A LAND USE HISTORY AND PRELIMINARY CULTURAL RESOURCE SURVEY OF THE WATER STREET DISTRICT, FLINT, MICHIGAN

FOR
FLINT DEPARTMENT OF COMMUNITY DEVELOPMENT

BY
CAMINOS ASSOCIATES
P.O. BOX 321
LINWOOD, MICHIGAN 48634

APRIL, 1982
(Revised)

TABLE OF CONTENTS

CAMINOS ASSOCIATES PERSONNEL

Principal Investigator	Earl J. Prahl
Historic Research State Library	William Lowery
Research Assistants	
Historic Research	Roberta Stoltz Mary MacLachlan
Volunteer Field Assistants	Richard Langtry Mary MacLachlan
Graphics	Allan Barnella

LIST OF FIGURES

18. 1880 Panoramic View of the City of Flint*

19. 1889 Randall Map of the City of Flint*

20. 1890 Panoramic View of the City of Flint*

21. Sanborn Insurance Map, 1909*

22. A map of the project area indicating areas of prehistoric archaeological sensitivity and showing areas of fill and disturbance

23. Map of the project area indicating loci of historic archaeological sensitivity

*Originals or legible reproductions are located in the Michigan Room of the Flint Public Library, 923 East Kearsley Street, Flint, Michigan.

LIST OF PLATES

INTRODUCTION

During the summer of 1981 the principal investigator was contacted by John Leppanen of the Flint Department of Community Development concerning a land use history of the Water Street district in downtown Flint, Michigan (Figure 1). Final contractual arrangements with Caminos Associates were completed in September with background and field research conducted in November. Only minimal archaeological testing was to be done under the contract arrangements. The land use history consists largely of a background and archives search. The present report is not intended to be a revision of Flint history. For purposes of overview traditional histories were consulted (Ellis 1879, Wood 1916). This report, though, focuses on documents and data that elucidate the cultural resources (both archaeological and standing) of the project area, especially in the near waterfront area where land modification is more apt to occur in the near future. Besides written documents, this report relies heavily on cartographic evidence, the best source of specific settlement pattern data, often lacking from the written document.

The Water Street district is bounded by the Flint River on the south. It extends northward to Fifth Avenue. Garland Street constitutes its eastern boundary, while Grand Traverse forms its western boundary (Figure 2). More specifically stated, the study area is in the SE 1/4 of Section 12 of Township 7N, Range 6E of Genesee County, Michigan (Figure 3).

The Water Street district, a 14 block area, largely consists of residential structures interspersed with small commercial establishments in its northern sector. Third and Fifth Avenues are major east-west thoroughfares crossing this portion of the district. The southern sector is composed of warehouses, former factories, a vacant lumber establishment, with some professional offices occupying space on Water Street.

The area north of the Flint River and west of the central business district is slated for redevelopment in various phases. Several construction projects to the south and east of the Water Street district have already impacted the waterfront and what archaeological and historical resources that may have been there. The major of these has been the Army Corp of Engineer flood control project which affected the waterfront area for a considerable distance east and west of Saginaw Street. The University of Michigan Flint Campus was built during the later 70s to the east of Saginaw Street on the south side of the river. The Hyatt-Regency Hotel has risen on the south side of the river, west of Saginaw Street. Another "high-rise" the State Office Building, is presently being completed between the University of Michigan complex and Saginaw Street.

Since the passage of the National Environmental Policy Act in 1970, land modifying projects involving federal funds have required environmental impact statements. Code of Federal Regulation Title 36, VII, 800 as well as several subsequent federal guidelines outline this process in regards to cultural resources. In accordance with federal policy, Code of Federal Regulations 36: 801:3 of Historic Preservation Requirements of Urban Development Action Grant Programs, clearly states that applicant's responsibilities include the identification of all properties that may be eligible for the National Register of Historic Places. This guideline requires survey of project impact areas through site examination by qualified personnel according to 36 CFR 1202.6.

As of this writing, no methodical or comprehensive (either archaeological or architectural) survey has been done by qualified persons of the downtown Flint area although federal and state funds have constantly been utilized for projects there. Several projects outside the downtown area have undergone archaeological and historical survey according to federal guidelines in regards to environmental impact statements. Survey of improvements at Bishop Airport was conducted in 1976 by Edward Wilmsen of the University of Michigan Museum of Anthropology. Richard Stamps of Oakland University conducted a survey of a federally funded sewer project along Gilkey Creek in 1977. In 1978 Commonwealth Inc. of Jackson, Michigan conducted a survey of the proposed General Motors Industrial Development north of the Flint downtown area. More recently a survey of the Carpenter Road area crossing the Flint River has been conducted. Results of these surveys are on file at the Michigan History Division (MHD), and are available to future researchers.

On the other hand, nothing is known of an "archaeological dig" conducted just west of Grand Traverse Street along the waterfront in 1974 by the Valley School. No report exists of this excavation in MHD files, although permission to do so was given by both the Army Corps of Engineers and the City Engineer of Flint.

Little has been researched in the recent period concerning the Flint waterfront, the focus of community activity throughout the City's history. Local historian Edmund Love has dealt with the Jacob Smith epoch and other aspects of Flint history (Love 1976). Gustin's 1976 editing of a bicentennial publication published by the Flint Journal is a good expense of bicentennial monies. Several important photographs and early maps are reproduced. Richards (1979) has published an excellent article on the original plats done by early surveyors at the Grand Traverse crossing.

The Flint Historic Preservation Committee has produced a well organized brochure promoting and explaining historic preservation. The Flint Historic District Commission is on record as being dili-

gent in monitoring construction and development activities that would affect buildings or neighborhoods of importance to Flint history. The most comprehensive document relating to the Water Street district was done by Preservation and Urban Design in 1978 for the Flint Department of Community Development supported by a grant from the National Endowment for the Arts. This document contains excellent planning data but no detailed archaeological or architectural surveys of the Water Street district which was beyond the scope of this particular report.

During 1975 severe land modification of the Flint waterfront area occurred adjacent to the river exposing historic strata and cultural material due to the Army Corp of Engineers flood control project. This became the hunting ground for bottle collectors and seekers of exotic artifacts. Shovel excavations were allowed and lively sales of such were conducted on the spot. Yet no Flint institution such as the Sloan Museum or the University of Michigan at Flint possess systematically derived archaeological samples from the downtown area.

During this period and subsequent building of the I-475 expressway, Don Simons, local archaeologist and member of the Michigan Archaeology Society, monitored all land modifying activities occurring. To him we owe what knowledge we have of archaeological deposits along the Flint River waterfront. Simons photographic records have been made available to this author.

As an architectural historian often finds difficulty defining significance for a building without referring to its historic context, so archaeologists look to ecological and environmental data as well as the written document as context for the final testing of the subsurface for significant archaeological samples. The Water Street district, its cultural resources, cannot be separated from the general natural history of the Flint area of which some 12,000 years of human occupancy is a part. The present report then aims at a context within which to consider the project area. The future is the next witness.

GEOLOGICAL SETTING AND GENESIS OF THE FLINT RIVER DRAINAGE

As can be seen from an examination of a map of the surficial geology of Michigan (Martin 1955) Flint's central city is built on a glacial outwash that traverses a portion of the recessional Flint moraine. This moraine is a remnant of the last retreat of the Wisconsin glacial ice, that in its further advance southward had reached Cincinnati and the Ohio Valley (Dorr and Eschman 1977). The Flint moraine is part of a greater area called the Lake Border moraine which forms the outer border of what is termed the Saginaw Valley or drainage (Martin 1955 and Figure 4). When the Lake Wisconsin ice was at its Lake Border or Flint position, large ponded lakes existed immediately to the east of the Flint area between the moraine there and those to the south. As the early settlement at Flint expanded from its early location it intruded areally into the ponded lake and moraine zones. These facts of soil and landform genesis are important in any interpretation of soil stratigraphy in the Flint region and the chronological position of the original soils underlying historic fill.

With retreat of the Wisconsin ice from its Lake Border position the land surrounding the morainic uplands were drained. A series of glacial lakes occupied the region north of Flint in the Saginaw Basin, the waters each in a lower position as the ice retreated towards the Mackinaw Straits. As these lakes receded the Flint River, already running from North Branch to Flint, began to cut its course north on the vacated lake bed. This geological event was to establish the future location of Flint as a strategic point on the prehistoric travel and trade network between the Detroit area and the Saginaw Valley.

The glacial waters occupying the Saginaw Basin had receded northward to approximately Montrose and the Flint River, while gathering its headwaters east of Flint continuing to cut northward to its egress. The shoreline at Montrose is known as Lake Warren. This is the beach along which the earliest inhabitants of Michigan, between 11-10000 B.C., may be found archaeologically. Benches or terraces relating to Lake Warren, the remnants of which exist near Montrose, can be identified in the project area in the rise from the rivers edge between the 790 and 720 foot contour. Lower lake levels of the glacial lake waters in Saginaw Bay are represented at lower levels.

The large southern-most meander on the Flint River was the first major waterway met on the overland trail from Detroit via the Pontiac region that led to Saginaw Valley. This interface between the overland route and water travel into the Saginaw Valley destined the Grand Traverse to be an important locus in the prehistoric travel system of the southeastern and central portions of the lower peninsula. The first white settlement will strategically begin at this place.

PREHISTORIC CONSIDERATIONS

It is evident that at the later end of the prehistoric continuum the strategic south bend in the Flint River was an important place of passage and at least semi-permanent occupation. As indicated above the locus constituted a "water break" in the overland route from Detroit to Saginaw and additionally offered water passage northward.

Another ecological or environmental characteristic marks the Grand Traverse crossing with significance. This portion of the Flint River drainage exists in the transitional zone between the southern hardwoods and the northern forests containing greater elements of Pine (Figure 5). Oak and Hickory dominated the morainic uplands in the Flint area while elm, Ash and Silver Maple existed on the lake plain north of Flint. North of the present village of Pine Run a large stand of White Pine stood, mixed with deciduous species (Veatch 1953, Veatch 1959).

Additionally, the Flint crossing stands at the edge of two major physiographic zones, the Saginaw Lake Plain province to the north and the more well drained morainic uplands of southeastern Michigan (Martin 1955, Figure 4, this report). A great deal of archaeological investigation has been done concerning the "edge" area between the Carolinian and Canadian biotic zones as a region of strategic prehistoric settlement and passage (See Fitting 1975, for a general discussion of Michigan prehistory).

Some 12,000 years of human occupation of the land are represented archaeologically in the Flint area. As yet, no documented evidence or excavation pinpoints any prehistoric site in the vicinity of the Flint River Waterfront or the project area. A Paleo Indian site near Grand Blanc dates from the period when the earliest inhabitants of Michigan entered the southern peninsula (Don Simons, personal communication). Paleo-Indians (11,000-8,000 B.C.) who occupied this site used the morainic uplands above the Late Pleistocene watercourses and ponded lakes. The future valley of the Flint River is an outwash plain bordered by tundra and Spruce parkland to the east of Flint. Barren ground caribou, musk ox, and cold adapted species of elephants were the fare of these Paleo hunters.

TABLE I

PREHISTORIC PERIODS OF THE GREAT LAKES REGION

Paleo Indian	11000 - 8000 B.C.
Archaic Period	
Early	8000 - 5000 B.C.
Middle	5000 - 3500 B.C.
Late	3500 - 1000 B.C.
Woodland Period	
Early	1000 - 300 B.C.
Middle	300 B.C. - A.D. 500
Transition	A.D. 500 - 800
Late	A.D. 800 to European Contact

By what is termed the Archaic Period (8,000 B.C.) the climate changes dramatically and the first extensive forests, dominated by coniferous species invade the Flint area. By this time the drainage pattern of the Saginaw Valley was essentially as it exists today. By 5,000 B.C., the modern forest types are presented along the Flint River.

Frequent use of the Grand Traverse, as a locus of seasonal occupation and small campsites, probably began in the Late Archaic Period (3,500 - 1,000 B.C.) and continued throughout the remainder of the prehistoric period. Archaeological deposits dating from the Late Archaic period are well documented from the lower Saginaw Valley. The headwater regions of the Saginaw and Grand River drainage are presently under investigation by archaeologists. Late Archaic sites would exist above the 720 foot contour in the project area and areas of higher relief and would represent seasonally occupied sites extending for distances along the southernmost bend in the Flint River. The northern sector of the project area could include such sites.

The Woodland Period is represented by only a few sites mentioned in the literature and found in site files (McCormick 1883, Hinsdale 1931). These were subsequently registered with the Michigan History Division. Local collections including one at the Sloan Museum include diagnostic material from this period but with little specific provenance.

A check of the Michigan History Division (MHD) site files reveals only four known archaeological sites in the near vicinity of the project area, one of these being the historically documented general location of the Jacob Smith trading post. Of the three prehistoric sites, a village is noted in section 3 (sic) and Township 7N, Range 6E (20 GS 14), in an area west of Welch and Clio Roads. A second archaeological site (20 GS 13), supposedly consisting of eight mounds is recorded in the N 1/2 section 19 of Township 7N, Range 7E, south of the project area in the vicinity of Thread Creek. More importantly, as regards the project area, the Village of Muscutawaing is recorded in the MHD files in Section 13 of Township 7N, Range 6E and Section 18 of Township 7N, Range 7E, which would locate this site in the general area of downtown Flint, between Swartz and Gilkey Creeks, on the south side of the Flint River; this latter is generally considered a historic Indian site.

The site designations are not primary sources being derived from the 1931 Archaeological Map of Michigan compiled by W.B. Hinsdale, curator of Great Lakes archaeology at the University of Michigan Museum of Anthropology (Hinsdale 1931). Although this is the first and rather comprehensive treatment of the distribution of Michigan's prehistoric sites, the basic locational data is

often vague and sometimes apocryphal. No data from this source records details about specific sites in the Flint area and the site boundaries are vague lending no aide to methodical investigation. At this writing no specific prehistoric site can be pinpointed within the project area.

Other prehistoric sites in the Flint area have been noted. William McCormick who in the early 1830s traveled the Flint River records in his journal Indian burial mounds near Flushing, Michigan, but more importantly on a high bluff just below (down river) the Flint settlement (McCormick 1832). The first area of high relief to be met down river from the downtown area is in the area of Glenwood Cemetery north of the river. Since burial mounds are usually associated with nearby settlement, this would indicate prehistoric settlement west of the project area. It is the impression of Donald Simons, local Flint area archaeologist and member of the Michigan Archaeological Society, that the probable location of the prehistoric occupation of the area is at the Atwood Stadium-Chevrolet Plant area, a locus of repeated burial finds. No prehistoric material was found during Simon's extensive monitoring of the Army Corp of Engineers Flood Control Project in 1975 in areas directly to the west (Eagles Building parking lot) or east of Saginaw Street, although extensive historic strata was noted (Don Simons, personal communication).

In summary, no exact location can be given for the indicated prehistoric Indian occupation in the vicinity of the project area. Methodical subsurface testing in the area above the 720 foot elevation or above Second Avenue would reveal or dismiss its presence.

THE HISTORIC INDIAN VILLAGE AT FLINT

Indications of a historic Indian village at the Flint River crossing is found in the Schedule of Indian Land Cessions in the United States, published as Part II of the 18th Annual Report of the Bureau of American Ethnology (Royce 1899). Plates OXXXVIII and OXXXVII mark the Grand Traverse Village at the Flint River crossing as well as Sesinsiwin's and Tonquish's Villages south of Pontiac in the headwaters region of the north branch of the River Rouge. Reaum's Village (Neome's) north of the Grand Traverse Village, on the Flint River, is also noted. By the Treaty of 1819, these villages became Indian reservations on the Saginaw Trail. This again emphasizes the importance of the Grand Traverse as a locus of historic Indian activity and indirectly its prehistoric origins. Whites, intruding into the area for fur trade activity and settlement, utilized the strategic points on the Indian network.

Maps done in the immediate decades following the 1819 Saginaw Treaty did not note the location of any traditional Native American villages and when they did so, only as reservations. The earliest existing post-treaty map of Michigan territory dating from 1822 shows neither reservations or Indian settlements at the Flint River crossing or elsewhere in southeastern Michigan. This map is created solely, as the legend states, "to exhibit the boundaries of several counties as described by His Excellency Governor Cass' Proclamation of September 10, 1822" (Figure 6). The J. Finlayson Map of this same year is useless for any historic construction being severely distorted and often in error (Finlayson 1822).

Judd's Map of 1824 (Figure 7), in similar fashion, exhibits only county lines and river drainage systems without noting reservations or Indian settlement. No new counties are shown within the recent treaty boundaries. Genesee County is yet to be organized. Orange Risdon's Map of 1825 (Figure 8), clearly shows the J. Smith Reservation, totaling 7041 acres, at the southern bend in the Flint River as well as other reservations in the Saginaw Valley and to the south of Pontiac. Risdon worked as a government surveyor and laid out the Monroe Pike or Chicago Trail, now U.S. 12. Risdon's map also shows a trail leading from north of Pontiac at a series of lakes which form the headwaters of the Clinton River in present Oakland County continuing northward to the Jacob Smith Reservation. From there the trail continues north some six miles ending at a tributary of the Flint River. This is undoubtedly the Military Road cleared in 1822-23 and followed the route of the Saginaw Trail.

The 1826 Farmer Map (Figure 9) also indicates the amount of surveying completed within each township. It is to be noted that

the internal survey of Michigan Territory or that land acquired by 1819 Treaty north of Flint was occurring at this time. The Farmer Map is the first to indicate the location of various Indian villages, but none is marked at the Jacob Smith Reservation. One is, interestingly enough, marked at Grand Blanc south of Flint.

Only a few certain facts are clear. Neome was the headman of a band of Ojibwa speaking Indians with village headquarters in the vicinity of Birch Run or Taymouth, several miles north of Flint. Neome's name is frequently associated with Jacob Smith and they both play a major role at the Council of the Treaty of 1819. The name of Neome's Village is given variant spellings such as Pewonigowink, Pe-wan-a-go-wing or Pewangong, meaning place of the flint.

It is the Village of Muscatawingh (Place of the Burnt Over Plain) that existed at the Grand Traverse crossing of the Flint River. Little is known of the exact location of this village if indeed it was a year-round permanent village. Michigan History Division site files locate this village on the south side of the river somewhat in the downtown area. Other traditional sources would favor the north side of the river and west of downtown. This position is strengthened by the many reported prehistoric finds in the vicinity of Atwood Stadium (Don Simons, personal communication) and again the location of Jacob Smith's trading post in a nearby location. The general locations of these two villages have never been archaeologically tested.

To understand the Saginaw Trail and the importance of the Grand Traverse, one must view it from a regional perspective and as a system of cultural importance that respects both topography and the river systems of southern Michigan. North of Flint the trail forks, one branch leading north to Saginaw Bay along the Flint River, another fork goes westward from Reaum's (Neome's) Village to the Shiawassee River and connects south with Kech-e-eaun-dau-gu-mink Village or the trading post known as Knagg's Bridge. A trail south of Flint branches off from the Saginaw Trail to this same location. From this spot it is but a short portage to the headwaters of the Looking Glass or Maple rivers which constitutes part of the Grand River drainage whose egress is on Lake Michigan (Figure 10). South of Flint the Saginaw Trail leads to the headwaters of the Rouge River and hence to the Detroit region and the Lower Great Lakes. It was at the meeting of the Saginaw Trail and the Rouge that Indian reservations were to be established as they were at the Grand Traverse (Martinez 1981).

It is not difficult to see that the Saginaw Trail united several of the headwater regions of river drainages in southeastern Michigan as well as the Grand River to the west. It is also evident that the crossing at the Flint River stands central to this water and trail system. This, of course, strengthens the idea that prehistoric as well as historic Indian deposits are present in the vicinity of Flint. It is also evident that the white man, whether by choice or necessity, used this system to his own advantage. The location of trading posts and reservations corroborate this point.

Designation of the Saginaw Trail is found on the original Wampler Map of the eleven sections set aside as Indian reservations at the Flint River crossing. The original resides in the state archives and was examined during the writing of this report (William Lowery, personal communication). A copy of this map is found in Massie (1967) and another edition engraved from Ellis' History of Genesee County.

History of Genesee County (Ellis 1879). These are seen in Figures 11 & 12. It is easily ascertained that with the projection of the north-south line between Range VI and VII of Township VIII on such and comparison with the modern USGS Quadrangle Map that this line is consonant with Saginaw Street (Figure 13 & 14). This line extending to the Flint River would cross the river as the locus of the Saginaw Street Bridge. As can be seen, the Saginaw Trail south of the river is east of Saginaw Street and continues so until north of the river. This evidence demonstrates that the Saginaw Trail was east of Saginaw Street and the present project area.

The Saginaw Trail, then, would have crossed to the north side of the Flint River in the vicinity of the present location of the IMA Auditorium and continued in a westerly fashion to a point north of Hurley Hospital, continuing north of Longfellow Junior High School and crossing Ballenger Road just south of Welch Street.

Ellis states that the Old Indian Crossing of the Flint was above the Saginaw Street Bridge, near the dam built by Stage and Wright. The road to it was completed in 1834 (Ellis 1879:40). From 1852 to 1879 this dam area was owned by William Hamilton (Ibid:137). The earliest atlas of the Flint area (Beers 1873) shows property south of the river at the juncture of Clifford Street and the river as owned by Hamilton. Again, this would indicate that the Saginaw Trail passed well east of Saginaw Street.

THE JACOB SMITH RESERVATIONS

Eleven Indian reservations were created at the southernmost bend of the Flint River on the Grand Traverse by the Treaty of Saginaw in 1819. This included some 7,000 acres of land and encompassed a great deal of the present City of Flint. These reservations are cited in Article 3 of that Treaty (Royce 1899; Institute for Development of Indian Law, nid; Indian Affairs, Laws and Treaties nid). This land was already in possession of the United States Government by the Treaty of 1807 (Ibid). Upon Smith's death, five of the reservations were claimed by Smith's white children. None were claimed by persons of full Ojibwa descent.

The importance here of these reservations is the manner in which their creation affected land tenure on the north side of the Flint River. Litigation over land there carried on for decades probably retarding development. The establishment of these reservations have no association with any specific settlement pattern data within the project area. Details, then, of the Treaty of 1819 and the eleven reservations have been therefore placed in an appendix (Appendix A).

LOCATION OF THE JACOB SMITH CABIN

Jacob Smith's trading post was established on what is to become reservation #2 or Metawanene (Ellis 1879:24). The west boundary between this reservation and reservation #3 or Annokeqoqua (Figures 11 and 12 is noted on atlases of the latter half of the 19th century (see Beers, 1873), and runs from Romona Park north of Begole Street to near the corner of Lyon and Water Street (Figure 13). Assuming that the Smith post was south and west of the Saginaw Trail or on its "riverside", its location would be in the area between the IMA Auditorium and Lyon Street, and south of Third Avenue (Figure 13 & 14). It is logical to assume, as Richards had done (1981), that the structure would be above the near flood plain or the 720 foot contour.

Tradition would have it that the Smith Cabin existed on the location which would become the site of the First Baptist Church located at the southeast corner of Lyon Street and First Avenue. The church can be easily located on the 19th century panoramic views of the City of Flint (1867, 1880, and 1890), and on the Beers Atlas Map of Flint (1873). Some historical evidence exist for this conclusion. Chauncey S. Payne, Smith's son-in-law or husband of Smith's daughter Louisa, arrived in Flint in 1825 soon after Smith's death, and donated land, part of his wife's inheritance, to the Baptist Church (Ellis 1879:40). This was not his to give in 1825 on behalf of his wife, for Metawanene was the Indian designation for Albert J. Smith, Jacob's son. Louisa is known under the designation of Annokeqoqua (Gustin 1976:22). This is strengthened by Wood's claim that the "-qua" ending on the designation of the reservation is feminine while others are masculine (Wood 1916:168). Jack Smith, an Ojibwa raised by Smith, also claimed to be Metawanene and was later to deed land in reservation #2 (Ellis 1879:26). Patents to reservation #2 were awarded Albert J. Smith by Congressional action in 1836 (Ellis 1879:26). Payne did not receive title to this land from Albert J. till after this date. The Baptist Church was dedicated on Dec. 12, 1855.

Chauncey S. Payne records in 1837 the platted map, "The Village of the Grand Traverse." Richard's (1981) discussion of this map notes that Lot 9 of Block 5 (bounded by Lyon, First Avenue, Garland and the Flint River) bears a graphic symbol resembling a building. No legend exists for this symbol at the corner of Lyon and First on this map. The memoirs of Hervey C. Parke, surveyor of the Village of the Flint River (1833), is one of the few written references that refers to a visit to the Smith site. Visiting the site in June 1821, he states that the cabin was well clear of the river which was at highwater stage. He adds importantly that the cabin was a few rods below the present (1874) railroad bridge. Richards feels that in 1874 this can only mean the Pere Marquette Bridge upstream from the Saginaw Street crossing (Richards 1981). The distance between the railroad bridge and the Baptist Church

location is between 700-800 feet. A rod is 16.5 feet and taking the lesser of the above distances would equal 42 rods (the distance from the railroad bridge to the Baptist Church site). The researcher is left with the problem of whether 42 rods fits Parke's mental category of "a few". John Todd lived on the south bank of the river on the west side of Saginaw Street. The late Judge Stowe lived about forty rods below on the North Branch of the river in the old Indian trading house of Jacob Smith (William McCormick, Personal handwritten Journal, on file Bay County Historical Society Museum, Bay City, Michigan).

One additional map has been discovered in the Michigan Room at the Flint Public Library which might shed light on the symbol noted by Richards at the corner of Lyon and First Avenue. A Julian Bishop map of 1855 has already been mentioned. Flint on this document is an insert next to a larger map of Genesee County. This is the map noted in Barnett's Checklist of Printed Maps of the Middle West to 1900(1981).

The newly discovered map, not noted in the Barnett Checklist (Lee Barnett, personal communication) was also printed by Julian Bishop. Bishop, a resident of Grand Blanc, would be aware personally of local cultural features. No date marks this map entitled Map of the City of Flint by an Act of Legislation of 1855 (Figure 15). City lots of 66 and 60 feet are platted on this map determined by Bishop and Fenton (sic). At the corner of Lyon and First Avenue a rectangular symbol exists in lot 4. The longer axis of this figure is oriented east and west. The figure is approximately a "chain" or 66 feet long. It's eastside is 33 feet east of Lyon Street. This configuration extends eastward into the second 66 foot lot along First Street. On this particular map the accompanying designation can be clearly read. It reads: Smith Grave.

With this knowledge it might be considered that the rectangle represented some sort of an enclosure surrounding the actual grave site. If this is so, it would eliminate this specific area as the locality of the Smith trading post structure, although Smith is recorded as being buried near his cabin. Further, the grant of this land to the Baptist Church where they finally erected their church takes on a new significance with this area identified as a gravesite. Since the Baptist Church was dedicated in December, 1855, Smith's body was possibly moved by this time to its final resting in Glenwood cemetery. This remains problematic since with the small scale nature of the maps we possess we cannot tell if the structure built there intruded into the gravesite area, although it appears so. Bishop's map must have been published sometime shortly after 1855 or the incorporation of the City of Flint since the fact is mentioned on the map. The drawing of the map occurs before this date since it records the Smith grave and not the Baptist Church structure. Further court house and records search might reveal the nature of the Payne-Baptist Church transaction as well as the time of the removal of the Smith grave and

the reasons. It is possible that the earlier granting of this plot to a religious organization may have been done for future preservation.

A further consideration is that the symbol noted by Richards (1981) on the 1837 map recorded by Chauncey Payne at the corner of Lyon and First Avenue may be an earlier noting of the gravesite rather than designating a structure. With the removal of the Smith grave from the site, its identification might have been removed from succeeding copies or transcriptions of the original map upon which the symbol for the grave site, for reasons we do not know, remained.

An additional, recently revealed document would corroborate the location of Lyon Street and First Avenue as the locus of the Smith trading post. The personal handwritten diary of William McCormick, who lived as a child in Flint during the 1830s, was consulted at the Bay County Historical Museum in Bay City, Michigan. The following quote is transcribed from the diary.

> "John Todd lived on the south bank of the river and the west side of Saginaw Street (present location of Hyatt Regency - author). The late Judge Stowe lived about forty rods below on the north branch of the river in the old trading post of Jacob Smith."

The popular images of a history, of a region, creates its own "needles in the haystack". Smith is seen living in a single log cabin within a small clearing in the middle of the great Michigan forest, with possibly a dog, and an occasional visit from an Indian friend who traded at this post. Not so. Smith was an experienced trader and conducted a prosperous business at the Grand Traverse crossing, having occupied the area since 1810 or 1811 (Massie 1967, Love 1967). Smith's dealings with Neome and the village at Muscatawingh date from this time. Structures had existed at the Flint crossing for over fifty years built by French traders (Love 1976). DeTocqueville, who visits Flint in 1831, six years after Smith's death, notes houses just south of Flint and at least three in the complex where he stopped at Grand Traverse owned by Todd (DeTocqueville 1861).

Besides the log crib living quarters Smith had erected, he also built a storehouse and possibly other storehouse outbuildings to house trade merchandise (Massie 1967). Smith also cleared land for farming and was witnessed during Hervey Parke's visit to the Grand Traverse in 1821, hoeing corn in his garden. Small agricultural tools as well as trade goods can be anticipated in the archaeological material coming from this period.

As to Smith's other neighbors, Bolieux, a French trader built a small cabin nearby the Smith complex and stayed there for extended periods (Love 1976:21). Baptist Cochios (who buried Smith) is

another of Smith's neighbors across the river, as well as Francois Eduard Campau (Nowokeshik) final claimant of reservation #7. White settlement and development of the Saginaw Trail northward makes the Flint crossing a well traveled spot. Joseph Campau's trading post at Saginaw is well established by 1819, the time of the Saginaw Treaty.

The point of the above remarks are to dispel notions that the frontier settlement at Flint is at one finite locus and that cultural deposits of this period will be found only there. In fact, archaeological material dating from this period could not be identified as coming from the Smith complex without further documentation as to its location. Admittedly, material from this cultural stratum has little chance of survival in the subsequent land modifying activities associated with the development of the village, the city and finally the urban environment.

One final comment is in order. Jacob Smith's cabin has been described as standing for several years after his death. In fact the writer had been told that the dismantled logs of the cabin were seen by people well into the last quarter of the 19th and beginning of the 20th centuries. Such statements ignore studies done on the life span of hewn or rough-cut wood structures which were often built upon the ground and lacked sills and foundations. At Fort Michilimackinac, for example, logs in contact with the ground began to rot at 10-12 years. Occupied houses became badly in need of repair in 20 years if not kept up (Heldman 1980, and personal communication).

A second frontier fact must be considered. On the frontier of the 1820s, where sawmills and goods were often scarce, no building or its contents would remain unmoved or unutilized. It is to be recalled that Chauncey Payne, Smith's son-in-law, arrived soon after his death to remove its contents. The cannibalization of buildings is also documented. John Todd, future innkeeper and ferryman at the Grand Traverse, arrived in Flint in the spring of 1830 with his family to find most of the floorboards missing from the cabin he and his family were to occupy. These were located later at Rufus Stevens' Sawmill on Thread Creek (Lethbridge 1976).

SETTLEMENT PERIOD

Following the early establishment of the outpost at the Grand Traverse and Lewis Cass' efforts to bring southeastern Michigan under territorial control, culminating in the Treaty of 1819, other settlers arrived on the Michigan frontier. Jacob Smith died in 1825, the year of the opening of the Erie Canal. Although no immediate population increase occurred in Michigan due to completion of the Erie Canal, it greatly facilitated travel of New Englanders to the west in search of new land and opportunity (Dunbar 1965).

Improved water travel on Lake Erie is heralded by the appearance of Walk-in-the-Water, the first steam ship routed between Buffalo and Detroit in 1818. The first land office had opened in Detroit that same year and other regional offices at Monroe (1825), White Pigeon (1831), Flint and Ionia (1836) soon followed (Dunbar 1965:240).

The Black Swamp stretching like a moat across northern Ohio had long hindered land travel along the southern shore of Lake Erie into southeastern Michigan and connection with the Saginaw Trail. With creation of the Western Reserve Road that route became more passable. The military road slated to link Detroit and the Saginaw Bay area had proceeded only 6 miles north of Flint by the time of Jacob Smith's death. Details of this period can be found by consulting Ellis (1879), Wood (1916) or Gustin (1976). Important here is how the post-Jacob Smith settlement affected the project area.

Upon Smith's death his children, relatives, and others soon arrived to claim land of the eleven reservations. Land south of the river was less contested, especially reservation #7, where something resembling an early nucleated village began to occur. By 1833 Hervey Parke platted the first subdivision at the Flint River settlement (Richards 1979), an area south of the River and west of the military road.

Saw and grist mills, the tavern-inn, and a ferry are the components of the early Michigan river settlement. By 1830 John Todd, the future proprietor of a tavern and ferry business on the Flint River, had acquired land in reservation #7 from Eduard Campau, the successful litigant for title to this land (Richards 1979), possibly due to the fact that terrain there had more relief and the smaller creek made the creation of millponds and sufficient head to drive the wheels that powered machinery. By the mid-1830s the first bridge was built across the River on the axis of Saginaw Street by the United States Government.

Little can be said about the detailed settlement pattern in the Water Street district during this early settlement period. Written documents tend strongly to indicate that both residential

and commercial development is retarded here and develops instead along the Saginaw Street axis to the east. This is again partly due to the litigation which surrounds the ownership and development of reservation lands established by the Treaty of 1819. In all, the documents consulted made no specific mention of any specific structure or business occupying this area. The insert on the Bishop Map of 1855, at the end of the early settlement period, shows no development along the waterfront encompassed by the present Water Street District.

Although the area is platted, no mills or other manufacturing buildings are indicated along the river. The riverfront area is entirely underdeveloped between Garland and Grand Traverse. The area north of First Avenue above the 740 contour has by this time definitely taken on its character of a residential neighborhood with some small businesses. This is to remain so until present times.

LUMBERING AND EXPANSION (1855-1880)

Flint was incorporated as a city in 1855. Prior to this the area had undergone success as an agricultural community. Genesee County is named after its counterpart in New York State from which many of the Michigan settlers came, a region of fertile soil and prosperous farms. By 1860 improved water travel, railroads and plank roads connected Michigan and its southern cities to the outside world. Local railroad lines followed the routes set forth by Michigan's Internal Improvement Program of 1837. By the 1860s Flint and Saginaw are connected by railroad (Dunbar 1965:379).

Flint turned on a grander scale to the exploitation of the rich native forests of the area. Technology to do so required more than the hydropowered wheels of the original settler. Water turbines and steam were utilized to power the larger more efficient mills that began to form the Flint waterfront. By the latter 1850s Henry Crapo had established several sawmill operations in the area, one being on the location of the IMA Auditorium east of Saginaw Street north of the river. Crapo's Flint and Holly Railroad connection with the Detroit and Milwaukee line at Holly allowed the shipment of local lumber to the outside, assuring success of the newly founded industry.

Again as seen in the maps of the epoch, it was the area to the east of Saginaw Street along the river that was to undergo industrial development while the central business district expanded south along Saginaw Street. The area north of the river and west of Saginaw Street is to maintain its residential character with areas near the river hardly undergoing any development at all until the appearance of the carriage industry in the 1880s.

The already mentioned Bishop map (not shown) at the beginning of this period in 1855 shows the waterfront area of Water Street platted but no structures. Detroit Street has not yet been cut through to the Saginaw Street Bridge at this point in time. The now established road, following the Old Saginaw Trail passes southwest of Goodrich and Davison through the Atherton Settlement to Flint crossing the river in the vicinity of or just east of the IMA Auditorium. An insert on the Bishop map shows a drawing of the First Baptist Church supposedly built on the site of the Jacob Smith trading post. Judging from the fenestration, the steeple of this 2-1/2 story structure, and the fence rails illustrated (usually 11 feet), this structure is approximately 30x40 feet.

The 1859 Geil and Jones map (not shown)* show few structures between Mason and Garland, Third Avenue and the river. The First Baptist Church is again represented at the corner of Lyon and

*The Bishop map is a large rolled-up copy in the Michigan Room of the Flint Public Library and could not be copied by ordinary methods. The Geil and Jones map consulted is framed in a large glass case at the same institution.

First Avenue. This structure sits several feet south of the south curb of First Avenue. No mills or industrial structures are represented along the river. A smaller scale insert of this map shows the Jacob Smith Reservation boundary lines. It is obvious from this that Detroit Street does not run parallel to the boundary line between reservation 2 and 3. Property and plat lines to the west of this boundary line align to borders of reservations 4 and 5.

A "birds-eye" or Panoramic View of Flint dating from 1867 (Figure 16) show structures that are probably factories on the north side of the river between Detroit and Garland. No other structures have been built along the waterfront directly to the west within the project area. North of Turner (Water) Street, residential development is occurring and the Baptist Church is again represented. A sawmill is represented to the west of the project area at the point where the river turns north again west of the present location of Atwood Stadium.

The 1873 Beers Map of the City of Flint (Figure 17), found in the Atlas of Genesee County, shows the same lack of development along the waterfront included in the project area. The 1880 Panoramic View of the City of Flint will be the final visual benchmark for the period (Figure 18). No buildings have yet been erected east of Mason and south of Water Street. West of Mason on the south side of Water residences and small shops can be discerned. West of Grand Traverse Street the Stone Woolen Mills are represented.

The 1880s can definitely be bracketed as the period of intrusion of industrial development into the area north of the river and east of Garland Street in the near downtown area (Figure 18). The 1889 Randall map (Figure 19) and the Panoramic View of Flint (Figure 20) shows startling changes in the decade separating it from their predecessor of 1880. Significant enough, the Baptist Church is gone, replaced by a residence, no doubt the present Aldrich house at 221 First Avenue. South of Water Street, between Mason and the river to the east, a series of factory buildings have been erected under the aegis of the Flint Road Cart Company. It is here that William Crapo Durant, grandson of Henry Crapo, is to found his carriage and cart factories, a product by which Flint becomes a major manufacturing center by this period.

DURANT-DORT FACTORY COMPLEX

The buildings which strongly dominate the landscape in the near waterfront district of Water Street, besides those of the Flint Lumber Company, are those of the Durant-Dort Carriage Company, associated with Flint entrepreneurs William Crapo Durant and J. Dallas Dort.

In 1886 Durant purchased the patent rights from O'Brien and Schmeldlen of Coldwater, Michigan to build a roadcart patented and manufactured by them (May 1975:185). Durant took on J. Dallas Dort, Manager of a local hardware store as a partner. The company was established on September 28, 1886, as the Flint Road Cart Company. The company started out modestly that fall, in rented quarters (May 1975). In the beginning Durant and Dort contracted W.A. Patterson to make carts to fulfill orders already obtained by Durant. When this arrangement failed they began production on their own. According to Gustin the building they leased was half of an idle cotton mill which had never gone into operation (Gustin 1973). With continuing success they rented the rest of the mill, finally buying and enlarging it (Gustin 1975:39). By 1889 Fred A. Aldrich was to become associated with the company and in 1890 Durant hired Charles W. Nash as a laborer in the road cart plant. Both of these men are to figure heavily in future events of Durant's companies and ultimately in the automobile industry. By 1895 the name of the corporation had been changed to the Durant-Dort Carriage Company and Aldrich and Nash held positions of Secretary and Vice-president respectively. Houses built by these men still stand in the Water Street District and certainly form part of the historic fabric of the area representing the carriage industry period.

The original buildings or cotton mill in which Durant first operated were on the south side of Water Street at the corner of Lyon, bordered by the Flint River on the east. A print of this building is found in Gustin (Gustin 1976:89). Expansion or additional buildings occurred west of Mason Street, except for a small addition to the original building to the east or towards the river. Buildings of the Durant-Dort complex between the river and Mason Street would predate 1886, with the above exception, since they were ready for occupation at that time. The cotton mill must have been constructed after 1880 since it does not exist on the 1880 birds-eye map of Flint (Figure 18). The 1889 Randall Map of the City of Flint, published by Cookingham shows only a building at the SE corner of Mason and South (Water Streets) and in the middle of the block towards Lyons Street (Figure 19). The 1890 panoramic view of the City of Flint (Figure 20) shows the complete Durant-Dort Complex on the south side of Water Street to Mason Street.

All of the presently standing buildings are present on the 1909 Sanborn Insurance Map (Figure 21). Two of the buildings of

this complex to the east of Mason Street have recently been removed in the present period. Two structures remain as possibilities for the original operation, one at 315 Water Street, adjacent to the river, and another which includes 311, 309, 307 and 301. The evidence of the Randall Map (Figure 19) would definitely point to the 315 structure as the original building.

The most impressive structure besides the expansion set (post 1886), stand at the corner of Water and Grand Traverse Streets. This is known as Durant-Dort #4. A photograph in Gustin identifies this building as the Diamond Buggy Works organized in 1896 and incorporated into the Durant-Dort Company along with A.B.C. Hardy, another Flint automotive pioneer (Gustin 1976).

To summarize the above: the building at 315 Water Street is probably the site of the original Durant-Dort Carriage business built between 1880 and 1886. The buildings immediately to the east and west of this stucture between Mason Street and the Flint River were built after 1889 and before 1909, the time of the economic expansion of the Durant-Dort Corporation. They were probably erected soon after the former date. This would include Durant-Dort factory building #7 and #4. Durant-Dort buildings #2 and #3 have since been destroyed. The warehouse (Dort #8) across Grand Traverse Street to the west of #4 post-dates 1909 since its presence is not noted on the 1909 Sanborn Insurance Map.

The Durant-Dort Carriage Works Company office and repository building, a structure presently registered as a National Historical Landmark and marked as the locus in which the organization of General Motors took place, is dated prior to 1898 at about 1894 - 1895. This building forms the core of the Durant-Dort Complex representing the transition from the carriage industry to automobile production (see Scharchburg 1978 for history of building and old preservation efforts there). A Michigan History Division historic site marker has been erected in front of this building in 1981.

The other large architectural addition to the project area of this period, was unrelated to the future automobile industry but probably acted as subsidiary producer for the carriage industry. This was the Flint Lumber Company structure built in 1901 between the river and the railroad tracks south of the Durant-Dort Complex (Figure 3). This large lumber mill and warehouse stands today and is the most salient feature along the south side of the river west of Saginaw Street. This building, if historic maps and photographs are correctly interpreted, is built largely on fill, which would contain no significant or associated archaeological deposits. The nearest soil borings would indicate that this area was low flood plain represented by strata 10 feet below the surface of the historic fill by organic sands or perpetually saturated deposits (see the section on soil borings). The buildings must be judged on their own. Perhaps at the time of any future architectural survey of the Water Street district their position in the historic district and potential for adaptive use must be decided.

THE RECENT PERIOD, POST 1920 - AUTOMOBILES AND CONEY ISLANDS

By the first decade of the present century, Flint's transition from carriage to automobile industry was well underway. Several automotive pioneers operating before the turn of the century made this possible as well as evolving corporate structures such as that headed by Durant. The Buick Motor Company is well established by the first decade of the century and General Motors is incorporated by 1908 (may 1975:317). By the time of World War I, Flint well deserves its name - Vehicle City. Details of the local development of the automobile industry can be had by consulting such sources as May (1975) or Gustin (1973). By the 1920s, the forces that are to bring forth mass society, industrial unions and the automotive giants are well evidenced. Again, we are interested here in how all this affected the project area.

The main current of change again occurs along the Saginaw Street axis south of the river, while urban and commercial expansion extends north along this same street. Saginaw Street continues to be the locus of commercial and merchandizing establishments while civic structures develop away from the river. This area additionally takes on the vital character of the urban downtown. Thompson's all-night restaurant, The Rialto Theatre, a second story pool hall, the Sunshine Club and the Brass Rail all attest to the near-downtown as a night and day recreation or social area. The near-waterfront area, on the south side of the river by the 1930s sees the development of several Coney Island restaurants, purveyors of Flint's second most famous product - the Chili Dog.

The huge factories that characterize the automobile industry, mainly the Buick and Chevrolet complexes were built away from the downtown area, largely due to the special spatial demands of the newly evolved mass production methods; the assembly conditions and the need to create locales for subsidiary production. Production was carried on in the buildings of the Durant-Dort Carriage Works on Water Street (Dort Auto Works) until they were abandoned or a few utilized in adaptive use. The association of the Durant-Dort building with the automobile industry is corporate; this building is usually considered the "home" of General Motors.

North of First Avenue, the project area maintains its residential character well into the recent period. Home replacement changes little except lot lines in the recent period, when apartment development occurs. Replacement of strictly family dwelling structures occur on the site of former houses. Small businesses continue to develop along the axis of Third and Fifth Avenues. These streets become the main east-west thoroughfares leading from the downtown area on the north side of the river to the burgeoning

population areas to the west where Flint is to undergo population expansion beginning in the 30s. Many of the small commercial buildings along Third Avenue in the near downtown area are of 30s and 40s vintage. These streets also serve as passage routes to the Chevrolet factory complex, Hurley Hospital, and the General Motors Institute to the west.

As the economic demands and urban planning concepts of the last quarter of the century occur, a new wave of development is expected to cross the narrow confines of the project area. The present neighborhood north of First Avenue will undergo continued deterioration until such development occurs. The neighborhood now has several areas of architectural cohesiveness and integrity as well as historic association with the industrial buildings at its southern end. Unplanned development will produce a "hodge-podge" neighborhood standing at the edge of the development in the downtown area. This will create the "edge effect" seen so often at the border of newly renovated central business districts, characterized by vast differences between the CBD and the older historic component which surrounds it.

One of the best ways to avoid this would be to incorporate historic preservation planning into any development plan. This would insure maintenance of the residential character of the neighborhood (hopefully for residences of varying incomes) as well as preserve those examples of architectural importance as viable structures for human use.

FIELD TESTING AND RESULTS

On November 9, 1981 a series of subsurface tests and auger probes were done in the near vicinity of the Aldrich house. Two 2' x 2' shovel test units were completed across from this structure on the north side of First Avenue (Figure 3). Test 1 and 2 revealed similar vertical soil profiles or approximately 20 cm. of humus colored silty top soil underlain by coarse yellow sands and gravels. Shovel test unit 3 excavated on the south side of First Avenue between the sidewalk and the curb in front of the Aldrich house revealed 20 cm. of dark topsoil underlain by yellow clayey sands. These subsurface tests were excavated to the depth of 70 cm. All soils derived were screened through a 1/4 inch mesh screen. No soils either in the topsoil zone or the yellow sands contained any cultural material.

Auger tests conducted by the principal investigator between the curb and the sidewalk on the south side of First Avenue west of Lyon Street and on the east and west side of Lyon Street south of First, indicated disturbance in the topsoil above the yellow sands, probably due to redeposited fill resulting from underground utility trenching. At the northeast corner of Lyon and First Avenue three historic sherds were discovered on the surface by the writer. These were thick-walled iron stoneware, semi-vitreous in paste. The white glazed surfaces of these sherds were embossed with decoration and represent a ceramic style popular in the latter half of the 19th century (Charles Marinez, personal communication).

On November 17, 1981 two more tests were conducted, permission having been obtained to excavate on the Aldrich house lawn. Again, material was screend through a 1/4 inch mesh screen. These test units were 2-1/2 feet square. Test unit 1 was excavated on the northeastern portion of the Aldrich house lot on First Avenue on the lawn in front of the house itself. A second test unit was completed at the southwest corner of the lot, adjacent to the curb to avoid the water line known to pass between there and the sidewalk. The first test was excavated to the depth of 50 cm. Below 10 cm. of black humus silty sands, a mottled black yellow silty sand was encountered. At 20 cm. a fine yellow sand with gravel appeared. These stratigraphic units were considered to be historic fill, although no cultural material was forthcoming. At 30 cm. a yellow fine clayey sand containing gravel and cobbles was met. This was determined to be a natural soil zone, sterile culturally.

The second test at the southwest corner of the Aldrich house lot showed a deposit of historic fill below 10 cm. of tan sand fill (Appendix B). This historic strata contained fragments of recent bottle and window glass and one ceramic sherd from a stoneware crock or vessel.

SOIL LOGS

All soil logs made available by John Leppanen of the Flint Department of Community Development, were examined by the principal investigator. Many of these, although taken in the Flint riverfront area, were outside the project area and did not aid in the interpretation of soil stratigraphy in this specific locus. One series done by Soils and Material Engineers Inc. for Hubwell, Roth, and Clark, Inc. of Bloomington Hills, Michigan crosses the project area and constitutes data germaine to this investigation. This was done in preparation of construction of a sewer interceptor. The line of soil borings ran east and west from Garland to Stevenson Streets between Second and Third Avenues (Appendix A, 1).

Soil borings to the west and north of this series (S-150, 151, 152) show a trend in the near subsurface (humus to 10 inches) of silty clays and clayey silts at the 762.9 foot contour to greater concentrations of sandy gravels as the river is approached. East from Stevenson Street to Grand Traverse subsurface clays are sandy and in two cases 4-5 feet of fill is indicated. No historic material is noted as in other logs east of Saginaw Street.

From Garland east to Saginaw Street sands or silty sands increasingly appear as subsurface material (745.1 and 737.5 foot levels). Fill at the surface seems lacking. No historic debris is noted. East of Saginaw Street increasing fill with mottled humus zones, wood and brick is noted in this series of soil logs. S-164 at the river's edge, east of the IMA building, notes pieces of root, wood, brush and concrete or other organic material to the depth of 16 feet.

Several things are apparent here. Most important is the fact that historic material has been noted by the driller, and this seems to increase, as could be logically assumed, as tests approach the river. Additionally, historic material would increase, as indicated by these logs, as one crosses Saginaw Street corroborating cartographic and written evidence that this has been a more intensely used area as evidenced in the kind of fill found there. We will presently state evidence from other sources concerning this fact. Lastly, fill between Second and Third Avenues crossing the project area is minimal meaning any archaeological deposits, if present, would be close to the surface.

On December 3, 1981 the principal investigator monitored two soil borings done in the Eagles parking lot west of Garland Street and directly north of the river. These borings, done to the depth of 40 feet, were conducted by Michigan Testing Engineers Inc. (MTE Inc.) of Detroit, Michigan. This area would be to the riverside

and just southeast of the Aldrich house. Running logs were kept of material derived from the 6 inch drill. Prahl conferred with the driller running the drill rig as well as Michael J. Mayes (Soils Engineer, MTE Inc.) as to his interpretation of soils examined. Prahl also examined spoon samples taken at 2-1/2 foot intervals. It was determined that at least 10 feet of sandy-gravelly fill overlaid natural soils which in this case were grey clays or silty clays. No historic material was encountered in the fill sand except at the near surface where asphalt, concrete and building material occurred.

Again, this corroborates that the area of the waterfront east of the Garland Bridge is a locus of less intense commercial activity than that east of Saginaw Street. This data also indicates that considerable "drop" existed between the locus of the Aldrich house and the river's edge, again enhancing the 720 foot contour as a minimal spot for settlement above the flood plain. Three more core borings completed in the parking lot area were done by M.T.E. but not forwarded to the writer before the final issuance of this report. It was determined though, from other sources, that a strata of historic material existed at 7 to 10 feet below surface in an area between the position of these five soil borings and the river's edge. This data was provided visually in the slides taken in 1975 during the Army Corps of Engineers flood control work by Don Simons and examined by the Principal Investigator. This evidence does not contradict the idea expressed above that areas north of the river in the Water Street District below the 720 foot elevation consisted of a low-lying, frequently inundated flood plain. Historic material evidenced in the Simons slides is dump material deposited in the last stage of filling in this swamp-like area.

SUMMARY AND RECOMMENDATIONS

The Water Street district potentially contains two broad categories of cultural resources: Native American and historic. The latter can be again divided into two categories; those that are archaeological or existing in the subsurface soils and those that are extant or standing as visible features of the cityscape. All of the above are termed cultural resources.

The cultural resource survey at its various levels of investigation aims at locating such resources and determining their significance in regards to the cultural history of a particular geographical locus, community or region. Again, as such resources are destroyed, removed or disturbed by modern land modifying activities, they are lost to the archaeological or historic record. Standing structures, once removed, leave others without visual context and the historic fabric of a street or community can be lost by indiscriminate demolition or unplanned development. The land use history is the first step towards methodical cultural resource survey and will indicate through examination of written documents and archives research the known area of archaeological and historic sensitivity.

Archaeological Remains

Evidence from a Paleo-Indian site near Grand Blanc indicates that the Flint area was occupied by Native Americans soon after the retreat of the ice of the last or Wisconsin glaciation some 12-13000 years ago. By 1000 B.C. the lake waters in Saginaw Bay were at a position near Montrose and the Flint River had cut a channel to this beachline. At this time the Flint River had already cut its southernmost bend which was to determine its position as a place of human habitation during the prehistoric period and well into historic times.

From settlement patterns known elsewhere, the earliest settlers of Michigan or Paleo-Indians and the succeeding Archaic people (post 8000 B.C.) probably utilized the morainic uplands in search of game. This kind of terrain existed distances north and south of the Flint River and evidence of these nomadic bands is probably lacking from the project area. Any seasonable and recognizable occupation near the river would probably begin in Late Archaic times (3500 - ca 1000 B.C.) a period well documented archaeologically for the Saginaw Valley. People of the Early Woodland period (post 1000 B.C.) exploited the interior river systems of the Great Lakes area on a seasonable basis and more specifically the headwaters region of the Saginaw Valley. The Middle Woodland period (300 B.C. - A.D. 500), may be represented at Flint by reported mound groups just west of the project area. Burial sites would be found along extensive, flat flood plains, a condition not present in the project area.

The Late Woodland period (post 700 A.D.), the period most probable in the project area, can only be inferred by reported sporadic finds and the historically documented presence of large bands of Indians speaking Ojibwa dialect at Neome's Village near Montrose (Pewonigowink, Pe-wan-a-go-wing or Pewangong) and at the Grand Traverse crossing at the Flint River itself (Muscatawingh).

Figure 23 illustrates geographically the above comments. Since the archaeology of the waterfront area is unknown at this writing, this can only be considered a first approximation or an indication of probabilities. Areas marked as fill can largely be dismissed as possible loci of meaningful prehistoric archaeological deposits. They would be largely disturbed or mixed with historic deposits. Core borings taken near the water's edge would indicate that there probably are no buried cultural bearing units below the several feet of fill found there. Subsurface testing just to the north and west of the Aldrich house recovered no prehistoric cultural material. The rest of the project area remains largely untested in regards to the subsurface, such being outside the scope of the present report. A walkover of the project area was conducted and a few accessible exposed surfaces examined, with no results. Several lots were noted as possible areas of future testing.

Historically the most important archaeological deposits, strongly indicated for the project area, would be those from the early settlement or trading post period predating 1830. These would not be found merely at one locus but perhaps at several along the river bank on the north side of the river above the 720 foot contour. For much of the historic period there was little development near the waterfront area within the Water Street district.

Development north of Water Street was largely residential and small scale commercial throughout the Historic Period. Archaeological deposits there would yield household goods, perhaps the best indicator of the material culture of the common folk. These would apt to be present in the period predating garbage and sewer services provided by the city. Archaeological deposits, shops and small industrial enterprises in this area would yield important evidence as to the cultural history of Flint's development. Figure 24, again, indicates chronological and spatial probabilities of the location of such material.

The archaeological potential of the near waterfront area in the Water Street district is not high. Manufacturing buildings began to be built here in the 1880s and continued till well past the turn of the century. Historic evidence would indicate strongly that there were no mills or other such enterprises created along the river in this area, in the earlier period, so archaeological testing would uncover little. Many of the buildings

erected from the 1880s onward are still standing and still form a visual and architectural whole, representing the early manufacturing period. These buildings, though have been largely cannibalized of their interior machinery and workings. There is no reason to believe that much of this is discarded in areas surrounding these buildings in the subsurface. Since there are no "buried" factories or manufacturing buildings per se, archaeological testing in the areas surrounding these buildings would do little to elucidate the written record. The preservation of these buildings cannot be rationalized by further archaeological testing. They stand, though as a powerful visual presence of an important epoch of Flint's past. With long range preservation planning and adaptive use, these buildings could remain such.

Of the area above or north of First Avenue little can be said without further archaeological testing beyond the preliminary statements made above. Any future funded land-modifying projects should follow federal guidelines and methodical subsurface testing to be done of specific project areas. This piecemeal and more costly approach could be eliminated and better planning procedures result if a sampling test plan agreed upon by the Michigan History Division would be put into operation north of First Avenue. In this manner, permanent decisions could be made concerning archaeological clearance.

Comment on Standing Buildings

At present, several buildings, as separate entities, constitute the State Historic District of the Water Street District. These include the Durant-Dort Carriage Company office building of national landmark status and the Nash House on Mason Street. Besides these two buildings one of the Durant-Dort Carriage Factory buildings and the nearby Market Street Fire Station (outside the historic district), constitute the local district established by the Flint Ordinance 2707 of 1979.

No residential structures besides the Nash House are included in this district. It is recommended that a more comprehensive architectural survey be done before further destruction of structures occurs and their significance appraised. This should include not only the present project area but future loci of land modification caused by federally funded projects. State of Michigan, Michigan History Division architectural site forms should be completed and forwarded to that agency. Thus, buildings undergoing destruction in the near future would be recorded and available in the historic record.

It must be noted that several of the buildings north of Water Street in the project area are of architectural as well as historic significance and could well be eligible for the National

Register of Historic Places. The PUDI document does not give data on specific structures, their significance or historic context, again beyond the scope of that report. It is not the purpose of this report to "sign off" on any building in the project area, as indicated in memorandums of the Flint Department of Community Development. Under federally funded conditions, this is the process outlined in federal guidelines, which requires review by the State Historic Preservation Officer.

Several of the residential buildings in question are in the vicinity of the present State Historic District. Perhaps, under conditions of long range preservation planning, some of these structures might be included in that district, especially those of the same time period as the Durant-Dort Complex.

The consultant disagrees with the implied conclusion of the PUDI Report, that only buildings of national or very evident period style are worthy of attention. What is termed "the historic fabric" in the Water Street district includes workers houses, family duplexes and boarding houses. Flint is a manufacturing but subsequently a working class town.

To summarize:

1) The City of Flint should consistently adhere to federal and state guidelines as to the appraisal of cultural resources (historical and archaeological) prior to the completion of federally funded projects in the Flint area. If the above is done, data will be derived to properly aid city and state agencies, engineers, developers and preservationists involved in the planning process.

2) The present report being among the first to be written concerning cultural resources, a portion of the downtown area was based on a rather narrow data base. It was additionally restricted to a confined space. This area could not be considered without reference to the general cultural patterns dating from early village life up to the creation of the modern CBD. It attempts though to provide context for future studies, both in the study area and the surrounding region. Field survey and investigations are the proper adjunct to correct preservation and cultural resource planning. To begin to correct deficiencies in the data base, an architectural and archaeological survey could be completed in the Water Street district. Archaeologically, a modest program of machine trenching and hand testing could elucidate definitively the subsurface potential of the Water Street district per se.

3) While the prehistoric potential of the Water Street district is considered moderate, the historic and architectural component is of greater sensitivity. Upon completion of a building survey, it if occurs, consideration of additional structures or architectural conclaves of historical significance for inclusion in the historic district should be done. This should be accomplished with the ideas of human use, development needs of the CBD as well as historic preservation in mind.

EC:mw D/19
03/11/82

BIBLIOGRAPHY

Barnett, Leroy
1981 to 1900. Checklist of the printed maps of the Middle West Boston, Massachusetts.

Beers, F.W. & Co.
1873 Atlas of Genesee County. New York.

Bishop, Julian
1855(?) Map of the County of Genesee (inset). Detroit, Michigan.

Bishop, Julian
1855(?) Map of the City of Flint incorporated in 1855. Grand Blanc, Michigan.

Day, Homer A.
1899 Atlas of Genesee County. Flint, Michigan.

Door John A. & Donald F. Eschman
1977 Geology of Michigan. University of Michigan Press, Ann Arbor, Michigan.

Dunbar, Willis Fredrick
1965 Michigan: a history of the Wolverine state. William B. Eerdmans Publishing Company. Grand Rapids, Michigan.

Dustin, Fred
1920 The Treaty of Saginaw 1819. Michigan History Volume IV. Michigan Historical Commission, Lansing, Michigan.

Ellis, Franklin
1879 History of Genesee County. Everts and Abbot. Philadelphia, Pennsylvania.

Farmer, John
1826 Map of the surveyed part of the Territory of Michigan. Arbalch and Stiles, Utica, New York.

Finlayson, J.
1822 Geographical, statistical, and historical map of Michigan Territory. Michigan Territory No. 36. Engraved by Young and Delleken.

Fitting, James E.
1975 The Archaeology of Michigan. Cranbrook Institute of Science, Bloomfield Hills, Michigan.

Gustin, Lawrence W. (editor).
1976 The Flint Journal centennial picture history of Flint. The Flint Journal, Flint, Michigan.

Gustin, Lawrence R.
1973 Billy Durant creator of General Motors. William B. Eerdmans Publishing Company, Grand Rapids, Michigan.

Guaranty Title of Mortgage Company
N.d. 1827 Map of Reservations on Flint River, Surveyor T. Wampler, D.S., Flint, Michigan.

Heldman, Donald & Roger T. Grange
1980 Excavation at Fort Michilimackinac 1978-1979: the Rue de la Babillarde. Archaeological completion series #3. Mackinac Island State Park Commission, Lansing, Michigan.

Hindsdale, W.B.
1931 An Archaeological Atlas of Michigan. University of Michigan Press, Ann Arbor, Michigan.

Indian Affairs, Laws and Treaties, 2nd Ed. Vol. 2 n.d. Senate document Vol. 39. State of Michigan.

Institute for the Development of Indian Law
n.d. Treaties and agreements of the Chippewa Indians. The American Indian Treaties Series. The Institute for the Development of Indian Law, Washington, D.C.

Judd, Philo E.
1924 Map of Michigan. On file Michigan Room, Flint Public Library, Flint, Michigan.

Lethbridge, Alice G.
1967 The Todd Family. In The Flint Journal centennial picture history of Flint, edited by Lawrence Gustin. The Flint Journal, Flint, Michigan.

Love, Edmund G.
1976 Jacob Smith. In The Flint Journal centennial picture history of Flint, edited by Lawrence Gustin. The Flint Journal, Flint, Michigan.

Martin, Helen
1955 map of the Surface Formations of the Southern Peninsula of Michigan. Department of Conservation, Geological Survey Division Publication 49. Lansing.

Martinez, Charles
1981 The reservations of Seginsiwin and Tonquish on the Upper Rouge in Oakland County. Oakland County Gazette, Volume 14, No. 1. Oakland County Pioneer and Historical Society, Oakland County, Michigan.

Massie, Dennis
1967 Jacob Smith in the Saginaw Valley. Michigan Volume 51, pp. 116-129. Michigan Historical Commission, Lansing, Michigan.

May, George S.
1975 A most unique machine. William B. Eerdmans Publishing Company. Grand Rapids, Michigan.

Map 1880
1880 panoramic view of the City of Flint. On file Michigan Room, Flint Public Library, Flint, Michigan.

Map 1822
Map of the surveyed part of the Territory of Michigan, exhibiting the boundaries of the several counties as described in his Excellency Gov. Cass' proclamation of September 10, 1822. On file Michigan Room, Flint Public Library, Flint, Michigan.

McCormick, William R.
1833 Mounds and mound builders of the Saginaw Valley. Michigan Pioneer and Historical Collections, Volume IV. Michigan Historical Commission. Lansing, Michigan.

McCormick, William R.
n.d. Personal Journal. On file Bay County Historical Society.

Pauli, Clemens J.
1890 Perspective Map of Flint, Michigan. C.J. Pauli, Milwaukee, Wisconsin.

Prahl, Earl J.
n.d. Jacob Smith, the treaty of 1819, and the early settlement at the Grand Traverse on the Flint River. Manuscript in possession of author.

Preservation/Urban Design, Inc.
1978 Water Steeet District, prepared for the City of Flint, Department of Community Development. Ann Arbor, Michigan.

Randall, Jesse S.
1889 Map of the City of Flint, Genesee County, Michigan. E.R. Cookingham, Ypsilanti(?), Michigan.

Richards, Donald G.
1979 Surveys at the Grand Traverse of the Flint River: Human determinants effecting the location of Flint, Michigan. Surveying and Mapping, Volume XXXIX, No. 2, pp. 141-149.

1981 The way it was. East Village Magazine. Volume XI, No. 5, p. 7. Flint, Michigan.

Royce, Charles
1899 Schedule of Indian land cessions in the United States. Bureau of American Ethnology 18th Annual Report (1896 - 1897). Washington, D.C.

Rutgers, Albert
1867 Flint, Genesee County, Michigan. A. Rutgers. Chicago, Illinois.

Scharchburg, Richard P.
1978 Preserving Flint's industrial heritage. Flint Forward Magazines, August-September, Flint, Michigan.

Toqueville, Alexis de
1861 Oeuvres et correspondence inedite. 2 Vols. Paris, France.

Veatch, J.O.
1953 Soils and Lands of Michigan. East Lansing, Michigan. Michigan State College Press. Lansing, Michigan.

1959 Presettlement forests in Michigan. Department of Resource Development. Michigan State University, East Lansing, Michigan.

Wood, Edwin O.
1916 History of Genesee County. Federal Publishing Company, Indianapolis, Indiana.

EC:mw D/20
03/11/82

FIGURES

Note: Reproduction's in this section of Figures 6 & 9, 11, 12 and 14-21 have been reduced and legibility is diminished. The original material is located in the Michigan Room of the Flint Public Library, 923 East Kearsley Street, Flint, Michigan.

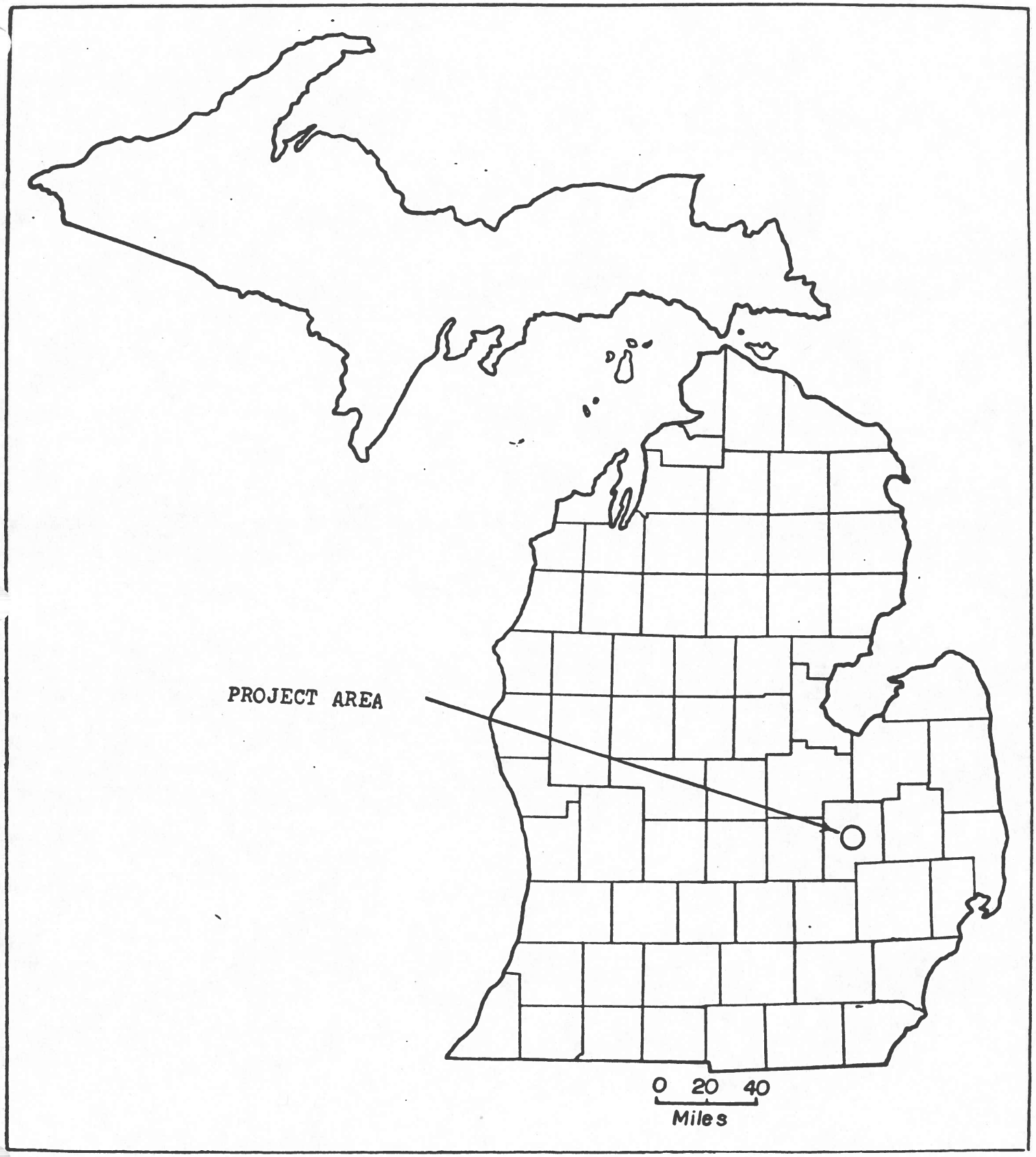


Figure 1. Project Area.

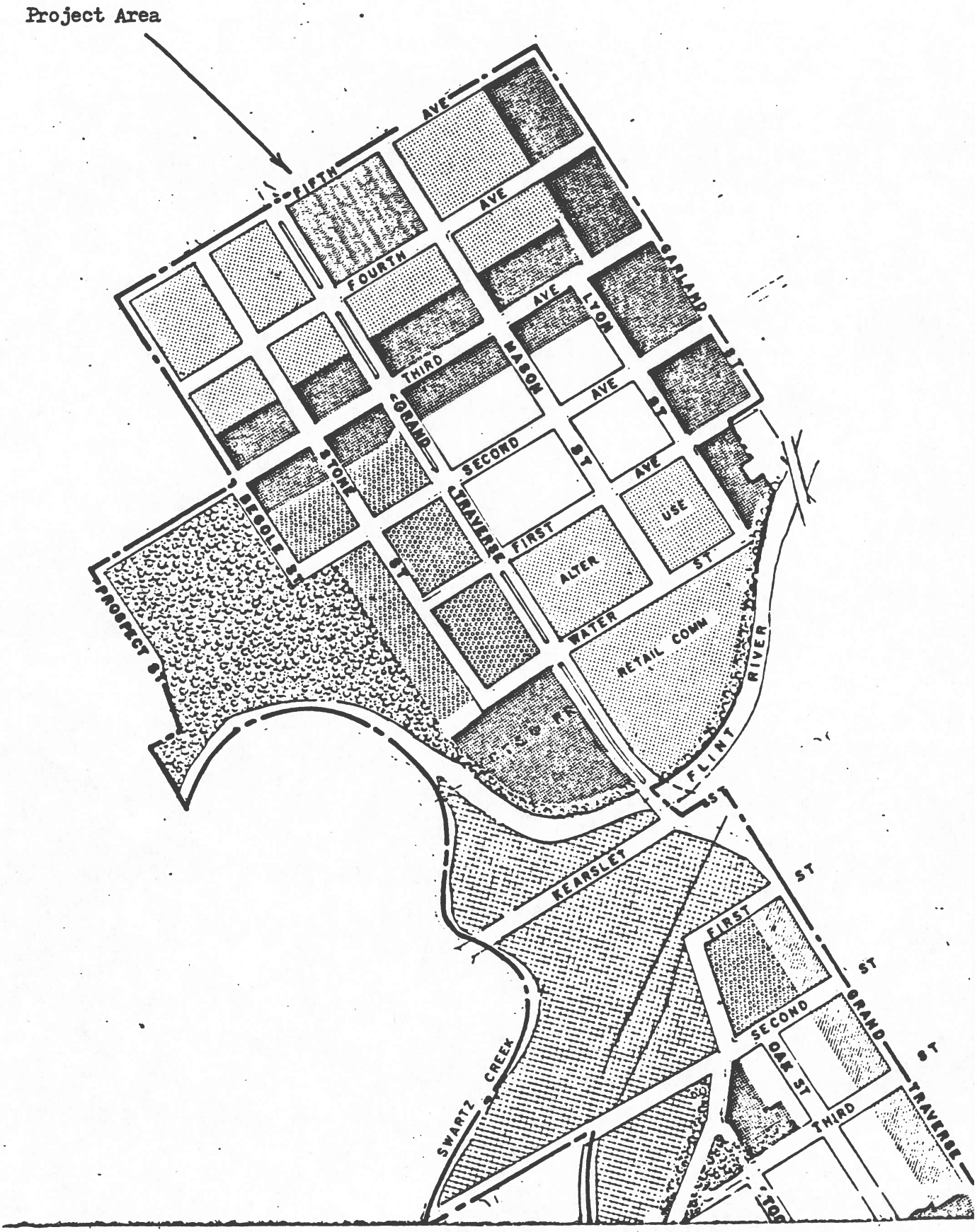


Figure 2. LOCATION OF WATER STREET DISTRICT IN DOWNTOWN AREA

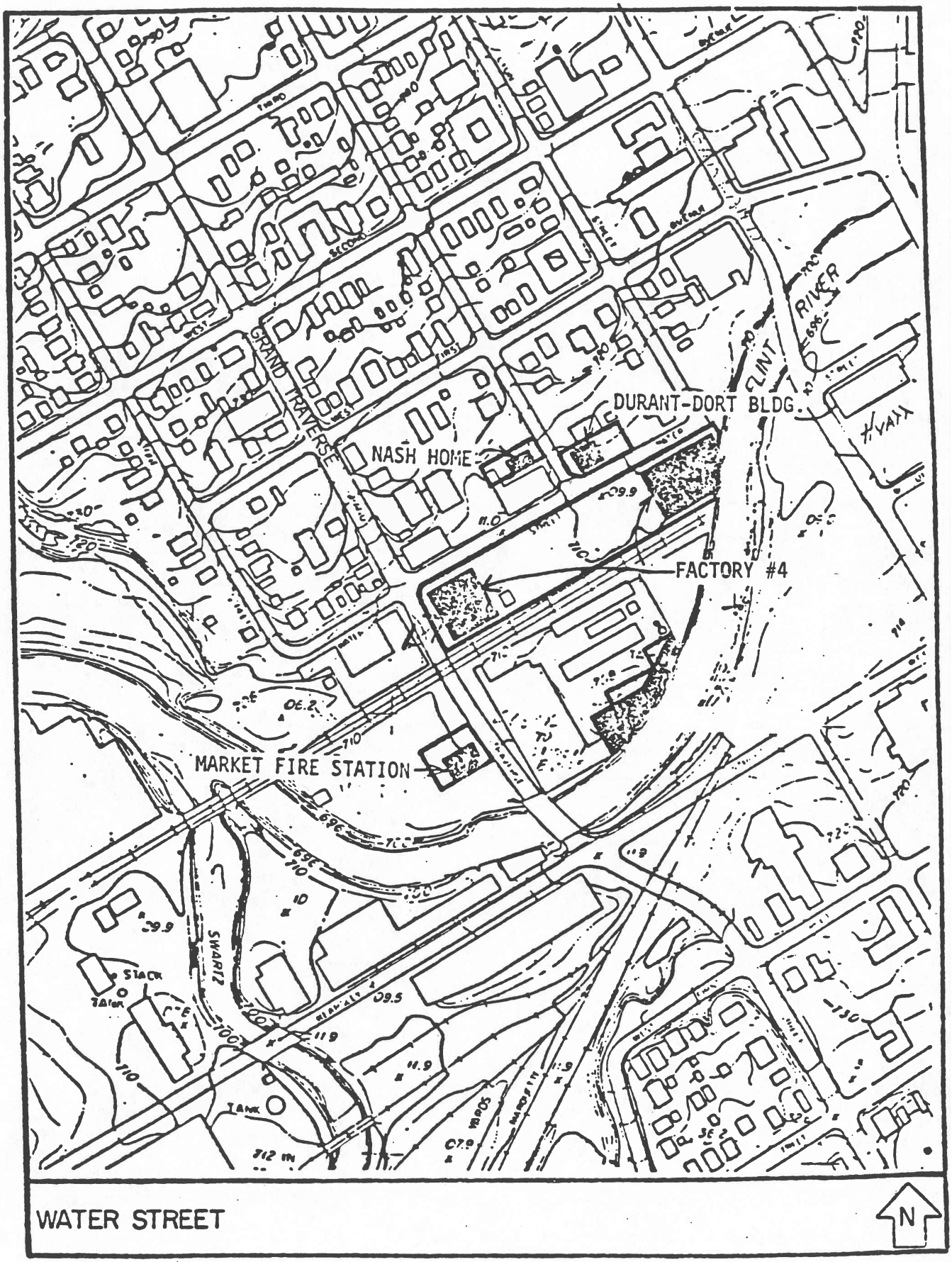


Figure 3. WATER STREET LISTED HISTORIC PROPERTIES

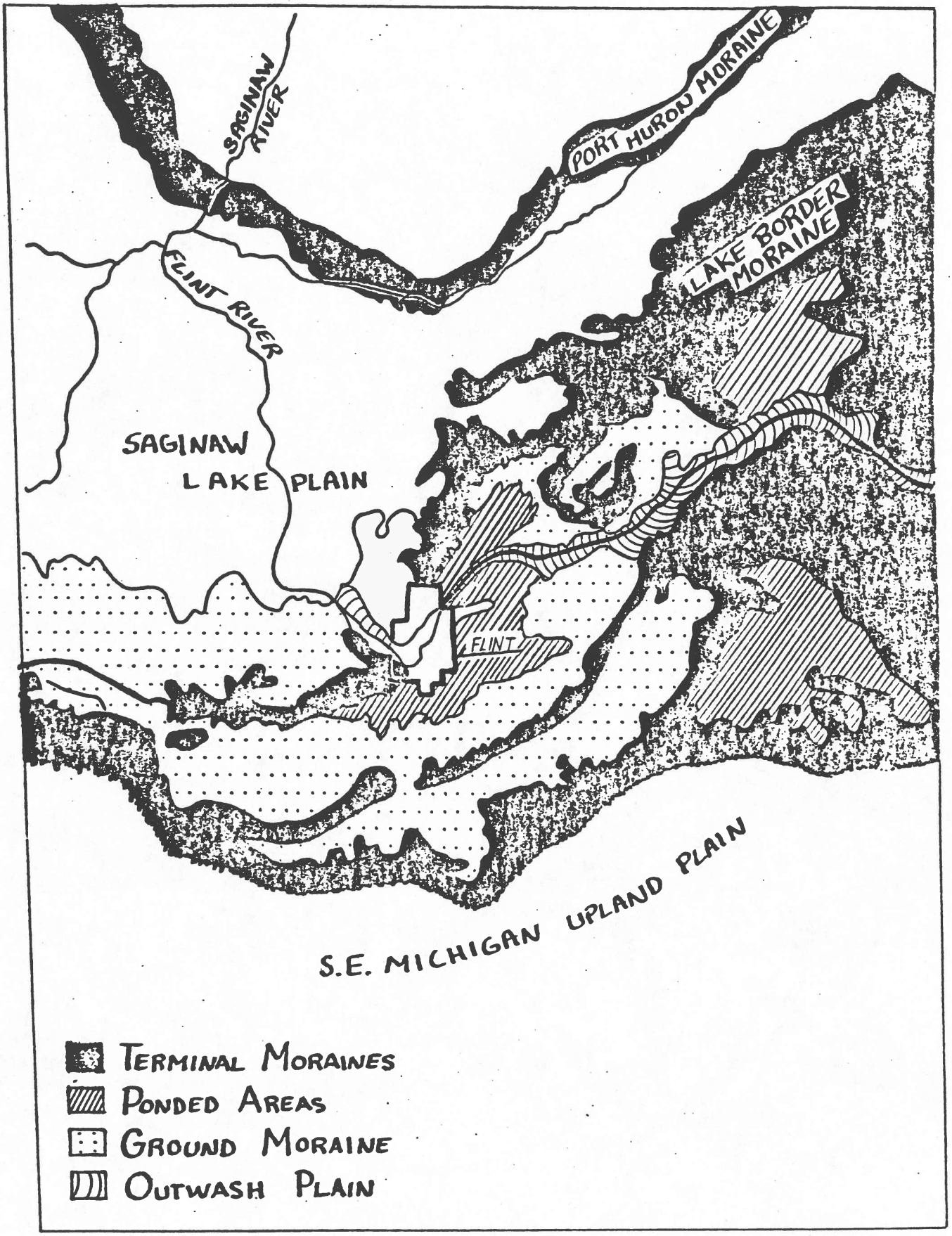


Figure 4. Physiographic map of the Flint area.

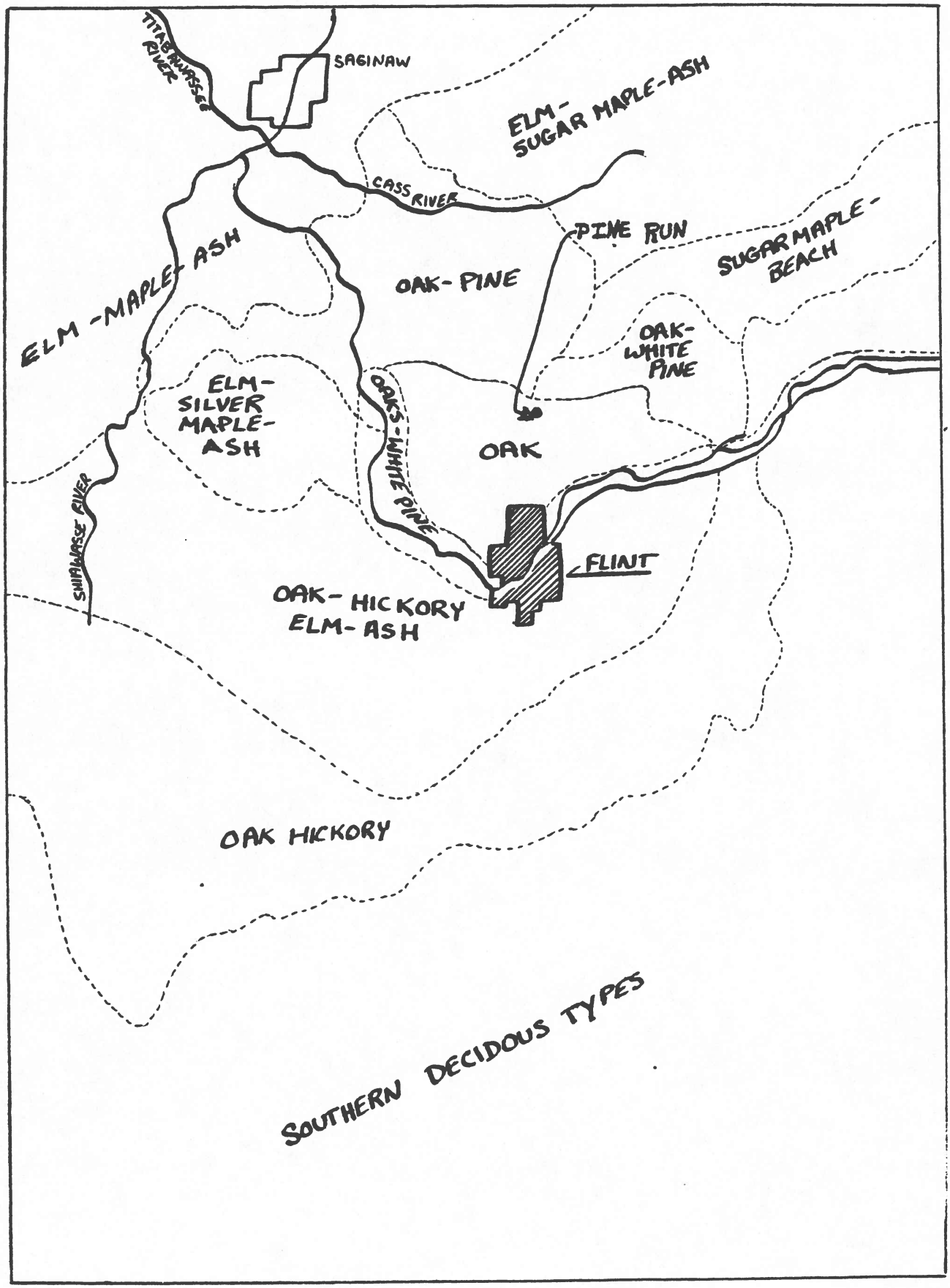


Figure 5. Presettlement Forest of Michigan. After Veatch, 1959.

Figure 6. 1822 MAP OF SURVEYED PART OF TERRITORY OF MICHIGAN

Figure 7. 1824-MAP OF MICHIGAN, PHILO E. JUDD

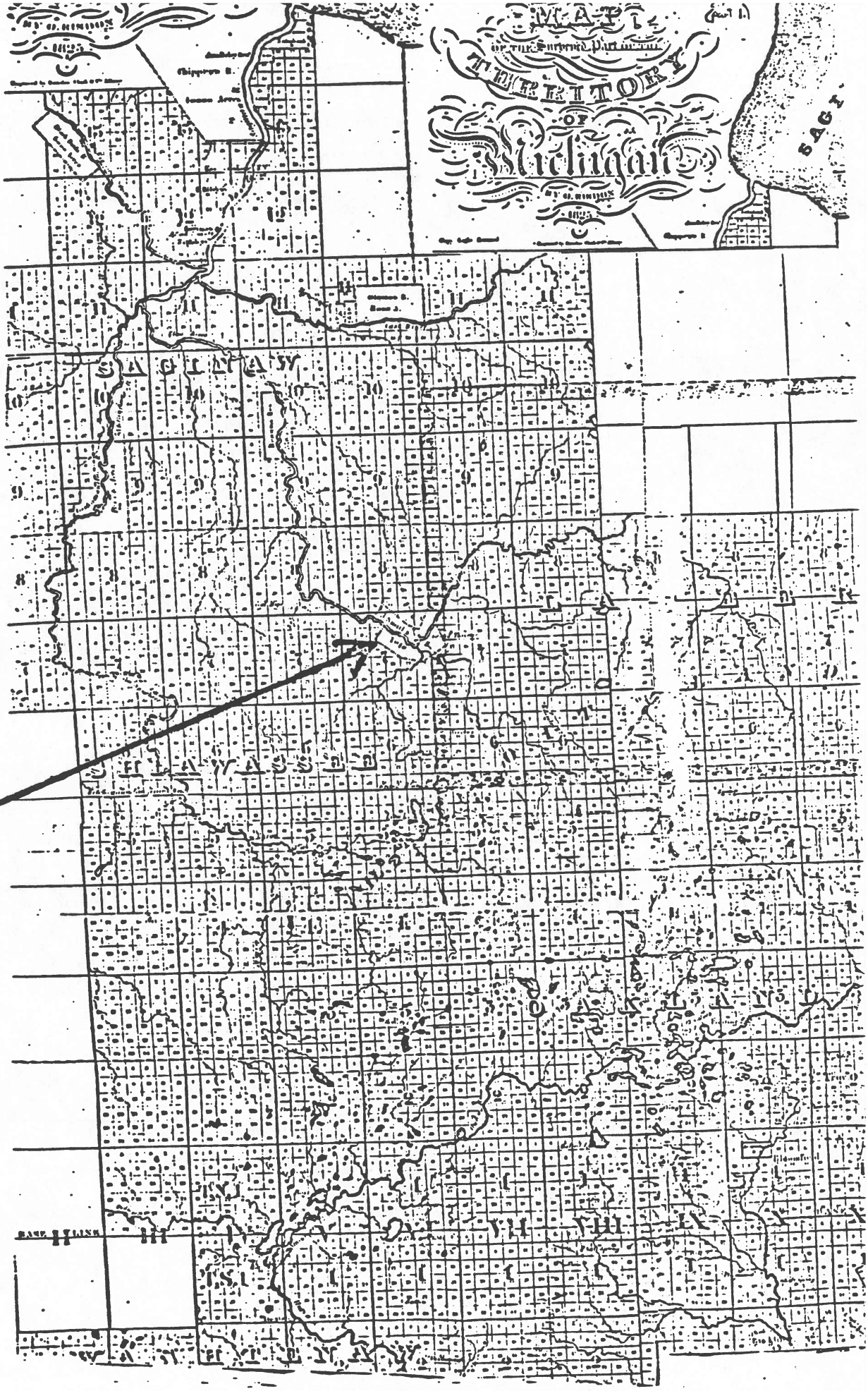


Figure 8. ORANGE RISDON'S MAP OF 1825 OF SOUTHEASTERN MICHIGAN

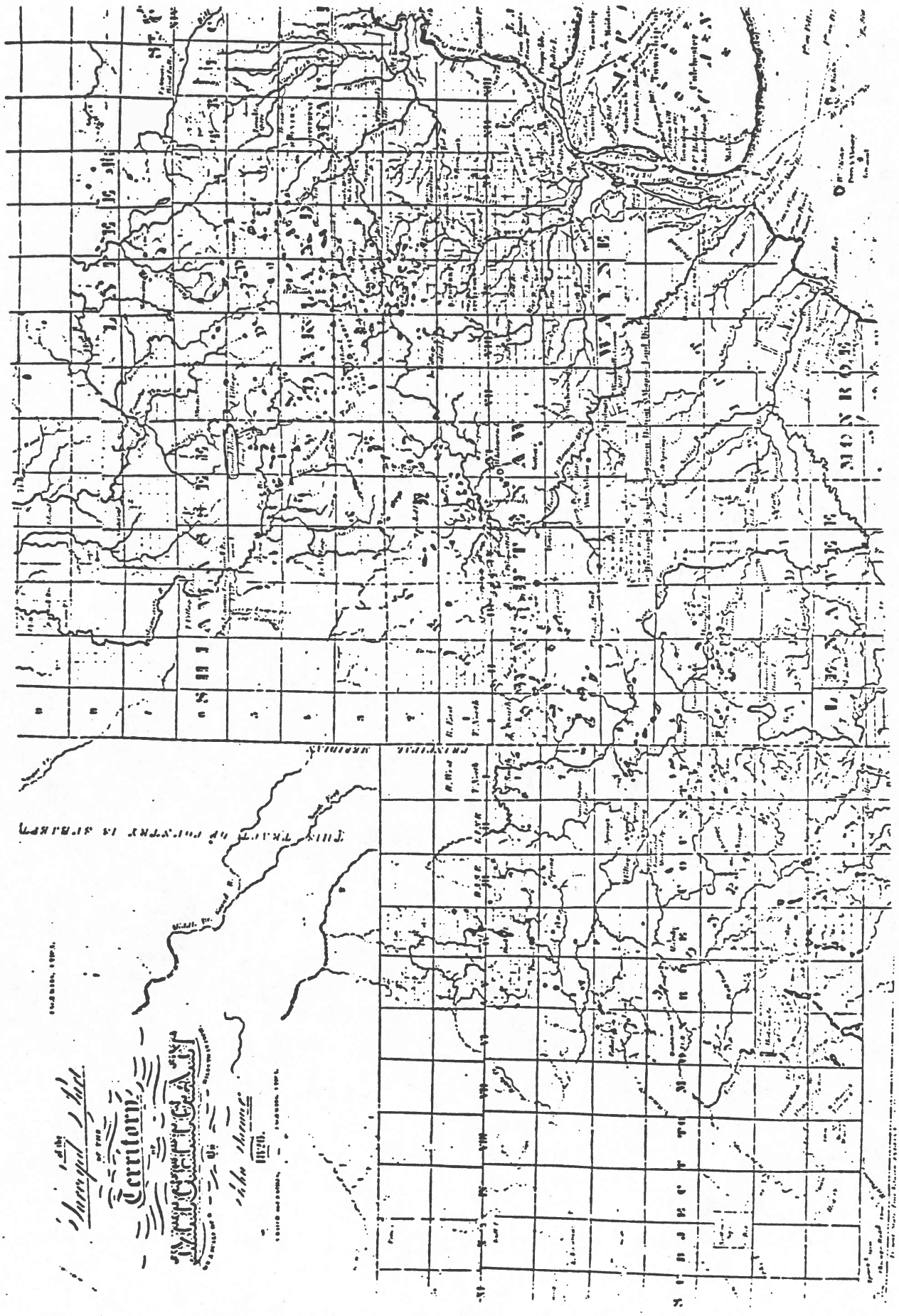


Figure 9. JOHN FARMER'S MAP OF 1826

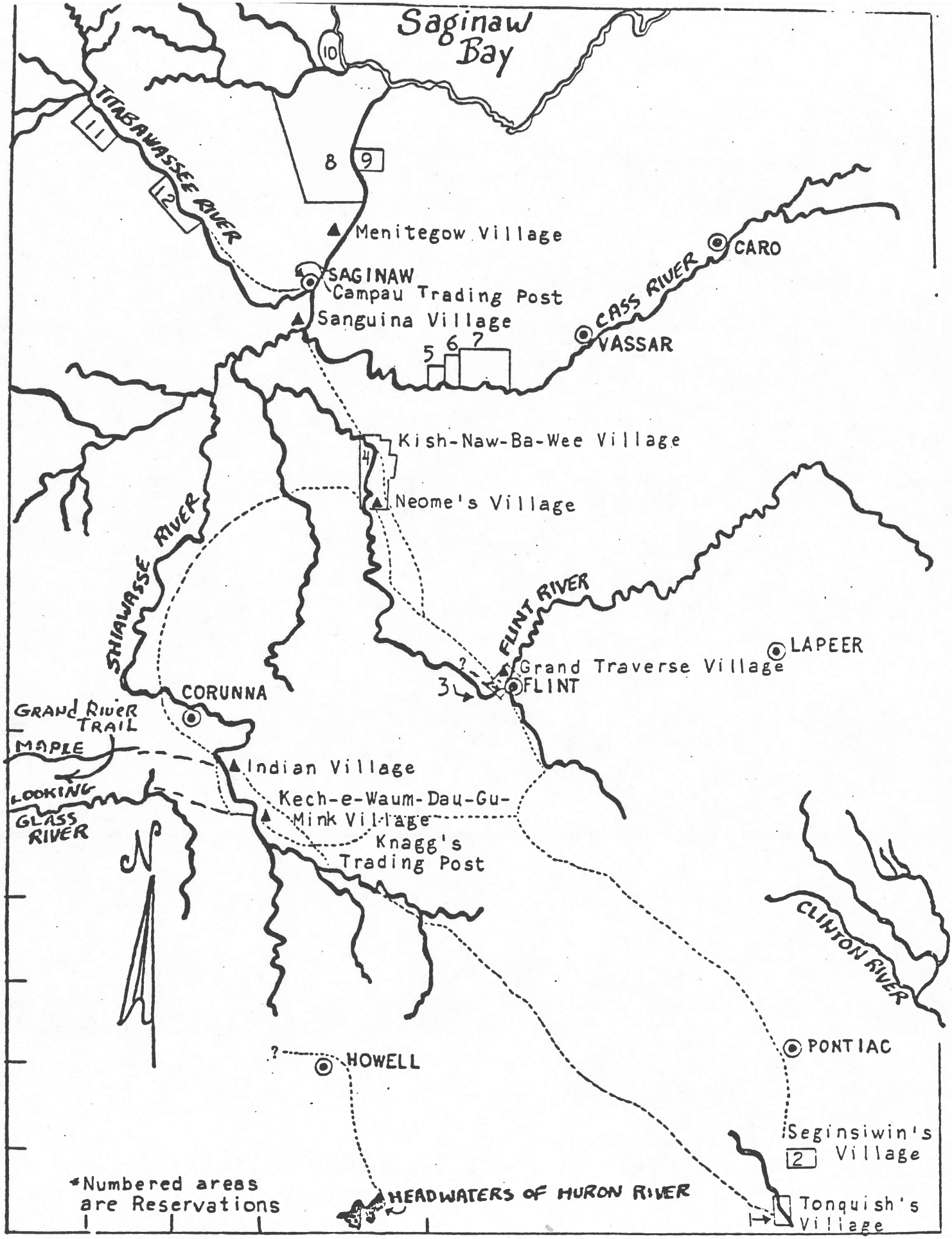


Figure 10. Indian Reservations established by 1819 Saginaw (After Royce 1899: Plates OXXXVIII and OXXXVII.)

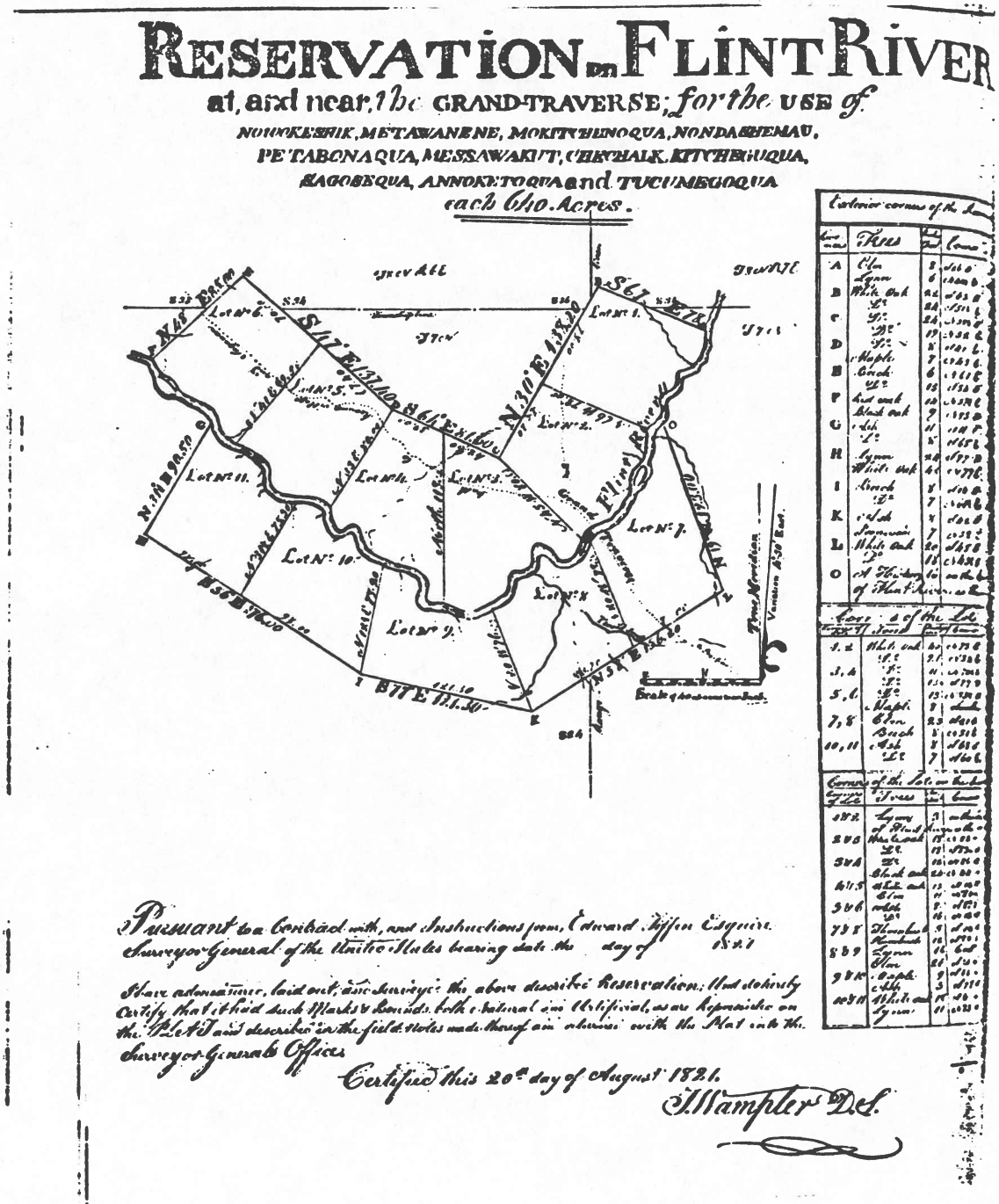


Figure 11 1821 Wampler Map of Eleven Indian Reservations at Grand Traverse.

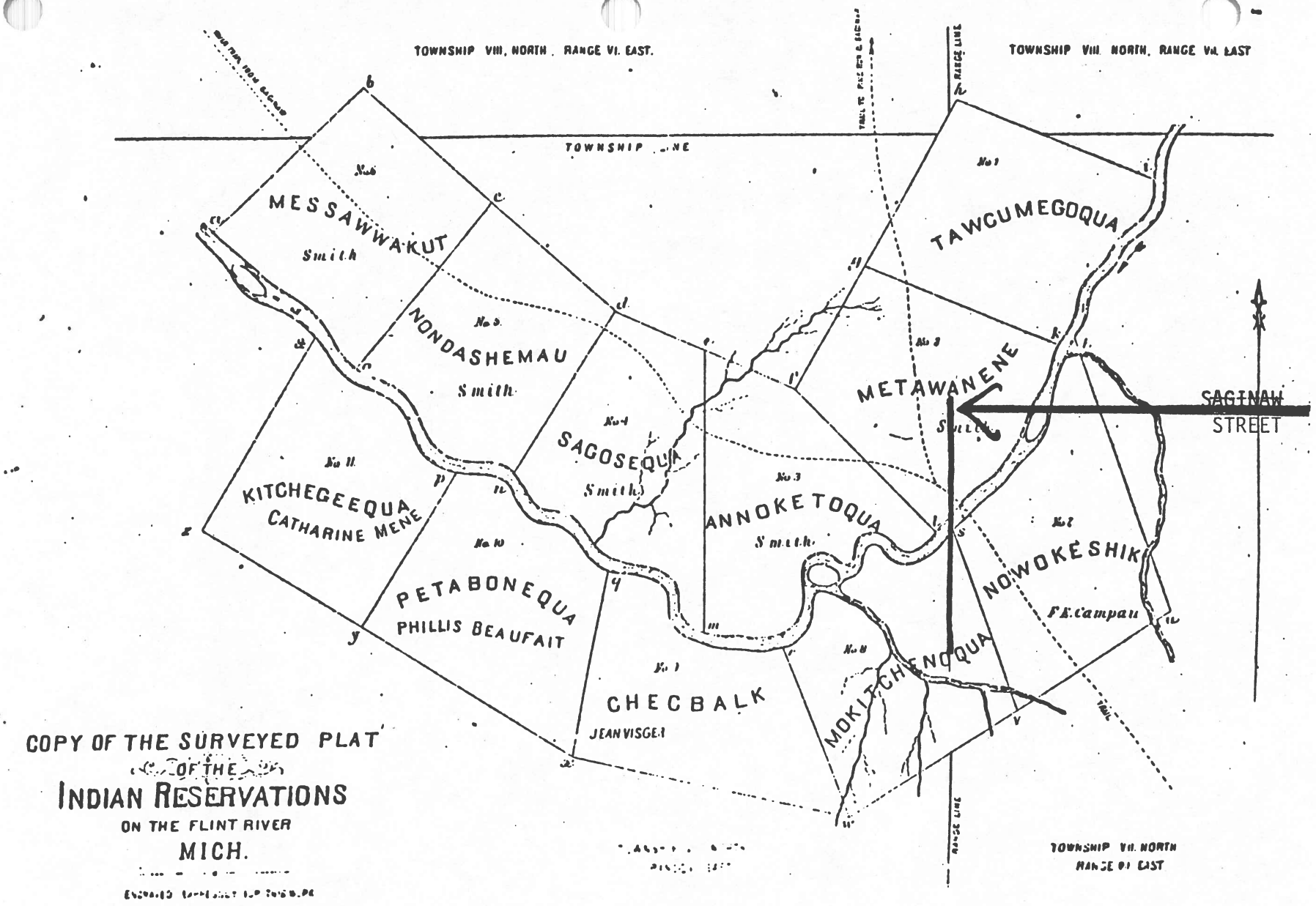


Figure 12. MAP OF THE ELEVEN RESERVATIONS AT FLINT SHOWING THE SAGINAW TRAIL. THE POSITION OF SAGINAW STREET IS SUPERIMPOSED (FROM ELLIS 1879).

FIGURE 13. USGS QUADRANGLE MAP

Reservation

on

Flint River

CERTIFICATE OF SURVEYOR

"Pursuant to a contract with and instructions from Edward Tiffin, Esquire, Surveyor General of the United States, bearing date of day of , 1827, I have admeasured, laid out and surveyed the above Reservation and hereby certify that it had such marks and bounds both natural and artificial as are represented on the Plat and described in the field notes made thereof and returned with Plats into the Surveyor General's Office.

Certified this 20th day of August, 1827.

T. WAMPLER, D. S."

See map on next page.

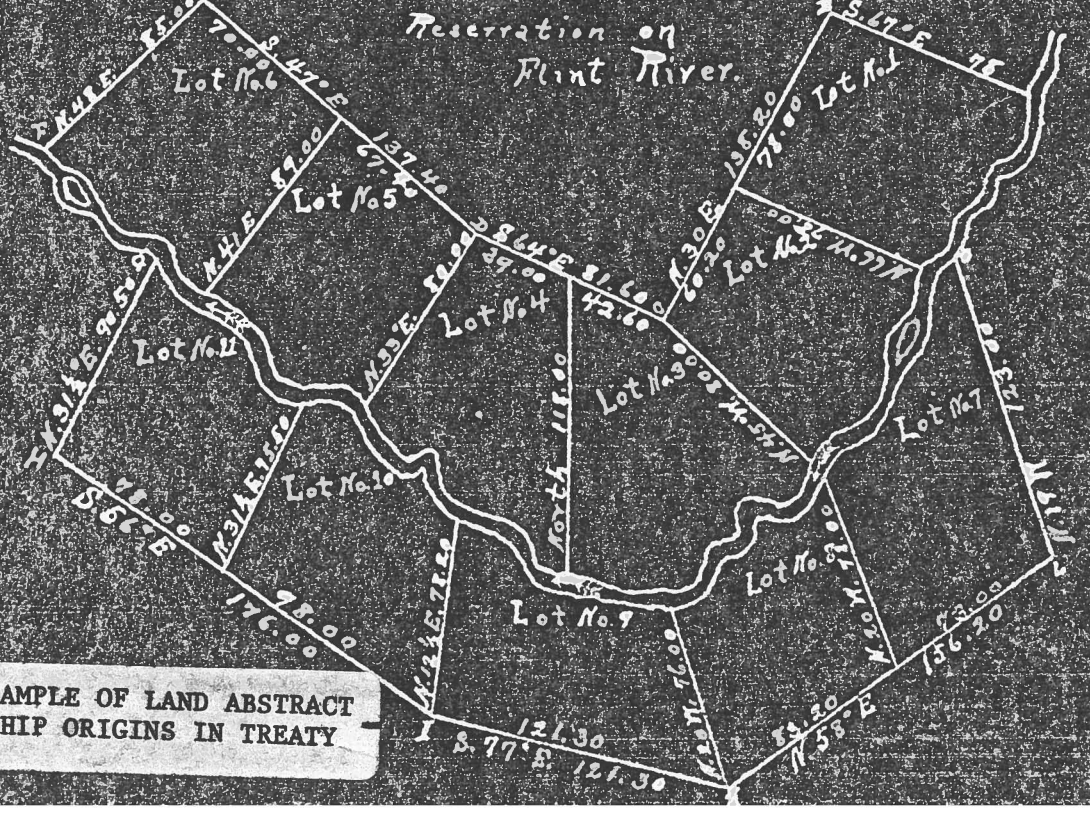


FIGURE 14. EXAMPLE OF LAND ABSTRACT SHOWING OWNERSHIP ORIGINS IN TREATY OF 1819

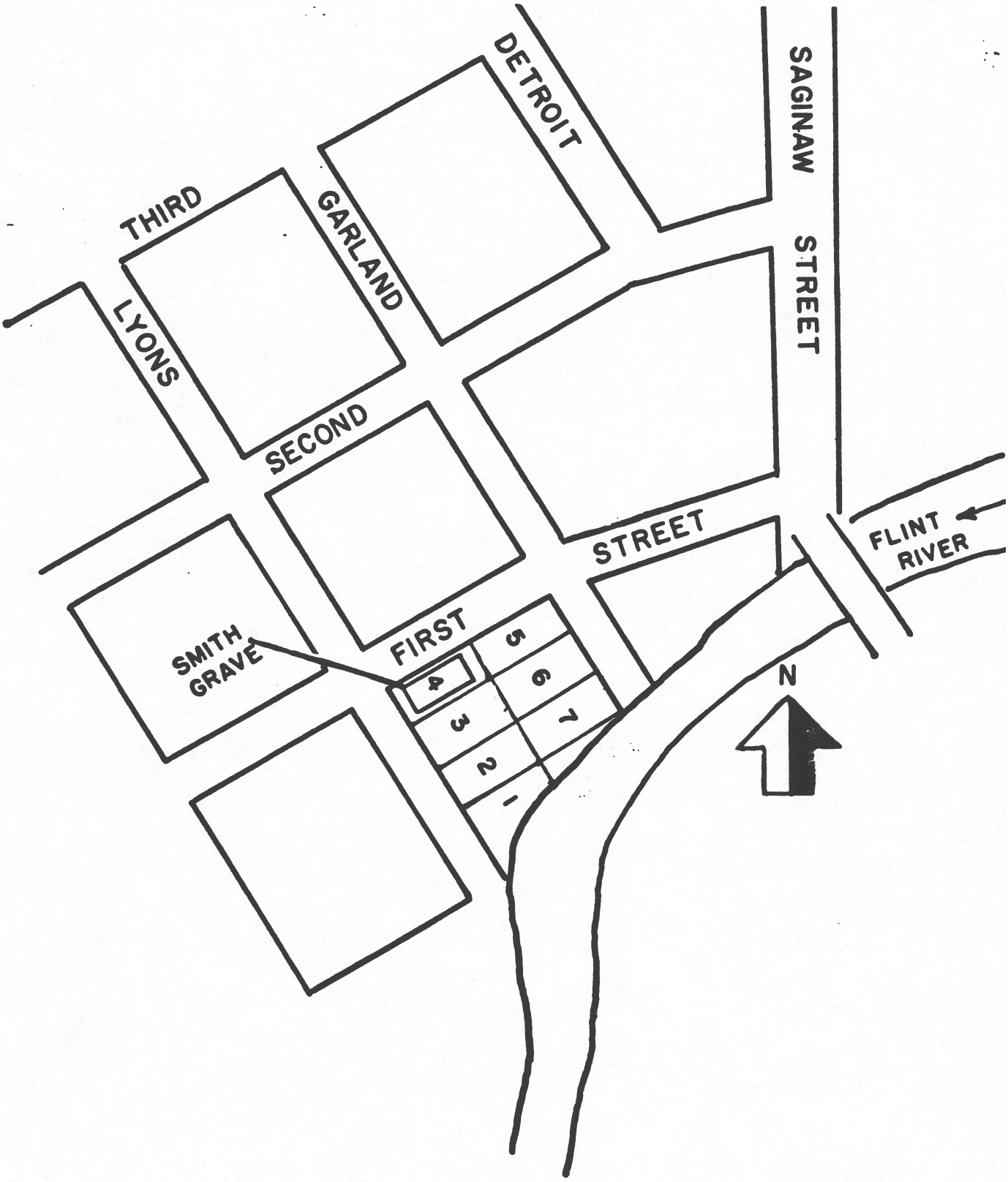


FIGURE 15. DRAWN FROM JULIAN BISHOP MAP
ca 1855
OF THE CITY OF FLINT

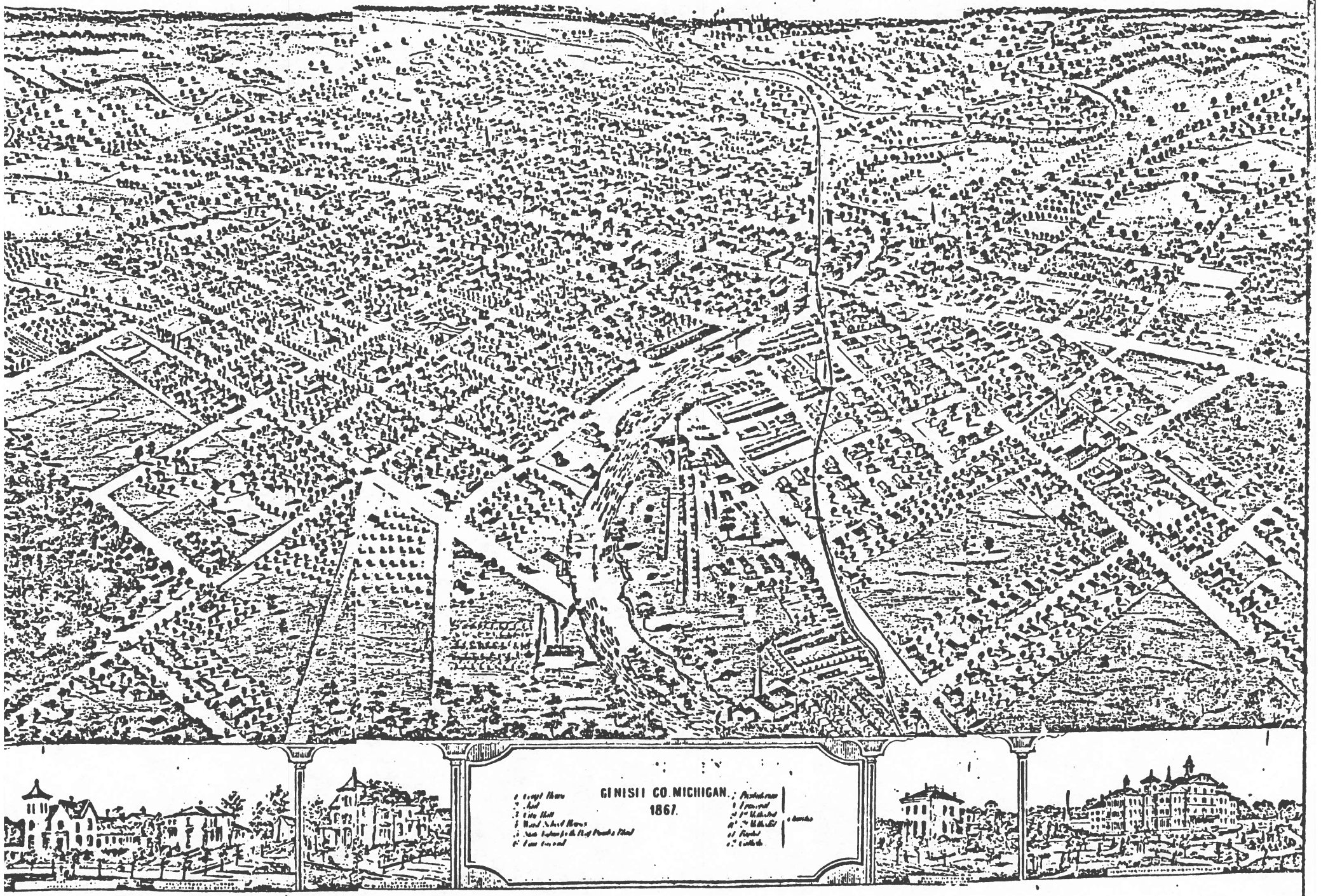


Figure 16. RUTGER'S "BIRDS-EYE" 1867 MAP OF FLINT

Figure 17. 1873 BEER'S MAP OF THE CITY OF FLINT

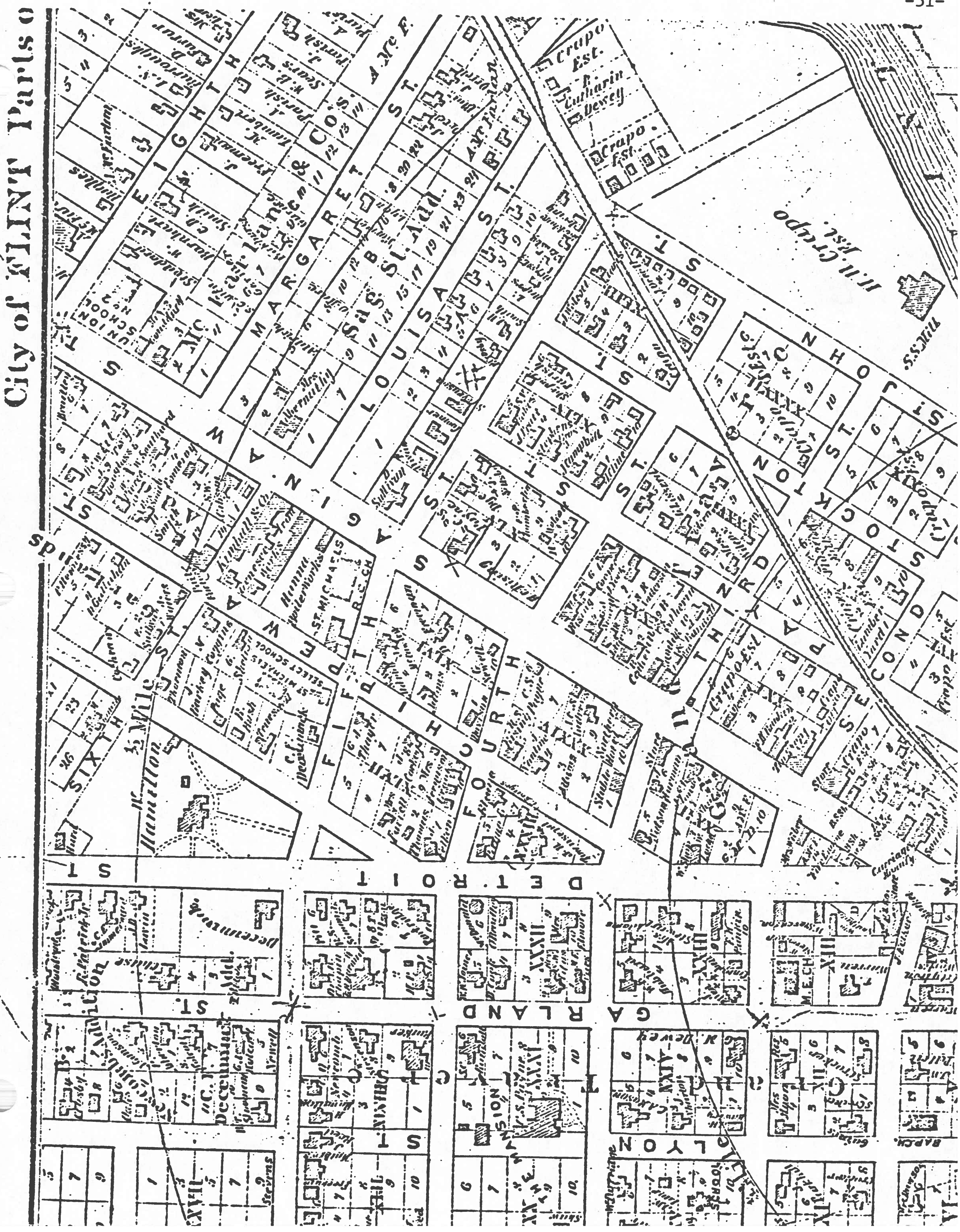


Figure 18. 1880 PANORAMIC VIEW OF THE CITY OF FLINT. GENESEE MAP COMPANY

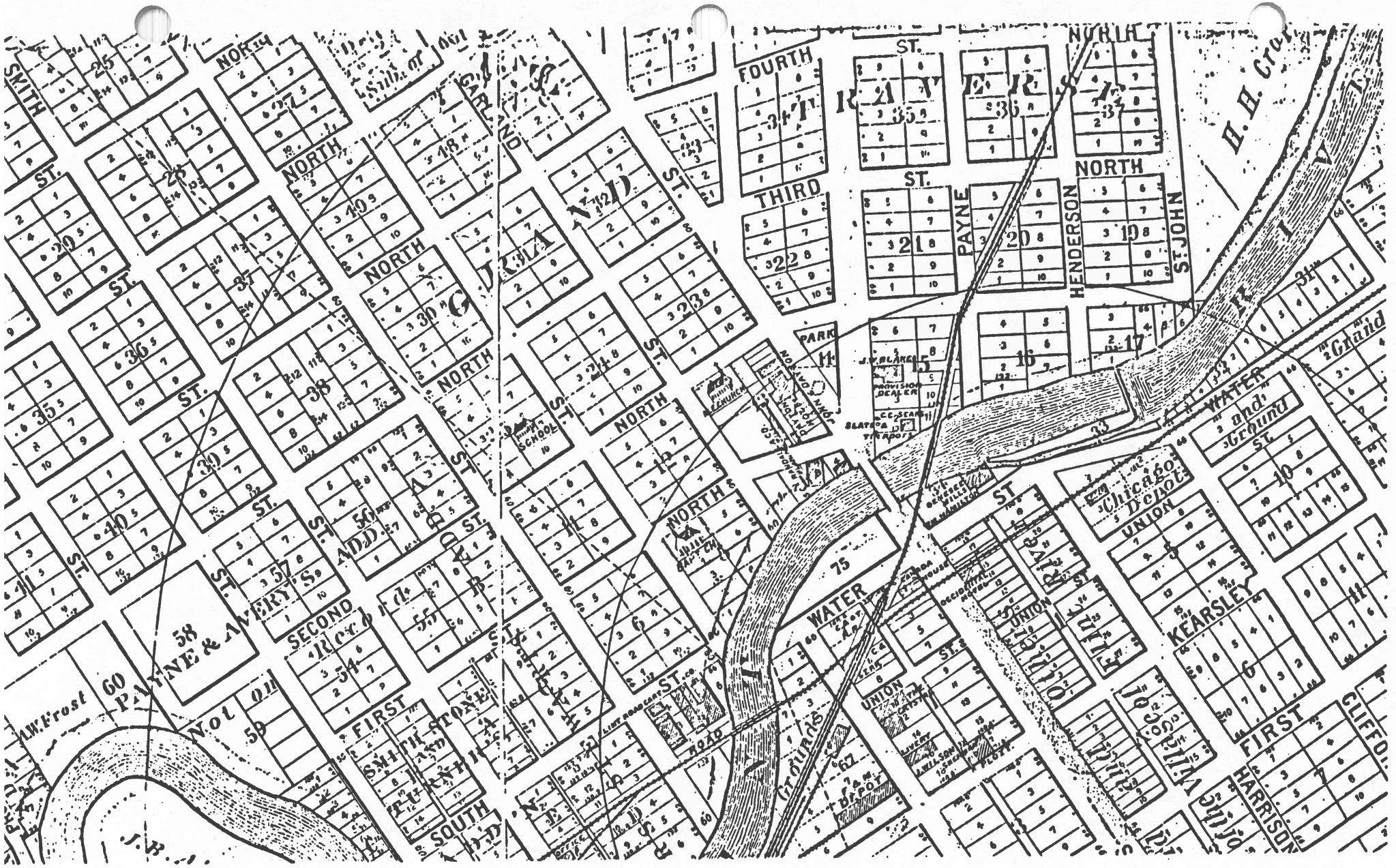


Figure 19. 1889 RANDALL MAP OF THE CITY OF FLINT

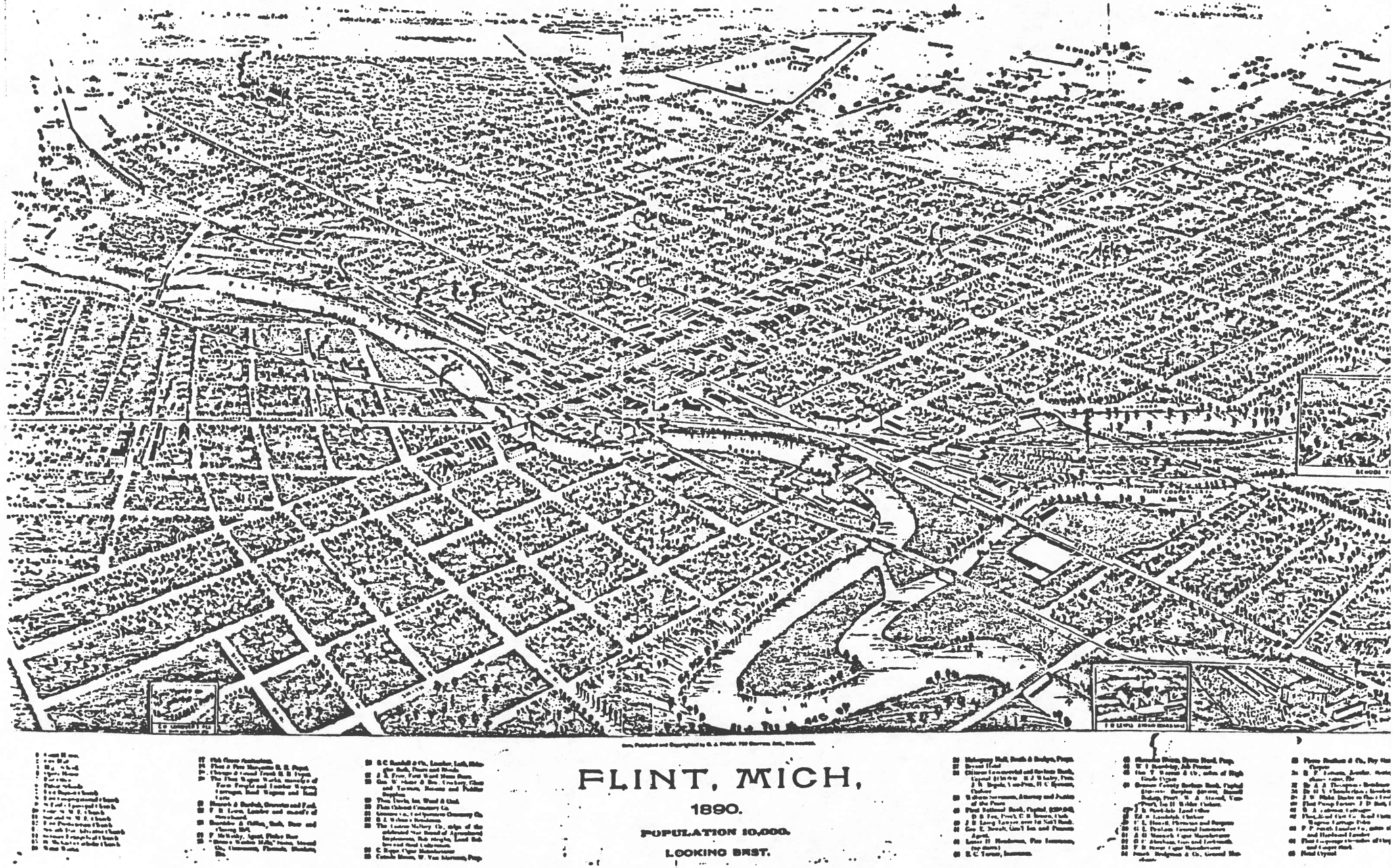


Figure 20. 1890 PANORAMIC VIEW OF THE CITY OF FLINT

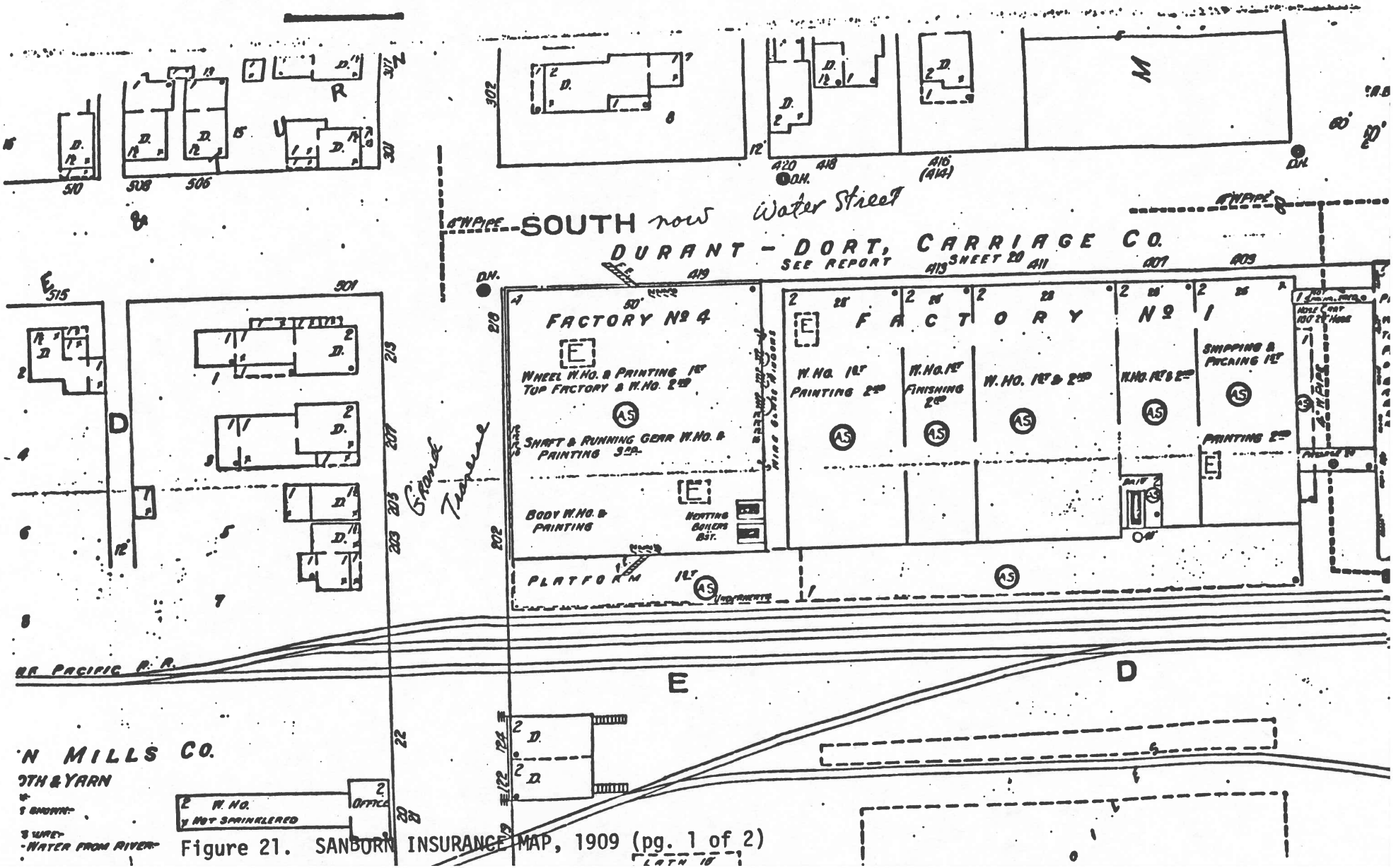


Figure 21. SANBORN INSURANCE MAP, 1909 (pg. 1 of 2)

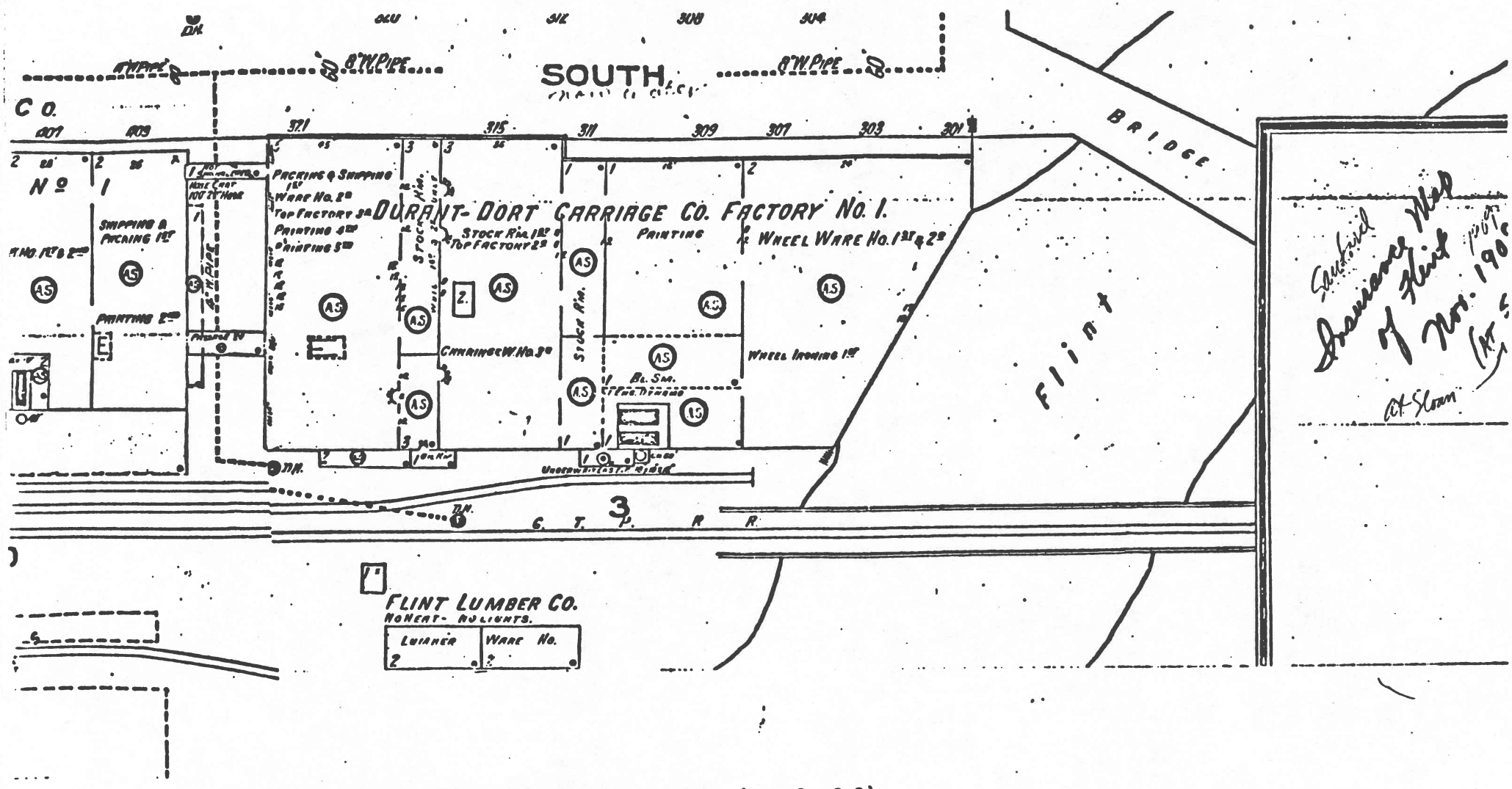


Figure 21. SANBORN INSURANCE MAP, 1909. (pg. 2 of 2)

Figure 22 Areas of Prehistoric and Historic Indian Occupation

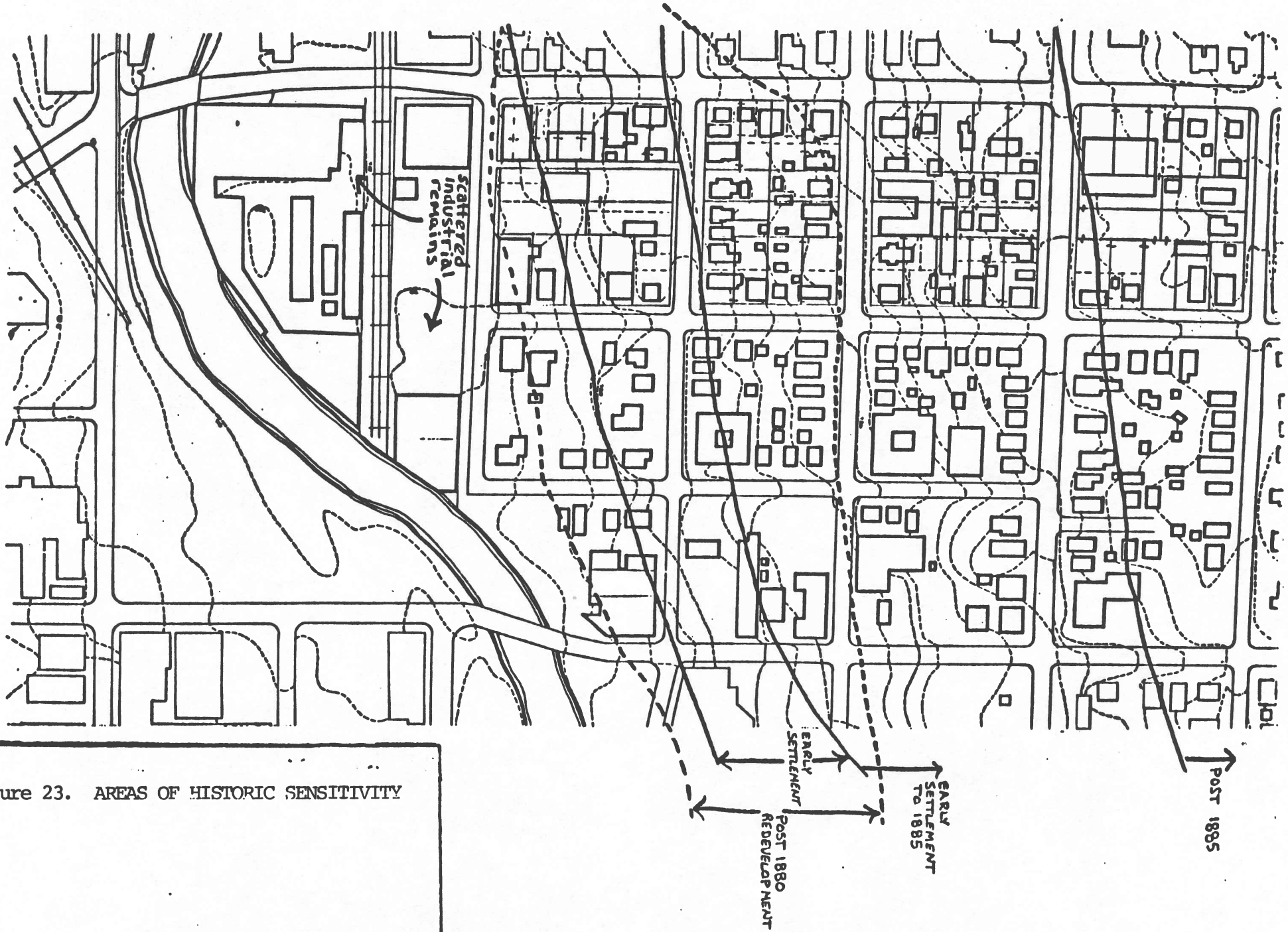


Figure 23. AREAS OF HISTORIC SENSITIVITY

PLATES

(PHOTOGRAPHED 1981)

Plate I-A

DURANT-DORT ADMINISTRATIVE BUILDING LOOKING NORTHEAST FROM WATER STREET

Plate I-B

DURANT-DORT FACTORY #1 ON WATER STREET LOOKING SOUTH FROM LYON.

Plate II-A DURANT-DORT COMPLEX REMAINING, LOOKING WEST ALONG WATER STREET. FLINT ROAD CART CO. (LATER DORT MOTOR CO.) AT LEFT, ANNEX #4 (RIGHT-REAR) NOW WAREHOUSE

PLATE II-B DURANT-DORT DEPARTMENT #4. FROM GRAND TRAVERSE STREET LOOKING SOUTH EAST.

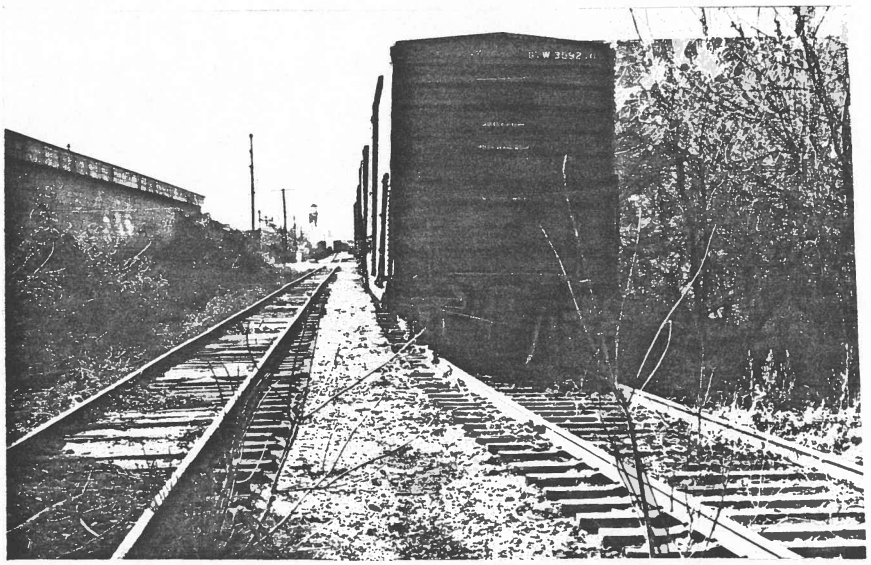


Plate III-A

GRAND TRUNK WESTERN RAILROAD.
LOOKING WEST BEHIND (SOUTH)
FACTORY COMPLEX.

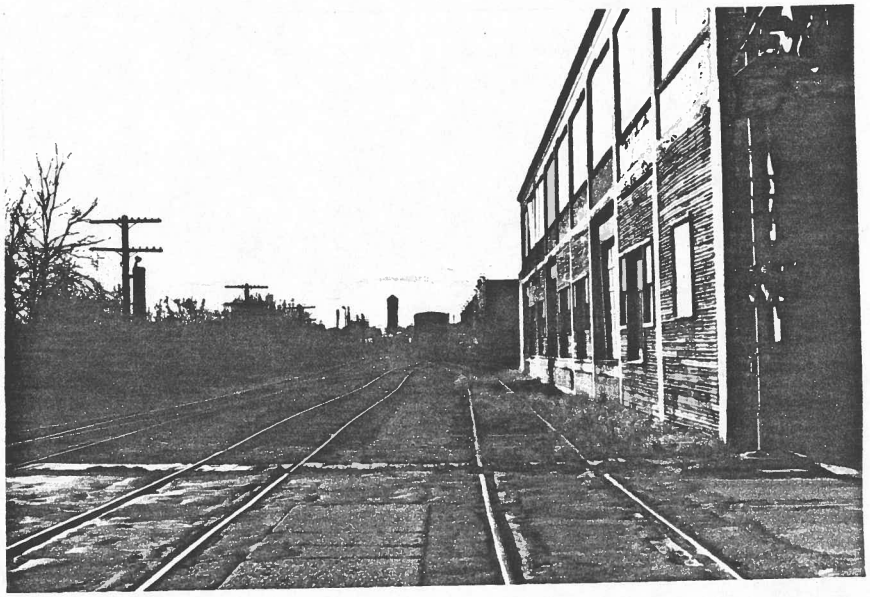


Plate III-B

GRAND TRUNK WESTERN RAILROAD LOOKING
WEST FROM GRAND TRAVERSE. DORT
MOTOR CAR COMPANY FACTORY #8 AT RIGHT.

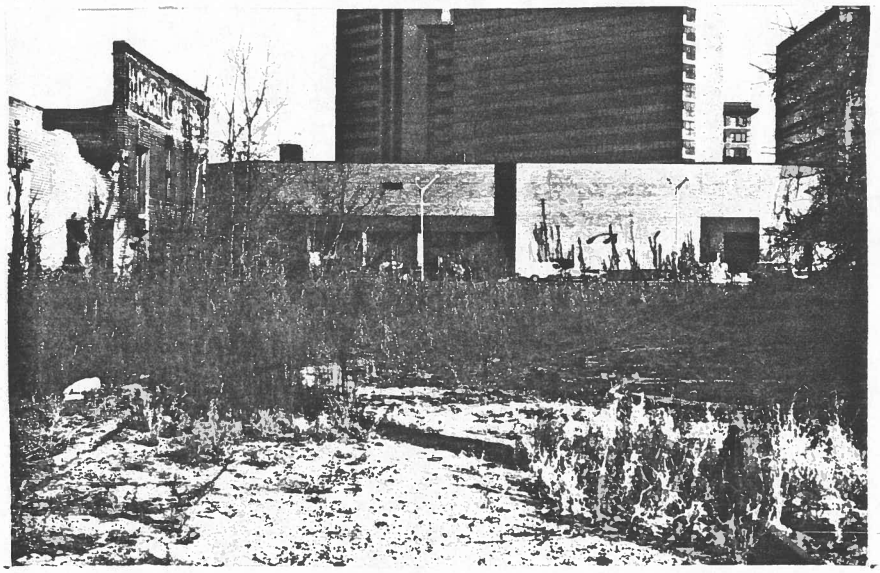


Plate IV-A

LOOKING EAST TOWARD BEACH STREET FROM BEHIND DURANT-DORT FACTORY COMPLEX. DURANT DORT #2 IS AT LEFT

Plate IV-B

DORT MOTOR CAR COMPANY FACTORY #8 LOCATED AT THE SOUTHWEST CORNER OF WATER AND GRAND TRAVERSE. VIEW IS LOOKING NORTHWEST.

Plate V-A

ALDRICH HOUSE. FORMER LOCATION OF FIRST BAPTIST CHAURCH

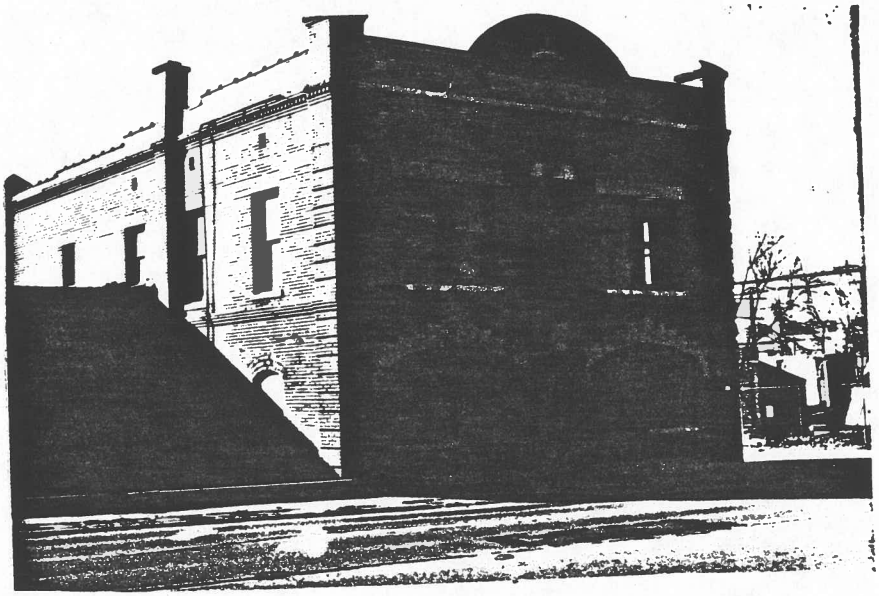


Plate V-B

MARKET STREET FIRE STATION. LOOKING NORTHWEST FROM GRAND TRAVERSE STREET

Plate VI-A

DUPLEX DWELLING NORTHWEST OF LYON AND WATER STREET INTERSECTION. DURANT-DORT CARRIAGE FACTORY PERIOD.

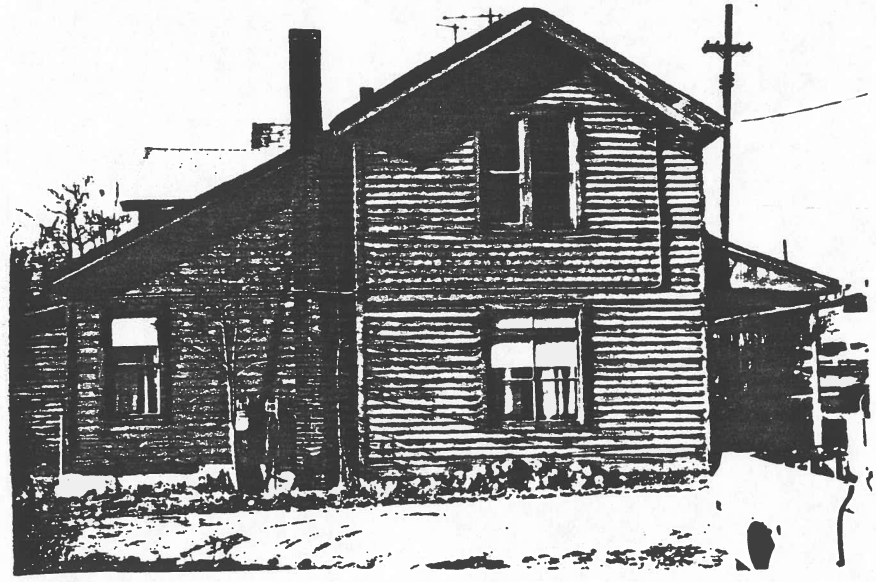


Plate VI-B

VIEW OF DUPLEX IN PREVIOUS PLATE LOOKING NORTH

Plate VII-A

NASH HOUSE LOOKING WEST FROM MASON. DORT-DURANT CARRIAGE FACTORY PERIOD.

Plate VII-B

DUPLEX WITH BOARDING HOUSE ADDITION LOOKING WEST FROM MASON. DURANT-DORT CARRIAGE FACTORY PERIOD.

Plate VIII-A

SINGLE FAMILY DWELLING NORTHWEST CORNER OF WATER AND STONE STREETS

APPENDIX A

TREATY OF 1819

JACOB SMITH, THE TREATY OF 1819, AND THE ELEVEN INDIAN RESERVATIONS AT FLINT

The first mention of the eleven Indian reservations at the "grand traverse of the Flint River" is found in Article 3 of the 1819 Treaty of Saginaw (Royce 1899; American Institute of Indian Law n.d.). The treaty was concluded in the near vicinity of Joseph Campau's trading post in what is now known as the City of Saginaw. The land at Flint was already under territorial control being ceded by the treaty of 1807(Ibid). Ojibwas were little consulted about their land except at major treaty conferences when large amounts of land were involved. They were considered part and parcel of territory under government control after the War of 1812. Land in southeastern Michigan was already being sold at $2.00 an acre with the opening of the land office in Detroit in 1818. This price was changed to $1.25 an acre in 1820 by Congress (Dunbar 1965).

The treaty session which Governor Lewis Cass attended as special commissioner of the federal government was attended by much whiskey drinking, brawls and the usual shenanigans by traders that accompanied dealings with Indians. The United States Government by this treaty ceded 6 million acres of southeastern and central Michigan. The western line of this cession ran from the Kalamazoo region to an angle northward to the AuSable River in Montmorency County, and hence down the AuSable to Thunder Bay. The eastern boundary of this cession is the eastern coastline of the Southern Peninsula except for an island in Saginaw Bay. This eastern line ended in the Thumb region below Port Huron and continued in a southwestern direction to near Owosso and then southward to a baseline projected east from Kalamazoo to Jackson Counties. This land encompassed all of the Saginaw River drainage including the Shiawassee River to the west.

For a few years Indians held reservation land set up by this treaty. Although these may have been in many cases strategic points on the Indian trade network, they were additionally sites of early fur trade outposts convenient to the white man's business. Within a few years "ownership" of these lands was taken from the Indians by congressional action. Their purpose was rendered obsolete as the Indian role in the trading system diminished. The Indian Removal Act of 1836 marks the end of an era and sealed the fate of Indian people in southern Michigan as regards land tenure.

Jacob Smith's activities in Michigan territory prior to 1819 treaty meetings are to determine his importance there. Smith had begun dealings with Ojibwas of the southern Saginaw Valley as early as 1810 or 1811 (Massie 1967, Love 1976). Neome's band, residing near the present city of Montrose were the people among whom Smith traded. This village was known as Pe-wan-a-go-wing or Place of the Flint. Smith traded from the strategic position of

the Grand Traverse crossing at the Flint River. We know little of the Indian village of Mucatawingh that existed there. Smith was an experienced trader, versed in frontier survival and could speak Algonkin Indian dialects as well as French. His presence at Saginaw at the 1819 treaty meeting would be critical to further developments at the Grand Traverse.

Some historians believe that Smith, who was respected among local Indian groups, was against the proposed 1819 treaty and mistrusted by Cass (Massie 1967:118). His influence against the treaty among Neome's band would have been considered financially critical to Lewis Cass, Territorial Governor who was to be provided $10,000 to defray treaty meeting costs (Dunbar 1965:236). Cass also planned to advance personal funds to provide Indians meeting at Saginaw monies guaranteed them by the Treaty of 1807 but not yet paid. Without this move Cass felt that the treaty was in jeopardy and hoped the federal government would reimburse him the amount, some $1,666.66 in silver. Cass states this in a letter he writes to Calhoun, Secretary of War in September, 1819.

> "I shall leave here on Monday next to meet the Indians at Saginaw, and endeavor, agreeable to your instructions, to procure a cession of that valuable territory."
>
> "It would be hopeless to expect a favorable result to the proposed treaty unless the annuities previously due are discharged. Under these circumstances I have felt myself embarrassed and no course has been left me but to procure the amount of the Chippewa annuity upon my private responsibility. By the liberal conduct of the Directors of the bank at this place, I have succeeded in procuring that annuity in silver, and shall thus be able to comply with past engagements before I call upon Indians to perform others. I trust the receipt of a draft will soon relieve me from the situation in which I am placed, and enable me to perform my promise to the bank." (Quoted in Dustin 1920:8).

Cass' personal career and ambitions for the settlement of Michigan Territory of which he was governor certainly played a part in his awareness of Jacob Smith and his influence among Neome's band of Saginaw Valley Ojibwas. His ultimate goal was removal of Indian claims to the land of the Saginaw Valley.

Cass, because of his position as territorial governor must have, from the first, sensed the politics of the early frontier, that he dealt with a class of traders whose goals were to carry on successful business and generate profit. For that matter they were the only mitigators between Cass and the Tribesmen who inhabited the vast forest north of Detroit. The trading of beaver, fox and other fur pelts with the adjunct use of whiskey is not a system that is to endure long in Michigan. Future settlers, so to speak, were waiting at the far west end of Lake Erie and were soon to disprove Surveyor General Tiffin's opinion that Michigan was

nothing but a swampland. If Cass is to become the politician expressing manifest destiny across the Great Lakes region, it is the Erie Canal (1825) that facilitates it. But in 1819 Cass must deal with the traders as agents of the frontier. In fact, as early as February 16, 1816 Cass wrote to A.J. Dallas, Secretary of the Treasury:

> "He (Smith) went at my urgent solicitation to bring in to the treaty at this place certain influential Indian Chiefs whose presence it was important to procure and which without him could not have been procured (Lewis Cass Letterbook, Michigan Historical Commission Archives, Quoted in Massie 1976).

The somewhat legendary Smith has been said by many historians to have an Ojibwa wife and in some accounts Indian children. There is little proof of this (Love 1976) and Smith's claimants for the land of the eleven reservations at the Grand Traverse at Flint were certainly not of Ojibwa descent but his direct white progeny. Smith is described by Ellis much later in 1879:

> "He was brave, true and nobly generous in his dealings with Indians. . .to a degree which gave him a firmer hold to their esteem and confidence, (and) although an alien by birth, he was warmly devoted to the cause of America, an officer under her banner, one who braved great personal peril in her service, and gave his property as he also risked his life to rescue (war) prisoners" (Ellis 1879:13; also quoted in Massie 1967:118).

Smith had operated in Detroit from as early as 1805. He had been sent by General William Hull in 1807 to bring the Saginaw bands to an Indian council at Detroit, an invitation which the intended target population rejects. As the records go, they reply:

> "Almighty God gave us this land for use to serve, but not for to sell (sic) -- Think never to buy them, for it is not of any use. Our Father, we are not ignorant of him that wishes to sell you our lands--but don't believe him, it is not his lands here" (MPC XL:145, quoted in Massie 1967).

Hull again uses Smith prior to the outbreak of the War of 1812 to sound out the Saginaw bands. Smith had been an American citizen since 1800, but the Ojibwas of the Saginaw Valley considered him a British citizen, a role which Smith failed to reveal to his Indian "friends". In modern parlance Smith would be called a "double agent."

Indians of the Saginaw Valley readily distinguished between British and Americans during the period of the 1812 conflict. At the same time their land was going under the assaults of treatys that they signed with X's, their real names as band members given English spelling by white treaty makers. It is obvious from

subsequent events at Saginaw that the bands of the Saginaw Valley little understood and further rejected the white man's idea of land tenure.

Smith's journey into Saginaw country for Hull resulted in the discovery of his double role, supposedly due to the fact that his companion, while under the influence of whiskey, told of Smith's national allegiance. Smith barely escaped with his life while the local Chippewa expressed their attitude towards American proposals by killing his talkative companion on the spot (Massie 1967:121). Smith was forced to abandon the trading merchandise he carried with him.

Smith's activity among the Saginaw Ojibwas then on the behalf of Cass was a continuance of the role he had played with Hull. By the time of the Saginaw Treaty though, he had "come in out of the cold." Smith was once again in the favor of at least some of the the members of the Saginaw bands, enough so as to be influential at the Treaty of Saginaw council. Residual respect probably existed for Smith because of his lifestyle. He was the frontierman par excellence, and had adapted Ojibwa lifeways. He had lived among them for years and spoke their language. According to the tradition he was adopted by them and was given the name of Wah-be-sins. In contrast to the politician, the military men, and even some of the other traders Smith probably approximated more closely the Indian idea what a human being should be.

Neome, leader of the Ojibwas band whose territory was north of Flint near Montrose, was the other central figure of the coming drama. It was with Neome's band that Smith had traded for years from his post at the Grand Traverse crossing of the Flint River. Neome's people were the first met while traveling on the Saginaw Trail to the Saginaw Valley. Dustin states this point succinctly:

> "In point of location, geographically, Neome and his powerful band stood at the door, the very threshold of the large body of land which our Government, through its faithful and earnest Commissioner wanted. To anyone standing at Detroit and looking northerly to the beautiful belt of the land lying westerly of the River St. Clair and Lake Huron, it was plain that the old Chief Neome stood, unless well disposed toward the treaty, indeed a lion in the path." (Dustin 1920:13)

The rather spectacular and often sordid details of the "doings" at the Saginaw Treaty Session are well documented and several accounts have been published.

Needless to say, Smith threw his influence behind Cass. Dunbar believes that Smith's price was the reservation land at Grand Traverse (Dunbar 19:237). This particular agreement is not documented. At any rate, Smith's change of mind only occurred sometime before the Neome from his particular shelter handed the names that were to designate the eleven reservations at Flint that were

requested by Wah-be-sins to William Knaggs, listed as a sub agent in the treaty document. Knaggs, the Campau extended family, and Smith and the two persons that had accompanied him and others were all traders, a profession well represented at the counsel.

Neome as a headsman was a trader by culture not profession. The Indians of the Great Lakes region had been trading for millenia. Archaeology documents in certain periods the Native American trade system stretched from the Keewanaw Peninsula of the Northern Peninsula to the Gulf Coast and eastward to the Niagara frontier on the Lower Great Lakes. The Saginaw Trail is a reality created as part of this system. At no point, if we are to judge by the ethnographic data, was trade ever associated with the acquisition of land.

The treaty was concluded at following council meetings, but not before fisticuffs had erupted between Joseph Campau and Smith over whether Campau should be paid for debts already accrued by local tribesmen, the now available Indian money, now as silver, was sitting on the council table. Besides Smith, there were two other traders who were in competition for funds already owed by the local bands.

With conclusion of the treaty councils, 15 barrels of whiskey were opened, 5 by the United States Quartermaster, 10 by Campau. Smith is certainly not unacquainted with the use of alcohol, now considered by modern pharmacologists and social workers who specialize in substance abuse as an addictive drug. Officials of the John Jacob Aster organization had complained in 1818 to John Jacob himself that Smith was disrupting trade at their best post at Saginaw because of his "clandestine introduction of spiritous liquors (sic) there (Wisconsin Historical Collections as quoted in Massie 1967:122).

Subsequent events as post documented post ten p.m. at the final Saginaw Treaty session can be well imagined. Well intoxicated Indians surrounded the Campau trading post. This complex had been planned as the locus of the treaty conference. Campau himself had set up the various structures which housed the personnel of the meeting. We can only assume that it was business as usual. Indians had been intoxicated since the beginning of the negotiations and some had sat mean and sulky in their own beds, retired from their anger over these negotiations about their land. It is never recorded in any documents how intoxicated the traders were, whether Neome or Smith exchanged libations. There is no documented evidence of Indian stills. The making of whiskey was a white man's skill.

Post ten o'clock the Honorable Governor Lewis Cass appeared at the door of his lodging, described by Louis Campau himself as "looking very grotesque with a red bandana handkerchief tied about his head, hollering, "Louis! Louis! stop the liquor" we shall all be killed. I say stop the liquor, Louis."

Louis Campau's reply to all this was, "General, you commenced it; you let Smith plunder me and rob me, but I will stand between you and all harm." Cass once again called out to Louis Campau to send "those" Indians to their wigwams, at least indicating that the tribesmen were living in their own established quarters.

Campau summarizes the whole thing in the saloon language of the frontier.

"I lost my money, I lost my fight; I lost my liquor; but I got good satisfaction."

Thus passed six million acres of Indian land to the United States.

By the Treaty of 1819 several Indian reservations were created. These were all at strategic positions on the river systems of the Saginaw. Whether they were the traditional homes or campsites of bands of the Saginaw Valley is yet to be established by document or archaeology. Many were, it is obvious, in strategic places of passage on the Saginaw Trail where trade coming from the interior could be intercepted. The link between the Saginaw Valley and river systems north and west had already been established in the post Treaty of 1807 period. Knaggs' trading post on the Shiawassee occupied an important trading position linking the Saginaw Valley with the Grand River Trail and the southwestern part of the state. Seginsiwin's and Tonquish's reservations occupied the northern gateway to the Detroit area on the Upper Rouge River.

The reservations at Flint are certainly in a locus of geographical importance, positioned as they are at the rim of the Saginaw Valley and on the trail leading southward to Detroit. What is frequently overlooked is that the land at the Grand Traverse was already under territorial control by the Treaty of 1807. What really occurred at the Treaty of 1819 is that land at the Grand Traverse ceded to the United States was granted to descendants of a white trader and others of little Indian blood quantum.

The Treaty reads:

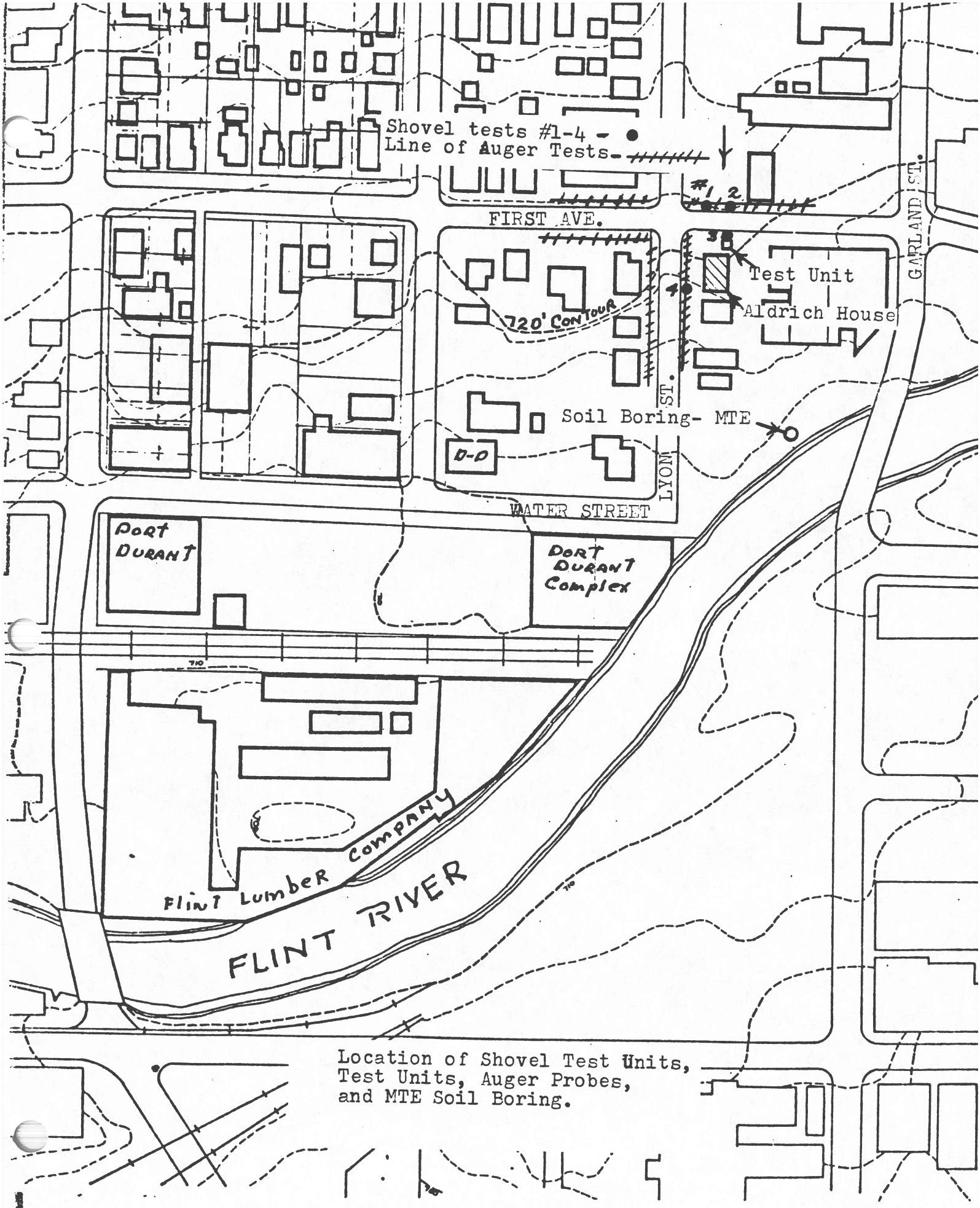
"For the use of Nowokeshik, Metawanene, Mokitchenoqua, Nondashemau, Petabonaqua, Messawwakut, Checbalk, Kitchegeequa, Sagosequa, Annoketoqua, and Tawcumegoqua, each six hundred and forty acres of land, to be located at and near the grand traverse of the Flint River, in such manner as the President of the United States may direct."

The creation of the eleven "Indian" reservations at Flint provides an excellent example of the effect that early frontier land dealings can have on land tenure and even the settlement pattern of a growing village. Litigation concerning the reservations

north of the river, as emphasized in this report, retarded development there. Certain streets in the northwestern sector of the modern Flint still maintain the axis of the treaty boundaries. Several factors of natural environment, such as water drainage and topography, may be given as the reason for the nuclear development of Flint's beginnings south of the Flint River. The historical fact that this occurred in Reservation 8, the first of these to be cleared of such land disputes cannot be discounted.

EC:mw D/20
03/11/82

APPENDIX B
FIELD TESTING SHEETS



Location of Shovel Test Units, Test Units, Auger Probes, and MTE Soil Boring.

Project JINT WATER STREET DISTRICT Transect# Pass

Datum SE Corner Lyons Street and First Ave. — Curb Intersection

Crew Member/Line# _____

_____

Date _____

Description

Texture (proportions of sand, silt and clay)

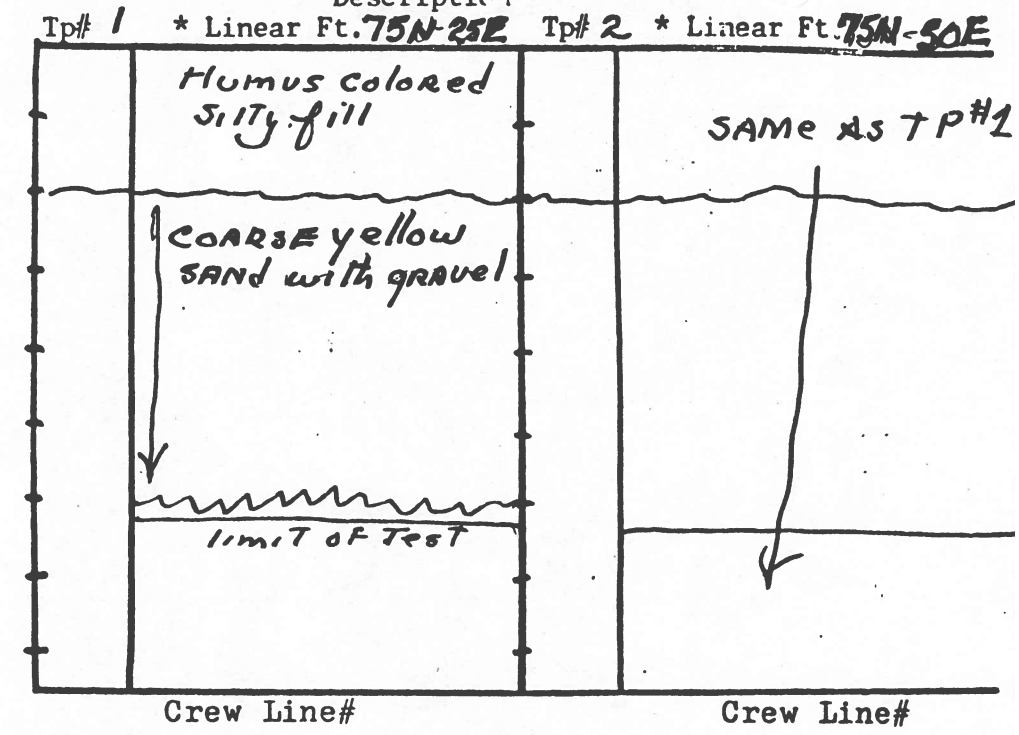
Structure (granular, blocky or lumpy, columnar or platy)

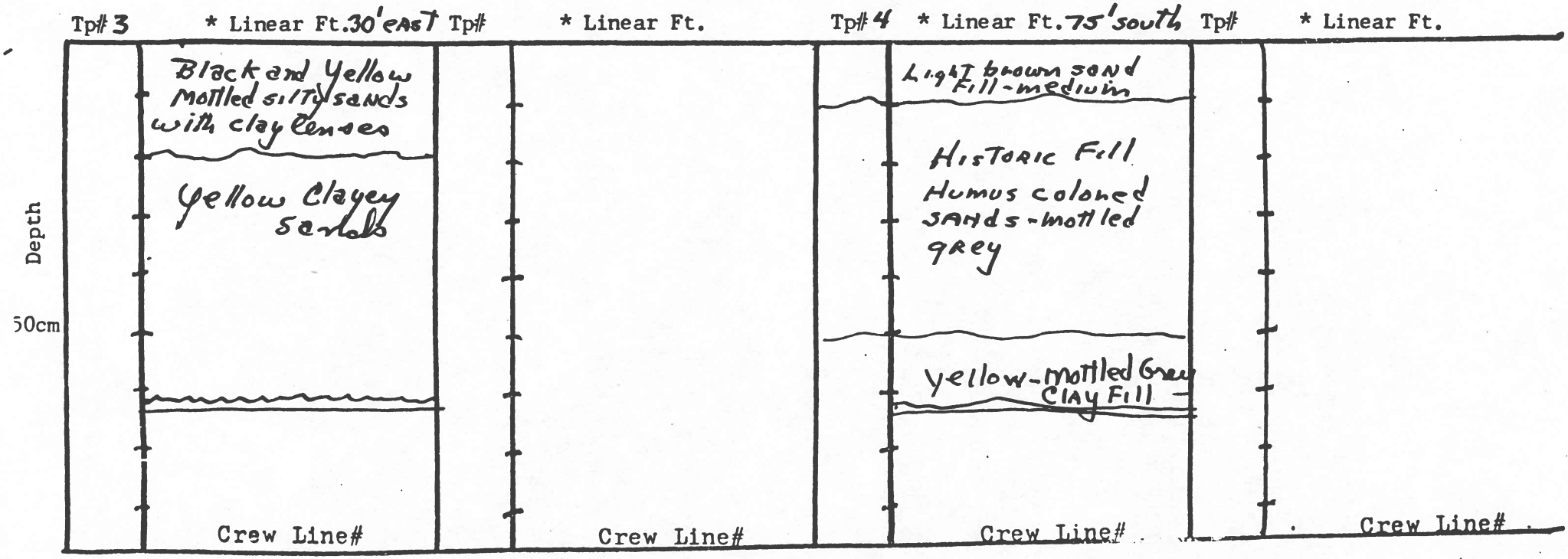
Color Code: red - R
yellow - y
brown - br
black - bl
grey - g

General condition (active erosion, fallow, etc.)

General terrain (slope, flatlands, etc.)

Description





* From Datum

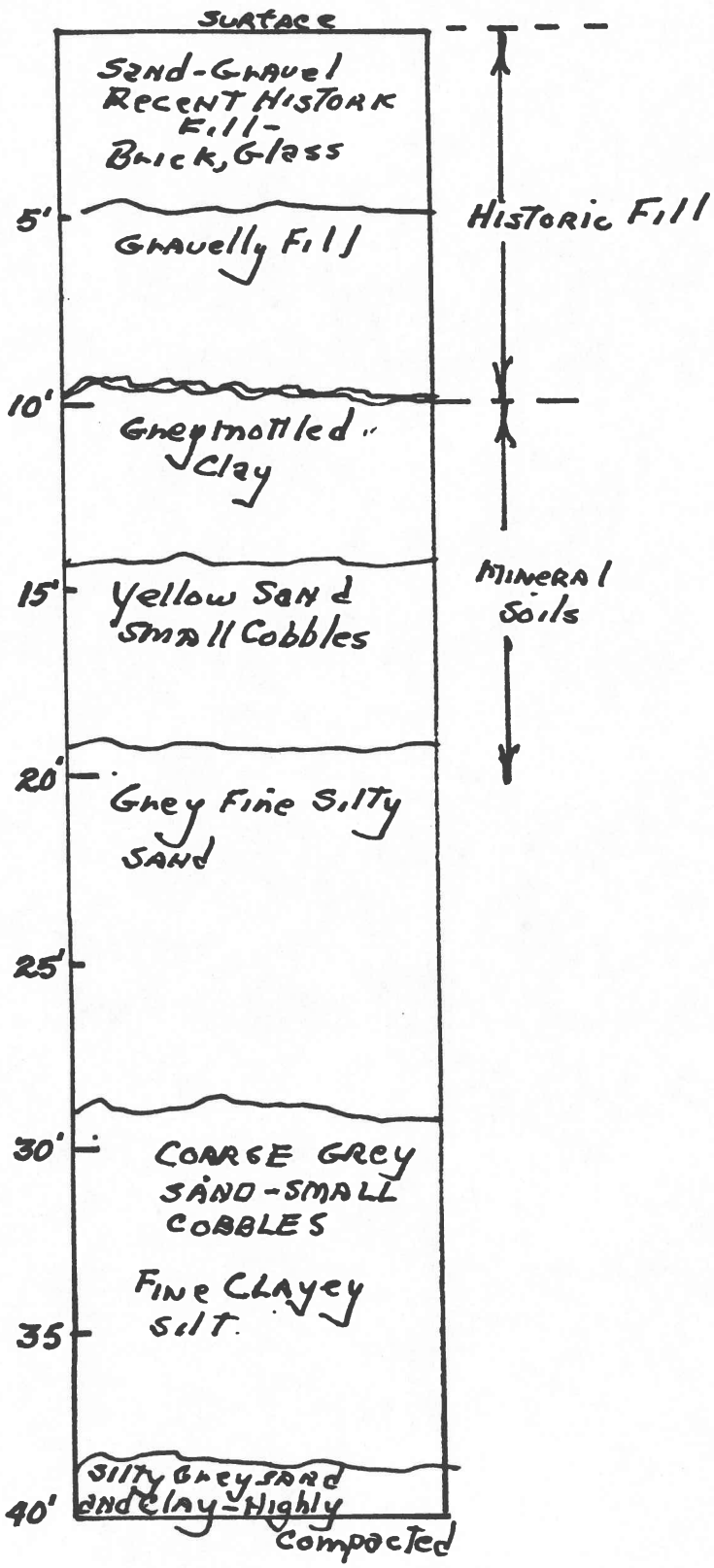
PROJECT: | Datum | Location:

Date:

Soil Boring

Eagle Parking Lot

Garland Street and Flint River



PROJECT:	datum:	location:
date:		

3" Depth

BLACK HUMUS-COLORED SILTY SANDS

-Fill

6" depth

Black silty-sands with yellow mottling

-Fill

Homogeneous Black sands

CONCENTRATION of Rocks

9" Depth

Clayey yellow fine sands with gravel

-Sterile

12" depth

Clayey yellow fine sands with gravel and Cobbles

-Sterile

0 1" 2"

TEST AT N.E CORNER OF ALDRICH HOUSE LOT

N

APPENDIX C

SOIL LOGS


P
P
P
P
P
P
P
P

BORING LOG NO. S-149 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 47' N of ℄ of Flushing Road, 9' E of W edge of Parking Lot - F.I.J.I. Fraternity

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER FT / DEPTH	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 751.8
	1	SS		4-4-6	Clay and Sand Backfill-Trace Silt & Gravel-Brown
10.0	2	SS		5-8-11	Silty Clay- w/Seams and Pockets Gray Silt-Brown
	3	SS		11-17-23	
20.0	4	SS		17-23-39	
	5	SS		30-39-51	
30.0	6	SS		39-43-61	
	7	SS		41-57-70	Silty Clay-Trace to Some Fine Sand & Occ. Sand Layers - Trace Gravel - Occ. Large Stones ± 4" dia.
40.0	8	SS		50-77-88	
	9	SS		117/5"	
50.0	10	SS		69-94-60/3"	
	11	SS		79-60/3"	
60.0	12	SS		84-60/3"	
	13	SS		68-91-60/3"	
70.0	14	SS		60/3"	

CONTINUED ON SHEET 2

BORING LOG NO. S-150 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 43' S of ℄ of Sixth Ave. in pavement of Frost St., 6' E of W curb line

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER FT / DEPTH	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 762.9
					Concrete
	1	SS		8 - 11 - 11	Silty Clay w/Small Silt Pockets-Trace Fine Sand & Gravel-Brown
10.0	2	SS		4 - 6 - 8	Silty Clay-Seams & Layers Silt-Gray
	3	SS		5 - 8 - 11	Silty Clay-Trace to Some Fine Sand-Brown
20.0	4	SS		2 - 3 - 7	Silt-Trace Fine Sand & Clay-Gray
	5	SS		21 - 36 - 51	
30.0	6	SS		16 - 60/2"	
	7	SS		18 - 75 - 67	
40.0	8	SS		55 - 100	Sandy Silt-Trace to Some Clay-Trace Gravel-Seams & Pockets Fine to Medium Sand- Driller notes Seam Sandy Brown Silt from 34' to 34.5'- Gray
	9	SS		100	
50.0	10	SS		100	
	11	SS		100	
60.0	12	SS		100	
	13	SS		9 - 18 - 22	Silty Clay w/Seams & Lenses Silt-Trace Fine Sand-Gray
70.0	14	SS		21 - 35 - 18	

CONTINUED ON SHEET 2

197

BORING LOG NO. S-150 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 43' S of ℄ of Sixth Ave. in pavement of Frost St., 6' E of W curb line

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
70.5					Sandy Silt-Trace to Some Clay-Trace Gravel-Gray
	15	SS		22 - 50 - 68	
80.0	16	SS		29 - 33 - 45	Silty Clay w/Layers & Seams Silt-Gray
	17	SS		49 - 100	Silt-Trace to Some Clay-Trace Fine Sand & Sand Layers-Gray
90.0					Clayey Silt-Trace Fine Sand & Gravel-Pockets & Layers Fine Sand-Gray
91.0	18	SS		20 - 43 - 57	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 10' of 4" casing used.

BORE HOLE PLUGGING METHOD: Bentonite slurry

GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL ____ WS or WD

WL ____ AB ____ HR AB

WL ____ 24 HR AB

WL Not taken

BORING STARTED 5-10-77

BORING COMPLETED 5-10-77

RIG: Mobile B-61 DRAWN BY: CC

FOREMAN: BT APPROVED: RH

JOB: 4458 SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC.

DETROIT • BAY CITY • GRAND RAPIDS

SW

198

BORING LOG NO. S-151 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 130' N of ℄ of 4th Avenue in pavement of Frost, 6' E of W curb line

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 766.6
					Driller Indicates Asphalt Surface
	1	SS		4 - 6 - 9	Clayey Silt-Trace Fine Sand & Small Gravel-Pockets of Sandy Silt-Brown w/Gray Spots
10.0	2	SS		7 - 8 - 10	
	3	SS		6 - 9 - 11	Silty Clay w/Silty Sand Pockets-Trace Fine Sand & Gravel-Brown
20.0	4	SS		2 - 4 - 5	Silty Clay-Trace Sand & Small Gravel-Gray- Driller indicates Small Cobble at 24' and Cobbles from 26.6' to 27'
	5	SS		5 - 9 - 19	
30.0	6	SS		23 - 33 - 28	
	7	SS		23 - 70 - 59	
40.0	8	SS		100	Clayey Silt-Trace to Some Fine Sand-Trace Gravel-Gray
	9	SS		100/2"	
50.0	10	SS		100/1"	
	11	SS		21 - 31 - 43	
60.0	12	SS		51 - 60/2"	
	13	SS		63 - 100/3"	Sandy Silt-Trace to Some Clay-Trace Small Gravel-Gray
67.0					CONTINUED ON SHEET 2

BORING LOG NO. S-151 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 130' N of ℄ of 4th Avenue in pavement of Frost, 6' E of W curb line

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

WATER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
67.0					
10.0	14	SS		57-60/3"	Silty Sand-Gray
	15	SS		51-58-65	
30.0					Fine to Medium Sand-Trace Silt-Gray
82.0	16	SS		51-56-58	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 10' of 4" Casing

BORE HOLE PLUGGING METHOD: Bentonite slurry to surface

GAS MEASUREMENT: None recorded

NOTE: The hole stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL _____ WS or WD

WL 20'3" AB 12 HR AB

WL _____ 24 HR AB

WL 9'4" BCR

BORING STARTED 5-11-77

BORING COMPLETED 5-11-77

RIG: B-1267 DRAWN BY: CC

FOREMAN: BT APPROVED: RH

JOB: 4458 SHEET: 2 of 2

SOIL MATERIALS ENGINEERS, INC

DETROIT • BAY CITY • GRAND RAPIDS

SW

BORING LOG NO. S-152 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 140' N of ℄ of Third Ave. in the pavement of Frost St., 6' E of W curb line

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

WATER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 774.4
	1	SS		7 - 10 - 15	Driller indicates 3" Asphalt Surface-Clayey Silt-Trace Fine Sand & Gravel-Pockets of Sandy Silt-Brown
10.0	2	SS		6 - 8 - 13	
	3	SS		4 - 4 - 5	
20.0	4	SS		3 - 4 - 5	Silty Clay-Trace Sand & Small Gravel-Driller indicates Small Silt Seams-Gray
	5	SS		2 - 3 - 4	
30.0	6	SS		4 - 6 - 11	
	7	SS		19 - 29 - 63	Clayey Silt-Trace Sand & Small Gravel
40.0	8	SS		8 - 13 - 18	
	9	SS		41 - 33 - 38	
50.0	10	SS		100/0"	Sandy Silt-Trace Clay & Gravel-Gray-Driller notes Boulder from 55.5' to 56.3'
	11	SS		100/0"	
60.0	12	SS		100/0"	
	13	SS		100/0"	
66.6					CONTINUED ON SHEET 2

BORING LOG NO. S-152 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 140' N of ℄ of Third Ave. in the pavement of Frost St., 6' E of W curb line

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
66.5					
70.0	14	SS		22 - 38 - 46	
	15	SS		20 - 51 - 60/2"	Clayey Silt-Trace Sand & Small Gravel-Silt Seams-Gray
90.0	16	SS		23 - 53 - 60	
	17	SS		37 - 63 - 60/3"	
95.0	18	SS		41 - 37 - 53	Silty Sand-Trace Medium Sand-Gray
	19	SS		30 - 35 - 44	
99.0	20	SS		35 - 45 - 50	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 10' of 4" casing used

BORE HOLE PLUGGING METHOD: Bentonite slurry to surface

GAS MEASUREMENT: 0% gas recorded to 99'

NOTE: The boundary classification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL _____ WS or WD

WL _____ AB _____ HR AB

WL _____ 24 HR AB

WL 12'2" BCR, 12'2" ACR

BORING STARTED 5-10-77

BORING COMPLETED 5-10-77

RIG: B-1267 DRAWN BY: CC

FOREMAN: BT APPROVED: RH

JOB: 4458 SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC.

DETROIT • BAY CITY • GRAND RAPIDS

SW

BORING LOG NO. S-153 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 56' N of ℄ of Third Ave. in pavement of Stevenson St., 6' E of W curb

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 760.1
	1	SS		3 - 5 - 7	Driller indicates Asphalt & Concrete Surface - Clayey Silt-Trace Fine Sand & Gravel-Brown
10.0	2	SS		4 - 7 - 7	
	3	SS		2 - 3 - 4	Clayey Silt-Trace Fine Sand-Gray
20.0	4	SS		20 - 38 - 22	Silty Clay-Trace Sand & Gravel Pockets & Layers - Gray
	5	SS		8 - 16 - 21	
30.0	6	SS		13 - 37 - 100	Sandy Silt-Trace to Some Clay-Trace Gravel & Fine Sand Layers-Brown
	7	SS		74 - 71 - 100	
40.0	8	SS		100/5"	
	9	SS		44 - 100	Fine to Medium Sand-Trace Silt-Reddish Brown
50.0	10	SS		42 - 58 - 100	
	11	SS		25 - 45 - 83	Silty Sand-Trace Medium Sand-Light Grayish Brown
60.0	12	SS		40 - 58 - 80	
62.0					CONTINUED ON SHEET 2

203

BORING LOG NO. S-153 (Sht. 2 of 2)

OWNER: CITY OF FLINT

ENGINEER: HUBBELL, ROTH & CLARK, INC.

SITE: 56' N of ℄ of Third Ave. in pavement of Stevenson St., 6' E of W curb

PROJECT NAME: WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

SURFACE ELEVATION:

Depth (ft)	Sample No.	Type Sample	Penetration N-Values (Blows per 6")	Description of Material
				CONTINUED FROM SHEET 1
62.0	13	SS	25 - 31 - 43	Fine Sand & Silt-Gray
70.0	14	SS	24 - 40 - 40	
	15	SS	20 - 24 - 32	Silty Sand-Gray
80.0	16	SS	26 - 31 - 32	
	17	SS	26 - 33 - 97	
90.0	18	SS	22 - 38 - 44	Sandy Silt-Trace Clay & Small Gravel-Gray
96.5	19	SS	45 - 100	END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 10' of 4" casing used.

BORE HOLE PLUGGING METHOD: Bentonite slurry to surface.

GAS MEASUREMENT: 0% after boring to 96.5'

MINERAL WELL PERMIT NO. 95-772-125

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

WATER LEVEL OBSERVATIONS			
WL 46'6" WS or WD	BORING STARTED	5-12-77	
WL ___ AB ___ HR AB	BORING COMPLETED	5-12-77	
WL ___ 24 HR AB	RIG B-1267	DRAWN BY: CC	
WL 11 BCR and 11' ACR	FOREMAN: BT	APPROVED: RH	
	JOB: 4458	SHEET: 2 of 2	

SOIL AND MATERIALS ENGINEERS, INC — DETROIT • BAY CITY • GRAND RAPIDS

SW

204

BORING LOG NO. S-154 (Sht. 1 of 2)

OWNER: CITY OF FLINT

ENGINEER: HUBBELL, ROTH & CLARK, INC.

SITE: 96' N of ℄ of Third Ave. in grass parkway of Patrick St., 6' E of E curb line of Patrick St.

PROJECT NAME: WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

SURFACE ELEVATION: 748.2

Depth (ft)	Sample No.	Type Sample	Penetration N-Values (Blows per 6")	Description of Material
	1	SS	2 - 2 - 2	Driller indicates Asphalt & Concrete Surface to 7"-Sandy Clay-Trace Silt & Small Gravel-Brown
10.0	2	SS	7 - 13 - 13	Sandy Silt-Trace Clay & Gravel-Brown; Silty Clay-Trace Small Gravel-Gray
	3	SS	7 - 9 - 13	Silty Clay w/Lenses Silt-Trace Fine Sand-Brown
20.0	4	SS	5 - 7 - 8	
	5	SS	30 - 59 - 87	Sandy Silt-Trace Clay & Gravel-Brown
30.0	6	SS	40 - 68 - 80	Fine to Medium Sand-Trace Silt-Brown
	7	SS	17 - 23 - 39	
40.0	8	SS	16 - 33 - 36	
	9	SS	18 - 19 - 24	Fine Sand-Trace Silt-Light Brown
50.0	10	SS	17 - 27 - 23	
52.5				CONTINUED ON SHEET 2

BORING LOG NO. S-154 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 96' N of ℄ of Third Ave. in grass parkway of Patrick St., 6' E of E curb line of Patrick St.

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

DEPTH METER FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
52.5	11	SS		23 - 35 - 38	Silty Sand-Brown to Gray
60.0	12	SS		20 - 30 - 35	
	13	SS		11 - 22 - 37	Fine Sand-Trace Silt-Gray
70.5	14	SS		24 - 37 - 37	
73.0	15	SS		21 - 35 - 43	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 10' of 4" casing used

BORE HOLE PLUGGING METHOD: Bentonite slurry to surface

GAS MEASUREMENT: 0% after boring to 73'

NOTE: The hydrostratigraphic lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL ___ WS or WD
WL 10.5' AB 1½ HR AB
WL ___ 24 HR AB
WL 10.5' BCR, 10.5' ACR

BORING STARTED 5-12-77
BORING COMPLETED 5-13-77
RIG: B-1267 DRAWN BY: CC
FOREMAN: BT APPROVED: RH
JOB: 4458 SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

SW

BORING LOG NO. S-155 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 94' N of ℄ of Third Ave. in grass parkway of Patrick St., 6' E of E curb line of Patrick St.

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

DEPTH METER FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 750.0
	1	SS		4 - 5 - 7	Sandy Silt Backfill indicated by Driller- Trace Clay-Brown
10.0	2	SS		6 - 7 - 10	
	3	SS		6 - 8 - 9	Fine to Medium Sand-Brown
20.0	4	SS		7 - 9 - 11	
	5	SS		9 - 14 - 21	
30.0	6	SS		17 - 39 - 56	Fine to Coarse Sand & Gravel-Trace Clay-Driller notes Large Stone ± 6" diameter- Brown
	7	SS		77/3"	
40.0	8	SS		19 - 24 - 37	
	9	SS		11 - 19 - 30	
50.0	10	SS		11 - 17 - 28	Fine Sand-Trace Coarser Sand-Brown
	11	SS		11 - 19 - 39	
60.0	12	SS		14 - 23 - 38	
61.5					CONTINUED ON SHEET 2

BORING LOG NO. S-155 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 94' N of ± of Third Ave. in grass parkway of Patrick St., 6' E of E curb line of Patrick St.

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
63.5	13	SS		19 - 21 - 27	~~Fine Sand-Trace Coarser Sand-Brown~~
70.0	14	SS		13 - 29 - 31	Sandy Clay-w/Small Pockets & Occasional ± 1' Layers of Fine Sand-Trace Silt & Gravel-Gray
75.0	15	SS		19 - 28 - 40	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 50' of Hollow Stem Auger used

BORE HOLE PLUGGING METHOD: Natural material to surface

GAS MEASUREMENT: 5% gas measured at 50' and 0 up through 75'

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 47.5' WS or WD

WL ____ AB ____ HR AB

WL ____ 24 HR AB

WL 46.3' 25 min. AB

BORING STARTED 5-11-77

BORING COMPLETED 5-11-77

RIG: CME DRAWN BY: RO

FOREMAN: ES APPROVED: JM

JOB: 4458 SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC.

DETROIT • BAY CITY • GRAND RAPIDS

SW

BORING LOG NO. S-156 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE Off Third Ave. in rear of parking lot for "King Arthurs", 38' S & 20' E of the SE building corner

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 747.1
	1	SS		3 - 4 - 5	2" Asphalt Surface Silty Sand Fill-Brown
10.0	2	SS		5 - 5 - 6	
	3	SS		6 - 7 - 6	Fine Sand-Brown
20.0	4	SS		6 - 11 - 21	
	5	SS		6 - 9 - 11	
30.0	6	SS		6 - 8 - 11	Fine Sand-Trace to Some Coarser Sand & Gravel-Brown
	7	SS		7 - 11 - 17	
40.0	8	SS		8 - 11 - 19	
	9	SS		8 - 11 - 13	
50.0	10	SS		7 - 12 - 16	
52.5					CONTINUED ON SHEET 2

Bad

214

BORING LOG NO. S-156 (Sht. 2 of 2)

OWNER: CITY OF FLINT
ENGINEER: HUBBELL, ROTH & CLARK, INC.
SITE: Off Third Ave. in rear of parking lot for "King Arthurs", 38' S & 20' E of the SE building corner
PROJECT NAME: WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
52.5					
	11	SS		9 - 12 - 17	
60.0	12	SS		11 - 16 - 19	Fine to Medium Sand-Trace Gravel w/Occ. Seams & Pockets Silty Clay-Trace Sandstone-Gray
	13	SS		14 - 17 - 21	
70.0	14	SS		17 - 30 - 54	
	15	SS		19 - 29 - 49	
80.0	16	SS		49 - 79 - 60/5"	Medium Sand w/Pockets & Layers Clay-Trace Gravel & Silt-Gray
84.1	17	SS		66 - 65/5"	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.
CASING USED: None ?
BORE HOLE PLUGGING METHOD: Natural materials to surface.
GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS
WL 52' WS or WD
WL 60' AB ___ HR AB
WL ___ 24 HR AB
WL ___ ___

BORING STARTED: 6-17-77
BORING COMPLETED: 6-17-77
RIG: CME DRAWN BY: RO
FOREMAN: ES APPROVED: RH
JOB: 4458 SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC

215

BORING LOG NO. S-157 Sht. 1 of 2)

OWNER: CITY OF FLINT
ENGINEER: HUBBELL, ROTH & CLARK, INC.
SITE: 43' S of ℄ of Third Avenue in pavement of Stone St., 3' W of E curb line
PROJECT NAME: WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION 747.9
					Driller notes Surface of Asphalt & Broken Concrete
	1	SS		2 - 2 - 2	Silty Sand-Trace Clay & Gravel-Brown
10.0	2	SS		3 - 3 - 3	Silty Clay-Trace Fine Sand & Sand Seam-Trace Gravel-Brown & Gray
	3	SS		5 - 5 - 5	Sandy Clay w/Fine Sand Pockets - Trace Silt & Gravel-Brown
20.0	4	SS		15 - 29 - 38	Clayey Silt-Some Fine Sand & Sand Seams-Trace Gravel-Brown
	5	SS		35 - 41 - 58	
30.0	6	SS		31 - 46 - 63	Silt-Trace Fine Sand & Sand Seams-Trace Clay-Brown
	7	SS		22 - 36 - 42	
40.0	8	SS		21 - 32 - 38	Fine Sand-Trace Silt & Coarser Sand- Driller notes Small Seams Coarse Sand-Brown & Gray
	9	SS		29 - 39 - 48	
50.0	10	SS		18 - 29 - 33	
51.0					CONTINUED ON SHEET 2

211

BORING LOG NO. S-157 (Shs. 2 of 2)

OWNER: CITY OF FLINT

ENGINEER: HUBBELL, ROTH & CLARK, INC.

SITE: 43' S of ℄ of Third Avenue in pavement of Stone St., 3' W of E curb line

PROJECT NAME: WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

SURFACE ELEVATION:

Depth (ft)	Sample No.	Type Sample	Penetration N-Values (Blows per 6")	Description of Material
				CONTINUED FROM SHEET 1
51.0	11	SS	30 - 31 - 32	Fine to Coarse Sand & Small Gravel-Trace Silt-Brown & Gray
60.0	12	SS	21 - 39 - 40	Fine to Medium Sand-Trace Silt & Small Gravel-Gray
				Driller Indicates Cobbles & Fragments of Cemented Sand
	13	SS	35 - 24 - 40	Fine to Medium Sand-Trace Silt & Small Gravel-Gray
70.0	14	SS	30 - 60 - 60/3"	
72.5	15	SS	44 - 100/6"	END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 10' of 4" casing used.

BORE HOLE PLUGGING METHOD: Natural materials to surface

GAS MEASUREMENT: 0% after boring completed.

MINERAL WELL PERMIT NO. 95-772-125

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

WATER LEVEL OBSERVATIONS

WL 32' WS or WD

WL ___ AB ___ HR AB

WL ___ 24 HR AB

WL 9'10" BCR

BORING STARTED 5-13-77

BORING COMPLETED 5-13-77

RIG: B-1267 | DRAWN BY: JM

FOREMAN: BT | APPROVED: RH

JOB: 4458 | SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

SW

212

BORING LOG NO. S-158 (Sht. 1 of 2)

OWNER: CITY OF FLINT

ENGINEER: HUBBELL, ROTH & CLARK, INC.

SITE: In pavement of Third Ave. 3' S of N curb & 40' E of ℄ of Sanford Place

PROJECT NAME: WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

SURFACE ELEVATION: 745.1

Depth (ft)	Sample No.	Type Sample	Penetration N-Values (Blows per 6")	Description of Material
				Asphalt & Concrete-noted by Drillers
				Sandy Silt-Trace Clay-Brown
	1	SS	4-5-4	Silty Clay-Trace Fine Sand & Sand Pockets-Trace Gravel-Brown
10.0	2	SS	3-1-2	
	3	SS	20-24-38	Silty Sand-Trace Gravel Seams-Brown
20.0	4	SS	34-37-67	
	5	SS	17-26-52	
30.0	6	SS	33-36-59	
	7	SS	41-47-63	Fine to Coarse Sand & Gravel-Trace Silt-Brown
40.0	8	SS	34-37-51	
	9	SS	33-52-51	
50.0	10	SS	32-34-37	Fine to Coarse Sand-Trace Silt & Gravel-Driller indicates Many Cobbles at 57.5' - Gray
	11	SS	42-38-37	
60.0	12	SS	30-33-32	
62.0				

CONTINUED ON SHEET 2

213

BORING LOG NO. S-158 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE In pavement of Third Ave. 3' S of N curb & 40' E of ℄ of Sanford Place

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
12.0					
	13	SS		31-27-37	Silty Sand-Trace Coarser Sands & Gravel-Gray
20.0	14	SS		27-30-50	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 25' of Hollow Stem Auger

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: 10.0% gas measured after boring to 70'

NOTE: The indicated stratification lines are approximate. In-situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS	BORING STARTED	5-15-77
WL 38' WS or WD	BORING COMPLETED	5-15-77
WL ____ AB ____ HR AB	RIG: CME 75	DRAWN BY: GK
WL ____ 24 HR AB	FOREMAN: DP	APPROVED: RH
WL 15' BCR	JOB: 4458	SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC.

SW

214

BORING LOG NO. S-159 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 90' E of ℄ of Lyon Pl. in pavement of Third Ave., 4' S of N curb line

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 737.5
					Asphalt & Crushed Rock Surface Indicated by Driller
	1	SS	12	14-18-11	
10.0	2	SS	12	22-28-33	Silty Sand-Trace Gravel & Clay-Brown
	3	SS	12	20-22-27	
20.0	4	SS	12	23-33-40	
	5	SS	12	17-28-39	Fine Sand-Trace to Some Silt-Pockets Medium Sand-Trace Gravel & Black Coal at 30' - Brown
30.0	6	SS	12	21-31-37	
	7	SS	12	25-33-36	
40.0	8	SS	12	56-61-63	
	9	SS	12	51-60-57	Fine to Coarse Sand-Some Gravel-Trace Silt & Sand Pockets- Driller indicates Cobbles between 44' & 48' and between 52' & 61.5'- Gray & Browns
50.0	10	SS	12	23-36-41	
	11	SS	12	27-37-39	
60.0	12	SS	12	54-61-72	
					CONTINUED ON SHEET 2

215

BORING LOG NO. S-159 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 90' E of ℄ of Lyon Pl. in pavement of Third Ave., 4' S of N curb line

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
60.0					
63.0	13	SS	22	92-81-71	Driller indicates Fine Sand-Gray
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 25' of Hollow Stem Augers used

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 30' WS or WD
WL: ____ AB ____ HR AB
WL ____ 24 HR AB
WL 2' BCR ____

BORING STARTED 5-14-77
BORING COMPLETED 5-14-77
RIG: CME 75 DRAWN BY: GK
FOREMAN: DP APPROVED: RH
JOB: 4458 SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC

SW

BORING LOG NO. S-160 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE In SE grass corner of Chippewa St. & Third Ave., 15' S of corner & 9' E of Chippewa St.

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
50.0					
	11	SS		11-19-31	Fine to Medium Sand-Trace Silt- Gray
59.0	12	SS		17-21-33	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: None

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: 0% recorded to 60'

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 24' WS or WD
WL: 20' AB ____ HR AB
WL: ____ 24 HR AB
WL: 21'6" 25 min. AB

BORING STARTED 4-20-77
BORING COMPLETED 4-21-77
RIG: CME DRAWN BY: GK
FOREMAN: ES APPROVED: RH
JOB: 4458 SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC

217

BORING LOG NO. S-160 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE In SE grass corner of Chippewa St. & Third Ave., 15' S of corner & 9' E of Chippewa St.

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

DEPTH METER FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 731.2
	1	SS	18	6-7-11	Fine Sand w/Sandy Clay Pockets-Trace Clay-Brown
10.0	2	SS	24	9-11-31	
	3	SS	24	19-25-37	Silt-Trace to Some Fine Sand-Brown
20.0	4	SS	24	20-31-48	
	5	SS	24	17-24-39	Medium Sand-Brown
30.0	6	SS	24	11-30-49	
	7	SS	24	19-39-50	Fine to Medium Sand-Trace Silt-Small Pockets Clay Found at 45'- Gray
40.0	8	SS	24	17-27-36	
	9	SS	24	11-20-37	
50.0	10	SS	24	17-23-36	CONTINUED ON SHEET 2

218

BORING LOG NO. S-161

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 70' W of ℄ of Saginaw St., 125' S of of 4th Ave. (In parking lot of Flint Tent Co.)

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

DEPTH METER FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 730.3
	1	SS	18	4-5-16	Silty Sand-Brown w/Occ. Black Spots
	2	SS	18	5-6-9	
10.0	3	SS	24	11-19-31	Silty Clay w/Frequent Seams, Lenses Silt-Gray
	4	SS	24	19-31-60	Silty Sand w/Occ. Clayey Sand Seams-Brown
20.0	5	SS	2	50/4"	
	6	SS	24	21-45-25/2"	Silty Sand-Trace to Some Clay-Trace Gravel-Gray
30.0	7	SS	2	75/3"	
	8	SS	24	19-25-37	Fine to Medium Sand-Trace to Some Silt-Trace Clay-Grayish Brown to Brown
40.0	9	SS	24	17-26-41	
	10	SS	24	11-25-32	
50.0	11	SS	24	15-29-46	
53.6	12	SS	6	19-41-20/1"	END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: None

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: 0.0% at 10' and 30'

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 6'/30' WS or WD
WL: 28.75' AB ½ HR AB
WL: ____ 24 HR AB
WCI WL: 25' AB ____

BORING STARTED 4-20-77
BORING COMPLETED 4-20-77

RIG: CME DRAWN BY: RO
FOREMAN: ES APPROVED: GK
JOB: 4458 SHEET: 1 of 1

SOIL & MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

BORING LOG NO. S-162

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 43' S of ℄ of 4th Ave., 78' E of North St. (In parking lot of McDonald Dairy)

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 730.3
					Asphalt noted
					Silty Sand FILL w/Pcs. Wood & Brick-Trace to Some Gravel-Dark Brown
	1	PA		Auger Sample	
	2	SS		11 - 19 - 30	
10.0	3	SS		17 - 29 - 30/2"	
	4	SS		75/3"	
20.0	5	SS		11 - 57 - 14	
	6	SS		50/11"	Fine to Coarse Sand-Some Gravel-Trace Silt-Dark Brown-Frequent Large Stones noted w/Difficult sampling
30.0	7	SS		11 - 29 - 30	
	8	SS		50/4"	
40.0	9	PA		Auger Sample	
	10	PA		Auger Sample	
	11	SS		17 - 55	
55.0	12	SS		50/2"	Clayey Sand-Some Gravel-Trace Silt-Dark Brown-Large Stone noted at 54' by Driller
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: None (*Dry cave-in including boulder at 50')

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: 0.0% at 30' to 54'

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 40' WS or WD
WL 40' AB 10 min. AB
WL ____ 24 HR AB
* WL 50' DCI ____

BORING STARTED 4-19-77
BORING COMPLETED 4-20-77

RIG: CME DRAWN BY: RO
FOREMAN: ES APPROVED: GK
JOB: 4458 SHEET: 1 of

SOIL & MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

SW

BORING LOG NO. S-163

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 110' N of ℄ of Industrial Road, 35' N of ℄ of 4th Avenue

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 716.9
					Driller notes Mixed Clay FILL
	1	SS		4 - 15 - 7	Silty Clay-Trace Fine Sand w/Seams, Pockets Sand-Brown
10.0	2	SS		29 - 46	
	3	SS		12 - 15 - 25	
20.0	4	SS		19 - 29 - 41	Fine to Coarse Sand & Gravel w/Occ. Large Stones (over 4" diameter) noted by Driller- Trace Silt-Brown
	5	SS		11 - 17 - 30	
30.0	6	SS		13 - 21 - 41	
	7	SS		9 - 16 - 30	
40.0	8	SS		11 - 20 - 41	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 40' of Hollow Stems

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: 0.0% at 15' to 40'

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 12.5' WS or WD
WL 12' AB ____ HR AB
WL 14' 5 min. AB
WL 12.4' ½ hr. AB

BORING STARTED 4-19-77
BORING COMPLETED 4-19-77

RIG: CME DRAWN BY: RO
FOREMAN: ES APPROVED: GK
JOB: 4458 SHEET: 1 of 1

SOIL & MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

BORING LOG NO. S-164

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 542' S of ℄ of Robert T. Longway 47' E of E curb line James P. Cole

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

SURFACE ELEVATION: 717.6

METER FT DEPTH	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
	1	SS	2	11 - 4 - 19	Mixed Sand, Clayey Sand & Gravel Fill w/Roots & Pcs. Wood, Brick & Concrete- Trace Silt-Organic Odor- Clay Fill also noted- Brown to Dark Brown
10.0	2	SS	2	17 - 29	
				W.L.= 15'	
	3	SS	2	6 - 7 - 19	Fine to Coarse Sand-Some Gravel-Trace Silt-Brown
20.0	4	SS	2	11 - 17 - 6	
	5	SS	2	6 - 6 - 11	Fine Silty Sand w/Occ. Layers Clayey Silt-Gray
30.0	6	SS	2	10 - 7 - 16	
	7	SS	2	6 - 8 - 13	
40.0	8	SS	2	9 - 11 - 17	Medium to Coarse Sand-Some Gravel - Trace Silt w/Occ. Small Pockets or Layers Clayey Silt-Gray
	9	SS	2	9 - 11 - 19	
50.0	10	SS	2	10 - 13 - 20	
					END OF BORING

NOTE: Wellpoint Piezometer set at 43' in clean sand fill. Borehole then plugged with Bentonite.

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 50' of Hollow Stem Auger used.

BORE HOLE PLUGGING METHOD: See Note above

GAS MEASUREMENT: 0.0% from 15' to 50'

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 11.5' WS or WD
WL 28.5' AB — HR AB
WL 16.2' 4 hr. AB
WL 12' 18 hrs. AB

BORING STARTED 5-12-77
BORING COMPLETED 5-12-77

RIG: CME DRAWN BY: RO
FOREMAN: ES APPROVED: GK
JOB: 4458 SHEET: 1 of 1

SOIL MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

SW

BORING LOG NO. S-165

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE 242' S of ℄ of Robert T. Longway, 25' E of E curb line James P. Cole

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

SURFACE ELEVATION: 716.8

METER FT DEPTH	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
	1	SS	2	11 - 19 - 39	Mixed Sand, Clay & Gravel Fill w/Pcs. Wood, Brick, Coal, etc. - Mixed Brown & Gray
10.0	2	SS	2	11 - 7 - 13	
	3	SS	2	9 - 8 - 12	
20.0	4	SS	2	1 - 2 - 4	Silty Clay w/Seams, Lenses & Small Layers Silt- Gray
	5	SS	2	11 - 25 - 37	Fine to Coarse Sand-Trace to Some Gravel-Trace Silt-Grayish Brown to Brownish Gray
30.0	6	SS	2	11 - 16 - 31	
	7	SS	2	16 - 25 - 39	
40.0	8	SS	2	14 - 27 - 38	Fine to Medium Sand-Trace to Some Silt-Gray
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: None

BORE HOLE PLUGGING METHOD: Natural materials to surface

GAS MEASUREMENT: 0.0% from 15' to 40'

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 8' WS or WD
WL 8' AB — HR AB
WL: 24 HR AB
WL 7.75' 15 min. AB

BORING STARTED 4-21-77
BORING COMPLETED 4-21-77

RIG: CME DRAWN BY: RO
FOREMAN: ES APPROVED: GK
JOB: 4458 SHEET: 1 of 1

SOIL MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

223

BORING LOG NO. S-166

OWNER CITY OF FLINT	ENGINEER HUBBELL, ROTH & CLARK, INC.
SITE NE corner Robt. T. Longway & James P. Cole, 27' N of far N curb of Robt. T. Longway	PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

37' E of E curb of James P. Cole

WATER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 718.5
	1	SS		9 - 7 - 6	Mixed Sand & Clay Fill w/Pcs. Brick & Concrete-Cinders noted- Trace Silt & Gravel-Brown
10.0	2	SS		2 - 3 - 3	Silty Sand-Trace Gravel-Dark Brown (Driller notes Wet at 9.0')
	3	SS		1 - 1 - 1	Silty Sand w/Occ. Layers Silty Clay-Gray
20.0	4	SS		1 - 2 - 2	
	5	SS		9 - 11 - 11	Fine Sand-Trace Silt, Clay & Gravel-Gray
30.0	6	SS		82 - 60 - 53	Medium to Coarse Sand-Some Gravel-Trace Silt-Brown to Brownish Gray
	7	SS		18 - 25 - 28	
38.0	8	SS		27 - 38 - 42	Fine Silty Sand-Trace Clay & Gravel-Gray
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: Hollow augers used to 38.5'

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS		
WL ____ WS or WD	BORING STARTED	4-29-77
WL ____ AB ____ HR AB	BORING COMPLETED	4-29-77
WL ____ 24 HR AB	RIG: GLD 35	DRAWN BY: RO
WL 7'2" ACR, 20'5" BCR	FOREMAN: BC	APPROVED: GK
	JOB: 4458	SHEET: 1 of 1

SOIL & MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

SW

224

BORING LOG NO. S-167

OWNER CITY OF FLINT	ENGINEER HUBBELL, ROTH & CLARK, INC.
SITE Avon Street Pump Station Site	PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

WATER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 719.6
					Black Sandy Topsoil noted
	1	SS		2 - 2 - 2	Driller indicates Silty Sand-Trace Gravel- Dark Brown
10.0	2	SS		2 - 1 - 2	Fine to Medium Sand-Tr. Silt w/Pcs. Brown Silty Clay-Trace Miscellaneous Fill noted- Reddish Brown to Brown (Possible Fill)
	3	SS		1 - 2 - 2	Driller notes Brown Silty Sand
					Silty Sand-Trace Gravel-Grayish Brown
20.0	4	SS		5 - 8 - 11	Silty Sand-Trace Clay-Mixed Brown & Dark Brown
	5	SS		8 - 9 - 12	Fine to Medium Sand-Trace Silt & Clay-Brown
30.0	6	SS		11 - 15 - 19	Fine to Medium Sand-Trace Silt, Clay & Gravel below 30' - Brown
	7	SS		13 - 21 - 26	
40.0	8	SS		15 - 23 - 30	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: Hollow auger used to 38.5'

BORE HOLE PLUGGING METHOD: Natural materials to surface

GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS		
WL ____ WS or WD	BORING STARTED	4-28-77
WL ____ AB ____ HR AB	BORING COMPLETED	4-28-77
WL ____ 24 HR AB	RIG: GLD 35	DRAWN BY: RO
WL 18'3" BCR	FOREMAN: BC	APPROVED: GK
	JOB: 4458	SHEET: 1 of 1

SOIL & MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

W

225

BORING LOG NO. S-168

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE Avon Street Pump Station Site

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 717.0
	1	SS		1 - 2 - 3	Mixed Clayey Silt & Silty Clay Fill w/Sand & Gravel-Brick, Wood, Glass, Broken Concrete & Cinders noted- Brown Clay Layer noted between 4.5' & 5.5'- Brown to Dark Brown
10.0	2	SS		1 - 1 - 2	
	3	SS		1 - 0 - 1	Silty Sand-Trace Clay w/Shells-Gray (Driller indicates Marl)
20.0	4	SS		2 - 1 - 1	Silty Sand w/Seams Clayey Silt-Dark Gray
	5	SS		8 - 10 - 11	Fine to Coarse Sand-Trace to Some Gravel-Trace Silt-Brownish Gray
30.0	6	SS		10 - 11 - 11	
	7	SS		12 - 12 - 14	Medium to Coarse Sand & Gravel-Trace Silt-Brown-Gray
40.0	8	SS		21 - 23 - 14	Fine to Coarse Sand-Trace to Some Silt & Gravel-Trace Clay-Gray
	9	SS		46 - 60/2"	
50.0	10	SS		60/2"	Driller notes Hardpan
53.7	11	SS		60/2"	END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: Boring cased to 44'

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL: 7' WS or WD

WL ____ AB ____ HR AB

WL ____ 24 HR AB

WL 18.25' BCR, 7.5' ACR

BORING STARTED 4-25-77

BORING COMPLETED 4-27-77

RIG: GLD 35 DRAWN BY: RO

FOREMAN: BC APPROVED: GK

JOB: 4458 SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC.

DETROIT • BAY CITY • GRAND RAPIDS

226

BORING LOG NO. S-169

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE Avon Street Pump Station Site

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 718.2
	1	SS		3 - 5 - 4	Black Sandy Topsoil noted
					Mixed Silty Sand & Clay Fill w/Pcs. Cinder & Concrete-Trace Gravel-Wood also noted-Brown
10.0	2	SS		1 - 0 - 0	Silty Sand w/Clayey Sand Pockets w/Small Pcs. Shells-Trace Gravel-Brown
	3	SS		1 - 1 - 1	Fine Silty Sand w/Seams Decayed Wood-Trace Clay-Brownish Gray
20.0	4	SS		2 - 1 - 1	Silty Clay w/Seams Sandy Silt-Trace Fine Sand-Gray
	5	SS		4 - 3 - 3	Fine to Coarse Sand & Gravel w/Mixed Seams & Pockets Clayey Silt w/Decayed Vegetation, Roots & Pcs. Shells below 25'- Brownish Gray
30.0	6	SS		13 - 19 - 23	
	7	SS		19 - 22 - 26	Coarse to Fine Sand-Gravel noted-Trace Silt-Grayish Brown
40.0	8	SS		20 - 27 - 31	
	9	SS		36 - 115 - 60/2"	Fine to Medium Sand-Trace to Some Silt-Trace Gravel-Trace Clay below 40'- Brownish Gray
50.0	10	SS		95 - 60/2"	
55.2	11	SS		60/2"	END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: Hollow auger used to 55'

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: None taken.

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL: ____ WS or WD

WL: ____ AB ____ HR AB

WL: ____ 24 HR AB

WL: None Taken

BORING STARTED 4-27-77

BORING COMPLETED 4-27-77

RIG: GLD 35 DRAWN BY: RO

FOREMAN: BC APPROVED: GK

JOB: 4458 SHEET: 1 of 1

SOIL AND MATERIALS ENGINEERS, INC.

DETROIT • BAY CITY • GRAND RAPIDS

SW

227

BORING LOG NO. S-170

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE Avon Street Pump Station Site

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 717.2
	1	SS		15 - 11 - 9	Topsoil noted Mixed Silty Sand Fill w/Pcs. Broken Concrete, Brick, Roots, Cinder & Misc. Fill- Trace Gravel & Pcs. Silty Clay-Brown
	2	SS		8 - 9 - 10	
	3	SS		3 - 3 - 7	Fine to Coarse Sand-Trace to Some Silt-Trace Gravel- Trace Organic material noted- Black
10.0	4	SS		1 - 1 - 3	
	5	ST			Silty Sand-Trace Clay & Gravel-Gray
20.0	6	SS		3 - 2 - 3	
	7	SS		5 - 6 - 5	Silty Sand-Trace to Some Clay-Trace Gravel- Silty Clay Seam noted- Gray- Boulder noted @ 27.2'
30.0	8	SS		10 - 17 - 16	
	9	SS		19 - 19 - 16	Fine to Coarse Sand & Gravel-Trace Silt w/Occ. Seams, Pockets Clayey Sand & Silt- Layer Silty Clay w/Sand Pockets @ 40'- Gray
40.0	10	SS		30 - 30 - 32	
	11	SS		35 - 100/5"	Driller notes Silty Fine Sand-Gray
49.2	12	SS		82 - 100/3"	END OF BORING

NOTE: Wellpoint Piezometer set at 30' in clean sand fill - bore hole then plugged with bentonite.

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: 10' of 4" casing used while drilling, then boring redrilled for piezometer using 35' of 4" casing

BORE HOLE PLUGGING METHOD: See NOTE above

GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS	BORING STARTED	5-11-77
WL 17'1" AB	BORING COMPLETED	5-11-77
WL 12'3" 1/4 hr. AB	RIG: R-Mobile	DRAWN BY: RO
WL 11'4" 1/2 hr. AB	FOREMAN: NE	APPROVED: GK
WL 10'4" 3/4 & 1 hr. AB	JOB: 4458	SHEET: 1 of 1
WL		

SOIL AND MATERIALS ENGINEERS, INC.

SW

228

BORING LOG NO. S-170-A

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE Middle of River - 75' E of W Bank, 100' S of Bridge

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 709.3
					River Bottom Elevation = 695.8
13.9		*		40/4"	Fine to Coarse Sand & Gravel-Gray
14.0	1	*	5.5	60	
		*		45	Fine to Coarse Sand-Trace Silt & Gravel-Trace Wood Chips-Gray
15.0		*		25	
		*		25	
16.0		*		40	Sandy Clay-Gray
16.8		*		60	END OF BORING

* One sample obtained as a result of using Dynamic Cone Penetrometer.

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: None

BORE HOLE PLUGGING METHOD: Natural materials

GAS MEASUREMENT: -

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS	BORING STARTED	6-10-77
WL ____ WS or WD	BORING COMPLETED	6-10-77
WL ____ AB ____ HR AB	RIG:	DRAWN BY: JM
WL ____ 24 HR AB	FOREMAN: ML	APPROVED: RH
WL: Indicated above	JOB: 4458	SHEET: 1 of 1

SOIL AND MATERIALS ENGINEERS, INC.

229

BORING LOG NO. S-171

OWNER	ENGINEER
CITY OF FLINT	HUBBELL, ROTH & CLARK, INC.
SITE 125' E of Hydrant at NE corner of Robert T. Longway & Avon St., 11' N of N curb of Avon St.	PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

SURFACE ELEVATION: 719.7

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					Driller notes Brown Sand w/Cinders & Misc. Fill
	1	SS	2"	2-2-1	Silty Sand-Trace Clay & Gravel-Brown
10.0	2	SS	6"	7-6-4	Silty Sand-Trace Clay & Gravel-Dark Gray (Cinders noted)
	3	SS	6"	5-8-13	Silty Sand-Trace Gravel-Gray
					Driller indicates Medium Sand & Gravel-Gray
20.0	4	SS	6"	52-19-16	
	5	SS	6"	9-12-14	Fine to Medium Sand & Gravel-Trace Silt-Brown (Coarse Gravel or Possible Boulders noted from 18.5' to 20.2')
30.0	6	SS	6"	6-8-11	
					Clayey Sand-Trace to Some Silt & Gravel-Gray
	7	SS	6"	16-19-26	
40.0 41.0	8	SS	12"	21-36-40	Silty Sand-Trace to Some Clay-Trace Gravel-Gray
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: Hollow Auger used to 39.5'

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS	BORING STARTED	4-28-77
WL ____ WS or WD	BORING COMPLETED	4-28-77
WL: ____ AB ____ HR AB	RIG: GLD 35	DRAWN BY: RO
WL: ____ 24 HR AB	FOREMAN: BC	APPROVED: GK
WL: 26'4" BCR, 10'3" ACR	JOB: 4458	SHEET: 1 of 1

SOIL & MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

239

BORING LOG NO. S-172

OWNER	ENGINEER
CITY OF FLINT	HUBBELL, ROTH & CLARK, INC.
SITE 15' N of N curb of Avon Street, 92' E of SE corner of 209 Avon Street	PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

SURFACE ELEVATION: 730.2

METER DEPTH FT	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					Black Sandy Topsoil noted
	1	SS	6"	1-2-2	Fine to Medium Sand-Trace Silt & Gravel- w/Occ. Lumps Sandy Silt below 5'- w/Occ. Roots- Orange Brown to Brown w/Small Black Pockets
10.0	2	SS	6"	4-7-10	
	3	SS	6"	7-11-13	
20.0	4	SS	6"	8-10-11	Fine to Medium Sand-Trace Silt-Light Brown changing to Brown below 20'
	5	SS	6"	7-8-10	
30.0	6	SS	6"	10-13-18	
	7	SS	6"	23-47-58	Fine to Medium Sand-Trace Clay, Silt & Gravel-Gray
40.0	8	SS	6"	45-62-80	
	9	SS	6"	39-51-74	Fine to Coarse Sand-Some Gravel-Trace Silt-Brownish Gray
49.0	10	SS	6"	48-70-81	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: Hollow auger used to 47.5'

BORE HOLE PLUGGING METHOD: Natural materials to surface.

GAS MEASUREMENT: None taken

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS	BORING STARTED	4-28-77
WL: ____ WS or WD	BORING COMPLETED	4-28-77
WL: ____ AB ____ HR AB	RIG: GLD 35	DRAWN BY: RO
WL: ____ 24 HR AB	FOREMAN: BC	APPROVED: GK
WL 29'7" BCR, 12'6" ACR	JOB: 4458	SHEET: 1 of 1

SOIL & MATERIALS ENGINEERS, INC.
DETROIT • BAY CITY • GRAND RAPIDS

BORING LOG NO. S-173 (Sht. 1 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE On E Property Line (extended) of 323 Avon St., 7' S of N curb of Avon St.

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

DEPTH IN FT.	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION: 739.3
					Asphalt noted.
	1	SS	24		Mixed Sand & Clay Fill indicated by Driller
10.0	2	SS	8		Driller notes Brown Sand
	3	SS	21	40-66-81	
	4	SS	24	59-77-60/3"	
20.0					
	5	SS	24	41-69-108	Silty Sand-Trace Clay becoming Trace to Some Clay below 20' - Trace Gravel-Gray
30.0	6	SS	24	65-83-60/3"	
	7	SS	24	41-62-80	
40.0	8	SS	24	27-37-50	Clayey Sand-Trace to Some Silt-Trace Gravel-Gray
					Silty Clay-Some Sand-Trace Gravel-Gray
	9	SS	22	30-51-72	Coarse to Fine Sand-Trace Silt-Brownish Gray
50.0	10	SS	24	39-50-68	
51.0					CONTINUED ON SHEET 2

BORING LOG NO. S-173 (Sht. 2 of 2)

OWNER CITY OF FLINT

ENGINEER HUBBELL, ROTH & CLARK, INC.

SITE On E Property Line (extended) of 323 Avon St., 7' S of N curb of Avon St.

PROJECT NAME WASTE WATER SYSTEM IMPROVEMENTS POLLUTION CONTROL PROJECT

METER IN FT. DEPTH	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	PENETRATION N-VALUES (BLOWS PER 6")	DESCRIPTION OF MATERIAL
					SURFACE ELEVATION:
					CONTINUED FROM SHEET 1
51.0					
	11	SS	24	47-68-77	Silty Sand-Trace Clay & Gravel-Gray
					Fine to Medium Sand-Trace Silt & Gravel-Brownish Gray
60.0	12	SS	24	40-70-81	
					END OF BORING

REMARKS: ABOVE DESCRIPTIONS ARE LAB CLASSIFICATIONS AND MAY NOT CORRESPOND TO FIELD LOG.

CASING USED: None

BORE HOLE PLUGGING METHOD: Natural materials to surface

GAS MEASUREMENT: 0.0%

NOTE: The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.

MINERAL WELL PERMIT NO. 95-772-125

WATER LEVEL OBSERVATIONS

WL 6' & 45' WS or WD
WL: Hole bailed to 41' AB
WL: 39'3" 1/4 hr. AB
WL: 36'10" 1/2 hr. AB

BORING STARTED	5-13-77
BORING COMPLETED	5-16-77
RIG: CME	DRAWN BY: RO
FOREMAN: ES	APPROVED: GK
JOB: 4458	SHEET: 2 of 2

SOIL AND MATERIALS ENGINEERS, INC.