0924-97

HISTORIC PRESERVATION RESOURCE IDENTIFICATION

MAY 23, 1997

TO: OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.: OKD 000829440

RE: HISTORIC PRESERVATION RESOURCE IDENTIFICATION INFORMATION

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BARTLESVILLE, OKLAHOMA

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TABLE OF CONTENTS

PAGE

BACKGROUND 1

FACILITY HISTORY 2

- LOCATION 2
- HISTORY OF INDUSTRIAL ACTIVITY 4
- INDUSTRIAL ACTIVITIES IN 1907 4
- INDUSTRIAL ACTIVITIES BETWEEN 1907 AND 1920 6
- INDUSTRIAL ACTIVITIES BETWEEN 1920 AND 1946 7
- INDUSTRIAL ACTIVITIES BETWEEN 1946 AND 1962 8
- INDUSTRIAL ACTIVITIES BETWEEN 1962 AND 1973 9
- INDUSTRIAL ACTIVITIES BETWEEN 1973 AND 1980 10
- INDUSTRIAL ACTIVITIES BETWEEN 1980 AND 1991 11
- INDUSTRIAL ACTIVITIES BETWEEN 1991 AND THE PRESENT 11

RESOURCE IDENTIFICATION FORMS

- APPENDIX 1 — BUILDING IDENTIFICATION
- APPENDIX 2 — LOCATION OF FACILITY
- APPENDIX 3 — DRAWINGS 11.2-1 THROUGH 11.2-7
- APPENDIX 4 — 1907 PHOTOGRAPH OF THE FACILITY
- APPENDIX 5 — GENERAL DIAGRAM/PROCESSING OPERATIONS PERFORMED AT THE FACILITY FROM 1907 THROUGH 1924
- APPENDIX 6 — 1970 PHOTOGRAPH OF THE FACILITY
- APPENDICES 7 & 8 — DIAGRAMS OF THE PROCESSING OPERATIONS PRIOR TO AND AFTER 1976 MODIFICATIONS
- APPENDIX 9 — COPY - 1991 AERIAL PHOTOGRAPH OF THE FACILITY
- APPENDIX 10 — FACILITY SOIL AND WASTE CLASS LOCATIONS

BACKGROUND

Zinc Corporation of America ("ZCA") recently submitted a Class III permit modification request to the Oklahoma Department of Environmental Quality ("ODEQ") to modify Resource Conservation and Recovery Act ("RCRA") Permit No. OKD000829440 to incorporate Facility-wide corrective measures to be taken by ZCA at the Bartlesville Facility ("Facility"). The requested modification proposed a comprehensive Facility-wide program consisting of several corrective action measures, including on-going voluntary demolition of certain Facility structures to obtain a better engineered, more effective capping system. The above-referenced demolition is being voluntarily performed by ZCA and was included in ZCA's request for permit modification for administrative completeness, not as a required corrective action (*i.e.*, partial structure demolition can not be required or be a necessary enforcement issue with either the U.S. Environmental Protection Agency or the ODEQ).

Following ZCA's submittal of the permit modification request, notice of the request was provided by publication and to those persons/entities contained within the ODEQ's mailing list, including the Oklahoma Historical Society ("OHS"). By letter dated April 8, 1997, the OHS notified the ODEQ that it was unable to process the ODEQ's request for the OHS to review ZCA's permit modification request. The OHS has requested the ODEQ supply the OHS with a completed "Historic Preservation Resource Identification Form" and appropriate photographs of each of the structures potentially affected by the requested permit modification. ODEQ has determined that ZCA's request is administratively complete, but that significant comments were received during the public comment period. ODEQ is continuing its technical review of the permit modification and requested ZCA to provide to ODEQ the historic information. Following ODEQ's technical review and

consideration of all public comments, the ODEQ will draft the permit modification for further public comment and consideration prior to issuance.

ZCA provides the following information, including completed "Historic Preservation Resource Identification Forms" and appropriate photographs as specified in the Oklahoma State Historic Preservation Office's "Review and Compliance Manual," to the ODEQ to comply with its request. In addition to the information provided, ZCA has maintained blueprints, engineering drawings and specifications, etc. covering various buildings, structures and processing facilities dating from the time the original Facility was constructed in approximately 1907 until the Facility ceased zinc refining operations in 1994. However, the historic zinc retort furnace processes and structures were demolished over time and completely dismantled by the mid-1970's and replaced with an electrolytic refinery. The electrolytic facility closed in 1994 and is currently being cleared to facilitate site-wide remediation of hazardous substances under the ODEQ's RCRA permit. These documents are currently stored and arrangements can be made for ODEQ and/or OHS personnel to review the documents. Either the originals or copies can be made available if requested by ODEQ.

FACILITY HISTORY

The following information is intended only to provide a summary overview of available facility background information and is not intended as a detailed examination of operations, which extend over more than 80 years.

LOCATION

The Facility is located near the city limits of Bartlesville, Oklahoma in Sections 11 and 14, Township 26 N, Range 12 E, in western Washington County as shown in Appendix No. 2. The city limits abut a portion of the

Facility to the north and are within several hundred feet to the east and south. The Facility is located at 11th Street and Virginia Avenue in Bartlesville, Oklahoma. The mailing address is P. O. Box 579, Bartlesville, Oklahoma, 74005.

The Facility covers approximately 150 acres and extends approximately 2,300 feet north to south and 3,000 feet east to west. State Highway 123 runs parallel to the western boundary and, at the Facility location, divides Washington and Osage counties. The property to the west of the Facility is an unincorporated portion of Osage County.

The Facility is bounded to the west, northwest, and south by industrial and commercial facilities. Residential properties border the Facility to the northeast and east. The west side of the Facility is immediately bounded by Oklahoma Highway 123. Phillips Petroleum Company occupies the property immediately west of Highway 123.

The northwestern portion of the Facility is immediately bounded to the north by property occupied by Public Service of Oklahoma ("PSO") and a beer distributor. The north-central portion of the Facility is immediately bounded to the north by 8th Street. The property immediately north of 8th Street is occupied by residential housing.

The northeastern portion of the Facility is bounded to the east by a public housing project. The southeastern portion of the Facility is bounded to the south by property formerly occupied by Somex Corporation. The Somex facility is now vacant, and the property is owned by Horsehead Industries, Inc., d/b/a ZCA. The south-central and southwestern portions of the

Facility are bounded to the south by property occupied by Hill Steer Company, an auto salvage yard, and 14th Street.

The entire property is enclosed with an eight foot cyclone and constantine (Razor) wire fence. Access to the Facility is controlled by a security gate and guard house. No public access is permitted. The Facility contains millions of tons of metal bearing residue and slag from the former operations. The Facility currently requires Interim Remedial Measures ("IRMs") to insure that releases from the Facility do not occur. IRMs will continue until the final corrective measures required by ODEQ are implemented. The area surrounding the Facility was also impacted by the historic air emissions from past operations. Approximately a three-mile radius from the plant site is undergoing Superfund remediation under the supervision of ODEQ and EPA.

HISTORY OF INDUSTRIAL ACTIVITY

The history and extent of industrial activity at the Facility are graphically depicted on Drawings 11.2-1 through 11.2-7 in Appendix No. 3. The drawings show the extent and development of industrial activity from 1907 to 1992. The drawings show specific industrial processes, general areas of industrial activities, materials management areas, and SWMUs. The items highlighted in bold lines on each drawing indicate additions, deletions, or other changes made to the Facility since the previous drawing.

INDUSTRIAL ACTIVITIES IN 1907

Industrial activities began at the Facility in 1907. (*See* Appendix No. 4 which contains a photograph of the Facility as the same appeared in 1907).

The extent of industrial activity is shown on Drawing 11.2-1 in Appendix No. 3. The drawing is based upon a Sanborn Insurance Company map dated 1907 and upon the chronology of land ownership and business lease records provided by ZCA. In 1907, three (3) smelters commenced operations at the Facility.

In 1907, the National Zinc Company ("NZC"), a New York corporation, operated a zinc refinery in the south-central portion of the Facility. Zinc ore was processed to recover zinc. The ores were originally roasted off-site. Roasters were added soon after operations began. Sintering operations began at least as early as 1923. Roasting the ores produced metal oxides which were sintered with carbon to agglomerate the charge and to drive off trace element vapors, then processed in horizontal retorts to drive off zinc vapors. The metal vapors were condensed to form metallic products. (*See* Appendix No. 5 for a general diagram of the processing operations performed at the Facility from 1907 through 1924).

The 1907 Sanborn map indicates that as of 1907, the NZC facility included four furnaces, a pottery manufacturing building, a machine shop, and a blacksmith shop.

In 1907, the Lanyon-Starr Smelting Company ("LSSC") began operating a zinc refinery in the southwest portion of the Facility. LSSC reportedly produced zinc and lead from mineral ores using processes essentially similar to those used at NZC. Tracts were sold by LSSC to Bartlesville Zinc Company ("BZC"). The LSSC industrial area also extended south beyond the present Facility boundary. Significant industrial processes shown on the 1907 Sanborn map include six furnaces, two calcining kilns, a

mineral ore storage and mixing area, a pottery manufacturing building, and a blacksmith shop.

In 1907, BZC operated a zinc refinery in the northwest portion of the Facility as well. BZC reportedly produced zinc from mineral ores using processes similar to those used at NZC. The 1907 Sanborn map indicates that as of 1907, BZC industrial operations included six furnaces, one calcining kiln, and a pottery manufacturing building.

INDUSTRIAL ACTIVITIES BETWEEN 1907 AND 1920

The extent of industrial activity at the Facility in 1920 is shown on Drawing 11.2-2 in Appendix No. 3. The drawing is primarily based upon Sanborn maps dated 1909, 1915 and 1920 and on the chronology of title and lease records. Industrial operations were conducted by NZSC, BZC and LSSC during this period.

The Sanborn maps indicates that between 1907 and 1909, changes at the NZC plant included expansion of the pottery building and construction of calcining kilns, ore storage, an ore mixing building, and a drying kiln. The Sanborn maps indicate that between 1909 and 1915, the pottery building was expanded, and three furnaces, ore bins, and two roasting kilns were constructed at the NAC plant. The Sanborn maps indicate that between 1915 and 1920, a bathhouse and ore shed were added.

The LSSC plant became BZC Plant B in approximately 1916. The Sanborn maps indicate that between 1907 and 1909, additional ore storage areas were added to the LSSC operation. Two roasting kilns and more ore storage were added between 1909 and 1915. The LSSC plant area is

referred to on the 1920 Sanborn map as Bartlesville Zinc Company Plant B. The 1920 Sanborn map indicates that between 1915 and 1920, additional ore storage was constructed.

As of approximately 1916, the original BZC plant became known as BZC Plant A. The Sanborn maps indicate that between 1907 and 1909, changes at BZC Plant A included expansion of the pottery building and construction of ore mixing and crushing areas and drying kilns. Four furnaces were added between 1909 and 1915.

Between 1915 and 1920, a zinc dust plant and two oxide furnaces were added to the BZC Plant A. The original BZC plant is referred to on the 1920 Sanborn map as Bartlesville Zinc Company Plant A. Near the end of World War I and for several years thereafter, all three (3) plants were operated by the U.S. Government.

INDUSTRIAL ACTIVITIES BETWEEN 1920 AND 1946

NZC was dissolved in 1922, and its assets were acquired by National Zinc Co., Inc. ("NZCI"), a New York corporation.

The extent of industrial activity at the Facility in 1946 is shown on Drawing 11.2-3 in Appendix No. 3. The drawing is based upon Sanborn maps dated 1920, 1927, and 1946, on aerial photographs taken in 1937 and 1941, and on the chronology of title and lease records and other information. By 1946, NZCI was the only smelter actively operating at the Facility. On June 8, 1938, NZCI acquired the old BZC Plant A and Plant B properties.

The 1920 and 1927 Sanborn maps indicate no changes in operations or process units at the NZCI plant site between 1920 and 1927. Sintering equipment was first operated by NZCI, in 1923, in a location just west of the current day roasters and the first acid plant began operation in 1928 just west of the current day acid plant. The 1946 Sanborn map indicates that the acid plant, ore storage, several furnaces, and a kiln were added to the NZCI plant between 1927 and 1946.

The 1946 Sanborn map has a blank space on that portion of the map that depicted BZC Plant B (formerly the LSSC plant) on the 1927 Sanborn map, indicating that all buildings had been torn down.

The 1937 and 1941 aerial photographs show the remnants of demolished structures and/or other residue materials in the BZC Plant A site area.

INDUSTRIAL ACTIVITIES BETWEEN 1946 AND 1962

The extent of industrial activity at the Facility in 1962 is shown on Drawing 11.2-4 in Appendix No. 3. The drawing is based upon Sanborn maps dated 1946 and 1962, and on the chronology of title and lease records compiled by ZCA. As of 1962, NZCI had active operations at the Facility. (*See* Appendix No. 6 which contains a photograph of the Facility as the same appeared in 1970).

The 1946 Sanborn map and the 1954 aerial photograph indicate that one furnace was constructed between 1946 and 1954.

Prior to 1954, NZCI utilized a dry feed process known as the Herreschoff roasting process to roast mineral ores. There was no wet scrubbing of the

hot discharge gases and therefore, the only process wastewater generated was non-contact cooling water. Stormwater and cooling water were discharged without treatment. The same process with similar wastes generated was used by BZC and LSSC.

In 1954, Door Oliver roasters were installed with hot tower gas cleaning and water treatment equipment. In 1958, a wastewater treatment plant was installed to replace the hot tower treatment system for the scrubber water. The plant was constructed at the location of the current day wastewater treatment plant.

INDUSTRIAL ACTIVITIES BETWEEN 1962 AND 1973

The extent of industrial activity at the Facility in 1973 is shown on Drawing 11.2-5 in Appendix No. 3. The drawing is based upon two aerial photographs taken in 1966, three aerial photographs taken in 1973; and on the chronology of title and lease records compiled by ZCA. In 1973, there were active industrial operations at the Facility.

In 1967, an additional 26-foot diameter thickener was added to the existing wastewater treatment plant constructed in 1958. The current day acid plant was constructed in 1969. In 1972, several changes were made to the Facility to assist with surface water management which among other things, addressed storm water runoff from wastes and residues at the Facility.

INDUSTRIAL ACTIVITIES BETWEEN 1973 AND 1980

The extent of industrial activity at the Facility in 1980 is shown on Drawing 11.2-6 in Appendix No. 3. The drawing is based upon two aerial photographs taken in 1980, and on the chronology of title and lease records compiled by ZCA. In 1980, there were active industrial operations at the Facility.

In 1974 National Zinc Co. ("NZ"), a Delaware company, acquired the Facility from National Zinc Company, Inc., an Oklahoma company (formerly known as J-V Smelting Co.). NZ was a wholly owned subsidiary of Engelhard Minerals and Chemicals Co. (now known as Salomon Inc.). the stock of NZ was sold to International Development Corporation in 1983.

In 1976, NZ commissioned the electrolytic zinc refinery, replacing the horizontal retort process used since 1907 and the sintering process used since 1923. The new refinery system included the leach and purification plant, the cell house and the melting and casting plant which were constructed in the area of the old Bartlesville Zinc Company Plant B. The new plant used the Vieille-Montagne goethite system for production of iron residue. One existing 5.5 meter Dorr fluo-solids roaster and a new 6.7 meter Door fluo-solids roaster, constructed in 1976, along with the existing Leonard Monsanto sulfuric acid plant were retained and operated as part of the new overall production system. In addition, all the existing offices, machine and maintenance shops, concentrate storage and handling facilities and all associated services facilities were left intact to serve the zinc refinery and roasting facilities. (*See* Appendices No. 7 and 8 for

diagrams of the processing operations performed at the Facility prior to and following the 1976 modifications).

The wastewater treatment plant was replaced in 1978 with a system utilizing two 50-foot thickeners.

INDUSTRIAL ACTIVITIES BETWEEN 1980 AND 1991

The extent of industrial activity at the Facility from 1980 to 1991 is shown on Drawing 11.2-7 in Appendix No. 3. The drawing is based upon an aerial photograph taken in 1981, three taken in 1984, and one taken in 1991, and on the chronology of title and lease records compiled by ZCA. (*See* Appendix No. 9 for a copy of the 1991 aerial photograph of the Facility).

The Facility was purchased by St. Joe Minerals Corporation ("St. Joe") in 1984. In 1987, the zinc assets of St. Joe were purchased by Horsehead Industries, Inc. ("HII") and merged with the zinc assets of New Jersey Zinc Co. HII operates its zinc assets as ZCA.

Between 1984 and 1986, a major demolition program was undertaken. The old acid plant, sintering building, furnaces, and other structures were demolished.

INDUSTRIAL ACTIVITIES BETWEEN 1991 AND THE PRESENT

ZCA ceased zinc refining operations in 1994 and is currently decommissioning the zinc refinery. Activities that continue at the Facility include the operation of the Equidae plant which is co-owned by ZCA and

Horsehead Resource Development Co., Inc. ("HRD") and continues to process lead concentrate from an HRD facility in Pennsylvania.

In 1992, the EPA conducted a RCRA Facility Assessment ("RFA") at the ZCA facility to identify releases or potential releases of hazardous wastes or hazardous constituents from solid waste management units that may require corrective action. Based on the findings in the RFA and other studies performed by ZCA, the EPA and ZCA entered into an Administration Order on Consent ("AOC") on September 1, 1993, to implement a Corrective Action Plan with three mutual objectives. These objectives are as follows:

1. Perform Interim Measures at the Facility to mitigate potential threats to human health and the environment.

2. Perform a RCRA Facility Investigation to determine fully the nature and extent of any release(s).

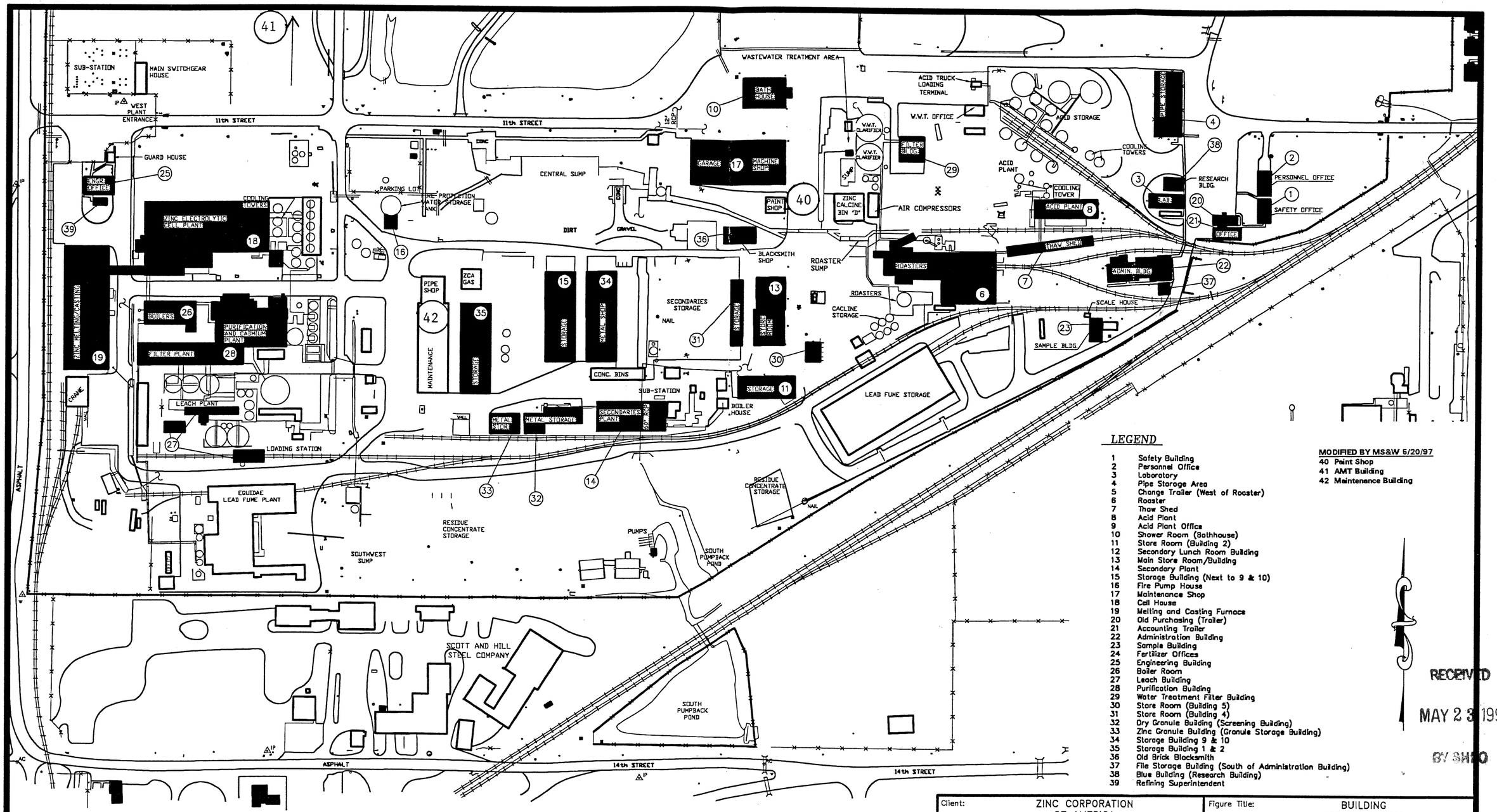
3. Perform a Corrective Measures Study to identify and evaluate alternatives for corrective actions to prevent or mitigate any migration of release(s) of hazardous wastes or hazardous constituents from the Facility.

Following completion of the RCRA Facility Investigation and the Corrective Measures Study, it was determined that soil and waste located in the active industrial areas within the Facility exceeded the applicable corrective action levels for certain hazardous wastes and/or hazardous constituents. (*See* Appendix No. 10 for Facility soil and waste class locations).

In 1995, the requirements of the AOC were incorporated into the ODEQ RCRA permit. Corrective action at the Facility has proceeded since the permit was issued under the conditions of the permit. The corrective

action alternative for the Facility requested by ZCA to prevent/mitigate migration of the hazardous wastes/constituents was to encapsulate (via a "cap") the hazardous wastes/constituents. In order to obtain a better engineered, more effective capping system to prevent/mitigate migration of the wastes/constituents, ZCA is voluntarily demolishing certain structures and has included this work in the request for permit modification to select final corrective actions (remediation) for completeness.

MAP/djp/30163-015/206198.1



LEGEND

1 Safety Building
2 Personnel Office
3 Laboratory
4 Pipe Storage Area
5 Change Trailer (West of Rooster)
6 Rooster
7 Thaw Shed
8 Acid Plant
9 Acid Plant Office
10 Shower Room (Bathhouse)
11 Store Room (Building 2)
12 Secondary Lunch Room Building
13 Main Store Room/Building
14 Secondary Plant
15 Storage Building (Next to 9 & 10)
16 Fire Pump House
17 Maintenance Shop
18 Cell House
19 Melting and Casting Furnace
20 Old Purchasing (Trailer)
21 Accounting Trailer
22 Administration Building
23 Sample Building
24 Fertilizer Offices
25 Engineering Building
26 Boiler Room
27 Leach Building
28 Purification Building
29 Water Treatment Filter Building
30 Store Room (Building 5)
31 Store Room (Building 4)
32 Dry Granule Building (Screening Building)
33 Zinc Granule Building (Granule Storage Building)
34 Storage Building 9 & 10
35 Storage Building 1 & 2
36 Old Brick Blacksmith
37 File Storage Building (South of Administration Building)
38 Blue Building (Research Building)
39 Refining Superintendent

MODIFIED BY MS&W 5/20/97
40 Paint Shop
41 AMT Building
42 Maintenance Building

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Client:	ZINC CORPORATION OF AMERICA	Figure Title:	BUILDING IDENTIFICATION
Location:	BARTLESVILLE, OKLAHOMA	Document Title:	ASBESTOS INSPECTION

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DATE: 11/13/96		PREPARED BY:	BR
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PROJECT NO: 93134P56		FIGURE NO.:	