JASPER SITE

FINAL REPORT

Prepared for

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I. INTRODUCTION

A. Project Background

In January 1986, the TES II Team received Work Assignment No. 479 to provide enforcement support in searching for parties responsible for contamination at the Jasper site in Jasper County Missouri. This site is part of the Tri-State Mining Area, consisting of southwestern Missouri, southeastern Kansas, and northeastern Oklahoma. From 1848 to 1970, the Tri-State Mining Area produced zinc and lead concentrates, resulting in abandoned waste piles of mill tailings, mine shafts, and collapsed mines which create hazards in these areas.

Under Work Assignment No. 479, TechLaw conducted research into lead and zinc mining activity in Jasper County, which resulted in the creation of a computerized database of over 1,000 mining and milling companies which were active in the county, with information on the time period and general areas of operation for each company.

In May 1986, TechLaw was directed to place work on this project on hold, pending a decision by EPA regarding the scope and direction of additional research to be conducted on this project. As directed by EPA, Work Assignment No. 479 was closed in July 1987.

In July 1987, the TES II Team received Work Assignment No. 669. The EPA Regional Contact was designated as Mr. Gene Gunn (913/236-2856). Under this assignment, TechLaw was requested to prepare a report summarizing the research conducted under Work Assignment No. 479, produce computer printouts from the Jasper County Mining database, and provide EPA with copies of all source materials used by TechLaw during the course of this research.

B. Project Approach

Under Work Assignment No. 479, TechLaw conducted research into lead and zinc mining activities in Jasper County, Missouri, in order to identify companies engaged in such mining activity as potentially responsible parties for the contamination of the Jasper Site.

In order to develop this information, TechLaw relied upon the following reference materials:

1. Missouri Geological Survey, Volume VII, Lead & Zinc Deposits, Section 2, by Arthur Winslow, 1894. pp. 544-595.

   This work contains a section on the Jasper County portion of the Tri-State Mining Area. The geology of ore formations by mining districts within Jasper County are discussed, as well as the location and productivity of specific mines and mining companies. Maps are also included which identify mine and mining tract locations.

2. Mineral Resources of the United States, Part I, Metal Series, U.S. Geological Survey, 1883 to 1887; 1893; 1907; 1908; 1910 to 1931.

   Mineral Yearbook, U.S. Bureau of Mines, 1932 to 1957; 1960; 1965.

   The series of yearbooks referenced above, contain narratives with general to extremely specific information on the mining activities occurring in southwestern Missouri for each year of publication. Most editions identify specific companies with interests in the mining operations in Jasper County, along with information regarding the relative productivity and extent of operations of these companies. Editions from 1907 to 1916 describe mining operations by specific mining districts.

3. Study of Stability Problems and Hazard Evaluation in the Missouri Portion of the Tri-State Mining Area, by Michael C. McFarland and James C. Brown, Jr., Missouri Department of Natural Resources, Division of Geology & Land Survey, April 1983.

   This study contains a discussion of mining activities in Jasper County, and provides a series of maps which show locations of all known mining areas in a four-quadrangle region near Joplin, Missouri. For areas in the study characterized as hazardous, the maps also identify specific mine names and/or the names of mining companies which operated the mines.

4. Geological Maps Showing Mining and Mineralized Areas, prepared by the State of Missouri Geological Survey and Water Resources, 1916 to 1922.

These maps were obtained through the Silva Library, Missouri Southern College, Joplin, Missouri. Each map displays the location of registered mines near Joplin, Missouri, and the extent of mine workings at that time.

5. U.S. Geological Survey Maps

These maps cover all of Jasper County, Missouri. Although specific mine names are not provided, these maps were used to locate mining areas referenced in the other sources listed above.

Information on the history of mining activities conducted in Jasper County was obtained from the Mineral Resources and Mineral Yearbooks (hereinafter "yearbooks"), and the Missouri Geological Survey, Volume VII, Lead & Zinc Deposits, Section 2, dated 1894, by Arthur Winslow, (hereinafter the "1894 Report"). The majority of information concerning the identity of specific mining companies, mining areas, time periods, and extent of mining activities, was also obtained from these sources.

To organize the specific mining company information contained in the yearbooks, TechLaw created a computerized database. Each record of this database contains the name of a mining company, the date of the yearbook reference, the district in which the mining activity occurred, and the general nature of this activity (e.g., mining, milling, etc.). When available, information such as the name of the mine, the number of shafts operated, and other miscellaneous information, was included in comments fields associated with each record.

From information contained in the Study of Stability Problems and Hazard Evaluation in the Missouri Portion of the Tri-State Mining Area, dated April 1983, (hereinafter the "MDNR Study"), the 1894 Report, and the mining maps dated 1916 to 1921, obtained from the Silva Library, TechLaw compiled a list of mine and mining company names with specific location information in the form of Township, Range, Section, and Quarter Section references. Work on this project was placed on hold by EPA prior to conducting the task of cross-referencing this list of mines and mining companies with the mining company references in the database. The specific location information contained in this list was used, however, to help define the boundaries of the mining districts referenced in the database.

As indicated in the Project Background section, this report

has been prepared as a summary of the research conducted by TechLaw under Work Assignment No. 479. Due to the fact that this research was suspended by EPA prior to its completion, this report should be considered preliminary, and by necessity, non-specific in its identification of parties potentially responsible for the contamination of the Jasper Site. As such, there is no section in this report entitled "Potentially Responsible Parties".

The remainder of this report has been organized as follows:

Section II - Site Information: This section includes a discussion of the history of mining in Jasper County, and a description of the mining districts referenced in this report. Section II.A. - Site History, contains a description of the mining history of the Jasper County portion of the Tri-State Mining Area. Section II.B. - Description of Mining Districts, describes the location and extent of the mining districts within Jasper County, as defined by the yearbooks and the 1894 Report, and the steps taken by TechLaw to define these districts by specific Township, Range and Section.

Section III - Database Development: This section describes the database compiled by TechLaw from the information contained in the mining yearbooks, and the assumptions and procedures used by TechLaw during the development of the database.

Section IV - Conclusions and Recommendations: This section presents conclusions on the research conducted by TechLaw into mining activity in Jasper County, and recommendations for developing more specific responsible party information for the Jasper Site.

Appendix A - Document References: This appendix contains a list of each document used as reference in the body of this report. Each document has been assigned an identification number which is used to reference the document in the report. Copies of these documents are included as Attachment I.

Appendix B - Mine Location Index: This appendix contains the mine and mining company list compiled from the MDNR Study, the 1894 Report, and the mining maps dated 1916 to 1921. Each mine location is referenced by Township, Range, Section, and Quarter Section.

Appendix C - Figures: Figures prepared by TechLaw which are referenced in this report are contained in this appendix.

Appendix D - Jasper County Mining Database Programs: This appendix contains an explanation of the computer programs developed by TechLaw for manipulating the database and producing printouts from the database. The programs and database files are being transmitted to EPA with this report.

Printouts from the Jasper County Mining Database are included as attachments to this report. Attachment II consists of an alphabetic list of each mining company referenced in the database. Attachment III consists of a printout of each record in the database, organized alphabetically by mining company name, and chronologically within company listings. Attachment IV consists of a printout of each record in the database, organized alphabetically by mining district, and chronologically within district.

II. SITE INFORMATION

A. Site History

According to the MDNR Study, mining activity began in Jasper County in 1848 and peaked in a mining boom during World War I (1914 to 1918) (58). The MDNR Study indicates that the collapse of metal prices following World War I caused a rapid decline in mining from which the Missouri portion of the Tri-State Mining Area never recovered. Although some production continued in southwestern Missouri through the late 1960's, following World War I, major mining activities in the Tri-State Mining Area were shifted to Kansas and Oklahoma (58).

Figure 1 shows the quantity of crude ore milled yearly in southwestern Missouri from 1907 to 1955, superimposed over a chart from the 1947 yearbook showing the quantity of crude ore milled in the entire Tri-State Mining Area from 1907 to 1947 (Appendix C). The decline of the lead and zinc mining industry in southwestern Missouri is illustrated, along with the shift of mining activities to Oklahoma and Kansas. The information on productivity for the Missouri portion of the Tri-State Mining Area was plotted onto the graph by TechLaw from production figures provided in the 1912 to 1955 yearbooks (11 - 53). It should be noted that most of the lead and zinc production in the Missouri portion of the Tri-State Mining Area can be attributed to Jasper County; however, lead and zinc ores were mined in several other counties in southwest Missouri (2 - 57).

According to the MDNR Study, early mining in Jasper County was confined to the upper-ground ore zone, above 100 feet. Early mining tracts were small, with some leases measuring as little as 4,000 square feet (58). Many mining shafts were sunk at close intervals, resulting in thousands of production and prospect shafts. The MDNR study indicates that as easily accessible ores

were exhausted, shafts were sunk deeper, eventually encountering the more extensive lower-ground ore zone or sheet-ground ore bodies, which were mined by a room-and-pillar method (i.e., underground mining in which some ore is left in place to support the roof) (58). According to the yearbooks, sheet-ground ore was the principal type mined from 1907 to 1918, although some mining of the upper-ground continued (7 - 17). The 1924 yearbook indicates that in 1921, almost all production was from the upper-ground, and in 1922, no sheet-ground was produced (23). Later volumes of the yearbooks do not indicate whether upper-ground or sheet-ground was predominantly mined (24 - 57).

Some information was provided in the yearbooks and the MDNR Study regarding the milling practices of mining companies. According to the yearbooks, mills were placed at each mine or group of mines to concentrate the ore (2 - 57). The yearbooks indicate that over a period of time, these mills developed in capacity, and in ability to concentrate the ore (2 - 57). The 1937 yearbook indicated that some companies began shipping crude ore from Missouri to Oklahoma for milling at that time (35). According to the MDNR Study, the mills generated a variety of waste products, referred to as tailings, consisting of various sizes of waste rock (58). The yearbooks indicate that old tailings were frequently milled to recover lead and zinc ores (2 - 57).

According to the 1914 yearbook, mining of lead ores began in Jasper County, two miles east of Joplin, in 1848 (13). This yearbook also indicated that in 1849, lead was discovered within the limits of Joplin. Around 1851, mining was begun on Center Creek in the camp known as Oronogo (13). In 1854, mining began at the Turkey Creek mines, located northeast of Joplin, near Bellevelle (13). The 1894 Report indicates that lead ore was first dug at Carthage in 1854 (1). The 1914 yearbook states that zinc ore had no value at this time and was thrown aside (13).

According to the 1914 yearbook, the Civil War checked development of lead mining in the Tri-State Mining Area, but work was resumed in 1865 (13). The extension of the St. Louis & San Francisco Railroad, which was finished as far as Springfield, Missouri, had the effect of stimulating the mining and smelting industry (13). According to the MDNR Study, the development of new milling and smelting techniques led to the first production of zinc ore in the Tri-State Mining Area, and the 1914 yearbook reported that the first zinc ore was shipped from Joplin in 1872 (58, 13). According to the 1894 Report, in 1873, ore was discovered in the Webb City-Carterville camp (1). The 1914 yearbook indicates that from 1870 to 1874, the mining population increased rapidly (13). The MDNR Study indicates that by 1875, Missouri had become the leading zinc producer in the United States (58).

According to the 1914 yearbook, from 1880 to 1900, there was a

nearly constant expansion of ore-producing territory, cheaper operating methods were developed, and ore was mined at increasing depths (13). The 1894 Report describes mining camps at that time near Joplin, Scotland, Webb City-Carterville, Lehigh, Sherwood, Oronogo, Carthage, Alba, and Belleville (1). Figure 2 shows the locations of these mining districts as defined in the 1894 report (Appendix C).

Production figures provided in the 1894 Report indicate that the Joplin and Webb City-Carterville districts were the leading ore producers in 1894 (1). The report references a 1893 property map of Webb City-Carterville which reportedly shows over 700 mines within the limits of these towns (1). An 1892 property map reportedly revealed 115 different mines within the town limits of Joplin, and several dozen mines located just outside of Joplin (1). The Tuckahoe mines were referenced as the scene of large operations where great quantities of ore had been mined (1). At the Scotland camp, and an adjoining settlement, Burch Center, mining had more or less been conducted for 25 years, although little work had been conducted recently (1).

The 1894 Report indicates that mining had been more or less continuous in Oronogo since its beginning, and that during the first years of mining, the camp was a principal producer (1). The 1894 Report indicated that the Belleville mines had been very productive and contained extensive excavations (1). According to the report, the Alba mines were new mines in 1886, and had only been operated at intervals, and the Sherwood mines had never been important producers (1). The mines at Lehigh had produced large quantities of ore in the past, but production had been impeded by the fact that the best ground lay near Center Creek, and no work could be done during the wet season (1). The Carthage camp, which at that time consisted of scattered mines between Carthage and Sarcoxie, never contained more that six operating mines at a time, and those immediately near the railroad depot at Carthage did not produce before 1889 (1).

According to the MDNR Study, between 1902 and 1907, mechanized volume-mining methods were developed which encouraged development of the low-grade, extensive sheet-ground ores (58). Yearbooks from 1907 to 1916 provide detailed accounts of the mining activities in southwestern Missouri by mining district, identify the largest producers, and discuss new developments which occurred within each district during this period (7 - 15).

The 1907 yearbook was the first in the yearbook series to contain detailed descriptions of mining activities in the area, and to document the expansion of mining in southwestern Missouri (7). The 1907 yearbook named several new mining districts which were not discussed in the 1894 Report (1). These new mining areas included Cave Springs, Sarcoxie-Reeds, and Duenweg-Porto Rico (7). The

changing of the names of three mining camps (Belleville to Zincite; Webb City-Carterville to Webb City-Carterville-Prosperity; and Lehigh to Carl Junction) suggests a shift in prinicpal mining areas, and/or expansion in the size of these camps (7).

In the 1910 yearbook, the Alba camp reported a large increase in production due to new producers in the northwestern portion of the camp, and was referenced as the Alba-Neck City district (9). Also in the 1910 yearbook, the Sherwood camp was expanded to include the Thoms Station camp, and rich strikes were reported in this area (9). The 1911 yearbook indicated that extensive prospecting and leasing in the Sherwood-Thoms Station district, led to this district achieving more prominence, advancing it from thirteenth to fifth in production amongst southwest Missouri districts (10).

The 1911 to 1914 yearbooks reference the Zincite district as the Zincite-Smithfield district, due to increased operations in the northern portion of the district (10 - 13). In 1915 and 1916, the Zincite district was referenced as the Zincite-Klondike district (14 - 15).

According to the 1907 to 1916 yearbooks, Webb City-Carterville-Prosperity led southwestern Missouri as the most productive district, followed by Joplin (7 - 15). In the 1912 to 1915 yearbooks, districts were ranked according to productivity (11 - 14). Although fluctuations occur, the districts of Duenweg-Porto Rico, Alba-Neck City, Thoms Station, and Oronogo ranked within the top five, and in 1915, Zincite-Klondike ranked seventh (11 - 14). The remaining districts were not ranked (7 - 15).

According to the 1918 yearbook, the end of World War I brought an end to price agreements, which caused major drops in ore prices (17). The 1918 yearbook notes a rapid decline of mining activity and production in Missouri, although Oklahoma and Kansas were able to maintain high levels of productivity (17). There was a drastic decrease in the number of active mining operations discussed in the 1918 and subsequent yearbooks for the Jasper County mining districts (17 - 57). However, the 1918 yearbook discusses the emergence of a new district, Waco, located along the Kansas-Missouri border (17).

According to the yearbooks, from 1919 to 1951, mines near Waco and Oronogo were the principal ore producers in Missouri (18 - 49). This series of yearbooks also indicate that the area near Webb City and Carterville, once the area with the largest production, was reduced to sporadic production, ranging from small scrapping and drilling operations, to production from tailings (18 - 49).

In the late 1920's, operations near Smithfield and the Kansas/Missouri state line, were the major ore producers in Jasper

County (24 - 29). Some mining activity was also conducted near Fidelity (24 - 29). Carthage, Carl Junction, Alba-Neck City, and Belleville reported either no production, or one or two producers each year (24 - 29). Subsequent to 1918, there is no reference to mining activities at Sarcoxie, Reeds, Sherwood, Porto Rico, or Prosperity within the yearbooks (18 - 57).

The 1957 yearbook names only one producer of lead and zinc ores in Jasper County (55). The MDNR Study indicated that the last significant production in Missouri occurred in 1957, but intermittent output continued into the late 1960's (58). The 1960 yearbook reported that for the third consecutive year, no zinc or lead ore was produced in southwestern Missouri (56). No mention of zinc or lead ore production in Jasper County was made in the 1965 yearbook (57).

B. Description of Mining Districts

In discussions of the history of the Jasper County portion of the Tri-State Mining Area, the yearbooks and the 1894 Report provide general location information regarding mining activities by referencing camps or mining districts (1, 2 - 57). The Jasper County Mining Database, prepared by TechLaw, also uses mining districts to identify the location of mining activities of specific companies.

The mining districts are named for towns in the vicinity of the mining activity, and the names and boundaries of various districts changed through time as the mining territories expanded and shifted. The 1894 Report specifically defines the mining districts at that time (1). In the yearbooks from 1907 to 1916, mining districts are defined in a consistent fashion, so that the history of mining companies in those districts can be traced through time (7 - 15).

Subsequent to 1917, the yearbooks no longer used the earlier district designations, and began to describe the location of mining activities by referencing nearby towns (17 - 57). In some cases, the same property was described as being near different towns, from one year to the next, depending on how general a description was provided each year. For example, "near Joplin" was sometimes used in the later yearbooks to describe the location of mining activity in the Joplin district, as well as in the Thoms Station, Cave Springs, and Smithfield districts. In other yearbooks, the same property may be referenced as near one of these other towns. For mining activity discussed in the later yearbooks, however, it was

possible to discern in which of the "districts" operations were actually conducted by tracing the history of the property back to the period of 1907 to 1916. Another method for determining the actual mining district for a particular operation, was to cross-reference the mine name to the mine name in the Mine Location Index (Appendix B).

This report includes four figures showing the location of the mining districts referenced in the 1894 Report and the yearbooks (Appendix C). Figure 2, prepared by TechLaw from maps and narrative in the 1894 Report, diagrams the extent of the mining districts in Jasper County as of 1894. Figure 2 represents the only specific mining activity location information contained within the documents reviewed by TechLaw for the eastern portion of Jasper County. Figure 3 shows the Webb City-Carterville district as it was defined in the 1894 Report, and specific tracts of land within this district. Figure 4 was taken directly from the 1894 Report, and shows the tracts of land within the Joplin and Belleville districts. Figure 5 diagrams the approximate boundaries of the major mining districts in the western section of Jasper County. These district boundaries were defined in the yearbooks, and by a comparison of mine names, by district, from the yearbooks, to mine names listed in the Mine Location Index (Appendix B).

As shown on Figure 5, it was not possible to define the exact boundaries of the mining districts within the far western portion of Jasper County (Joplin, Zincite-Smithfield, Cave Springs, Thoms Station-Sherwood, and Carl Junction). Within this area, certain mines located between these districts were referenced in the yearbooks in more than one district. For this reason, the district boundaries presented in Figure 5 should be considered approximations only.

There are twelve major mining districts defined in Jasper County in the 1894 Report and the yearbooks. Each district is described as follows:

1. Joplin: According to the 1894 Report, this district includes mining activity within the town limits of Joplin, mining conducted to the east of Joplin, and the Tuckahoe Mines located north of Joplin (1) (See Figure 2 and Figure 4). The yearbooks from 1907 to 1916 further define this district as including areas west of Joplin, as far as Central City (7 - 15). As illustrated in Figure 5, the Joplin mining district was the most extensive of the Jasper County districts.

2. Thoms Station-Sherwood: According to the 1894 Report, the original Sherwood mines were located about one mile southeast of Lehigh, and the 1883 yearbook indicated that the Sherwood diggings were four miles north of Joplin (1, 2). None of the maps obtained by TechLaw show the location of the town of Sherwood.

According to the 1910 yearbook, the Thoms Station portion of the camp was situated two and a half miles north of Joplin along the Kansas City Southern Railroad (9). The specific location of this camp on Figure 5 was determined only by comparison of mine names in the yearbooks to the Mine Location Index. It was not possible to define a precise boundary between the Joplin district and the Thoms Station-Sherwood district.

3. Zincite-Smithfield: This district was also referenced in the yearbooks as the Zincite, Zincite-Klondike, and Smithfield districts. According to the 1894 Report, this district was originally known as the Belleville district and included the mines within East Hollow and West Hollow, located southeast of Belleville (1). A comparison of the location of mines discussed in the Zincite district, to the location of the Belleville and Hollow mines, indicate that the Belleville district is part of the Zincite district. According to the 1914 yearbook, the mines of this district include those in the territory south of Zincite, along the western border line between Missouri and Kansas to the north of Smithfield (13). None of the maps obtained by TechLaw show the location of Zincite. Only that portion of the district described in the yearbooks which could be confirmed by comparison of mine names to the Mine Location Index, has been outlined in Figure 5.

4. Cave Springs: No general location information for this district was given in either the 1894 Report, or the yearbooks, and the location of this district within Figure 5 was obtained strictly through the comparison of mine names in the yearbooks to the Mine Location Index.

5. Carl Junction: According to the 1894 Report, mining in this camp began near Lehigh, situated a mile west of Carl Junction. A comparison of the mining maps obtained from the Silva Library to the U.S. Geological Survey (USGS) maps shows that Lehigh is now known as Stringtown (59 - 65). The 1907 and subsequent yearbooks reference the "old Lehigh diggings" when describing operations in the Carl Junction district (7 - 57). The 1912 yearbook describes operations four miles north of Carl Junction as part of this district (11). Further boundaries for this district were made through a comparison of mine names in the yearbooks with the Mine Location Index.

6. Oronogo: The 1908 yearbook describes the Oronogo district as that part of the Oronogo-Duenweg, sheet-ground territory lying north of Center Creek (8). Comparison of mine names in the yearbooks with the Mine Location Index confirms this boundary. The growth of the Oronogo district can be seen from a comparison of Figure 2 and Figure 5 (Appendix C).

7. Duenweg-Porto Rico: The yearbooks describe this district as that portion of the Oronogo-Duenweg, sheet-ground belt lying south of Porto Rico (7 - 15). Although Porto Rico cannot be found on the current USGS maps, the mining maps from the Silva Library show its location (59 - 64). A comparison of mine names in the yearbooks to the Mine Location Index were used to define the northern boundary, although some of the larger mines do cross this boundary. The westerly border of this district was defined by the lack of significant mining activity between Joplin and Porto Rico, as noted on maps contained in the MDNR Study (58). In the yearbooks, reference to operations in the Scotland camp, when any, are included under this district. According to the 1894 Report, the Scotland camp also included the Burch camp (1). Later yearbooks reference operations at Fidelity, which appears to be in the same location as the Burch camp (1). Figure 2 shows the location of the Scotland and Burch camps as of 1894, and Figure 5 shows the location of the Duenweg-Porto Rico district, as defined above.

8. Webb City-Carterville-Prosperity: The 1894 Report defines this district as including mines within the limits of Webb City and Carterville and the vicinity (1). According to the yearbooks, this district included the majority of the sheet-ground territory in Jasper County (7 - 15). The western boundary was defined by a lack of mining activity between this district and those to the west. The location of this district is shown on Figure 5.

9. Alba-Neck City: This district is located apart from the other districts in Jasper County. A comparison of Figure 2 and Figure 5 illustrates the growth of this district over time.

10. Waco: The Waco district also is located apart from the other districts in Jasper County. The boundaries of the Waco district are illustrated in Figure 5.

11. Carthage: According to the 1894 Report, and as shown in Figure 2, mines in this district were widely scattered from Reeds to northwest of Carthage (1). The western boundaries for this district, as illustrated in Figure 5, show only a portion of the Carthage district, as defined through a comparison of mine names in the yearbooks with the Mine Location Index.

12. Sarcoxie-Reeds: According to the yearbooks, this district lies in the area between Reeds and Sarcoxie (7 - 15). No more specific location information was available for this district. The location of these towns is illustrated in Figure 2.

III. DATABASE DEVELOPMENT

In order to organize the mining activity information contained in the yearbooks and the 1894 Report, TechLaw created the Jasper County Mining Database. The narratives in these two sources identified specific mining companies involved in mining operations in Jasper County. This information included the time period in which the activity occurred, the owner and/or lease holder of the property on which the activity was conducted, and the district in which the mining occurred. Other available information included the nature of the mining activity, the capacity of the mill(s), and the number of shafts in operation.

Due to the volume of mining activities conducted in southwestern Missouri, a complete description of mining activities was not included in each edition of the yearbooks. Information included in the yearbooks for a given mining operation, was more or less specific over time. The database was developed to allow each reference to a particular mining operation to be listed chronologically, to present an overall picture of that mining company's operations.

For each reference in the 1894 Report or yearbook(s) to a particular mining operation, a record was created in the database. Each record was comprised of the mining company name, the year of the reference, the mining district, the type of activity, and a comments field for presenting miscellaneous information.

The type of mining activity was characterized within the database by the use of a series of codes which are explained below:

TRAC - This code was used to indicate that the company had an interest in the mining property, although from the narrative, it was not clear if the company actually conducted mining or milling operations itself, or other companies actually worked on the property. The narrative stated only that the company's tract produced, or that the company had a mine.

MINE - This code was used to indicate that the narrative specifically stated that a company operated a mine or conducted mining operations.

MILL - This code was used to indicate that the narrative stated that the company had a mill or operated a mill, to treat mined ore. It is not clear whether the company actually conducted the mining operations and milled its own ore, or milled ore mined by other companies.

PROD - This code was used to indicate that the narrative stated that the company produced ore or reported production. It is not clear whether the reported production resulted from mining operations conducted by the company itself, or if the mining was conducted by another company.

The comments fields in the database were used to hold miscellaneous information about the company contained in the yearbook reference. For example, the name of the mine(s) which were on its property; the number of shafts in operation; the number and/or capacity of mills in operation; and former mine names; were included in the comments fields when available. Other information which may be found in the comments fields would include the name of the property owner, and/or the lease holder of the property on which the company operated.

As indicated in Section II.B., mining activity location information within the 1907 to 1916 yearbooks is presented by mining district (7 - 15). However, latter editions of the yearbooks did not use these district references in a consistent fashion (16 - 57). In order to continue to use the district designations in the database, TechLaw cross-referenced each latter year entry with an earlier year entry in order to determine the appropriate district designations. Companies which could not be cross-referenced to a specific district, were entered into the database under the default district, "Jasper County".

Specific production information was rarely provided for the mining companies referenced in the yearbooks. In certain cases, ore producers were characterized by the amount of their production within a district, by such terms as "large", "moderate", and "small." Due to the incompleteness and uncertainty surrounding this production information, no attempt was made to include this information in the database.

In addition to their use in identifying mining companies active in Jasper County, the database printouts also serve as an index to the yearbooks and 1894 Report. The 1894 Report and the 1886 and 1887 yearbooks provide actual production figures for many companies (1, 4, 5). In many cases, additional information about the company (for example, relative productivity) can be obtained from the yearbooks for the years referenced for each company.

IV. CONCLUSIONS AND RECOMMENDATIONS

This report summarizes research conducted by TechLaw into mining activities in Jasper County, Missouri. The focus of this research was to identify mining companies which operated in Jasper County as parties potentially responsible for the contamination of the Jasper Site. EPA suspended this research prior to its completion, however, and so the actual identification of potentially responsible parties should be considered preliminary. For this reason, the mining companies identified through TechLaw's research have not been listed in this report as potentially responsible parties.

In its research, TechLaw has identified over 1,000 mining companies active in Jasper County, Missouri, from the mid-1800's to 1965. As can be seen from the database printouts presented as Attachments I, II, and III, the period of time that these mining companies were involved in mining ranged from one or two years to decades. Due to the adverse economic conditions which have affected the lead and zinc mining industry in Jasper County, and the length of time which has passed since many of the identified companies operated, it is likely that few of these companies are currently in existence.

In order to continue research to identify viable potentially responsible parties for the Jasper County site, TechLaw makes the following recommendations:

1. Conduct Corporate Status Research. Corporate status research should be conducted to identify those mining companies listed in the Jasper County Mining database which are still in existence.

2. Obtain Title Documentation. In order to obtain additional evidence linking specific mining companies to mining activities in Jasper County, title documents should be obtained from Jasper County property records. These records are organized through a grantor/grantee index, which would allow access to these records by referencing the list of mining companies in the database. These title documents also would allow mining activity locations to be defined more precisely.

3. Conduct Additional Analysis of Collected Documents. A detailed comparison of the list of mines included in the Mine Location Index (Appendix B), to the mines referenced in the Jasper County Mining database, could allow the mining activities of specific companies to be defined more precisely.

4. Review Responsible Party Information Developed for the Kansas and Oklahoma Portions of the Tri-State Mining Area. Due to the collapse of lead and zinc mining in the Missouri portion of the Tri-State Mining Area in 1918, it is possible that certain mining companies moved their operations to Kansas and Oklahoma. TechLaw understands that EPA has previously conducted potentially responsible party research into the mining activities in these states. Current corporate status information may be contained in these reports for some of the mining companies listed in the Jasper County Mining Database.

APPENDIX A

DOCUMENT REFERENCES

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59. Geological Map Showing Mining and Mineralized Areas, Missouri, Jasper-Newton Counties, Township 27 North, Range 33 West and Township 27 North, Range 34 West, prepared by the State of Missouri Geological Survey and Water Resources, 1916 to 1921.

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65. U.S. Geological Survey Maps

APPENDIX B

MINE LOCATION INDEX

This index of mine names was compiled from maps contained in the 1894 Report, the MDNR Study, and the mining maps obtained from the Silva Library (1, 58 - 64). The locations of these mines are presented in terms of Township (T), Range (R), Section (S), and Quarter Section (QS). Document reference numbers are presented in the right-hand column. The document reference numbers are contained in parenthesis. Numbers to the right of the parenthesis are mine location references from the referenced maps.

MINE NAME	T	R	S	QS	Reference
10 O'Clock	28	32	28	NE	(61)-141
1909 Mine	29	32	6	SW	(64)-49
1915 Mine	28	34	14	SE	(63)-203
4 and 6	27	33	14	NW	(59)-143
A No. 1	27	33	14	SW	(59)-147
A. B. R.	28	32	28	NE	(61)-139
A.B.C. Mine	28	33	32	SE	(63)-156
A.W.C. No. 1	27	33	6	SE	(59)-43,(58)-10,11
A.W.C. No. 2	27	33	6	SE	(59)-44
A.W.C. No. 3	27	33	6	SE	(58)-12
A.W.C. No. 3	27	33	7	NE	(59)-45
A.W.C. No. 5	27	33	6	SE	(59)-38
Aberdeen	28	34	23	NW	(63)-196
Acton Shaft	28	33	34	SW	(1)
Ad Valorem	27	33	16	SE	(59)-163
Adams & Hicks	27	34	24	NE	(58)-2
Adams & Hicks	27	34	24	SE	(59)-236-N,(58)-3
Adelaide	27	33	4	SE	(59)-112
Adirondack	27	33	9	NE	(59)-79
Aelor M. Co.	28	32	17	SE	(1)
After Glow Mine	28	32	6	SW	(58)-8
Airdale	27	33	6	NE	(59)-35,(58)-3,4,5
Alabama	28	32	34	NE	(61)-203
Alabama	28	32	34	NW	(61)-203,(58)-2,3
Alba Co.	29	32	16	SE	(1)
Alba Mines (district)	29	32	15	SW	(1)
Alba Mines (district)	29	32	16	SE	(1)
Albatross	29	32	22	NW	(64)-41

MINE NAME	T	R	S	QS	Reference
Albatross	29	32	15	SW	(64)-41
Albatross Mining Co.	29	32	15	SW	(1)
Albert	28	34	25	SW	(63)-229
Albert F.	28	32	28	NW	(61)-124
Allegheny	29	34	23	NE	(62)-25
Allegheny-Western	29	34	14	SE	(58)-2,3
Allegheny-Western	29	34	23	NE	(58)-3,4,5
Amalgamated	27	33	4	NE	(59)-3
Amblon	28	33	33	SE	(58)-2
American Beauty	28	32	6	SW	(61)-3,(58)-2
American Beauty	28	32	6	SE	(61)-3
American Davey	28	32	21	NE	(61)-77
American Davey	28	32	21	NW	(61)-77
American Davey	28	32	16	SW	(61)-77
American Davey	28	32	16	SE	(61)-77
American Davies Mine	28	32	21	NW	(58)-44
American Davies Mine	28	32	21	NE	(58)-45
American M. & E. Co.	28	33	21	NE	(63)-80
American Mill, E.P.	29	32	31	SW	(64)-62
Anderson	28	33	33	SW	(63)-136
Anna	27	33	4	SE	(59)-113
Anna Linda	29	32	8	NE	(64)-11
Anna Linda	29	32		8	(64)-11
Annabell	27	32	13	SE	(60)-58
Anne Baxter Mine	27	33	15	SW	(58)-1
Appleknocker	28	32	34	NW	(58)-11,12
Apple Knocker, Old	28	32	34	NW	(61)-185
Argo	28	32	21	NW	(61)-73
Arkansan	28	33	33	NW	(63)-131
Arkansas (George M.)	28	32	28	NW	(61)-120
Armiralty Zinc Co.	27	33	14	SE	(59)-159
Athletic	28	33	12	SE	(63)-10
Athletic	27	32	3	NW	(60)-14
Athletic	27	32	4	NE	(60)-14
Atlas	28	32	21	SE	(61)-101
Atlas Shaft (Boston Get)	28	32	21	SE	(58)-4
Attic C	28	32	31	NW	(61)-162
Audrain	27	33	4	SE	(59)-101
Avondale	28	32	21	SW	(61)-115
Aylor, J.W. land	28	32	30	SE	(1)
Aylor, J.W. land	28	32	30	NE	(1)
B. and C.	27	33	4	SE	(59)-100
B. and H. No. 1	28	33	33	SW	(63)-134
B. and H. No. 2	28	33	33	SW	(63)-137
Baby Girl	27	33	16	NE	(59)-78
Bacon	27	33	13	SW	(59)-158
Bacon and Bailey	28	32	31	NW	(61)-160
Baker	28	33	33	NW	(63)-144

MINE NAME	T	R	S	QS	Reference
Baker Shaft, Possum Hol.	28	33	33	NE	(1)
Ball Gunning	29	32	8	NE	(64)-10
Baltic	27	32	10	NW	(60)-18,(58)-1
Baltic	27	32	3	SW	(60)-18
Baltimore	27	33	4	NW	(59)-18,(58)-5,6
Banty Hen	27	33	7	SW	(59)-215
Barker Shaft	27	33	11	SW	(1)
Barnett & Walker	27	33	18	SE	(59)-223
Barnsdall No. 14	29	34	14	SW	(62)-14
Barnsdall No. 2	29	34	22	NW	(62)-22
Barnsdall No. 2	29	34	22	NE	(58)-1,2,3,5,6,15,16
Barr and Son	28	34	25	NE	(63)-208
Batavia	28	32	21	SE	(61)-102
Battle Ax	29	32	16	NE	(64)-23
Beacon Hill	28	33	32	NE	(63)-153
Beasley Shaft	28	32	17	NW	(1)
Belleville Mining Co.	28	34	25	NE	(1)
Ben B.	27	33	6	SW	(59)-49,(58)-13
Ben Franklin	28	32	17	SW	(61)-55,(58)-35-38
Bentley Mines	28	34	36	NE	(1)
Berkey Tailing Mill	29	32	10	SW	(64)-63
Bertha A.	28	33	12	SE	(63)-11
Bertha B.	27	33	11	SW	(59)-134
Betsy Jane	28	34	36	SW	(63)-250
Beulah C	28	32	17	SW	(61)-57
Beulah Mine	28	32	17	SW	(58)-26
Beville M. Co.	28	31	27	NE	(1)
Big 3	27	33	16	NW	(59)-64
Big 4	27	33	4	SE	(59)-114
Big Dick	28	32	31	SW	(61)-158
Big Eight	27	33	4	NW	(59)-11
Big Elm M. Co.	28	32	21	SW	(1)
Big Hit	28	32	17	SE	(61)-67
Big Indian	29	32	6	SE	(64)-46
Big Irishman	28	33	22	SE	(63)-45
Big Joe, Old (Napoleon)	28	33	22	NW	(63)-47
Big Kate Mine	29	32	8	NW	(58)-6-8
Big Mixer	28	34	25	SW	(63)-228
Big Run Mine	28	33	33	NE	(1)
Big Western	28	33	16	SW	(63)-30
Billie B.	28	33	19	NE	(63)-75
Bird Dog	28	32	17	NW	(61)-41
Black Calf	27	32	10	SE	(60)-45
Black Cat	28	32	7	NE	(61)-10
Black Cat	28	34	11	NE	(63)-189,(58)-1
Black Diamond, Old	27	33	3	SW	(59)-105

MINE NAME	T	R	S	QS	Reference
Black Hawk	28	33	29	SE	(63)-117
Black Jack East	27	33	20	NW	(58)-5
Black Jack West	27	33	19	NE	(58)-1
Blackberry	27	33	4	NE	(59)-4
Blair Boy	28	32	31	NW	(61)-163
Blizzard	28	34	36	NW	(63)-236
Bloc City	28	34	36	NW	(63)-232
Block City Mine	28	34	36	NW	(1)
Blossom	28	34	25	NE	(63)-217
Blue Bird	27	33	3	SW	(59)-121
Blue Rock	29	34	14	SW	(62)-13,(58)-4,5,6
Blue Stern	27	33	9	NW	(59)-76
Blue Wing	28	32	17	SE	(61)-65
Bob Ingersoll	28	33	32	SE	(63)-169
Bob McGee	27	32	10	NW	(60)-51
Bonnie Bell	28	33	21	NW	(63)-61
Boss	27	33	11	SE	(59)-188
Boston Get There-AtlasS	28	32	21	SE	(58)-4
Boston Get There-PhoenixS	28	32	21	SE	(58)-3
Boston Get There-WalkerS	28	32	21	SE	(58)-2
Boston Get There-WilgusS	28	32	21	SE	(58)-5
Boston-Cherokee	28	33	32	NE	(63)-147
Boulder Mill	27	33	29	SW	(59)-228-N
Boulder Mining Co.	28	33	33	NW	(63)-126
Bradley No. 2	27	33	5	NW	(59)-32
Brewington	27	33	11	NE	(59)-192
Briar Patch	28	34	24	NW	(63)-204
Brick Mill Mine	28	32	17	SW	(58)-17
Brock Mine	27	31	7	SE	(1)
Broken Hill	28	33	22	NW	(63)-82
Brookfield	27	33	14	SW	(59)-146
Brooklyn	27	32	4	SE	(60)-22
Brooklyn	28	33	33	NW	(63)-121
Brown	27	33	9	NE	(59)-81
Brown and Company	29	32	10	SW	(64)-32
Bryant Mine	28	33	7	SE	(58)-6,7
Bryant Mine	28	33	7	NE	(58)-7
Buck L. and Z. Co.	28	34	14	SE	(63)-200
Buckeye	27	33	9	SE	(59)-72
Buckeye Mining Co.	28	34	25	SW	(1)
Buckeye Mining Co.	28	34	25	SE	(1)
Budweiser	28	33	21	NE	(63)-79
Buffalo Bill	27	33	4	SE	(59)-115
Bull Dog	27	32	17	SW	(60)-72
Bull Durham	28	33	17	SE	(63)-24
Bull Frog	27	33	4	NE	(59)-6,(58)-2
Bulldog	28	32	6	SW	(61)-7,(58)-9,10

MINE NAME	T	R	S	QS	Reference
Bumble Bee	27	33	13	NW	(59)-164
Bunker Hill	27	33	5	NE	(59)-21
Bunker Hill	27	33	4	NW	(59)-21
Burch	27	32	11	SW	(60)-55
Burch Diggings	27	31	11	NW	(1)
Burch M. Co.	28	32	16	SW	(1)
Burgner land	28	32	20	NE	(1)
Burgner land	28	32	20	SE	(1)
Butler	27	33	11	NW	(59)-128
Buzzard	29	32	9	SW	(64)-14
Byers, Conner & Murphy	27	33	4	SE	(1)
C and D	28	32	28	SW	(61)-128,(58)-9
C. and B.	28	33	21	NW	(63)-60
C. and S. (Old Imperial)	28	34	35	SW	(63)-245
C. and S. (Old Imperial)	28	34	35	NW	(63)-245
C. and S. No. 2	28	33	12	NE	(63)-7
C. and S. No. 5	28	33	12	NE	(63)-6
C. C.	28	33	32	SE	(63)-166
Calumet Zinc Co.	29	32	8	NW	(64)-4
Cantaline	28	34	36	NW	(63)-235
Captain	27	33	3	SW	(59)-93
Carico	27	33	7	SE	(59)-216
Carlatt	28	32	19	NE	(61)-110
Carlisle	27	33	11	SW	(59)-135
Carlstead Tailing	28	32	29	NE	(61)-213
Carlyle	28	34	25	SE	(63)-259
Carthage Mines	28	31	8	NE	(1)
Cataract	27	33	5	NW	(59)-29
Cayle King & Co.	27	33	14	NW	(59)-218
CC M. Co.	28	32	17	NW	(1)
Center Creek M. Co. Mine	28	32	18	SE	(58)-5,6,7
Center Creek M. Co. Mine	28	32	17	SW	(58)-29-32,34
Center Creek M. Co. Mine	28	32	17	NW	(58)-63
Center Creek M. Co. Mine	28	32	18	NE	(58)-3,4,5
Center Creek Mines	29	32	31	part	(1)
Center Creek Mines	29	33	36	part	(1)
Center Creek Mining Co.	28	32	18	NE	(1)
Center Creek Mining Co.	28	32	18	SE	(1)
Center Creek Mining Co.	28	32	17	SW	(1)
Center Creek Mining Co.	28	32	17	NW	(1)
Central	29	32	15	NW	(64)-39
Centralia	28	33	21	NW	(63)-59
Century	27	32	3	SW	(60)-20
Century Zinc Co.	29	32	8	NE	(64)-7
Chapel	28	32	34	NW	(61)-193
Chapel	28	32	34	NE	(61)-193
Chapman Bros.	28	32	8	SW	(61)-39
Chapman Bros.	28	32	8	SE	(61)-39

MINE NAME	T	R	S	QS	Reference
Chapman Land Co. Mine	28	32	8	SW	(58)-1,2
Chapman, Lennan & Carter	28	33	15	SW	(63)-36
Chapman, Lennan & Carter	28	33	22	NW	(63)-36
Charter Oak	28	32	21	SE	(61)-103
Charter Oak	28	32	17	SE	(61)-60,(58)-9-13
Chase	27	33	12	SW	(59)-177
Chatham M. Co. (440 ac)	28	32	19	SE	(1)
Chatham M. Co. (440 ac)	28	32	20	NW	(1)
Chatham M. Co. (440 ac)	28	32	18	SE	(1)
Chatham M. Co. (440 ac)	28	32	17	SW	(1)
Chatham M. Co. (440 ac)	28	32	20	NE	(1)
Chatham M. Co. (440 ac)	28	32	20	SE	(1)
Chatham M. Co. (440 ac)	28	32	20	SW	(1)
Cherokee	28	33	28	NE	(63)-96
Chicago Consolidated	28	33	32	SE	(58)-3,4
Chicago-Joplin	27	33	8	SE	(59)-54
Chicago-Lehigh	28	33	7	SE	(63)-16,(58)-5
Chicago-Lehigh	28	33	7	NE	(63)-16,(58)-1,2,3,4
Childress	27	33	19	NE	(59)-207-N
Childress&Messenger	27	34	12	NE	(59)-233
Childress&Messenger	27	34	12	SE	(59)-233
Chitwood Joplin	28	33	32	NE	(63)-119
Chitwood-Bessie	28	33	32	NE	(63)-146
Chrisman	29	32	9	SE	(64)-28
Church	28	33	7	SW	(63)-17
Church & Company Mine	28	32	6	SW	(58)-11 to 15
Church - Mitchell	28	32	33	NW	(61)-170
Cinamo	28	32	29	NE	(61)-156
Cisco No. 1	28	32	7	NW	(61)-29
Cisco No. 3	28	32	19	SE	(61)-112
Clara Bell	28	33	31	NW	(63)-109
Clear Mine	27	32	16	NE	(60)-71
Clear-Peacher	27	32	16	NW	(60)-42
Cliff	28	33	33	SW	(63)-132
Cliffwood	29	33	1	NE	(62)-2
Clover Leaf	27	33	3	SW	(59)-98
Coaheila	28	32	33	SE	(61)-175,(58)-6
Coaheila	28	32	33	NE	(61)-175,(58)-5,6
Coal Mine	29	32	10	SE	(64)-31
Coatts and Ortt	28	33	21	SW	(63)-57
Coatts and Ortt	28	33	21	SE	(63)-57
Coble	28	33	21	NE	(63)-81
Cock Robin	28	33	32	SE	(63)-168,(58)-1
Colgair	28	33			(63)-104
Colony (now Taneycomo)	28	32	34	NE	(61)-204
Colorado	28	34	35	SE	(63)-242
Columbia Mining Co.	28	33	20	NE	(63)-184

MINE NAME	T	R	S	QS	Reference
Combination	27	33	11	NE	(59)-194
Comet	28	32	17	NW	(61)-51,(58)-51-62
Concord Mine	28	32	17	SE	(58)-4,5
Condor	27	33	4	NW	(59)-15,(58)-3
Conolidated Mining Co.	27	33	2	NW	(1)
Conolidated Mining Co.	28	33	35	SW	(1)
Conqueror	28	33	32	SE	(63)-175
Consolidated	29	32	24	SW	(64)-42
Consumers	27	33	7	NE	(59)-46
Continental Mine	28	32	21	NW	(58)-35-43
Cook Forty	27	33	2	SE	(1)
Coon, Old	27	33	14	SE	(59)-154
Cooper and Peters	28	33	32	NW	(63)-115
Copley	28	34	25	SE	(63)-258
Cora Lotta Mining Co.	27	33	1	SW	(1)
Cornell Shaft	28	31	18	NE	(1)
Cornfield	28	32	20	NE	(61)-69,(58)-1,2
Cornfield M. Co.	28	32	17	SE	(1)
Cornfield M. Co.	28	32	20	NE	(1)
Coronation Mine	28	32	34	SW	(58)-7
Cottonwood Mines	28	33	31	NW	(1)
Cottonwood Mines	28	33	31	NE	(1)
Cowbell	27	33	11	SW	(59)-138
Cowhead	27	33	9	NE	(59)-118
Cox and Pierce	27	33	12	SW	(1)
Coyne	28	32	20	SE	(61)-85
Coyote	27	33	6	NE	(59)-34,(58)-1,2
Crackerjack	28	33	33	SW	(63)-135,(58)-5
Croesus	28	32	21	SW	(61)-208
Crossman Mines	27	32	7	SW	(1)
Crossroads	28	33	21	SW	(63)-65
Crown Crest	27	32	10	NE	(60)-52
Crown Crest	27	32	10	SE	(60)-52
Crown Point	27	32	10	NE	(60)-61
Crusan Mill	28	32	7	SW	(61)-216
Crusan Mill	28	32	7	NW	(61)-216
Cumberland	28	33	32	NE	(63)-118
Cumberland	28	32	28	NW	(61)-119,(58)-15
Cumberland	28	32	17	SE	(61)-62
Cygni M.Co.(Old M&S)	28	32	28	NW	(61)-121
D. and Y.	28	33	20	NW	(63)-67
D.C. and E.	28	33	1	SE	(63)-4, (58)-2
Dagley-Peck-Randall	27	33	14	NE	(59)-219
Daisy Bell	28	34	23	NW	(63)-197
Damfine	27	33	4	NW	(59)-10
Damfine	27	33	4	NE	(59)-10
Danglade	28	32	28	NW	(61)-127
Danglade	28	32	28	SW	(61)-127,(58)-8

MINE NAME	T	R	S	QS	Reference
Danville M. Co.	28	32	16	NE	(1)
Danville M. Co.	28	32	16	SE	(1)
Davey land	28	32	16	NW	(1)
Davey land	28	32	16	SW	(1)
Davey land	28	32	16	SE	(1)
Davis mine	28	30	29	NE	(1)
Davy Crockett	29	32	24	SW	(64)-43
Davy Crockett	29	32	24	SE	(64)-43
Daylight	28	32	17	NW	(61)-44,(58)-74-76
De Graff	28	34	36	SW	(63)-251
Dead Horse	27	33	14	NE	(59)-175
Dead Horse	27	33	11	NE	(59)-199
Dead Mule	27	33	9	NE	(59)-117
Deep Rock	28	33	32	SE	(63)-173
Deerpark Mining Co.	27	33	26	SE	(59)-227-N
Diamond Jack	28	33	32	SE	(63)-150
Diamond Mining Co.	27	33	16	SE	(1)
Dickey	28	32	20	NW	(61)-90,(58)-16
Dinger	28	32	17	NW	(61)-42
Disbrow	28	32	17	NW	(61)-43
Dixie	28	32	29	NE	(61)-142
Dominion	28	32	21	SW	(61)-116,(58)-26
Dorothy	27	33	4	SE	(59)-90
Double Eagle	27	32	3	NE	(60)-4,(58)-2
Dudley's Mill	28	29	17	part	(1)
Duffelmeyer	27	33	11	SE	(59)-190
Duffelmeyer	27	33	11	NE	(59)-190
Duluth Mine	28	32	17	SW	(58)-27,28
Dundas	28	33	31	NE	(63)-112
Duquesne					(59)-211-N
Duquesne	27	34	24	NE	(59)-234-N
Duquesne	27	33	19	NE	(59)-234-N
Durlap land	28	32	8	SE	(1)
Dutchmans Dream	28	33	20	NW	(63)-69
Eagle Mines	27	33	16	SE	(1)
Eagle Mines	27	33	15	SW	(1)
Eagle North Mine	27	33	15	SW	(58)-3
Eagle South Mine	27	33	15	SW	(58)-2
Eaglewood	28	34	25	NE	(63)-210
Eakins Custom Mill	28	32	21	SE	(61)-212
Eakins Tailing Mill	28	32	21	SW	(61)-211
Ealor Mining Co. Mine	28	32	17	SE	(58)-14,15
East 15th Street	27	33	12	SW	(59)-200
East Ground Floor	28	32	7	NW	(61)-11
East Ground Floor	28	32	7	NE	(61)-11
East Hill Top	29	32	31	SW	(64)-52
Eastern Star M. Co.	28	32	21	NE	(1)
Eden	27	33	9	SE	(59)-69

MINE NAME	T	R	S	QS	Reference
Edgar land	28	32	16	SW	(1)
Edith	27	33	3	SW	(59)-213
Edwina	29	32	9	SE	(64)-27,(58)-2
Egyptian	28	32	34	NE	(61)-198
Eleanor	28	34	36	NW	(63)-237
Electrical M. Co.	28	32	7	NW	(61)-22,(58)-7
Eleventh Hour M. Co.	28	32	21	SW	(1)
Eleventh Hour M. Co.	28	32	21	SE	(1)
Eleventh Hour Mine	28	32	21	SE	(1)
Eleventh Hour Mine	28	32	21	SE	(58)-12,15,16,19
Eleventh Hour Mine	28	32	21	SW	(58)-17-20
Ellen B.	28	34	36	NE	(63)-266
Elliot land	28	32	19	SE	(1)
Ellipse M. Co.	28	32	21	NW	(1)
Emma	28	33	16	SW	(63)-31
Emperor	27	33	19	NW	(59)-209-N
Empire Zinc Co.	27	33	16	SE	(58)-1
Empire Zinc Co.	27	33	16	SE	(1)
Empire Zinc Co.	27	33	15	SW	(1)
Empire Zinc Co.	27	33	4	SE	(1)(post89)
Empire Zinc Co.	27	33	3	SW	(1)(post89)
Empire Zinc Co.	27	33	9	NE	(1)(post89)
Empire Zinc Co.	27	33	10	NW	(1)(post89)
Empress #2 Mine	28	32	8	SW	(58)-5
Empress No. 2	28	32	8	SW	(61)-143
Engineers	28	32	7	NW	(61)-13
England land	28	32	9	SW	(1)
Equitable	28	34	35	SE	(63)-241
Ethel Gray	28	33	32	SE	(63)-157
Etta May	28	34	35	SE	(63)-240
Eureka	28	34	25	NE	(63)-219
Evans-Hall-Soy	27	32	4	NE	(60)-24
Evansville	27	33	9	SE	(59)-68
Evansville-No. 1	29	32	8	NE	(64)-5
Excel	27	33	3	SW	(59)-104
Excelsior	28	33	18	SW	(63)-27
Express	29	32	8	NE	(64)-12,(58)-1
F. and B.	27	32	2	SW	(60)-12
F.R.L.	27	33	13	SW	(59)-157
Federated	28	33	15	SW	(63)-37
Federated	29	32	15	NW	(64)-34,(58)-3
Federated L&Z Co. Mine	29	32	9	NE	(58)-1
Fenix-Martin	29	32	31	SW	(64)-60
Fenix-Martin Mill	29	32	31	SW	(64)-61
Fidelity	28	32	34	NW	(61)-186
Fidelity	28	32	34	SW	(58)-8
Fighting Wolf	28	33	30	SW	(63)-98
First Luck	28	34	11	NE	(63)-191

MINE NAME	T	R	S	OS	Reference
First National	28	32	34	NE	(61)-197
Fleming Diggings	27	31	6	NE	(1)
Florence	28	33			(63)-127
Florence G.	28	34	14	SE	(63)-202
Florine	28	32	18	NW	(61)-30,(58)-11
Florine Shaft (Milan M.)	28	32	28	NW	(58)-10
Flynn & Co.	27	34	12	NE	(59)-232
Fort (now Hartford)	28	32	34	SW	(61)-187
Fort Scott Shaft	27	32	4	NE	(60)-27
Foster	27	33	14	SE	(59)-156
Fountain	28	32	16	NW	(1)
Fountain et al.	28	32	16	NW	(1)
Four Corner Diggings	27	33	2	NW	(1)
Four Corners Mine	28	34	25	NW	(63)-206
Francis	27	33	11	SE	(59)-179
Francis T.	28	33	17	SE	(63)-22
Franklin	27	33	4	SE	(59)-111
Franklin	27	32	3	NE	(60)-2,(58)-4
Freehold No. 1	29	34	22	NW	(62)-18
Freehold No. 1	29	34	22	NE	(62)-18
Freehold No. 2	29	34	14	SW	(62)-19,(58)-10,11
Freehold No. 3	29	34	23	NW	(62)-20,(58)-6-11
Freehold No. 4	29	34	15	SE	(62)-21
Freehold No. 4	29	34	15	NE	(62)-21
Freeman	28	34	25	NE	(63)-220
Freeman	28	33	16	SW	(63)-85
Friday	27	33	14	NW	(59)-145
Frisco	28	33	20	NE	(63)-63
Fullerton	28	32	17	SE	(61)-66,(58)-6,7
G.C. and M. Mine	28	32	7	SE	(61)-31
Gabriel Mine	27	32	4	NE	(58)-1
Gardner	27	32	4	NE	(60)-25
Gardner and Dean	27	33	11	NW	(59)-124
Garrison L & Z Co.	28	32	19	NE	(1)
Gas Shaft	28	33	32	SE	(63)-158
Gascho	29	34	14	NW	(62)-12,(58)-7,8,9
General	28	34	35	NE	(63)-238
George H	28	32	28	NW	(61)-122
Geronimo	27	33	7	SE	(59)-58
Geronimo	27	33	8	SW	(59)-58
Geronimo	28	33	30	SW	(63)-100
Get There M. Co.	28	32	21	SE	(1)
Gibson	28	32	28	SW	(61)-132,(58)-2
Gibson	27	33	6	SE	(59)-36,(58)-6,7
Gibson Girl	28	33	32	SE	(63)-176
Gimlet	27	34	24	SE	(59)-237-N
Gimlet	27	34	24	SE	(58)-4-7,9-11
Gimlet	27	34	24	SW	(58)-8

MINE NAME	T	R	S	QS	Reference
Gladstone	28	32	21	NW	(61)-72
Gladys Mine	28	32	20	SW	(58)-13
Glendale	27	33	3	SW	(59)-99
Globe M & M Co.	28	30	17	part	(1)
Globe M & M Co.	28	30	8	part	(1)
Gobar	27	33	4	SE	(59)-110
Gobar	27	33	11	NW	(59)-129
Gobar & Tomlinson Shaft	27	33	11	SW	(1)
Gobbler	28	32	21	SE	(61)-96,(58)-10,11
Golden Glow	28	32	6	SW	(61)-4,(58)-1
Goldenrod	28	33	33	SW	(63)-141
Goldfield	29	32	8	NW	(64)-58
Gooch	27	32	2	SW	(60)-9
Good Enough	28	33	32	SW	(63)-161
Good Friday	29	32	16	NE	(64)-25,(58)-1
Good Sheperd	29	32	8	NW	(64)-3,(58)-5
Good Wednesday	29	32	15	NW	(64)-35,(58)-1,2
Good Will	29	32	31	SW	(64)-54,(58)-1-7
Goodrich	28	32	28	NW	(61)-123,(58)-13,14
Goodwin & Co.	27	33	18	NE	(59)-222
Goodyear	29	34	22	NE	(58)-7 thru 14
Googie	28	32	29	NE	(61)-150
Gore	29	32	9	SW	(64)-15,(58)-7,8
Gotham	28	32	28	SW	(61)-129
Gouvernour	28	33	18	SW	(63)-26
Grace	28	33	33	SW	(63)-129
Grace	28	33	33	SW	(63)-139
Grace No. 1	28	33	33	SW	(63)-142
Grace No. 3	28	33	33	SW	(63)-143
Grace No. 3	28	33	33	NW	(63)-143
Granby M&S Co. land	28	32	8	SW	(1)
Granby M. & Smelting Co.	27	33	2	SE	(1)
Granby M. & Smelting Co.	27	33	11	NE	(1)
Granby M. & Smelting Co.	28	33	33	SE	(1)
Granby M. & Smelting Co.	28	33	33	SW	(1)
Granby M. & Smelting Co.	28	33	34	SE	(1)
Granby M. & Smelting Co.	28	33	34	SW	(1)
Granby M. & Smelting Co.	28	33	33	NE	(1)
Grand Central	27	33	9	SW	(59)-63
Grand Haven	28	32	32	NW	(61)-167
Grasselli #2, Shaft #1	28	33	16	SW	(63)-38
Grasselli #2, Shaft #2	28	33	16	SW	(63)-39
Grasselli #2, Shaft #3	28	33	16	SW	(63)-40
Grasselli #2, Shaft #4	28	33	16	SW	(63)-41
Grasselli #2, Shaft #5	28	33	16	SW	(63)-42
Grasselli #2, Shaft #6	28	33	16	SW	(63)-43
Grasselli #2, Shaft #7	28	33	16	SW	(63)-44
Grasshopper	28	32	21	SW	(61)-93,(58)-21-23

MINE NAME	T	R	S	QS	Reference
Gray Goose	28	33	28	NE	(63)-92
Great Northern Mine	28	33	7	SE	(58)-8,9
Great Western Z.&L. Co.	27	32	6	SE	(1)
Great Wonder	28	32	17	SE	(61)-61,(58)-8
Greatest American	28	33	20	SW	(63)-66
Greatest American	28	33	20	NW	(63)-66
Green Castle	27	32	7	SW	(60)-35
Green Snake	27	32	6	SE	(60)-33
Green Valley	27	32	5	SW	(60)-62
Greenhorn	27	32	10	SW	(60)-47
Greenhorn M. Co. land	28	32	8	SE	(1)
Gregg Shaft	27	33	18	SE	(1)
Gretchen Lead & Zinc Co.	28	33	31	NW	(1)
Gretchen Lead & Zinc Co.	28	33	31	SW	(1)
Greyhound	27	33	9	NE	(59)-91
Gross	27	33	11	SW	(59)-137
Ground and Irwin	28	32	33	NE	(61)-174
Ground Floor	28	32	7	NW	(61)-9,(58)-10,11
Groundhog	27	33	14	NW	(59)-140
Grove Creek Diggings	27	32	12	NW	(1)
Grundler	28	34	35	SE	(63)-243
Guengerich & Gregg Shaft	28	33	31	NW	(1)
Guinn & Lloyd Mines	27	33	14	NE	(1)
Guinn & Lloyd Mines	27	33	14	SE	(1)
Guinn & Lloyd Mines	27	33	13	NW	(1)
Guinn & Lloyd Mines	27	33	13	SW	(1)
Guinn, John C. (640 ac)	28	32	7	SW	(1)
Guinn, John C. (640 ac)	28	32	7	SE	(1)
Guinn, John C. (640 ac)	28	32	8	SW	(1)
Gulch	28	33	18	NW	(63)-18
Gulch	28	33	18	NE	(63)-18
Gussie K.	28	32	33	SW	(61)-178,(58)-7
H. and F.	28	32	29	SW	(61)-138
H.C. and M.	27	32	10	NW	(60)-65
Hagerton & Warren	27	33	26	NE	(59)-226-N
Hamburg	27	33	14	NE	(59)-170
Hamilton Shaft	27	33	1	SW	(1)
Hancock	27	33	9	SE	(59)-74
Hansel	28	33	12	SE	(63)-12
Happy Jack	29	32	9	SE	(64)-20,(58)-3
Happy Rock Mine	27	34	2	NE	(58)-1
Harrington Shaft	27	33	3	NW	(1)
Harrison	27	33	5	NE	(59)-22
Hartford	27	34	2	SE	(59)-230
Hartford (Old Fort)	28	32	34	SW	(61)-187
Hasler & Thomas land	28	32	8	SW	(1)
Hawk and Company	27	33	13	NW	(59)-166
Hayes Shaft	28	33	34	SW	(1)

MINE NAME	T	R	S	QS	Reference
Hayseed	29	32	25	NE	(64)-44
Hegoda	27	33	11	SE	(59)-184
Henckel Mine	27	32	24	SW	(58)-1
Henderson L. & Z. Co.	28	33	19	NW	(63)-78
Henry Tucker Shaft	28	33	34	NW	(1)
Herbert S. Mine	28	33	12	NE	(58)-2,3
Hercules	28	32	34	SW	(61)-189
Herold M. Co.	28	32	29	NE	(1)
Herring	27	33	11	SE	(59)-189
Hickory	28	34	25	NE	(63)-213
Hickory, Old	28	33	32	SE	(63)-164
High Five	29	34	15	SW	(62)-16
High Five	29	34	15	SE	(62)-16,(58)-2-8
High Five	29	34	15	SE	(62)-17
High Grade	27	33	14	NW	(59)-220
High Grade M. Co.	27	33	5	NW	(59)-224
High Tariff	28	33	16	SW	(63)-84
Hoboken	27	33	9	NE	(59)-82
Hoge	28	32	17	SE	(61)-108
Holden	28	34	13	SE	(63)-262
Holy Smoke Mine	28	32	21	SW	(58)-24
Home Mining Co.	27	33	15	NE	(1)
Homestake	28	34	12	NE	(63)-261
Homestead	28	32	20	NE	(61)-70
Homestead	28	32	17	SE	(61)-70
Homestead M. Co.	28	32	17	SE	(1)
Homestead M. Co.	28	32	20	NE	(1)
Hoo-Hoo	29	32	9	SW	(64)-13
Hood Shaft	27	32	7	SW	(1)
Hopi Mining Co.	28	33	16	SE	(63)-182
Hornedy	27	33	12	SW	(59)-178
Horseshoe	27	33	4	NE	(59)-8
Horseshoe	28	34	25	NW	(63)-207
Hot Air	28	32	29	NE	(61)-146
Hough land	28	32	19	SW	(1)
Hough land	28	32	19	NW	(1)
Houston	28	34	25	NE	(63)-222
Howard	27	33	11	NE	(59)-197
Huckleberry	28	33	31	NW	(63)-105
Huddleston	28	33	28	NE	(63)-95
Hughes Sludge Mill	28	32	7	SE	(61)-215
Hummel Bros. land	28	32	9	SE	(1)
Hunch Bugger	28	34	25	NE	(63)-216
Hurry Up	28	32	7	NW	(61)-12,(58)-9
Hutchinson Mine	27	33	20	SE	(58)-1,2
Hyde Park	28	32	34	SE	(61)-192,(58)-4
I Know	27	33	4	NE	(59)-9
Ice Plant	28	32	7	SE	(61)-25

MINE NAME	T	R	S	QS	Reference
Illinois & Missouri Co.	28	33	30	SW	(1)
Illinois Zinc Co.	28	33	8	SE	(63)-181
Imperial	28	32	7	SW	(61)-24
Imperial, Old(C. and S.)	28	34	35	SW	(63)-245
Imperial, Old(C. and S.)	28	34	35	NW	(63)-245
Incline	28	32	17	NW	(61)-45,(58)-72,73
Indiana Mine	29	33	18	SE	(62)-7,(58)-1 thru 5
Iowa Mining Co.	28	33	8	NW	(63)-180
Isabella M. Co.	29	32	10	SW	(64)-33
Isabella Mine	29	32	10	SW	(58)-1
Isherwood Mine	28	34	12	NW	(58)-1,2,3,4
Island	27	33	11	NE	(59)-195
Isley	28	34	36	NW	(63)-233
J.A.T.	28	33	21	SE	(63)-56
J.B.S. Mine	27	32	16	NE	(60)-69
J.M. Slaight	28	32	17	SW	(61)-59,(58)-24,25
Jack Daw	28	33	33	SW	(63)-140
Jack Harvard	27	33	4	SE	(59)-94
Jack Johnson	28	33	32	SE	(63)-160
Jack Johnson	28	33	32	SW	(63)-160
Jack Rose	27	33	5	NE	(59)-24
Jackpot	27	32	18	NW	(60)-39
Jacobs Brothers	27	32	7	NE	(1)
James	28	34	35	NW	(63)-244
Jasper Cnty. Land &M Co.	28	32	28	NW	(58)-12
Jasper Diggings	27	33	11	NE	(1)
Jasper Mining Co.	28	33	34	NW	(1)
Jersey P.	29	32	16	NE	(64)-24
Jersey P. Mine	29	32	16	NE	(58)-2
Jewell	28	33	33	NW	(63)-123
John Jackson	28	33	32	SE	(63)-163
John L. Mine	28	33	12	NE	(58)-1
Johnson	28	34	36	NE	(63)-256
Johnson Diggings	27	32	20	SE	(60)-59-N
Johnson Mine	27	33	26	NE	(59)-225-N
Joplin Mines Co.	27	32	18	SW	(60)-40
Joplin-Kentucky	28	33	32	NW	(63)-116
Juanita	27	32	10	NW	(60)-50
Juggernaut	28	34	36	NE	(63)-253
K.C.B. Mining Co.	29	33	18	SE	(62)-5
Kandy Kid	27	32	10	SW	(60)-44
Kans.Expl.Inc. Isherwood	28	34	12	NW	(63)-190
Kans.Expl.Inc. Martin	28	34	11	NE	(63)-188
Kans.Expl.Inc. Martin	28	34	2	SE	(63)-188
Kans.Expl.Inc. Martin	28	34	2	SW	(63)-188
Kansas Exploration Co.	29	33	23	SE	(62)-9
Katherine	28	33	16	SW	(63)-32
Kathleen	28	34	25	SW	(63)-223

MINE NAME	T	R	S	QS	Reference
Katy	28	33	16	SW	(63)-86
Katy Lou	27	33	4	NW	(59)-13
Katydid	28	33	32	NW	(63)-155
Kelley land	28	32	7	SW	(1)
Kelley land	28	32	18	NW	(1)
Kelley land	28	32	19	NW	(1)
Kellor M. Co.	28	32	29	SW	(1)
Kellor M. Co.	28	32	29	SE	(1)
Kelsey Norman Mine	28	33	19	NE	(58)-1
Kentucky L and Z Co.	28	33	32	SE	(63)-165
Kenyon	27	33	11	NW	(59)-132
Konyon	27	33	11	SW	(59)-132
Keystone	28	34	25	NW	(63)-212
Kid Hollow	28	33	31	NE	(63)-110
King Edward	28	32	8	SW	(61)-36
King Jack	28	33	32	SE	(63)-174
King Solomon M. Co.	27	33	17	SW	(1)
King William	27	32	3	SW	(60)-17
King William	27	32	4	SE	(60)-17
Kingfisher	28	33	32	NE	(63)-154
Kirkwood	28	32	20	NE	(61)-81
Knickerbocker	27	32	3	NE	(60)-5
Knoble Mining Co.	28	34	25	NW	(1)
Knox and Co.	27	33	11	NE	(59)-191
Kohinoor	27	33	4	SE	(59)-96
Kohinoor Mines	27	33	4	SE	(1)
Kramer	27	34	2	NE	(59)-229,(58)-2,3
Kramer #1 Mine	27	34	2	NE	(58)-4
Kramer #2 Mine	27	34	2	NE	(58)-5
Kramer Incline Mine	27	34	2	NE	(58)-6
Kramer Mine	29	33	19	SE	(62)-8
Kronprinz	28	33	32	SE	(63)-159
L. C. Mine	28	33	31	NE	(63)-111
La Tosca	29	32	31	SW	(64)-55,(58)-8-14
Lackawanna	28	33	32	NE	(63)-149
Lackawanna	28	33	33	NW	(63)-149
Lambert Custom Mill	27	32	16	NW	(60)-77
Larkins	27	33	11	NE	(59)-193
Last Chance	27	33	14	SW	(59)-149
Latoka	28	32	29	SW	(61)-137
Latoka	28	32	29	SE	(61)-137
Laura	28	32	21	SE	(61)-100
Lawrence and Joplin	27	33	4	SE	(59)-122
Lead Hill	28	34	25	NE	(63)-264
Leadville Hollow	28	33	33	SW	(1)
Leadville Hollow	28	33	33	NW	(1)
Leepers	27	33	24	NW	(59)-161
Lehigh Mine	28	33	7	SW	(58)-14 thru 21

MINE NAME	T	R	S	QS	Reference
Leidy and Henson	28	32	8	SW	(61)-34
Lela	29	32	9	SE	(64)-29
Leonard and Co.	27	33	14	NW	(59)-144
Lewis & Co.	29	32	9	SE	(64)-18,(58)-5
Liberty Bell	27	33	7	NE	(59)-48
Lichliter	27	33	9	SW	(59)-67
Lichliter	28	34	25	SW	(63)-224
Lima	28	32	29	NW	(61)-144,(58)-6
Lindemann	27	33	9	NE	(59)-88
Linzee Mines	28	31	8	part	(1)
Little Bess	28	33	7	NW	(63)-13
Little Bob	27	32	3	SE	(60)-7
Little Coon	27	33	13	NW	(59)-169
Little D	28	32	31	SW	(61)-161
Little Diamond	28	32	17	SW	(61)-52,(58)-46-50
Little Em	29	32	8	NW	(64)-1
Little Francis	29	32	6	SW	(64)-50
Little Hope	27	32	7	SW	(60)-36
Little Mary	29	32	6	SW	(64)-47
Little Mary	29	33	1	NE	(62)-1
Little Nuggett Mill	28	33	34	NW	(63)-186
Little Scott	28	33	32	SE	(63)-170
Live Oak	27	33	8	NE	(59)-51
Lizard	28	33	33	NW	(63)-124
Lloyd	27	33	13	NW	(59)-167
Lock	28	34	23	NE	(63)-195
Log Cabin	27	32	2	SW	(60)-1
Lola	28	33	33	SE	(63)-177,(58)-1
Lone Elm Diggings	27	33	3	NW	(1)
Lone Elm Diggings	28	33	34	SW	(1)
Lone Peach	27	32	6	SE	(60)-63
Lone Star Mine	29	32	8	NE	(58)-2
Long Green Mine	27	32	6	NW	(60)-64
Longacre-Chapman	29	32	8	NE	(64)-9
Loraine	27	32	4	SE	(60)-31
Louisa T	28	34	36	SW	(63)-249
Lounetta	27	33	4	NW	(59)-17
Lucky Abe	28	32	33	SW	(61)-180
Lucky Budge	28	32	21	SW	(61)-117,(58)-25
Lucky Five	27	32	4	NE	(60)-28
Lucky Five	27	32	4	SE	(60)-28
Lucky Five	28	34	36	NW	(63)-234
Lucky George	28	33			(63)-103
Lucky Joe	28	33	18	SW	(63)-28
Lucky Mack	28	33	20	NW	(63)-71
Lucky May	27	33	9	SW	(59)-62
Lucky Mine	29	33	18	SE	(62)-6
Lucky Tiger	29	32	8	NW	(64)-6,(58)-3,4

MINE NAME	T	R	S	OS	Reference
Lucky Tiger	29	32	8	NE	(64)-6
Lucky Tom	28	32	29	NE	(61)-148
Lucy (Sultana #2)	27	33	3	SW	(59)-107
Lucy Bell	28	32	20	NW	(58)-14,15
Lucy Bell	28	32	20	NW	(61)-89
Luscombe	28	32	17	SE	(61)-64,(58)-2,3
Lynch	28	34	25	SW	(63)-231
M&S (now Cygni M.Co.)	28	32	28	NW	(61)-121
M. & H. Custom Mill	28	34	12	NE	(63)-265
M. and B.	27	32	4	SE	(60)-23,(58)-2
M. and B.	27	32	3	SW	(60)-23
M.M. Co.	27	32	2	SW	(60)-10
Madgeburg	27	33	14	NE	(59)-152
Mahaska Mining Co.	27	33	15	SW	(1)
Mahaska Mining Co.	27	33	15	SE	(1)
Mahatma	28	32	29	SW	(61)-136
Mahatma	28	32	29	SE	(61)-136
Mammoth	28	32	29	NW	(61)-153
Mandarian	27	33	5	NE	(59)-30
Mandarin	27	33	8	SE	(59)-55
Manhattan Lease	28	33	28	SE	(1)
Manhattan Mine	28	32	20	SE	(58)-5
Manhattan Mine	28	32	20	SW	(58)-5
Manhattan Mine	28	32	20	SE	(58)-3,4
Manhattan Mine	28	32	20	SW	(58)-3,4
Manning Custom Mill	27	32	16	NW	(60)-76
Marguerite	28	33	28	NE	(63)-93
Marion #1 and #2	27	33	4	SE	(59)-95
Marjorie Stewart	28	32	34	NE	(61)-196,(58)-1
Markapaux	27	33	11	SE	(59)-180
Marquis	28	32	29	SE	(61)-135
Martha Bell	27	33	5	NW	(59)-31
Martin #2 Mine	28	34	11	NE	(58)-2
Mary Ann	27	33	14	SW	(59)-150
Mary B.	27	33	3	SW	(59)-120
Mary B.	28	33	19	NE	(63)-74
Mary C	28	33	16	NW	(63)-29
Mary C.	28	32	29	NE	(61)-155,(58)-1
Mary Ellen	27	33	16	NE	(59)-75
Mary Jane	27	32	10	SW	(60)-66
Mary Jane	27	32	10	NW	(60)-66
Mary Jones	28	33	17	SE	(63)-21
Mary Lincoln	27	33	9	SE	(59)-73
Mary O'Reilley	28	33			(63)-106
Mary S.	28	33	32	SE	(63)-171
Massasoit	27	33	14	NW	(59)-139
Mattes	28	33	18	SE	(63)-73
Mattes Bros.	27	33	19	NW	(59)-210-N

MINE NAME	T	R	S	QS	Reference
Mattes Bros.	27	34	24	NE	(59)-235-N,(58)-1
Mattes Bros.	28	32	20	NW	(61)-56
Mattoax	28	33	25	SW	(63)-88
Maude L.	28	33	32	NE	(63)-148
Maybelle	27	33	5	NE	(59)-23
McBride	28	33	33	NW	(63)-125,(58)-7,8
McClelland, T. A. land	28	32	29	SE	(1)
McCorkle Mines	28	32	18	SE	(1)
McDonald	28	32	21	SW	(61)-114
McDonald	28	32	28	NW	(61)-126
McGavran	27	33	14	SE	(59)-155
McGregor Mine	28	32	21	SW	(58)-28
McKinley	28	32	28	SW	(61)-134
McKinley M. Co.	28	32	28	NW	(1)
Meadow Lark	27	32	15	NE	(60)-43
Meadville	28	32	34	NW	(61)-182
Meadville	28	32	8	SW	(61)-32
Media	28	32	7	NE	(61)-23,(58)-3,4
Melrose	28	32	33	NW	(61)-171,(58)-8,9
Mercantile	28	32	7	SE	(61)-28
Mercantile	28	32	7	SW	(61)-28
Mercantile #4 Mine	28	32	7	SW	(58)-5,6
Mercantile Group	28	32	33	SE	(61)-177
Miami	28	33	33	SW	(63)-138
Miami	28	32	34	NE	(61)-200
Middle West	27	33	16	NW	(59)-66
Middle West	27	33	16	NE	(59)-66
Midnight Mine	28	34	25	SW	(58)-1
Mikado	27	33	8	NE	(59)-52
Milan	28	32	28	NW	(61)-125
Milan M. (Florine Shaft)	28	32	28	NW	(58)-10
Milan Mine	28	32	28	NW	(58)-11
Mildred	27	33	4	SE	(59)-108
Millard	28	32	34	NE	(61)-199
Miller land	28	32	30	NW	(1)
Millie Doe	28	33	33	SW	(63)-130
Milton	28	33	32	SE	(63)-152
Mineral King	28	32	7	NW	(61)-17,(58)-8
Mineral Recovery Mill	28	32	8	SW	(61)-209
Minneapolis M. Co.	28	32	21	SW	(1)
Minnie Lou	28	33	7	NW	(63)-14
Minnie May	28	32	21	SW	(61)-74,(58)-27
Minnie May	28	32	21	NW	(61)-74
Minor Heir	28	32	6	SW	(61)-19
Missouri	28	33	20	NE	(63)-62
Missouri Mule	28	32	7	NW	(61)-14
Missouri, Old	28	33	31	SE	(63)-114
Mo. H.	27	33	7	NE	(59)-47

MINE NAME	T	R	S	QS	Reference
Moark-Nemo	28	32	18	NE	(61)-26,(58)-1,2
Mohawk	28	33	21	NE	(63)-50
Monitor	27	33	4	NE	(59)-1
Monkey Hill Mine	27	33	19	NE	(58)-2,3
Montclair Mine	29	32	16	NE	(58)-3
Monte B	28	32	8	SW	(61)-37
Montgomery L.& Z. Co.	28	33	28	SE	(1)
Montgomery L.& Z. Co.	28	33	27	SW	(1)
Monticello Shaft	28	32	21	SW	(61)-118
Moon Diggings	27	33	2	NW	(1)
Morley M. Co.	28	32	17	SE	(1)
Morning Hour	27	33	16	NW	(59)-65
Morning Star	28	34	25	SW	(63)-227
Morrison Mine	28	32	29	NE	(58)-5
Morse Shaft	27	33	3	NW	(1)
Moss	29	32	9	SE	(64)-30
Mound City M. Co.	28	32	21	SW	(1)
Mound City M. Co.	28	32	28	NW	(1)
Mound City M. Co.	28	32	29	NE	(1)
Movakan	28	32	31	SE	(61)-165
Mt. Ararat	28	32	29	NE	(61)-149,(58)-1
Mt. Clair	29	32	16	NE	(64)-22
Mt. Clair	29	32	9	SE	(64)-22
Muddauber	28	34	25	SW	(63)-225
Munson	28	32	21	NW	(61)-76
Muskogee	27	32	11	NW	(60)-67
Must go	28	32	28	NW	(61)-207
Must go	28	32	29	NE	(61)-207
Mutt and Jeff	27	33	26	NE	(59)-202-N
Myrick	27	33	9	SW	(59)-61
Mystic	27	33	20	SW	(59)-206-N,(58)-3
N. Carterville L&Z. Co.	28	32	17	NW	(1)
N.E. Perry Mines	28	32	21	NW	(1)
Nancy B.	28	34	25	SW	(63)-226
Napoleon (Old Big Joe)	28	33	22	NW	(63)-47
Nashville	28	33	30	SW	(63)-101
National No. 2	28	32	18	SE	(61)-109,(58)-8,9
Nevada M. Co.	28	32	17	NW	(1)
New Coon	27	33	14	NE	(59)-153
New Dividend	27	32	6	NE	(60)-32
New Dividend	28	32	31	SE	(61)-164
New Emmet Mine	27	33	12	SW	(58)-1
New England	28	34	14	SE	(63)-201
New Geronimo	28	33	30	SW	(63)-99
New Hope	28	32	33	SE	(61)-206
New Hope Mine	28	32	33	SE	(58)-1
New Moon	28	33	19	NE	(63)-76
New York Mining Co.	28	33	34	SE	(1)

MINE NAME	T	R	S	QS	Reference
Newboy	27	32	3	SW	(60)-19
Nicholasville	28	33	32	SE	(63)-167,(58)-2
Nina F.	28	33	17	SE	(63)-23
Nine O'Clock	28	32	28	SW	(61)-131,(58)-6,7
No Name	29	32	10	SW	(64)-36
No. 104	27	33	13	NW	(59)-174
No. 117	27	33	11	SE	(59)-182
No. 168	27	33	11	SE	(59)-181
No. 2	27	33	11	NE	(59)-198
No. 29	27	33	11	SE	(59)-176
No. 45	27	33	11	SE	(59)-187
No. 5	27	33	11	NW	(59)-131
Noble land	28	32	19	NE	(1)
Noble Mining Co.	28	32	19	NE	(1)
Noonday	28	32	21	SE	(61)-94,(58)-6-9
North Joplin Mining Co.	28	33	34	SE	(1)
Northern Indiana M&D Co.	28	33	25	SW	(63)-185
Nos. 91 and 92	27	33	11	SE	(59)-183
Nowata	28	32	28	SW	(61)-133,(58)-3
Nowata No. 3	27	33	8	SE	(59)-57
Nowata No. 3	27	33	8	SW	(59)-57
Nutmeg	28	32	21	SE	(61)-95
O'Keefe Mine	27	33	14	NW	(1)
O.F. & L.	27	32	3	NE	(60)-3,(58)-3
O.K. Mining Co.	29	32	15	NW	(64)-38
O.S. and Y.	27	33	16	NW	(59)-60
Oak Hill	28	33	20	NW	(63)-70
Oakwood	28	33	12	NE	(63)-9
Octo	27	33	14	SW	(59)-148
Olympia	27	33	14	NW	(59)-142
Olympic	28	33	32	SE	(63)-151
Omaha L. Y Z. Co.	28	33	19	NW	(63)-77
Omega	28	33	33	SW	(63)-133,(58)-4
Onamena	27	32	10	NW	(60)-48
Onamena	27	32	3	SW	(60)-48
Once More	27	33	6	SE	(59)-37,(58)-8,9
One Spot	27	32	11	NW	(60)-54
Opal Wonder	28	32	21	SW	(61)-82,(58)-29,30
Open Air	27	32	10	NE	(60)-53
Orange Mine	28	32	17	NW	(61)-47
Orange Mine	28	32	17	NW	(58)-66
Orchard City	28	32	21	SE	(61)-106
Oronogo Circle Mine	29	33	36	SE	(62)-11,(58)-1
Oronogo Mutual	29	33	36	SE	(62)-10
Oronogo Mutual	29	32	31	SW	(64)-53
Oronogo Mutual	28	32	6	NW	(61)-1
Oronogo Mutual	29	32	31	SW	(61)-1
Oronogo Mutual No 5	28	32	6	NW	(61)-214

MINE NAME	T	R	S	OS	Reference
Orphan Boy	28	32	21	SE	(61)-98
Osage	28	32	17	SE	(61)-63
Osceola No. 3	27	33	8	NW	(59)-42
Oswego Mining Co.	27	33	11	SE	(1)
Oswego Mining Co.	27	33	11	SW	(1)
Oswego Mining Co.	27	33	11	NE	(1)
Oswego Mining Co.	27	33	11	NW	(1)
Oswego Mining Co.	27	33	12	NW	(1)
Oswego Mining Co.	27	33	12	SW	(1)
Oswego Mining Co.	27	33	12	SE	(1)
Overland Mine	27	32	3	NE	(58)-1
Owasso	28	32	33	SE	(61)-176,(58)-2
Oxford	28	32	8	SW	(61)-75
Oxford	28	32	20	NW	(61)-91
Paoma	27	33	9	NE	(59)-80
Paragon	27	33	5	SW	(59)-40
Park	27	33	9	SE	(59)-70
Parker Mine	28	32	6	SW	(61)-2,(58)-16
Parker Mine	28	32	6	SW	(58)-17 to 21
Parker Mine	28	32	6	NW	(58)-22
Parr Hill	27	33	11	SE	(59)-173
Pawnee	28	32	17	SW	(61)-54,(58)-23
Paxton,Raybn&Crln	27	33	11	SW	(59)-133
Paymaster	28	34	25	SE	(63)-260
Pearson(KatherineD)	27	33	8	SE	(59)-56
Peck and Company	27	33	13	SW	(59)-160
Peggy	27	33	11	SE	(59)-185
Pelican	28	33	32	SE	(63)-172
Pencil Frank	27	32	3	SW	(60)-21
Pencil Frank	27	32	3	SE	(60)-21
Perkins	28	34	25	NE	(63)-218
Perry mine	27	30	12	NE	(1)
Pfotenhauer	28	33	20	NW	(63)-68
Phenix, Old	28	32	21	SE	(61)-104
Phoenix - Vernon	28	32	21	SE	(61)-105
Phoenix Shaft(BostonGet)	28	32	21	SE	(58)-3
Picher Bros.	27	33	11	SE	(1)
Picher Bros.	27	33	11	SW	(1)
Picher Bros.	27	33	11	NE	(1)
Picher Bros.	27	33	11	NW	(1)
Picher Bros.	27	33	12	NW	(1)
Picher Bros.	27	33	12	SW	(1)
Picher Bros.	27	33	12	SE	(1)
Picher Lead Co.	27	33	3	NW	(1)
Pittsburg	28	33	33	NW	(63)-145
Playter Custom Mill	29	34	22	NE	(62)-26
Plymouth Rock	27	32	6	NW	(60)-34
Plymouth Rock	27	32	12	SE	(60)-74

MINE NAME	T	R	S	QS	Reference
Plymouth Rock	27	32	12	SW	(60)-74
Pocatella	28	33	21	SE	(63)-55
Pocohontas	28	33	16	SE	(63)-35,(58)-1
Porter mines	28	31	4	NW	(1)
Porter Mines	27	33	2	SW	(1)
Portland	27	33	4	NW	(59)-16,(58)-4
Porto Rico (Roland)	28	32	34	NE	(61)-202
Postal	27	33	4	NW	(59)-14
Poundstone land	28	32	8	SE	(1)
Poverty Flat	27	33	11	SE	(59)-186
Powhattan	28	33	16	SE	(63)-34
Prairie Chicken	27	33	3	SW	(59)-102
Prairie Chicken	27	33	3	SW	(59)-106
Prairie State	27	33	9	NE	(59)-86
Praline Mine	28	33	33	NW	(58)-6
Preble	27	33	5	NE	(59)-26
Premier Mine	28	32	7	SE	(58)-1,2
Primrose	27	32	9	NE	(60)-73
Priscilla	27	33	7	SE	(59)-59
Providence	28	32	34	NE	(61)-201
Providence	28	32	7	NW	(61)-15,(58)-13
Pump Shaft	27	33	14	NE	(59)-171
Puritan	27	33	19	NW	(59)-208-N
Puritan	27	33	19	SE	(58)-4
Puritan	27	33	19	NE	(58)-5
Pyramid	29	34	14	SE	(62)-24,(58)-1
Pyramid	29	34	23	NE	(58)-1,2
Quaker Maid	27	33	5	NE	(59)-25
Queen Esther	28	32	21	NW	(61)-80
Quick Seven	29	32	6	SW	(64)-51
R. and C. Mine	29	32	15	NW	(64)-37
R. and L.	28	34	36	NE	(63)-254
Rabbit Foot	27	33	7	NW	(59)-50
Rabbits Foot	27	33	11	SW	(59)-136
Ragged Seven	28	34	24	SW	(63)-205
Rain in the Face	28	33	21	NW	(63)-179
Rainbow	27	33	4	NW	(59)-20
Ramage	28	32	17	NW	(61)-49,(58)-68,69
Ramage	27	33	5	SW	(59)-39,(58)-2,3
Randall & Co.	27	33	11	NW	(59)-126
Raymond A	28	33	22	SW	(63)-46
Rebecca	27	33	5	NW	(59)-33,(58)-4
Red Bird	28	32	21	NE	(61)-78,(58)-1
Red Brush	29	32	8	NE	(64)-8
Red Dog	28	32	7	NW	(61)-8,(58)-12
Red Dog	28	32	7	SW	(58)-6
Red Dog	28	32	6	SW	(61)-18
Red Eagle	28	32	17	NW	(61)-46,(58)-70,71

MINE NAME	T	R	S	OS	Reference
Red Lion	28	34	25	NE	(63)-211
Red Lion	28	34	25	NW	(63)-211
Reding	27	33	35	NE	(59)-204-N
Regent	27	33	3	SW	(59)-116
Regina	28	32	8	SW	(61)-35
Rein Miller Shaft	27	32	20	SW	(60)-75-N
Reliance	28	32	33	SW	(61)-181
Rex M. & Smelting Co.	27	32	18	NE	(1)
Rex M. & Smelting Co.	27	32	18	NW	(1)
Rex M. & Smelting Co.	27	32	18	SE	(1)
Rex M. & Smelting Co.	27	32	18	SW	(1)
Rex M. & Smelting Co.	27	32	7	SW	(1)
Rex M. & Smelting Co.	27	32	7	SE	(1)
Rex M. & Smelting Co.	27	32	8	SW	(1)
Rich-In-Ore	28	33	16	SW	(63)-87
Richland	28	32	21	NW	(61)-71,(58)-31,34
Richland M. Co.	28	32	21	NW	(1)
Richland Mine	28	32	21	NW	(1)
Richmond	28	32	21	SW	(61)-83
Richvale	28	32	6	NW	(61)-20,(58)-23,24
Richvale	28	32	6	SW	(58)-23
Rickey diggings	28	30	17	part	(1)
Rising Sun M. Co.	28	32	20	SE	(1)
Riverside	27	33	29	SW	(59)-205-N,(58)-1,2
Roarke Diggings	27	32	30	SE	(58)-1,2,3,4
Robinson Wells	27	33	24	NW	(59)-201-N
Rochester	28	32	20	SE	(61)-84
Rochester Imperial	27	33	9	NE	(59)-83
Rockford	29	33	17	SW	(62)-4
Roland (Porto Rico)	28	32	34	NE	(61)-202
Rose Bud	28	33	1	NE	(63)-2
Rosy Jane	28	33	21	SE	(63)-54
Rowena	27	34	2	SW	(59)-231
Royal Blue	27	33	4	NE	(59)-5
Royle	27	32	4	SE	(60)-30
Rubberneck	29	32	8	NW	(64)-2
Rueben	28	34	36	SW	(63)-247
Ruth	27	33	9	SE	(59)-71
S and B	27	33	4	NW	(59)-19
S. Carterville M. Co.	28	32	17	SW	(1)
S. Carterville M.&S. Co.	28	32	17	SW	(58)-21,22
Sagawah	27	33	16	NE	(59)-77
Saginaw Diggings	27	32	30	SE	(60)-60-N
Sam Hill	27	33	14	SE	(59)-151
Sam Hill	27	33	14	SW	(59)-151
Sam Moore	28	33	33	NW	(63)-122
Samolia	29	32	8	NW	(64)-57
San Cabriel	27	32	3	NW	(60)-13

MINE NAME	T	R	S	QS	Reference
San Gabriel	27	32	3	NW	(61)-190
Sangamo M. Co.	28	32	29	NE	(1)
Sarabell	28	33	28	SE	(63)-91
Saum	28	33	20	NE	(63)-64
Sawyer	28	32	20	SW	(61)-145
Sayers	27	32	3	SE	(60)-8
Sayers	27	33	4	NE	(59)-12
Schoenhoerr & Walton	28	32	8	SW	(61)-33
School House	28	32	17	NE	(61)-40,(58)-1
Schott Diggings	27	33	11	NE	(1)
Schott Diggings	27	33	11	SE	(1)
Sciota Tailing Mill	28	32	20	NW	(61)-210
Scotia Mining Co.	27	33	18	SE	(1)
Scotland Diggings	27	32	12	NW	(60)-57
Scott	27	32	4	NE	(60)-26
Scranton	27	33	3	SW	(59)-103
Scranton	28	34	25	NE	(63)-221
Second National	29	32	9	SE	(64)-21
Seneca	28	32	29	NE	(61)-152
September	28	32	35	NE	(61)-205
Seven Angels	28	34	23	NE	(63)-199
Seven Devils	28	34	23	NW	(63)-198
Shaft and Derrick	28	32	20	SW	(61)-87
Shaft No. 4	28	32	34	NW	(61)-184
Shamrock	27	33	14	NW	(59)-141
Sharpe Lease	27	32	18	NE	(1)
Sheldon	27	33	4	SE	(59)-89
Sheldon	27	33	9	NE	(59)-89
Sheldon-Midnight	28	34	25	SW	(63)-230
Shoestring	28	32	32	NE	(61)-169
Show Me State	28	32	7	SW	(61)-27
Show Me State	28	32	7	SE	(61)-27
Show Me State	28	32	18	NW	(61)-27
Show Me State	28	32	18	NE	(61)-27
Shylock	28	34	36	NE	(63)-252
Sigler	28	34	25	SE	(63)-257
Silver Creek	27	33	26	NE	(59)-203-N
Silver Dick	28	33	17	SW	(63)-25
Sitting Bull	28	33	21	NE	(63)-49,(58)-1,2
Sixty	27	33	11	NW	(59)-130
Slaton Shaft	28	33	34	SW	(1)
Smith	28	34	25	NW	(63)-263
Snapp-Cunning Mine	29	33	23	SE	(58)-1,2
Sneed-Proctor	27	32	11	SW	(60)-68
Snyder Brothers	27	33	16	SE	(1)
Sparkler	27	33	5	NW	(59)-27
St. Anthony	28	32	29	SE	(61)-147,(58)-3
St. Joe	28	33	32	NW	(63)-113

MINE NAME	T	R	S	OS	Reference
St. Louis M & M Corp. #8	28	33	21	NE	(63)-52
St. Louis M&M Corp. Mill	28	33	16	SW	(63)-183
St. Louis S & R. Co.	29	34	15	NE	(62)-15,(58)-1
St. Patrick	27	33	9	NE	(59)-119
St. Regis	27	32	3	SW	(60)-16,(58)-6
St. Regis	28	33	32	SW	(63)-162
Standard	28	32	21	SE	(61)-107
Standard L. & Z. Co.	28	34	25	NE	(1)
Standard No. 1	28	34	25	NE	(63)-215
Standard No. 2	28	34	25	NE	(63)-214
Star	28	32	20	SW	(61)-86,(58)-11,12
Star	28	33	12	NE	(63)-5
Star	28	34	25	NE	(63)-209
Stephenson	27	32	10	NW	(60)-49
Sterling L.& Z. Co.	28	33	28	SE	(1)
Steve-Son land	28	32	9	SW	(1)
Stevens Mine	28	33	31	NW	(1)
Stevison and Moore	28	32	33	SW	(61)-179
Stout land	28	32	9	SW	(1)
Stout land	28	32	16	NW	(1)
Stout land	28	32	16	NE	(1)
Street	27	33	4	SE	(59)-97
Stump	28	34	36	NE	(63)-255
Sucker Flat Diggings	28	32	19	NE	(61)-111,(58)-1
Sunflower	28	32	8	SW	(61)-38,(58)-3,4
Sunrise	27	32	10	SE	(60)-46
Sunset	28	32	17	SW	(61)-53,(58)-39-45
Superior	28	33	32	NE	(63)-120
Superior Lead & Zinc Co.	27	32	7	NE	(1)
Sutton Shaft	27	33	3	NW	(1)
Swan	28	34	36	NW	(63)-246
Sweetheart	28	33	21	NW	(63)-83
Swindle Hill Diggings	27	33	11	NW	(1)
Swindle Mine	27	33	2	SW	(58)-1
Sycamore	27	32	18	SW	(60)-37
Symmes	27	33	8	NE	(59)-53
T.S. and J. Mine	29	32	6	SW	(64)-48
Talisman	28	32	17	NW	(61)-48,(58)-67
Taneycomo (Old Colony)	28	32	34	NE	(61)-204
Tecumseh	28	33	22	NW	(63)-48
Teddy R.	29	32	9	SE	(64)-26
Temagami	27	33	9	NE	(59)-84
Ten O'Clock	28	32	28	SW	(61)-130,(58)-4,5
Texamo	29	32	6	SW	(64)-56
Texas	28	33	17	NW	(63)-20
Texas Bull Mine	28	33	17	NW	(58)-2,3
Texas Steer	29	32	9	SW	(64)-16
Texas Steer	29	32	9	SE	(58)-6

MINE NAME	T	R	S	QS	Reference
Thanksgiving	28	32	34	NW	(61)-183,(58)-9,10
Thayer and Graham	28	34	14	SW	(63)-192
The Doctor M. Co.	28	32	31	NW	(61)-157
Thomas Connor (600 ac)	28	32	20	SW	(1)
Thomas Connor (600 ac)	28	32	20	SE	(1)
Thomas Connor (600 ac)	28	32	21	SW	(1)
Thomas Diggings	27	33	12	SW	(1)
Thompson & Co.	28	32	29	NW	(1)
Thornton	27	33	13	NW	(59)-168
Thoroughbred	28	33	31	NW	(63)-108
Thousand-Acre Tract	27	32	18	NE	(1)
Thousand-Acre Tract	27	32	18	NW	(1)
Thousand-Acre Tract	27	32	18	SE	(1)
Thousand-Acre Tract	27	32	18	SW	(1)
Thousand-Acre Tract	27	32	7	SW	(1)
Thousand-Acre Tract	27	32	7	SE	(1)
Thousand-Acre Tract	27	32	8	SW	(1)
Three Links	27	32	2	SW	(60)-11
Tinker	27	33	11	NW	(59)-125
Toad Frog	28	33	20	NW	(63)-72
Tom C. No. 3	28	32	29	NE	(61)-154
Tom C. No. 4	28	32	20	NW	(61)-113
Tom C. No. 4	28	32	29	NE	(61)-151,(58)-4
Tom Cat	27	33	5	NW	(59)-28
Tomahawk	27	33	9	NE	(59)-92
Tower & Regan land	28	31	8	NE	(1)
Tri-State Chitwood Mill	28	33	33	SW	(63)-187
Trimore	28	33	33	NW	(63)-128,(58)-9
Trinity	28	32	34	SW	(61)-191,(58)-5,6
Trossack	29	32	9	SE	(64)-19,(58)-4
Trouble	27	33	9	NE	(59)-85
Troup	28	34	35	SE	(63)-239
Troup	28	32	21	SE	(61)-97
Troup	28	32	19	SE	(1)
Troup Mines	28	32	21	SE	(1)
Tuckahoe Mines	28	33	27	SW	(1)
Tuckahoe Mines	28	33	28	NE	(1)
Tuckahoe Mines	28	33	28	SE	(1)
Tulsa-Pittsburg	29	34	23	NW	(62)-23,(58)-1013-16
Twelve O'Clock	28	32	28	NW	(61)-140
Twin Cities	28	32	17	NW	(61)-50,(58)-64,65
Twin Cities	28	32	21	SE	(61)-79
Twin City Mine	28	32	21	SE	(58)-13,14
Two Bobs	28	33	21	SE	(63)-53
U.S. Lead & Zinc Co.	28	33	21	NW	(63)-58
U.S. Mill	27	32	19	NE	(60)-38
U.S. Mill	27	32	19	NW	(60)-38
Underroof	27	33	4	NE	(59)-2,(58)-1

MINE NAME	T	R	S	QS	Reference
Union	28	32	27	SW	(61)-166
Union Mine	27	32	28	SE	(58)-1
United Zinc Co.	28	33	7	SE	(63)-15,(58)-10-12
United Zinc Co.	28	33	7	SW	(58)-13
United Zinc Co.Westfield	28	32	34	SW	(61)-188
Unity	28	33	1	SE	(63)-3, (58)-1
Ute	27	33	11	NW	(59)-127
Utopia	27	33	16	SE	(59)-162
Valentine	28	33	16	NE	(63)-33
Van Hoose					(64)-59
Van Scoyk	28	33	34	SW	(63)-178
Vanalia	27	33	4	SE	(59)-87
Vantage	28	32	6	SW	(61)-21
Vaughan	28	32	32	NE	(61)-168
Vernon	28	32	21	SE	(61)-99
Vestal	27	33	4	SE	(59)-109
Vestry	27	32	3	SE	(60)-6
Victor Mine	28	32	20	SW	(58)-6-10
Victor Mining Co.	28	32	20	SW	(1)
Victoria	28	33	31	NW	(63)-107
Vinegar Hill	28	33	28	NW	(63)-94
Vinegar Hill	28	33	28	NE	(63)-94
Virginia, Old	28	32	17	SE	(61)-68
Vogey	28	32	34	NW	(61)-195
Vogey	28	32	27	SW	(61)-195
Walcott	27	33	11	NE	(59)-196
Walcott	27	33	11	NW	(59)-196
Walker	27	33	14	NE	(59)-172
Walker Shaft(Boston Get)	28	32	21	SE	(58)-2
Walnut Ridge	28	33	1	NW	(63)-1
Wampum	28	32	31	NW	(61)-159
Waneta-Pearl	28	33	17	NW	(63)-19,(58)-1
Water Dog	27	32	11	SW	(60)-56
Weaver	29	32	18	NE	(64)-45
Weaver	29	33	17	SW	(62)-3
Webb land	28	32	16	NE	(1)
Webb land	28	32	21	NE	(1)
Weno	27	33	4	NE	(59)-7
West 7th Street	27	33	5	SW	(59)-41,(58)-1
West Hollow Mining Co.	28	34	25	SE	(1)
West Hollow Mining Co.	28	34	36	NE	(1)
West Side Mines, Old	29	32	16	SE	(64)-40,(58)-4
West Twenty	28	32	33	NE	(61)-172
Western Zinc Co.	27	33	11	SE	(1)
Western Zinc Co.	27	33	11	SW	(1)
Western Zinc Co.	27	33	11	NE	(1)
Western Zinc Co.	27	33	11	NW	(1)
Western Zinc Co.	27	33	12	NW	(1)

MINE NAME	T	R	S	QS	Reference
Western Zinc Co.	27	33	12	SW	(1)
Western Zinc Co.	27	33	12	SE	(1)
Westney-Foltz	28	33	21	NW	(63)-51
What Cheer	28	32	33	NE	(61)-173,(58)-3,4
White Dog	28	32	7	NW	(61)-16
White Shirt	28	33	30	SE	(63)-97
Whitsett	28	32	34	NW	(61)-194
Wild Cherry Tree	27	32	17	SW	(60)-41
Wildwood	27	33	18	SE	(59)-214
Wilgus Shaft(Boston Get)	28	32	21	SE	(58)-5
William	28	34	36	SW	(63)-248
Windsor Mining Co.	27	33	1	SW	(1)
Wingfield	28	33	12	NE	(63)-8, (58)-4,5
Winifrede	27	32	4	SW	(60)-29
Wolfheart	27	32	3	NW	(60)-15,(58)-5
Wood land	28	32	8	SE	(1)
Wood land	28	32	9	SW	(1)
Woodlawn	28	33	36	NE	(63)-90
Woods & Brown	28	32	17	SW	(61)-58,(58)-18,20
Woods & Brown Mine	28	32	17	SW	(58)-19
Woodson Shaft	27	33	2	NW	(1)
World's Fair Mining Co.	27	32	7	SW	(1)
Wysbrod	28	33			(63)-102
Yale	28	32	20	NW	(61)-92,(58)-17
Yellow Dog	28	32	6	SW	(61)-5,(58)-3,4,5
Yellow Jacket	27	33	13	NW	(59)-165
Yellow Jacket	28	34	14	SW	(63)-193
Yellow Jacket	28	34	23	NW	(63)-193
Yellow Pup	28	34	23	NW	(63)-194
Yellow Stone	27	33	11	SE	(59)-217
Yellowstone Mine	27	33	11	SE	(58)-1
Zinc Fields	28	32	20	NW	(61)-88
Zinco	28	33	26	SE	(63)-89
Zola	27	33	2	SW	(59)-123,(58)-2
Zola	27	33	11	NW	(59)-123

APPENDIX C

Figures 1, 2, 3, 4, 5

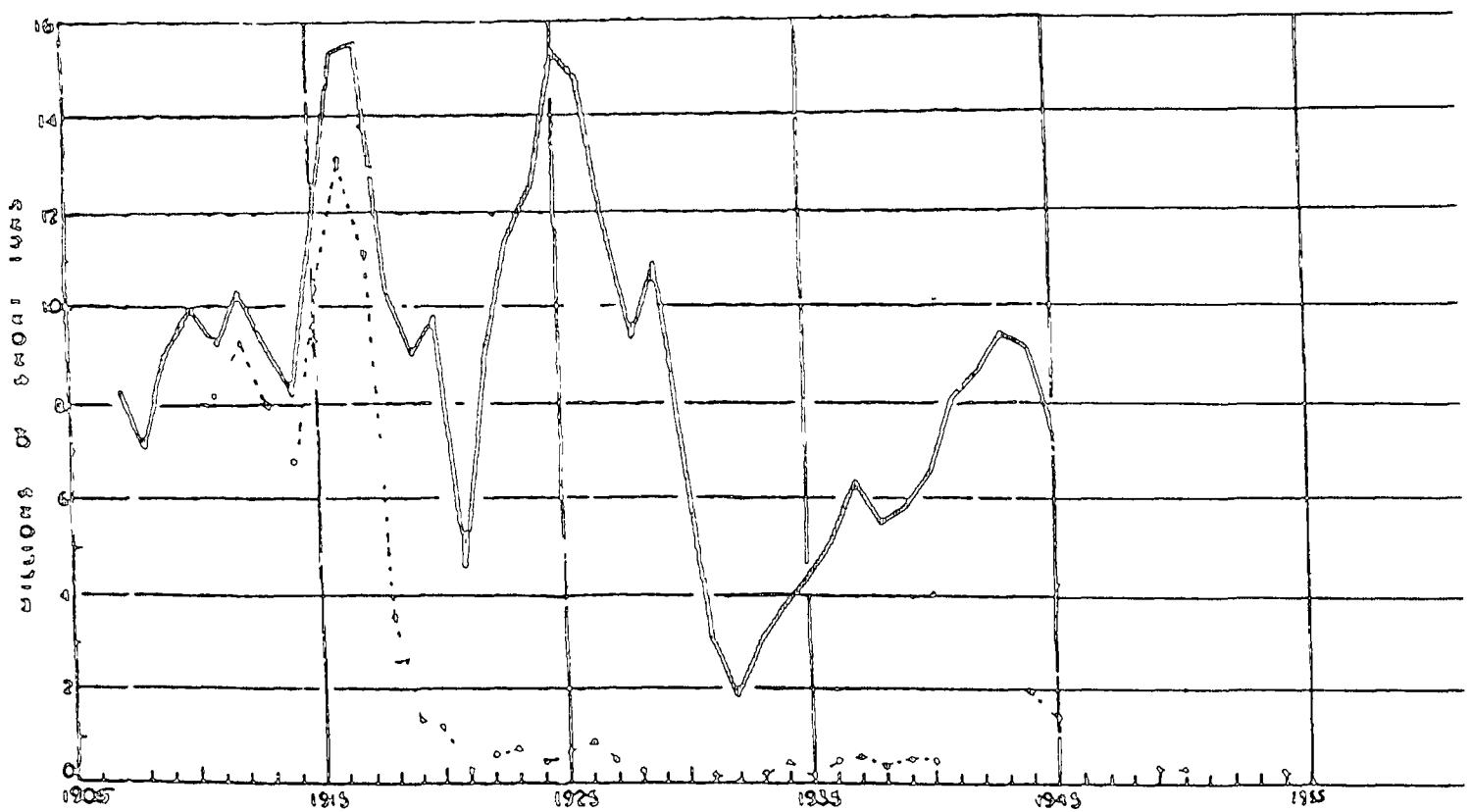


Figure 1: Quantities of Crude Ore Milled

LEGEND

—— = Total crude ore milled in Tri-State District (Missouri, Kansas, Oklahoma)

--- = Total crude ore milled in southwestern Missouri

SOURCE Yearbooks

Note: Breaks in the lines do not indicate that no ore was milled, but that data was not available

TechLaw, Inc.

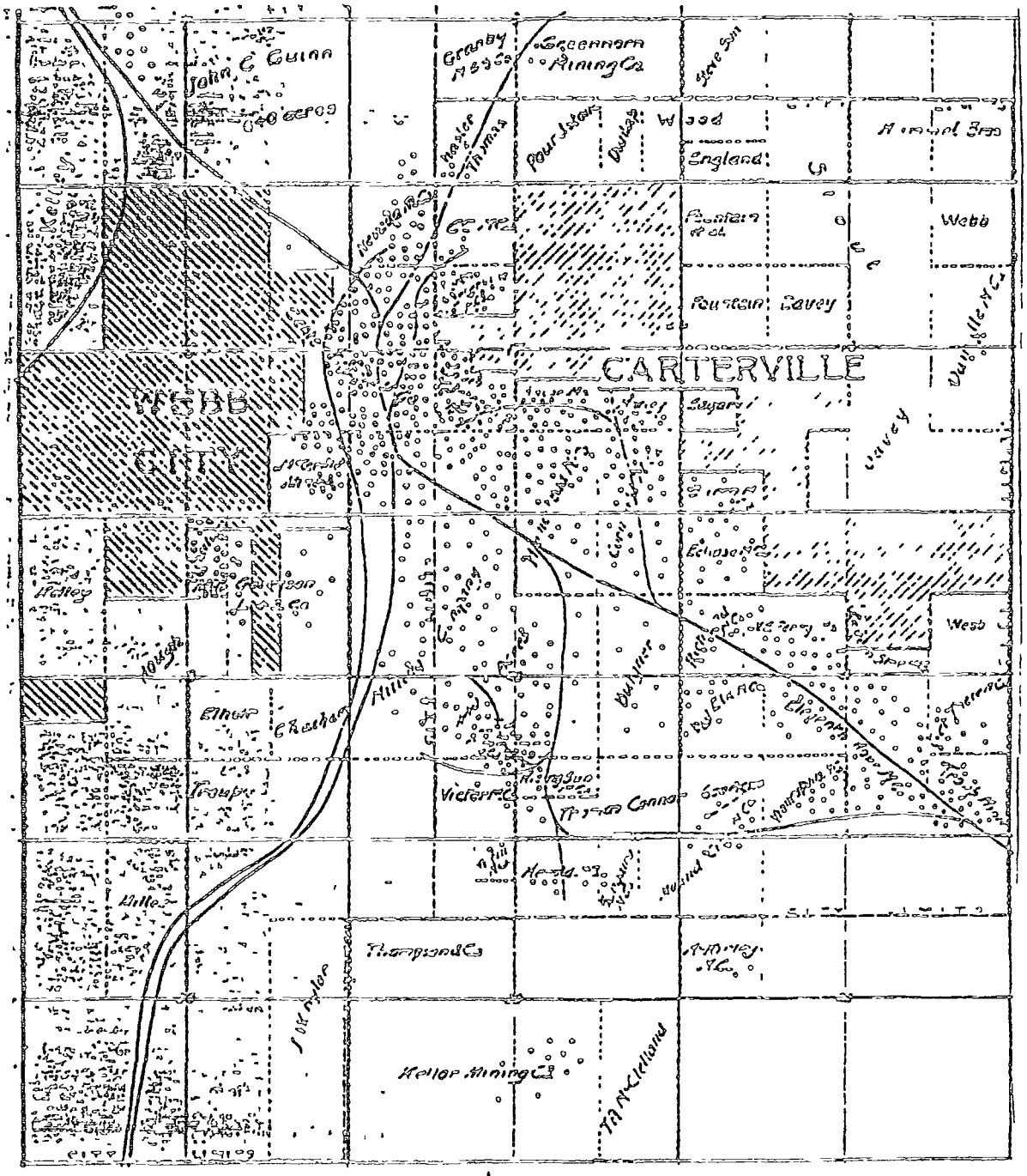


Figure 3: Webb City-Carterville District--1894

LEGEND

○ Mine

SOURCE: 1894 Report

TechLaw, Inc.

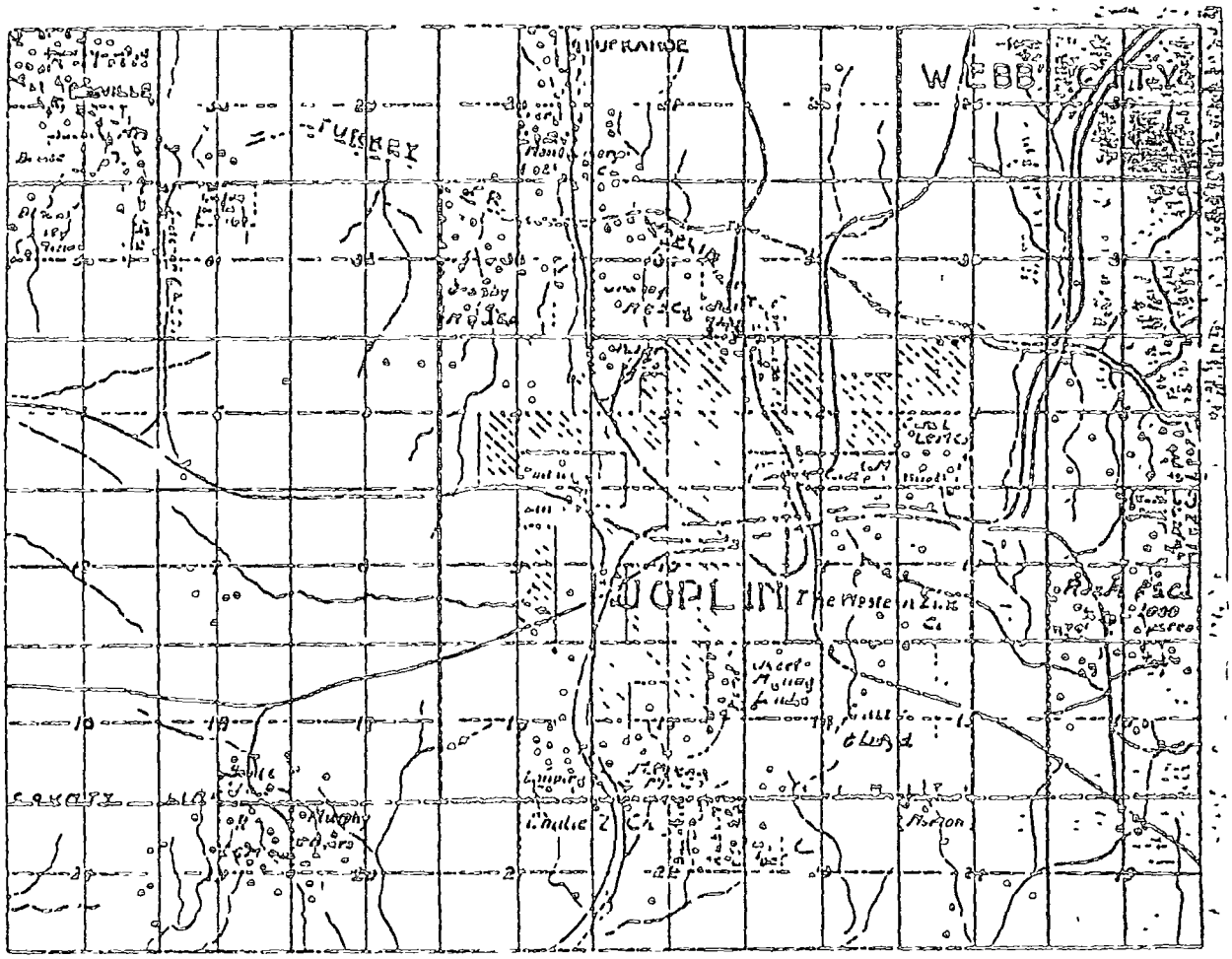


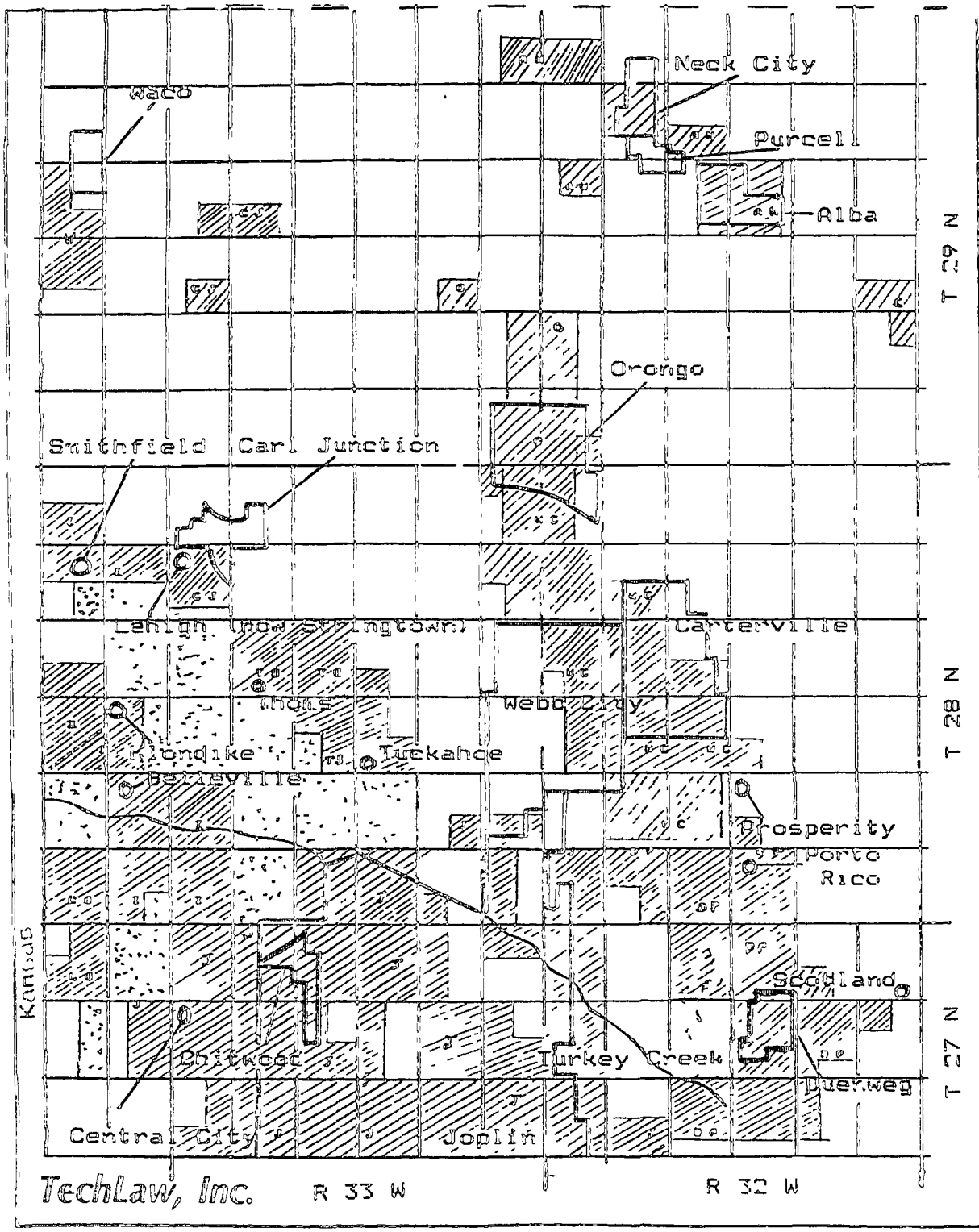
Figure 4: Joplin District and Belleville District --1894

LEGEND

Mine

SOURCE: 1894 Report

Techlaw, Inc.



TechLaw, Inc.

Figure 5. Mining District Locations

LEGEND

AN---Alba-Neck City District
CJ---Carl Junction District
C----Carthage District
CS---Cave Springs District
DP---Duenweg-Porto Rico District
J----Joplin District
O----Oronogo District
TS---Thoms Station-Sherwood District
W----Waco District
WC---Webb City-Carterville-Prosperity District
Z----Zincite District (AKA Zincite-Klondike, Zincite-Smithfield)

Actively Mined Areas -District Defined

Actively Mined Areas -District Cannot Be Defined

No Mining Conducted or Scattered Prospects Only

| | = 1 Mile

SOURCE MDNR Study, Yearbooks, 1894 Report, Mining Maps

APPENDIX D

JASPER COUNTY MINING DATABASE PROGRAMS

I. INTRODUCTION

The Jasper County Mining Database was created using dBase III Plus software. The single database file, Jasper1.dbf, is manipulated using a series of programs written in the dBase programming language by Techtaw, Inc. These programs allow the user to add new records, edit existing records, delete records, print reports, index, and backup important files.

The programs, database, format, and index files associated with the Jasper County Mining Database are contained on a single, high density (1.2 Megabyte), floppy diskette. The files on this diskette should be copied to a hard disk which also contains dBase III Plus software. To run these programs, load dBase III Plus, type "Do Jasper", and hit the Return Key.

II. PROGRAM EXECUTION

Upon initiation of the Jasper program, the user is presented with a menu. The Main Menu of the Jasper County Mining Database programs provides the user with options for manipulating the database (Figure 1). The database is comprised of records. Each record in the database contains the following fields:

Mining Company - The name of the mining company.

Year - The year of the mining activity.

Type - The type of mining activity.

District - The district in which the activity occurred.

Comments - Any comments regarding the activity.

Each record in the database has a unique record number, which is used to access specific records within the database. Additional explanations of the information contained in the fields listed above, are contained in Section III of this Report.

The operation of each of the Main Menu options is explained below.

A. Add a Record

This option allows the user to add additional records to the database. Upon selecting this option, the user is presented with a screen for entering a new record as illustrated in Exhibit 2.

B. Edit a Record

This option allows the user to change the information in any of the records currently contained in the database. Upon selecting this option, the user is presented with the menu entitled "Edit a Mining Record" (Exhibit 3). If the number of the record to be edited is known, the user selects the first option, "Enter a Record Number", and is then prompted to enter this number (Exhibit 3). Upon entering the record number, a screen containing the record's current information is displayed. Any of the fields in the record can then be modified by the user (Exhibit 3).

If the user is uncertain of the record number they wish to edit, the second option on the "Edit a Mining Record" menu, "Display Record Numbers", can be selected (Exhibit 3). Upon selecting this option, the menu entitled "Listing of Mining Records" is displayed (Exhibit 4), which gives the user the choice of seeing record numbers displayed in record number order, alphabetically by mining company name, or chronologically by year (Exhibit 4). Each of these options will display on the screen a listing consisting of record number, mining company name, and year.

C. Delete a Record

This option allows the user to delete any record in the database. Upon selecting this option, the user is presented with a menu entitled "Delete A Mining Record" (Exhibit 5). Upon selecting the "Delete a Record" option from this menu, the user is prompted to enter the record number they wish to delete. The screen then displays the record number, the mining company, and the year, and asks the user if that is the correct record to delete. Entering 'Y' will then delete the record (Exhibit 5).

D. Print Options

Selecting this option presents the user with a menu of reports which can be printed from the database (Exhibit 6). The first print option, "Print Database by Mining Company and Year", will print each record in the database alphabetically by mining company name, with each record for a particular mining company listed chronologically (Attachment III).

The second option, "Print Database by District and Year", will print each record in the database, alphabetically by District, with records within the same District listed chronologically. Records in the same year, will list mining company names alphabetically (Attachment IV).

The third print option will print a list of mining company names contained in the database, alphabetically (Attachment II).

E. Utilities

This option provides the user with the capability of updating the index files associated with the database, and to backup the database files to floppy diskette (Exhibit 7). Additional instructions for the backup option are provided when this option is selected (Exhibit 7).

F. Quit

The final option from the Main Menu closes the Jasper County Mining Database programs. Upon selecting this option, the user is presented with an exit screen which reminds the user to backup the database.

Exhibit 1

```
JASPER COUNTY MINING DATABASE
******* MAIN MENU ********

 ADD A RECORD
>EDIT A RECORD
 DELETE A RECORD
 PRINT OPTIONS
 UTILITIES
 QUIT

Mark selection with up/down arrow cursor key.  <ENTER> to make selection.
```

Exhibit 2

JASPER COUNTY MINING DATABASE

Record Number: 2777

Mining Company: _____

Year: ____ Type: ____

District: _____

Comments: _____

Ctrl-W or PgDn to Save Changes and Return. Esc to Abandon

Exhibit 3

JASPER COUNTY MINING DATABASE
EDIT A MINING RECORD

)Enter a Record Number
Display Record Numbers
Return to Main Menu

Enter Record Number or Esc to Return

Enter Record: 23

JASPER COUNTY MINING DATABASE

Record Number: 23

Mining Company: COLUMBIA MINING COMPANY

Year: 1907 Type: OPER

District: CAVE SPRINGS

Comments: MILL BUILT ON HELLEVILLE LAND & MINING CO. LAND

Ctrl-W or PgDn to Save Changes and Return. Esc to Abandon

Exhibit 4

JASPER COUNTY MINING DATABASE
LISTING OF MINING RECORDS

List Records by Record Number
)List Records by Mining Company
List Records by Year
Return to Previous Menu.

Record#	miner	year
289	1915 MINING CO.	1915
315	1915 MINING CO.	1916
2443	66 MINE CORPORATION	1934
361	66 MINE CORPORATION	1935
598	A. F. FORD & CO.	1914
2078	A. R. G. MINING CO.	1916
1316	A. S. BALDRY & CO.	1913
1274	A. W. C. MINING CO.	1913
453	A. W. C. MINING CO.	1914
454	A. W. C. MINING CO.	1914
489	A. W. C. MINING CO.	1915
490	A. W. C. MINING CO.	1915
515	A. W. C. MINING CO.	1916
516	A. W. C. MINING CO.	1916
1078	A. W. GRANNIS CO.	1908
259	ABALINE MINING CO.	1914
142	ABERDEEN MINING CO.	1911
176	ABERDEEN MINING CO.	1912
219	ABERDEEN MINING CO.	1913

Press any key to continue...

Exhibit 5

```
JASPER COUNTY MINING DATABASE
** DELETE A MINING RECORD **

>Delete a Record
 Return To Main Menu
```

```
Enter Record Number or Esc to Return

     Enter Record:  1
```

```
Record Selected:     1

 Mining Company: MURPHY, P.

            Year: 1886

Is this the correct record to delete?
```

Exhibit 6

JASPER COUNTY MINING DATABASE
PRINT DETAILED REPORTS

)Print Database by Mining Company and Year
Print Database by District and Year
Print Alphabetic List of Mining Companies
Return to Main Menu

Mark selection with up/down arrow cursor key. (ENTER) to make selection.

Exhibit 7

JASPER COUNTY MINING DATABASE
***** UTILITIES *****

Reindex All Databases in System

>Backup All Databases To Floppy Disk(s)

Return To Main Menu

This file backup option uses the Disk Operating System Backup utility.

The first prompt tells you to "Insert Source Disk if Appropriate". Simply hit the return key.

The second prompt requests that you insert a diskette in Drive A, and you should place a diskette in Drive A.

Insert additional diskettes as prompted to contain all of the system files. Once the process is complete, you will be returned to the database system. If you need to restore the files on the backup diskettes to another computer, ask your computer support personnel for assistance in using the DOS Restore Command.

Press any key to continue...

Insert source disk if appropriate
Strike any key when ready

Insert backup diskette 01 in drive A:

Warning! Files in the target drive
A:\ root directory will be erased
Strike any key when ready

Exhibit 8

JASPER COUNTY MINING DATABASE
********** E X I T ***********

Remember to frequently backup the database.

Main Menu Selection UTILITIES provides a backup routine.

Alphabetic List of Mining Companies

Mining Company

1915 MINING CO.
66 MINE CORPORATION
A. F. FORD & CO.
A. R. G. MINING CO.
A. S. BALDRY & CO.
A. W. C. MINING CO.
A. W. GRANNIS CO.
ABALINE MINING CO.
ABERDEEN MINING CO.
ACME LEAD & ZINC CO.
ADAMS-HICKS LEAD & ZINC CORPORATION
ADIRONDACK LEAD AND ZINC COMPANY
ADIRONDACK MINING COMPANY
ADMIRALTY ZINC CO.
AELOR MINING CO.
AIKENS, CURTIS & COSDEN
AIKINS, CURTIS & COSDEN
AIRDALE MINING CO.
ALAMO LAND & MINING CO.
ALBA COMPANY
ALBA MINES CONSOLIDATED
ALBA MINING AND SMELTING CO.
ALBA TAILING CO.
ALBATROSS MINING CO. (AKA ALBA MINING CO.)
ALBERTA MINING CO.
ALHAMBRA LAND & MINING CO.
ALHAMBRA MINING CO.
ALLAN-COURTAD MINING CO.
ALLEGHENY WESTERN MINING CO.
ALLINGTON & CRISTY
ALLINGTON, CHRISTY & THORNTON
AMALGAMATED ZINC AND LEAD COMPANY
AMERICAN BEAUTY MINING CO.
AMERICAN BEAUTY MINING CO. NO. 1
AMERICAN BEAUTY NO. 2 MINING CO.
AMERICAN CANADIAN MINING CO.
AMERICAN LEAD & ZINC CO.
AMERICAN LEAD, ZINC & SMELTING CO.
AMERICAN MINING COMPANY
AMERICAN SMELTING & REFINING CO. A. Arco
AMERICAN ZINC, LEAD & SMELTING
AMERICAN ZINC, LEAD & SMELTING CO.
AMERICAN ZINC, LEAD, & SMELTING CO.
AMERICAN, ZINC, LEAD & SMELTING CO.
ANDERSON MINING CO.
ANNALINDA MINING CO.

Alphabetic List of Mining Companies

Mining Company

ARCO MINING CO.
ARKANSAS MINING COMPANY
ARMIL SLUDGE & TAILING CO.
ARMIL SLUDGE CO.
ASHCRAFT, REYNOLDS & CO.
ASTOR MINING CO.
ATCHISON MINING & MILLING CO.
ATGATE & CO.
ATHLETIC MINING & SMELTING CO.
ATHLETIC MINING CO.
ATLANTIC MINING COMPANY
AURORA CIRCLE MINING CO.
AVA MARIA MINING CO.
AVONDALE LAND & MINING CO.
AYLOR BROS.
AYLOR BROTHERS
B. F. & H. MINES, INC.
BABSON, BATTEN & COX
BAILEY & CO.
BAILEY & STICKNEY
BAKER REALTY CO.
BANKERS MINING CO.
BANNER INVESTMENT CO.
BARBEE & CO.
BARNETT MINING CO.
BARNSDALL ZINC MINING CO.
BARRETT & COMPANY
BARTHOLOW SLUDGE CO.
BASH DEVELOPMENT CO.
BATESVILLE MINING CO.
BATTLE AXE MINING CO.
BEACON MINING CO.
BEARCAT MINING CO.
BECKER & RELLING
DEE TREE MINING CO.
BELL & CO.
BELL MINING CO.
BELL STAR MINING CO.
BELLEVILLE LAND & MINING CO.
BELLEVILLE MINING CO.
BELVILLE LAND & MINING CO.
BELVILLE MINING & CUSTOM MILLING CO.
BEN B. MINING CO.
BEN FRANKLIN MINING CO.
BENDELARI & LONGACRE
BENDELARI LAND CO.

Alphabetic List of Mining Companies

Mining Company

BENSCOTTER & CO.
BERRY & PICKSON
BERRY SLUDGE CO.
BERTHA A. MINING CO.
BESSEMER LEAD & ZINC CO.
BETSEY JANE MINING CO.
BETSY MINING CO.
BEULAH S. MINING CO.
BIG BROWNIE MINING CO.
BIG BROWNING MINING CO.
BIG ELM MINING CO.
BIG FROG MINING CO.
BIG IKE MINING CO.
BIG INDIAN MINING CO.
BIG IRISHMAN MINING CO.
BIG RUN ZINC CO.
BIG SIX MINING CO.
BIG STICK MINING CO.
BIG STUMP MINING CO.
BIG TOM MILLING CO.
BILLY B. MINING CO.
BILLY SUNDAY MINING CO.
BIRD DOG MINING CO.
BIZZY IZZY MINING CO.
BLACK & CO.
BLACK CAT MINING CO.
BLANCH MAY MINING CO.
BLANTON AND WYATT
BLATCHLEY MINING & MILLING CO.
BLENDVILLE MINING & LEASING CO.
BLOCK CITY MINING CO.
BLUE BIRD MINING CO.
BLUE GRASS MINING CO.
BOHEMIAN GIRL LEAD & ZINC CO.
BONNIE L. MINING CO.
BONNIE PATTIE MINING CO.
BOSTON AURORA MINING CO.
BOSTON GET THERE ZINC CO.
BOSTON-DUFNWEG MINING CO.
BOULDER LEAD & ZINC CO.
BOWMAN SCOTT & WARE
BOWMAN, SCOTT & WARE
BOWMAN, WARE & SCOTT
BRADFORD & KANSAS CITY ZINC CO.
BRADFORD KANSAS CITY MINING CO.
BRADFORD-KANSAS CITY MINING CO.

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Mining Company

BRADLEY LEAD & ZINC CO.
BRAIN STORM MINING COMPANY
BREWER MINING COMPANY
BRITISH MINING CO.
BROKEN HEART MINING CO.
BUCKEYE HOOSIER MINING CO.
BUCKEYE MINING CO.
BUCYRUS MINING CO.
BULLDOG MINING CO.
BULLFROG MINING CO.
BURCH LEAD & ZINC CO.
BURCH MINING CO.
BURGNER MINING COMPANY
BURKE & CO.
BURKE MINING CO.
BURTON MINING CO.
BUSY BEE MINING CO.
BUTTS AND CRELLER
BUXTON & DURFEE
BUXTON-DURFEE
BYERS, CONNER & MURPHY
BYERS, MURPHY & CONNOR
C. & O. MINING CO.
C. & S. MINING CO.
C. C. & B. MINING CO.
C. C. & H. MINING & MILLING CO.
C. C. PLAYTER MINING CO.
C. G. & C. CO.
C. H. & Y. MINING CO.
C. H. JACKSON MINING COMPANY
C. M. & H. MINING CO.
C. M. SHELDON MINING CO.
C. S. & P. MINING CO.
C. T. & S. MINING CO.
CACTUS HILLS MINING CO.
CADWELL-ALLEN MINING CO.
CALUMET ZINC CO.
CAMBRIA MINING CO.
CAMERON MINING CO.
CAMERON ZINC COMPANY
CAMPBELL & CO.
CAMPBELL, PICKETT & CREACH
CAPITALISTA MINING CO.
CAPTAIN E. MINING CO.
CARBONDALE MINING CO.
CARLAT MINING CO.

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Mining Company

CARLSON & CO.
CARMEAN & SQUIRES MINING CO.
CARMEAN & SQUIRES MINING CO. NO. 5
CAROLET MINING CO.
CARTERVILLE CO. CONSOL.
CARTERVILLE MINING & SMELTING CO.
CARTHAGE MINING CO.
CASH MINING COMPANY
CATHERINE MINING & ROYALTY CO.
CATHERS MINING CO.
CAVE SPRING MINING CO.
CAVE SPRINGS LEAD & ZINC CO.
CAVE SPRINGS MINING CO.
CAWOOD & WALKER
CC MINING CO.
CENTER CREEK MINING AND SMELTING COMPANY
CENTER CREEK MINING CO.
CENTRAL MILLING & CONCENTRATING CO.
CENTRAL MINING CO.
CENTRAL STATES MINING CO.
CENTURY MINING CO.
CENTURY ZINC CO. LTV
CHAPMAN & LENNAN
CHAPMAN BROS.
CHAPMAN BROS. MINING CO.
CHAPMAN HOSLEY MINING CO.
CHAPMAN LAND CO.
CHAPMAN, LENNAN & CARTER
CHARTER OAK MINING CO.
CHATAUQUA MINING CO.
CHATHAM MINING CO.
CHEROKEE MINING CO.
CHERRY TREE MINING CO.
CHICAGO LEHIGH MINING CO.
CHICAGO MINES CO.
CHICAGO-JOPLIN MINING CO.
CHILDRESS & MESSENGER
CHURCH-MITCHELL MINING CO.
CINOMO MINING CO.
CISCO MINING CO.
CITY OF JOPLIN
CLARA BELLE MINING CO.
CLARA C. MINING CO.
CLARK CONCENTRATING CO.
CLARK WARD MINING CO.
CLARY & CO.

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Mining Company

CLIFFWOOD MINING CO.
COAHUILA LEAD & ZINC CO.
COAHUILA MINING CO.
COATS & ORTT
COBLE MINING COMPANY
COCHRAN BROS.
COLGAN MINING COMPANY
COLUMBIA MINING COMPANY
COMANCHE MINING CO.
COMET MINING CO.
COMMERCIAL METAL MINING CO.
CONNECTICUT ZINC CO.
CONNELLY & MCDONALD
CONNICO MINING CO.
CONNOR INVESTMENT CO.
CONNOR REALTY CO.
CONNOR-PITCHER
CONSOLIDATED MINING COMPANY
CONSOLIDATED TROUP COMPANY
CONSUMERS MINING CO.
CONTINENTAL ZINC CO.
COOK, MIDDLEBURY & CO.
COOLEY BROS.
COOPER & CO.
COOPER & PETERS
COPPERHEAD MINING COMPANY
CORA LOTTA MINING COMPANY
CORALBUT MINING CO.
CORNELL & CO.
CORNFIELD MINING CO.
CORNING MINING CO.
CORRIE COLE MINING CO.
COSHOCTON MINING CO.
COTTONWOOD MINING CO.
COX MINING CO.
COYOTE MINING CO.
CRAGG & CO.
CRAGIN & STAPLES
CRELLAR LAND CO.
CRELLER & YOUNG
CREOLA MAY MINING CO.
CRITERION MINING CO.
CROSS ROADS MINING CO.
CROSSMAN MINING CO.
CROWN CREST LAND & ZINC CO.
CROWN CREST MINING CO.

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Mining Company

CROWN CREST ZINC & LEAD CO.
CROWN POINT MINING CO.
CUCKLEBURR MINING CO.
CULBERT LEAD AND ZINC. CO.
CULPEPER MINING CO.
CUMBERLAND MINING & MILLING CO.
CUMBERLAND MINING CO. NO. 2
CUNARD MINING CO.
CUNNINGHAM & KANE
CUNNINGHAM - KANE
CYGNI MINING CO.
D. & C. MINING CO.
D. C. & E. MINING CO.
DALLAS MINING CO.
DANA MINING CO.
DANIELS BROS.
DANVILLE MINING CO.
DAUGHERTY & DAVEY
DAUGHERTY, DAVEY & DAUGHERTY
DAUPHIN MINING CO.
DAVE SAYERS MINING CO.
DAVEY & CO.
DAVEY CROCKETT MINING COMPANY
DAVEY, TOWER & CO.
DAVIDSON JOPLIN MINING CO.
DAVIDSON LEAD & ZINC CO.
DAVIDSON-JOPLIN MINES CO.
DAVIS MINING CO.
DAVISON & WRIGHT
DECATUR MINING COMPANY
DELKER MINING CO.
DENNY MINING CO.
DEXTER MINING CO.
DIAMOND JACK MINING CO.
DIAMOND MINING COMPANY
DICK TURPIN MINING CO.
DINGER MINING CO.
DIRIGO LAND & LEASING CO.
DISBROW MINING CO.
DITTMAR COMPANY
DOANE MINING CO.
DODSON & CO.
DOLLIE C. MINING CO.
DOUBLE D. MINING CO.
DOUGHERTY & DAVEY
DOUGHERTY & LYONS

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Mining Company

DOUGLAS & ANDERSON
DUENWEG LEAD & ZINC CO.
DUENWEG ZINC CO.
DUNDAS MINING CO.
DUNNIGAN & CO.
DUQUESNE
DUQUESNE MINING CO.
DURBY LEAD & ZINC CO.
DURSTON MINING CO.
DUTCHMAN'S CHOICE MINING CO.
DUTCHMAN'S DREAM MINING CO.
E. & N. MINING CO.
E. B. AND G. MINING COMPANY
E. D. HORNBROOK MINING CO.
EAGLE-PICHER LEAD CO.
EAGLE-PICHER MINING & SMELTING CO.
EALY MINING CO.
EAST ALBA MINING CO.
EAST HOLLOW MINING CO.
EAST SIDE MINING CO.
EASTERN ILLINOIS MINING COMPANY
EASTERN STAR MINING CO.
ECLIPSE LAND AND MINING CO.
ECONOMY MINING CO.
EDGAR COUNTY PROSPECTING AND MINING COMPANY
ELDORADO MINING CO.
ELECTRICAL LEAD & ZINC MINING CO.
ELEVEN O'CLOCK MINING CO.
ELEVENTH HOUR MINING CO.
ELIA MAY MINING CO.
ELLIOT & BANES
ELLIOT & LONG
ELLIPSE MINING CO.
ELLIS & CO.
ELSIE MINING CO.
EMILIE ZINC CO.
EMILY G. MINING CO.
EMMA C. MINING CO.
EMPIRE ZINC CO.
EMPRESS MINING CO.
EMPRESS NO. 1 MINING CO.
EMPRESS NO. 2 MINING CO.
ENDEAVOR MINING CO.
ENGINEERS ZINC CO.
EQUITABLE ZINC AND LEAD COMPANY
ETHEL GRAY MINING CO.

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Mining Company

ETTA B. MINING CO.
EUNAMER MINING COMPANY
EVANS HALL SOY MINING CO.
EXCELSIOR ZINC & LEAD CO.
EXPANSION MINING CO.
EXPANSION REALTY CO.
F. & M. MINING CO.
F. L. COLE & CO.
F. W. EVANS MINES
F.W. EVAMS
F.W. EVANS
FALLS CITY MINING CO.
FAMOUS MINING COMPANY
FARE & CO.
FARE & GRAHAM
FEDERAL MINING & SMELTING CO. ASARCO
FEDERATED MINES & MILLING CO.
FEDERATED MINING & MILLING CO.
FENIX & MARTIN
FENIX & MARTIN MINING CO.
FENIX & SONS
FIDELITY MINING CO.
FIGHTING WOLF MINING CO.
FLANNERY ZINC CO.
FLORENCE LEAD AND ZINC COMPANY
FLORENCE MINING CO.
FLORINE MINING CO.
FLUORINE MINING CO.
FLYNN & CO.
FOSS, WM.
FOUR CORNERS MINING CO.
FOUR DOGS MINING CO.
FRANCES MINING CO.
FRANCIS T. MILLING CO.
FRANCIS T. MINING CO.
FRANKLIN LEAD & ZINC CO.
FRANKLIN MINING CO.
FRANKLIN SMITH & CO.
FRANKLIN ZINC CO.
FREEHOLD OIL & GAS CO.
FREEMAN & LLOYD
FREMONT MINING & MILLING CO.
FRERER MINING CO.
FRIEL & PHILLIPS
FRISCO MINING CO.
FRISCO SLUDGE CO.

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Mining Company

FRYE & SONS
G. M. MINING CO.
GAGER MINING & MILLING CO.
GAINES & MC CARREN
GALENA BOOSTERS MINING CO.
GALENA JOPLIN LEAD & ZINC CO.
GALENA-JOPLIN LEAD & ZINC CO.
GARNET MINING CO.
GARRISON LEAD AND ZINC COMPANY
GASCHO MINING CO.
GASHCO ZINC CO.
GEEDING & GRANNIS
GEER & CO.
GENERAL LEAD & ZINC CO.
GENEVA LAND & MINING CO.
GENEVA MINING & LEASING CO.
GEORGE H. MINING CO.
GEORGE M. MINING CO.
GERMAN AMERICAN MINING CO.
GERMAN-AMERICAN MINING CO.
GERONIMO LEAD & ZINC MINING CO.
GET THERE MINING CO.
GIBSON MINING CO.
GILMAN MINING CO.
GILMORE & CO.
GLASS LEAD & ZINC CO.
GLASS LEAD & ZINC COMPANY
GLOBE M.& M. & CO.
GLOBE ZINC CO.
GOBBLER MINING CO.
GOLDEN GLOW MINING CO.
GOLDEN RULE LEAD & ZINC CO.
GOOD DAY MINING CO.
GOOD MINING CO.
GOOD SAMARITAN MINING CO.
GOOD SHEPHERD MINING CO.
GOODE CO.
GOODRICH MINING CO.
GOPHER MINING CO.
GORDON HOLLOW LAND & MINING CO.
GORDON HOLLOW MINING & MILLING CO.
GOTHAM MINING CO.
GOULD & CO.
GOUVERNOUR LEAD & ZINC CO.
GRACE PING MINING CO.
GRANBY MINING & SMELTING CO.

Mining Company

GRANBY MINING AND SMELTING CO.
GRAND HAVEN MINING CO.
GRAND TOWER MINING CO.
GRASS ROOTS MINING CO.
GRASSELLI MINING CORP.
GRAY EAGLE MINING CO.
GRAYSON MINING & MILLING CO.
GREAT WESTERN ZINC AND LEAD COMPANY
GREEN MINING CO.
GREENE & CO.
GREENHORN MINING CO. LAND
GRETCHEN LEAD AND ZINC COMPANY
GREYHOUND MINING COMPANY
GRIER MINING COMPANY
GROUND & IRWIN
GROUND FLOOR MINING CO.
GROWER MINING CO.
GRUNDY REALTY CO.
GUANT MINING & MILLING CO.
GUINN
GUINN & LLOYD
GULCH MINING AND SMELTING CO.
GUSSIE K. MINING CO.
H. & C. C. MINING CO.
H. & F. MINING CO.
H. L. KRAMER MINES CO.
H. L. KRAMER MINING CO.
H. W. CORNELL MINING CO.
HACKETT MINING CO.
HACKMEISTER, SNEED & CO.
HALEY MINING CO.
HALL LAND MINING CO.
HAMMETT LEAD AND ZINC COMPANY
HANCOCK-CONNOR REALTY CO.
HANDFORD MINING CO.
HANEY & CO.
HAPPY HOLLOW MINING CO.
HARDY MINES CO.
HARRISON MINING CO.
HARTFORD MINING CO.
HASKELL, HICKS & DITMAN
HASLER & THOMAS
HATCHER MINING CO.
HAYES & CO.
HAYS & MANNING MINING CO.
HEATHER MINING CO.

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Mining Company

HECMA LAND & MINING CO.
HEMPHILL MINING CO.
HENRIETTA LEAD & ZINC CO.
HERALD ZINC & LEAD MINING CO.
HERBERT S. MINING CO.
HERCULES MINING CO.
HERMAN MINING CO.
HERMOSA MINING CO.
HERO MINING CO.
HEROLD MINING CO.
HERRIN & MEYERS
HICKAM MINING CO.
HICKMAN MINING CO.
HIGH FIVE MINING CO.
HIGH GRADE MINING CO.
HIGH TARIFF MINING CO.
HILL & CO.
HILL MINING CO.
HILLSIDE MINING CO.
HOFF L. AND M. COMPANY
HOLMES MILLING CO.
HOLT & CO.
HOLY MOSES MINING CO.
HOME DEVELOPMENT CO.
HOME LAND & LOAN CO.
HOME MINING CO.
HOME RUN CO.
HOME TALENT DEVELOPING CO.
HOME TALENT MINING CO.
HOMESTAKE MINING CO.
HOMESTEAD MINING CO.
HOO HOO MINING CO.
HORNBROOK MINING CO.
HORSESHOE MINING CO.
HOUND DOG MINING CO.
HOWE MINING CO.
HOWELL & SADLER
HUB MINING CO.
HUBB & PUCKETT
HUDSON MINING COMPANY
HUMMEL BROS.
HURRY UP MINING CO.
HYDE PARK LEAD & ZINC CO.
HYDE PARK MINING CO.
ICE PLANT MINING CO.
IDA MAY MINING CO.

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Mining Company

ILLINOIS AND MISSOURI MINING COMPANY
IMPERIAL ZINC CO.
INCLINE MINING CO.
INDEPENDENCE MINING CO.
INDEPENDENT GRAVEL CO.
INDEPENDENT ZINC LANDS CO.
INDIANA MINING CO.
INTER-CITY MINING CO.
INTERSTATE ROYALTY CO.
INTERSTATE TRUST CO.
IRIS B. MINING CO.
ISABEL MINING CO.
ISABEL MINING COMPANY
ISHPEMING MINING CO.
J. COLE & CO.
J. F. ROBINSON MINING CO.
J. L. NEWLANDS & CO.
J. P. MINING CO.
J. P. ROYALTY & MINING CO.
J. R. WISBY & CO.
JACK MILLING CO.
JACK SNIPE MINING CO.
JACOBS BROTHERS
JASPER COUNTY MINING CO.
JASPER COUNTY ROYALTY CO.
JASPER MINING CO.
JASPER ROYALTY CO.
JAYENEL METALS CORPORATION
JESSIE MILLING CO.
JESSIE MINING CO.
JEWELL MINING CO.
JIM D. MINING CO.
JOALMO MINING CO.
JOHN JACKSON INVESTMENT COMPANY
JOHN JACKSON MINING CO.
JOHN L. MINING CO.
JOHNSON & CO.
JOHNSON AND COPLEY
JONES & CO.
JOPLIN BARBER SUPPLY MINING CO.
JOPLIN CONCENTRATING CO.
JOPLIN CONSOLIDATED MINING CO.
JOPLIN MINING CO.
JOPLIN ROYALTY & MINING CO.
JOPLIN SYNDICATE
JOPLIN-COLORADO MINING CO.

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Mining Company

JOPLIN-KENTUCKY MINING COMPANY
JUBILEE MINING COMPANY
JUMBO MINING CO.
JUMBO TAILING CO.
JUNIOR MINING CO.
KALITAN MINING CO.
KANE & REECE
KANSAS CITY ZINC CO.
KANSAS EXPLORATIONS
KANSAS EXPLORATIONS, INC. St Joe
KANSAS-MISSOURI LAND & MINING CO.
KANTENWEIN MINING COMPANY
KATHERINE LEASE CO.
KATY MINING CO.
KELLER REALTY CO.
KELLEY LAND CO.
KELLOR MINING CO.
KELLY LAND CO.
KENTUCKY LEAD & ZINC CO.
KERSEY MINING CO.
KEYSTONE MINING CO.
KIDD MINING CO.
KING PIN MINING COMPANY
KING SOLOMON MINING CO.
KIRKWOOD MINING CO.
KITTREL & CO.
KITTY MACK MINING CO.
KNOBLE M. COMPANY
L. C. MOSES MINING CO.
L. E. HOLDEN & CO.
LA NORA B. MINING CO.
LAGONDA LEAD & ZINC CO.
LAGONDA MINING CO.
LANCASTER MINING & MILLING CO.
LANG & STARK
LAST CHANCE MINING CO.
LATOKA MINING CO.
LAURA ALICE MINING CO.
LAWSON-CAMERON MINING CO.
LEAD-ZINC CORPORATION
LEHIGH CONSOLIDATED
LEHIGH DRAINAGE AND MINING COMPANY
LELAH MINING COMPANY
LEONA MINING CO.
LEONARD H. MINING CO.
LEONARD REALTY CO.

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Mining Company

LEONARD ROYALTY COMPANY
LEONARDS, E.B.
LIBERTY BELL MINING CO.
LIBERTY MINING CO.
LICHLITER & CO.
LIHME ZINC CO.
LINCOLN MINING CO.
LINCOLN ZINC & SMELTING CORPORATION
LINDSAY LEAD & ZINC CO.
LINZEE HILL MINING CO.
LINZIE HILL MINING CO.
LITTLE BEN MINING CO.
LITTLE BILL MINING CO.
LITTLE BOB MINING CO.
LITTLE DAISY MINING CO.
LITTLE DANA MINING CO.
LITTLE ISRAELITE MINING CO.
LITTLE JERSEY LEAD & ZINC CO.
LITTLE JOHN MINING CO.
LITTLE MAID MINING CO.
LITTLE MARTHA MINING CO.
LITTLE MARY MINING CO.
LITTLE PUMPKIN MINING CO.
LITTLE THREE MINING CO.
LIVE WIRE MINING CO.
LIVE WIRE ZINC LAND CO.
LLOYD & SPENCER
LOG CABIN MINING CO.
LONE ELM DEVELOPMENT & MINING CO.
LONE ELM MINING COMPANY
LONE PILGRIM MINING CO.
LONE STAR MINING CO.
LONG MINING COMPANY
LONGACRE & CHAPMAN
LONGACRE & CHAPMAN MINING CO.
LONGACRE CHAPMAN MINING CO.
LORRAINE MINING CO.
LOUISIANA MINING CO.
LOWER LEVEL MINING CO.
LUCAS AND COLLINS
LUCKY BEN MINING CO.
LUCKY EIGHT MINING CO.
LUCKY ELEVEN MINING CO.
LUCKY FOUR MINING CO.
LUCKY GEORGE MINING CO.
LUCKY JOE MINING CO.

Mining Company

LUCKY MINING CO.
LUCKY SEVEN MINING CO.
LUCKY SHOT MINING CO.
LUCKY STRIKE MINING CO.
LUCKY TIGER MINING CO.
LUKE & ASH
LUKE & BROWN
LUKE & BROWN MINING CO.
LUKE & BROWN NO. 3 MINING CO.
M. & W. MINING CO.
M. I. AND O. COMPANY
M. M. & B. MINING CO.
MACK & CO.
MADISON LAND & MINING CO.
MAGNET MINING CO.
MAGNOLIA MINING CO.
MAHASKA MINING CO.
MAHATMA MINING CO.
MAJESTIC MINING CO.
MAJORIE STEWART MINING CO.
MALLOY & CAMERON
MAMMOTH ZINC & LEAD WORKS
MANLOCK & SMITH
MANNING & WINSTON
MANNON & MCGEE
MAPLE LEAF MINING CO.
MARGERUM MINING CO.
MARION B. MINING CO.
MARION LAND CO.
MARIPOSA MINING CO.
MARQUIS & BALL
MARTHA BALL MINING CO.
MARTIN & CO.
MARY B. MINING CO.
MARY C. MINING CO.
MARY JANE MINING CO.
MARY L. MINING CO.
MARY MILLING CO.
MATTES
MATTES & HART
MATTES BROS.
MATTHIESSEN & HEGELEN MINING CO.
MAUD V. MINING CO.
MAUDE H. MINING CO.
MAY & CO.
MCBRIDE MINING & MILLING CO.

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Mining Company

MCCLINTOCK MINING CO.
MCCORKFE & AYLOR
MCCORKLE & AYLOR
MCCROSKEY MINING CO.
MCCULLOGH & MURDOCK
MCCULLOUGH & MURDOCK
MCDONALD BROS. MINING CO.
MCDONALD MINING CO.
MCKINLEY MINING CO.
MCNADB COAL CO.
MCDIA MININO CO.
MERCANTILE METAL & MILLING CO.
MERCANTILE METAL MILLINO CO.
MERCANTILE MINING CO.
MERCEDES MINING CO.
MERRITT & LANT
MEXICO-JOPLIN LAND
MEXICO-JOPLIN LAND CO.
MEXICO-JOPLIN MINING CO.
MIAMI MINING & REALTY CO.
MIAMI REALTY & MINING CO.
MIDNIGHT MINING COMPANY
MIDSUMMER MINING COMPANY
MIDWOOD MINING CO.
MIGNONETTE MINING CO.
MILAN MINING CO.
MILLER & RITTER
MILLER MINING CO.
MILTON MINING CO.
MINERAL KING MINING CO.
MINERAL RECOVERIES
MINERAL RECOVERIES CO.
MINNEAPOLIS MINING CO.
MINOR GRAHAM LEAD & ZINC CO.
MINOR GRAHAM MINING CO.
MINOR HEIR MINING CO.
MINOR HEIR PRODUCING CO.
MINOR HEIR VANTAGE MINING CO.
MISSOURI HILLS ZINC CO.
MISSOURI LEAD & ZINC CO.
MISSOURI LEAD & ZINC MILLS
MISSOURI MINING CO.
MISSOURI STANDARD MINING CO.
MISSOURI ZINC & LEAD MILLS CO.
MISSOURI ZINC FIELDS CO.
MISSOURI-KANSAS ZINC CORP.

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Mining Company

MITCHELL & CO.
MOARK-NEMO CONSOLIDATED MINING CO.
MOARK-NEMO LEAD & ZINC CO.
MOARK-NEMO MINING CO.
MODOC CO.
MODOC MINING CO.
MOHLER-SMITH COMPANY
MOLER SMITH LEAD & ZINC CO.
MOLER-SMITH LEAD & ZINC CO.
MONT B. MINING CO.
MONTGOMERY LEAD & ZINC CO.
MOORE & PLATT
MORBOUGH BROS.
MORGAN & CO.
MORGAN, SIMPSON & CO.
MORLEY MINING CO.
MORNING STAR MILLING CO.
MORNING STAR MINING CO.
MORNING STAR SLUDGE CO.
MORSMAN MINING CO.
MOSBAUGH & CO.
MOSS MINING COMPANY
MOSSBACK LAND & MINING CO.
MOTLEY MINING CO.
MOUND CITY MINING COMPANY
MOVOKAN MINING CO.
MUNSON IRWIN MINING CO.
MUNSON MINING CO.
MURPHY & BYERS
MURPHY & BYERS TANYARD COMPANY
MURPHY AND CONNOR
MUSKINGUM LEAD & ZINC MINING CO.
MUSKINGUM ZINC & LEAD MINING CO.
MUSKOGEE MINING CO.
MUSTAIN MINING CO.
MUTUAL LEAD & ZINC CO.
MYERS & JEMMINSON
N. C. SPENCER & CO.
N. C. YANCTIN & CO.
NANCY B. MILLING CO.
NAPOLEON MINING CO.
NATIONAL LEAD & ZINC CO.
NEARBY MINING CO.
NEVADA MINING CO.
NEW ENGLAND ZINC CORPORATION
NEW GERONIMO LEAD & ZINC CO.

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Mining Company

NEW HOPE MINING CO.
NEW YEAR MILL & GRAVEL CO.
NEW YEAR MINING CO.
NEW YORK & WESTERN ZINC CO.
NEW YORK MINING CO.
NEWELL MORSE ROYALTY CO.
NEWMAN & CO.
NEWTON & CO.
NO NAME MINING CO.
NOBLE MINING CO.
NORMAN & CO.
NORTH BELLEVILLE LEAD & ZINC CO.
NORTH BELLEVILLE LEAD & ZINC COMPANY
NORTH CARTERVILLE MINING CO.
NORTH JOPLIN MINING COMPANY
NORTH KIMBERLY MINING COMPANY
NORTH ORONOGO MINING CO.
NORTHSIDE MINING CO.
NORTON MINING CO.
NOWATA MINING CO.
O'JACK MINING CO.
O. & C. M. DEGRAFF
O. & M. MINING CO.
O. D. DITTICK, COOK & CO.
O. F. & L. MINING CO.
O. K. MINING CO.
O. MILLER & CO.
OAK HILL MINING CO.
OAK ORCHARD MINING CO.
OAKLAND MINING CO.
OAKWOOD MINING CO.
OCTAGON MINING CO.
OHIO LAND CO.
OHIO MISSOURI PROSPECTING CO.
OHIO MISSOURI PROSPECTING CO.
OKLAHOMA CONSOLIDATED LEAD & ZINC CO.
OLD BACON MINING CO.
OLD COLONY MINING CO.
OLD COLONY ZINC CO.
OLD DOMINION MINING CO.
OLD FRIENDS ZINC MINING CO.
OLD JORDAN MINING CO.
OLD JUDGE MINING CO.
OLD STAPLE MINING CO.
OLD TIMES LEAD AND ZINC COMPANY
ONAMENA MINING CO.

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Mining Company

ONCE MORE MINING CO.
ONTARIO MINING COMPANY
OPTIMO LEAD AND ZINC COMPANY
ORANGE MINING & MILLING CO.
ORANGE MINING CO.
ORNDUFF & CO.
ORONOGO CIRCLE MINING CO.
ORONOGO MINES CONSOLIDATED
ORONOGO MINING & DEVELOPMENT CO.
ORONOGO MUTUAL MINING CO.
OSAGE MINING CO.
OSCEOLA LEAD & ZINC CO.
OSCEOLA NO. 1 LEAD & ZINC CO.
OSCEOLA NO. 1 MINING CO.
OSCEOLA NO. 2 (LEAD AND ZINC CO.)
OSCEOLA NO. 2 MINING CO
OSWEGO MINING CO.
OSYKA MINING COMPANY
OTIS MINING CO.
OVERLAND MINING CO.
OWENSBORO-JOPLIN MINING CO.
OWOSSO DEVELOPMENT CO.
P. & N. MINING CO.
PACIFIC MINING CO.
PACIFIC SLUDGE CO.
PAOMA MINING CO.
PARACON MINING COMPANY
PARK LAND & MINING CO.
PARKINSON, GRAVES & HARPER
PARKINSON, GRAVES, & HARPER
PATTON & CO.
PAXTON LEAD AND ZINC COMPANY
PEARL BROS.
PEARL LEHIGH MINING CO.
PEARL MINING COMPANY
PEARSON & CO.
PENN MINING AND DRAINAGE COMPANY
PENN ZINC CO.
PERUVIAN MINING CO.
PETERS, DOOLEY & CO.
PFLUG MINING CO.
PICHER BROS.
PICHER L. CO.
PIKE LAND CO.
PIKE'S LAND CO.
PINKARD & BLACK

Alphabetic List of Mining Companies

Mining Company

PINNACLE MINING CO.
PIONEER MINING CO.
PITTSBURG-JOPLIN LEAD & ZINC CO.
PITTSBURG-JOPLIN MINING CO.
PITTSBURG-MISSOURI LEAD & ZINC CO.
PLAYTER BROS.
PLAYTER BROS. MINING & REALTY CO.
PLAYTER MINING CO.
PLAYTER, C.C.
PLEASANT VALLEY MINING CO.
POCATELLA MINING CO.
POLAND TAILING CO.
PONTIAC MINING CO.
PORTER & MYERS
PORTER MINING CO.
PORTLAND LEAD & ZINC CO.
POTTER & SIMMS
POTTER-SIMS MINES, INC.
POWERS MINING CO.
PRAIRIE CHICKEN MINING CO.
PRIGMORE & CO.
PRINCETON MINING CO.
PRODUCERS MINING CO.
PROGRESSIVE MINING CO.
PROSPERITY LAND & MINING CO.
PROSPERITY MILLING CO.
PROVIDENCE MINING & MILLING CO.
PURCELL MINING CO.
PURCILLER MINING CO.
PYRAMID MINING CO.
QUEEN BEE MINING CO.
QUEEN ESTHER MINING CO.
QUICK FOUR MINING CO.
QUICK SEVEN MINING CO.
R. A. M. MINING CO.
R. A. MINING CO.
R. L. MCGEE MINING CO.
R. W. LATSHAW & CO.
RABBIT FOOT MINING CO.
RABBIT FOOT ZINC MINING CO.
RAVENSWOOD MINING COMPANY
RAYMOND MINING CO.
REALIZATION ROYALTY & INVESTMENT CO.
REALTY EXTRACTION CO.
REBECCA MINING CO.
RED BIRD MINING CO.

Alphabetic List of Mining Companies

Mining Company

RED BRUSH MINING CO.
RED FOX MINING CO.
RED WING MINING CO.
REEDS LEAD & ZINC MINING CO.
RELIANCE MINING CO.
RELIANCE MINING CO. NO. 2
RELIANCE MINING CO. NO. 1
RELIANCE MINING CO. NO. 3
REO MINING CO.
REVENUE MILLING CO.
REX MINING & SMELTING CO.
RHEA LEAD & ZINC CO.
RHEA MINING CO.
RICH HOLLOW MINING CO.
RICH IN ORE MINING CO.
RICHARDS & CO.
RICHLAND MINING CO.
RIDEAU MINING CO.
RISING SUN MINING CO.
RISTORIA LEAD & ZINC CO.
RITTER MINING CO.
RIVERSIDE MINING CO.
ROADSIDE MINING CO.
ROARING SPRINGS LAND & MINING CO.
ROB ROY ZINC CO.
ROBERTA MINING CO.
ROBERTSON & STUCKEY
ROBINSON & BAKER
ROCHESTER
ROCHESTER LAND & LEASING CO.
ROCHESTER LAND AND LEASING CO.
ROCKFORD MINING CO.
ROGERS MILLER MINING CO.
ROGERS MINING CO.
ROLLAMO MILLING CO.
ROLLIN & LLEWELLEN
ROSAMOND MINING CO.
ROSE LAND & MINING CO.
ROSE LAND MINING CO.
ROWEND & CO.
ROYALTY LAND & MINING CO.
RUBY C. MINING CO.
RUBY D. MINING CO.
RUBY MINING & SMELTING CO.
RUSK SLUDGE CO.
RUTH GRADELLE MINING CO.

Alphabetic List of Mining Companies

Mining Company

S. & M. MINING CO.
S. V. & D. MINING CO.
S. Y. RAMAGE MINING CO.
SADTLER LEAD & ZINC CO.
SADTLER MINING CO.
SAGINAW INVESTMENT CO.
SAGINAW LAND & MINING CO.
SALVATOR TAILING CO.
SAMPSON MINING CO.
SAMSON MINING CO.
SANFORD & MCCROSKEY
SANGAMO MINING CO.
SANSOME & STAPLES
SANTA BARBARA MINING CO.
SATURDAY MINING CO.
SAXET MINING CO.
SAYERS MINING CO.
SCAMMON MINING CO.
SCHENLEY LEAD & ZINC CO.
SCHMIDT & SCHEMERHORN
SCHMIDT & SCHEMMERHORN
SCHMIDT BROS. & SCHEMMERHORN
SCHNUR & CO.
SCHOENHERR REYNOLDS MINING CO.
SCHOENHEUER-WALTON MINING CO.
SCHOOLHOUSE MINING CO.
SCOITA MILLING CO.
SCOTIA MINING CO.
SCOTT MINING CO.
SCRANTON MINING & SMELTING CO.
SCRANTON MINING CO.
SEMINO MINING CO.
SEVEN MINING CO.
SEWARD & GILL
SHAMROCK MINING CO.
SHELLING MINING CO.
SHERIDAN ADAMS ROYALTY SYNDICATE
SHERIDAN-ADAMS ROYALTY SYNDICATE
SHOAL CREEK MINING CO.
SHORT CREEK MINING CO.
SHOTGUN MINING CO.
SHOW ME STATE MINING CO.
SILVER DICK MINING CO.
SILVER LAKE MINING CO.
SILVER SPOON MINING CO.
SIMMS & CO.

Mining Company

SITTING BULL MINING CO.
SLONIKER & CO.
SMART & CO.
SMITH & CO.
SMITHFIELD ZINC CO.
SNEED MINING CO.
SNOWDRIFT MINING CO.
SNOWSTORM MINING CO.
SNYDER BROTHERS
SOPHIA MINING CO.
SOUTH CARTERVILLE MINING CO.
SOUTH JOPLIN LEAD & MINING CO.
SOUTH JOPLIN LEAD & ZINC CO.
SOUTH JOPLIN MINING COMPANY
SOUTHSIDE MINING CO.
SPARKLER MINING CO.
SPAWR & CO.
SPENCER & LLOYD
SPENCER SLUDGE CO.
SPIRAL LEAD & ZINC CO.
SPOTTED DOG MINING CO.
SQUAW MINING CO.
ST. JOE MINING CO.
ST. LOUIS MINING & MILLING CO.
ST. LOUIS SMELTING & REFINING CO. NL Ind
ST. LOUIS-JOPLIN LEAD & ZINC CO.
ST. LOUIS-JOPLIN MINING
ST. PAUL MINING CO.
ST. REGIS MINING & SMELTING CO.
ST. REGIS MINING & SMELTING CO. (NO.2)
ST. REGIS MINING CO.
STAG MINING CO.
STANDARD HILL MILLING & MINING CO.
STANDARD ZINC AND LEAD COMPANY
STAR MINING CO.
STEALEY DEVELOPMENT CO.
STEERS & RICE
STEPHENS MINING CO.
STERLING LEAD AND ZINC CO.
STERLING LEAD-ZINC CO.
STEVISON ROGERS MINING CO.
STEVISON, JONES & CO.
STEVISON-ROGERS LEAD AND ZINC COMPANY
STILLWELL MINING COMPANY
STOKES SHOEMAKER MINING CO.
STONEY & CO.

Alphabetic List of Mining Companies

Mining Company

STUMP MINING CO.
STURM, ROBERTS & SMITH
SUCCESS MINING CO.
SUCKER FLAT COMPANY
SUN MINING CO.
SUNFLOWER LEAD & ZINC CO.
SUNFLOWER ZINC CO.
SUNNYBROOK LEAD & ZINC CO.
SUPERIOR LEAD & ZINC CO.
SWAN MACHINERY CO.
SWAYBACK MINING CO.
TALBOT & MILLER
TALISMAN MINING CO.
TAYLOR & GLOVER
TEDDY R. MILLING CO.
TEN PER CENT PROSPECTING CO.
TENNESSEE LEAD & ZINC CO.
TEXAHOMA MINING CO.
TEXAS MINING CO.
THANKSGIVING MINING CO.
THEURER & KENNEDY
THOMPSON & CO.
THORTON MINING CO.
TIAJUANA MINING CO.
TIDIOUTE MINING COMPANY
TILHO MINING CO.
TOLEDO-JOPLIN MINING CO.
TOWER & REGAN
TOWER & TOWER
TOWER, DAVEY & CO.
TRACEY LEAD AND ZINC CO.
TRI-CITY MINING COMPANY
? TRI-STATE ZINC CO. Galena
TRIGGER MINING CO.
TRINITY ZINC, LEAD AND SMELTING CO.
TRIPLE P. MINING CO.
TUCKAHOE MINING CO.
TULSA-PITTSBURG MINING CO.
TURKEY CREEK MINING COMPANY
TURNER & CO.
TWELVE O'CLOCK MINING CO.
TWIN CITIES MINING CO.
TWO BILLS TAILING CO.
TYSON, DYNES & YANKIE
U. S. BAYMANSTER MINING CO.
U. S. SMELTING CO.

Alphabetic List of Mining Companies

Mining Company

UNDERWRITERS LAND CO.
UNDERWRITERS' LAND CO.
UNEX LEAD & ZINC CO.
UNITED LEHIGH MINING CO.
UNITED ZINC CO.
UNITED ZINC COMPANIES
UNITED ZINC COS.
UNITY MINING CO.
UNIVERSAL EXPLORATION CO.
UTAH-MISSOURI MINES CO.
V. & P. MINING CO.
VALENTINE MINING CO.
VANTAGE EXTRACTION CO.
VANTAGE LEAD AND ZINC CO.
VANTAGE MINING CO.
VESUVIUS MINING CO.
VESUVIUS MINING CO. (INC.)
VICTOR MINING CO.
VIENNA MINING CO.
VINEGAR HILL ZINC CO. LTV
VINTAGE EXTRACTING CO.
VIRGINIA MINING CO.
VOEGEL MINING CO.
W. B. S. LAND CO.
W. B. SHACKLEFORD AND ASSOCIATES
W. H. SMITH CO.
W. JOHNSON MINING COMPANY
W. O. CRAGG & CO.
W. R. LIVELY & CO.
WADDELL ZINC COMPANY
WALKER & CO.
WALLOWER MINING CO.
WALNUT HOLLOW MINING CO.
WANETA MINING CO.
WANETA PEARL MINING CO.
WARE & BOWMAN
WARE, BOWMAN & SCOTT
WATER OAK MINING CO.
WATSON & CO.
WEAVER MINING CO.
WEAVER TRI-CITY MINING CO.
WEBB CITY LEAD & ZINC CO.
WEBB CITY MINING CO.
WEEKS & BRIGGLE
WEST HOLLOW LEAD & ZINC CO.
WEST HOLLOW MINING CO.

Mining Company

WEST JOPLIN LEAD & ZINC COMPANY
WEST MINING CO.
WESTERN ZINC CO.
WESTON LAND & MINING CO.
WESTON LEAD & MINING CO.
WHAT CHEER MINING CO.
WHITE DOG MINING CO.
WHITE FLINT MINING CO.
WHITE OAK MINING CO.
WHITE RAT MINING CO.
WHITE SHIRT MINING CO.
WILCOX MINES CO.
WILDWOOD MINING CO.
WILSON MINES CO.
WINDSOR MINING COMPANY
WINGFIELD MINING CO.
WINSLOW MINING CO.
WISBY & CO.
WISE GUY MILLING CO.
WISE GUY MINING CO.
WISE MINING & DEVELOPMENT CO.
WOLFHEART MINING CO.
WOOD, BROWN & CO.
WOODBURN MINING CO.
WOODLAWN MINING CO.
WORLD'S FAIR COMPANY
WYATT MINES CO.
WYATT MINING CO.
WYHOFF & TINKER
YALE & BARBEE
YALE ZINC CO.
YELLOW JACKET MINING CO.
YELLOW PUP MINING CO.
ZIG ZAG MINING CO.
ZINC CORPORATION
ZINC CORPORATION OF MISSOURI
ZINC FIELDS MINING CO.

APPENDIX A

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59. Geological Map Showing Mining and Mineralized Areas, Missouri, Jasper-Newton Counties, Township 27 North, Range 33 West and Township 27 North, Range 34 West, prepared by the State of Missouri Geological Survey and Water Resources, 1916 to 1921.

60. Geological Map Showing Mining and Mineralized Areas, Missouri, Jasper-Newton Counties, Township 27 North, Range 32 West, prepared by the State of Missouri Geological Survey and Water Resources, 1921 to 1922.

61. Geological Map Showing Mining and Mineralized Areas, Missouri, Jasper County, Township 28 North, Range 32 West, prepared by the State of Missouri Geological Survey and Water Resources, 1920.

62. Geological Map Showing Mining and Mineralized Areas, Missouri, Jasper County, Township 29 North, Range 33 West and Township 29 North, Range 34 West, prepared by the State of Missouri Geological Survey and Water Resources, 1919 to 1922.

63. Geological Map Showing Mining and Mineralized Areas, Missouri, Jasper County, Township 28 North, Range 33 West and Township 28 North, Range 34 West, prepared by the State of Missouri Geological Survey and Water Resources, 1916 to 1919.

64. Geological Map Showing Mining and Mineralized Areas, Missouri, Jasper County, Township 29 North, Range 32 West, prepared by the State of Missouri Geological Survey and Water Resources, 1922.

65. U.S. Geological Survey Maps

ATTACHMENT I: SOURCE DOCUMENTS
THE 1894 REPORT (REFERENCE NO. 1)
JASPER SITE (NO. 669)

THE JASPER COUNTY SUB-DISTRICT

[illegible] sub-district [illegible] Jasper County line in Newton county and to the [illegible] of Galena, Kan. As belonging to the sub-district may also be [illegible] the recent developments at Spring City in Newton county, [illegible]

[illegible] to the [illegible] of the [illegible] group and to the [illegible] deposits of southwestern Missouri, in preceding chapters will show that the [illegible] of this sub-district [illegible] Lower Carboniferous [illegible] horizontal [illegible] formation, [illegible] limestone [illegible] and other fossils. With [illegible] beds are [illegible] proportions of chert, which is sometimes disclosed in nodules, [illegible] generally the [illegible] sometimes in [illegible] and sometimes [illegible] bodies. A predominance of chert has been observed at the [illegible] along the large streams, where great [illegible] these are known, however, not to be persistent. In the [illegible] the limestone country rock is much decomposed and often [illegible]. The [illegible] pressed, [illegible] bars, [illegible] sometimes [illegible] over the ore body. Overlying these Lower Carboniferous rocks, and [illegible] depressions in them, are frequent limited patches of Coal Measure shales and sandstones, often containing coal beds of workable thickness.

The ore bodies proper are brecciated masses of irregular form, of no predominant trend, but generally of greater horizontal than vertical extent. They are composed principally of the residuary products of decay of Lower Carboniferous limestones, largely chert, but also of Coal Measure shales and sandstones, with occasional fragments of coal. The fragments of these materials are surrounded by a matrix consisting of comminuted particles of the same or of plastic clay or [illegible]. Frequently this matrix is solidified, sometimes through the deposition of lime forming an impure limestone, and more often, through the deposition of silica forming an impure chert. The metalliferous minerals are diffused through the matrix or occupy cavities between the fragments.

The compounds of lead and zinc are principally galena and blende; their oxidation products are comparatively rare in this sub-district. The most common associated minerals are dolomite, calcite and marcasite.

Though certain groups of mines are along the lower levels of the country, the [illegible] are [illegible] distributed upon the divides between the larger streams, the *Joplin*, *Webb City* and *Galena* camps being notably so located. Individual mines may be in or adjacent to the minor depressions, but, in a large sense, [illegible] characterize the uplands rather than the lowlands.

A noteworthy feature of this sub-district is that the ores are purchase [illegible] and are not uniformly distributed over the area, and in many cases no connection can be traced between such groups of deposits.

Within the Jasper County sub-district, we distinguish certain camps or clusters of mines gathered around different towns or places. The most important of these are about Joplin, Webb City and Carter, the Carthage, Oronogo, Lehigh, Belleville, Saginaw, Scott and Spring City and Colonia, Kansas. The [illegible]

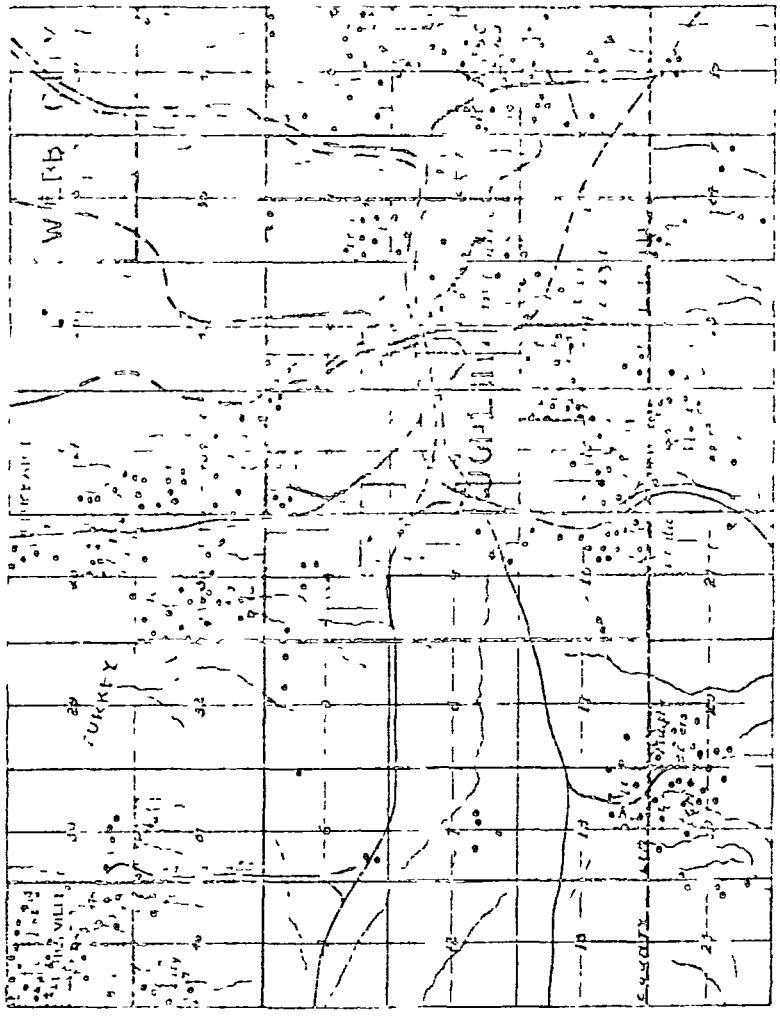


Fig. [illegible] Map of Joplin and Vicinity. From map of [illegible]

of these camps we will now proceed to describe, giving chief prominence, as types, to those most important mines recently studied by the Geological Survey, but including reference also to mines previously described by others which are now inaccessible.

The productions and relative importance of the different camps can be judged of from the following tables of productions during recent years.

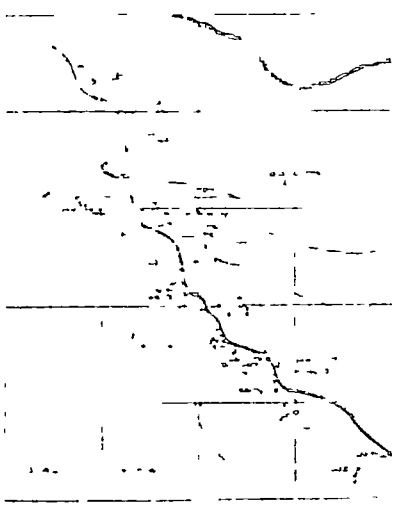
TABLE OF PRODUCTIONS OF JASPER COUNTY SUB-DISTRICT BY CAMPS, FROM 1886 TO 1893 (IN TONS)

	1886		1888		1889		1890		1891		1892		1893	
	Lead ore	Zinc ore	Lead ore	Zinc ore	Lead ore	Zinc ore	Lead ore	Zinc ore	Lead ore	Zinc ore	Lead ore	Zinc ore	Lead ore	Zinc ore
Joplin	[illegible]	22,208	2,386	11,299	2,611	19,516	2,801	19,147	4,270	32,433	6,021	27,672	[illegible]	50,572
Webb City and Carterville	2,581	21,019	2,107	24,735	3,614	41,588	3,820	41,149	3,861	50,11[illegible]	[illegible]	62,035	[illegible]	65,169
Lehigh	25	5,242		6,217		3,[illegible]	12	2,916		[illegible]		[illegible]		
Sherwood				49[illegible]		187			[illegible]	478	[illegible]	[illegible]		
Orongo	572	865	168	718			[illegible]	768	[illegible]	[illegible]	417	[illegible]	2,11[illegible]	[illegible]
Carthage		[illegible]		[illegible]						[illegible]		[illegible]		[illegible]
Belleville			159	12,745		8,671	92	[illegible]	[illegible]	[illegible]	102	[illegible]	[illegible]	[illegible]
Quapaw, Kas	2,[illegible]	27,210	2,[illegible]	27,275	3,[illegible]	39,676	4,171	21,[illegible]	3,002	[illegible]	7,[illegible]	[illegible]		

NOTES.—The figures for 1886 were obtained from Wilson's pamphlet [illegible]. For 1887 no data were obtained. For 1888 and 1889 the figures of zinc ore were furnished by Mr. Chas. Gumgerich, lead ore for 1888 was calculated from the tables of weekly production of Mr. [illegible] Zook, for 1889 they were estimated. For the years 1890-93, the figures are those of the State Mine Inspector. In Joplin are included the Roaring Springs, Turkey and Spot and camps.

[illegible]

[illegible]



[illegible]

[illegible] Long Jop[illegible] [illegible] from the [illegible] accompanying Schmidt's report of that year. On land maps of the district issued by Mr. J. R. Holibaugh, M. E. of Joplin, in 1892, from [illegible] of the preceding page is prepared, 115 different mines, each probably representing several openings, are located within the town limits and a dozen or so beyond those; many more have undoubtedly been [illegible] in past years. It is [illegible] entirely impractical to enumerate all of these, and still more so to attempt their description. Many are long since abandoned, and no records are preserved, [illegible] others are mere shallow pits, the scenes of a few weeks' work. Similarly with regard to the mapping of the mines, much detailed field work and sheets on large scales would be necessary in order to locate all of the openings. On the [illegible] maps accompanying this report, on [illegible] general [illegible] Topographic [illegible] on a much larger scale have been drawn [illegible] have been issued with special reports as soon as the means were [illegible].

[illegible]

Fig. [illegible] Map of the [illegible] Mine of the [illegible] Zinc company, from surveys made by the company. Scale, 1 inch = 500 feet.

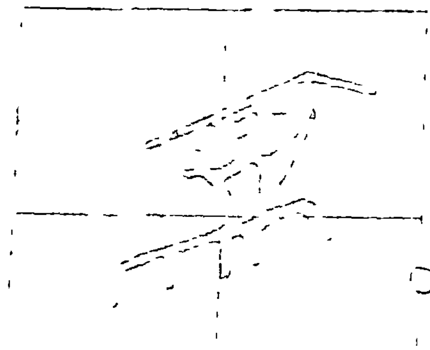
Fig. 121. Map of the Emillemine

[illegible] a dark brown secondary chert. Some [illegible] Besides [illegible]

[illegible] It lies between the levels of [illegible]

[illegible] light drab in color and is very brittle. That [illegible] a dark-bluish drab color and [illegible] of a brownish drab color and [illegible]

[illegible] shows that the runs [illegible] is plainly [illegible] NW-SE, [illegible] the eagle [illegible] much [illegible] ground, [illegible]



[illegible]

[illegible]

[illegible] around [illegible] Dunn[illegible] of [illegible] made by Mr [illegible]

[illegible] following [illegible]

	Lead ore		Zinc ore	
	Tons	[illegible]	Tons	[illegible]
[illegible]	1 32	[illegible]	1 144	[illegible]
[illegible]	172	[illegible]	1 3	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1 212	[illegible]	[illegible]	[illegible]

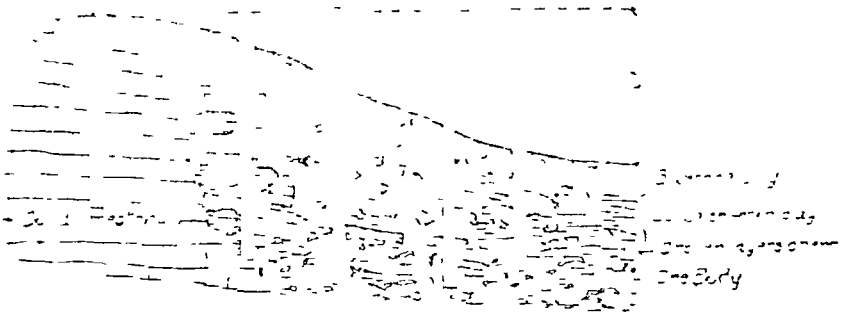
[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]



[illegible]

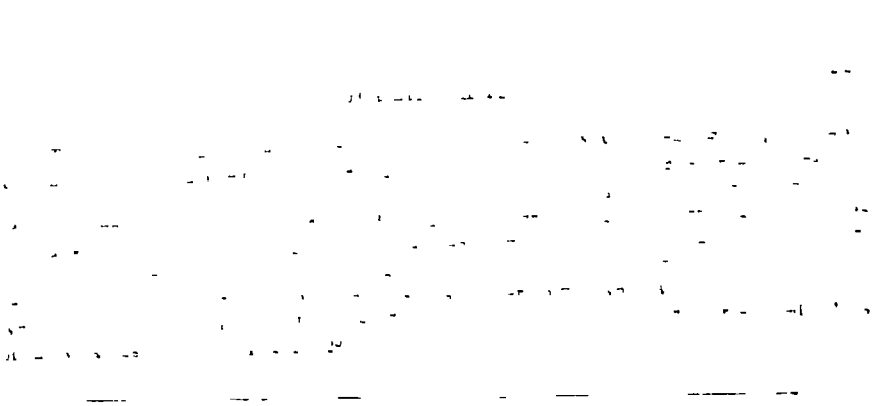
[illegible]

	Lead ore		Zinc ore	
	[illegible]	[illegible]	Tons	[illegible]
[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

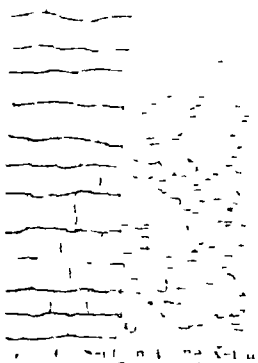
[illegible]



[illegible]

[illegible]

[illegible]

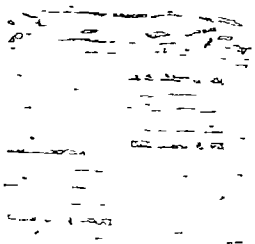


[illegible]

Broadhead in describing Jasper county in the report of 1873, refers to the mines along Joplin creek on page [illegible]. He notices the absence of solid beds of limestone and the presence of loose chert and dolomite in their place through which the lead is irregularly [illegible] in the Porter land, which we reproduce here. He refers to pockets of coal being found just west of Joplin, of irregular form and thinning out rapidly.

[illegible]

Covering the west half of the N.W. [illegible] as well as the forty acres north of this in the next section are the lands of the Consolidated Mining Company. They have not been [illegible] [illegible] was done [illegible]



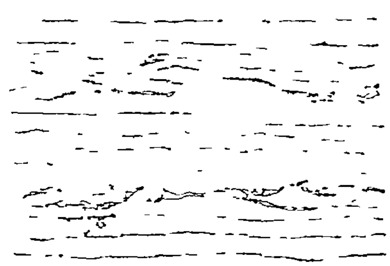
[illegible]

[illegible]

[illegible]

Fig. [illegible] Map of the [illegible] Lowery [illegible] Form [illegible] by J. R. [illegible], M. [illegible]

[illegible]



[illegible]

[illegible] the following table

	Lead ores		Zinc ores	
	Tons	Value	Tons	Value
Tr[illegible] M. Co., 1880 to [illegible]	4[illegible]7	$22,[illegible]	1,746	$42,[illegible]
[illegible] Z[illegible] Co., [illegible]			[illegible]01	[illegible]
Sterling [illegible] Z. Co., [illegible]	15[illegible]	3,[illegible]	[illegible]	[illegible]
Dr[illegible] M[illegible] Co., (1880 [illegible])			[illegible]33	11,[illegible]47
Dr[illegible] M[illegible] Co., ([illegible] and [illegible])	3	117	512	[illegible]
Tark[illegible] Cr. M. Co. ([illegible])	98	4,[illegible]	2,[illegible]	20,[illegible]
Tark[illegible] Cr. M. Co. ([illegible] to [illegible])	15[illegible]	7,[illegible]	4,207	[illegible]
[illegible] M. Co. [illegible]			[illegible]4	11,[illegible]

[1] From the State Mine Inspector's report [illegible]

[2] From [illegible] H. Wilson [illegible]

[illegible] were being operated and [illegible] was [illegible] however, as to obtain copies of a number of [illegible]

[illegible] on the [illegible] Mining Company [illegible]

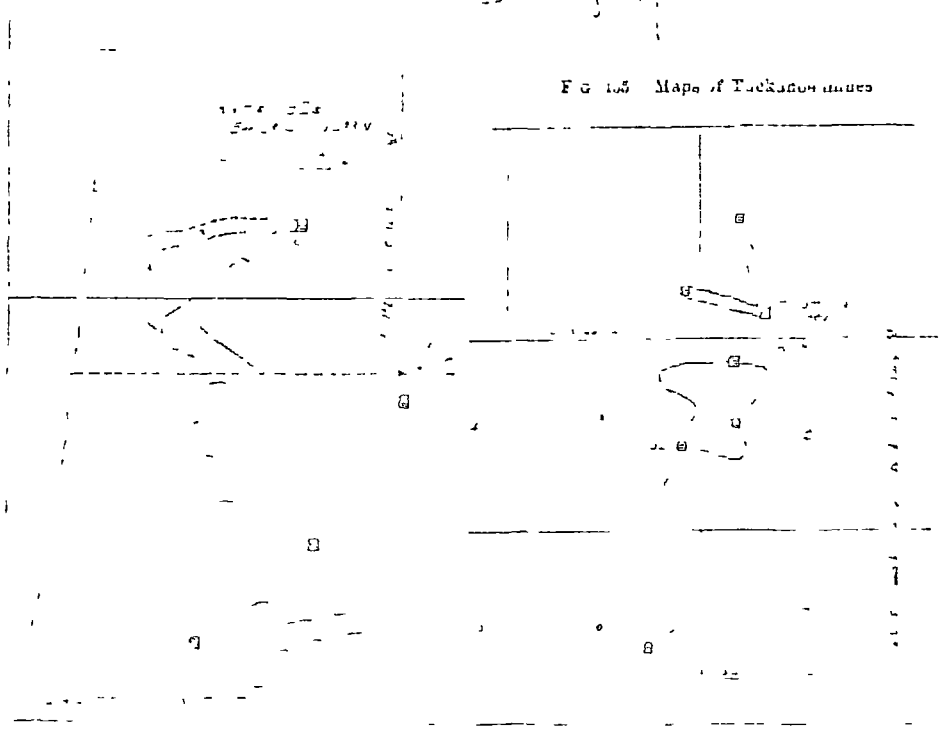
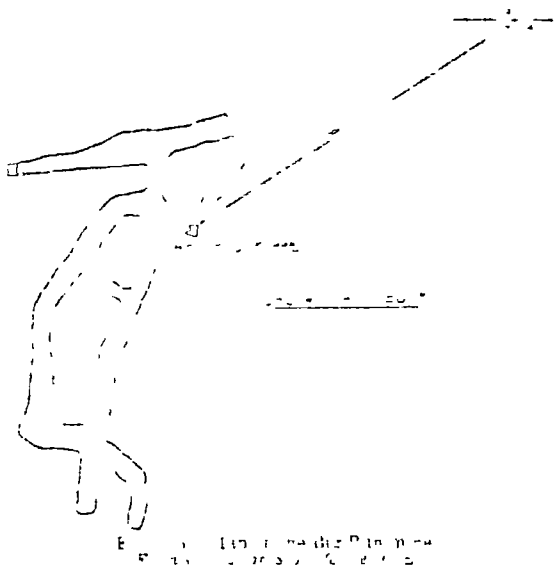


Fig. 105 Maps of Tuckahoe mines

[illegible]



[illegible]

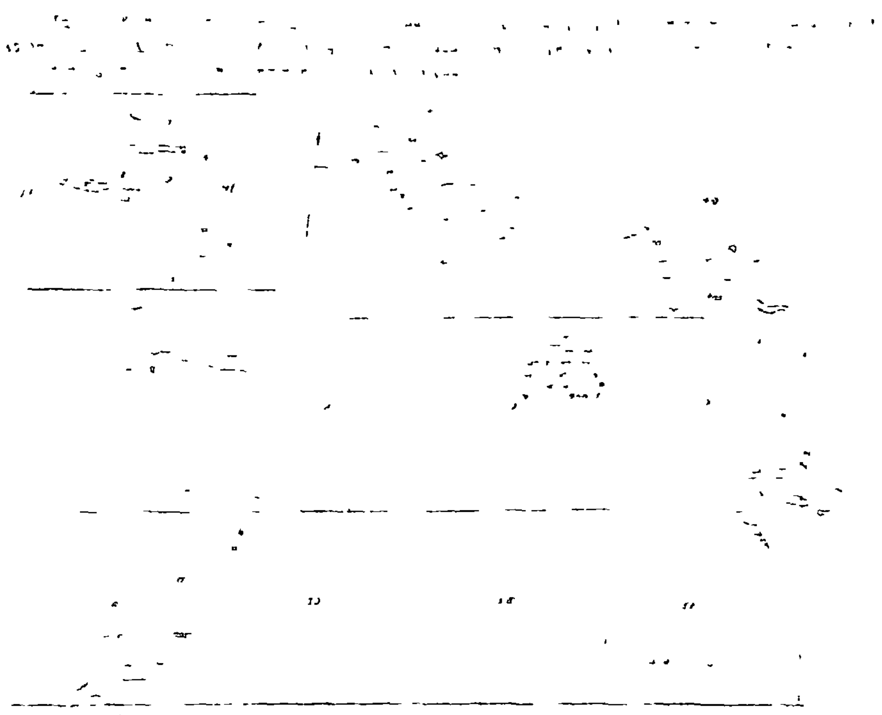
[illegible] in a prairie near the [illegible] between Turkey and Shoal Creeks [illegible] the same company. This land was owned by [illegible], Conner & Murphy before it was taken hold of by the Empire company in 1889, since that time it has produced as follows, according to the company's books:

	Lead ore	Zinc ore		Lead ore	Zinc ore
	Tons			*Tons*	
1890	No lead ore	401	1892	1	1,720
1891	[illegible]	1,2[illegible]	189[illegible]	1	2,2[illegible]

The figures of page [illegible] reproduced from the excellent mine maps of the company show the location and the extent of the workings. They also show very clearly the nature of the ground traversed and the depths of the drifts and are, hence, more instructive than any other of the maps presented.

[illegible] was [illegible] by the water [illegible] was [illegible] deep, and drifts were driven from it at several levels [illegible] the [illegible] was [illegible]. As is shown on the map, the run of [illegible] was a NE-SW direction. The ore bodies consist largely of a black secondary chert, and some [illegible] of a later formation and a dark yellow clay. An analysis [illegible] clay was made and the results are given on page 445. Limestone bars or walls were [illegible] of the chert gangue [illegible] decidedly calcareous and [illegible] secondary deposition of lime in the matrix, producing [illegible] No [illegible] in this [illegible] the [illegible] the [illegible] the past [illegible] NW [illegible] was [illegible] of chert. The ore body [illegible] consist of a [illegible] of chert and limestone containing both [illegible] the ore.

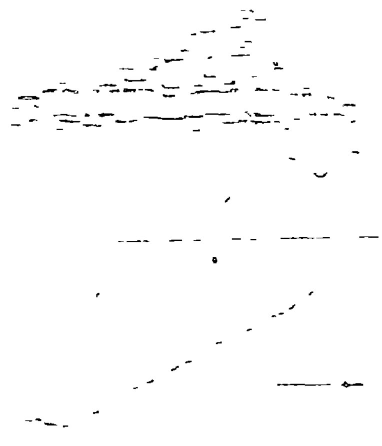
[illegible] the ore body seems to have something of the [illegible] on page [illegible]



F… 57. Map of the Ken… mine … Empire … company

About … the location … [illegible]

[illegible]



An interesting … [illegible]

[illegible]

[illegible]

[illegible] South Joplin Mining [illegible]

Fig. 1[illegible] Map of South Joplin Mining [illegible] mine
From survey by S. J. [illegible]

Zinc ore is exclusively mined [illegible] ton or [illegible] of lead [illegible] It is [illegible] companying plat shows the [illegible]

From [illegible] the [illegible] within the [illegible] will [illegible] proceed [illegible] and [illegible] Roaring Springs [illegible]

[illegible]

The mines of [illegible] some four miles southwest of Joplin [illegible] the common corner of sections 17, 18, 19 and 20 of township 27 N., 33 W., as is illustrated in the map of the next page. The principal diggings are on the lands of the Roaring Springs Land & Mining company, the Scotia Mining company and P. Murphy and Byers. The following tables give the production [illegible] the recent years. The production, though large, are not up to [illegible] of the [illegible] mines.

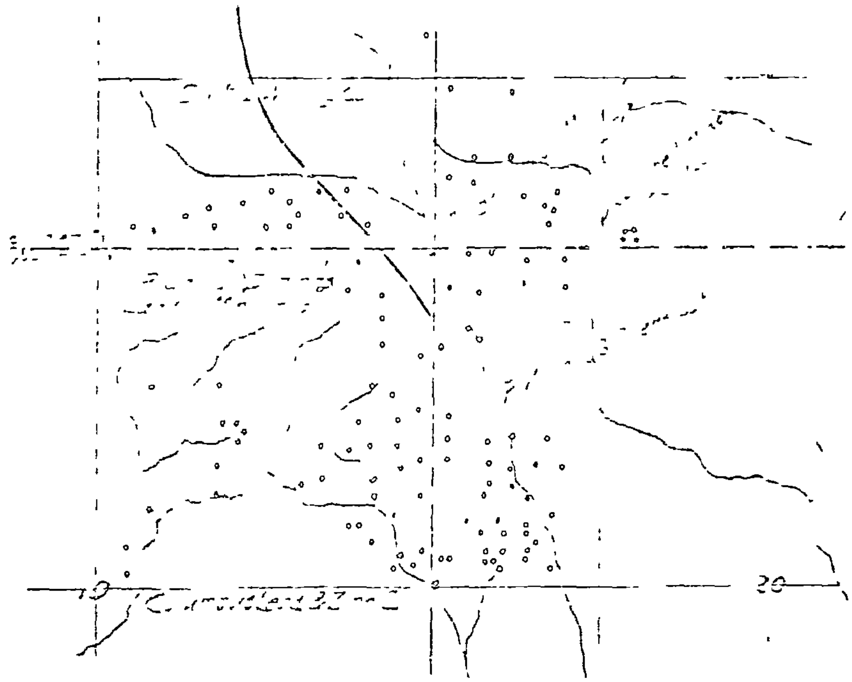
PRODUCTIONS OF THE ROARING SPRINGS M. CO.
From J. R. [illegible], from statement of the company

	Lead ore		Zinc ore			Lead ore		Zinc ore	
	Tons	*Values*	*Tons*	*Values*		*Tons*	*Values*	*Tons*	*Values*
1899			344	$6,[illegible]	1902	[illegible]	$3,447	1,117	$[illegible]
1900			31[illegible]	[illegible]	[illegible]	[illegible]	1,294	5[illegible]	[illegible]
1[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Total	12[illegible]	5,[illegible]	3,2[illegible]	[illegible]

[illegible]
From J. R. [illegible] by H. H. Gregg

	Zinc ore			Zinc ore	
	Tons	*Values*		*Tons*	*Values*
1[illegible]	[illegible]	$1[illegible]	1[illegible]	745	$12,[illegible]
2	1,[illegible]	2[illegible],0[illegible]	Total	1,[illegible]	[illegible]

[illegible] is [illegible] the [illegible] [illegible] ore [illegible] used [illegible]



F[illegible] 10 — Map of Roaring Springs [illegible]
From [illegible]

The Roaring Springs Land and Mining company's mines are described as follows by Mr. Robertson:

"Most of the mining here is done by individuals to whom the land is leased. There are some ten or more [illegible] shafts, all of which are sunk in the limestone which prevails over this portion of [illegible] county. At an average [illegible] of 50 feet the heavy bedded cherts are [illegible], and are [illegible] attempt having been made to penetrate them.

"The [illegible] is mainly of blende of good quality and quite light in color, [illegible] It is rarely crystallized, and is found in the broken chert cemented together by a [illegible] of black [illegible]. A variety of blende known as 'steel jack' [illegible] of a peculiar steel-like color and [illegible] is found and is considered of a very good quality. Galena also [illegible] here, [illegible]

"[illegible] seems to [illegible] direction N. [illegible] W. It has been followed by [illegible] The width and thickness are very [illegible]

"[illegible] minerals. Pyrite [illegible]

[illegible] on his company's property was examined by [illegible] The ore was [illegible] [illegible] [illegible] [illegible] [illegible] slickensided and [illegible] [illegible] to the surface [illegible]

[illegible] southeastern corner [illegible]
[illegible]

[illegible]

THE BELLEVILLE CAMP.

The town of Belleville and the included mines are on the north side of Turkey creek, about the middle of section 25, township 28 N., 34 W., the camp, however, [illegible] also the mines of West Hollow, East Hollow and Cotton-[illegible] south side of the creek. The mines about the town of Belleville [illegible] and the excavations in some are very extensive [illegible] the Standard Zinc and Lead company, the Knoble M. company, the Hod L. and M. company, the Pat Murphy and and the Rosemond M. company. The size of these mines may be judged of from the following table of production for the years 1891 and 1892 (ending June 30) as given by the State Mine Inspector.

	Lead ore	Zinc ore		Lead ore	Zinc ore
	Tons	*Tons*		*Tons*	*Tons*
Standard L. and Z. Co.		3057	Pat Murphy land	46	517
Knoble M. Co.	24	1[illegible]3	S. A. Holden (1890)	65	[illegible]59
Hod M. Co.	9	214			

A large part of the production, however, was, during years before 1890 as is shown in the following statement of productions at Belleville for 1886, extracted from Mr. Jno. N. Wilson's tables.

	Lead ore		Zinc ore	
	Tons	*Value*	*Tons*	*Value*
Pat Murphy	75	[illegible]	4,[illegible]50	[illegible]
[illegible]	2	[illegible]3	1,[illegible]	[illegible]
[illegible]	47	2,[illegible]40	1,[illegible]	41,[illegible]50
[illegible] L. & Z. Co.	32	1,[illegible]4	[illegible]50	1[illegible]9
[illegible]			[illegible]	2,1[illegible]

From May 1, 1887 to June 1, 1889, the sales of zinc and lead ores from the Holden [illegible] according to J. R. Hollbaugh. As the tables plainly show, the production of lead is insignificant as compared with the zinc.

T[illegible] [illegible] [illegible] [illegible]

[illegible]

[illegible] slopes [illegible] Creek, and probably less than 100 ft. above the valley. [illegible]

FIG. 142. Map of the Standard mine.
From surveys of J. [illegible]

The productions of recent years are as follows:

[illegible]	1,[illegible] tons zinc ore, sold for	[illegible]
[illegible]	1,470 " "	[illegible]
[illegible]	1,[illegible] " "	[illegible]
[illegible]	1,386 " " "	34,[illegible]
[illegible]	1,715 " "	[illegible]

[illegible] tons of zinc ore were mined [illegible] Mr. Holbanen.

[illegible] 30 feet [illegible]

[illegible]

[illegible]

MINES [illegible]

[illegible] West Hollow [illegible] Lead and Zinc [illegible] These [illegible] have [illegible] [illegible] the work has [illegible]

Mine	Lead ore	Zinc ore	Mine	Lead ore	Zinc ore
	Tons	Tons		Tons	Tons
[illegible]	1	[illegible]	[illegible] and Cortez		[illegible]
[illegible]	27	[illegible]	[illegible] Lead & Zinc M. Co.		72
[illegible]		[illegible]	[illegible] Co.		[illegible]
[illegible]	1		[illegible]		[illegible]
[illegible] M. Co.		2	[illegible] Lead & Zinc Co.	3	[illegible]
[illegible] L. & Z. Co.	5	2,074	West Hollow M. Co.		1,[illegible]
[illegible] M. Co.		[illegible]	West Hollow L. & Z. Co.	22	[illegible]
West Hollow L. & Z. Co.	2	75	189 *b* Joplin syndicate		454
189 *b* Cottonwood M. Co.	2	212	West Hollow L. & Z. Co.	0	420
West Hollow L. & Z. Co.	41	33			

a Jno. H. Wilson tables [illegible]. *b* State Mine Inspector reports, years end June 30.

Only one mine was examined here by the survey, as almost all of the others were out of operation at the time of inspection. This mine we will now describe.

The [illegible] and [illegible] — This mine is situated at the head of Cottonwood hollow, in the [illegible] of the [illegible] of section [illegible], on the east slope of the hollow, near the hill-top. It was 140 feet deep. The ore body consists of white chert, broken though not greatly brecciated. [illegible] between the fragments and blocks of chert [illegible] chalcopyrite and iron pyrite [illegible] openings of [illegible] which [illegible] [illegible] feet. At the end of the western [illegible] the exposure is very high, and shows [illegible] the intervening [illegible] [illegible] dolomite matrix [illegible] decomposed [illegible] following [illegible]

	Lead ore		Zinc ore	
	Tons	Value	Tons	Value
[illegible]	1	[illegible]	[illegible]	$10[illegible]
[illegible]	[illegible]	[illegible]	45	[illegible]

[illegible] reports, years ending June [illegible]

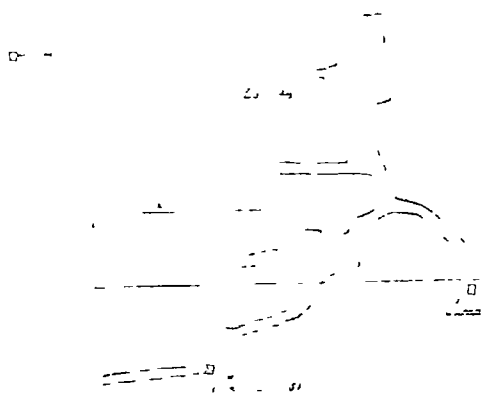
[illegible]

[illegible] NE-SW [illegible] This [illegible]

[illegible]

[illegible]

[illegible] extreme south [illegible] corner of section [illegible]



[illegible]

THE LEHIGH CAMP

Lehigh is situated about a mile west of Carl Junction in the northwestern corner of the sub-district. Most of the mines are on the north side, or in the bed of Center creek, but a few south of the creek as far as Sherwood may also properly be included in this camp.

The mines at Lehigh have in the past produced large quantities of ore notwithstanding the fact that they have had many obstacles to contend with. The principal of these was the fact that [illegible] of the best ground [illegible] and [illegible] [illegible] Center creek [illegible] the waters of that creek had to be [illegible] during the progress of mining. Consequently during the [illegible] could be done. An idea of the amount produced [illegible] mines may be gathered from the following figures.

[illegible]

	Lead ore		Zinc ore	
	Tons	Value	Tons	Value
[illegible]	25	$1,150	3,212	[illegible]
[illegible]			190	[illegible]
[illegible]			154	[illegible]
[illegible]	12	[illegible]	2,500	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]

[illegible]

A [illegible] was visited [illegible] the mines were drowned [illegible] grass and [illegible], hence could not be examined. As [illegible] however the ground consists of a soft [illegible] breccia in the [illegible]. The figures on production show that [illegible] On the [illegible] of the creek the ground has caved in over a number of old workings, exposing in places [illegible] limestone roof and walls penetrated by chimneys and [illegible] filled with ore breccia.

During the autumn of 1913 a promising deposit of lead ore was opened on the hill-side, northwest of the creek mines in the SE ¼ of the NW ¼ of section 12. A shaft was sunk in December to a depth of 90 ft. in soft ground with a black mud [illegible].

The Sherwood mines, about one mile southeast of Lehigh, have never been important producers—during the years 1911 and 12 only a few tons of lead ore and less than 100 tons of zinc ore being mined. Work was not in progress there at the time of [illegible] visit and hence these mines were not inspected.

THE ORONOGO CAMP

Mining operations have been prosecuted about Oronogo as long as at any point in the county, and during the first years of mining they were the principal producers. They were known and were described by Swallow in 1854 as the Center Creek mines on [illegible] of section 31, township 29 N., 32 W., and of section [illegible] in the township to the west. From that time on, more or less mining has been [illegible] down to the present date. The following figures [illegible] of the rates of production at different periods.

		Tons			
[illegible]	[illegible]	[illegible]			
1870	M[illegible]	6.5			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]		
	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	472	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	

[illegible]

From [illegible] Report State Mine Inspector, [illegible] ending June [illegible]

A[illegible] the [illegible] was visited by the writer, [illegible] could not [illegible] the open and [illegible] north of the town. The new ground of the [illegible] land just south of Center Creek had, however, just been opened, and the Ashcraft and Hendrickson shaft was examined.

ASHCRAFT AND HENDRICKSON SHAFT.

This shaft was located in the alluvial basin of Center creek, on [illegible] on h[illegible]. It was about 50 ft[illegible] deep. The ore [illegible] of [illegible] which were [illegible] large [illegible] some [illegible] sorted. [illegible] occurred in gray or [illegible] clay [illegible] which [illegible] the blocks of chert. The ground is hardly in the condition of a breccia, though the traces of [illegible] are not [illegible] plain. The following are the figures of recent production:

From the company's books, by J. R. [illegible].

March 2 to D[illegible] 1893	[illegible] tons lead ore, sold for [illegible]	
June [illegible] " 1893	2 [illegible] " " "	69 570

THE [illegible] OR [illegible] MINES.

The older workings [illegible] which were not visited were examined quite carefully during the progress of [illegible]. As they presented many features of interest, [illegible] some of these [illegible]

[illegible] the report of 1874 [illegible] Center [illegible] mines [illegible] brown sandstone [illegible] west line [illegible] small, without [illegible] through [illegible]

[illegible]

[illegible] distribution of the diggings at the [illegible] and [illegible] of the deposit. The diggings were [illegible] into the Branch [illegible] and [illegible] of the postoffice and [illegible] northwest of the postoffice. [illegible] makes a special note here of the presence and prevalence of a dark secondary chert or quartzite, which occurs both massive and cementing fragments of chert and limestone [illegible] generally dense and indurated, though he notes that it is sometimes coarsely crystalline and granular [illegible] through action of the silica-bearing waters on the original chert. It [illegible] We have already referred to [illegible] material in other shafts of the sub-district, but at the time of Schmidt's report it seems to have been encountered only at a few localities.

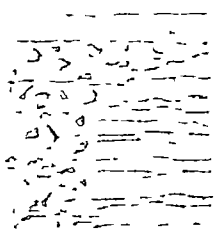
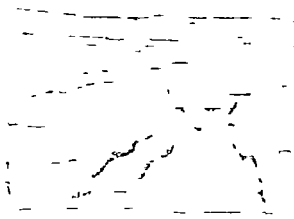


Fig. [illegible] Section at the Branch [illegible]

The Branch [illegible] along the small stream appear to have worked [illegible] which occurred in small runs in the usual chert and limestone [illegible] galena and blende were distributed in streaks [illegible] to [illegible] inch. Secondary chert was in abundance here as already stated. [illegible] only [illegible] mass of galena 6 to 8 ft. long, and [illegible] was found loose in the clay. In some of the [illegible] the contact between the ore or [illegible] and undurated limestone was [illegible] shaft [illegible] illustrated in figure 146. [illegible] shaft [illegible] gray sandy limestone with streaks of black [illegible] shaft was [illegible] as much as [illegible] inch [illegible] seams [illegible] of galena [illegible] in the [illegible] figure [illegible] secondary chert [illegible] In [illegible] and streaks [illegible] inch [illegible] wall [illegible] gravel [illegible] small crystals and fragments of galena and blende.

Fig. 147. Section at Branch Diggings (Schmidt)

[illegible]



[illegible]

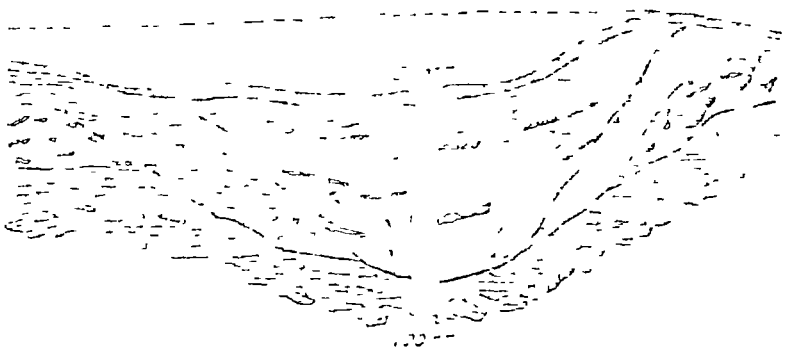


Fig. 149. Ideal cross-section of the circle diggings. (Schmidt.)

The above ideal cross-section represents the conditions here, as illustrated by Schmidt. According to this interpretation the circular form of this deposit is due to the breaking down of strata, [illegible] by underground erosion, so that it is of the same nature as the sink-holes so commonly found in limestone formations.

THE ALBA MINES

An outlying group of mines which is best considered here occurs about one-half mile south of the town of Alba in the SW corner of section 15, and the SE corner of section 16, township 29 N., 32 W. In 1886 these were new mines and they have [illegible] been operated only at intervals. The yield is consequently not very large. The following figures, applying to three different years, illustrate the rate of production.

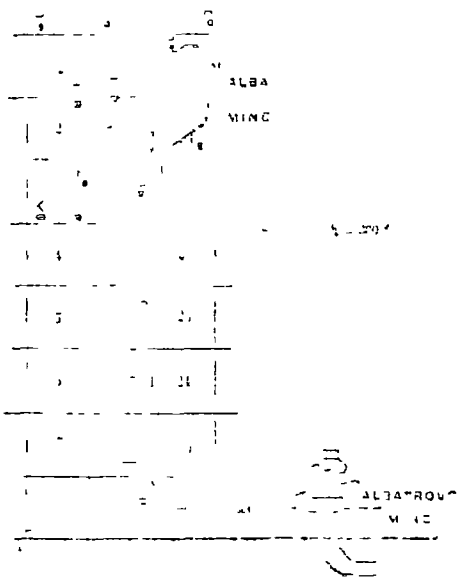
[illegible]

	[illegible]			
	Tons	[illegible]	[illegible]	[illegible]
[illegible] Alba Mining Co	5	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
Alba Mining Co			[illegible]	[illegible]
[illegible] Alba Mining Co [illegible] same as Alba Mining Co			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]

[illegible] from Mine [illegible] Fine [illegible] [illegible]

[illegible] Alba company in section 16, [illegible] Mining [illegible] in section 15. The [illegible] the first company were [illegible] by the [illegible] some detail.

[illegible]



At A is a shaft [illegible] feet deep, [illegible] ground.

At B is a shaft [illegible] feet deep in similar ground, with some blende at 70 feet.

At C is a shaft 70 feet deep through fractured [illegible] limestone with some white chert; only small specks of blende were found.

At D is a shaft 40 feet deep in solid limestone.

At E the shaft is 179 feet deep and passed through a section illustrated in figure [illegible].

At F is a shaft 70 ft. deep, through open ground with dolomite but no slate, at about 55 ft. coarsely crystallized blende is disseminated through the dolomite.

At G is shaft No. 12 160 ft. deep. Only about 15 ft. of slate was passed through [illegible], covered by the surface clay and chert, and underlain by limestone and dolomite blocks; the ore body was struck at about [illegible] ft. containing some galena and much blende; this continued down to 70 ft. Between [illegible] and [illegible] ft. another run of ore was found.

At H is a shaft 72 ft. deep in which chert and [illegible] were found [illegible] the [illegible]

[illegible] Alba mine [illegible]

At [illegible] was struck.

At M [illegible] passed through [illegible] ground and about 15 ft. of shale. The [illegible] run of ore [illegible] blende was struck at [illegible]

At N [illegible] of soil, [illegible] chert was [illegible] exposure. Just west [illegible] the slate, [illegible] was struck at about [illegible]

[illegible] from Mine Inspector's report [illegible] June [illegible] from G. Denison, president.

[illegible]

[illegible]

[illegible] Blocks of dolomite and secondary limestone, with [illegible] between the blocks

[illegible] Ore body consisting of breccia of white chert fragments surrounded by black [illegible] also reddish and black tallow clay, all [illegible] minately mixed [illegible] some dolomite [illegible] grains and [illegible] grains of light red [illegible] collor

Fig. 151. Section of Alba Co.'s shaft.

During the year [illegible] an attempt was made to work this upper run of ore by an open cut or pit which was sunk at great expense to a depth of [illegible] ft. Its outlines are defined on the map. Among other [illegible] some [illegible] ft. of coal shale was taken out within the limits shown.

A [illegible] of all these facts plainly shows that we have here another instance of a coal pocket around the margin of which the ores occur in a breccia of residuary material [illegible] lower [illegible] rocks. This zone of brecciated material, [illegible] irregular [illegible] [illegible] and beyond this, the undisturbed limestone is encountered. A few hundred yards south of the mine undisturbed limestone is seen in the bluffs along spring river.

[illegible] —The mine which is just accross the road to the east of the last described [illegible] ground, and the deposit is associated with slate. I [illegible] not admit of a special examination. The main shaft is [illegible] deep; the outlines of the workings are shown in [illegible]

WEBB CITY AND CARTERVILLE CAMP

[illegible] Webb City and Carterville camp [illegible] the first discovery of ore there was made [illegible] progress [illegible] however and the [illegible] not exceed [illegible] feet [illegible] which [illegible] encountered and no attempt was made to penetrate it. Within a few years however some of the [illegible] were run [illegible] and the camp soon attained an important [illegible] position during recent years, even overtopping the Joplin camp as is shown by the table of productions by [illegible] It, therefore, now ranks next in importance to Joplin in the production of zinc ore.

The [illegible] are approximately defined by the limits of the two towns. [illegible] an area of about [illegible] acres. A [illegible] of the mines [illegible] though [illegible] adjacent towns will be considered [illegible]

A [illegible] number of borings have been made in and about Webb City and Carterville. They are [illegible] called M[illegible] with [illegible] between the two towns. In addition south and southeast of [illegible] area of [illegible] Mr. Ho[illegible] prior property map of the two towns of [illegible] there are as many as 70 mines located within their limits and a number more within a distance of a mile or so. The cut of p. 377 prepared from data [illegible] well illustrates the density. It is manifestly as impossible here as with Joplin, to describe and give records of all of these openings, nor could we even locate them on a small map. An attempt to accurately describe even all the most important would prove futile. It is truly lamentable of how few mines any adequate description or history is preserved. No provisions have been made for maps which would show the extent of the workings and from which the shape and distribution of the ore bodies over the whole camp might be deduced. Many of these workings are now inaccessible.

A number of the most important mines were examined by the writer during 1912. As time and opportunity did not permit visiting a large number, effort was made to distribute observation equally over the area, and to select such mines as might stand as types. These we will now proceed to describe by groups.

THE SOUTH WEBB CITY GROUP

The [illegible] Mining Co.—This company operates a small tract of land of only about 5 acres, situated [illegible] corner of the NW ¼ of the NE ¼ of section [illegible] in the southern [illegible] of the town of Webb City. It is along with a number of other mines on what is known as South [illegible], in the area of [illegible] operations. [illegible] not been [illegible] for [illegible] years. The [illegible] are now [illegible] following [illegible]

	Lead		Zinc	
	Tons	Values	Tons	Values
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	214	[illegible]	425	[illegible]

[illegible]

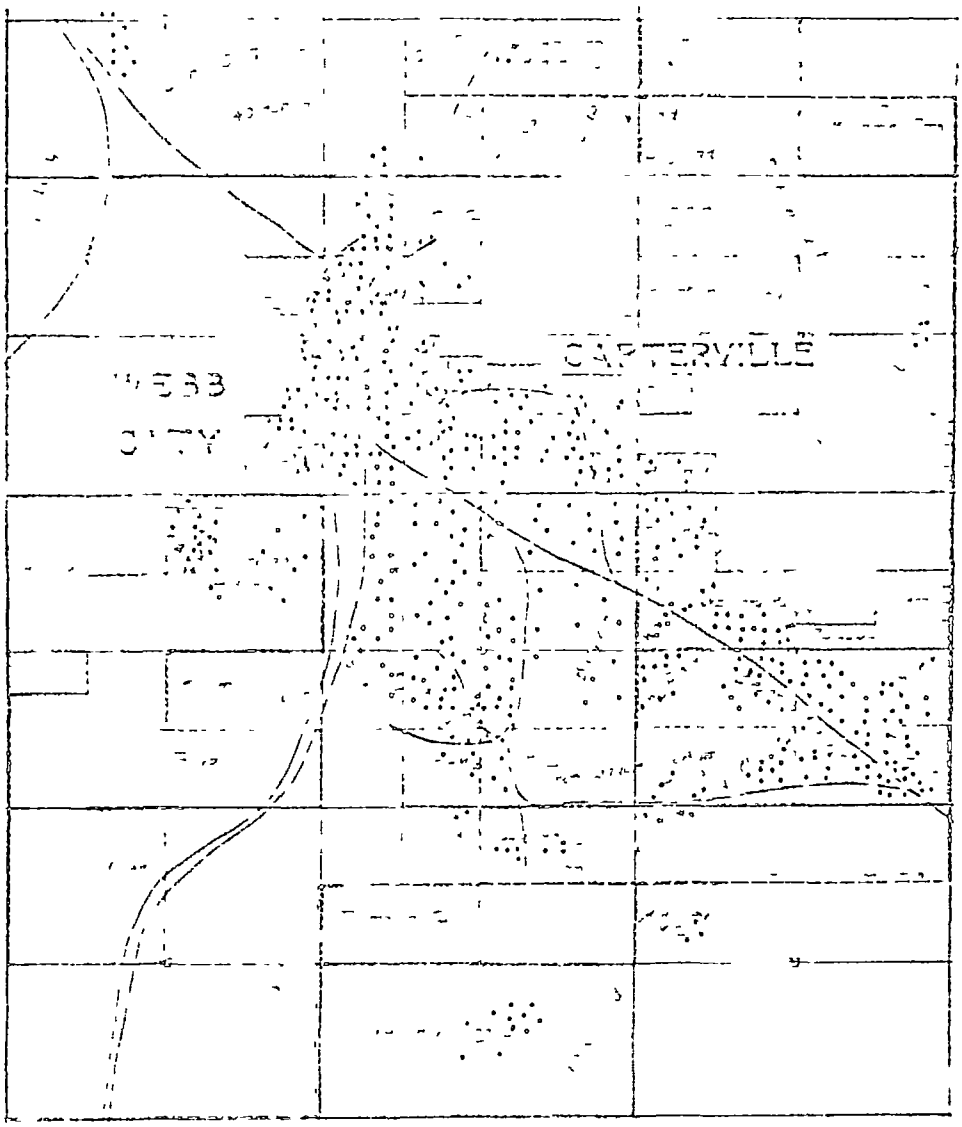


Fig. 2. Map of [illegible]
From [illegible]

[illegible] Drifts had been driven at [illegible] at [illegible] ft. [illegible] and at [illegible] ft. at the bottom of the shaft. [illegible] The [illegible] of fragments of chert sur- [illegible] blende [illegible] especially near the bottom of [illegible] Al[illegible] galena was found, and some pyrite was disseminated [illegible] Large [illegible] shale were [illegible] in this drift, distinctly bedded, and these bedding planes were [illegible] showing that the material had been [illegible] sinceritis [illegible] This [illegible] was observed in many other mines of this [illegible] At the bottom of the shaft, [illegible] appearance [illegible] horizontal layers, but the bedding [illegible] somewhat resembled the [illegible] at Grand Falls. Immediately adjacent to the shaft Coal Measure shale was encountered in a number of diggings. It is [illegible] blue to dark gray [illegible] shale overlying about [illegible] of black [illegible]

[illegible] Garrison Lead and Zinc Company, the [illegible] Tracy land. [illegible] the extent of the [illegible]

	Lead ore		Zinc ore	
	Tons	Values	Tons	Values
[illegible] Garrison L. & Z. Co.	[illegible]2	[illegible]2,529	1,522	[illegible]
M. Corbie & Aylor	[illegible]0	[illegible]	[illegible]0	[illegible]
[illegible] Garrison L. & Z. Co.	58	2,[illegible]05	[illegible]54	[illegible]
[illegible] Garrison L. & Z. Co.	248	11,160	1,522	[illegible]4,473
[illegible] Garrison M. Co.	118	4,477	940	[illegible]

[illegible] Wilson's tables [illegible]

[illegible] From State Mine Inspector's reports, years ending June [illegible]

In addition Mr. Holbaugh has contributed the following figures of the Tracy lands obtained from the company's books.

	Lead ore		Zinc ore		Totals
	Tons	Values	Tons	Values	Values
[illegible]	2	[illegible]20	[illegible]	[illegible]	[illegible]
[illegible]	41	3,394	1,[illegible]70	26,[illegible]21	[illegible]
[illegible]	76	1,[illegible]	2,[illegible]	[illegible]	[illegible]
[illegible]	71		4,142		[illegible]
[illegible]	432		7,[illegible]30		[illegible]
[illegible]	[illegible]		[illegible]		[illegible]
[illegible]	[illegible]		11,[illegible]		[illegible]
[illegible]	270		10		[illegible]

[illegible]

[illegible] Blanton and Wyatt, Rising Sun, Cherokee, Mound City, Kellar and the Pennsylvania [illegible] mines. [illegible] able to obtain many figures of production from this group, nor did we have opportunity to examine many of the underground workings. The following table will, however, convey an idea of their importance.

	Lead ore		Zinc ore	
	Tons	Values	Tons	Values
[illegible]	[illegible]	[illegible]		
Blanton and Wyatt b			[illegible]	[illegible]
[illegible] Cherokee M. Co.			[illegible]	
Rising Sun M. Co. c			[illegible]	
Blanton and Wyatt b	94	4,200	[illegible]	[illegible]
Mound City M. Co.			[illegible]	
[illegible] M. Co.	[illegible]		[illegible]	[illegible]
Blanton and Wyatt b	26	1,100	1,717	[illegible]
Mound City c	[illegible]		570	14,246
Rising Sun c	1		[illegible]	

a From State Mine Inspector's report, year ending June 30.
b From J. R. Hollinaugh, derived from company's books.
From W. C. Stewart, of Webb City.

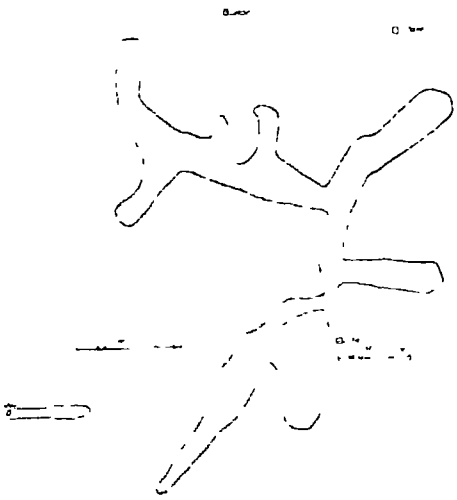


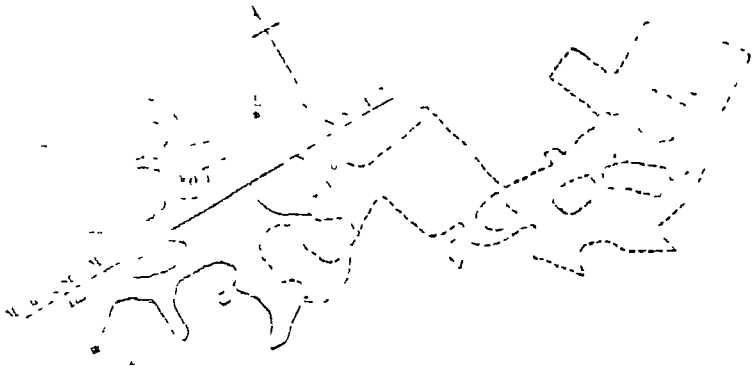
Fig. [illegible] Map of the Mound City mines. Surveyed by O. [illegible], C. E.

Only one shaft was examined, namely, the Victor, which we will now describe; the ground in which the others work is, however, similar. The adjoining map of the Mound City mine is added for reference here.

The Victor Mine.—This mine operates what is known as the Thomas Conner land, and is in the northeastern corner of the [illegible] of the SW [illegible] of section 20. It immediately adjoins the Morning Star mine, with which the workings are connected underground. The map of [illegible] shows the extent of these workings. This mine has been one of the largest producers of the group, the product being [illegible] zinc ore. The following table [illegible] [illegible] years.

According to a circular [illegible] Commercial Club, the production for [illegible] was 2704 tons zinc ore at [illegible] and [illegible] tons, at [illegible].

This mine has not been in operation much longer than the period to which these figures



[illegible] Map of Morning Star and Victor mine
From Surveying [illegible], C. E.
[illegible]

Lead ore		Zinc ore	
[illegible]	[illegible]	Ton	[illegible]
[illegible]	[illegible]	1,147	[illegible]
1891a	1891a	2,383	53,[illegible]63
[illegible]	[illegible]	4,[illegible]8	1[illegible],[illegible]00
[illegible]	[illegible]	2,[illegible]00	54,[illegible]00

a From State Mine Inspector reports [illegible] years ending June 30.

apply. At the time of inspection the shafts were about 200 ft. deep. No. 3 shaft passed through about 50 ft. of limestone, overlying the ore body. The latter was a chert breccia, the matrix or filling between the chert fragments consisting of clay and a soft earthy silicified shale or chert (*Anal. No. 73, p. 447*). Masses of dark bituminous shale were also found in the ore body, showing planes of stratification and containing nodules of chert. The layers of shale were seen, however, to dip strongly in evidence that it was not in its original position. Drifts are opened in this ore body to a height of 70 ft. The chert is very brittle and much shattered, often breaking into long splinters, whence it is called "butcher's knife flint." No black, oil-coats and hard secondary chert was seen. The ore, which is almost entirely blende, occurs in massive crystalline masses between the slabs of chert and also disseminated through the gangue. Very little pyrite or dolomite were observed.

The fact that shaft No. 3 penetrated a thick stratum of limestone does not necessarily mean that the whole body of ore is covered by such a cap, and the same remark applies to the other mines in this camp which are operated under a limestone roof. On the contrary, at the Victor mine numerous [illegible] of old mines were seen, which showed that the [illegible] of Lower Carboniferous limestone was [illegible] up to the surface in many places by pipe and [illegible] [illegible] channels for the ready transit of surface material to underground [illegible].

THE SOUTHEASTERN CARTERVILLE GROUP.

In the southeastern part of the town of Carterville, along the branch of the Mo. Pacific railway [illegible] to Birch Center is a group of important mines of comparatively recent development. The principal of these are the [illegible], the Troub, the Eleventh Hour, the [illegible], the Eastern Star, the [illegible] and the [illegible] mine. These have been large producers in past years, and

[illegible] of the mines are [illegible] steam plants. The following [illegible] obtained from [illegible] mining here.

	Lead ore		Zinc ore	
	Tons	[illegible]	Tons	[illegible]
[illegible] Wilson [illegible] (Trouble [illegible])	1[illegible]	[illegible]	42	[illegible]
Avlor Bros (Eleventh Hour)	25	1,[illegible]		
[illegible] Eleventh Hour	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] Trouble [illegible]	23	[illegible]	[illegible]	[illegible]
Eleventh Hour	215	[illegible]	3,162	72,[illegible]
Burton [illegible]			14	[illegible]
[illegible] Trouble [illegible]	[illegible]	11,[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	14,[illegible]	1,[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
Burton M. Co.			[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Richland	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] M. Co.	23	[illegible]	[illegible]	[illegible]
[illegible] Hour M.	[illegible]	[illegible]	[illegible]	[illegible]
Minneapolis M. Co.	2	[illegible]	17	[illegible]

[illegible] From [illegible]

[illegible] From [illegible] Mine [illegible] ending June [illegible]

In addition Mr. [illegible] has contributed the following obtained by him directly from the companies' books.

	Tons lead ore	Tons zinc ore	Total [illegible]
Richland M. Co., 1891	154	[illegible]	818,742
" " 1892	470	2,235	70,[illegible]
" " 1893 (to Nov. 18)	[illegible]	734	29,[illegible]
Trouble mine [illegible] (to Nov. [illegible])	228	613	18,[illegible]
Perry mines (July 1892 to Nov. [illegible])	[illegible]	[illegible]	[illegible]
Eclipse mine	62	[illegible]	4,[illegible]
Eastern Star (June 1893 to Nov. 1, [illegible])		4,156	[illegible]

Two mines were selected out from this group for examination by the writer, and they may be considered [illegible] for the whole.

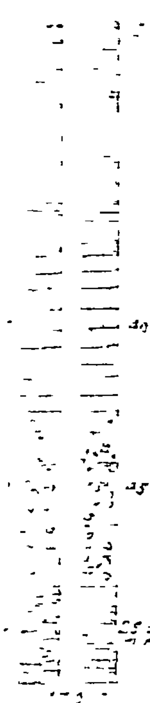


FIG. 53.—Section at the Richland mine.

[illegible] in the SW. [illegible] of the NW. [illegible] section 21. [illegible]

[illegible] sometimes [illegible] No. [illegible] town [illegible] No [illegible]

[illegible]—The [illegible] section 21, [illegible] having been successively in shale and massive limestone, while the lower [illegible] in the [illegible]. The [illegible] of the mine was in the lower part of the ore body. The breccia consisted of white, fractured chert fragments in a matrix of sand and clay and dark-gray secondary chert. No dolomite and no calcite were observed. Some lead was found in the upper portions of the workings, and the blende occurred in the lower part in crystalline masses and caves, and also disseminated through the breccia. Very little pyrite is found here. No indications of stratification were observed in the breccia or chert, but the constituent parts are arranged apparently without any particular order.

Other mines of this group might have been examined had time permitted, but at others there was no work going on at the time. It is thought, however, that this brief description will sufficiently indicate the general nature of the ground. The limestone overlying the great mass of brecciated material is a marked characteristic. The presence of overlying Coal Measure shales is also to be noted.

THE [illegible] [illegible] GROUP.

Under this heading we include a number of the most important mines and the [illegible] operating lands lying [illegible] between Webb City and Carterville, on both sides of Mineral creek. A portion also [illegible] south of Carterville. In this group we include the mines of the Center Creek, the Nevada, the North Carterville, the South Carterville, the Ealy, the Morley, the Homestead, the [illegible] Mining [illegible]. It was within the limits of these lands that the first mining in Webb City was done, and work has continued here almost [illegible] to the present [illegible] the bulk of the [illegible] of the [illegible] has been from this [illegible] lands [illegible] the Center [illegible] Mining Company. The following table, compiled largely from the [illegible] reports, [illegible] of the productiveness of the mines.

	Lead [illegible]		Zinc [illegible]	
	Tons	[illegible]	Tons	[illegible]
[illegible] Creek M Co *	[illegible]	[illegible]	[illegible]	[illegible]
Nevada M Co	712	[illegible]	1,504	[illegible]
Carterville Co (Consol N & S Carterville Co)	1,541	73,104	3,917	110,216
Modoc M Co	26	1,[illegible]	46	1,[illegible]
[illegible] Center Creek M Co *	1,290	9,[illegible]	29,054	[illegible]
Nevada M Co	146	3,773	[illegible]	[illegible]
Modoc M Co	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] Daugherty, Davey & [illegible] (Cornfield)	[illegible]	47,[illegible]	[illegible]	[illegible]
Davey Tower and Tower Davey & Co (N & S Carterville Co)	[illegible]	37,[illegible]	[illegible]	[illegible]
[illegible] Creek M Co *	[illegible]	[illegible]	[illegible]	[illegible]
Nevada M Co	160	3,250	1,254	[illegible]
Daugherty & Davey (Eaton)	[illegible]	13,[illegible]	1,472	[illegible]
Daugherty, Davey & Daugherty (Cornfield)	925	37,433	[illegible]	13,[illegible]
Davey, Tower & Co (S Carterville Co) and	120	9,[illegible]	[illegible]	23,[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Modoc M Co	413	19,[illegible]	1,[illegible]	27,[illegible]
[illegible] Center Creek M Co *	573	41,[illegible]	2,735	106,157
Nevada M Co	128	5,[illegible]	750	[illegible]
Daugherty & Davey (Eaton)	144	6,640	1,016	29,576
Daugherty, Davey & Daugherty (Cornfield)	409	18,814	756	18,309
Davey Tower & Co (S Carterville Co)	60	2,971	553	12,[illegible]
Tower Davey & Co (N Carterville Co)	245	11,321	1,015	20,564
Modoc M Co	228	10,[illegible]	1,349	19,[illegible]
[illegible] Center Creek M Co *	710	23,[illegible]	11,313	281,[illegible]
Daugherty & Davey (Eaton)	167	7,[illegible]	423	7,[illegible]
Daugherty, Davey & Daugherty (Cornfield)	375	15,[illegible]	150	[illegible]
Davey Tower & Co (S Carterville Co)	68	2,[illegible]	[illegible]	17,931
Tower Davey & Co (N Carterville Co)	159	6,[illegible]	615	12,910
Modoc M Co	127	5,[illegible]	734	20,741

[illegible] from N. Wilson's [illegible] [illegible] mine inspector [illegible] years [illegible]

* [illegible] from the [illegible] W. [illegible] and on [illegible]

[illegible] the [illegible] years [illegible] the following [illegible] of these mines

	Lead ore Tons	Zinc ore Tons	Total values
[illegible]	[illegible]	135 [illegible]	[illegible]
[illegible]	2	[illegible]	[illegible]
[illegible] December [illegible]	1 [illegible]	2 [illegible]	1[illegible] 310

[illegible] from [illegible] H[illegible], as obtained from the companies' books

As a general [illegible] many of the mines over this long-worked area are now abandoned and are inaccessible [illegible] have caved [illegible] and turn an excellent examination of the character of the [illegible] The [illegible] of the plate opposite [illegible] of a cave in on the Nevada company's land. It gives some idea of the [illegible] workings. The [illegible] limestone rock, which is here about 10 ft thick, is shown [illegible]

The Center Creek Mining Company.—This company owns [illegible] acres of this area, including [illegible] of the NW [illegible] NW [illegible] of section 17 [illegible] and the NE [illegible] I was within this area that [illegible] and [illegible] the present a very [illegible] A [illegible] number of the [illegible] will be [illegible] of this report. The whole surface of the ground [illegible] and [illegible] from [illegible]

[illegible] large quantities of [illegible] been [illegible] From [illegible] a prospectus and report of the company, prepared by Mr J R Holibaugh and others, the total value of the lead ore produced was [illegible], while that of the zinc ore was [illegible]. The following table gives the outputs of the mines of this company during the last 13 years:

	Lead ore Tons	Zinc ore Tons	Total values		Lead ore Tons	Zinc ore Tons	Total values
[illegible]			[illegible]	1888 b	383	13,7[illegible]	[illegible]
18[illegible]			2[illegible]	1889 b	1,[illegible]	13 941	317,3[illegible]
18[illegible]			15[illegible] 331	1890 b	1 2[illegible]	23,[illegible]	[illegible]0,1[illegible]
18[illegible]			107,211	[illegible]1 b	[illegible]	17 2[illegible]	417,[illegible]7
18[illegible]			211 [illegible]	1892 b	5[illegible]	11,77[illegible]	2[illegible] 5[illegible]
[illegible]			[illegible]	[illegible] b [illegible] 31 *	475	7,[illegible]81	[illegible]3,[illegible]
18[illegible]	[illegible]20	14 [illegible]	2[illegible]				

a From prospectus and report of the company.
b From J R Holibaugh, as obtained from the company's books.
* In [illegible] the company [illegible] tons of blende [illegible], which is not included in the above [illegible]

[illegible] company were [illegible] possible [illegible] examination [illegible] opportunity [illegible] was selected [illegible]

[illegible] Mining Co. [illegible] NE [illegible] the NW [illegible] 17 [illegible] was [illegible] limestone was struck at [illegible] Under [illegible] was encountered [illegible] of white [illegible] Some [illegible] were also found [illegible] Some

Fig. 156. Sketch of stopes in the Beasley mine.

galena was found, but the metalliferous mineral is principally blende [illegible] and also in crystals or massive frequently cementing fragments of chert. Some pyrite and a little dolomite and calcite were also found. The sketch on this page conveys an idea of the size of the drifts and the manner of working the ore. These drifts are often 10 and 10 ft. high.

In a shaft on a lot immediately south of this one the section of figure 157 was passed through according to information furnished by the foreman in charge.

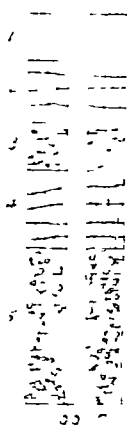


Fig. 157. Section near the Beasley shaft.

Especially worthy of note in this section is the occurrence of the bed of broken chert, carrying lead and zinc ore between the two limestone [illegible] and overlying the main ore body. This is an unusual occurrence in the camp.

As illustrating the extent and distribution of the workings of other mines of this group, we add the map of the opposite page. Of the Center Creek mines no maps could be obtained.

Reviewing what we have said concerning the Webb City and Carterville camp, it will be seen that the principal distinguishing features are: 1) the presence of a stratum of limestone of variable thickness, which overlies the main ore body; 2) the frequent presence of bodies of Coal Measure shale, and sometimes of coal-beds above this limestone roof, the shales often reaching as much as [illegible] ft. in thickness; 3) the great size of the ore body and its complete brecciation, no evidence

*At some points the coal-bed is of sufficient thickness and extent to warrant mining, and during recent years such a pocket northwest of Webb City has yielded several thousand tons of coal.

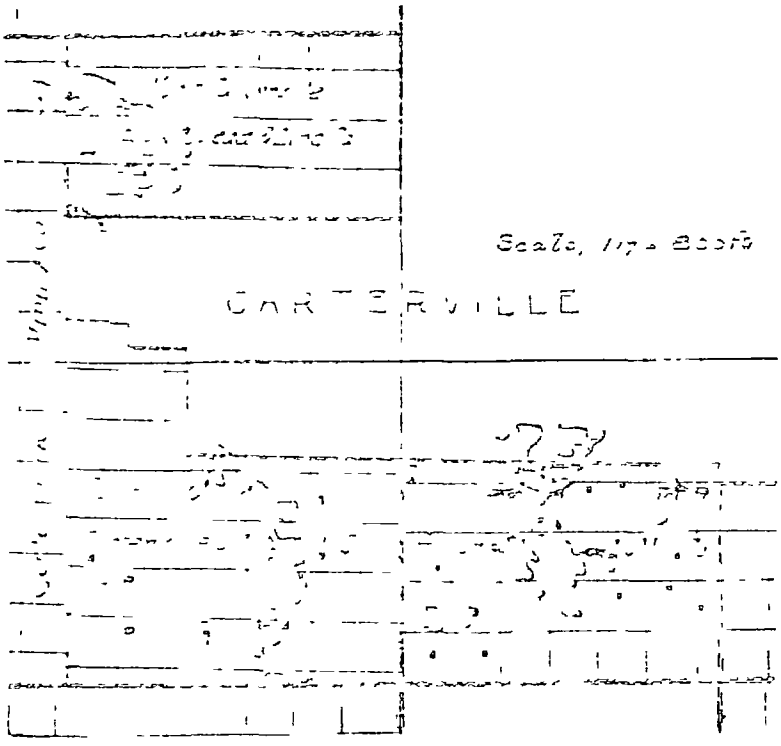


Fig. 154. Map of Carterville L and Z Co. mines, S. 17, T. 28 N., 32 W.
From Survey by Geo. H. Bradford, C. E.

formation in the large mines examined that the materials of the ore bodies were ever stratified; 4) the inclusion in this ore breccia of large masses of shale, distinctly bedded and dipping at various angles indicative of disturbance; 5) the preponderance of zinc minerals over lead minerals, as is clearly shown by the statistics of production given, a very small percentage of the output being lead ore—probably less than one per cent if measured by tons.

THE CARTHAGE CAMP

The principal mines of the Carthage camp belong to a group on the northwestern edge of town, just south of Spring river and close to the Missouri Pacific railway depot, and to another group two or three miles southwest of these. In addition we shall refer, however, under this heading, to a few scattered deposits [illegible] as east of Carthage adjacent to Spring river and others several miles south of Carthage, on Center creek.

Mining in the vicinity of Carthage was started at quite an early date. Lead ore was dug there as far back as 1851, but the larger developments have been confined to comparatively recent years, with the exception of that at Pleasant Valley, where mining was in progress at quite a early date ago.

[illegible] the total production has been produced from the Carthage [illegible] as considerable, it is still very much less than that of either the Joplin or Webb City camps. The number of mines operated there at any one time has not exceeded one-half dozen. The following table, derived from the Mine Inspector's reports, shows the production of these mines during the past four years. Those near the Missouri Pacific depot did not produce much before 1890.

PRODUCTIONS OF CARTHAGE MINES.

		Lead ore		Zinc ore	
		Tons	Values	Tons	Values
[illegible]	[illegible] Mining Co. (3 miles [illegible] Carthage)			[illegible]	[illegible]
	Harris & Masters (Mo. P. depot)	3	[illegible]		
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Little Jerry L. & Z. Co. (3 miles SW. Carthage [illegible] Carthage L. & Z. Co.)			[illegible]	[illegible]
	Myers & Emmison (Mo. P. depot)			23	[illegible]
	Porter M. Co.			1,[illegible]	[illegible]
1891	Connecton M. Co.			[illegible]	[illegible]
	Jasper Co. M. Co.	[illegible]	[illegible]	44	[illegible]
	Magnet M. Co. (7 miles SE. Carthage)			[illegible]	[illegible]
	Myers & Emmison			1,[illegible]	[illegible]
	Pacific M. Co. (Mo. P. depot)			[illegible]	[illegible]
	Pleasant Valley M. Co. (3 miles SW. Carthage)			350	14,[illegible]
1892	Carthage M. Co. (at Pleasant Valley)			[illegible]	[illegible]
	Myers & Emmison			1,440	[illegible]
	Pacific M. Co.			[illegible]	[illegible]
	Porter M. Co.			1,471	[illegible]
1893	Cave Spring M. Co.	4	143	450	[illegible]
	Myers & Emmison			300	[illegible]
	Pacific M. Co.			137	[illegible]

Several of the more important of these mines were examined by the writer during the summer of 1892. The results of these examinations we will now proceed to give.

The Fraser mine.—These mines are located near the center of section 3, about a half mile west of the [illegible].

The shaft here was 170 feet deep and in sinking it the material thrown out was passed through a working [illegible] the report of the superintendent.

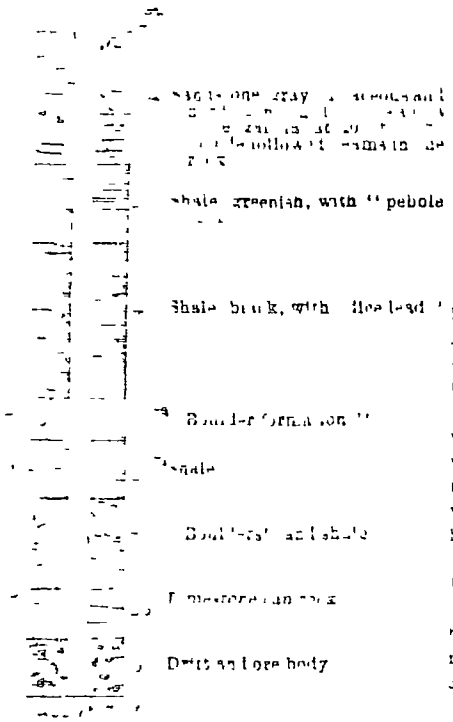


FIG. 159. Section of Linzee shaft

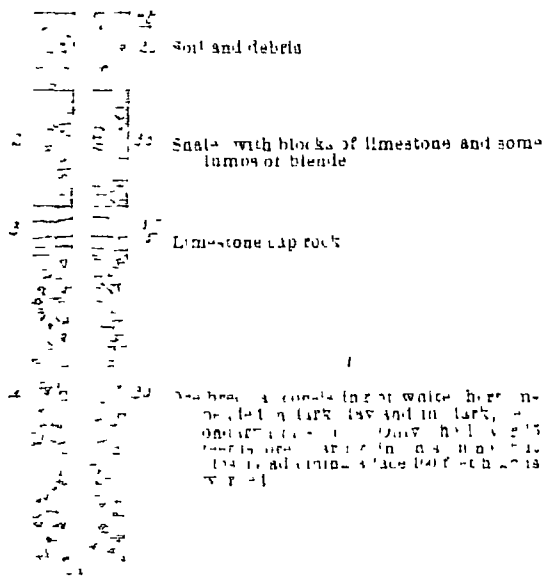


FIG. [illegible]. Section of the Cornell shaft

The ore body consisted of chert and limestone breccia, the fragments being cemented [illegible] [illegible] dolomite was also found [illegible] and no tallow [illegible] [illegible] metalliferous minerals are exclusively blende and galena [illegible] [illegible] The blende is imbedded in the limestone and shale matrix. No pyrite was observed. Slickensides [illegible] were seen in the mine, indicating more or less movement. [illegible] hard indurated sandstone containing a few scales of mica. This sandstone and the upper six members of the shaft section are [illegible] to be referred to the coal measure formation.

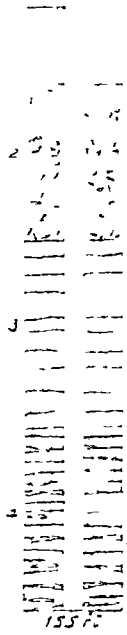
References to mines in this same section in which galena was found in the chert and [illegible] made by Swallow in his report of 1854 [illegible] notes the presence of brown sandstone here which he classes as "Ferruginous [illegible]. Broad [illegible] the Carthage mines on Lower [illegible] land in the NE [illegible] of this section [illegible] [illegible] found the former mineral [illegible] to stigmaria and fern impressions in the shale and sandstone.

No figures of production were obtained relating to this special mine.

The Cornell shaft at Pleasant Valley. This shaft, located in the NE [illegible] of the NE [illegible] of section 18, is adjacent to the mines of the Pleasant Valley Mining Company, and was operated by the Carthage Mining Company. The shaft was 115 ft. deep. According to the recollection of the superintendent, the materials shown in the accompanying section were encountered in this shaft, successively from the top downward.

Blende is the only metalliferous mineral found, no lead or silicate of zinc having been taken out—though both silicate and galena have been [illegible] in the surface clays above the cap rock. The blende [illegible] through the matrix and [illegible] and granular. No tallow [illegible] is found here, [illegible] little [illegible] mite, a good deal of [illegible] was observed in crystals. The ore is characterized as hard, and has to be blasted.

[illegible] lower carbonif[illegible] [illegible]



[illegible] the value of the output of blende between [illegible] and [illegible] [illegible] November of that [illegible] March [illegible] [illegible] was mined.

The Porter shaft.—[illegible] more [illegible] the M[illegible] [illegible] of section 4. The shaft was [illegible] level of the railway track. The accompanying section figure [illegible] of [illegible] materials [illegible]

About 20 feet [illegible] soft ground [illegible] This [illegible] in succession proceeding from the shaft, of 1) shaft [illegible] chert in clay, followed by a layer of black, massive and somewhat granular zinc ore called "calamine," but really smith-onite; 2) soft black clay or [illegible], enclosing fragments of chert with blende disseminated throughout.

About 120 feet east of the shaft, at the lowest level of the mine, drab and black shale was found containing blocks of coal. Here the ground was loose and broken up to the surface, but, [illegible] feet farther east, another limestone "bar," similar to that in which the bottom of the shaft was sunk, was encountered.

The Myers & Jemmison mine.—This mine is another of the group near the Missouri Pacific railway depot. The shaft is not over 200 yards north of the Porter shaft. When examined by the writer two drifts were operated, an upper one at 120 feet and a lower one at 157. No solid limestone was struck in the shaft, but the ground contains many blocks of that rock and of chert. In the upper drift the ore body consisted of clay and dark drab shale, surrounding fragments of chert and rounded blocks of limestone, and also intermixed with large masses of that rock. The "silicate" of zinc, which is the principal metalliferous mineral, is distributed through this material, some galena and blende are found at points remote from the shaft. In the lower level most of the blende occurs, however, there is also more chert there, and the ore body is firmer and harder. Calcite is quite common, and a little dolomite is also found; some pyrite was observed.

[illegible] no mining is done though Broadhead in his report of 1875, refers to part [illegible] blende [illegible] dark bituminous limestone in a well about [illegible] miles north of town.

[illegible] there was more or less mining in past years, but the work was on a small scale [illegible] section 7, township [illegible] N., [illegible] W., about nine miles [illegible] of Carthage. Broadhead refers to several [illegible] in 1873 though no lead or zinc was found in them at the time. In [illegible] township [illegible] N., [illegible] W., about [illegible] of Carthage, some mining has been done, the Globe M. & M. Company, which has a place in the table of [illegible] near this locality. At Dudley's mill on Spring river, in section 17, township [illegible] N., [illegible] W., Broadhead notes that two wagon loads of lead were dug out of [illegible]

[illegible]

[illegible] Chisel [illegible] have been a number of opinions [illegible] some of them of [illegible] The [illegible] shaft in the SW ¼ of the NE ¼ of section 27 township [illegible] N, 1 W was examined by the writer. The shaft was about 120 ft deep and pene- [illegible] coal [illegible] and rated, [illegible] sandstone was also [illegible] of the same to wash p. Broadhead states in his report of 1873 that [illegible] limestone was found [illegible] Low Carbonferous limestone [illegible]

[illegible] of section 12 [illegible] 27 N [illegible] W was [illegible] known as the Perry mine [illegible] in one out 25 ft deep dirt and clay were passed through [illegible] shaft [illegible] was found [illegible] shaft [illegible] was found [illegible] chicken [illegible] others [illegible]

THE SCOTLAND CAMP

The little postoffice of Scotland is situated about six miles southwest of Carthage and seven miles east of Joplin. About it and the adjoining settlement, known as Burch Center, more or less mining has been done during the past 25 years. At present, very little work is in progress, and opportunity was not afforded to examine the underground workings at the time planned to visit this locality. Considerable space is, however, devoted to the mines of this camp in the report of the Geological Survey for 1873 and from these we will make a few brief extracts.

The Bro[illegible] mine was in the SW ¼ of the SE ¼ of section 7, township 27 N, 31 W. A number of bar[illegible] [illegible] t, and been [illegible] penetrating 30 ft of red clay and chert with 5 ft of gray [illegible] dolomitic limestone. The ore was found in crevices at the bottom, in a cherty [illegible]

The [illegible] mines were in the NW ¼ of the NE ¼ of section 8 and several others were [illegible] the limestone country rock.

The [illegible] were the principal operations at this early date in the NW ¼ of section 12 [illegible] work was done before the war. Broadhead and Schmitt describe a number of [illegible] found, but ore was found near the surface, in hard [illegible] and [illegible] of [illegible] limestone, with [illegible] clay, calcite, blende [illegible] the Lead-bearing [illegible] at a depth of 35 ft. [illegible]

The [illegible] about two miles east of Scotland in the SW ¼ of the NW ¼ of section [illegible] The [illegible] galena [illegible] about, soft rock, the [illegible]

During [illegible] mining [illegible] has been about Burch Center. The pro- [illegible] years, according to the Mine Inspector's reports, [illegible]

	Lead ore		Zinc ore	
	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]

[illegible] to J. N. Wilson [illegible]

	Lead ore		Zinc ore	
	[illegible]	[illegible]	[illegible]	[illegible]
Jonesboro mines	[illegible]	[illegible]		
[illegible] Co.			[illegible]	[illegible]

THE SAGINAW OR THURMAN CAMP

The Saginaw camp includes a group of mines extending about two miles north of Thurman postoffice on the east side of Thurman creek and along its tributaries. Mining has also been carried on here for quite a long period, and diggings were described in the Survey report of 1873.

The Thurman diggings in the N. [illegible] of the S. [illegible] of section [illegible] were described by Swallow as follows: [illegible] limestone which [illegible] rock. [illegible] was found [illegible] yellow sandy limestone containing [illegible] of galena and blende. Decomposed dolomite also occurs. Calamine was found in masses enclosing crystals of galena [illegible] crystals. The clay [illegible] with these ores [illegible] gritty and [illegible] and sometimes of the texture and consistency of tallow clay. In this loose masses of galena were imbedded, galena was also found in fine seams running through the chert. Many old shafts have been put down at this point.

The Johnson diggings, near the middle of section 20, consisted of shafts sunk through ground containing blocks of coarse gray, apparently secondary limestone, enclosing dark bituminous crystals of galena and angular chert; several shafts were also sunk through broken chert and limestone [illegible] vein [illegible] between. In this loose galena occurs along thin and narrow veins, the galena being found attached to the chert; brown clay and tallow clay were in streaks and masses. Occasionally loose masses of calamine were found.

During recent years the production of this camp have been as follows, according to the State Mine Inspector's annual reports (June 30):

	Lead ore		Zinc ore	
	Tons	*Values*	*Tons*	*Values*
1891 Sturgeon mine	2½	442		
1892 Saginaw L. & Z. Co.	40	1,600	20	500
1893 " "	20	800	20	240

[illegible] recently worked in this camp are by Mr. Robertson [illegible]

[illegible] Zinc Company.—This company was composed mainly of residents of the town [illegible] Springs. They owned about [illegible] acres, but only a portion of this land was [illegible] section 20 and the SW. ¼ of section 21. The land was [illegible] miles southeast of Bolete, in Jefferson county. The company was working on the land in 1891 as follows:

1. Valley Mining Co., SE. ¼ S. 20
2. J. L. Hawkins & Co., [illegible] S. 20
3. Hayes & Bee, SE. ¼ S. 20
4. Moore & Robertson, SW. ¼ SE. ¼ S. 20

[illegible] The ore was almost entirely silicate of zinc [illegible] The chert here forming much [illegible] of the general character found [illegible] generally known [illegible]

This property was once very rich in residuary deposits of lead in the overlying clay. In 1876-77 [illegible] There is but little lead [illegible]

[illegible] N.W. [illegible] W. H. Fairbanks leased 10 acres from Tower & Burch, [illegible] mining at depths of less than 50 feet producing considerable galena and silicate. From [illegible] silicate and 100 tons lead ore had been [illegible]

[illegible] four or five miles are a number of shafts owned by [illegible] some prospecting has [illegible] been done. No records of [illegible] were however obtained.

[illegible] about six miles east in the NE [illegible] of section 3, township 26 N., 31 W., some [illegible] but no examinations of the deposits have been made.

THE SPRING CITY MINES

This group of mines is situated south of Shoal creek, about the center of section [illegible], township 26 N., 33 W. Prospecting was done here for a number of years, but not until 1882 was much encouragement found in the results, and not until early in 1893 were shafts sunk and large deposits of ore opened out. These mines are remote from others, and furnish an instance of the way new deposits are developed in ground remote from the centers of mining, and in ground which once stood condemned as barren. A number of shafts have been sunk here.

The Aloha shaft was one of the first opened. It is in the N.W. [illegible] of the SE [illegible]. Comparatively little ore was mined here, but much of interest bearing upon the character of the deposits was developed. The following section obtained from the superintendent, Mr. J. W. Allen, is hence included.

Soil and clay.
Slate, black, with a 3 inch coal-seam near the middle in a horizontal position.
Shale, gray, with zinc crystals scattered through it.
Blue selvage, composed of blue and shaly clay surrounding fragments of chert and containing some [illegible] and blende [illegible] and a little dolomite, not very hard [illegible] mill was necessary.
Chert, white or [illegible] calamine, but no galena, hard round.
Soft chert [illegible], with dolomite containing some blende, calamine, much pyrite, no galena, blende of a light-red [illegible] bottom of shaft.
Chert, [illegible] with dolomite [illegible]
Chert, hard, with blende.
Shale, blue.
Chert, hard, solid, blue.

Fig. [illegible] Section [illegible] Aloha shaft.

ATTACHMENT: I: SOURCE DOCUMENTS
THE MDNR STUDY (REFERENCE NO. 58)
JASPER SITE (NO. 669)

APPENDIX A:

TABULATIONS OF MINE-RELATED HAZARDS

000125

Table A-1 - OPEN MINE SHAFTS (continued)

Name	Site #	Location	Present Condition	Suggested Rehabilitation
Roarke Diggings (west shaft)	27-32-30-1	SE-SW-SE-SW-NE-SE Sec. 30-27N.-32W. Joplin East Quad Newton Co., Mo.	Small shaft with rock-walled sides, 40' deep.	Ample chat piles in the vicinity would provide back-fill for the open shaft
Roarke Diggings (central shaft)	27-32-30-2	SW-SW-SE-NE-SE Sec. 30-27N.-32W. Joplin East Quad Newton Co., Mo.	Small shaft with rock-walled sides, 40' deep.	Ample chat piles in the vicinity would provide back-fill for the open shaft
Roarke Diggings (east shaft)	27-32-30-3	SW-SW-SE-SE-NE-SE Sec. 30-27N.-32W. Joplin East Quad Newton Co., Mo.	Small shaft with rock-walled sides, 30' deep.	Ample chat piles in the vicinity would provide back-fill for the open shaft.
Roarke Diggings (open pit)	27-32-30-4	SW-SW-SE-NE-SE Sec. 30-27N.-32W. Joplin East Quad Newton Co., Mo.	Large open pit, 100' long (north-south direction), 150' wide (east-west direction), 20' deep, steep-sided walls in places.	Since land lots are being sold in this area, the open pit should be graded and smoothed out. Ample fill material in the vicinity
Union Mine (west shaft)	28-32-28-1	E2-SE-SE-SE Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open and caving, 50' deep to a dry bottom, opening is 4' x 4', rock-walled, no cribbing visible, very small tailings dump, thick foliage surrounds site, small waste pile adjacent to shaft.	Shaft could be filled with forest debris which is available nearby. Since there is a dry bottom to the shaft, back-filling would do an adequate job of closing the hazard.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Gibson Mine	28-32-28-2	S2-N2-SE-SW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft was originally 185' deep, is now 60' deep to water level, 4' x 6' cribbing is intact, large chat piles in area, and barbed wire fencing at one side of shaft. Opening is adjacent to a large natural sinkhole, hazard has limited access; is on private property with owner's home a short distance from shaft.	Since area is private property, access is limited, fencing and/or a wooden cover would serve as an adequate temporary closure. Ample boulders and chats are available for back-filling.
Nowata Mine	28-32-28-3	NE-NE-SW-SE-SW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft was originally 190' deep, now 50' deep to water level, opening is covered with a wood grate and surrounded by barbed wire, large chat piles. This shaft is a USGS water gauging station, has limited access, private property with owner's home a short distance from shaft area.	Concrete pad poured over the existing wood grate would serve as an effective seal. Plenty of fill material in vicinity. Area is accessible to heavy machinery.
Ten O'Clock Mine (northeast shaft)	28-32-28-4	SE-NE-NE-NE-SW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, lined by steep piles of waste rock on north side, 3' x 3' cribbing intact, hazard easily accessible, no vegetation present	Ample chat piles in area, could be used for back-filling. Opening is cribbed with wood and provides a crude base for laying a seal over shaft.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Ten O'Clock Mine (northwest shaft)	28-32-28-5	C-W2-E2-NE-NE-SW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open with 3' x 3' wood cribbing intact, located on NW slope of an open pit area.	Ample fill material lies near this shaft. Fencing the area of the opening is also an option. Heavy machinery would have easy access to this site
Nine O'Clock Mine (southeast shaft)	28-32-28-6	SE-NW-NE-NE-SW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open with a large tree growing out of edge of shaft, hidden by dense vegetation, open pits lie nearby, area is difficult to approach due to thick foliage.	Nearby chat piles could be used for fill material, dense vegetation could also add to the fill, large tree growing out of shaft could be used to wedge some large objects against and thus effect a seal.
Nine O'Clock Mine (southwest shaft)	28-32-28-7	SW-NW-NE-NE-SW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, slightly vegetated around entrance, 3' x 3' cribbing intact, hazard is easily accessible, adjacent to jeep trail.	Site is approachable by earth-moving machinery, chat pile by shaft could be used for fill material. Fencing could also be easily accomplished.
Danglade Mine	28-32-28-8	NW-SE-NE-NW-SW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft lies within a small thicket of trees, some collapse at top of opening, 5' x 5' wood-cribbed entrance, adjacent to concrete foundations and boulder/chat piles.	Some of the foundations may be wedged into the shaft to effect a closure. Fencing the entire fortified area around shaft could serve as a temporary safety precaution

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Milan Mine (Florine shaft)	28-32-28-10	NE-SW-SE-NW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, originally 201' deep, now 65' deep to water level, 3' x 5' wood cribbing remains but is quickly collapsing; site is somewhat foliated, large boulder and chat piles adjacent to shaft, hazard is easily accessible being adjacent to a jeep trail. This shaft is a USGS water gauging station.	The boulder piles in area could quickly back-fill this shaft - the collapsing cribbing may close this opening naturally. Fencing would be a temporary precaution since site is very accessible.
Milan Mine (west shaft)	28-32-28-11	W2-W2-W2-SE-NW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open with 3' x 3 wood cribbing intact, 40' deep to water level, hazard is easily accessible being adjacent to jeep trail and miner's drainage canal, some foliage in area.	This shaft could be back-filled easily with nearby chats. Fencing would be a low-cost, temporary option Lack of collapse at surface could make a wood or metal cover over top of cribbing another good option
Jasper County Land & Mining Co. Mine (north shaft)	28-32-28-12	N2-N2-SE-SW-NW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo	Shaft is open, originally 132' deep, now 40' deep to water level, located on NW slope of a large open pit, opening is 3' x 3' and wood-cribbed, easily accessible via jeep roads.	Cribbing is intact to surface and no collapse evident - thus, a wood, metal or concrete cover, using the square cribbing as a base, would effect a good seal.
Goodrich Mine (east shaft)	28-32-28-13	SE-SE-NE-NW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, originally 175' deep, now 50' deep to water level, entrance lies in a foliated area alongside a large chat pile, wood-cribbed opening is in a state of minor collapse.	Plenty of chat for fill material nearby Site is very accessible to heavy machinery

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Goodrich Mine (west shaft)	28-32-28-14	SW-SE-NE-NW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, originally 175' deep, now 60' deep to water level, opening lies between large chat piles and vegetation, cribbed entrance has minor collapse.	Ample chats for back filling, good access for heavy machinery
Mt. Ararat Mine	28-32-29-1	N2-SE-NE-NE Sec. 29-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, originally 133 deep, now 40' deep to water level, opening is not visible due to dense vegetation and trees growing in and around shaft, some collapse is evident at opening.	Ample chat and boulders adjacent to shaft for back-filling. Area is marginally accessible to heavy machinery.
Mary C. Mine	28-32-29-2	SW-SW-NE-SE-NE Sec. 29-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, 40' deep to water level, dense vegetation near opening; east-west fence line runs past shaft on north side, large chats lie on SE side.	Poor access to shaft area for heavy machinery. Ample fill material adjacent to site. Fencing not too practical around this shaft since loose waste rock is too close to opening
St. Anthony Mine	28-32-29-3	N2-NE-NE-SE Sec. 29-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft lies 100' SW of a shallow open pit, opening is slightly collapsed at surface and measures 3' x 3' at wood cribbing, some chats and boulders nearby.	Back-filling would probably be the best method for closure. Collapse around opening would not permit fencing to offer a long-term remedy. Ample fill material in area and good access exists for heavy machinery.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Morrison Mine (southwest shaft)	28-32-29-5	S2-S2-N2-NE Sec. 29-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, originally 124' deep, now 40' deep to water level, located on NE slope of an open pit, jeep road passes by the opening on the north, barbed-wire fence on south side of shaft.	Fencing of shaft would be a low-cost safety measure nearby chats are available for fill material access is good for earth-moving machinery.
New Hope Mine	28-32-33-1	C-NE-NE-SE Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	20 diameter pool of water lies adjacent to large boulder pile, water is about 5-10' deep, shaft may be present near boulder pile.	Fencing and/or back-filling would be adequate safeguards, boulder pile adjacent to pool could serve as fill.
Owasso Mine	28-32-33-2	SW-SW-NE-SE-SE Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open and has caving sides, 40' deep to water level, opening is 4' x 6', wood-cribbed, and 20' below caved area.	Fencing would be a quick safeguard, back-filling recommended due to caving sides. Fill material not available in the immediate area
What Cheer Mine (north shaft)	28-32-33-3	C-NE-NW-NE Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, originally 183' deep, now 40' deep to a dry bottom, wood-cribbed to the surface, opening measures 4' x 6', wire fencing surrounds this site	Site is now fenced off, a large amount of fill material lies adjacent to the shaft and could be easily used for back-filling
What Cheer Mine (southeast shaft)	28-32-33-4	C-N2-S2-SE-NW-NE Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open and 30' deep to water level, rock-walled sides are caving in, concrete foundations are also collapsing into the opening	Heavy machinery could possibly push in the remaining concrete foundations to plug the opening, fencing may serve as a useful temporary measure

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Coahuila Mine (northwest shaft)	28-32-33-5	SE-SW-NE-SW-NE Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open and 50' deep to water level, present opening is quite small due to collapse - about 1 foot square. Shaft is rock-walled and caving badly	Some more back-filling; along with the natural collapse should close off this hazard
Coahuila Mine (central shaft)	28-32-33-6	C-W2-E2-W2-E2 Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open and 80' deep to water level, badly collapsing ground adjacent to shaft, opening is 6 ft square, pentagonal shape of wire-fencing surrounds the site.	Site is very dangerous despite the fencing, further safeguard is needed such as back-filling or plugging.
Gussie K. Mine (south shaft)	28-32-33-7	SE-SW-SW-NE-SW Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	Open pit with water measures 30' in diameter; shaft could possibly be open below the water. Area is presently protected by a tall wire fence completely surrounding the site, water depth is at least 20', large chat piles are nearby	Site is well protected at this time; however, a permanent solution should be proposed for the future, possibly draining the pit and then back-filling.
Melrose Mine (south workings)	28-32-33-8	S2-NW-SE-SE-NW Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open and 70' deep to water level, opening measures 4' x 6' and is wood-cribbed to the surface, metal fencing surrounds the site, large chat piles and concrete foundations are adjacent to the shaft.	This site is protected temporarily by the fencing, a further safeguard would be a metal or concrete cover, or plug, over the entrance.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Melrose Mine (north workings)	28-32-33-9	E2-NE-NW-NE-NW Sec. 33-28N.-32W. Joplin East Quad Jasper Co., Mo.	Water-filled pit, 20 in diameter, lies 100' south of paved section-line road and adjacent to a boulder pile; shaft possibly open below the water.	Back-filling with the adjacent pile of boulders may be best procedure. Fencing would also be a good safeguard
Marjorie Stewart Mine (north shaft)	28-32-34-1	W2-SE-NW-NW-NE Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft area is somewhat foliated and strewn with debris and junk, opening is 30' deep to water level.	Ample back-fill material near this site. Very good access for heavy machinery. Fencing is another option since collapse near the shaft is not evident.
Alabama Mine (east shaft)	28-32-34-2	SE-SE-SE-NE-NW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is fenced but west side of the fencing is deteriorating.	Shaft has temporary safety measures at this time. Independent Gravel Co. controls this area and private access is limited
Alabama Mine (west shaft)	28-32-34-3	SW-SE-SE-NE-NW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Railroad rails and concrete slabs are lying over the opening and form a temporary closure.	Shaft has temporary safety measures at this time. Independent Gravel Co. controls this area and private access is limited

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Hyde Park Mine	28-32-34-4	SW-SW-SW-SE Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, originally 209', now 70' deep to water level, shaft was used as a USGS water gauging station, shaft lies just south of large chat pile which is being quickly removed by Independent Gravel Co. for reprocessing. Opening is covered with steel plates that are securely welded together and attached to a concrete collar surrounding shaft.	Steel cover serves as a good protective closure, fencing would be an excellent additional measure.
Trinity Mine (south shaft)	28-32-34-5	W2-NE-SE-SE-SW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, has caving sides, 20' deep to water level, area is wire-fenced, hole is rock-walled, opening at surface is 20' in diameter.	Ample chats nearby could be used for back-filling; some sturdier fencing would be a temporary safeguard as well as warning signs being posted.
Trinity Mine (north shaft)	28-32-34-6	SW-SE-NE-SE-SW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open, has caving sides, 20' deep to water level, area is wire-fenced, hole is rock-walled, opening at surface is 20' in diameter.	Ample chats nearby could be used for back-filling, some sturdier fencing would be a temporary safeguard as well as warning signs being posted.
Coronation Mine	28-32-34-7	SW-SE-NW-NW-SW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open; some collapse around shaft with concrete foundations falling slowly into it.	Ample chat piles in area for use as back-fill material. Excellent access for earth moving machinery.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Fidelity Mine	28-32-34-8	C-S2-SE-SW-SW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is well-hidden amidst a dense thicket of foliage at the NW end of a huge chat pile; opening is collapsed at surface to 15' diameter, 4' x 6' wood cribbing visible 20' below surface.	Huge chat pile lies adjacent to shaft site. Back-filling would be a good corrective measure since access is excellent for the necessary heavy machinery.
Thanksgiving Mine (south shaft)	28-32-34-9	N2-NE-NE-SW-NW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is well-hidden, lying within a thicket of trees adjacent to gravel road, opening is collapsing, 10 diameter at surface.	Shaft is rear road and could be fenced and/or filled easily if the trees in the area were removed.
Thanksgiving Mine (central shaft)	28-32-34-10	S2-SE-SE-NW-NW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	6' x 6' wood cribbing remains intact to the surface, shaft is 50' deep to water level.	Shaft has a huge chat pile adjacent to it, wood cribbing provides a base for a metal or wood cover for sealing, fencing would also be a good option in this case. Access is good for any type of machinery
Applcknocker Mine (south shaft)	28-32-34-11	NE-NW-SW-SW-NW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo.	Shaft is open and rock-walled with some caving near the surface, originally 185' deep, now 50' deep to water level, shaft opening is well-hidden due to thick vegetation.	Plenty of boulder-size rock lies immediately south of shaft. Access for heavy vehicles to back-fill is marginal.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Mechanical Action
Appleknocker Mine (north shaft)	28-32-34-12	SE-SW-NW-SW-NW Sec. 34-28N.-32W. Joplin East Quad Jasper Co., Mo	Open shaft is well-hidden although near main road, 3' x 7' cribbed opening is slightly collapsed at surface, about 60' deep to water level.	Boulder pile just north of shaft can be utilized for fill material. Good access for heavy earth-moving machinery.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Underroof Mine	27-33-4-1	NE-NW-SE-NE-NE Sec. 4-27N.-33W Joplin West Quad Jasper Co., Mo.	Shaft is open, 10' in diameter, filled with water, junk metal and debris. Chat flats in area.	Back-filling, recommended, fill material would have to be hauled in, good access for heavy machinery
Condor Mine	27-33-4-3	C-E2-E2-NE-NW-NW Sec. 4-27N.-33W Joplin West Quad Jasper Co., Mo.	Shaft is open, 10' in diameter, 5' to water level; floating vegetation in shaft Chat and boulders remain	Ample chats in vicinity for back-filling purposes
Portland Mine	27-33-4-4	E2-NE-NE-NW-NW Sec. 4-27N.-33W Joplin West Quad Jasper Co., Mo.	Shaft is open, 15' in diameter, water-filled. Concrete foundations drifting toward shaft.	Old foundations and nearby chats would provide back-fill material
Baltimore Mine	27-33-4-6	E2-SE-NW-NW-NW Sec. 4-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 25' in diameter, very steep, loose near opening, 20' deep to water level.	Boulder and chat piles in area can be used for back-filling
Ramage Mine (east shaft)	27-33-5-2	C-W2-W2-SE-NW-SW Sec. 5-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 30' diameter pool of water within a caving pit, adjacent to chat/boulder piles	Large chat/boulder piles at site should provide plenty of back-fill material.
Ramage Mine (west shaft)	27-33-5-3	C-SW-NW-SW Sec. 5-27N.-33W Joplin West Quad Jasper Co., Mo.	Shaft is open, 20' diameter pool of water within a caving pit, shaft possibly open below water.	Large chat/boulder piles at site should provide plenty of back-fill material

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Rebecca Mine	27-33-5-4	S2-SE-SW-NW-NW Sec. 5-27N -33W. Joplin West Quad Jasper Co., Mo.	Shaft is open and 2' square at water level, which is 15' below surface, opening is 20' in diameter at surface and sides are caving down to the water level	Ample chats are available at this site for back-filling purposes
Coyote Mine (northwest shaft)	27-33-6-1	NE-SW-SW-NE-NE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open and water-filled to the surface, rock-walled, opening is 6' square Some barbed wire surrounds shaft	Suggest some cyclone fencing be installed to replace the barbed wire Back-fill chats are in the vicinity.
Coyote Mine (southeast shaft)	27-33-6-2	SE-SW-NE-NE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open and water-filled to the surface, rock-walled, opening is 6' square. Some barbed wire surrounds shaft	Suggest some cyclone fencing be installed to replace the barbed wire. Back-fill chats are in the vicinity
Airdale Mine (north shaft)	27-33-6-3	SE-NW-NE-SE-NE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, wood-cribbed 4' x 6' hole, water-filled, fenced with barbed wire.	Recommend better fencing be installed. back-fill material is available at the site
Airdale Mine (central shaft)	27-33-6-4	NW-SW-NE-SE-NE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, wood-cribbed 4' x 6' hole, water-filled, fenced with barbed wire	Recommend better fencing be installed Back-fill material is available at the site
Airdale Mine (south shaft)	27-33-6-5	C-SE-NE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is probably open below a 15' diameter pool of water. Adjacent to a small chat pile.	Recommend better fencing be installed Back-fill material is available at the site

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Gibson Mine (north shaft)	27-33-6-6	C-NW-NE-SE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is probably open below a 10' diameter pool of water	Back-fill chats are in area, chain-link fencing and warning signs also suggested.
Gibson Mine (south shaft)	27-33-6-7	SE-SE-NW-NE-SE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo	Shaft is open, 6' x 8' wood-cribbed hole has a concrete collar at the surface, opening is 15' deep to water level.	Back-fill chats are in area, chain-link fencing and warning signs also suggested.
Once More Mine (north shaft)	27-33-6-8	S2-NE-SE-NE-SE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open below 20 diameter pool of water	Chat/boulder piles in the vicinity could be used for back-filling purposes.
Once More Mine (south shaft)	27-33-6-9	NE-SE-SE-NE-SE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open below 20' diameter pool of water.	Chat/boulder piles in the vicinity could be used for back-filling purposes
A.W C. #1 Mine (east shaft)	27-33-6-10	NE-SE-SW-SE-SE Sec 6-27N -33W. Joplin West Quad Jasper Co., Mo.	Shaft is plugged with fill but appears ready to re-open, opening is 20' in diameter at surface and drops 25' to the plug	Ample chats in area could be used for back-filling
A.W.C. #1 Mine (west shaft)	27-33-6-11	SE-NW-SW-SE-SE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open and caving down to 30' below the surface where some rotten cribbing (4' x 6') is visible; shaft is 40' deep to water level.	Ample chats in area could be used for back-filling

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
A.W.C. #3 Mine	27-33-6-12	SW-NE-SE-SW-SE Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open and caving at surface, 30' deep to water level, concrete pillars drifting into surface hole which is 15' in diameter.	Plenty of chat in area to use as back-fill
Ben B. Mine	27-33-6-13	N2-NE-SW-SE-SW Sec. 6-27N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 8' diameter concrete collar surrounds hole but is about to cave in, opening is 15' deep to water level, some barbed wire fencing is present	Suggest back-filling since area is collapsing Fencing is presently being consumed by hole
Monkey Hill Mine (east shaft)	27-33-19-2	W2-NW-SE-SE-NE Sec. 19-27N.-33W. Joplin West Quad Newton Co., Mo.	3' x 3' wood-cribbed opening, cribbing is rotted; 30' deep to water level.	Fencing or back-filling would be both quick and inexpensive
Monkey Hill Mine (west shaft)	27-33-19-3	NE-NE-SW-SE-NE Sec. 19-27N.-33W. Joplin West Quad Newton Co., Mo.	3' x 3' wood-cribbed opening, cribbing is rotted; 30' deep to water level.	Fencing or back-filling would be both quick and inexpensive.
Puritan Mine (south shaft)	27-33-19-4	NE-NW-NW-NW-SE Sec. 19-27N.-33W. Joplin West Quad Newton Co., Mo.	Open shaft is caving and quite unstable despite its rock walls, 40' deep and dry-bottomed.	Ample back-fill material in the area Good access for earth-moving machinery
Puritan Mine (north shaft)	27-33-19-5	NE-SW-SW-SW-NE Sec. 19-27N.-33W. Joplin West Quad Newton Co., Mo.	Open shaft is caving and quite unstable despite its rock walls; 40' deep and dry-bottomed.	Ample back-fill material in the area Good access for earth-moving machinery

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Unknown	27-33-19-6	W2-NE-SW-SW-NE Sec. 19-27N.-33W. Joplin West Quad Newton Co., Mo.	Shaft runs under the road, has collapsed and is 30' deep to water level, shaft has produced a natural bridge and is wet.	Back-fill material in area, road is soon to collapse due to the adjacent shafts, thus, back-filling would be the best corrective action
Unknown	27-33-19-7	NE-NW-SW-SW-NE Sec. 19-27N.-33W. Joplin West Quad Newton Co., Mo.	Shaft is open, easily accessible, and walk-in, dry and associated with a 10' drift	Back-fill material in area, road is soon to collapse due to the adjacent shafts, thus, back-filling would be the best corrective action
Unknown	27-33-19-8	E2-SW-NW-SW-NE Sec 19-27N.-33W. Joplin West Quad Newton Co., Mo.	Several uncribbed prospect shafts, rock-walled, ranging from 15-40' in depth; shafts are located along a valley side in Roaring Springs Hollow.	Access is limited to this area, dirt roads have locked gates at their entrances, and fencing and signs would be an expensive precaution
Hutchinson Mine	27-33-20-2	C-W2-W2-NE-NE-SE Sec. 20-27N.-33W. Joplin West Quad Newton Co., Mo.	Shaft is open and 30 deep to a dry bottom, probably associated with the adjacent subsidence pit	Two well-travelled roads are adjacent to this hazard (high-priority hazard!) Suggest hauling in fill material to close the shaft
Mystic Shaft	27-33-20-3	NW-SW-SE-SW-SW Sec. 20-27N.-33W Joplin West Quad Newton Co., Mo.	Shaft is open, rock-walled and roughly 10' in diameter, slowly caving in at the surface; shaft is 20' deep to water level and within 10' of creek level; small waste pile at south edge of shaft	Site is private and access is controlled (fencing and a danger sign would probably be an effective safeguard

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Unknown	27-33-20-4	C-S2-NW-NW-NW-SW Sec. 20-27N.-33W. Joplin West Quad Newton Co., Mo.	Shaft is open, 3' x 3', wood-cribbed, water-filled to the surface, cribbing is intact and water is level with top of crib.	Since the cribbing is intact to the surface, a concrete pad could close off this hole easily. Also, there is plenty of back-fill material in the area.
Riverside Mine (central shaft)	27-33-29-1	E2-E2-W2-NE-SW Sec. 29-27N.-33W. Joplin West Quad Newton Co., Mo.	Shaft is open and wide-mouthed; lies within 100' of busy highway, opening is well-hidden among the old concrete foundations and timber debris, as well as the normally thick vegetation. There is a concrete collar around the top of the opening which has been undercut by the collapse.	This shaft could be sealed at the top with a concrete plug, or a gridwork of metal or wood. It would have a solid base on top of the concrete collar already surrounding the opening. The timber scattered around this site could be cleaned up with a small effort.
Riverside Mine (west shaft)	27-33-29-2	C-NE-SE-NW-SW Sec. 29-27N.-33W. Joplin West Quad Newton Co., Mo.	Shaft is open, rock-walled, and water-filled to within 25' of surface, hole is caving from the water level to the surface where it is 30' in diameter, sides are funnel-shape and collapsing.	Shaft is only 100' south of busy road and access is easy. Fencing and danger sign would be a quick initial safeguard.
Happy Rock Mine	27-34-2-1	SW-SW-SW-SE-NE Sec. 2-27N.-34W. Joplin West Quad Jasper Co., Mo.	Shaft is open with caving sides dropping 10' to water level, area is fenced with barbed wire.	New fencing needed or back-filling with adjacent chats.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Kramer #1 Mine	27-34-2-4	E2-SE-NW-SW-NE Sec. 2-27N -34W. Joplin West Quad Jasper Co., Mo.	Shaft is open and 60' deep to water level, opening is 15' x 15' and very steep-sided; site is fenced with barbed wire	Area is controlled by Farmer's Chemical Co and, thus, new and better fencing would serve as an effective safeguard in the future, back-filling would be recommended
Kramer #2 Mine	27-34-2-5	SE-NW-NW-SW-NE Sec. 2-27N.-34W. Joplin West Quad Jasper Co., Mo.	Shaft is open and 15' deep to water level, sides are caving in and area is fenced with barbed wire, large subsidence pits are located nearby.	This site will probably coalesce with the adjacent subsidence pit in the near future. Posting danger signs would be a temporary safeguard. Area is controlled by Farmer's Chemical Co
Kramer Incline Mine	27-34-2-6	C-SE-SW-NW-NE Sec. 2-27N.-34W. Joplin West Quad Jasper Co., Mo.	Shaft is open and 20' deep to a choked bottom; sides are caving and residuum forms most of the choked area; some barbed wire fencing surrounds the pit.	Further back-filling would be a primary step to safeguard the site, some new fencing also suggested Area is controlled by Farmer's Chemical Co
Unknown	27-34-2-7	C-E2-NW-SW-SW Sec. 2-27N.-34W. Joplin West Quad Jasper Co., Mo.	Shaft is open and 30' deep to water level, wood-cribbing intact, concrete foundations remain in area	Nearby chats available for back-filling purposes
Unknown	27-34-2-8	E2-NE-NW-SW-SW Sec. 2-27N.-34W Joplin West Quad Jasper Co., Mo.	Shaft is open, 40' deep to water level, sides are caving	Chat piles are nearby to use as fill material

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Mattes Bros. Mine (west shaft)	27-34-24-1	C-SE-NE-SE-NE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, 60' deep to water level, opening is wood-cribbed to the surface and measures 8' x 12' Mining structures remain at shaft site, chat piles and "chat flats' nearby	This shaft could easily be fenced for safety Access is limited due to private residence nearby
Adams - Hicks Mine (north shaft)	27-34-24-2	S2-SW-SE-SE-NE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, wood-cribbed but caving at surface, water level is 60' below surface and 40 below top of crib; large chat and boulder piles in vicinity.	Ample chats available in area for back-filling Fencing not suggested since area is collapsing around the shafts
Adams - Hicks Mine (south shaft)	27-34-24-3	C-NW-NE-NE-SE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, wood-cribbed but caving at surface, water level is 60' below surface and 40' below top of crib; large chat and boulder piles in vicinity.	Ample chats available in area for back-filling Fencing not suggested since area is collapsing around the shafts
Gimlet Mine (north shaft)	27-34-24-4	SW-SW-NE-NE-SE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, rock-walled, collapsing, and 30' deep to water level.	Access is controlled to this area due to private property, however, ample chats are available for back-fill material Posting danger signs would also be a good safe-guard.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Gimlet Mine (north-central shaft)	27-34-24-5	N2-NW-SE-NE-SE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, rock-walled, collapsing, and 30' deep to water level.	Access is controlled to this area due to private property, however, ample chats are available for back-fill material Posting danger signs would also be a good safeguard.
Gimlet Mine (east-central shaft)	27-34-24-6	SW-NW-SE-NE-SE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, rock-walled, collapsing, and 30' deep to water level.	Access is controlled to this area due to private property, however, ample chats are available for back-fill material Posting danger signs would also be a good safeguard.
Gimlet Mine (west-central shaft)	27-34-24-7	SE-NE-SW-NE-SE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, rock-walled, collapsing, and 30' deep to water level.	Access is controlled to this area due to private property, however, ample chats are available for back-fill material. Posting danger signs would also be a good safeguard
Gimlet Mine (southwest shaft)	27-34-24-9	C-N2-SE-SW-NE-SE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, rock-walled, collapsing, and 30' deep to water level.	Access is controlled to this area due to private property, however, ample chats are available for back-fill material Posting danger signs would also be a good safeguard

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Gimlet Mine (south shaft)	27-34-24-10	C-S2-S2-S2-NE-SE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	Shaft is open, rock-walled, collapsing, and 30' deep to water level	Access is controlled to this area due to private property, however, ample chats are available for back-fill material Posting danger signs would also be a good safeguard
Gimlet Mine (southeast shaft)	27-34-24-12	S2-SW-SE-NE-SE Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo	Shaft is open, rock-walled, collapsing, and 30' deep to water level	Access is controlled to this area due to private property; however, ample chats are available for back-fill material. Posting danger signs would also be a good safeguard
Cock Robin Mine	28-33-32-1	SW-SW-NW-NE-SE Sec. 32-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 12' in diameter, artesian, shaft area is foliated Chat and boulder piles remain.	Cyclone fencing, posting "DANGER" signs, and back-filling is recommended
Nickolsville Mine	28-33-32-2	C-E2-E2-SE-NW-SE Sec. 32-28N -33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 10' in diameter, 12' deep to water level, concrete foundations are being undercut by sloughing Boulder and chat piles remain.	Nearby chat piles can be used for back-fill material.
Chicago Consolidated Mine (north shaft)	28-33-32-3	C-W2-W2-SW-SW-NE-SE Sec. 32-28N -33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, fenced, 12' in diameter, water-filled to top; fences sloughed.	Nearby chat piles can be used for back-fill material.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Chicago Consolidated Mine (south shaft)	28-33-32-4	SE-SE-SE-NW-SE Sec. 32-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, unfenced, 10' square, water-filled to top. Boulders and chat piles remain.	Cyclone fencing, posting "DANGER" signs, and back-filling is recommended.
Lola Mine	28-33-33-1	S2-NW-SE-SE-SE Sec. 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, caving, now 20' diameter, 8' deep to water level. Boulders, chat piles and concrete foundations remain.	All mining waste (boulders, chats, concrete) in area can be used for back-filling.
Amblon Mine	28-33-33-2	W2-SE-SE-SE-SE Sec. 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 10' in diameter, caved, partially clogged with trash and metal, 10' deep to water level. Boulders and chat piles very near houses and used as a play area by children.	High-priority hazard! Nearby chat piles can be used for back-fill material
Omega Mine (east shaft)	28-33-33-3	C-W2-E2-SW-SE-SW Sec. 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 5' x 3' hole in bottom of caving area 50' in diameter, 20' deep, water 5' below base of hole opening	Nearby chat piles can be used for back-fill material
Omega Mine (west shaft)	28-33-33-4	W2-SW-SE-SE-SW Sec. 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 9' in diameter, 5' deep to water level, edges caving Boulders, chat piles and concrete foundations remain	Nearby chat piles can be used for back-fill material

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Crackerjack Mine	28-33-33-5	SW-NE-SE-SE-SW Sec. 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 12' in diameter, artesian. Boulders and chat piles remain.	Cyclone fencing, posting "DANGER" signs, and back-filling is recommended
Prairie Mine	28-33-33-6	C-W2-SW-SW-SE-NW Sec. 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 15' x 25', 12' deep to water level. concrete collar undercut by sloughing and collapse. Boulders and chat piles remain.	Nearby chat piles can be used for back-fill material
McBride Mine	28-33-33-8	NE-NW-SW-SE-NW Sec. 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 6' x 12', concrete collar intact, was originally 90' deep, now 6' deep to water. Boulders, chat piles and concrete foundations remain in area	Cyclone fencing, posting "DANGER" signs, and back-filling is recommended
Trimore Mine	28-33-33-9	SE-SE-NW-SE-NW Sec. 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	Shaft is open, 15' diameter, originally 100' deep, now 10' deep to water, sloughing beneath concrete collar. Boulders, chat piles and concrete foundations remain.	All mining waste (boulders, chats, concrete) in area can be used for back-filling

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Chicago Lehigh Mine (shaft #1)	28-33-7-1	C-W2-NW-NE-SW-NE Sec 7-28N.-33W. Carl Junction Quad Jasper Co., Mo.	Shaft is open and 30' in diameter at surface, sides are caving in, 10' deep to water level.	Ample fill material in vicinity, good access for heavy earth-moving machinery
Chicago Lehigh Mine (shaft #2)	28-33-7-2	SE-NW-NE-SW-NE Sec 7-28N -33W. Carl Junction Quad Jasper Co , Mo.	Shaft is open and 30' in diameter at surface, sides are caving down to 8' diameter hole, water level is at 12' depth	Nearby chat and boulder piles can be used for back-fill material
Chicago Lehigh Mine (shaft #3)	28-33-7-3	NW-SW-NE-SW-NE Sec. 7-28N.-33W. Carl Junction Quad Jasper Co , Mo	Shaft is open and caving, 5' x 5' cribbing in hole, 15' deep to water level	Cyclone fencing, posting "DANGER" signs, and back-filling is recommended
Chicago Lehigh Mine (shaft #4)	28-33-7-4	W2-SE-SE-SW-NE Sec. 7-28N.-33W. Carl Junction Quad Jasper Co., Mo	Shaft is open and 30' in diameter at surface, concrete is collapsing into hole, water level is at 15' depth	All mining waste (boulders, chats, concrete) in area can be used for back filling
Chicago Lehigh Mine (shaft #5)	28-33-7-5	NW-NE-NE-NW-SE Sec. 7-28N -33W. Carl Junction Quad Jasper Co , Mo.	Shaft is open and 8' in diameter at surface, hole is water-filled	Ample fill material in vicinity, good access for heavy earth-moving machinery
Bryant Mine	28-33-7-6	SE-NE-NW-NW-SE Sec. 7-28N -33W. Carl Junction Quad Jasper Co , Mo.	Shaft is open and 15' in diameter, 10' deep to water level	Nearby chat and boulder piles can be used for back-fill material
Great Northern Mine	28-33-7-8	NW-NW-NW-NW-SE Sec. 7-28N -33W. Carl Junction Quad Jasper Co., Mo	Shaft is open and 12' in diameter, 5' deep to water level, chat and boulder piles remain, surface diggings evident	All mining waste (boulders, chats, concrete) in area can be used for back filling

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
United Zinc Mine (east shaft)	28-33-7-11	NE-SW-NW-NW-SE Sec. 7-28N -33W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 10' in diameter, water-filled, chat piles and concrete foundations remain. Surface diggings evident	Nearby chat and boulder piles can be used for back-fill material
United Zinc Mine (west shaft)	28-33-7-13	SE-SE-SE-NE-NE-SW Sec. 7-28N.-33W. Carl Junction Quad Jasper Co., Mo.	Shaft is open, 12' in diameter, water-filled; chat piles and concrete foundations remain. Surface diggings evident	Nearby chat and boulder piles can be used for back-fill material
Lehigh Mine (northeast shaft)	28-33-7-14	SE-SE-SE-NE-SW Sec. 7-28N.-33W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 8' - 12' diameter, caving, water-filled	Ample fill material in vicinity, good access for heavy earth-moving machinery
Lehigh Mine (north-central shaft)	28-33-7-15	SW-SE-SE-NE-SW Sec. 7-28N -33W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 8' - 12' diameter, caving, water-filled.	Ample fill material in vicinity, good access for heavy earth-moving machinery
Lehigh Mine (southeast shaft)	28-33-7-16	C-W2-NE-NE-SE-SW Sec. 7-28N -33W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 8' - 12' diameter, caving, water-filled	Ample fill material in vicinity, good access for heavy earth-moving machinery
Lehigh Mine (south-central shaft)	28-33-7-18	NW-NW-NW-NE-SE-SW Sec. 7-28N.-33W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 12' in diameter, caving, funnels to 4' in diameter, 10' deep to water level	Nearby chat and boulder piles can be used for back-fill material
Lehigh Mine (southwest shaft)	28-33-7-19	SE-NE-NW-SE-SW Sec. 7-28N.-33W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 5' square, vertical 10' to water	Cyclone fencing, posting "DANGER" signs, and back-filling is recommended

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Lehigh Mine (northwest shaft)	28-33-7-21	N2-NE-SE-NW-SW Sec. 7-28N.-33W Carl Junction Quad Jasper Co., Mo.	Shaft is open, 1[illegible]' in diameter, water-filled	Ample fill material in vicinity, good access for heavy earth-moving machinery
Texas Bull Mine	28-33-17-2	NW-SW-NE-SE-NW Sec. 17-28N.-33W. Carl Junction Quad Jasper Co., Mo	Shaft is open and 20' in diameter, originally 153' deep, now 15' deep to water level, foundations are undercut by sloughing Chat and boulder piles remain	All mining waste (boulders, chats, concrete) in area can be used for back-filling
Sitting Bull Mine (north shaft)	28-33-21-1	NW-NW-NW-NE-NE Sec 21-28N -33W. Carl Junction Quad Jasper Co., Mo.	Shaft is open and 18' in diameter, originally 185' deep, water-filled, also filled with junk and brush Chat piles, concrete foundations and boulders remain	Nearby chat and boulder piles can be used for back-fill material
Sitting Bull Mine (south shaft)	28-33-21-2	C-W2-W2-NW-NE-NE Sec. 21-28N -33W. Carl Junction Quad Jasper Co., Mo.	Shaft is open and 15' in diameter, originally 185' deep, water-filled, also filled with junk and brush Chat piles, concrete foundations and boulders remain	All mining waste (boulders, chats, concrete) in area can be used for back-filling

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Isherwood Mine	28-34-12-2	C-SE-NW-SW-NW Sec. 12-28N.-34W. Carl Junction Quad Jasper Co., Mo.	Shaft is open and 8' square, concrete collar caving, 10' deep to water level Debris and trees pushed into entrance	All mining waste (boulders, chats, concrete) in area can be used for back-filling
Indiana Mine (shaft #1)	29-33-18-1	C-W2-E2-E2-SE Sec 18-29N.-33W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 8 square, concrete collar caving, wood-cribbed, 4' x 4', 12' deep to water level	Cyclone fencing, posting "DANGER" signs, and back-filling is recommended
Indiana Mine (shaft #2)	29-33-18-2	SW-SW-SE-NE-SE Sec. 18-29N.-33W. Carl Junction Quad Jasper Co., Mo.	Shaft is open and 15' in diameter, caving, 6 square, 12' deep to water level.	Nearby chat and boulder piles can be used for back-filling
Indiana Mine (shaft #3)	29-33-18-4	C-S2-S2-S2-NE-SE Sec 18-29N.-33W. Carl Junction Quad Jasper Co., Mo.	Shaft is open, 4' square hole, covered with timber and concrete, 12' deep to water level.	All mining waste (boulders, chats, concrete) in area can be used for back-filling
Indiana Mine (shaft #4)	29-33-18-5	SE-SE-SW-NE-SE Sec. 18-29N.-33W. Carl Junction Quad Jasper Co , Mo.	Shaft is open and 12' in diameter, caving, 4' diameter 8' below (at water level).	Nearby chat and boulder piles can be used for back-fill material
Pyramid Mine (north shaft)	29-34-14-1	SE-SW-SE-SW-SE Sec 14-29N.-34W. Carl Junction Quad Jasper Co., Mo.	Shaft is open and 20' in diameter, filled with brown stagnant water Surface diggings and boulders remain	Boulder and chat piles in area should provide enough back-fill material, access to hazard is controlled due to private property
Allegheny-Western Mine (north shaft)	29-34-14-2	C-S2-SW-SW-SW-SE Sec. 14-29N.-34W. Carl Junction Quad Jasper Co , Mo	Shaft is open and 12' in diameter, originally 200' deep, now water-filled, contains dead animals, boulders remain	Boulder and chat piles in area should provide enough back-fill material, access to hazard is controlled due to private property

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Blue Rock Mine	29-34-14-5	NE-SW-NE-SE-SW Sec. 14-29N -34W Carl Junction Quad Jasper Co , Mo	Shaft is open and 15' in diameter, water-filled, boulders remain	Ample fill material in vicinity, good access for heavy earth-moving machinery
Gascho Mine (north shaft)	29-34-14-8	SW-NE-SW-SE-NW Sec 14-29N -34W Carl Junction Quad Jasper Co , Mo	Shaft is open and 20' in diameter, sloughing	Ample fill material in vicinity, good access for heavy earth-moving machinery
Gascho Mine (south shaft)	29-34-14-9	NW-SE-SW-SE-NW Sec 14-29N.-34W Carl Junction Quad Jasper Co , Mo	Shaft is open and 12' in diameter, located between subsidence and concrete foundations, sloughing, 15' deep to water level	All mining waste (boulders, chats, concrete) in area can be used for back filling
Freehold #2 Mine	29-34-14-10	NE-NW-SW-SW-SW Sec 14-29N -34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 6' square, 15' deep to water level	Nearby chat and boulder piles can be used for back-fill material
St Louis Smelting & Refining Mine	29-34-15-1	S2-SW-NE-SE-NE Sec 15-29N -34W Carl Junction Quad Jasper Co , Mo	Shaft is open and 12' in diameter, 6' to water level, concrete caving and sloughing	All mining waste (boulders, chats, concrete) in area can be used for back filling
High Five Mine (east shaft)	29-34-15-3	SW-SE-SE-NE-SE Sec 15-29N -34W. Carl Junction Quad Jasper Co , Mo	Shaft is open and 10' in diameter, water-filled, sloughing, coalesced with subsidence to north	Ample fill material in vicinity, good access for heavy earth-moving machinery
High Five Mine (west shaft)	29-34-15-6	C-E2-SW-NE-SE Sec. 15-29N -34W Carl Junction Quad Jasper Co , Mo.	Shaft is open, 12' x 12', water-filled, concrete collar undercut by sloughing	Ample fill material in vicinity, good access for heavy earth-moving machinery

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remediation
Barnsdall #2 Mine (north shaft)	29-34-22-1	S2-NW-NW-NE-NW Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo.	Shaft is open, northeast of long subsidence, 15' in diameter, water-filled.	Nearby chat and boulder piles can be used for back-fill material
Barnsdall #2 Mine (northwest shaft)	29-34-22-2	NE-SW-NW-NW-NE Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo.	Shaft is open; northwest of long subsidence, 15' in diameter, water-filled	All mining waste (boulders, chats, concrete) in area can be used for back-filling
Barnsdall #2 Mine (west shaft)	29-34-22-4	NW-NE-SW-NE-NE Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo.	Shaft is open, west of long subsidence, 15' in diameter, water-filled	Ample fill material in vicinity, good access for heavy earth-moving machinery
Goodyear Mine (northeast shaft)	29-34-22-7	C-N2-SW-SE-NE-NE Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo.	Shaft is collapsed with concrete and boulders sloughing, 15' deep, water in bottom	All mining waste (boulders, chats, concrete) in area can be used for back-filling
Goodyear Mine (northwest shaft)	29-34-22-9	NW-NW-NE-SE-NE Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, cribbed, 4' x 4', cave to 10' diameter, 20' deep to water level	Cyclone fencing, posting "DANGER" signs, and back-filling is recommended
Goodyear Mine (southeast shaft)	29-34-22-12	SW-SE-NW-SE-NW Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 3' in diameter, water-filled	Nearby chat and boulder piles can be used for back-fill material
Goodyear Mine (southwest shaft)	29-34-22-14	C-E2-SW-NE-SE-NE Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo.	Shaft is open, 12' in diameter, filled with water, junk and debris	Ample fill material in vicinity, good access for heavy earth-moving machinery

Table A-1 - OPEN MINE SHAFTS Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Barnsdall #2 Mine (south shaft)	29-34-22-16	W2-SE-NW-SE-NE Sec. 22-29N.-34W Carl Junction Quad Jasper Co., Mo	Shaft is open, 6' in diameter, water-filled	Nearby chat and boulder piles can be used for back-fill material
Pyramid Mine (south shaft)	29-34-23-1	C-N2-NE-NW-NE Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 12' in diameter, water-filled, artesian	Boulder and chat piles in area should provide enough back-fill material, access to hazard is controlled due to private property
Allegheny-Western Mine (central shaft)	29-34-23-3	NE-NE-NW-NW-NE Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 12' in diameter, pool, artesian, brown water. Boulders, chat flats, and concrete foundations remain	All mining waste (boulders, chats, concrete) in area can be used for back-filling
Allegheny-Western Mine (south shaft)	29-34-23-5	C-N2-SE-NW-NW-NE Sec. 23-29N.-34W Carl Junction Quad Jasper Co., Mo	Shaft is open, 12' in diameter, 6' deep to water level, partially junk-filled. Boulders, chat flats, and concrete foundations remain	Boulder and chat piles in area should provide enough back-fill material, access to hazard is controlled due to private property
Freehold #3 Mine (northeast shaft)	29-34-23-6	N2-NE-NE-NE-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 8' in diameter, artesian, brown water. Concrete foundations, chat flats, and boulders remain.	Nearby chat and boulder piles can be used for back-fill material
Freehold #3 Mine (northwest shaft)	29-34-23-8	NW-NW-NE-NE-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 12' in diameter, water-filled, coalesced with west subsidence. Concrete foundations, chat flats, and boulders remain	All mining waste (boulders, chats, concrete) in area can be used for back-filling

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Freehold #3 Mine (west shaft)	29-34-23-10	SW-NW-NE-NE-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 25' in diameter, water-filled, caving. Concrete foundations, chat flats, and boulders remain.	Ample fill material in vicinity, good access for heavy earth-moving machinery
Freehold #3 Mine (southwest shaft)	29-34-23-11	NW-SW-NE-NE-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 10' in diameter, water-filled. Concrete foundations, chat flats, and boulders remain	Boulder and chat piles in area should provide enough back-fill material, access to hazard is controlled due to private property
Tulsa-Pittsburg #1 Mine (north shaft)	29-34-23-12	SW-NW-NW-SE-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 10' in diameter, 6' deep to water level, Pennsylvanian shales caving into hole. Chat flats and boulders remain	Nearby chat and boulder piles can be used for back-fill material
Tulsa-Pittsburg #1 Mine (south shaft)	29-34-23-13	NW-NW-SW-SE-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 20' in diameter, water-filled, Pennsylvanian shales caving into hole. Chat flats and boulders remain	Ample fill material in vicinity, good access for heavy earth-moving machinery
Tulsa-Pittsburg #1 Mine (central shaft)	29-34-23-15	C-SE-NE-SW-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	Shaft is open, 10' in diameter, 6' deep to water level, Pennsylvanian shales sloughing into hole. Chat flats and boulders remain	Nearby chat and boulder piles can be used for back-fill material
Tulsa-Pittsburg #1 Mine (west shaft)	29-34-23-16	W2-SE-NE-SW-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo.	Shaft is open, 6' in diameter, 10' deep to water level, Pennsylvanian shales visible in sides of hole. Chat flats and boulders remain	Boulder and chat piles in area should provide enough back-fill material, access to hazard is controlled due to private property

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Golden Glow Mine	28-32-6-1	SE-NW-NE-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and caving, 20' in diameter, hole is water-filled	Steep, [illegible] make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended
American Beauty Mine	28-32-6-2	NW-NE-SE-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Incline shaft is open, 10' X 20' hole has concrete, vertical sides with an approximate 45° incline, 30' deep to water level and trash, concrete collar is intact	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards.
Yellow Dog Mine (north shaft)	28-32-6-3	C-NW-NE-SE-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Incline shaft is 20' deep to trash fill, 10' X 20' opening has concrete, vertical sides with an approximate 45° incline, concrete collar is intact	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards.
Yellow Dog Mine (south shaft)	28-32-6-4	SE-SW-NE-SE-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Opening is 20' in diameter and 12' deep to unstable fill of boulders and concrete foundations, concrete collar is collapsed	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Red Dog Mine (north workings)	28-32-6-6	SE-NE-SW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, caving concrete collar, 80' deep to water level, boulders sloughing into hole from west side.	Chat/boulder piles in the vicinity could be used for back-filling purposes.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remediation
After Glow Mine (south shaft)	28-32-6-7	C-N2-NW-SE-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and measures 15' in diameter at surface, caving concrete collar, 50' deep to water level	All mining waste (chat, boulders, concrete) in area can be used for back-filling
After Glow Mine (north shaft)	28-32-6-8	C-N2-S2-N2-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and caving at surface, 30' in diameter, hole is water-filled.	Ample fill material in vicinity, need access for heavy earth-moving machinery
Bull Dog Mine (east shaft)	28-32-6-9	SW-NE-SW-SW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 15' in diameter and 30' deep to water level, concrete collar is caving and is badly undercutting boulder pile at east side.	Steep, caving sides make fencing a temporary safeguard, back-filling is recommended
Bull Dog Mine (west shaft)	28-32-6-10	NE-SW-SW-SW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is 40' in diameter with steep, caving sides, 25' deep to trash fill	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Church & Company Mine (south shaft)	28-32-6-11	NW-NW-NE-SW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and 15' in diameter at surface, thick vegetation near opening, hole is water-filled	Chat/ boulder piles in the vicinity could be used for back-filling purposes
Church & Company Mine (east shaft)	28-32-6-12	SE-SW-SE-NW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 5' in diameter, water-filled, thick vegetation near hole	All mining waste (chats, boulders, concrete) in area can be used for back-filling

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remediation
Church & Company Mine (central shaft)	28-32-6-13	E2-SE-SW-NW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, water-filled to surface, 4' X 4' wood-cribbing visible below water.	Back-fill material [illegible] the area, chain link fence [illegible] and warning signs are also suggested
Church & Company Mine (north shaft)	28-32-6-14	C-SW-NW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled to surface, 10' X 20' concrete collar is intact, double compartment opening is undercut on north and west sides, floating vegetation in shaft.	Ample fill material in vicinity, good access for heavy earth-moving machinery
Church & Company Mine (west shaft)	28-32-6-15	C-W2-SW-NW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 6' in diameter, water-filled to surface, floating vegetation in shaft.	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Parker Mine (east shaft)	28-32-6-17	W2-SW-NE-NW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled to surface, 10' in diameter, floating vegetation in shaft.	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Parker Mine (south shaft)	28-32-6-18	NW-NE-SW-NW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled to surface, 10' in diameter, coalesced with adjacent subsidence pool	Ample fill material in vicinity, good access for heavy, earth-moving machinery
Parker Mine (south-central shaft)	28-32-6-19	C-S2-S2-NW-NW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open and water-filled at surface, 20' in diameter	Back-filling recommended, nearby chat/boulder piles can be used for fill material

Table A-1 - OPEN MINE SHAFTS - continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Parker Mine (central shaft)	28-32-6-20	C-S2-NW-NW-SW Sec. 6-28N -32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' in diameter, water-filled to surface, floating vegetation in shaft	Chat/boulder piles in the vicinity could be used for back-filling purposes
Parker Mine (north-central shaft)	28-32-6-21	SW-NE-NW-NW-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled to surface, 10' in diameter, floating vegetation in shaft	All mining waste (chat, boulders, concrete) in area can be used for back-filling
Parker Mine (north shaft)	28-32-6-22	SW-SE-SW-SW-NW Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and caving at surface, 10' in diameter opening descends to 4' X 4' hole which is water-filled.	Steep, caving sides are fencing a temporary safe-guard, nearby waste-rock can be used for back-filling purposes
Richvale Mine	28-32-6-23	C-E2-W2-E2-W2-W2 Sec. 6-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 30' in diameter, concrete collar is caving at surface and sloughing into shaft, 10' deep to water level, floating vegetation in shaft which will soon coalesce with adjacent subsidence pool	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Premier Mine (north shaft)	28-32-7-1	SE-NW-NW-NE-SE Sec. 7-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 10' X 10' concrete collar is intact, 5' X 7' rock-walled shaft begins 6' below collar, 60' deep to water level.	Back-fill materials are in the area, chain link fencing and warning signs also suggested

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Premier Mine (south shaft)	28-32-7-2	T2-SW-NW-NE-SE Sec. 7-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and 25' in diameter at surface, concrete collar is caving into 6' X 6' rock-walled shaft, 40' deep to water level	Steep, caving sides make feasible temporary safeguard, back-filling recommended
Media Mine (north shaft)	28-32-7-3	NW-SE-NW-SW-NE Sec. 7-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 6' X 10' concrete collar is intact, hole is rock-walled and 80' deep to trash fill.	Cyclone fence and posting "DANGER" signs should provide reasonable safeguards
Media Mine (south shaft)	28-32-7-4	C-S2-SW-SW-NE Sec. 7-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and 30' in diameter at surface, 4' X 6' concrete collar is collapsing into hole, 15' deep to chat/concrete fill.	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Mercantile #4 Mine	28-32-7-5	NW-SW-NE-SE-SW Sec. 7-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and 30' in diameter at surface, 6' X 6' rock-walled shaft descends 30' to dry bottom.	Back-filling recommended nearby chat/boulder piles can be used for fill material
Electrical Mine	28-32-7-7	NE-SW-SE-NW Sec. 7-28N.-32W Webb City Quad Jasper Co., Mo.	Incline shaft is open and measures 6' X 10' with an approximate 40° incline, surface opening is 20' in diameter with caving sides, concrete roof above incline is also collapsing, depth to water level is 25' along incline angle.	Boulder and chat piles in area should provide enough back-fill material, access to hazard is good for heavy, earth moving machinery
Mineral King Mine	28-32-7-8	NE-NE-SW-NW Sec. 7-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and caving at surface, 4' X 4' concrete collar is also collapsing, 50' deep to water level	Ample fill material in the vicinity, good access for heavy, earth-moving machinery

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remediation
Hurry Up Mine	28-32-7-9	W2-SE-SW-NE-NW Sec 7-28N -32W Webb City Quad Jasper Co , Mo	Shaft is open with concrete collar intact, 5' X 7' opening is wood-cribbed to a depth of 40' to a trash fill	Cyclone fencing and warning "TARGET" signs would provide reasonable safeguards
Ground Floor Mine (southeast shaft)	28-32-7-10	E2-NE-SE-NE-NW Sec 7-28N -32W Webb City Quad Jasper Co , Mo	Shaft is 30' in diameter at surface, cavity concrete collar, 20' deep to fill of boulders and concrete foundation.	All mining waste (chat, boulders, concrete) in area can be used for back-filling
Ground Floor Mine (northwest shaft)	28-32-7-11	NW-SE-NW-NE-NW Sec 7-28N -32W. Webb City Quad Jasper Co , Mo	Shaft is open and 30' in diameter at surface, concrete collar is caving, 15' deep to 6' X 10' rock-walled shaft, 60' deep to water level.	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Red Dog Mine (south workings)	28-32-7-12	W2-NW-NW-NE-NW Sec. 7-28N.-32W Webb City Quad Jasper Co., Mo	Shaft is open and 20' in diameter at surface, concrete collar is caving, 15' deep to rock-walled shaft, 60' deep to water level	Back-filling is commended, nearby chat/boulder piles can be used for fill material
Providence Mine	28-32-7-13	C-W2-W2-SW-NW-NW Sec 7-28N.-32W Webb City Quad Jasper Co., Mo	Shaft is open and 25' in diameter at surface, 15' deep to 8'-diameter rock-walled shaft, 20' deep to water level, shaft sides are composed of unstable shales and soils	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Mitigation
Chapman Land Company Mine (east shaft)	28-32-8-1	C-E2-E2-W2-NE-SW Sec. 8-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 5' X 7' concrete collar is intact, double compartment hole is water-filled.	Back-fill material are in the area, chain link fencing and warning signs are also suggested
Chapman Land Company Mine (west shaft)	28-32-8-2	SW-SE-NW-NE-SW Sec. 8-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 5' X 5' concrete collar is intact, hole is water-filled, dense vegetation in area.	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
Sunflower Mine (north shaft)	28-32-8-3	SE-NE-SW-SE-SW Sec. 8-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled, 12' in diameter at surface, concrete collar is visible below water	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Sunflower Mine (south shaft)	28-32-8-4	E2-SE-SW-SE-SW Sec. 8-28N.-32W Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled, 10' in diameter at surface, concrete collar is visible below water.	Chat/boulder piles in the vicinity could be used for back-filling purposes
Empress #2 Mine	28-32-8-5	SE-SW-SE-SW-SW Sec. 8-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, concrete collar is caving, 4' X 4' wood-cribbing descends 12' to water level	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended
School House Mine	28-32-17-1	NW-NW-SE-NE-NE Sec. 17-28N.-32W Webb City Quad Jasper Co., Mo.	Shaft is open and 25' in diameter at surface, hole is water-filled and contains floating vegetation	Boulder and chat piles in area should provide enough back-fill material, access to hazard is controlled due to private property
Luscombe Mine	28-32-17-2	NE-SW-NW-NE-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 10' X 20' concrete collar is caving, trash and other debris is sloughing into hole	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Concord Mine (east shaft)	28-32-17-4	W2-SE-SW-NE-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and hidden by vegetation, 16' in diameter at surface, 4' X 5' wood-cribbing descends 20' to water level	All mining waste (chat, boulders, concrete) in area can be used for back-filling
Concord Mine (west shaft)	28-32-17-5	SE-SW-SW-NE-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 25' in diameter at surface, 6' X 6' wood-cribbing descends 20' to water level, shaft is obscured by trash	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
Charter Oak Mine (northeast shaft)	28-32-17-10	C-S2-N2-NW-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and hidden by vegetation, 25' in diameter at surface, sides are caving, 20' deep to water level	Steep, caving sides make fencing a temporary safe-guard, back-filling with nearby waste-rock is recommended
Charter Oak Mine (east shaft)	28-32-17-11	SE-SE-NW-NW-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 3' wood-cribbing is deteriorating, 20' deep to water level, shaft contains trash and other debris	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Charter Oak Mine (southeast shaft)	28-32-17-12	N2-NE-SW-NW-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 4' X 4' wood-cribbing is caving into hole which is 30' deep to a dry bottom	Cyclone fencing and posting "DANGER" signs should provide reasonable safe-guards
Charter Oak Mine (southwest shaft)	28-32-17-13	NW-NE-SW-NW-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 8' in diameter at surface, caving concrete collar, 5' X 5' wood-cribbing descends 10' to water level.	Chat/boulder piles in the vicinity could be used for back-filling purposes

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Rehabilitation
Eaton Mining Company Mine	28-32-17-14	SE-NW-SW-NW-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled, 12' in diameter at surface, caving to a 5' X 5' hole	Back-fill material are in the area, chain link fencing and warning signs are also suggested
Woods & Brown Mine	28-32-17-19	C-W2-E2-NE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and 20' in diameter at surface, hole is water-filled.	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
South Carterville Mining & Smelting Company Mine	28-32-17-21	SW-NE-SW-NE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and 15' in diameter at surface, caving 12' down to water level.	All mining waste (chats, boulders, concrete) in area can be used for back-filling
J.M.Slaight Mine	28-32-17-24	C-W2-NW-NW-SE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled to the surface, 30' in diameter, sides are unstable	Steep, caving sides make fencing a temporary safe-guard, back-filling with nearby waste-rock is recommended
Beulah Mine	28-32-17-26	W2-NE-SE-SW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 3' X 3' wood-cribbing is intact, 15' deep to a dry bottom	Cyclone fencing and posting "DANGER" signs should provide reasonable safe-guards
Duluth Mine	28-32-17-28	C-W2-NE-SW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled to surface, forming a 20' X 30' stagnant pool, trash and debris in pool	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Center Creek Mining Company Mine (east workings - south shaft)	28-32-17-29	SE-NE-NE-SW-SW Sec. 17-28N.-32W Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled to surface, 30' in diameter with unstable, collapsing sides	Steep, caving sides make fencing a temporary safe-guard, back-filling with nearby waste-rock is recommended

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remediation
Center Creek Mining Company Mine (east workings-northeast shaft)	28-32-17-32	SE-SE-SE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled to surface, 4' X 4' wood-cribbing is visible below water	Cyclone fencing and warning "DANGER" signs would provide reasonable safeguards.
Center Creek Mining Company Mine (east workings-northwest shaft)	28-32-17-33	SW-SE-SE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open and water-filled to surface, 3' X 3' wood-cribbing is visible below water	Cyclone fencing and warning "DANGER" signs would provide reasonable safeguards.
Ben Franklin Mine (south shaft)	28-32-17-36	SE-SW-NW-SW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 10' X 10' concrete collar is intact, 15' deep to trash fill.	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Ben Franklin Mine (north shaft)	28-32-17-38	E2-NW-NW-SW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 40' in diameter at surface, caving 20' down to water level, 8'-diameter pool, Mississippian bedrock exposed in shaft walls.	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Sunset Mine (west workings-south shaft)	28-32-17-39	SE-NW-SE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open within chat pile, 3' X 3' wood-cribbed hole is water-filled.	Chat/boulder piles in the vicinity could be used for back-filling purposes
Sunset Mine (west workings-east shaft)	28-32-17-40	C-N2-SE-NW-SW Sec. 17-28N.-32W Webb City Quad Jasper Co., Mo	Shaft is open and producing an artesian flow, 20' in diameter at surface, sides are unstable	Back-filling recommended, nearby chat/boulder piles can be used for fill material.
Sunset Mine (west workings-central shaft)	28-32-17-41	NE-NW-SE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open within chat pile, 10' in diameter at surface, hole is water-filled	All mining waste (chats, boulders, concrete) area can be used for back-filling

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Sunset Mine (west workings-northwest shaft)	28-32-17-42	N2-N2-NW-SE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open and producing an artesian flow, 20' in diameter at surface, surge pool lies 40' south of shaft and is vegetated	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
Sunset Mine (east workings-south shaft)	28-32-17-43	NW-NE-SE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open and is 8' in diameter at surface, hole is water-filled and contains floating vegetation	Chat/boulder piles in the vicinity could be used for back-filling purpose
Sunset Mine (east workings-central shaft)	28-32-17-44	SW-SE-NE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, water-filled, 10' in diameter at surface, floating vegetation in shaft	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Sunset Mine (east workings-north shaft)	28-32-17-45	NW-SE-NE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 10' in diameter at surface, water-filled, hole contains floating vegetation	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
Little Diamond Mine (southeast shaft)	28-32-17-46	SW-NE-NE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 6' in diameter at surface and water-filled	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Little Diamond Mine (east shaft)	28-32-17-47	C-NE-NE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open and water-filled, 6' in diameter at surface.	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Little Diamond Mine (central shaft)	28-32-17-48	W2-NE-NE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, water-filled, sides are caving	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Little Diamond Mine (northwest shaft)	28-32-17-49	NE-NW-NE-NW-SW Sec. 17-28N.-32W Webb City Quad Jasper Co., Mo.	Shaft is open and 8' in diameter at surface, water-filled, hole contains floating vegetation	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Little Diamond Mine (southwest shaft)	28-32-17-50	SW-NW-NE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and 15' in diameter at surface, hole is water-filled	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
Comet Mine (southeast shaft)	28-32-17-51	C-S2-SE-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 20' in diameter at surface, caving 10' down to the water level.	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Comet Mine (northeast shaft)	28-32-17-52	SW-NE-SE-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 6' concrete collar is intact, 3' X 3' wood-cribbing also in good shape, 5' deep to water level.	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards.
Comet Mine (north shaft)	28-32-17-53	SE-NW-SE-SW-NW Sec. 17-28N.-32W Webb City Quad Jasper Co., Mo.	Shaft is open and water-filled, 3' X 4' wood-cribbing visible below water	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Comet Mine (south shaft)	28-32-17-54	SW-SW-SE-SW-NW Sec 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 10' in diameter at surface, 8' deep to water level	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Comet Mine (central shaft)	28-32-17-55	NW-SW-SE-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 8' in diameter at surface, 8' deep to water level	Chat/boulder piles in the vicinity could be used for back-filling purposes

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Comet Mine (southwest shaft)	28-32-17-58	C-S2-SW-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 20' in diameter at surface, caving 8' down to a 5'-diameter pool at water level	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Comet Mine (west shaft)	28-32-17-59	C-SW-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 6' in diameter at surface and 6' deep to water level	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Comet Mine (northwest shaft)	28-32-17-62	C-S2-NW-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 12' in diameter at surface, 6' deep to water level, hole is about to coalesce with adjacent subsidence pit	Chat/boulder piles in the vicinity could be used for back-filling purposes
Twin Cities Mine	28-32-17-65	SW-SE-NE-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, 3' X 3' wood-cribbing is badly deteriorated, 20' deep to water level	Steep, caving sides make fencing a temporary safeguard, back-fill is with nearby waste-rock is recommended
Talisman Mine	28-32-17-67	SW-SW-SE-NE-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 3' X 5 wood-cribbing is intact, 40' deep to a dry bottom, jeep and motorcycle trails immediately adjacent to opening	Back-fill materials are in the area, chain link fencing and warning signs are also suggested
Ramage Mine (southeast shaft)	28-32-17-68	S2-NE-SW-NE-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 5' X 5' concrete collar is intact, some wood-cribbing remaining in shaft, 40' deep to water level.	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Reclamation
Ramage Mine (northwest shaft)	28-32-17-69	C-S2-S2-NW-NE-NW Sec 17-28N -32W Webb City Quad Jasper Co , Mo.	Shaft is open, caving concrete collar, 4' x 6' wood-cribbing descends 25' down to water level	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
Red Eagle Mine	28-32-17-70	NE-NE-NE-SW-NW Sec 17-28N -32W Webb City Quad Jasper Co., Mo	Shaft is open, 40' in diameter at surface, caving 15' down to a 10'-diameter pool at water level	All mining waste (chat, boulders, concrete) in area can be used to back-filling
Incline Mine	28-32-17-72	C-E2-NW-SW-NW Sec. 17-28N.-32W Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, caving 25' down to a 5'-diameter pool at water level, shaft is about to coalesce with adjacent subsidence pit	Back-filling recommended, nearby chat/boulder pile can be used for fill material
Daylight Mine	28-32-17-75	C-E2-E2-W2-W2-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 30' in diameter at surface, caving 15' down to an 8'-diameter pool at water level.	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended
Moark-Nemo Mine (northeast shaft)	28-32-18-1	NE-NW-NE-NE-NE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 30' in diameter at surface, caving concrete collar, sides are sloughing 20' down to a 5' X 7' rock-walled shaft, 100' deep to water level	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Moark-Nemo Mine (southwest shaft)	28-32-18-2	E2-NE-NW-NE-NE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, caving concrete collar, sides are sloughing 15' down to a 5' X 7' wood-cribbing which is deteriorating, 100' deep to water level.	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remediation Action
National #2 Mine	28-32-18-9	SW-NW-NE-SE-SE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 10' X 5' concrete collar is intact, sides are caving below collar, 40' deep to water level, some wire-fence surrounds shaft area at surface.	Boulder and chat piles in area should provide enough back-fill material, access to hazard is controlled due to private property.
Florine Mine	28-32-18-11	C-W2-NE-NE-NW Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, caving concrete collar, 15' deep to choked area of trash and debris, 6' X 6' rock-walled shaft descends 20' down to water level.	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended.
Cornfield Mine (north shaft)	28-32-20-1	SE-NW-NW-NE-NE Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 3' wood-cribbing is intact, 20' deep to water level.	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards
Cornfield Mine (south shaft)	28-32-20-2	NE-SW-NW-NE-NE Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, 20' deep to water level, 4' X 4' wood-cribbing visible at water level, sides are unstable.	Chat/boulder piles in the vicinity could be used for back-filling purposes.
Manhattan Mine	28-32-20-5	C-N2-S2-N2-S2 Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 10' in diameter at surface, caving 10' down to 3' X 3' wood-cribbing, 40' deep to water level.	Back-filling recommended, nearby chat/boulder piles can be used for fill material

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Victor Mine (east shaft)	28-32-20-6	W2-NE-NW-SE-SW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' concrete collar and wood-cribbing are intact, 50' deep to water level	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Victor Mine (central shaft)	28-32-20-8	W2-NW-NE-SE-SW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 4' X 4' concrete collar and wood-cribbing are intact, 40 deep to water level	Cyclone fencing and posting "DANGER" signs should provide reasonable safe-guards
Victor Mine (west shaft)	28-32-20-10	N2-NE-NW-SE-SW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 4' wood-cribbing is intact, 10' deep to water level	Cyclone fencing and posting "DANGER" signs should provide reasonable safe-guards
Star Mine	28-32-20-11	NE-SW-SE-NE-SW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 5' wood-cribbing is intact, 40' deep to water level.	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested.
Gladys Mine	28-32-20-13	N2-N2-NW-NW-SW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 15' in diameter at surface, caving concrete collar, 3' X 4' wood-cribbing is intact, 30' deep to a dry bottom	All mining waste (chat, boulders, concrete) in area can be used for back-filling
Lucy Bell Mine (south shaft)	28-32-20-14	NW-SW-SE-SW-NW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 15' in diameter at surface, 4' X 4' wood-cribbing is deteriorating, 10' deep to water level.	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Lucy Bell Mine (north shaft)	28-32-20-15	SW-NW-SE-SW-NW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 5' X 5' rock-walled hole is 30' deep to water level.	Cyclone fencing and posting "DANGER" signs should provide reasonable safe-guards

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Red Bird Mine	28-32 21-1	C-N2-SW-SE-NE Sec. 21-28N.-32W Webb City Quad Jasper Co., Mo	Shaft is open, 10' in diameter at surface, rock-walled hole is 60' deep to a dry bottom, concrete foundations and trash are sloughing into opening	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Boston Get There Mine (Walker Shaft)	28-32-21-2	N2-NE-SE-NE-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' wood-cribbing is caving into hole, 40' deep to water level.	Back-filling is recommended, nearby chat/boulder piles can be used for fill material.
Boston Get There Mine (Phoenix Shaft)	28-32-21-3	C-W2-W2-SE-NE-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 5' wood-cribbing is intact, 30' deep to water level	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards.
Boston Get There Mine (Atlas Shaft)	28-32-21-4	C-W2-E2-SW-NE-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 5' X 5' wood-cribbing is collapsing into hole, 50' deep to water level.	Chat/boulder piles in the vicinity could be used for back-filling purpose
Boston Get There Mine (Wilgus Shaft)	28-32-21-5	N2-SW-NW-NE-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, concrete foundations sloughing into hole, 40' deep to a dry bottom.	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Noonday Mine (northeast shaft)	28-32-21-6	NW-SW-SW-NE-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 12' in diameter at surface, sides are unstable, 60' deep to water level	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended
Noonday Mine (southwest shaft)	28-32-21-7	NW-NW-NW-NE-SW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' wood-cribbing is deteriorating, 25' deep to water level	Back-filling recommended, nearby chat/boulder piles can be used for fill material

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remediation
Gobbler Mine (southwest shaft)	28-32-21-10	S2-SW-NE-NW-SE Sec 21-28N.-32W Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 3' wood-cribbing is intact, 40' deep to a dry bottom	Back-fill material are in the area, chain-link fencing and warning signs are also suggested
Gobbler Mine (northeast shaft)	28-32-21-11	E2-SW-NE-NW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 3' wood-cribbing is intact, 40' deep to a dry bottom	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Twin City Mine (east shaft)	28-32-21-13	E2-NE-NW-NW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 3' X 4' wood-cribbing is intact, 25' deep to water level	Cyclone fencing and posting "DANGER" signs should provide reasonable safe-guards
Twin City Mine (west shaft)	28-32-21-14	NW-NE-NW-NW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' wood-cribbing is intact, 50' deep to water level	Cyclone fencing and posting "DANGER" signs should provide reasonable safe-guards
Eleventh Hour Mine (northeast shaft)	28-32-21-15	W2-SW-NW-NW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 3' wood-cribbing is intact, 50' deep to water level	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Eleventh Hour Mine (southeast shaft)	28-32-21-16	C-W2-W2-W2-NW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 4' X 4' wood-cribbing is intact, 15' deep to a dry bottom	Cyclone fencing and posting "DANGER" signs should provide reasonable safe-guards
Eleventh Hour Mine (southwest shaft)	28-32-21-17	NE-NE-NE-SE-NE-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is 20' in diameter at surface, caving 25' down to an unstable rock fill, 3' X 3' wood-cribbing is visible near fill.	Steep, caving sides make fencing a temporary safe-guard, back-filling with nearby waste-rock is recommended

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Eleventh Hour Mine (northwest shaft)	28-32-21-18	S2-SE-NE-NE-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' wood-cribbing is intact, 70' deep to water level	Chat/boulder piles in the vicinity could be used for back-filling purposes
Eleventh Hour Mine (west shaft)	28-32-21-20	NW-NE-NW-NE-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and hidden by vegetation, adjacent to MO-PAC railroad, 70' deep to water level	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Grasshopper Mine (northeast shaft)	28-32-21-21	W2-SW-NE-NE-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 30' in diameter at surface, caving 25' down to 4' X 4' wood-cribbing, 75' deep to water level, hole is 15' south of MO-PAC railroad	Fencing is inappropriate due to instability of surficial material around shaft, boulder piles in area would provide good back-fill material
Grasshopper Mine (northwest shaft)	28-32-21-22	C-S2-N2-NE-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 5' wood-cribbing is intact, 50' deep to a dry bottom, hole is 100' south of MO-PAC railroad	Back-filling recommended, chat/boulder piles in the area would provide enough fill material and access is good for heavy, earth-moving machinery
Grasshopper Mine (south shaft)	28-32-21-23	SE-NW-SE-NE-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 3' wood-cribbing is intact, 30' deep to a dry bottom	Fencing would be an inexpensive, adequate safety measure, nearby chat piles could be used for fill material since access is good for heavy machinery and equipment
Lucky Budge Mine	28-32-21-25	C-NW-SW-SE-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 5' X 5' wood-cribbing is intact, 30' deep to a dry bottom.	Ample fill material in the vicinity, good access for heavy, earth-moving machinery.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Dominion Mine	28-32-21-26	S2-NE-NE-SW-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, hidden by thick brush and vegetation, 3' X 3' wood-cribbing is intact, 25' deep to a dry bottom	Chat/boulder piles in the vicinity could be used for back-filling purpose
Minnie May Mine	28-32-21-27	N2-NE-NE-NW-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, collapsed at surface, 5' X 5' wood-cribbing is intact, 50' deep to water level	Steep, caving sides make fencing a temporary safe-guard, back-filling with nearby waste-rock is recommended
McGregor Mine	28-32-21-28	N2-NW-SW-NW-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 5' X 5' wood-cribbing is intact, 50' deep to water level	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Opal Wonder Mine (east shaft)	28-32-21-29	C-E2-NW-NW-NW-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 5' wood-cribbing is intact, 40' deep to water level	Chat/boulder piles in the vicinity could be used for back-filling purposes
Opal Wonder Mine (west shaft)	28-32-21-30	SW-NW-NW-NW-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, concrete collar is intact, 3' X 3' wood-cribbing descends 30' down to the water level	All mining waste (chat, boulders, concrete) in area can be used for back-filling
Gladstone Mine	28-32-21-31	SW-NW-SE-SW-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, adjacent to MO-PAC railroad, hole is 4' X 4' at surface, caving sides descend 20' down to the water level	Back-filling recommended, nearby chat/boulder piles can be used for fill material

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remediation
Unknown	28-32-21-32	C-NW-SW-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo	Shaft is open, 20' in diameter at surface, 20' deep to water level, sides are unstable	Chat/boulder piles in the vicinity could be used for back-filling purposes
Unknown	28-32-21-33	S2-NW-NW-SW-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, caving sides, water-filled	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Continental Mine (west shaft)	28-32-21-35	S2-SE-NE-SW-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 15' in diameter at surface, water-filled.	Back-filling recommended; nearby chat/boulder piles can be used for fill material
Continental Mine (northwest shaft)	28-32-21-37	N2-SW-NW-SE-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' wood-cribbing is intact, 30' deep to water level, concrete foundations are caving into hole.	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
Continental Mine (southwest shaft)	28-32-21-38	NE-SE-SE-SW-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 3' X 3' wood-cribbing is intact, hole is water-filled	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Continental Mine (south shaft)	28-32-21-39	SW-SW-SE-SE-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, adjacent to large subsidence pit, hole is water-filled.	Chat/boulder piles in the vicinity could be used for back-filling purposes
Continental Mine (central shaft)	28-32-21-40	NW-SW-SE-SE-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, adjacent to large subsidence pit, hole is water-filled	Back-filling recommended, nearby chat/boulder piles can be used for fill material

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Continental Mine (Steel Shaft)	28-32-21-42	NE-SE-SE-SE-NW Sec 21-28N.-32W Webb City Quad Jasper Co , Mo.	Shaft is open, 4' X 4' wood-cribbing is intact, 50' deep to water level, some wire-fencing surrounds opening at surface	Back-fill material are in the area, chain-link fencing and warning signs are also suggested.
Continental Mine (northeast shaft)	28-32-21-43	S2-SW-NE-SE-NW Sec 21-28N -32W Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' wood-cribbing is intact, 10' deep to water level	Cyclone fencing and posting "DANGER" signs would provide reasonable safeguards
American Davies Mine	28-32-21-44	N2-SW-SW-NE-NW Sec 21-28N -32W. Webb City Quad Jasper Co , Mo	Shaft is open, 4' X 4' wood-cribbing is intact, 60' deep to a dry bottom, hole is hidden by vegetation	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Cumberland Mine	28-32-28-15	N2-NE-NW-NW Sec 28-28N.-32W Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 6' concrete collar is intact, 3' X 5' wood-cribbing descends 50' down to the water level, shaft is a USGS water gauging station, hazard is easily accessible only 200' south of well-travelled section line road	Fencing could be easily installed around opening, concrete collar would be a good base for some type of seal or cap over the opening, back filling material is also nearby
Unity Mine	28-33-1-1	NE-SW-NE-NE-SE Sec 1-28N -33W Webb City Quad Jasper Co., Mo.	Shaft is open, 30' in diameter at surface, water-filled, floating vegetation in shaft.	Chat/boulder piles in the vicinity could be used for back-filling purposes

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
D. C & E. Mine	28-33-1-2	E2-SE-SE-NE-SE Sec. 1-28N.-33W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' concrete collar is intact, hole is water-filled, shaft is easily accessible: only 50' west of well-travelled paved road	Back-fill materials are in the area; chain-link fencing and warning signs are also suggested
John L. Mine	28-33-12-1	E2-SE-SW-NE-NE Sec. 12-28N.-33W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20 in diameter at surface, caving concrete collar, 50' deep to water level.	All mining waste (chats, boulders, concrete) in the area can be used for back-filling
Herbert S. Mine (west shaft)	28-33-12-2	C-E2-NW-SE-NE Sec. 12-28N.-33W. Webb City Quad Jasper Co., Mo.	Shaft is open, 8' X 12' hole at surface, water-filled, boulders sloughing into shaft	Chat/boulder piles in the vicinity could be used for back-filling purposes
Herbert S. Mine (east shaft)	28-33-12-3	C-E2-W2-NE-SE-NE Sec. 12-28N.-33W. Webb City Quad Jasper Co., Mo.	Shaft is open, 50' in diameter at surface, 30' deep to rock-walled, 6' X 6' hole which is plugged with chat and boulders.	Back-filling recommended; nearby chat/boulder piles can be used for fill material
Wingfield Mine (northeast shaft)	28-33-12-4	C-N2-N2-SE-SE-NE Sec. 12-28N.-33W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 6' concrete collar and wood-cribbing are intact, 50' deep to water level, vegetation obscures shaft.	Back-fill materials are in the area, chain-link fencing and warning signs are also suggested
Wingfield Mine (southwest shaft)	28-33-12-5	C-E2-SW-SE-NE Sec. 12-28N.-33W. Webb City Quad Jasper Co., Mo.	Shaft is open, 30' in diameter at surface, sides are unstable and descend 20' down to a trash fill which was burning at time of field visit.	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Lucky Tiger Mine	29-32-8-3	C-W2-E2-SE-SE-NW Sec. 8-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 60' in diameter at surface, sides are very unstable, descending 30' down to 3' X 3' wood-cribbing, 60' deep to water level, site is easily accessible and presently being used as local trash dump: only 75' west of well-travelled paved road.	Back-filling recommended, steep, caving sides make fencing a temporary safeguard.
Good Shepard Mine	29-32-8-5	NW-NW-SE-SW-NW Sec. 8-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 15' in diameter at surface, hole is water-filled.	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards.
Big Kate Mine (northeast shaft)	29-32-8-7	C-E2-SE-SE-NW-NW Sec. 8-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' concrete collar is intact, 15' deep to water level	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards.
Big Kate Mine (northwest shaft)	29-32-8-8	SW-SE-SE-NW-NW Sec. 8-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 6' in diameter at surface, wood-cribbing is deteriorated, 20' deep to water level.	Chat/boulder piles in the vicinity could be used for back-filling purposes.
Federated Lead & Zinc Company Mine	29-32-9-1	C-S2-SE-NE Sec. 9-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 40' in diameter at surface, 15' deep to water level, sides are collapsing, hole is in the middle of a plowed field.	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended.
Trossack Mine	29-32-9-4	C-N2-N2-SW-SE Sec. 9-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, water-filled.	Back-filling recommended, nearby chat/boulder piles can be used for fill material.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Lewis & Company Mine	29-32-9-5	SE-NW-SW-NW-SE Sec. 9-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 4' X 4' concrete collar is intact, hole is water-filled	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards
Texas Steer Mine	29-32-9-6	C-W2-W2-NW-SE Sec. 9-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and producing an artesian flow, 4' X 4' concrete collar is intact	Cyclone fencing and posting "DANGER" signs should provide reasonable safeguards.
Gore Mine (east shaft)	29-32-9-7	NE-SW-SE-NE-SW Sec. 9-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and producing an artesian flow, 4' X 4' concrete collar is intact, floating vegetation in shaft.	All mining waste (chats, boulders, concrete) in area can be used for back-filling
Gore Mine (west shaft)	29-32-9-8	NE-SE-SW-NE-SW Sec. 9-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and producing an artesian flow, 4' X 4' concrete collar is intact, floating vegetation in shaft.	All mining waste (chats, boulders, concrete) in area can be used for back-filling.
Good Wednesday Mine	29-32-15-1	W2-NE-NE-NE-NW Sec. 15-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open and producing an artesian flow, 6' in diameter at surface, floating vegetation in shaft.	Back-filling recommended, nearby chat/boulder piles can be used for fill material
Goodwill Mine (southeast shaft)	29-32-31-3	C-SE-NE-NW-SW Sec. 31-29N.-32W. Webb City Quad	Shaft is open, 12' X 12' concrete collar is caving, 6' X 6' rock-walled shaft descends 20' to water and debris.	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended.
Goodwill Mine (northeast shaft)	29-32-31-4	S2-NE-NE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, unstable sides caving down to 3' X 3' rock-walled hole, 20' deep to water level.	Back-filling recommended, nearby chat/boulder piles can be used for fill material.

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Goodwill Mine (central shaft)	29-32-31-5	NW-SE-NE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 30' in diameter at surface, unstable sides caving down to 4' X 4' rock-walled hole, 15' deep to water level.	Back-filling recommended, nearby chat/boulder piles can be used for fill material.
Goodwill Mine (northwest shaft)	29-32-31-6	E2-NW-NE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 50' in diameter at surface, unstable sides caving down to 5' X 5' rock-walled hole, 30' deep to water level.	Ample fill material in the vicinity, good access for heavy, earth-moving machinery
Goodwill Mine (west shaft)	29-32-31-7	SE-NW-NE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 25' in diameter at surface, unstable sides caving down to 5' X 5' rock-walled hole, 25' deep to water level.	Steep, caving sides make fencing a temporary safeguard; back-filling with nearby waste-rock is recommended.
La Tosca Mine (northeast shaft)	29-32-31-8	SW-SE-NE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, unstable sides caving down to 5' X 5' rock-walled hole, 20' deep to water level.	Chat/boulder piles in the area could be used for back-filling purposes.
La Tosca Mine (northwest shaft)	29-32-31-10	C-E2-W2-E2-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 30' in diameter at surface, very unstable sides descend 25' to fill of junk and trash	Steep, caving sides make fencing a temporary safeguard, back-filling with nearby waste-rock is recommended
La Tosca Mine (east shaft)	29-32-31-12	W2-SW-SW-NE-SW Sec. 31-29N.-32W. Webb City Quad	Shaft is open, 40' in diameter at surface, 12' deep to water level and trash.	Boulder and chat piles in area should provide enough fill material; access is good for heavy, earth-moving machinery

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
La Tosca Mine (south shaft)	29-32-31-13	C-S2-S2-S2-N2-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	Shaft is open, 20' in diameter at surface, unstable sides caving down to 3' X 3' wood-cribbing, 15' deep to water level and trash	Back-filling recommended, nearby chat/boulder piles can be used for fill material.
Snapp-Gunning Mine	29-33-23-1	C-W2-E2-NE-SE Sec. 23-29N.-33W. Webb City Quad Jasper Co., Mo.	Shaft is open, 25' in diameter at surface, hole is water-filled, located adjacent to concrete mill structures.	Boulder and chat piles in area should provide enough fill material, access to hazard is controlled due to private property

Table A-1 - OPEN MINE SHAFTS, ADITS, AND PITS - Continued

Location	Site Number	UTM Coordinates Zone 15	Name	Size and Present Condition	Suggested Remedial Action
T.34S., R.25E., Sec. 12 Joplin West Quad Cherokee Co., Ks.	1	4107030N, 355735E	Buckeye Mine	Collapsed, 60 ft dia, 15 ft deep, dry, low hazard.	Filling
Do	2	4106265N, 356145E	Prospect	Collapsed, 20 ft dia, 15 ft deep, dry; low hazard.	do
Do	3	4105865N, 356140E	Cave Springs	5 ft x 5 ft, 10 ft deep; dry, low hazard.	do
Do	4	4105810N, 356180E	do	Collapsed; 30 ft dia, 20 ft deep, dry; moderate hazard.	do
T.34S., R.25E., Sec. 13 Joplin West Quad Cherokee Co., Ks.	1	4105775N, 356180E	Boston-Missouri Mining Co.	Collapsed; 50 ft dia, 25 ft deep, some trash, moderate hazard.	do
Do	2	4105780N, 356205E	do	25 ft dia at top; 8 ft dia below, 50 ft deep, dry, collapsed; high hazard.	Pluggin
Do	3	4105720N, 356130E	Merchants Mining Co.	Collapsed; 25 ft dia at top, 6 ft dia at depth, 50 ft deep to water, high hazard.	do
Do	4	4105750N, 356070E	do	Collapsed; 15 ft dia at top, 17 ft dia below; 30 ft deep to water, high hazard.	do
Do	5	4105730N, 356075E	do	Collapsed, 18 ft dia at top; 6 ft dia below, 20 ft deep to water, high hazard.	do

Table A-1 - OPEN MINE SHAFTS, ADITS, AND PITS - Continued

Location	Site Number	UTM Coordinates Zone 15	Name	Size and Present Condition	Suggested Remedial Action
T.34S., R.25E., Sec. 13 Joplin West Quad Cherokee Co., Ks.	6	4105720N, 356060E	Merchants Mining Co.	Collapsed, 10 ft dia at top; 6 ft dia below; 10 ft deep to water, high hazard.	Plugging
Do	7	4105710N, 356080E	do	Collapsed; 6 ft dia, 10 ft to water, high hazard.	do
Do	32	4104670N, 355590E	Connor Investment Co.	Collapsed; 20 ft dia at top, 6 ft dia below, 30 ft deep, dry, high hazard.	do
Do	33	4104630N, 355550E	do	Collapsed, 30 ft dia at top; 6 ft dia below, 40 ft deep to water, high hazard.	do
Do	34	4104605N, 355590E	do	Collapsed, 25 ft dia at top; 6 ft dia below, 40 ft deep to water, high hazard.	do
Do	35	4104600N, 355605E	do	Collapsed; 20 ft dia at top, narrows to 6 ft dia, 40 ft deep to water, high hazard.	do
Do	36	4104575N, 355615E	do	Collapsed, 6 ft dia; 15 ft deep; dry, low hazard.	Filling
Do	37	4104570N, 355580E	do	Collapsed; 25 ft dia, narrows to 6 ft dia; dry; low hazard.	do

Table A-1 - OPEN MINE SHAFTS, ADITS, AND PITS - Continued

Location	Site Number	UTM Coordinates Zone 15	Name	Size and Present Condition	Suggested Remedial Action
T.34S., R.25E., Sec. 13 Joplin West Quad Cherokee Co., Ks.	38	4104520N, 355555E	Connor Investment Co.	Partially collapsed; 6 ft dia, 50 ft deep to water; in high grass; very hazardous.	Plugging
Do	41	4104495N, 355655E	do	Collapsed; 20 ft dia; 15 ft deep; dry; moderate hazard.	Filling
Do	42	4104495N, 355760E	do	Collapsed, 20 ft dia; 30 ft to water, 20 ft to cribbing, high hazard.	Plugging
Do	43	4104445N, 355655E	do	Collapsed; 30 ft dia at top, narrows to 6 ft dia, 25 ft to water; moderate hazard.	do
Do	44	4104415N, 355670E	do	Collapsed; 20 ft dia at top; narrows to 6 ft dia; 15 ft deep to water; moderate hazard.	do
Do	45	4104405N, 355655E	do	Collapsed, 20 ft dia at top; narrows to 5 ft dia; 15 ft deep to water, moderate hazard.	do
Do	46	4104350N, 355615E	do	Collapsed; 20 ft dia at top, narrows to 4 ft dia, 15 ft deep to water; cribbed to 4 inches above water; moderate hazard.	do

Table A-1 - OPEN MINE SHAFTS, ADITS, AND PITS - Continued

Location	Site Number	UTM Coordinates Zone 15	Name	Size and Present Condition	Suggested Remedial Action
T.34S., R.25E., Sec. 13 Joplin West Quad Cherokee Co., Ks.	47	4104345N, 355690E	Connor Investment Co.	Collapsed; 20 ft dia; 10-15 ft deep, dry, low hazard.	Filling
T.34S., R.25E., Sec. 25 Joplin West Quad Cherokee Co., Ks.	1	4101015N, 355945E	Unknown	Collapsed; prospect shaft; 20 ft dia, 20 ft deep; dry; moderate hazard.	do

Table A-1 - OPEN MINE SHAFTS, ADITS, AND PITS - Continued

Location	Site Number	UTM Coordinates Zone 15	Name	Size and Present Condition	Suggested Remedial Action
T. 32S., R. 25E., Sec. 24 Carl Junction Quad Cherokee Co., Ks.	4	4123060N, 355875E	Grassell No. 1 Mine	Collapsed; 40 ft dia, 20 ft deep, partly filled with large concrete blocks, moderate hazard.	Filling
Do	5	4122655N, 356400E	Butte-Kansas Mine	Collapsed, 40 ft dia; 15 ft deep; dry, low hazard	do
Do	6	4122635N, 356375E	do	Collapsed; 30 ft dia; 10 ft deep; dry, low hazard	do
Do	7	4122175N, 356280E	do	Collapsed; 50 ft dia; 25 ft deep; partly filled with trash, moderate hazard	do
T.32S., R.25E., Sec. 25 Carl Junction Quad Cherokee Co., Ks.	1	4122045N, 356365E	Acme No. 1 Mine	Collapsed; concrete slab falling in one side, 20 ft dia at top; 5 ft x 5 ft at top of shaft, 30 ft deep, dry; high hazard	do
Do	2	4121635N, 356355E	Barnesdall No 3 Mine	Collapsed, 25 ft dia at top, some cribbing left, large cottonwood over hole; depth-100 ft to water; high hazard.	Plugging or fencing
Do	3	4121375N, 356355E	do	Collapsed, 60 ft dia; mostly filled with water, appears deep; high hazard.	Fencing

Table A-1 - OPEN MINE SHAFTS, ADITS, AND PITS - Continued

Location	Site Number	UTM Coordinates Zone 15	Name	Size and Present Condition	Suggested Remedial Action
T.32S., R.25E., Sec. 25 Carl Junction Quad Cherokee Co., Ks.	4	4121250N, 356385E	Unknown	Partly collapsed, 9 ft x 12 ft slab in place; depth-100 ft to water, no protection, high hazard.	Capping or plugging
Do	5	4121640N, 356260E	Barnesdall No. 3 Mine	Uncollapsed; 4 ft x 4 ft, 30 ft to water, hole partially covered by oak tree trunk.	Plugging
Do	6	4120910N, 355910E	Unknown	Collapsed, 15 ft dia, 50 ft to water, in trees, fenced, high hazard.	do
T.33S., R.25E., Sec. 13 Carl Junction Quad Cherokee Co., Ks.	2	4114230N, 355840E	Cincinnati Mine	Collapsed, 25 ft dia, 10-15 ft deep; dry, low hazard.	Filling
Do	3	4114150N, 355830E	do	Collapsed, 25 ft dia, 10-15 ft deep, partially filled with trash, low hazard.	do
Do	4	4114070N, 355790E	do	Collapsed, 25 ft dia, 10-15 ft deep, dry; low hazard.	do
T.33S., R.25E., Sec. 25 Carl Junction Quad Cherokee Co., Ks.	1	4112115N, 356195E	Chicago Mine	Collapsed, 30 ft dia, 15 ft deep, trees and concrete filling hole, low hazard.	do
Do	2	4112100N, 356145E	do	Collapsed, 20 ft dia, 10 ft deep, in trees, low hazard.	do

Table A-1 - OPEN MINE SHAFTS - Continued

Name	Site #	Location	Present Condition	Suggested Remedial Action
Woltheart Mine	27-32-3-5	NE-NW-SW-SE-NW Sec. 3-27N -32W. Joplin East Quad Jasper Co , Mo.	Shaft is open, shallow pool overlies opening, barbed wire fencing encloses area.	Site is on private land and access is controlled
St. Regis Mine	27-32-3-6	SW-NW-SE-NE-SW Sec. 3-27N.-32W. Joplin East Quad Jasper Co., Mo	Shaft is open, 30' deep to water level, wood-cribbing is collapsing into shaft; hole measures 4' x 6', barb-wire fencing surrounds shaft, limited access to area as trucking firm uses the grounds.	Shaft appears to be closing itself as the cribbing is about to collapse. Ample chat in the area for back-filling purposes.
Gabrie Mine	27-32-4-1	W2-NW-NW-NE-NE Sec. 4-27N.-32W. Joplin East Quad Jasper Co., Mo.	Water-filled prospect pit lies only 30' south of paved section-line road; pit is steep-sided, used for dumping junk, and is filled with 15' of water. Diameter at top of pit is 20'.	Wire-fencing around this pit would be a temporary solution. Filling would be quite easy. Good access for a bulldozer and ample fill material adjacent to pit.
Henckel Mine (south shaft)	27-32-24-1	SW-NE-NE-SW-SW Sec. 24-27N.-32W. Joplin East Quad Newton Co., Mo.	Shaft, back-filled to within 20 ft. of the surface, collapsed around surface to 15 ft in diameter, west end of this pit is an overhang due to a concrete slab that extends out over the pit; pit is somewhat camouflaged due to thick brush around the edge of the pit and trees growing out of the bottom of the pit.	There appears to be enough fill material in the immediate area to fill this pit. Other concrete remains from mining operations 200 ft. northeast of this pit could also be used

Table A-2 - SUBSIDENCE EVENTS

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
27-32-4-2	C-W2-E2-E2-NE-SE Sec. 4-27N.-32W Joplin East Quad Jasper Co., Mo.	pre-1938	This site overlies M. & B. Mine, water-filled open pit measures 200' x 100' with estimated water depth about 40', located near well-travelled road, easily accessible to public. Large amount of chats in this area as well as boulder-rock piles, all could be used for fill. Pit could be graded and/or drained. [illegible]
27-32-10-1	C-N2-N2-NW-NW Sec. 10-27N.-32W Joplin East Quad Jasper Co., Mo.	pre-1938	This site overlies Baltic Mine; water-filled pit, 150' in diameter, adjacent to old U.S.-66 Back-fill material lies adjacent to this pit and would provide the best solution for this hazard.
27-33-11-1	SE-SW-NW-NE-SE Sec 11-27N.-33W. Joplin East Quad Jasper Co., Mo.	early 1970's	This site overlies Yellowstone Mine, shaft was originally 130' deep. A Joplin city engineer reported a subsidence in the area above this mine, no evidence was found at time of field check. City street location. 15th St & Kansas Ave., NE corner of intersection, side yard at north side of private residence.
27-33-12-1	C-E2-NW-SW Sec. 12-27N.-33W. Joplin East Quad Jasper Co., Mo.	early 1970's	This site overlies New Emmet Mine, shaft was originally 170' deep. At Murphy Blvd. & 15th St., 1st Community Church had foundation problems during construction. They had planned to build a multi-story structure, but it was determined that the ground was sinking after the 1st story was built. The basement also suffered severe cracking and settling.
28-32-28-9	SW-NW-SW Sec. 28-28N.-32W. Joplin East Quad Jasper Co., Mo.	pre-1938	This site overlies C. & D. Mine, open pit with deep water, pit is irregular shaped, approximately 200' long in SW-NE direction, 75' across, and 30' deep to water level. Ample chat piles surround pit and could be pushed in for fill material. Trenching a ravine through a slope of the pit and out into an undeveloped field may solve the problem of deep water.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-12 29-4	C-W2-NE-SW-SE-NW Sec 29-28N.-32W. Joplin East Quad Jasper Co., Mo.	pre-1938	This site overlies Tom C. #4 Mine, large open pit, generally circular, about 150' diameter, 30' deep to water level, slopes are not steep. Some concrete foundations are located due west of the above hazard and are not too stable in the ground. The concrete foundations should be knocked down and/or removed as they are in a state of collapse. The water-filled open pit could be drained into the dry open pit via ditches and ravines. The numerous chat piles and boulders could be levelled/graded into and around the pit

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
27-33-2-1	S2-SW-NW-SE-SW Sec. 2-27N.-33W Joplin West Quad Jasper Co., Mo.	early 1982	This site overlies Swindle Hill Mine, the Joplin city engineer reported a 30' deep subsidence occurred in the southbound lane of Murphy Blvd. between 5th & 6th Sts. The hole was filled and patched.
27-33-2-2	S2-S2-SE-SW Sec. 2-27N.-33W. Joplin West Quad Jasper Co., Mo.	1970-present	This site overlies Zola Mine, 7th St. bridge over Joplin Creek and railroads is slowly sinking on the north side. This is probably in part due to mined areas below. The site is being monitored for amount of movement by Mo Hwy. Dept.
27-33-4-2	W2-NW-SE-NE Sec. 4-27N.-33W. Joplin West Quad Jasper Co., Mo.	pre-1938	This site overlies Bullfrog Mine, open pit, 160' diameter, 25' to water level, bedrock exposed along steep sides of subsidence. Tailings pond, chat piles and boulders in the area.
27-33-4-5	C-N2-N2-W2-NW-NW Sec 4-27N.-33W. Joplin West Quad Jasper Co., Mo.	pre-1938	This site overlies Baltimore Mine, subsidence is 120' diameter, 60+' deep, 20' deep to water level, steep sides. Bedrock near water level on west side. Chat piles and foundations remain.
27-33-5-1	SW-SE-SW-SW Sec 5-27N.-33W. Joplin West Quad Jasper Co., Mo.	1940-present	This site overlies West 7th Street Mine, Mo. Hwy. Dept. reported major highway failures at this site due to the caving mine workings below. Large scale repairs were carried out in the years 1981, 1963 and throughout the 1940's.
27-33-9-1	NW-NW-NW-SE-SE Sec. 9-27N.-33W. Joplin West Quad Jasper Co., Mo.	1980	This site does not directly overlie any known mine working, however, numerous shafts and mines are nearby. A 40' diameter hole opened in an unpaved parking lot at the KODE (radio) baseball park. The hole was filled with trash, dirt, and gravel.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
27-33 14-1	SW-SW-NW-SW-SW Sec. 14-27N.-33W. Joplin West Quad Jasper Co., Mo.	late 1970's	This site lies in an area of numerous prospects and shafts, but does not directly overlie any known mine, the Joplin city engineer reported a curb section of 30th St. (south side), between Pennsylvania & Virginia Sts., had to be filled and patched due to a small subsidence.
27-33-15-1	E2-SE-NW-SW Sec. 15-27N.-33W. Joplin West Quad Jasper Co., Mo.	1981	This site overlies Arne Baxter Mine; a subsidence occurred during October 1981 at the Ozark Health Center in Joplin A hole, 15' in diameter and 30' in depth, opened in the asphalt-paved parking area. A sewer line was exposed near the base of the hole. The area is underlain by mine drifts at depths of 55' and 75'. Additional sinking at this spot was observed during March and June 1982. Drilling program now underway to detail the underground cavities.
27-33-15-2	E2-W2-W2-SW Sec. 15-27N.-33W. Joplin West Quad Jasper Co., Mo.	1960-present	This site overlies Eagle South Mine, many small subsidences in this hospital area complex. Drilling program now underway to detail hazardous underground cavities that may prove dangerous to future construction.
27-33-15-3	W2-E2-NW-SW Sec. 15-27N.-33W. Joplin West Quad Jasper Co., Mo.	1982	This site overlies Eagle North Mine; many small subsidences in this hospital area complex. A major subsidence occurred in the hospital parking lot during early June 1982. The resultant hole was 60' deep, water-filled to within 20' of the surface. Surface outline was oval-shaped, 10' x 20'. Drilling program is now underway to detail underground cavities that may prove dangerous to future construction.
27-33-16-1	SW-SE-SE-SE-SE Sec. 16-27N.-33W Joplin West Quad Jasper Co., Mo.	late 1970's	This site overlies pre-1900 mine workings of the Empire Zinc Co. A 20' diameter hole, located on the west side of the intersection of Maiden Ln. and 32nd St., was patched by the city.

Table A-2 - **SUBSIDENCE EVENTS** - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
27-3[illegible]-19-1	C-E2-W2-SE-SE-NE Sec. [illegible]9-27N.-33W. Joplin West Quad Newton Co., Mo.	pre-1938	This site overlies Black Jack West Mine, large subsidence pit is 60' in diameter, 25' deep, quite dry, sides are steep and collapsing, junk, tires and trash are being dumped in the pit. A large amount of material would have to be dumped into the pit to back-fill it. Area is unstable and probably would continue to subside. Controlled access and danger signs would be a preliminary measure.
27-3[illegible]-20-1	C-W2-W2-NE-NE-SE Sec 20-27N.-33W. Joplin West Quad Newton Co., Mo.	post-1938 pre-1961	This site overlies Hutchinson Mine; elongate pit measures 40' x 100' and 30' deep to water level, very steep and collapsing sides. Two well-travelled roads are adjacent to this pit - high priority hazard! Suggest hauling in numerous loads of fill material to close the pit.
27-3 - 20-[illegible]	C-W2-W2-SW-SW-NW Sec. 20-27N.-33W. Joplin West Quad Newton Co., Mo.	pre-1938	This site overlies Black Jack East Mine; large subsidence pit is roughly 80' in diameter and 30' in depth, some deep water pools at the bottom of the south and east ends of pit, lots of tires and rubbish accumulating quickly in the pit. Entire area is unstable; thus, back-filling would probably be futile. Access is limited due to private property so fencing and danger signs would be effective safeguards temporarily.
27-3 - 2-2	W2-SE-NW-SW-NE Sec. 2-27N.-34W. Joplin West Quad Jasper Co., Mo.	pre-1938	This site overlies Kramer Mine, south pit is 30' deep to a dry bottom, steep-sided, caving and fenced with barbed wire This pit will probably join the north pit by gradually collapsing the road that lies between them. Area is controlled by Farmer's Chemical Co. and hopefully they can limit access into this area.
27-3 - 2-3	E2-SW-NW-SW-NE Sec. 2-27N.-34W. Joplin West Quad Jasper Co., Mo.	pre-1938	This site overlies Kramer Mine, north pit is water-filled to within 50' of surface, steep-sided, caving and fenced with barbed wire. This pit will probably join the south pit by gradually collapsing the road that lies between them Area is controlled by Farmer's Chemical Co. and hopefully they can limit access into this area.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
27-34-24-8	C-E2-SW-NE-SW Sec. 24-27N.-34W. Joplin West Quad Newton Co., Mo.	pre-1938	This site overlies Gimlet Mine, northwest subsidence pit is 30' in diameter, steep-sided and water-filled Access is controlled to this area due to private property, however, ample chats are available for back-fill material. Posting danger signs would also be a good safeguard.
27-34-24-11	C-S2-S2-NE-SE Sec 24-27N.-34W Joplin West Quad Newton Co , Mo.	pre-1938	This site overlies Gimlet Mine; southeast subsidence pit is elongate - 40' x 15' - with steep sides and deep water Access is controlled to this area due to private property, however, ample chats are available for back-fill material Posting danger signs would also be a good safeguard
28-33-33-7	C-NW-SW-SE-NW Sec 33-28N.-33W. Joplin West Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies McBride Mine; subsidence pit is 100' in diameter, water-filled. Boulders, chat piles and concrete foundations remain in area.
28-33-33-10	SE-SE-NE-SW-NW Sec. 33-28N.-33W. Joplin West Quad Jasper Co , Mo.	mid 1970's	This site does not directly overlie any known mine working, but large mines and numerous shafts are nearby. A 4' diameter hole in the center of Schifferdecker Rd. was patched by the city.
28-34-25-1	S2-NE-SE-SE-SW Sec. 25-28N.-34W. Joplin West Quad Jasper Co., Mo.	pre-1938	This site overlies Midnight Mine; large oval-shaped sinkhole with steep sides measures 200' x 100' x 80' deep. Actual mine is at bottom of sinkhole on the NW end, mine is water-filled. Posting of danger signs would alert hikers and other unsuspecting people, rim of sinkhole could also be fenced although only the west end is hidden by the chat piles.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-33-7-7	C-W2-W2-E2 Sec 7-28N.-33W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Bryant Mine; subsidence pit is 60' x 80', has steep sides, and is 15' deep to the water level.
28-33 7-9	W2-NW-NW-NW-SE Sec 7-28N.-33W Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Great Northern Mine; subsidence pit is 100' in diameter, has steep sides, and is 10' deep to the water level. Chat and boulder piles remain in the area
28-33-7-10	NW-SW-NW-NW-SE Sec 7-28N.-33W. Carl Junction Quad Jasper Co , Mo.	pre-1938	This site overlies United Zinc Mine, north pit; subsided area is 40' in diameter and 10' deep to the water level Chat piles and concrete foundations remain in the area
28-33-7-12	SW-SW-NW-NW-SE Sec. 7-28N.-33W. Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies United Zinc Mine, south pit, subsided area is 40' in diameter and 10' deep to the water level Chat piles and concrete foundations remain in the area
28-33-7-17	W2-NW-NE-SE-SW Sec 7-28N.-33W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Lehigh Mine, east pit; subsided area is 30' in diameter and 5' deep to the water level.
28-33-7-20	C-W2-SW Sec 7-28N.-33W. Carl Junction Quad Jasper Co., Mo.		This site is not a subsidence, it is the Lehigh Mine - an open pit, water-filled, covering 10 acres, its sides are steep in most places This area is frequented by local youths as a swimming/fishing hole Site is easily accessible.
28-33-16-1	C-S2-SW-SE-SE Sec. 16-28N -33W. Carl Junction Quad Jasper Co., Mo.		This site is not a subsidence, it is an unstable chat pile which overlies the Pocahontas Mine Area is easily accessible via playgrounds and subdivision only 200' away Some shallow pools of water also in the area.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-3 - 17-1	C-W2-17-SW-NE-NW Sec 17-28N.-33W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Waneta Pearl Mine, subsidence pit is 25' in diameter and water-filled Concrete foundations, chat and boulder piles remain in the area
28-3 - 17-[illegible]	SW-SE-NW-SE-NW Sec 17-28N.-33W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Texas Bull Mine, subsidence pit is 75' in diameter with bedrock exposed, approximately 15' deep. Owner reports that it is usually dry Chat and boulder piles remain
28-3 - 19-1	NE-NE Sec. 19-28N.-33W. Carl Junction Quad Jasper Co., Mo.		This site is not a subsidence, it is the Kelsey Norman Mine - an open pit, water-filled, covering 11 acres, its sides are steep and cut into ravines, some thin coal seams were mined here as well as zinc and lead. Area seems to be a popular swimming/fishing hole in addition to being a junk and trash dumping site. Area is easily accessible
28-3[illegible] - 11-1	NW-NE-NW-NE-NE Sec 11-28N.-34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Black Cat Mine, subsidence pit is 100' x 150', water level is at 15'. Pit is presently being used as a trash dump; approximately 30 cubic yards of trash are visible. Chats are removed and field is agriculturally productive.
28-3[illegible] - 11-	NW-NW-NE-NW-NE Sec 11-28N.-34W. Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Martin #2 Mine, subsidence pit is 200' in diameter with water level at 15'. Land is agriculturally productive
28-3[illegible] - 12-	SW-NE-NW-SW-NW Sec 12-28N.-34W. Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Isherwood Mine, northeast pit, subsidence is 200' x 100' and water-filled, area is agriculturally productive

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-34-12-3	C-S2-NW-SW-NW Sec. 12-28N.-34W Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Isherwood Mine, southwest pit, subsided area measures 200' x 150' and is water-filled, agriculturally productive area
28-34-12-4	SE-NW-NW-SW-NW Sec. 12-28N.-34W Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Isherwood Mine, northwest pit, subsidence is 125' x 50' and water-filled; land in this area is agriculturally productive.
29-33-18-3	NW-NW-NE-SE-SE Sec. 18-29N.-33W Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Indiana Mine, subsidence pit is 50' in diameter, 15' deep to water level.
29-34-14-2	SW-SW-SW-SW-SE Sec. 14-29N.-34W. Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Allegheny-Western Mine, north pit, subsided area is 60' in diameter, water-filled Boulders remain.
29-34-14-4	E2-SE-NE-SE-SW Sec. 14-29N.-34W. Carl Junction Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies Blue Rock Mine, east pit; subsided area is 200' x 100', water-filled. Boulders remain
29-34-14-6	SW-NE-SE-SW Sec. 14-29N.-34W Carl Junction Quad Jasper Co., Mo	post-1938 pre-1961	This site overlies Blue Rock Mine, west pit, subsided area is 100' in diameter, water-filled. Boulders remain.
29-34-14-7	C-N2-SE-SW-SE-NW Sec. 14-29N.-34W Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Gascho Mine; subsidence pit is 200' x 100', water 15' below surface. Water flowing into coalescing open shaft to north

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
29-34 14-11	C-W2-W2-SW-SW Sec 14-29N.-34W. Carl Junction Quad Jasper Co., Mo	post-1938 pre-1961	This site overlies Freehold #2 Mine; subsidence pit is 120', 10' to water level.
29-34 15-2	NE-SE-SE-NE-SE Sec 15-29N.-34W. Carl Junction Quad Jasper Co., Mo	post-1938 pre-1961	This site overlies High Five Mine, east pit; subsided area is 50' in diameter, water-filled
29-34 15-4	SE-SE-SE-SE-SE Sec. 15-29N.-34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies High Five Mine, southeast pit, subsided area is 60' in diameter, water-filled Tailings ponds and boulder piles are present in the area.
29-34 15-5	NE-SE-SW-NE-SE Sec 15-29N.-34W Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies High Five Mine, southwest pit; subsided area is 50' in diameter, water-filled.
29-34 15-7	NE-NE-SW-NE-SE Sec 15-29N.-34W Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies High Five Mine, central pit; subsided area is 100' in diameter, water-filled, coalesced with shaft and concrete foundations
29-34 15-8	C-W2-W2-NW-NE-SE Sec 15-29N.-34W Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies High Five Mine, northwest pit; subsided area is 100' x 300', water 25' below surface, coalesced with 2 shafts and concrete foundations
29-34 22-3	W2-SE-NW-NE-NE Sec 22-29N.-34W. Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Barnsdall #2 Mine, northwest pit, subsided area is 100' x 300', water 20' below surface, filled with junk and debris.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
29-3 - 22-'	C-N2-NE-SW-NE-N Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Barnsdall #2 Mine, north-central pit, subsided area is 100' in diameter, water 15' below surface, filled with junk and debris
29-3 - 22-'	N -SE-SW-NE-NE Sec 22-29N.-34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Barnsdall #2 Mine, south-central pit, subsided area is 80' in diameter, water 20' below surface, filled with junk and debris.
29-3 - 22-'	C-S2-SE-NE-NE Sec 22-29N -34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Goodyear Mine, north pit, subsided area is 70' in diameter, dry, 20' deep adjacent to NE open shaft
29-3 - 22-'	C-N2-NE-SE-NE Sec 22-29N -34W. Carl Junction Quad Jasper Co., Mo	pre-1938	This site overlies Goodyear Mine, east pit; subsided area is 150' x 200', 15' deep to water level.
29-3 - 22-'	SE-SE-NE-SE-NE Sec 22-29N -34W. Carl Junction Quad Jasper Co , Mo.	pre-1938	This site overlies Goodyear Mine, southeast pit, subsided area is 50' in diameter, 15' deep to water level.
29-3 - 22-'	N -NW-SE-SE-NE Sec 22-29N -34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Goodyear Mine, southwest pit, subsided area is 100' x 150', 20' deep to water level.
29-3 - 22-'	C-SE-NW-SE-NE Sec. 22-29N.-34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Barnsdall #2 Mine, southwest pit, subsided area is 120' in diameter, water 20' below surface, filled with junk and debris.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
29-34-23-2	NW-NW-NE-NW-NE Sec 23-29N.-34W. Carl Junction Quad Jasper Co., Mo.	post-1961 pre-1980	This site overlies Pyramid Mine, subsidence pit is 50' in diameter, water-filled. Boulders, chat flats and concrete foundations remain.
29-34-23-4	C-NE-NW-NW-NE Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Allegheny-Western Mine, south pit, subsided area is 150' in diameter, water-filled Boulders, chat flats and concrete foundations remain
29-34-23-7	SW-NE-NE-NE-NW Sec 23-29N.-34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Freehold #3 Mine, east pit, subsided area is 120' in diameter, water-filled Concrete foundations, chat flats and boulders remain
29-34-23-9	C-NW-NE-NE-NW Sec. 23-29N.-34W. Carl Junction Quad Jasper Co., Mo	post-1938 pre-1961	This site overlies Freehold #3 Mine, west pit, subsided area is 50' in diameter, water-filled Concrete foundations, chat flats and boulders remain
29-34-23-14	NE-NE-SE-SW-NW Sec 23-29N.-34W. Carl Junction Quad Jasper Co., Mo.	pre-1938	This site overlies Tulsa-Pittsburg #1 Mine, subsidence pit is 60' in diameter, 15' deep to water level Boulders and chat flats remain.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-6-5	C-W2-E2-W2-SE-SW Sec. 6-28N.-32W. Webb City Quad Jasper Co , Mo	pre-1938	This site overlies Yellow Dog Mine, subsidence pit is 40' in diameter, 30' deep, with steep, caving sides
28-32-6-16	W2-NW-SW Sec. 6-28N -32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Parker Mine, subsided area measures 400' X 700' and is water-filled, with several open shafts having coalesced near its perimeter
28-32-6-24	S2-SW-SE-SW-NW Sec. 6-28N -32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Richvale Mine; subsidence pit is water-filled, 180' in diameter, with steep, unstable slopes
28-32-7-6	W2-NE-NW-SE-SW Sec. 7-28N.-32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Mercantile #4 Mine, subsided area is 80' in diameter, 25' deep to water pool, adjacent to STL-IRISCO railroad, pirates wet-weather stream entering area from the south.
28-32-17-3	C-N2-SW-NE-SE Sec. 17-28N -32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Luscombe Mine; subsided area is 100' X 300', 40' deep to a muddy bottom, adjacent to gravel roads and trash dumps.
28-32-17-6	NW-NE-NW-SE-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies Fullerton Mine, east pit, subsidence is 150' in diameter and water-filled
28-32-17-7	C-NW-NW-SE-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies Fullerton Mine, west pit, subsided area measures 200' in diameter and is water-filled

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-17-8	C-SW-SE-NW-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Great Wonder Mine, subsided area is 100' in diameter and water-filled
28-32-17-9	NE-SE-NW-NW-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Charter Oak Mine, subsidence is 60' in diameter, trash and debris partially filling pit, located within 50' of private residences in the city of Carterville
28-32-17-15	W2-SW-SW-NW-SE Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Lalor Mining Company Mine, subsidence pit is 60' in diameter, water-filled, and located in a densely vegetated area.
28-32-17-16	E2-SW-SE-SE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	post-1980	This site does not directly overlie any known mine working, but large mines and numerous shafts are nearby, subsided area is 15' in diameter, water-filled, and located in an open field adjacent to paved highway.
28-32-17-17	SE-NW-NE-SE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies Brick Mill Mine; subsidence pit is 200' in diameter, 50' deep to water level, with steep, unstable sides.
28-32-17-18	E2-NW-SE-NE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Woods & Brown Mine, south pit, subsidence measures 100' X 400', water-filled, with unstable slopes, trash dumps located near north end of pit
28-32-17-20	C-S2-N2-NE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Woods & Brown Mine, north pit, subsided area is 100' X 200' and water-filled, trash dumps are located nearby.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-17-22	SE-SW-NW-NE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	post-1961 pre-1980	This site overlies South Carterville Mining & Smelting Company Mine, subsidence pit is 80' X 200' and water-filled
28-32-17-23	SW-SW-NE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Pawnee Mine, subsided area is 80' X 150', 15' deep to water pool, with unstable sides
28-32-17-25	E2-SW-NW-SE-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies J. M. Slaight Mine; subsidence pit is 100' X 200', 15' deep to water pool, with unstable slopes
28-32-17-27	C-S2-NE-SW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Duluth Mine, subsided area is 50' in diameter, 20' deep to water level
28-32-17-30	C-NE-NE-SW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Center Creek Mining Company Mine, east workings, south pit, subsidence pit is 100' X 150' and 20' deep to water level.
28-32-17-31	N2-NW-NE-SW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Center Creek Mining Company Mine, east workings, west pit, subsided area measures 100' X 150', 20' deep to water pool, with unstable sides
28-32-17-34	W2-SE-SE-NW-SW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Center Creek Mining Company Mine, east workings, north pit, subsidence is 80' X 100', 20' deep to water level, with caving sides.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-17-35	E2-NE-NW-SW-SW Sec. 17-28N -32W. Webb City Quad Jasper Co , Mo	pre-1938	This site overlies Ben Franklin Mine, east pit, subsidence is 200' X 300', 30' deep to water pool, located adjacent to MO-PAC railroad
28-32-17-37	C-N2-NW-SW-SW Sec. 17-28N -32W Webb City Quad Jasper Co , Mo	pre-1938	This site overlies Ben Franklin Mine, west pit, subsided area measures 100' X 200', 30' deep to water level
28-32-17-56	E2-SE-SW-SW-NW Sec. 17-28N.-32W Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Comet Mine, southeast pit, subsidence is 150' X 200', 20' deep to water level, located adjacent to MO-PAC railroad
28-32-17-57	SE-SW-SW-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Comet Mine, southwest pit, subsided area is 50' X 100', 25' deep to water pool, with unstable sides
28-32-17-60	C-S2-N2-SW-SW-NW Sec. 17-28N.-32W Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Comet Mine, west pit, subsidence pit is 50' X 100', 20' deep to water level, with caving slopes
28-32-17-61	W2-SE-NW-SW-NW Sec. 17-28N -32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Comet Mine, northwest pit, subsided area measures 50' in diameter, 20' deep to water level, located adjacent to MO-PAC railroad.
28-32-17-63	NE-NW-SW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Center Creek Mining Company Mine, north workings, northeast pit, subsidence is 150' in diameter, 20' deep to water level, connected to other subsidences in adjacent section.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-17-64	W2-NW-SW-SE-NW Sec 17-28N -32W Webb City Quad Jasper Co , Mo.	pre-1938	This site overlies Twin Cities Mine, subsided area is 250' in diameter, 30' deep to water level, with very unstable sides, located near residences in the city of Carterville
28-32-17-66	S2-NW-SE-NW Sec 17-28N -32W Webb City Quad Jasper Co , Mo	pre-1938	This site overlies Orange Mine, subsidence pit measures 400' X 500', 30' deep to water level, with steep, caving sides, located near residences in the city of Carterville
28-32-17-71	C-E2-E2-W2-NW Sec 17-28N -32W Webb City Quad Jasper Co , Mo	pre-1938	This site overlies Red Eagle Mine, subsidence is 80' in diameter, water-filled, pirates stream entering area from the south, pit is located adjacent to MO-PAC railroad
28-32-17-73	NE-NW-SW-NW Sec 17-28N.-32W Webb City Quad Jasper Co , Mo	pre-1938	This site overlies Incline Mine, subsided area measures 300' in diameter, 30' deep to water pool, with unstable sides, located adjacent to MO-PAC railroad.
28-32-17-74	SW-SE-NW-NW Sec. 17-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Daylight Mine, east pit, subsidence is 300' X 400', 25' deep to water level, with very unstable sides, located adjacent to MO-PAC railroad and used by local residents for swimming and fishing.
28-32-17-76	N2-SE-SW-NW-NW Sec 17-28N.-32W. Webb City Quad Jasper Co , Mo	pre-1938	This site overlies Daylight Mine, west pit; subsided area is 50' X 70', 20' deep to water pool
28-32-18-3	SE-NE-SE-SE-NE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Center Creek Mining Company Mine, north workings, north pit, subsidence is 200' in diameter, water-filled, with steep, caving slopes visible below water, connected to several adjacent pits during high-water periods

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-18-4	NW-SE-SE-SE-NE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Center Creek Mining Company Mine, north workings, northwest pit, subsidence is 200' in diameter, 20' deep to water pool, with unstable slopes, connected to other pits during times of high water levels
28-32-18-5	C-N2-E2-E2 Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Center Creek Mining Company Mine, north workings, southwest pit, subsided area is 120' in diameter, 20' deep to water level
28-32-18-6	S2-NE-NE-NE-SE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Center Creek Mining Company Mine, north workings, south pit, subsidence is 150' in diameter, 20' deep to water pool, with steep, caving sides
28-32-18-7	E2-NE-SE-NE-SE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Center Creek Mining Company Mine, south workings, subsided area is 100' X 200', 20' deep to water level, trash dump located at north end of pit
28-32-18-8	E2-NE-NE-SE-SE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies National #2 Mine, subsidence is 100' in diameter, 30' deep to a dry bottom, adjacent to a spur of the MO-PAC railroad.
28-32-18-10	S2-SW-SE-SW-SE Sec. 18-28N.-32W. Webb City Quad Jasper Co., Mo.	1981	This site does not directly overlie any known mine working, but large mines and numerous shafts are nearby, a 2'-diameter hole, 6' in depth, opened in the paved parking lot of Mr. Swiss restaurant, hole was filled and patched with asphalt
28-32-19-1	S2-NW-NE Sec. 19-28N.-32W. Webb City Quad Jasper Co., Mo.		This site is not a subsidence, it is the Sucker Flats Mine - a large open pit, water-filled to within 50' of the surface, measuring 400' X 800' and covering 5 acres, with very steep slopes, located just south of the city of Webb City

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-20-3	C-S2 Sec. 20-28N.-32W Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Manhattan Mine, south pit, subsided area measures 100' X 150', 50' deep to muddy bottom, small adit near base of pit in north wall, sides are steep and unstable
28-32-20-4	C-S2-N2-S2 Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Manhattan Mine, north pit, subsidence is 100' X 200', 40' deep to a dry bottom, with unstable slopes.
28-32-20-7	C-E2-E2-SW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Victor Mine, east pit, subsidence is 300' in diameter, 50' deep to a dry bottom, with steep, unstable, sides.
28-32-20-9	SW-SW-SE-NE-SW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Victor Mine, west pit, subsided area is 200' in diameter, 40' to a dry bottom, with caving sides
28-32-20-12	NE-NE-SW-NE-SW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Star Mine; subsidence pit is 100' in diameter and 25' deep to a dry bottom.
28-32-20-16	C-E2-NW-SW-NW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Dickey Mine, subsidence pit measures 100' X 300' and is water-filled, located adjacent to MO-KAT railroad.
28-32-20-17	N2-SW-SW-NW-NW Sec. 20-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Yale Mine, subsided area is 100' X 300', 30' deep to a dry bottom, abundant trash dumps in the immediate vicinity.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-21-8	NE-SW-SE-NW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Noonday Mine, south pit, subsided area is 80' in diameter, 20' deep to a dry bottom, pit contain trash and debris.
28-32-21-9	SE-NW-SE-NW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Noonday Mine, north pit, subsidence is 80' in diameter with steep sides, 20' deep to a dry bottom, junk and trash in pit
28-32-21-12	SE-NW-NW-SE Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Eleventh Hour Mine, east workings, subsided area measures 200' X 400', 80' deep to a dry bottom, with unstable slopes.
28-32-21-19	C-S2-N2-N2-S2 Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Eleventh Hour Mine, west workings, subsidence pit is 200' in diameter and 60' deep to a dry bottom.
28-32-21-24	NW-SE-SW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Holy Smoke Mine, subsided area includes two pits, covering 4 acres, measuring 400' X 600', 0' deep to water level, with very unstable slopes, abundant trash dumps in and around pits.
28-32-21-34	E2-SE-NW-SW-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Richland Mine; subsidence is 60' in diameter and water-filled
28-32-21-36	NW-SW-NW-SE-NW Sec. 21-28N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Continental Mine, north pit, subsided area measures 50' X 100' and 30' deep to a dry bottom

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
28-32-21-41	W2-SW-SE-SE-NW Sec 21-28N.-32W Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Continental Mine, south pit, subsidence is 150' X 300', water-filled, with steep sides visible below the water.
28-32-21-45	NW-NE Sec 21-28N -32W. Webb City Quad Jasper Co , Mo		This site overlies American Davies Mine; a large roof-fall occurred in this area during mining operations, no surface evidence of this collapse is visible on aerial photos and field investigation disclosed no features relating to ground subsidence
28-32-29-6	SE-NW-NE-NE-NW Sec. 29-28N.-32W Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Lima Mine; subsidence pit is 40' X 200', 25' deep to water pool, metal rubbish dumped into pit, located 200' south of well-travelled section-line road
29-32-8-1	N2-SE-SW-NE Sec. 8-29N.-32W. Webb City Quad Jasper Co , Mo.	pre-1938	This site overlies Express Mine, subsided area measures 200' X 600', 50' deep to water level, with steep sides
29-32-8-2	N2-NE-SW-SW-NE Sec. 8-29N.-32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Lone Star Mine, subsidence is 150' X 300', 60' deep to water pool, Pennsylvanian shales and sandstones exposed in sides of pit.
29-32-8-4	E2-W2-SE-SE-NW Sec. 8-29N.-32W. Webb City Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies Lucky Tiger Mine, subsided area is 80' X 200' and used as a local trash dump, no water in pit.
29-32-8-6	SE-SE-SE-NW-NW Sec 8-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Big Kate Mine, subsidence pit measures 100' in diameter, 20' deep to water level, with steep, unstable slopes

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
29-32-9-2	S2-NE-SW-SE-SW Sec. 9-29N.-32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Edwina Mine, subsidence is 30' X 40', 20' deep to water level, with unstable sides.
29-32-9-3	W2-SE-SW-SE Sec. 9-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Happy Jack Mine, subsided area measures 100' X 200' and is 20' deep to water level
29-32-10-1	C-W2-SW-SW-SW Sec. 10-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Isabella Mine, subsidence is 150' in diameter and 25' deep to water pool.
29-32-15-2	S2-NW-NE-NE-NW Sec. 15-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Good Wednesday Mine, subsidence pit is 150' in diameter, water-filled, with steep, caving sides visible below the water.
29-32-15-3	W2-NW-NW-NE-NW Sec. 15-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Federated Mine, subsided area measures 100' X 150' and is water-filled.
29-32-16-1	NW-SW-NE-NE-NE Sec. 16-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Good Friday Mine, subsidence is 150' X 200' and 30' deep to water level
29-32-16-2	N2-SW-NW-NE-NE Sec. 16-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Jersey P. Mine; subsidence pit is 100' in diameter, 25' deep to water level, abundant trash dumps in immediate vicinity.

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
29-32-16-3	NE-NE-NE-NW-NE Sec. 16-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies Montclair Mine, subsided area 120' in diameter and 15' deep to water level
29-32-16-4	SE-NW-SE-SE Sec. 16-29N.-32W. Webb City Quad Jasper Co., Mo.		This site is not a subsidence, it is the Old West Side Mine an open pit covering 3 acres and measuring 300' in diameter, 40' deep to water level, with unstable sides composed of Pennsylvanian strata
29-32-31-1	SE-SE-NE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo	pre-1938	This site overlies Goodwill Mine, south pit, subsidence is 80' X 120', 30' deep to a dry bottom, much trash and metal rubbish in pit.
29-32-31-2	E2-SE-NE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies Goodwill Mine, north pit, subsided area is 60' in diameter, 30' deep to a dry bottom, much trash and metal rubbish in pit
29-32-31-9	C-W2-E2-E2-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies La Tosca Mine, northeast pit, subsidence is 50' in diameter, 40' deep to water pool, with very steep, unstable sides, Pennsylvanian strata exposed in walls of pit.
29-32-31-11	NE-NW-SE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	post-1938 pre-1961	This site overlies La Tosca Mine, northwest pit, subsidence is 80' in diameter, 50' deep to a fill of boulders and metal rubbish, Pennsylvanian shales and sandstones exposed in the caving sides of pit
29-32-31-14	NW-SE-SE-NW-SW Sec. 31-29N.-32W. Webb City Quad Jasper Co., Mo.	pre-1938	This site overlies La Tosca Mine, south pit, subsided area is 100' X 200', 40' deep to water level, large amount of trash and debris in pit

Table A-2 - SUBSIDENCE EVENTS - Continued

Site #	Location	Date of Subsidence	Damages Involved/Present Condition
29-33-23-2	E2-NW-SE Sec. 23-29N.-33W. Webb City Quad Jasper Co., Mo.		This site is not a subsidence, it is the Shipp-Gunnin Mine - an open pit covering 5 acres and measuring 400' in diameter, 40' deep to water pool, some Pennsylvanian bedrock exposed in sides of pit, access to area is controlled due to private property, reported depth of pit is 150'
29-33 36-1	E2-NE-SE Sec. 36-29N.-33W. Webb City Quad Jasper Co., Mo.		This site is not a subsidence, it is the Oronogo Circle Mine, a famous open pit covering 11 acres and measuring 800' in diameter, 60' deep to water pool, with very steep, unstable sides, pit is used for swimming, fishing, and scuba-diving, access to area is not controlled, reported depth of pit is 300'.

Table A-2 - SUBSIDENCE EVENTS - Continued

Location	Site Number	UTM Coordinates Zone 15	Date of Subsidence	Size and Present Condition	Suggested Remedial Action
T.34S., R.25E., Sec. 12 Joplin West Quad Cherokee Co., Ks.	1	4107065N, 355700E	pre-1938	60 x 120 ft; 20 ft deep, dry, may not be due to collapse, some waste material nearby.	None
Do	2	4106330N, 355660E	do	200 ft dia; 30 ft deep, water at bottom, partly water-filled, partial chat pile to north.	Fencing
T.34S., R.25E., Sec. 13 Joplin West Quad Cherokee Co., Ks.	21	4104745N, 355600E	pre-1950	50 ft dia, 10 ft deep; dry, shallow, low hazard	None
Do	22	4104775N, 355625E	do	100 ft dia, 10 ft deep, dry, shallow, low hazard	do
Do	23	4104765N, 355655E	do	80 ft dia, 10-15 ft deep, dry; shallow; some trash	do
Do	24	4104740N, 355625E	do	50 ft dia; 10 ft deep, dry; shallow, low hazard.	do
Do	25	4104660N, 355720E	do	90 ft dia; 10-15 ft deep, dry; shallow, low hazard	do
Do	26	4104625N, 355775E	do	90 ft dia, 10-15 ft deep, dry, shallow, low hazard.	do
Do	27	4104600N, 355795E	do	50 ft dia; 5-10 ft deep, dry, shallow, low hazard.	do
Do	28	4104570N, 355810E	do	130 x 60 ft, 5-10 ft deep, dry, shallow, low hazard	do

Table A-2 SUBSIDENCE EVENTS - Continued

Location	Site Number	UTM Coordinates Zone 15	Date of Subsidence	Size and Present Condition	Suggested Remedial Action
T.34S., R.25E., Sec. 13 Joplin West Quad Cherokee Co., Ks.	29	4104600N, 355735E	pre-1950	60 ft dia, 5 ft deep, dry, shallow, low hazard	None
Do	30	4104550N, 355670E	do	40 ft dia, 10 ft deep; dry, shallow, low hazard.	do
Do	31	4104520N, 355685E	do	60 x 100 ft; 10-15 ft deep, shallow, low hazard.	do
Do	32	4104370N, 355625E	pre-1938	100 ft dia, water at 15 ft deep, partly water-filled, moderate hazard.	do

Table A-2 - SUBSIDENCE EVENTS - Continued

Location	Site Number	UTM Coordinates Zone 15	Date of Subsidence	Size and Present Condition	Suggested Remedial Action
T.32S., R.25E., Sec. 24 Carl Junction Quad Cherokee Co., Ks.	3	4123250N, 355880E	1938-1950	150 ft dia, 20 ft deep, collapsed shaft on west side, flooded to 15 ft of surface, shaft not visible when flooded, high hazard.	Fencing
Do	4	4123120N, 355890E	pre-1938	200 ft dia, 20 ft deep, dry-mud bottom; low hazard.	do
Do	5	4123050N, 355920E	do	50 ft dia, 15 ft deep, dry, low hazard.	do
Do	6	4122760N, 356160E	do	220 ft dia; 35 ft deep; mud bottom, moderate hazard.	do
Do	7	4122790N, 356280E	do	200 ft dia, 35 ft deep, mostly dry; holds water on photos, moderate hazard.	do
Do	8	4122740N, 356410E	do	200 x 450 ft, 30 ft deep, chat in bottom, low to moderate hazard	do
Do	9	4122660N, 356280E	do	400 x 200 ft, 40 ft deep; dry, moderate hazard	do
Do	10	4122560N, 356390E	do	450 x 200 ft; 20 ft deep; collapsing piers on northeast side near Stateline Road; low hazard.	Fencing, warning signs

Table A-2 - SUBSIDENCE EVENTS - Continued

Location	Site Number	UTM Coordinates Zone 15	Date of Subsidence	Size and Present Condition	Suggested Remedial Action
T.32S., R.25E., Sec. 24 Carl Junction Quad Cherokee Co., Ks.	11	4122400N, 356460E	pre-1938	200 x 400 ft, 30 ft deep, some water in bottom, along Stateline Road.	Fencing, warning signs
T.32S., R.25E., Sec. 25 Carl Junction Quad Cherokee Co., Ks.	1	4122040N, 356270E	1938-1950	200 ft dia; 25 ft deep, dry; chat in bottom, slight hazard.	None
Do	2	4122050N, 356400E	do	100 x 150 ft, 40 ft deep; dry, piers collapsing on northwest side, slight hazard.	do
Do	3	4121990N, 356360E	pre-1938	175 x 250 ft, 40 ft deep, water-mud bottom with car bodies, moderate hazard.	Fencing
Do	4	4121850N, 356350E	do	250 ft dia, 35 ft deep, water bottom, moderate hazard.	do
Do	5	4121660N, 356450E	west end: 1938-1950 east end: pre-1938	400 x 250 ft; 35 ft deep, chat bottom; moderate hazard.	do
Do	6	4121560N, 356370E	1950-1973	160 ft dia; 35 ft deep; chat bottom, slight hazard.	do
Do	7	4121550N, 356220E	do	160 x 220 ft; 15 ft deep; chat-water bottom, slight hazard.	None

Table A-2 - SUBSIDENCE EVENTS - Continued

Location	Site Number	UTM Coordinates Zone 15	Date of Subsidence	Size and Present Condition	Suggested Remedial Action
T.32S., R.25E., Sec. 25 Carl Junction Quad Cherokee Co., Ks.	8	4121450N, 356375E	1938-1950	Small, 22 ft dia, 5 ft deep, dry, low hazard.	None
Do	9	4121430N, 356375E	do	10 ft dia, 5 ft deep, dry, low hazard.	do
Do	10	4121410N, 356380E	do	20 ft dia; 5 ft deep; dry, low hazard.	do
Do	11	4121335N, 356410E	1950-1973	50 ft dia, shallow depth, water-filled to within 3 ft of surface, moderate hazard.	Fencing
Do	12	4121275N, 356440E	pre-1938	250 ft dia, 40 ft deep, dry, used for trash dumping, especially along west side of Stateline Road.	Warning signs along road, fencing
Do	13	4121215N, 356470E	do	90 ft dia; 30 ft deep; dry, trash dump along east side of Stateline Road.	Warning signs, fencing
T.33S., R.25E., Sec. 13 Carl Junction Quad Cherokee Co., Ks.	1	4114190N, 355830E	do	220 x 60 ft; 6 ft to water; near railroad track.	Fencing
Do	2	4114060N, 355760E	do	50 x 90 ft, 10-15 ft deep, just west of shaft; some water in bottom with trees and trash; low hazard.	None

Table A-3 - CHAT PILES AND TAILINGS PONDS

Location	Site Number	UTM Coordinates Zone 15	Name	Size and Present Condition	Suggested Remedial Action
T.34S., R.25E., Sec. 12 Joplin West Quad Cherokee Co., Ks.	1	4106950N, 355800E	Buckeye Mine	Chat pile-180 ft dia, 25 ft high, partially reclaimed	Reclamation
Do	2	4106450N, 355750E	Unknown	Chat pile-250 x 130 ft on hillside, variable height.	do
T.34S., R.25E., Sec. 13 Joplin West Quad Cherokee Co., Ks.	8	4105600N, 356175E	Merchants Mining Co.	Chat pile-150 ft dia; 20-30 ft high; partially reclaimed on northeast side.	Reclamation or use for shaft filling.
Do	27	4104525N, 355750E	Connor Investment Co.	Chat pile-250 ft dia, 20 ft high, partially reclaimed on east side.	do
Do	28	4104300N, 355650E	do	Chat pile-200 x 180 ft, partially reclaimed on south side.	do

Table A-3 - CHAT PILES AND TAILINGS PONDS - Continued

Location	Site Number	UTM Coordinates Zone 15	Name	Size and Present Condition	Suggested Remediation
T 32S., R.25E., Sec. 24 Carl Junction Quad Cherokee Co., Ks.	1	4123000N, 356000E	Grassellı No. 1 Mine	Old tailings pond embankments are breached, area-5 2 acres, drains into surface collapse on west side; susceptible to wind erosion.	Revegetation
Do	2	4122400N, 355900E	High Five Land	Old tailings pond area covers 9 acres, embankments breached; dry; possible air pollution, some run-off into tributary of Cow Creek	do
Do	3	4122400N, 356200E	Butte-Kansas	Low chat pile, 20 ft high, 300 ft dam.	Reclamation - use to fill some nearby hazards
T.32S., R.25E., Sec. 25 Carl Junction Quad Cherokee Co., Ks.	4	4121400N, 356000E	Hurlbut-Acme No. 2	Old tailings pond, dry, area-15 acres; run-off may reach tributary of Cow Creek, possible wind erosion	Revegetation

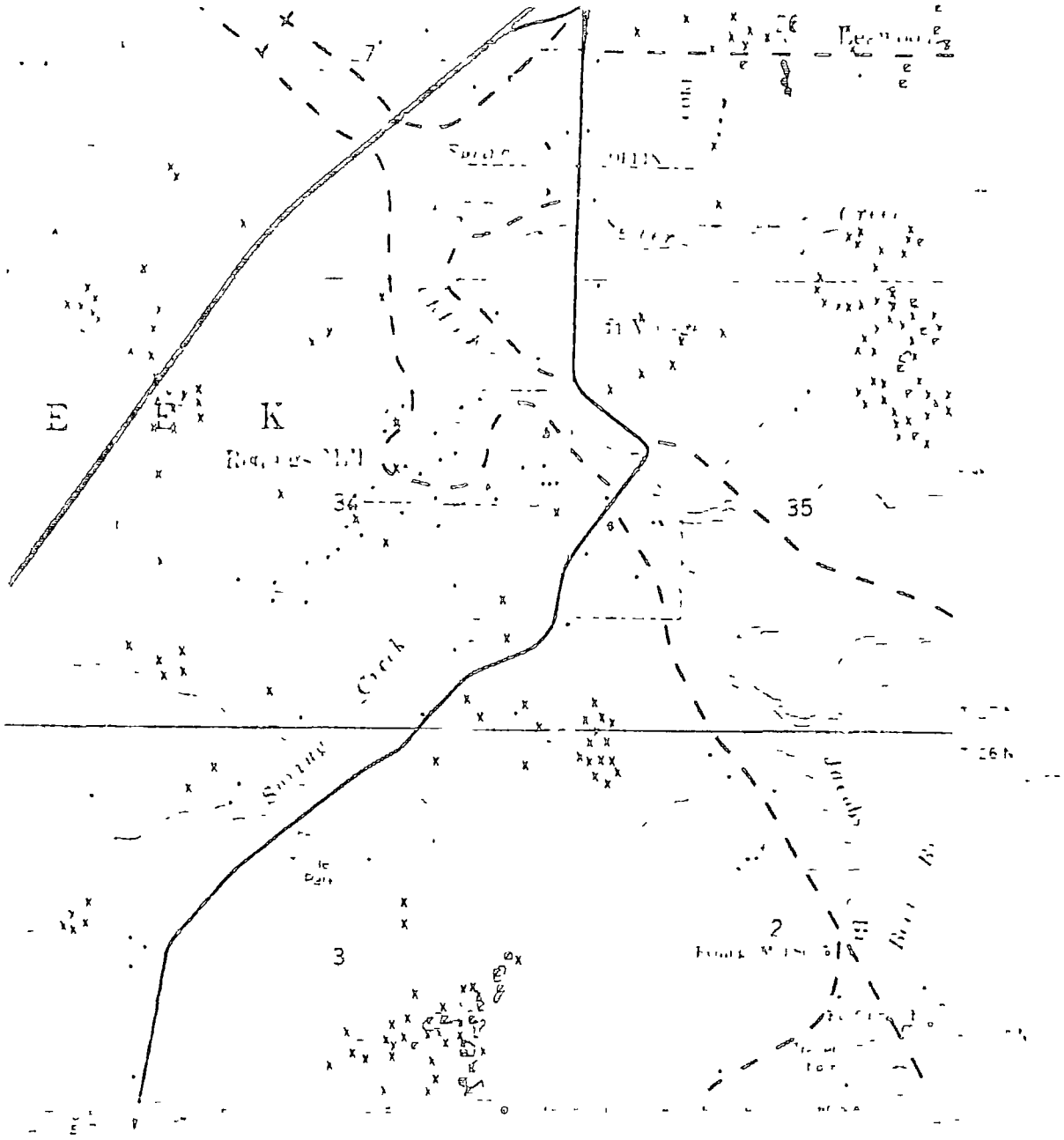
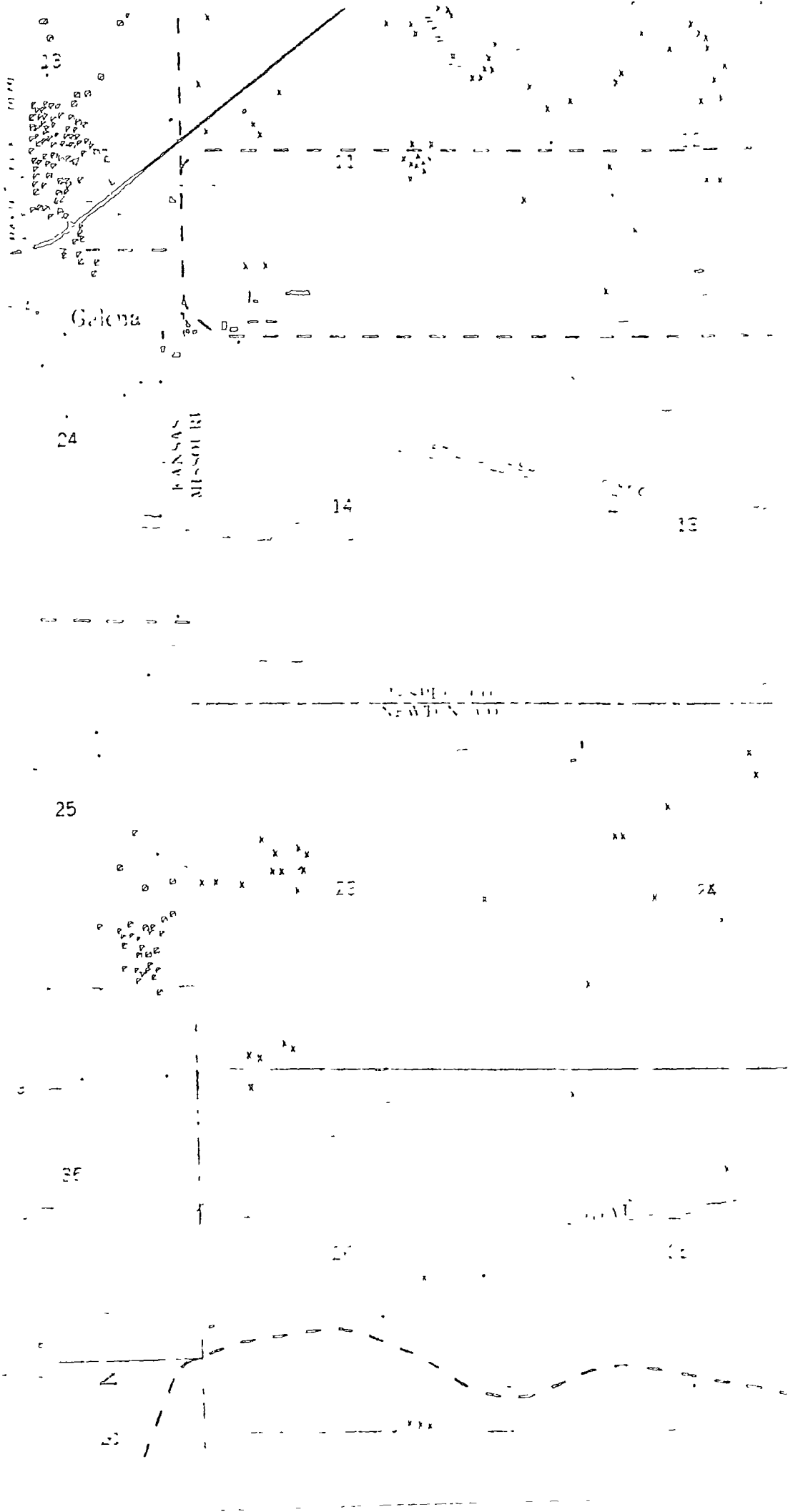


PLATE 1–B: UNDERGROUND MINES AND SHAFTS JOPLIN WEST QUADRANGLE, MISSOURI

By Michael C. McFarland, 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
Prepared under U. S. Bureau of Mines
Contract Number J0100132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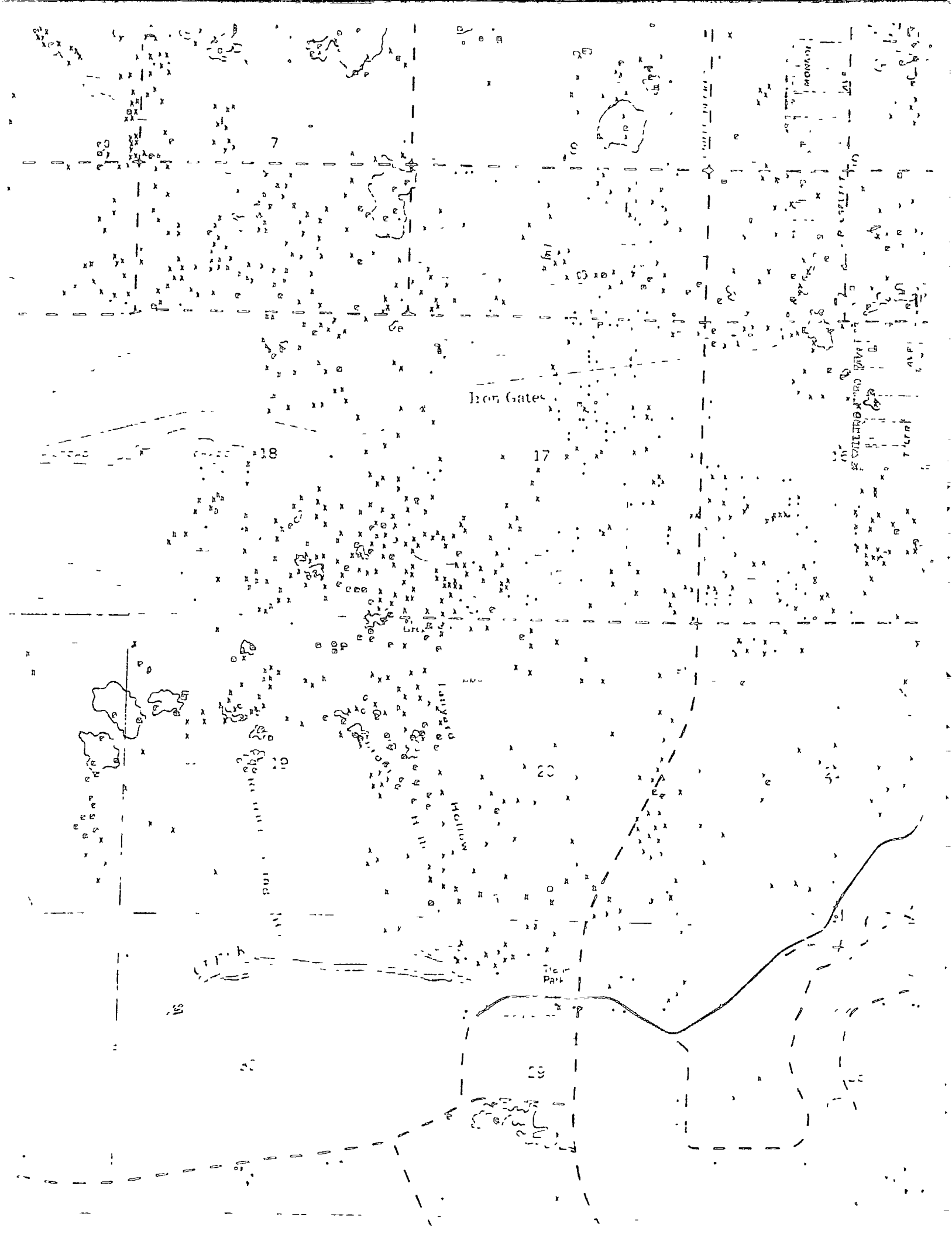
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Iron Gates
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Park
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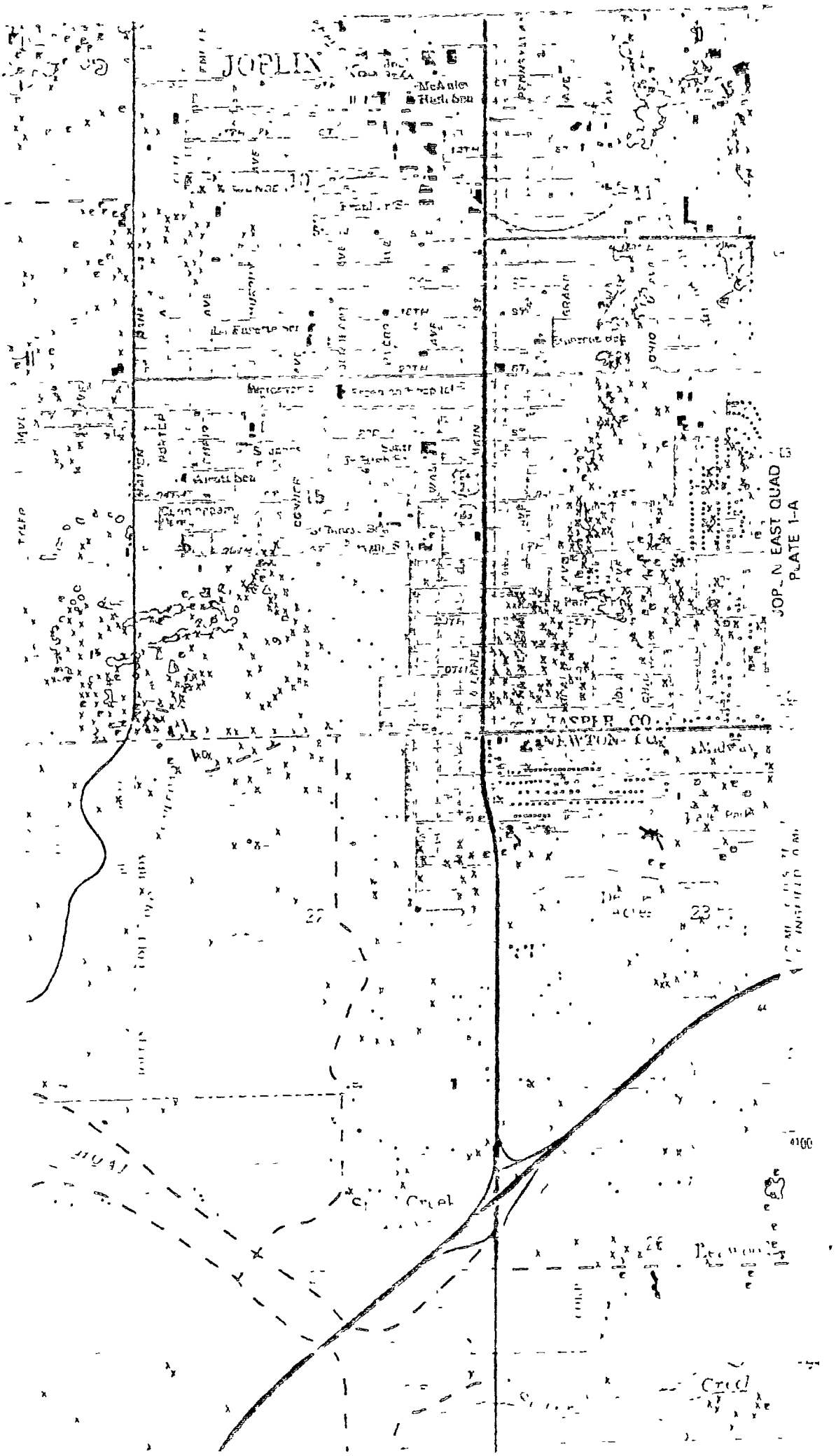
JOPLIN
McAuley Hall Sea
JASPER CO.
NEWTON CO.
Midway
Creek
Creek
JOPLIN EAST QUAD
PLATE 1-A

36
SHAWNEE
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CARL JUNCTION QUAD
PLATE 1-C

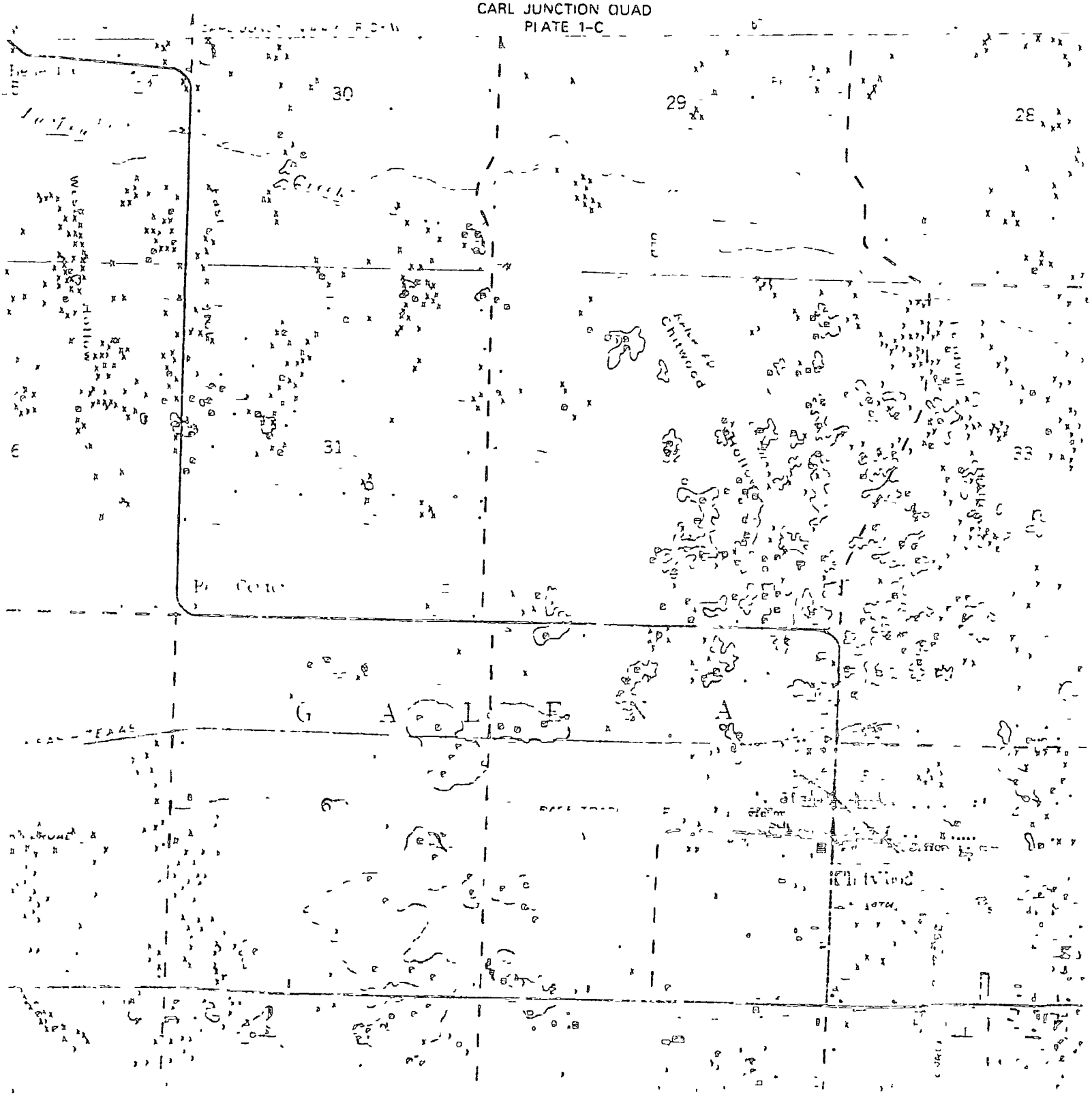

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plate 1-D

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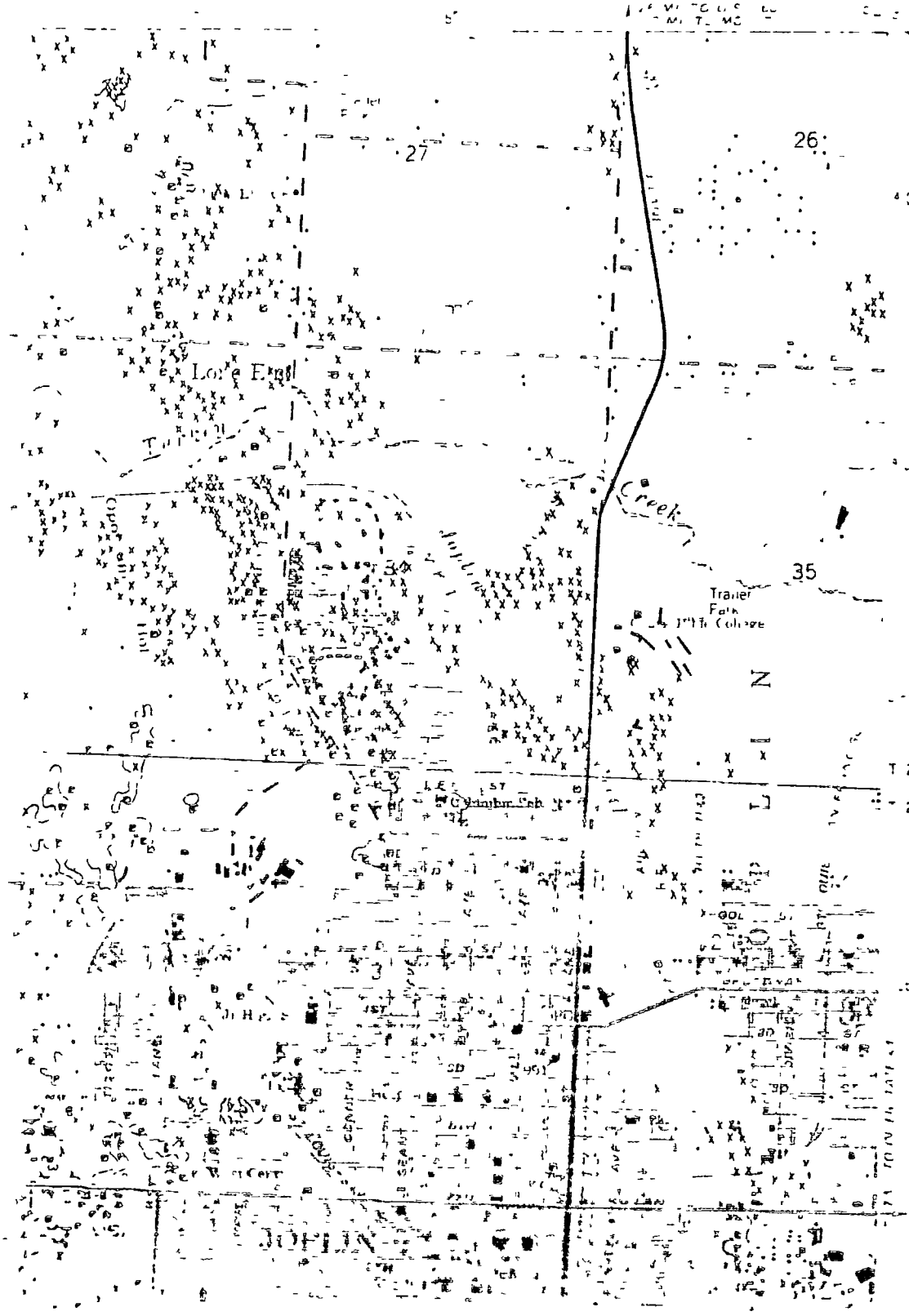
WEBB CITY QUAD
PLATE 1-D

PLATE 1-B: UNDERGROUND MINES AND SHAFTS
JOPLIN WEST QUADRANGLE, MISSOURI



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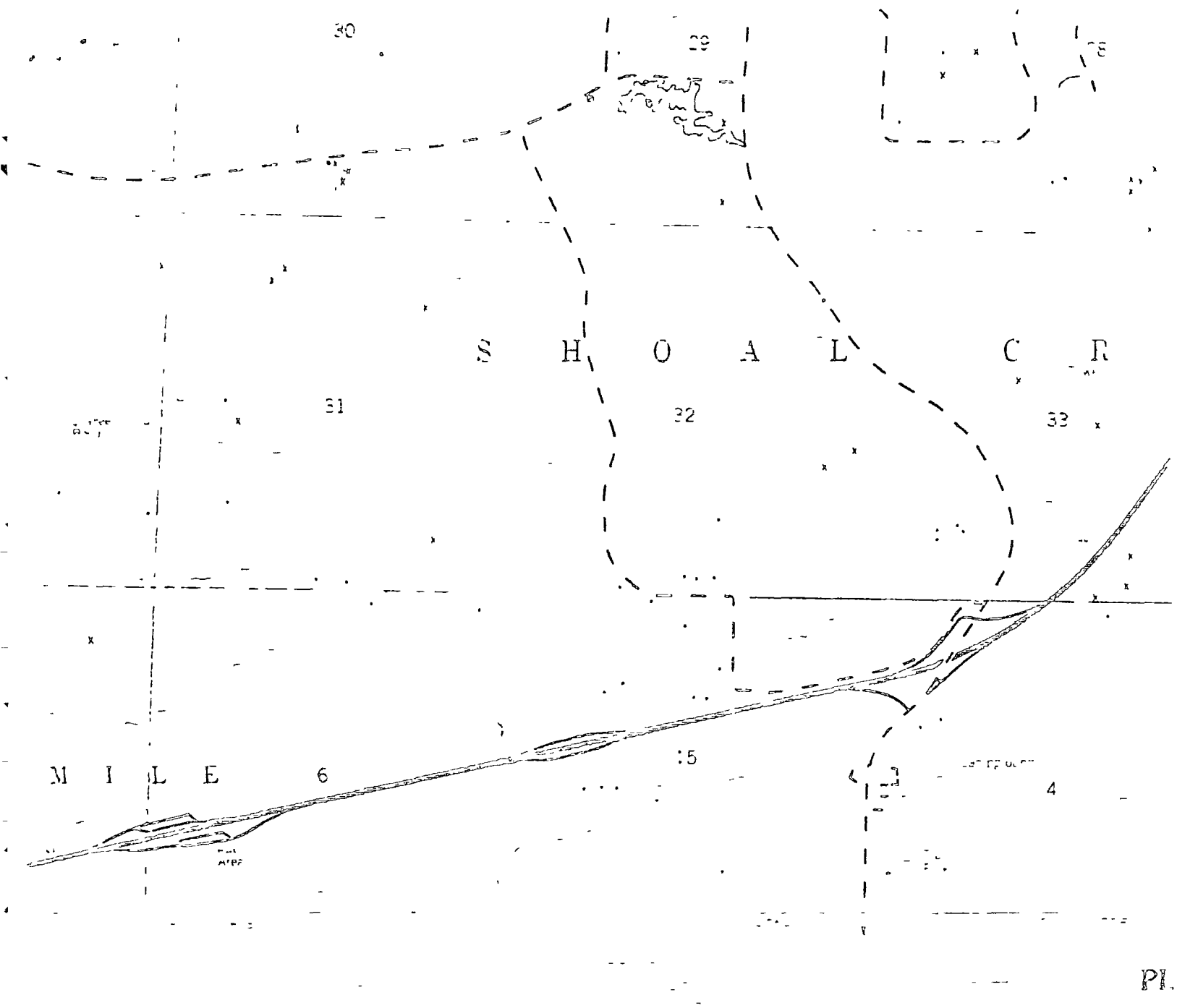
LIBRARY



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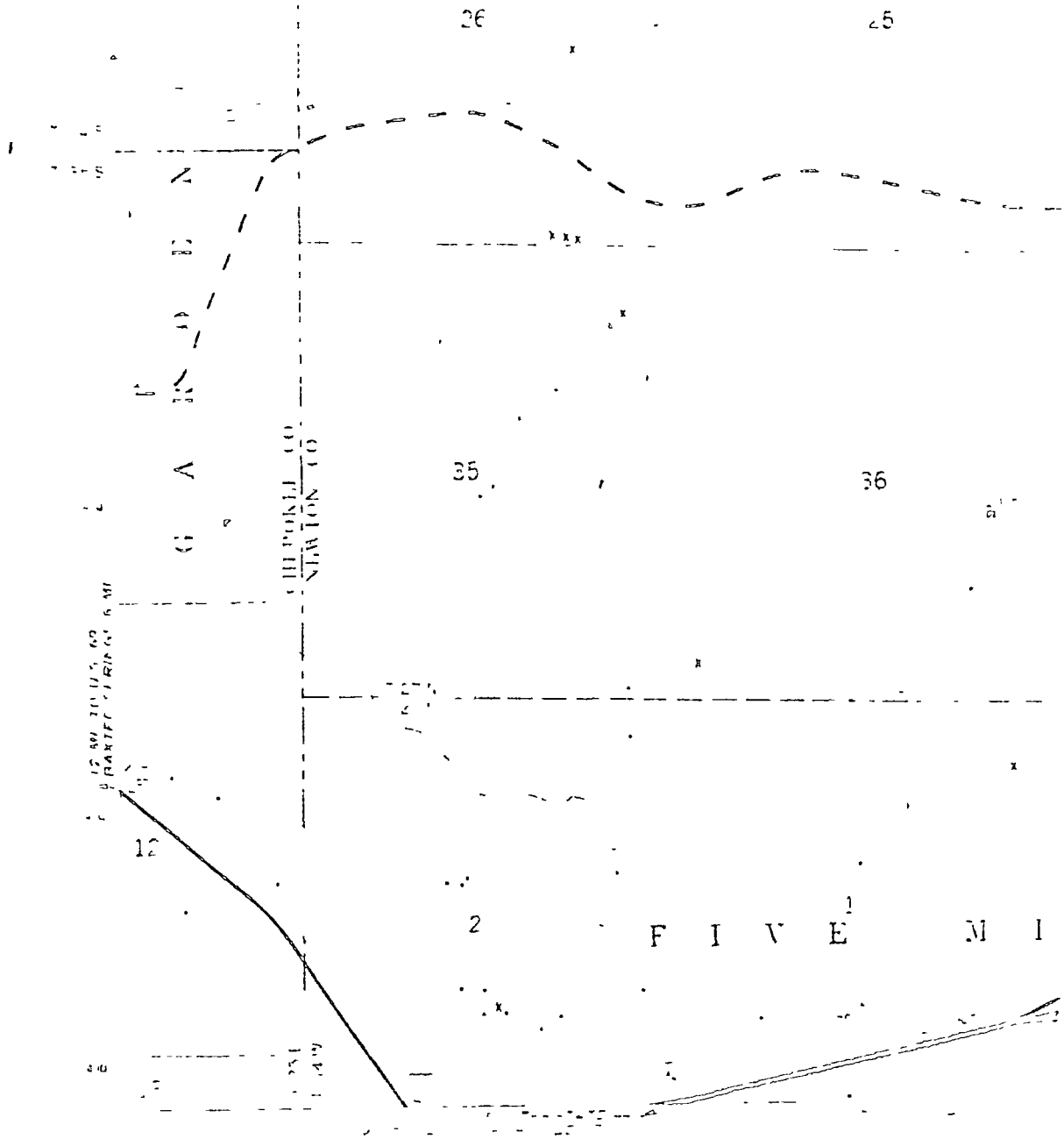
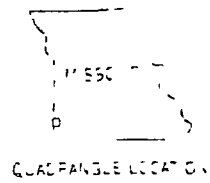


LEGEND

Underground Workings

Shaft

Prospect



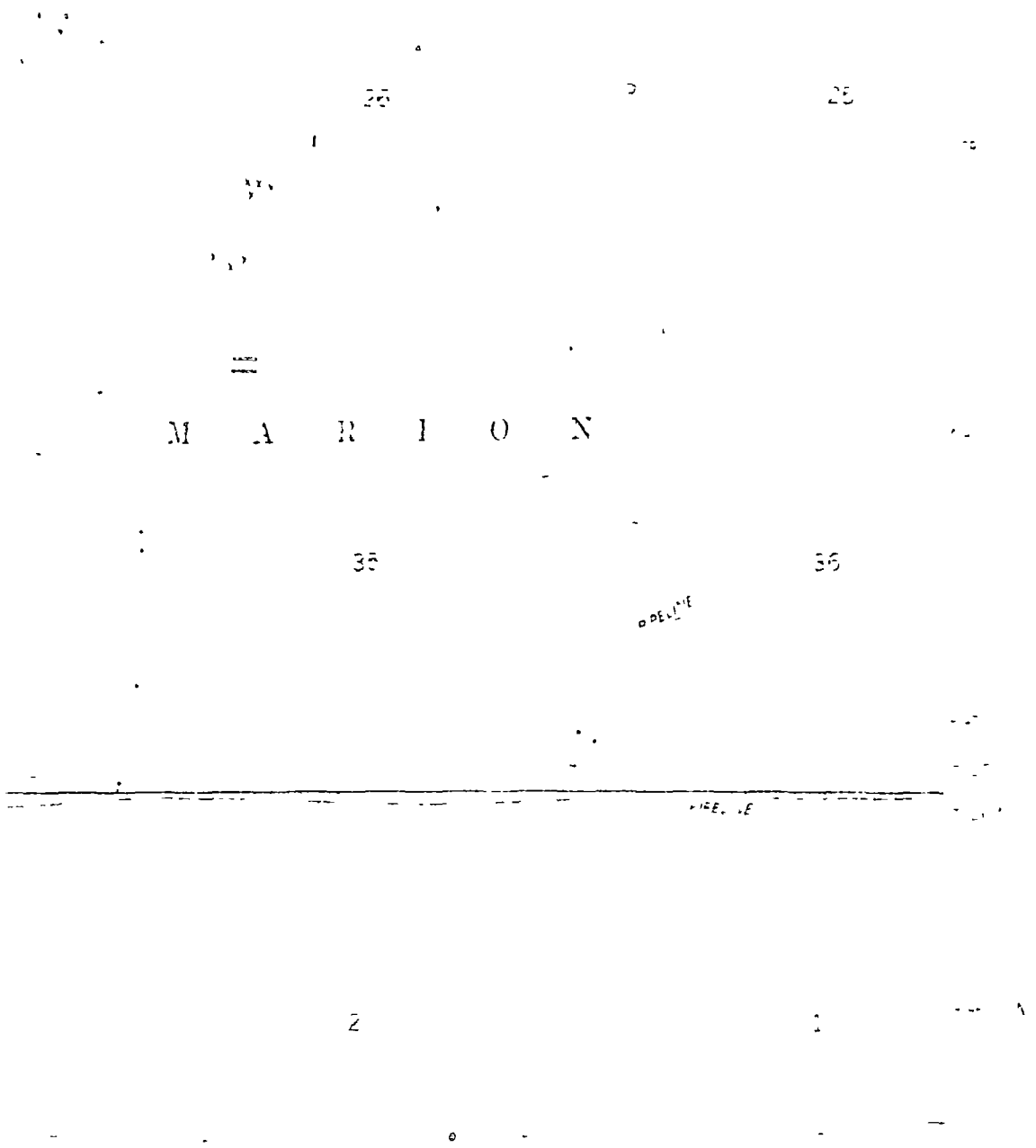


PLATE 1–A: UNDERGROUND MINES AND SHAFTS
JOPLIN EAST QUADRANGLE, MISSOURI

By Michael C McFarland, 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
Prepared under U. S. Bureau of Mines
Contract Number J0100132

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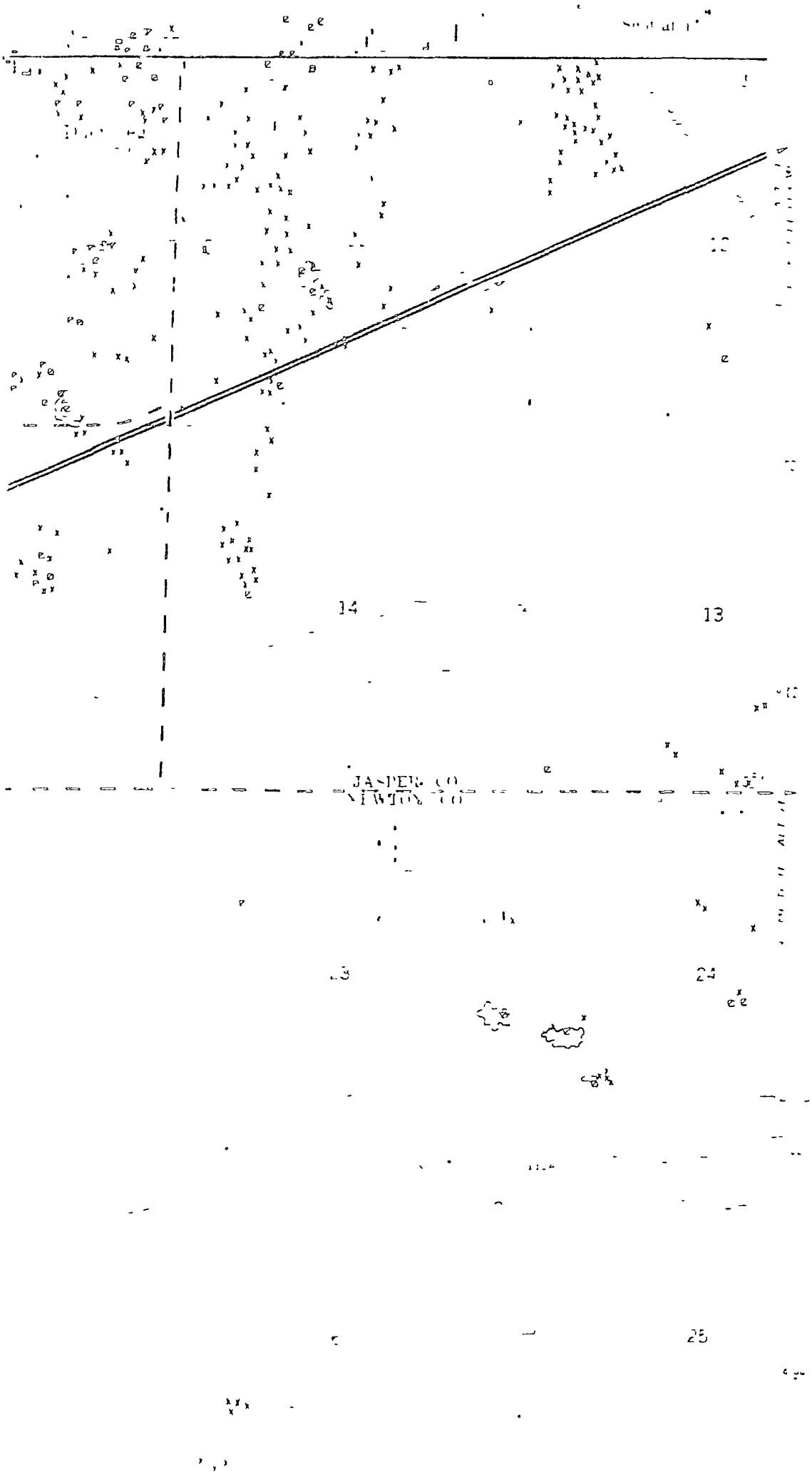
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JASPER CO
NEWTON CO
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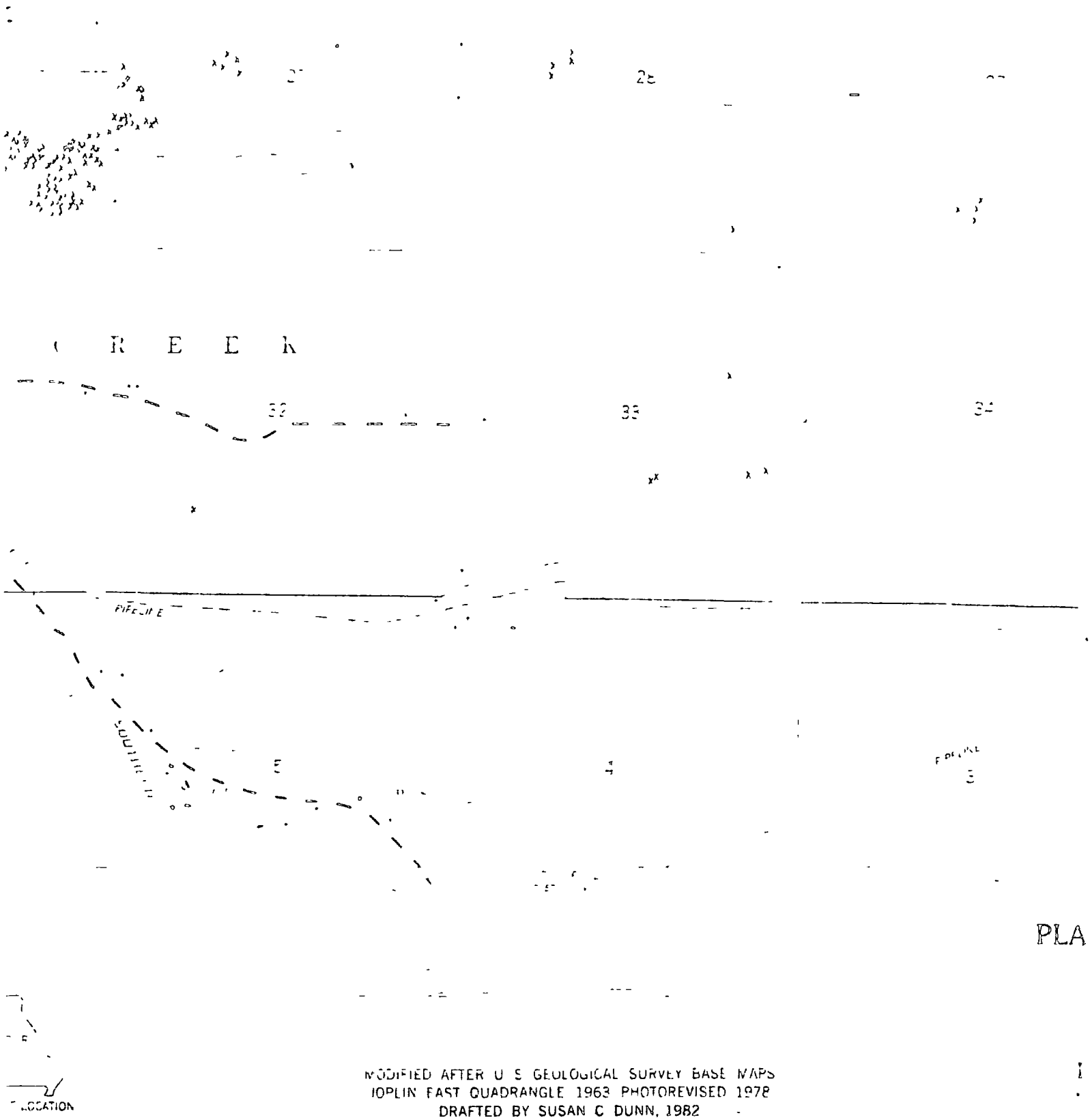

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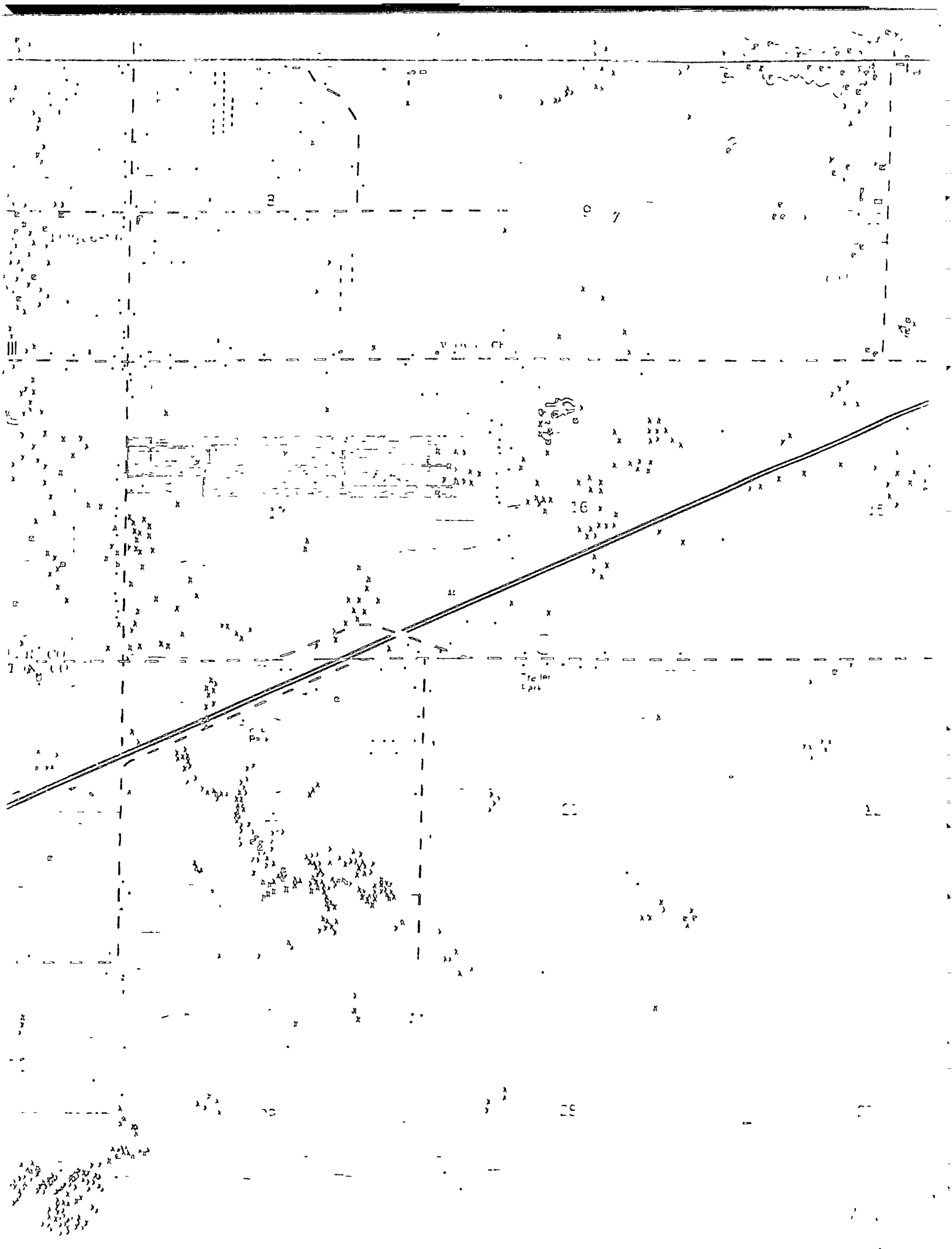
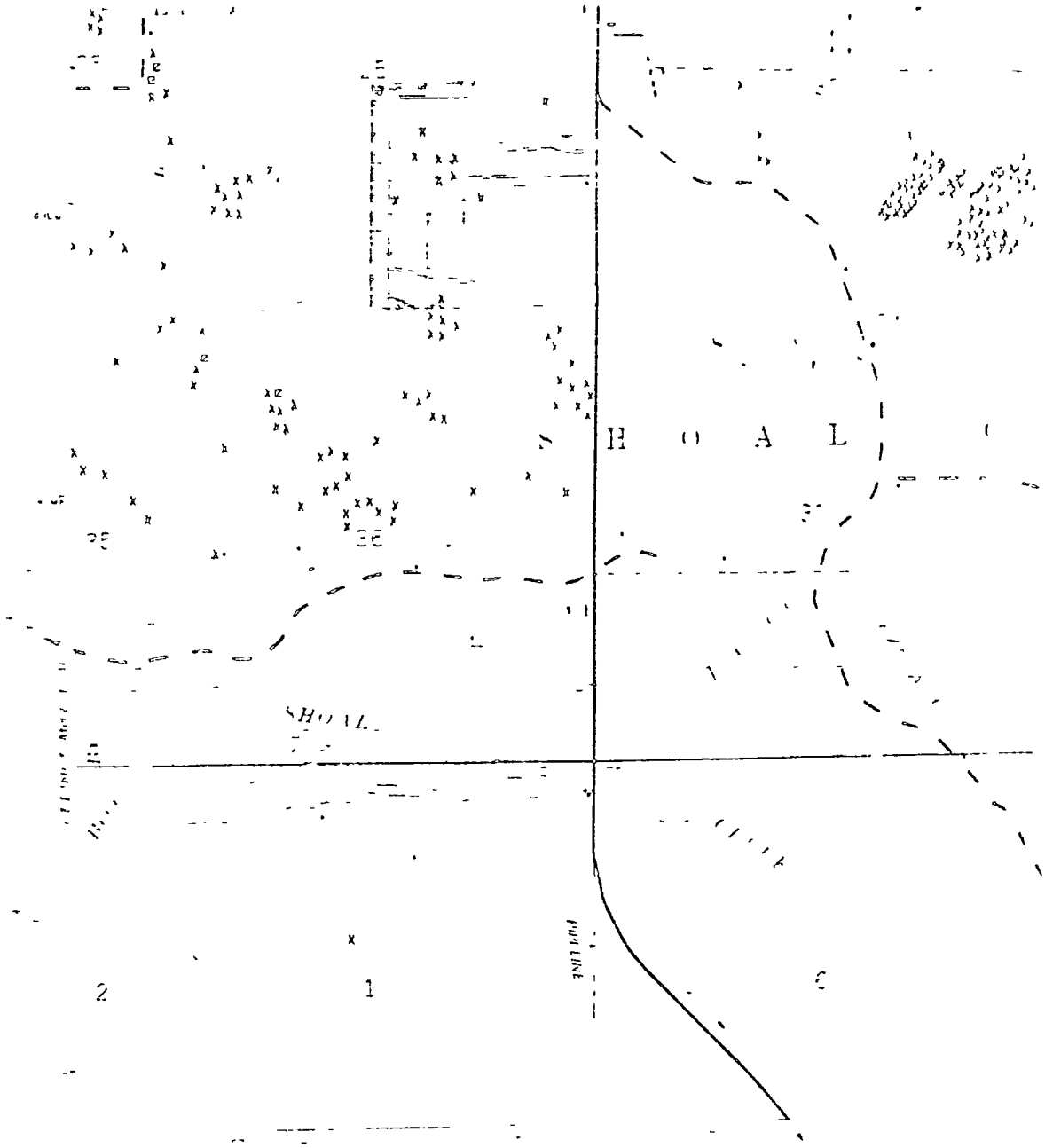
DRAFTED BY SUSAN C DUNN, 1982





LEGEND

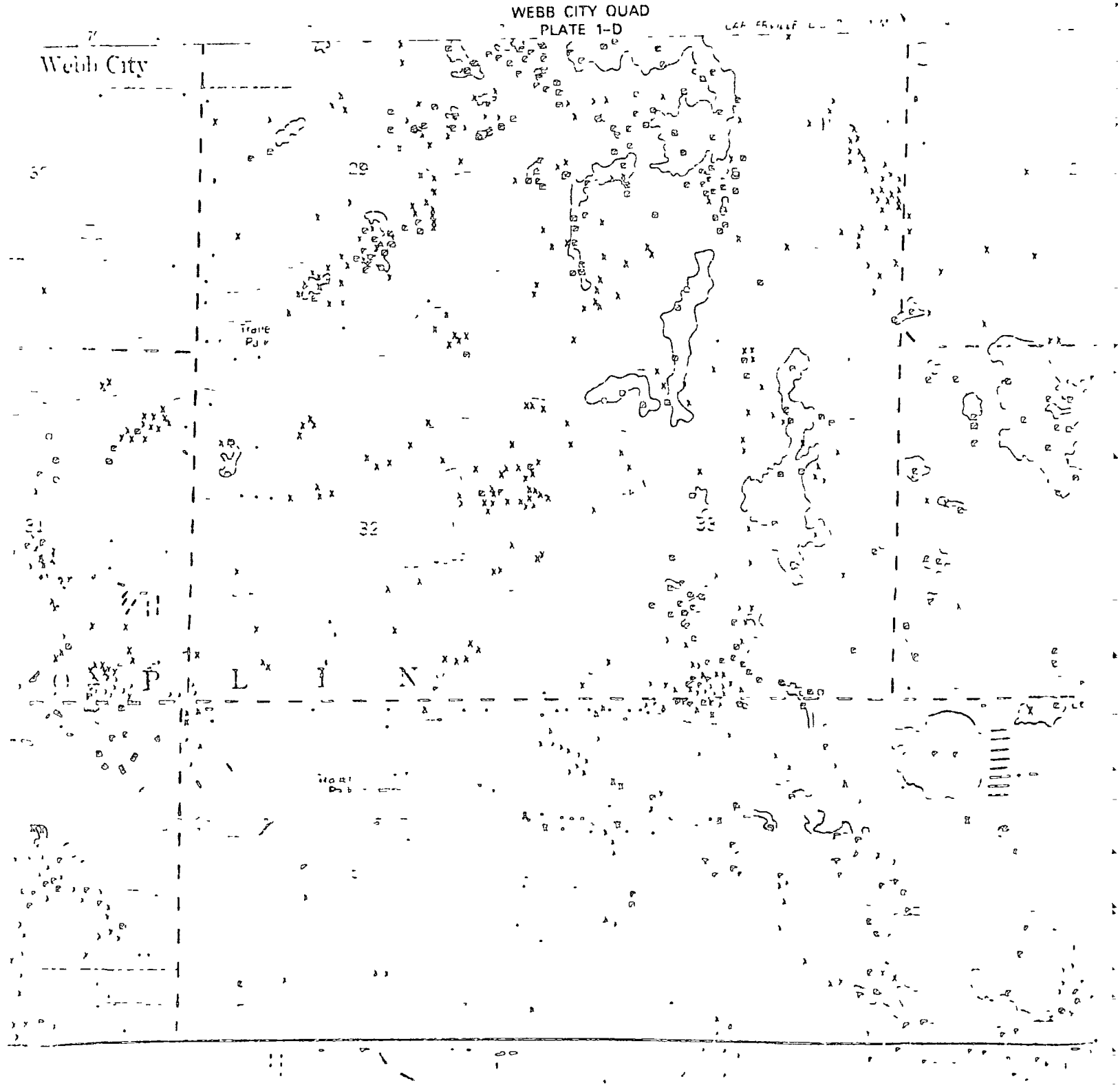
Underground Workings

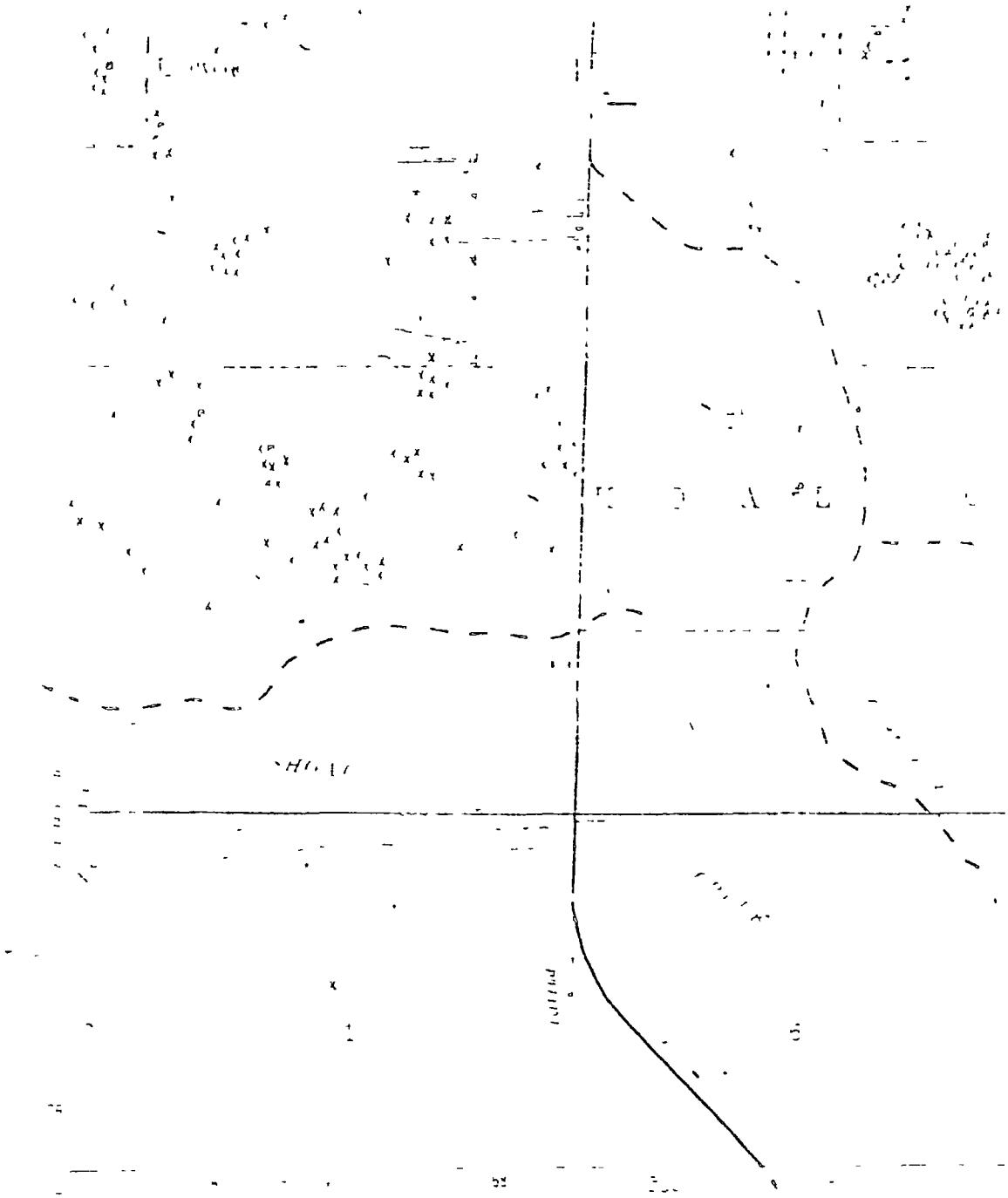
Shaft

Prospect

QUADRANGLE LOCATION

WEBB CITY QUAD
PLATE 1-D





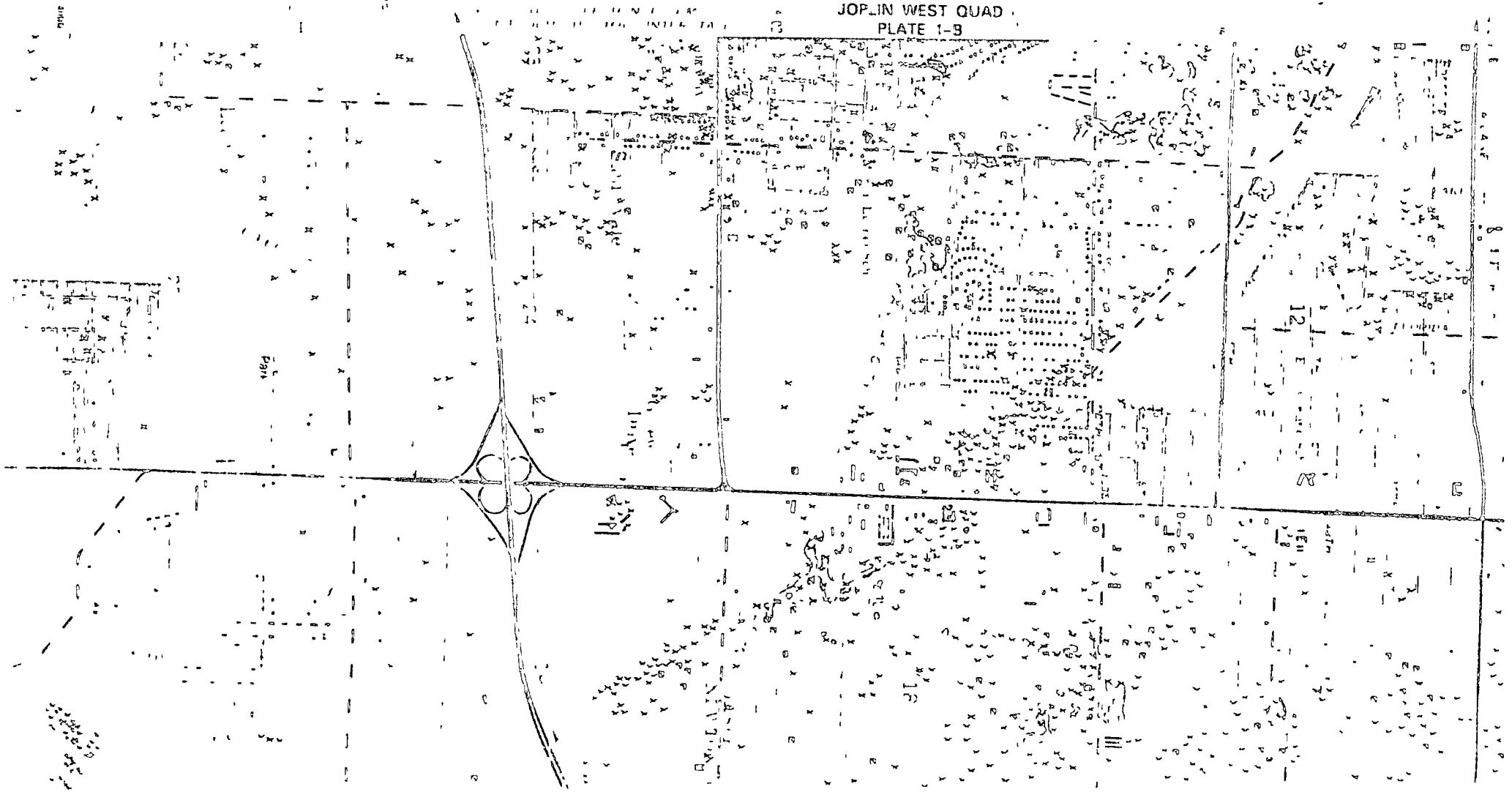
LEGEND

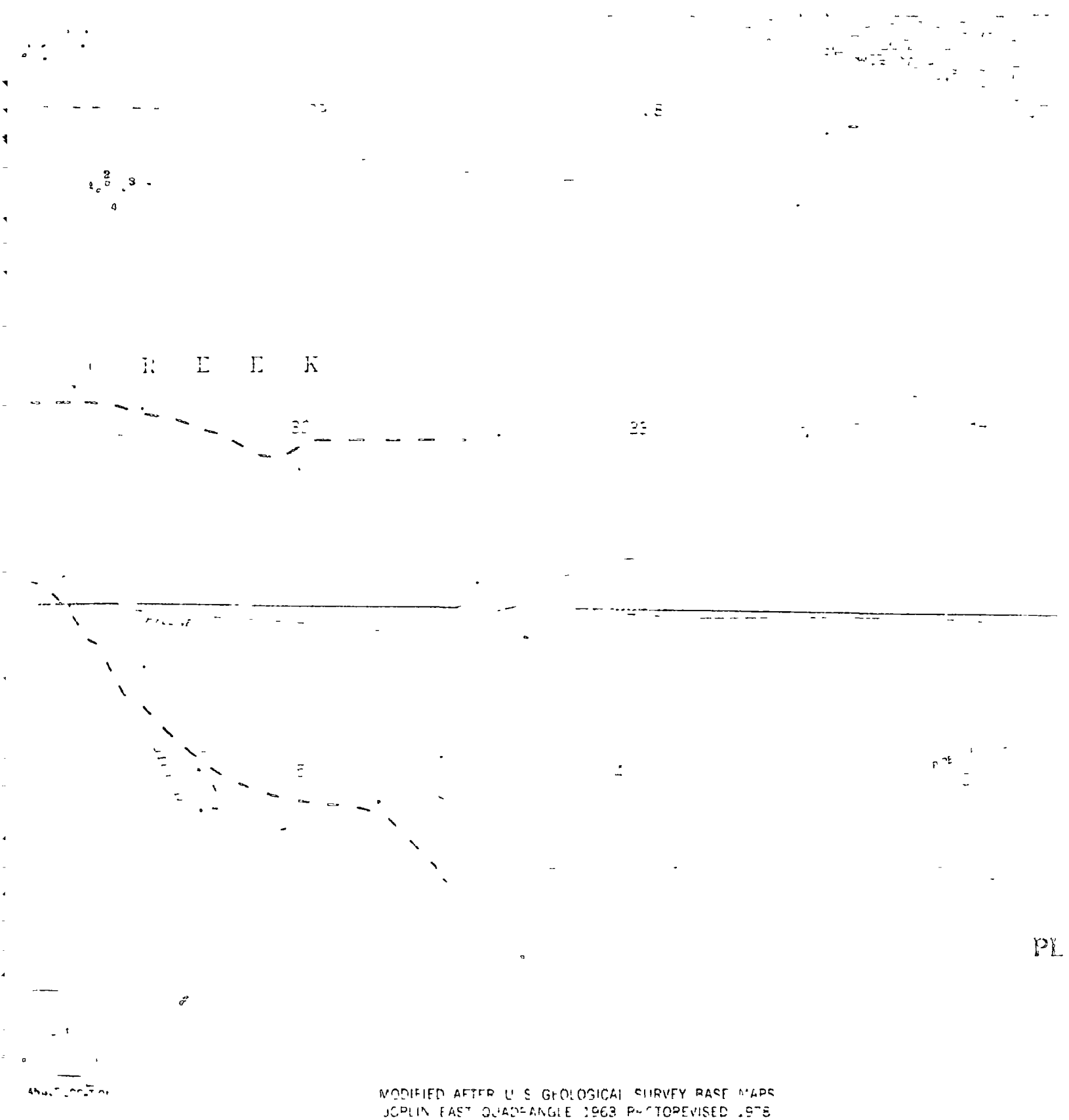
Underground Workings

Shaft

Prospect

JOPLIN WEST QUAD
PLATE 1-B





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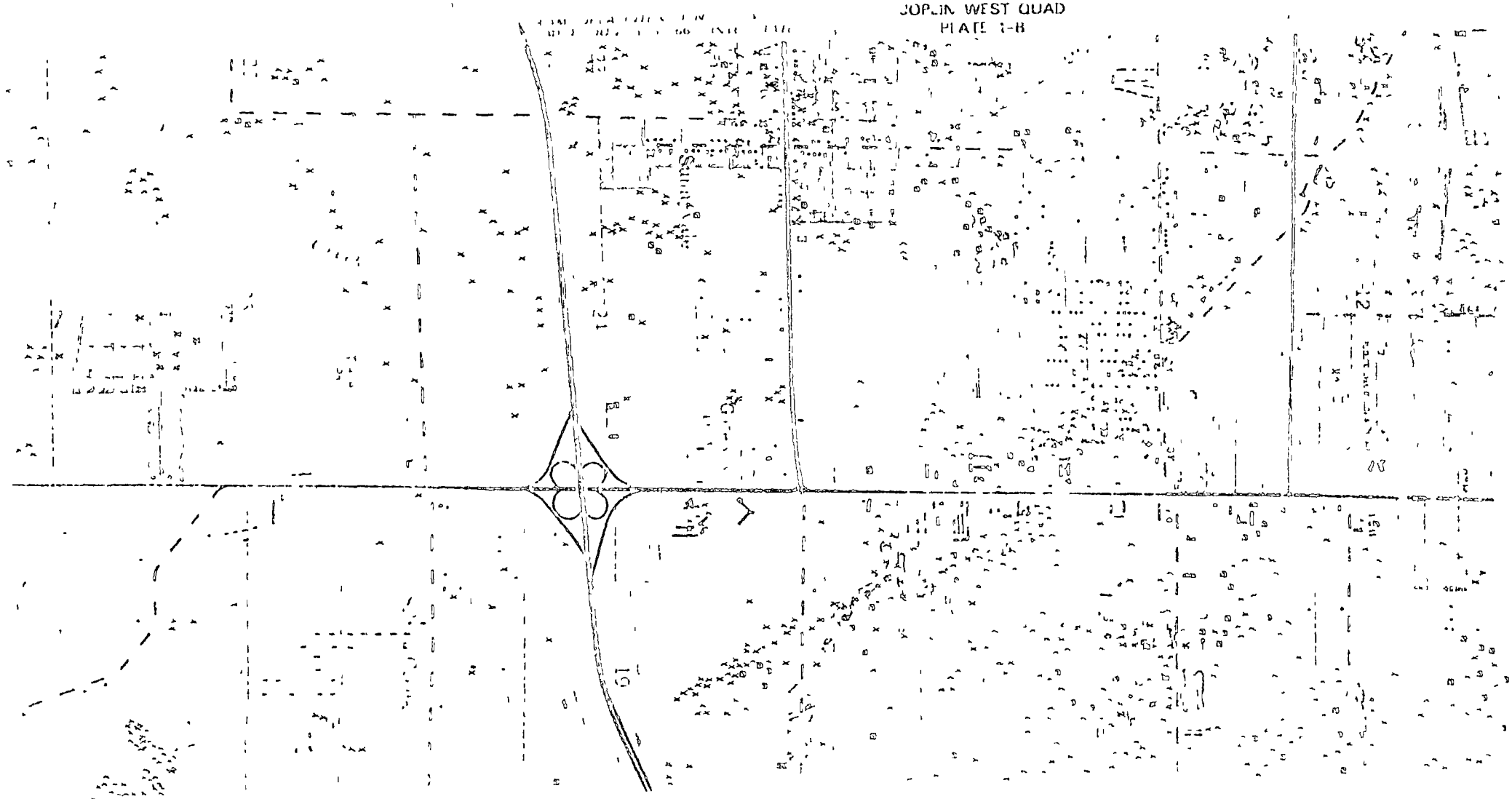
JOPLIN WEST QUAD
PLATE 1-B



CARL JUNCTION QUAD
PLATE 1-C

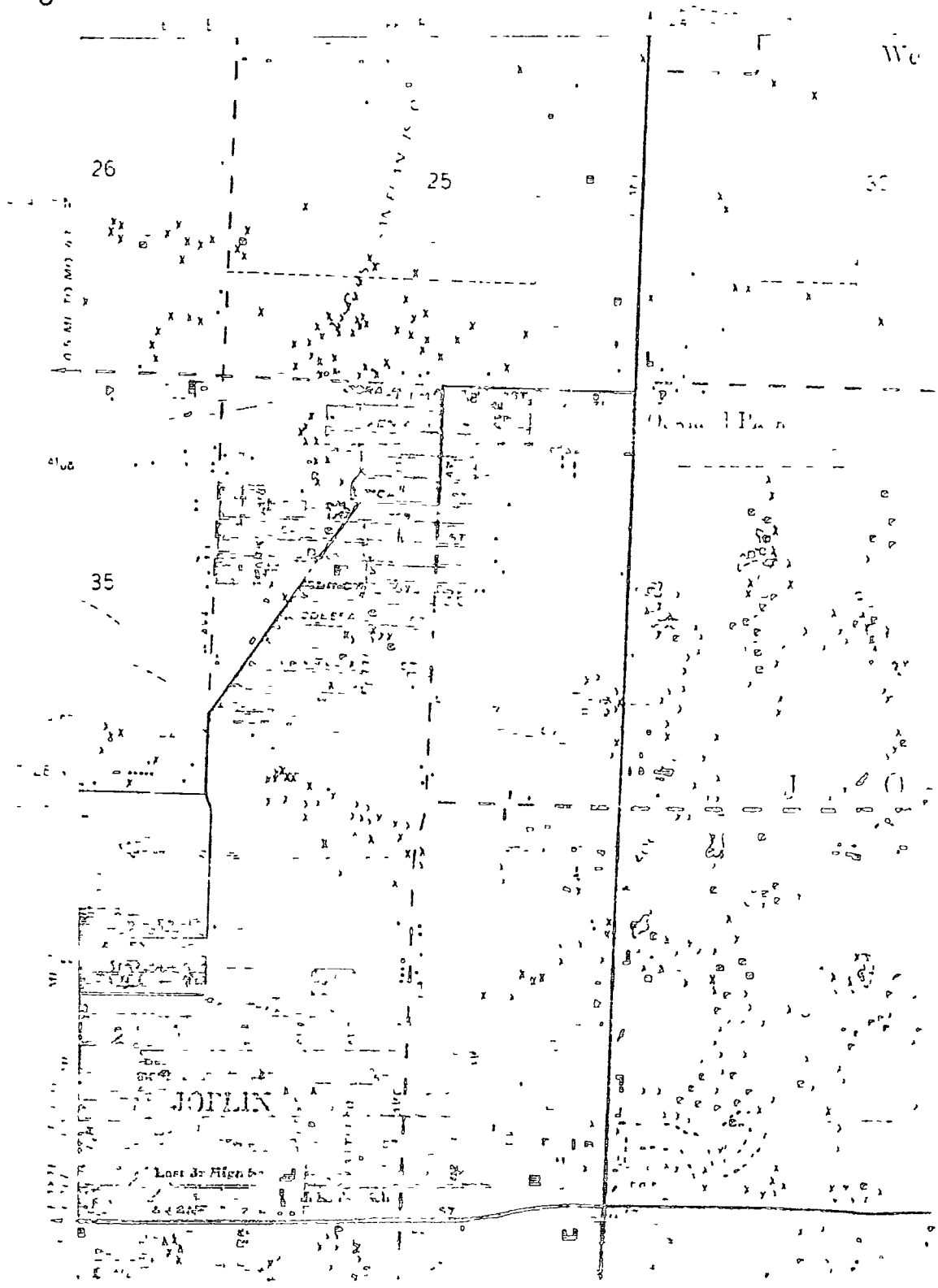


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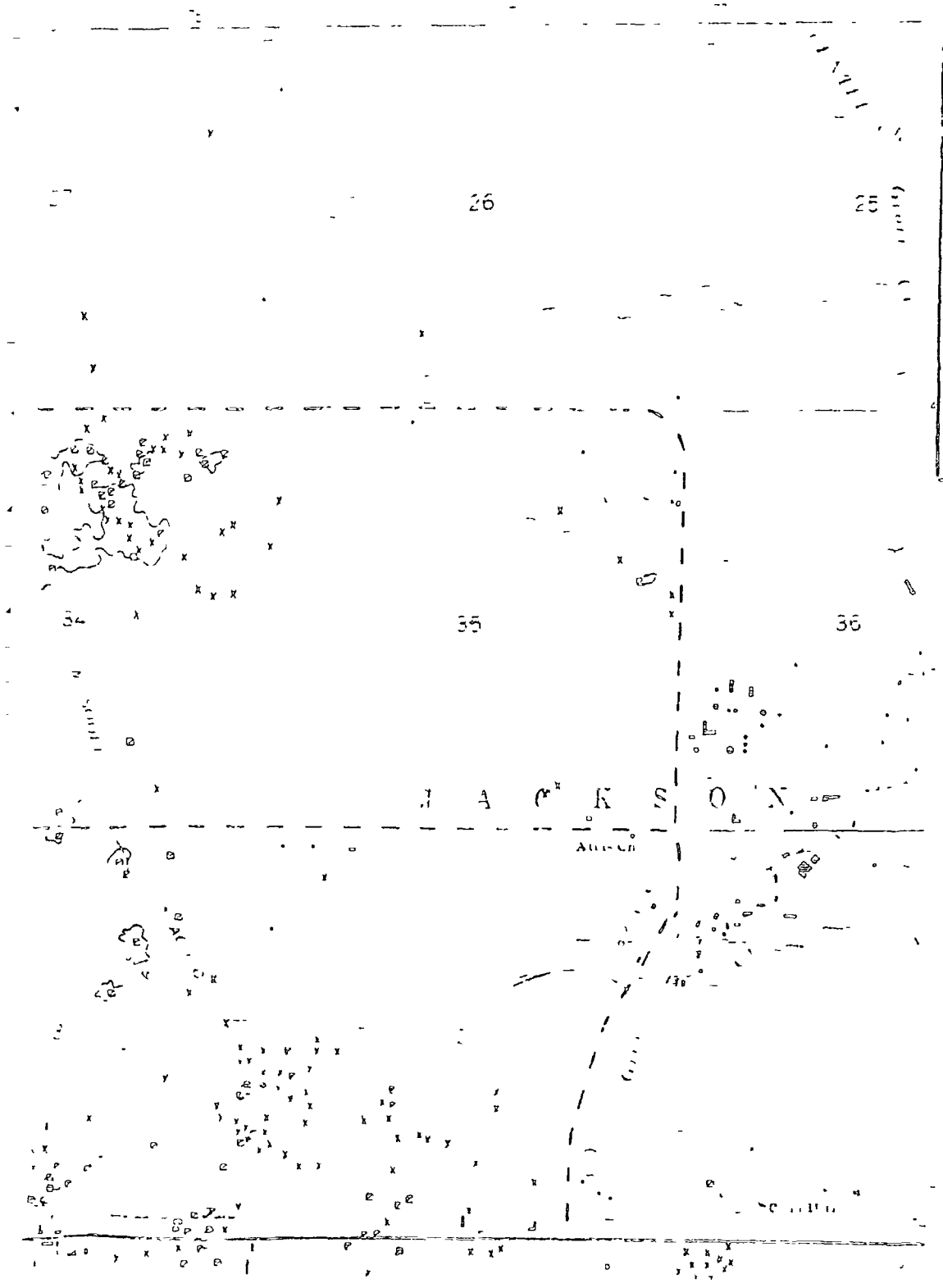
PLATE 1-A· UNDERGROUND MINES AND SHAFTS
JOPLIN EAST QUADRANGLE, MISSOURI



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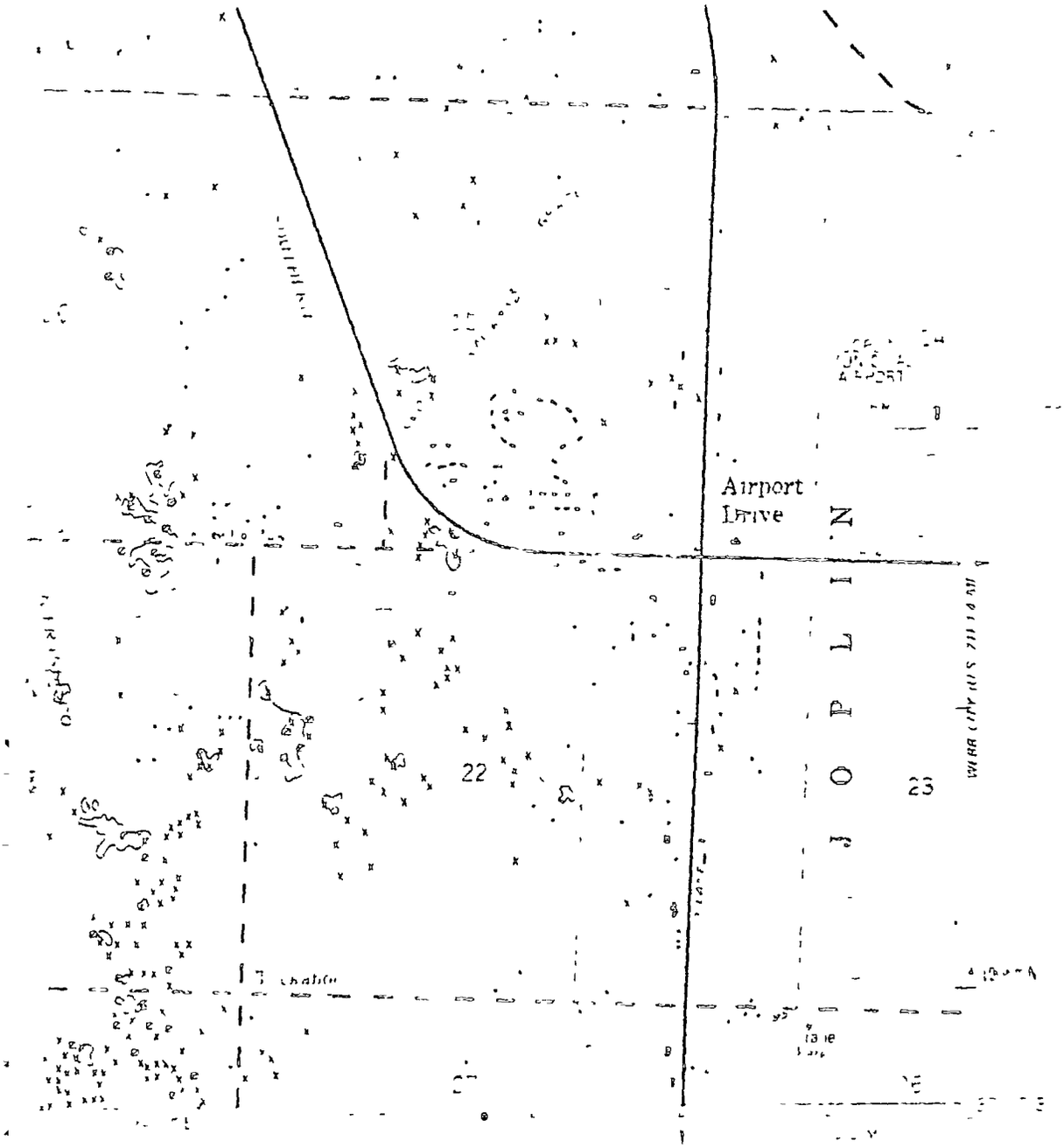

PLATE 1–C: UNDERGROUND MINES AND SHAFTS
CARL JUNCTION QUADRANGLE, MISSOURI

By Michael C. McFarland, 1982

JOPLIN EAST QUAD
PLATE 1–A

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DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
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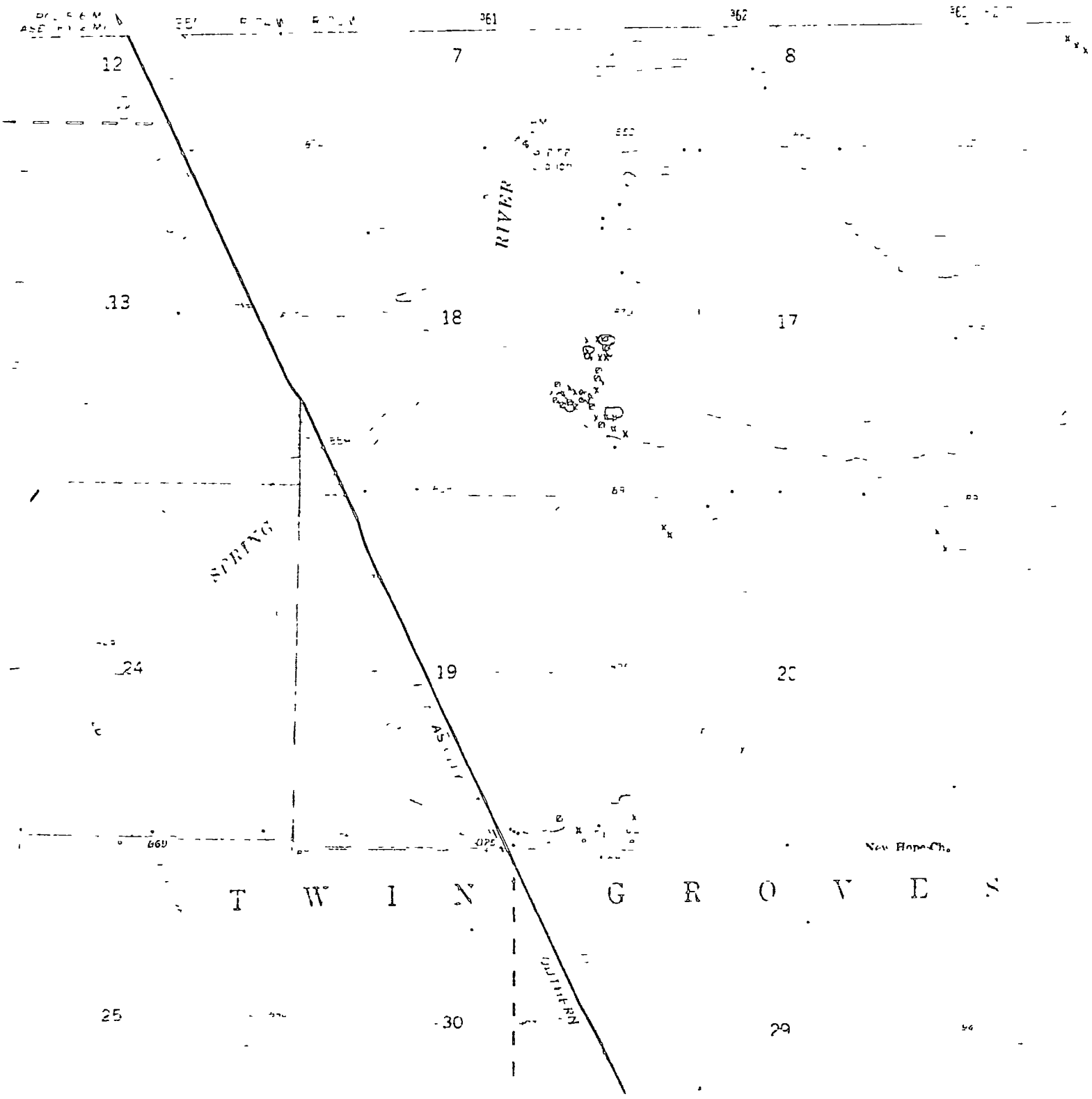

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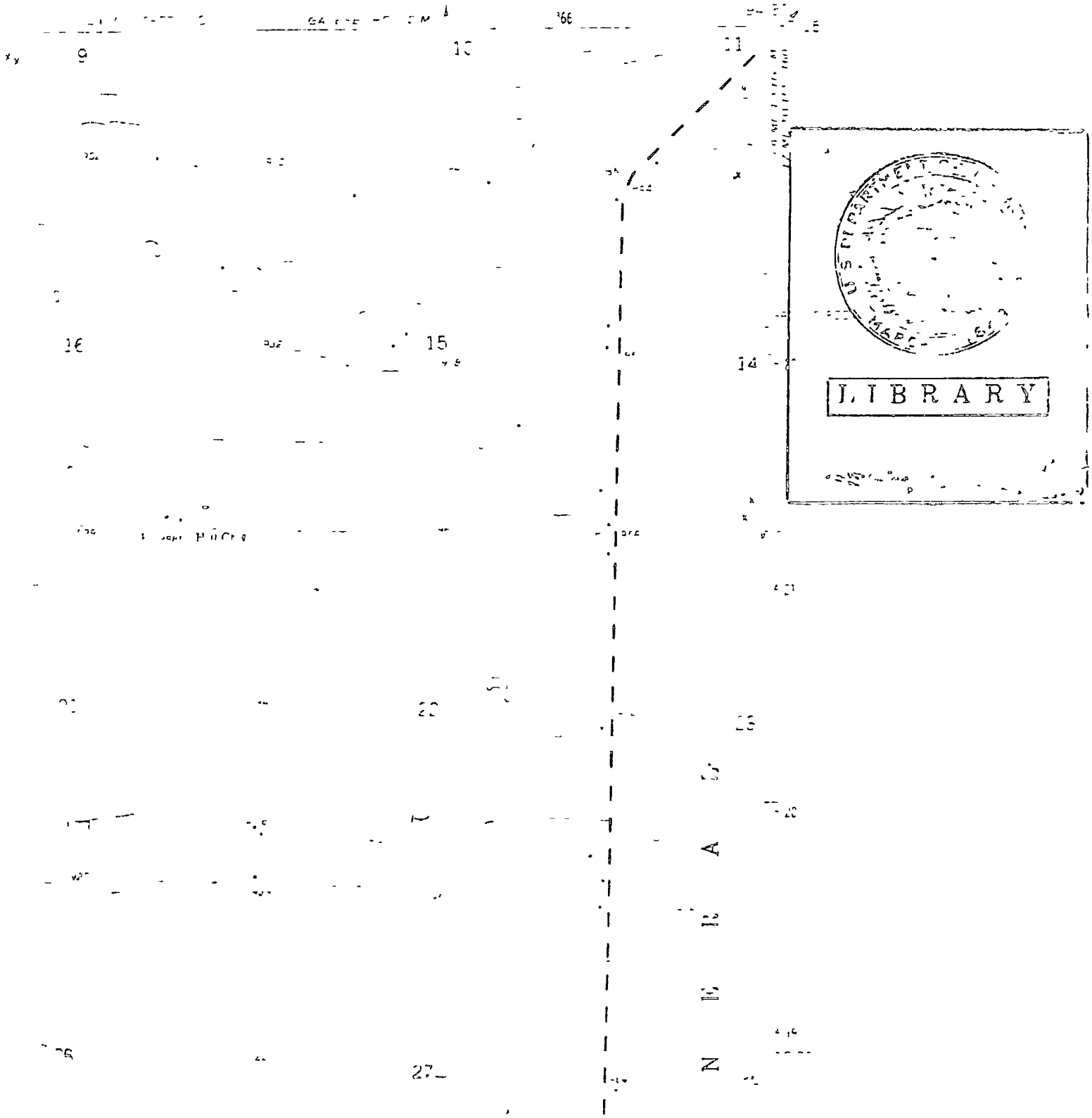
PLATE 1–C. UNDERGROUND MINES AND SHAFTS
CARL JUNCTION QUADRANGLE MISSOURI



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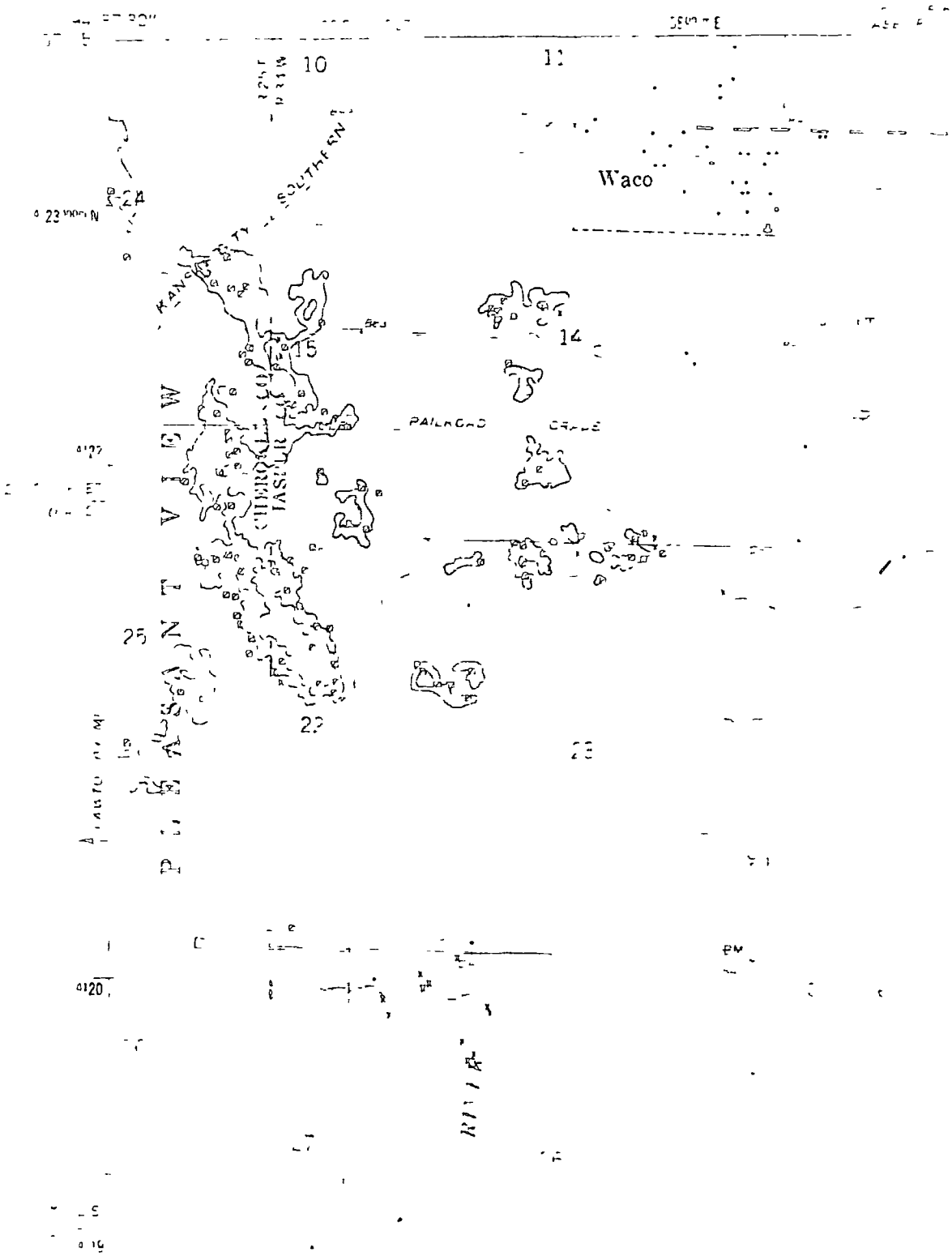
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JASPER
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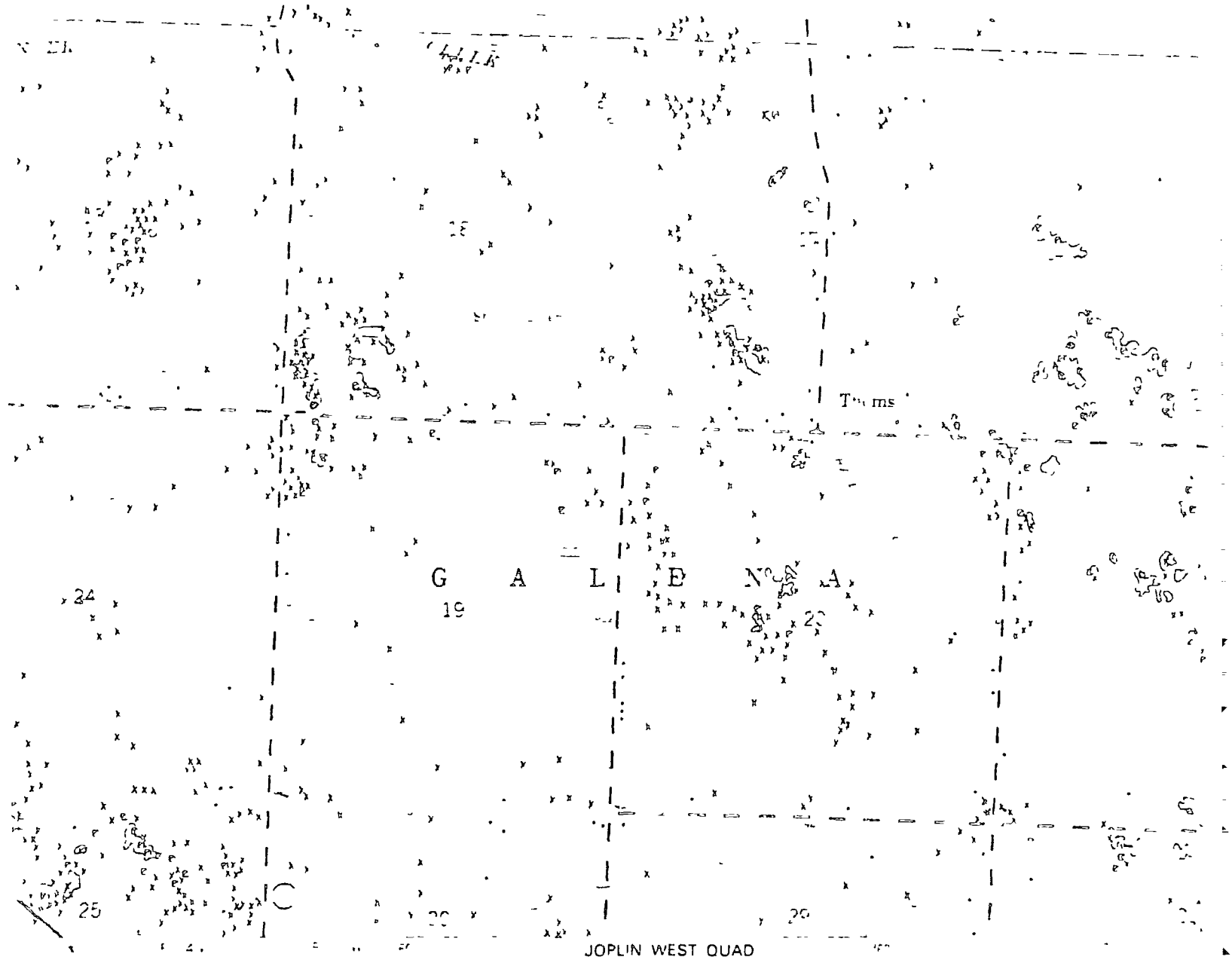

JOPLIN WEST QUAD
PLATE 1-B

QUADRANGLE LOCATION

NATIONAL GEODETIC VERTICAL DATUM 1929

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CARL JUNCTION QUADRANGLE 1963 PHOTOREVISED 1978
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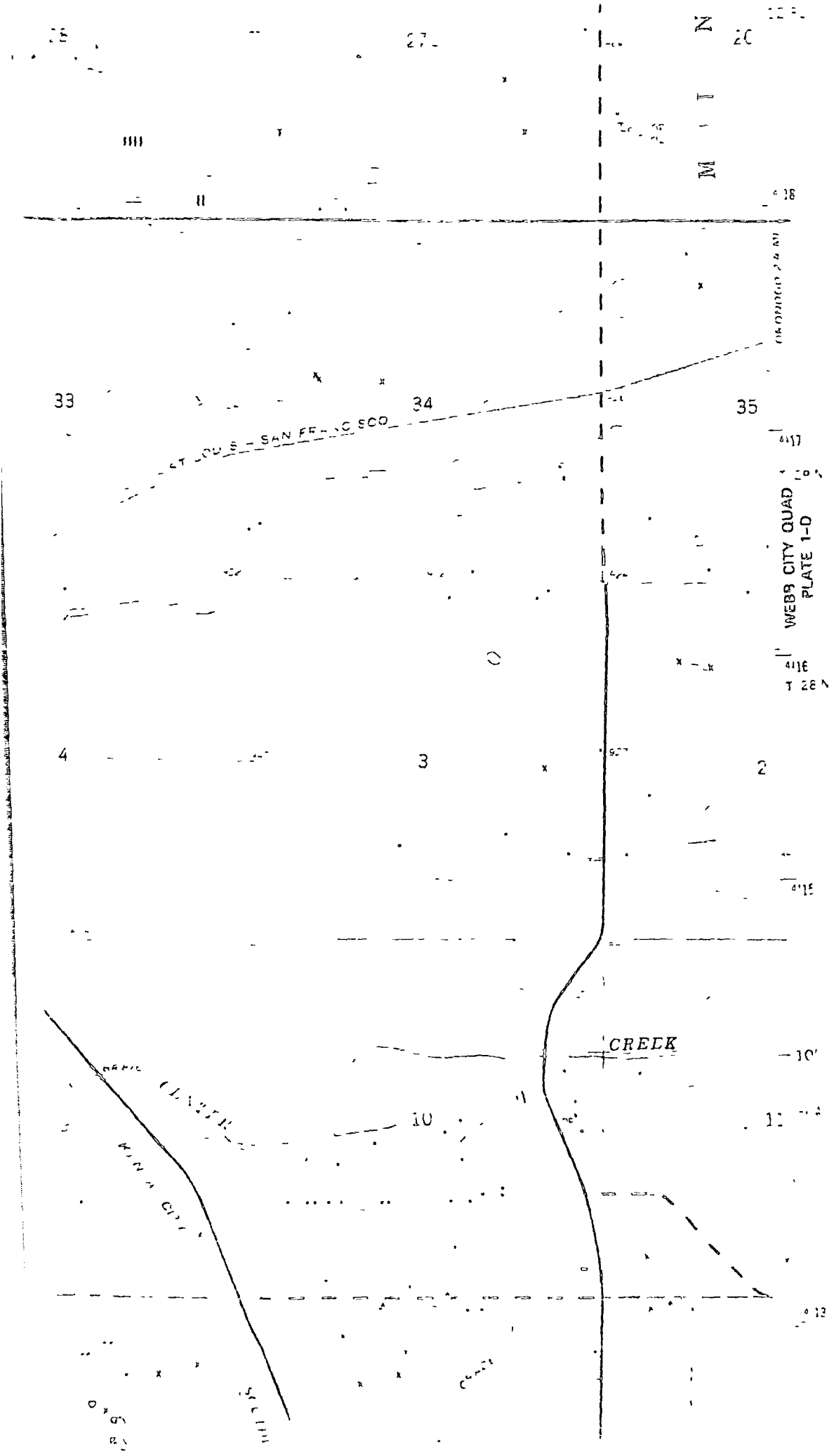

WEBB CITY QUAD
PLATE 1-D
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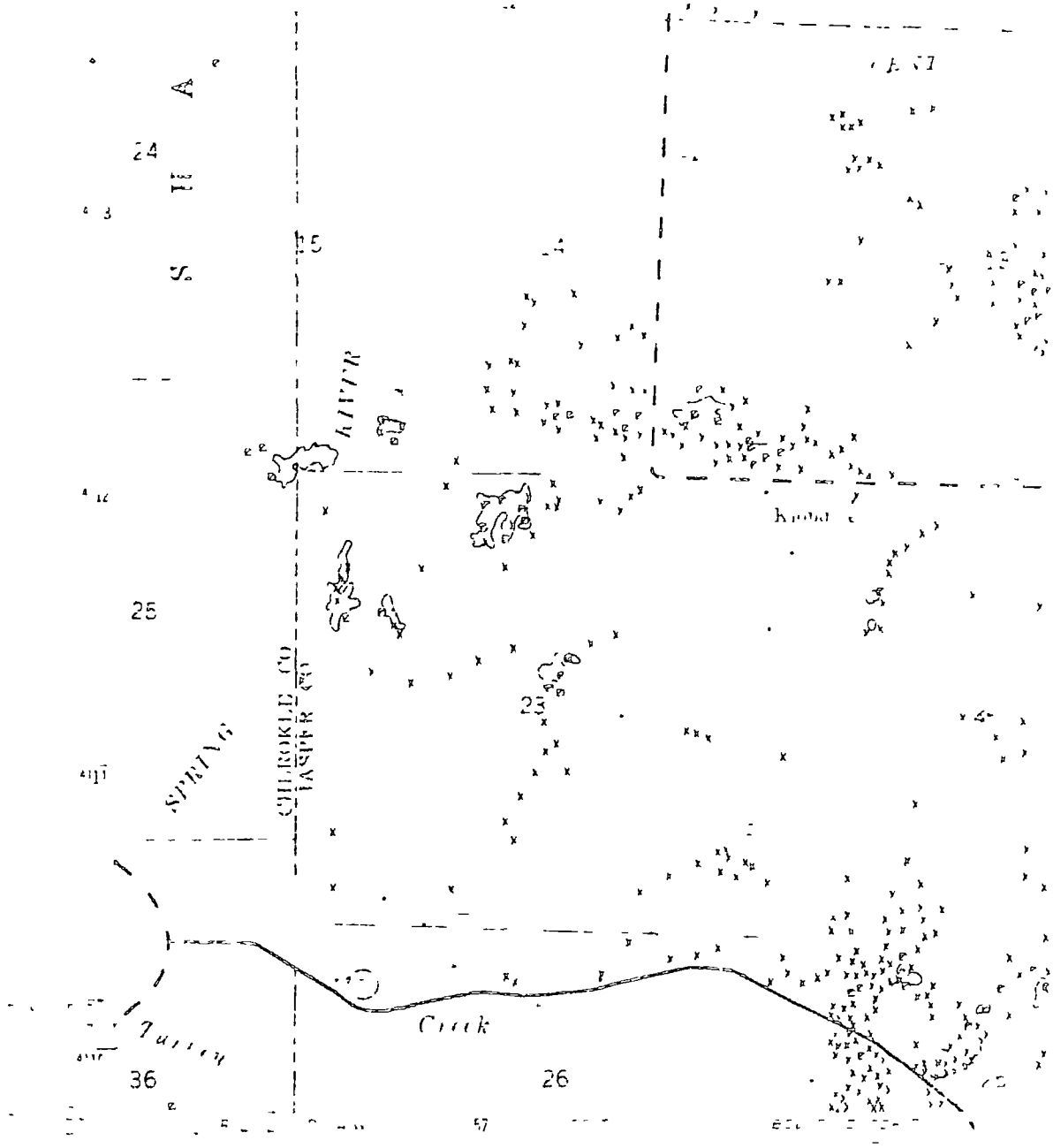
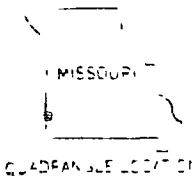


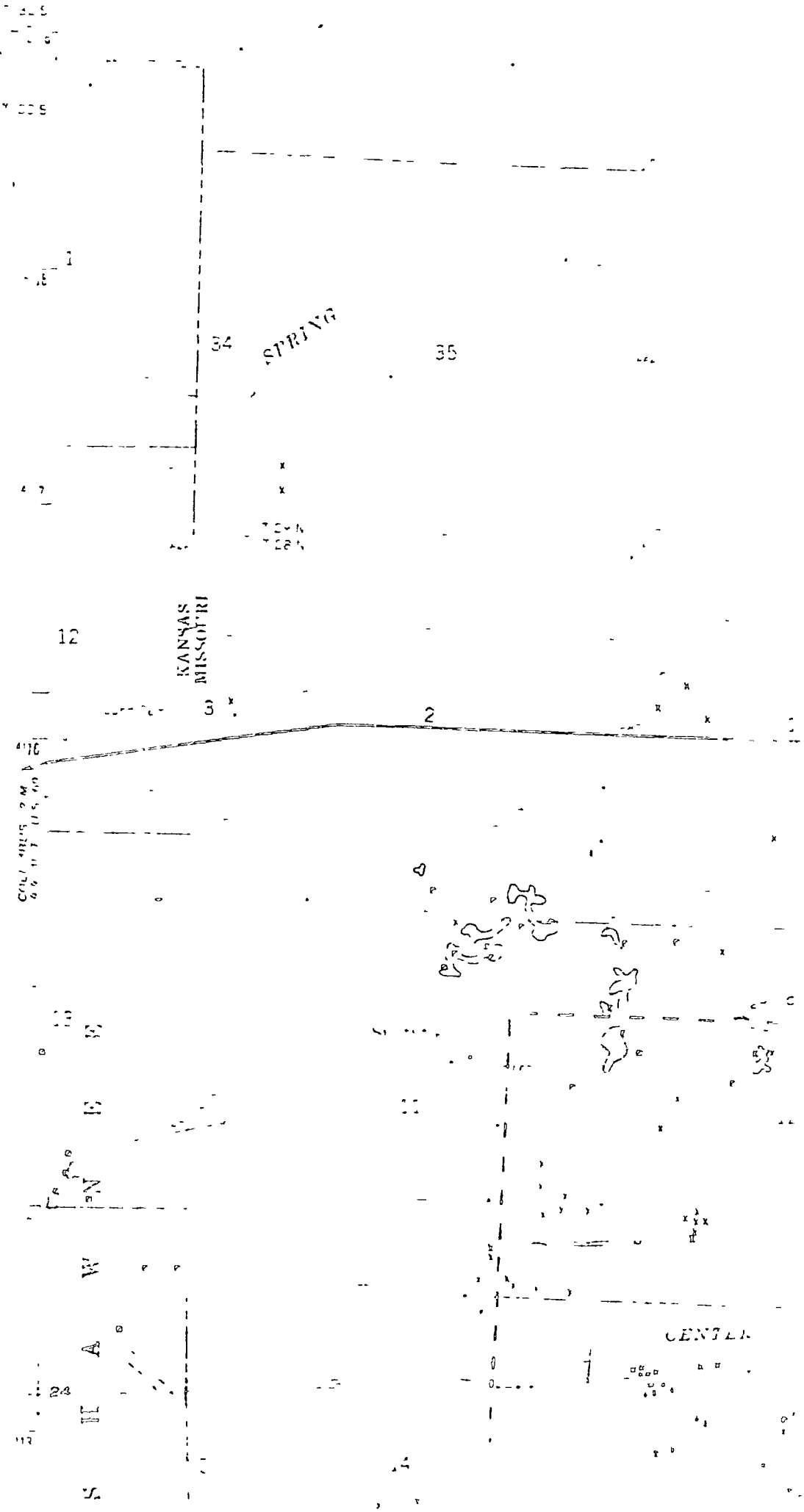
LEGEND

Underground Workings

Shaft

Prospect

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KANSAS
MISSOURI
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CENTER
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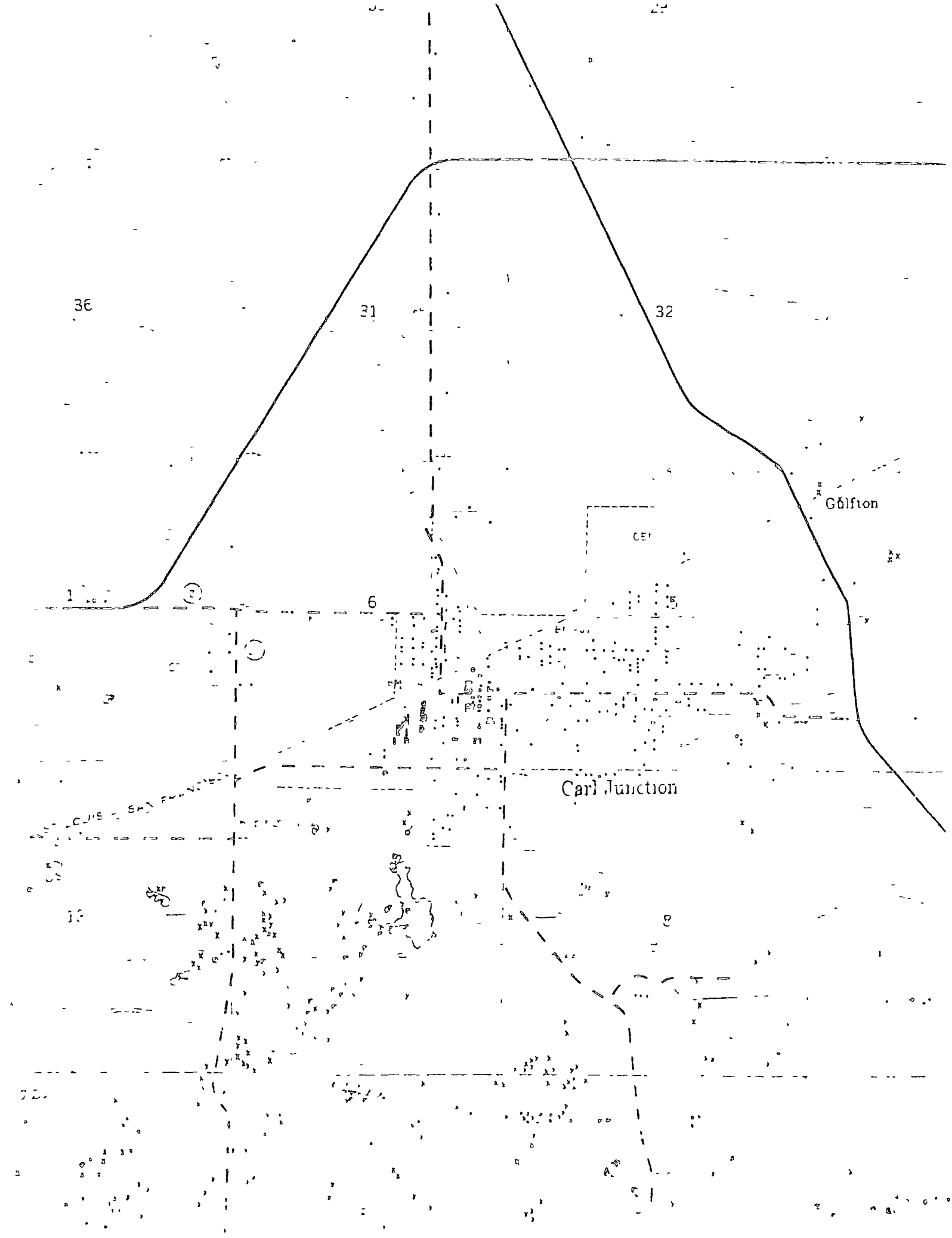
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Carl Junction

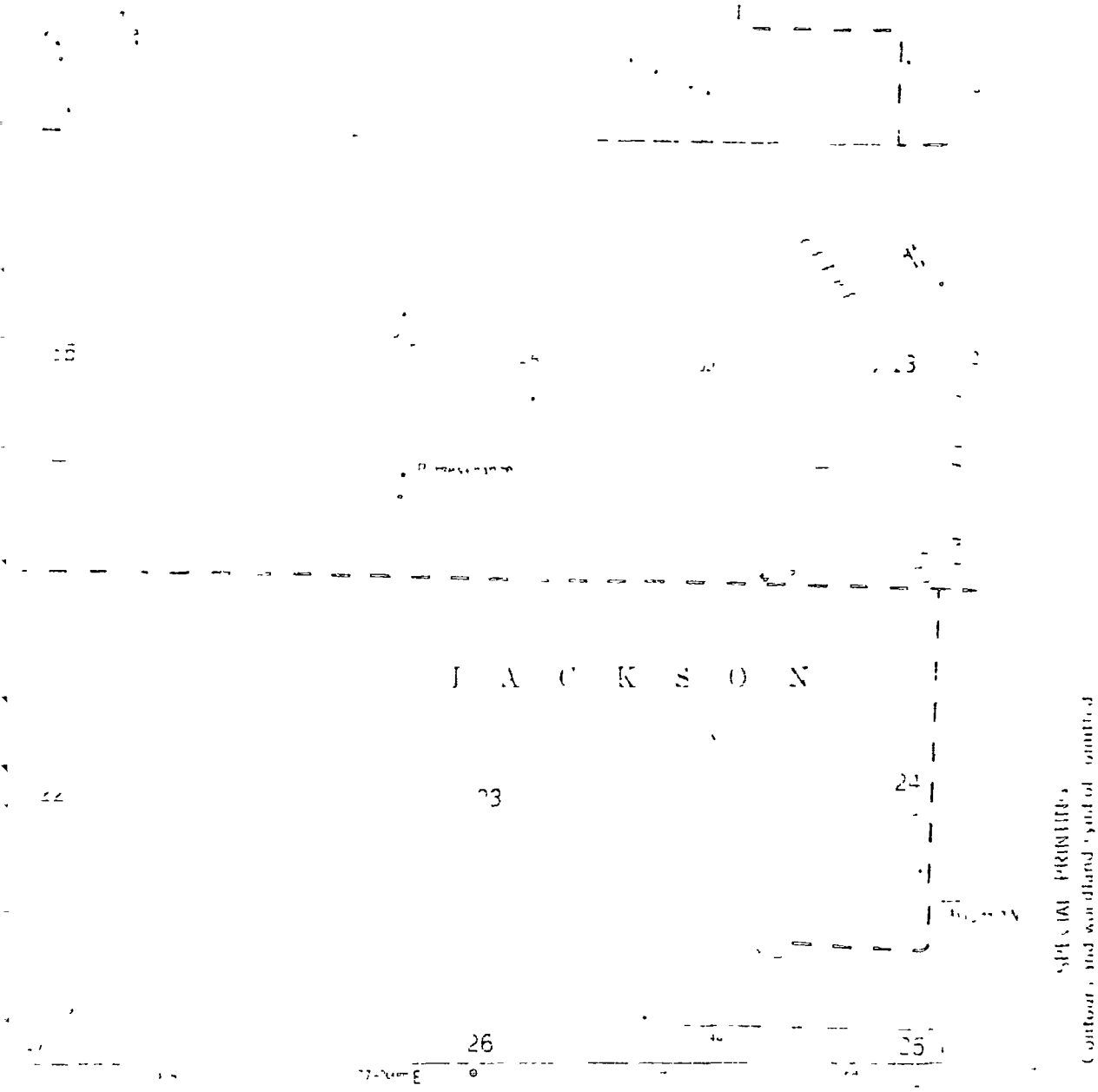

PLATE 1–D: UNDERGROUND MINES AND SHAFTS
WEBB CITY QUADRANGLE, MISSOURI

By Michael C. McFarland, 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO

Prepared under U. S Bureau of Mines
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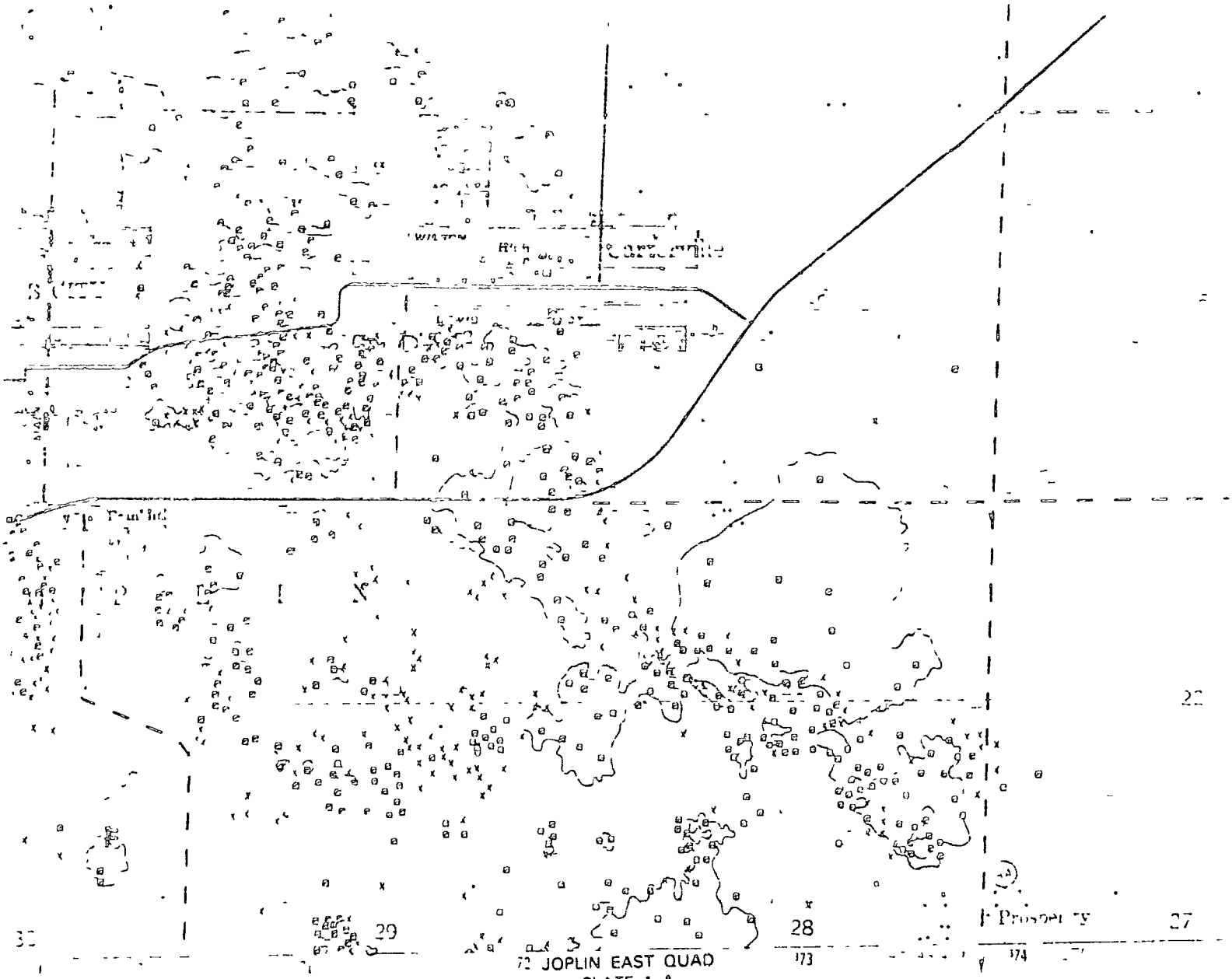

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WEBB CITY QUADRANGLE, 1963
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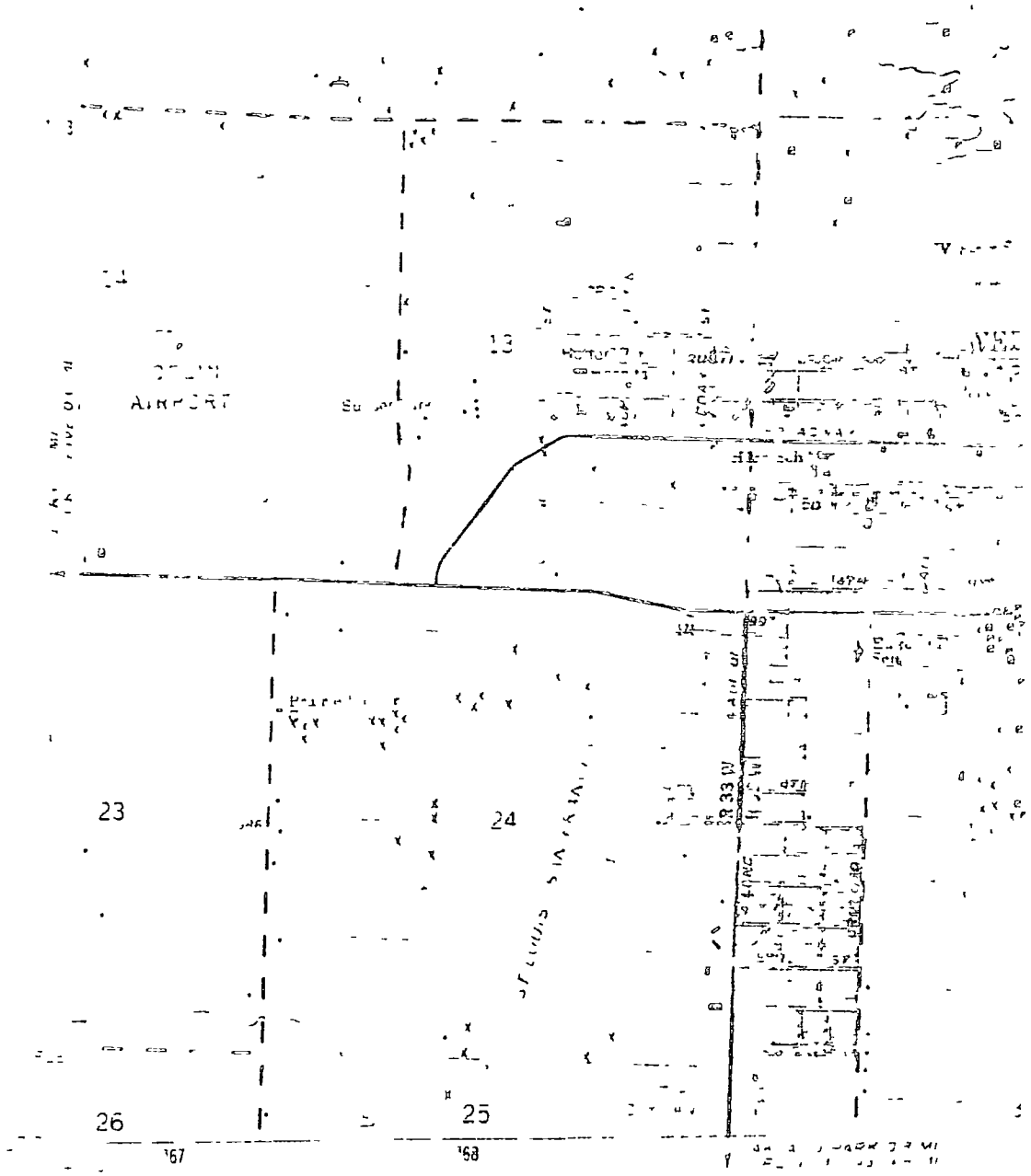

JOPLIN WEST QUAD
PLATE 1-B

LEGEND

Underground Workings

Shaft

Prospect

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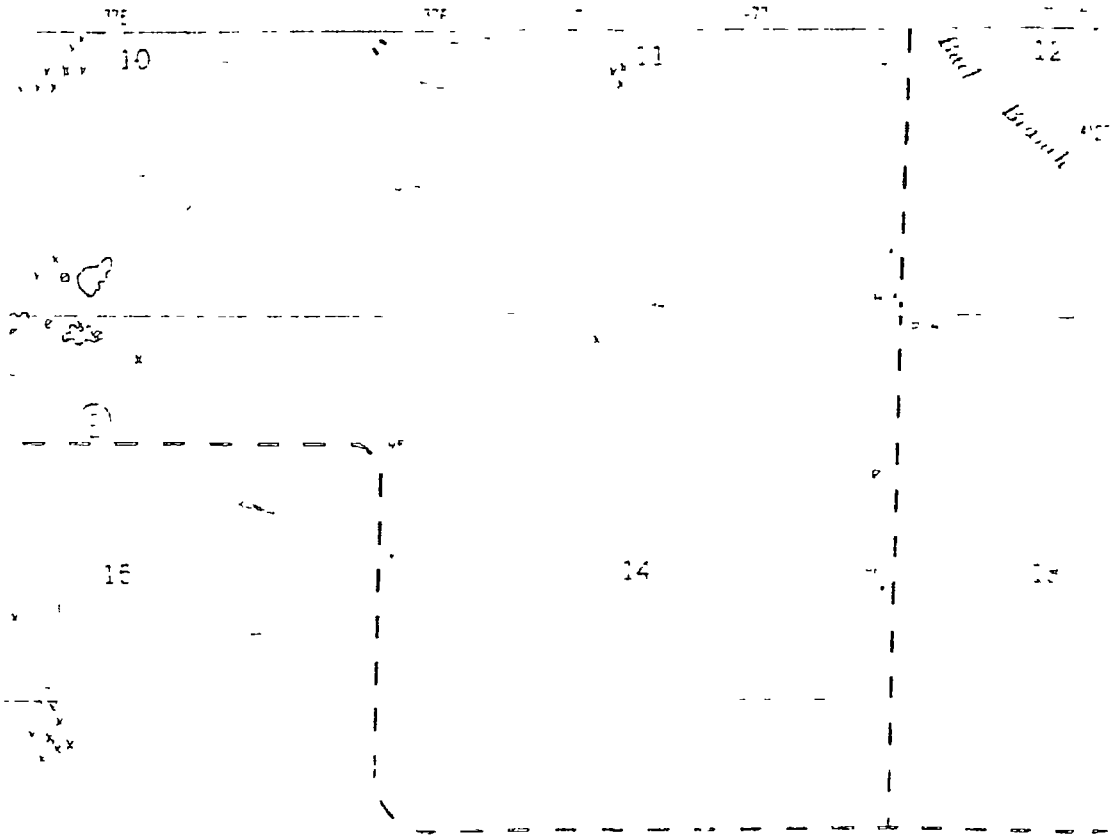
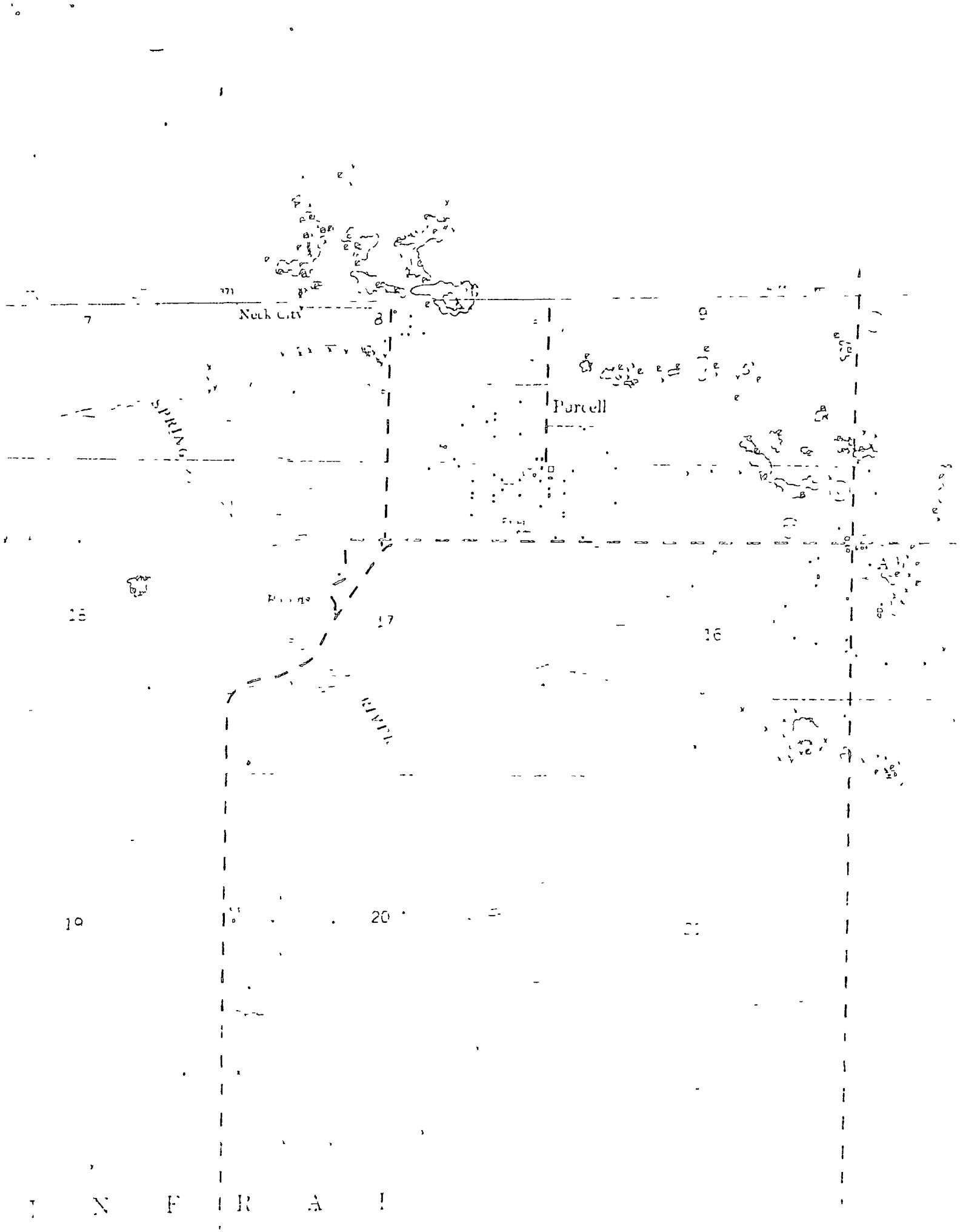
PLATE 1-D: UNDERGROUND MINES AND SHAFTS
WEBB CITY QUADRANGLE, MISSOURI





Neck City
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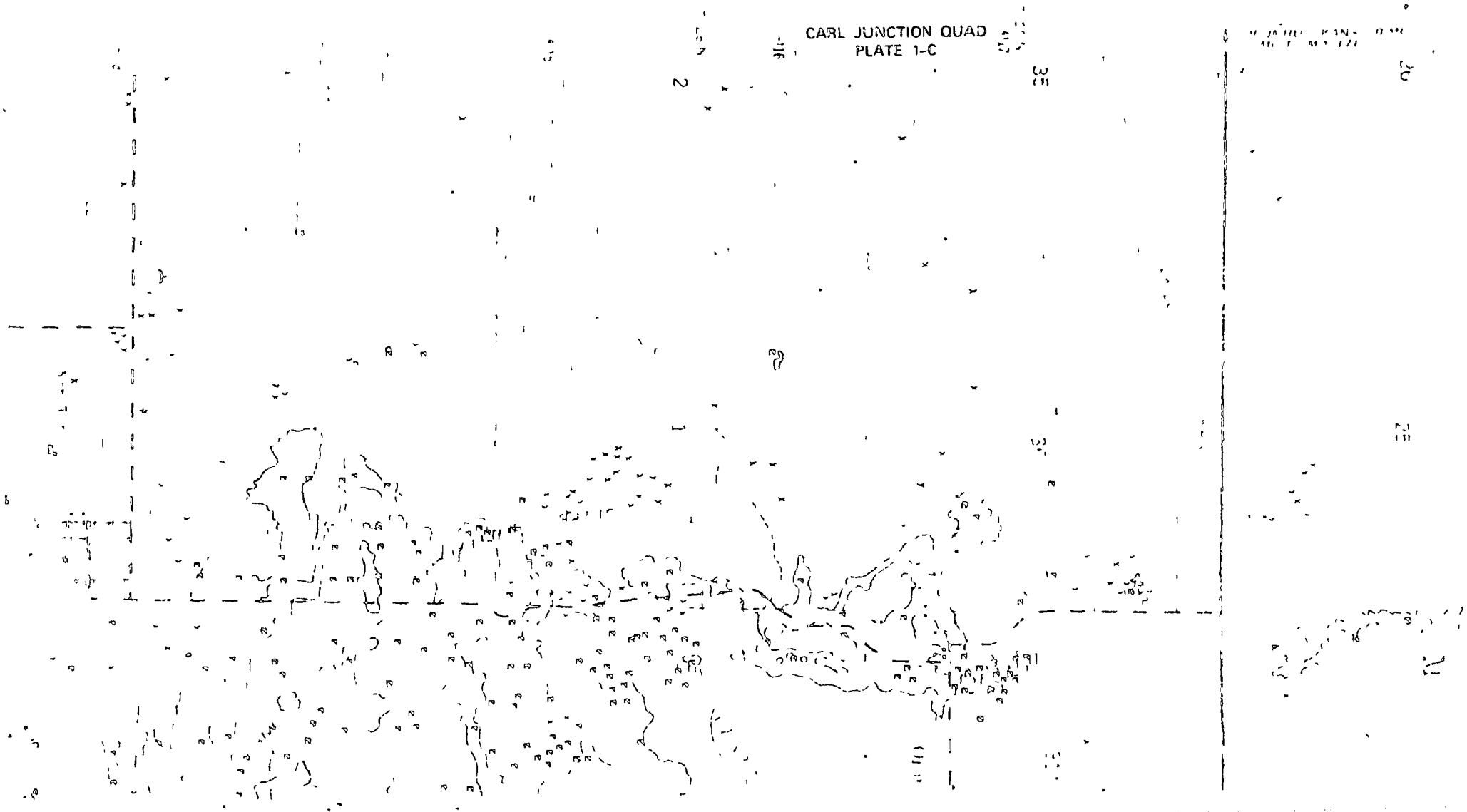
CARL JUNCTION QUAD
PLATE 1-C



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M A R I O N

PIPE_LINE

PLATE 3–A: MINE & MILL WASTE (PILES & PONDS)
JOPLIN EAST QUADRANGLE, MISSOURI

by James C Brown Jr., 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO

Prepared under U S. Bureau of Mines
Contract Number J0100132

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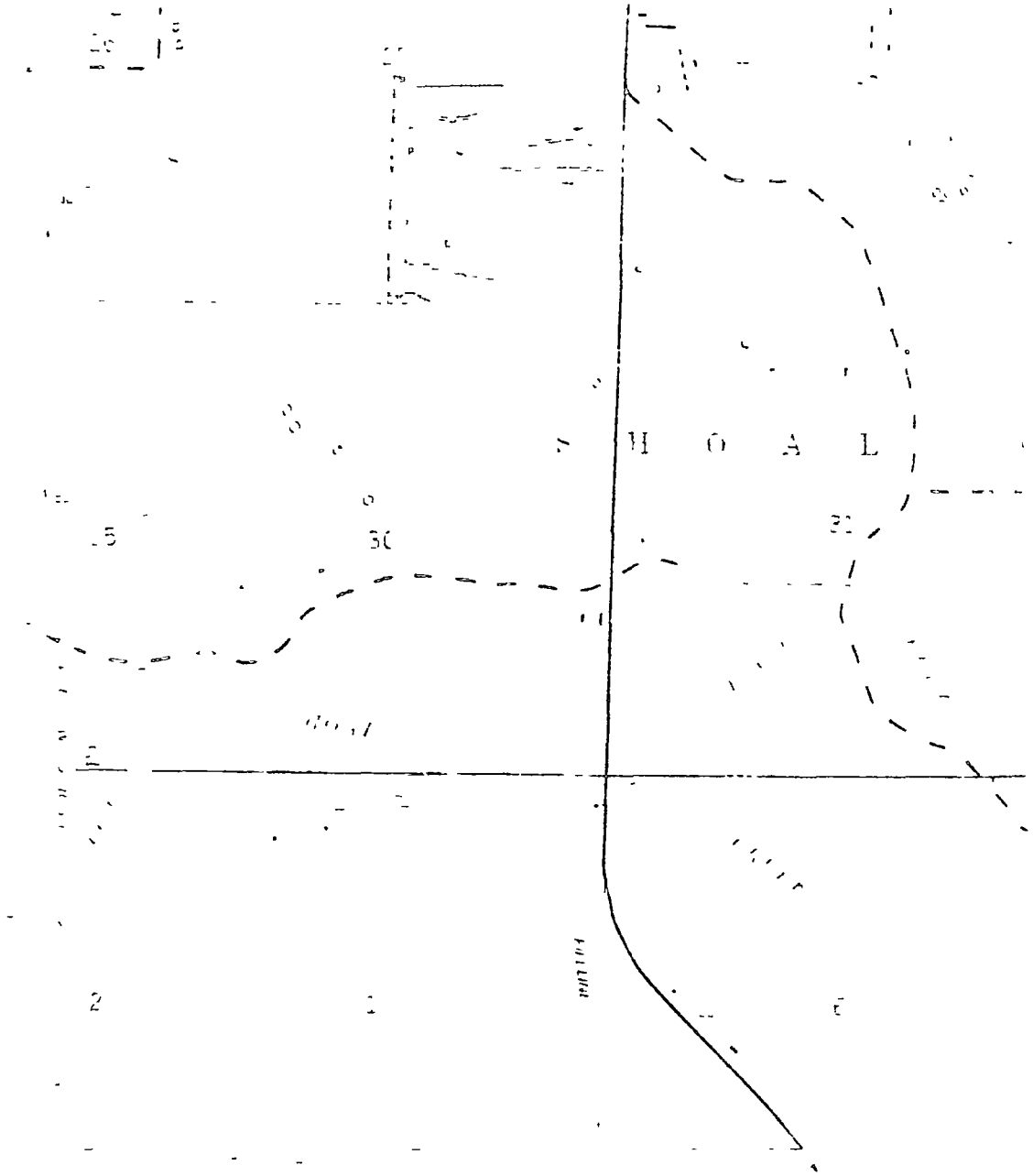
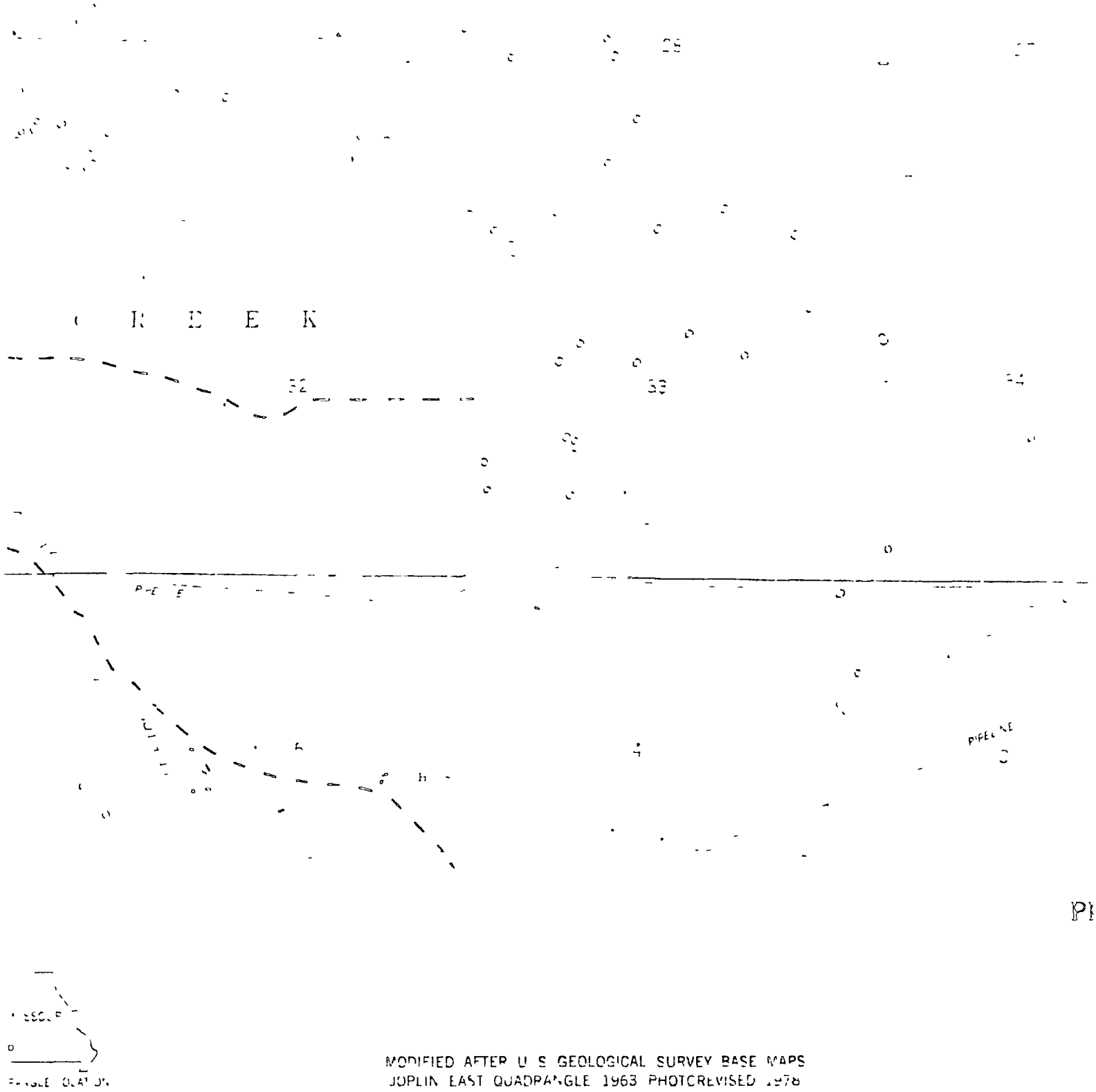


LEGEND

Waste Pile, Existing

Waste Pile, Former

Tailings Pond



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JOPLIN EAST QUADRANGLE 1963 PHOTOREVISED 1978
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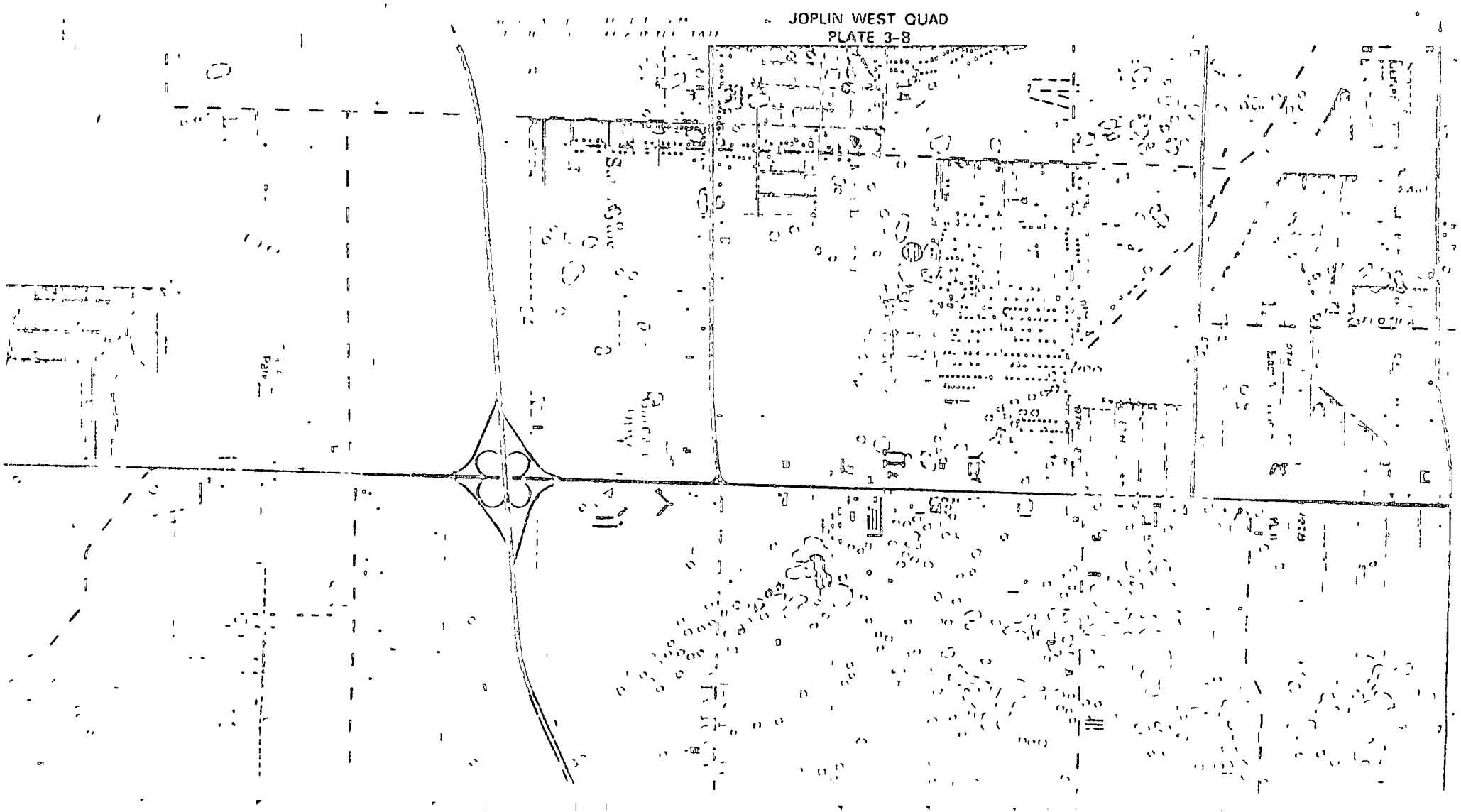
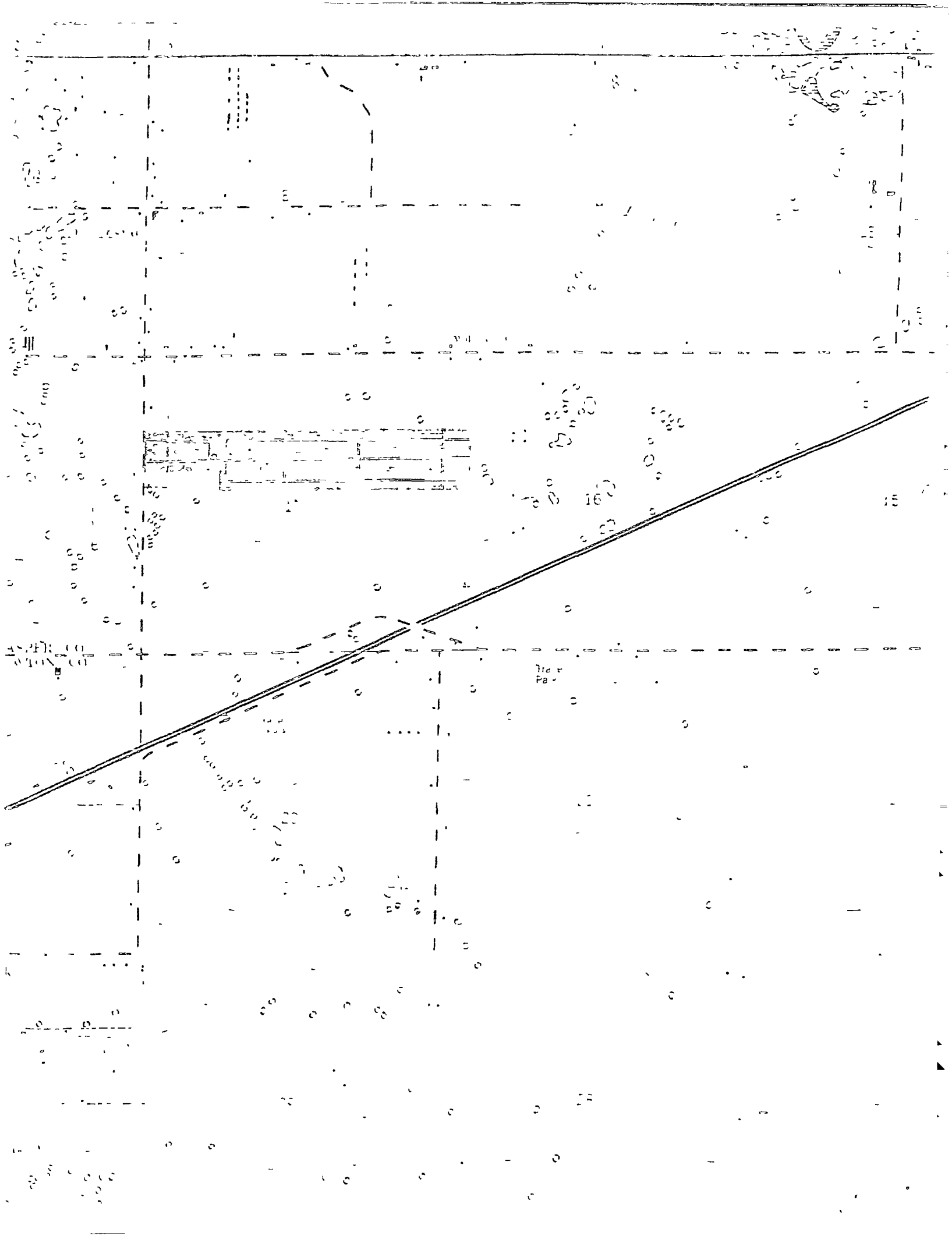
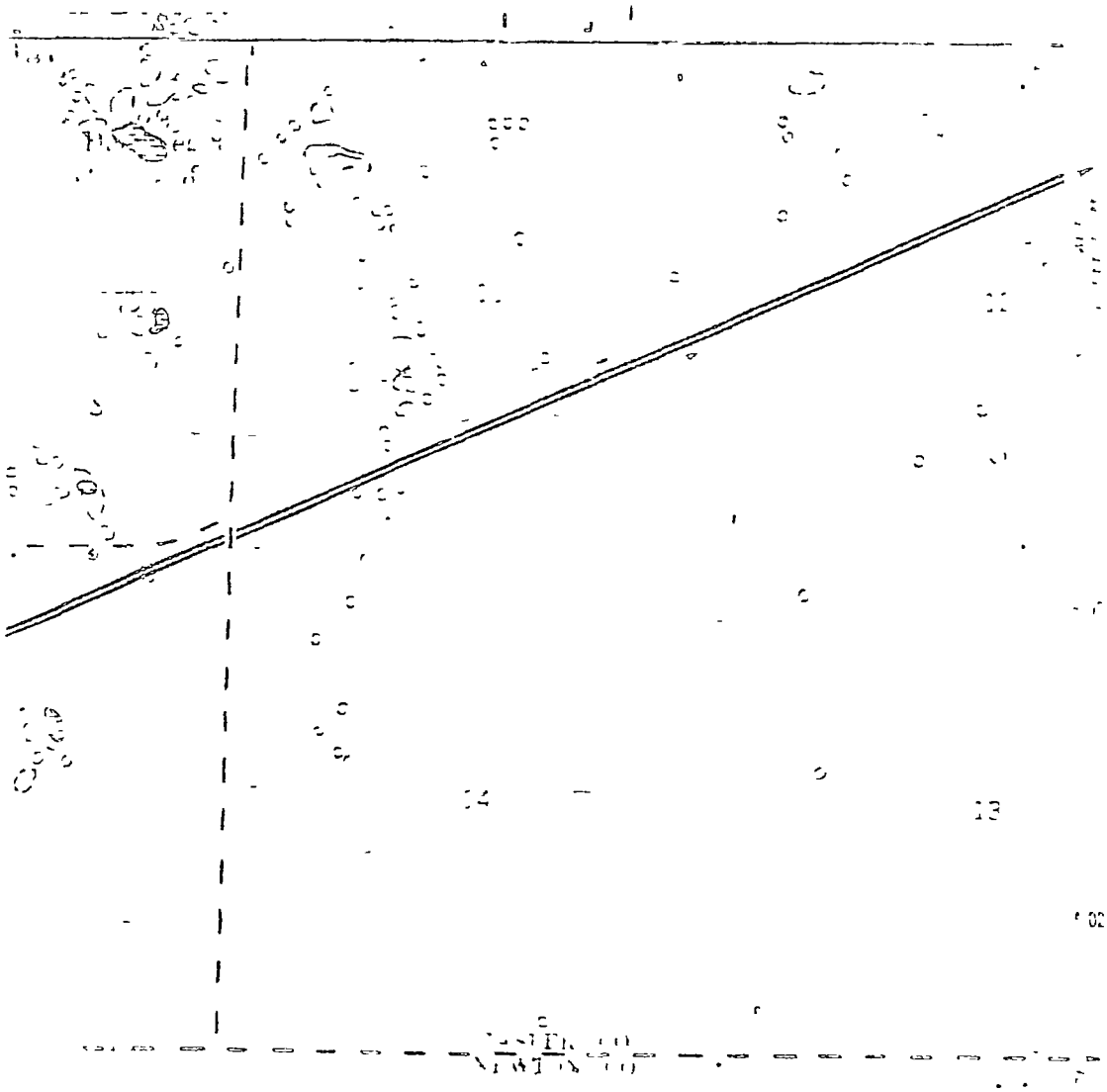
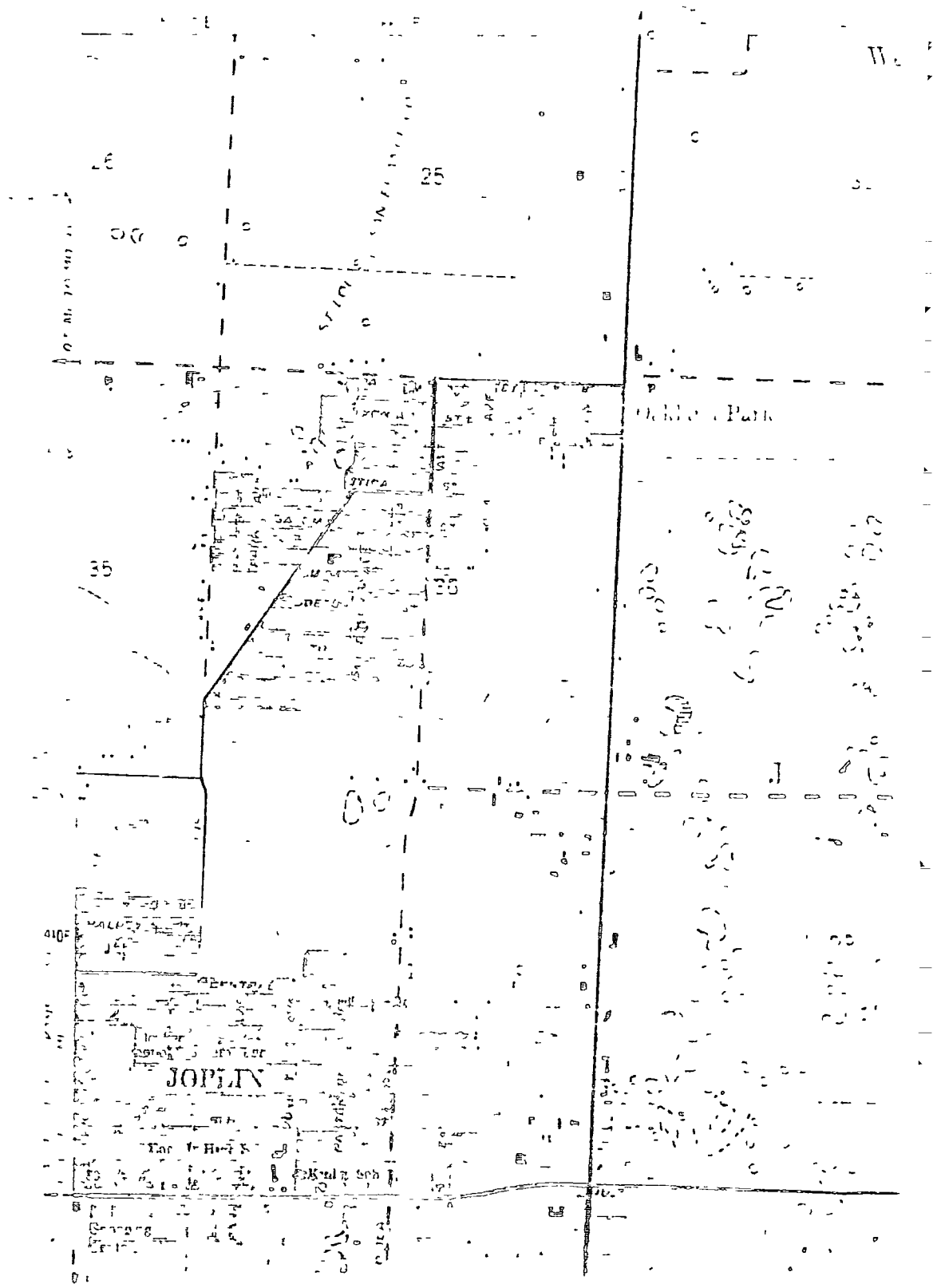
JOPLIN WEST QUAD
PLATE 3-8







CARL JUNCTION QUAD
PLATE 3-C



WEBB CITY QUAD
PLATE 3-D

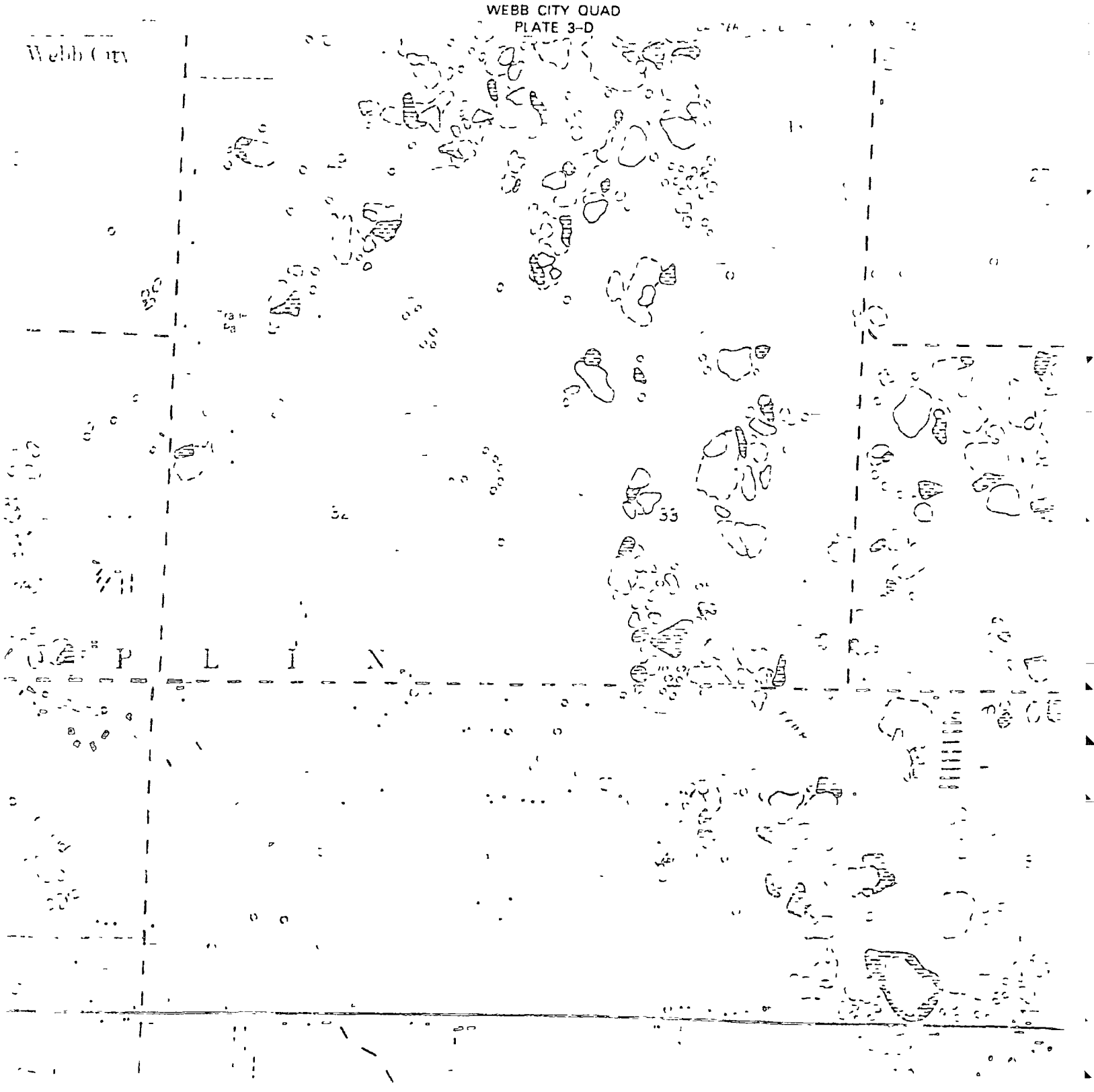


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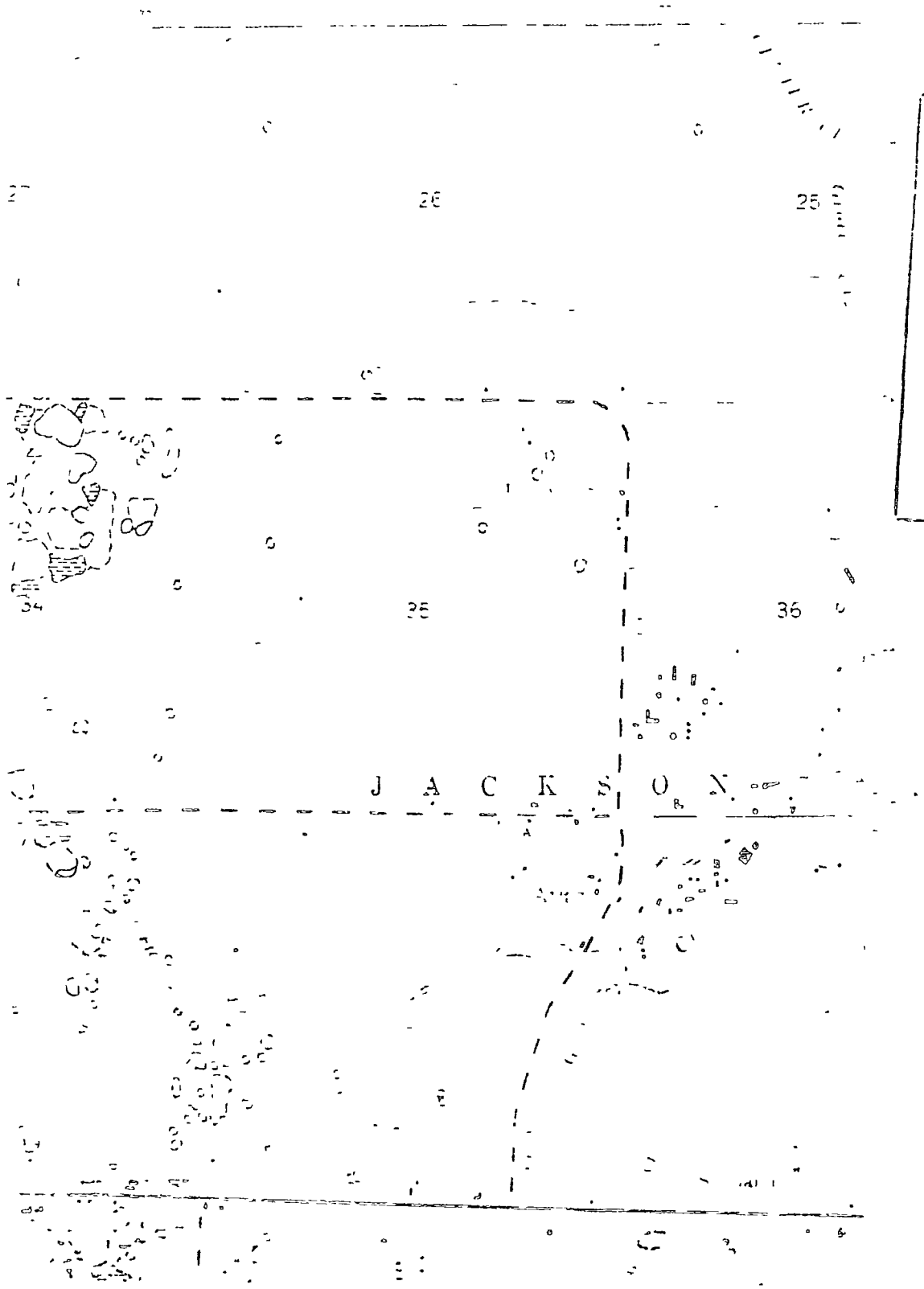
PLATE 3-A· MINE & MILL WASTE (PILES & PONDS)
JOPLIN EAST QUADRANGLE, MISSOURI



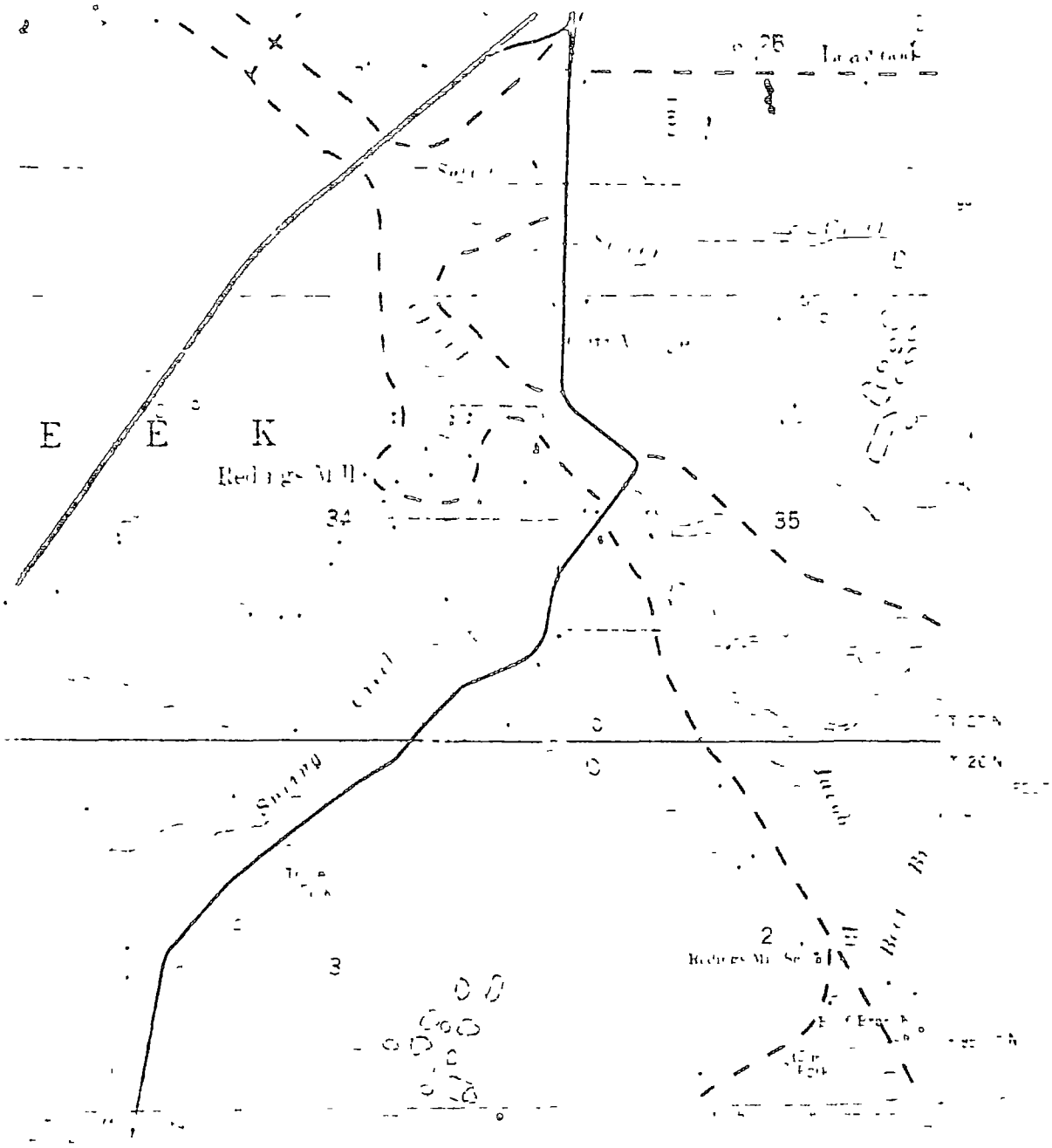
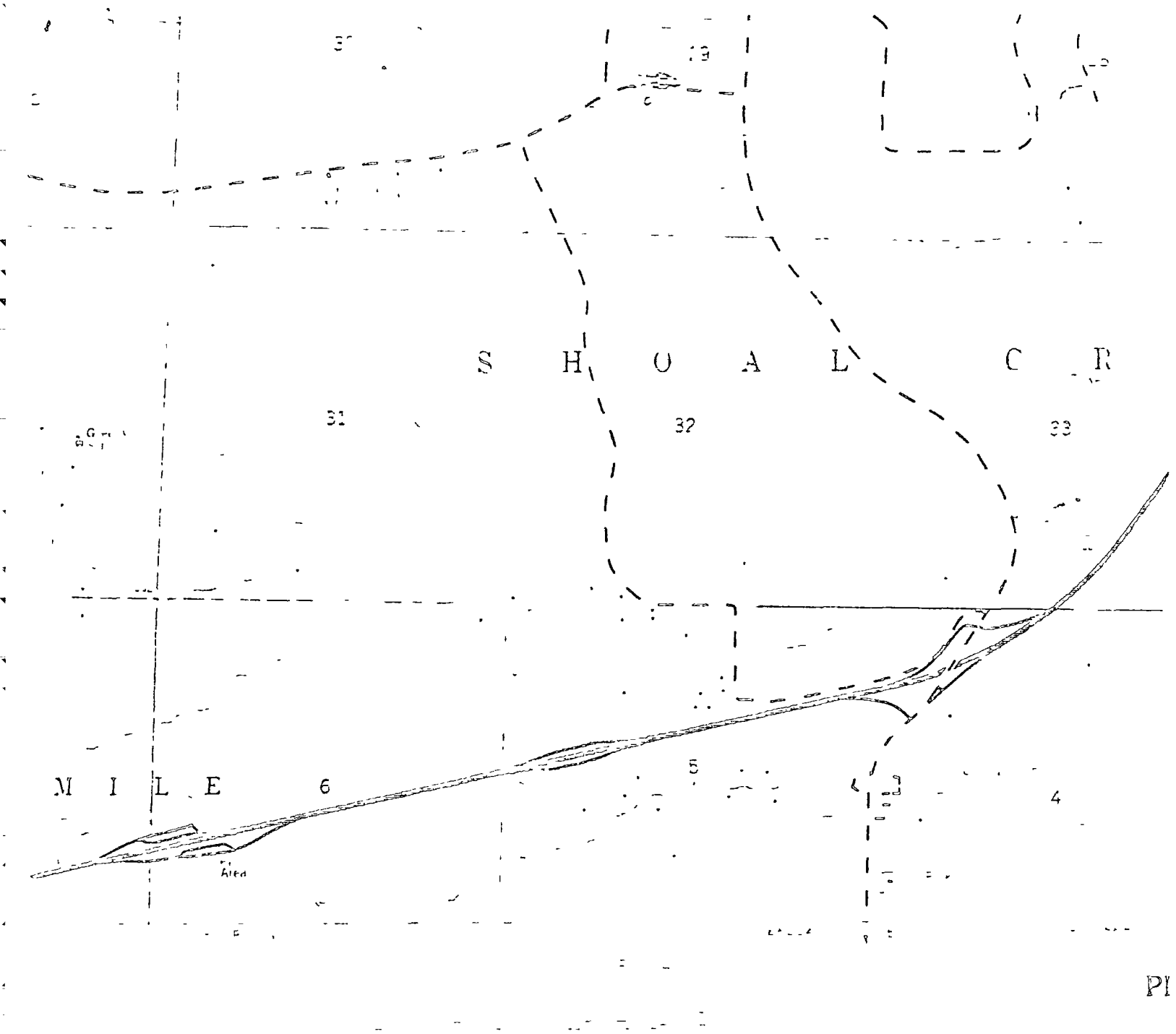


PLATE 3–B: MINE & MILL WASTE (PILES & PONDS)
JOPLIN WEST QUADRANGLE, MISSOURI

by James C. Brown Jr., 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
Prepared under U S Bureau of Mines
Contract Number J0100132



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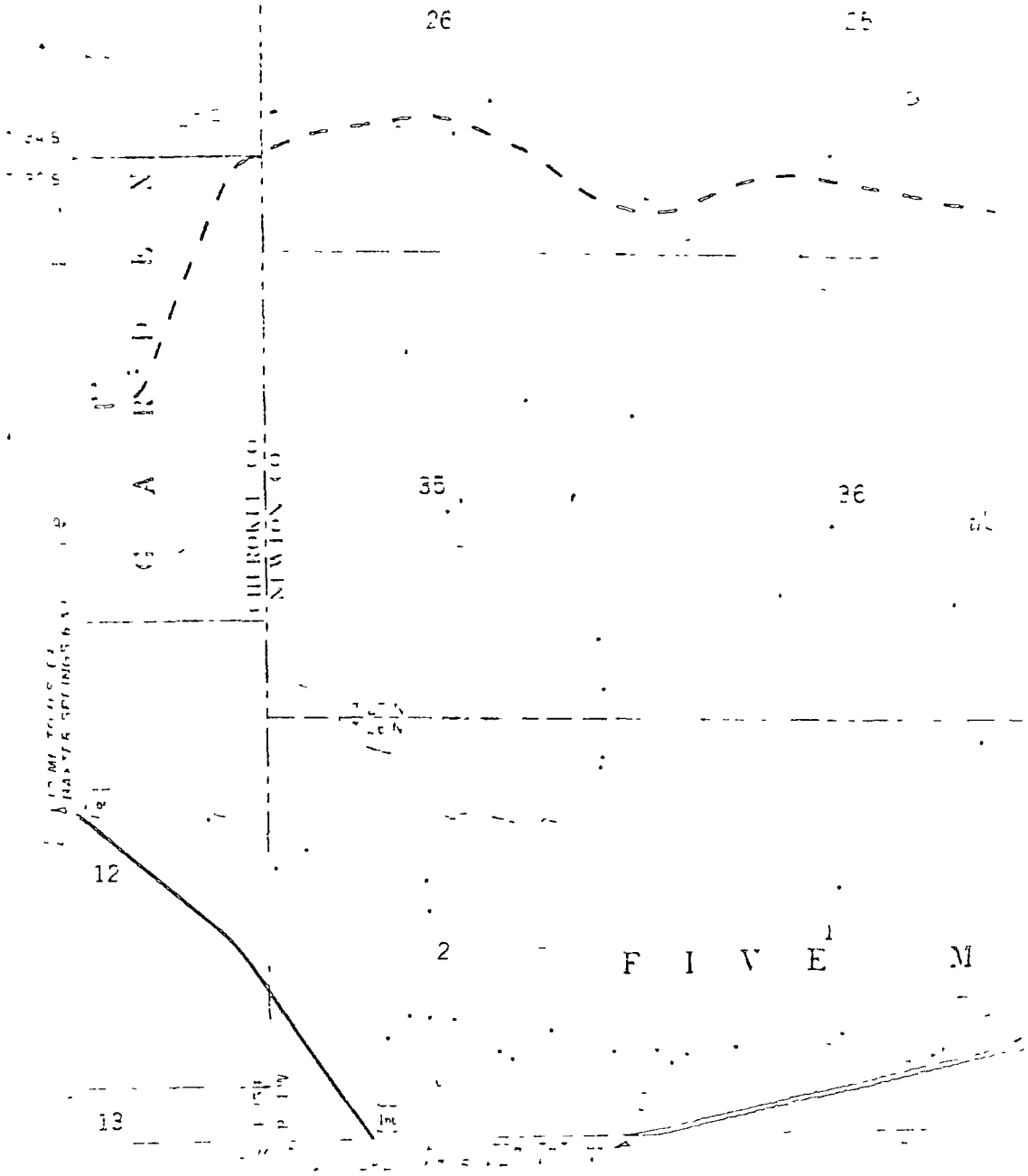
SSOURI

GLE LOCATION

MODIFIED AFTER U S GEOLOGICAL SURVEY BASE MAPS
JOPLIN WEST QUADRANGLE 1962 PHOTOREVISED 1975
DRAFTED BY SUSAN C DUNN 1982

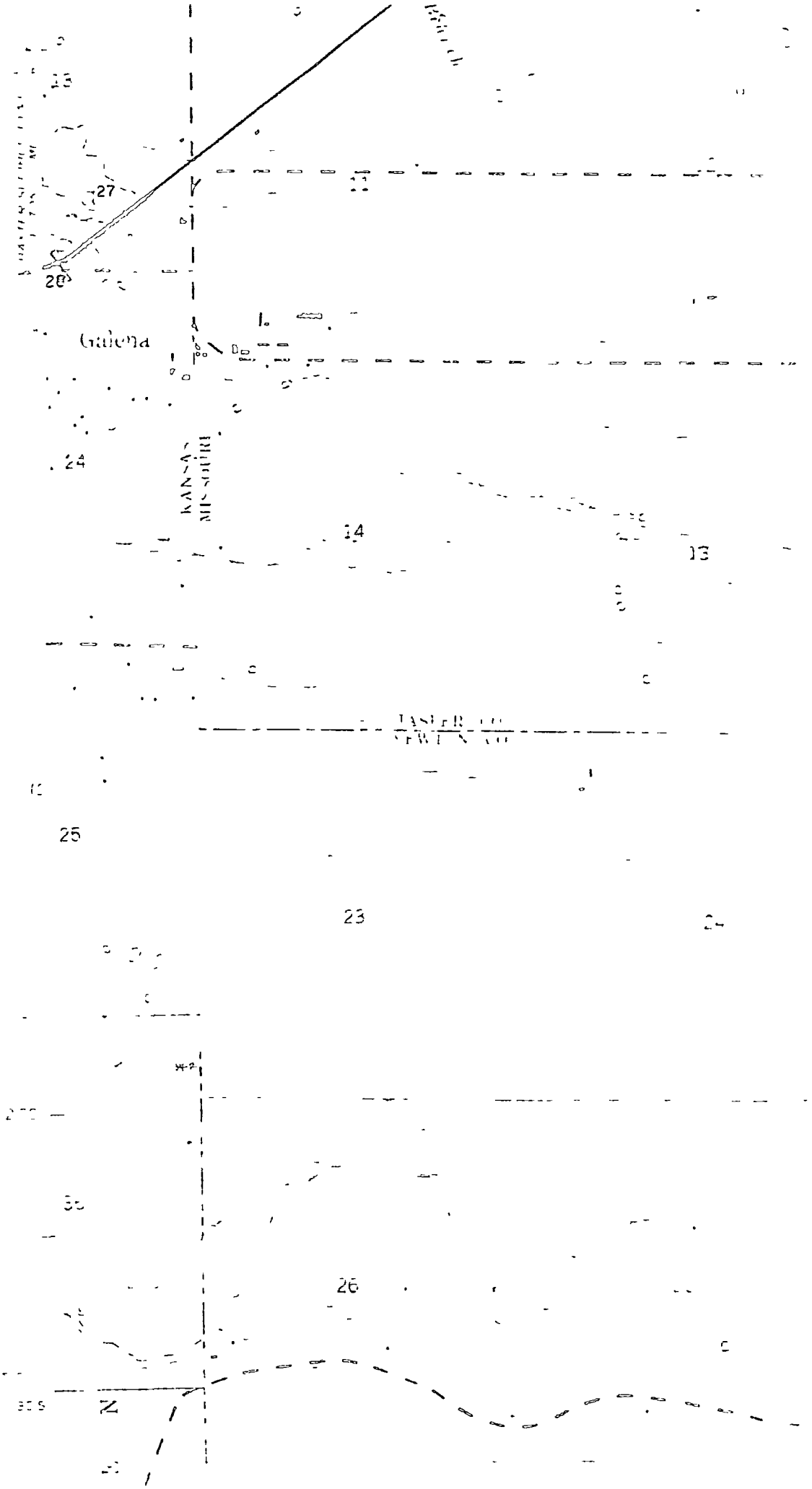


LEGEND

Waste Pile, Existing

Waste Pile Former

Tailings Pond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Galena
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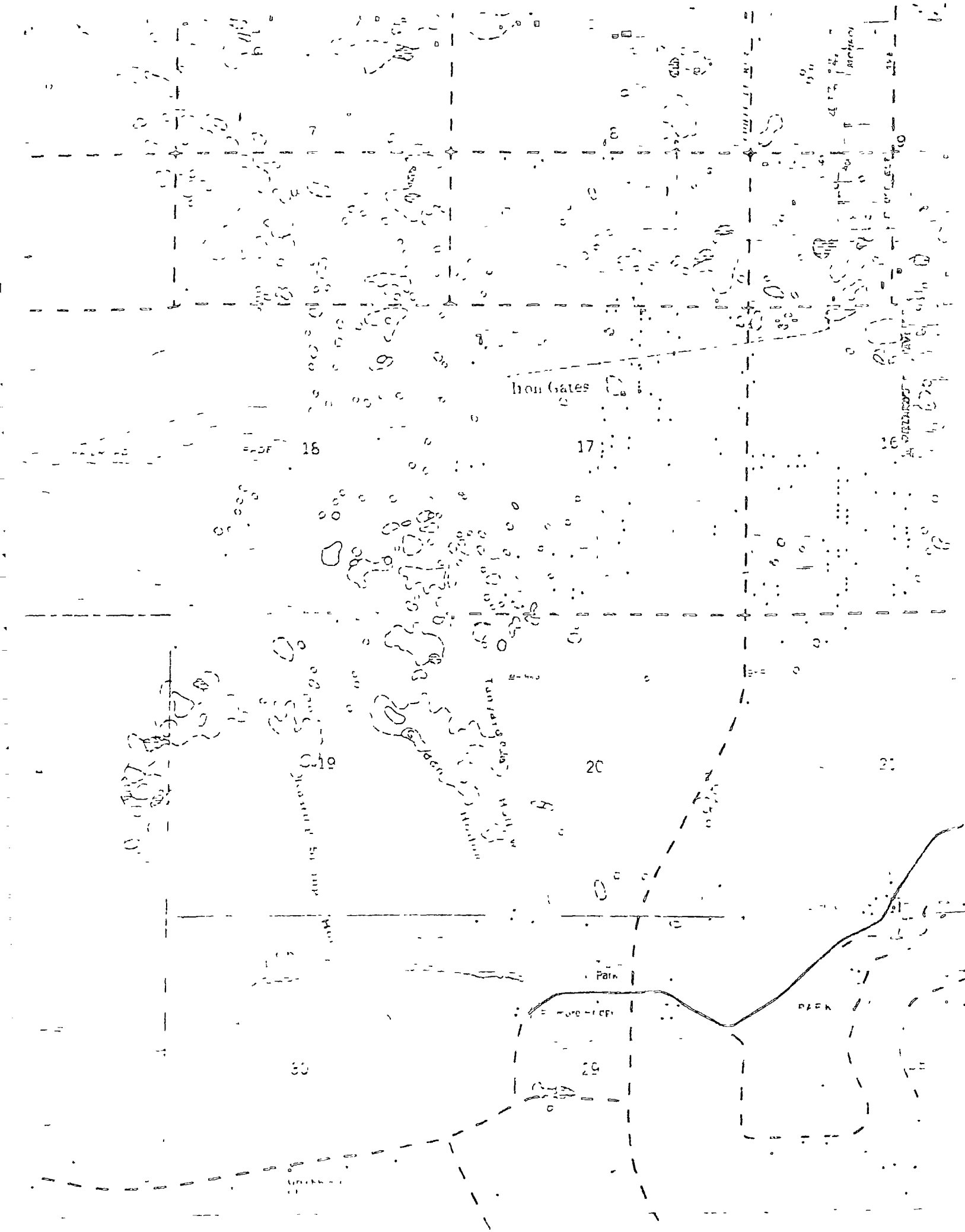
Iron Gates
18
17
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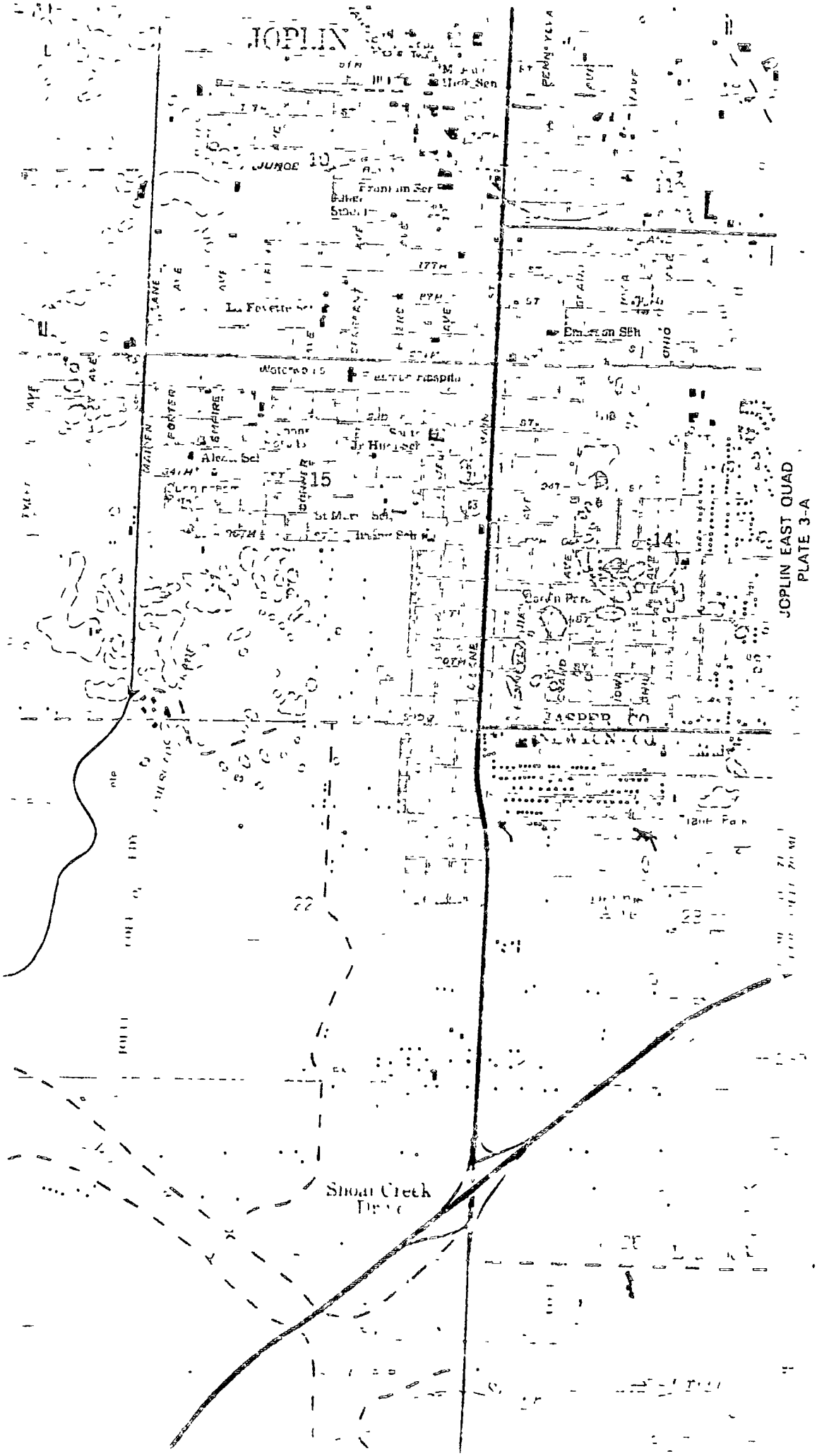
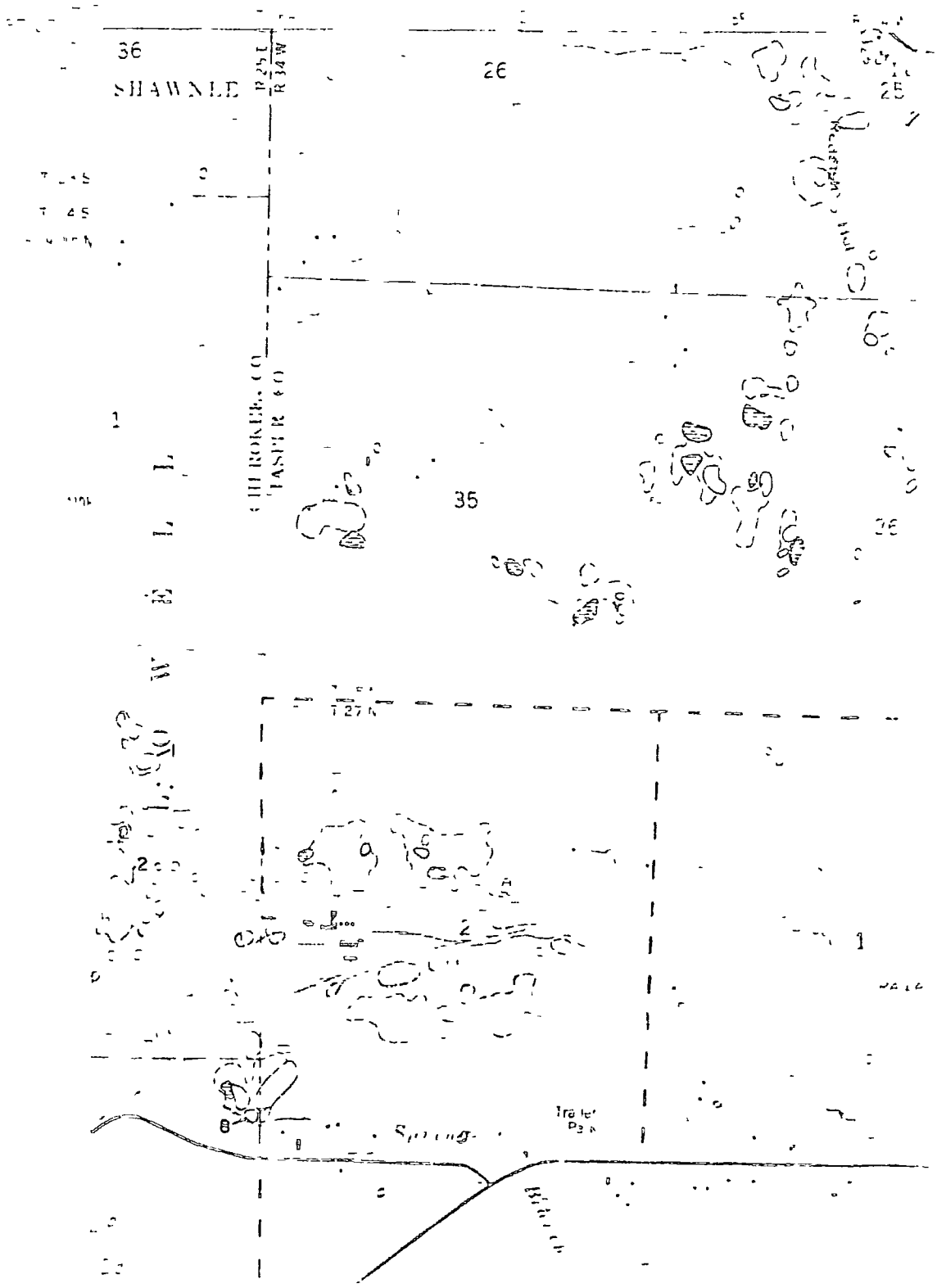
29
Park
PARK



JOPLIN EAST QUAD
PLATE 3-A


36
SHAWNEE
26
25
35
T 27 N
Trailer Park

CARL JUNCTION QUAD
PLATE 3-C

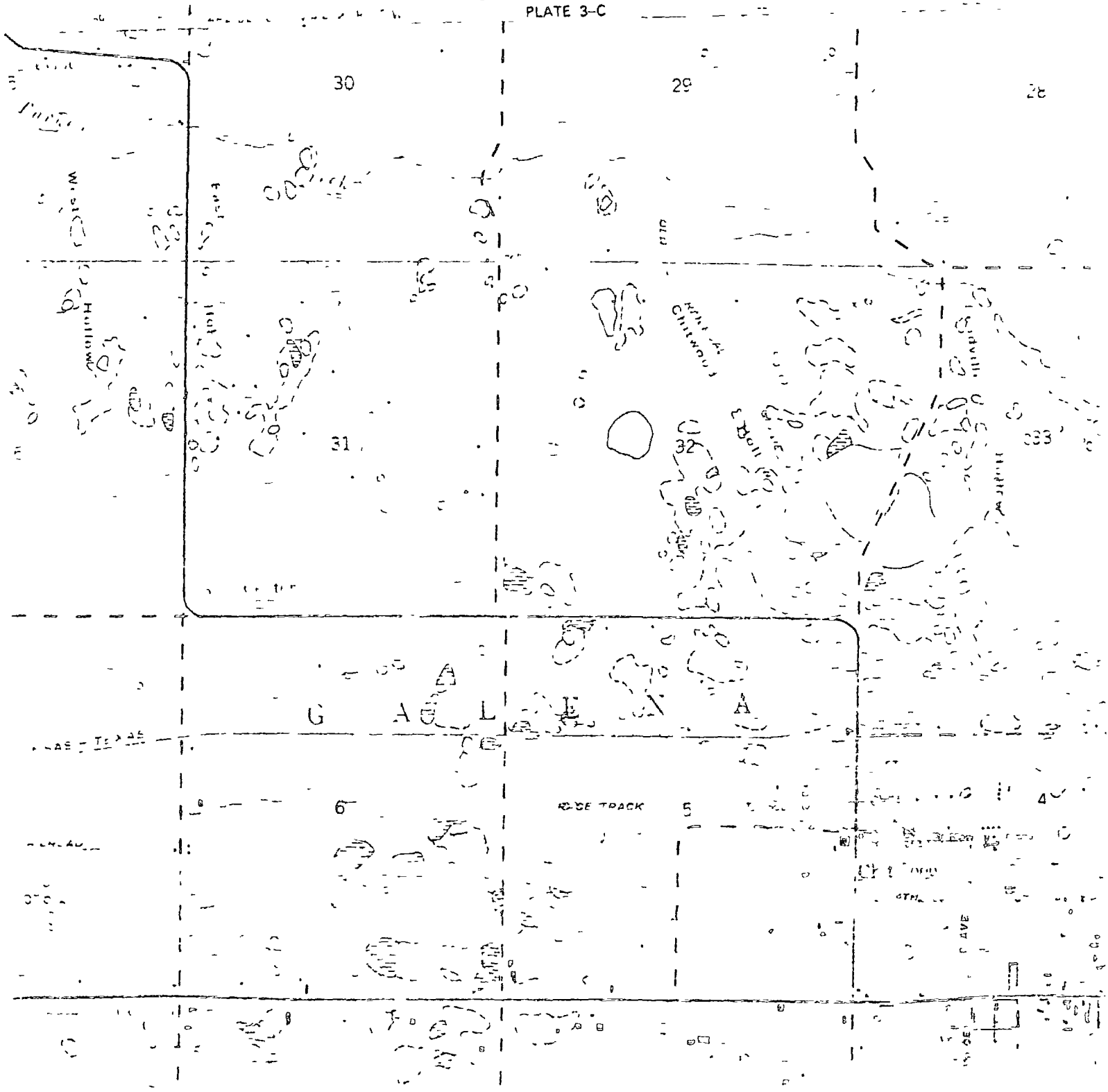


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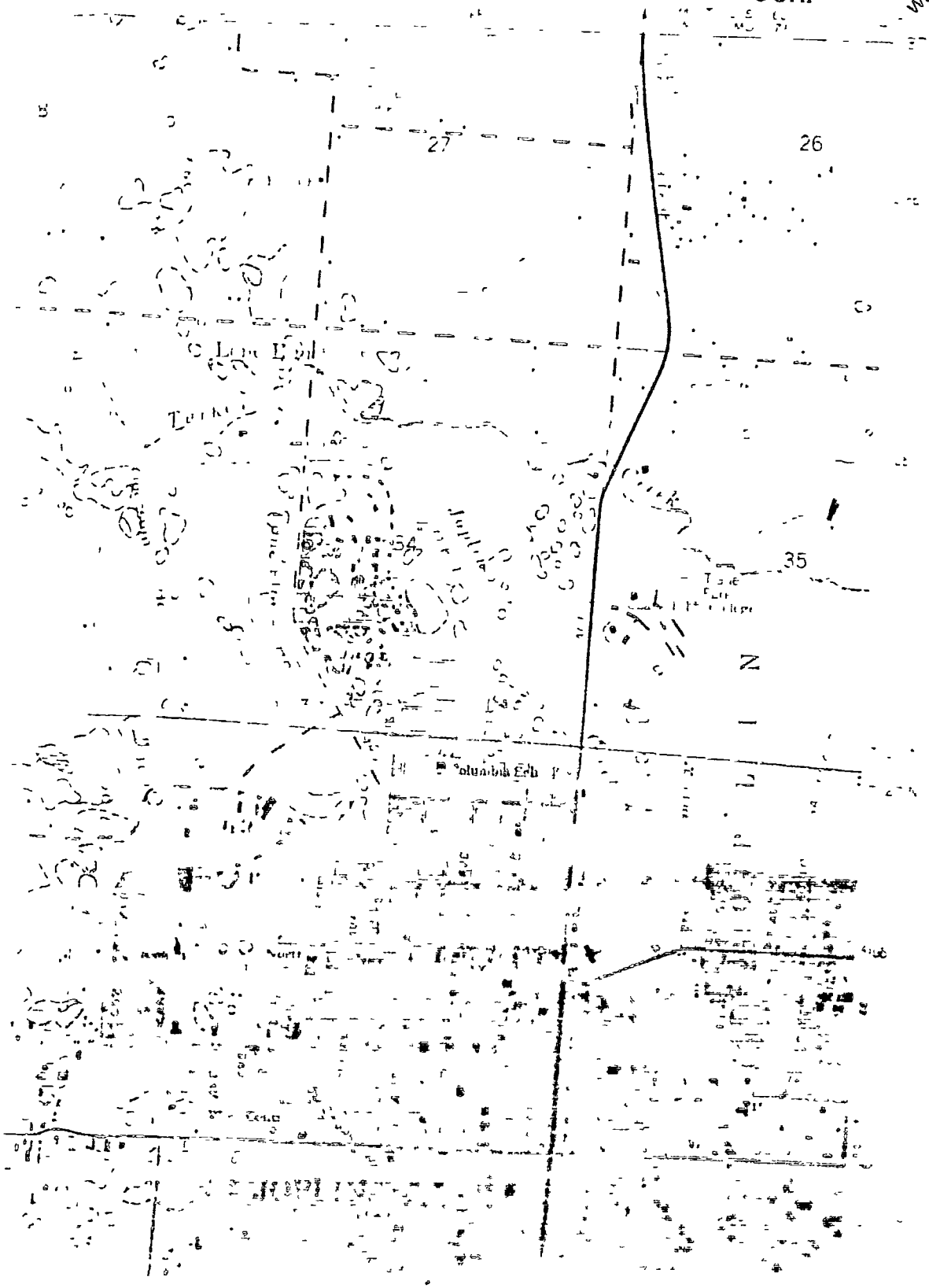
PLATE 3-B: MINE & MILL WASTE (PILES & PONDS)
JOPLIN WEST QUADRANGLE MISSOURI

WEBB CITY QUAD
PLATE 3-D



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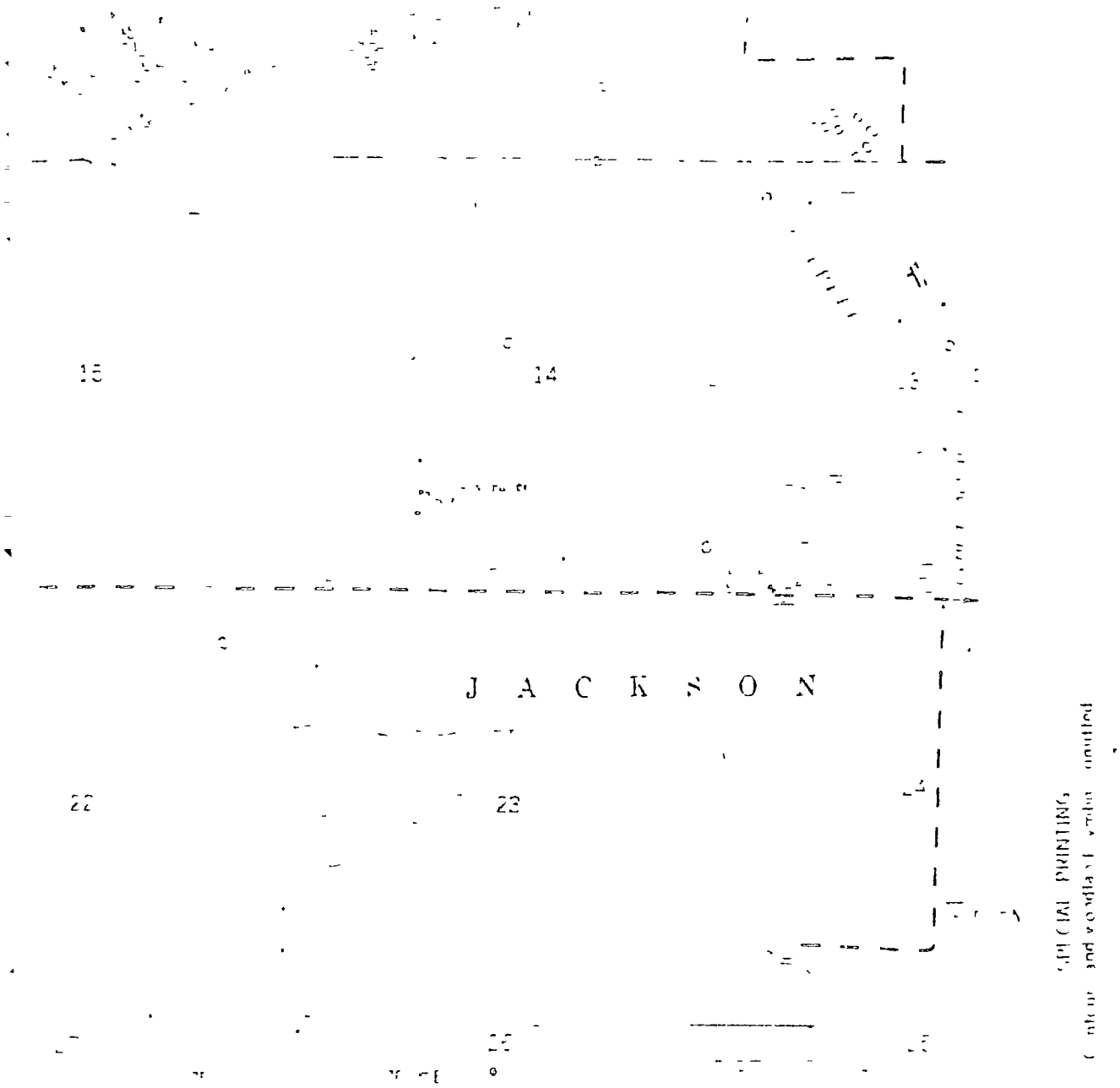

PLATE 3–D: MINE & MILL WASTE (PILES & PONDS)
WEBB CITY QUADRANGLE, MISSOURI

by James C. Brown Jr., 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
Prepared under U S Bureau of Mines
Contract Number J0100132

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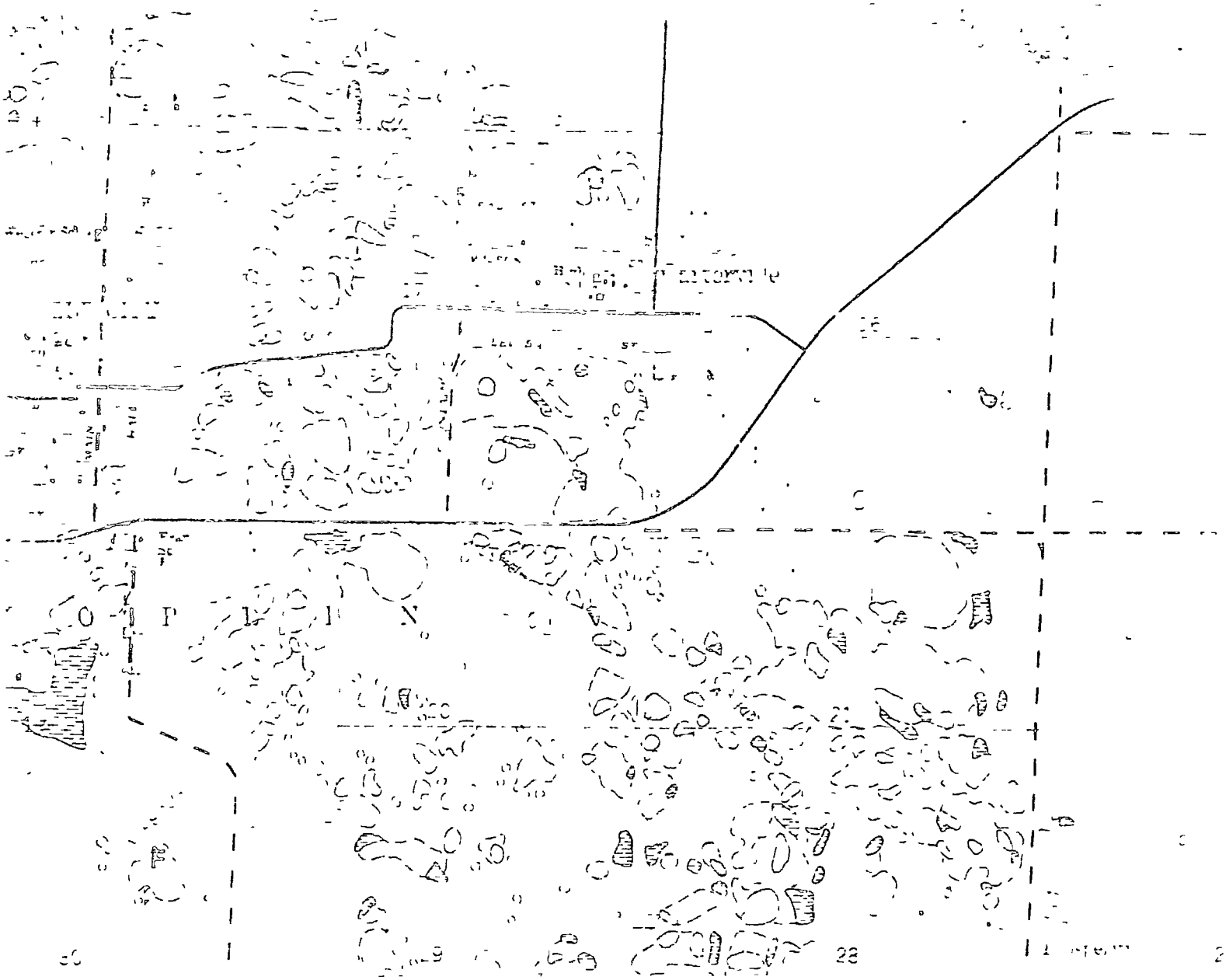

JOPLIN EAST QUAD
PLATE 3-A

PLA

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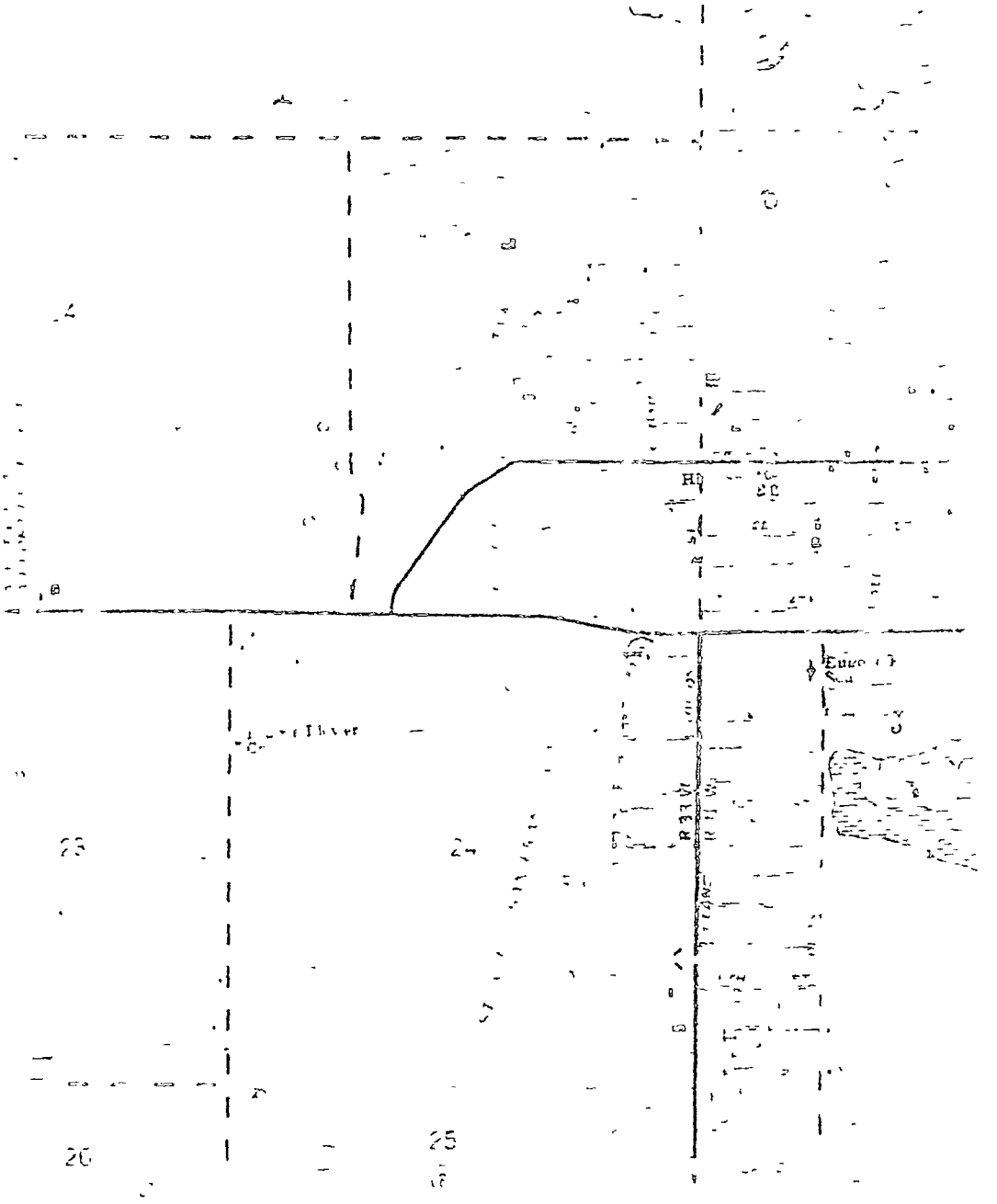
WEBB CITY QUADRANGLE, 1963
DRAFTED BY SUSAN C DUNN 1982



JOPLIN WEST QUAD
PLATE 3-B

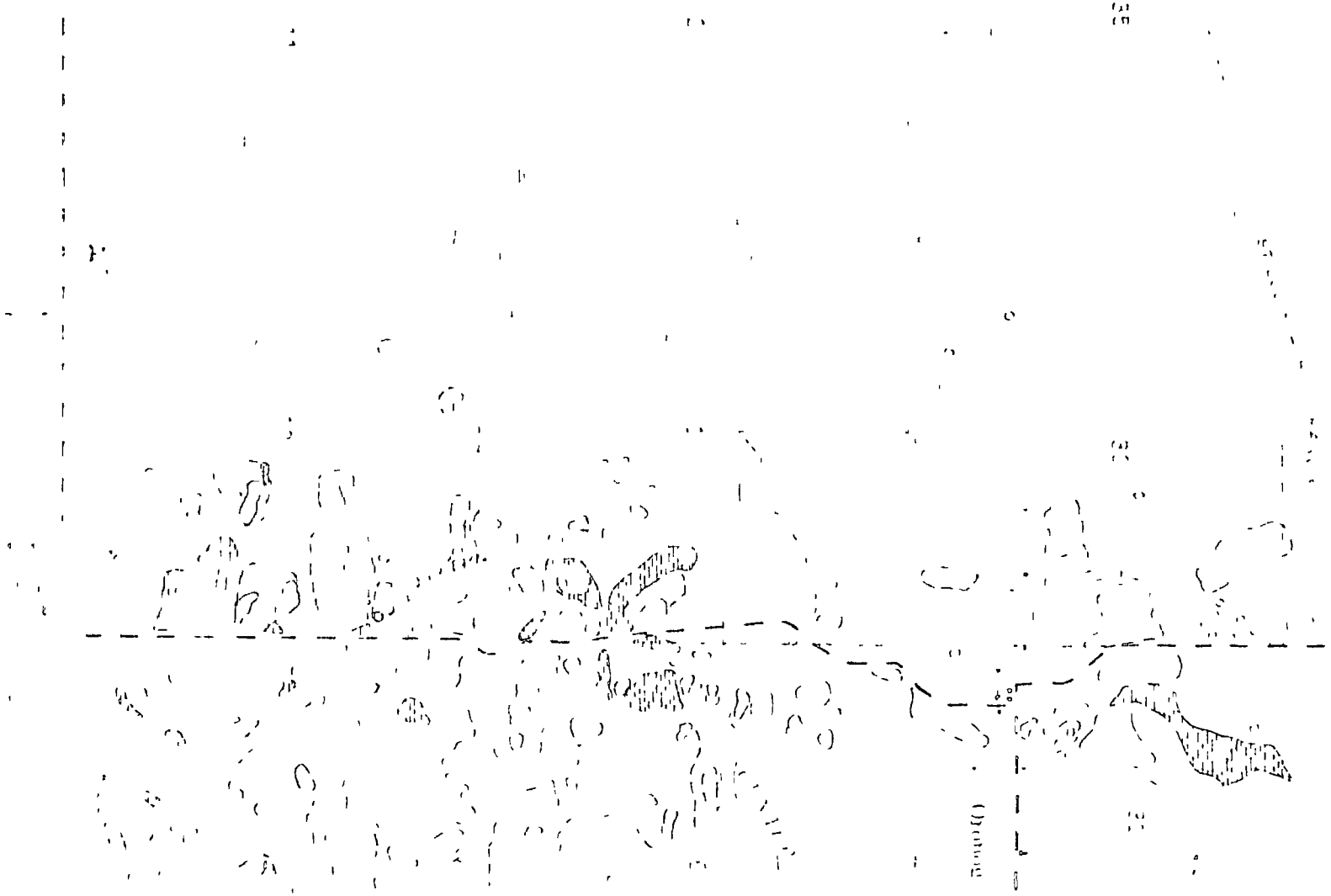
LEGEND

Waste Pile Existing

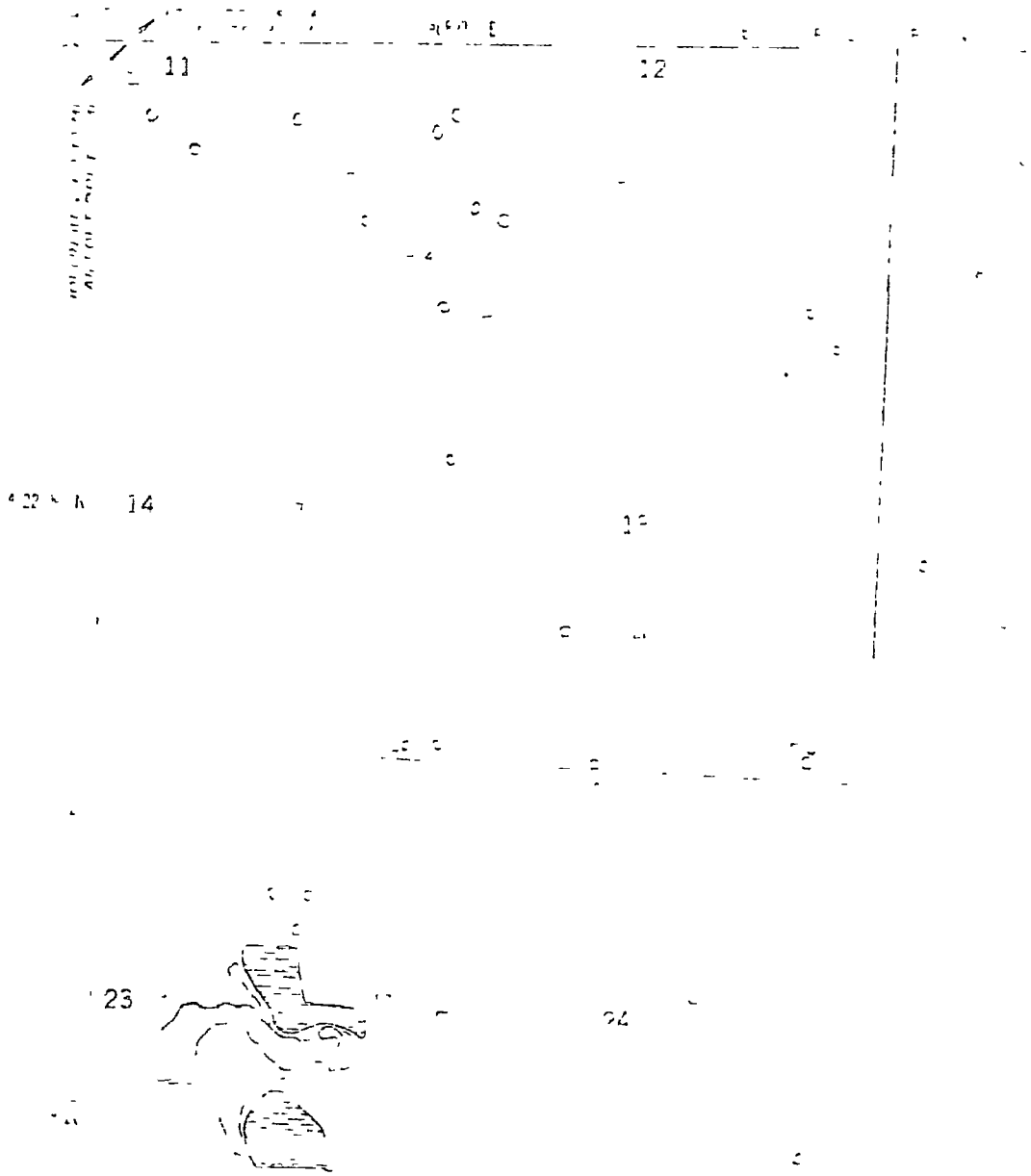
Waste Pile, Former

Tailings Pond

CARL JUNCTION QUAD
PLATE 3-C



I N E R A L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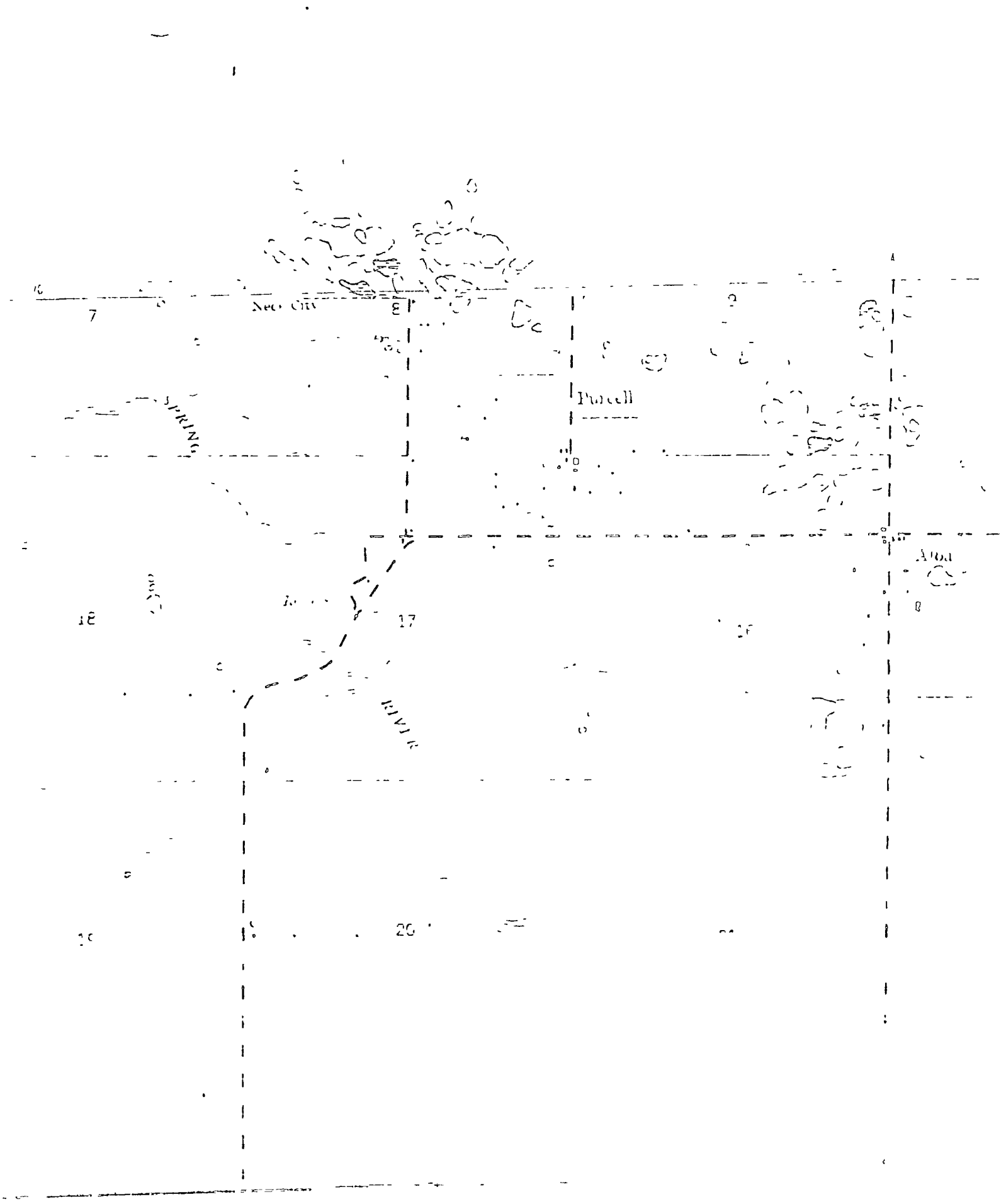

Purcell
SPRING
RIVER
7
8
17
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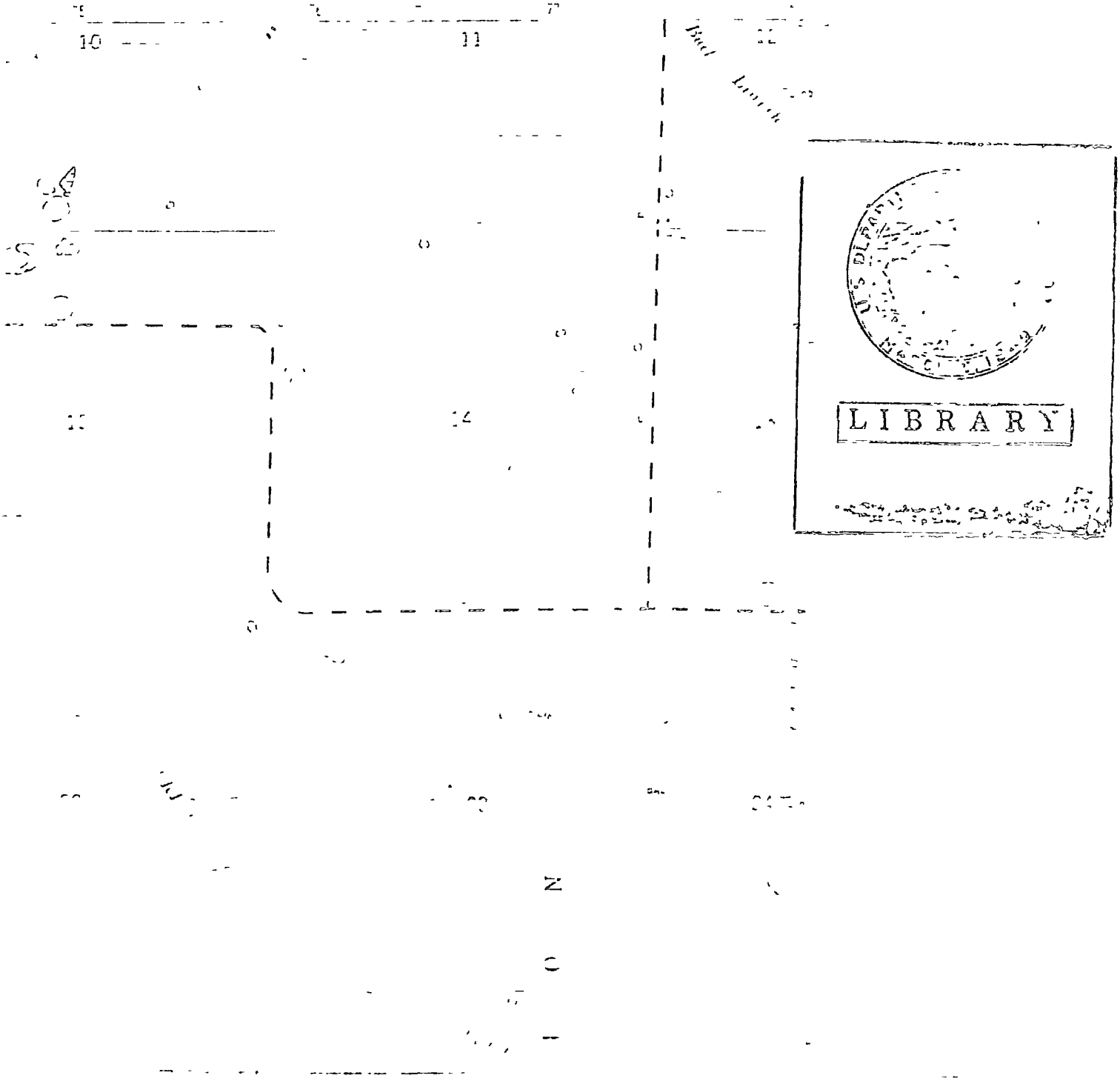
PLATE 3-D. MINE & MILL WASTE (PILES & PONDS)
WEBB CITY QUADRANGLE MISSOURI



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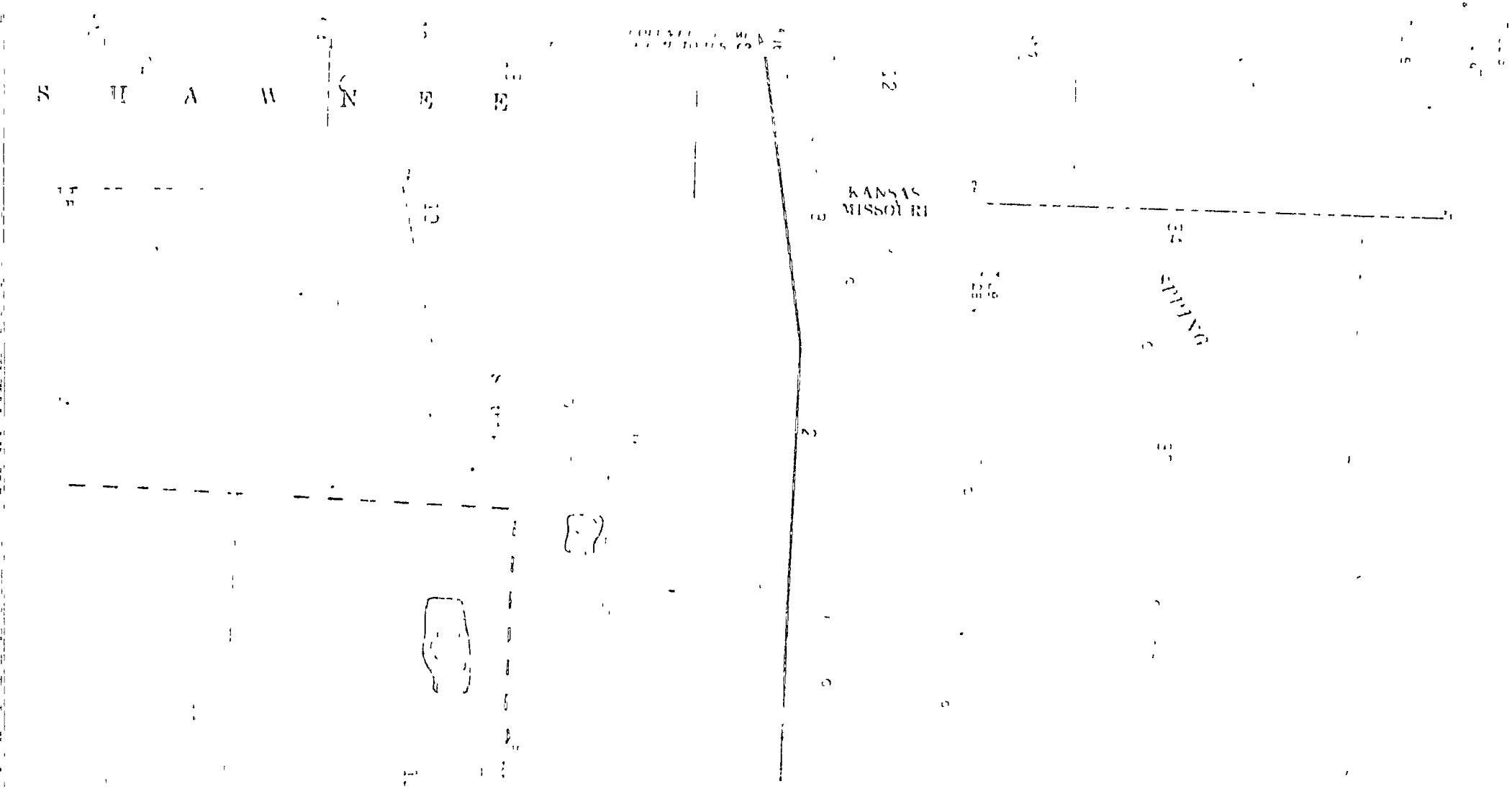
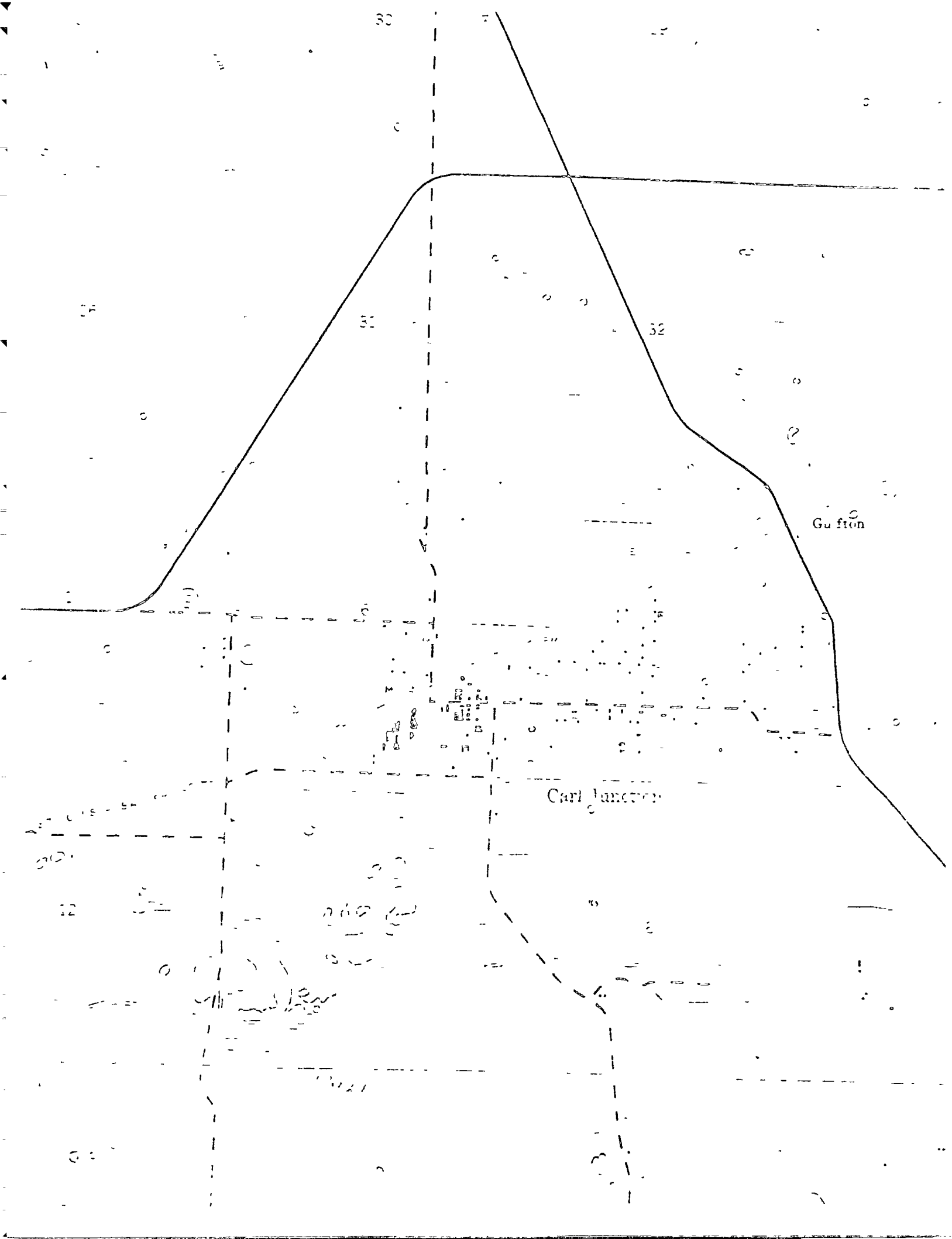
JOPLIN EAST QUAD
PLATE 3 A

PLATE 3-C: MINE & MILL WASTE (PILES & PONDS)
CARL JUNCTION QUADRANGLE, MISSOURI

by James C. Brown Jr., 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
Prepared under U. S Bureau of Mines
Contract Number J0100132


KANSAS
MISSOURI
SHAWNEE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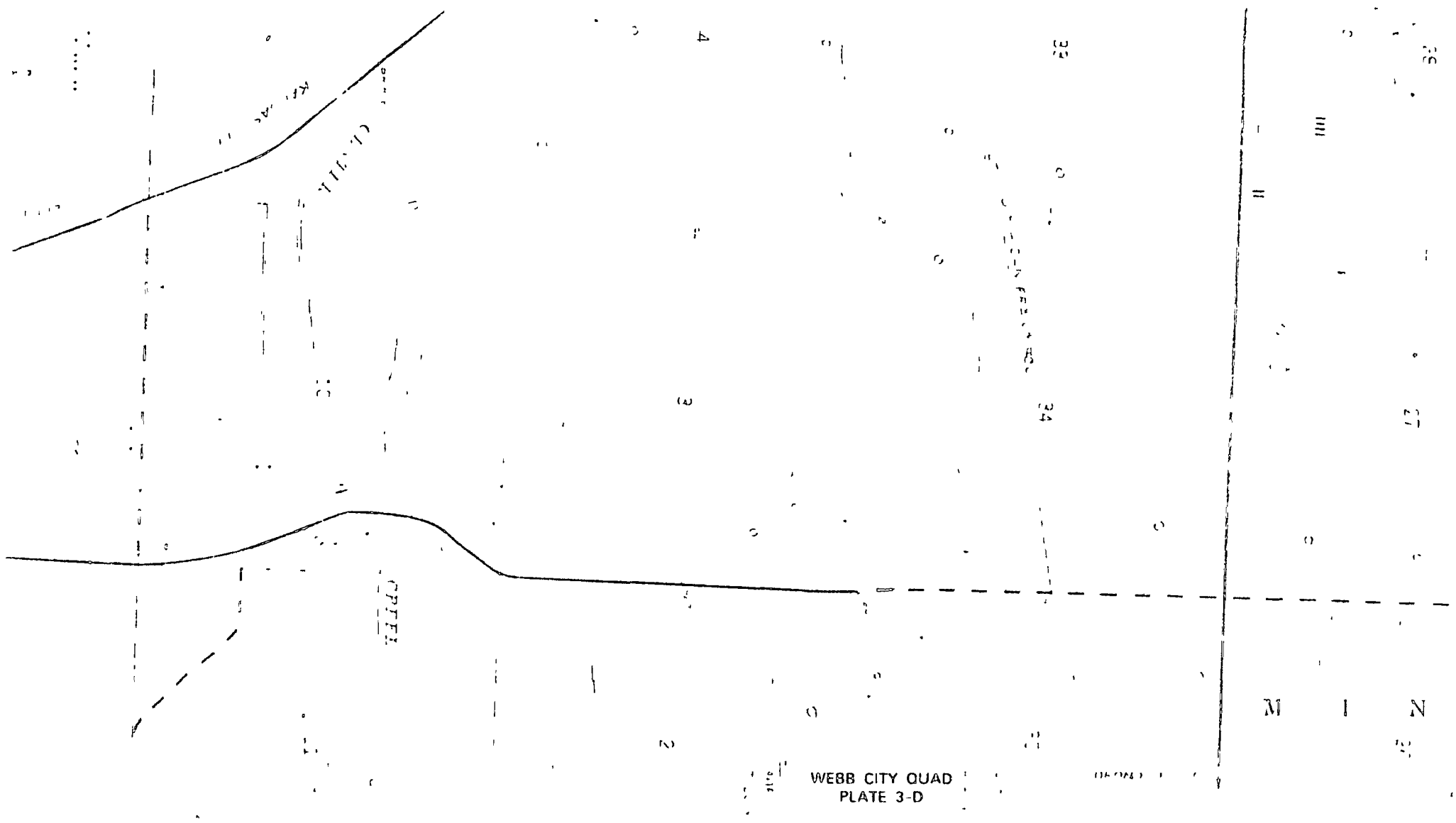
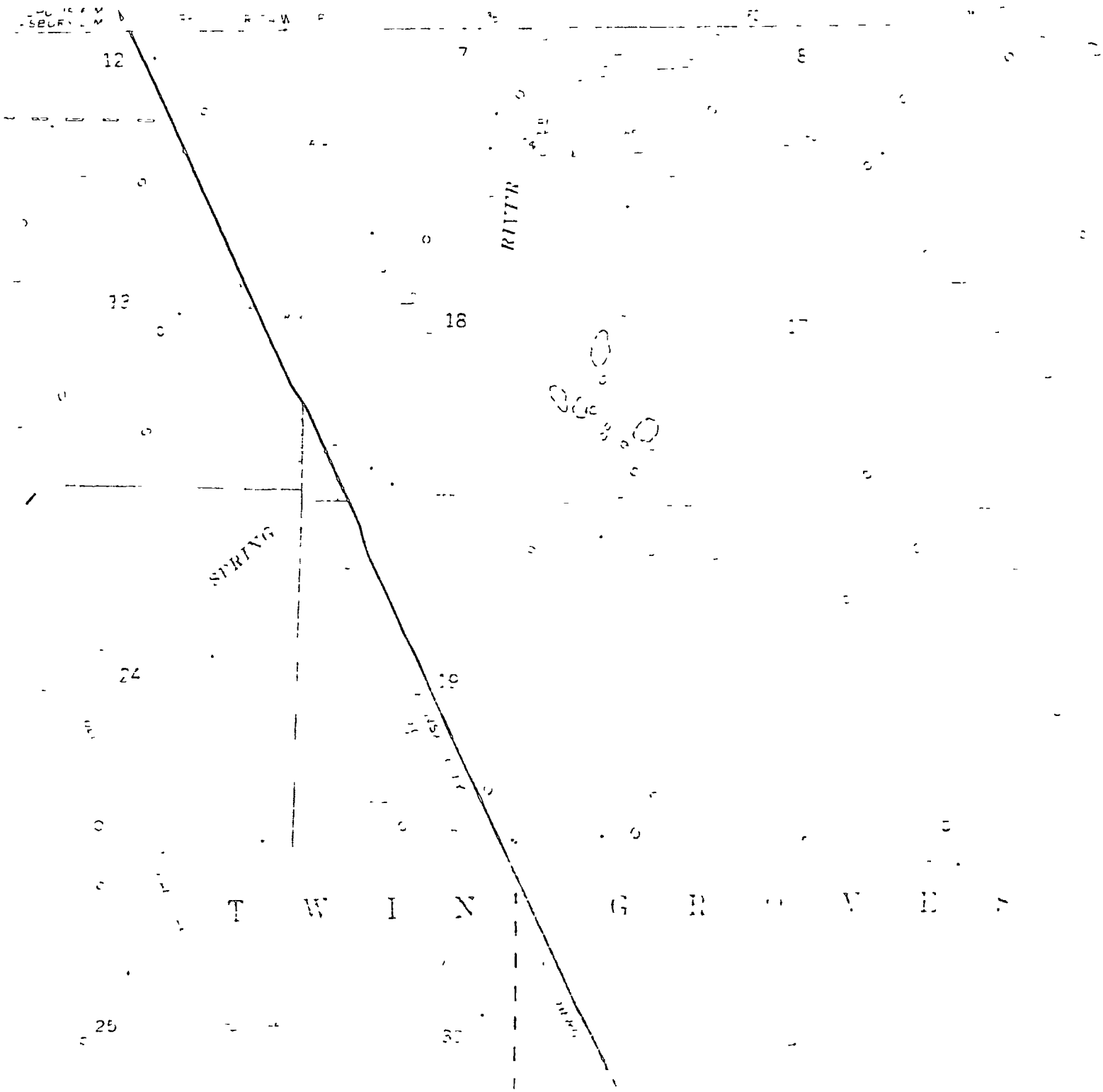
Carl Junction



WEBB CITY QUAD
PLATE 3-D

CHEROKEE CO
JASPER CO
Waco


12
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RIVER
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18
SPRING
24
19
T W I N G R O V E
25
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23
U44
1983-7
plate 3-1

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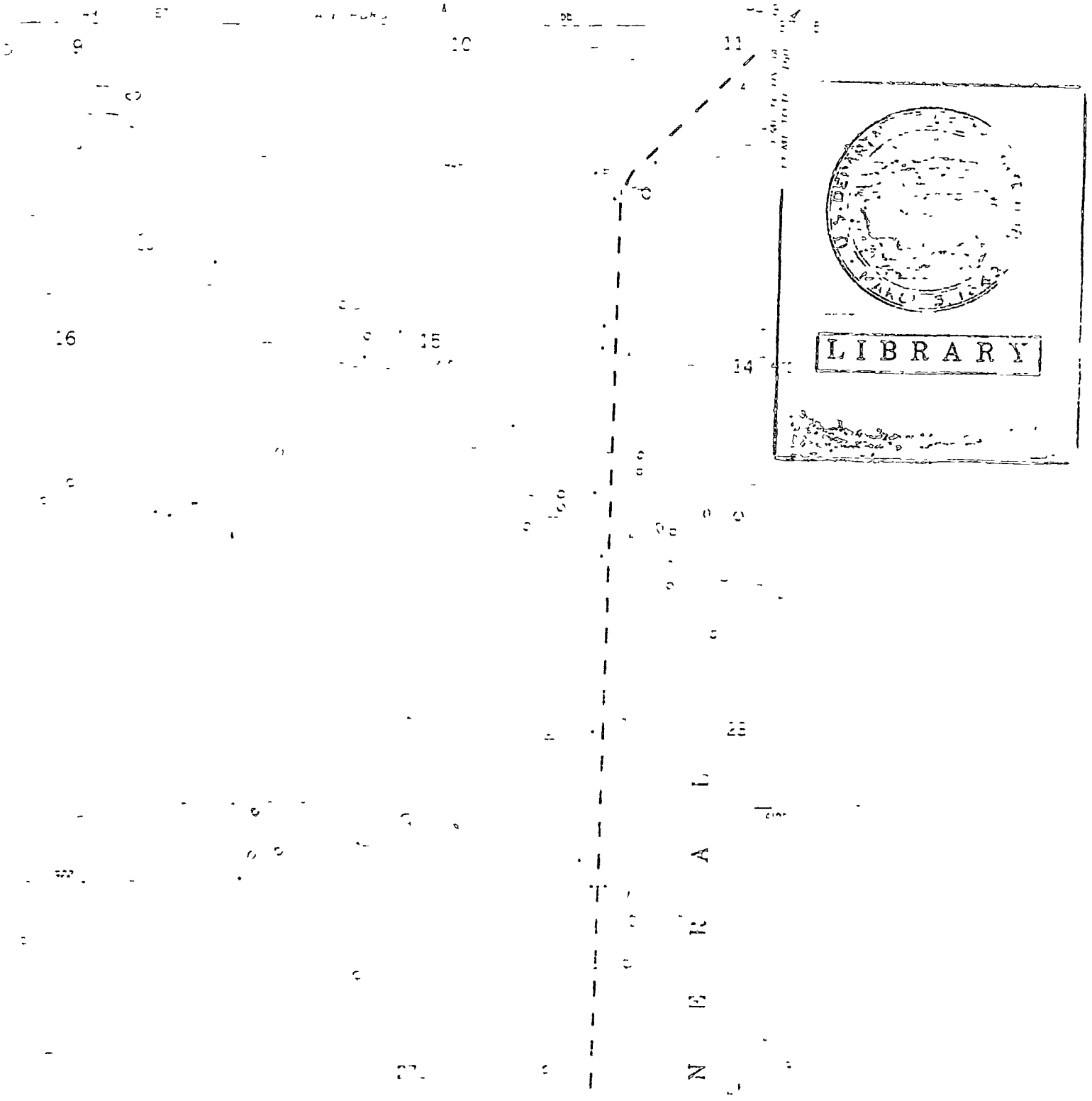
PLATE 3–C. MINE & MILL WASTE (PILES & PONDS)
CARL JUNCTION QUADRANGLE, MISSOURI



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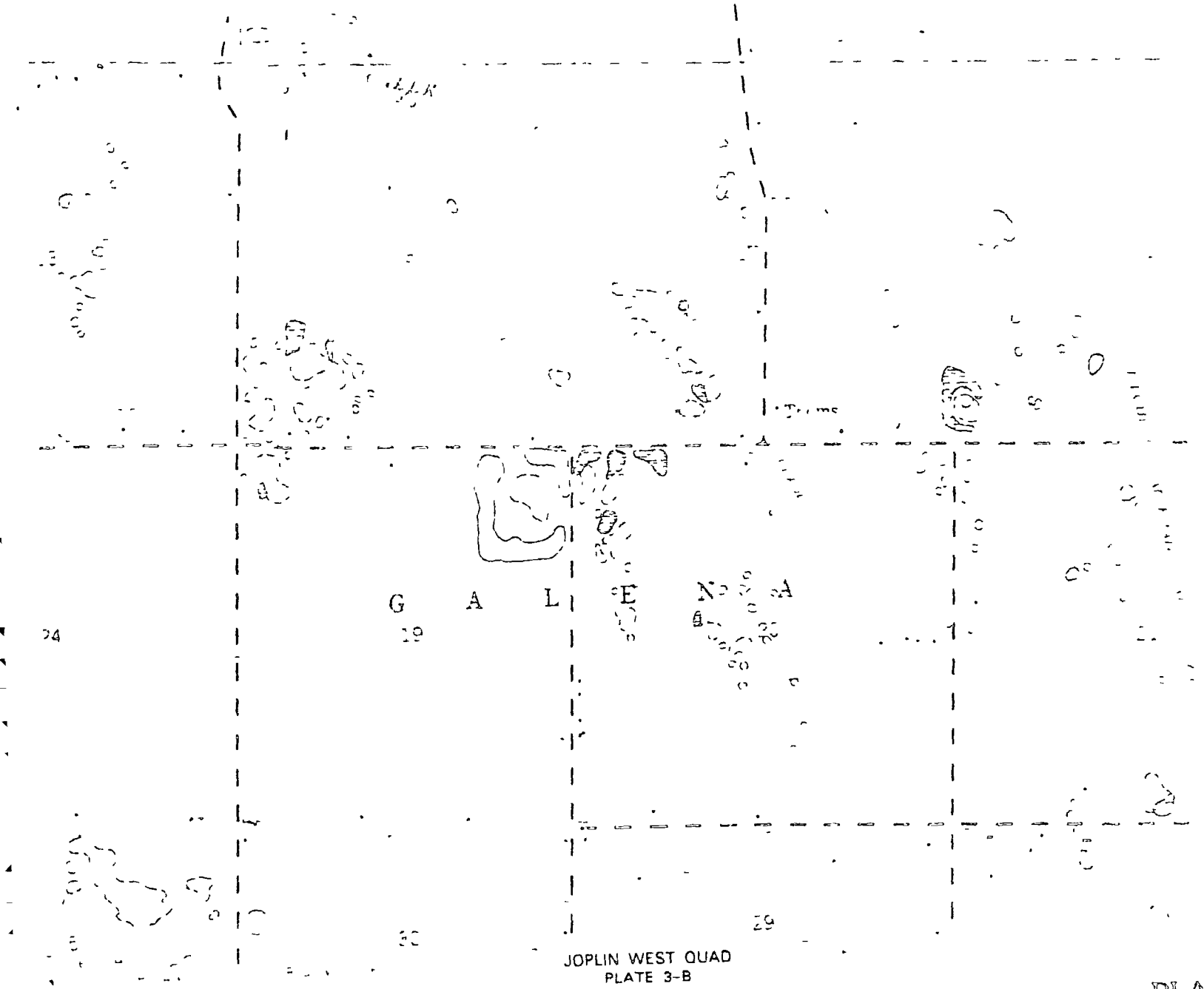
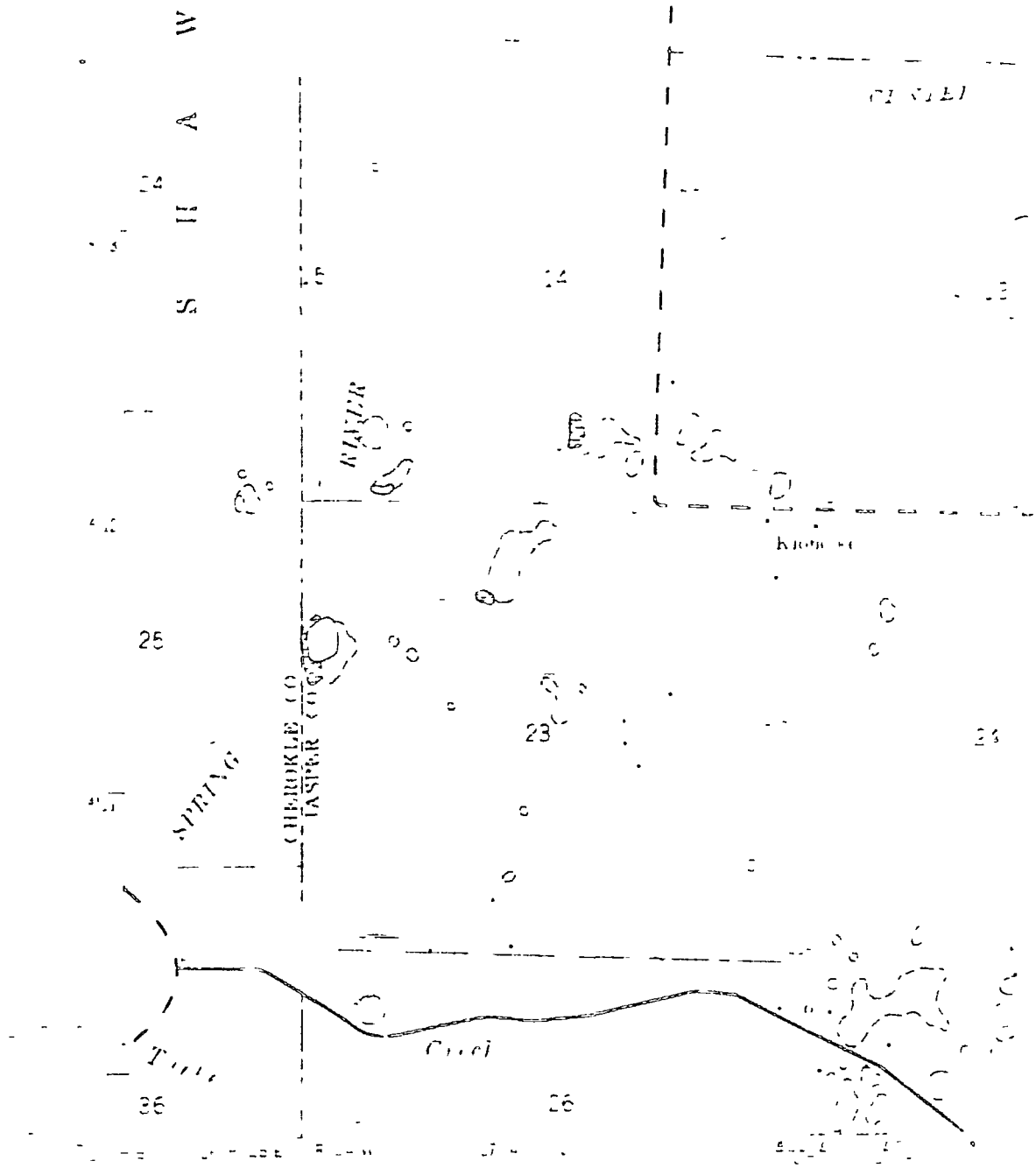


JOPLIN WEST QUAD
PLATE 3-B

PLA

MODIFIED AFTER U S GEOLOGICAL SURVEY BASE MAPS
CARL JUNCTION QUADRANGLE 1963 PHOTOREVISED 1978
DRAFTED BY SUSAN C DUNN, 1982



LEGEND

Waste Pile Existing

Waste Pile Former

Tailings Pond

MISSOURI

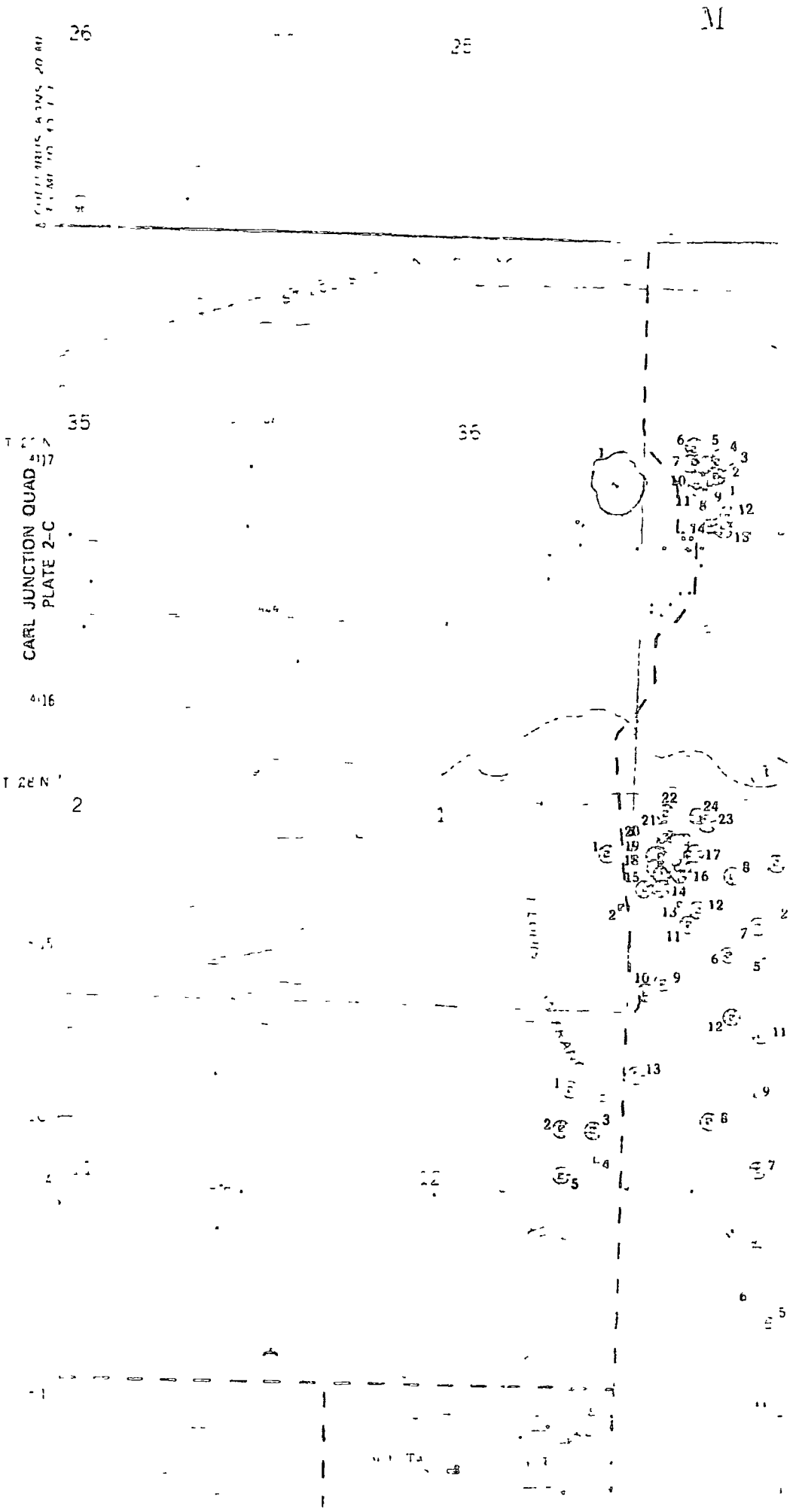
QUADRANGLE LOCA

0045

PLATE 2–D: OPEN SHAFTS, PITS, & SUBSIDENCES
WEBB CITY QUADRANGLE, MISSOURI

by Michael C McFarland and James C. Brown Jr., 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
Prepared under U. S. Bureau of Mines
Contract Number J0100132


CARL JUNCTION QUAD
PLATE 2-C
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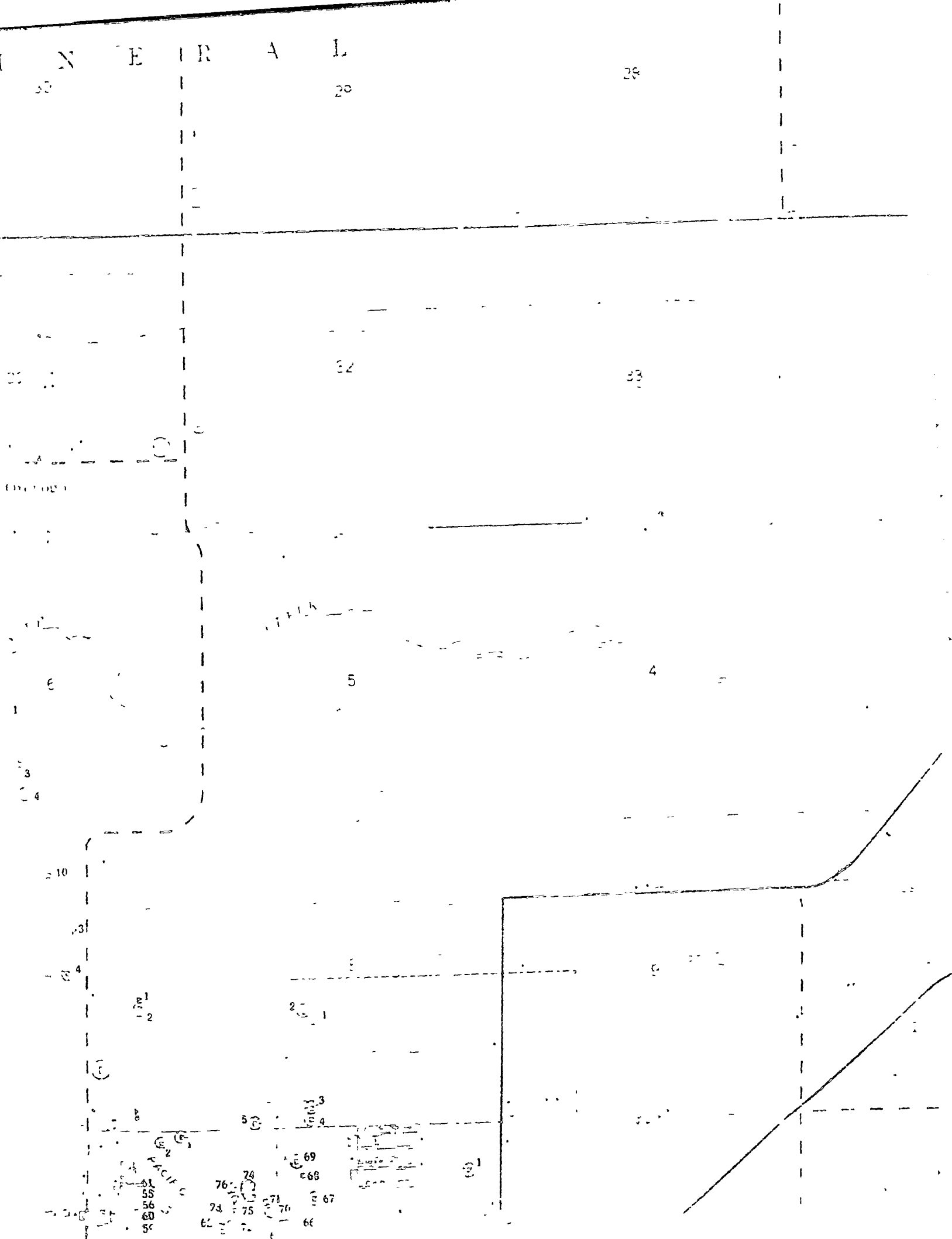
N E R A L
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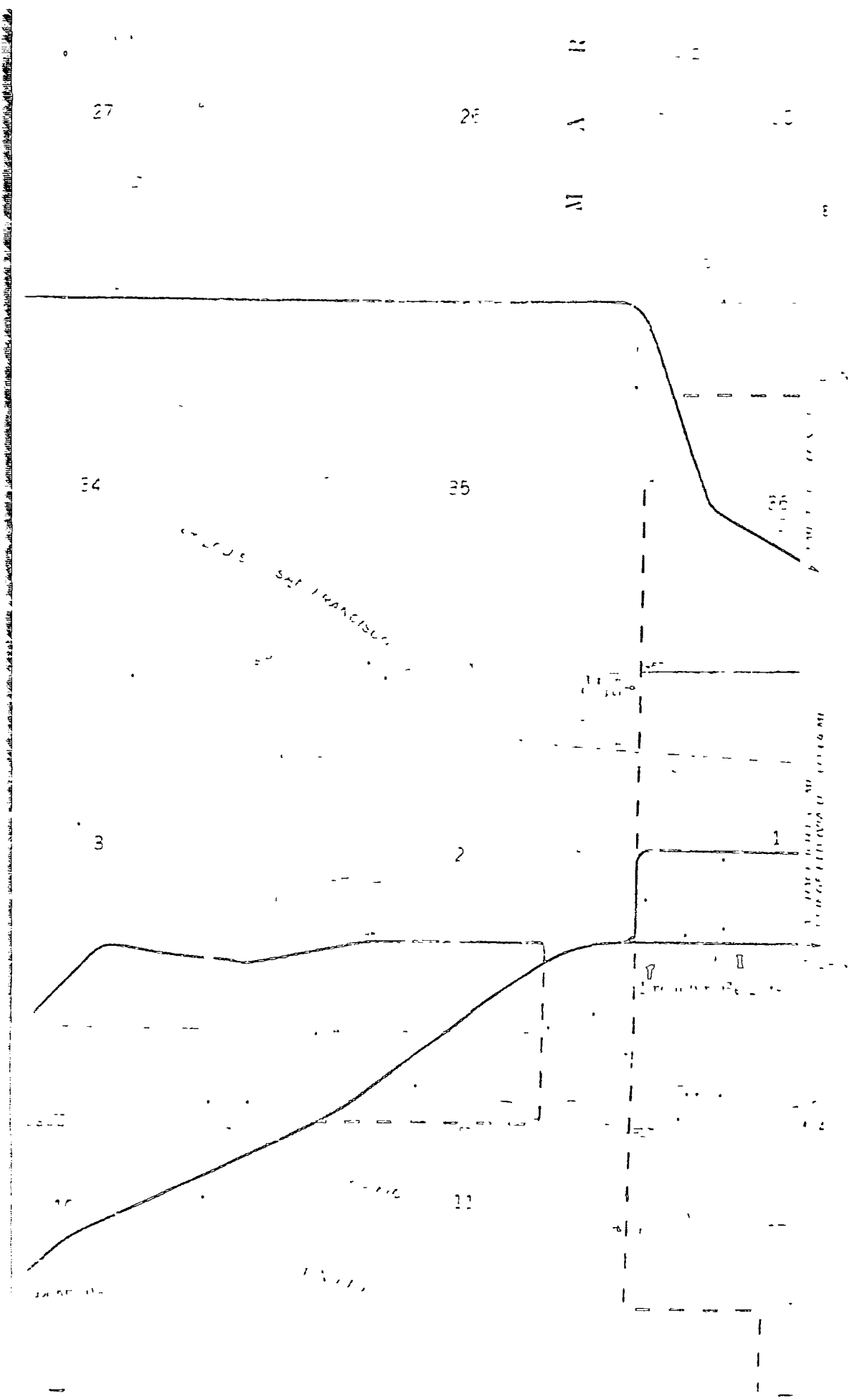

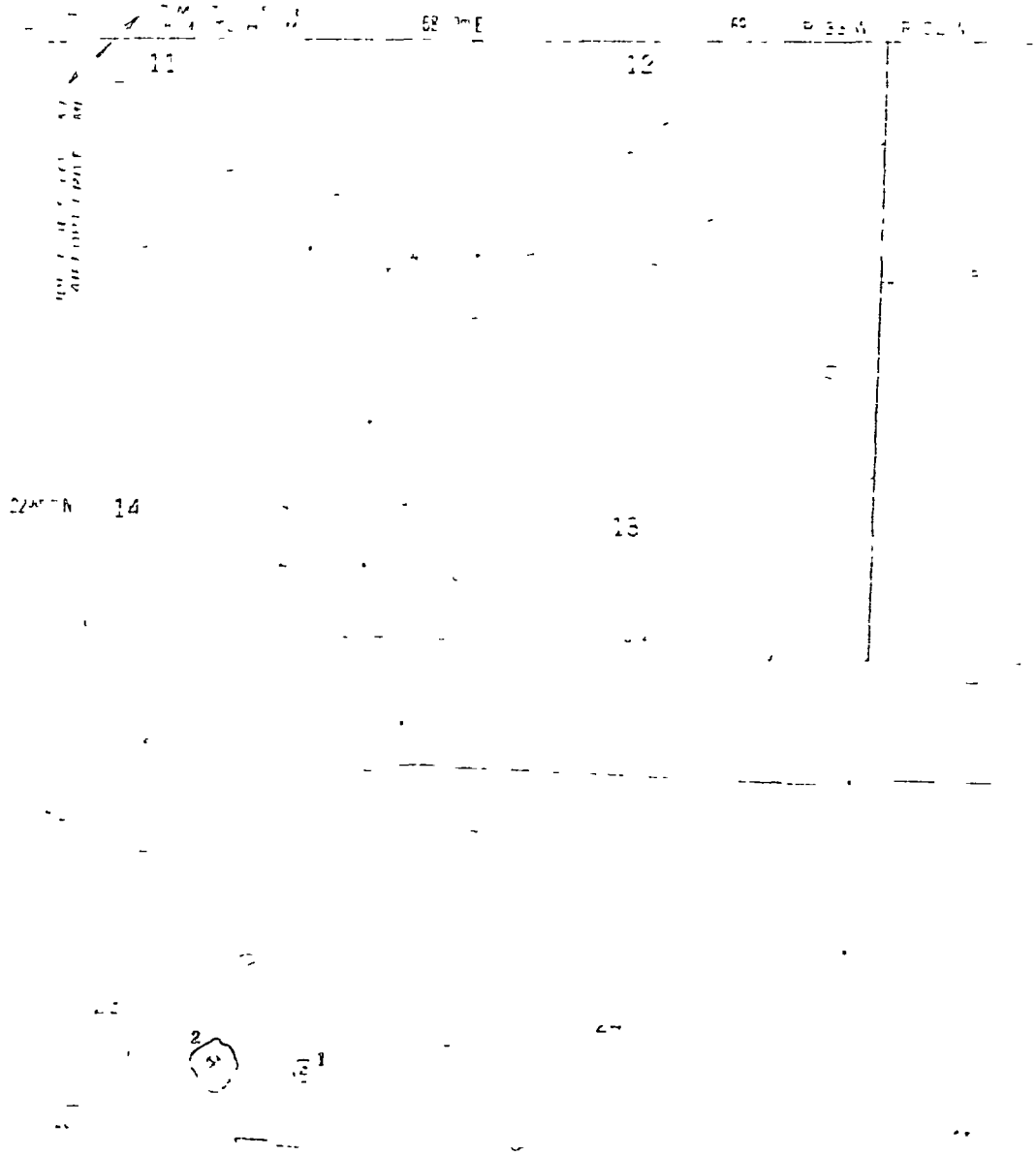
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Purcell
Alba
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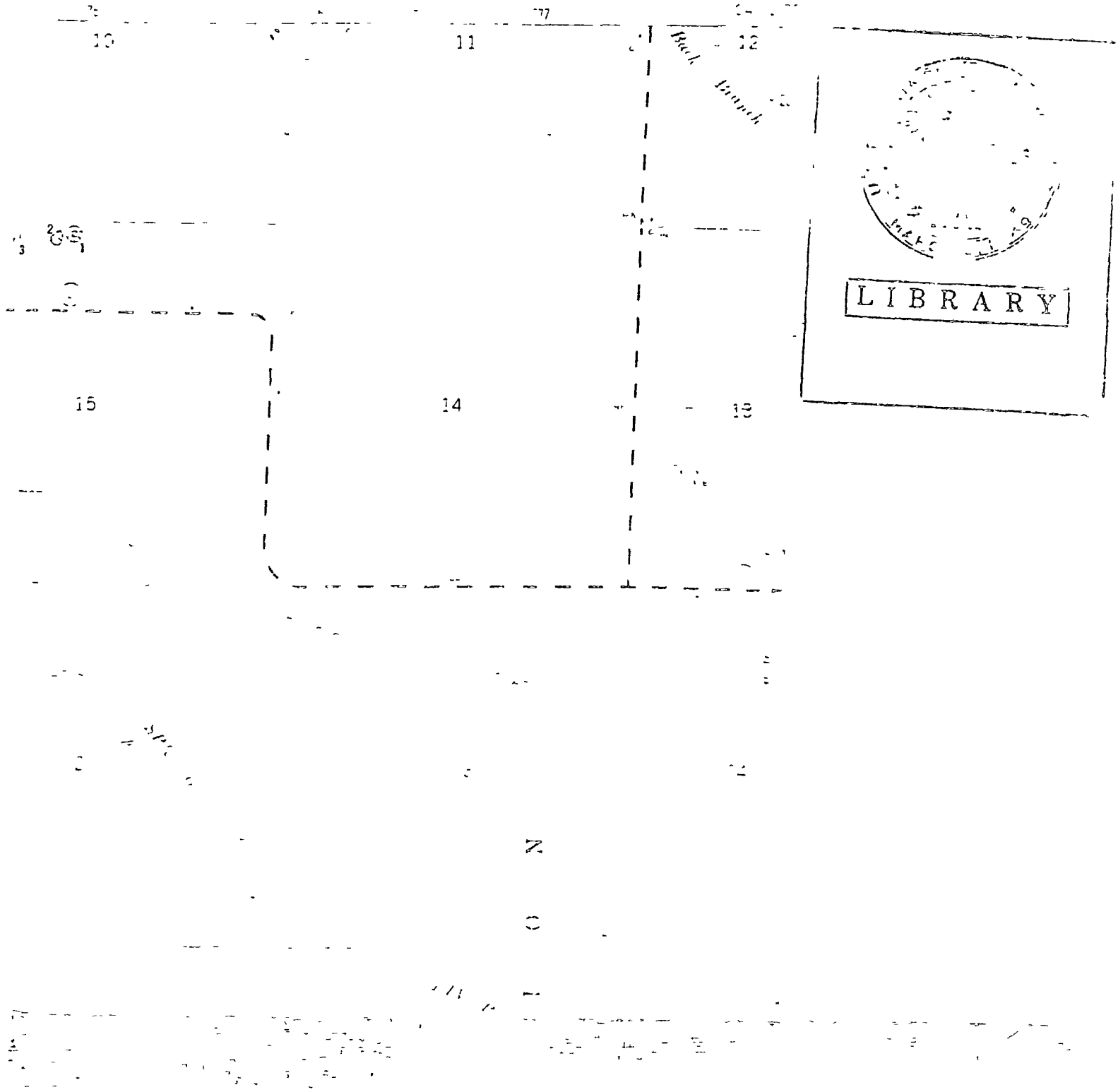
PLATE 2-D. OPEN SHAFTS, PITS, & SUBSIDENCES
WEBB CITY QUADRANGLE MISSOURI



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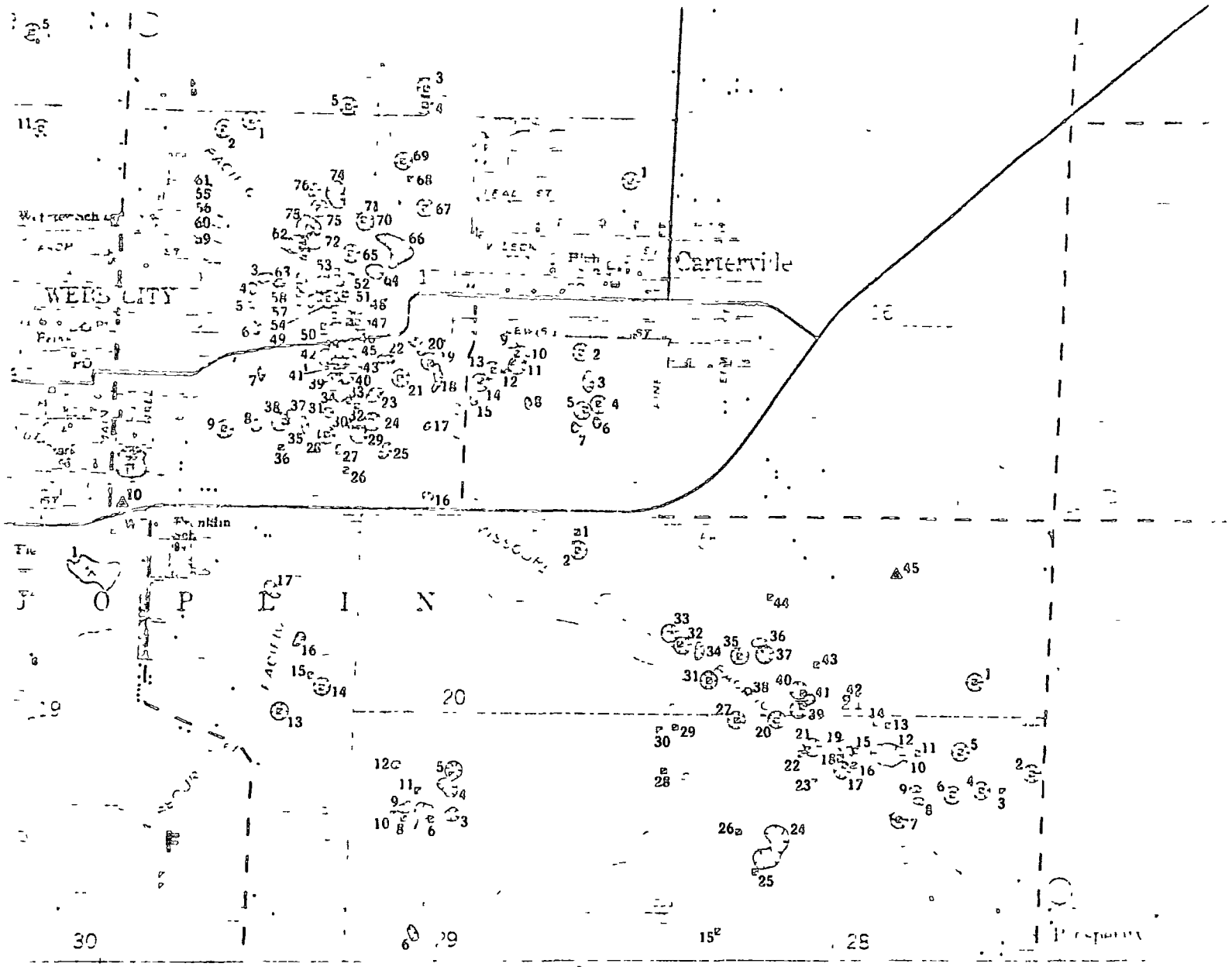
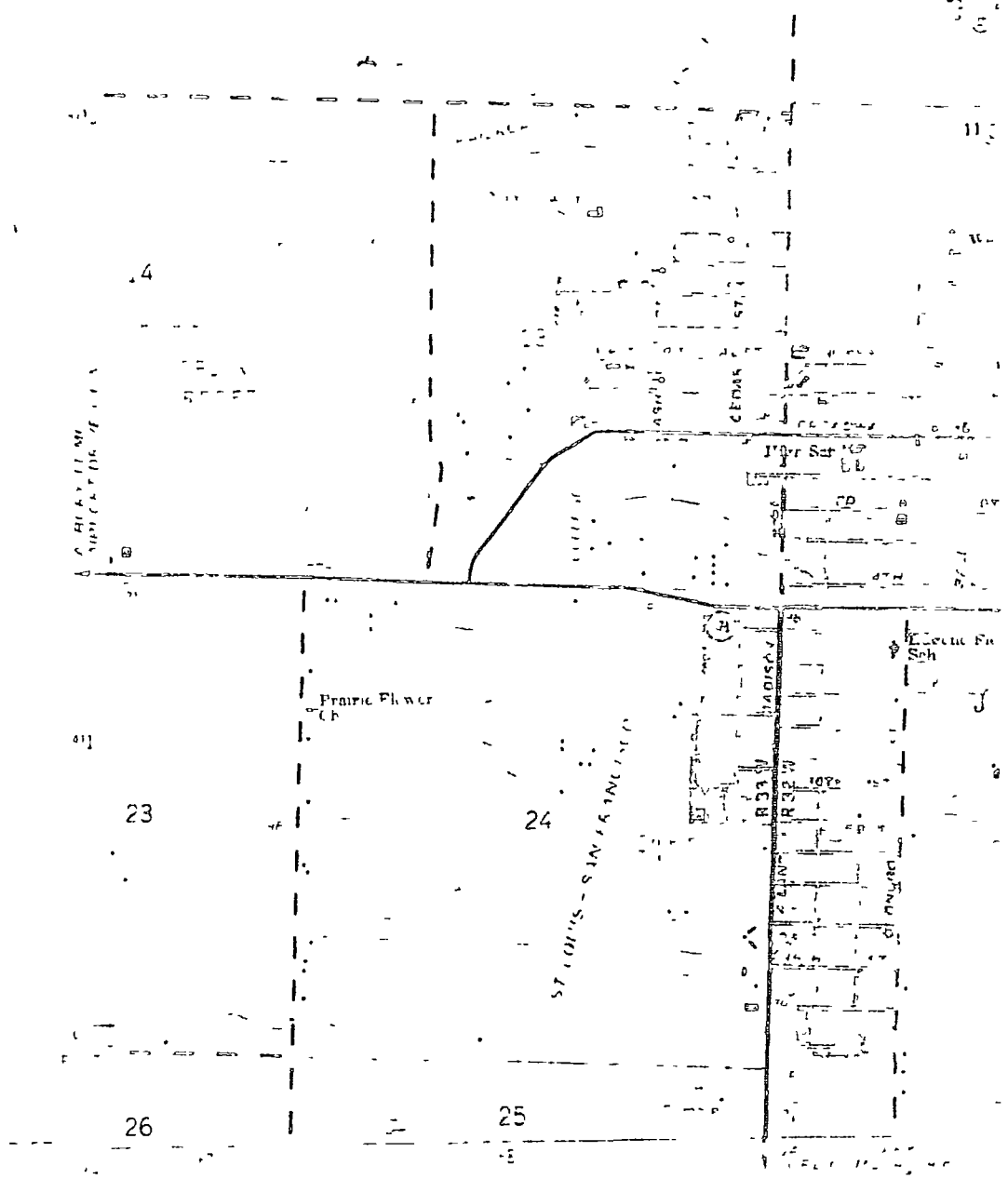


JOPLIN EAST QUAD
PLATE 2-A

ANGLE LOCATION

MODIFIED AFTER U S GEOLOGICAL SURVEY BASE MAPS
WEBB CITY QUADRANGLE 1963
DRAFTED BY SUSAN C DUNN, 1982



JOPLIN WEST QUAD
PLATE 2-B

LEGEND

- Open Shaft
- Open Shaft Collapsed
- Open Pit
- Subsidence
- Subsidence, Reported

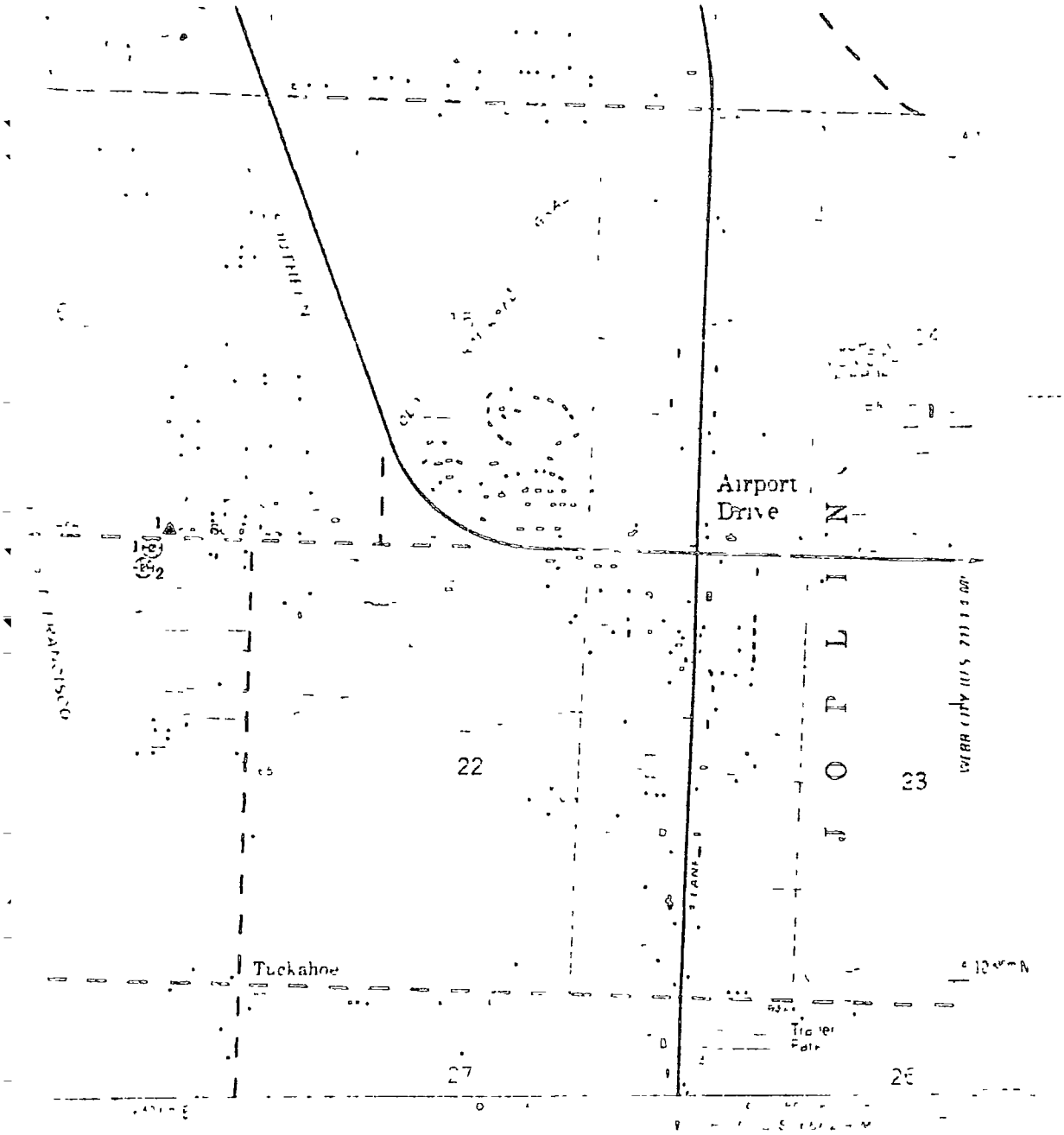


PLATE 2–C: OPEN SHAFTS, PITS, & SUBSIDENCES
CARL JUNCTION QUADRANGLE, MISSOURI

by Michael C. McFarland and James C. Brown Jr., 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
Prepared under U. S. Bureau of Mines
Contract Number J0100132

JOPLIN EAST QUAD
PLATE 2-A

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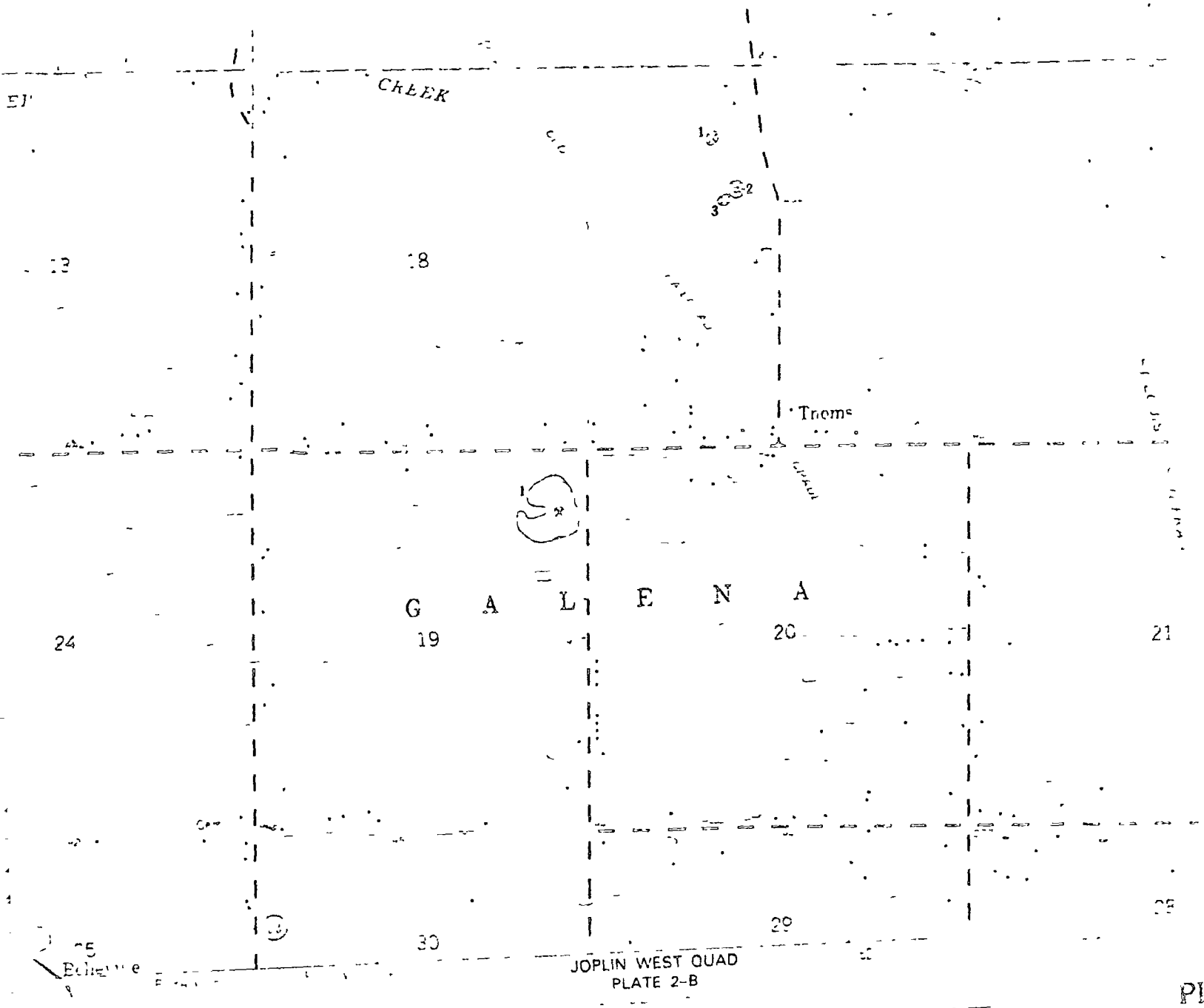
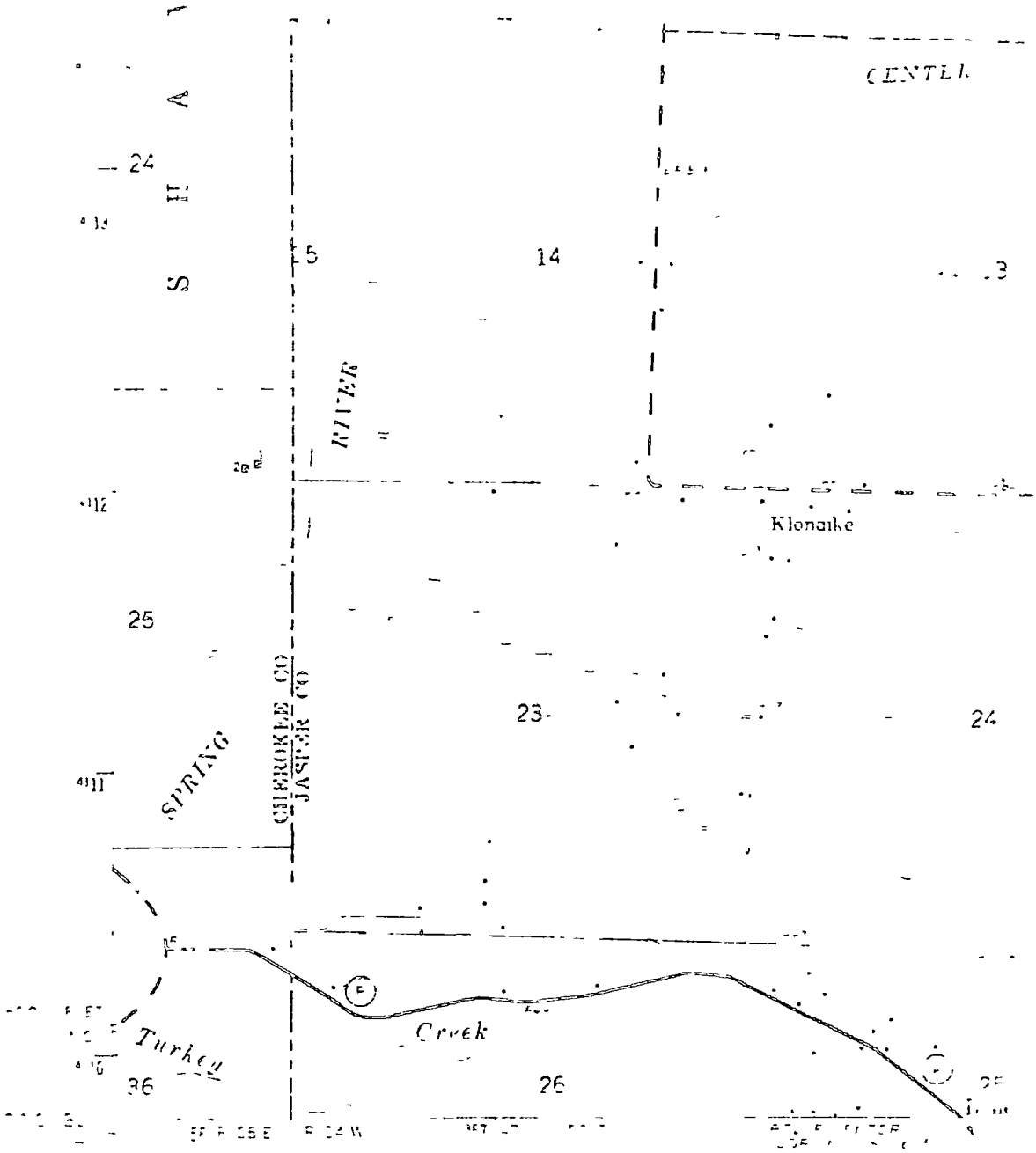
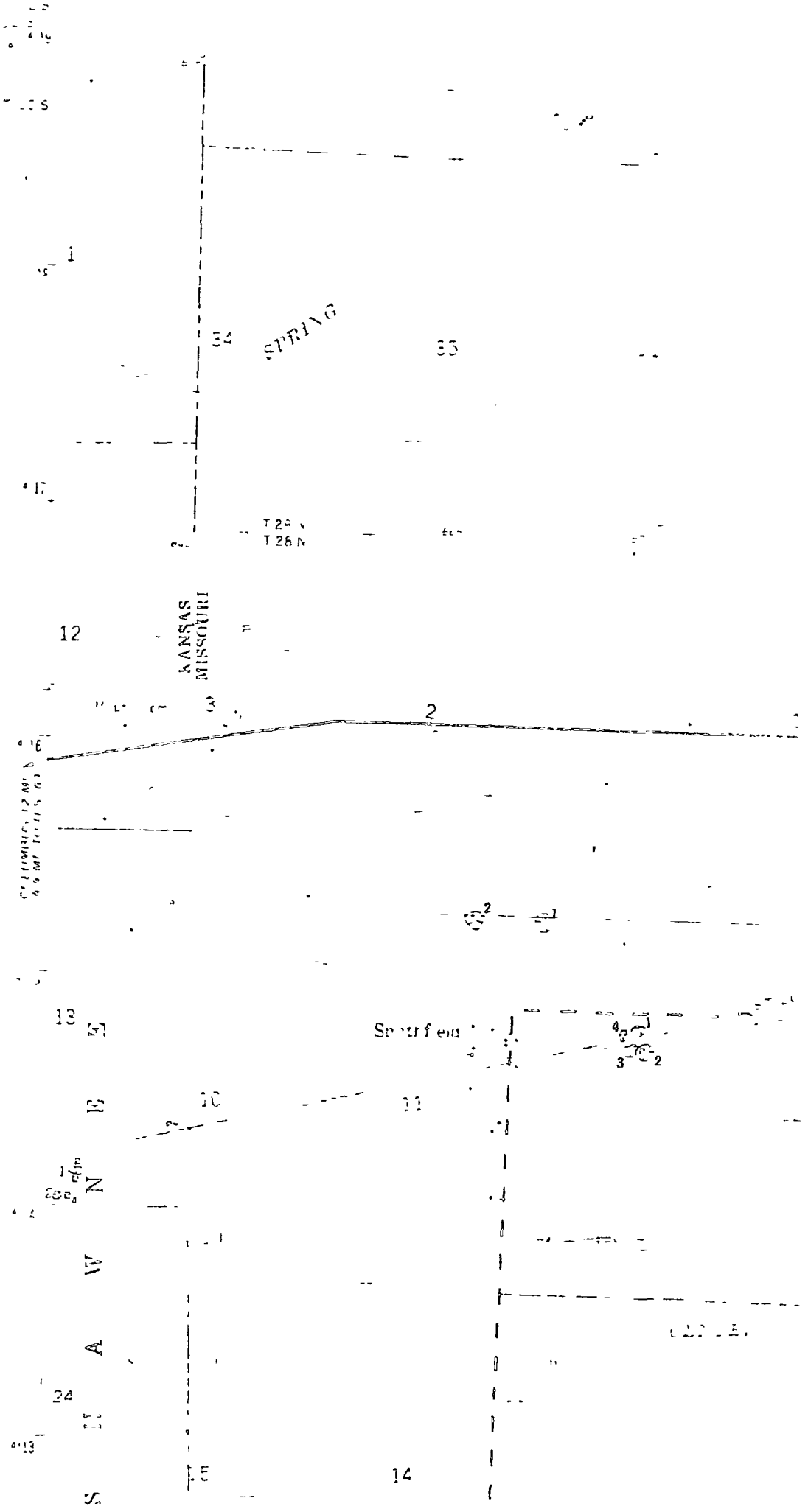


MODIFIED AFTER U S GEOLOGICAL SURVEY BASE MAPS
CARL JUNCTION QUADRANGLE 1963 PHOTOREVISED 1978
DRAFTED BY SUSAN C DUNN, 1982



LEGEND

- Open Shaft
- Open Shaft, Collapsed
- Open Pit
- Subsidence
- Subsidence, Reported



SPRING
KANSAS
MISSOURI
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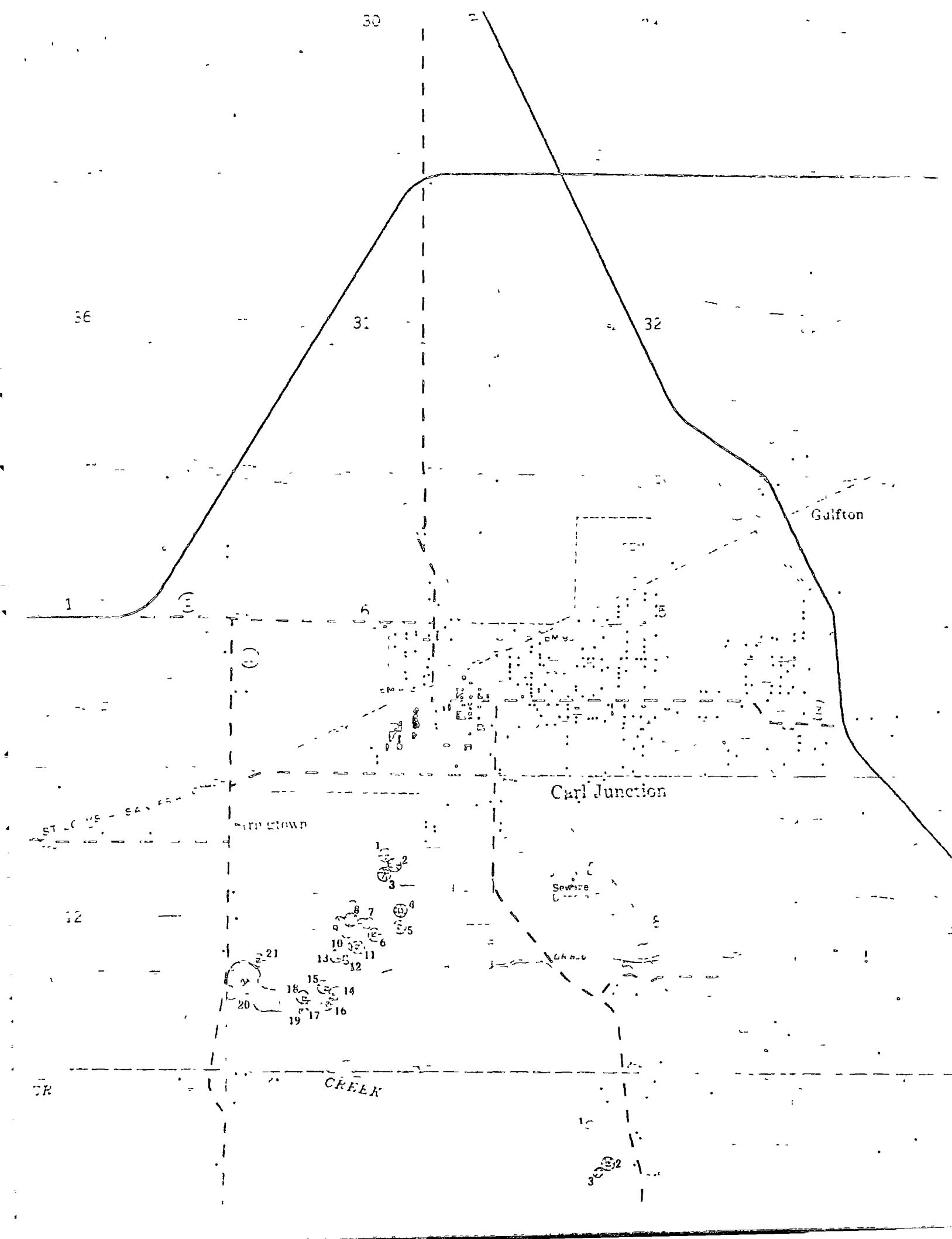
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Gulfton
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Carl Junction
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Sewage
CREEK
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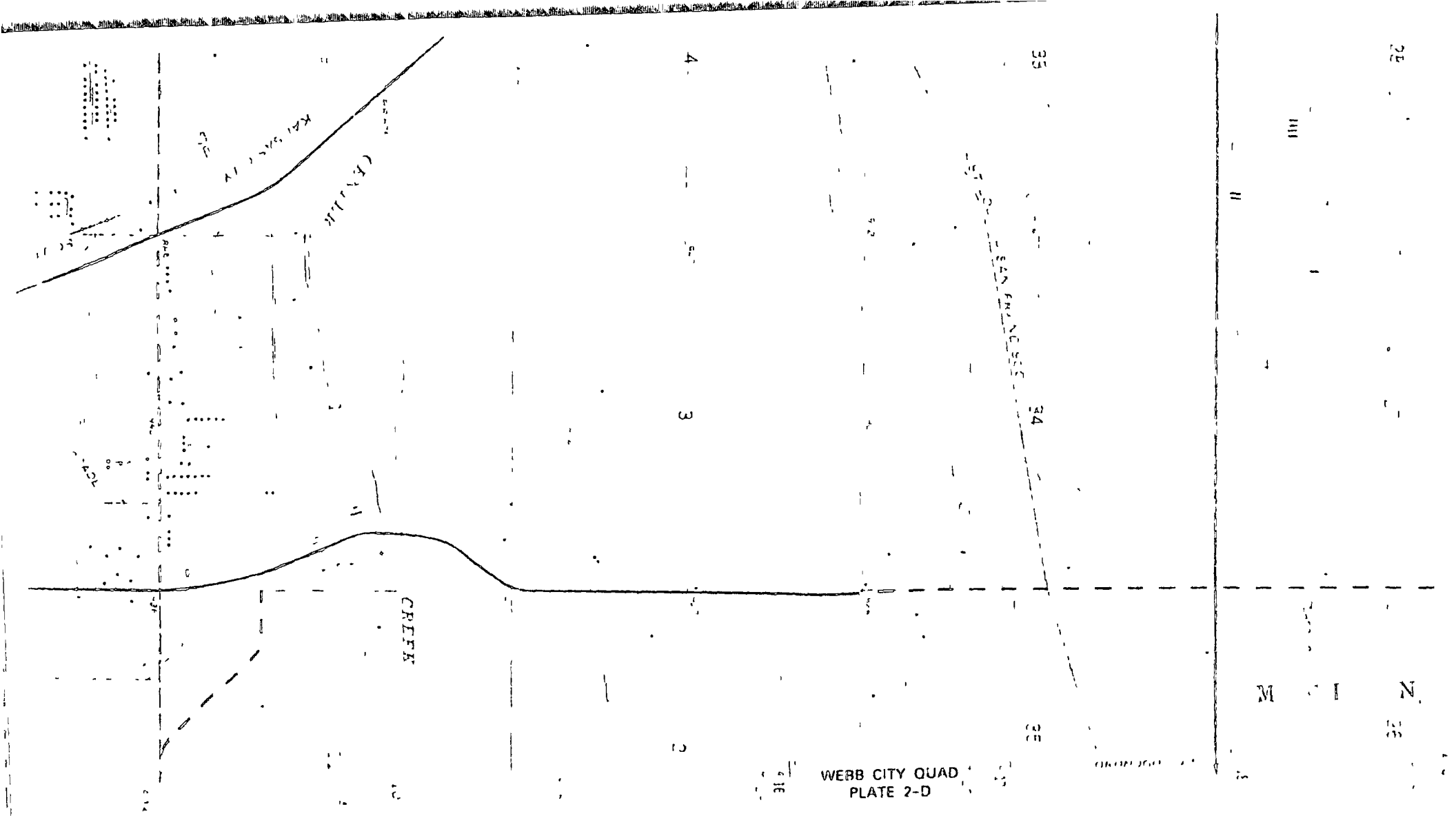
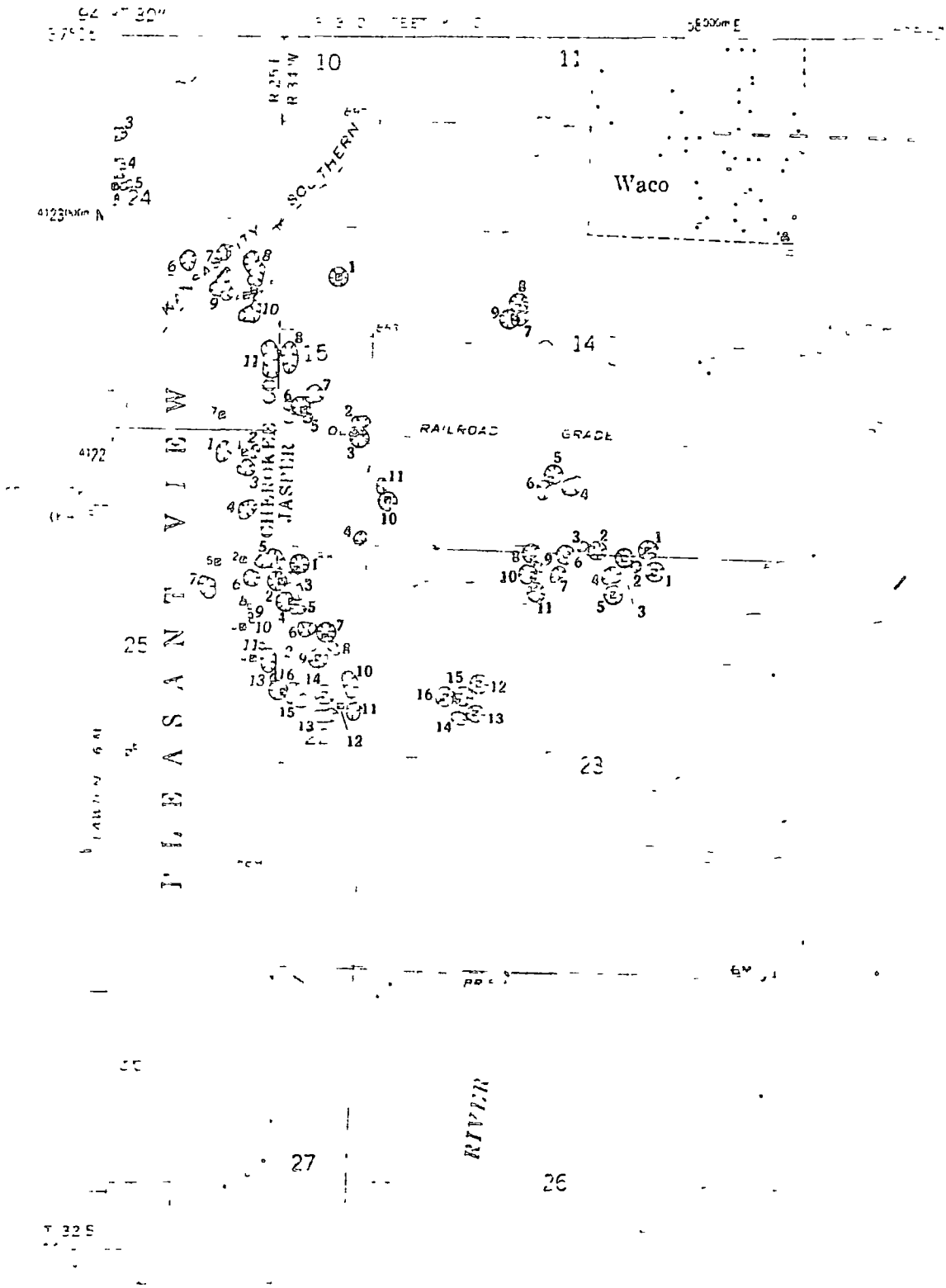


WEBB CITY QUAD
PLATE 2-D



Waco
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RAILROAD
GRADE
CHEROKEE
JASPER
PLEASANT VIEW
RIVER
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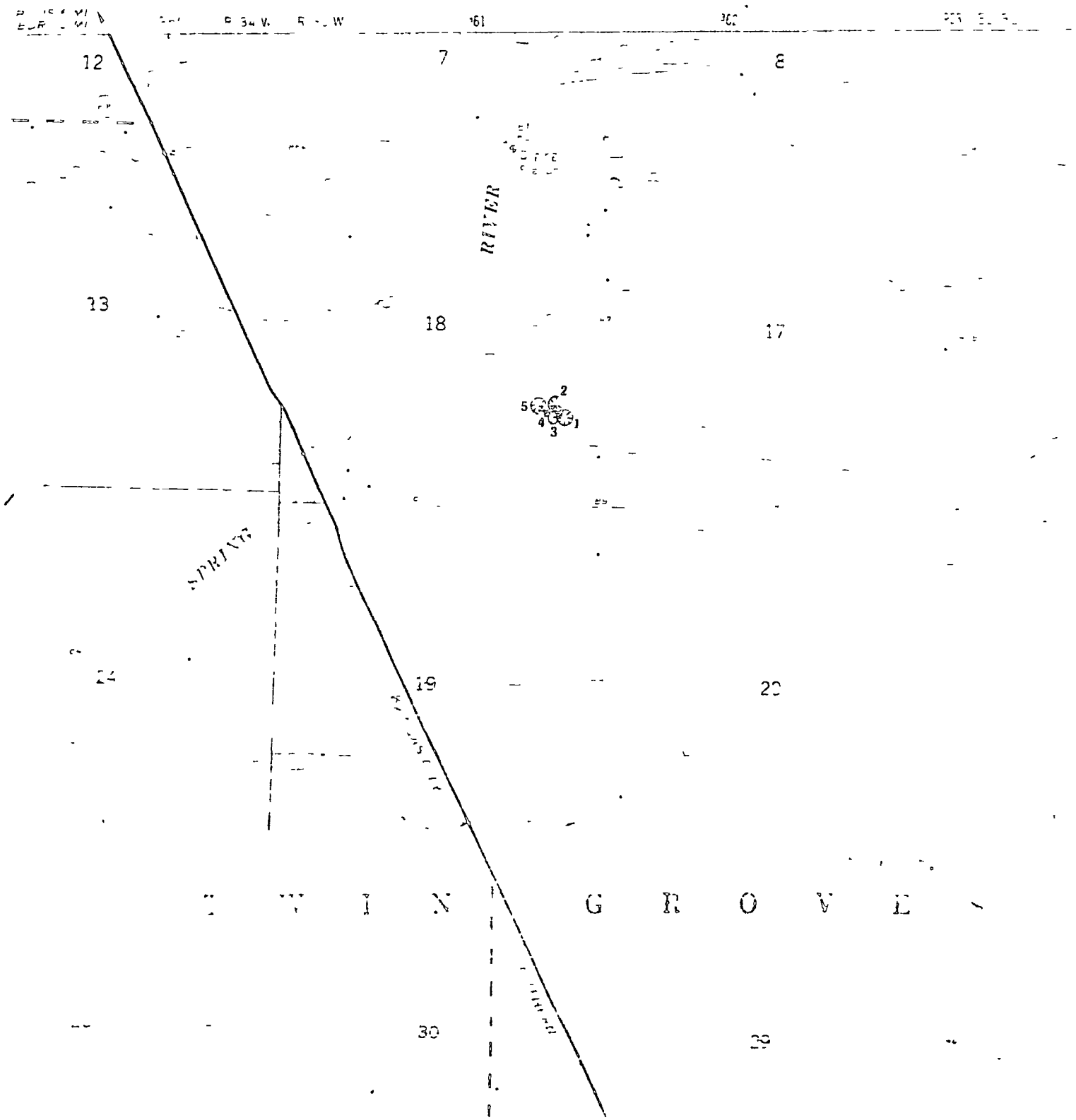
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RIVER
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T W I N G R O V E
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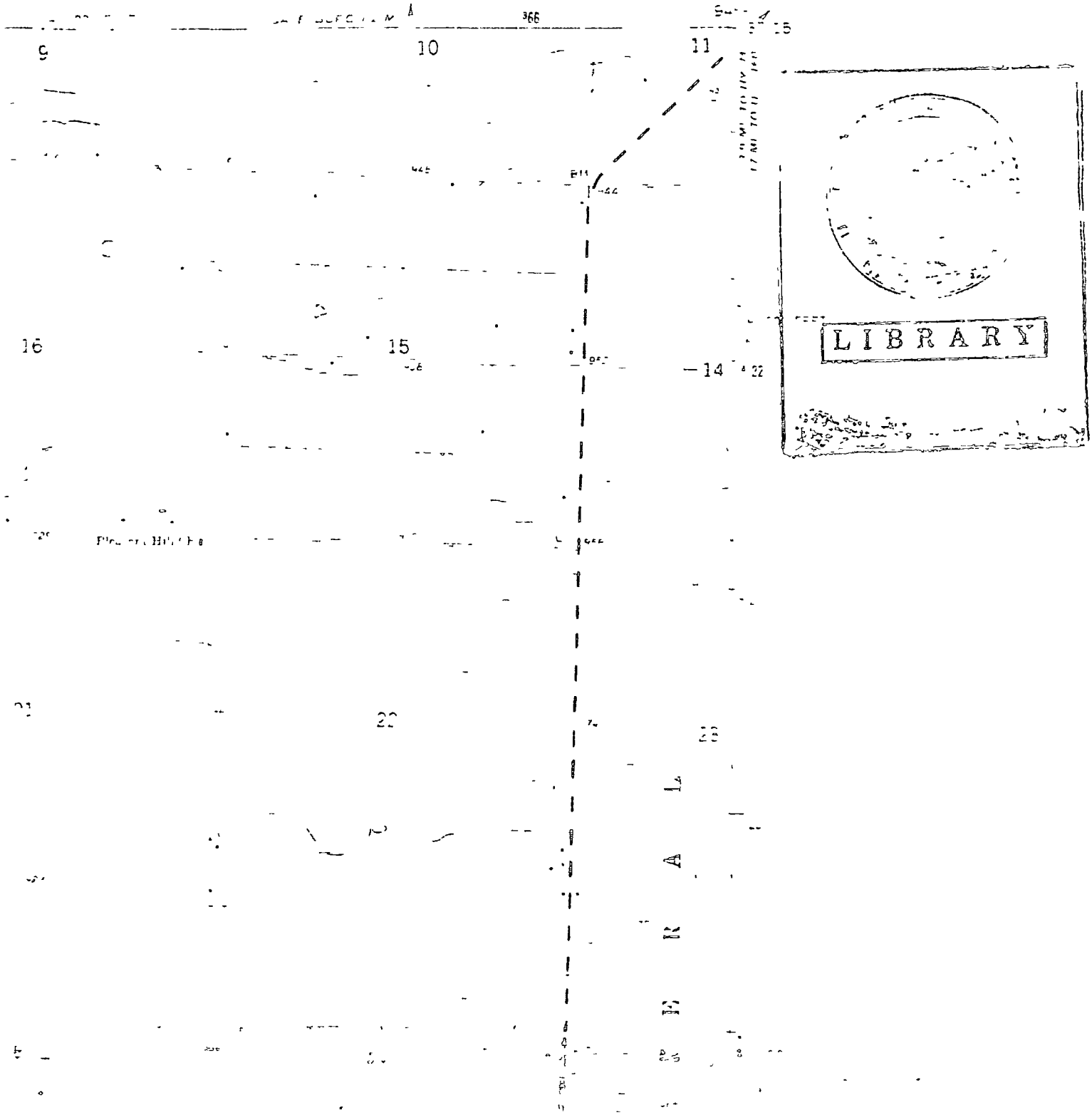
Washington, D.C. 20240

PLATE 2-C. OPEN SHAFTS, PITS, & SUBSIDENCES
CARL JUNCTION QUADRANGLE, MISSOURI



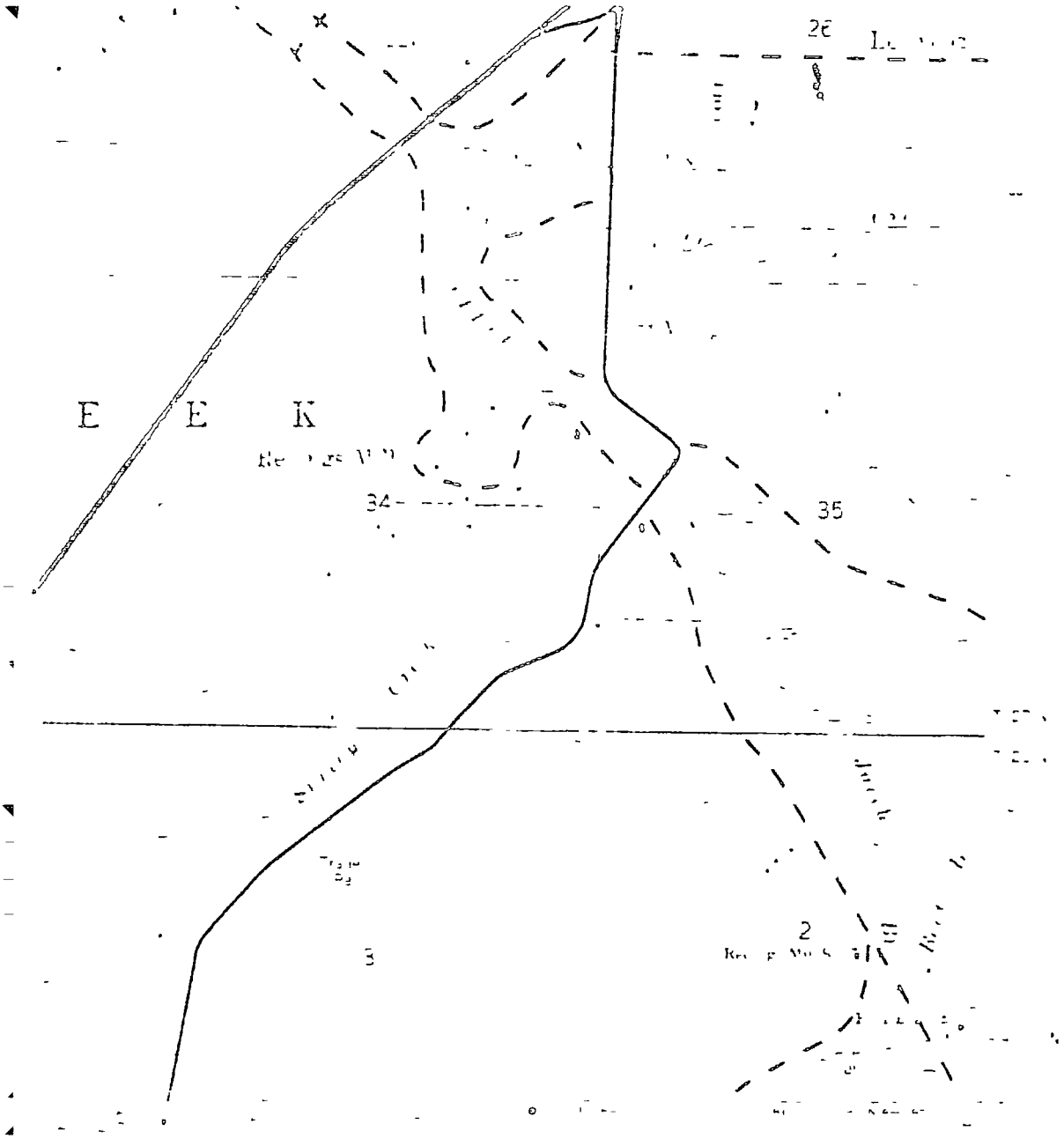
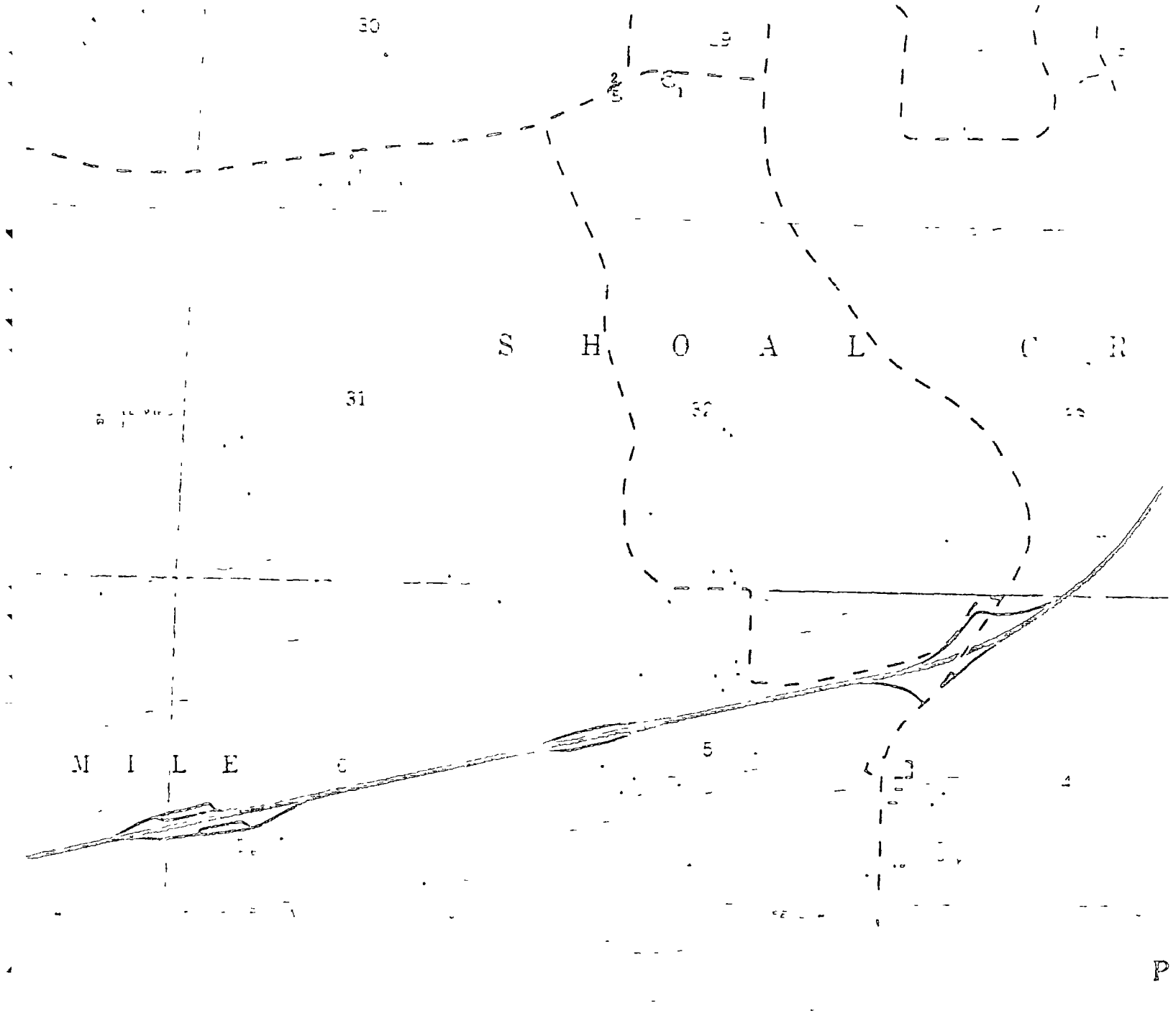


PLATE 2–B: OPEN SHAFTS, PITS, & SUBSIDENCES
JOPLIN WEST QUADRANGLE, MISSOURI

by Michael C McFarland and James C. Brown Jr . 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO
Prepared under U. S Bureau of Mines
Contract Number J0100132



MISSOURI

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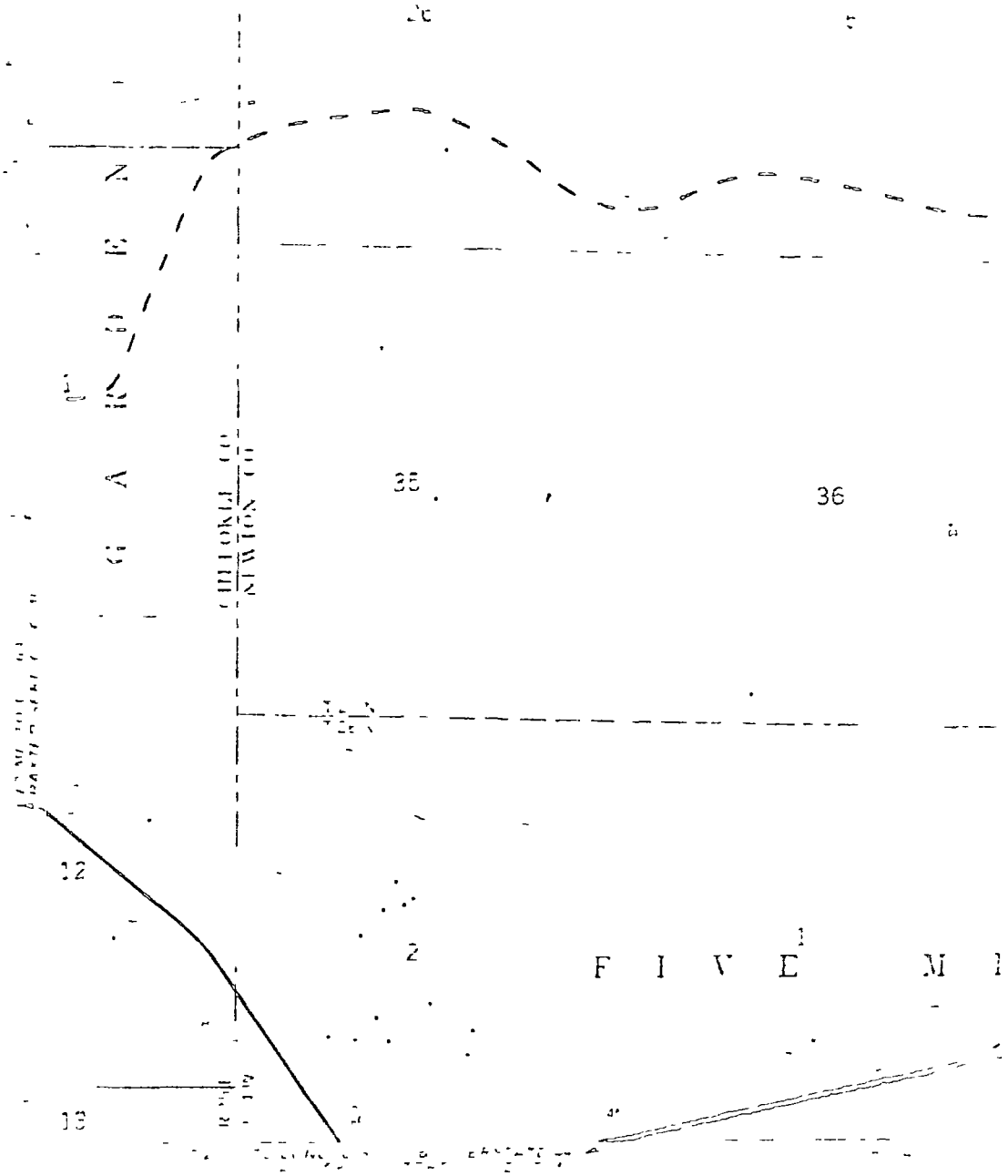
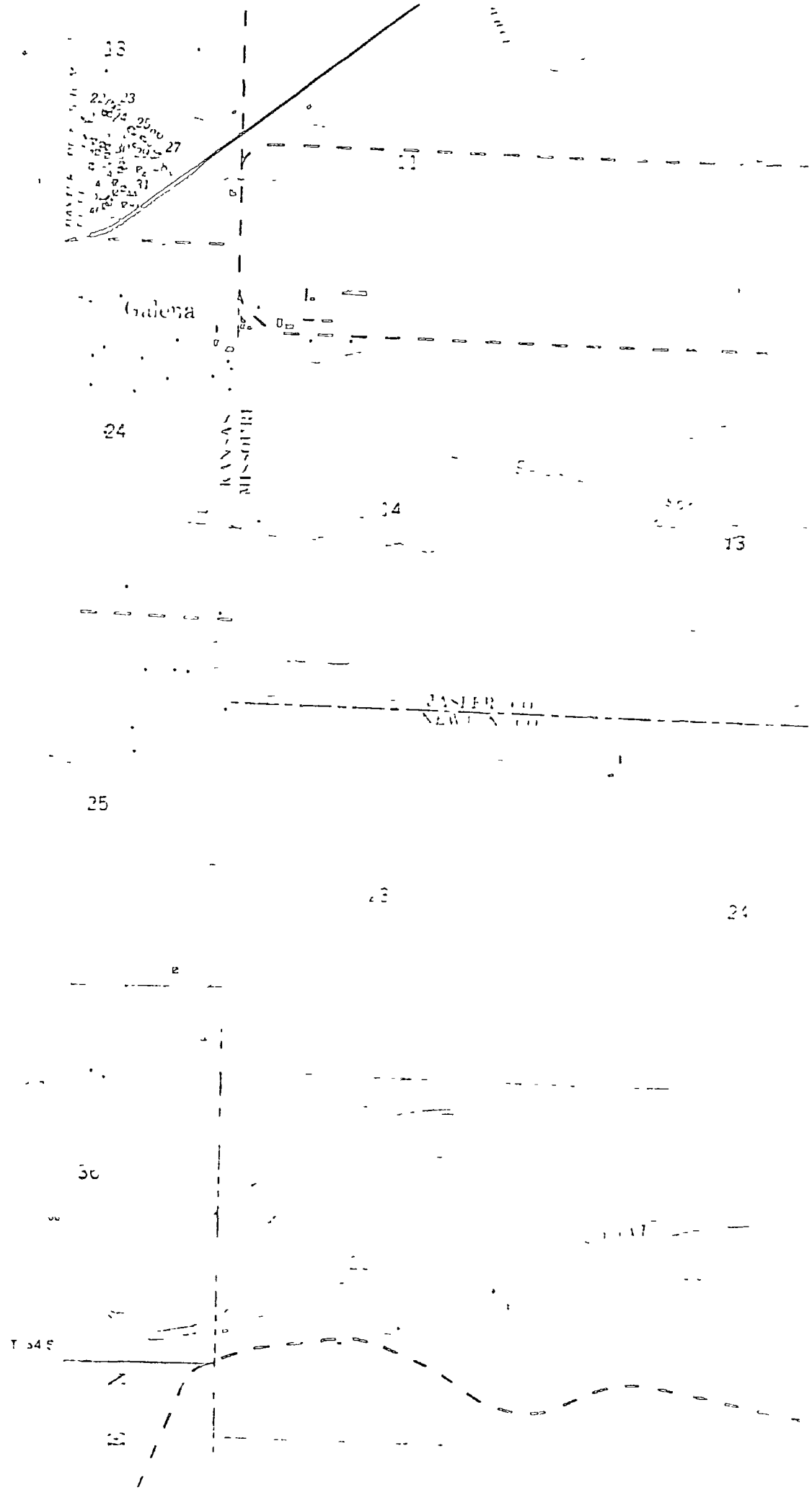
JOPLIN WEST QUADRANGLE 1962 PHOTOREVISED 1978
DRAFTED BY SUSAN C DUNN 1982



LEGEND

- Open Shaft
- Open Shaft Collapsed
- Subsidence
- Subsidence Reported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25
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Galena
24
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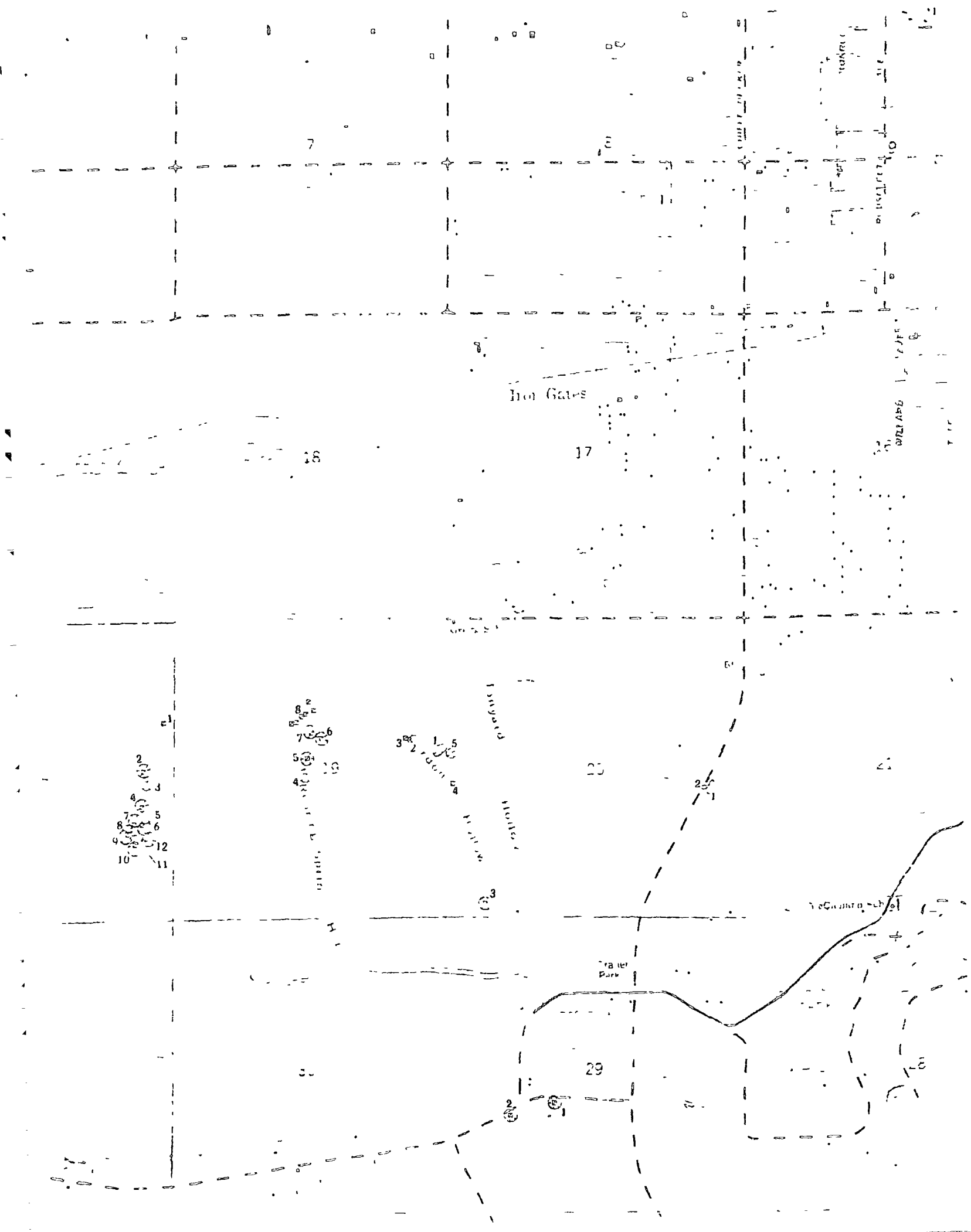
25
24
36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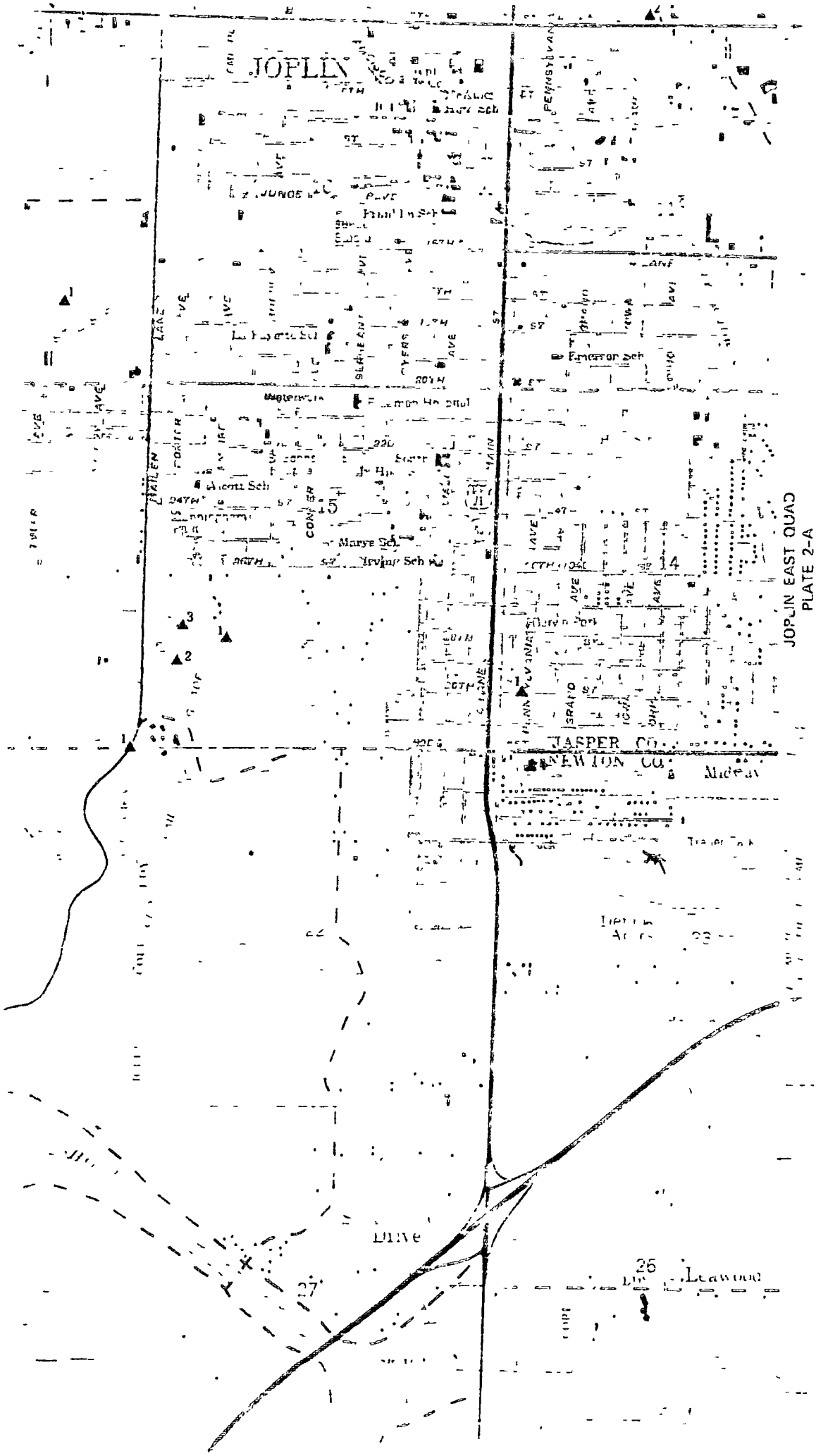
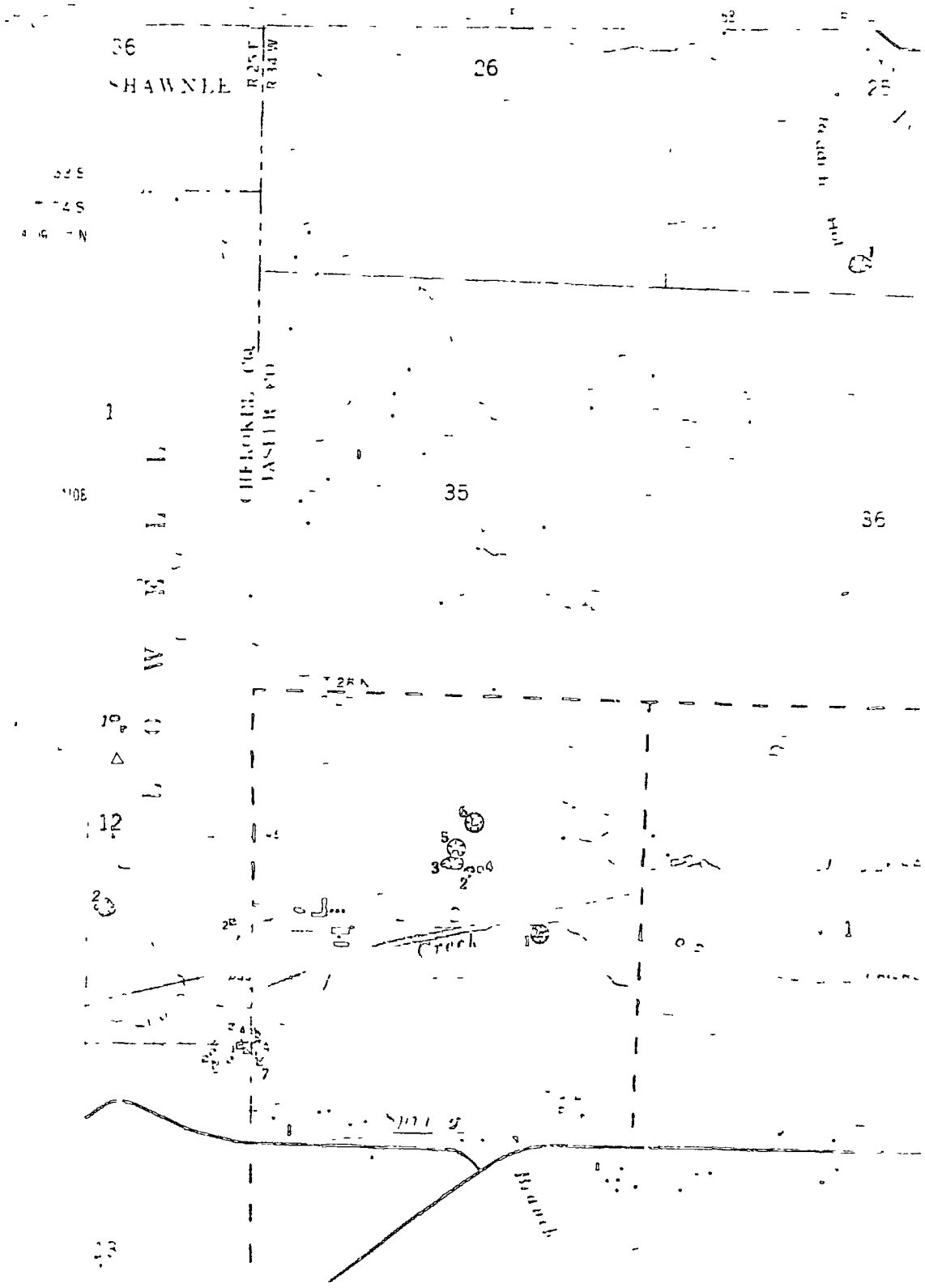
Hot Gates
18
17
19
20
Trailer Park
29


JOPLIN
JASPER CO.
NEWTON CO.
Midway
Drive
Leawood
JOPLIN EAST QUAD
PLATE 2-A


36
SHAWNEE
26
25
1
35
36
12
Creek

CARL JUNCTION QUAD
PLATE 2-C

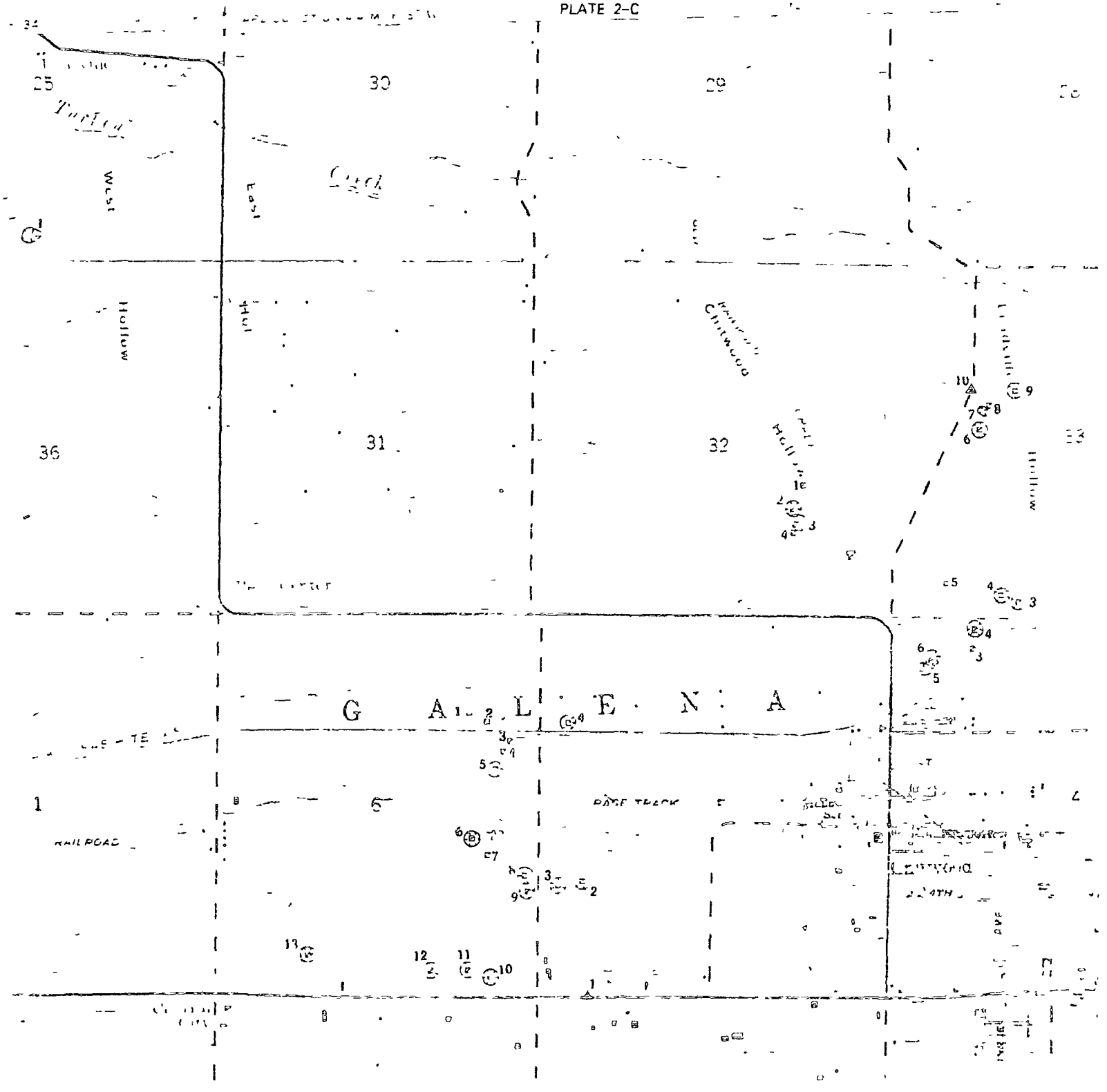


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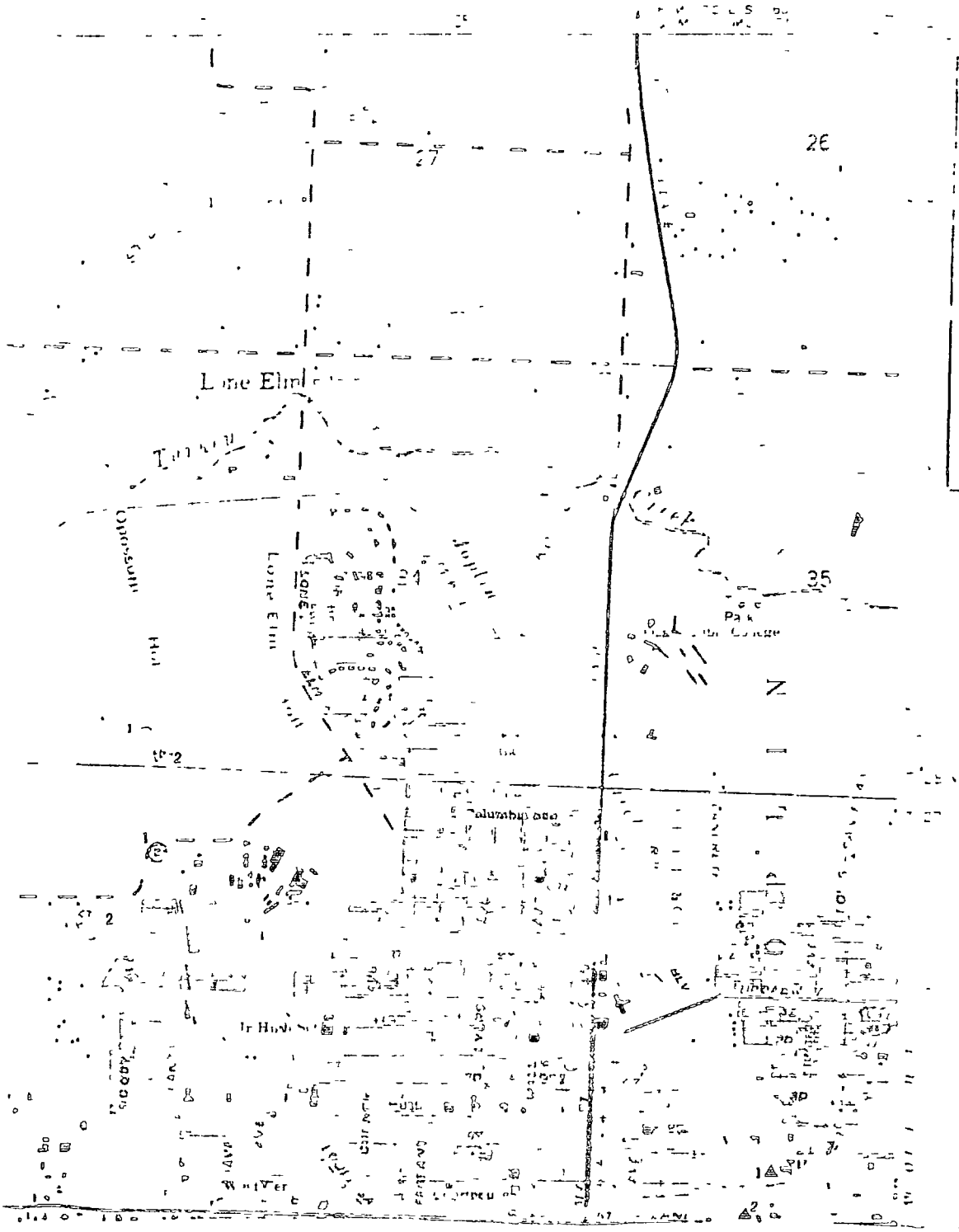
PLATE 2-B: OPEN SHAFTS, PITS, & SUBSIDENCES
JOPLIN WEST QUADRANGLE, MISSOURI

WEBB CITY QUAD
PLATE 2-D



LIBRARY

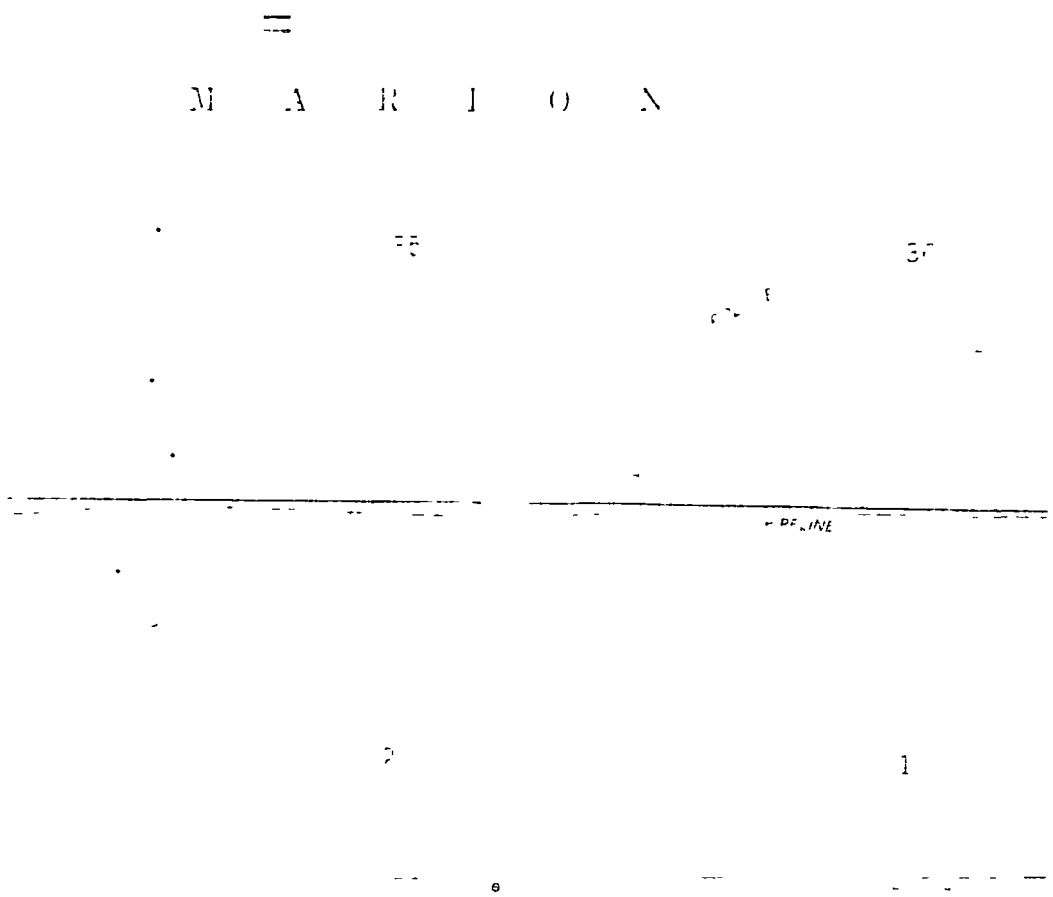


PLATE 2--A: OPEN SHAFTS, PITS, & SUBSIDENCES
JOPLIN EAST QUADRANGLE, MISSOURI

by Michael C. McFarland and James C. Brown Jr., 1982

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY, ROLLA, MO

Prepared under U. S Bureau of Mines
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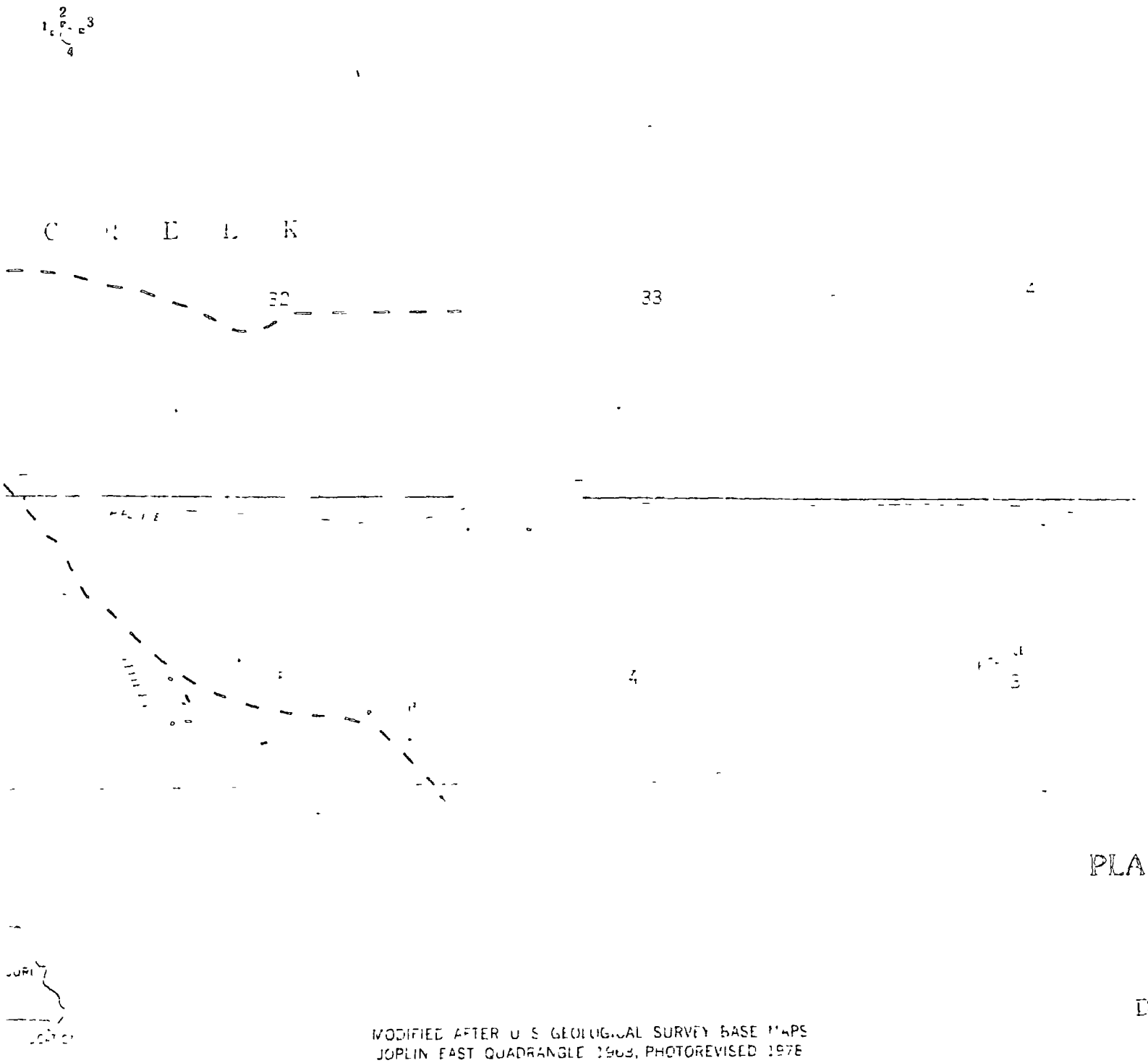

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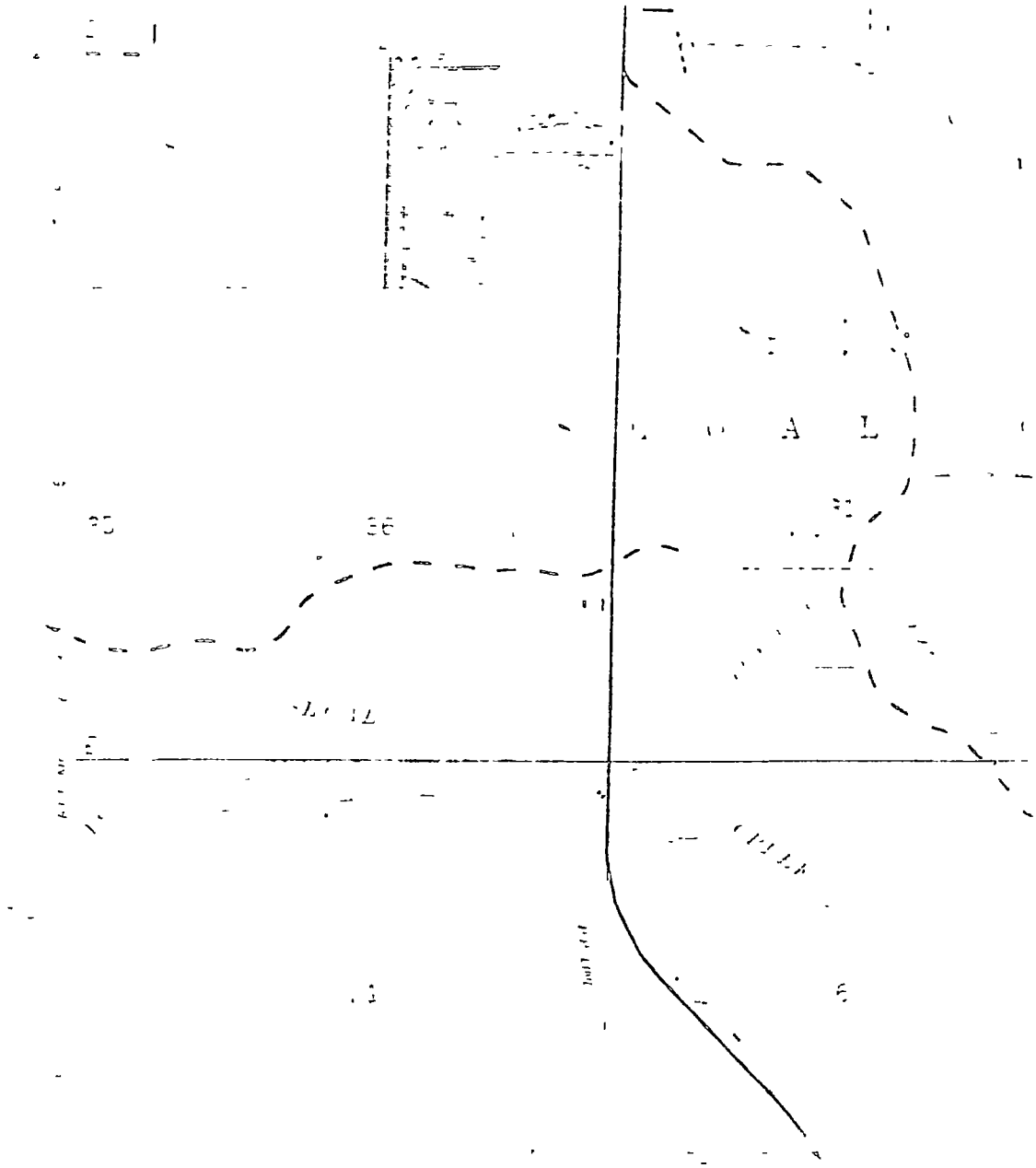
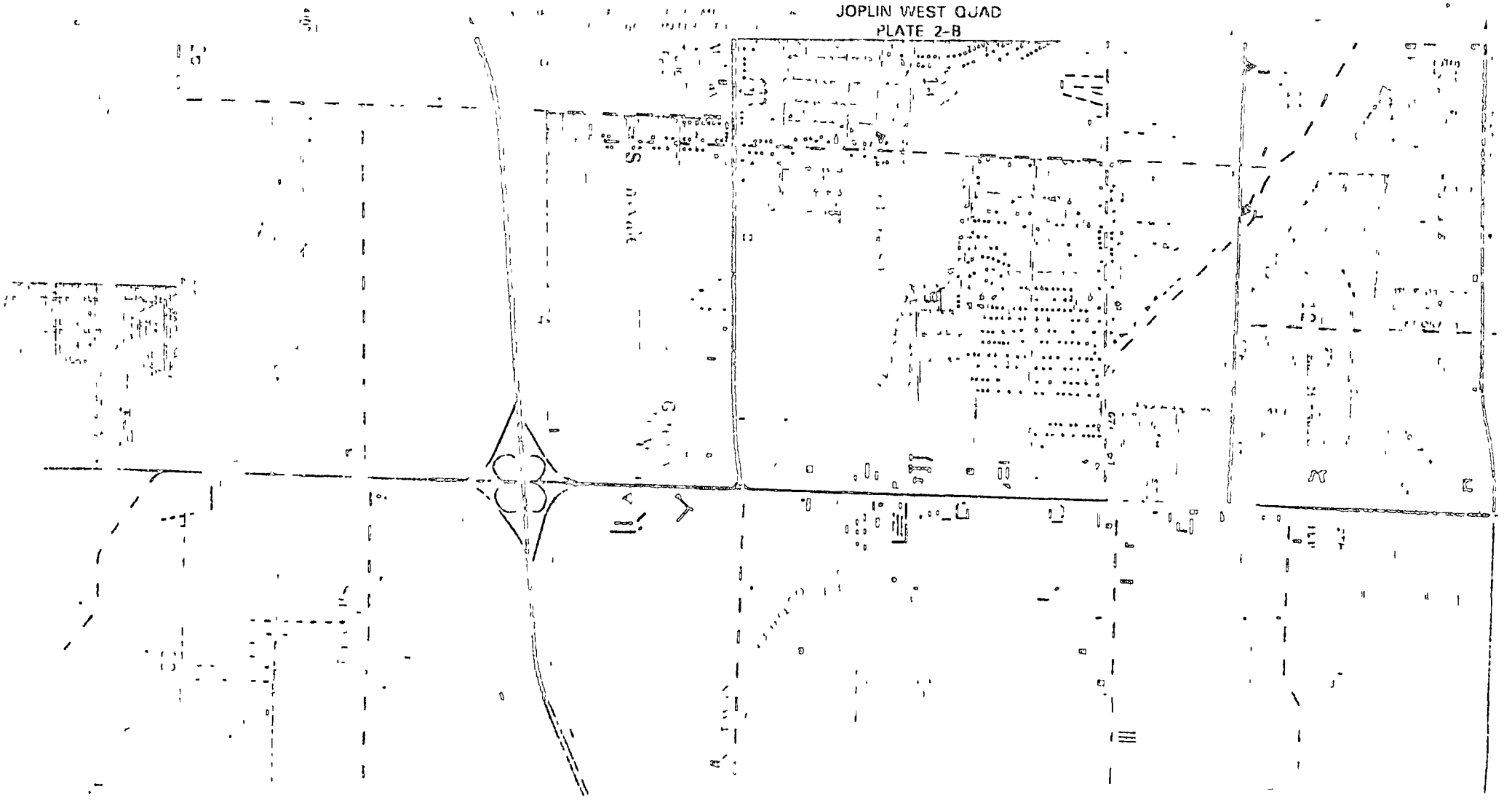
JOPLIN EAST QUADRANGLE 1963, PHOTOREVISED 1978
DRAFTED BY SUSAN C DUNN, 1982

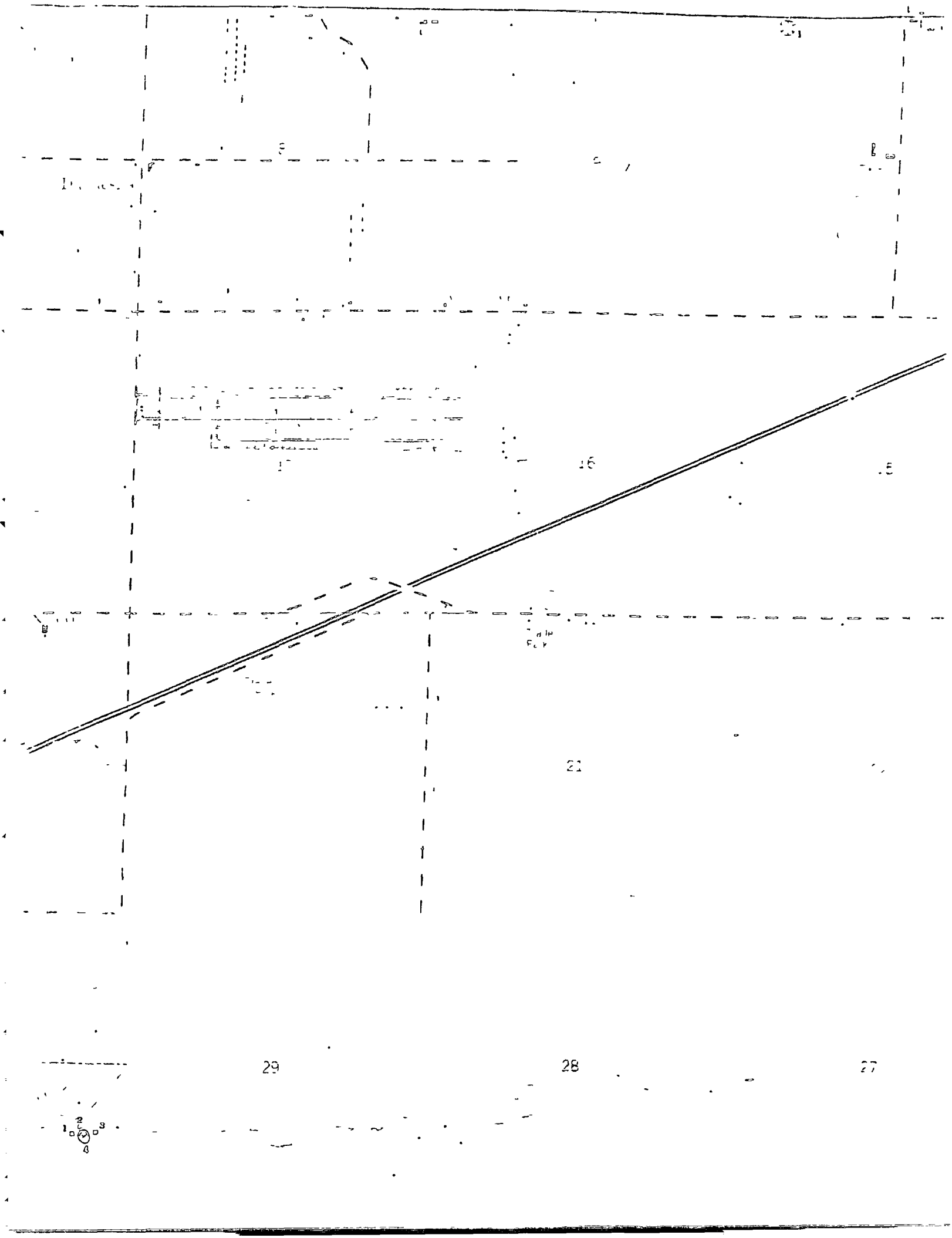


LEGEND

- Open Shaft
- Open Shaft Collapsed
- Open Pit
- Subsidence
- Subsidence Reported

JOPLIN WEST QUAD
PLATE 2-B

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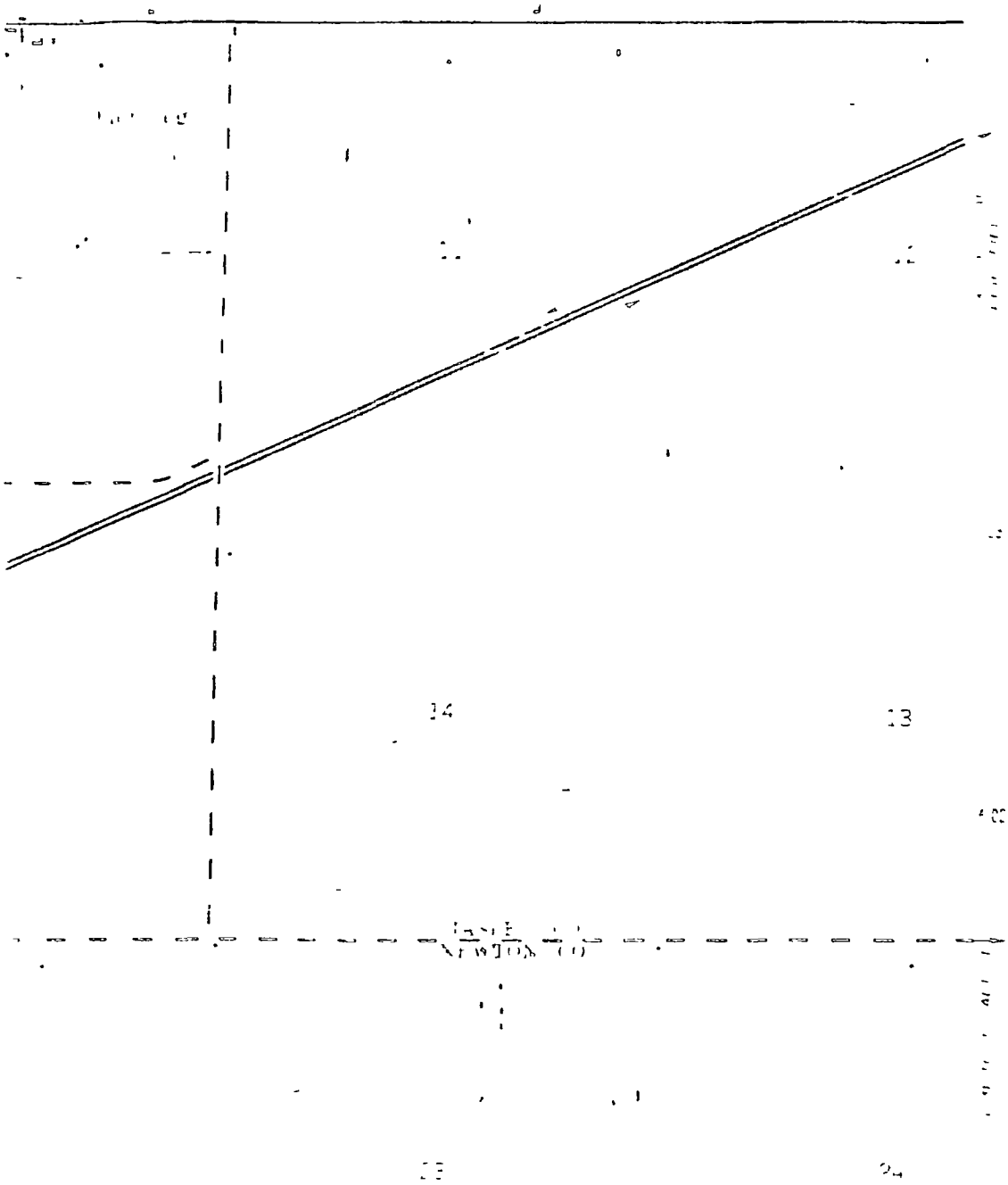
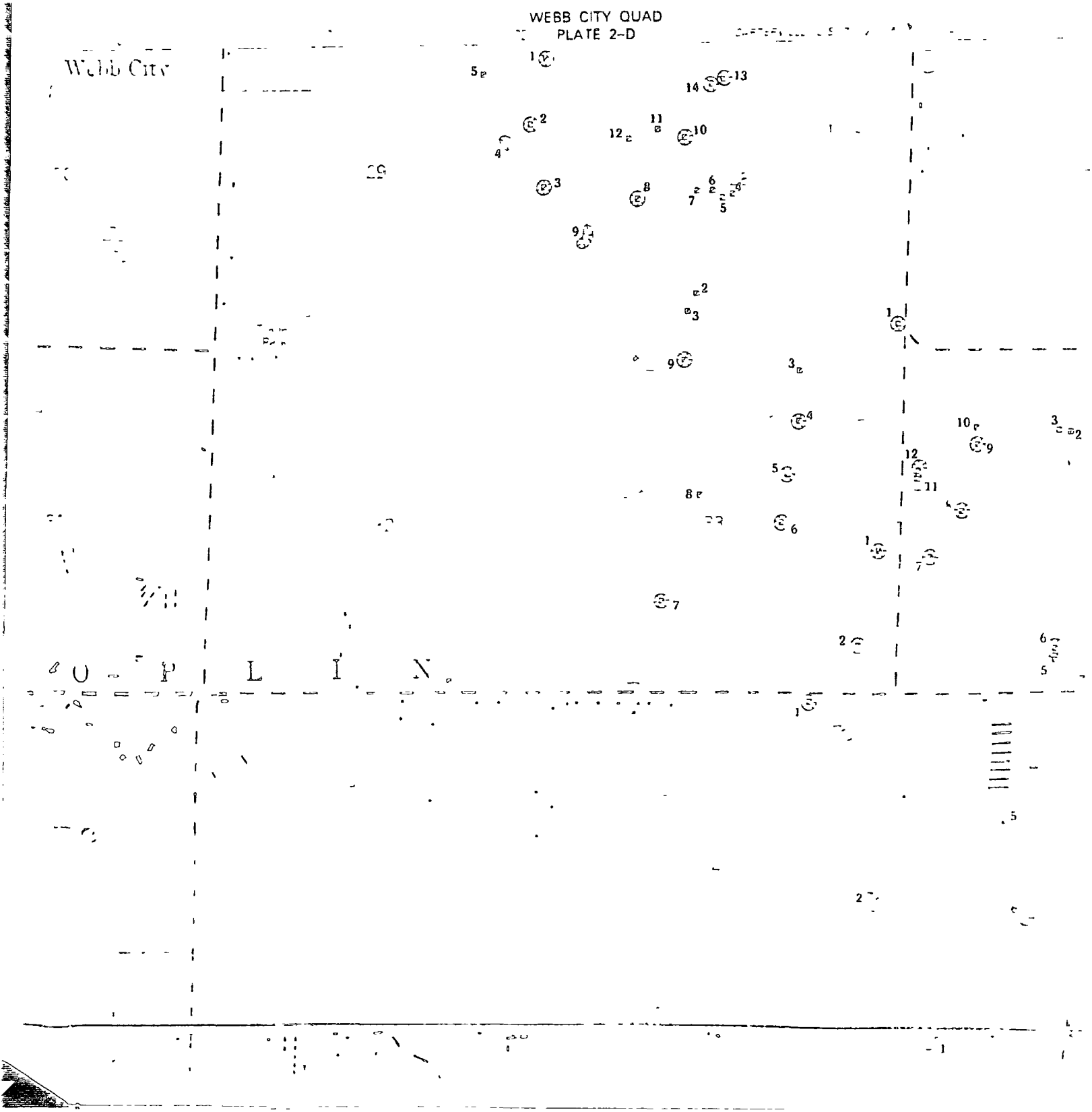


CARL JUNCTION QUAD
PLATE 2 C

WEBB CITY QUAD
PLATE 2-D



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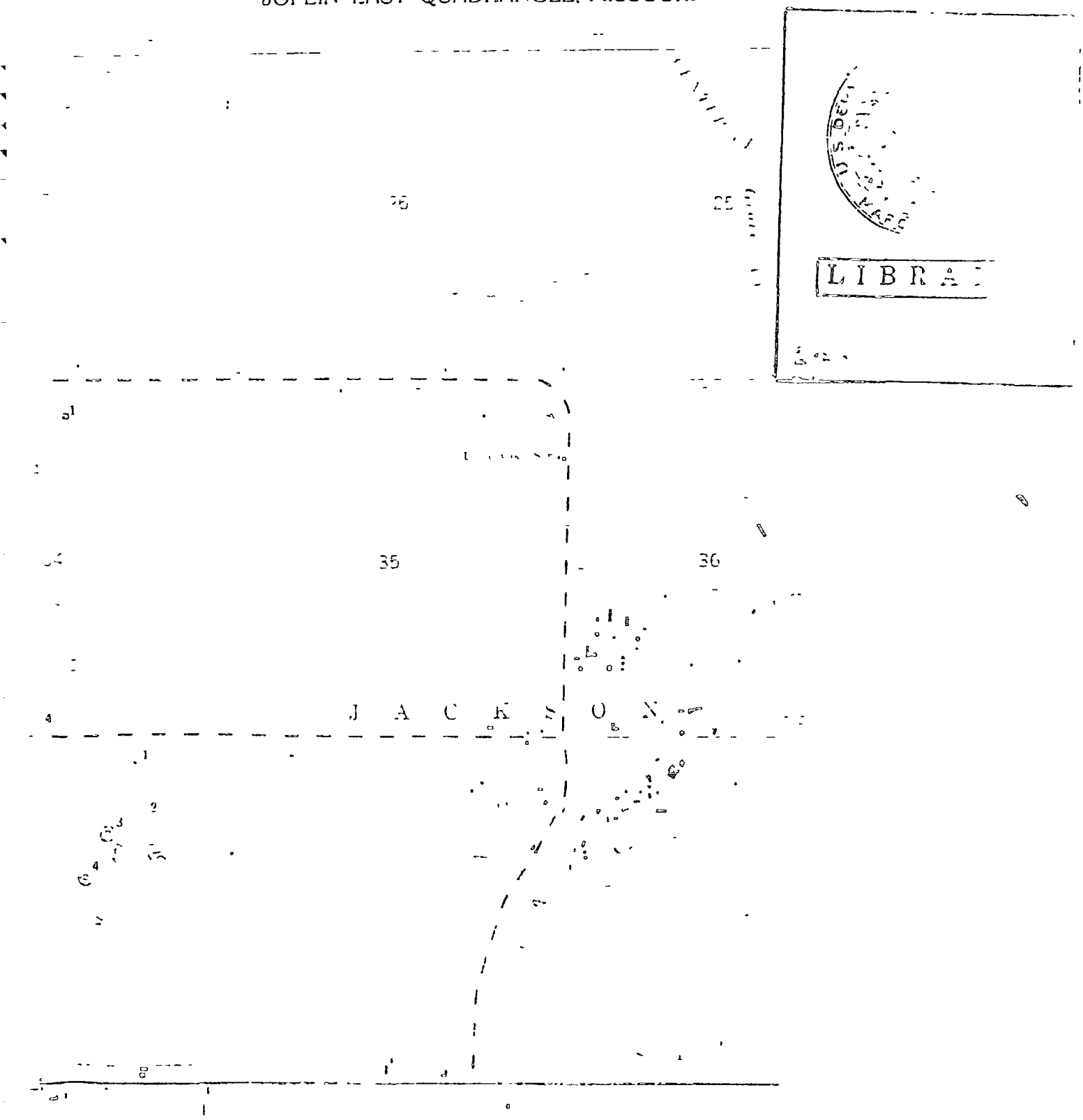
PLATE 2-A. OPEN SHAFTS, PITS, & SUBSIDENCES
JOPLIN EAST QUADRANGLE, MISSOURI