ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

915135

PHASE I INVESTIGATION

BERN METALS, SITE NUMBER 915135 CITY OF BUFFALO, ERIE COUNTY

September 1989



Prepared for:

New York State Department of Environmental Conservation 50 Wolf Road, Albany, New York 12233 Thomas C. Jorling, Commissioner

Division of Hazardous Waste Remediation Michael J. O'Toole, Jr., P.E., Director

Prepared by:

Ecology and Environment Engineering, P.C.

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EXECUTIVE SUMMARY

1.1 SITE BACKGROUND

The Bern Metals Company site (Bern Metals) is a former metals waste handling facility located at 22 Bender Street in the City of Buffalo, Erie County, New York (see Figure 1-1). Bern Metals, Inc., was primarily engaged in the buying and selling of scrap metals. The former owner and president, Mr. Bernard Arwitz, is deceased and the facility is no longer in use.

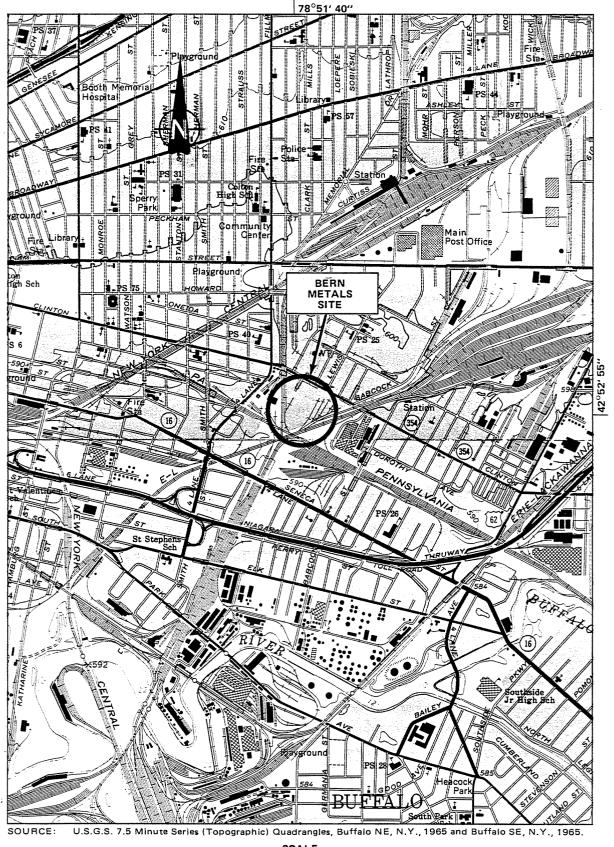
The site comprises approximately 6 acres and consists of a scale house and large storage building, numerous piles of scrap metals and solids, and approximately 200 drums. The site is bordered on the south and the east by a railroad, on the west by a manufacturing plant, and on the north by a residential area. A drainage ditch extends along the southern border (see Figure 1-2).

1.2 PHASE I EFFORTS

On July 15, 1987, Ecology and Environment, Inc. (E & E) conducted a site inspection in support of this investigation. Prior to the inspection, available federal, state, county, and municipal files were reviewed. The site inspection consisted of a visual survey of the property that included:

- Overall site conditions;
- Description of vegetation and a survey for stressed vegetation;

recycled paper



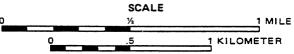
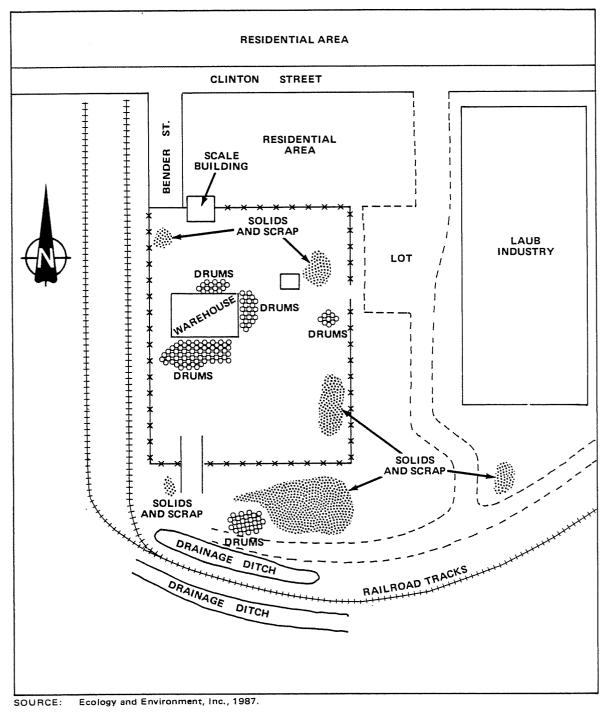


Figure 1—1 LOCATION MAP



NOT TO SCALE

Figure 1-2 SITE MAP - BERN METALS

- o Presence of structures on the site;
- o Distance to nearest residence;
- o Location of nearest agricultural land;
- o Visual delineation of waste disposal areas;
- o Air quality survey using an HNu photoionizer; and
- o Photodocumentation of the site.

All observations were recorded in a field logbook and in the United States Environmental Protection Agency Site Inspection Report form.

1.3 ASSESSMENT

The site contains approximately 200 drums, many which contain solids that have spilled onto the ground. There are also numerous piles of green, blue, and gray granular material.

The site is surrounded by a 6-foot-high chain link fence which has numerous openings. At the time of the inspection, the back portion of the site was not fenced and is near the New York Central and Erie Lackawanna railroad tracks. The scale building, located at the front of the site on Bender Street, was also open and provides access to the site and waste materials. Subsequently, EPA contractors installed new and repaired existing fencing (May 1988). However, NYSDOH reported in November 1988 that the fence gate at the back of the site was open and the lock appeared to be broken.

Analytical results from past sampling efforts at the site indicate high concentrations of heavy metals, including lead, copper, chromium, and arsenic in soils. Past analysis was limited only to metals, and it is unknown if any other contaminants exist. The extent of contaminant migration is also unknown. Air samples collected by the EPA on May 31, 1988 were well below permissible exposure limits.

The background information indicates that the former operations included the burial of wastes and the incineration of automotive battery cases (Nosenchuck 1987).

1.4 HAZARD RANKING SYSTEM SCORE

A preliminary application of the Hazard Ranking System (HRS) has been made to quantify the risk associated with this site. As the Phase I investigation is limited in scope, not all the information needed to fully evaluate the site is available. An HRS score was completed on the basis of the available data. Absence of necessary data may result in an unrealistically low HRS score.

Under the HRS, three numerical scores are computed to express the site's relative risk or damage to the population and the environment. The three scores are:

- o S_M reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility by routes involving groundwater, surface water, or air. It is a composite of separate scores for each of the three routes (S_{GW} = groundwater route score, S_{SW} = surface water route score, and S_A = air route score).
- o SFE reflects the potential for harm from substances that can explode or cause fires.
- o S_{DC} reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

The preliminary HRS score was:

$$S_M = 2.48$$
 $(S_{GW} = 3.97; S_{SW} = 1.61; S_A = 0)$

 $S_{FF} = Not scored$

 $S_{DC} = 62.50$

2. PURPOSE

This Phase I investigation was conducted under contract to the NYSDEC Superfund Program. The purpose of the investigation was to provide a preliminary evaluation of the potential hazardous waste present at the site, to estimate the potential pollutant migration pathways leading off site, and to determine the natural resources or extent of the human population that might be affected by the pollutants. This initial investigation consisted of conducting a detailed file review of available information and a site inspection. The evaluation includes preparation of a narrative site description, initial characterization of the hazardous substances on site, and calculation of a preliminary HRS score. This assessment will be used to determine what additional actions, if any, should be conducted at the site.

3. SCOPE OF WORK

The Phase I effort involved the following tasks:

- A review of available information from state, county, municipal, and private files;
- Interviews with individuals knowledgeable of the site; and
- Physical inspection of the site that included review of USGS
 7.5-minute topographic maps. No samples were collected,
 although air monitoring was performed using an HNu photoionizing organic vapor detector.

Photographs were taken during the site inspection and are included in Appendix A. Table 3-1 lists sources contacted for the Phase I investigation. References are included in Section 7.

Table 3-1

SOURCES CONTACTED FOR THE NYSDEC PHASE I INVESTIGATION AT THE BERN METALS SITE

Agencies Contacted

U.S. Environmental Protection Agency Region II Office 26 Federal Plaza, Room 900 New York, New York 10278 Telephone No.: 212/264-8677 Contact: Ben Conetta

Date: 5/20/87

Information Gathered: File search for the Bern Metals site

New York State Department of Environmental Conservation, Region 9 Solid and Hazardous Waste 600 Delaware Avenue Buffalo, New York 14202 Telephone No.: 716/847-4585 Contact: Lawrence Clare Date: 4/29/87, 5/22/87 Information Gathered: Analytical results, background

Information Gathered: Analytical results, background information

New York State Department of Environmental Conservation, Region 9 Division of Fish and Wildlife 600 Delaware Avenue Buffalo, New York 14202 Telephone No.: 716/847-4550 Contact: Jim Farquar Date: 8/26/87 Information Gathered: Floodplains, significant habitats, fisheries resources, plant species of concern, wetlands in vicinity of Bern Metals site

State of New York Department of Health Corning Tower
The Governor Nelson A. Rockefeller Empire State Plaza
Albany, New York 12237
Telephone No.: 518/458-6310
Contact: Lani Rafferty
Date Contacted: April 5, 6, 1989
Information: File search for site history, correspondence, background information.

New York State Department of Health
584 Delaware Avenue
Buffalo, New York 14202
Telephone No.: 716/847-4365
Contact: Linda Russen, Cameron O'Connor
Date: 7/21/87, 4/13/89
Information Gathered: File search on the Bern Metals site

Erie County Department of Environmental Planning 95 Franklin Avenue Buffalo, New York 14202 Telephone No.: 716/846-6370 Contact: Kermit Studley Date: 6/26/87

Information Gathered: File search for Bern Metals background

information

United States Department of Agriculture (USDA) Soil Conservation Service 21 South Grove Road East Aurora, New York 14731 Telephone No.: 716/655-1210 Contact: John Whitney Date: 8/25/87

Information Gathered: Agricultural district lands and distance to productive prime agricultural lands

City of Buffalo, City Hall Real Property Assessor 65 Niagara Street Buffalo, New York Telephone No.: 716/851-5261 Contact: Tax Assistant

Date: 6/26/87

Information Gathered: Property ownership history

Erie County Department of Health 95 Franklin Street Buffalo, New York 14202 Telephone No.: 716/846-7677 Contact: Mr. Cotrella Date Contacted: July 21, 1987 Information Gathered: Correspondence to NYS Dept. of Health

Interviews

Thomas Wojchiechowski Attorney for Gerald Arwitz Estate Telephone: 716/856-1344 Date: 7-13-87 Information Gathered: Permission for site entry

Mr. Stanley Noga 18 Bender Street Buffalo, New York Telephone No.: 716/847-6118 Date: 7-15-87

Mrs. Marilyn Kraus 1037 Clinton Avenue Buffalo, New York Telephone No.: 716/856-4763 Date: 7-15-87

4. SITE ASSESSMENT

4.1 SITE HISTORY

The Bern Metals site is an abandoned metal-waste reprocessing/ recycling industry which is situated on 6 acres of land at 22 Bender Street in the City of Buffalo, Erie County, New York.

A review of the City of Buffalo tax records indicated that the property was purchased by Bern Metals, Inc., in 1956. Bern Metals, Inc. was primarily engaged in buying and selling scrap metals. Mr. Bernard Arwitz purchased Bern Metals, Inc., in 1981 (City of Buffalo 1987).

The first information indicating possible environmental problems at the site surfaced in September 1978, when the Erie County Department of Environment and Planning (ECDEP) received a complaint that transformer oil was being dumped along the railroad right-of-way. ECDEP responded and discovered no spilled oil, but did find a blue, chalk-like material. Samples were collected and analyzed. The results indicated the samples contained copper sulfate, chromium, and zinc (O'Connor 1983).

In 1979, the Interagency Task Force Report on Hazardous Waste reported that Bern Metals, Inc., transported copper sludge, lead sulfate sludge, and chromium hydroxide from Buffalo Color and Allied Specialty Chemical Division (O'Connor 1983).

On October 20, 1979, ECDEP received a complaint of flat-bed trucks dumping 55-gallon drums on the property. An ECDEP inspection revealed drums on the site which contained a blue chemical that was soluble in water with no reaction. A letter from the company advised

ECDEP that they commonly received scrap metal in drums and that the only chemicals on the premises were copper sulfate and copper sulfide, which they sold for the reclamation of its copper content (0'Connor 1983).

On August 18, 1982, ECDEP received a complaint of smoke coming from a drum at the Bern Metals Howard Street facility which, upon investigation, proved to be steam from a reaction between aluminum grinding sludge and water (O'Connor 1983). These drums were later removed to Bender Street (O'Connor 1983).

On December 14, 1982, ECDEP received a complaint of drums being placed adjacent to the fence and the burning of wire and oil. The ECDEP inspection revealed empty automotive battery cases and acid sludge outside of the fence line. ECDEP required a cleanup, which was conducted (O'Connor 1983).

On April 6, 1983, ECDEP received a complaint of blue material on the ground behind Bern Metals by Sherry Margolis, a reporter for Channel 7 news. Channel 7 had received a complaint by a resident of the area that a child had walked through waste on the site. ECDEP collected liquid and soil samples from the site which indicated elevated levels of copper, iron, lead, and zinc. The lead concentration in the soil sample was found to be 260,000 ppm (26%). A report was given to the Erie County Health Department (ECHD) (Clare 1983).

ECHD notified the New York State Department of Health (NYSDOH) in a letter dated April 18, 1983, which advised that the exposure be further evaluated through blood testing and tests conducted in the houses of those residents whose children had walked through material at the site (Barry 1983).

On April 21, 1983, a complaint was received by ECDEP alleging that a blue substance was running off the surface of the Bern Metals site onto a property located at 1041 Clinton Street. An investigation by ECDEP revealed no evidence of runoff, vegetative stress, or odors (O'Connor 1983).

A complaint was received by ECDEP on April 24, 1983, which alleged that a drum labeled "Flammable Industrial Waste" was dumped on the Bern Metals site. The investigation revealed that a drum containing leather dye was located behind Laub Industries and was subsequently removed and placed inside the Laub Industries building. A

sample of leather dust was also collected from behind Laub Industries and analyzed for chromium. The result was 1.0 ppm (O'Connor 1983).

A complaint was received by ECDEP on April 27, 1983 which claimed that transformers and batteries were stored along the property at 1045 Clinton Street. An investigation found no evidence of batteries, oil, or transformers (O'Connor 1983).

On June 27, 1983, ECDEP performed a site inspection to determine site conditions. They noted piles of scrap metals, drums, crushed battery casings, and sludges. They also conducted tests on site to determine the depth of stained soil and nature of soil. The depth was found to be approximately three inches, underlain by tan clay in some areas and rubble in others (O'Connor 1983).

On April 11, 1984, ECDEP performed a site inspection and found numerous drums and piles of solid wastes and sludges. Also found was a strip of red solid material located west of the site adjacent to the Conrail tracks. It was noted that green granular material had migrated from the site into a drainage ditch at the south side of the site (O'Connor 1983).

On March 21, 1987, NYSDEC collected a soil sample. Subsequent analysis revealed elevated metals concentrations including lead (8.3%), copper (7.4%), chromium (2,500 ug/g), and arsenic (4 ug/g) (NYSDEC 1987a).

On April 22, 1987, the City of Buffalo, Department of Inspections and Community Revitalization, conducted an inspection which found the site in general disrepair and constituting a "definite health and safety hazard to the residents in the community." A notice of violation was filed on April 24, 1987, against Gerald Arwitz, executor of the property, as the former owner. Bernard Arwitz was deceased and the company had suspended operations (City of Buffalo, Department of Inspections and Community Revitalization 1987).

Ecology and Environment, Inc. (E & E) performed a site inspection on July 15, 1987. Approximately 200 drums were observed on site, many open with spilled contents. There were also numerous piles of blue, grey, and green solids, scrap metals, wire, and battery cases (E & E 1987).

Residents interviewed alleged that children frequently play on the site (Kraus 1987). Access to the site is possible through the scale building or through a number of openings in the perimeter fence. Materials on the south side of the site near the Conrail tracks are not surrounded by the perimeter fence. No warning signs existed at the site (E & E 1987).

On March 19 and 20, 1987, NYSDEC, Region 9, collected one sample from the Bern Metals site to confirm DEP sampling results from April 1983 and to determine if the waste was hazardous. The results were similar to those obtained by DEP and the sample failed the EP toxicity test for lead (Clare 1987).

On September 10, 1987, NYSDEC Central Office requested that the EPA provide funding pursuant to the Superfund Amendments and Reauthorization Act of 1986 to perform a removal action including securing the site and waste removal (Nosenchuck 1987). On June 21, 1988, EPA, Region II, Response and Prevention Branch, issued a Pollution Report which stated that Allied fence secured the site by installing over 1,700 feet of chain-link fence and by repairing the existing fence. In addition, EPA contractors posted warning signs and collected air samples. The sample results were well below permissible exposure limits (EPA 1988).

On November 2, 1988, NYSDOH Central Office reported that during inspection of the site, the fence gate at the rear of the site was open and the lock appeared to be broken (Rafferty 1988).

4.2 SITE TOPOGRAPHY

The Bern Metals site is located on the Erie-Ontario Lowlands approximately 1-1/2 miles east of Lake Erie and approximately 1 mile north of the Buffalo River in the City of Buffalo, Erie County, New York. The Erie-Ontario Lowlands are primarily flat with little relief. The site elevation is approximately 600 feet above mean sea level (USGS 1965).

A residential area exists north and adjacent to the site. East of the site is a manufacturing plant. West and south of the site are two sets of railroad tracks with ditches running alongside of them.

4.2.1 Soils

The soil type in the site vicinity has been identified as an urban land-Schoharie Complex. This soil type is characterized as deep, well-drained silty clay or silty loam soils. It is not considered prime agricultural soil (USDA SCS 1986).

The nearest prime agricultural land in production is greater than 2 miles from the site (Whitney 1987).

4.2.2 Wetlands

Several state- and federally designated wetlands are located near the Bern Metals site. The state wetlands are 12.4 acres or more in size while the federal wetlands are as small as 0.5 acres.

Three state wetlands are located 2.4 miles south of the site. The largest is the Tifft Farm Wetlands, designated BU-15, which is 95 acres in size and is a Class I wetland. This wetland also constitutes the Tifft Farm Nature Preserve, a federally designated wetland. The wetland is also considered a significant coastal fish and wildlife habitat area (Farquar 1987).

The Republic Steel Wetland, BU-1, is 50 acres in size, is a Class I wetland, and is composed of a number of long, thin ponds located between sections of railroad tracks. One of these ponds is also a federally designated wetland (Farquar 1987).

The third state-designated wetland is the Tifft Street Wetland, BU-7, which is 20 acres in size, is a Class II wetland, and is also a federally designated wetland (Farquar 1987).

In addition to the above-mentioned federally designated wetlands, there are a cluster of wetlands located in the same general area and extending south to South Park. The Buffalo River and a cluster of small wetlands located 1.5 miles east of the site also are federally designated wetlands (Farquar 1987).

4.2.3 Surface Waters

The nearest surface water is the Buffalo River which is located 1 mile south of the site and flows east to west, eventually emptying into Lake Erie. The Buffalo River has had a history of pollution problems including contamination by heavy metals and PCBs from point and non-point discharges (Niagara River Toxics Committee 1984).

The site drainage appeared to flow south to the ditch running parallel to the railroad tracks and emptying into a storm sewer.

4.2.4 Land Use

The site is located in a mixed suburban-industrial area. Directly north and adjacent to the site is a residential area containing

recycled paper

approximately nine residences. East of the site is Laub Industries' manufacturing plant. West and south of the site are a series of railroad tracks, and farther southwest is a trucking company (E & E 1987).

4.2.5 Critical and Sensitive Habitats

NYSDEC has not identified any critical or sensitive habitats other than the Tifft Farm Nature Preserve (Farquar 1987).

4.3 SITE HYDROLOGY

4.3.1 Regional Geology and Hydrogeology

The Bern Metals site lies within the Erie-Niagara basin and the Erie-Ontario Lowland physiographic province. The overburden in Erie County consists mainly of glacial till, an unconsolidated poorly sorted mix of clay, silt, and/or sand. It forms a thin mantle over the bedrock and exhibits low permeability. The region between the Onondaga Escarpment to the north and the hilly areas to the south also received lacustrine clay and silt deposits during late Pleistocene time from the larger ancestral Great Lakes. These deposits exhibit very low permeabilities. As the ancestral lakes retreated, sandy beach sediments were also deposited in this region. These deposits exhibit relatively high permeabilities (Buehler and Tesmer 1963).

The bedrock in the region is exclusively sedimentary. The shale, limestone, and dolomite units dip gently southward approximately 40 feet per mile. Although the bedrock dips southward, the land surface is flat or actually increases in elevation to the south. Therefore, the farther south the location, the younger the underlying bedrock (LaSala 1968).

Up to 32 distinct bedrock members have been identified in Erie County (see Figure 4-1). The oldest unit, Silurian in age, underlying the northern part of the county is the Camillus Shale. This member, which is 30 to 100 feet thick, contains significant reserves of groundwater in cavities formed by the dissolution of gypsum (LaSala, 1968).

Several limestone members also of Silurian age overlie the Camillus Shale. The Bertie limestone, approximately 50 feet thick, overlies the Camillus Shale and is in turn overlain by the Akron Dolomite, which is about 8 feet thick. Little record of latest

System	Series	Group	Formation	Thickness	Section	
3,3tc	Jeries	Giosp	Tomation	feet	Jet.tron	
		Conneaut Group of Chadwick (1934)		500		Shale, siltstone, and fine-grained sandstone. โดย is missing in area.
		Canadaway Group of Chadwick (1933)	Undivided .	600		Gray shale and sritstone, interbodded. (section broken to save space) ~
	Upper		Perrysbury	400- 450		Gray to black shule and gray siltstone containing many zones of calcareous contretions, Lower 100 feet of formation is office-gray to black shale and interbedded gray shale containing shally concretions and pyrite.
Devonian	ld		Java	90- 115		Greenish-gray to black shale and some interbedded limestone and zones of calcareous nodules. Small masses of pyrite occur in the lower part.
Devo			West Falls	400- 520		Black and gray shale and light-gray siltstone and sandstone. The lower part is petroliferous. Throughout the formation are numerous zones of calcareous concretions, some of which contain pyrite and marcasite.
			Sonyea	45-85		Olive-gray to black shale.
			Genesee Moscow	10-20		Dark-gray to black shale and dark-gray limestone. Reds of nodular pyrite are at base.
			Shale Ludlowville	12-55		Gray, soft shale. Gray, soft, fissile shale and limestone beds
	9	Hamilton	Shate Skaneateles	65-130		at top and bottom. Olivergray, gray and black, fissile shale and some calcareous
	Middle		Shale Marcellus	60-90		beds and pyrite. Gray limestone, about 10 feet (bick is at the base.
		<u>.</u>	Shate Onondaga	30 55		Black, dense fissile shale.
		Unconformity	Limestone	108		Gray limestone and cherty limestone.
			Akron Dolomite	8		Greenish-gray and buff fine-grained dolomite.
Silurian	Саунда	Salina	Bertie Limestone	50-60		Gray and brown dolomite and some interbedded shale.
			Camillus Shate	400		Gray, red, and green thin-bedded shale and massive mudstone Gypsim occurs in beds and lenses as much as 5 feet thick. Subsidiace information indicates dolomite (or perhaps, more currectly, magnessine-line mudrock) is interbedded with the shale (shown schematically in section). South of the outcop area, at depth, the formation confains thick salt beds.
	Niagara		Lockport Dolomite	150		Dark-gray to brown, massive to thin-bedded dolomite, locally containing alignt reef and gypsim nodules. At the base are high-typay timestone (Gosport Limistone Member) and gray shally dolomite (DeCew Limestone Member).
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Figure 4-1 BEDROCK UNITS OF THE ERIE-NIAGARA BASIN

ecology and environment

Silurian or Early Devonian history is preserved in Western New York. However, the Middle and Late Devonian record is well preserved beginning with the Onondaga Limestone unconformably overlying the Akron Dolomite. The unit comprises three distinct members that cumulatively are approximately 140 feet thick (Buehler 1966).

The Marcellus Shale member overlies the limestone units. This dense, black, fissile shale is approximately 30 to 55 feet thick. This shale, unlike the Camillus Shale, is impermeable. It confines the limestone and Camillus Shale aquifers below (LaSala 1968).

The Skaneateles Formation overlies the Marcellus Shale. This 60-to 90-foot-thick formation is represented by the Stafford Limestone and Levanna Shale. The black, fissile shale is expected to be impermeable and will therefore confine groundwater found in the lower limestone units (Buehler 1966).

Overlying the Skaneateles is the Ludlowville formation represented by the Centerfield Limestone, Ledyard Shale, Wanakah Shale, and Tichenor Limestone members. The shale members contain numerous limestone beds. The Ludlowville Formation is followed by the Moscow Formation represented by the Kashong shale and Windom shale. The Moscow Formation is followed by 2,500 feet of upper Devonian rocks in southwestern New York State consisting of the Genesee, Sonyea, West Falls, Java, Canadaway, Chodakoin, and Cattaraugus formations. These consist almost exclusively of shale members. The Canadaway formation is by far the thickest (up to 1,000 feet) and underlies the southern third of Erie County (LaSala, 1968).

Significant amounts of groundwater occur only in the overburden and in the lower bedrock units. The Camillus shale contains numerous cavities formed by the dissolution of gypsum and is thus a very productive aquifer. The Onondaga, Akron, and Bertie Dolomite and limestones contain water in bedding joints widened by dissolution. Vertical fractures in the limestone provide hydraulic connections among the many bedding planes (LaSala 1968).

Very little groundwater is found in the formations above the limestone unit. These formations, principally shale, are impermeable. Some water transmission occurs in small fractures in the bedrock, but no wells of significant yield are found in these units. Groundwater in these regions is obtained mainly from glacial overburden deposits (LaSala, 1968).

4.3.2 Site Hydrogeology

The United States Geological Survey (USGS) drilled four test borings on the Houdaille Industries - Manzel Division site (NYSDEC No. 915037) located 1,500 feet to the east. The test borings extended to a maximum depth of 6.5 feet. At each location, clay was encountered at approximately 4 feet. The bedrock was reported at 20 feet below the land surface (Koszalka 1985). No other data exists concerning the site hydrogeology.

The permeability of the bedrock deposits will depend upon fracturing, weathering, and the solution features of the rock beneath the site. To more accurately determine the site hydrology, extensive subsurface investigations would have to be performed, including the installation of monitoring wells in upgradient and downgradient locations on the site.

For purposes of the HRS scoring, the aquifer of concern is considered to be perched groundwater on top of the bedrock in the overburden.

4.3.3 Hydraulic Connections

No specific information regarding hydraulic connections is available other than that groundwater transport in the bedrock is most readily through the vertical joints (LaSala 1968). The downward migration of flow of groundwater may be impeded by the presence of glacial deposits, but there is insufficient data to adequately assess the hydraulic gradients and dominant flow patterns.

4.4 SITE CONTAMINATION

A number of soil samples and one surface water sample were collected from the site. Table 4-1 presents a summary of the samples collected by ECDEP and the analytical results. Table 4-2 is a summary of a sample collected by NYSDEC and the analytical results.

The data indicates that the site contains high concentrations of lead, copper, chromium, and arsenic. The background information indicates that the first three contaminants probably exist as lead sulfate, elemental lead, copper sulfate, copper sulfide, and chromic hydroxide. The extent of contamination, both vertically and over the ground surface, is unknown. It is likely that contaminants have migrated off site via windblown dust and surface runoff.

Table 4-1

ERIE COUNTY DEPARTMENT OF ENVIRONMENT AND PLANNING BERN METALS SITE SAMPLING RESULTS

Sample Deint A Dive Cal	id Motomiol
Sample Point A - Blue Sol	ia Mareriai
Parameter	Result
Sulfate	110.0 ppm
Chromium	4.8 ppm
Copper	47.0 ppm
Zinc	0.91 ppm
April 6, 1983	
Sample Point B	
Parameter	Result
Copper	1,906 ppm
Iron	8,518 ppm
Lead	260,000 ppm
Zinc	1,114 ppm
April 6, 1983	
Sample Point C - Liquid	
Parameter	Result
Copper	12,600 ppm
Iron	1,730 ppm
Lead	1,000 ppm
Zinc	406 ppm

Source: Erie County Department of Environment and Planning 1983.

Table 4-2

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION SOIL SAMPLE ANALYTICAL RESULTS, BERN METALS SITE MAY 22, 1987

Parameter	Concentration (ug/g dry)
Antimony	13.0
Arsenic	41.0
Beryllium	<0.57
Ca dm i um	4.0
Chromium	2,500.0
Copper	74,000.0
Lead	83,000.0
Nickel	420.0
Mercury	2.3
Selenium	<1.7
Silver	<1.2
Thattium	<0.57
Zinc	840.0

Source: New York State Department of Environmental Conservation 1987.

On March 19 and 20, 1987, NYSDEC, Region 9, collected one sample from the Bern Metals site to confirm DEP sampling results from April 1983 and to determine if the waste is hazardous (see Table 4-2). The results were comparable to DEP findings. In addition, the sample failed the EPA toxicity test for lead.

The major contaminants identified thus far primarily attack the skin, respiratory system, and liver (NIOSH 1985). The compounds are relatively nonignitable, compatible, and unreactive under the site conditions (Merck 1976). The contaminants are elements, and therefore are persistent.

The previous efforts did not address possible contamination by organic compounds. A complaint lodged on September 20, 1978, with ECDEP alleged that transformer oils were dumped near the site. This complaint suggests the possibility of polychlorinated biphenyls (PCBs) existing at the site.

Air monitoring for volatile organics was conducted during E & E's site inspection with an HNu photoionizing detector and no readings above background were noted. Air samples collected by EPA on May 31, 1988 were well below the permissible exposure limit (EPA 1988).

Further sampling and analysis of the site should be conducted to further assess the nature and extent of the site contamination. This is addressed in Section 6.

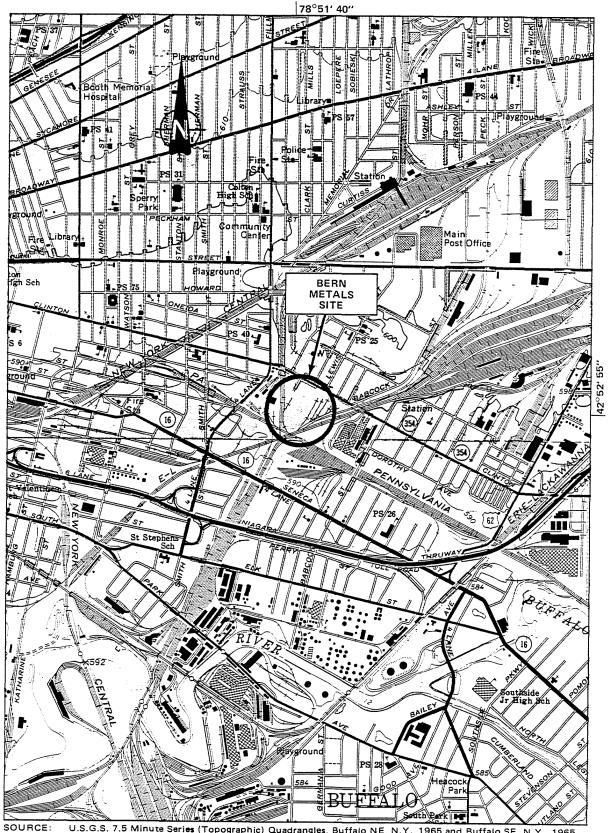
5. PRELIMINARY APPLICATION OF HAZARD RANKING SYSTEM

5.1 NARRATIVE SUMMARY

The Bern Metals site encompasses approximately 6 acres in the City of Buffalo, Erie County, New York. The property was purchased by Bern Metals, Inc. in 1956. Since 1981, the Bern Metals facility was used by the owner, Mr. Bernard Arwitz, to buy and sell scrap and waste metals and metal compounds. The site currently contains approximately 200 drums and several waste piles. Mr. Arwitz is now deceased and the facility is not in operation.

Past sampling and analytical results indicate the site is contaminated with heavy metals.

The site is located approximately 1-1/2 miles east of Lake Erie and 1 mile north of the Buffalo River. A residential area exists north and adjacent to the site. Approximately 21,942 people are located within one mile of the site (GEMS 1987). Groundwater is not used for drinking in the area, and surface water intakes are greater than 2 miles from the site.



U.S.G.S. 7.5 Minute Series (Topographic) Quadrangles, Buffalo NE, N.Y., 1965 and Buffalo SE, N.Y., 1965.

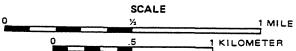


Figure 5-1 LOCATION MAP

FIGURE 1

HRS COVER SHEET

Fa	acility Name:Bern Metals
Lo	ocation: 22 Bender Street, Buffalo, New York, Erie County
EF	PA Region:II
Pe	erson(s) in Charge of Facility: Gerald Arwitz - Estate Executor
	100 Claremont
	Kenmore, New York 14223
- Na	ame of Reviewer: A. Mark Sienkiewicz Date: July 17, 1987
Ge	eneral Description of the Facility:
S	For example: landfill, surface impoundment, pile, container; types of hazardous ubstances; location of the facility; contamination route of major concern; types of information needed for rating; agency action; etc.)
	A former metals and battery recycling industry. Received aluminum, copper sulfate, batteries, and unknown materials. Soil samples and one surface water sample collected by ECDEP contained high concentrations of lead, copper, chromium, and arsenic. Lead in one sample was 260,000 ppm or 26 percent. Children from neighborhood play in exposed material. Site was secured in May 1988 by an EPA contractor; however, in November 1988, NYSDOH reported that the back gate was open and the lock was broken during an inspection conducted on October 20, 1988.
Sc	cores: $S_M = 2.48$ ($S_{gw} = 3.97$ $S_{sw} = 1.61$ $S_a = 0$)
	SFE = Not scored
	$S_{DC} = 62.50$

Ground Water Route Work Sheet Assigned Value Max. Multi-Ref. Score Rating Factor (Circle One) plier Score (Section) 1 Observed Release , 45 (0)3.1 1 45 0 If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line [2]. 2 Route Characteristics 3.2 0 1 2 (3) Depth to Aquifer of Concern 2 **Net Precipitation** Permeability of the 2 3 **Unsaturated Zone** 0 (1) 2 3 1 3 Physical State **Total Route Characteristics Score** 15 11 3 0 1 2 (3) Containment 1 3 3 3.3 **Waste Characteristics** 3.4 Toxicity/Persistence 18 18 Hazardous Waste 8 Quantity **Total Waste Characteristics Score** 23 26 5 Targets 3.5 9 **Ground Water Use** 3 Distance to Nearest 40 0 Well/Population Served **Total Targets Score** 49 3 6 If line 1 is 45, multiply 1 x 4 x 5 is 0, multiply $2 \times 3 \times 4 \times 5$ If line 1 ,227 57,330 7 Divide line [6] by 57,330 and multiply by 100 Saw -3.97

FIGURE 2
GROUND WATER ROUTE WORK SHEET

<u> </u>	Surface Water Route Work Sheet								
	Rating Factor			ed Value e One))	Multi- plier	Score	Max. Score	Ref. (Section)
	Observed Release	(0	4	5	1	0	45	4.1
	If observed release is								
2	Route Characteristics Facility Slope and Int	ervening (① 1 2	3		1	0	3	4.2
	1-yr. 24-hr. Rainfall Distance to Nearest Water	Surface	0 1 2	3		1 2	2 2	3 6	
	Physical State		0 ① 2	3		1	1	3	
		Total R	loute Chi	aracteris	tics Score		5	15	
3	Containment		0 1 2	3		1	3	3	4.3
4	Waste Characteristics Toxicity/Persistence Hazardous Waste Quantity		0 3 6 0 1 2		5 (18) 5 (8 7 8	1	18 5	18 8	4.4
		Total W	/aste Ch	aracteris	tics Score		23	26	
5	Targets Surface Water Use Distance to a Sensitive Environment Population Served/Disto Water Intake Downstream		0 (1) 0 1 0 4 18 24 30	2 3 2 3 6 8 18 20 32 35	10	3 2	3 0 0	9 6 40	4.5 .
			Total Tar	gets Sco	re		3	55	
_		ply 1 x ly 2 x 3					1,035	64,350	
7	Divide line 6 by 64,3	350 and mul	tiply by 1	100	,	S _{sw} =	1.61		

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

	Air Route Work Sheet									
	Rating Factor		Assigned Value Multi- (Circle One) Plier Sco			Score	Max. Score	Ref. (Section)		
1	Observed Release	0)	4	5		1	0	45	5.1
	Date and Location:									
	Sampling Protocol:									
		S _a = 0. Enter on proceed to li								
2	Waste Characteristics Reactivity and	0	1 2	3	•		1		3	5.2
	Incompatibility Toxicity	0	1 2	3			3	•	9	
	Hazardous Waste Quantity	Ō	1 2	3 4	5 6	7 8	1		8	
		•	•	***	**************************************			dan sa wajayaa wa p He		
		Total Wa	ste Cha	aracteri	stics Sc	core			20	
3	Targets	_								5.3
	Population Within 4-Mile Radius	} 0 21	9 12 24 27	15 18 30	¥.		1		30	
	Distance to Sensitive Environment	. 0	1 2	3			2		6	
	Land Use	0	1 2	3			1		3	•
							-			
					•					
		To	tal Țar	gets S	core				39	
4	Multiply 1 x 2	× 3							35,100	
5	5 Divide line 4 by 35,100 and multiply by 100 Sa = 0									

FIGURE 9
AIR ROUTE WORK SHEET

• • • • • • • • • • • • • • • • • • •	s	S ²
Groundwater Route Score (Sgw)	3.97	15.77
Surface Water Route Score (S _{SW})	1.61	2.59
Air Route Score (Sa)	0	0
$s_{gw}^2 + s_{sw}^2 + s_a^2$		18.36
$\sqrt{s_{gw}^2 + s_{sw}^2 + s_a^2}$		4.29
$\sqrt{s_{gw}^2 + s_{sw}^2 + s_a^2} / 1.73 = s_M =$		2.48

FIGURE 10 WORKSHEET FOR COMPUTING S_M

Fire and Explosion Work Sheet										
Rating Factor	Α	ssign (Circi			0		Multi- plier	Score	Max. Score	Ref. (Section)
Containment	. 1				3		1		3	7.1
Waste Characteristic Direct Evidence Ignitability Reactivity Incompatibility Hazardous Waste Quantity	0 0 0 0	1 2	3	4	5 6	. 78	1 1 1 1		3 3 3 8	7.2
	Total Was	te Ch	arac	teri	stics	Score		-	20	
Targets Distance to Nearest Population Distance to Nearest Building Distance to Sensitiv Environment Land Use Population Within 2-Mile Radius	0	1 2 1 2 1 2 1 2 1 2	3 3	4	5		1 1 1 1		5 3 3 5	7.3
Buildings Within 2-Mile Radius	0	1 2	3	4	5	•	1	·	5	
	Tot	al Tạr	gets	Sc	ore				24	
Multiply 1 x 2	4 Multiply 1 x 2 x 3 1,440									
5 Divide line 4 by 1,440 and multiply by 100 SFE - Not scored										

FIGURE 11
FIRE AND EXPLOSION WORK SHEET

Direct Contact Work Sheet						
	Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)
1	Observed incident	① 45	1	0	45	8.1
	If line 1 is 45, proceed if line 1 is 0, proceed t					
2	Accessibility	0 1 2 3	1	3	3	8.2
3	Containment	0 (15)	1	15	15	8.3
1	Waste Characteristics Toxicity	0 1 2 3	5	15	15	8.4
5	Targets Population Within à 1-Mile Radius	0 1 2 3 4 (5)	4	20	20	8.5
	Distance to a Critical Habitat	① 1 2 3 .	4	0	12	
	·	Total Targets Score		20	32	
	If line 1 is 45, multiply If line 1 is 0, multiply 2	1 × 4 × 5 2 × 3 × 4 × 5	1	3,500	21,600	
7						

FIGURE 12
DIRECT CONTACT WORK SHEET

DOCUMENTATION RECORDS FOR

	HAZARD RANKING SYSTEM
Instructions:	As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference. Include the location of the document.
Facility Name:	Bern Metals
Location:	22 Bender Street, Buffalo, Erie County, New York
Date Scored:	July 17, 1987
Person Scoring:	A. Mark Sienkiewicz
Primary Source(NYSDEC Region ECDEP Site Inspecti	
Factors Not Scc	red Due to Insufficient Information:
Comments or Qua Fire and Expl marshal.	lifications: Dision not scored as site has not been declared a fire hazard by a fire .
	,

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GROUNDWATER ROUTE

OBSERVED RELEASE Contaminants detected (3 maximum): None reported Rationale for attributing the contaminants to the facility: 2. ROUTE CHARACTERISTICS Depth to Aquifer of Concern Name/description of aquifer(s) of concern: Perched aguifer in unconsolidated deposits: Ref. No. 13 Depth(s) from the ground surface to the highest seasonal level of the saturated zone (water table(s)) of the aquifer of concern: 20 feet Ref. Nos. 13 (well 255-850-1), 19 Depth from the ground surface to the lowest point of waste disposal/storage: Estimate 6-8 feet Ref. No. 7 Net Precipitation Mean annual or seasonal precipitation (list months for seasonal): 36 in/yr Ref. No. 1 Mean annual lake or seasonal evaporation (list months for seasonal): 27 in/yr Ref. No. 1 Net precipitation (subtract the above figures):

36 - 27 = 9 in/yr Ref. No. 1

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Urban land - Schoharie Complex Ref. No. 2

Permeability associated with soil type:

 1.41×10^{-4} to 4.24×10^{-4} cm/sec Ref. No. 2

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Wastes observed were solids, unconsolidated and unstabilized Ref. No. 7 $\,$

* * *

3. CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No containment observed Ref. No. 7

Method with highest score:

No containment

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Copper, copper sulfate, copper sulfide, lead, lead sulfate, chromium hydroxide

Compound with highest score:

All compounds have toxicity ratings of 3 and persistence ratings of 3 $^\circ$ Ref. Nos. 15, 16

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (give a reasonable estimate even if quantity is above maximum):

400 cu. yds. Ref. Nos. 7, 22

Basis of estimating and/or computing waste quantity:

200 drums ÷ 4 = 50 cu. yds. 350 cu. yds. in piles Total 400 cu. yds. Ref. Nos. 7, 22

* * *

5. TARGETS

Groundwater Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Not used Ref. No. 6

Distance to Nearest Well

Location of nearest well drawing from $\underline{aquifer\ of\ concern}$ or occupied building not served by a public water supply:

>5 miles Ref. No. 6

Distance to above well or building:

NA

Population Served by Groundwater Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from $\underline{aquifer(s)}$ of concern within a 3-mile radius and populations served by each:

None Ref. No. 6

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

None Ref. No. 6

Total population served by groundwater within a 3-mile radius:

None Ref. No. 6

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SURFACE WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

None reported

Rationale for attributing the contaminants to the facility:

* * *

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

0-3% Ref. No. 7

Name/description of nearest downslope surface water:

Buffalo River 1 mile to south Ref. No. 5

Average slope of terrain between facility and above-cited surface water body in percent:

0-3% Ref. No. 5

Is the facility located either totally or partially in surface water?

No Ref. No. 7

Is the facility completely surrounded by areas of higher elevation?

No Ref. No. 7

1-Year 24-Hour Rainfall in Inches

2.1 in/yr Ref. No. 3

Distance to Nearest Downslope Surface Water

Buffalo River, 1 mile Ref. No. 5

Physical State of Waste

Unconsolidated, unstabilized solids Ref. No. 7

* * *

CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

No containment observed Ref. No. 7

Method with highest score:

None Ref. No. 7

4. WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Copper, copper sulfate, copper sulfide, lead, lead sulfate, chromium hydroxide

Compound with highest score:

All have toxicity and persistence ratings of 3 Ref. No. 16

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (give a reasonable estimate even if quantity is above maximum):

400 cu. yds. Ref. Nos. 7, 22

Basis of estimating and/or computing waste quantity:

200 drums ÷ 4 drums/cu. yd. = 50 cu. yds. 50 cu. yds. + 350 cu. yds. (piles) = 400 cu. yds. Ref. Nos. 7, 22

* * *

5. TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Buffalo River, with docking facilities. Moderately to heavily polluted. Industrial uses. Ref. Nos. 5, 7, 20

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```
No
Distance to a Sensitive Environment
Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:
  >2 miles
  Ref. No. 14
Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:
  1.5 miles, federal wetland
  Ref. No. 14
Distance to critical habitat of an endangered species or national wildlife refuge,
if 1 mile or less:
  >i mile
  Ref. No. 14
Population Served by Surface Water
Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile
(static water bodies) downstream of the hazardous substance and population served by
each intake:
  >3 miles
  Ref. No. 6
Computation of land area irrigated by above-cited intake(s) and conversion to popula-
tion (1.5 people per acre):
 NA
Total population served:
 NA
Name/description of nearest of above water bodies:
 NA
Distance to above-cited intakes, measured in stream miles:
 NA
```

Is there tidal influence?

AIR ROUTE

1. OBSERVED RELEASE

```
Contaminants detected:
```

No release detected with HNu
Air samples collected by USEPA on May 31, 1988 were well below permissible exposure limits.
Score = 0
Ref. Nos. 7, 24

Date and location of detection of contaminants:

NΑ

Methods used to detect the contaminants:

NA

Rationale for attributing the contaminants to the site:

NA

* * *

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

NA

Most incompatible pair of compounds:

NA

Toxicity

Most toxic compound:

Copper, lead, chromium Ref. Nos. 15, 16

Hazardous Waste Quantity

Total quantity of hazardous waste:

400 cu yds. Ref. Nos. 7, 22

Basis of estimating and/or computing waste quantity:

200 drums ÷ 4 = 50 cu. yds. 350 cu. yds. in piles Total = 400 cu. yds. Ref. Nos. 7, 22

* * *

```
3. TARGETS
```

Population Within 4-Mile Radius

```
Circle radius used, give population, and indicate how determined:
     0 to 4 mi
                      0 to 1 mi
                                       0 to 1/2 mi
                                                          0 to 1/4 mi
  21,942
 Ref. No. 4
Distance to a Sensitive Environment
Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:
 Ref. Nos. 14, 18
Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:
  1 mile
  Ref. Nos. 14, 18
Distance to critical habitat of an endangered species, if 1 mile or less:
  Ref. No. 14
Land Use
Distance to commercial/industrial area, if 1 mile or less:
  Adjacent
  Ref. No. 5
Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:
  Ref. No. 5
Distance to residential area, if 2 miles or less:
  Adjacent
  Ref. No. 5
Distance to agricultural land in production within past 5 years, if 1 mile or less:
  Ref. No. 21
Distance to prime agricultural land in production within past 5 years, if 2 miles
or less:
  NA
  Ref. No. 21
Is a historic or landmark site (National Register of Historic Places and National
Natural Landmarks) within the view of the site?
  No
  Ref. No. 17
```

FIRE AND EXPLOSION

```
1. CONTAINMENT
                                                                                 Not scored
   Hazardous substances present:
      Heavy metals
      Ref. No. 10
    Type of containment, if applicable
      No containment
      Ref. No. 7
2. WASTE CHARACTERISTICS
   Direct Evidence
    Type of instrument and measurements:
      NA
    Ignitability
    Compound used:
      NA
    Reactivity
    Most reactive compound:
      NA
    Incompatibility
    Most incompatible pair of compounds:
      NΑ
    Hazardous Waste Quantity
    Total quantity of hazardous substances at the facility:
      400 cu. yds.
Ref. Nos. 7, 22
    Basis of estimating and/or computing waste quantity:
      200 drums + 4 = 50 cu. yds.
      350 cu. yds. in piles
Total = 400 cu. yds.
      Ref. Nos. 7, 22
```

```
3. TARGETS
   Distance to Nearest Population
      Adjacent
     Ref. No. 5
   Distance to Nearest Building
     Ref. No. 5
   Distance to a Sensitive Environment
   Distance to wetlands:
      1 mile
      Ref. Nos. 14, 18
    Distance to critical habitat:
     Ref. No. 14
    Land Use
    Distance to commercial/industrial area, if 1 mile or less:
      Adjacent
      Ref. No. 5
    Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:
      Ref. No. 5
    Distance to residential area, if 2 miles or less:
      Adjacent
      Ref. No. 5
    Distance to agricultural land in production within past 5 years, if 1 mile or less:
      Ref. No. 21
    Distance to prime agricultural land in production within past 5 years, if 2 miles or
```

NA

less:

Ref. No. 21

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within the view of the site?

Ref. No. 17

Population Within 2-Mile Radius

84,520 Ref. No. 4

Buildings Within 2-Mile Radius

43,690 Ref. No. 4

DIRECT CONTACT

1. OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No confirmed direct contact incidents

* * *

2. ACCESSIBILITY

Describe type of barrier(s):

A 6-foot high fence exists around the site; however, during a NYSDOH inspection, the gate was reported open and the lock broken. Ref. Nos. 7, 23

• * *

CONTAINMENT

Type of containment, if applicable:

None Ref. No. 7

***** *

4. WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

Lead, lead sulfate, copper, copper sulfate, copper sulfide, chromium hydroxide, arsenic

Compound with highest score:

All scores = 3 Ref. Nos. 15, 16

* * *

5. TARGETS

Population within one-mile radius

21,942 Ref. No. 4

Distance to critical habitat (of endangered species)

>1 mile Ref. No. 14

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REFERENCES

If the entire reference is not available for public review in the EPA regional files on this site, indicate where the reference may be found:

Reference Number	Description of the Reference
1	United States Department of Commerce, National Climatic Center, 1979, Climatic Atlas of the United States. Document location: E & E, Buffalo, New York.
2	United States Department of Agriculture, Soil Conservation Service, 1986, Soil Survey of Erie County. Document location: E & E, Buffalo, New York.
3	United States Department of Commerce, <u>Technical Paper No. 40</u> . Document location: E & E, Buffalo, New York.
4	Graphical Exposure Modeling System, June 1987, Environmental Protection Agency, Office of Pesticides and Toxic Substances, Federal Plaza, New York, New York. Document location: E & E, Buffalo, New York.
5	USGS 7.5-Minute Topographical Map, 1965, Buffalo SE and NW Quadrangle. Document location: E & E, Buffalo, New York.
6	New York State Department of Health, 1982, New York State Atlas of Community Water System Sources. Document location: E & E, Buffalo, New York.
7	Ecology and Environment, Inc., July 15, 1987, Site Inspection Logbook and Photolog. Document location: E & E, Buffalo, New York.
8	Noga, Stanley, July 1987, personal communication, resident of Buffalo, New York. Document location: E & E, Buffalo, New York.
9	Kraus, Marilyn, July 1987, personal communication, resident of Buffalo, New York. Document location: E & E, Buffalo, New York.
10	Erie County Department of the Environment and Planning, April 21, 1983, Memorandum from Lawrence Clare to J. McMahon. Document location: ECDEP files, Buffalo, New York.
11	Erie County Laboratory, April 15, 1983, Results of Examination of Sewage and Water. Document location: E & E, Buffalo, New York.
12	City of Buffalo, Department of Inspections and Community Revitalization, April 24, 1987, Notice of Violation to Gerald Arwitz. Document location: E & E, Buffalo, New York.
13	LaSala, A.M., 1968, <u>Groundwater Resources of the Erie-Niagara Basin</u> , USGS and NYS Conservation Department, Albany, New York. Document location: E & E, Buffalo, New York.
14 .	New York State Department of Environmental Conservation, Region 9, Wetland Maps and Critical Habitat Maps for Erie County, September, 1987. Document location: NYSDEC, Region 9, Buffalo, New York.
15	Merck Chemical Company, 1976, The Merck Index, Rahway, New Jersey. Document location: E & E, Buffalo, New York.

Reference Number	Description of the Reference
16	Sax, I.N., 1979, Dangerous Properties of Industrial Materials (6th ed.), Van Nostrand Reinhold, New York. Document location: E & E, Buffalo, New York.
17	United States Department of the Interior, 1976, National Register of Historic Places. Document location: E & E, Buffalo, New York.
18	United States Department of the Interior, 1987, National Wetland Inventory Maps. Document location: E & E, Buffalo, New York.
19	Koszalka, Edward J., et al., 1985, Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from Selected Waste Disposal Sites. EPA-905/4-85-001. Document location: E & E, Buffalo, New York.
20	Niagara River Toxics Committee, 1984, Report of the Niagara River Toxics Committee, Niagara Falls, New York. Document location: E & E, Buffalo, New York.
21	Whitney, John, USDA SCS, August 25, 1987, personal communication, East Aurora, New York. Document location: E & E, Buffalo, New York.
22	Nosenchuck, Norman, 1987, NYSDEC, Albany, New York, Letter to Stephen D. Luftig, USEPA, Region II, New York, New York. Document location: E & E, Buffalo, New York.
23	Rafferty, Lani, 1988, NYSDOH, Central Office, Letter to Al Roulmore, NYSDEC, Albany, NY. Document location: E & E, Buffalo, New York.
24	USEPA Region II, 1988, Pollution Report, Bern Metals, Buffalo, New York.

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REFERENCE NO. 1

recycled paper

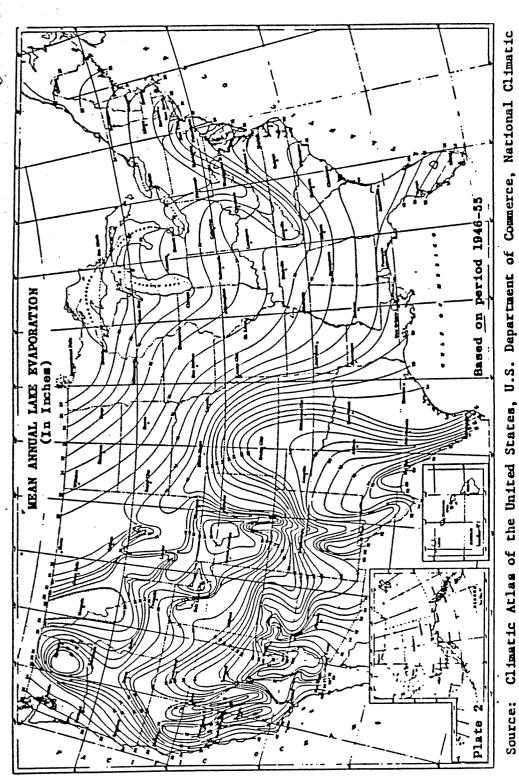
Uncontrolled Hazardous Waste Site Ranking System

A Users Manual (HW-10)

Originally Published in the July 16, 1982, Federal Register

United States Environmental Protection Agency

1984



Center, Ashville, N.C., 1979.

FIGURE 4

MEAN ANNUAL LAKE EVAPORATION

(IN INCHES)

1.

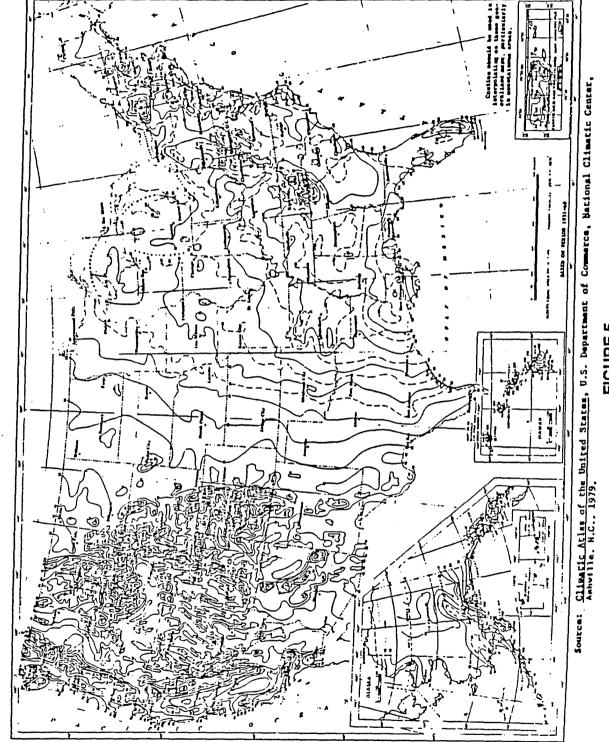


FIGURE 5
NORMAL ANNUAL TOTAL PRECIPITATION (INCHES)

14

REFERENCE NO. 2

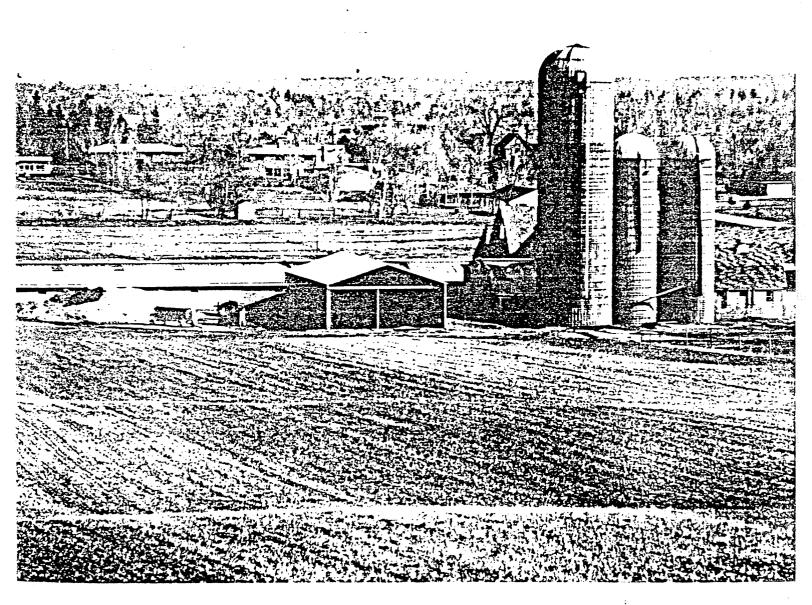
recycled paper

ecology and environment

United States Department of Agriculture

Soil Conservation Service In Cooperation with the Cornell University Agricultural Experiment Station Soil Survey of Erie County, New York

S 591 G3803.E6



seasonally wet, have low strength, and generally cover less than 800 square feet. Some older homes and buildings show signs of settling. Most building activity is on sites of demolished buildings.

Some of the undisturbed areas of Odessa soils are subject to heavy foot traffic and are shaded by tall buildings. Because of seasonal wetness and clayey subsoil texture, lawns and gardens are difficult to establish on these soils. The small size of most undisturbed areas limits their suitability for many uses, such as recreational areas and parks. Onsite investigation is necessary to determine the suitability and limitations of this complex for any proposed use.

This Urban land-Odessa complex has not been assigned a capability subclass.

Uu—Urban land-Schoharie complex. This complex is made up of nearly level areas of Urban land and deep, well drained to moderately well drained Schoharie soils. The Schoharie soils formed in reddish, clayey, lake-laid sediments. This complex is on relatively flat landscapes in the city of Buffalo and its metropolitan area. Areas of this complex are generally about 5 to 800 acres or slightly more and are irregular in shape. Slope ranges from 0 to 3 percent.

A typical area of this complex is about 60 percent Urban land that is mostly covered by concrete, asphalt, buildings, or other impervious surfaces; about 35 percent undisturbed Schoharie soils; and 5 percent other soils. Urban land and Schoharie soils occur together in such an intricate pattern that it was not practical to separate them in mapping.

Typically, Schoharie soils have a surface layer of dark brown silt loam about 9 inches thick. The subsoil extends to a depth of 31 inches. It is brown silty clay loam in the upper part; reddish brown silty clay in the middle part; and mottled, reddish brown silty clay in the lower part. The substratum to a depth of 60 inches is reddish brown varved silty clay. In places the surface layer is silty clay loam.

Included with this soil in mapping are small intermingled areas of the somewhat poorly drained Odessa soils and the gently sloping Schoharie soils. Also included are Udorthents, smoothed, which are areas of deep fills or excavations. Areas of included soils range up to 3 acres.

In the spring, the Schoharie soils have a perched seasonal high water table in the lower part of the subsoil. Permeability is slow or very slow, the available water capacity is moderate to high in undisturbed areas, and runoff is medium. Bedrock is at a depth of more than 5 feet. Reaction is medium acid to neutral in the surface layer. Runoff is rapid in the Urban land areas of this complex.

This Urban land-Schoharie complex is not suited to farming because of the high degree of urbanization. The few areas that are not built up include narrow plots

between streets and sidewalks, small yards, courtyards, and small traffic islands and circles. These undisturbed areas are limited for building because they have a clayey subsoil and low strength and generally cover less than 800 square feet. Most building activity is on sites of demolished buildings.

Some of the undisturbed areas are subject to heavy foot traffic or are shaded by tall buildings. These areas are moderately suited to lawns, shrubs, and vegetable gardens. Because of slow or very slow permeability and small size, these areas only have limited suitability for recreational uses and for small parks. Onsite investigation is necessary to determine the suitability and limitations of this complex for any proposed use.

This Urban land-Schoharie complex has not been assigned a capability subclass.

Uv—Urban land-Swormville complex. This complex is made up of nearly level areas of Urban land and somewhat poorly drained Swormville soils. The Swormville soils formed in silty and clayey lake-laid sediments underlain by sandy deposits. This complex is on relatively flat landscapes in the city of Buffalo and its metropolitan area. Areas of this complex are generally about 5 to 100 acres and are irregular in shape. Slope ranges from 0 to 3 percent.

A typical area of this complex is about 70 percent Urban land that is mostly covered by concrete, asphalt, buildings, or other impervious surfaces; about 25 percent undisturbed Swormville soils; and 5 percent other soils. Urban land and Swormville soils occur together in such an intricate pattern that it was not practical to separate them in mapping.

Typically, these Swormville soils have a surface layer of dark brown silt loam about 8 inches thick. The subsoil extends to a depth of 26 inches. It is mottled, yellowish brown silty clay loam in the upper part; mottled, yellowish brown silt loam in the middle part; and mottled, light yellowish brown loamy fine sand in the lower part. The substratum to a depth of 60 inches is mottled, gray fine sand. In places the surface layer is loam or silty clay loam.

Included with this soil in mapping are Udorthents, smoothed, which are areas of deep fill deposits or excavations that are not paved or built upon. Some areas are gently sloping. Areas of included soils range from 1/4 acre to 3 acres.

From November through May, the Swormville soils have a seasonal high water table in the upper part of the subsoil. Permeability is moderately slow to slow in the surface layer and upper part of the subsoil and moderately rapid in the substratum in the undisturbed Swormville soils, the available water capacity is moderate, and runoff is slow. Bedrock is at a depth of more than 5 feet. The surface layer is strongly acid to neutral. Runoff is rapid from the relatively impermeable Urban land areas of this complex.

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REFERENCE NO. 3

5-31

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P.G./M.C.)

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual

Kris W. Barrett S. Steven Chang Stuart A. Haus Andrew M. Platt

August 1982

MTR-82W111

SPONSOR:
U.S. Environmental Protection Agency
CONTRACT NO.:
68-01-6278

The MITRE Corporation

Metrek Division

1820 Dolley Madison Boulevard

McLean, Virginia 22102

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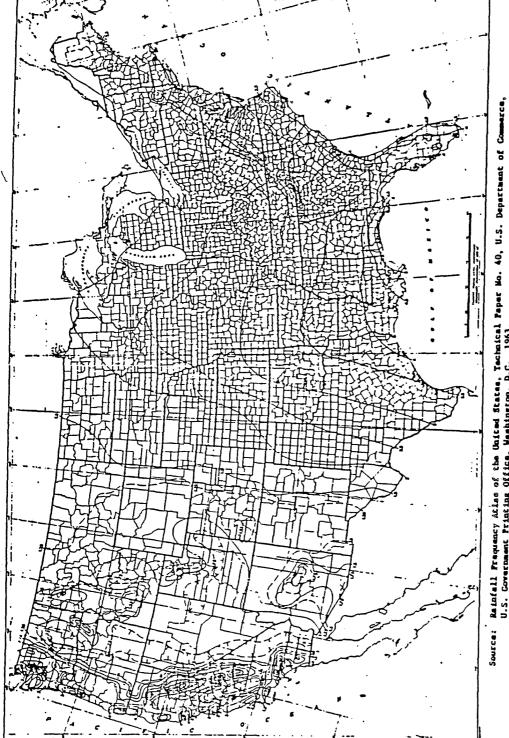


FIGURE 8 1-YEAR 24-HOUR RAINFALL (INCHES)

REFERENCE NO. 4

recycled paper

DRAFT

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 1. CORE MANUAL

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION
Task No. 3-2
Contract No. 68023970
Project Officer: Russell Kinerson
Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION 6100 Chevy Chase Drive, Suite 200 Laurel, Maryland 20707

Submitted: February, 1987

1. INTRODUCTION

The Graphical Exposure Modeling System (GEMS) is an interactive computer system developed by General Sciences Corporation under the auspices of the Modeling Section in the Exposure Evaluation Division (EED), Office of Toxic Substances (OTS) of the Environmental Protection Agency (EPA). It provides a simple interface to environmental modeling, physiochemical property estimation, statistical analysis, and graphic display capabilities, with data manipulation which supports all of these functions. An overview of the basic GEMS components is shown in Figure 1-1. The system is installed on the OTS VAX 11/780 computer in Research Triangle Park, North Carolina, and is accessible through dial-up lines.

GEMS is being developed to support integrated exposure analyses at OTS. Its purpose is to provide environmental researchers and analysts with a set of sophisticated tools to perform exposure assessments of toxic substances without requiring them to become familiar with most aspects of computer science or programming.

GEMS is designed under a unique concept which integrates the computerized tools of graphics, mapping, statistics, file management, and special functions such as modeling and physiochemical property estimation, under a user-oriented and simple-to-learn interface. GEMS prompts the user or provides a menu for each action to be performed. The following features provide users with great flexibility during the GEMS execution:

- o 'HELP commands When you are using the GEMS system, you may not always have a user's manual readily available and/or you may need to see the format and type of a command or an answer before you enter it. Various HELP commands are available in GEMS which provide such information.
- o Recovering from errors If you enter a command or a response incorrectly, the system issues an error message and reprompts you for the correct information.
- o Built-in defaults for model execution GEMS is designed to guide inexperienced users through the execution of selected models. Default responses are usually available when you cannot specify a choice or supply an input to a prompt during model execution.
- o Data management of modeling results Data generated from execution of the SESOIL, ISC, SWIP, or AT123D models may be stored automatically in GEMS. These data may be accessed or analyzed via GEMS' file management, graphics, and statistics operations.

The purpose of this document is to describe GEAS from the user's point of view. It is intended as a comprehensive guide to the use of GEAS for personnel who have no specialized knowledge of computer programming. However, a working knowledge of environmental modeling is necessary for complete and accurate use of the system.

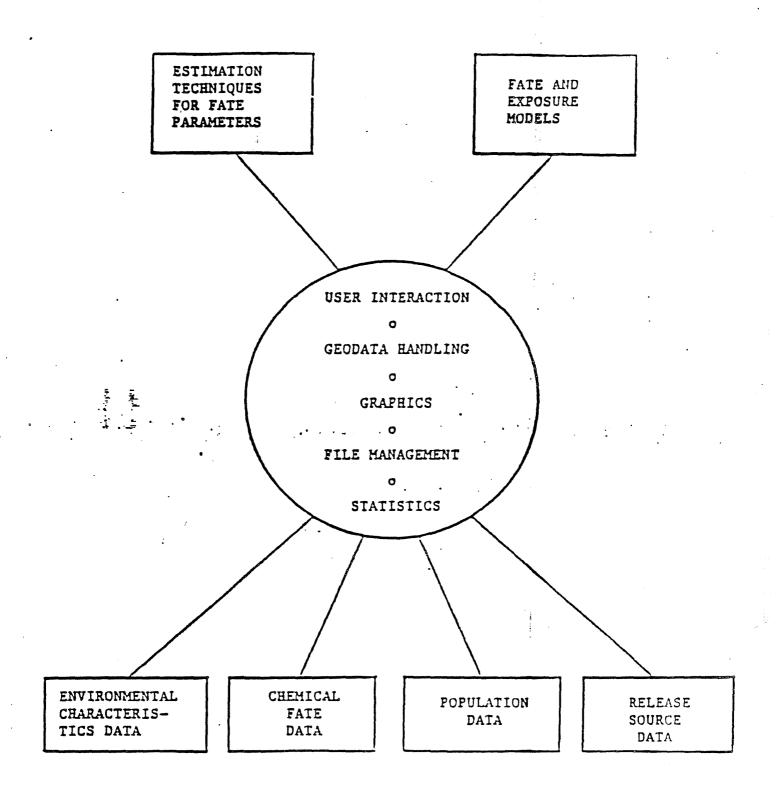


FIGURE 1-1. Components of the Graphical Exposure Modeling System (GEMS)

Since the last draft of the GEMS User's Guide, completed in June, 1984, the GEMS system has gone through a number of modifications and enhancements. It is no longer feasible to hold all sections in one single volume. This revised user's guide is designed in a modular fashion of six separate volumes described briefly below. In addition, GEMS has been adapted to function on an IEM PC/XT or AT. This prototype called PCGEMS has many of the same capabilities of the mainframe GEMS. These include environmental modeling procedures such as ENPART and AT123D as well as property estimation procedures such as CLOGP and AUTOCHEM. The prototype PCGEMS works in large part through interface with the OTS VAX 11/780 on which GEMS resides, a user's guide for PCGEMS will be available in the near future.

Volume 1: Core-Manual

This volume is a reference manual and introduction for first-time users. In addition to Section 1 - Introduction, a functional description of GEMS is presented in Section 2, a detailed guide to the use of the system is presented in Section 3, and summaries of the VAX operating environment and system and frequently used utilities are presented in Section 4. Two sample runs are given in the attachment to provide users with information in order to interact with the GEMS system, to generate a dataset, and subsequently, produce a map from the dataset.

.Volume 2: Modeling

This volume consists of all GSC prepared user's manuals to GEMS models, grouped according to media. User's manuals are available for the following models: SESOIL, AT123D, SWIP, ENPART, TOX-SCREEN, INPUFF, and ISC/GAMS. A user's manual for EXAMS II model will be available later this year. Refer to Section 2.2 for further information.

Volume 3: Graphics and Geodata Handling

This volume contains two GEMS operations, Graphics and Geodata Handling. The Graphics operation contains a variety of graphics procedures which may be used to display results from modeling runs or from datasets. The Geodata Handling operation contains procedures that perform geographic data manipulation and generate maps of U.S. states or counties. Refer to Section 2.3 for further information.

Volume 4: Data Manipulation

This volume contains descriptions of GEMS system-installed datasets and two GEMS operations - File Management, and Utilities. Refer to Section 2.4 for further information.

Volume 5: Estimation

This volume consists of user's manuals for SFILES, FAP, CLOGP, and AUTOCHEM. These estimation programs may be used to provide estimated physiochemical properties for model input or for other environmental fate analyses. Refer to Section 2.5 for further information.

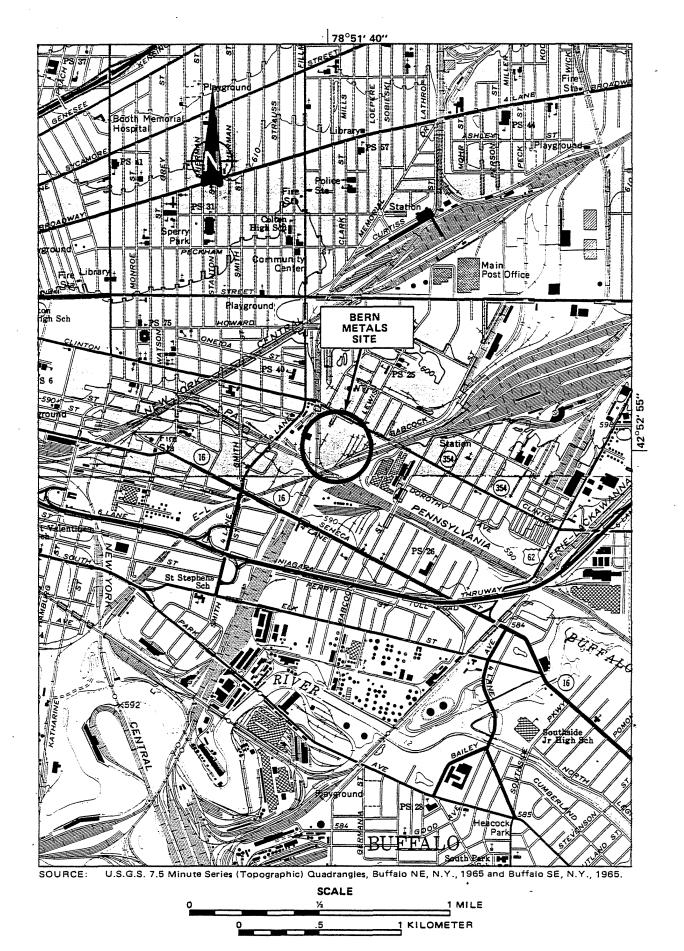
Volume 6: Statistics

This volume contains information on the GEMS Statistics operation which includes the Descriptive Statistics procedure and procedures to produce simple or multiple regression and contingency tables. Refer to Section 2.6 for further information.

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New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH 518-474-2121 DIVISION OF ENVIRONMENTAL PROTECTION 518-458-6423 BUREAU OF PUBLIC WATER SUPPLY PROTECTION 518-458-6731 /6743 DIVISION OF ENVIRONMENTAL HEALTH 518-458-6400

NIAGARA COUNTY

א סו	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Mun	icipal Community		
	Lockport City (See No 12, Eri Middleport Village Niagara County Water District (See No 13, Erie Co)	2000	.Wells (Springs)
2	Niagara Falls City (See also Erie Co)	77384 16	.Niagara River - East Branch
Non	Municipal Community		
3	Country Estates Mobile Villag	e28	.Wells

ERIE COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE					
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1234567 8 901123456781901	Akron Village (See No 1 Wyomin Page 10)		.Lake Erie .Lake Erie .Wells .Wells .Wells .Lake Erie .Niagara River - East Branch .Niagara River .Wells .Wells .Niagara River - East Branch .Niagara River - West Branch .Niagara River - West Branch .Wells .Niagara River - West Branch .Wells .Niagara River - West Branch .Pipe Creek Reservoir .Wells .Niagara River - East Branch .Niagara River - East Branch .Niagara River - East Branch					
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1 de

Bern Metals

1130- met stanley Noge 2 18 Bendus Hue, Buffield, 14706 at site entrance.

Mr. Bernald had told Mr. Noge that material

Came from Pennsylvania Drums brought in and

Chumped in Back area, Covered with a buildozer.

-post 30 years at residence. Burned batteries in

building on site.

1142 Entrance to Side via open building on Bender St. end.

Bldg. 1 - tiles, desks, safe - weigh room
2 - open - overtorned drom, black solid makinal
gas pumps nearby - LUST?
- photo # 1 of building # 2
photo # 3+213id 3 from North

did not proceed off of concrete due to safety concerns—

note-Scale inspected 5-82

some Stressed vegetation near rusty metals pile-clead larges photos 4,5,6,7,8,9 Stereo of back of property on meas

10 drums with solids - 100% easy access
to site and materials - clid not eiter.

ground is Covered with slag and pieces of battery
Casings. Ovound also has green, perpile, it materials

1245 Kraus, Marilyn - Iving in house 13 years, Some chances went to. Bingen Street - in newspaper - normum, of material silvery soot landed on clothes, approx. Il years ago. Kids entering into side. 1037 Bender - Some heighbor kids got rash from Site.

1300 - Seanched Weigh Bldg - no louisness popers found.
1305 - Off site. weather same as pg 6

(2. Mark furthers.)
7-15-17

Witnessed & Understood by me.

Date

Invented by

Recorded by

5-51



Received 7-23-87 ANS ecology and environment, inc.

195 SUGG ROAD, P.O. BOX D, BUFFALO, NEW YORK 14225, TEL. 716-632-4491, TELEX 91-9183

International Specialists in the Environment

INTERVIEW ACKNOWLEDGEMENT FORM

· SITE NAME

CONTACTED

: BERN METALS

I.D. NUMBER

: 915134

PERSON

ADDRESS

: MR. STANLEY NOGA

DATE

7/15/87

AFFILIATION

18 BENDER AVE

PHONE NUMBER

: RESIDENT

CONTACT

TYPE OF CONTACT : INTERVIEW

PERSON(S)

: A. MARK SIENKIEWICZ

INTERVIEW SUMMARY

Mr. Stanley Noga resides at 18 Bender Ave., near the entrance to the Bern metals Property. He has lived there for approximately 30 years. He witnessed tractor trailers hauling drums onto the site, the contents of which were dumped at the back of the property and bulldozed level.

Mr. Noga also stated that Bernard Arwitz had burned batteries in one of the site buildings.

ACKNOWLEDGEMENT

I have read the above transcript and I agree that it is an accurate summary of the information verbally conveyed to Ecology and Environment, Inc. interviewer(s) (as revised below, if necessary).

Revisions (please write in any corrections needed to above transcript)

tanky. W. Maga

Date: 7-16-01/



ecology and environment, inc.

195 SUGG ROAD, P.O. BOX D, BUFFALO, NEW YORK 14225, TEL. 716-632-4491, TELEX 91-9183

International Specialists in the Environment

INTERVIEW ACKNOWLEDGEMENT FORM

SITE NAME

: BERN METALS

I.D. NUMBER

915134

PERSON

CONTACTED

: MRS. MARILYN KRAUS

DATE

7/15/87

AFFILIATION

: RESIDENT

PHONE NO.

ADDRESS

: 1037 CLINTON AVE.

CONTACT

: A. MARK SIENKIEWICZ

TYPE OF CONTACT :

INTERVIEW

PERSON(S)

INTERVIEW SUMMARY

Mrs. Marilyn Kraus has resided at 1037 Clinton Ave. for 13 years. During operations at Bern Metals, incineration occurred which generated a silvery colored soot. The soot blew from the site onto her laundry.

Mrs. Kraus also has neighbors who have had kids come home with rashes after playing near the facility. She knows that kids are now playing in the facility.

ACKNOWLEDGEMENT

I have read the above transcript and I agree that it is an accurate summary of the information verbally conveyed to Ecology and Environment, Inc. interviewer(s) (as revised below, if necessary).

Revisions (please write in any corrections needed to above transcript)

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COUNTY OF ERIE

DEPARTMENT OF ENVIRONMENT & PLANNING 2006 DEC

MEMORANDUM

TO	John McMahon, NYSDEC	DATE April	21, 198
FROM _	Lawrence G. Clare		
	Bern Metal - Complaint No. 02356		

Attached is a copy of our complaint card for our investigation of sludge dumping behind the Bern Metal Company in the City of Buffalo. The lead sludge from Battery Reclamation Practices, blue dye, and previously copper sulfate, are being stored in an unfenced area behind the Bern Metal Company on Clinton Street. Recently some neighborhood people have tracked home what turns out to be lead sludge. Margolis of Channel 7 News has been treating this site as another potential toxic disposal site. We are forwarding it to you to make certain that you are aware of our involvement (I discussed this with Bob Mitrey this morning).

Two separate actions are being taken as a result of our investigation:

- The Erie County Health Department is following up on residents who may have tracked home lead sludges and have dried lead particles in their home. It is our understanding that Dave Barry has offered Erie County Health Department services for testing lead and blood levels. Furthermore the Health Department is considering requiring fencing of the storage area.
- 2.. Our Solid Waste staff will prepare a site profile in order to evaluate past disposal practices in the area. A tentative date of July 1, 1983 has been set for completion of this site profile.

This information is being forwarded to you in the event that the media contacts you relative to solid waste disposal practices on the site. As I discussed with Bob Mitrey, we do not feel that the temporary storage of material outside the fenced area constitutes any clear Environmental Conservation Law violation. Please contact me if you have any questions regarding our handling of this complaint.

LAWRENCÉ G. CLARE, P.E.

Assistant Deputy Commissioner

recyclesGeberjk

Enc.

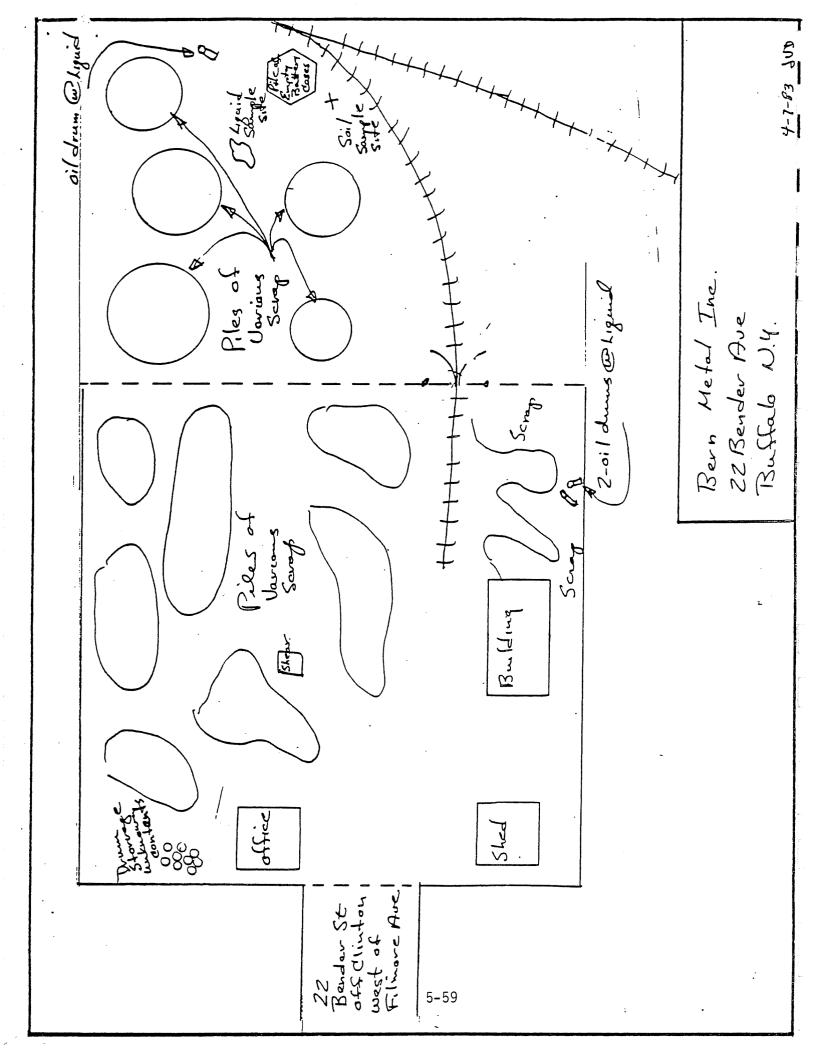
Joan Loring

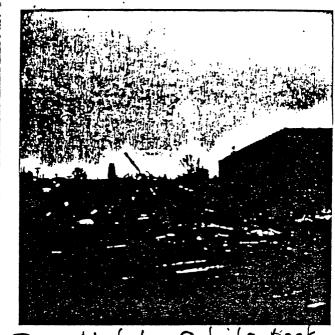
5-56

ecology and environment

ERIE COUNTY ENVIRONMENTAL CONTROL - COMPLAINT CARD
Name of Person, Company, or Institution Complained against: Ben Metals - Mr Demait 198 Hendre Bld Williams
Address: Phone Number 854-5235
Month Date Year Date: 4 6 3 Time: A.M. P.M. //. 30
Name of Complainant: Sheray Mangalows as per 15. Wage (Mark Cas
Address: Phone Number:
DESCRIPTION OF COMPLAINT
Happening Now: Yes () No () Emergency: Yes () No ()
Ben Metal Co.
COMPLAINT CATEGORY/COUNTY RULE (STATE RULE)
By Fuel Burning/Rule 3 (Part 227) () I. Oil Spill () J. Chemical Spill (17-0701)
DE Process Equipment/Rule 5 (Part 212) () K. Sewerage E Nuisance/Rule 7.5 (Part 211) () L. Water Pollution () M. Other
G. Odori G. M. J. J. O. O. J.
Person taking complaint:
Person handling complaint:
Contact Complainant Date: Time: Field: YES NO *(U YES see back)
INSPECTOR'S REPORT: Referral to:
- She said the samples were taken from
puddles at The puddles were no longer
a Very Blue soil and a shallow puddle was
found and sampled for Metals
DATE TIME
N.Y.S. DEC
U.S.C.G. () Resolved
OTHER OF Referred To Erie Co Health Den OD.C Sor Site Profile by
Inspector's Signature Supervisor's Signature and Date Supervisor's Signature and Date
Inspector's Signature Supervisor's Signature and Date 5-57

	1
FACILITY # SOURCE #	
COMPANY	2. FIELD INVESTIGATION: Type 5 () Other
SOURCE	
GROUP CODE ()	
DATE OF INSPECTION	3b. PLEASE SCHEDULE INSPECTION FOR
TOTAL NUMBER OF VISITS	TYPE
VIOLATION: Yes No P (Rule 10)	4. COMPLIANCE SCHEDULE REQUIRED Yes No D
DATE OF VIOLATION NOTICE	DATE REQUIRED
REPLY OR CONFERENCE DUE	The second secon
ቹ ፟፟፟፟፟ FIELD REPORT AND FOLLOW UP:	
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Bern Metals - Outside Back Gate behind RETrack. Samplet Taken for Metal Samplet Taken for Metal Screen JUD 4/6/83

PROJECT NAME	Complaint 2356
DATE/TIME	4-6-83 1:00pm to 2:00pm
WEATHER CONDITIONS	overeart
SAMPLE NUMBER	1 0 . 0 0
TYPE SAMPLE	Argend and Soil
ANALYZED FOR	Metals - Cu & Pb
SAMPLE LOCATION	See skitch
REASON FOR ANALYSIS	Reported High lead contact of sail and water at this sete
	and water at this site
COMMENTS/SITE SKETCH/PHOT	OGRAPH
	\mathcal{I}
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Bern Metals	Soil 1
22 Bender	St. I I I I I I I I I I I I I I I I I I I
BSC	The state of the s
DATE AND TIME TO LAB	6-83/2:30rm
	5-61

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COUNTY OF ERIE DEPARTMENT OF ENVIRONMENT & PLANNING DIVISION OF ENVIRONMENTAL CONTROL

MEMORANDUM

то	Dave Barry	DATE.	April	19,	1983
FROM	Lawrence G. Clare, P.E.			-	·
SUBJECT	Lab Reports from Samples taken behind				
•	Bern Metal Scrap Yard, (C) Buffalo				

Attached are copies of the above subject lab reports for your information.

Lawrence G. Clare, P.E. Asst. Deputy Commissioner Environmental Control

LGC:JVD:aj Attach.

ERIE COUNTY LABORATORY PUBLIC HEALTH DIVISION

RESULTS OF EXAMINATION OF SEMAGE AND POLLUTED WATER

Lab Nos 83-27	<u> 6 </u>	llected by	John Daleo	
Date:Collected 4	76/83 Receive	d 4/6/83	Examined 4	/15/83
Place Buffalo			County	Erie
Source Bern Me	tals - Scrap metal	yard - Soil		
·		•	·	
BACTERIAL EXALIBIAT		100 -1		•
Tests for coliform	group: n.r. per	LOO MIL.		
CHERICAL EXAMINATION	<u>011</u>		-	
Color		Hardr	1055	•
Turbidity				
Odor* Suspended matter*			l Solids	
nH walue			otal olatNe	
Temperature C			xed	-
		.		
B.O.D., 5 day	•	Suspe	ended Solids	
Dissolved oxygen		To	otal	
> Saturation		٧c	latile	,
Fluoride		F	TPN	
Prosphates		5.		
Sulfates Anionic detergent			lved Solids	
Phanol			otal platile	
Phenol Cyanide			xed	
o) and a			-xeu	
Nitrogen Cycle		C.O.D).	
Free Ammonia			ides	
Organic			inity	
Nitrites		Greas	e and Oil	
Nitrates mg.NO -	-NO ₂ -N/1			
REMARKS:				
Copper	1906			
Iron	8518			
Lead 26.0%	260,000			· i t)
Zinc	1114			

All results in mg/l.

* l-very slight, 2-slight, 3-distinct, 4-decided, 5-extreme recycled paper Gerhard Paluca

Senior Samitary Chemist

JOSEPH PULEO, DVM, MPH Director engironment

DRIE COUNTY LABORATORY PUBLIC HEALTH DIVISION

RESULTS OF EXAMINATION OF SENAGE AND POLLUTED WATER

Lab Nos.	83-275	Coll	ected by	John Daleo	
Date:Col	lected 4/6/83	Received_	4/6/83	Examined 4/15/83	
Place_	Buffalo	· .		County Erie	-
Source_	Scrap metal yard	puddle - Liq	uid Bern	Metals	
7.40	T TOTAL TOTAL COLUMN			•	
	L EXALIMATION r coliform group:	M F. Dev 10	∩ m"l .		
16818 10	r corrrorm group;	mer e her ro			
CHELICAL	EXALIDIATION		·,		
			79		
Color			Haro	ness	-
Turbidit Odor*	Y		Tota	l Solids	
	d matter*			otal	
pH value			Ve	olatile	
Temperat	ure C		F	ixed	
B.O.D.	5 day		Suspe	ended Solids	
DIBBOTAE	a oxylen		T	otal	
% Satura	tion		V	olatile	
Fluoride			F	ixed	
Phosphat	es		•		
Surrates				olved Solids	
Anionic	detergent			otal	
Phenoi			γ (π-	olatileixed	
Cyanide_			Σ.	1xeu	•
Nitrogen	Cycle			D	
Free .	Ammonia			rides	-
	ic			linity	
Nitri			Great	se and Oil	
Nitra	tes mg NO +NO N/1				
REMARKS:					
Copper	12	,600			
Iron		,730			
Lead		,000			
Zinc		406			

All results in mg/l.

* 1-very slight, 2-slight, 3-distinct, 4-decided, 5-extreme

Gerhard Paluca Senior Sanitary Charist

JOSEPH PULEO, DVN, MPH Director

TRIE COUNTY LABORATORY PUBLIC HEALTH DIVISION

RESULTS OF EXAMINATION OF SENAGE AND POLLUTED WATER

Lab Nos. 83-27	6Coll	Lected by	John Daleo		
Date:Collected 4	/6/83 Received	4/6/83	Examined	4/15/83	
Place Buffalo			County	Erie .	
Source Bern Me	tals - Scrap metal	vard - Soil			
	,			·	
BACTERIAL EXALIMATI					
Tests for colliform	group: H.F. per 10	00 ml			
CHENICAL EXAMINATION	771				
Color Turbidity		Hordn	1888		
Odor*		Total	Solids		
Suspended matter*			tal		
-11 7			latile		
Temperature C		Fi	xed		
B.O.D., 5 day	•	Suspe	nded Solids		
Dissolved oxygen		To	tal		
% Saturation			latile	•	
Fluoride		Fi	xed		
Phosphates		TVI	11 0-111-		
Sulfates Anionic detergent			lved Solids tal		
		. V n	latile		
Cyanide		Fi	xed		
Nitrogen Cycle		C.O.D	•		
Free Ammonia		Chlor			
Organic		Alkal	inity		
Nitrites		Greas	e and Oil		
Nitrates mg.NO +	NON/1				
reiarks:					
Copper	1906				
Iron	8518				
Lead 26.0%	260,000				
Zinc	1114				

All results in mg/l.

* 1-very slight, 2-slight, 3-distinct, 4-decided, 5-extreme recycled paper Gerhard Paluca Senior Sanitary Chemist

JOSEPH PULEO, DVM, MPH Director environment

IRIE COUNTY LABORATORY PUBLIC HEALTH DIVISION

RESULTS OF EXAMINATION OF SENAGE AND POLLUTED WATER

6/83 Examined 4/15/83 County Erie Bern Metals
perit Wefaita
•
1.
Hardness
Total Solids
Total
Volatile
Fixed
Suspended Solids
Total
Volatile
Fixed
Dissolved Solids
Total
Volatile
Fixed
C.O.D.
Chlorides
Alkalinity
Grease and Oil

All results in mg/l.

* 1-very slight, 2-slight, 3-distinct, 4-decided, 5-extreme

Gerhard Paluca
Senior Sanitary Chemist

JOSEPH PULEO, DVN, MPH Director

COUNTY OF ERIE DEPARTMENT OF ENVIRONMENT & PLANNING DIVISION OF ENVIRONMENTAL CONTROL

MEMORANDUM

T()	David E. Barry, Deputy Commissioner, ECHD	DATE April 12, 1983
FROM	Lawrence G. Clare	
SUBJECT	Investigation of Rear Property	
	Bern Metals 22 Bender Street Buffalo, New York	

On April 6, 1983 Sherry Margolis of Channel 7 TV called New York State DEC and was referred to this office regarding the exposure of children to material behind Bern Metals Scrap Yards. Two samples were taken, a liquid and a soil. Preliminary indications from the Erie County Laboratory indicate the water sample contained approximately 10 ppm of lead, 126 ppm copper and 4 ppm zinc. The soil sample contained 26% lead, .2% copper, and .1% zinc.

The complete area is covered with a blue material that appears to be a dye. The manager remembers that about four to five years ago, they used this area for bulk storage of a blue dye.

In our meeting with Channel 7 at the site, the principal questions raised related to the possible health effects on a complainant's (to Channel 7) child who had walked in the lead sludge. We are therefore, referring our material on this site along with the sampling results to you for whatever follow-up you may judge appropriate.

Our office will be preparing a site profile in an effort to identify any environmental contamination (principally groundwater) which may be occurring. There is no obvious violation of the Environmental Conservation Law occurring now since the area is being used as a 'storage' area rather than a disposal site.

LAWRENCE G. CLARE, P.E.

Assistant Deputy Commissioner

LGC:JVD:jk Attachments

では、我はまで、これではなります。 「本語の情報でしている」とは、ままない。

cc: D. Campbell

DEPARTMENT OF INSPECTIONS AND COMMUNITY REVITALIZATION DIVISION OF HOUSING & PROPERTY INSPECTIONS

The Director:	DATE: 4-22 1987
RESPECTFULLY REPORT THE FOLLOWING:	1070R
WNER ESTATE BERNARD ARWITZ	LOCATION OF 22 BENOER
WNER'S ADDRESS KEN MORE NY TYPE OF NO. OF PERSONS 14223 BUILDING NO. OF FAMILIES	STORIES HIGH PREVIOUSUSE SCRAP YARD OCCUPIED NEW
	OCCOI IIID NO.
ON THIS DATE I IN	RECTED THE PREMISES
KNOWN AS 22 BEN	
	SERN METAL CO. INC.
BERNARD ARWITZ I	ECEASED WAS THE
OWNER OF BERNMETA	
THE YARD AREA IS	LITTERED WITH OLD
SCRAP TURNING OLD TIM	les AND BARRELS OF
POSSIBLE TOXIC MATERIA	AW ARE STREWN THROUGHOUT
THE YARD AREA. SOME	OF THE BARRELS ARE
ROTTED AHD RUSTED OUT	
HAS SGILLED ON THE	GROUND, THE GROUND
COLORIN VARIOUS LOCAT.	INAS OF THESE PARRELS
RANGE FRAY. GRAY.	PORPLE BLUE YGREEN.
THE FENCING IS ?	SROKEN DNO VJEN ON
THUSIDES OF THE YARD	. THE BUILDINW ON
THE PREMISES ARE O	DEIN AND IN DISKEPAIR
T BELIEVE THE COND	ITIEN OF THE PROMISES
ARE A DEFINITE HEALTI	4. HAZARD TOTHE
COMMONITY. I HAVE	CONTACTED THE NEW
YORK STATE DEPARTMENT	OF ENVIRON MENTAL
CONSERVATION GO PEZA	NU ARE AVE BUFFILLO N.Y
855-4585	5-70 deglog and environment

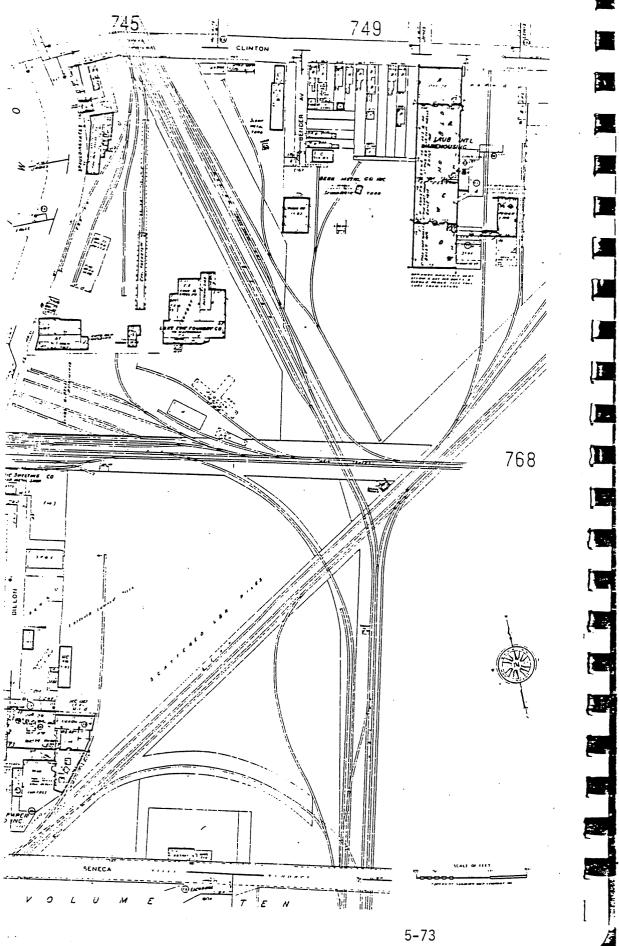
PURPOSE Court / A.O. V.	REQUEST RECEIVED
	DATE SEARCH PREPARED Quil 23.1987
TO: Jerry Hannox	7
DIVISION OF ACK	
	slev st.
Assessed Description = =	
2.	30,50 5 CLINTON
	6 X/23
TAX DISTRICT 13	TAX NO. 10232200
400 contact of the co	
Dear Sir:	
I advise that the records in the County Clerk's office show the follow	e City Assessor's Office and Erie wing information:
Type of Deed: 10 Liber: 90	8/ Page: <u>257</u> Filed: //-/8-8/
OWNER(S) OF RECORD	PRESENT ADDRESS
Bernard Arwitz	(Deceased)
	·
:	ADDRESS OF RECORD
MORTGAGEE(S) OF RECORD	ADDRESS OF RECORD 198 Hendricks Llut. Egyptorille, n.y. 14226 ADDRESS
MONIGRADE (S) OF RECORD	for court of J. O.V.
not related	for have or op. o.v.
→	·
VERIFICATION:	
Telephone Directory	U Assistance
City Directory Tax/Water	Other Surrotate felt #
Directory Assistance	85-1800.
	1/1. to Shuld Univers
ADDITIONAL INFORMATION: 171.08+	18.82
Current Taxes Due: 171.08+	
Current Sewers Due: $\frac{2}{0.86+}$ Taxes in Arrears: $\frac{106.00+}{0.000}$	
Sewers in Arrears:	
Surrogates fell #80 1870	SIGNED (Saturia) drivis
lists Guald and	DEFARTMENT OF INSPECTIONS
100 Claremont ave.	COMMUNITY REVITALIZATION
· Kenmore, N. y. 14223 do	UPDATÉD BY:
Surrogates file #86 1890 lists General awity 100 Claremont ave., Kenmore, N.y. 14223 as executor	(Date)

CITY OF BUFFALO, NEW YORK

DEPARTMENT OF INSPECTIONS AND COMMUNITY REVITALIZATION

NOTICE OF VICLATION

DATE: 4-24-87
CERALA ARWITZ AS EXECUTOR, ESTATE OF BERNARD PRINTS
100 CLAREMONT AUENUE
KENIMORE NY 14223
RE: 22 PEN Address)
(Lippoint industry
2 Xee 77 L'
Our records reflect that you are the current owner of record of the subject property. Accordingly, please be advised that an inspection of
this property reveals that the Ordinances of the City of Buffalo are being violated for the following reasons:
1) THE FENCINE ON ALLEDET OF THE
PROPERTY IN TOROKEN AND IDEN
2) THE WINDOW AP - TRENER IN THE FACTOR
OFFIRE BUILDING AND THE WAREHOUSE
BY THE REAR CONCRETE BLOCK WALL OF THE
WARE HOUSE ILAS PLANGE HOLE IN IT.
A THE FRAME BUILDING INJUSE THE PENNER
ST GATE SHOULD RE REPORTED IN DE MORNIGED
THE YAKO AREAR IN LITTERED WITH ELD
RAPPELLS TIRES JORAN METALANDETHAL
MARIOUN THREE IF DEBRAN, THIN
CONDITION CONSTITUTES A DEFINITE MEALTH
PHO SREETY HAZARD TO THE RESIDENTS IN
THE COMMUNITY
The state of the s
(Additional Violations are listed on reverse side, if necessary.)
In view of the above, it is your responsibility to (1) arrange for the correction of the above-stated violations within 30 days from the date of this notice, and (2) contact this office at 855-72 1000.
to arrange for an inspection date prior to the end of the above-mentioned
AS HEREBY DIRECTED TO THIS NOTICE WITHIN 30 DAY TIME PERIOD, IT WILL BE ASSUMED THAT YOU DO NOT INTEND TO COMPLY WITH THIS DIRECTIVE
AND THIS MATTER WILL BE REFERRED FOR PROSECUTION BY THE CITY COURT OF BUFFALO. If you wish to schedule a hearing concerning this matter.
please advise by no later than $3 - 26 - 97$.
SIGNED: (Date)
SIGNED: Desires (Title)
CC: Director James W. Comerford/Division of Housing and Property Insp. ATTENTION: CHIEF BUILDING INSPECTOR TOLET A "
recycled paper
ecology and environmen



REFERENCE NO. 13

recycled paper

ecology and environment

Erie-Niagara Basin

Ground-Water Resources

ERIE NIAGARA BASIN REGIONAL WATER RESOURCES PLANNING BOARD

GROUND-WATER RESOURCES OF THE ERIE-NIAGARA BASIN, NEW YORK



Prepared for the Erie-Niagara Basin Regional Water Resources Planning Board

by

A. M. La Sala, Jr.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
in cooperation with

THE NEW YORK STATE CONSERVATION DEPARTMENT DIVISION OF WATER RESOURCES

STATE OF NEW YORK CONSERVATION DEPARTMENT WATER RESOURCES COMMISSION

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GEOLOGY AND TOPOGRAPHY

The Erie-Niagara basin is underlain by layers of sedimentary bedrock which are largely covered with unconsolidated deposits. Descriptions of the various bedrock units are given in figure 2. The bedrock consists mainly of shale, limestone, and dolomite; the Camillus Shale contains a large amount of interbedded gypsum. All the bedrock units were built up by fine-grained sediments deposited in ancient seas during the Silurian and Devonian Periods and, therefore, are bedded or layered. The dip of the rocks (inclination of the bedding planes) is gently southward at from 20 to 60 feet per mile, but the average dip is between 30 and 40 feet per mile. The dip is so gentle that it is hardly perceptible in outcrops.

The unconsolidated deposits are mostly glacial deposits formed during Pleistocene time about 10,000-15,000 years ago when an ice sheet covered the area. The glacial deposits consist of: (1) till, which is a nonsorted mixture of clay, silt, sand, and stones deposited directly from the ice sheet; (2) lake deposits, which are bedded clay, silt, and sand that settled out in lakes fed by the melting ice; and (3) sand and gravel deposits, which were laid down in glacial streams. The glacial sand and gravel deposits are of both the ice-contact and outwash types, as will be explained later in the report. The glacial deposits generally are less than 50 feet thick in the northern part of the basin. They are considerably thicker in some valleys in the southern part and reach a maximum known thickness of 600 feet near Chaffee. Other unconsolidated deposits are alluvium formed by streams in Recent times and swamp deposits formed by accumulation of decayed plant matter in poorly drained areas.

Relief of the present land surface is due to preglacial erosion of the bedrock and subsequent topographic modification by glaciation. contrast to the southward dip of the rocks, the land surface rises to the south largely because preglacial erosion was more vigorous in the northern part of the basin. The shale in the southern part of the basin is somewhat more resistant to erosion than the rocks in the northern part of the basin but not significantly so. Figure 3 shows the relationship of the topography and rock structure and delineates the two topographic provinces of the basin: the Erie-Ontario Lowlands and the Appalachian Uplands. The rocks crop out in belts which trend generally east-west. The bedrock geologic map, plate 2, shows that the outcrop belts bend around to the southwest near Lake Erie. They assume this direction mainly because relatively intense erosion in the Erie-Ontario Lowland near Lake Erie has exposed the rock at lower elevations than farther east. The Lockport Dolomite and the Onondaga Limestone, because they are relatively resistant to erosion, form low ridges in the northern part of the basin. Tonawanda, Murder, and Ellicott Creeks descend the escarpment of the Onondaga at falls and cataracts.

In the hilly southern half of the basin (the Appalachian Uplands), preglacial valleys, deepened by glacial erosion, are cut into the shale. The valleys are partly filled with glacial deposits so that some of the present streams flow 200 to 600 feet above the bedrock floors of the valleys as shown in figure 3.

| Cooling and environment

5-82

System	Series	Group	Formation	Thickness in	Section	
	 			feet		
		Conneaut Group of Chadwick (1934)		500		Shale, sitistene, and froe-grained snedstone. Top is missing in area,
			Undivided	600		Gray shale and siltstoon, interboddod. (see from broken to savo spaco)
	Upper	Canadaway Group of Chadwick (1933)	Perrysburg	400- 450		Gray to black shale and gray sillstone containing many zines of calcareous concretions, Lower 100 feet of formation is ulive gray to black shale and interledded gray shale containing shaly concretions and pyrite.
Devonian	ָ ס		Java	90 115	THE RESIDENCE OF THE PARTY OF T	Greenish-gray to black shale and some interhedded timestone and zones of calcarenus nodules. Small masses of pyrite occur in the lower part.
De			West Falls	400 520		Black and gray state and light-gray siltstone and sandstone. The lower part is petroliferous, fbroughout the formation are movemers zones of calcimous concretions, some of which contain pyrite and narchisite.
İ	1		Sonyea	. 45-85		Olive-gray to black shale.
ŀ			Genesee	10-20		Dark-gray to black shale and dark-gray limestone. Bods of nodular pyrite are at base.
		,	Moscow State Ludlowville	12.55		Gay, soft shale. Gray, soft, fissile shale and limestone beds
	<u>e</u>	Flamilton	Shale Skaneateles	65 130		at top and bottom. Olive gray, gray and black, fissile shale and some calcareous
	Middle		Shate Marcellus	60.90		beds and preste. Gray timestone, about 10 feet thick is at the base.
			Shale	30 55		Black, decele fessilu shafo,
		Unconformity	Onoodaga Eurestone	108		tray timestone and cherty binestone.
			Akron Dolomite	8		toremshignly and bull Investment dolomite.
	1		Bertie Limestone	50 60		Gray and brown delocate and some interhedded shale.
l						Gray, red, and green thin-hedded shale and massive midstone Gypsum occurs in heds and lenses as much as 5 feet thick.
Silurian	Сачира	Salina	Canullus Shale	400	77777	Subsorbice information indicates dolomite (or perhaps, more correctly, independent in the state techniques, and the state is shown schematically in section). South of the outcop inear at depth, the formation contains thick saft beds.
Silurian	Niagara Cavuqa	Salina		400		correctly, mapaesanchine madrock) is interbedded with the shalle islanon schematically in section). South of the note up argae at depth, the formation

Figure 2.--Bedrock units of the Erie-Niagara basin.

Erie-Niagara Basin

Ground-Water Resources

ERIE-NIAGARA BASIN REGIONAL WATER RESOURCES PLANNING BOARD

Table 6. -- Records of selected wells in the Erie-Niagara basin (Continued)

			Year						Al Pi Puda	1	1 miles				
			9	Type	Depth		Depth		apove	Below	1000	Mathod	Dampage Dumpage		
Number	County	Omer	p p p	÷ =	5 3		to bedrock	Vater-bearing metorial	: 3	land surface Date	Date		or flow	• 5	
					- 1	(Inchas)	(feat)		(feat)	(feat)		1	per day)		
254-829-3	£1.9	Village of Aldan	1961	ī	r e 35	ŧ	!	Sand and grave!	845	ŀ	:	Į,	:	2	Construction of well is reported to be similar to that of well 254-829-1; yield 220 gpm,
15/4-830-1	કુ	W. and J. Fahringer	*1904	10	11,150	60	;	Lockport Bolomite?	840	r350	8-62	2	ŀ	U	Gas test well which yields a black brine used for mineral baths.
254-834-1	ģ.	G. Glose	1962	ř	66.2	2	. *	Shalo	770	p26.3	8-13-6 1	ž e r	450	٥	H ₂ S.
7	9	R. Maue	1961	10	52.9	v	9	Ç	765	7.1	49-61-8	7	200	٥	fron; H25; water-bearing zone at 25 feet; blasting charge fired at 20-25 ft to incress yield.
5-812-1	255-812-1 Genesee	Wastern New York Concrete Corp.	1957	2	85.9	∞	ı	Sand and gravel	965	7.4	7-17-63	ı	ì	<	Anal; acrean, 8-inch diameter; 77.9-85.9 ft; pumping test 60 gpm, swl 2 ft, dd 42 ft (r).
7	ģ.	do.	1957	DrI	4.18	80	ı	કુ	970	7.3	7-17-63	ı	1	<	Yield about 50 gpm (r); UM.
Ť	ę,	H. Eart	¥6_	Pri	38.5	و	:	ક	\$	6.3	49-91-9	3.	1,000	ш,	Iron.
255-848-1	Erie	Commodore Theater	ļ	ŗ	27.2	80	1	Limestone	640	•	1951	Te.	ı	ပ	Air-conditioning use; pumping date, 130 gpm, dd 10 ft (f).
255-850-1	do.	, Magel Dafry	;	P.	윤	œ	92	do.	099	r,p20	1951	Te.	i	v	Pumping data, 180 gpm, dd 45 ft.
256-818-1	Genesea	D. Hagge	1959	0r1	54	9	•30	Shela	935	9.7	7-30-64	ĕ	700	<u>.</u>	Yield 8 gpm (r).
256-822-1	œ,	K. Skeet	1961	1.0	27.5	9	.	3	830	7.3	7-30-64	3	38	٥	Anal; H ₂ S.
256-831-1	£ri•	Steracki	1959	r.	52.3	¢	OH6	8	800	9.91	49-61-8	ĕ	200	٥	Anal.
256-835-1	ક	Huber	1961	110	68.5	٠	:	ģ	770	18.7	7-23-64	ŧ	1	۵	
7	ę,	C. Suess	1958	0	65	9	#£	Limestone	750	29.6	9-19-61-8	į	250	٥	Anel.
256-844-1	ક	Twin industries Corp., Aerospece Olvision	1961	10	417		1	, do.	715	•	ı	ž	i	- -	iron; H ₂ 5; well is unused because quelity of water has detailorated; formerly supplied 150,000 gpd; yield about 285 gpm.
7	ę,	do.	1961	Dri	90	8	:	8	715	542	7- 3-64	:	:		
257-812-1	Genesee	E. Foster	1955	0-1	99	9	ı	Sand and gravel	895	5.2	49-91-9	7	1,500	·	
7	ę,	W. Cook	1960	r _o	11.3	9	:	œ,	895	5.5	19-91-9	3	150	٥	Anal; Iron.
257-817-1	do.	J. Penkszyck	1961	o.	r\$2	1	;	Shale	920	ł	1	ř	;	٥	fron.
257-824-1	œ,	VIIIage of Corfu	1954	10	139.3	12, 8	30	Sand and gravel; shale	850	9	1- 6-54	Tur	55,000	æ	Temp 49.8, 1-17-63; screen, 8-inch diameter, 100-siot from 34,3-39.3 ft; 12-inch diameter gravel pack from 32-39.3 ft; pumping rate 90 gpm; pumping test 100 gpm, awl 6 ft, dd 11 ft.
-7	ŝ.	do.	1952	Ort	136.6	12	33	ŝ.	850	3	10-27-52	;	;	<	Pumping test, \$10 gpm, swi 4 ft, dd 12 ft.
257-855-1	Erio	E. I. du Pont de Nemours & Co.	1925	- O	101	80	55	Camillus Shale	230	130	1961	₹	;	- •	Yield 125 gpm; I of 3 wells of the "north" well fleid; combined pumpage was 200,000 gpd.
7	ĝ,	do.	1925		r123	80	55	do.	290	130	1561	₹	ł	- -	Vield 125 gpm; I of 7 wells of the "south" well field; combined pumpage was I mgd.
258-809-1	Geneses	0-AT-KA Hilk Products Cooperative, Inc.	1958	T _Q	r49.2	18, 10	1	Sand and grave!	900	26.5	8- 1-58	Ter	ŀ	-	Screen, 10-inch diemeter, 125-elot, from 41 to 49 ft; gravel packed, Cape May No. 5 gravel; pumping test, 456 gpm, swl 26.5 ft, dd 12.8 ft.
7	8.	ę,	1958	r _o	;	. 60	;	do.	900	22.2	5- 8-63	Tur	ı	-	
258-813-1	કું	H. Loveland	}	ī	11.7	•	;	Shale	006	8.1	6-26-63	;	1	<	
7	કું	ę,	1	ī	33	9	ŀ	ģ	8	13.1	6-26-63	J	ı	9	Anal; Iron; temp 48.0.

Table 6. -- Accords of selected wells in the Erla-Niegere besin (Continued)

Abilitude Mater level above Balow and a leaf Dapth Type Year comi allen

County

number

مي. ب

Hathod pumpage of pr flow and lift and por day)

5**-**85 - 102 -

REFERENCE NO. 14

CONTACT REPORT

AGENCY: NYSDEC Region 9 Fresh and Wildlife Habitats

ADDRESS: 60 Delaware Ave., Buffalo, New York 14202

TELEPHONE: 847-4550

PERSON

CONTACTED: Jim Farquar

TO: F. Mc Kosky

FROM: P. Gunther

DATE: 8/26/87

SUBJECT: Wetlands in Erie Co., Significant Habitats, & Floodplains

for DEC Phase 1 Investigations

xc: M. Sienkiewicz, G. Florentino, J. Sundquist, P.

Farrell, ubsood

Jim Farquar has provided us with state and federal wetland maps along with wetland descriptions for wetlands that are closest to each site. Attached is a list of sites and the wetlands that are closest to the site. Using the site assignments we settled on at the Erie Co. group meeting on 8/25/87; I have enclosed for each project member the state wetlands that he/she will need. Use the wetland information for the following:

- 1) Wetland Classification
- 2) Wetland Size
- 3) Wetland Cover Type (swamp, meadow, etc.)
- 4) Look for endangered, threatened, or rare species.
- 5) Determine if there is anything special about the wetland (i.e. it no longer exists, it has an extensive management plan, it is considered a significant habitat, etc.)
- 6) Wetland Common Name

Enclose wetland information for documentation.

Also attached are soil sheets for some sites. These should be kept in with file documentation.

Federal wetland maps are also attached. State wetlands are 12.4 acres or more in size, while federal wetlands may be as small as 0.5 acre. Each federal wetland has a code that describes the wetland type. Use the attached wetland legend sheets to determine the Federal wetland type (i.e. PFOIE is a palustrine, forested, fresh water, alkaline, seasonally saturated wetland). Note that several sites are on or very close to federal wetlands.

Also attached are significant habitats for Erie Co. and a description for each site. It'll be necessary to obtain a full scale quad sheet for your hazardous waste site, plot the closest significant habitats using the enclosed map, and determine if there is a significant habitat within 3 miles. Enclosed is a short description for each significant habitat and its common name.

The sites within a 100 year floodplan are:

- 1) Snyder tank Republic Steel building
- 2) Springville

All other sites are not in the 100 year floodplan.

WETLANDS IN ERIE CO. NEAR DEC PHASE 1 SITES

Sites Wetlands

Springville AH-1, SP-11

Dupont BW-6, BW-2

FMC BW-6, BW-2

Whiting AK-14, AK-7

HiView BU-13

Clarence CL-5, CL-2, CL-1, CL-11

Gutenkist HP-15

Bern BU-1, BU-15

Tift BU-1, BU-15, BU-7

Republic BU-1, BU-15, BU-7

Buf-Hop BU-1, BU-7, BU-15

C. Auto BU-1, BU-7, BU-15, BU-14

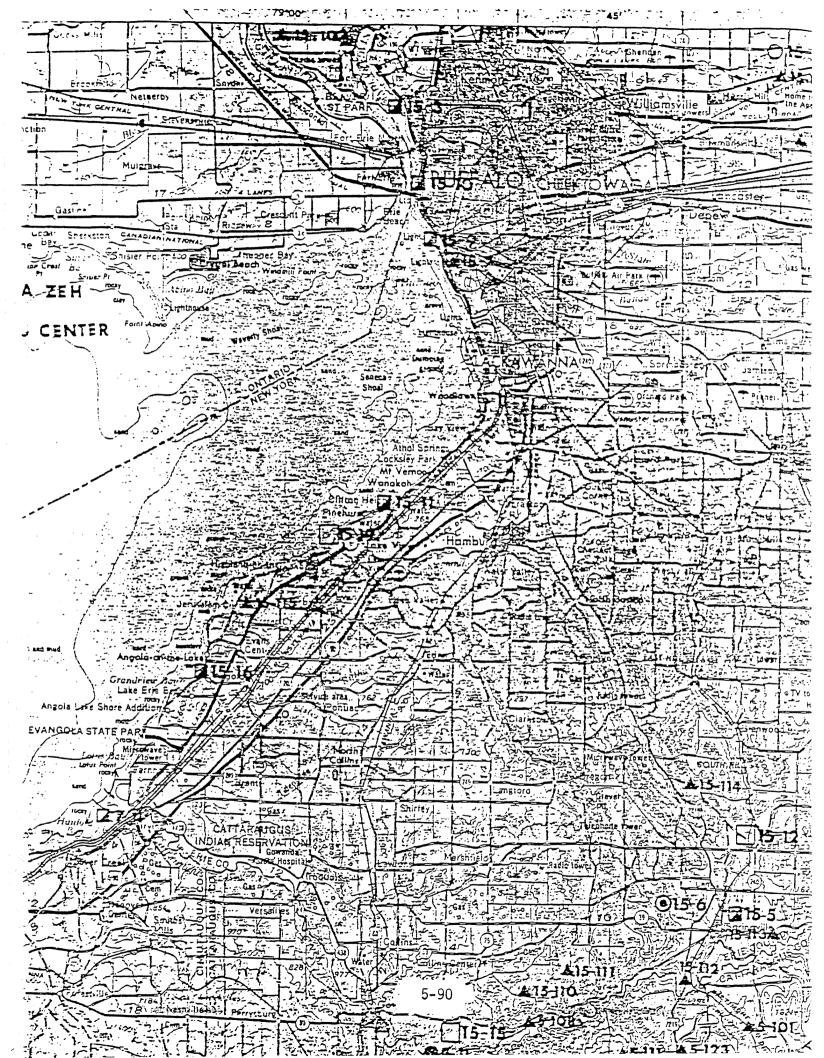
LSB BU-14, BU-4

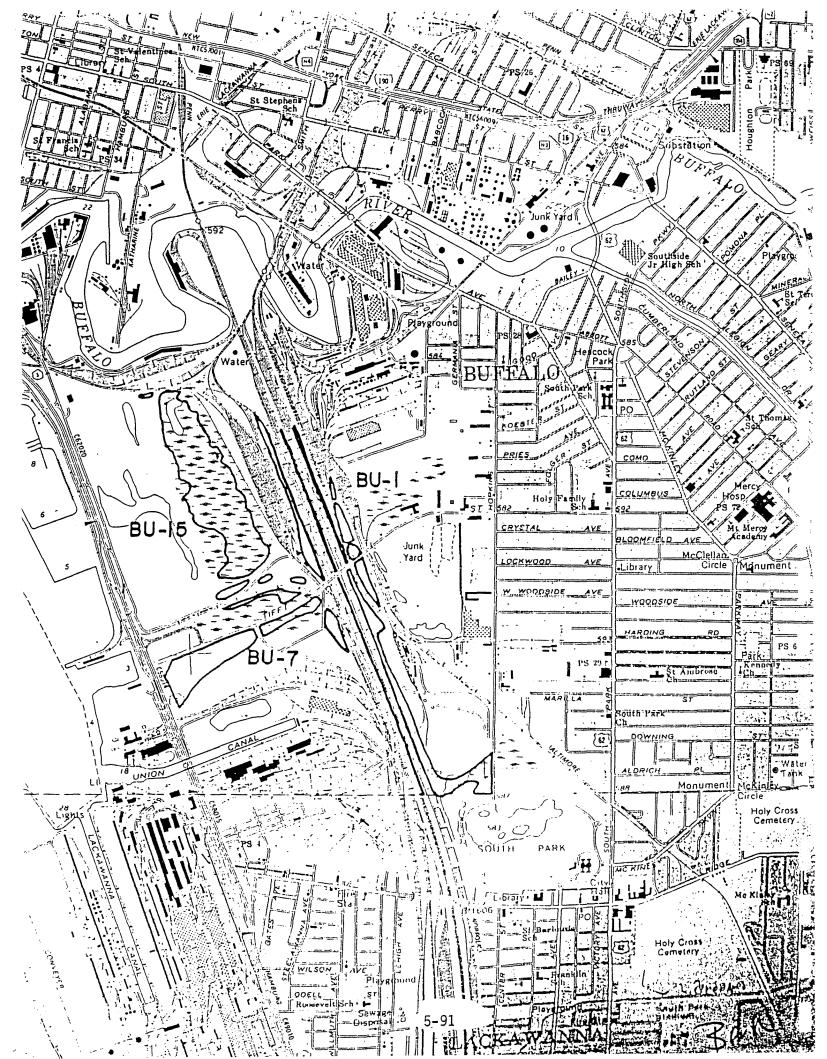
Snyder BU-14, BU-4

Eden ED-4, ED-7, ED-5, ED-11, ED-13

J. Fox AN-5

Schreider HB-12





ERIE COUNTY (15)

) 1	Hickleberry Survey	•
	Lover Niagara River Duck Wintering Men.	Aerial-Survey
2.	Grand Island & Vicinity of Upper River	Wayne Hadley
3.	*Strawberry Island	Wayne Hadley & Robert F
4.	Tillman Road Swamp	Erie County EMC
1 5.	Spring Brook	Gordon Deitrich III
1 6.	Spooner Creek Valley	Gordon Deitrich III
₹ 7.	Times Beach Diked Dredge Disposal Site	Robert F. Andrle (Dr.)
8.	Buckhorn Island Control Dike Gull and Tern Colony	Robert F. Andrle
9.	Donnelley's Pier (North Breakwater) & North End Light Breakwater Gull and Tern Colonies	Robert F. Andrle
10.	Source of the Niagara River Waterfowl, Gull and Tern Concentration Area (International)	Robert F. Audrle
11.	Pinehurst Raptor Migration Observation Site	Robert F. Andrle
] 12.	Dead Man's Lake Bog	Terry Moore (DEC) and Alan Seidman
13.	Burnt Ship Creek Waterfowl and Marsh Bird Habitat	Dr. Robert F. Andrle
] 14.	Hemstreet Road Site	Alan Seidman
] 15.	Vail Road Site	Alan Seidman
J 16.	Buffalo Bridge to Cattaraugus Creek Duck Wintering Area	Aerial Survey
17.	. Prisadory Lander Farguett - Home Hill	-Claraces

STORTE LOADE HABITAL HAPS

The key below is to be used for interpreting significant habitat overlays at the scale of 1:250,000.

- Significant for plants

 Significant for wildlife
 Significant for both plants and wildlife
 Potentially significant for plants

 Potentially significant for wildlife
 Potentially significant for both plants and wildlife
 Known deer concentration areas
- Known deer concentration areas not in use
- Aerial survey yards not field checked
 - \Rightarrow Other such as unique geological formations

A potentially significant habitat is one that once was occupied, where the potential exists for reestablishing the species. It also applies to unconfirmed sightings in a given area.

The numbers identify significant habitats. The digits preceding the hyphen are county code numbers (with counties listed apphabetically). A county code sheet is attached. Numbers following the hyphen ranging from 1 to 99 were assigned to significant habitats as reports were received for each county. Numbers of 101 or more denote deer concentration areas.

* * *

The significant habitat locations on this map represent initial reports of areas from a variety of people, but usually from those affiliated with a governmental agency (including Department of Environmental Conservation), university, local conservation organization, bird club, etc., and occasionally just knowledges individuals. Most locations have not been verified as to exact boundaries, confirmation of data reported, etc., and at this stage the map (overlay) is meant only as an early alert or "red-flag" system strictly for the purpose of identifying potential conflicts. If a potential conflict with a development project is determined from a map location, more information should be obtained from DEC, and a field check may be warranted to resolve the situation. As more accurate information is obtained, and/or locations are verified, the maps will be refined.

The map locations represent only information on hand and are by no means compared and area does not appear on a map, doesn't mean it isn't significant, it probably just hasn't been reported.

D/77 - New York State Department of Environmental Conservation Bureau of Wildlife - Wildlife Habitat Section - Significant Habitat Program

- 7. Hoopers Corners Bog Towns of Machias and Yorkshire.
 Bog contains at least two rare plant species.
- C. Chantangua County: of bear a love of the days continued the
 - 1. Chautauqua Creek Gorge Toyna of Westfield and Chautauqua. Scenic gorge with unusual geologic and vegeta-
 - tive interest. Also, historic nest sites for Ospreys and Eagles. The water frame, deam is the site of - 2. Canadaway Creek Gorge Towns of Arkwright and Pomfret.
 Unique geologic area with several waterfalls. Also, historic nest sites of Endangered Raptors.
 - 3. Twenty Mile Gulf Town of Ripley. Scenic, unique geology and vegetation. Historic nest sites of Endangered Raptors.
- D. Frie County; Air was a dear to sugar the line to the removement,
 - 1. Strawberry Island Town of Tonavanda, This area provides a major waterfowl feeding and resting area, as well as important game fish spawning habitat. This horseshoe-shaped island has been degraded over the years by gravel removal. Although this activity has stopped, there is potential that natural erosion could continue to degradate the island.
- 2. <u>Huckleberry Syamp Town of Holland</u>. This unique area (15 acres[±]) has rare plants such as Sphagnum Moss, and Larch. The area is part of Erie County Forest #5; so it has a certain degree of protection. The main potential problem is lack of appreciation on the part of Erie County; thereby, it may be improperly managed.
- 3. Grand Island Shoreline Town of Grand Island. This shallow water habitat provides excellent fish habitat and is a major wintering habitat for 10-20,000 ducks.

 The major species of waterfowl are the rather uncommon Canvasback, common Merganser and Scaup. The shoreline is very vulnerable to degradation by dock and bulkhead construction.
 - 4. Times Beach City of Buffalo. This partially filled, shallow-diked disposal site provides an extensive littoral zone. Therefore, waterfowl and shorebirds utilize the area. A total of 186 species of birds have been identified here. The fact that it is located within walking distance of downtown Buffalo gives great potential for high human use. While the area is owned by the City and leased to the Army Corps of Engineers, the area

15-7

15-3

1 -- 1-- 19

- is destined to be filled with dredge material? However, the area is very valuable to local and migratory birds and should be maintained in its present state. It has not the potential of being lost if the Corps continues its plans to fill the site. The local is the corps continues its plans to fill the site. The local is the corps continues its plans to fill the site. The local is the local in erest.
- 5. Gull and Tern Colony Buckhorn Island Town of Grand Island. This man-made (rock) dike is the site of one of the few and largest Gull and Tern nesting colonies in the area. While the area itself will tend to remain, it is subject to visitation by humans. Disturbance during nesting could be disastrous to the reproduction of Gulls and Ternsyna in the finding ragion.
- Donnelley's Pier and North End Light Breakwater Gull and Tern Colonies City of Buffalo. These breakwaters provide the only two major Gull and Tern nesting sites in the Buffalo area, Even though these piers are permanent, there is the chance of rehabilitation of the piers which would destroy the nest sites. Also, human disturbance during the nesting period could be detrimental to the reproduction of Gulls and Terns.

In the time wearpaids also a contract their articles. The Contract

Junt Ship Canal and Buckhorn Island - Town of Grand Island. This large cattail, rush and marsh habitat supports a large variety of aquatic life which provides feeding and nesting habitat for a variety of waterfowl and shorebirds. The area also hosts a large number and variety of migratory waterfowl. In fact, the area serves as the southern terminus of a large number of diving ducks. Buckhorn Island is under control of the Nisgara Frontier State Park Commission and should be relatively safe from degradation.

15-13

15.14

- 8. Hempstead Road Site Town of Marilla 10 acres. This bog contains rare and unique flora characteristics of the boreal forest. Since the area is on private land, it is subject to filling or draining unless protected under the Freshwater Wetlands Protection Act. Also, the area could be subject to degradation by National Fuel Gas by the laying of a large diameter gas line.
- 9. Onondaga Limestone Escaroment Harris Hill Clarence,
 This 27 acre calcareous rock outcrop provides a unique
 area for calciphilic plants. Due to the rare occurrence
 of such sites, the area is unique. The site could be
 degradated by removing rock and/or building sites for
 residences.

Eighteen Mile Creek - Towns of Evans and Hamburg. This scenic gorge area between Old Lake Shore Boulevard and Lake Erie has remained essentially undisturbed from human number lastices. In and commercial development. The only indiscriminate use is by fishermen. The land is protected by a restrictive clause in the deed to prevent any commercial development. The area has lush growth of ferns, and large Eastern Cottonwoods dominate the gorge. Eighteen Mile Creek diffuses into several channels at this delta. Large scale ferminate the fect on this pristine lakeshore habitat due to its close in the fect on this pristine lakeshore habitat due to its close form the found in the fishing rights acquisition file lotened.

~^K15-18

11. Counterfeiters Ledge - Town of Maystend. This 27 acre area also extends into the County of Genesee. This area is similar to the Onondaga Limestone Escarpment. Calciphilic plants occur here. Wood cutting and residential development represent the only major threats to this area.

12. Newstead Sink - Town of Newstead. The area (200 acres) is in two parcels located on either side of the New York State Thruway. The Spring flooding provides a stopover for several thousand ducks, geese and swans. It is probably the most highly used waterfowl area in Erie County. The area provides nesting habitat for some resident waterfowl. The most important threat is due to agricultural drainage and encroachment.

Niagara Gorge (Hydroelectric Gull Concentration Area) Town of Lewiston. Town of Miagara on the Lake. This is
one of the largest Gull concentration (19,000+) areas in
the Region. They are attracted by the "chumming" of
small fish at the hydroelectric plants. The rocky, nearly
vertical walls are quite safe from disturbance, except
a potential threat exists from additional expansion of
power projects by the U.S. or Canada.

F. Wyoming County:

Beaver Meadows Hature Sanctuary - Town of Java. This 226 acre diverse, ecological area is owned by the Buffalo Audubon Society. The area is used as an outdoor laboratory and educational center. The area is unique in providing neveral diverse communities in close proximity to each other.

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7. "

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parate Class II characteristic in determining item 7. Complete information on reverse side of form to substantiate your mber of species to which characteristics 13, 14 or 15 apply shall be identified in parentheses with species considered a nclusions. A wetland with no Class I, II, or III characteristics is a Class IV wetland structions: Circle numbers of applicable classification characteristics and place check next to appropriate class.

uad name Buffale Sie.	Jity, Bown, Villane) Suffice
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water supply or hydraulically substantially developed area Significant flood protection for region or state Res. hab., thr./endg. anim. sp. Thr./endg. plant sp. connected to public water supply Adj./contig. to reservoir or public Unus. abund./div. anim. sp. in 4 or more Class II characteristics

> UTM Coord. 475/0000 Wetland no. Wetland name Tiff+ 151-15 Form Wetlands

8 Empt. marsh: pur. loosestrife and/or phragmites max. 66% of covertype CLASS IT

Contig. to tidal wetlands 2 or more wetland structural groups

Assoc. with ext: perm. onen water Adj./contig. C(t) or higher stream mig. hab. thr:/endg: anim. so..

Res. hab. vuln. anim. sp.: state

Vuln. plant sp.: state

16. Unus. abund/dv. anim. sp.; county

18. Archeo./paleo. significance

Flood protection value: agr., light or planned develonment area Unusual geologic feature

Hydraulically connected to aqui er

sewage disposal system : Tertiary treatment capacity for a Within urbanized area

In publicly owned recreation area 1 of 3 last. wetlands: city, town

DEC no. 115-01-0165 Lastadard No. of sheets Inspection Dates

attached

Date

or phragmites min. 66 Engt. marsh, pur. loosestrife or cove

Deciduous swamp

23 Wetland open water Floatin- and/or submergent

30 Total alkalinity at least 50 F Contains island

soils Adj. to fert. upland; high bas

or state Res. for region: mig. for regi Res./mig. hab. of vuln. anim.

Vuln. plant sp.; region

Visible and aesthetic/open sna which pollution reduction occu Part of significantly pollute value nermanent onen water system in

covertype within a town 1 of 3 lgst. wetlends of of tat Sane

(8) Publicly owned land open to town acreage

Wetland acreage max. 15

public use

NOTE

********NOTICE****

This wetland, FW No. 6V-/5, is also classified as a significant coastal fish and wildlife habitat. SEE TIPFI FROM NATURE PLESTIVE file, under SIGNIFICANT COASTAL FISH AND WILDLIFE HABITATS, and habitat boundaries on coastal area maps.

TON

FRESHWATER WETLAND CLASSIFICATION

eparate Class II characteristic in determining item 7. Complete information on reverse side of form to substantiate your onclusions. "A wetland with no Class I, II, or III characteristics is a Class IV wetland umber of species to which characteristics 13, 14 or 15 apply shall be identified in parentheses with species considered a structions: Circle numbers of applicable classification characteristics and place check next to appropriate class.

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lity,	City, Town,	STATE OF	(e)	いってたい	را	
ounty	Ecli	λ·				•
uad. name	name	. 13	ffalo	S.E.		
	,		. !			

substantially developed area Significant flood protection for region or state Unus. abund./div. anim. sp. in Thr./endg. plant sp.

> UTM Coord. 47500000 M. 185 200 171 Wetland no. Bu-7 Wetland name TIII Street Wetland DEC no. 915-01-0275

16. 14 (B) "Contig. to tidal wetlands Within urbanized area or planned develonment area Assoc. with ext. perm. open water 1 of 3 lest. wetlands: city, town, Tertiary treatment capacity for a Hydraulically connected to aquifer Flood protection value: agr., light Ad, 1./contig. C(t) or higher stream In publicly owned recreation area Archeo./paleo. significance Unus. abund/dv. anim. sp.; county 2 or more wetland structural groups phragmites max. 66% of covertype Emet. marsh: pur. loosestrife and/or Unusual geologic feature) Vuln. plant sp.: state Res. hab. vuln. anim. sp.: state

4 or more Class II characteristics

connected to public water supply water supply or hydraulically

Adj./contig. to reservoir or public

No. of sheets attached Preparer (Inspection Dates

Elayt. marsh, pur. loosestgife

- Deciduous swamp or phragmites min. 65 of cover
- Shrub swamp
- 29. ა ა Contains island Wetland open water Floating and/or submergent open water O
- W N Adj. to fert. upland; high base soils Total alkalinity at least 50 FT
- ű Res./mig. hab. of vuln. anim. s or state Res. for region: mia. for regio
- 35. <u>نک</u> Part of significantly polluted Vuln. plant sp. region
- Visible and aesthetic/open space which pollution reduction occur permanent open water system in
- Wetland acrease max. 15 of tota 1 of 3 lest. wetlands of same

37.

covertype

Vetland acreage max. —

town acreage

Publicly owned land oren do

over o

over do

The state of the s

PPLY? coportion of the wetland's area. id assign the wetland to the class representing the largest rea, add up all the separate covertype areas in each class sin//le covertype is of at least 50% of the AREA wetland open water min. 15% TOTAL Class Wet meadow Class IV Class II Wetland open water Water - submergent, floating veg., shrub swamp min. 25%. Coniferous swamp TOTAL Class Wetland open water Floating/submergent veg Shrub swamp Deciduous swamp, phragmite min. 66% of covertype Engt. marsh; pur. loosestrife and/or Class III TOTAL Class II phragmite max. Engt. marsh: pur. Floating/submergent veg. Shrub swamp Coniferous swamp Deciduous swamp Wet Meadow COVERTYPE (min. 50% of area) meadow min. 25% of wetland. Dmergent marsh - deciduous, coniferous, 66% of covertype loosestrife and/or Instructions Diminant Š

Emergent work and decidence county of the Emergent was to repeat the Emergent was to repeat the Emergent was to read in the Emergent was to read the the Emergent was
WETLAND DATA

WETLAND NAME: T: H't Street Wetland
LOCATION: City of Buttalo
Quad: (USGS)(DOT) Buffulo SE
County: Evie
Town: City of Bulliala
Town: City of Bullelo Piles Pir. 5 From Tiff Farm
INVESTIGATOR(S): James Snicker
THAT JULIE TO THE TANKER
DATE(S) OF FIELD INVESTIGATION:
Date(s) Weather
3/6/80 Suny - 300
TYPE OF ANALYSIS:
a. Reconnaissance
b. Releve'
c. Continuum
VFGETATION CONTUNITY:
a. Size of Wetland DC acves
b. Covertypes (estimated percentage)
1. Wet meadow
2. Fmergent Marsh
3. Deciduous Swamp 3 95 %
4. Coniferous Swamp
5. Shrubs Gwamp
6. Submergent &/or floating 5?
7. Wetland open water 570
c. Remarks:

FCOLOGICAL ASSOCIATIONS

1. Covertype Groups

1. + 2. = 9-973

6+7 = 5

2. Classic Fettlehole bog No

VQ4. Associated with open water <u>No</u>

5. Proximity to Mud Flats No

6. Island present $\mathcal{N}_{\mathcal{O}}$

7. Adjacent to Class C(T) or higher stream

None

SPECIAL FRATURES

BA

Excollent interspersion
of covertypes. Emergent
vegetation and decideous
wetland combined through
much of the wotland.

Ice cover hindered
ability to determine if
the one portion was
open water or had
submergent vegetation,

parate Class II characteristic in determining item 7. Complete information on reverse side of form to substantiate your mber of species to which characteristics 13, 14 or 15 apply shall be identified in parentheses with species considered a structions: Circle numbers of applicable classification characteristics and place check next to appropriate class. Mote A wetland with no Class I, II, or III characteristics is a Class IV wetland

ad. name - 13 wffalo ity, Town, Willage) Buffale

nclusions.

water supply or hydraulically region or state connected to public water supply substantially developed area Significant flood protection Unus. abund./div. anim. sp. in .. Adj./contig. to reservoir or public Thr./endg. plant sp. Res. hab., thr./endg. anim. sp. Classic kettlehole bog CLASS I X

> UTM Coord. 475010000 11: 19610000 Wetland no. (311-1 Wetland name Republic Steel Wetland DEC no. 915-01-6212

CLASS IT

6 phragmites max. 66% of covertype Emgt. marsh; pur. loosestrife and/or

10. 6 Contig. to tidal wetlands 2 or more wetland structural groups

Assoc. with ext. perm. open water

12. Adj./contie. C(t) or higher stream

mig. hab. thr./endg. anim. sp.

14. Vuln. plant sp.: state Res. hab. viln. anim. sp.: state

16. Unus. abund/dv. anim. sp.; county

18. Archeo./paleo. significance

Unusual geologic feature Flood protection value: agr., light

4 or more Class II characteristics

or planned development area Hydraulically connected to aqui er

sewage disposal system ... Tertiary treatment capacity for a

NYC Borough 1 of 3 lgst. wetlands: city, town, Within urbanized area

In publicly owned recreation area

No. of sheets attached ! Inspection Dates 71, 8177

Preparer | Date

..25. Eagt. marsh, pur. loosestrife a or phragmites min. 667 of cover

Chrub swamp Deciduous swamp

29. 25, Wetland open water

<u>3</u>1. 30. Contains island Total alkalinity at least 50 PF

32. Adj. to fert. upland; high base soils

بن Res./mir. hab. of vuln. anim. s Res. for region: mig. for regio

Vuln. plant sp. region

36. Part of significantly polluted Visible and aesthetic/open snac which pollution reduction occur permanent open water system in

٠<u>۲</u> covertype within a town 1 of 3 lest. wetlands of

38. Wetland acreage max. 15 of tota town acreage

public use Publicly owned land open to

OTHER MOTABLE FRATURES (Reference Information Sources where appropriate)

- 1. Foils. No soils information available. It, would appear that original soil may have been by human activities.
- Muman influence-degradation

There is a present proposal for using aven adjacent to the wetland for land till activities. Potential for complete loss of welland land fill should not ho trept and it the

OFFER HORABLE FLATURES (Cont.)

Pescription of Faunal Community Cottontail Rabbit - Sylvilagus Floridary Ring-nectical Phassant - Phas: anus Muskvat - Ondatra This wetland should have additional, forms of wildlife associated with it. It was would appear to be an excellent site for breeding waterfoul plus use by waterfoul derice migration periods. Others This area is located within Yenile of Tiff Farm Nature Preserve. The area compliments the habitats nature center.

proportion of the wetland's area. and assign the wetland to the class representing the largest area, add up all the separate covertype areas in each class If no single covertype is of at least 50% of the wetland PPL. PPLY? Acces AREA 652 10% wetland open water min. 15% COVERTYPE (min. 50% of area) Woody - deciduous, coniferous, TOTAL Class III Wetland open water Water - submergent, floating veg., shrub swamp min. 25%. meadow min. 25% of wetland. Herbaceous-emgt. marsh, wet CITCILL TOTAL Class Wet meadow Floating/submergent veg. Shrub swamp phragmite min. 66% of covertype Emgt. marsh; pur. loosestrife and/or TOTAL Class II Floating/submergent veg. Shrub swamp Coniferous swamp Deciduous swamp Wet Meadow Coniferous swamp Class IV Wetland open water Deciduous swamp Class III phragmite max. Engt. marsh; pur. Class Emergent marsh GRU J 66% of covertype loosestrife and/or ;

· Nature Preserve	This without	Howamy Block	J 2061 Gaisin	Wetland within		and conther	15 included of	about acrease	Seport Account	Core type Category	ć		Wall policy area	American Company of the Company of t
ic.	is meet the	Statistics of the	Bureau J. Comme	o elchonard dre	(See enclosed men	crec is no lourer	Trick of Cooke	Do Tarasa I da						
		70.7		5-10		50 3000	Re Cartiller				ndy management of seminates on management through the sea	A Character section of the formal and the section of the section o		And the second s

			FIELD BATA SHEET . UTN L L	L.lL_tl Additional
•	Name Republic Steel Wotlan	<u>nd</u> :	8. Aquatic shrubs	Comments
	riles 1 dir NW from Lackawa	ind.	9. Dead shrubs	Wetland Size
•	Topo quad Buffalo SE		<u>Emergents</u>	50 acres
٠ : (County Evie	•	10. Sub-strubs	
;	roun City of Buttalo	····	11. Robust cinergents 55%	
- 1	Region 9. Artif	icial	12. Tall meadow emergents 2	
•	Interspersion 6 Vegetative Cover	<u>80 7.</u>	13. Short meadow emergents 10 %	
(5-24" depth <u>30</u> 2		14. Narrow-leaved marsh emergents%	
3	SETLAND TYPES		15. Broad-leaved marsh emergents%	
•	Inland Fresh	•	Surface Vegétation	
1	. Seasonally flooded basins/flats	7.	16. Floating-leaved vegetation 10%	
2	Presh meadows	102	17. Floating vegetation7	
3	3. Shallow fresh marshes	55%	Submergents	
4	. Deep fresh marshes	10%	18. Submergents	
. 5	Open frosh marshes	15 %	If open water, proportion of submergents:	
6	. Shrub swamps	z	0-1/3 2/3-2/3 2/3-1	
7	. Wooded swamps	10 2		
. 8	. Pogs	z	Purple loosestrife: None plants	
	Coastal Fresh		Clumps (1m.diam. Clumps) 1m.diam.	
3	2. Shallow fresh marshes	%	Adjoining clumps through an area	
. 1	3. Deep fresh marshes	%	Solid, most of wetland	
. 1	4. Open fresh water	×	Green timber impoundment potential	•
	Coastal Saline		Mature Trees or overmature trees 80-100'	
. 1	5. Salt flats	z	80% crown closure About 30"+ muck	•
1	6. Salt meadows	2	Red, Swamp Wh.Oak, Red Ash	
1	8. Regularly flooded salt marshes	%	Understory: Sensitive Fern/Arrow Arum	
1	9. Sounds and bays	%	Water	
y	EGETATIVE CLASSES		Total alkalinity (1) (2) (3)
	Trees	' '	(4)(5)(6)(7)	
1	. Live deciduous trees		(8) (9) (10) mean:	
2	. Live evergreen trees	7	Water temp. (1)(2)(3)	
3	. Dead trees	X	(4)(5)(6)(7)	W-11
	Shrubs		(8)(9)(10)	
4			Not enough water to sample	
5	. Bushy shrubs		Investigator: James Snider	5-1-06
G	recycled paper Low compact shrubs	½	nitle: Sr, Wildlife Bidog. 51 and envi	ronment
7	Low spaces cheabs	.,	mate: 7/20/28 \$ 7/24/28 Time:	7 T T T T T T T T T T T T T T T T T T T

INFLUENCES ASO VALUES

uman influence Min. Mod. Maj.	MISCELLANZOUS VALUES (use boxes to describe).
Several functioning [X []	Unique Geology
railroad tracks []	
Disposal site for IN I	
materials from	Source:
Republic Steel	Unique in Environs
	Portions of this wetland
	Portions of this wetland mear Tiff Farm Noture Preserve
	Source: J. Smider
*	Flood Courrol
Prod. loss to degradation 10-20%	
source: J. Snider	-
Vulnerability to destruction	Source: Sediment Filtering
lowhigh	
h	•
Reason for vulnerability classification	Source:
Partions of this wetland	Potential Use
on both Republic Steel	·
property - vailroad property	
potential site for filling & storage	Source:
source:	Aesthetic/Open Space
J. Snider	
Enhancement possibility	
low medium high	
Work needed:	Source: . Historical Value
	Source: Migration Distribution
	flight lane
Expected gain	
	Source:
Source:	
	t
Known ownership Federal State Local	,
Conservation Organ. Sport Private	Source:
D Printed F	5-107

REFERENCE NO. 15

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Les from dil acetic acid. Bitter taste with g/kg i.p.; 6.64 g/kg orally. Hartung, Cornish, Toxicol. When anhydr, mp 198°. [a]0° + 37° [c + 1] Pharmacol. 12, 486 (1968).

C = 6.4. Not precipitated by digitors agree CAT: Lipotropic.

O.28 g/l; in alcohol 30.56 g/l; in ehalier and control of the cornish of t acial acetic acid 152.12 g/l. Sol in sola or carbonates.

44O5, crystals from ethyl acetate +pe

H₃₉NaO₃, sodium cholate. Crystals. So 568.9 g/l. Caution: The names "sodium um choleate" are sometimes used to s. The term "sodium choleate" is to be lts, see Ox Bile Extract.

rty of forming molecular compds is cor For instance a blue molecular compa O, may be prepd by mixing an alcohole ind a soln of iodine in aq potassium io J. Chem. Soc. 101, 1404 (1912). oleretic.

2- Hydroxy- N,N,N- trimethylethanamisi urine; amanitine; gossypine; vidine; but HERAP CAT: Lipotropic. C₅H₁₅NO₂; mol wt 121.18. C 49.55%, O 26.41%. Found in many plants and

alkaline liq, has been crystallized; absorbs Very sol in water, alcohol; insol in ether. Usually used as the chloride. atropic.

Ascorbate. Monocholine ascorbate. C₁₁ :79.28. C 47.30%, H 7.58%, N 5.01%, 0 m choline and ascorbic acid in methanoli 2,823,166 (1958).

 J_{25}^{25} 1.32. $[\alpha]_0^{25}$ + 66.9° (c = 10 in H₂0). 2.5 in H₂O). Sol in water, sorbitol solutions

Picarbonate. Choline hydrogen carbonau thyl)trimethylammonium bicarbonate. 165.19. C 43.62%, H 9.15%, N 8.48%, 0 H₂N · (CH₃)₃]HCO₃. Prepd by passing CH₂N · (CH₃)₃]HCO₃ ough a solution of choline until the pH of are is 9.0 or lower; the mixture is then ated with carbon dioxide to a pH of 8.5 is by vacuum evapn of the soln. oscopic white solid with a strong, fishy,

e-like odor. Very sol in water, freely sol in alcohol, slightly sol in benzene, practically insol in chloroform. The pH of a 10% ag soln is about 8.5.

201. Choline Chloride. Biocolina: Hepacholine: Lipo-C3H₄C1NO: mol wt 139.63. C 43.01%, H 10.11%, Cl 13%, N 10.03%, O 11.46%. [HOCH₂CH₂N' (CH₃)]Cl 2m: Klein, Kapp, U.S. pat. 2,623,901 (1952 to Nopeom.). Polymorphism: Collin, J. Am. Chem. Soc. 79, 6086

Miquese crystals. Very sol in water or alcohol. The aq is practically neutral. Keep tightly closed. LD50 in rats:

1202. Choline Citrate. Tricholine citrate: tris[(2-hydr- $_5H_{42}O_5$, crystals from 95% alcohol + whethyl)trimethylammonium] citrate. $C_{11}H_{47}N_3O_{16}$; mol wt 163. C 50.28%, H 9 45%, N 8.38%, O 31.90%. Prepd m choline and citric acid: Blackett, Soliday, U.S. pat. 74,759 (1956 to Am. Cyanamid).

$$\left[\begin{array}{cc} (\text{ch}_3) \sqrt[3]{\text{hch}_2 \text{ch}_2 \text{oh}} \\ \end{bmatrix}_3 & \begin{array}{c} \text{ch}_2 \text{coo} \\ \text{ch}_2 \text{coo} \end{array} \right]$$

HERAP CAT: Lipotropic.

2203. Choline Dehydrocholate. Dehydrocholic acid salt choline; Biscolan. C. H. NO.; mol wt 506.71. C 68.74%, 1955%, N 2.76%, O 18.95%. Prepn: Giovambattista, Rev. Les. Bioquim. Arg. 19, 180 (1954). C.A. 49, 13275 (1955). ydroxyethyl)trimethylammonium hydrus Crystals from methanol + ether, mp 196-198.

2204. Choline Dihydrogen Citrate. (2-Hydroxyethyl)tri-204. Choline Dinydrogen Citrate. (2-11ydroxyetny). Found in many plants and libid. She brain, yolk of eggs, hops, bell-shylammonium citrate; Chothyn; Citrocolina; Citrachoss. It is the basic constituent of lecithin testically from trimethylamine and ethyl-fi. 17%, N 4.74%, O 43.35%. [HOCH₂CH₃N+(CH₃)]-ethylene oxide: Blackett, Soliday, US [H₂O₃]. Prepn: Klein et al., U.S. pat. 2,870,198 (1959). Granules, mp 105-107.5*. Acrid taste. Freely sol in waz, very slightly sol in alcohol. Practically insol in benzene, where The Ph of a 25% ag soln is 4.25. May be doroform, ether. The pH of a 25% aq soln is 4.25. May be mulated with calcium citrate for better taste and easier bletting.

THERAP CAT: Lipotropic.

MERAP CAT (VEI): Dietary source of choline (lipotropic nor) in poultry.

2205. Choline Esterase. There are at least two choline strases. Acetylcholinesterase is a "specific" choline esterse, hydrolyzing predominantly choline esters, and characmiled by high concus in brain, nerve and red blood cells. the other type, called butyrylchalinesterase, is a nonspecific boline esterase ("pseudo" choline esterase), hydrolyzing ther esters as well as choline esters, and found in blood the sum, pancreas and liver, cf. Sumner and Somers, Chemistry ind Methods of Enzymes (New York, 1947). Prepn from dog ancreas: Mendel, Mundell, Biochem. J. 37, 64 (1943); from bise serum: Strelitz, ibid. 38, 86 (1944). Reviews: Davies. Gren. Advan. Enzymol. 20, 283 (1958); Froede, Wilson. Acetylcholinesterase" in The Enzymes. P. D. Boyer, Ed. Academic Press, N. Y., 3rd ed., 1971) vol. 5, pp 87-114. Specific choline esterase develops its max activity at pH 7 and at low levels of acetylcholine (less than 2.5 mg %). Both manymes are inhibited by very small quantities of physostignine (eserine). Acetylcholinesterase is inhibited by phoshorus-containing insecticides and nerve gases.

2206. Choline Gluconate. (2-Hydroxyethyl)trimethylmmonium D-gluconate. C₁₁H₁₅NO₄; mol wt 299.32. C 4.14%, H 8.42%, N 4.68%, O 42.76%. [HOCH₂CH₂N -(H₁)₃][C₆H₁₁O₇]. Prepn: Hermann, U.S. pat. 2,691,617

Brownish, viscous mass. Amme-like odor. Bitter taste. is in water. Slightly sof in alc, ether. Practically insol in tenzene, chloroform. pH of 50% aq soln: 5 to 6. THERAP CAT: Lipotropic.

2207, Choline Salicylate, 2-Hydroxy-N,N,N-trimethylethanaminium salt with 2-hydroxybenzoic acid (1:1); (2-hydroxyethyl)trimethylammonium salicylate; choline salicylic acid salt; salicylic acid choline salt; Actasal; Arret; Arthropan; Artrobione; Mundisal. C₁₂H₁₉NO₄; mol wt 241.28. C 59.73%, H 7.94%, N 5.81%, O 26.53%. Prepd by mixing stoichiometric amounts of choline chloride with sodium salicylate in acetone, removing the formed sodium chloride by filtration, and precipitating the choline salicylate by addition of petr ether: Broh-Kahn, Intern. Rec. Med. 173, 219 (Apr. 1960); cf. Johnson, Brit, pat. 8031 (1919); Broh-Kahn et al.. U.S. pat. 3,069,321 (1962 to Labs. for Pharmaceut. Dev.). Variations of process: Belg. pat. 583,513 (1960 to Mundipharma, AG).

Extremely hygroscopic solid, mp 49.5-50.0°. Very freely sol in water. Also sol in alcohol, acetone, other hydrophilic solvents. Practically insol in ether, petr ether, benzene, oils. Aq solns are stable, they contain the compd in the form of its dissociated choline and salicylate ions. pH of 10% aq soln 6.5. Aq solns are easily discolored by minute traces of iron. The addition of acid to aq solns immediately precipitates free salicylic acid, while choline base, readily recognized by its fishy odor, is liberated upon the addition of alkali. LD₅₀ orally in rats: 1.53 g/kg.

THERAP CAT: Analgesic, antipyretic.

2208. Choline Theophyllinate. Theophylline cholinate: theophylline salt of choline; oxtriphylline; oxytrimethylline; Teokolin; Teofilcolina; Filoral; Cholinophylline; Choledyl; Theoxylline; Soliphylline. Prepn: Ladenburg et al., U.S. pat. 2,776,287 (1957 to Nepera Chem.).

White granules (contains about 60% of anhydr theophylline). One gram dissolves in 1 ml water. Also sold as Cholinophylline Magnesium Glycinate which contains 43% of anhydr theophylline.

THERAP CAT: Smooth muscle relaxant.

2209. Chondrillasterol, 5_{\$\pi\$}-\$Stigmasta-7,22-dien-3\beta-ol. C 84.40%, H 11.72%, O 3.88%. Isolated from the green alga Scenedesmus obliquus (Turpin) Kuetz., Scenedesmuceae: Bergmann, Feeney, J. Org. Chem. 15, 812 (1950).

Crystals from chloroform-methanol, mp 168-169°. $[\alpha]_D^{24}$ -2° (chloroform).

Acetate, $C_{11}H_{50}O_{2}$, crystals from chloroform-methanol, mp 174.5-175.5°. [α] $_{10}^{10}$ -0.7° (chloroform). Benzoate, $C_{36}H_{52}O_{2}$, crystals from dioxane, mp 194-195°. [α] $_{10}^{10}$ + 3.9° (chloroform). crystals from chloroform-methanol,

2210. d-Chondrocurine. 6;6'-Dimethoxy-2,2'-dimethyltubocuraran-7',12'-diol; d-chondocurine; d-tubocurine. C_MH_MN₁O₆; mol wt 594.68. C 72.70%, H 6.44%, N 4.71%, O 16.14%. Isoln from Chondodendron tomentosum Ruiz & Pav., Menispermaceae: Wintersteiner, Dutcher, Science 97, 467 (1943); King, J. Chem. Soc. 1948, 1945; Bick, Clezy, ibid. 1960, 2402; Boissier et al., Lloydia 28, 191 (1965), C.A. 64, 948 (1966). Structure: Dutcher, J. Am. Chem. Soc. 68, 419 (1946); Hultin, Acta Chem. Scand. 15, 1130 (1961). Configuration: Bick, Clezy, J. Chem. Soc. 1953, 3893; Hultin, Acta Chem. Scand. 17, 753 (1963). Revised structure: Everett et al., Chem. Commun. 1970, 1020.

ìП. recycled paper ric salt: Tomita, Bull. Chem. Soc.

eep-blue, rhombic needles. Loses 13°, and dec with gas evolution at tly sol in alcohol.

powdery crystals. Loses one H₂O at bout 140°. Dec with gas evolution

nalysis for copper.

ritional factor. Given parenterally uminants.

10rosilicate. Cupric fluosilicate; F₆Si; mol wt 205.93. Cu 30.90%, F F₆. Prepn: Worthington, Haring, Ed. 3, 7 (1931).

onoclinic, efflorescent crystals. J. Chem. 47, 3859 (1969). Readily :losed.

ening white marble; treating plant

cide. Copper hydrate: hydrated iol wt 97.56. Cu 65.13%, H 2.07%, Commercial prepn: Furness, U.S. Cellosilk); idem, U.S. reissue pat. Research); Rowe, U.S. pat. 2,536,-lopper); laboratory prepn: Weiser 54, 503 (1942); Gauthier, Bull. Soc.

or light blue cryst powder. Stabiliiethod of prepn; may dec to black lays or on heating. d 3.37. Pracin concd alkali when freshly pptd;

, battery electrodes, other Cu salts: pigment; in fungicides, insecticides: ng and staining paper; in prepn of atalysts.

CuN₂O₆; mol wt 187.56. Cu 8%. Cu(NO₃)₂. Prepn: Gmelin's, i-179 (1958); Addison, Hathaway,

uesc, orthorhombic crystals. Subi-256°. Sol in water, ethyl acetate, reacts vigorously with ether. Keep

Blue, deliquesc, rhombic plates. sol in water, alcohol; practically I of 0.2 molar aq soln 4.0. Keep

iquesc prismatic crystals. reely sol in water; sol in alc. Keep

reproductive papers; as ceramic dant in textile dyeing and printing; iron, for giving a black "antique" ring zinc brown; in nickel-plating thteners; in wood-preservatives, yrotechnic compositions; as cataocket fuel; as nitrating agent for npds; as catalyst for organic reacto skin, mucous membranes.

9-Octadecenoic acid copper salt. 5.43. C 69.02%, H 10.62%, Cu I33COO)2Cu. Prepd from CuSO4 ik, J. Chem. Soc. 1954, 4412. ctically insol in water; slightly sol

spositions; as emulsifier and disnt in lubricating oils; as combusas stabilizer for amide polymers;

ver, a hydrocarbon mixture used

Ethanedioic acid copper C 15.85%, Cu 41.92%, O 42.23%. ion of CuSO, with oxalic acid: 1 water, alcohol, NH,OH.

David. Bull. Soc. Chim. France 1960, 719. Usually contains ome water.

Blue-white powder. Loses any hydrated water by 200°; de in air at 310° to CuO. Practically insol in water, alcohol, ther, acetic acid; sol in NH4OH.

USE: As catalyst for organic reactions; as stabilizer for cetylated polyformaldehyde; in anticaries compositions; in sed treatments to repel birds and rodents.

2648. Cupric Oxide. Black copper oxide. CuO; mol wt 9.54. Cu 79.88%, O 20.12%. Occurs in nature as the minsals tenorite (triclinic crystals) and paramelaconite (tetraheial, cubic crystals). Prepn: Glemser, Sauer in Handbook of heparative Inorganic Chemistry, vol. 2, G. Brauer, Ed. Academic Press, New York, 2nd ed., 1965) p 1012.

Black to brownish-black amorphous or cryst powder or ranules. di 6.315. Practically insol in water, alc. Soly sudy: Hayward et al., Nature 215, 730 (1967). Sol in dil cids, alkali cyanides. (NH₄)₂CO₃ soln; slowly sol in NH₃.

USE: As pigment in glass, ceramics, enamels, porcelain glazes, artificial gems; in manuf of rayon, other Cu compds; in sweetening petr gases; in galvanic electrodes; as flux in Cu metallurgy; in correcting Cu deficiencies in soil; as opticalglass polishing agent; to impart flux-and abrasion-resistance to glass fibers; in antifouling paints, pyrotechnic compositions; welding fluxes for bronze; as exciter in phosphor mixtures; as catalyst for organic reactions.

2649. Cupric Perchlorate. Cl₂CuO₃, mol wt 262.45. Cl 1.02%, Cu 24.21%, O 48.77%. Cu(ClO₄)₂. Prepd from (u(NO₃)₂ and perchloric acid or nitrosyl perchlorate: Cam. Bryce, J. Chem. Soc. 1934, 514; Hathaway, Underhill. id. 1960, 648; 1961, 3091; Hathaway, Proc. Chem. Soc. 1958, 344,

Very pale green, hygroscopic crystals. Volatilizes on heatg. Thermally stable to 130°; above 130° dec to a basic archlorate, mp about 230-240°. Soluble in water, ether, axane, ethyl acetate. Practically insol in benzene, CCl.

Hexahydrate, deep blue, monoclinic crystals. Freely sol in ater, methanol, ethanol, acetic acid, acetic anhydride, aceae; slightly sol in ether, ethyl acetate.

ISE: Analytical reagent: Kolb. Ind. Eng. Chem., Anal. 1 11, 197 (1939); 16, 38 (1944); Serjeant, Nature 186, 963 160). Also in copper electrodeposition; in catalysts for mbustion and propellants.

2650. Cupric p-Phenoisulfonate. p-Hydroxybenzenesulmic acid copper salt; cupric sulfocarbolate; Cupriaseptol. ₁H₁₀CuO₂S₂; mol wt 409 86. C 35.16%, H 2.46%, Cu 5.50%, O 31.23%, S 15.65%. [C₄H₄(OH)SO₃]₂Cu. Prepd by ouble decomposition of CuSO₄ and Ba p-phenolsulfonate: agenbeck, Mahrwald, Ann. 605, 111 (1957). Hexahydrate, blue to green, rhombic prisms or needles. sluble in water, alcohol.

USE: In baths for Cu electroplating; esterification catalyst.

2651. Cupric Phosphate. Cu₃O₃P₃; mol wt 380.57. Cu 109%. O 33.63%, P 16.28%. Cu₃(PO₄). Basic salts occur nature as the minerals: cornetite, dihydrite, libethenite, tosphorochalcite, pseudolibethenite, pseudomalachite, tagite. Prepn from CuSO₄ and (NH₄)₂HPO₄. Klement, Haselick, Z. Anorg. Allgem. Chem. 334, 27 (1964).

Trihydrate, blue or olive orthorhombic crystals or blue to luish-green powder. Dec on heating. Practically insol in old water; slightly sol in hot water; sol in acids. NH4OH. USE: Fungicide; catalyst for organic reactions, fertilizer; mulsifier; corrosion inhibitor for H₃PO₄; protectant for metal surfaces against oxidation.

2652. Cupric Salicylate. 2-Hydroxybenzoic acid copper alt. C₁₄H₁₀CuO₆; mol wt 337.76. C 49.78%, H 2.98%, Cu [8.81%, O 28.42%. Cu[C₆H₄(OH)COO]₂. Prepd from reacon of CuSO₄ with Na salicylate: Hanic, Michalov, Acta Spyt. 13, 299 (1960); Inoue et al., Inorg. Chem. 3, 239

Brown, blue-green or green powder. Absorbs water in soist air to form the tetrahydrate.

Tetrahydrate, pale-blue needles or blue-green plates. he-green modification loses water on standing in air. Sol

USE: In the separation of monoolefinic from di- or polyolefinic hydrocarbons.

2653. Cupric Selenate. CuO₄Se; mol wt 206.50. 30.77%, O 30.99%, Se 38.24%. CuSeO. Prepd by the action of selenic acid on cupric carbonate: Klein, Ann. Chim. 14, 263 (1940).

Pentahydrate, light-blue triclinic crystals. Loses water above 80°, forming the monohydrate at 150-220° and becoming anhydr by 265°; dec to the selenite and basic selenite at ~480° and to CuO at ~700°. d 2.56. Sol in water; very slightly sol in acetone; practically insol in alcohol.

USE: In coloring Cu or Cu alloys black.

2654. Cupric Selenide. CuSe; mol wt 142.50. Cu 44.59%, Se 55.41%. Occurs in nature as the mineral klockmannite. Prepd by reduction of cupric selenite with hydrazine: Benzing et al., J. Am. Chem. Soc. 80, 2657 (1958); Kulifay, J. Inorg. Nucl. Chem. 25, 75 (1965).

Blue-black to greenish-black prismatic needles or hexagonal plates. Dec at a dull red heat. d 6.0-6.6. Sol in HCl with H₂Se evolved, in H₂SO₄ with SO₂ evolved; oxidized to CuSeO₃ by HNO₃.

USE: Catalyst in Kjeldahl digestions; in semiconductors.

2655, Cupric Selenite, CuO1Se; mol wt 190.50. Cu 33.35%, O 25.20%, Se 41.45%. CuSeO₃. Occurs in nature as the dihydrate, *chalcomenite*. Prepd by the action of selenious acid or an alkaline selenite on a cupric salt: Rocchiccioli, Compt. Rend. 247, 1108 (1958).

Dihydrate, blue, orthorhombic or monoclinic crystals. Becomes anhydr by 265°. Dec to CuSeO₃,CuO above 460° and to CuO above 660°. d 3.31. Practically insol in water. H₂SeO₃; sol in acids, NH₄OH.

2656. Cupric Stearate. Octadecanoic acid copper salt. C₃₆H₇₀CuO₄; mol wt 630.46. C 68.58%, H 11.19%, Cu 10.08%, O 10.15%. (C₁₇H₃₅COO)₂Cu. Prepd by metathesis of alcohol cupric acetate with an alcohol soln of stearic acid: Martin, Waterman, J. Chem Soc. 1957, 2545; Rai, Mehrotra, J. Inorg. Nucl. Chem. 21, 311 (1961).

Pale-blue to blue-green amorphous powder. Considered to be dimeric. mp about 250°: Grant, Can. J. Chem. 42, 951 (1964). Practically insol in water, methanol, ethanol, acetone, ether; sol in pyridine, dioxane, acetic anhydride; sol in hot but practically insol in cold benzene, toluene, CCl, CHCl, ethyl acetate.

In antifouling paints; in textile and wood preserva-USE: tives; in rubber aging; as catalyst.

2657. Cupric Sulfate. CuSO₄; mol wt 159.61. Cu 39.81%, O 40.10%, S 20.09%. Occurs in nature as the mineral hydrocyanite. Commercial preparation of pentahydrate: Faith et al., Industrial Chemicals (John Wiley, New York, 3rd ed., 1965) p 288; other prepns: Gmelin's, Copper (8th ed.) 60B, 491-560 (1958).

Grayish-white to greenish-white rhombic crystals or amorphous powder. On heating dec above 560°. d 3.6. Hygroscopic. Sol in water; practically insol in alcohol. Keep tightly closed.

Monohydrate. dried cupric sulfate. Hygroscopic, almost white powder. Sol in water, practically insol in alcohol. Keep tightly closed.

Pentahydrate, bluestone, blue vitriol, Roman vitriol, Salzburg vitriol. Occurs in nature as the mineral chalcanthite. Large, blue or ultramarine, triclinic crystals or blue granules or light-blue powder. Slowly efflorescent in air. Loses 2H,O at 30°, 2 more H₂O at 110°; becomes anhydr by 250°. distance of the solid powder in water; sol in methanol, glycerol; all of 0.2 miles or only 40° LD. slightly sol in ethanol. pH of 0.2 molar aq soln 4.0. LD_{so} orally in rats: 960 mg/kg, Smyth et al., Am. Ind: Hyg. Assoc. J. 30, 470 (1969).

Human Toxicity: A strong irritant. See also Copper.

USE: Anhydr salt for detecting and removing trace amounts of water from alcohols and other organic compds; as fungicide. Pentahydrate as agricultural fungicide, algicide, bactericide, herbicide; food and fertilizer additive; in insecticide mixtures; in manuf of other Cu salts; as mordant in textile dyeing; in prepn of azo dyes; in preserving hides; in tanning leather; in preserving wood; in electroplating solns; as battery electrolyte; in laundry and metal-marking inks; in petroleum refining; as flotation agent; pigment in paints,

e. Lead oxide yellow; plumbous it; lead protoxide. OPb; mol wt 17%. PbO. Prepn of high purity , J. Inorg. Nucl. Chem. 27, 1591 nid. 29, 39 (1967).

red to reddish-yellow, tetragonal y temp; yellow, orthorhombic crysersen, J. Am. Chem. Soc. 63, 2617 -450° in the air, it converts slowly emp reverts to PbO. d 9.53. mp hol; sol in acetic acid, dil HNO, sali hydroxides. LD₅₀ i.p. in rats: ick, Ind. Med. 10, Ind. Hyg. Sect.

rs; preparing soln of lead subace. ass flux for painting on porcelain nishes; with glycerol as metal cecolors on brass and bronze; colostances, e.g., hair, nails, wool, ise shell and horn; pigment for ed oil; in assay of gold and silver reathing dust. Wear dust mask of Mines for this purpose. Wash smoking. Keep away from feed

₂O₆Pb; mol wt 331.23. N 8.46%, ว์(NO₃)₂.

cent crystals. d 4.53. Poisonous! , 0.75 ml boiling water, in 2500 nethanol; insol in coned HNO, i. pH of 20% aq soln at 25° =

pecial explosives; as mordant in les; mordant for staining horn, dye industry; sensitizer in pho-

been used as a caustic in equine

acid lead salt. Approx Pb(C18-

Insol in water; sol, when fresh, urpentine. LD orally in guinea Toxicology vol. 1, W. S. Spechia, 1956) pp 176-177. me pressure lubricants.

O₄Pb; mol wt 295.23. C 8.14%,

c at 300°. d 5.28. Poisonous! NO3, fixed alkali hydroxides;

O₄P₂Pb₃; mol wt 811.59. O Pb₃(PO₄)₂, p 1014*. Poisonous! Insol in fixed alkali hydroxides.

"5Se; mol wt 350.17. O 18.28%, Prepd by adding a soln of :: Lenher, Kao, J. Am. Chem.

²⁰ 6.37. Dec by heat. Sol in

Se; mol wt 334.17. O 14.36%, 3. Prepd by adding selenious soln of lead chloride or nitrate: ol. X, 833 (1930).

700° forming a yellow liquid. ig off selenium oxide. Very y dec by boiling sulfuric acid.

.ead trioxide; plumbous plum-O 10.38%, Pb 89 62%. Pb₂O₃, verted at 370° in air to Pb₃O₄. l in water; dec by concd HCI+ I Cl or oxygen, respectively.

5275. Lead Sodium Thiosulfate. Lead sodium hyposulhie Na₄O₉PbS₆; mol wt 653.59. Na 14.47%, O 22.66%, Pb 32.60%, S 30.27%. Na₄Pb(S₂O₃)₃.

White small, heavy crystals. *Poisonousl* Sparingly sol in water, more in thiosulfate solns.

USE: Manuf matches.

5276. Lead Stearate. Stearic acid lead salt. Approx PHC11H35O2)2.

White powder, mp about 125°. Poisonous! Insol in water: sol in hot alcohol.

USE: In extreme pressure lubricants; as drier in varnishes,

5277. Lead Subacetate. Lead monosubacetate; monobauc lead acetate. C₄H₁₀O₃Pb₃; mol wt 807.75. C 5.95%, H 125%, O 15.85%, Pb 76.96%. Pb(C₂H₃O₂)₂.2Pb(OH)₂. White, heavy powder. *Potronous!* Sol in 16 parts cold, 4

parts boiling water with alkaline reaction. On exposure to ar absorbs CO2 and becomes incompletely sol. Keep well

USE: In sugar analysis to remove coloring matters, etc., from solns before polarizing; for clarifying and decolorizing other solns of organic substances.

5278. Lead Sulfate. O₄PbS; mol wt 303.28. O 21.10%, Pb 68.32%, S 10.57%. PbSO₄. Occurs as the minerals: anglesite, lanarkite.

White, heavy, cryst powder. Poisonous! d 6.2. mp 1170°. Sol in about 2225 parts water; more soluble in dil HCl or HNO_y less in dil H₂SO₄, sol in NaOH, ammonium acetate or tartrate soln; sol in coned hydrodic acid; insol in alcohol. LD₁₅ i.p. in guinea pigs: 290 mg/kg, *Handbook of Toxicology* vol. 1, W. S. Spector, Ed. (Saunders, Philadelphia, 1956) pp 178-179.

USE: Instead of white lead as pigment; with zinc in galvanic batteries; manuf minium, in lithography; preparing rapidly drying oil varnishes; weighting fabrics.

5279. Lead Sulfide. PbS; mol wt 239.28. Pb 86.60%, S 13.40%. Occurs as the mineral galena.

Black powder. Insol in water; sol in HNO3, hot, dil HCl. LD₅₀ i.p. in rats: 1.8 g/kg, Bradley, Fredrick, Ind. Med. 10, Ind. Hyg. Sect. 2, 15 (1941). USE: Glazing earthenware.

5280. Lead Telluride. PbTe; mol wt 334.82. Pb 61.89%, Te 38.11%. Found in nature as the mineral altaite. Prepd from lead nitrate, sodium carbonate and powdered tellurium: Montignie, Bull. Soc. Chim. France 1947, 750. Prepn of single crystals by heating stoichiometric quantities of the elements in a graphite cup or fused quartz tube: Brady, J. Electrochem. Soc. 101, 466 (1954).

Silver-gray cubic crystals. d_4^{20} 8.16. mp 905°. Most of the crystal is p-type, the n-type material being present in the surface layer. Energy gap 0.27 ev. Electron mobility 2240 cm²/volt-sec. Hole mobility 860 cm²/volt-sec. Resistivity 0.005 ohm-cm (p-type), 0.00090 ohm-cm (n-type). Not attacked by hydrochloric, hydrofluoric, perchloric and acetic acids or their mixtures; not attacked by solns of 30% potassium hydroxide or of alkali metal sulfides. Dil nitric acid turns the surface black, while coned nitric acid produces lighter gray surface and turns the black surface to gray. Hot coned sulfuric acid produces a reddish-violet surface.

USE: In photoconductor cells, in semiconductor research.

5281. Lead Tetraacetate. $C_2H_1O_2Pb$; mol wt 443.39. C 21.67%, H 2.73%, O 28.87%, Pb 46.73%. Pb(CH₃COO)₄, Prepd from Pb₃O₄ and glacial acetic acid preferably in the presence of some acetic anhydride: Dimroth, Schweizer, Ber. 56, 1375 (1923); Bailar, Inorg. Syn. 1, 47 (1939); Baudler in Handbook of Preparative Inorganic Chemistry vol. 1, G. Brauer, Ed. (Academic Press, New York, 2nd ed., 1963) p 767. Prepn by electrolysis: Fioshin, Gus'kov, Dokl. Akad. Nauk SSSR 112, 303 (1957), C.A. 51, 16146 (1957); Sataev et al., Khim. Prom. (Moscow) 46, 892 (1970), C.A. 74, 49005x (1971). Reviews of prepri and use as oxidizing agent: Criegee "Oxidations with I ead Tetraacetate" in Oxidation in Organic Chemistry, Part A. K. B. Wiberg, Ed. (Academic Press, New York, 1965) pp 277-366. Zyka. Pure Appl. Chem. 13, 569-581 (1966).

Colorless monoclinic prisms from glacial acetic acid. Turns pink easily. Unstable in air. Hydrolyzed by water

with the formation of brown lead dioxide and acetic acid. Avoid contact with skin. d47 2.228. mp 175-180°. Sol in hot glacial acetic acid, benzene, chloroform, tetrachloroethane, nitrobenzene. Dissolves in concd halogen acids with the formation of haloplumbic acids, H2PbX6. The dry material can be stored in sealed, evacuated ampuls.

USE: Selective oxidizing agent in organic syntheses: Criegee, Angew. Chem. 53, 321 (1940); Newer Methods of Preparative Organic Chemistry (Interscience, N. Y., 1948) pp 1-17.

5282. Lead Tetrafluoride. Plumbic fluoride. F₄Pb; mol wt 283.21. F 26.84%, Pb 73.16%. PbF₄. Prepd by passing fluorine diluted with CO₂ or N₂ over PbF₂ at 300°: v. Wartenberg, Z. Anorg. Allgem. Chem. 244, 339 (1940). Review: Kemmitt, Sharp, Advan. Fluorine Chem. 4, 187 (1965).

White, tetragonal crystals, d 6.7. mp about 600°. Readily hydrolyzes and turns brown (forms PbO2) in the presence of moisture.

USE: Has been proposed as a fluorinating agent for hydrocarbons.

5283. Lead Tetroxide. Lead oxide red; red lead; minium; lead orthoplumbate; mineral orange; mineral red; Paris red; Saturn red. O₄Pb₃; mol wt 685.63. O 9.33%, Pb 90.67%. Pb₃O₄. The article of commerce contains about 90% Pb₃O₄; the remainder being chiefly lead monoxide.

Bright-red, heavy powder. *Poisonousl* Dec at about 500° with evolution of oxygen. d 9.1. Insol in water or alcohol; sol in excess glacial acetic acid, in hot HCl with evolution of Cl. in dil HNO₃ in presence of H₂O₂. LD₅₀ i.p. in guinea pigs: 220 mg/kg, Handbook of Toxicology vol. 1, W. S. Spector, Ed. (Saunders, Philadelphia, 1956) pp 176-177.

USE: Plasters and ointments; manuf colorless glass; glaze for faience; flux for porcelain painting, protective paint for iron and steel; oil-color for ship paints, varnishes; coloring rubber; cement for glass, gas and steam pipes; storage batteries; pencils for writing on glass; manuf lead peroxide. matches.

5284. Lead Thiocyanate. Lead sulfocyanate. C2N2PbS2; mol wt 323.38. C 7.43%, N 8.66%, Pb 64.08%, S 19.83% Pb(SCN)2. Prepn: Gardner, Weinberger, Inorg. Syn. 1, 85 (1939)

White, odorless powder. d 3.82. Poisonous! Sol in about 200 parts cold, 50 parts boiling water; also sol in alkali hydroxide and thiocyanate solns.

USE: Reverse dyeing with aniline black; manufacture of safety matches and cartridges.

5285. Lead Tungstate(VI). O₄PbW; mol wt 455.07." O 14.06%, Pb 45.53%, W 40.41%. PbWO4. Occurs as the minerals raspite, scheelite, stolzite. White powder. Insol in water or cold HNO3; sol in fixed

alkali hydroxide solns.

5286. Lead Vanadate(V). Lead metavanadate. O₆PbV₂; mol wt 405.11. O 23.70%, Pb 51.15%, V 25.15%, Pb(VO₃)₂. Yellow powder, insol in water; dec by HNO, USE: Manuf other vanadium compds; as pigment.

5287. Lecithin. Phosphatidylcholine; Lecithol; Vitellin; Kelecin: Granulestin. Phosphatide found in all living organisms (plants and animals). Significant constituent of nervous tissue and brain substance. A mixture of the diglycerides of stearic, palmitic, and oleic acids, linked to the choline ester of phosphoric acid. Commercial grades contain 2.2% P. Isoln from eggs: Sinclair, Can. J. Res. 26B, 777 (1948). Product of commerce is predominantly soybean lecithin obtained as a by-product in the manuf of soybean oil: Stanley in K. S. Markley, Soybeans vol. II (Interscience, New York, 1951) pp 593-647. Soybean lecithin contains palmitic acid 11.7%, stearic 4.0%, palmitoleic 8.6%, oleic 9.8%, linoleic 55.0%, linolenic 4.0%, C_{20} to C_{22} acids (includes arachidonic) 5.5%. Synthesis of a mixed acid α -lecithin: de Haas, van Deenen, Tetrahedron Letters 1960 (no. 9), 1. Synthetic I-α-(distearoyl)lecithin is identical with hydrogenated egg yolk lecithin and t-α-(dipalmitoyl)lecithin is identical with a natural phosphatide of brain, lung, and spleen. (See also Phosphatidic Acid.) Commercial grades of natural lecithin are reported to contain a potent vasodepressor substance: McQuarrie, Andersen, U.S. pat. 2,931,818 (1960 to Cutter Labs.). Comprehensive monograph: G. B. Ansell, J. N.

REFERENCE NO. 16

Dangerous Properties of Industrial Materials

Fifth Edition

N. IRVING SAX

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388 ARSENATE OF IRON, FERRIC

phenylarsine acid. White, crystalline powder. NH₂C₆H₄AsO(OH)₂, mw: 217.0, mp: 232°.

Acute tox data: Oral LD₅₀ (rat) = 216 mg/kg. [3]

THR = HIGH via oral route. See also arsenic. A grasshopper bait; a food additive permitted in the feed and drinking water of animals and/or for the treatment of food-producing animals. [109] See arsenic compounds and aniline. A recog carc. [14]

Fire Hazard: Mod. Decomp by heat to yield flam vapors.

Disaster Hazard: Dangerous; when heated to decomp or on contact with acid or acid fumes, emits highly toxic fumes of aniline and arsenic.

ARSENATE OF IRON, FERRIC. See ferric arsenate.

ARSENATE OF IRON, FERROUS. See ferrous arsenate.

ARSENIC (see also arsenic vapor). Silvery to black, brittle, crystalline and amorphous metalloid. As₄. mw: 299.64, mp: 814° @ 36 atm, bp: subl @ 615°, d: black crystals 5.724 @ 14°; black amor 4.7, vap. press: 1 mm @ 372° (sublimes).

Acute tox data: im LD_{LO} (rat) = 25 mg/kg; sc LD_{LO} (rabbit) = 300 mg/kg. [3]

THR = HIGH via im and sc routes. A poison. An exper (±) carc. [3, 6] Some human carc implication as well. [6, 23, 95] Used as a food additive in food for human consumption. [109] See arsenic compounds.

Radiation Hazard: For permissible levels see Table 5A.5, Section 5. Artificial isotope ⁷⁴As, $T_{\frac{1}{2}} = 18d$. Decays to stable ⁷⁴Ge via ec and via positrons of 0.91 MeV (26%), 1.53 MeV (4%). Also decays to stable ⁷⁴Se via β 's of 0.72 MeV (14%), 1.35 MeV (18%). Emits γ 's of 0.60 and 0.63 MeV.

Fire Hazard: Mod in the form of dust when exposed to heat or flame or by chemical reaction with powerful oxidizers such as bromates, chlorates, iodates, peroxides, Li, NCl₃, KNO₃, KMnO₄, Rb₂C₂, AgNO₃, NOCl, IF₅, CrO₃, CIF₃, ClO, BrF₃, BrF₅, BrN₃, RbC = CH, CsC = CH, [19]

Explosion Hazard: Slight in the form of dust when exposed to flame.

Disaster Hazard: Dangerous; when heated or on contact with acid or acid fumes, emits highly toxic fumes; can react vigorously on contact with oxidizing materials.

m-ARSENIC ACID. White crystals. HAsO₃, mw: 123.9, mp: decomp.
THR = See arsenic compounds.

o-ARSENIC ACID. Syn: true arsenic acid. White,

translucent crystals. $H_3AsO_4 + \frac{1}{2}H_2O$, mw: 150. mp: 35.5°, bp: $-H_2O$ @ 160°, d: 2.0-2.5.

Acute tox data: Oral LD₅₀ (rat) = 48 mg/kg; iv I_{1}) (rabbit) = 8 mg/kg. [3]

THR = HIGH via oral and iv routes. See arseni compounds.

ARSENIC ACID, LIQUID. See arsenic acid.

ARSENIC ACID, SOLID. See arsenic acid.

ARSENICAL BABBITT. A bearing metal. Compition: Up to 3% As.

THR = See arsenic compounds.

ARSENICAL COMPOUNDS OR MIXTUR 3 N.O.S. LIQUID.

THR = See arsenic compounds.

ARSENICAL DIP, LIQUID. Syn: sheep dip. THR = See arsenic compounds.

Disaster Hazard: See arsenic compounds.

ARSENICAL DUST. See arsenic.

ARSENICAL FLUE DUST. See arsenic.

ARSENICAL MIXTURE OR COMPOUNDS, N.O.S. SOLID. See arsenic compounds.

ARSENIC BISULFIDE. Syn: arsenic sulfide, realgur. Red-brown crystals. As₂S₂, mw: 214, bp: 565°, mp: $\beta = 307$ °, d: $\alpha = 3.506 \oplus 19$ °, $\beta = 3.254 \oplus 19$ °.

THR = See arsenic compounds and sulfides.

Fire Hazard: Mod, in the form of dust when exposed to heat or flame.

Explosion Hazard: When intimately mixed with poverful oxidizers such as Cl₂, KNO₃ chlorates.

Disaster Hazard: Dangerous, see SO_x and arsenic compounds, it will react with water or steam to produce toxic and flam vapors; can react vigorously with oxidizing materials.

ARSENIC BROMIDE. Syns: arsenic tribromide, arsenous bromide. Yellowish-white crystals. AsBr₃, mw: 314.7, mp: 32.8°, bp: 220.0°, d: 3.54 @ 25°, vap. press: 1 mm @ 41.8°.

THR = See arsenic compounds and bromides.

ARSENIC CHLORIDE. See arsenic pentachloride.

ARSENIC COMPOUNDS. Syn: arsenicals. Used a insecticides, herbicides, silvicides, defoliants, desiccants and rodenticides. Poisoning from arsenic compounds may be acute or chronic. Acute poisoning usually results from swallowing arsenic compounds, chronic poisoning from either swallowing or inhal. Acute allergic reactions to arsenic compounds used ir medical therapy have been fairly common. The typt and severity of reaction depending upon the compound of arsenic. Inorganic arsenicals are more toxic than organics. Trivalent is more toxic than pentavalent. [89]

- THR = MOD via oral and dermal routes. See parathion. This is a toxic organic phosphate cholinesterase inhibitor.
- Disaster Hazard: Dangerous; when heated to decomp, emits highly toxic fumes.
- CHOLANTHRENE. C₂₀H₁₄, mw: 254.3 An exper carc. [3, 23] An exper carc to mice via dermal and sc routes. [103]
- CHOLCHAMINE. C₂₁H₂₅O₅N, mw: 371.5. An exper teratogen and neo. [3]
- CHOLECALCIFEROL. See vitamin D₃.
- CHOLEIC ACID. $C_{24}H_{40}O_4$, mw: 392.8. THR = An exper neo. [3]
- 5,7-CHOLESTADUN-3-β-OL. See vitamin D₃.
- 5-α-CHOLEST-7-EN-3-β-OL. $C_{27}H_{47}O$, niw: 387.7. THR = An exper neo. [3]
- CHOLEST-5-EN-3-OL-14-METHYL HENA-DECANOATE. C₄₄H₇₈O₂, mw: 638.7. THR = An exper carc to mice via ip route. [103]
- CHOLESTENONE. $C_{27}H_{44}O$, mw: 384.7. THR = An exper carc. [3]
- CHOLESTEROL. White or faint yellow, pearly leaflets. C₂₇H₄₆O, mw: 386.7, mp: 148.5°, bp: 360° decomp. THR = An exper (±) neo and carc. [3. 1]
- CHOLESTEROL-5-HYDROPEROXIDE. C₂₇H₄₆O₃, mw; 418.7.

THR = An exper neo. [3]

- CHOLESTERYL-p-BIS(2-CHLOROETH\L)
 AMINO PHENYL ACETATE.
 THR = An exper neo. [3]
- CHOLESTEROL ISOHEPTYLATE. C., M58O2, mw: 498.9.

THR = An exper neo. [3]

- CHOLESTEROL- α -OXIDE. $C_{27}H_{46}O_2$, mw: 402.7. THR = An exper neo to mice via sc rouse. [3, 103]
- CHOLIC ACID, HYDRATE. The most a Andant bile acid, the monohydrate crystallizes in plates from dilute acetic acid, sol in glacial acetic acid, acetone, and alcohol. Slightly sol in chloroform, practically insol in water and benzene. C₂₄H₄₀O₅ · H₂O, mw 426.7.

 Acute tox data: sc LD₁₀ (frog) = 1600 ms. kg. [3]

 THR = MOD via sc route. An emulsifying agent food additive. [109]
- CHOLINE. $C_5H_{14}ON$, mw: 104.2. Acute tox data: ip LD_{50} (rat) = 400 mg 4.5 [3] THR = HIGH via ip route. An exper cas. [23]
- CHOLINE ACETATE. C₇H₁₆O₂N, mw: 14λ².

 Acute tox data: Oral LD₅₀ (mouse) = 3(W mg/kg; iv

- LD_{50} (rat) = 22 mg/kg; sc LD_{50} (rat) = 250 mg/kg.
- THR = HIGH via iv and sc; MOD via oral routes.
- CHOLINE BITARTRATE. White crystalline powder, odorless or faint trimethylamine like odor, sol in water and alcohol, insol in ether, chloroform and benzene. (C₅H₁₄NO · C₄H₅O₈), mw: 253.
 - THR = U. Probably LOW. A nutrient and/or dietary supplement food additive. [109]
- CHOLINE XANTHATE. A food additive permitted in the feed and drinking water of animals and/or for the treatment of food-producing animals. [109]

Disaster Hazard: Dangerous; see sulfur compounds.

CHONDROITIN SULFATE.

THR = An exper teratogen. [3]

- CHONDRUS EXTRACT. Syns: carrageen, irish moss, chondrus, irish gum, pig wrack, rock salt moss. A sulfated polysaccharide. Dried plant of seaweed chondrus crispus, yellow-white when powdered, insol in organic solvents.
 - Acute tox data: iv LD_{LO} (rabbit) = 50 mg/kg. [3] THR = HIGH via ip route. An exper (S) neo and carc.

[3, 7] A stabilizer food additive. [109]

- CHROMATED ZINC ARSENATE. Syn: Boliden salt.

 Powder. Arsenic acid + sodium arsenate + sodium dichromate + zinc sulfate.
 - THR = HIGH via oral and inhal routes. An exper carc. [3] See arsenic and chromium compounds. Disaster Hazard: Dangerous; see arsenic compounds.
- CHROMATES. See chromium compounds.
- CHROM ALUM. Syn: chromium-potassium sulfate. Dark violet-red crystals. CrK(SO₄)₂·12H₂0, mw: 499.3, d: 1.813.

THR = See chromium compounds.

- CHROME HYDROXIDE. Syn: chromic oxide, hydrous. Blue-green powder, nearly insol in water. Cr(OH)₃, mw: 103.0.
 - THR = HIGH via inhal, oral and imp routes. A recog human care and neo. [3, 6] See chromium compounds.
- CHROME YELLOW. See lead chromate.
- CHROMIC ACETATE (III). Gray-green powder or bluish green pasty mass. $Cr(C_2H_3O_2)_3 \cdot H_2O$, mw: 247.16.
 - THR = A recog human care and neo. [3, 6] See also chromium compounds.
- CHROMIC ACID. Syns: chromic anhydride, chromium trioxide. Dark, purple-red crystals. CrO₃, mw: 100.01, mp: 196°, d: 2.70.
 - THR = VERY HIGH via inhal route. An exper (+) carc. [3, 6] See also chromium compounds. It is a

Acute tox data: Oral LD₅₀ (rat) = 140 mg/kg; oral LD₅₀ (human) = 200 mg/kg. [3]

THR = HIGH via oral and inhal routes. Used as a fungicide. Also a trace mineral added to animal feed. [109] See copper compounds and chlorides. Can react violently with K, Na. [19]

COPPER-γ-CHLOROACETO ACETANILIDE. Solid. Cu(C₈H₇ ClNO)₂, mw: 400.7.

THR = See copper compounds, acetanilide and chlorides.

COPPER CHROMATE, BASIC. See cupric chromate, basic.

COPPER COMPOUNDS. As the sublimed oxide, copper may be responsible for one form of metal fume fever. Inhal of copper dust has caused, in animals, hemolysis of the red blood cells, deposition of hemofuscin in the liver and pancreas, and injury to the lung cells; injection of the dust has caused cirrhosis of the liver and pancreas, and a condition closely resembling hemochromatosis, or bronzed diabetes. However, considerable trial exposure to copper compounds has not resulted in such disease.

As regards local effect, copper chloride and sulfate have been reported as causing irr of the skin and conjunctivae which may be on an allergic basis (Section 9). Cuprous oxide is irr to the eyes and upper respiratory tract. Discoloration of the skin is often seen in persons handling copper, but this does not indicate any actual injury from copper. There is an excess of cancer cases in the Cu smelting industry. [102]

In man the ingestion of a large quantity of copper sulfate has caused vomiting, gastric pain, dizziness, exhaustion, anemia, cramps, convulsions, shock, coma and death. Symptoms attributed to damage to the nervous system and kidney have been recorded, jaundice has been observed and, in some cases, the liver has been enlarged. Deaths have been reported to have occurred following the ingestion of as little as 27 g of the salt, while other victims have recovered after having taken much larger amounts, up to 120 g. Many copper-containing compounds are used as fungicides. Many Cu salts form highly unstable acetylides. Those formed in basic solutions from (Cu salts + C₂H₂) are less stable than those formed from Cu⁺⁺ salts. (Cu salts + hydrazine) react strongly, and with nitro-methane are explosive. [19]

COPPER-8-CUNILATE.

THR = See copper compounds.

COPPER CYANIDE. Syn: cupric cyanide. Yellowish-green powder. Cu(CN)₂, mw: 115.61, mp: decomp before melting.

Acute tox data: ip LD_{LO} (rat) = 50 mg/kg. [3] THR = HIGH via ip route. See cyanides and copper compounds.

COPPER DIAZO AMINO BENZENE. Orange crystals, insol in water, sol in benzene. CuN₃(C₆H₅)₂. mw: 259.8, mp: 270° (decomp).

THR = See copper compounds.

COPPER DICHLOROBENZOATE. Syn: CDCB.

THR = A toxic material. See copper compound Used as a fungicide.

Disaster Hazard: Dangerous; see chlorides.

COPPER DIMETHYL DITHIOCARBAMATE.

Acute tox data: ip LD_{LO} (rat) = 25 mg/kg. [3] THR = HIGH via ip route. See carbamates and copper compounds.

Disaster Hazard: Dangerous; when heated to decor pemits toxic fumes.

COPPER ETHYL XANTHOGENATE. See cop : xanthate.

COPPER FLUORIDE. Syn: cupric fluoride. Monc clinic blue crystals. CuF₂ · 2H₂O, mw: 137.60, d: 2 · 3 THR = See fluorides and copper compounds.

COPPER FLUOROACETIC ACID. CuFOOCCH mw: 141.7.

Acute tox data: Oral LD_{LO} (rat) = 10 mg kg. [3] THR = HIGH via oral and inhal routes. See fluoride

blue, fine crystalline powder, sol in water, insuacetone, alcohol and ether.

[CH₂OH(CHOH)₄COO]₂Cu, mw: 453.5.

THR = U. See copper compounds. A nutrient at dietary supplement food additive. Also a tramineral added to animal feed. [109]

COPPER HYDRIDE. Red-brown crystals. CuH. in 64.55, mp: decomp @ 60°, d: 6.38.

THR = See copper compounds and hydrides.

COPPER HYDROSELENITE. Bluish-green, prisms. Cu(HSeO₃)₂, mw: 319.5.

THR = See selenium and copper compounds.

COPPER HYDROXIDE. Syn: cupric hydroxide. gelatinous or amorphous powder. Cu(OH)₂, 97.59, d: 3.368.

Acute tox data: Oral LD_{LO} (human) = 200 mg/...g THR = HIGH via oral and inhal routes. A mineral added to animal feeds. Used as a fur [109] See copper compounds.

COPPER-8-HYDROXYQUINOLINE. See copp quinolinolate.

COPPER MATTE NICKEL ORE.

THR = A recog carc. [14] See nickel compoun

For Countermeasure Information and Abbreviations see the Directory at the Beginning of this Section.

C₁₈H₁₂N₂O₂Cu, mw: 351.83, mp: decomp @ 210°. Acute tox data: ip LD₅₀ (mouse) = 67 mg/kg. [3] THR = HIGH via ip route. An exper (±) neo via oral and sc routes. [3, 81] A fungicide. See copper compounds.

COPPER RESINATE. Green powder. Cu(C₂₀H₂₀O₂)₂, mw: 666.43.

THR = See copper compounds.

COPPER RICINOLEATE. A green plastic solid. Cu₂(CO₂(CH₂)₇CHCHCH₂CHOH(CH₂)₅), mw: 654, softening p: 64°.

THR = See copper compounds.

COPPER SEBACATE. A solid. Cu(CH₂)₈C₂O₄, mw: 263.8.

THR = See copper compounds.

COPPER SILICATE. Greenish crystals. CuSiO₃, mw: 139.6.

THR = See copper compounds and silicates.

mw: 282.22, mp: 850°, d: 7.53.

THR = See copper compounds and silanes.

COPPER SILICOFLUORIDE. See cupric fluosilicate.

COPPER STEARATE. Syn: cupric stearate. Light blue amorphous powder. $Cu(C_{18}H_{35}O_2)_2$, mw: 630.50, mp: 125°.

THR = See copper compounds.

COPPER SUBOXIDE. Olive green crystals. Cu₄O, mw: 270.16, mp: decomp.

THR = See copper compounds.

COPPER SUBSULFATE. Syn: cupric sulfate, basic. Light blue powder. 4CuO · SO₃

Acute tox data: Oral LD_{LO} (human) = 200 mg/kg. [3] THR = HIGH via oral route. See copper compounds and sulfates.

COPPER SULFATE. Syns: blue vitriol, blue stone, roman vitriol. Blue crystals or blue, crystalline granules or powder. CuSO₄ · 5H₂O, mw: 249.71, mp: -4H₂O @ 110°, d: 2.284.

Acute tox data: Oral LD₅₀ (rat) = 960 mg/kg; ip LD₅₀ (mouse) = 33 mg./kg. [3]

THR = HIGH via ip; MOD via oral and inhal routes. Reacts violently with hydroxylamine, Mg. [19] Used as a trace mineral added to animal feeds. It is a substance which migrates to food from packaging materials. [109] It is also used as an herbicide. See copper compounds and sulfuric acid.

COPPER SULFATE, AMMONIATED. Syn: cupric sulfate, ammoniated. Dark blue crystals. CuSO₄ · 4NH₃ · H₂O, mw: 245.8.

THR = See copper compounds, ammonia and sulfates.

COPPER SULFATE, BASIC. See copper subsulfate.

copper sulfide. Syn: cupric sulfide. Black powder or crystals. CuS, mw: 95.6, mp: transition @ 103°, bp: decomp @ 220°, d: 4.6.

THR = See copper compounds and sulfides. Can react violently with Cd(ClO₃)₂, HClO₃, H₂O₂, (NH₄MgNO₃ + water), Mg(ClO₃)₂, Zn(ClO₃)₂, [19]

COPPER TELLURITE. Green solid. CuTeO₃, mw₁ 239.15.

THR = See tellurium compounds and copper compounds.

COPPER TETRAZOL.

THR = See copper compounds.

Explosion Hazard: Severe, when exposed to heat or shock.

Disaster Hazard: Very dangerous; shock and heat will explode it; when heated to decomp, emits toxic fumes

COPPER THIOCYANATE. Syn: cuprous thiocyanate. White to yellowish powder. CuCNS, mw: 121.6, mp: 1084°, d: 2.85.

THR = See copper compounds and thiocyanates.

COPPER TRICHLOROPHENATE. A crystalline solid. Cu(Cl₃C₆H₂O)₂, mw: 456.5.

THR = See chlorinated phenols and copper compounds.

COPPER XANTHATE. Syn: copper ethyl xanthogenate. Yellow precipitate. Cu(C₃H₅OS₂)₂, mw: 305.94, mp: decomp.

THR = See copper compounds.

Disaster Hazard: Dangerous; see sulfates.

COPPER ZINC CHROMATE. Variable in composition.

THR = HIGH. A recog carc. [14] See chromium compounds. Used as a fungicide.

COPPER ZINC SULFATE.

THR = Toxic. See copper and zinc compounds. Used as a fungicide.

Disaster Hazard: Dangerous. See sulfates.

COPRA.

THR = U.

Fire Hazard: Mod, when exposed to heat; dangerous if stored wet and hot.

Spontaneous Heating: Slight.

CO-RAL. See coumaphos.

CORDEAU DETONANT FUSE. See explosives, high.

CORDITE. See smokeless powder.

CORN MEAL FEEDS.

THR = Weak allergens. Local contact can cause contact dermatitis. Inhal or ingestion may provoke

Fire Hazard: Slight, when exposed to heat or flame. Disaster Hazard: Mod dangerous; when heated to decomp, emits toxic fumes; can react with oxidizing materials.

To Fight Fire: Foam, CO2, dry chemical.

LAURYL QUINALDINIUM BROMIDE.

THR = U. See also bromides.

Fire Hazard: U.

MW

de

int

se.

Disaster Hazard: Dangerous. See bromides.

LAURYL QUINOLINIUM CHLORIDE. U. A fungicide.

Fire Hazard: U.

Disaster Hazard: Dangerous. See chlorides.

LAURYL THIOCYANATE. CH₃(CH₂)₁₀CH₂SCN, mw: 227.3.

Acute tox data: oral LD₅₀ (rat) = 1250 mg/kg. [3] THR = MOD via oral route. An insecticide.

LAWRENCITE. See ferrous chloride.

LAWRENCIUM. A synthetic transuranium element of atomic number 103 and atomic mass 257. Lw.

THR = Radioactive.

Radiation Hazard: Intensely radioactive and therefore highly radiotoxic.

LD-813. A mixture of aromatic amines. (approx 40% MOCA).

THR = An exper carc to rats via oral route. [3]

LEACHATE PRODUCTION FROM SOLID WASTE. See Section 6.

LEAD. Syn: *plumbum*. Bluish-gray, soft metal. Pb, atwt: 207.21, mp: 327.43°, bp: 1620°, d: 11.288 @ 20°/20°. vap. press: 1 mm @ 973°.

THR = See lead compounds. A common air contaminant. It is a (S) care of the lungs and kidney and an exper teratogen. [3, 23]

Radiation Hazard: For permissible levels, see Section 5, Table 5A.5. Natural isotope ²¹⁰ Pb (radium-D, uranium series), $T_{\frac{1}{2}} = 21$ y. Decays to radioactive ²¹⁰ Pb via β 's of 0.0015 (19%) MeV. Emits γ 's of 0.046 MeV. ²¹⁰ Pb usually exists in equilibrium with its daughters, ²¹⁰ Bi and ²¹⁰ Po. Natural isotope ²¹² Pb (Thorium-B, thorium Series), $T_{\frac{1}{2}} = 10.6$ h. Decays to radioactive ²¹² Bi via β 's of 0.16 (5%). 0.34 (81%), 0.58 (14%) MeV. Emits γ 's of 0.24, 0.34 MeV and x-rays.

Fire Hazard: Mod, in the form of dust when exposed to heat or flame. See also powdered metals.

Explosion Hazard: Mod, in the form of dust when exposed to heat or flame. Violent reactions with NH₄NO₃, ClF₃, H₂O₂, NaN₃, Na₂C₂, Zr. [19]

Disaster Hazard: Dangerous; when heated, emits highly toxic fumes; can react vigorously with oxidizing materials.

LEAD ACETATE. Syn: sugar of lead. White crystals, sol in water. Commercial grades are frequently brown or gray lumps. Pb(C₂H₃O₂)₂·3H₂O, mw: 379.35, mp: 75°, anhydrous mp: 280°. d: 2.55.

Acute tox data: ip LD_{LO} (rat) = 204 m μ /kg; iv LD₅₀ (rat) = 120 mg/kg, [3]

THR = HIGH via ip and iv routes. See also lead compounds. A poison. An exper (+) care and teratogen. [3, 9] Violent reaction with KBrO₃. [19] An insecticide.

LEAD ACETATE, BASIC. White powder.

 $Pb_2OH(C_2H_3O_2)_3$, mw: 608.6.

THR = An exper (+) carc. [3, 9] See also lead acetate.
A poison.

LEAD ACETATE (III) TRIHYDRATE.

THR = An exper (+) carc. [3, 9] See also lead acetate.

LEAD ANTIMONATE. Syns: naples yellow, antimony yellow. Orange yellow powder. Ph₁(ShO₄)₂, mw: 993.2.

THR = See lead and antimony compounds.

LEAD ARSENATES. Syn: lead-o-arrenate. White crystals. PbHAsO4, mw: 327.1.

Acute tox data: Oral LD_{LO} (human) = 1.4 mg/kg; oral LD_{so} (rat) = 100 mg/kg. [3]

THR = HIGH via oral route. See also lead and arsenic compounds. A poison. An exper carc. [3, 9]

Disaster Hazard: Dangerous; on heating, emits highly toxic fumes.

LEAD-m-ARSENATE. AsH₁O₄ · (Pb)_X.

Acute tox data: Oral LD₅₀ (rat) = 100 mg/kg; oral LD₅₀ (mouse) = 1000 mg/kg; oral 1.10₅₀ (rabbit) = 125 mg/kg. [3]

THR = HIGH via oral to MOD via oral routes depending upon species. See also lead arsenate. A poison.

LEAD-o-ARSENATE. See lead arsenates.

LEAD ARSENITE. Syns: lead-o-arsenite, lead-m-arsenite. White powder: PbAs₂O₄, mw: 421.

THR = HIGH. See lead compounds and arsenic compounds.

Disaster Hazard: Dangerous; on heating, emits highly toxic fumes.

LEAD-m-ARSENITE. See lead arsenite.

LEAD-o-ARSENITE. See lead arsenite.

LEAD AZIDE. Colorless needles. Pb(N₁)₂, mw: 291.26. THR = See lead compounds and azides. Fire Hazard: U.

Explosion Hazard: Severe, when shocked or exposed to heat or flame. Explodes at 250°. Violent reaction with brass, calcium stearate. CS₂, Cu, Zn. [19] Disaster Hazard: Highly dangerous; shock and heat

766 LEAD BENZOATE

will explode it; when heated, emits highly toxic fumes of lead.

LEAD BENZOATE. White crystals. Pb(C₂H₅O₂)₂. H_2O , mw: 467.5, mp: $-H_2O$ @ 100°. THR = See lead compounds and lead.

LEAD-m-BORATE. White powder. Pb(BO₂)₂·H₂O₃ mw: 310.87, d: 5.598 (anhydrous).

THR = See lead and boron compounds. A poison.

LEAD BROMATE. Monoclinic crystals. Pb(BrO₃)₂. H₂O, mw: 481.06, mp: 180° (decomp), d: 5.53. THR = See lead compounds and bromates. A poison.

LEAD BUTYRATE. $C_8H_{14}O_4Pb$, mw: 381.4. THR = A poison. See also lead compounds.

LEAD CAPRATE. $Pb(C_{10}H_{19}O_2)_2$, mw: 549.71, mp: 103°-104°.

THR = See lead compounds and lead.

LEAD CAPROATE. Crystals. Pb(C₆H₁₁O₂)₂, mw: 437.51, mp: 73°-74°. THR = See lead compounds and lead.

LEAD CAPRYLATE. White leaf. Pb(C₈H₁₅O₂)₂, mw: 493.61, mp: 83.5°-84.5°.

THR = See lead compounds and lead.

LEAD CARBONATE. Syn: cerussite. White powdery crystals. PbCO₃, mw: 267.22, mp: decomp @ 315°, d: 6.61.

THR = An exper (\pm) carc. [3, 9] A poison. Violent reaction with F2. [19] See lead compounds and lead.

LEAD CARBONATE, BASIC. Syns: white lead, hydrocerussite. White powder, amorphous. 2PbCO₃Pb(OH)₂, mw: 775.67, mp: decomp @ 400°, d: 6.14.

THR = See lead compounds and lead. A poison. Violent reaction with F₂. [19]

LEAD CEROTATE. White crystals. Pb(C26H51O2)2, mw: 998.55, mp: 113.5°.

THR = See lead compounds and lead.

LEAD CHLORATE. Monoclinic white crystals. Pb(ClO₃)₂, mw: 374.12, mp: decomp. d: 3.89. THR = See lead compounds, chlorates and lead. A poison. Reacts violently with S. [19]

LEAD CHLORIDE. Syn: cotunnite. White crystals, PbCl₂, mw: 278.1, mp: 501°, bp: 954°, d: 5.85, vap. press: 1 mm @ 547°.

THR = See lead compounds. A poison. An exper teratogen. [3].

LEAD CHLORITE. Monoclinic yellow crystals. Pb(ClO₂)₂, mw: 342.12, mp: explodes @ 126°. THR = See lead compounds and chlorites. Reacts violently with Seq 19] or

LEAD CHROMATE. Syns: crocoite, chrome vellow. Yellow crystals. PbCrO₄, mw: 323.22, mp: 844° bp: decomp. d: 6.3.

Acute tox data: ip LD₅₀ (guinea pig) = 400 mg kg. [3] THR = HIGH via ip route. An exper (\pm) neo and carc. [3, 6] Reacts violently with ferric ferrocyanide. [19]

LEAD CHROMATE, BASIC. Red, amorphous or crystals. Pb₂(OH)₂ · CrO₄, mw: 564.45, mp: 920°.

THR = See lead and chromium compounds. An exper neo. [3]

LEAD CITRATE. White crystalline powder. $Pb_3(C_6H_5O_7)_2 + 3H_2O_7$ mw: 1053.88.

THR = See lead compounds.

LEAD COMPOUNDS.

THR = Poisons. Lead poisoning is one of the commonest of occupational diseases. The presence of lead-bearing materials or lead compounds in an industrial plant does not necessarily result in exposure on the part of the workman. The lead must be in such form, and so distributed, as to gain entrance into the body or tissues of the workman in measurable quantity, otherwise no exposure can be said to exist. Some are exper (+) carc of the lungs and kidneys. [14, 23, 9, 95]

Mode of entry into body:

- 1. By inhal of the dusts, fumes, mists or vapors. (Common air contaminants.)
- 2. By ingestion of lead compounds trapped in the upper respiratory tract or introduced into the mouth on food, tobacco, fingers or other objects.
- 3. Through the skin; this route is of special importance in the case of organic compounds of lead, as lead tetraethyl. In the case of the inorganic forms of lead, this route is of no practical importance.

When lead is ingested, much of it passes through the body unabsorbed, and is eliminated in the feces. The greater portion of the lead that is absorbed is caught by the liver and excreted, in part, in the bile. For this reason, larger amounts of lead are necessary to cause poisoning if absorption is by this route, and a longer period of exposure is usually necessary to produce symptoms. On the other hand, upon inhal, absorption takes place easily from the respiratory tract and symptoms tend to develop more quickly. From the point of view of industrial poisoning, inhal of lead is much more important than is ingestion.

Lead is a cumulative poison. Increasing amounts build up in the body and eventually a point is reached where symptoms and disability occur. Lead produces a brittleness of the red blood cells so that they hemolyze with but slight trauma; the hemoglobin is not affected. Due to their increased fragility, the red cells 5-120

are destroyed more rapidly in the body than normally, producing an anemia which is rarely severe. The loss of circulating red cells stimulates the production of new young cells which, on entering the blood stream, are acted upon by the circulating lead, with resultant coagulation of their basophilic material. These cells after suitable staining, are recognized as "stippled cells." As regards the effect of lead on the white blood cells, there is no uniformity of opinion. In addition to its effect on the red cells of the blood, lead produces a damaging effect on the organs or tissues with which it comes in contact. No specific or characteristic lesion is produced. Autopsies of deaths attributed to lead poisoning and experimental work on animals, have shown pathological lesions of the kidneys, liver, male gonads, nervous system, blood vessels and other tissues. None of these changes, however, have been found consistently.

In cases of lead poisoning, the amount of lead found in the blood is frequently in excess of 0.07 mg per 100 cc of whole blood. The ____arv lead excretion generally exceeds 0.1 mg per liter of urine.

The toxicity of the various lead compounds appears to depend upon several factors: (1) the sol of the compound in the body fluids; (2) the fineness of the particles of the compound; sol is greater, of course, in proportion to the fineness of the particles; (3) conditions under which the compound is being used; where a lead compound is used as a powder; contamination of the atmosphere will be much less where the powder is kept damp. Of the various lead compounds, the carbonate, the monoxide and sulfate are considered to be more toxic than metallic lead or other lead compounds. Lead arsenate is very toxic, due to the presence of the arsenic radical.

Signs and Symptoms: Industrial lead poisoning commonly occurs following prolonged exposure to lead or its compounds. The common clinical types of lead poisoning may be classified according to their clinical picture as (a) alimentary; (b) neuromotor; and (c) encephalic. Some cases may show a combination of clinical types. The alimentary type occurs most frequently, and is characterized by abdominal discomfort or pain. Severe cases may present actual colic. Other complaints are constipation and/or diarrhea, loss of appetite, metallic taste, nausea and vomiting, lassitude, insomnia, weakness, joint and muscle pains, irritability, headache and dizziness. Pallor, lead line on the gums, pyorrhea, loss of weight, abdominal tenderness, basophilic stippling, anemia, slight albuminuria, increased urinary excretion, and an increase in the lead content of the whole blood, are signs which may accompany the above symptoms.

In the neuromuscular type, the chief complaint is weakness, frequently of the extensor muscles of the wrist and hand, unilateral or bilateral. Other muscle groups which are subject to constant use may be affected. Gastroenteric symptoms are usually present, but are not as severe as in the alimentary type of poisoning. Joint and muscle pains are likely to be more severe. Headache, dizziness and insomnia are frequently prominent. True paralysis is uncommon, and usually is the result of prolonged exposure.

Lead encephalopathy is the most severe but the rarest manifestation of lead poisoning. In the industrial worker it follows rapid and heavy lead absorption. Organic lead compounds, such as tetraethyl lead, are absorbed rapidly through the skin as well as through the lungs, and are selectively absorbed by the CNS. The clinical picture in these cases is usually an encephalopathy. With inorganic lead compounds, comparable conc in the CNS are reached only when the workplace is heavily contaminated with vapor, fume and dust. Encephalopathy begins abruptly, and is characterized by signs of cerebral and meningeal involvement. There is usually stupor, progressing to coma, with or without convulsion, and often terminating in death. Excitation, confusion and mania are less common. In milder cases of short duration, there may be symptoms of headache, dizziness, somnolence and insomnia. The cerebrospinal pressure may be increased. See also specific compound.

Diagnosis: A diagnosis of lead poisoning should not be made on the basis of any single clinical or laboratory finding. There must be a history of significant exposure, signs, and symptoms (as described above) compatible with the diagnosis, and confirmatory laboratory tests. Increase of stippled red blood cells, mild anemia, and elevated lead in blood and urine, i.e., more than 0.07 mg/100 ml blood and similar values per liter of urine. An increase of coproporphyrins and certain amino acids in urine may be present. Diagnostic mobilization of lead with calcium EDTA may be useful in questionable cases.

Treatment of Lead Poisoning: It has been found that the chelating agent, calcium ethylenediaminetetracetate, and related compounds are highly efficacious in removing absorbed lead from the tissues of the body. (The therapeutic agents of this group are also known as versene, versenate, edathamil and Ca EDTA. Ca EDTA is effective only when administered intravenously. Various dosage schedules have been proposed. An effective regime is 3-6 g of Na Ca EDTA in 300 cc-500 cc of 5% glucose by intravenous drip over a period of 3-8 hrs. Treatment may vent makes it an industrial hazard, because it can cause intoxication not only by inhal but also by absorption through the skin. Decomp when exposed to sunlight or allowed to evaporate; forms triethyl lead, which is also a poisonous compound, as one of its decomp products. This liquid lead compound, when handled in undiluted form or concentrated solution as when it is manufactured or in the plants where it is mixed with gasoline, may cause lead exposure intoxication by coming in contact with the skin. Therefore, any open receptacle which contains these liquids in high conc or any container, article of clothing, or any other object which is not kept clean, particularly in contact with this material, may subject personnel to serious lead exposure. An exper (\pm) carc. [3, 6] A common air contaminant.

Fire Hazard: Mod, when exposed to heat, flame or oxidizers.

Disaster Hazard: Dangerous; see lead; can react vigorously with oxidizing materials.

To Fight Fire: Dry chemical, CO₂, mist, foam.

LEAD TETRAFLUORIDE. Syn: plumbic fluoride. White crystals, reacts with moisture. PbF₄, mw: 283.2, d: 6.7, mp: 600° (approx).

THR = See lead compounds and fluorides.

LEAD TETRAMETHYL. Syn: tetramethyl lead. Colorless liquid. Pb(CH₃)₄, mw: 267.33, mp: -18° F, lel = 1.8° C, bp: 110°, d: 1.99, vap. d: 9.2, flash p: 100° F.

Acute tox data: Oral LD₅₀ (rat) = 109 mg kg; pa LD₅₀ (rat) = 105 mg kg; ip LD_{LO} (rat) = 73 mg/kg; iv LD_{LO} (rabbit) = 90 mg/kg. [3]

THR = HIGH via oral, pa. ip and iv routes. See also lead and lead tetraethyl. An exper (±) carc. [3, 6]

Fire Hazard: Dangerous, when exposed to heat, flame or oxidizers.

Explosion Hazard: Mod, in the form of vapor when exposed to flame.

Disaster Hazard: Dangerous: see lead; can react vigorously with oxidizing materials.

To Fight Fire: Water, foam, CO2, dry chemical.

LEAD THIOCYANATE. See lead sulfocyanate.

LEAD THIOSULFATE. Syn: lead hyposulfite. White crystals. PbS₂O₃, mw: 319.33, mp: decomp, d: 5.18. THR = See lead compounds.

Disaster Hazard: Dangerous: See lead and SOx.

LEAD-m-TITANATE. Pale yellow solid. PbTiO₃H, mw: 304.1, d: 7.52.

Acute tox data: ip LD₅₀ (rat) = 2000 mg/kg. [3] THR = MOD via ip route. See also lead and titanium compounds.

LEAD TRINITRORESORCINATE. Syn: lead styphnate. Orange-yellow, monoclinic crystals.

 $C_6H(NO_2)_3(O_2Pb)$; mw: 450.30, mp: explodes @ 311°, d: 3.1-2.9.

THR = See lead compounds and nitrates. Very sensitive explosive. It is shock-sensitive and has detonated spont when dry. [19]

Fire Hazard: See nitrates and explosives, high.

Explosion Hazard: Severe, when heated.

Disaster Hazard: Dangerous; explodes at 311°.

LEAD TUNGSTATE. Syn: lead wolframate. Yellowish powder. PbWO₄, mw: 455.13, d: 8.235.

THR = See lead compounds and tungsten compounds.

LEAD-m-VANADATE. Yellow powder. Pb(VO₃)₂, mw: 405.11.

THR = See lead and vanadium compounds.

LEAD WOLFRAMATE. See lead tungstate. LEATHER.

THR = A MILD allergen. Handling "green" hides from certain parts of the world can bring about contact with anthrax spores. Furthermore, tanning can introduce materials such as chromium, formaldehyde, etc.

Fire Hazard: Slight, when exposed to heat or flame; can react with oxidizing materials.

LEATHER BLEACH.

THR = U.

Fire Hazard: Dangerous, when exposed to heat or flame.

Explosion Hazard: U.

Disaster Hazard: Mod dangerous; when heated to decomp, emits toxic fumes; can react with oxidizing materials.

To Fight Fire: Foam, CO₂, dry chemical.

LEATHER DRESSING. Flash p: < 80° F.

THR = U. Some dressings may act as irr or allergens. Fire Hazard: Dangerous, when exposed to heat or flame; can react with oxidizing materials.

Explosion Hazard: U.

To Fight Fire: Foam, CO2, dry chemical.

LECITHIN. The lecithins are mixtures of diglycerides of fatty acids linked to the choline ester of phosphoric acid. They are classified as phosphoglycerides or phosphatides.

 $CH_2(R)CH(R')CH_2OPO(OH)O(CH_2)_2N(OH)(CH_3)_3$ where R and R' are fatty acid groups.

THR = U. Probably LOW. Used as a general purpose food additive. It is a substance which migrates to food from packaging materials. [109]

"LEDATE." See lead dimethyl dithiocarbamate. LEGAL MEDICINE. See forensic toxicology. LENACIL. See venzar.

ZEARALENONE. C₁₈H₂₂O₅, mw: 318.4.

THR = An exper carc. [23]

ZEOLITE. A hydrated alkali aluminum silicate, capable of exchanging alkali for calcium and magnesium; used for softening water. There are a number of artificial zeolites now on the market. Na₂O·Al₂O(SiO₂)₄·(H₂O)_x.

THR = A nuisance dust. See nuisance dusts. May be alkaline on contact with tissue moisture. LOW via oral route. [20]

ZEPHIRAN CHLORIDE. See benzalkonium chloride. ZERO TOLERANCE CONCEPT. [109]

ZINC. A bluish-white lustrous metal. Zn, atwt: 65.38, mp: 419.58, bp: 907°, d: 7.133 @ 25°, vap. press: 1 mm @ 487°.

Acute tox data: ip LD_{50} (mice) = 15 mg/kg. [3]

THR = HIGH via ip route. See also zinc compounds. Radiation Hazard: For permissible levels, see Section

5A, Table 5A.5. Artificial isotope 65 Zn, $T_{\frac{1}{2}} = 245$ d, decays to stable 65 Cu by ec; emits γ 's of 1.12 MeV and x-rays.

Fire Hazard: Mod, in the form of dust when exposed to heat or flame.

Spont Heating: No.

Explosion Hazard: In the form of dust when reacted with acids, NH₂NO₃, BaO₂, Ba(NO₃)₂, Cd, CS₂, chlorates, Cl₂, ClF₃, CrO₃, (ethyl acetoacetate + tribromoneopentyl alcohol), F₂, hydrazine mononitrate, hydroxylamine, Pb(N₃)₂, (Mg + Ba(NO₃)₂ + BaO₂), MnCl₂, HNO₃, performic acid, KClO₃, KNO₃, K₂O₂, Se, NaClO₃, Na₂O₂, S, Te, H₂O. [19] See also powdered metals.

To Fight Fire: Special mixtures of dry chemical.

ZINC ACETATE. Monoclinic crystals. Zn(C₂H₃O₂), mw: 183.47, mp: 242°, bp: sublimes in vacuum, d: 1.84.
 Acute tox data: Oral LD₅₀ (rat) = 2460 mg/kg. [3]
 THR = MOD via oral route. See zinc compounds. A trace mineral added to animal feeds. [109]

ZINC ACETONYL ACETONATE.

Acute tox data: ip LD_{50} (rat) = 50 mg/kg. [3] THR = HIGH via ip route. See also zinc compounds.

ZINC ALKYL AMINE o-PHENYL PHENATE.

THR = U. See phenols and zinc compounds. A fungicide.

Disaster Hazard: Dangerous; when heated to decomp, emits high toxic fumes.

ZINC ALLYL DITHIOCARBAMATE.

Acute tox data: Oral LD₅₀ (rat) = 375 mg/kg; oral LD₅₀ (mice) = 440 mg/kg. [3]

THR = HIGH via oral route. See also carbamates and zinc compounds.

ZINC AMIDE. Amorphous, white powder. Zn(NH₂)₂, mw: 97.43, mp: decomp @ 200°, d: 2.13 @ 25°.

THR = Can react violently with hydrazine. [19] See zinc compounds.

ZINC AMMONIUM NITRITE. Solid. ZnNH₄(NO₂)₃, mw: 221.5.

THR = See nitrites and zinc compounds.

Fire Hazard: Mod, by spont chemical reaction. A powerful oxidizing agent.

Explosion Hazard: U.

Disaster Hazard: See nitrites.

ZINC ARSENATE. White, odorless powder. Compositions: variable; approx 5ZnO, 2As₂O₅.

THR = A poison. See arsenic and zinc compounds.

ZINC-o-ARSENATE. Monoclinic crystals.

 $Zn_3(AsO_4)_2 \cdot 8H_2O$, mw: 618.09, mp: decomp @ 100°, d: 3.309 @ 15°.

THR = See arsenic and zinc compounds.

ZINC ARSENIDE. Cubic crystals. Zn: As₂, mw: 345.96.

THR = HIGH. See zinc and arsenic compounds. Fire Hazard: Mod; can evolve arsine upon contact

with moisture or acid; see also arsine.

Explosion Hazard: Mod; can evolve arsine upon contact with moisture or acid; see also arsine.

Disaster Hazard: Dangerous; when heated to decomp, or on contact with acid or acid fumes, emits highly toxic fumes of arsenic.

ZINC ARSENITE. See zinc-m-arsenite.

ZINC-m-ARSENITE. Syns: ZMA, zinc arsenite. White powder. Zn(AsO₂)₂, mw: 279.2.

THR = HIGH. A wood preservative, insecticide. See arsenic compounds; also see zinc compounds.

ZINC ASHES. See zinc.

ZINC BACITRACIN. Creamy white powder, slightly sol in water.

THR = U. An additive permitted in food for human consumption. Also permitted in the feed and drinking water of animals and/or for the treatment of food-producing animals. [109]

For Countermeasure Information and Abbreviations see the Directory at the Beginning of this Section.

ZINC BENZENE DIAZONIUM CHLORIDE.

C₆H₅N₂Cl₃Zn, mw: 276.8.

THR = Has exploded in storage. [19] See also zinc compounds.

ZINC BENZOATE. White powder, sol in water (40 parts). Zn(C₇H₅O₂)₂, mw: 307.60.

THR = A MILD respiratory irr. See also zinc compounds.

ZINC BERYLLIUM SILICATE. See beryllium zinc silicate.

ZINC BORATE. White amorphous powder or triclinic crystals. 3ZnO · 2B₂O₃, mw: 383.42, mp: 980°, d(amorphous): 3.64, d(crystal): 4.22.

THR = See boron and zinc compounds.

ZINC BROMATE. White, deliquescent powder.

 $Zn(BrO_3)_2 \cdot 6H_2O$, mw: 429.3, mp: 100°, bp: -6H₂O @ 200°, d: 2.566.

THR = See bromates and zinc compounds. Can react violently with Al, As, C, Cu, metal sulfides, organic matter, P, S. [19]

ZINC BROMIDE. Rhombic, colorless, hygroscopic crystals. ZnBr₂, mw: 225.2, mp: 394°, bp: 650°, d: 4.219 @ 4°.

THR = See bromides and zinc compounds. Can react violently with K, Na. [19]

ZINC CAPRYLATE. Lustrous scales, slightly sol in boiling water, mod sol in boiling alcohol.

 $Zn(C_*H_{15}O_2)_2$, mw: 351.78, mp: 136°.

THR = U. On decomp, it releases irr fumes of caprylic acid. See also zinc compounds. A fungicide.

ZINC CARBONATE. White crystalline powder.

ZnCO₃, mw: 125.4, mp: -CO₂ @ 300°, d: 4.42-4.45. THR = See zinc compounds. A trace mineral added to animal feeds. [109]

ZINC CHELATE COMPLEX OF 8-QUINOLINOL. A susp carc. [14] See 8-hydroxyquinoline.

ZINC CHLORATE. Colorless, very deliquescent crystals. Zn(ClO₃)₂ · 4H₂O, mw: 304.36, mp: decomp @ 60°, bp: decomp, d: 2.15.

THR = See chlorates and zinc compounds. Can react violently with Al. Sb₂S₃, As. As₂S₃, C. charcoal, Cu. CuS. MnO₂, metal sulfides, dibasic organic acids, organic matter, P. SnS. S. H₂SO₄. [19]

ZINC CHLORIDE. Syn: butter of zinc. Cubic, white, deliquescent crystals. ZnCl₂, mw: 136.30, mp: 290°, bp: 732°, d: 2.91 @ 25°, vap. press: 1 mm @ 428°. Acute tox data: ip LD₅₀ (mice) = 31 mg/kg; iv LD_{LO} (rat) = 30 mg/kg. Human inhal of 4800 mg/m³ for ↓ hr → pulmonary effects.

THR = HIGH via ip, iv and inhal routes. See zinc compounds and chlorides. Used as a trace mineral

added to animal feeds. Also as a nutrient and/or dietary supplement food additive. It is a substance that migrates to food from packaging materials. [109] The fumes are highly toxic. A poison. An exper neo. [3] Can react violently with K. [19]

ZINC CHLORIDE, CHROMATED. Solid.

THR = A recog carc. [14] See chromium compounds, chlorides and zinc compounds.

ZINC-5-CHLORO-2-MERCAPTOBENZOTHIA-ZOLE.

THR = U. See zinc compounds and chlorides.

ZINC CHROMATE. Lemon-yellow prisms. ZnCrO₄, mw: 181.4.

Acute tox data: iv LD_{LO} (mice) = 30 mg/kg. [3] THR = HIGH via iv route. See also zinc compounds and chromium compounds.

ZINC CHROMATE HYDROXIDE.

 $ZnCrO_4 \cdot Zn(OH)_2 \cdot H_2O$, mw: 299.

THR = An exper (+) carc [3, 6] via inhal route.

ZINC COMPOUNDS.

THR = Variable, generally of low toxicity. Zinc is not inherently a toxic element. However, when heated. it evolves a fume of zinc oxide which, when inhaled fresh, can cause a disease known as "brass founders' ague," or "brass chills." It is possible for people to become immune to it, but this immunity can be broken by cessation of exposure of only a few days. Zinc oxide dust which is not freshly formed is virtually innocuous. There is no cumulative effect to the inhal of zinc fumes. Fatalities, however have resulted from lung damage caused by the inhal of high conc of zinc chloride fumes. Sol salts of zinc have a harsh metallic taste; small doses can cause nausea and vomiting, while larger doses cause violent vomiting and purging. So far as can be determined, the continued administration of zinc salts in small doses has no effect in man except those of disordered digestion and constipation. Exposure to zinc chloride fumes can cause damage to the mu mem of the nasopharnyx and respiratory tract and give rise to a pale gray cyanosis. Workers in zinc retining have been reported as suffering from a variety of non-specific intestinal, respiratory and nervous symptoms. Ulceration of the nasal septum and eczematous dermatosis are also reported.

It has been stated that zinc oxide dust can block the ducts of the sebaceous glands and give rise to a papular, pustular eczema in men engaged in packing this compound into barrels. Sensitivity to zincoxide in man is extremely rare. Zinc chloride, be cause of its caustic action, can cause ulceration of the fingers, hands and forearms of those who use it

REFERENCE NO. 17

Reflects developexposition, Anson C. Multiple

UILDING urch and Sullivan. hing; 12 t and side 2nd-story cornice v fenesuer round a cornice. hw relief with cast ic frieze e windows and piers. rn skysbuilding ty with or-

HURCH, I story, entrance indows in and inmodified C. alterafor Black r. J. Ed. Urban NAACP.

i COMs., 1906, iplex conreinforced curtain ins up to elements depresents developrated by later use. Mul-

COPAL 500-1851, ashlar, I ons; corme with with tall with enwer with I molds, 888 fire signed by clerestory building Private: Buffair THEODOR! ROOSEVELT INAUGU-RAL NATIONAL HISTORI: SITL, Deniwara Ave., 1838. Site includes Ansa., Wilcox nouse brick, 2-1,2 storie i modifier rectangle, gabled roof sections, some with end return i interior end chimney, front tub-width 2-stor pedimented portico, center entrance with tanlight. Palladian window in tympanum, 1863 remodeling, portico moved, 1890's addition; 20th C interior alterations; restored. Greek Revival Built for officers' quarters as part of Poinsett Barracks; site of Theodore Roosevelt's inauguration Sept. 14, 1901 after William McKinley's assassination, Museum, Feuerall/NPS

Buffalo, U.S. POST OFFICE, 121 Elicott St.: 1897-1901, James Knox Taylor, architect. Rock-faced granited base, granite ashiar: 4-1/2 stories over high basement, modified rectangle. gabled and pyramidal root sections, numerous gabled dormers, modillion cornice; front center tall tower with corner turrets, gargovies, and spire with crockets and finial, front 3 entrances recessed under 3-bay entrance porch with elaborate Gothic detailing, each side with 3-bay entry and 1-3 entrances, rear cast iron portecochere, string courses windows grouped under pointed arches; molded and carved detail including foliate capitals and buffalo neads: 4story-high central courtyard above 1st floor with steel and glass root surrounded by galleries with rectangular, segmenta: and pointed arched openings; 1936 remodeling included roofing of 1st floor of court, and and skylight Later Gothic Revival. Excellent example of late-19th C. dual-nature architecture combining revivalist style with technological mnovations; designed by James Knox Taylo, Supervising Architect of the U.S. Treasury. Federal/GSA: HABS.

East Aurora. FILLMORE, MILLARD, HOUSE, 24 Shearer Ave. 1826. Frame, clapboarding: 1-1/2 stories, medified L snape, gabled roof sections, exterior end chimneys, 1-story full-width front tetrastyle Doric porch, front center entrance; moved, 1915 and 1930; for tentered, c. 1930. Greek Revival elements. Built by Millard Fillmore, lawyer, state and U.S. representative, and U.S. Vice President who became President upon the death of Zachary Taylor in 1850. Private: not accessible to the public: NHL.

East Aurora. ROYCROFT CAMPUS, Main and W. Grove Sts., Late-19th C-1938. Complex containing approximately 9 structures, the majority of which feature creneiated towers, half-timbered gables, and stone or shingled exteriors. Built as part of Arts and Crafts artistic community established in late-19th C. by writer Elbert Hubbard after visiting a similar English community organized by Arts and Crafts movement leader William Morris: utilized Medieval organization and building concepts as inspired by the writings of John Ruskin; in operation until 1938. Multiple public/private.

Irving. THOMAS INDIAN SCHOOL, NY 438 on Cattaraugus Reservation. 1900, Barney and Chapman, architects. Educational complex

consisting of 9 principal brick Georgian Keywal buildings and 25 dependencies, notable is the elaborate. Administration Building with its ornate stone trim and decorative use of Indian related motifs and subject matter. Built by NY on reservation as a self-sufficient educational racility, school began, mid-18th C., as the Thomas Asylum of Orphan and Destitute Indian Children and developed into a successful, accredited educational institution; in operation until 1958 when closed as result of centralization of the public school system. *Tribai*.

ESSLY COUNTY

ADIRONDACK FOREST PRESERVE, Reterence—sec Cinton County

Crown Point FORT ST, FREDERIC, Jet of NY 8 and 98, 1731 Limestone ruins of fort established by French to guard Lake Champlain route into Canada. Abandoned in 1759 after Lord Jeffrey Amnerst captured nearby Fort Carillon, which the British renamed Fort Ticonderoga (see also Fort Ticonderoga, NY), during the French and Indian War, State NR

Crown Point vicinity, FORT CROWN POINT, Crown Point Reservation, SW of Lake Champian Bridge and NY 8, 1760. Limestone walls of 5-sided fort containing 6.5-acre parade ground and 2 of 3 original barracks, and surrounded by dry moat. Constructed by British as Fort Crown Point of Amherst after Lord Jeffrey Amherst who drove French from area during the French and Indian War. Damaged in 1775 when powder magazine exploded, reconstruction interrupted by Revolution was never completed. Occupied alternately by Americans and British during Revolution. State: NHL.

Essex vicinity. CHURCH OF THE NAZARENE, W of Essex on NY 22, 1855. Frame, board-and-batten siding: gabied roof with double pitch and end returns, front shoulder arched entrance, lancet windows, trefoil in gable, interior wooden arches spring from unengaged wooden posts to form primary roof support. Gothic Revival. Simple design apparently based upon small mission chapel prototype in Richard Upjohn's Rural Architecture, published 1852, Private.

Essex vicinity. OCTAGONAL SCHOOL-HOUSE, On Rtc. 22 in Bouquet, 1826, Benjamin Gilbert, builder. Rubble sandstone, I story, modified octagon, polygonal roof, octagonal open belfry with polygonal roof, front entrance with shed porch, rear entrance leads to frame vestibule addition; porch addec Octagon Mode. Probably state's oldest school-house; served as school until 1952. Municipal.

Ironville. IRONVILLE HISTORIC DISTRICT, 19th C.. Rural residential area includes focal Penfield Homestead (1828), other houses, church, boardinghouse, Grange Hall. inn, schoolhouse, and ruinous remains of ironworks. Est. 1807; developed major iron industry; pioneered in industrial use of electricity. Museum. Multiple private.

gows set in almost round recesses, decorative prickwork and pargeopards, stone quoins antifim. Ist-story window with stained gias transom Original 4-snaped structure enlarged and redecorated with Queen Anne elements late-19th C. Privati

Poughkeepsie LOCUST GROVE (SAMUEL I. B. MORSE HOUSE), 370 South St., 1830 Frame, clapboarding, 2 stories, modified T snape, gabled roof, interior chimneys, pracketed cornice, projecting octagonal wings, 4-story stuccoed end tower with round arched windows, porch with latticework fascia and posts, carriage house extension with large round arched openings; substantially expanded juring Morse's ownership, Italianate. Home inter 1847 of Samuel F. B. Morse, inventor of ne telegraph and a noted artist who had stunied and traveled in England and Europe.

roughkeepsie. MAIN BUILDING, VASSAR JOLLEGE, Vassar College campus, Mid-19th L., James Renwick, architect. Brick, 4 stories with 5-story pavilions, U-shaped, mansard roof unctuated by towers and central convex manard section. One of the earliest Second Empire unidings in the U.S., reputedly designed after oth C. Tuileries Palace School founded by datthew Vassar, Poughkeepsie philanthropist no pioneered nigner education for women.

OUGHKEEPSIE. MILL STREET-NORTH LOVER: STREET HISTORIC DISTRICT, 9th-20th C.. Residential area containing nmarily 2-3-story brick houses from postivil War period in styles ranging from Greek evival to those of the Victorian period; notate are the numerous Second Empire structures at the Queen Anne Italian Center (see also alian Center, NY) Eastern section became by sicivic and cultural center under direction the Vassar family. Multiple public/private.

bughkeepsie. POUGHKEEPSIE CITY HALL, 28 Main St., 1831. Brick, 2 stories, rectangue, gabled roof, denticulated cornice, front pen balustraded frame belfry with hipped of, rear cupola with pyramidal roof, front inter entrance with transom and side lights; ownstone trim including wide belt course tween stories, lintels, and sills; 2 brick addins: altered. Greek Revival. Built as market id village hall, presumably with open 1st-floor arket area; served as post office, 1865–1886. unicipal.

eughkeepsie. SECOND BAPTIST CHURCH, Vassar St., Mid-19th C., Brick base, frame, ish siding; 1-1/2 stories over high basement, trangular temple-form, gabled roof, interior d chimneys, entablature surrounding builds; front tetrastyle Doric pedimented portico th balustrade, oculus in tympanum, and 2 ennees with shouldered architraves; side asters; side rectangular windows, each with mice and shouldered architrave; altered, eek Revival. Property originally purchased m Matthew Vassar's family; building has

been used for Protestant and Jewish worship. Private

Poughkeepsie UNION STREET HISTORIC DISTRICT. About 8 blocks in downtown Poughkeepsie centered around Union St., 19th C. Working class urban neighborhood contaming 173 historical commercial and residential structures, features numerous 2 1/2-story brick buildings in styles from Federal to those of the Victorian period, long narrow lots, and backyards. City's oldest section; settled largely by German, Irish, Italian, and Slavic immigrants, and by Blacks. Multiple public/private.

Poughkeepsie. VASSAR HOME FOR AGED MEN, I Vassar St., 1880. Brick, 3 stories over high basement, rectangular, low hipped roof with deck, interior end chimney, gabled section rises above cornice line on each side, bracketed cornice with narrow arched corbel tables below, stairway leads to front entrance with transom; I-story baiustraded porch with slender columns, similar side and rear porches with entrances, granite banding connects granite architraves and sills Italianate. Built on the site of Matthew Vassar's town residence as home for men 65 and over, as established by Matthew Vassar, Jr., and John Guy Vassar, Public.

Poughkeepsie VASSAR INSTITUTE, 12 Vassar St., 1882, J. A. Wood, architect, Brick, 2 1/2 stories, rectangular, convex mansard and hipped roof sections, interior chimney, round arched dormers with raised ridge, bracketed cornice with decorative frieze, front center 3-story tower, entrance porch with paired columns, recessed brick paneling, segmental arched openings, granite trim, rear lower wing with round arched windows houses auditorium; tower dome removed. High Victorian Italianate with Second Empire elements. Built for Matthew Vassar Jr, and John Guy Vassar; contained natural history museum and library. *Private*.

Poughkeepsie. VASSAR, MATTHEW. ESTATE (SPRINGSIDE), Academy and Livingston Sts., 1850-1852, Andrew Jackson Downing, architect. Rural estate containing a 2-story cottage with board-and-batten siding, gabled roof, bay windows, and decorative bargeboards, shutter trim, and bracketing; a gatehouse in similar style, and the remains of an L-shaped barn complex Picturesque Gothic Revival. Home of Matthew Vassar, Poughkeepsie brewer and Vassar College founder (see also Main Building, Vassar College, NY). Grounds also designed by early landscape architect Andrew Jackson Downing. Private; not accessible to the public: NHL; HABS.

Red Hook. MAIZEFIELD, 75 W. Market St., 18th-19th C., Brick, 3 stories, rectangular main block with later additions, flat roof, 4 interior end chimneys, 1-story front entrance portico with Palladian window above, heavy cornice with block modillions. Federal. Only extant dependency-2-story, hipped roof board-and-batten cottage designed by Alexander Jackson Davis. Residence of Gen. David Van Ness,

prominent military and political leader in the late-18th and early-19th C. Private

Rhinebeck, DELAMATER, HENRY, HOUSE 44 Montgomery St., 1844, Alexander Jackson Davis, architect. Frame, board-and-batten siding; modified rectangle; hipped roof with cross gable, each end with finial: interior chimneys, carved scalloped bargeboards. 3 front Tudor arched openings, 1-story 3-bay-wide porch with carved flat posts and brackets forming Tudor arches, balustraded deck; center 2nd story and attic, each with rectangular window under blind pointed arch with tracery, each side with bay window, interior designed by architect to harmonize with exterior design; rear veranda enclosed and extended; board-and-batten carriage house. Excellent example of Gothic Revival cottage design advocated by Alexander Jackson Davis and Andrew Jackson Downing, Private,

Sylvan Lake vicinity SYLVAN LAKE ROCK SHELTER, 5000 B.C. 700 A.D. Undisturbed stratified rock shelter; served as winter camp for Archaic hunters beginning c. 5000 B.C. Excavations between 1964 and 1966 revealed numerous remains of the Sylvan Lake Culture (c. 2500 B.C.), elements of the Susquehanna Tradition (c. 1500-1000 B.C.), and Middle and Late Woodland deposits. *Private*

ERII COUNTY

Buffalo. ALBRIGHT-KNOX ART GALLERY, 1285 Elmwood Ave., in Detaware Park, 1900–1905, Edward B. Green, architect. Partially marble faced, 2 stories, modified H snape, gabled roof sections. E. pedimented ionic entrance portico flanked by colonnaded wings ending in pavilions, each with caryatids by Augustus Saint Gaudens; W semielliptical ionic porch flanked by colonnaded sections, interior sculpture courtyard. Neo-Ciassical Revival. Built to permanently house the collections of the Buffalo Fine Arts Academy. Private.

Buffalo BUFFALO STATE HOSPITAL, 400 Forest Ave., 1871-1890. Henry Hobson Richardson, architect. Random rough ashlar sandstone, brick; 3 1/2 stories above high basement, main block with 5 W wards and 2 E wards, gabled and hipped roof sections, gabled and flared hipped dormers, front entrance recessed under 3-bay areade flanked by projecting pavilion; 2 main-block towers with steeply hipped roofs, shed dormers, and corner turrets: machicolations, rectangular and segmental arched windows, wings with projecting cross-gable sections; 3 wards removed, 1960's: 4 service buildings; site plan by Frederick Law Olmsted. Richardsonian Romanesque elements. Early development example of Henry Hobson Richardson's work. State: HABS.

Buffalo. DELAWARE AVENUE HISTORIC DISTRICT, W side of Delaware Ave. between North and Bryant Sts., 19th-20th C.. Remaining section of elite residential area of predominantly turn-of-the-century grand dwellings. Era's Neo-Classical and Georgian Revival styles

represented in designs by noted as McKim. Mead, and Wi overwhelmingly successful economent stimulated by Pan-Americ 1901. Prominent residents inclu Goodyear and Millard Fillm publiciprivate.

GUARANTY (PRUDENTIAL BUILDING) . Pearl Sts., 1894-1895, Lo architect. Steel frame, terra cott: 1/2 stories. U-shaped, flat roof; entrances, each with large lunett level; first 2 stories topped by r form base for upper levels upp tration organized in vertical banc arches, oculi in coved section i decorative terra cotta ornamen. covers entire building; interior le iron and leaded glass skylight, and cast iron stairway. 1st-story altered 1970 to form flat plane Sullivanesque. A milestone in craper development by Louis Susuccessfully integrates structural namentation. Private: NHL; HABS

Buffalo. MACEDONIA BAPTI: 511 Michigan Ave., 1845. B rectangular, gabled roof, encivestibule flanked by round arch recessed rectangular panels, roscribed stone plaque above entrimeetinghouse pian with apse; 2 tions. Social and religious cen community for 125 years. Parisi ward Nash, a founder of the League and the local branch of Private.

Buffalo. PIERCE ARROW FAC PLEX, Elmwood and Great Arro Albert Kahn, architect. Factory taining 14 major buildings mainiconcrete steel with brick and walls; saw-tooth roof sections, lat 60'; some Arts- and Crafts decor on Administration Building from synthesis of trends foreshadowments in factory design; owned at Pierce Arrow Co. until 1938; converted for diversified comme tiple private.

ST. PAUL'S CATHEDRAL, 125 Pearl St. Richard Upjohn, architect. Sand: story, irregular shape, gabled roo nice sections, some with modillic trefoil arcading; front 3-stage to spire, entrance porch, transept c trance and adjacent 3-stage be spire, nave lancet windows with buttresses; towers completed 18" destroyed interior; new interior English architect, Robert Gibsadded. Fine example of Gothic Radapted to unusual triangular HABS.

Sylvan Lake vicinity SVISAN LAKE ROCK NHELTER. (7-12-74) PH0009385 Tivoli vicinity. MONTGOMERY PLACE

Ticonderoga vicinity. FORT TICONDEROGA, 2.5 mi. S of Ticonderoga on NY 22, (10-15-66) PH0132357 NHL.

(CH4TEAU DE MINTGOMERY), S of Twol: (5:2-75 Twoh. (5-2-75

ALBRIGHT-KNOY ART GALLERY. 1285 Eimwood Ave., in Delaware Park, (5-7-71) PH0009458

Buffalo. BUFFALO GAS LIGHT COMPANY WORKS, 249 W. Genesee St., (9-1-76) Buffalo. BUFFALO STATE HOSPITAL, 400 Forest Ave., (1-12-73) PH0009466 HABS.

Buffalo. COUNTY AND CITY HALL, 95 Franklin St., (5-24-76)

Buffalo. DELAWARE AVENUE HISTORIC DISTRICT, W side of Delaware Ave. between North and Bryant Sts., (1-17-74) PH0009474

GUARANTY RIIII.DING Buffalo. (PRUDENTIAL BUILDING), Church and Pearl Sts., (3-20-73) PH0009491 NHL; HABS. Buffalo. MACEDONIA BAPTIST CHURCH, 511 Michigan Ave., (2-12-74) PH0009482

Buffalo. MARTIN, D. D., HOUSE COMPLEX, 123 Jewett Pkwy., (12-30-75) HABS.

Buffalo. PIERCE ARROW FACTORY COM-PLEX, Elmwood and Great Arrow Aves. (10-1-74) PH0031721

Buffaio. SHEA'S BUFFALO THEATER, 646 Main St., (5-6-75)

ST. PAUL'S **EPISCOPAL** Buffalo. CATHEDRAL, 125 Pearl St., (3-1-73) PH0009504 HABS.

Buffalo. THEODORE ROOSEVELT INAU GURAL NATIONAL HISTORIC SITE Delaware Ave., (11-2-66) PH0201111

Buffalo, U.S. POST OFFICE, 121 Ellicott St., (3-16-72) PH0009521 HABS.

Cheektowaga. CHAPEL OF OUR LADY HELP OF CHRISTIANS, 4125 Union Rd., (12-14-78)

ast Aurora. FILLMORE, MILLARD, HOUSE, 24 Shearer Ave., (5-30-74) East

PH0290467 NHL. East Aurora. ROYCROFT CAMPUS, Main and W. Grove Sts., (11-8-74) PH0030279 Irving. THOMAS INDIAN SCHOOL, NY 438 Cattaraugus Reservation, (1-25-73) PH0009512

county ADIRONDACK FOREST PRESERVE, Reference-see Clinton County

Crown Point FORT ST. FREDERIC, Jct. of NY 8 and 9N, (10-15-66) PH0131989 NHL. Crown Point vicinity. FORT CROWN POINT, Crown Point Reservation, SW of Lake Champlain Bridge and NY 8, (11-24-68) NHL.

isex and vicinity. ESSEX VILLAGE HISTORIC DISTRICT, Town of Essex and Fiscer surroundings on W bank of Lake Champlain, (5-28-75)

CHURCH OF ssex vicinity. CHURCH OF THE NAZARENE, W of Essex on NY 22, (6-19-73) PH0009547 G. Essex

Essex vicinity. OCTAGONAL SCHOOL-HOUSE, On Rte. 22 in Bouquet, (1-17-73) PH0009571

Ironville. IRONVILLE HISTORIC DISTRICT, (12-27-74) PH0084808

Lake Placid (North Elba). BROWN, JOHN John Brown Rd., (6-19-72) FARM, Jo PH0009563

Port Kent. WATSON, ELKANAH, HOUSE, 3 mi. E of U.S. 9, (10-15-66) PH0131873

Tahawus vicinity. ADIRONDACK IRON AND STEEL COMPANY: UPPER WORKS, N of Tahawus at Henderson Lake, (10-5-77)

franklin county

ADIRONDACK FOREST PRESERVE. Reference—see Clinton County (1-2-74) Malone, HORTON GRISTMILL, Mill St., (4-21-75)

falone. LINCOLN, ANSELM, HOUSE, 49 Duane St., (4-21-75)

Malone. MALONE FREIGHT DEPOT, 99 Raiiroad St., (12-12-76)

Malone. PADDOCK BUILDING, 34 W. Main St., (11-7-76)

fulton county

ADIRONDACK FOREST PRESERVE, Reference-see Clinton County

Dolgeville. DOLGE COMPANY FACTORY COMPLEX, S. Main St., (9-17-74) (also in Herkimer County)

Gloversville. GLOVERSVILLE FREE LIBRA-RY, 58 E. Fulton St., (5-24-76)

Gioversville. KINGSBORO HISTORIC DIS-TRICT, Area surrounding Kingsboro Ave. Park to N side of cemetery and S to include both sides of Gregory St., (2-24-75)

COURTHOUSE (TRYC COUNTY Johnstown. (TRYON COUNTY COURTHOUSE), N. William St., (7-24-72) PH0009580 HABS.

Johnstown, JOHNSON HALL, Hall St., (10-15-66) PH0131806 NHL, HABS.

genesee county

ALEXANDER CLASSICAL Alexander. SCHOOL. Bustaio St., (10-25-73)PH0009598

Batavia. BATAVIA CLUB (BANK OF GENESEE), Main and Bank Sts., (6-19-73) PH0009601

GENESEE Batavia. COURTHOUSE, Main and Ellicott Sts., (6-18-73) PH0009610

Batavia. HOLLAND LAND OFFICE, W. Muin St., (10-15-66) PH0046540 NHL.

Batavia. RICHMOND MEMORIAL LIBRA-RY, 19 Ross St., (7-24-74) PH0009636

forganville. MORGANVILLE POTTERY FACTORY SITE, Morganville Rd. off NY 237, (2-15-74) PH0009628

Stafford. STAFFORD VILLAGE FOUR COR-NERS HISTORIC DISTRICT, Jet. U.S. 5 and U.S. 237, (10-8-76)

greene county

Athens vicinity. WEST ATHENS HILL SITE, W of Athens, (3-20-73) PH0009661

Catskill. €OLE, THOMAS, HOUSE, 218
Spring St., (10-15-66) PH0131814 NHL.

Catskill. SUSQUEHANNAH TURNPIKE, Beginning at Catskill, follows the Mohican Trail (NY 145) and CR 20 and 22 NW to Schoharie County line, (1-2-74) PH0009652

Coxsackie vicinity. BRONCK, PIETER, HOUSE, 2 mi. W of Coxsackie on W side of U.S. 9W, (12-24-67) PH0132756 NHL.

Coxsackie vicinity. FLINT MINE HILL ARCHEOLOGICAL DISTRICT, Eastern Greene County, (11-29-78)

Earlton vicinity. FORESTVILLE COMMON-WEALTH, NW of Earlton off NY 81, (11-20-74) PH0031534

PREVOST MANOR Greenville vicinity. HOUSE (HUSH-HUSH FARM), W of Greenville PH0009644

hamilton county

ADIRONDACK FOREST PRESERVE, Reference-see Clinton County

Blue Mountain. BLUE MOUNTAIN HOUSE ANNEX, NY 30, (12-7-77)

Blue Mountain Lake vicinity. CHURCH OF THE TRANSFIGURATION, N of Blue Mountain Lake on NY 30, (7-26-7)

Racquette Lake vicinity. SAGAMORE, Off NY 28 at W end of Sagamore Lake, (1-11-76)

herkimer county

ADIRONDACK FOREST PRESERVE, Reference—see Clinton County (1-2-74) DOLGE COMPANY FACTORY COMPLEX, Reference-see Fulton County (1-2-74) PH0084794

Cold Brook. COLD BROOK FEED MILL, NY 8, (10-9-74) PH0031691

Danube, HERKIMER HOUSE, Near NY 5 S., (2-12-71) PH0009725

East Herkimer vicinity. FORT HERKIMER CHURCH (REFORMED PROTESTANT DUTCH CHURCH OF GERMAN FLATTS), NY 5S, (7-24-72) PHOSO-679 HABS, G. erkimer. HERRIMER COL

COUNTY -Herkimer. COURTHOUSE, 320 N. Main St., (1-14-72) PH0009733 G.

Herkimer, HERKIMER COUNTY HISTORI-CAL SOCIETY (DR. A. HALTER SUITER HOUSE), 400 N. Main St., (4-13-72) PH6009695

Herkimer, HERKIMER COUNTY JAIL, 327 N. Main St., (1-14-72) PHU099709 HABS; G. Herkimer, REFORMED CHURCH, THE, 405 N. Main St., (3-16-72) PH0009741 G.

Ilion, REMINGTON STABLES, I Remington Ave., (10-29-76)

Indian Castle vicinity. INDIAN CASTLE CHURCH, NY 58, (2-18-71)

Little Falls: HERKIMER COUNTY TRUST COMPANY BUILDING, Corner of Ann and Albany Sts., (3-5-70) PH0009717

Salisbury Center. SALISBURY CENTER COVERED BRIDGE, Fairview Rd. over Spruce Creek, (6-19-72) PH0009750

jefferson county

Adams vicinity. TALCOTT FALLS SITE, U.S. 11 at jet, with Old Rome State Rd., (6-5-74) PH0009792

Alexandria Bay. CORNWALL BROTHERS' STORE, 2 Howell Pl., (5-2-75)

Alexandria Bay vicinity. BOLDT, GEORGE C., YACHT HOUSE, NW of Alexandria Bay on Wellesley Island, (4-26-78)

Black River vicinity. LERAY MANSION, NE of Black River on Camp Drum Military Reservation, (7-11-74) PH0044032

Cape Vincent. LERAY, VINCENT, HOUSE (STONE HOUSE), Broadway (NY 12E), (11-15-73) PH0009784

Cape Vincent vicinity. FORT HALDIMAND SITE, NE of Cape Vincent, (12-15-78)

Mannsville vicinity. PIERREPONT MANOR COMPLEX, N of Mannsville on Ellisburg St., (9-15-77)

Sackets Harbor. CAMP, ELISHA, HOUSE (BRICK CAMP MANOR), 310 General Smith Dr., (4-23-73) PH0009768

Sackets Harbor. MADISON BARRACKS, Military Rd., (11-21-74) PH0132977

Sackets Harbor. SACKETS HARBOR BAT-TLEFIELD, Coastline and area from Sackets Harbor SW to and including Horse Island, (12-31-74) PH0132985

off NY 81, (11-15-72) Sackets Harbor. UNION HOTEL, Main and Ray Sts., (6-19-72) PH0009806 G.

Hamburg, Bethany Chapel (Hamburg Presbyterian Church) 103 Hamburg Tpke. (2-29-80)

Wallpack Center vicinity. Peters Valley
Historic District. Sandyston-Haney's Mill.
Walpack, and Kuhn Rds. (2-29-80)

Union County

Fanwood, Central Railroad of New Jersey (Fanwood Railroad Station Complex) 238 North Ave. (7-17-80)

New Providence vicinity, Feltville Historic District. S of New Providence (6-6-80)

Warren County .

Belvidere, Belvidere Historic District, Off-U.S. 46 (10-3-80)

Vienna vicinity, Moant Bethel Methodist Church. S of Vienna on Mount Bethel Rd. (2-29-80)

NEW MEXICO

ANASAZI SITES WITHIN THE CHACOAN INTERACTION SPHERE THEMATIC RESOURCES. Reference—see individual listings under McKinley and San Juan Counties.

Bernalillo County

Albuquerque, *Hope Building*, 220 Gold St., SW. (8–29–80)

Albuquerque. Pacific Desk Building. 213-215 Gold Ave., SW. (9-30-80)

Grant County

San Juan vicinity, Wheaton-Smith Site (7-23-

San Lorenzo vicinity, Janes Site (7-23-80)

Luna County

Deming, Mahoney Building, Gold and Spruce Sts. (9-30-80)

McKinley County

Crownpoint vicinity, Casa De Estrella Archeological Site (Anasazi Sites Within the Chacoan Interaction Sphere Thematic Resourcesi (10–10–80)

Crownpoint vicinity, Daiton Pass Archeological Site (Anasazi Sites Within the Chacoan Interaction Sphere Thematic Resources) (10–10–80)

Crownpoint vicinity, Greenlee Archeological Site (Anasazi Sites Within the Chacoan Interaction Sphere Thematic Resources) (10–10–80)

Crownpoint vicinity, Haystack Archeological District (Anasazi Sites Within the Chacoan Interaction Sphere Thematic Resources) [10-10-80]

Crownpoint vicinity, Upper Kin Klizhin
- Archeological Site (Anasazi Sites Within
the Chacoan Interaction Sphere Thematic
Resources) (10–10–80)

Fort Wingate vicinity, Fort Wingate Archeological Site (Anasazi Sites Within the Chacoan Interaction Sphere Thematic Resources) (10–10–80)

Otero County

LA LUZ TOWNSITE MULTIPLE RESOURCE AREA. This area includes: La Luz. La Luz Historic District. Off NM 63: Garcia. Juan. House. Tularosa St.: Queen Anne House. Kearny St.: Sutherland. D. H.: House. Main St. (10–23–40)

Rio Arriba County

Espanola, Bond. Frank, House. Bond St. (3-6-80)

Sandoval County

Bernalillo, Abenicio Salazar Historic District. U.S. 85 (6-6-80)

Corrales, San Ysidro Church, Church Rd. (7-30-80)

Guadalupe vicinity, Guadalupe Ruin, SE of Guadalupe (3-24-80)

San Juan County

Bloomfield vicinity, Halfway House Archeological Site (Anasazi Sites Within the Chacoan Interaction Sphere Thematic Resources) (10–10–80)

Bloomfield vicinity, Twin Angels
Archeological Site (Anasazi Sites Within
the Chacoan Interaction Sphere Thematic
Resources) [10–10–80)

San Miguel County

Las Vegas. Distrito de los Escuelas. S. Pacific and S. Gonzales Sts. (3-18-80)

Las Vegas. Ilfeld, Adele, Auditorium, New Mexico Highlands University campus (1–8–80)

Santa Fe County

Santa Fe vicinity, Acequia System of El Rancho de las Golondrinas, 12 ml, SE of Santa Fe (2-1-80)

Socorro County

Magdalena, MacDonald Merchandise Building, U.S. 80 (9-25-80)

Taos County

Taos, Fechin, Nicholai, House, NM 3 (12–31–79)

Valencia County

Encinal, Village of Encinal Day School (8-8-80)

NEW YORK

INTERBOROUGH RAPID TRANSIT
SUBWAY CONTROL HOUSES
THEMATIC RESOURCES. Reference—see
individual listings under Bronx, King, and
New York counties.

Women's Rights Historic Sites Thematic Resources. Reference—see individual listings under Seneca County.

Albany County

Albany. Abrams Building, 55-57 S. Pearl St. (2-14-80)

Albany, Center Square/Hudson-Park Historic District, Roughly bounded by Park Ave., State, Lark and S. Swan Sts. (3-18-80)

Albany, Downtown Albany Historic District, Broadway, State, Pine, Lodge and Columbia Sts. (1-31-80)

Albany, St. Peter's Episcopal Church, 107 State St. (1-16-80) NHL.

Alcove Rd. (7-24-80)

Guilderland. Albany Glassworks Site (7–22–80)

Allegheny County

Alfred, Fireman's Hall, 7 W. University St. [3-18-80]

Bronx County

Bronx. Bronx Central Annex-U.S. Post Office. 558 Grand Concourse (5-6-80)

Bronx, Fonthill Castle and the Administration Building of the College of Mount St. Vincent, W. 281st St. and Riverdale Ave. (7–11–80)

Bronx, Mott Haven Historic District, An irregular pattern along Alexander Ave. and E. 140th St. (3–25–80)

Bronx, New York, Westchester and Boston Railroad Administration Building, 481 Morris Park Ave. (4-23-80)

Bronx. Poe Cottage. 2640 Grand Concourse [8-19-80]

Bronx. St. Ann's Church Complex. 295 St. Ann's Ave. (4–16–80)

New York, Mott Avenue Control House (Interborough Rapid Transit Subway Control Houses Thematic Resources), 149th St. and Grand Concourse (5–6–80)

Broome County

Binghamton, Roberson Mansion, 30 Front St. (3-25-80)

Binghamton, Rose. Robert H., House, 3 Riverside Dr. (8–28–80)

Windsor, Windsor Village Historic District.
College Ave., Academy, Chapel, Church,
Dewey, Elm and Main Sts. (7-30-80)

Cayuga County

Auburn, Case Memorial-Seymour Library, 176 Genesee St. (5-6-80)

Chautauqua County

Dunkirk, Point Gratiot Lighthouse Complex. Sycamore Rd. (12-18-79)

Chemung County

Elmira, Elmira Civic Historic District, E. Church, Lake, E. Market, Baldwin, Carroll, and State Sts. (7-30-80)

Horseheads, Horseheads 1855 Extension = Historic District, Grand Central Ave., Fletcher, Sayre, W. Mill and Center Sts. [7-30-80]

Columbia County

Claverack. Double-Span Whipple Bowstring Truss Bridge. Van Wyck Lane (+17-80) Hudson vicinity. Wiswall. Oliver. House. W of Hudson (9-4-80)

Delaware County

Franklin, New Stone Hall. Center St. (5-6-80)

Dutchess County

Fishkill vicinity, Stony Kill Farm, W of Fishkill on NY 9D (3-20-80)

Hyde Park. Roosevelt, Eleanor, National Historic Site, Violet Ave. (3-20-80)
Pawling, Kane, John, House, 126 F. Main

Pawling, Kane, John, House, 126 E. Main St. ___(10-20-80)

Red Hook vicinity, Heermance Farmhouse, N of Red Hook on W. Keriey Corner Rd. (5-6-80)

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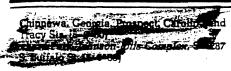
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Erie County

Bullalo, Allentown Historic District. Off 1384 [4-21-30]

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Fulton County

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NY

Ephratah vicinity, Garoga Site (7-22-80) Ephratah vicinity, Klock Site (7-22-80) Ephratah vicinity, Pagerie, Smith, Site (4-22-80)

Genessee County

North Bergen, Gifford-Walker Farm, 7083 N. Bergen Rd. (1-10-80) (also in Orleans County)

Greene County

Coxsackie. Reed Street Historic District.
Reed. Ely, Mansion, and River Sts. (5-6-80)

Jefferson County

Alexandria Bay vicinity, Ingleside, W of Alexandria Bay on Cherry Island (4-16-80) Watertown, Flower, Roswell P., Memorial Library, 229 Washington St. (1-10-80) Watertown, Paddock Mansion, 228 Washington St. (12-11-79)

Watertown, Watertown Masonic Temple, 240
Washington St. (1-23-80)

Kings County

Brooklyn, Brooklyn Borough Hall, 209 Joralemon St. (1-10-80)

Brooklyn. Hanson Place Seventh Day Adventist Church. 88 Hanson Pl. (4-23-80) Brooklyn. Kings County Savings Bank. 135 Broadway (4-16-80)

Brooklyn. Monsignor McGolrick Park and Shelter Pavilion. Bounded by Nassau and Driggs Aves.. Russell and Monitor Sts. (5– 8–20)

Brookiyn, New Utrecht Reformed Church and Buildings, 18th Ave. and 83rd St. (4-9-80) Brookiyn. Prospect Park. Bounded by

Parkside, Ocean and Flatbush Aves.. Prospect Park W. and Prospect SW. (9-17-80)

Brooklyn, Old Gravesend Cemetery, Gravesend Neck Rd. and MacDonald Ave. (9-17-30)

Brooklyn, Russian Orthodox Cathedral of the Transfiguration of Our Lord, 228 N. 12th St. (4–16–80)

Brooklyn, St. Bartholomew's Protestant
Episcopal Church and Rectory, 1227 Pacific
St. (4–23–30)

Brooklyn, State Street Houses, 291–299, 290– 324 State St. (1–17–80)

Brooklyn, Twentythird Begiment Armory, 1322 Bedford Ave. (5–6–80)

Brooklyn. Williamsburgh Savings Bank, 175 Broadway (4-9-30)

New York, Atlantic Avenue Control House (Interporough Rapid Transit Subway Control Houses Thematic Resources)

Flatbush and Atlantic Aves. (5–5–80) New York. Bennett. Floyd. Field Historic District. Flatbush Ave. (4–11–80)

New York, Public School 39, 417 6th Ave. (4-17-30).

Livingston County

Avon vicinity, Barber-Mulligan Farm, NE of Avon at 5403 Barber Rd. (5-19-30) (also in Monroe County)

Lima, Hillcrest, 7242 W. Main St. (5-8-30) Oakland vicinity, Edgerley, S of Oakland at 9303 Creek Rd. (7-16-80) Monroe County

BARBER-MULLIGAN FARM. Reference—see Livingston County.

Fairport. DeLand. Henry, House, 99 S. Main-St. (4-17-80)

Fairport. Wilbur House. 187 S. Main St. (5-8-80)

Perinton. Richardson's Tavern. 1474 Marsh Rd. (5-6-80)

Montgomery County

Amsterdam. Greene Mansion. 92 Market St. (12-31-79)

Canajoharie vicinity, Rice's Woods (7-18-80)
Nelliston, Nelliston Multiple Resource Area
This area includes: Nelliston Historic
District, Prospect, River, Railroad and
Berthoud St.; Ehle, Peter, House, E. Main
St.; Lasher-Davis House, U.S. 5: Nellis,
Jacob, Farmhouse, Nellis St.; Walrath-Van
Horne House, W. Main St.; WatermanGramps House, School St. (9-27-80)

Nassau County

Manhasset, Onderdonk, Horatio Gates, House, 1471 Northern Blvd. (4-16-80)

New York County

New York Alwyn Court Apartments 180 W. 58th St. (12-28-79)

New York. American Fine Arts Society, 215 W. 57th St. (5-6-30)

New York, American Radiator Building, 40— 52 W. 40th St. (5-7-30)

New York. Ansonia Hotel, 2101—2119 Broadway (1–10–80)

New York. Association of the Bar of the City of New York. 42 W. 44th St. (1-3-80)

New York, Audubon Terrace Historic
District. Bounded by Broadway, Riverside
Dr., W. 155th and W. 156th Sts. (5–30–80)
New York, Bailey House, 10 St. Nicholas Pl.
(4–23–80)

New York. Battery Park Control House (Interborough Rapid Transit Subway Control Houses Thematic Resources) State St. and Battery Pl. (5-5-30)

New York. Belnord Apartments, 225 W. 36th St. (4-23-80)

New York. Bowling Green Fence and Park. Broadway and Beaver Sts. (4–9-80) New York Building at 45 East 66th Street (5–

6-80) New York, Building at 35 Leonard Street (4-

New York, Building at 35 Leonard Street (4-23-80)

New York. Building at 378—380 Lafayette Street (12-28-79)

New York. Bouwerie Lane Theater. 330
Bowery St. (4-23-80)

New York. Bowery Savings Bank. 130 Bowery St. (4-23-30)

New York. Chanin Building, 122 E. 42nd St. (4-23-80)

New York. Chapel of the Intercession Complex and Trinity Cemetery, 550 W. 155th St. (7-24-80)

New York. Church of Notre Dame and Rectory. 405 W. 114th St. and 40 Morningside Dr. (5-6-80)

New York. Church of St. Ignatius Loyola Complex. Park Ave., 33rd and 84th Sts. (7-24-80)

New York. Church-of the Holy Communion and Buildings. 656-662 6th Ave. (4-17-80)

New York, Church of the Immaculate Conception and Clergy House, 408–414 E. 14th St. (3–28–60) New York, Church of the Transfiguration, 25 Mott St. (4-18-80)

New York, Claremont Stables (Claremont Riding Academy) 173-177 W. 89th St. (+-16-80)

New York, Control House on 72nd Street (Interborough Rapid Transit Subway Control Houses Thematic Resources) W. 72nd St. and Broadway (5-8-80)

New York, East 78th Street Houses. 157, 159, 161, and 163–165 E. 78th St. (3–25–80)

New York, East 80th Street Houses, 116-130 E. 80th St. (3-26-30)

New York, Eldridge Street Synagogue. 12-16 Eldridge St. (3-28-80)

New York, Federal Reserve Bank of New York, 33 Liberty St. (5-6-60)

New York, First Houses, E. 3rd St. and Ave. A (12-18-79)

New York, First Shearith Israel Graveyard, 55-57 St. James Pl. (4-17-80)

New York, Former Police Headquarters Building, 240 Centre St. (3-28-30)

New York, Gramercy Park Historic District, Roughly bounded by 3rd and Park Aves. S., E. 18th and 22nd Sts. (1-23-80)

New York. *Hariem Gourthouse*, 170 E. 121st St. (4–16–80)

New York, Hariem River Houses, 151st to 153rd St., Macombs Pl. and Harlem River Dr. (12-18-79)

New York, Harvard Club of New York City, 27 W. 44th St. (3-28-80)

New York, Holy Trinity Church, St. Christopher House and Parsonage, 312-316 and 332 E. 38th St. (5-30-30)

New York, House at 37 East 4th Street (1-)= 801

New York, Knickerbocker Hotel, 142 W. 42nd St. (4-11-80)

New York, Lescaze House, 211 E. 48th St. 5-19-80)

New York, Marsle Collegiate Reformed Church, 275 5th Ave. (4-)-301

New York, Mariner's Temple, 12 Oliver St. (4-16-80)

New York, McGraw-Hill Building, 328 VV. 42nd St. (3–28–30)

New York, Municipal Asphalt Plant. Between 90th and 91st Sts. (5-23-30)

New York, New Amsterdam Theater, 214 W. 42nd St. (1-10-80)

New York, New York City Marble Cometery, 52-74 E. 2nd St. (9-17-30)

New York, New York Public Library, 115ta

Street Branch. 203 W. 115th St. (5-6-x)1 New York. New York Public Library and

Bryant Park, Avenue of the Americas, 5th Ave., 40th and 42nd Sts. (10-15-66) MHL.

New York, No. 3 Thomas Street Building, 3 Thomas St. (4-30-30)

New York, Old Colony Club, 120 Madison Ave. (4-23-80)

New York, Old Grolier Club, 29 E. 32nd St. (4-23-80)

New York, Park Avenue Houses, 680, 584, 686 and 690 Park Ave. (1-3-30)

New York, Public Baths. Asser Levy Pl. and E. 23rd St. (4-23-30)

New York, Public School 35 (Public School 135) 931 1st Ave. (10-27-40)

New York. Rice. Isaac L., Mansion (Villa Julia) 346 W. 89th St. (6-25-60)

New York, Riverside-West 195th Street Historic District, Roughly bounded by W. End Ave., Riverside Dr., W. 104th and W. 106th Sts. (8–19–60) ʻ`⊃**п.**

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2 023 Otero County

Sacramento vicinity, Circle Cross Ranch Headquarters, SW of Sacramento (11-17-80)

Valencia County

Beien. Belen Hotel. 200 Becker Ave. (11-12-80)

NEW YORK

STONE HOUSES OF BROWNVILLE
THEMATIC RESOURCES. Reference—
individual listings under Jefferson County.

Albany County

Albany, Knickerbocker and Arnink Garages, 72—74 (11–28–80)

Cayuga County

Aurora. Aurora Village-Wells College Historic District. NY 90 (11-19-80)

Chenango County

Oxford. Burr, Theodore, House, Fort Hill Sq. (9-11-81)

Dutchess County

Hyde Park, Hyde Park Railroad Station. River Rd. (9-11-81)

Erie County

Defavire Asserting William House Asserting Asserting County

Paul Smiths, Smith's, Paul. Hotel Store, Paul Smith's Coilege Campus (12-3-80)

Fulton County

Johnstown. Fulton County Jail (Tryon County Jail) Perry and Montgomery Sts. (10-19-81)

Greene County

Athens. VILLAGE OF ATHENS MULTIPLE RESOURCE AREA. This area includes: Athens Lower Village Historic District. Roughly bounded by Hudson River. NY 385. Vernon and Market Sts.: Brick Row Historic District. Off NY 385: Stranshan-DelVecchio House. N. Washington St.: Van Loon. Albertus. House. N. Washington St.: Zion Lutheran Church, N. Washington St. (11-28-80)

Jefferson.County

Brownville, Archer, William, House (Stone Houses of Brownville Thematic Resources) 112 Washington St. (11–19–80)

Brownville. Brown. Gen. Jacob. Mansion (Stone Houses of Brownville Thematic Resources) Brown. Blvd. (11–19–80)

Brownville, Brownville Hotel (Stone Houses of Brownville Thematic Resources) Brown Blvd. and W. Main St. (11–19–30) Brownville, Vogt House (Stone Houses of

Brownville, Vogt House (Stone Houses of Brownville Thematic Resources) 110 Main St. (11–19–60)

Brownville. Walrath. Arthur. House (Stone Houses of Brownville Thematic Resources) 114 Corner Pike (11–19–80)

Kings County

Brooklyn, Park Slope Historic District.
Roughly bounded by Prospect Park West.
Berkeley Pl., 15th St., 6th, 7th and Flatbusn
Aves., (11–21–30)

New York, Parachute Jump, Coney Island (9-2-80)

Livingston County

North Bloomfield, North Bloomfield School, 7840 Martin Rd. (5-28-81)

Maaison County

Oneida, Cottage Lawn, 435 Main St. [11-8-80]

Monroe County

Riga, Riga Academy, 3 Riga-Mumford Rd. (11-21-80)

New York County

Liberty Island. Statue of Liberty National
Monument. Ellis Island and Liberty Island
(10-15-68) (also in Hudson County. NJ)

New York, Houses at 83 and 85 Sullivan Street, 83–85 Sullivan St. (11–17–80) New York, New York Public Library,

Hamilton Grange Branch, 503 and 505 W. 145th St. (7-23-61)

New York, Stuyvesant Square Historic District, Roughly bounded by Nathan D. Perleman Pl., 3rd Ave., E. 18th and E. 15th Sts. (11-21-80)

Omondaga County

Syracuse. Central Technical High School. 700-745 S. Warren St. (4-9-81)

Orange County

Goshen. Church Park Historic District. Park Pl., Main and Webster Sts. (11-17-80)

Montgomery, MONTGOMERY VILLAGE
MULTIPLE RESOURCE AREA. This area
includes Bridge Street Historic District
Union Street-Academy Hill Historic
District: Crabtree-Patchett House, 232
Ward St.: Miller. Johannes. House, 272
Union St.: Montgomery Worsted Mills,
Factory St. (11–21–80)

Newburgh. New York State Armony, Broadway and Johnson St. (8-18-81)

Otsego County

Cooperstown, Cooperstown Historic District. NY 23, NY 80 and Main St. (11-18-80) Oneonta. Stonehouse Farm, E of Oneonta on

NY 7 (11-19-80) Oneonta vicinity, Fortin Site, (11-28-80)

Queens County

Rockaway Point vicinity, Riis, Jacob, Park Historic District, Rockaway Beach Blvd. (6-17-81)

. Rensseiarer County

Hoostek Falls. Hoosiek Falls Historic District. Roughly bounded by RR tracks. Church. Main and Elm Sts. (12–3–80)

Richmond County

Staten Island. St. Paul's Memorial Church and Rectory. 225 St. Paul's Ave. (11-21-80)

Schenectady County

Schenectady, General Electric Realty Plot.
Roughly bounded by Oxford Pl., Union
Ave., Nott St., Lenox and Lowell Rds. (11–
18–80)

Schohame County

Fulton. Shafer Site. (11-28-60)

Seneca County

Covert, Covert Historic District, NY 36 17.

Steuben County

Rheims. Pleasant Valley Wine Company. SR 88 (11-18-30)

Suffolk County

Bay Shore vicinity, Fire Island Light Station, Robert Moses Causeway (9-11-31)

Huntington. Fort Golgotha and the Old Buria.

Hill Cametery, Main St. and Nassau Rd. (3-2-81)

Mastic Beach, Floyd, William, House (Old Mastic) 20 Washington Ave. (10-15-30)

Tioga County

Owego, Owego Central Historic District. North Ave., Park, Main, Lake, Court, and Fronts Sts. (12-3-80)

Ulster County

Cragsmoor vicinity, Chetolah (George Inness, Jr., Estate), S of Cragsmoor on Vista Maria Rd. (10-21-30)

Westchester County

Katonah, Jay. John. Homestead, Jay St. (5-29-81) NHL

Peeksill vicinity. Van Cortlandt Upper Manor House. Oregon Rd. (4-2-31)

Scarsdale, Wayside Cottage, 1039 Post Rd. (5-1-81)

Yorktown Heights. Yorktown Heights
Railroad Station, Commerce St. (3-19-61)

Wyoming County

North Java, Arcade and Attica Railroad (11-17-80)

NORTH CAROLINA

Beaufort County

Belhaven, Bethaven City Hail, Main St. (1-27-81)

Bertie County

Windsor vicinity. King House. NW of Windsor off NC 208 (8-48-71)

Brunswick County

Southport. Southport Historic District.
Roughly bounded by Cape Fear River.
Rhett. Bay. Short and Brown Sts. (11-25-30)

Chatham County

Pittsboro vicinity, Hadley House and Grist Mill. NW of Pittsboro on SR 2165 (11-25-80)

Cumberland County

Fayetteville, Confederate Breastworks. Raleigh Rd. and U.S. 401 (10-7-61)

Currituck County

Poplar Branch vicinity. Baum Site (31CK9), N of Poplar Branch (12-6-0)

Davidson County

Lexington vicinity, Sowers, Philip, House, 4R 1182 (11–25–30)

Thomasville vicinity, Brummed's ian, Net Thomasville (11-25-60)

Thomasville, Thomasville dancend
Passenger Decot. W. Main St. 7-4-411

ecology and environment

NEW JERSEY—Continued

Springfield. SAYRE HOMESTEAD, Sayre Homestead Lane, (8-24-79); 79-11-29 079 0005006

Union. TOWNLEY, JAMES, HOUSE, Morris Ave. and Green Lane, (5-14-79); 79/07/19 079 0001676

warren county

Alpha vicinity. HUNT, GEORGE, HOUSE, SW of Alpha at 135 Warren Glen Rd, (9-12-79); 79-11-29 079 0005007

Washington. WASHINGTON RAILROAD STATION, Railroad Ave., (7-3-79); 79/11/ 01079 0003307

NEW MEXICO

Albuquerque

Albuquerque. FIRST NATIONAL BANK BUILDING, 217-233 Central Ave., NW, (2-2-79); 79/07/16 079 0000178

bernalillo county

O'REILLY, J.H., HOUSE, 220 9th St., NW., (1/29/79); 79/07/16 079 0000179 Alberquerque. LEWIS, CHARLES W. BUILDING, 1405-1407 2nd St., SW., (7-3-79); 79/11/01079 0003308

Albuquerque. DE GRACIA. TOMASA GRIEGO, HOUSE, 6939 Edith Blvd., NE Albuquerque. BARELA-BLEDSOE HOUSE, 7017 Edith Blvd., NE., (3-12-79); 79/07/12

079 0000592

Albuquerque. FIRST NATIONAL BANK BUILDING, 217-233 Central Ave., NW., (2-2-79); 80/01/10079 0006769

Albuquerque. O'REILLY, J.H., HOUSE, 220 9th St., NW., (1-29-79); 80/01/10079 0006770 Albuquerque. SAN IGNACIO CHURCH, 1300 Walter St., NE. (8-21-79); 79-11-29 079 0005008

colfax county

Eagle Nest vicinity. EAGLE NEST DAM, 3 mi. SE of Eagle Nest off U.S. 64, (4-18-79); 79/07/19 079 0001677

Springer. COWAN, R. H., LIVERY STABLE, 220 Maxwell Ave., (8-3-79); 79-11-13 079 0004381

de baca county

Fort Sumner vicinity. FORT SUMNER RAILROAD BRIDGE, 2 mi. (3.2 km) W of Fort Sumner over Pecos River, (3-21-79); 79/07/12 079 0000593

lincoln county

Nogal vicinity. EL PASO AND SOUTHWESTERN RAILWAY WATER SUPPLY SYSTEM. S of Nogal, (11-21-79); 80/01/10079 0006377

mckinley county

Gallup. COTTON, C.N., HOUSE, 406 W. Aztec Ave. (7-10-79)

Prewitt vicinity. ANDREWS ARCHEOLOGICAL DISTRICT, NE of Prewitt, (5-17-79); 79/07/19 079 0001678

mora county

Cleveland. CASSIDY, DANIEL, AND SONS GENERAL MERCHANDISE STORE, NM 3, (8-1-79); 79-11-13 079 0004362 Ocate. STRONG, J. P., STORE, NM 21 and NM 120, (7-27-79); 79-11-13 079 0004363

otero county

Cloudcroft vicinity. MEXICAN CANYON TRESTLE, NW of Cloudcroft off NM 83. (5-7-79); 79/07/19 079 0001679.

La Luz vicinity. LA LUZ POTTERY FACTORY, 2 mi. (3.2 km) E of La Luz. (05-29-79); 79/11/06 079 0002139 Tularosa. TULAROSA ORIGINAL TOWNSITE DISTRICT, U.S. 54/70, (2-14-79): 80/01/10079 0006771

rio arriba county

Dulce vicinity. VICENTI SITE, (5-14-79): 79/ 07/19 079 0001680

Embudo. EMBUDO HISTORIC DISTRICT. U.S. 64, (3-12-79); 79/07/12 079 0000594

san juan county

La Plata vicinity. MORRIS' NO. 41 ARCHEOLOGICAL DISTRICT, (5-17-79); 79/07/19 079 0001681

san miguel county

Las Vegas. LIBRARY PARK HISTORIC DISTRICT, Liberty Park and environs, (3-12-79): 79/07/12 079 0000595

Las Vegas. LINCOLN PARK HISTORIC DISTRICT, 7th, 8th, Lincoln and lackson

Sts. (8-6-79); 79-11-13 079 0004364 Las Vegas. RAILROAD AVENUE HISTORIC DISTRICT, U.S. 85, (8-6-79); 79-11-13 079

Rociada vicinity. PENDARIES GRIST MILL, 1 mi. (1.6 km) E of Rociada off NM 105, (2-2-79]; 80/01/10079 0006772

santa fe county

Lamy vicinity. APACHE CANYON RAILROAD BRIDGE, 3 mi. (4.8 km) NE of Lamy over Galisteo Creek, (4-27-79): 79/ 07/19 079 0001682

Santa Fe. VIERRA, CARLOS, HOUSE, 1002 Old Pecos Trail, (8-3-79); 79-11-13 079 0004366

sierra county

Arrey vicinity. PERCHA DIVERSION DAM, 2 mi. (3.2 km) NE of Arrey, (4-6-79); 79/07/ 16 079 0001081

Elephant Butte vicinity. ELEPHANT BUTTE DAM AND RESERVOIR, NW of Elephant Butte off NM 51, (4-9-79); 79/07/16 079 0001082

socorro county

Magdalena vicinity. CLEMENS RANCHHOUSE, S of Magdalena, (4-18-79); 79/07/19 079 0001683

taos county

Taos. GASPARD, LEON, HOUSE, Raton Rd., (2-23-79); 79/07/12 079 0000596 Tres Piedras. TRES PIEDRAS RAILROAD

WATER TOWER, off U.S. 285, (2-2-79); 80/ 01/10079 0006773

Tres Piedras. TRES PIEDRAS RAILROAD WATER TOWER, Off U.S. 285, (2-2-79); 79/07/16 079 0000182

torrance county

Moriarty vicinity. MORIARTY ECLIPSE WINDMILL, 2 (3.2 km) W of Moriarty off NM 222, (06-04-79); 79/11/06 079 0002140

valencia county

Los Lunas. ATCHISON, TOPEKA, AND SANTA FE RAILROAD DEPOT, U.S. 85, (8-1-79); 79-11-13 079 0004367

San Mateo vicinity. SAN MATEO ARCHEOLOGICAL SITE, NW of San Mateo, (5-17-79); 79/07/19 079 0001684

waseca county

Janesville vicinity. SEHA SORGHUM SYRUP MILL, SE of Janesville off MN 60, (06-04-79); 79/11/06 079 0002141 -

NEW YORK

albany county

Albany. TEN BROECK HISTORIC DISTRUCT, irregular pattern along Ten Broeck St. from Clinton Ave. to Livingston Ave., (1-25-79): 80/01/10079 0006774 Alvany. TEN BROECK HISTORIC

DISTRICT, Irregular pattern along Ten Broeck St. from Clinton Ave. to Livingston Ave., (1-25-79): 79/07/16 079 0000183

Conoes. SILLIMAN MEMORIAL PRESBYTERIAN CHURCH, Mohawk and Seneca Sts., (8-1-79): 79-11-13 079 0004368

Menands. ALBANY RURAL CEMETERY. Cemetery Ave, (10-25-79); 80/01/0079 0006188

bronx county

Bronx. HALL OF FAME COMPLEX, Bronx Community College campus, (9-7-79): 79-11-29 079 0005009

chenango county

Greene. ROSEKRANS BUILDING. 62 Genessee St. (7-27-79): 79-11-13 079 0004369

columbia county

Claverack. VAN HOESEN. JAN, HOUSE, NY 66. (8-1-79); 79-11-13 079 0004370

Clermont vicinity. SIXTEEN-MILE DISTRICT, W of Clermont along Hudson River, (3-7-79) (also in Dutchess County): 79/07/13 079 0000597

Germantown vicinity. CLERMONT ESTATES HISTORIC DISTRICT. S of Germantown, (5-7-79): 79/07/19 079 0001686

Linlithgo vicinity. OAK HILL. N of Linlithgo on Oak Hill Rd., (6-26-79): 79/11/01079 0003310

Valatie. FIRST PRESBYTERIAN CHURCH. Church St. (9-7-79); 79-11-29 079 0005010

cortland county

Preble vicinity. LITTLE YORK PAVILION. S of Preble off NY 281, (7-27-79): 79-11-13 079 0004371

dutchess county

Beacon. EUSTATIA, 12 Monell Pl., (2-26-79); 79/07/13 079 0000599

Poughkeepsie. POUGHKEEPSIE RAILROAD BRIDGE, Spans Hudson River, (2-23-79) (also in Ulster County); 79/07/13 079 0000600

Rhinebeck. RHINEBECK VILLAGE HISTORIC DISTRICT, U.S. 19 and NY 308. (8-8-79); 79-11-13 079 0004372

erie county 👵 😴

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LAROV Are. [8-3-79]: 78-11-13 079 000432

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essex county

Elizabethtown. HAND-HALE HISTORIC DISTRICT, River and Maple Sts., (3-5-79); 79/07/13 079 0000601

genesee county

LeRoy. KEENEY HOUSE, 13 W. Main St. (9-11-79); 79-11-29 079 0005011

greene county

LEEDS VICINITY. NEWKIRK HOMESTEAD. NW of Leeds on Sandy Plains Rd., (7-22-79); 79/11/01079 0003311

Newark, Lincoln Park Historic District Addendum, 107812, 108012 Broad St.

Hudson County

Southern Hoboken Historic District Jersey City, Bergen Station Post Office, 750-756 Grand St.

Jersey City, Buildings at 273-2731/2 Tenth Street

Hunterdon County .

Dart Mill Historic District, Lambertville, Lilley Mansion

Monmouth County

Asbury Park, Steinbach Building Long Branch, Congregation Brothers of Israel Synagogue

Long Branch, Doll House at 87 Second Avenue

Long Branch, Summer House at 87 Second
Avenue

Morris County

Upper Longwood Forge Historic District

Pessaic County

Dundee Canal

Somerset County

Lyons, Veterans Administration Medical Center (63.3)

NEW MEXICO

Fort Bliss Multiple Resource Area

Bernalillo County

Archeological Site NM:0:3:1:11 Archeological Site NM:1:15:3:8

Dona Ana County

Archeological Site OCA:FA1 Archeological Site OCA:FA:2 Archeological Site OCA:FA5 Archeological Site OCA:FA8

Archeological Site OCA:FA9 Archeological Site OCA:FA:11

Archeological Site OCA:FA:12-Archeological Site OCA:FA:13

Archeological Site OCA:FA:15 Archeological Site OCA:FA:18

Archeological Site OCA:FA:18
Archeological Site OCA:FA:20

Archeological Site OCA:FA:21

Archeological Site OCA:FA:22 Archeological Site OCA:FA:23

Archeological Site OCA:FA:24

Ctero County

Fairchild Site, Dog Canyon White Sands
National Monument

San Juan County

Archeological Site LA 20239

NEW YORK

Portchester, Putnam-Mellor Engine and Hose Company

Albany County

Albany, South End Historic District-Plum Street Extension

3ronx County

New York, P.S. 15 Little Red Schoolhouse, 4010 Dyre Ave.

New York, P.S. 17 City Island Community Center, 190 Fordham South Bronx, Morris High School Historic District

Broome County

Binghamton, Parlor City Historic District (63.3)

Columbia County

Hudson, Hudson Historic District (63.3)

Erge County

Market 1887 1887 1887

Kings County

Brooklyn, Brooklyn Army Terminal

New York County

New York, City Center Dance Theater, W. 55th St.

Onondaga County

Syracuse, Main Post Office, 101 N. Clinton St.

Monroe County

Rochester. Commercial Historic District, South Ave.

Rockland County

Clarkstown, Upper Nyack Firehouse, 330 N. Broadway

Grand View on Hudson, Grand View Village Hall, 118 River Rd.

Haverstraw, Haverstraw King's Daughters Public Library (63.3)

Suffoik County

Northport, Veteran's Administration Medical Center, Middleville Rd.

Southold, Southold Library, Main Rd. (63.3)

Tompkins County _

Ithaca. St. James AME Zion Church

Westchester County

Tarrytown, Pierson School

NORTH CAROLINA

Caswell County

Womack's Mill (County Line Creek Watershed) (also in Rockingham County)

Cumberland County

Shaw-Gillis House

Fayetteville, Poe. Edgar Allen, House. 206 Bradford Ave.

Durham County

Durham. Old North Durham Historic District

Gaston County

Mount Holly, Davenport House, 1505 N. Main St.

Mount Holly, Nantz House, 714 N. Main St.

Guiford County

Old Greensborough Historic District
Boundary Extension, Elm. S. Davie, E.
Washington, W. Washington and S. Green
Sts.

Hoke County

McNeill House

Madison County

California Creek Missionary Baptist Church

Martin County

Smithwick-Green-Clark House, U.S. 17

Woolard-Perry House

Pitt County

Bethel vicinity, Brown, Henry Williamston, House

Bethel vicinity, Brown, Herbert P., House Bethel vicinity, Moore House

NORTH DAKOTA

McKenzie County

Arnegard, Cinnamon Creek Rioge Archeological District

Mercer County

Zap, Archeological Site 32ME218 (63.2)

OHIO

Allen County

Lima, Holland Block Annex, 112-116 E. High St.

Athens County

Athens, West Hills Historic District Glouster, Hisylvania No. 22 Mine Entrances and Tippie

Cuyanoga County

Strongsville, Strongsville Acuvity Center

Hamilton County

Cincinnati, Block 23 (Ben's Department Store) Bounded by Central Ave., 7th. 8th. and former John Sts.

Cincinnati, Building at 1032 Foracker Avenue Cincinnati, Buildings at 1307–1309 Pendleton

Cincinnati, Building at 1422 Apjones Street Cincinnati, Building at 2843 Meirose Avenue

Cincinnati, Building at 3022 Park

Cincinnati, Buildings at 4008, 4010 and 4012 Gulow Street

Cincinnati, Building at 4217 Mad Anthony

Street
Cincinnati, Building at 4224 Williams Place

Cincinnati, Building at 4267 Williams Place Cincinnati, Carmel United Presoyterica Church, 3549 Reading Rd.

Cincinnati, St. Leo's Church Complex.
Baltimore St. and St. Leo Pl.

Hocking County

Logan, Hocking County Courthouse, E. Main St. (63.3)

Knox County

Lehmon Road Bridge, SR 239 (63.3)

Scioto County

Portsmouth, Fowler Building, 700 Second St. (63.3)

Portsmouth, Fowier Property =1, 716 Second St. (63.3)

Portsmouth, Fowler Property =2, 712 Second St. (63.3)

Summit County

Akron, Mustill, Frederick, House, 234 Ferndale St

Akron, Mustill Store, 248 Ferndale St. Akron, Ohio Canal Lock No. 15 Akron, Ohio Canal Locks No. 10-14

(Staircase of Locks)

REFERENCE NO. 18

Newton Corner, Massachusetts 02158 U.S. Fish and Wildlife Service 1 Gateway Center, Suite 700

Federal, State and local regulatory agencies with jurisdiction over wetlands may deline and describe wellands in a different manner than that used in this inveniory. There is no attempt, in either the design or products of this inveniory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning securities agency regulatory programs and proprietary jurisdictions that may affect such activities.



WETLAND LEGEND

U — Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

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CONTROLLED WATER REGI

(1) information on the water regime modifiers found on this legend, but not found in the classification system, may be obtained from the above listed source

il regulatory agencies with jurisdic-define and describe wetlands in a lat used in this inventory. There is design or products of this inven-go proprietary jurisdiction of any government or to establish the government or to establish the regulatory programs of govern-incending to engage in activities in intending to engage in activities in intending to engage in activities in the replacent to wetland areas it appropriate Federal. State or local golfied agency regulatory programs ons that may affect such activities.



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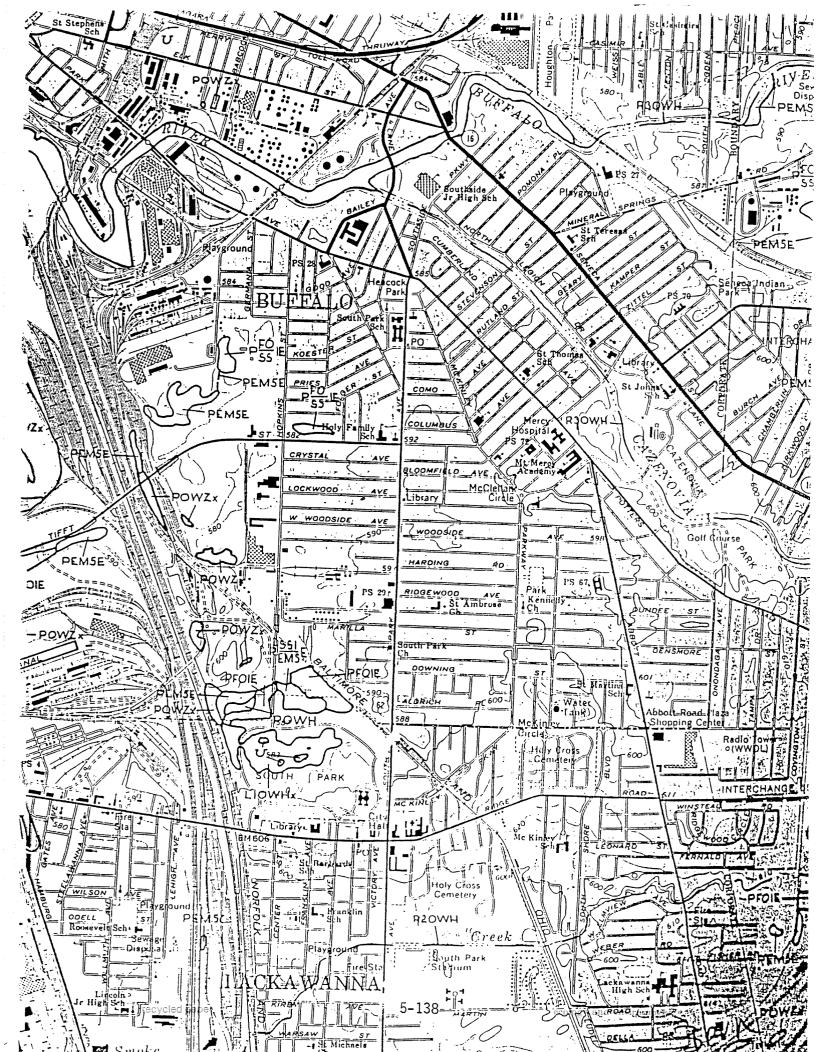
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C.C. Transmission FISH AND WILDLIFE SERVICE

Prepared by Office of Biological Services for the National Wetlands Inventory

WETLAND LEGEND

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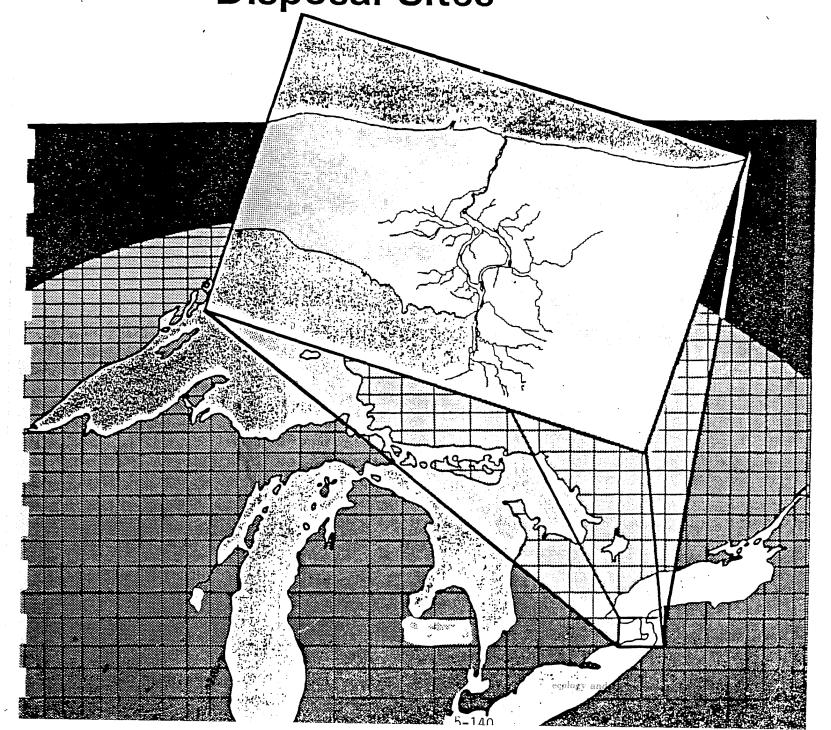


REFERENCE NO. 19



Preliminary Evaluation Of Chemical Migration To Groundwater and The Niagara River from Selected WasteDisposal Sites





"Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from Selected Waste-Disposal Sites"

Ву

Edward J. Koszalka, James E. Paschal, Jr.,
Todd S. Miller and Philip B. Duran

Prepared by the U.S. Geological Survey
in cooperation with the

New York State Department of Environmental Conservation
for the

U.S. ENVIRONMENTAL PROTECTION AGENCY

140. HOUDAILLE INDUSTRIES--MANZEL DIVISION (USGS field reconnaissance)

General information and contaminant-migration potential.—The Houdaille Industries-Manzel Division site, in the southern part of the city of Buffalo, was used for cutting oils, solvents, and cooling compounds, which were dumped directly upon the ground.

The potential for horizontal migration of contaminants at this site is indeterminable, but the potential for vertical migration is limited by the underlying clay unit. The U.S. Geological Survey first sampled this site in 1982 but resampled it in the spring of 1983 to verify offsite contaminant migration.

Geologic information.—The site is underlain by glacial-lake deposits of interbedded clay, silt, and fine sand; these in turn are underlain by limestone bedrock at 20 ft below land surface.

The U.S. Geological Survey drilled four test borings on the site in August 1982; the locations are shown in figure A-7. The geologic logs are as follows:

Boring no.	Depth (ft)	Description
1	0 - 4.0 4.0 - 4.5 4.5 - 6.5	Topsoil and fill. Clay, dark gray. Clay, yellow. SAMPLE: 4 ft.
2	0 - 1.5 $1.5 - 3.0$ $3.0 - 6.5$	Topsoil, organic, peatlike. Soil, loose, brown, dry. Clay, greenish-yellow, dry. SAMPLE: 3 ft.
3	0 - 3.0 3 - 3.5 3.5 - 6.6	Topsoil, black, organic, becoming brown near bottom. Sand, greenish-yellow. Clay, greenish-yellow. SAMPLE: 3 ft.
4	0 - 2.5 2.5 - 4.0	Topsoil, black, organic. Clay, yellow. SAMPLE: 2.5 ft.

Hydrologic information.—Hydrologic data are lacking because the test borings did not encounter ground water, but a seasonal water table may form within the more permeable sand zones above bedrock. The direction of ground-water flow would most likely be southward toward the Buffalo River.

Chemical information.—In August 1981, the Erie County Department of Environment and Planning collected seven soil samples for benzene, toluene, xylene, chloroform, and polychlorinated biphenyl analysis. Toluene and xylene had concentrations of less than 7,000 pylyz in all samples. Persent had a concentration of less than 7,000 pylyz in six samples, but the seventh had a concentration of 56,000 pylyz. Chloroform concentrations ranged from 213,000 to 421,000 pph.

In August 1982, the U.S. Geological Survey collected four soil samples for copper, iron, lead, nickel, and organic compound analysis; results are given in table A-8. Copper in sample 3 exceeded concentrations in soil samples from undisturbed areas. The samples contained 22 organic priority pollutants, some with concentrations as high as $30,000~\mu g/kg$ (fluoranthene); six organic nonpriority pollutants were also detected.

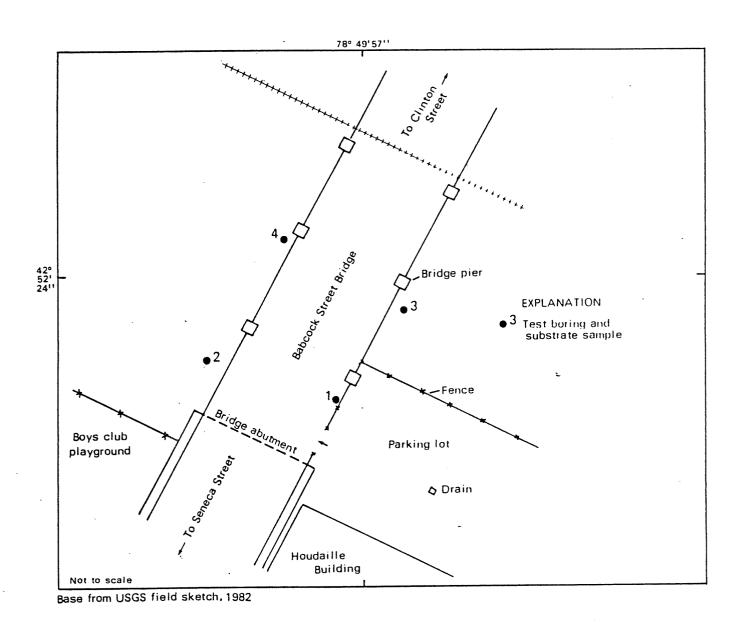


Figure A-7. Location of sampling holes at Houdaille Industries-Manzel Division, site 140, Buffalo.

Table A-8.--Analyses of substrate samples from Houdaille Industries, site 140, Buffalo, N.Y. (continued)
[Locations shown in fig. A-7. Concentrations are in µg/kg; dashes indicate that constituent or compound was not found, LT indicates it was found but below the quantifiable detection limit.]

	Sample number					
Second sampling (05-20-83)	1A (4.0)	2A (3.0)	3A (3.0)	4A (2.5)		
Nonpriority pollutants						
Acetone	190	****				
Dibenzofuran		170	LT	1,900		
Fluorotrichloromethane	50	18	16	46		
2-Methylnaphthalene	*** ***	280	LΤ	LT		
l-Methylnaphthalene ^l		350,000	-			
1,8-Dimethylnaphthalenel	white store	325,000				
Benzo(j)fluoranthenel			700,000	1,000,000		

141. MOBIL OIL CORPORATION (USGS field reconnaissance)

NYSDEC 915040

General information and contaminant-migration potential. -- The Mobil Oil Corporation site, in the southern part of the city of Buffalo, was used to dispose of unknown quantities of cooling water, air-flotation unit sediments, gravity-separator sediments, tetraethyl lead, lubricating sludges, spent catalysts, and soil contaminated with asphalt.

The highly permeable sand underlying the site suggests a major potential for contaminant migration to the Buffalo River. The rate of movement and the concentration of contaminants would depend on the amount of precipitation percolating through the unsaturated zone and the ground-water gradients at the site.

Geologic information.—The site consists of fill underlain by fine to medium sand and gravel. The U.S. Geological Survey drilled four test borings in August 1982; locations are shown in figure A-8. The geologic logs are as follows:

Boring no.	Depth (ft)	Description				
1	0 - 6.5	Topsoil, fill, gravel, sand, fine to medium, brown, wet at 5.5 ft.				
	6.5 - 11.5 11.5 - 16.5	Same but wetter. Sand, dark gray-green; depth is below river bed. SAMPLE: 8 ft.				

Table A-8.--Analyses of substrate samples from Houdaille Industries, site 140, Buffalo, N.Y.

[Locations shown in fig. A-7. Concentrations are in µg/kg; dashes indicate that constituent or compound was not found, LT indicates it was found but below the quantifiable detection limit.]

	Sample	number and dept	h below land su	rface (ft)
	1	2	3	4
First sampling (08-06-82)	(4.0)	(3.0)	(3.0)	(2.5)
Inorganic Constituents				
Copper	2,000		100,000††	ese 400
Iron	620,000	67,000	1,600,000	1,800,000
Lead		***	10,000	20,000
Nickel				-mp -mile
	Sample num	ber (depths are	same as in fir	st sampling
Second sampling (05-20-83)	lA	2A	3A	4A
Organic Compounds				::
Priority pollutants				
Methylene chloride	380			210
Tetrachloroethene	560	400		
Toluene	10	29	24	20
Trichloroethene	LT		NISS -110	***
Acenaphthene	***		mage with	1,400
Fluoranthene	30,000	650	2,300	9,500
Naphthalene	4,000	370	1,400	2,400
Di-n-butyl phthalate	6,000	-		
Benzo(a)anthracene	14,000	370	1,900	3,300
Benzo(a)pyrene	18,000	280	2,800	1,900
Chrysene	10,000	370	1,900	3,300
Acenaphthalene	16,000	LT	econ emo	4,300
Anthracene	4,000	LΤ	LT	2,400
Benzo(ghi)perylene	18,000	LT	2,800	LT
Fluorene		***		1,900
Phenanthrene	12,000	750	1,900	10,000
Indeno(1,2,3-cd)pyrene	16,000	LT	2,800	1,400
Pyrene	28,000	560	LT	6,200
δ-BHC	-	LT		-
Benzo(b)fluoranthene			3,300	2,400
Benzo(k)fluoranthene	NOTES YEAR	***	3,300	2,400

Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semiquantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analysts.

^{††} Exceeds concentrations in samples taken from undisturbed soils in the Buffalo area. Undisturbed soils were not analyzed for iron.

REFERENCE NO. 20

The Niagara River Toxics Committee

OCTOBER 1984







FROM: The Niagara River Toxics Committee

TO: Mr. C. Daggett, Regional Administrator, Region II U.S. Environmental Protection Agency

New York, N.Y.

Mr. J.W. Giles, Associate Deputy Minister Ontario Ministry of the Environment Toronto. Ontario

Dr. J.D. Kingham, Regional Director General Ontario Region, Environment Canada Toronto, Ontario

Mr. H. Williams, Commissioner N.Y. State Department of Environmental Conservation Albany, New York

Gentlemen:

The Niagara River Toxics Committee is pleased to submit, herewith, its final report and associated summary. The report is a comprehensive and detailed review of the project studies and their results. It assesses toxic chemicals and their sources, reviews toxic chemical control programs, recommends improvement to these programs and proposes a long term monitoring program. The summary highlights the general findings of the Committee and includes the Committee's recommendations.

Respectfully submitted, October 1984.

E. Tony Wa E.T. Wagner Co-Chairman

Environment Canada

P./J. Crabtree

Ontario Ministry of the Environment

D.J. Pascoe Environment Canada

FYSTScher Ontario Ministry of the Environment

Co-Chalrman

N.Y. State Dept. of Env. Conservation

V.J. Saulys

U.S. Environmental Protection Agency

J.C. McMahon

N.Y. State Dept. of Env. Conservation

R.B. Hemmett

U.S. Environmental Protection Agency

1.1 Pollution in the Niagara River

On its route from Lake Erie to Lake Ontario, the Niagara River passes through a complex of steel, petrochemical, and chemical manufacturing industries. The Niagara Frontier's proximity to a source of cheap electrical power and water for use in industrial processing has caused it to become a highly industrialized area, particularly on the U.S. side.

Historically, decisions about the development of the Niagara Frontier have been based solely on economic factors, such as the creation of jobs and the production of cheaper materials. These decisions have proven to be the cause of environmental problems both in the Niagara River and the surrounding area.

More recently, environmental degradation and its impact on human health has become a pervailing consideration in decisions regarding use and management of the Niagara River. Over the last decade, high levels of bacteria, phenols, oil, iron, phosphorus, chloride, mercury, and color have been reduced significantly.

Currently, toxic substances and their effects on human health and the ecosystem are being focussed on. Major toxic waste disposal sites have been identified along the Niagara River corridor, and toxic substances have been measured in the effluents of industrial and municipal facilities discharging into the river.

With increased research, the link between the discharge of toxic substances into the Niagara River and the subsequent effects on the ecosystem has become more clear. In some cases, conditions in Lake Ontario can be attributed directly to substances from the Niagara River; the occurrence of mirex and dioxin in Lake Ontario fish is an example of such a direct relationship. Certain species of fish from specific areas of the lake are banned for commercial fishing as a result of mirex and PCB levels,

attributable, in part, to Niagara River contaminants. In other cases, the linkage is less direct but nonetheless real; chemicals originating in the Niagara River combine with other sources to Lake Ontario to contaminate the water, sediment, and biota in the lake.

The presence of toxic chemicals in the Niagara River is not new; these substances have probably been in the river for years. The development of more sophisticated analytical equipment and methodology has led to greater detection capability, enabling scientists to find chemicals at very low concentrations. Unfortunately, the ability to detect these compounds has outstripped our ability to correlate their concentrations with direct adverse effects on human health and the environment.

Existing long term data show a decline in many contaminants, and, for the chemicals for which drinking water standards exist, monitoring shows that they are within current Canadian and United States limits. The development of drinking water standards is an on-going process, however, and there are chemical compounds presently being identified in the Niagara River for which no standards have as yet been established.

Many members of the public feel that there has been a lack of government concern and action in assessing and solving the problems in the Niagara River. In fact, pollution in the Niagara River has been a major concern of federal, state and provincial governments since the early 1950's.

Millions of dollars have been, and are continuing to be spent by government and industry in implementing clean-up programs, determining the effectiveness of river clean-up programs, and identifying additional contamination sources requiring action. Significant progress has already been made in alleviating the sources of many of the earlier problems, largely through the control of municipal and industrial waste discharges.

A continuing effort is now being directed at solving the more complex problems of toxic substance contamination in the Niagara River. In

recycled paper

many cases, the scientific basis for understanding the environmental and human health significance of these chemical compounds, either individually or in combination, does not exist and will have to be developed. This is by no means an easy or inexpensive task, nor can it be accomplished in a short time frame. In the mean time, responsible Canadian and U.S. agencies have accepted the premise that they will have to make decisions regarding the control of toxic substances in the absence of all the evidence that might be scientifically desirable.

In summary, the occurrence of toxic chemicals in the Niagara River is a major public concern in both countries. While much has been accomplished, toxic substances remain a problem. The task is to assess what is there, identify the sources, implement additional appropriate abatement strategies, and monitor the effectiveness of these strategies.

1.2 <u>The Niagara River Toxics Committee</u>

The mutual concern of both Canadian and United States environmental agencies regarding the water quality of the Niagara River resulted in a decision to cooperate in a joint investigation of toxic chemicals entering the Niagara River. There had been previous investigations and reports on water quality in the river; however, no investigation had attempted a coordinated study on toxic substances pollution. In February, 1981, the Niagara River Toxics Committee (NRTC) was established to oversee and coordinate such a program. The committee consisted of representatives from:

- Environment Canada
- Ontario Ministry of the Environment
- United States Environmental Protection Agency
- New York State Department of Environmental Conservation

The Committee was co-chaired by representatives of Environment Canada and the New York State Department of Environmental Conservation. Funding for the investigation was provided by the four cooperating agencies.

River Toxics Committee. The Sub-committee findings and recommendations are contained in a report which has been published separately. Data quality discussions are included in all appropriate chapters of this report.

1.3 The Niagara River - Background and Overview

1.3.1 <u>General Description</u>

The 58 kilometre (37 mile) Niagara River, with an average flow of 5,700 cubic metres per second (cms) or 200,000 cubic feet per second (cfs), connects Lake Erie to Lake Ontario. Divided into the upper and lower reaches by Niagara Falls, it provides 83 percent of the total tributary flow to Lake Ontario. The river drains an area of about 227,000 square kilometres (88,000 square miles). Between Lake Erie and Lake Ontario, the river drops about 100 metres (328 feet) with about one-half of the drop occurring at Niagara Falls.

For both Canada and the United States, the Niagara River provides municipal and industrial water supplies and a source of power generation, commerce, recreation, and tourism.

As a source of municipal drinking water, it serves a combined Canadian/United States population of more than 400,000 people. The City of Buffalo municipal water plant, which obtains water at the junction of Lake Erie and the Niagara River, services an additional 530,000 people. The river, in return, receives the treated waste from these same populations.

From Lake Erie to Strawberry Island (off the southern tip of Grand Island), a distance of about eight kilometres (5 miles), the Niagara River drops about two metres (6 feet). At Strawberry and Grand Islands, the river divides into two channels, the Chippawa Channel and the Tonawanda Channel, located west and east of Grand Island, respectively.

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Niagara River Toxics Committee, Data Quality Sub-committee, Final Report to the Niagara River Toxics Committee, March, 1984.

The Chippawa Channel is approximately 18 kilometres (II miles) long and carries about 57 percent of the total river flow, while the Tonawanda Channel is about 24 kilometres (15 miles) long and carries the remaining portion of the river flow. During the navigation season (April/May through November/December), the New York State Barge Canal withdraws water from the Tonawanda Channel at Tonawanda, New York and discharges it into Lake Ontario at several points in the State of New York. Average diversions by the Barge Canal in recent years during the navigation period have been about 30 cms (1100 cfs).

At the north end of Grand Island, the Chippawa and the Tonawanda Channels unite to form the Chippawa-Grass Island Pool. The fall between Strawberry Island and the Pool is about one metre (3 feet).

In 1950, Canada and the United States signed the Niagara River Treaty to preserve the scenic spectacle of Niagara Falls, and to make more efficient use of the Niagara River for power generation purposes. To fulfill the objectives of the Niagara River Treaty, Ontario Hydro and the New York Power Authority constructed a control structure at the lower end of the Chippawa-Grass Island Pool. The structure consists of eighteen gates and extends from the Canadian shore part way across the river. It is operated by the two power entities under the direction of the International Joint Commission's International Niagara Board of Control.

The Niagara River Treaty requires that a minimum flow of 2830 cms (100,000 cfs) be maintained over the Falls during the daylight hours of the tourist season (April through October). At all other times, the minimum required flow over the Falls is 1410 cms (50,000 cfs). The control structure permits a relatively quick change over from daylight to night-time flow (and vice versa) during the tourist season. It also regulates the water level in the Chippawa-Grass Island Pool to facilitate power diversions within limits established by the Niagara Board. The present procedure requires that the water level in the Pool be maintained as nearly as may be practicable to its

long-term average elevation of 170.99 metres (561 feet). The operation of the control structure has a negligible effect on the outflows of Lake Erie.

The Canadian plants include the Canadian Niagara, Ontario Power, and Sir Adam Beck I and II Power Plants. Total Canadian diversion capability is about 2350 cms (84,000 cfs). The Robert Moses Niagara Plant is the only plant on the Niagara River in the United States and has a diversion capacity of about 3115 cms (110,000 cfs). Each of these power plants withdraws water from the upper Niagara River and discharges it downstream of Niagara Falls. During the tourist season, the additional water made available for power purposes during night-time hours is diverted and stored in the pump-storage reservoirs and released during the daylight hours when the power demand is This is also the case during the non-tourist season, when the additional water is available on a continuous basis. The excess water is stored during periods of lower energy demand, such as nights and week-ends, and released during periods of high energy demand. Thus, there is a persistent within-the-day variation in flow in the lower Niagara River between the Falls and Queenston, Ontario, due to discharge from these plants.

At Niagara Falls, water drops about 56 metres (182 feet) over the Falls into the Maid-of-the-Mist Pool. In the next five kilometres (3 miles), the river drops about 23 metres (75 feet) through the Whirlpool Rapids. The fall in the 11 kilometre (6 mile) reach from the foot of the Whirlpool Rapids to Lake Ontario is about 0.2 metres (0.6 feet).

1.3.2 <u>Local Inflows and Outflows</u>

1.3.2.1 Surface Water

The flow of the Niagara River between Buffalo and Queenston is increased by the local inflow from streams tributary to the upper river and by the water diverted into the Welland River from the Welland Canal. It is reduced by the diversion of the New York Barge Canal, which has an average flow of about 30 cms (1100 cfs) during the navigation season. Local

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CONTACT REPORT

AGENCY : USDA SOIL CONSERVATION SERVICE

ADDRESS : 21 S. GROVE RD., EAST AURORA, NY

TELEPHONE : (716) 652-8480

PERSON

CONTACTED : JOHN WHITNEY

TO : FRED MCKOSKY

FROM : PAM GUNTHER

DATE : AUGUST 25, 1987

SUBJECT : PRIME AGRICULTURAL LANDS THAT HAVE BEEN IN PRODUCTION

SINCE 1982 FOR DEC PHASE 1 INACTIVE HAZARDOUS WASTE

SITES OF ERIE CO.

XC : M. SIENKIEWICZ, G. FLORENTINO, J. SUNDQUIST, P. FARRELL,

FILE ND-2000

John Whitney can provide aerial photos (slides) for all hazardous waste sites in Erie Co. for the following years: 1938, 1958, 1966, 1978, 1981-1987. They cost \$1.00 each with a 2 week turnover time. Payment must be received in advance.

To obtain location on prime agricultural lands that have been in production over the past 5 years we looked at enlarged 1978 aerial photos that are updated annually from farmers that maintain crop records with the Agricultural To receive federal subsidies Stabilization Conservation Service (ASCS). the farmers must be in contact with ASCS. Therefore, the ASCS has a good record of who's growing what and where. Truck farmers do not receive federal subsidies and are excluded from ASCS records. Attached is a list of the distances to each prime agricultural farmland from the inactive hazardous waste site and the soil type that classifies the land as prime. Note that ASCS has fewer soil types classified as prime ag. lands than does the New York State classification system. New York State classifies all ASCS prime ag. lands as prime but also includes more soil types. Note this difference for the Gutenkist site. All other sites will have the same ag. land for both state and ASCS. Note this distance was calculated for up to 2 miles away from the site.

Mr. Whitney has also provided me with a bibleography of ground water resources for Erie County which is attached. I have also ordered the attached USGS reports that were recently published.

	Distance	Soil Type
Buffalo - Hopkins	> 2 miles	-
E.I. Dupont	> 2 miles	-
FMC Corp.	> 2 miles	-
Whiting Development Corp.	0	Collamer silt loam, Ag. land adjacent to sit
Republic Steel	> 2 miles	~
Snyder Tank Co.	> 2 miles	Varysburg gravelly loam
Village of Springville	300 ft.	Varysburg gravelly loam
James Fox site	300 ft	Manlius shaly silt loam
Gutenkist State	1600 ft.	Farnham shaly silt loam
ASCS	6015 ft.	Blasdell shaly silt loam
Eden Sanitation Services	4950 ft	Niagara silt loam (note: this land is only
George Schreiber	700 ft.	Palmyra gravelly loam
Clarence Ready Mix	1700 ft.	~
Central Auto Wrecking	> 2 miles	Hamlen silt loam
Hi View Terrace	5280 ft.	_ -
Tift and Hopkins	> 2 miles	
LSB Warehouse	> 2 miles	-
Berns Metals	> 2 miles	$oldsymbol{arphi}$

REFERENCE NO. 22

R. Tramontone

151

New York State Department of Environmental Conservation.
50 Wolf Road, Albany, New York 12233-

/ %

SEP 1 0 1987

Thomas C. Jorling Commissioner

Mr. Stephen D. Luftig
Director
Office of Emergency and Remedial Response
United States Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

Dear Mr. Luftig:

RECEIVED

SEP 1 3 1987

ASSESSMENT
Removal Action

Re: Request for USEPA Removal Action

Berne Metals Site. ID #915135
Buffalo, New York

The Berne Metals Site, City of Buffalo, Niagara County, was originally owned by Berne Metals Corporation and operated as a scrap reprocessor until 1985. The site is presently abandoned and the company no longer exists.

There are currently approximately 200 - 55 gallon drums on site along with scrap metal turnings, waste chemicals, sludges, and battery cases. Previous complaint investigations documented copper sulfate sludge, spilled battery acids and sludges, lead contamination in soil as high as 25 percent and leather fines. All wastes were part of a recycling operation prior to closure.

Enclosed is a copy of an August 6, 1987 letter from Ecology and Environment to Walter Demick of the New York State Department of Environmental Conservation (NYSDEC) which provides more information concerning conditions at the site. Also enclosed is a copy of an April 11, 1987 site inspection report prepared by the NYSDEC and a July 14, 1983 site profile prepared by the Erie County Department of Environment and Planning. These documents will provide additional site background.

Therefore, it is requested that the United States Environmental Protection Agency (USEPA) provide funding pursuant to the Superfund Amendments and Reauthorization Act of 1986 (SARA) to perform a removal action at the Berne Metals Site. This should include securing the site and removal of the waste.

Mr. Stephen D. Luftig

Page 2

For additional information, please contact Mr. Christopher P. Allen, P.E., of my staff, at (518) 457-0315.

Sincerely,

Nórman H. Nosenchuck, P.E.

Director

Division of Solid and Hazardous Waste

Enclosures

cc: J. Malool, USEPA, Edison, NJ

- F. Rubel, USEPA, Edison, NJ
- G. Pavlou, USEPÁ, Region II
- N. Kim, NYSDOH
- R. Tramontano, NYSDOH

REFERENCE NO. 23



Corning Tower The Governor Nelson A. Rockefeller Empire State Plaza Albany, New York 12237

David Axelrod, M.D. Commissioner

November 2, 1988

Mr. Al Rockmore NYS Dept. of Environmental Conservation 50 Wolf Road Albany', NY 12203

> RE: Bern Metal Site #915135 (C) Buffalo, Erie County

Dear Mr. Rockmore:

During a Health Department inspection of the above-referenced property conducted on October 20, 1988, it was noted that a six foot chain link fence had recently been erected around the site. This fence obviously was erected to restrict public access, thereby limiting potential exposure to on-site waste. However, the gate at the rear of the site was open and it appeared that the lock had been broken off.

Due to the severity of documented contamination and the presence of drums and other wastes on site, it is imperative that access to the site be restricted. The existing condition of the site presents several physical hazards to anyone who enters the buildings. We request that the DEC pursue the necessary action to insure that the gate is locked and the site secured.

Please let me know if I can be of any assistance in this matter. I can be reached at (518)458-6306.

Sincerely,

Program Research Specialist I Bureau of Environmental Exposure

Investigation

LDR: vbh (83070070)

cc: Mr. Tramontano

Ms. Stanish

Mr. Meehan

Dr. Smith-Blackwell/Mr. Violanti

rechared replacement

Mr. Kodjaja Mr. Tygert

5-162

ecology and environment

REFERENCE NO. 24

Copy. n. Iramonauiu D Axelrocl

U.S. ENVIRONMENTAL PROTECTION AGENCY

POLLUTION REPORT

_ DATE: June 21, 1988

Region II

Response and Prevention Branch

Edison, New Jersey 08837

(201) 548-8730 - Commercial and FTS 24 Hour Emergency

TO: C. Daggett, EPA

S. Luftig, EPA R. Salkie, EPA

J. Marshall, EPA ERD Washington

(E-Mail)

J. Czapor, EPA

B. Sprague, EPA

G. Zachos, EPA

C. Fitzsimmons, EPA

B. Adler, EPA

D. Kraft, EPA

G. Pavlou, EPA

R. Cahill, EPA

M. O'Toole, NYSDEC

W. Nelson, ATSDR

S. Foti, NYSDEC

E. Sullivan, NYSDEC

TAT

POLREP NO.:

INCIDENT NAME:

SITE/SPILL NO.:

POLLUTANT:

CLASSIFICATION:

SOURCE:

LOCATION: AMOUNT:

WATER BODY:

Five (5) Bern Metal

3A

Heavy Metals

Major

Unknown

Buffalo, Erie County, New Yorkxposure INVESTIGATION

Unknown 🕦

Buffalo River

RECEIVED

JUL 1 4 1988

BUREAU OF ENVIRONMENTAL

SITUATION:

See first POLREP.

ACTION TAKEN:

On May 25, 1988, Allied Fence finished it's operation of securing the site by installing over 1700 feet of chain linked fence and by repairing existing fence. After ERCS and TAT posted warning signs on the fence, the project was completed and any immediate threat to the public this site might have posed was mitigated by this EPA removal action.

B. Lab analysis on the fourth set of air samples were, received on May 31, 1988 and all results were well below the permissible exposure limits.

JUL 08 1988

3. FUTURE PLANS AND RECOMMENDATIONS:

A. A phase II action memorandum will be prepared to address a more complete characterization of the hazards present at the site.

4. FINANCIAL STATUS

A.	Total Project Ceiling Authorized	\$ 87,000
В.	Total Funds Authorized for Mitigation Contracts	\$ 48,000
c.	Expenditures for Mitigation Contracts	
	1.a Amount Obligated to DCN #KE-0079	\$ 48,000
	1.b Estimated Expenditures as of June 21, 1988	\$ 34,500
	1.c Balance Remaining	\$ 13,500
D.	Unobligated Balance Remaining	-0-
E.	Estimate of Total Expenditures to Date for all Mitigation Contracts	\$ 34,500
F.	Other Extramural Costs	
	1.a TAT Salary/Travel as of June 21, 1988	\$ 22,000
G.	Intramural Removal Costs	
	1.a EPA Travel and Salaries as of June 21, 1988	\$ 19,000
H.	Total Expenditures Percent of \$2 Million	\$ 75,500 3.8%
I.	Percent of Total Project Ceiling	86.8%

FURTHER POLREPS FINAL POLREP FORTHCOMING	_SUBMITTED	BY ach Hum
	_	Jack Harmon, OSC Response and Prevention Branch

DATE	OF	RELEASE:	6/28	86

₽A

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

01 State 02 Site Number NY 915135

PART 1 - SITE LOCATION AND INSPECTION INFORMATION

II. SITE NAME AND LOCATION						
01 Site Name (Legal, common, or descript Bern Metals	ive name	of site)		eet, Route 2 Bender Av		c Location Identifier
03 City Buffalo		04 State	05 Zip Code 14220	06 County Erie	07 County 08 Cong. Code Dist. 038 29	
09 Coordinates	10 Tvo	of Owners	hin (Chack	(000)		
Latitude Longitude [X] A. Private [] B. Federal [] C. State [] D. (
III. INSPECTION INFORMATION						
01 Date of Inspection					OWN	
[] E. State [X] F. State Contractor	(Name o	f Firm) E []			, Municipal Cont	ractor (Name of Firm)
05 Chief Inspector .	06 Ti	tle	. (07 Organiza	ation	08 Telephone No.
A. Mark Sienkiewicz	En	v. Speciali	st	Ecology	& Environment	(716) 684-8060
09 Other Inspectors 10 T		10 Title		11 Organization		12 Telephone No.
Gene Florentino	Ge	eologist ————————————————————————————————————		Ecology & Environment		(716) 684-8060
						()
						()
						()
						()
13 Site Representatives Interviewed	14 Ti	tle	15 Addre	ss		16 Telephone No.
Stanley Noga	Re	sident	18 Be	nder Avenue	9	()
Marilyn Kraus	Re	sident	1037 (Clinton Ave	enue	()
						()
	 					()
	†			· ·		()
17 Access Gained By (Check one) 18 Time [X] Permission	e of In	spection	19 Weath	er Conditio	ons	
[] Warrant	1200		Parti	y sunny, 6	0-70° F, SW wind	i
IV. INFORMATION AVAILABLE FROM						
01 Contact Walter E. Demick		02 Of (Age NYSDE	ency/Organ EC - Alban			03 Telephone No. (518) 457-9538
04 Person Responsible for Site Inspectio	n Form	05 Agency	06 Orga	nization	07 Telephone No	1
recycled paper M. J. Farrell		5-166.	E &	E eco	ogy and environmen (716) 684-8060	9 / 10 / 87 Month Day Year

١.	IDENTI	FICAT	T I ON	
01	State NY	02	Site 9151	Number 35

PART 2 - WASTE INFORMATION

							
O1 Physical States (Check all that apply)		(Measure of	02 Waste Quantity at Site (Measure of waste quanti- ties must be independent)		aste Characteristi (1 A. Toxic	app	oly)
[X] A. So	lid []E. Slurr	y Ton	s	1	() B. Corrosive		Ignitable Highly volati
	wder, Fines F. Liqui	•		1	1 C. Radioactive		-
[X] C. SI	~	No. of Drum	s 200	D	() D. Persistent	[] K.	Reactive
[] D _• . Ot	(Specify)	_		1			Incompatible
	(Speci <u>r</u> y)			1	<pre>1 F. Infectious 1 G. Flammable</pre>	[] M.	Not applicable
III. WASTE	TYPE			Ī			
Category	Substance Name	01 Gross Amount	02 Unit of Mea	sure	03 Comments	* 	
SLU	Sludge						
OLW	Oily waste						
SOL	Solvents						
PSD	Pesticides						
occ	Other organic chemicals						
100	Inorganic chemicals	Unknown	NA Tot		Total waste estim	nated a	† 390 cu. yds.
ACD	Acids						
BAS	Bases						
MES	Heavy Metals	Unknown	NA NA				
IV. HAZARD	OUS SUBSTANCES (See Appen	dix for most freq	uently cited CA	S Numb	pers)		
01 Category	02 Substance Name	03 CAS Number	04 Storage/Di Method	sposal	05 Concentra	tion*	06 Measure of Concentratic
100	Copper	7440508			74,000		ug/g
100	Copper sulfate	7758987			Unkn own		
MES	Lead	7439921			260,000		ug/g
MES	Lead sulfate	07446142			Unknown		
MES .	Arsenic	7440382			41		ug/g
MES	Chromium hydroxide	1308141			Unknown		
MES	Chromium (T)				2,500		ug/g
					*maximum det in soils	ected	
V. FEEDST	OCKS (See Appendix for CA	S Numbers)		.5		·····	
Category	01 Feedstock Name	02 CAS Number	Category	01 F	eedstock Name	1 0	2 CAS Number
FDS			FDS			+	
FDS			FDS			 	
FDS			FDS				
FDS			FDS			+	
	S OF INFORMATION (Cite sp	ecific references	<u> </u>	iler	sample analysis	renort	·<)
VI. SOURCE							

5-167

1 DENTILICATION	1.	IDENT	۱F	ICAT	101
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01 State NY 02 Site Number 915135

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

II. HAZARDOUS CONDITIONS AND INCIDENTS	
01 [X] A. Groundwater Contamination 03 Population Potentially Affected 0	02 [] Observed (Date) [X] Potential [] Alleged 04 Narrative Description:
A potential exists for contaminants to migra	te into the groundwater.
01 [X] B. Surface Water Contamination 03 Population Potentially Affected 0	02 [X] Observed (Date 4/6/83) [] Potential [] Alleged 04 Narrative Description:
Samples collected from a puddle on site by E	CDEP revealed lead, chromium, copper, and zinc.
01 [X] C. Contamination of Air 03 Population Potentially Affected est. 30	02 [Observed (Date) [X] Potential [] Alleged 04 Narrative Description:
The potential exists for windblown dust from	the site to be blown into air and off site.
01 [X] D. Fire/Explosive Conditions	02 (Observed (Date) X) Potential Alleged
03 Population Potentially Affected Unknown	04 Narrative Description:
Possible underground storage tanks with gaso	ine.
or tyles given out of	02 () Observed (Data
01 IX) E. Direct Contact 03 Population Potentially Affected Unknown	02 [] Observed (Date) [] Potential [X] Alleged 04 Narrative Description:
Alleged dust contact occurred in April 1983. on April 6, 1983.	Reported by Sherry Margolis of "Eyewitness News" (Channel 7)
01 [X] F. Contamination of Soil	02 [X] Observed (Date 4/6/83) [] Potential [] Alleged
03 Area Potentially Affected 6 (Acres)	04 Narrative Description:
Soil samples collected indicated copper, chr revealed arsenic.	omium, zinc, and lead contaminants. Later soil samples also
01 [] G. Drinking Water Contamination 03 Population Potentially Affected	02 [] Observed (Date) [] Potential [] Alleged 04 Narrative Description:
No potential exists.	
01 [X] H. Worker Exposure/Injury 03 Workers Potentially Affected Unknown	02 [Observed (Date) [X] Potential [Alleged O4 Narrative Description:
The state of the s	
The potential exists for past workers at Ber	
01 [X] L. Population Exposure/Injury 03 Population Potentially Affected Unknown	02 [] Observed (Date) [X] Potential [] Alleged 04 Narrative Description:
The potential exists for the population near	the site to have been exposed.

I. IDENTIFICATION

01 State NY 02 Site Number | 91513**5**

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

II. HAZARDOUS CONDITIONS AND INCIDENTS (Cont.)	
01 [X] J. Damage to Flora 04 Narrative Description:	02 [X] Observed (Date 7-15-87) [] Potential [] Alleyed
Small amount of vegetation dead and brown no	ear the east side of the site.
•	
01 [X] K. Damage to Fauna 04 Narrative Description:	02 [] Observed (Date) [X] Potential [] Alleyed
The potential exists for fauna to come into	contact with materials on site
The person of the real and the seems that	
01 [] L. Contamination of Food Chain 04 Narrative Description:	02 [] Observed (Date) [] Potential [] Alleyed
of Natiative Description.	
-	
01 [X] M. Unstable Containment of Wastes	02 [X] Observed (Date 7-15-87) [] Potential [] Alleged
(Spills/Runoff/Standing liquids, Leaking drums)	
03 Population Potentially Affected Unknown	04 Narrative Description:
Open drums, spilled contents, piles of waste	es exposed.
01 [X] N. Damage to Offsite Property 04 Narrative Description:	02 [] Observed (Date) [X] Potential [] Alleged
·	
The potential exists for contaminants to mig	grate off site via surface water and windblown dust.
	· ·
01 [X] O. Contamination of Sewers, Storm Drains,	02 [] Observed (Date) [X] Potential [] Alleged
WWTPs 04 Narrative Description:	
·	
the potential exists for waste materials to	migrate off site and into storm sewers at south end of site.
01 [] P. Illegal/Unauthorized Dumping	02 L L Observed (Date
04 Narrative Description:	02 [] Observed (Date) [] Potential [] Alleged
	•
05 Description of Any Other Known, Potential, or	Alleged Hazards
	Į
III. TOTAL POPULATION POTENTIALLY AFFECTED 30-4	O nearby residents
IV. COMMENTS	
	1
V. SOURCES OF INFORMATION (Cite specific refer	rences, e.g., state files, sample analysis, reports)
NYSDEC file; E & E site inspection; ECDEP f	I le

1.	IDENTI	FICAT	101
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01 State NY 02 Site Number 915135

PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

II. PERMIT INFORMATION			•		
01 Type of Permit Issued (Check a11 that apply)	02 Permit Number	03 Date Iss	sued 04 Expiration Date	05 Comments	
[] A. NPDES			·		
[] B. UIC					
[] C. AIR					
[] D. RCRA	•				
[] E. RCRA Interim Status					
[] F. SPCC Plan					
[] G. State (Specify)					
[] H. Local (Specify)					
[] I. Other (Specify)					
[X] J. None					
III. SITE DESCRIPTION					
01 Storage Disposal (Check all that apply)	02 Amount	03 Unit of Measure	04 Treatment (Check all that appl	05 Other	
[] A. Surface Impoundment	-		[] A. Incineration	[X] A. Buildings On	
[X] B. Piles	350	cu. yds.	[] B. Underground Inje	ction Site :	
[X] C. Drums, Above Ground	200	est.	[] C. Chemical/Physica	1	
[] D. Tank, Above Ground			[] D. Biological		
[] E. Tank, Below Ground			[] E. Waste Oil Proces	sing	
[X] F. Landfill	Unknown		[] F. Solvent Recovery	06 Area of Site	
[] G. Landfarm			[] G. Other Recycling	Recovery	
[] H. Open Dump			[] H. Other(Speci	6 Acres	
[] . Other (Specify)			Сэрест		
07 Comments : Open and spill spread onto site.	ied drums with so	lids, piles o	of wastes, other waste in	cluding battery casings	
IV. CONTAINMENT					
01 Containment of Wastes (Che	eck one)				
[] A. Adequate, Secure	[] B. Moderate	[] C.	Inadequate, Poor [X] D	· Insecure, Unsound, Dangerous	
02 Description of Drums, Diki	ng, Liners, Barr	iers, etc.			
No containment measures,	, site open for a	ccess.			
V. ACCESSIBILITY					
01 Waste Easily Accessible: 02 Comments:	[X] Yes [] No				
Gate open, no security, no containment measures.					
VI. SOURCES OF INFORMATION	Cite specific re	ferences, e.g	g., state files, sample a	nalysis, reports)	
E & E site inspection,	, 1987.	5-	ecology a	nd environment	
				2/2/2	

I. IDENTIFICATION

01 State	02 Site Number
NY	91513 5

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

II. DRINKING WATER SUPPLY	,										
01 Type of Drinking Supply (Check as applicable)		02 Statu	S					03 Dista	nce to S	ite	
	Surface Well A. [X] B. []	Endanger		Affec B. [itored '	Α	>2	(m	ıi)
Community Non-community	D. [] D. []	A. []		E. 1				В		(m	ıi)
III. GROUNDWATER		<u> </u>	 .					L			
01 Groundwater Use in Vicin	nity (Check one)										
[] A. Only Source for Drinking	[] B. Drinking available Commercia Irrigatio water sou	a) il, Indust on (No oth	rial, er		1 C.	lrrig (Limi	trial,			Not Used, Unuseable	
02 Population Served by Gro	oundwater 0		03 Di	stance	to N	earest	Drinkin	g Water we	ell <u>></u> 2	2(mi)
04 Depth to Groundwater)5 Direction of Gro Flow	oundwater		pth to Conce		fer 0	7 Potent of Aqu	ial Yield ifer		le Source Lifer	
est. 20(ft)	Unknown			20 ·	(f†)		Unknow	n (gpd)	(Yes [X]	No .
09 Description of Wells (In	ncluding usage, dep	th, and l	ocatio	n rela	tive	to pop	ulation	and build	ings)		
USGS monitoring wells	installed 1,500 fe	et to the	east,	only	6.5 f	eet de	ep.				:
10 Recharge Area			11 Di	scharg	e Are	а					
der	uifer (unconsolidat posits) recharged b ecipitation			l Yes	Com	ments:					
IV. SURFACE WATER								Mirroditor dilinosido editor dilentendo edicordo edicidade			
OI Surface Water (Check one	<u>. </u>										
[] A. Reservoir, Recrea		rigation, portant R			У	IXI C.	Commerc Industr	•		ot Current sed	ly
02 Affected/Potentially Aff	ected Bodies of Wa	ter	•								
Name:	•						Af	fected	Distanc	e to Site	
Buffalo River								1 1		(m	i)
								[]			i) i)
V DEMOCRAPHIC AND BROBE	DTY INFORMATION										
V. DEMOGRAPHIC AND PROPE 01 Total Population Within						<u> </u>	02 Diet	ance to Ne	arest Pa	oulation	-
	Two (2) Miles of S	ite Th	ree (3) Mile	e of	si+a	02 0151	ance to the	saiesi i	pararron	1
•	B. 84,520 No. of Persons		1				-	20 fe	eet	(mi)	l
03 Number of Buildings With	nin Two (2) Miles o	of Site	04	Dista	nce t	o Near	est Off-	Site Build	ding		
43,690					-		20 fee	<u> </u>	_ (mi)		ł
,	05 Population Within Vicinity of Site (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)										

5-171

Densely populated urban and commercial/industrial.

•	FICATION
01 State	02 Site Number
NY	915135

PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

	FART 5 - MATER,	DEMOGRAPHIC,	AND C	THA LEGIMEN	TAL DATA		·	
VI. ENVIRONMENTAL I	NFORMATION							
01 Permeability of Un	saturated Zone (Ch	eck one)						
[] A. 10 ⁻⁶ - 10 ⁻⁸ cm	/sec [X] B. 10 ⁻⁴	- 10 ⁻⁶ cm/se	c []	C. 10 ⁻⁴	- 10 ⁻³ cm	/sec [] D. Gre	ater Than 10	³ cm/sec
02 Permeability of Be	drock (Check one)							
[] A. Impermeable (Less than 10	[]B.R 6 cm/sec) (•	meable than 10
03 Depth to Bedrock	04 Depth of Conta	minated Soil	Zone	05 Soil	pН			
20 (f†)	Unknow	<u>n</u> (f	+)	Un	known			
06 Net Precipitation	07 One Year 24-Ho	our Rainfall			Directio	n of Site Slope	Terrain Aver	age Slope
<u>9</u> (in)	2.1	(in)		0-3 %		South	0-3	 %
09 Flood Potential	<u> </u>	10						
Site is in 100	Year Floodplain	[]Site Flood		Barrier I	sland, Co	astal High Hazar	d Area, River	ine
11 Distance to Wetlan	ds (5 acre minimum) 12 Dī	stance	to Criti	cal Habit	at (of Endangere	d Species)	
ESTUARINE	OTHER				**************************************	>3 (mi)		
A (mi)	B. 1	(mi) En	danger	ed Specie	s:			
13 Land Use in Vicini	ty							
Distance to: COMMERCIAL/INDUSTR	RESIDENTI	AL AREAS, NA STS, OR WILD	TIONAL LIFE R	/STATE ESERVES	PRIM	AGRICULTUR E AG LAND	AL LANDS AG LAN	D
A. Adjacent (m		Adjacent				>2 (mi)		
North and adjace north is an exte	e in Relation to S ocated in an area nt to the site is nsive residential Iroad tracks and t	of Buffalo c a residentia area. Locat	ontain I area ed eas	ing mixed containi t of the	ng approx site is L	imately nine res aub Industries.	idences. Fur West and sou	ther th of
						• .		

E & E Site Inspection, 1987
USGS Buffalo NE Topographical Map

NYSDEC Files ECDEP Files

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

1.	IDE	1T I F	ICAT	ION		
•	~	1	~ ~			

PART 6 - SAMPLE AND FIELD INFORMATION

01 State | 02 Site Number NY 915135

II. SAMPLES	TAKEN None						
Sample Type	01 Number of Samples Taken	02 Samples Sent to		03 Estimated Date Results Available			
Groundwater							
Surface Water							
Waste							
Air							
Runoff							
Spili		,					
Soil							
Vegetation							
Other							
III. FIELD ME	ASUREMENTS TAKEN			·			
01 Type	02 Comments						
HNu	No organic v	apors detected above backgr	ound.				
				:			
IV. PHOTOGRA	PHS AND MAPS		,				
01 Type [X]	Ground [] Aeria	02 In Custody of	See Appendix A (Name of organization or inc	lividual)			
03 Maps 0	4 Location of Maps						
[X] Yes		Foo	ology and Environment, Inc.				
[] No		L C\	rogy and Environment, the				
V. OTHER FI	ELD DATA COLLECTED	(Provide narrative descrip	tion of sampling activities)				
				•			
	•						
		•					
		•					
				ı			
VI. SOURCES	OF INFORMATION (Ci-	te specific references, e.g	,, state files, sample analysis, r	eports)			
Е & Е,	E & E, 1987, Site Inspection						

O1 State | O2 Site Number NY 915135

PART 7 - OWNER INFORMATION

II. CURRENT OWNER(S)		PARENT COMPANY (If applicable)					
01 Name O2 D+B Number Gerald Arwitz - Executor			D+B Number	08 Name		09 D	+B Number
3 Street Address (P.O. Bo 100 Claremont Avenue	04 SIC Code	10 Street Address (P	.O. Box, RFD	, etc.)	11 SIC Code		
95 City Kenmore	06 St NY	ate	07 Zip Code 14223	12 City	13	State	14 Zip Code
1 Name		02	D+B Number	08 Name		09 D	+B Number
3 Street Address (P.O. Bo	ox, RFD #, e	tc.)	04 SIC Code	10 Street Address (P	.O. Box, RFD A	, etc.)	11 SIC Code
5 City	06 St	ate	07 Zip Code	12 City	13	State	14 Zip Code
1 Name	•	02	D+B Number	08 Name		09 D	+B Number
3 Street Address (P.O. Bo	ox, RFD #, e	tc.)	04 SIC Code	10 Street Address (P	.O. Box, RFD i	, etc.)	11 SIC Cod
5 City	06 St	ate	07 Zip Code	12 City	13	State	14 Zip Code
1 Name		02	D+B Number	08 Name		09 D	+B Number
3 Street Address (P.O. Bo	ox, RFD #, e	tc.)	04 SIC Code	10 Street Address (P	.0. Box, RFD #	, etc.)	III SIC Cod
5 City	06 St	ate	07 Zip Code	12 City	13	State	14 Zip Code
II. PREVIOUS OWNER(S) (L	ist most re	cent	first)	IV. REALTY OWNER(S) first)	(If applicable	, list	most recent
l Name Bernard Arwitz		02	D+B Number	01 Name		02 D	∰ Number
3 Street Address (P.O. Bo Unknown	ox, RFD #, e	tc.)	04 SIC Code	03 Street Address (P	.O. Box, RFD #	, etc.)	04 SIC Cod
5 City	06 St	ate	07 Zip Code	05 City	06	State	07 Zip Code
1 Name Bern Metals, Inc.		.02	D+B Number	01 Name		02 0	16 Number
3 Street Address (P.O. Bo 22 Bender Street	ox, RFD #, e	†c.)	04 SIC Code	03 Street Address (P	.0. Box, RFD #	, etc.)	04 51C Cod
5 City Buffalo	06 St NY		07 Zip Code 14220	05 City	06	State	07 Zip Code
1 Name	•	02	D+B Number	01 Name	-	02 D	₩3 Number
3 Street Address (P.O. Bo	ox, RFD #, e	tc.)	04 SIC Code	03 Street Address (P	.O. Box, RFD #	, etc.)	04 SIC Code
5 City	06 St	ate	07 Zip Code	05 City	06	State	07 Zip Code

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

1. IDENTIFICATION

01 State NY 02 Site Number 91513**5**

PART 8 - OPERATOR INFORMATION

01	Name			02	D+B Number	10 Name .			11 D	+B Number
	No current operator				·				<u> </u>	
03	Street Address (P.0	. Box, RF	D #, etc	c.)	04 SIC Code	12 Street Address	(P.O. Box, R	FD #,	etc.)	13 SIC Code
05	City		06 Sta	te	07 Zip Code	14 City		15 9	State	16 Zip Code
08	Years of Operation	09 Name	of Owner	r				-1		
Π.	PREVIOUS OPERATOR provide only if d					PREVIOUS OPERATORS	PARENT COM	PANIES	G (lf	applicable) -
	Name Bern Metals, Inc.			02	D+B Number	10 Name			11 D	+B Number
	Street Address (P.O 22 Bender Street	. Box, RF	D #, etc	c.)	04 SIC Code	12 Street Address	(P.O. Box, R	FD #,	etc.)	13 SIC Code
	City Buffalo		06 Stat	te	07 Zip Code 14220	14 City		15 9	itate	16 Zip Code
08	Years of Operation	09 Name Perio		- Du	ring This					
01	Name			02	D+B Number	10 Name			11 D-	⊞ Number
03	Street Address (P.O.	. Box, RF	D #, etc	c.)	04 SIC Code	12 Street Address	(P.O. Box, R	FD #,	etc.)	13 SIC Code
05	City	·	06 Stat	re	07 Zip Code	14 City		15 9	tate	16 Zip Code
08	Years of Operation	09 Name Perio		- Du	ring This					
01	Name		·	02	D+B Number	10 Name			11 D-	⊞ Number
03	Street Address (P.O.	. Box, RF) #, etc	:•)	04 SIC Code	12 Street Address	(P.O. Box, R	FD #,	etc.)	13 SIC Code
)5	City		06 Stat	е	07 Zip Code	14 City		15 S	tate	16 Zip Code
8	Years of Operation	09 Name Perio		- Du	ring This		,	 		

I. IDENTIFICATION

PART	9	-	GENERATOR/TRANSPORTER	INFORMATION

01 State 02 Site Number NY 915135

II. ON-SITE GENERATOR				
01 Name	(02 D+B Number		
03 Street Address (P.O. Box, RF	D #, etc.	.) 04 SIC Code		
05 City	06 State	07 Zip Code		
III. OFF-SITE GENERATOR(S)				
01 Name	(02 D+B Number	01 Name	02 D+B Number
03 Street Address (P.O. Box, RF	D #, etc.	04 SIC Code	03 Street Address (P.O. Box, R	FD #, etc.) 04 SIC Code
05 City	06 State	07 Zip Code	05 City	06 State 07 Zip Code
01 Name		D2 D+B Number	01 Name	02 D+B Number
03 Street Address (P.O. Box, RF	D #, etc.	.) 04 SIC Code	03 Street Address (P.O. Box, R	FD #, etc.) 04 SIC Code
05 City	06 State	07 Zip Code	05 City	06 State 07 Zip Code
IV. TRANSPORTER(S)				
01 Name		02 D +B Number	01 Name	02 D+B Number
03 Street Address (P.O. Box, RF	D #, etc.	.) 04 SIC Code	03 Street Address (P.O. Box, R	FD #, etc.) 04 SIC Code
05 City	06 State	e 07 Zip Code	05 City	06 State 07 Zip Code
01 Name	C	02 D+B Number	01 Name	02 D+B Number
03 Street Address (P.O. Box, RF	D #, etc.	.) 04 SIC Code	03 Street Address (P.O. Box, R	FD #, etc.) 04 SIC Code
05 City	06 State	07 Zip Code	05 City	06 State 07 Zip Code
V. SOURCES OF INFORMATION (Ci	te specif	fic references, e.	.g., state files, sample analysi	s, reports)

1. ID	ENTI	FICA	TION
-------	------	------	------

01 State NY 02 Site Number 915135

PART 10 - PAST RESPONSE ACTIVITIES

II. PAST RESPONSE ACTIVITIES		
01 [] A. Water Supply Closed 04 Description:	02 Date	03 Agency
01 [] B. Temporary Water Supply Provided 04 Description:	02 Date	03 Agency
01 [] C. Permanent Water Supply Provided 04 Description:	02 Date	03 Agency
01 [] D. Spilled Material Removed 04 Description:	02 Date	03 Agency
01 [] E. Contaminated Soil Removed 04 Description:	02 Date	03 Agency
01 [] F. Waste Repackaged 04 Description:	02 Date	03 Agency
01 [] G. Waste Disposed Elsewhere 04 Description:	02 Date	03 Agency
01 [] H. On Site Burial 04 Description:	02 Date	03 Agency
01 [] I. In Situ Chemical Treatment 04 Description:	02 Date	03 Agency
01 [] J. In Situ Biological Treatment 04 Description:	02 Date	03 Agency
01 [] K. In Situ Physical Treatment 04 Description:	02 Date	03 Agency
01 [] L. Encapsulation 04 Description:	02 Date	03 Agency
01 [] M. Emergency Waste Treatment 04 Description:	02 Date	03 Agency
01 [] N. Cutoff Walls 04 Description:	02 Date	03 Agency
01 [] O. Emergency Diking/Surface Water Diversion 04 Description:	02 Date	03 Agency
01 [] P. Cutoff Trenches/Sump 04 Description:	02 Date	03 Agency
01 [] Q. Subsurface Cutoff Wall 04 Description:	02 Date	03 Agency

I. IDENTI	FICATION
01 State	02 Site Number
NY	915135

PART 10 - PAST RESPONSE ACTIVITIE

PART TO - PAS	T RESPONSE ACTIVITIES	
II. PAST RESPONSE ACTIVITIES (Cont.)		_
01 [] R. Barrier Walls Constructed 04 Description:	02 Date	03 Agency
01 [] S. Capping/Covering 04 Description:	02 Date	03 Agency
01 [] T. Bulk Tankage Repaired 04 Description:	02 Date	03 Agency
01 [] U. Grout Curtain Constructed 04 Description:	02 Date	
01 [] V. Bottom Sealed 04 Description:	. 02 Date	
01 [] W. Gas Control 04 Description:	02 Date	· 03 Agency
01 [] X. Fire Control 04 Description:	02 Date	. 03 Agency
01 [] Y. Leachate Treatment 04 Description:	02 Date	03 Agency
01 [] Z. Area Evacuated 04 Description:	02 Date	03 Agency
01 [X] 1. Access to Site Restricted 04 Description: USEPA contractors installed		fence and posted warning signs.
01 [] 2. Population Relocated 04 Description:	02 Date	03 Agency
01 [] 3. Other Remedial Activities 04 Description:	02 Date	03 Agency

!!!. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

١.	IDENTI	FICAT	LION	
01	State NY	02	Site 9151	Number 35

PART 11 - ENFORCEMENT INFORMATION

PART II - ENFORCEMENT INFORMATION	
	•
II. ENFORCEMENT INFORMATION	*
01 Past Regulatory/Enforcement Action [X] Yes [] No	
02 Description of Federal, State, Local Regulatory/Enforcement Action	
City of Buffalo, Department of Inspections and Community Revitalization, Division of Housing and Pr Inspections	operty
April 24, 1987, Notice of Violation-Health and Safety Threat to the Community Residents.	
May 25, 1988, USEPA, installed over 1,700 feet of chain-link fence and repaired existing fence. Wasigns were posted.	rning
•	

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Above Document, NYSDEC files

6. ASSESSMENT OF DATA ADEQUACY AND RECOMMENDATIONS

After assessing the information gathered for this site and applying it to an HRS worksheet, it is determined that the existing data are not adequate to accurately score the site and that further investigations are necessary to determine a proper HRS score.

It has been documented through past sampling and analysis efforts that hazardous substances are present at the site. The past sampling has been limited to the surface soils of the site proper. The extent of contamination both on and off the site is unknown. Analysis was also limited to metal parameters, and it is unknown what other contaminants exist.

A two-part Phase II investigation is recommended for the Bern Metals site:

- Determine the nature of contaminants on site through the collection of a limited number of composite soil samples and analyze for the complete range or inorganic and organic priority pollutants.
- 2. Extensive surface soil-sampling program on site and in the surface runoff channels. Installation of groundwater monitoring wells in the overburden and collection of groundwater samples. Analysis of samples for hazardous constituents detected in Part 1 of Phase II.

In addition and as a result of the assessment information gathered in this Phase I investigation, it is recommended that the following emergency actions be taken to isolate the site from the local population:

- o Secure door of scale house on Bender Street and board up windows; and
- o Repair gate lock.

٠;

5.

7. REFERENCES

- Barry, David E., Erie County Department of Health (NYSDOH), April 18, 1983, letter to Dr. Nancy Kim, NYSDOH, Buffalo, New York.
- Buehler, E.J., (ed.), State University of New York at Buffalo, 1966, Geology of Western New York, Buffalo, New York.
- City of Buffalo, Department of Inspections and Community Revitalization, April 24, 1987, Notice of Violation to Gerald Arwitz.
- City of Buffalo, Real Property Assessment, 1987, Review of Tax Assessment Computer file.
- Clare, Lawrence G., Erie County Department of Environment and Planning, April 21, 1983, memorandum to John McNahon, NYSDEC, Buffalo, New York.
- Ecology and Environment, Inc., July 15, 1987, Site Inspection Field Logbook and Photographic Log, Buffalo, New York.
- Kraus, Marilyn, July 15, 1987, personal interview, Buffalo, New York.
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- Koszalka, Edward J., et al., 1985, Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from Selected Waste-Disposal Sites, USGS and NYSDEC.
- La Sala, A.M., United States Department of the Interior, New York State Conservation Department, 1968, <u>Groundwater Resources of the</u> Erie Niagara Basin, Albany, New York.

- Merck Chemical Company, 1976, The Merck Index, New Jersey.
- New York State Department of Environmental Conservation, Region 9, May 1987, Bern Metal Analytical Results.
- Noga, Stanley, July 15, 1987, personal interview, Buffalo, New York.
- Niagara River Toxics Committee, October 1984, Report of the Niagara River Toxics Committee, Niagara Falls, New York.
- Nosenchuck, Norman, 1987, NYSDEC, Albany, New York, letter to Stephen D. Luftig, USEPA, Region II, New York, New York.
- O'Connor, Cameron, Erie County Department of the Environment and Planning, 1983, Site Profile: Bern Metals Co., Inc.
- O'Connor, Cameron, April 16, 1984, memorandum to Donald Campbell, NYSDEC, Buffalo, NY.
- Rafferty, Lani, 1988, NYSDOH, Central Office, letter to Al Roulmore, NYSDEC, Albany, New York. Document location: E & E, Buffalo, New York.
- United States Geological Survey, 7.5-Minute Topographical Map, 1965, Buffalo SE and NW Quadrangle.
- United States Department of Agriculture, Soil Conservation Service, 1986, Soil Survey of Erie County, 1986.
- United States Department of the Interior, 1987, National Wetland Inventory Maps.
- USEPA Region II, 1988, Pollution Report, Bern Metals, Buffalo, New York.
- Whitney, John, August 25, 1987, personal communication, USDA SCS, East Aurora, New York.
- Wojchieckowski, Thomas, July 13, 1987, personal communication.

APPENDIX A

PHOTOGRAPHIC RECORD

PHOTOGRAPHIC RECORD

 Client:
 NYSDEC
 E & E Job No.:
 ND-2021

 Camera:
 Make
 Olympus OM-10
 SN:
 2387486



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 11:42

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 1

Comments*: Garage/storage
building at north end of site.

Grey solids and drum inside.



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 11:42

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 2

Comments*: East exposure of main building.

PHOTOGRAPHIC RECORD

 Client:
 NYSDEC
 E & E Job No.:
 ND-2021

 Camera:
 Make Olympus OM-10
 SN: 2387486



Photographer: A.M. Sienkiewicz

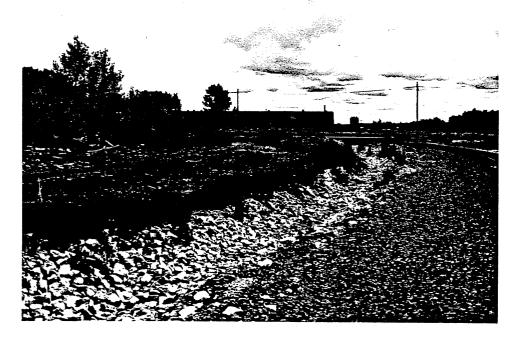
Date/Time: 7/15/87; 12:00

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 3

Comments*: North exposure of main site building.



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 12:00

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 4

Comments*: At south end of site looking east.

PHOTOGRAPHIC RECORD

 Client:
 NYSDEC
 E & E Job No.:
 ND-2021

 Camera:
 Make
 Olympus OM-10
 SN: 2387486



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 12:00

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 5

Comments*: At south end of site looking north. Open
fence, drums, former railroad tracks.



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 12:00

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 6

Comments*: At south end of site looking northeast.

Drums, solids, scrap wire and metal. Laub in background.

PHOTOGRAPHIC RECORD

 Client:
 NYSDEC
 E & E Job No.:
 ND-2021

 Camera:
 Make Olympus OM-10
 SN: 2387486



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 12:00

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 7

Comments*: South end of site

looking northeast. Scrap

wire and metal.



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 12:00

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 8

Comments*: Drums, scrap

metals, piles of solids

Located at south end of site.

PHOTOGRAPHIC RECORD

 Client:
 NYSDEC
 E & E Job No.:
 ND-2021

 Camera:
 Make
 Olympus OM-10
 SN:
 2387486



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 12:00

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 9

Comments*: South end of site

Looking northwest. Abandoned

railroad tracks and opening

in fence.



Photographer: A.M. Sienkiewicz

Date/Time: 7/15/87; 12:00

Lens: Type: 35-70 mm

SN: 301285

Frame No.: 10

Comments*: Drums and solids,
battery casings located at
south end of main building.

Photo from the west through
opening in fence.

APPENDIX B

UPDATED INACTIVE HAZARDOUS WASTE DISPOSAL SITE REGISTRY FORM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF SOLID AND HAZARDOUS WASTE

Priority Code: 3	2a	Site Code:	015135
riformy code		Jile Code.	913133
Name of Site:	Bern Metals		Region: 9
Street Address:	22 Bender Street		
Town/City: Buf	falo, New York	County	/: Erie
Name of Current Own	er of Site:	Gerald Arwitz - Execut	tor
Address of Current	Owner of Site:	100 Claremont, Kenmore	e, NY
Type of Site:	X] Open Dump [l Structure	[] Lagoon
1	Landfill	l Treatment Pond	
Estimated Size:	6 acre(s)		
Site Description: A former metals	and battery recycli	ng industry which rece	eived aluminum, copper
Site Description: A former metals sulfate, chromic exist in the soi	and battery recycli um hydroxide, batter	ng industry which rece	rials. Lead is known to
A former metals sulfate, chromic exist in the soi onsite. No acce	and battery recycli mm hydroxide, batter il in percentage amo ess control exists.	ng industry which rece ies, and unknown mater	rials. Lead is known to the neighborhood play
A former metals sulfate, chromic exist in the so onsite. No acce	and battery recycli mm hydroxide, batter il in percentage amo ess control exists.	ng industry which receives, and unknown mater ies, and unknown mater ounts. Children from t	rials. Lead is known to the neighborhood play
A former metals sulfate, chromic exist in the so onsite. No acce	and battery recyclium hydroxide, batteril in percentage amoess control exists.	ng industry which receives, and unknown mater ounts. Children from t	rials. Lead is known to the neighborhood play
A former metals sulfate, chromic exist in the so onsite. No acce	and battery recyclim hydroxide, batter il in percentage amo ess control exists. sposed: [] Conf Hazardous Wastes	ng industry which receives, and unknown mater ounts. Children from t	rials. Lead is known to the neighborhood play 1 Suspected Quantity
Site Description: A former metals sulfate, chromic exist in the socionsite. No access Hazardous Waste District Type and Quantity of Lead sulfate.	and battery recyclim hydroxide, batter il in percentage amo ess control exists. sposed: [] Conf Hazardous Wastes	ng industry which receives, and unknown mater ounts. Children from t	Quantity s, Drums, Tons, Gallons)

Time Period Site was Used for Hazardous V	daste Disposal:
Circa , 19 56 To	Circa , 19 84
Owner(s) During Period of Use:	Bernard Arwitz
Site Operator During Period of Use:	Bernard Arwitz
Address of Site Operator: Dece	eased
	[X] Surface Water [] Groundwater [] None
Contravention of Standards: [] C	Groundwater [] Drinking Water Surface Water [] Air
Soil Type: <u>Disturbed - urban/Schoha</u>	rie complex
Depth to Groundwater Table: 20	feet
Legal Action: Type: Local zonir	g [] State [] Federal
Status: [] In Progress	[] Completed
Remedial Action: [Proposed	
Nature of Action:	
Assessment of Environmental Problems:	
Heavy metals contamination of soil. Po contaminants may be present.	ssible migration off site. Other
Assessment of Health Problems:	
Possible exposure of local residents to	heavy metals.
Person(s) Completing This Form:	
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION	NEW YORK STATE DEPARTMENT OF HEALTH
Name:	Name:
Title:	Title:
Name:	Name:
Title:	Title:
Date:	Date: ecology and environment

APPENDIX C

PHOTOCOPIED REFERENCES

April 18, 1983

Dr. Nancy Kim, Director
Surveillance & Investigations
Bureau of Toxic Substances Assessment
New York State Department of Health
Empire State Plaza, Tower Building
Albany, New York 12237

Dear Nancy:

Enclosed please find a report given to us by the Erie County Department of Environment and Planning concerning certain findings on the Bern Metals Property, 22 Bender Street, Buffalo. You will notice that the soil samples contain an extremely high amount of lead, and that at least two youngsters have walked through this area.

We have advised the media people who brought this to the County's attention to contact the family involved since the media has not disclosed names or addresses to us. Our advice was to have the individual family members consult a physician and have blood lead level tests taken as soon as possible. We have also advised that the family should contact our lead abatement unit to have tests made to determine if there is an undue concentration of lead in the house brought in through tracking, etc.

We would appreciate your evaluation as to whether this amount of lead in soil may cause a public health hazard to residents of the immediate vicinity, as well as to employees of the firm. Your early response would be appreciated.

With best personal regards, I am

Very truly yours,

David E. Barry, P.E.
Deputy Commissioner
Environmental Health Services

DEB:pp Enc.

cc: Dr. Thomas

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Dr. Citron

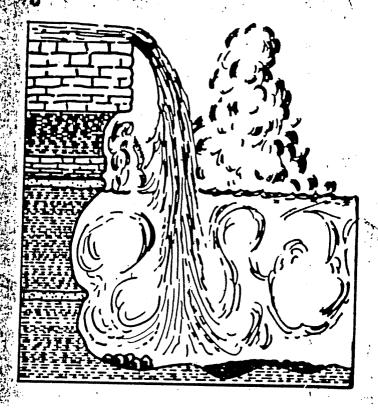
Mr. Nadler

Mr. Violanti

Mr. Voell

GEOLOGY OF WESTERN NEW YORK

GUIDE BOOK



NEW YORK STATE GEOLOGICAL ASSN.
38th ANNUAL MEETING

1966

TATE UNIVERSITY OF NEW YORK AT BUFFALO
BUFFALO, N. Y.

ecology and environment

E. J. Buehler, Editor

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NEW YORK STATE GEOLOGICAL ASSOCIATION 38th Annual Meeting April 29 - May I, 1966

GUIDEBOOK

Geology of Western New York Edward J. Buehler, Editor

Department of Geological Sciences State University of New York at Buffalo

Additional copies are available from the permanent secretary of the New York State Geological Association: Dr. Kurt E. Lowe, Department of Geology, City College of the City University of New York, 139th St. at Convent Ave., New York, N. Y.

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Throughout most of the subsurface and presumably along the outcrop belt as well, the Vernon may be subdivided into three parts. Significant facies changes occur. In all three divisions these changes involve the lateral replacement of red shale in the east by mixed red and green shale, then green or gray shale and dolomites, and finally dolomites with anhydrite and halite in the west.

Syracuse Formation

The Syracuse Formation of Clarke, 1903, has recently been redefined, described and traced along the Silurian outcrop belt by Leutze (1955, 1959). The name originally was proposed for the subsurface salt beds of the Salina Group, but it is now also applied to the associated dolomites, anhydrites and shales. Thus the formation can be recognized along the outcrop belt where the salt beds have been dissolved by ground water.

In Onondaga County, Leutze subdivided the Syracuse into five members, some of which are exposed in the standard reference section, a railroad cut near Manlius Center. These consist of gray shales and gray or brown dolomites with interbedded clay (leached salt beds) and gypsum. The formation is about 160 feet thick. Leutze discovered fossils in several horizons within the formation and assembled a collection of brachiopods, pelecypods, ostracodes, gastropods, cephalopods, and eurypterids. He was able to map the Syracuse Formation and to recognize its subdivisions eastward into southernmost Herkimer County but was unable to carry his detailed work west of Cayuga Lake where the formation is virtually unexposed.

In the vicinity of Buffalo, the Syracuse consists of dolomites and anhydrite but lacks significant beds of salt. It is about 100 feet thick and is not known to be exposed in the Niagara Frontier.

In the subsurface the Syracuse is a readily recognizable portion of the Salina Group but it cannot be subdivided into the five members distinguished by Leutze along the outcrop. The majority of the halite and anhydrite beds of the subsurface Salina Group occur in the Syracuse Formation. Thicknesses in excess of 1000 feet are attained in the center of the Salina basin.

Camillus Shale

The upper portion of the Salina Group in Onondaga County and eastward consists of a chunky green shale, unfossiliferous, with some red beds in southernmost Herkimer County. Leutze (1959) restricted the application of the name Camillus (Clarke, 1903) to this portion of the Salina. It is about 200 feet thick in the type area, somewhat thinner both east and west of there.

In the Niagara Frontier the Camillus is 80-100 feet thick and includes the O-atka beds of Chadwick (1917), formerly assigned to the overlying Bertie Formation. The Predominate Lithology is a green shale, but dolomite, anhydrite and siltstone, also occur. Eurypterids have been reported from a dolomite bed near the top of the formation in

Chadwick's O-atka beds. This uppermost portion of the Camillus is exposed at Akron Falls, Indian Falls, Morganville and Oatka Falls. Another exposure of the Camillus is a small section along Murder Creek north of Akron.

At several localities along the Silurian outcrop belt there are underground mines for gypsum formed by conversion of the subsurface anhydrite of the Salina Group to gypsum through hydration by ground water. The National Gypsum Company has a mine at Clarence Center, the Bestwall Gypsum Company at Akron and the United State Gypsum Company at Oakfield. The stratigraphic position of the gypsum beds mined by these companies has, in the past, been assigned to the Camillus. They are located about 200 feet below the base of the Onondaga Limestone. In nearby gas wells, the Camillus is anhydritic but significant beds of anhydrite occur only in the Syracuse Formation, 150 to 200 feet_below the Onondaga. Further study is needed but it appears that the gypsum mines may be in the Syracuse rather than the Camillus. The thickness of the Camillus in the subsurface appears to be quite uniform but the formation has several facies. Dolomite and anhydrite comprise significant portions of the Camillus in the center of the Salina basin; red shales become predominate in the east.

Bertie Formation

The type section of the Bertie Formation (Chapman, 1864) is located in Bertie township, Welland County, Ontario. In an abstract Chadwick (1917) subdivided the Bertie of western New York into four members, in descending order: Buffalo cement bed, Scajaquada shale and dolomite, Falkirk dolomite and O-atka shale (here included in the underlying Camillus). Chadwick later (see Clarke, 1918, p. 42) renamed the upper member Williamsville as the term Buffalo was preoccupied. The Bertie of western New York is everywhere underlain by the Camillus Shale and overlain, where complete sections are found, by the Akron Dolomite. Owing to the relief of a pre-Onondaga unconformity, however, exposures are found where the Onondaga Limestone directly overlies the Williamsville Member of the Bertie or some lower member. Chadwick was first to point this out.

The thickness of the Bertie Formation in western New York is uncertain because few exposures continue downward into the underlying Camillus Shale. It is believed to be about 50 feet thick where all members are present. Its thickness will, of course, vary from place to place depending upon the amount removed by erosion prior to deposition of the Onondaga Limestone. The contact of the Bertie with the overlying Akron Dolomite is gradational. Its contact with the underlying Camillus is much less clearly understood because of the lack of good exposures. Some authors (Grabau, 1901, p. 115) and Alling (1928, pp. 27-28) have suggested that this contact possibly is disconformable.

The Falkirk Member of the Bertie is composed of massive beds of dark gray dolomite, weathering yellowish brown, which are characterized by coarse conchoidal fracturing, a small marine fauna and a basal eurypterid horizon. Owing to its greater resistance the Falkirk

commonly produces a waterfall where exposed in streambeds. Its thickness varies from 18 to 25 feet. The overlying Scajaquada Member consists of dark shales or blocky waterlimes, less resistant than the Williamsville above or the Falkirk below, and presumably contains more argillaceous material than those two members. It varies from 3 to 10 feet in thickness and, in southern Ontario, eurypterids occur near its base ("Bridgeburg horizon").

The Williamsville Dolomite, because it formerly was mined for natural cement in the vicinity of Buffalo, is perhaps the best known member of the Bertie. It consists of laminated, fine-grained dolomite, up to 5 or 8 feet thick, which weathers light gray. Its pronounced conchoidal fracture, among other criteria, serves to distinguish it from the overlying Akron Dolomite which has an irregular fracture. According to Monahan (1931, p. 379) most of the fossils, especially the eurypterids, of the Bertie Formation cited by Ruedemann (1925) and others have been obtained from the Williamsville Member.

The Bertie Formation is noted for its abundance of well-preserved eurypterids, most of which apparently were obtained from the upper or Williamsville Member. In addition to these, bryozoans, brachiopods, gastropods, cephalopods, ostracodes, and graptolites also have been found.

Exposures of the Bertie Formation and the overlying Akron Dolomite are fairly common in the Niagara Frontier region. Outcrops in Buffalo are located near the Main Street entrance to Forest Lawn Cemetery, in the storm sewer on East Amherst (old Bennett quarry), and in a New York Central Railroad cut between Kensington and Morris Avenues. East of the city important localities are in Ellicott Creek at Williamsville, in the Louisville Cement quarry near Clarence, at the falls in Akron Falls Park, at Indian Falls, at Morganville and along Route 19 and in Oatka Creek at North LeRoy.

Akron Dolomite

The highest rock unit of the Silurian in the Niagara Frontier is the Akron Dolomite (Lane and others, 1908). The type section is an outcrop in Murder Creek, at Akron, New York, where the formation is about 8 feet thick. Other exposures are cited in the discussion of the Bertie (except Indian Falls, Morganville and North LeRoy).

The Akron consists of gray to buff, mottled and banded dolomite, fine-grained and often pitted by the solution of fossil corals. The lower contact with the Bertie is gradational and difficult to identify. The upper contact with the Onondaga Limestone is a conspicuous disconformity broadly undulating, with occasional channels or "dikes" of sandstone or arenaceous limestone extending down into the underlying Akron (or Bertie where the Akron is absent). Although not an abundantly fossiliferous rock, the Akron is the most fossiliferous portion of the entire Cayugan Series in western New York. Its fauna includes corals, brachiopods, gastropods, cephalopods, and ostracodes. Eurypterids and graptolites also have been reported but are relatively rare.

The Akron Dolomite of western New York appears to be a continuation of the Cobleskill Limestone of Eastern New York. Doubts regarding the tracing and correlation of these units, particularly the Akron, across Ontario, Monroe and Genesee Counties persist despite the efforts of several stratigraphers (Schuchert, 1903; Hartnagel, 1903; Alling, 1928; Hoffman, 1949; Rickard, 1953; Leutze, 1959). In the subsurface it frequently is not possible to separate the Akron-Cobleskill from the underlying Bertie in sample logs because the lighologic differences are slight. However, where the Cobleskill is a fossiliferous limestone, the separation is more easily made. Radioactivity logs provide an additional means of differentiating these formations in some parts of the subsurface.

THE HAMILTON GROUP IN WESTERN NEW YORK

By Edward J. Buehler

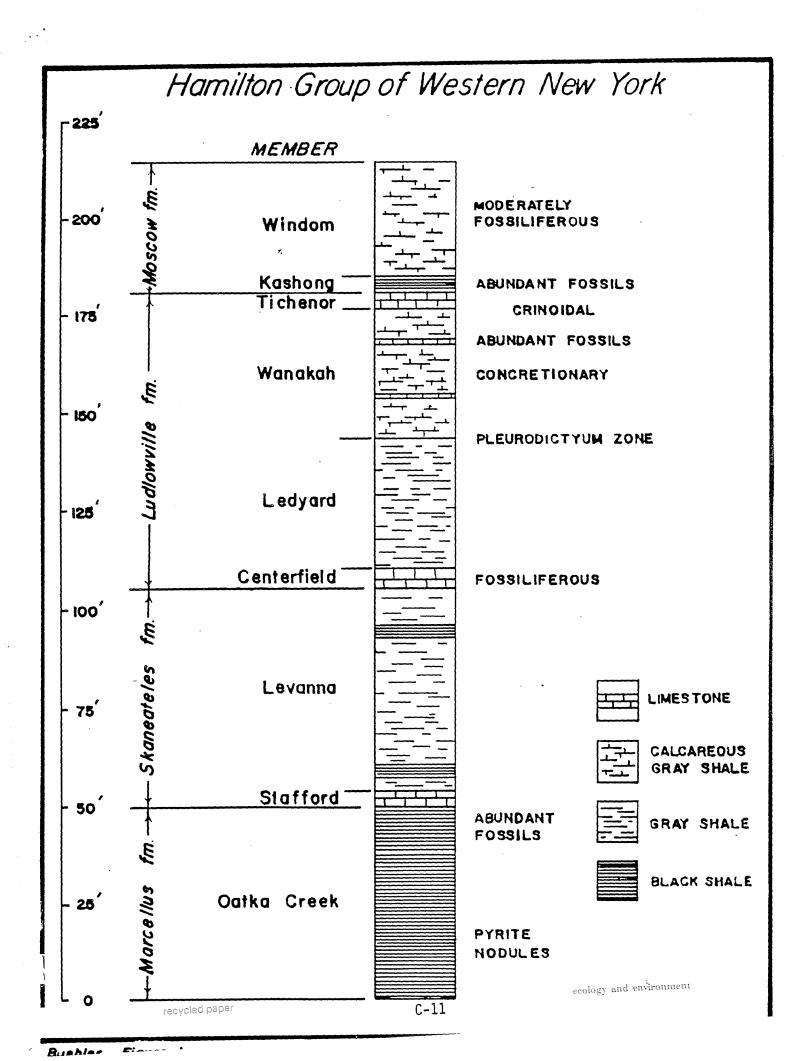
State University of New York at Buffalo

Circumstances which developed at the last minute left us without a paper on the Hamilton Group of Western New York. There was, of course, no intent to slight this most interesting and richly fossiliferous section of rock. Therefore, a column (fig. 1) a few notes and references are inserted here.

The two post-Hall classical works on the Hamilton are Grabau's (1898) Geology and Paleontology of Eighteen Mile Creek, and Cooper's (1930) Stratigraphy of the Hamilton Group of New York. deWitt (1956) describes the upper Hamilton of the Eden quadrangle. Buehler and Tesmer (1963) summarize the data on the paleontology and stratigraphy of the Hamilton group in Erie County. The chart "Correlation of the Devonian in New York State" by Rickard (1964) gives correlation across the state and the depositional phases as well as other stratigraphic information.

The Hamilton sediment of western New York was deposited at the western, seaward extremity of the Catskill Delta. This facies situation is described, with varying degrees of accuracy, in every textbook on stratigraphy and historical geology and should be familiar to all. The Marcellus and Skaneateles Formations are black and bluish-gray shale with thin limestone beds. They are separated by the Stafford Limestone, regarded as the base of the Skaneateles. Large pyrite nodules are common near the base of the Oatka Creek Shale and the brachlopod Leiorhynchus limitare is abundant near the top. Portions of these units, especially near the top of the Oatka Creek, are fossiliferous; other are not.

The Ludlowville and Moscow Formations consist of calcareous gray shale which may weather to a clayey consistency. Concretionary layers and thin limestone beds are common. Two of these limestones, the Centerfield and Tichenor are used as key beds in correlation and subdivision of the Hamilton Group. The upper Hamilton, especially the upper part of the Ludlowville, is richly fossiliferous. The fauna is predominantly one of corals, bryozoans, and brachiopods. Some of the particularly abundant species are Stereolasma rectum, Athyris spiriferoides, Mucrospirifer mucronatus, and Favosites, hamiltoniae. The tabulate Pleurodictyum americanum is common at the base of the Wanakah shale and the brachiopod Ambocoelia umbonata is abundant at the base of the Moscow shale. Some beds contain common specimens of the trilobite Phacops rana. The Tichenor is a crinoidal limestone. Molluscs, ostracodes and tentaculitids are also common in the upper Hamilton and there is a modest amount of plant material. Many of the fossils are extremely delicate and show little or no evidence of transportation. The fossiliferous pyrite (?) concretions occur in the Ledyard member. The Middle Devonian is separated from the Upper Devonian by the lensatic Leicester Pyrite.



UPPER DEVONIAN STRATIGRAPHY AND PALEONTOLOGY OF SOUTHWESTERN NEW YORK STATE (ERIE. CHAUTAUQUA AND CATTARAUGUS COUNTIES)

by Dr. Irving H. Tesmer

State University of New York College at Buffalo

Upper Devonian rocks in southwestern New York State consist of about 2500 feet of largely detrital material associated with the Catskill Clastic Wedge. During Late Devonian time, clastic sediment gradually spread westward and northwestward across New York State and Pennsylvania, eventually filling the epeiric seas that occupied the Appalachian Trough and adjacent areas.

There is some disagreement as to the exact boundaries that mark the base and top of the Upper Devonian in southwestern New York State but the present writer includes all strata from the base of the Geneseo Member of Genesee Formation to the top of the Cattaraugus Formation (Cooper et al., 1942; Rickard, 1964). The overlying Knapp Conglomerate is considered to be Lower Mississippian (Holland, 1959).

Some authors have subdivided Upper Devonian strata into two series, an earlier Senecan and a later Chautauquan. Although there may be some paleontological evidence (especially cephalopods) to suggest this, the present writer does not see strong justification for such a division in southwestern New York State and therefore assigns all Upper Devonian units to a single series, the Chautauquan.

Within the Chautauquan Series, three groups are recognized (Tesmer, 1955), in ascending order the Seneca (600 feet), Arkwright (1250 feet) and Conewango (650 feet). The boundaries between these groups are based upon lithologic changes and facies differences that are persistent throughout the three counties of southwestern New York, namely Erie (Buehler and Tesmer, 1963), Chautauqua (Tesmer, 1963) and Cattaraugus. The Seneca Group extends from the base of the Geneseo Member of the Genesee Formation to the top of the Hanover Member of the Java Formation. The Arkwright Group includes strata from the base of the Dunkirk Member of the Canadaway Formation to the top of the Ellicott Member of the Chadakoin Formation. Locally assigned to the Conewango Group is the Cattaraugus Formation. It includes redbeds, conglomerates and coarse buff sandstones interbedded with marine siltstones and shales.

The Seneca Group includes in ascending order the Genesee, Sonyea, West Falls, and Java Formations. These units are largely gray and black shales although a few limestone and siltstone beds also occur. Although the Genesee Formation varies only from about 10 to 20 feet in thickness, various members have been recognized including the Geneseo Shale (2 inches to 2 feet of black shale), Penn Yan Shale (9 inches of dark gray shale) [deWitt and Colton, 1959], Genundewa Limestone (2 inches to 2 feet of light to dark gray limestone) and West River Shale (8 to 14) feet of gray shale. The Genundewa and West River Members include numerous species of conodonts and fish but the faunal content of the thin Geneseo and Penn Yan Members is less well known in Erie County.

The Sonyea Formation (Colton and deWitt, 1958) is divided into an older Middlesex Shale and younger Cashaqua Shale Member. The 6 to 8 feet of black Middlesex shales contain some conodonts and the 35 to 75 feet of gray Cashaqua shales have a modest molluscan fauna including several species of the cephalopod *Manticoceras*.

The next youngest unit is the West Falls Formation (Colton, 1956; de Witt, 1956; Pepper, de Witt and Colton, 1956) consisting of an older Rhinestreet Shale (150 to 195 feet of black shale), Angola Shale (220 to 340 feet of mostly light gray shale with some interbedded dark gray shale, thin limestones and calcareous siltstones) and younger Nunda Siltstone (0 to 25 feet of light gray siltstone) Member. The Rhinestreet has a very rich conodont (Youngquist, Hibbard and Reimann, 1948) and fish (Carter, 1945) fauna, including several species of Dinichthys while the gray Angola shales have an entirely different faunal assemblage, almost all mollusks (Clarke, 1904). The faunal content of the Nunda Siltstone Member, limited to eastern Erie County, is as yet unknown locally.

The Java Formation (Pepper and deWitt, 1950; deWitt and Colton, 1953; deWitt, 1960) is divided into an older Pipe Creek and a younger Hanover Member. The Pipe Creek contains from one to two feet of black shale with some carbonized plant remains and conodonts. In the 85 to 95 feet of Hanover, some conodonts and mollusks have been collected. The Hanover is largely composed of gray shales but also includes some interbedded dark gray shales and thin limestones, as well as several zones of calcareous nodules. It is similar in appearance to the older Angola Shale Member of the West Falls Formation.

The Arkwright Group (Tesmer, 1955) includes an older Canadaway and younger Chadakoin Formations. These units consist of black and gray shales interbedded with an increasing percentage of gray siltstone toward the top of the group. Seven members are recognized in the Canadaway Formation of Chautauqua County, the Dunkirk (oldest), South Wales (Pepper and deWitt, 1951), Gowanda, Laona, Westfield, Shumla and Northeast (youngest). The Dunkirk Shale is composed of about 40 feet of black shale containing a few carbonized plants and conodonts. The overlying South Wales Member includes from 60 to 80 feet of interbedded gray and black shales with a limited faunal and floral content similar to the underlying Dunkirk Shale Member. Above the South Wales are found from 120 to 230 feet of mostly gray shales and siltstones with some black shale beds, assigned to the Gowanda Member. Although Gowanda fossils are not numerous nor widely distributed stratigraphically, a considerable number of species have been collected, largely mollusks and conodonts. The faunal assemblage and accompanying lithologies are quite like the older Angola Member of the West Falls Formation and the Hanover Member of the Java Formation. This marks the last appearance of the "Naples Fauna" of Clarke (1904).

The Laona Siltstone Member of the Canadaway Formation contains many species introduced for the first time in southwestern New York State. These include the brachiopods Ambocoelia gregaria, Athyris angelica, Camarotoechia contracta and Tylothyris mesacostalis as well

as the pelecypod *Mytilarca chemungensis*. The Laona attains a maximum thickness of about 25 feet of mostly gray siltstone and is essentially confined to Chautauqua County.

Above the Laona Siltstone one finds the Westfield Shale Member of the Canadaway Formation, comprised of 100 to 220 feet of gray shales with a few interbedded gray siltstones. These strata are largely barren of megafossils but a few brachiopods, plant stems and conodonts have been collected. The next youngest Shumla Siltstone Member has a nearly identical appearance to the older Laona Siltstone but is almost always barren except for scattered conodonts (Hass, 1958). The Shumla lenses as did the Laona, reaching a maximum thickness of about 35 feet. It is also essentially limited to Chautauqua County.

The thickest member of the Canadaway Formation is the uppermost Northeast Shale Member, varying from about 400 to 600 feet, and containing gray shales with considerable percentages of interbedded gray siltstones, particularly toward the top of the unit and in an eastward direction. In Cattaraugus County, where the Laona and Shumla Siltstone Members are not present, the nearly identical Gowanda, Westfield and Northeast Shale Members merge to form a very thick, undifferentiated sequence of gray shale beds with a fair percentage of interbedded gray siltstones. The Northeast Shale Member is often quite barren near the base of the unit, but the upper part of the member contains numerous specimens of Ambocoelia gregaria, Camarotoechia contracta, Chonetes spp., Cyrtospirifer spp., bryozoans and crinoid columnals.

In Chautauqua County, the Chadakoin Formation (Caster, 1934) contains an older Dexterville and a younger Ellicott Member. Both members are interbedded gray shales and siltstones, often nearly identical in appearance. The Dexterville Member, however, can be recognized by the presence of an index fossil, the brachiopod Pugnoides duplicatus, which is confined to this unit. In Cattaraugus County where Pugnoides duplicatus is nearly completely absent, the Chadakoin Formation is not differentiated into members. The Chadakoin Formation is about 250 feet thick, the Dexterville including the lower 100 feet, where recognized. Fossils are quite abundant in the Chadakoin (Caster, 1934) and various groups are represented, particularly bryozoans, brachiopods, pelecypods and conodonts. Many of the species were first introduced to the area during Laona times when a similar environment must have prevailed.

Much work remains to be done on the Conewango Group, which is locally the Cattaraugus Formation. This formation exhibits great variations in lithology, ranging from typical marine gray shales and siltstones through near-shore coarse buff sandstones and conglomerates to non-marine red shales, siltstones and sandstones. Total thickness is about 650 feet, within which there are many sandstone-conglomerate lenses. These lenses cannot be distinguished from one another in the field and must be separated by careful plotting as to geographic location and elevation. It is hoped that eventually the Cattaraugus Formation may be divided into an appropriate number of formal members (Tesmer, 1958) but presently the Cattaraugus is largely undifferentiated,

particularly in Cattaraugus County, its type locality. Faunal content is somewhat similar to the underlying Chadakoin Formation but several new genera are introduced, notably the pelecypod *Ptychopteria* (Butts, 1903; Chadwick, 1935). Some of the conglomerate lenses likely to be retained as members include the Panama, Pope Hollow, Salamanca and Wolf Creek.

GONIATITE ZONATION OF THE NEW YORK STATE DEVONIAN

by M. R. House

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Oxford, England

Goniatites are not uncommon in calcareous shales concretions, shales and siltstones in western New York and typically horizons bearing them tongue eastwards towards the more littoral deposits of the Catskills. Earlier goniatite horizons, in general, tongue farther east than the later horizons. Thus the Cherry Valley agoniatitid fauna is known almost to the Helderbergs, whilst the latest Famennian faunas, of the Gowanda and Ellicot Shales, have not been traced farther east than Chautauqua County. Faunas lack generic diversity when compared with corresponding European faunas, but they have a value far exceeding this apparent poverty since the horizons may be placed within successions which are known with greater stratigraphic precision than those of Europe. Their importance in establishing a zonal standard and for evolutionary studies generally cannot be over emphasized.

The most striking absentees from the New York goniatite faunas are, from the Middle Devonian, Maenioceras, Sobolevia (both known in Virginia), Wedekindella (known with Maenioceras in Canada), Anarcestes and Pinacites. The Senecan shows greater European affinity, but the probable absence of Koenenites (known in Michigan) and Timanites (known in Canada) and the rarity of Beloceras is striking. Only three genera of Famennian goniatites are known and clymenids are apparently absent. Future collecting may nevertheless yield more records. Elsewhere the author has related the unusual features of the goniatite faunas to a possible migration route from Europe and European Russia via the Arctic, around the northern borders of the Old Red Sandstone continent (House 1964).

ONONDAGA FORMATION

The earliest certain goniatite occurence in the state is Foordites cf. Buttsi (Miller) from the Nedrow member (Oliver 1956). This genus is not known before the Eifelian in Europe. No indubitably Lower Devonian goniaties are known.

HAMILTON GROUP

The first probable Givetian indicator is Cabrieroceras plebeiforme (Hall) from the Werneroceras Bed (Rickard 1952) just below the Cherry Valley Limestone: it occurs with Parodiceras sp. and Subanarcestes cf. micromphalus (Roemer). Shales immediately above the Werneroceras Bed contain Agoniatites nodiferus (Hall) (fide Rickard).

The Cherry Valley Limestone has yielded the types of Agoniatites vanuxemi (Hall), A. intermedius Flower, and A. floweri Miller, but it has been suggested (House 1962, p. 254) that these may be synonyms. In view of the importance of its descendants. Parodiceras discoideum (Hall) may be used as the zonal index. The succession given here for the higher Hamilton is substantially more detailed than an earlier generalized statement by the author in 1962. This results from study of the Tornoceratidae (House 1965). Skaneateles tornoceratids, T. (T.) arkonense etc., (better known from the Ontario contemporaries) are characterised by a shallower lateral lobe than those of the Ludlowville [T. (T.) uniangulare widderi], and this trend, essentially towards an increasingly steep ventrad face to the lateroumbilical saddle continues in the Moscow with the genotype from the Leicester Pyrite, T. (T.) uniangulare uniangulare (Conrad). A distinct ribbed form first noted by Professor J. W. Wells, from the King Ferry Shale on Cayuga Lake has been named T. (T.) amuletum. It is probable, but not certain that this species is younger than T. (T.) uniangulare aldenense from the Alden Marcasite. Agoniatitids are also not uncommon in the Hamilton, but these have not, as yet, been studied in detail. The highest agoniatitid known is Sellagoniatites unilobatus (Hall) from Norton's Landing, Cayuga Lake. This genus occurs in the Canadian N. W. T. and in Europe is restricted to the upper Givetian (House and Pedder 1963, p. 512).

GENESEE GROUP

The earliest occurrence of Frasnian goniatites is in the Tully where Pharciceras amplexum occurs. Tornoceratids are common including forms comparable to T. (T.) arcuatum (House) from the Koenenitesbearing Squaw Bay Limestone of Michigan.

Typical lowest Frasnian ponticeratids occur in the Geneseo Shale, especially P. perlatum (Hall), and others, also Epitornoceras peracutum (Hall), the latter a rare genus also known in the European low Frasnian. From the Genundewa Limestone come the types of Probeloceras genundewa, Manticoceras apprimatum, M. contractum, M. fasciculatum and M. styliophylum. At Bethany Center T. (T.) uniangulare compressum is abundant. The record of a Koenenites from the West River Shale may be based on a Manticoceras.

SONYEA GROUP

From The Middlesex shale there are several records of noded goniatites probably referable to *Sandbergeroceras*. Goniatites are rare at this level and all so far found are crushed.

The fauna of the Cashaqua Shale is rich and varied. This is the source of Probeloceras lutheri, P. (?) accelerans, Manticoceras sinuosum, M. tardum, M. neapolitanum (formerly thought to be a clymenid), Neomanticoceras naplesense, Eobeloceras and probably also Sandbergeroceras. The fauna is at present being studied by Mr. W.T. Kirchgasser of Cornell. Particularly famous is the horizon of concretions with barytic replacements which lies some six feet below

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the top of the formation in the gullies between Conesus and Honeoye Lake and especially in Shurtleff's Gully, 2.75 miles S. E. of Livonia.

WEST FALLS GROUP

There are singularly few records from the Rhinestreet Shale. At the top of the Unit Manticoceras and Tornoceras occur in concretionary horizons just below the 'Scraggy Bed' on Big Sister Creek and thereabouts. Large manticoceratids occur in giant concretions around the northern promontory of Grandview Bay. From the Angola Shale, however, many fine specimens are known. Recent work by the author has shown that Clarke's Big Sister Creek localities lie in the lower part of the Angola Shale where cyclothemic units of black shale, worm burrowed shale, grey shale and shale with concretions are repeated many times. A succession of the lowest six of these has been traced bed-for-bed as far east as the Warsaw Valley. The Gibson's Gien goniatite horizon is higher than these. The concretionary horizons almost invariably yield goniatites, but these become rarer to the east. Manticoceratids are chiefly of the M. rhynchostoma group and oxygonic groups: Aulatornoceras and Tornoceras are also common. Scattered records are known from the Gardeau, and farther east the records of Beloceras by Wells (1956) and of Shindewolfoceras are of interest in that they have not yet been found in supposed equivalent rock in the west.

JAVA GROUP

Goniatites are extremely rare in the Pipe Creek Shale, but from the Hanover Shale, especially from nodules in the lower fifteen feet, they are not uncommon. This is probably the source of the types of M. cataphraetum and $Aulatornoceras\ rhysum$.

CANADAWAY GROUP

No goniatites are yet known from the Dunkirk Shale or South Wales Shale. From the Gowanda Shale at Corell's Point on Lake Erie shore 250 yards S.W. of the outlet of Walker Creek, 2.85 miles west of Brocton, Chatauqua Co. (House 1962) the Cheiloceras fauna is known. The same horizon, with Cheiloceras amblylobum, Tornoceras (T.) concentricum and Aulatornoceras bicostatum has now been located, in an identical concretionary layer, in Little Canadaway Creek below Lamberton, 2,200 feet N.W. of the junction of Lake Road and Rt. 20 at an altitude of about 630 feet, and again in Walnut Creek, below Forestville, about 200 yards upstream of the railroad culvert and at an altitude of about 847 feet. It is now clear that the horizon which yielded the types of Aulatornoceras clarkei is lower than this and occurs three feet above a 2 inch siltstone in the creek floor below the Sheridan Road bridge over Walnut Creek at Forestville. Both horizons are in the upper part of the Gowanda Shale.

CONTACT REPORT

TO:

Fred McKosky

FROM:

A. Mark Sienkowicz

RE:

Bern Metals Site NYSDEC #915134

DATE:

June 12, 1987

CONTACT:

Erie County Department of Real Property Assessment Review of Data Base for Property Ownership History

Bern Metals, 22 Bender Avenue, Buffalo

Owner

Date Purchased

Bern Metal, Inc. Bernard Arwitz 5/6/56 11/18/81

djr

March Sampling

Site:

Bern Hetal (915135)

Sample Description :

Dirt Sample in approximate area of previous DEP Sampling (Battery Cases)

		TOTAL	CONCEN (45/9 Day)	E.P. Tox ($m_{\rm S}/2$
-,-	Priority Pollat	R 986-0	25 DEP Samle	_	Sta
	Metals	01	4/6/83	01	
	Antimony .	13		Ba 4.05	101
	Arsenic As	41		4,003	5.0
** ** *	Beryllion Be	4.57			
	Cadmium Cd	4.0		4,025	1.0
	Chromium Cr.	2500		, 14	5.0
	Copper Cu.	74,000	1906		
	Lead Pb	83,000	260,000	28.	5.0
	Nichel Ni	420			
	Méreury Hg	_ 2.3		4,0002	0.5
•	Selemium Se	41.70			1.0
	Silver Ag.			.015	5.
	Thallium TL	4,57			
	Zinc Zn	840	1.11		
	Total Phanols PHEN	S			
	Total Cyande CNTS	5.			
	Sulfide SLFD	S			

__ Endrin

•

Lindane

C-20

T 1 --

5

SAMPLE ID R986-22-01 AG_I_A 0.012 AS_ mg/1	2-01 AS_GFA_<0.003 mg/1	SAMPLE # 06 Date & Time BA_I_A 0.22 mg/1	FRACTIONS: A Collected 03/21/87 CD_F_A <0.025 mg/1	CR_I_A_<(Category <a><0.025 EP EXT 04/01/87 mg/l date complete	
EXMERA 04/09/87 exteraction date	EXPESA 04/09/87 extraction date	HG_CVA_<0.0002 mg/l	PB_F_A 0.17 mg/l	SE_GFA<0	<0.010 mg/l	
SAMPLE ID <u>R986-23-01</u>	3-01	SAMPLE # 07 Date & Time	SAMPLE # 07 FRACTIONS: A Date & Time Collected 03/20/87	7	Category	
$\frac{\text{CNT}}{\text{ug/g}} \frac{\text{S}}{\text{dry wt}}$	SLFD S <24 ug/g (dry wt)					
SAMPLE ID R986-24-01	4-01	SAMPLE # 08 Date & Time	FRACTIONS: A Collected 03/20/87	7	Category	
CNT_S4,100 ug/g_(dry_wt)	SLFD S <24 ug/g (dry wt)		•			
SAMPLE ID R986-25-01 Sern Meto(5-01 to (3/20/87)	SAMPLE # 09 Date & Time	FRACTIONS: A.B Collected 03/20/87	7	Category	
AG_I_A 0.015 mg/1	AG_I_S ug/g	AS_GFA<0.003 mg/l	AS_GFS41 .ug/g (dry wt)	BA_I_A	<pre><0.05 mg/l ug/g (dry wt)</pre>	
CDoco A CO.025 and mg/1	CD_GFS 4.0 CR_I_A_ug/g (dry wt)	CR_I_A	CR_I_S2,500 ug/g_(dry_wt)	CU_I_S_74,000 ug/g_(dry_wt)	74,000 DIGSOL 03/30/87 ry wt) date complete	



Teboral McGrath

Fax: (617)-275-7411

83,000

PB_GFS__83,000 ug/g (dry wt)

 $\frac{28}{\text{mg/l}}$

PB_F_A

 $\frac{\text{NI} \quad \text{I}}{\text{ug/g}} \frac{\text{S}}{(\text{dry wt})}$

HG_CVS____2.3 ug/g_(dry_wt)

HG_CVA_<0.0002 mg/l

EPEEXT 04/01/87

840

 ZN_{IS} 840 Ug/g (dry wt)

TL_GFS <0.57 ug/g (dry wt)

<1.7

SE GFS

<0.003

SE_GFA_

13

SBrdFS

ug/g (dry wt)

ug/g (dry wt)

mg/1

SITE PROFILE

BERN METAL CO., INC.

22 Bender Street Buffalo, New York

> Cameron O'Connor Environmental Quality Technician Department of Environment and Planning July 14, 1983

BERN METAL 22 Bender Road Buffalo, New York

Bern Metal Co., Inc., is located at 22 Bender Avenue south of Clinton Street approximately 600 feet east of Fillmore Ave. The Universal Transvere Mercator coordinates for the site are 47 49 200 mN., 6 76 400 mE on the U.S.G.S. 7.5 minute Buffalo Northeast Quadrange, (Figure 1).

Bern Metals Co., Inc. is primarily engaged in the buying and selling of scrap metal.

Background Information

The Draft Interagency Task Force Report on Hazardous Waste (1979) reports that Bern Metal hauled copper sludge, lead sulfate sludge and chromium hydroxide from Buffalo Color and Allied Chemical Specialty Chemical Division.

There are no records that landfilling activities occurred at Berns Metals. Aerial photography inter-pretation indicated no extensive landfilling occurred on the property.

Since Bern Metal did not operate a solid waste management facility, regular inspections did not occur. Salvage operations are not currently regulated pursuant to Part 360 of the Environmental Conservation Law.

ecology and environment

Site Profile Berns Metal July 11, 1983 Page 2

The Erie County Department of Environment and Planning has responded to Citizen complaints involving activities at the firm.

1) Complaint #00852 - Received September 20, 1978

Suspected transformer oil being dumped along the railroad right ε way.

Investigation

No oil stained ground noted along railroad right of way. Further investigation found soil stained with a blue chalk like material Samples were taken by DEP. Results indicated the material was copper sulfate. Results also revealed chromium, iron and zinc. (Results in Appendix A)

2) Complaint #1195 - Received November 20, 1979

Flat Bed Trucks carrying 55 gallons are dumping at Bender Street Facility.

Investigation

Inspection found drums on site which contained a blue chemical soluble in water with no reaction. Letter from company advise that they commonly receive scrap metal in drums and that the only chemical on their premises was copper sulfide or copper sulfate which they sold for the reclamation of its copper.

3) Complaint #2150 - Received August 18, 1982

Smoke noted coming from a 55 gallon drum located at the Bern he Howard Street Facility.

Investigation

Investigation determined that an uncontrolled chemical reaction occurred in single drum (of of a group of 25) of waste alumingrinding sludge. The most likely explanation for this occurration in the reaction between aluminum and water. The reaction resulted in the evolution of heat, strong odor and steam.

Drums were secured and removed to Bender St. Facility. DEP requested that Bern Metal take precautions for storage and had and develop a periodic inspection plan for materials that requirements.

pate Profile
Berns Metal
July 11, 1983
Page 3

4) Complaint #02261 - Received December 14, 1982

Drums being placed adjacent to fence, burning wire and dumping oil.

Investigation

Empty car battery cases and acid sludge noted outside of fence line. DEP required clean-up of battery cases and removal of acid sludge. Bern Metal clean-up-storage of acid sludge in drums on site.

5) Complaint #02356 - Received April 6, 1983

Blue material on ground behind Bern Metal Company.

Investigation

DEP collected liquid and soil samples. Results indicated high lead level in soil and liquid sample. High levels of copper, iron and zinc also detected. (See Appendix A)

Due to high levels of lead the matter referred to Erie County Health Department. DEP to prepare site profile. Letter sent to Bern Metal from Health Department requesting that they take immediate steps to limit access to the property.

6) Complaint #02377 - Received April 21, 1983

Blue substance running off Bern Metal property to property located at 1041 Clinton St.

Investigation

No evidence of runnoff to 1041 Clinton. Vegetation healthly-no odors associated with soil.

7) Complaint #02388 - Received April 27, 1983

Seven or eight years ago, transformers and batteries used to be stored along property at 1045 Clinton Street.

Investigation

No evidence of batteries or transformers (or oil) noted in the area at present.

site Profile
Berns Metal
July 11, 1983
Page 4

8) Complaint #02384 - Received April 24, 1983

Drum labeled flammable Industrial Waste dumped on site.

Investigation

Actually behind Laub Industries piles of Industrial Waste are leather dust from a leather sanding operation. Approximately 3 cu. ft. of material generated every 6 months. The drum was a leather dye, which was removed and placed into the building. Sample was taken of leather and analyzed for chrome. Result was 1.0 ppm.

Field Inspection

On June 27, 1983 DEP performed a field inspection of Berns Metal to determine on site conditions.

The area is typical of large scrap metal firms. Piles of various types of scrap metal are throughout the area both inside and outside of the fence parimeter.

Battery cases and drums filled with acid sludge are located within the fence of the western portion of the property. Numerous fifty-five gallon drums filled with metal grinding are located on the northeast portion of the property.

On the southern portion, outside of the fence, an area that is stained purple was noted. Numerous piles of crushed battery cases, scrap metal and drums filled with a granular solid are located on this area. No transformers were noted among the scrap metal piles.

A Veihmeyer sampler was used to determine the depth of the area stained with purple (probably copper sulfate or dye) and to get an idea of the type of soil beneath the surface. Five test holes were driven with the following results (see Site Sketch for locations).

Test Number	Description
	Moist stained earth to 2 inches in depth, tan clay to end of sample at one foot. No odor noted.
2 & 3	Soil stained to 3 inches in depth. Refusal encountered at 3 inches. Material beneath soil approved to be brick and concrete fill. No odor noted.

Site Profile
Berns Metal
July 11, 1983
Page 5

4

Dry grandular purple stained soil to depth of 3 inches, tan clay to end of sample at one foot. No odor noted.

5

Off site sample. Top soil to depth of one foot. No odor noted.

Due to the extended dry periods no surface runnoff was observed. A ditch was noted to the west of Berns Metal.

Environmental Data

A. Soils - the Quaternary Geology report by E.H. Mueller, 1977
reports that the original soils in this area consist of lake silt,
sand and clay. This area has received extensive disturbance to the
original soil due to building construction, roadways, railroad
construction and parking lots. A report prepared by U.R.S.
Engineers reported depth to water table, permeability and soil
texture as miscellaneous. This means that subsurface movement of
water is highly variable depending on the soil texture beneath.
Areas of undisturbed clay deposits would have lower permeability,
areas of unconsolidated fill would have more rapid movement of
water.

Soil tests taken during the June 27, 1983 field inspection indicate that at least a portion of the property has received unconsolidated fill. Depth to bedrock is reported to be greater than 10 feet.

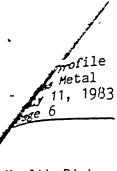
- B. Groundwater There are no known groundwater supplies within a one (1) mile radius of the site. All drinking water is supplied by the City of Buffalo with the Niagara River being the source.
- C. Surface Water The site is not within the floodplain of the Buffalo River. Surface drainage from the site is expected to flow into the Buffalo Sewers.

Geographic Data

Land use within a one mile radius of the site is residential, commercial and industrial. Laub Industries is immediately east of the firm and Universal Salvage is immediately west.

Direct Contact

There is no access control on the southern portion of the scrap metal storage area. The northern portion of this site is surrounded by a fence. Although the fence has numerous holes, direct contact to this area should be limited to Bern Metal Employees.



Health Risk

This soil in the southern portion of the site has been found to contain substantial amounts of lead. As this area has no access control and it has been reported that children frequent the vicinity, it may represent a health hazard to them. The Erie County Health Department was contacted in April 1983. They have contacted the State Health Department for further information.

Conclusion

Laboratory analysis indicates that the soil on the southern portion of the property is contaminated with high levels of lead. Zinc, iron and chromium were also found. The concentrations of lead, zinc and chromium are probably due to the residue from the sludges that were hauled to the site for reclamation. The acid sludge can be attributed to battery storage.

The soil on the southern protion of the property is visibly stained with copper sulfate to a depth of three (3) inches. Copper sulfate is not considered acutely hazardous to humans, however can be detrimental to fish and certain vegetation. Due to the lack of any nearby waterway, run-off of copper sulfate from the site is unlikely to cause further environmental degradation.

The contamination of the soil and condition noted at Bern Metal may be repesentative of any operation of this nature. Little investigatory work has been performed on these types of operations as possible sources of hazardous or toxic materials into the environment.

(The Federal Government has recognized that certain types of reclamation firms are potential sources and have proposed regulations to include them under RECRA).

Recommendations

All materials that are going to be reclaimed or have future potential to be recycled should be kept within the confines of the Bern Metal fence.

The southern portion of the property that is unfenced should be fenced to preclude contact by children who frequent the area.

Should the State and County Health Department's determine that the soil must be removed, the soil will have to go to a secured Solid Waste Management Facility. Leachate potential and EPA Toxicity Test should be performed on the soil prior to disposal.

Additional sampling that could be performed, due to the alleged storage of transformers at the site, are soil analysis for PCB's. However this should only be performed as part of a comprehensive investigation of conditions at all salvage or recycling firms.

Profile Fn Metals July 11, 1983 Page 7

Appendix A

DEP Sampling Results

September 20, 1978

Sample Point A* - Blue Solid Material

Paramater Result

Sulfate 110.0 ppm**

Chromium 4.8 ppm

Copper 47.0 ppm

Zinc .91 ppm

April 6, 1983

Sample Point B*

Parameter

Copper

1906 ppm (1.9%)

Iron

8518 ppm (8.5%)

Lead

260,000 ppm (26%)

Zinc

1.11 ppm (1.1%)

April 6, 1983

Sample Point C* - Liquid

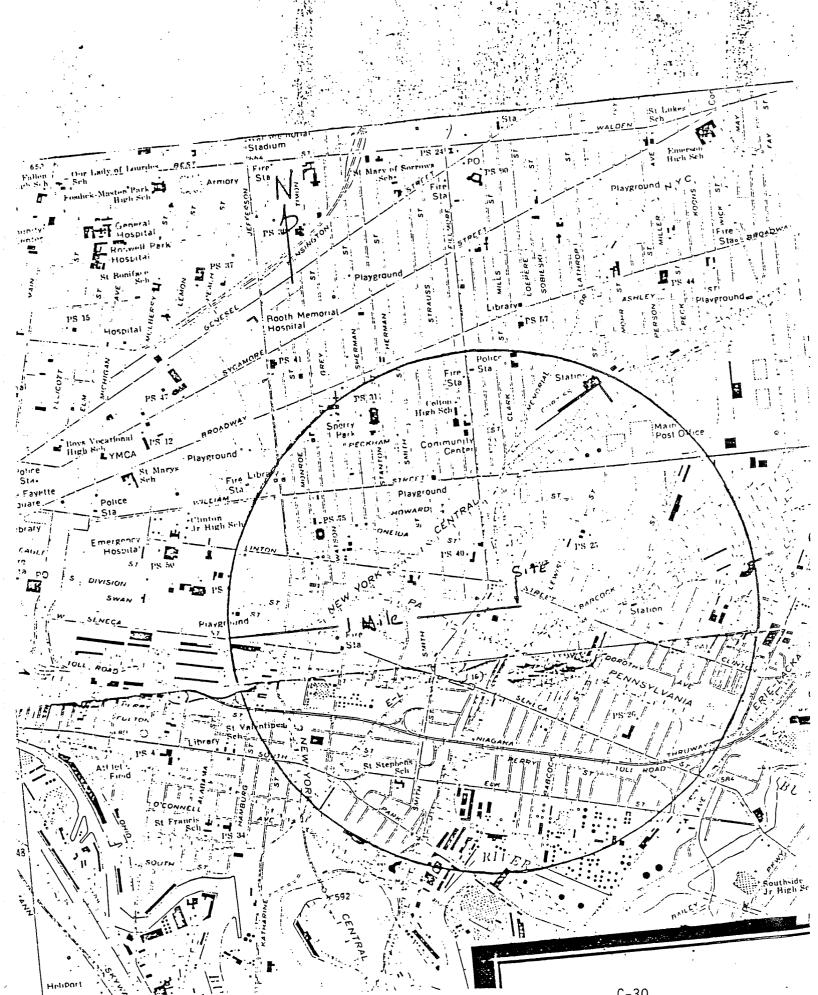
 Parameter
 Result

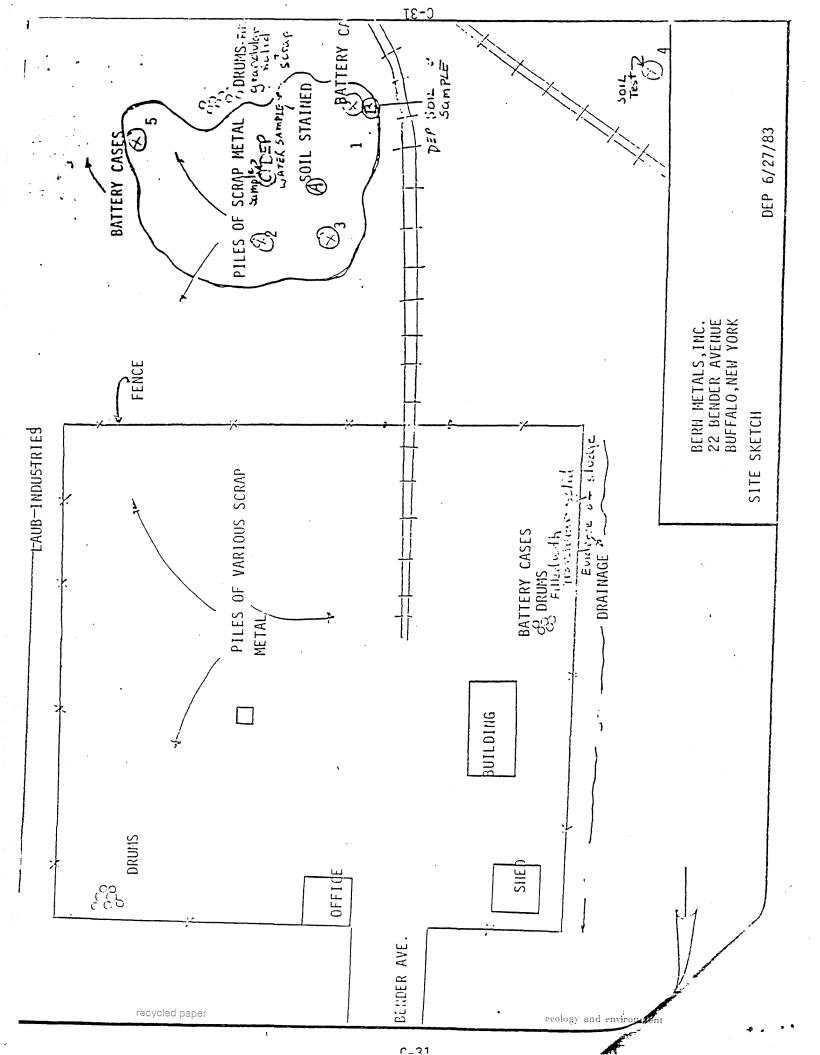
 Copper
 12,600 ppm

 Iron
 1,730 ppm

 Lead
 1,000 ppm

 Zine
 406 pmn





COUNTY OF ERIE DEPARTMENT OF ENVIRONMENT & PLANNING DIVISION OF ENVIRONMENTAL CONTROL

Berns Mela

MEMORANDUM

TO	Donald Campbell	DATEApril	16 1984
FROM	Cameron O'Connor		
SUBJECT	Complaint #02041 - Berns Metal and Adjacent Conrail Pro	operty-Clinton	Street-

City of Buffalo

On April 11, 1984, Ron Koczaja and I performed a field inspection of the above referenced property.

The purpose of the field inspection was to confirm reports by Sue Barnes of the City of Buffalo, that blue, purple, red, tan and green colored material was on and adjacent to the Berns Metal Property. Sue Barnes reported this after she and a member of the State Attorney's Office toured the facility.

During the field inspection, Ron and I made the following observations:

- 1) Site improvements on the Conrail property area are extensive. New tracks, grading and other improvements are occurring on the east and south sides of the Berns Metal Property.
- There is an approximately 150 foot long, 4 foot wide strip of an identified red material located on the east side of the railroad tracks located west of Berns Metal (see map). The edge of this red material is defined.
- The purple/blue material noted on the Berns Metal property is copper sulfate as noted on previous investigations.

Other wastes noted on the southern portion of Berns Metal property included sludge from battery reclamation and approximately 15 drums of Aluminum filings.

- An unidentified green-granular material is adjacent to the southeast portion of the Berns Metal property. The material has leached into a drainage ditch as noted on the attached map.
- 5) The tan material was identified as leather fines (located behind Lavbindustries).

-continued-

Donald Campbell April 16, 1984 Page 2

On-site observations led to the conclusion by the DEP field team that conditions at the Berns Metal Site have not changed since previous investigations nor represent an immediate threat to the environment. The recommendations as stated in DEP's July 14, 1983 site profile still apply.

However, it was felt that the red material noted on the Conrail property should be identified by sample analysis - if this material was being transported off site.

Ron Koczaja followed this matter up on April 12, 1984. During this inspection, it was observed that all of the red material has been covered by several to be of compacted railroad ballast.

Conrail was contacted on April 13, 1984. Mr. Walt Hammons, the Conrail representative was not cooperative when advised that the material should be sampled.

Larry Clare has advised that future DEP action should be a referral to Peter Buechi of the New York State Department of Environmental Conservation for possible follow up by the Attorney General's Office.

CAMERON O'CONNOR

Env. Quality Technician

Division of Environmental Control

CO'C:rb

Attachment

cc: L. Clare

R. Koczaja

P. Buechi, NYSDEC

CONTACT REPORT

TO:

Fred McKosky

FROM:

A.M. Sienkiewicz

RE:

Bern Metals Site, NYSDEC #915134

DATE:

July 13, 1987

CONTACT:

Mr. Thomas Wojchiechowski, Attorney for Gerald

Arwitz Estate, Buffalo, NY

phone:

716-856-1344

I contacted Mr. Wojciechowski concerning the Bern Metals site. He conveyed that he has no information concerning the site history. He claimed that he has had problems at the site with vandalism.

Mr. Wojchiechowski gave verbal permission for us to enter on the site for our site inspection on July 15, 1987.

djr

GEOLOGY =

ERIE COUNTY

New York

Edward J. Bubhler

State University of New York at Buffalo

CIRVING H. TESMER Professor of Geology State University College at Buffalo



BUFFALO SOCIETY OF NATURAL SCIENCES BULLETIN

Buffalo, 1963

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Surficial Geology

PHYSIOGRAPHY

Both the altitude and relief of the land surface tend to increase from north to south. The lowest elevation is 565 feet above sea level at the northern tip of Grand Island and the highest, 1,945 feet above sea level, is in Sardinia township, southeastern Eric County. On the basis of physiography the county may be divided into three parts: the flat Lake Tonawanda plain in the north, followed by the Lake Eric plain, and the Allegheny plateau in the south.

The Onondaga escarpment is a conspicuous topographic feature. This north-facing cliff, formed by the outcropping northern edge of the resistant Onondaga Limestone and Upper Silurian dolostone, can be traced from Buffalo eastward through Akron. In Eric County it seldom exceeds 40 feet in height. Some of the streams which cross the escarpment form waterfalls, but many of the smaller streams disappear in fissures and caves and reappear on the plain to the north.

Between the Onondaga escarpment and the parallel Niagara escarpment to the north is the Lake Tonawanda plain, so named because in late Pleistocene time it was occupied by now extinct Lake Tonawanda. This plain actually is a shallow east-west trending trough, 10 to 15 miles in width, which is drained along its axis by Tonawanda Creek.

The Lake Erie plain, so called because it was covered by glacial lakes ancestral to the present Lake Erie, is an area 6 to 12 miles in width between the Onondaga escarpment and the hilly region to the south. This plain is smooth or gently rolling and rises in elevation toward its southern border where much of it is 900 to 1,000 feet above sea level.

The southern third of the county lies within the maturely dissected Allegheny plateau, the northern border of which is sometimes referred to as the Lake Erie or Portage escarpment. The hilly topography of this region appears to be largely the result of stream erosion for there are no appreciable folds or faults. Glacial erosion has modified the shape of some of the larger valleys and has produced a general rounding of the topography. The amount of glacial drift is commonly so great as to obscure the topography of the underlying bedrock.

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Erie County has no large lakes other than bordering Lake Erie. The major streams, all of which flow west or northwest into Lake Erie, are Tonawanda, Ellicott, Cayuga, Buffalo, Cazenovia, Eighteenmile, and Cattaraugus Creeks. Tonawanda Creek, part of which coincides with the Erie Barge Canal, flows over the flat bottom of extinct Lake Tonawanda. Ellicott Creek crosses the Onondaga escarpment at Williamsville where it forms a waterfall, as does Murder Creek at Akron. Cayuga, Buffalo, Cazenovia, and Eighteenmile Creeks flow northwest from the hills of the Allegheny plateau to the Lake Erie plain and cut post-glacial gorges which expose thick sections of Middle and Upper Devonian rock. Cattaraugus Creek flows essentially westward, part of it through the picturesque gorge known locally as Zoar Valley.

PLEISTOCENE GEOLOGY

INTRODUCTION

The surficial geology of Erie County consists largely of the effects of the Pleistocene glaciation (Fig. 2). The Pleistocene geology of western New York provides a fertile field for research, not only from the scientific viewpoint of understanding more of this last phase of geologic history, but also from the practical aspect of engineering geology and sand and gravel resources.

Following is a list of the glacial and interglacial stages of the Pleistocene Epoch. Although erosion by earlier glacial stages undoubtedly played a role in shaping the topography of Eric County, all the identified features date from the Wisconsin Stage, and a more detailed breakdown of that stage is provided. The most conspicuous of these features are the moraines deposited by the retreating ice sheet and the strand lines of the late Wisconsin lakes. Hough (1958, pp. 90 · 109) describes the subdivisions given below:

Wisconsin Glacial Stage

Valders Substage
Two Creeks Interval
Mankato (Port Huron) Substage
Cary Substage
Tazewell Substage
Iowan Substage
Farmdale Substage

Sangamon Interglacial Stage

Illinoian Glacial Stage

Yarmouth Interglacial Stage

Kansan Glacial Stage

Aftonian Interglacial Stage

Nebraskan Glacial Stage