Appendix E:
Environmental Baseline Survey

ENVIRONMENTAL BASELINE STUDY (EBS) DISPOSAL OF GREEN RIVER LOCK AND DAM NOS. 3, 4, 5, AND 6, AND BARREN RIVER LOCK AND DAM NO. 1, KENTUCKY

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers, Louisville District, is considering the disposal of federal interest in Green River Locks and Dams nos. 3, 4, 5, and 6, and Barren River Lock and Dam No. 1 due to the lack of any continued authorized project purpose.

In February 2000, G.E.C., Inc. was contracted to conduct an Environmental Baseline Study (EBS) in order to facilitate the possible disposals. In accordance with applicable requirements of Army Regulation 200-1, *Environmental Protection and Enhancement*, and American Society for Testing and Materials Standard E1527-97, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment*, G.E.C. reviewed Department of the Army records, federal, state, and local databases and federal and state agency evaluations, conducted historical research of the sites and surrounding areas, interviewed pertinent personnel, and performed site investigations in order to characterize environmental conditions at each site. Recent site investigations by USACE, Louisville District personnel were conducted on December 2-3, 2013 to evaluate any changes that may have occurred at the sites since the EBS conducted by G.E.C was prepared. No substantive changes have occurred at any of the sites since this EBS was completed, therefore, new database and records checks were not deemed necessary.

There is no evidence that hazardous materials were ever stored, handled, transported, or disposed of at any of the sites.

Hydraulic oil released to the environment at Green River Lock and Dam No. 5 and Barren River Lock and Dan No. 1 has the potential to contain polychlorinated biphenyls, as does a pole-mounted transformer located at Green River Lock and Dam No. 6. If either of locks and dams nos. 1 and 5 are removed, analytical investigations of soils under the structures could be warranted. The transformer at Lock and Dam No. 6 appears to pose no current hazard to human health or the environment, however if its removal is required pursuant to any disposal action it should be done so in accordance with state and local regulations.

G.E.C. could find no information in the course of the records review or field investigations that any of the facilities ever stored significant amounts of petroleum products and/or petroleum derivatives, or that a release of such materials ever occurred, except at Barren River Lock and Dam No. 1 and Green River Lock and Dam No. 5, where hydraulic oil stains were observed in the

operations buildings and at several locations in the lock chambers. The stains are the result of vandalism to hydraulic piping systems at both sites, and hydraulic oil has been released to the environment.

Chipped, cracked, and flaked paint was observed at each site, on fittings associated with the locks and on various other structures. Should the paint contain lead, conditions at all five sites could pose a hazard to human health, and removal or disturbance of any of the structures would have to be conducted in accordance with state and local regulations.

There appear to be no asbestos concerns at any of the properties except Green River Lock and Dam No. 3, where possible asbestos containing material, in the form of ceiling tiles, was observed in the former residence. Should the tiles contain asbestos, conditions in the residence could pose a hazard to human health. Disturbance or removal of the residence would have to be conducted in accordance with state and local regulations.

There are no apparent air quality issues associated with any of the properties other than the possible lead and asbestos concerns.

None of the five sites is secured from public access, and significant falling/drowning hazards are present at all of the sites. For these reasons, there is liability associated with continued ownership of the projects.

No potential environmental sites of concern appear to be located within the recommended search radius for any of the five sites.

Except for the remaining federal property at Green River Lock and Dam No. 4 (0.01 acre), forested palustrian wetland occurs at each site.

A Phase I Cultural Resources Survey has concluded there is no evidence of prehistoric or undisturbed historic era cultural remains in the vicinity of any of the sites and efforts are currently underway to document existing structures at each facility and coordinate the results of these studies with the Kentucky Heritage Council. To date, the Louisville District has completed a brief historical overview of the Green and Barren rivers navigational system and prepared archival quality photograph documentation of all extant structures. It is anticipated that the report containing this information will be completed July 2000. It is expected that these facilities will be determined eligible for inclusion in the National Register of Historic Places and will require an as yet undetermined level of additional research and documentation.

Threatened and endangered species are known to occur in the vicinity of each project.

In accordance with Finding of Suitability to Transfer (FOST) Requirements for Notification, Covenants, and Access, Green River Locks and Dams Nos. 3, 4, and 6 are Category 1 sites, those

where no release or disposal of hazardous substances or petroleum products has occurred, and no migration of these substances from adjacent areas has occurred. Barren River Lock and Dam No. 1 and Green River Lock and Dam No. 5 are Category 2 sites, those where only release or disposal of petroleum products has occurred.

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1.0 PURPOSE OF THE ENVIRONMENTAL BASELINE STUDY

The purpose of this Environmental Baseline Study (EBS) is to characterize the environmental baseline conditions of Green River Locks and Dams Nos. 3, 4, 5, and 6, and Barren River Lock and Dam No. 1, Kentucky, and identify any potential environmental impacts posed by the transfer of the facilities from U.S. Army Corps of Engineers (Corps) ownership.

1.1 Introduction

The Corps, Louisville District (District) is considering the disposal of federal interest in Green River Locks and Dams Nos. 3, 4, 5, and 6, and Barren River Lock and Dam No. 1 due to the lack of any continued authorized project purpose.

Four alternatives are under consideration. The first is one of no action, i.e. the facilities, along with any adjacent Corps-owned property, would remain in federal ownership and no operations or maintenance would be conducted at the sites. The second is disposal of the sites in their existing condition. A third alternative involves disposal of the sites after stabilizing their improvements, and the fourth alternative is disposal of the sites after removal of the improvements.

1.2 Scope of Work

The objectives of this EBS are:

1. To characterize the environmental baseline conditions of the properties and identify any potential environmental contamination liabilities associated with their transfer from Corps ownership;

2. To evaluate all existing environmental information related to storage, release, treatment, or disposal of hazardous substances or petroleum products at the properties in order to determine or discover the presence, or likely presence, of a release, or threatened release, of any hazardous substance or petroleum product;

3. To briefly identify all, if any, natural, cultural, and historical resources of concern related to the possible property transfers; and

4. To determine the condition of the properties in accordance with *Finding of Suitability to Transfer (FOST) Requirements for Notification, Covenants, and Access*, as specified by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Section 120(h), and current Department of Defense (DOD) guidance;

To achieve these objectives, G.E.C., Inc. (G.E.C.) was directed to rely on existing documents, data, interviews, and inspections of the properties. In general, additional studies or analyses were not anticipated as necessary to prepare the EBS. The complete Scope of Work for this project is presented in Appendix A.

2.0 METHODOLOGY

This report was prepared in accordance with the applicable requirements contained in the following documents:

> Army Regulation 200-1 (AR 200-1), *Environmental Protection and Enhancement*, 21 February 1997;
>
> U.S. Army Corps of Engineers Regulation ER 1165-2-132, *Water Resources Policies and Authorities for Hazardous, Toxic, and Radioactive Waste for Civil Works Projects*, 26 June 1992; and
>
> American Society for Testing and Materials Standard (ASTM) E1527-97, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*.

2.1 Department of the Army Records

In accordance with AR 200-1, G.E.C. personnel conducted a detailed search and review of records and information at the District on January 24, 2000, and all real estate and environmental files provided by the District were reviewed. Refer to Appendix B for a list of the references consulted in the preparation of this study.

2.2 Federal, State, and Local Records

Vista Information Solutions, Inc. (Vista) conducted an environmental database search for each project area. Particular attention was given as to whether National Priority List (NPL) sites or permitted treatment, storage, and disposal (TSD) sites of hazardous waste and material are located within one mile of the properties.

G.E.C. also collected supplemental environmental data directly in order to ensure adequate regulatory record review for the project areas. Between Vista's database search and G.E.C.'s supplemental data review, all applicable and reasonably obtainable federal, state, and local government environmental records specified by AR 200-1 and ASTM E1527-97 were reviewed for each property and adjacent properties. The areas fall under the jurisdiction of the Kentucky Department for Environmental Protection (KDEP) and Region IV, U.S. Environmental Protection Agency (EPA).

2.3 Interviews

District and other pertinent personnel were interviewed pursuant to this investigation regarding site history and current conditions, and whether environmental concerns are present. Points of contact are presented in Appendix C.

2.4 Site Investigations

Site investigations were conducted in order to inspect the properties, including any buildings, structures, equipment, pipes, pipelines, or other improvements on, or adjacent to, each site, and to note utility lines, runoff patterns, evidence of environmental impacts or other observations that might indicate any actual or potential releases of hazardous substances or petroleum products. G.E.C. personnel conducted thorough inspections at the properties January 24-26, 2000. EBS checklists were completed during each inspection, they are presented sections B1 and G3-G6, Appendix B. Photographs taken during the investigations are presented in sections B1 and G3-G6, Appendix C.

2.5 Historical Use Information

Prior to performing the field investigations, a thorough historical record review was conducted for each site. The objective in consulting historical sources is to develop an idea of the previous uses and occupants of a site and the surrounding area. For this project G.E.C. reviewed topographic maps, land title records, and historical aerial photographs. All real estate and environmental files made available by the District were also reviewed. Appendix B contains a complete list of the references consulted.

U.S. Geological Survey (USGS) Topographic (quadrangle) maps were reviewed to identify structures, mines/quarries, clearings, wells, or other indications of potential areas of concern. Land title records dating to the 19th century were reviewed in order to view fee ownership, leases, land contracts, easements, liens, and other encumbrances for each site.

2.6 Federal and State Agency Evaluations

G.E.C. researched evaluations prepared by the U.S. Department of the Interior regarding wetland status and threatened/endangered species and their habitats for each site.

The District provided Information as to whether the sites, or nearby properties, qualified as significant cultural or archaeological resources.

2.7 Limitations and Exceptions

G.E.C.'s review included record information that was reasonably ascertainable from standard sources. *Reasonably ascertainable* implies: (1) information that is publicly available; and (2) information that is obtainable from its source within reasonable time and cost constraints. G.E.C.'s review included information gathered directly from regulatory agencies and an electronic database search performed by Vista.

The results and conclusions of this report are limited to the portions of the project areas that were actually observed and the records that were reviewed. No guarantee is made or intended that all

site conditions were observed or that all records were reviewed. Should any higher level of confidence be required, physical sampling and laboratory analyses would be necessary.

Much of the information provided in the report was compiled from public records and other sources maintained by third parties. Although reasonable care was exercised in its preparation, G.E.C. cannot be held responsible for errors, omissions, or inaccurate information.

3.0 PROJECT SETTING

3.1 Project Data and Locations

Project data and locations are presented in Figure1.

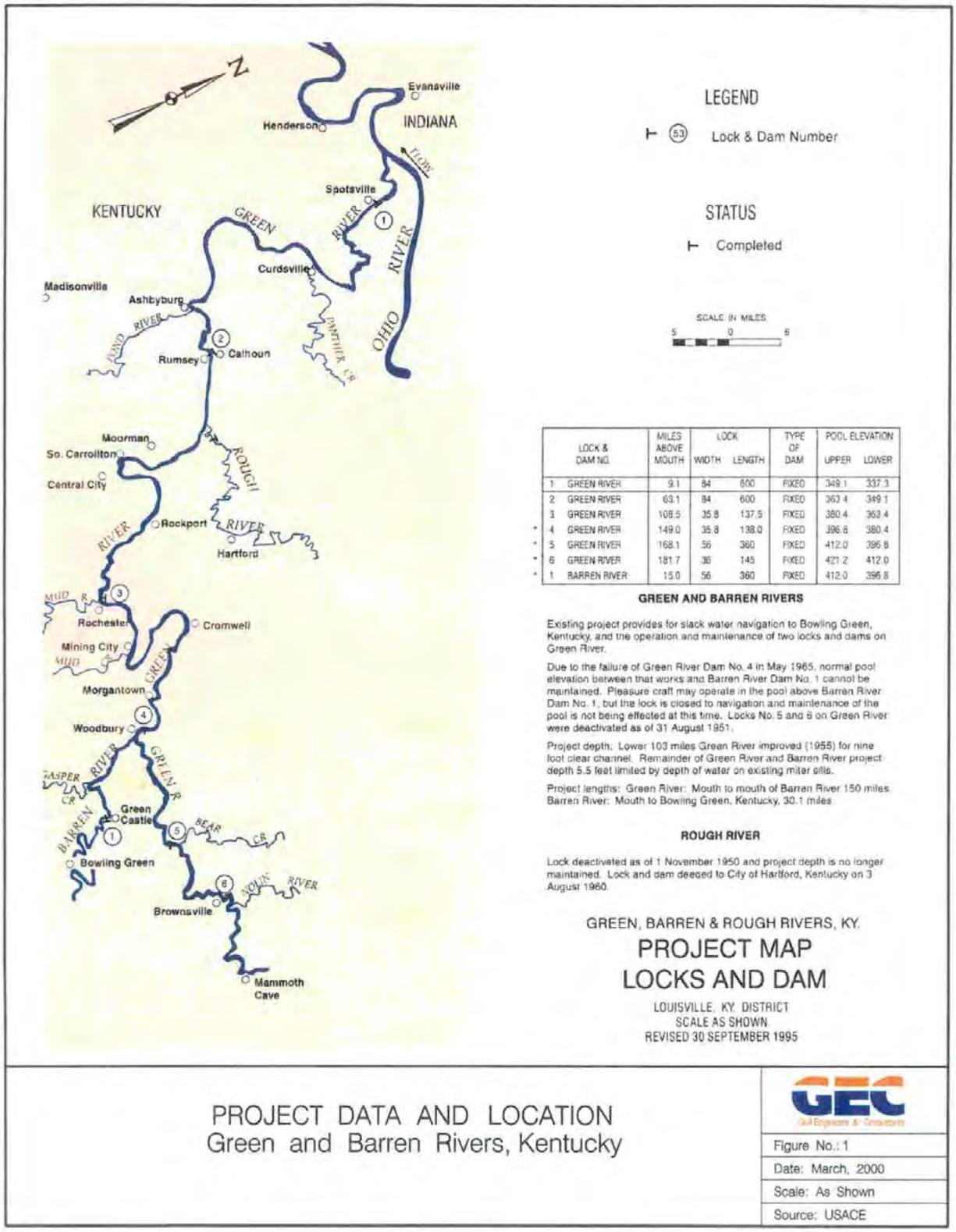
Barren River Lock and Dam No. 1 (B1) is located just upstream of Greencastle, in Warren County, Kentucky, 15 miles above the mouth of the Barren River. The site occupies approximately 16.63 acres on the right descending bank, and improvements at the site include the lock, dam, esplanade, and operations building. The original lock and dam were built in 1841 and acquired by the United States on February 20, 1886. The current lock and dam were built 1933-1934 and operations commenced on September 17, 1934. Operations ceased May 24, 1965 due to the breach at Green River Lock and Dam No. 4 and a subsequent loss of pool.

Green River Lock and Dam No. 3 (G3) is located just downstream of Rochester, in Muhlenberg and Ohio counties, Kentucky, 108.5 miles above the mouth of the Green River. The site occupies approximately 4.99 acres on the left descending bank and 6.72 acres on the right descending bank. Improvements at the site include the lock and dam and the remains of a residence, warehouse, garage, well, and septic tank, all on the right descending bank. The original lock was built in 1833-1836 and acquired by the United States on February 4, 1895. Locking operations were discontinued in September 1981.

Green River Lock and Dam No. 4 (G4) is located at Woodbury, Butler County, Kentucky, 149.0 miles above the mouth of the Green River. Government-owned property at the site consists of the lock and lock walls and a U.S. Geological Survey (USGS) gauging station situated on a 0.01-acre tract located on the left descending bank.

Green River Lock and Dam No. 5 (G5) is located near Glenmore, in Butler and Warren counties, Kentucky, 168.1 miles above the mouth of the Green River. The site occupies approximately 27.064 acres on the right descending bank and 5.21 acres on the left descending bank.

Figure 1. Project Data and Location



	LOCK & DAM NO.	MILES ABOVE MOUTH	LOCK WIDTH	LOCK LENGTH	TYPE OF DAM	POOL ELEVATION UPPER	POOL ELEVATION LOWER
	1 GREEN RIVER	9.1	84	600	FIXED	349.1	337.3
	2 GREEN RIVER	63.1	84	600	FIXED	363.4	349.1
	3 GREEN RIVER	108.5	35.8	137.5	FIXED	380.4	363.4
*	4 GREEN RIVER	149.0	35.8	138.0	FIXED	396.8	380.4
*	5 GREEN RIVER	168.1	56	360	FIXED	412.0	396.8
*	6 GREEN RIVER	181.7	36	145	FIXED	421.2	412.0
*	1 BARREN RIVER	15.0	56	360	FIXED	412.0	396.8

PROJECT DATA AND LOCATION
Green and Barren Rivers, Kentucky

Figure No.: 1
Date: March, 2000
Scale: As Shown
Source: USACE

Improvements at the site include the lock, dam, the remains of an earlier lock, an operations building, and a spring house, all on the right descending bank. The original lock was put into operation on January 17, 1900 and taken out of service in 1934. The current lock and dam were built in 1933-1934 and operations commenced on December 22, 1934. The structure was deactivated on August 31, 1951.

Green River Lock and Dam No. 6 (G6) is located just upstream of Brownsville, in Edmonson County, Kentucky, 181.7 miles above the mouth of the Green River. The site occupies approximately 18.0 acres on the right descending bank and 0.83 acres on the left descending bank. Improvements at the site include the lock, dam, a spring house located on the 0.83-acre tract, and a U.S. Geological Survey (USGS) gauging station located on the 18.0-acre tract, upstream of the lock. Operations commenced on January 1, 1906 and ceased on August 1, 1951. The structure was deactivated on August 31, 1951.

3.2 History

The Commonwealth of Kentucky authorized and funded a slackwater navigation project on the Green and Barren rivers from the Ohio River to Bowling Green, Kentucky. Construction of the 175-mile project was completed in 1842 and consisted of G1-G4, and B1. The dams consisted of stone-filled, timber cribs varying from 300 to 680 feet in length and from 15 to 22 feet in height. Lock chamber dimensions were 36 feet by 160 feet. The project provided for a 5.5-foot channel and average lift of the stone-masonry locks was 15.5 feet.

The structures were damaged for military reasons during the Civil War and their maintenance was neglected. Rather than legislate funds for their repair, the Commonwealth leased the locks and dams to the Green and Barren River Navigation Company in 1868 with the provision that the company repair and maintain the system. The arrangement lasted until the early 1880s.

The company offered to sell the project in 1884, and the Commonwealth of Kentucky ceded its rights of eminent domain to the United States in 1886. Under the River and Harbor Act of 1888, the United States appropriated money to purchase the project and initiated repair and reconstruction of the locks and dams.

In order to extend the system upstream and to open mineral resources along Bear Creek and Nolin River, the United States authorized construction of G5 under the River and Harbor Act of July 13, 1892. G6 was authorized under the River and Harbor Act of July 13, 1902.

G5 and G6 were closed due to a lack of traffic in 1951. G4 was breached on May 24, 1965 and has not been restored. The breach at G4 and resulting loss of pool prevented barge traffic from reaching B1, and it was subsequently deactivated.

3.3 Geography

The Green River Basin is located in west-central Kentucky and north-central Tennessee. It encompasses all or parts of 31 counties in Kentucky and three in Tennessee. The basin comprises an area of 9,273 square miles.

The Green River originates in Lincoln and Casey counties in Kentucky and flows 330 miles in a northwesterly direction to its confluence with the Ohio River, eight miles upstream of Evansville, Indiana. The river varies in width from a few feet in upstream areas to approximately 1/3 mile in downstream areas. Elevations range from 1,800 feet above sea level near the source to 337 feet at the mouth. Among the principal tributaries of the Green River are the Barren, Nolin, Pond, and Rough rivers. The population in the basin is predominately rural.

3.4 Physiography

The project area, as well as the entire Green River Basin, lies within the Interior Low Plateau Physiographic Province. This province is south of the limit of glaciation and along the axis of the Cincinnati Arch. The topography of the Green River Basin varies from rugged hilly terrain in the eastern part of the basin, deep valleys and cavern areas in the central section, to swampy and wide alluvial plains in the western and northern sections.

Two major physiographic regions occur within the project area: the Western Coal Fields Region, which is located in the western portion, comprises most of the project area. This area is characterized by gently rolling uplands and broad floodplains up to three miles wide.

The Mississippian Plateau, also known as the Pennyroyal Region, covers most of the central and eastern portions of the basin, and the southern portion of the project area. The area is characterized by undulating limestone uplands and moderately wide floodplains. Numerous karst areas and large caverns formed by subsurface drainage occur in this region.

3.5 Climate

The climate of the project area is of the humid, subtropical type. The mean annual temperature is about 57° Fahrenheit, varying from a mean of 37° Fahrenheit in January to a mean of 76° Fahrenheit in July. The area has a growing season of approximately 180 days.

Precipitation in the project area is fairly evenly distributed throughout the year, with smaller amounts occurring in late summer and fall. The average annual rainfall over the entire Green River Basin averages 47 inches, varying from 42 inches in the lower portion of the basin to 49 inches in the upper portion.

3.6 Soils

Soils in the project area are divided into three major categories based on the material in which they were developed. Some soils in the uplands and along valley walls were developed from residuum, a weathered form of bedrock. Other soils in the uplands were developed from loess. The soils in the bottomland along the stream valleys were developed in the alluvium. The three dominant soil associations in the lower Green River Basin include the Gilpin-Wellston Association, the Gilpin-Caseyville-Dekalb Association, and the Baxter-Bedford Association.

3.7 Geology

The Green River Basin overlaps two major structural features, the Illinois Basin and the Cincinnati Arch. The Western Coal Fields Region forms the extreme southern part of the larger Illinois Basin. The rocks in this area are Pennsylvanian in age, and, with the exception of the Quaternary alluvium near the Ohio River, are the youngest formations in the basin.

The Cincinnati Arch, a northeast-southwest trending anticline, is located east of the Western Coal Fields Region. Rocks in this area get progressively older from west to east, moving up the western flank of the Arch.

An east-west trending system of complex faults extends across the Green River Basin. This system, known as the Rough Creek Fault Zone, is thought to be part of a 400-mile long structural disturbance extending from central Pennsylvania, across West Virginia and Kentucky, into southern Illinois. The principal fault in the system is probably a high-angle thrust fault, with the south side being the up-thrown block. A number of oil pools that are associated with the Rough Creek system have been developed in the basin.

The oldest rocks at the bedrock surface in the Green River Basin are of Ordovician age. These rocks are located in the extreme eastern portion of the basin and consist of interbedded limestones and shales. Moving to the west, the bedrock becomes progressively younger. A series of Silurian and Devonian limestones and shales immediately overlie the Ordovician formations.

The Mississippian and Pennsylvanian systems comprise over two-thirds of the bedrock surface in the basin. Rocks of the Osage Group are at the base of the Mississippian section in this area and consist of shale, limestone, chert, and sandstone. The next youngest group of rocks within the Mississippian system are the limestones of the Meramec Group, which are cavernous and underlie the rolling karst areas in the basin. Most of the caverns of Mammoth Cave are developed in one of these formations. At the top of the Mississippian section are the sandstones, limestones, and shales of the Chester Group.

Rocks of the Pennsylvanian System occur in the Western Coal Fields Region. Conglomerates, sandstones, siltstones, and shale are included in this sequence, as well as some coal and thin limestone. Among the coal-bearing formations are the Caseyville Sandstone, the Tradewater Formation, and the Carbondale Formation.

The top of the stratigraphic sequence in the Green River Basin is comprised of Quaternary alluvium, which consists of sand, gravel, silt, and clay that was deposited along the Ohio River as glacial outwash.

4.0 SIGNIFICANT FINDINGS

4.1 Polychlorinated Biphenyls

Hydraulic oil released to the environment at Green River Lock and Dam No. 5 and Barren River Lock and Dam No. 1 has the potential to contain polychlorinated biphenyls, as does a pole-mounted transformer located at Green River Lock and Dam No. 6. If either of locks and dams nos. 1 and 5 are removed, analythical investigations of soils under the structures could be warranted. The transformer at Lock and Dam No. 6 appears to pose no current hazard to human health or the environment, however if its removal is required pursuant to any disposal action it should be done so in accordance with state and local regulations.

4.2 Petroleum Products / Petroleum Derivatives

G.E.C. observed hydraulic oil stains in the operations buildings and at several locations in the lock chambers at B1 and G5. The stains are the result of vandalism to the hydraulic piping system, and hydraulic oil has been released to the environment. However, it is G.E.C.'s opinion that any hazard to human health or the environment posed by the releases is low.

4.3 Lead

Chipped, cracked, and flaked paint was observed at each site, on fittings associated with the locks and on various other structures. Should the paint contain lead, conditions at all five sites could pose a hazard to human health, and removal or disturbance of any of the structures would have to be conducted in accordance with state and local regulations.

4.4 Asbestos

There appear to be no asbestos concerns at any of the properties except Green River Lock and Dam No. 3, where possible asbestos containing material, in the form of ceiling tiles, was observed in the former residence. Should the titles contain asbestos, conditions in the residence could pose a hazard to human health. Disturbance or removal of the residence would have to be conducted in accordance with state and local regulations.

4.5 Public Safety

None of the five sites is secured from public access, and significant falling/drowning hazards are present at all of the sites. For these reasons, there is liability associated with continued ownership of the projects.

4.6 Wetlands

Except for the remaining federal property at G4, forested palustrian wetland occurs at each site, in the form of narrow riparian zones adjacent to the river.

4.7 Cultural Resources

A Phase I Cultural Resources Survey has concluded there is no evidence of prehistoric or undisturbed historic era cultural remains in the vicinity of any of the sites and efforts are currently underway to document existing structures at each facility and coordinate the results of these studies with the Kentucky Heritage Council. To date, the Louisville District has completed a brief historical overview of the Green and Barren rivers navigational system and prepared archival quality photo documentation of all extant structures. It is anticipated that the report containing this information will be completed July 2000. It is expected that these facilities will be determined eligible for inclusion in the National Register of Historic Places and will require an as yet undetermined level of additional research and documentation.

4.8 Threatened and Endangered Species

Threatened and endangered species occur in the Green and Barren rivers and on adjacent terrestrial habitat. The federally endangered Kentucky cave shrimp (*Palaemonias ganteri*) is endemic to the Mammoth Cave system, portions of which are located within the pool created by G6, and the U.S. Fish and Wildlife Service (USFWS) has designated portions of the Roaring River passage of the Flint-Mammoth Cave system in the Edmonson County portion of Mammoth Cave National Park as critical habitat for the species.

Caves in the study area also provide habitat for the federally endangered gray bat and Indiana bat, which use the caves as hibernacula. One cave within the study area is known to support a gray bat maternity colony, and future surveys in additional caves may find other maternity colonies. Suitable habitat for Indiana bat maternity colonies also exists throughout the project area, and additional studies may confirm their presence.

The study project area also contains habitat for a variety of federally listed species of birds. Wintering populations of federally threatened bald eagles (*Haliaeetus leucocephalus*) have been observed, and nesting pairs have been confirmed in areas to the west. Such nesting pairs will probably inhabit the project area in the future as the species continues to expand its range. The

Federally endangered American peregrine falcon (*Falco peregrinus anatum*) also occurs as a migrant or transient in the study area.

Endangered freshwater mussels in the study area include the rough pigtoe (*Pleurobema plenum*), orange-footed pearly mussel (*Plethobasus cooperianus*), northern riffleshell (*Epioblasma torulosa rangiana*), pink mucket pearly mussel (*Lampsilis abrupta*), and the fanshell (*Cyprogenia stegaria*). Recently deceased specimens of the ring pink (*Obovaria retusa*) and clubshell (*Pleurobema clava*) have also been observed, indicating their presence in the project area as well. Other listed mussel species that might still occur in the project area include the fat pocketbook (*Potamilus capax*), tuberculed-blossom pearly mussel (*Epioblasma torulosa torulosa*), cracking pearly mussel (*Hemistena lata*), and purple catspaw pearly mussel (*Edpioblasma sulcata sulcata*). The orange-footed pearly mussel, ring pink, and purple catspaw pearly mussels still reproduce in the Green River, and it is thought that this is one of the few, perhaps the only, rivers in which this occurs.

Federally threatened plants found in the study area include Price's potato bean (*Apios priceana*) and Eggert's sunflower (*Helianthus eggertii*).

Rare species for which potential habitat exists in the project area include the southeastern bat (*Myotis austroriparius*), Rafinesque's big-eared bat (*Plecotus rafinesquii*), eastern small-footed bat (*Myotis leibii*), eastern woodrat (*Neotoma floridana*), Bachman's sparrow (*Aimophila aestivalis*), eastern sand darter (*Ammocrypta pellucida*), northern cave fish (*Amblyopsis spelaea*), southern cave fish (*Typhlichthys subterraneus*), longhead darter (*Percina macrocephala*), blue sucker (*Cycleptus elongatus*), hellbender, Kirtland's water snake (*Clonophis kirtlandi*), cooperbelly water snake (*Nerodia erythrogaster* var. *neglecta*), spectacle case pearly mussel (*Cumberlandia monodonta*), Kentucky creekshell mussel (*Villosa ortnanni*), rabbit's foot pearly mussel (*Ouadrula cylindrica*), purple liliput pearly mussel (*Toxolasma lividus*), pale false foxglove (*Agalinis skinneriana*), royal catchfly (*Silene regia*), and Gattinger's lobelia (*Lobelia appendiculata* var. *gattingeri*). These species are not currently considered candidate species, however, they could be listed in the future if their numbers decline and threats to their survival persist.

5.0 SUMMARY AND CONCLUSIONS

The Corps is considering the disposal of federal interest in B1, G3, G4, G5, and G6 due to the lack of any continued authorized project purpose, and G.E.C. was contracted by the District to conduct an EBS in order to facilitate the disposals. In accordance with applicable requirements of AR 200-1 and ASTM E1527-97, G.E.C. reviewed Department of the Army records and federal, state, and local databases, federal and state agency evaluations, conducted historical research of the sites

and surrounding areas, interviewed pertinent personnel, and performed site investigations in order to characterize environmental conditions at each site.

There is no evidence that hazardous materials were ever stored, handled, transported, or disposed of at any of the sites.

Hydraulic oil released to the environment at Green River Lock and Dam No. 5 and at Barren River Lock and Dam No. 1 has the potential to contain polychlorinated biphenyls, as does a pole-mounted transformer located at Green River Lock and Dam No. 6. If either of locks and dams nos. 1 and 5 are removed, analythical investigations of soils under the structures could be warranted. The transformer at Lock and Dam No. 6 appears to pose no current hazard to human health or the environment, however if its removal is required pursuant to any disposal action it should be done so in accordance with state and local regulations.

G.E.C. could find no information in the course of the records review or field investigations that any of the facilities ever stored significant amounts of petroleum products and/or petroleum derivatives or that a release of such materials ever occurred, except at B1 and G5, where hydraulic oil stains were observed in the operations buildings and at several locations in the lock chambers. The stains are the result of vandalism to hydraulic piping systems at both sites, and hydraulic oil has been released to the environment. However, it is unlikely that the releases pose any hazard to human health or the environment.

Chipped, cracked, and flaked paint was observed at each site, on fittings associated with the locks and on various remaining structures. Should the paint contain lead, conditions at all five sites could pose a hazard to human health, and removal or disturbance of any of the structures would have to be conducted in accordance with state and local regulations.

There appear to be no asbestos concerns at any of the properties except Green River Lock and Dam No. 3, where possible asbestos containing material, in the form of ceiling tiles, was observed in the former residence. Should the tiles contain asbestos, conditions in the residence could pose a hazard to human health. Disturbance or removal of the residence would have to be conducted in accordance with state and local regulations.

There are no apparent air quality issues associated with any of the properties other than the possible lead and asbestos concerns.

None of the five sites is secured from public access, and significant falling/drowning hazards are present at all of the sites. For these reasons, there is liability associated with continued ownership of the projects.

No potential environmental sites of concern appear to be located within the recommended search radius for any of the five sites.

Except for the remaining federal property at G4, forested palustrian wetland occurs at each site.

A Phase I Cultural Resources Survey has concluded there is no evidence of prehistoric or undisturbed historic era cultural remains in the vicinity of any of the sites and efforts are currently underway to document existing structures at each facility and coordinate the results of these studies with the Kentucky Heritage Council. To date, the Louisville District has completed a brief historical overview of the Green and Barren rivers navigational system and prepared archival quality photo documentation of all extant structures. It is anticipated that the report containing this information will be completed July 2000. It is expected that these facilities will be determined eligible for inclusion in the National Register of Historic Places and will require an as yet undetermined level of additional research and documentation.

Threatened and endangered species are known to occur in the vicinity of each project.

In accordance with Finding of Suitability to Transfer (FOST) Requirements for Notification, Covenants, and Access, G3, G4, and G6 are Category 1 sites, those where no release or disposal of hazardous substances or petroleum products has occurred, and no migration of these substances from adjacent areas has occurred. B1 and G5 are Category 2 sites, those where only release or disposal of petroleum products has occurred.

SITE REPORTS

Section B1

BARREN RIVER LOCK AND DAM NO. 1

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1.0 INTRODUCTION

Barren River Lock and Dam No. 1 (B1) is located just upstream of Greencastle, in Warren County, 15 miles above the mouth of the Barren River. The site occupies approximately 16.63 acres on the right descending bank (east bank). Improvements at the site include the lock, dam, esplanade, and operations building. The original lock and dam was built in 1841 and acquired by the United States on February 20, 1886. The current lock and dam was built 1933-1934 and operations commenced on September 17, 1934. Operations ceased May 24, 1965.

The Corps is considering disposing of the federal interest in B1 due to a lack of any continued project purpose. The purpose of this EBS is to characterize the environmental baseline condition of the property in order to facilitate the possible disposal and to identify any potential environmental impacts posed by a transfer of the property from Corps ownership.

2.0 METHODOLOGY

2.1 Federal, State, and Local Records

The Vista report for this project is presented in Appendix B1-A.

2.2 Site Investigation

G.E.C. personnel conducted a thorough investigation of the property on January 26, 2000. An EBS checklist completed during the investigation is presented in Appendix B1-B. Photographs taken during the investigation are presented in Appendix B1-C.

2.3 Historical Use Information

For this project G.E.C. reviewed maps dating back to 1954. Maps reviewed:

7.5' Hadley, Kentucky	1954
7.5' Hadley, Kentucky	1973

3.0 SITE DESCRIPTION

3.1 Location

B1 is located approximately one mile upstream of Greencastle, in Warren County, Kentucky, 15 miles above the mouth of the Barren River. A site location map is presented in Figure B1-1 and an aerial photograph is presented in Figure B1-2.

3.2 Site and Vicinity Characteristics

The 16.63-acre site is accessed by taking Greencastle-Richardsville Road west from Kentucky Highway 263. Entrance to the site is via a gated dirt road that proceeds south and west from a boat ramp and parking lot adjacent to Taylor Creek. The site is utilized for hay production and appears to be comprised of fill that is approximately 12-15 feet above natural ground.

Figure B1-1. Site Location Map

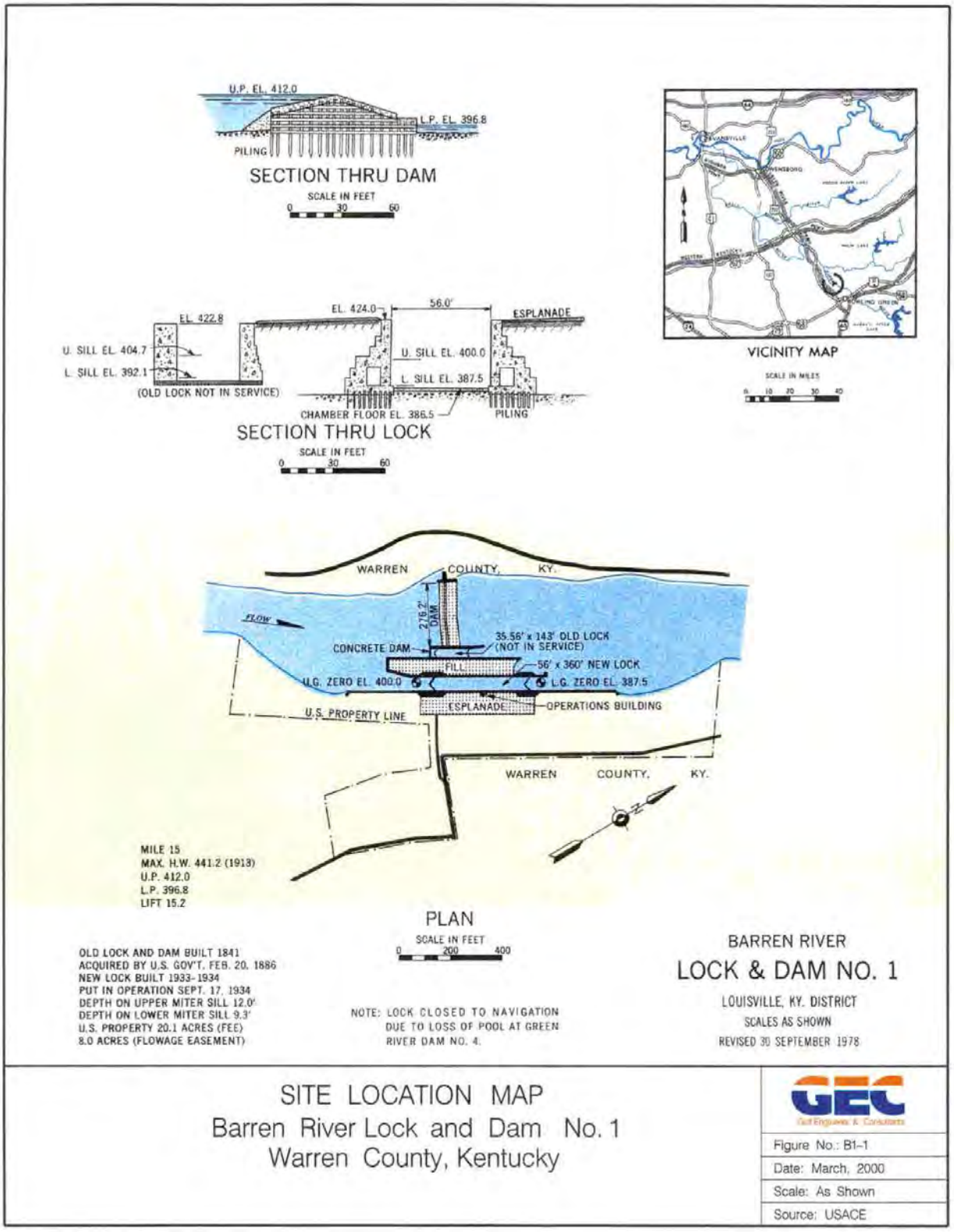
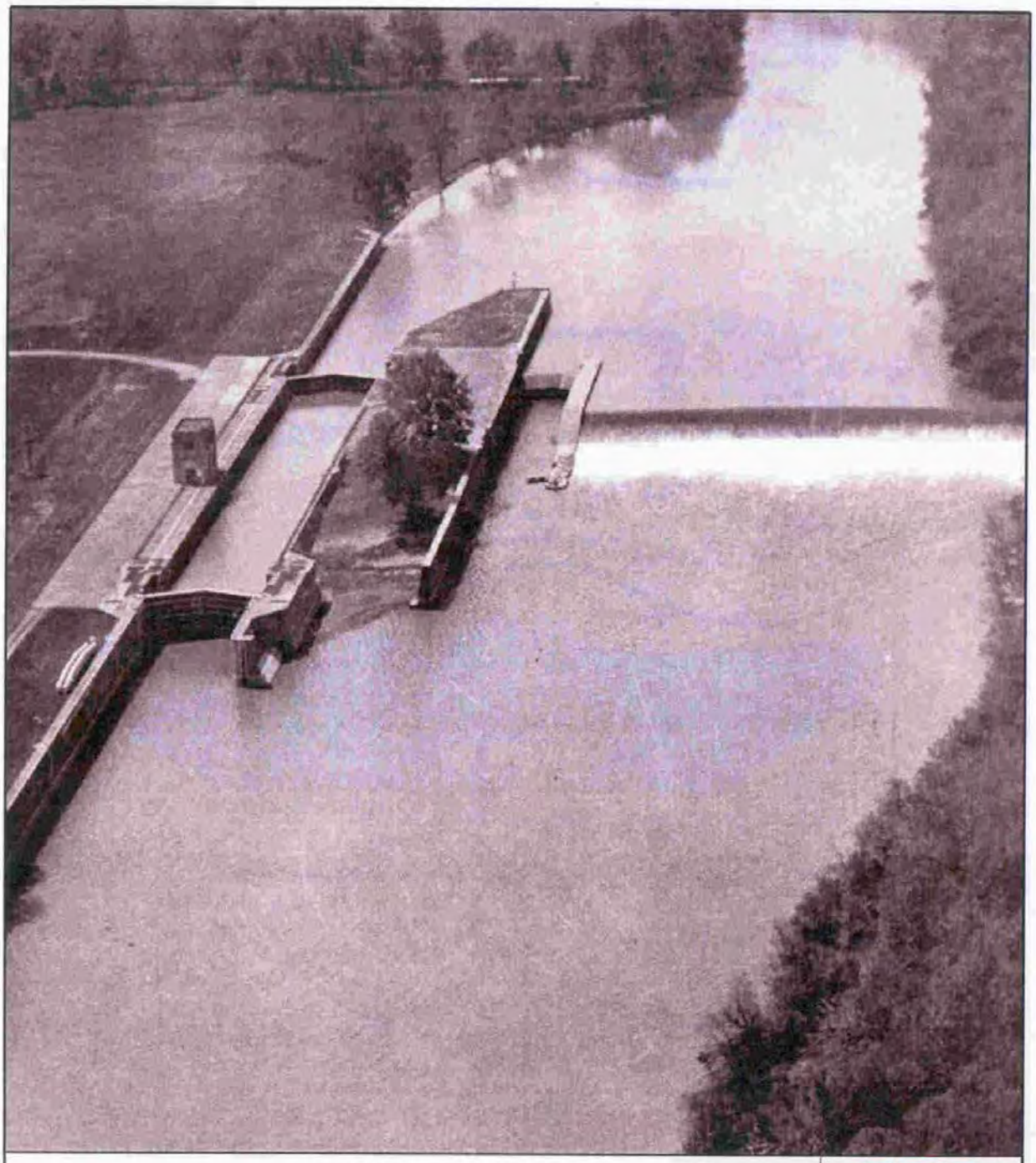


Figure B1-2. Aerial Photograph



AERIAL PHOTOGRAPH
Barren River Lock and Dam No. 1
Warren County, Kentucky

GEC
Gulf Engineers & Consultants

Figure No.: B1–2
Date: March, 2000
Scale: N/A
Source: USACE

B1 was constructed in the19th century to provide slack water navigation on the Barren River and to enhance water supply for Bowling Green, Kentucky. The original lock and dam was put into operation in 1841 and acquired by the United States on February 20, 1886. The current lock and dam was built 1933-1934. Operations ceased May 24, 1965 due to a loss of pool at G4. Improvements at the site include the lock, dam, esplanade, and operations building. There are no minerals of any value at the site.

Elevation at the property is 420-430 feet, and storm water runoff flows west across the property into the Barren River.

3.3 Structures, Roads, and Other Improvements

The site is not fenced but the access road is gated.

Overhead electrical service transits the site, along the access road, however no electrical transformers were observed, and no other utilities were noted during the field investigation.

The only remaining improvements at the site include the lock, dam, an earlier lock, an operations building, and the esplanade. The old lock and dam was left intact and the new lock was built adjacent to, and east of, the older one. The old lock measures 35.6 feet wide and 143 feet long. The new, larger lock measures 56 feet wide and 360 feet long. The dam is fixed. Upper pool elevation is 412.0 feet and lower pool elevation, prior to the breach at G4, was 396.8 feet.

3.4 Past Use of the Property

Figure B1-3 presents locations of the parcels described in this section. The original lock and dam were built in 1841, and acquired by the United States on February 20, 1886.

The state of Kentucky ceded Parcel A, 15.00 acres fee, to the United States. The United States condemned the parcel in 1895 to clear title.

Parcel B, 13.1 acres fee, was acquired from Charles E. and Hester Miller by deed dated August 11, 1933, recorded September 8, 1933, in deed book 172, page 367, in the records of Warren County.

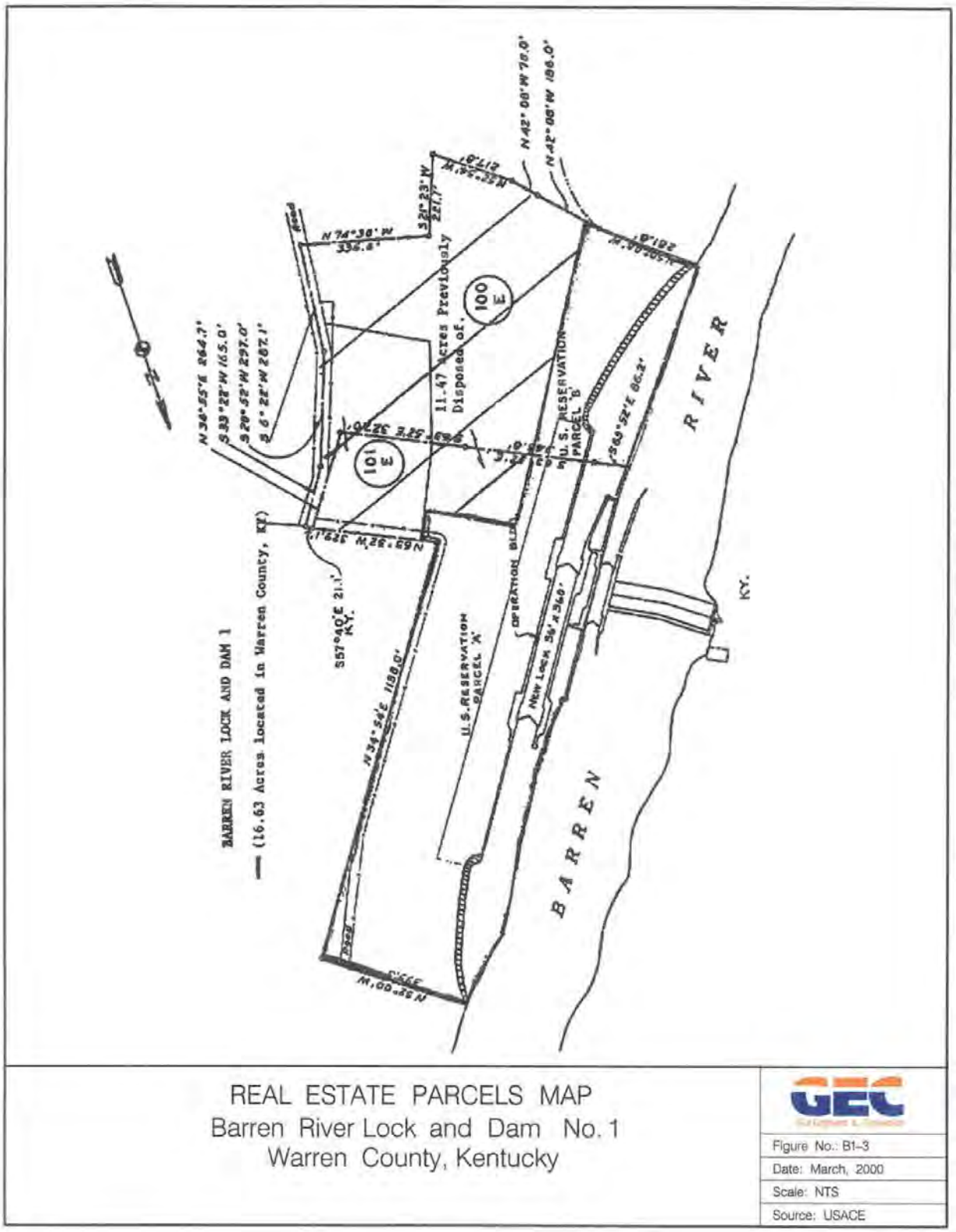
In 1933-1934 the current lock and dam were built adjacent to the old lock and dam, which was left intact. Operation of the new structure commenced on September 17, 1934.

Operations ceased May 24, 1965, due to a loss of pool at Green River Lock and Dam No. 4.

Portions of both parcels have been disposed of. The United States conveyed 3.47 acres of fee land and eight buildings from Parcel A to George W. and Barbara l. Inman by quitclaim deed dated January 20, 1975. No reservations to the United States were included in the quitclaim deed.

The United States conveyed 8.00 acres of fee land from Parcel B to James C. Long by quitclaim deed dated April 9, 1955, together with a 30-foot right-of-way easement to Barren River

Figure B1-3. Real Estate Parcels Map



REAL ESTATE PARCELS MAP
Barren River Lock and Dam No. 1
Warren County, Kentucky

GEC

Figure No.: B1-3
Date: March, 2000
Scale: NTS
Source: USACE

for watering livestock. In accordance with the quitclaim deed, the right of way is void due to nonuse. The United States also reserved a perpetual flowage easement and right of way for government-owned roads and utilities over the entire 8.0 acres.

One outgrant, permit no. DACW27-4-95-30, was issued to the 160th Special Operations (Aviation) Division, Fort Campbell, Kentucky, for land navigation training. The permit expired December 31, 1999.

3.5 Current Use of the Property

B1 is currently unused and considered excess to the needs of the U.S. Government. The Corps is considering disposing of the federal interest in the facility due to a lack of any continued project purpose. There are no Corps employees or contractors at the site.

The remaining government structures present an attractive nuisance and they are subject to vandalism. The property itself is currently used for hay production.

The highest and best use of the land is considered to be recreational. An appraisal of the property estimates the value of the 16.63 acres owned in fee simple at $16,000. A value of $1 has been assigned to each of the easements.

3.6 Adjoining Property

Land surrounding the site is used for pasture and hay production.

Based on G.E.C.'s review of quadrangle maps, aerial photographs, and land title records, land-use in the vicinity of B1 appears little changed over the last 46 years. A portion of the 1954 quadrangle is presented in Figure B1-4.

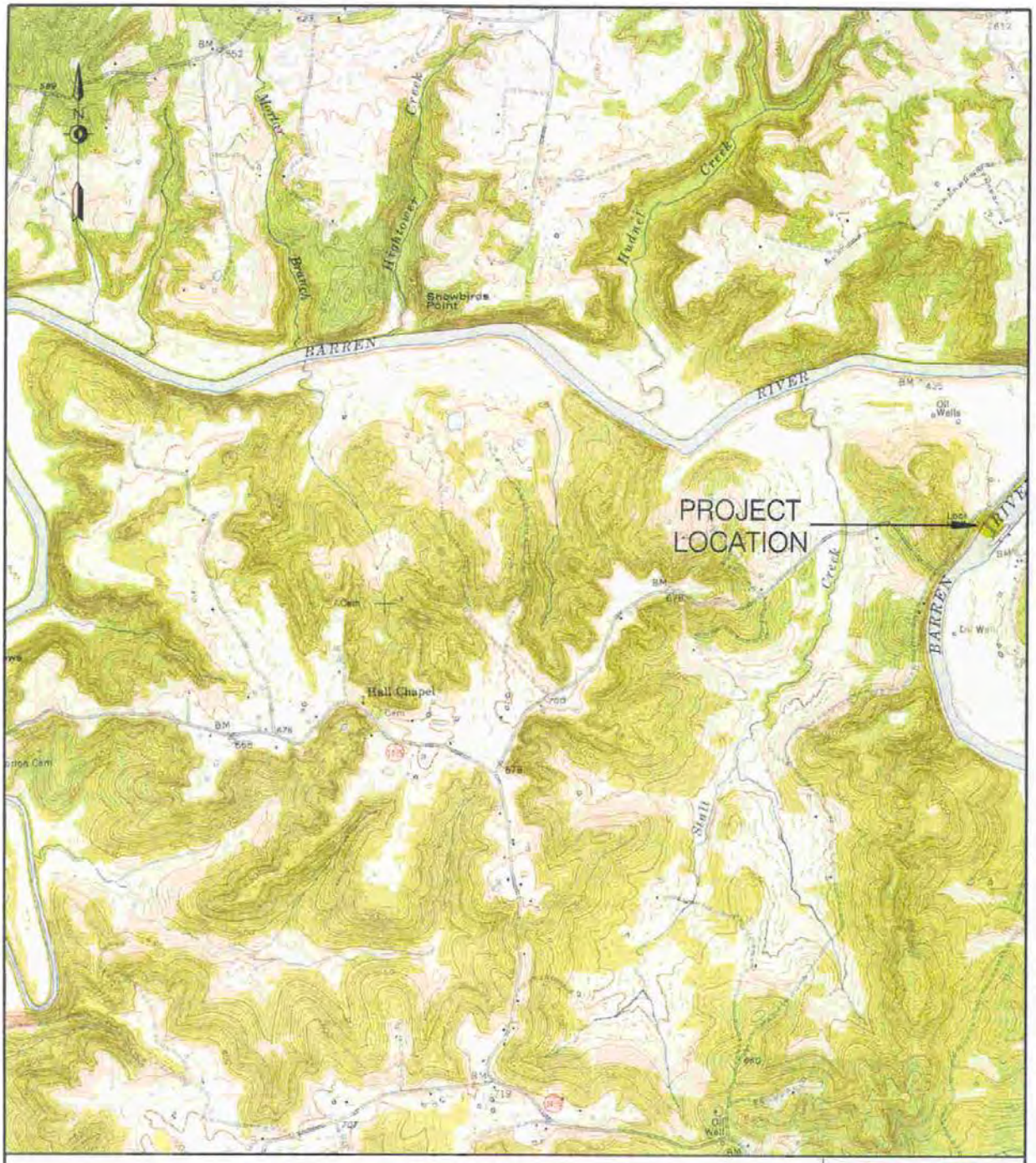
4.0 RECORDS REVIEW

A search of federal, state, and local government environmental databases was conducted in order to obtain and review records and documents that would aid in identifying known or potential environmental concerns at, or in the vicinity of, B1. ASTM E1527-97 provides a list of records that should be reviewed and the minimum search distances to use. AR 200-1 requires a search of Department of the Army records.

4.1 Sites Identified During Records Review

Table B1-1 presents a summary of the sites found in each database during the records review.

Figure B1-4. Historic Topographic Map



HISTORIC TOPOGRAPHIC MAP
Barren River Lock and Dam No. 1
Warren County, Kentucky

USGS 7.5' Series Quadrangle Hadley, Kentucky 1954

GEC
Gulf Engineers & Consultants

Figure No.:	B1-4
Date:	March, 2000
Scale:	1" = 24,000'
Source:	USACE

Table B1-1. Federal and State Database Review Summary

Database	< 0.13 Mile	0.13-0.25 Mile	0.25-0.50 Mile	0.50-1.0 Mile	Total
NPL	0	0	0	0	0
RCRIS-CA	0	0	0	0	0
RCRIS-TSD	0	0	0	-	0
CERCLIS	0	0	0	-	0
CERCLIS (S)	0	0	0	-	0
SWLF	0	0	0	-	0
WELLS	0	0	1	-	1
VIOLATERS	0	0	-	-	0
TRIS	0	0	-	-	0
UST/AST	0	0	-	-	0
ERNS	0	-	-	-	0
GNRTR	0	-	-	-	0

Source: G.E.C., February 2000. (-) Outside ASTM-recommended search radius.

The database review resulted in one plottable site within the ASTM-recommended minimum search distances and three unplottable sites. Unplottable sites are those with insufficient location information such that they can only be identified as being within the same zip code as B1. G.E.C. made every effort to locate these sites and assess their relevance to the project.

Of the four sites, three are UST/AST sites. The remaining site is a USGS water well.

5.0 FINDINGS

5.1 Hazardous Substances

This section applies to the storage, handling, transportation, and disposal of substances deemed hazardous under the Resource Conservation Recovery Act (RCRA) at B1.

No evidence of such activity at the site, such as stained soil or distressed vegetation, was noted during the field investigation nor discovered in the process of the federal and state database review.

5.2 Polychlorinated Biphenyls

There are no pole-mounted electrical transformers located at the site and electrical utilities have been disconnected from the operations building, however hydraulic oil released to the environment (Section 5.3) has the potential to contain PCBs. If the structure is removed, analytical investigations of soils under the structure could be warranted.

5.3 Petroleum Products / Petroleum Derivatives

During the field investigation G.E.C. observed hydraulic oil stains in the operations building and at several locations in the lock chamber. The stains are a result of vandalism to the hydraulic piping system, and hydraulic oil has been released to the environment.

G.E.C. found no other evidence or information that the facility ever stored significant amounts of other petroleum products and/or derivatives or that releases of such materials occurred.

It is G.E.C.'s opinion that any hazard to human health or the environment posed by the hydraulic oil releases is low.

5.4 Lead

Chipped, cracked, and flaked paint was observed at the site, on bollards, cleats, and rails associated with the lock, and on the door of the operations building. Should the paint contain lead, conditions at B1 could pose a hazard to human health, and any removal or disturbance of any of the fittings would have to be conducted in accordance with state and local regulations.

5.5 Asbestos

There appear to be no asbestos concerns at the property.

5.6 Air Quality

There are no apparent air quality issues associated with the property.

5.7 Public Safety

The lock walls, miter gates, operations building, and esplanade appear to be in good condition, although G.E.C. observed evidence of seepage through and around the land-side lock wall. However, several of the bulkhead valve and piping pits are no longer covered with grating, and because the site is not secure from public access, these and other falling/drowning hazards present a liability associated with continued ownership of the site.

5.8 Potential Sites of Concern

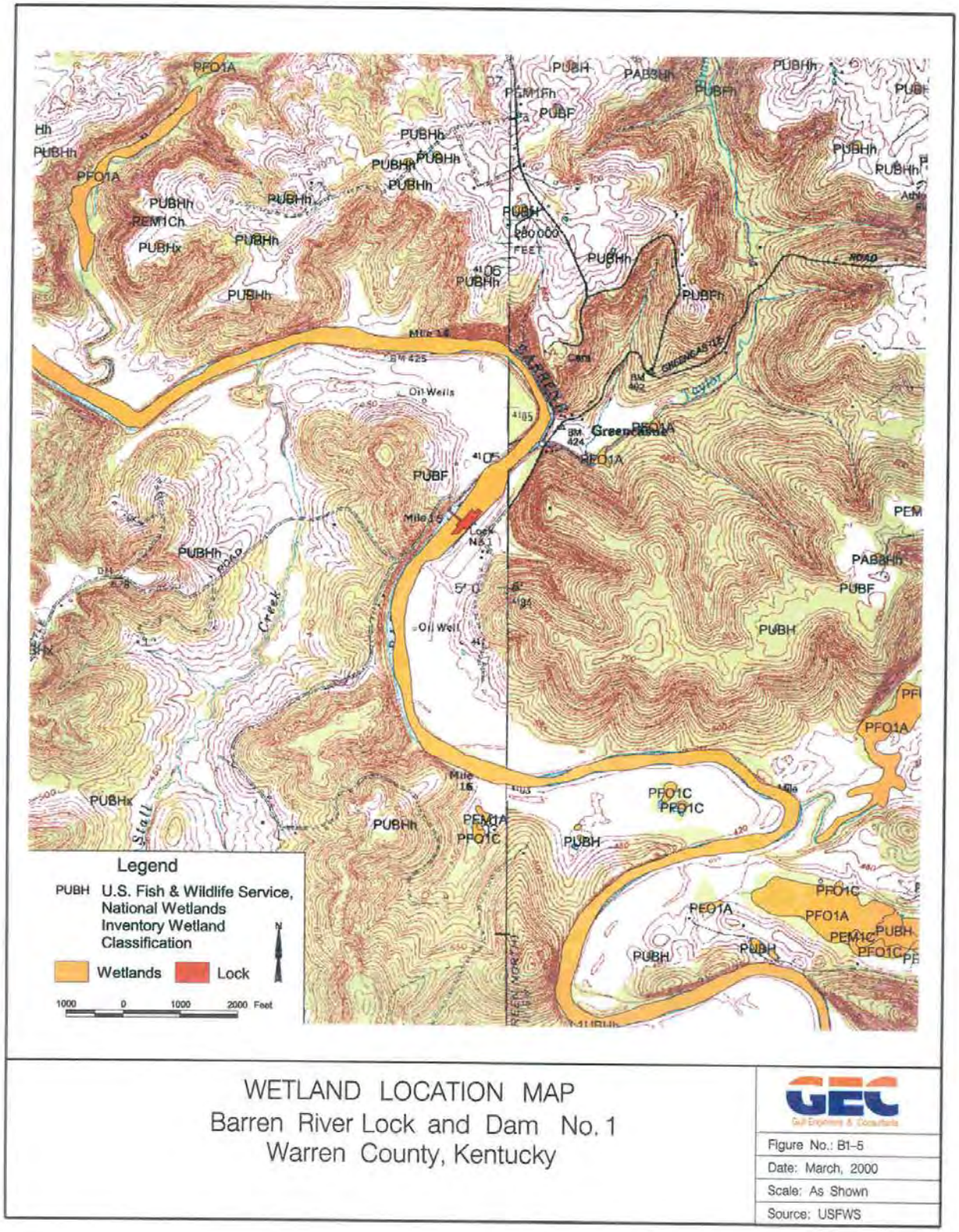
G.E.C. was unable to locate the three UST/AST sites, however they were not observed in the vicinity of the site. As a result, it is G.E.C.'s opinion that none of the three are likely to have had an impact on environmental conditions at B1.

5.9 Federal and State Agency Evaluations

5.9.1 Wetlands

A Department of the Interior National Wetlands Inventory Map dated 1988, a portion of which is presented in Figure B1-5, indicates a forested palustrian wetland at the site, in the form of a narrow riparian zone adjacent to the river. G.E.C. confirmed this during the field investigation, as well as the presence of another palustrian wetland, upstream of the lock on the right descending

Figure B1-5. NWI Map



bank. The area, less than one acre in size, is dominated by red maple and consists of a seasonally flooded water regime that holds backwater during periods of high flow.

5.9.2 Cultural Resources

A Phase I Cultural Resources Reconnaissance was performed in 1998 for the site to determine if any archaeological resources would be impacted by federal disposal of the property. The reconnaissance found no evidence of prehistoric or undisturbed historic era cultural remains. Efforts are currently underway to document the existing structures at the facility and coordinate the results of the studies with the Kentucky Heritage Council. To date, the District has completed a brief historical overview of the Green and Barren rivers navigational system and prepared archival quality photo documentation of all extant structures. It is anticipated that the report containing this information will be completed July 2000. The District expects that the facility will be determined eligible for inclusion in the National Register of Historic Places and will require an as yet undetermined level of additional research and documentation.

5.9.3 Threatened and Endangered Species

Threatened and endangered species occur in the Green and Barren rivers and on adjacent terrestrial habitat. The federally endangered Kentucky cave shrimp (*Palaemonias ganteri*) is endemic to the Mammoth Cave system, portions of which are located within the pool created by G6, and the U.S. Fish and Wildlife Service (USFWS) has designated portions of the Roaring River passage of the Flint-Mammoth Cave system in the Edmonson County portion of Mammoth Cave National Park as critical habitat for the species.

Caves in the study area also provide habitat for the federally endangered gray bat and Indiana bat, which use the caves as hibernacula. One cave within the study area is known to support a gray bat maternity colony, and future surveys in additional caves may find other maternity colonies. Suitable habitat for Indiana bat maternity colonies also exists throughout the project area, and additional studies may confirm their presence.

The study project area also contains habitat for a variety of federally listed species of birds. Wintering populations of federally threatened bald eagles (*Haliaeetus leucocephalus*) have been observed, and nesting pairs have been confirmed in areas to the west. Such nesting pairs will probably inhabit the project area in the future as the species continues to expand its range. The Federally endangered American peregrine falcon (*Falco peregrinus anatum*) also occurs as a migrant or transient in the study area.

Endangered freshwater mussels in the study area include the rough pigtoe (*Pleurobema plenum*), orange-footed pearly mussel (*Plethobasus cooperianus*), northern riffleshell (*Epioblasma*

torulosa rangiana), pink mucket pearly mussel (*Lampsilis abrupta*), and the fanshell (*Cyprogenia stegaria*). Recently deceased specimens of the ring pink (*Obovaria retusa*) and clubshell (*Pleurobema clava*) have also been observed, indicating their presence in the project area as well. Other listed mussel species that might still occur in the project area include the fat pocketbook (*Potamilus capax*), tuberculed-blossom pearly mussel (*Epioblasma torulosa torulosa*), cracking pearly mussel (*Hemistena lata*), and purple catspaw pearly mussel (*Edpioblasma sulcata sulcata*). The orange-footed pearly mussel, ring pink, and purple catspaw pearly mussels still reproduce in the Green River, and it is thought that this is one of the few, perhaps the only, rivers in which this occurs.

Federally threatened plants found in the study area include Price's potato bean (*Apios priceana*) and Eggert's sunflower (*Helianthus eggertii*).

Rare species for which potential habitat exists in the project area include the southeastern bat (*Myotis austroriparius*), Rafinesque's big-eared bat (*Plecotus rafinesquii*), eastern small-footed bat (*Myotis leibii*), eastern woodrat (*Neotoma floridana*), Bachman's sparrow (*Aimophila aestivalis*), eastern sand darter (*Ammocrypta pellucida*), northern cave fish (*Amblyopsis spelaea*), southern cave fish (*Typhlichthys subterraneus*), longhead darter (*Percina macrocephala*), blue sucker (*Cycleptus elongatus*), hellbender, Kirtland's water snake (*Clonophis kirtlandi*), cooperbelly water snake (*Nerodia erythrogaster* var. *neglecta*), spectacle case pearly mussel (*Cumberlandia monodonta*), Kentucky creekshell mussel (*Villosa ortnanni*), rabbit's foot pearly mussel (*Ouadrula cylindrica*), purple liliput pearly mussel (*Toxolasma lividus*), pale false foxglove (*Agalinis skinneriana*), royal catchfly (*Silene regia*), and Gattinger's lobelia (*Lobelia appendiculata* var. *gattingeri*). These species are not currently considered candidate species, however, they could be listed in the future if their numbers decline and threats to their survival persist.

6.0 SUMMARY AND CONCLUSION

B1 is located just upstream of Greencastle, in Warren County, 15 miles above the mouth of the Barren River. The site occupies approximately 16.63 acres on the right descending bank. Improvements at the site include the lock, dam, esplanade, and operations building. The original lock and dam was built in 1841 and acquired by the United States on February 20, 1886. The current lock and dam were built 1933-1934 and operations commenced on September 17, 1934. Operations ceased May 24, 1965.

The Corps is considering disposing of federal interest in the facility due to a lack of any continued project purpose, and G.E.C. was contracted to conduct an EBS in order to facilitate the possible disposal. In accordance with applicable requirements contained in AR 200-1 and ASTM E1527-97, G.E.C. reviewed Department of the Army records and federal, state, and local databases,

federal and state agency evaluations, conducted historical research of the site and surrounding area, interviewed pertinent personnel, and performed a site investigation in order to characterize environmental conditions at the site.

There is no evidence that hazardous materials were ever stored, handled, transported, or disposed of at the site.

There are no pole-mounted electrical transformers located at the site and electrical utilities have been disconnected from the operations building, however hydraulic oil released to the environment (Section 5.3) has the potential to contain PCBs. If the structure is removed, analytical investigations of soils under the structure could be warranted.

There is no evidence that the site ever stored significant amounts of petroleum products and/or derivatives, however G.E.C. observed hydraulic oil stains in the lock chamber and operations building. The stains are a result of vandalism to hydraulic piping systems at the facility. Although hydraulic oil was released to the environment, it is G.E.C.'s opinion that any hazard posed to human health or the environment is low.

Chipped, cracked, and flaked paint was observed at the site, on bollards, cleats, and rails associated with the lock, and on the door of the operations building. Should the paint contain lead, conditions at B1 could pose a hazard to human health, and any removal or disturbance of any of the fittings would have to be conducted in accordance with state and local regulations.

There appear to be no asbestos or air quality concerns at the site.

The lock, dam, and operations building appear to be in fair condition. However, due to obvious falling/drowning hazards, and because the site is not secure from public access, there is a potential liability associated with continued ownership of the site.

Three unplottable sites of potential concern were found during the federal and state database review. G.E.C. believes that none of the three are likely to have had any impact on environmental conditions at B1.

G.E.C. observed forested palustrian wetlands at the site, and threatened and endangered species are known to occur in the vicinity.

A Phase I Cultural Resources Survey has concluded there is no evidence of prehistoric or undisturbed historic era cultural remains in the vicinity of the site, however the improvements at B1 may themselves be potentially eligible for listing in the National Register of Historic Places.

In accordance with Finding of Suitability to Transfer (FOST) Requirements for Notification, Covenants, and Access, B1 is a Category 2 site, an area where only release or disposal of petroleum products has occurred.

Section G3

GREEN RIVER LOCK AND DAM NO. 3

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1.0 INTRODUCTION

G3 is located just downstream of Rochester, Kentucky, 108.5 miles above the mouth of the Green River. The site occupies approximately 4.99 acres on the left descending bank (west bank, Muhlenberg County), and 6.72 acres located on the right descending bank (east bank, Ohio County). Improvements at the site include the lock and dam, and the remains of a residence, warehouse, garage, well, and septic tank, all on the right descending bank. The original lock was built in 1833-1836 and acquired by the United States on February 4, 1895. Locking operations were discontinued in September 1981.

The Corps is considering disposing of the federal interest in G3 due to a lack of any continued authorized project purpose. The purpose of this EBS is to characterize the environmental baseline condition of the property in order to facilitate the possible disposal and to identify any potential environmental impacts posed by a transfer of the property from Corps ownership.

2.0 METHODOLOGY

2.1 Federal, State, and , Local Records

The Vista report for this project is presented in Appendix G3-A.

2.2 Site Investigation

G.E.C. personnel conducted a thorough investigation of the property on January 26, 2000. An EBS checklist completed during the investigation is presented in Appendix G3-B. Photographs taken during the investigation are presented in Appendix G3-C.

2.3 Historical Use Information

For this project G.E.C. reviewed the 1953 7.5-minute Rochester, Kentucky quadrangle.

3.0 SITE DESCRIPTION

3.1 Location

G3 is located just downstream of Rochester, in Muhlenberg and Ohio counties, Kentucky, 108.5 miles above the mouth of the Green River, and approximately 600 feet downstream of the Mud River's confluence with the Green. A site location map is presented in Figure G3-1 and an aerial photograph is presented in Figure G3-2.

3.2 Site and Vicinity Characteristics

The 4.99-acre tract in Muhlenberg County lies alongside Kentucky Highway 70. The site consists primarily of an improved gravel parking lot. A small bottomland area is south of the parking lot, towards the Mud River. The northern portion of the site is comprised of a sandstone bluff.

The 6.72-acre tract in Ohio County is accessed by taking an unnamed improved road west from Kentucky Highway 369. The majority of the site consists of level cleared land.

Figure G3-1. Site Location Map

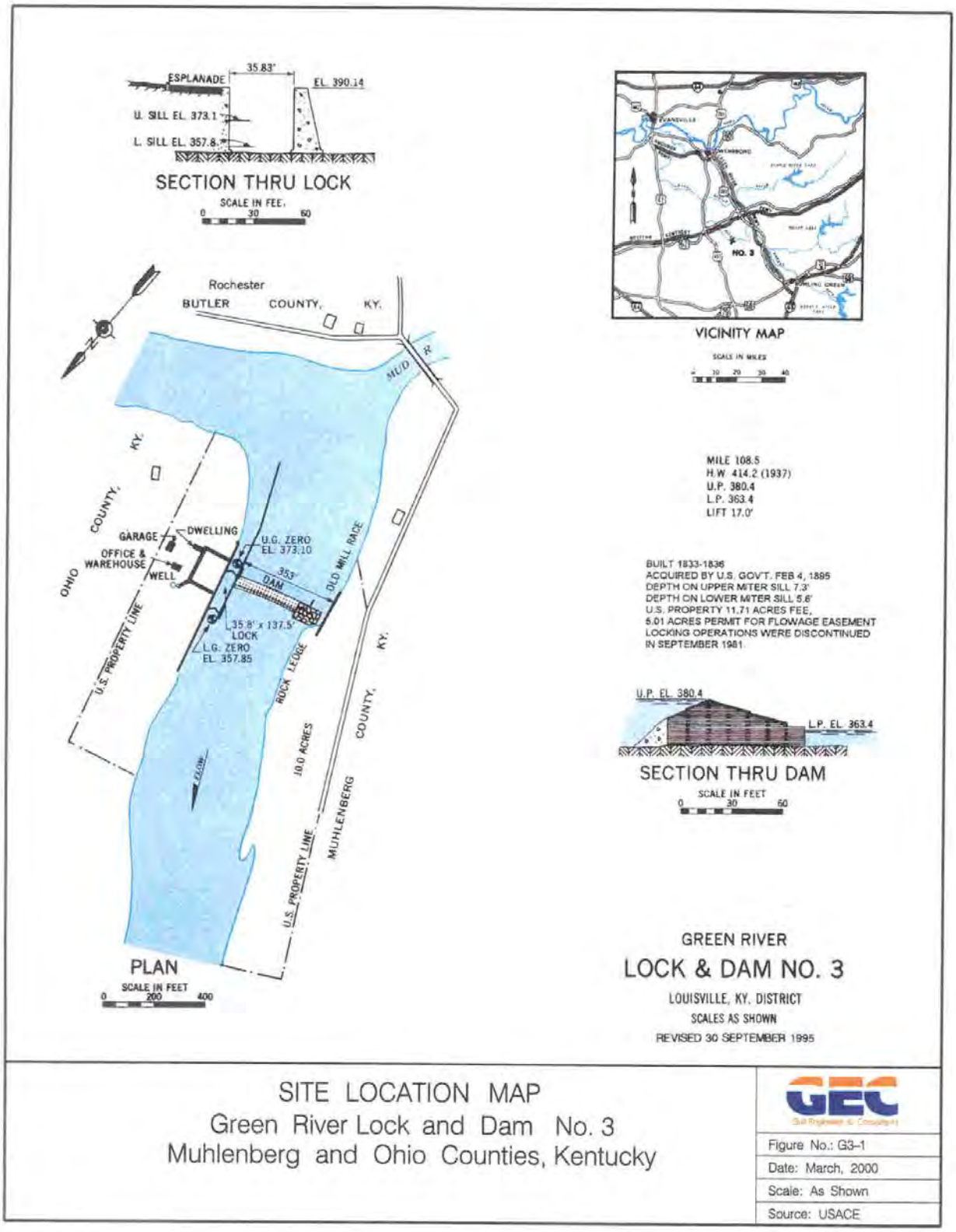
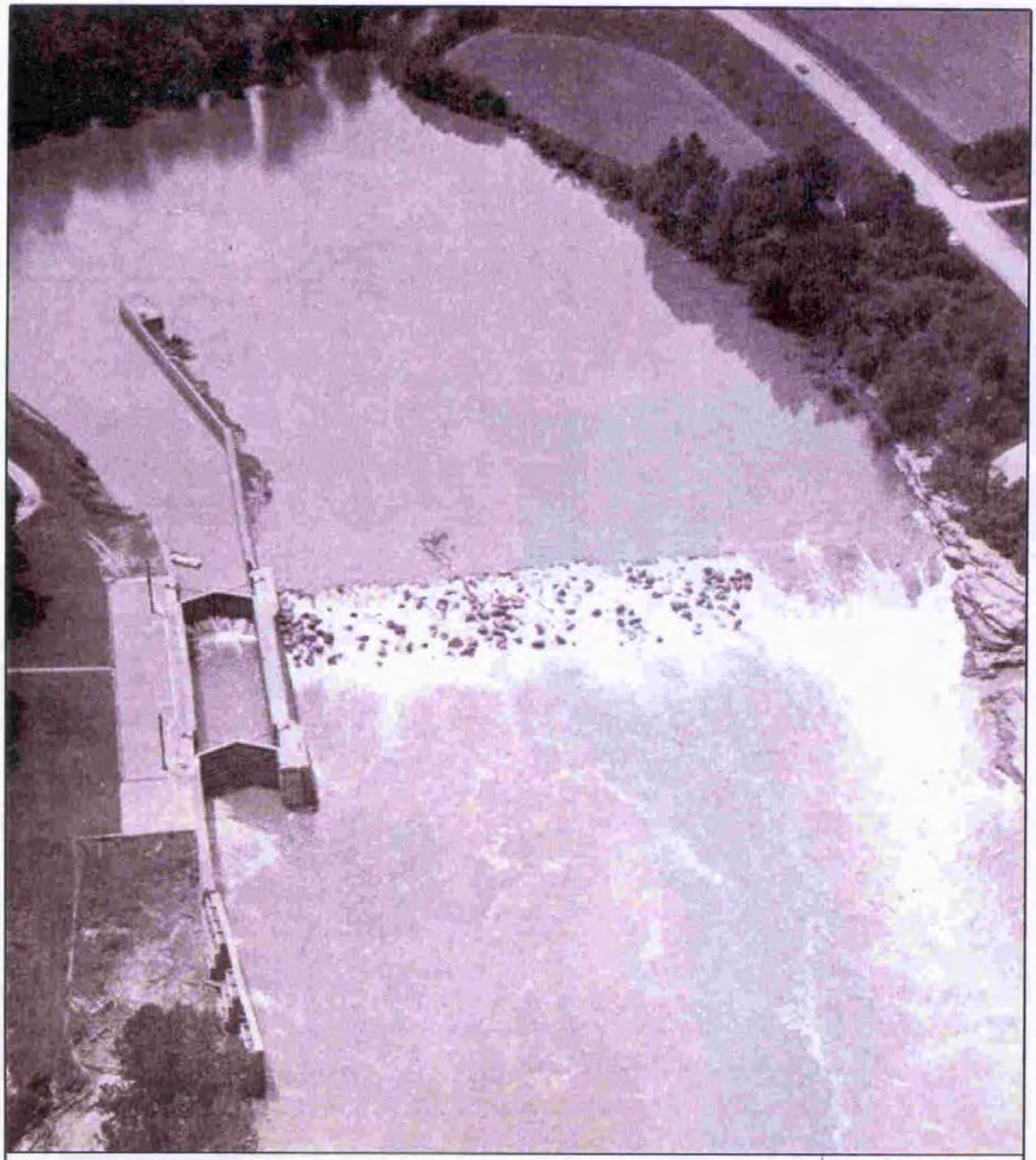


Figure G3-2. Aerial Photograph



AERIAL PHOTOGRAPH
Green River Lock and Dam No. 3
Muhlenberg and Ohio Counties, Kentucky

GEC
Gulf Engineers & Consultants

Figure No.:	G3-2
Date:	March, 2000
Scale:	N/A
Source:	USACE

G3 was constructed at the turn of the century to provide slack water navigation on the Green River. The original lock was built in 1833-1836 and acquired by the United States on February 4, 1895. Locking operations were discontinued in September 1981. Improvements at the site include the lock and dam, and the remains of a residence, warehouse, garage, well, and septic tank, all on the right descending bank. There are no minerals of any value at the site.

Elevation at the property is 395-400 feet, and storm water runoff flows across the property into the Green River.

3.3 Structures, Roads, and Other Improvements

Neither tract is fenced or gated.

Overhead electrical service transits the 6.72-acre tract. No utilities were observed at the 4.99-acre tract.

The facility originally contained several improvements on the right descending bank, including the lock and dam, two residences, a warehouse, two chicken houses, two coal houses, and two toilets. The only remaining improvements are the lock and dam, one residence, the warehouse, garage, well, and septic tank.

The lock is 35.8 feet wide and 137.5 feet long, and the dam is a fixed-type. Upper pool elevation is 380.4 feet and lower pool elevation is 363.4 feet.

3.4 Past Use of the Property

Figure G3-3 presents locations of the parcels described in this section. Parcel A, comprised of 6.72 acres located in Ohio County, was acquired from Prudence Bowles in February 1895. The 6.72 acres included 3.00 acres ceded by the state of Kentucky and 0.25 acres from J. P. Shrum in a deed dated February 1891.

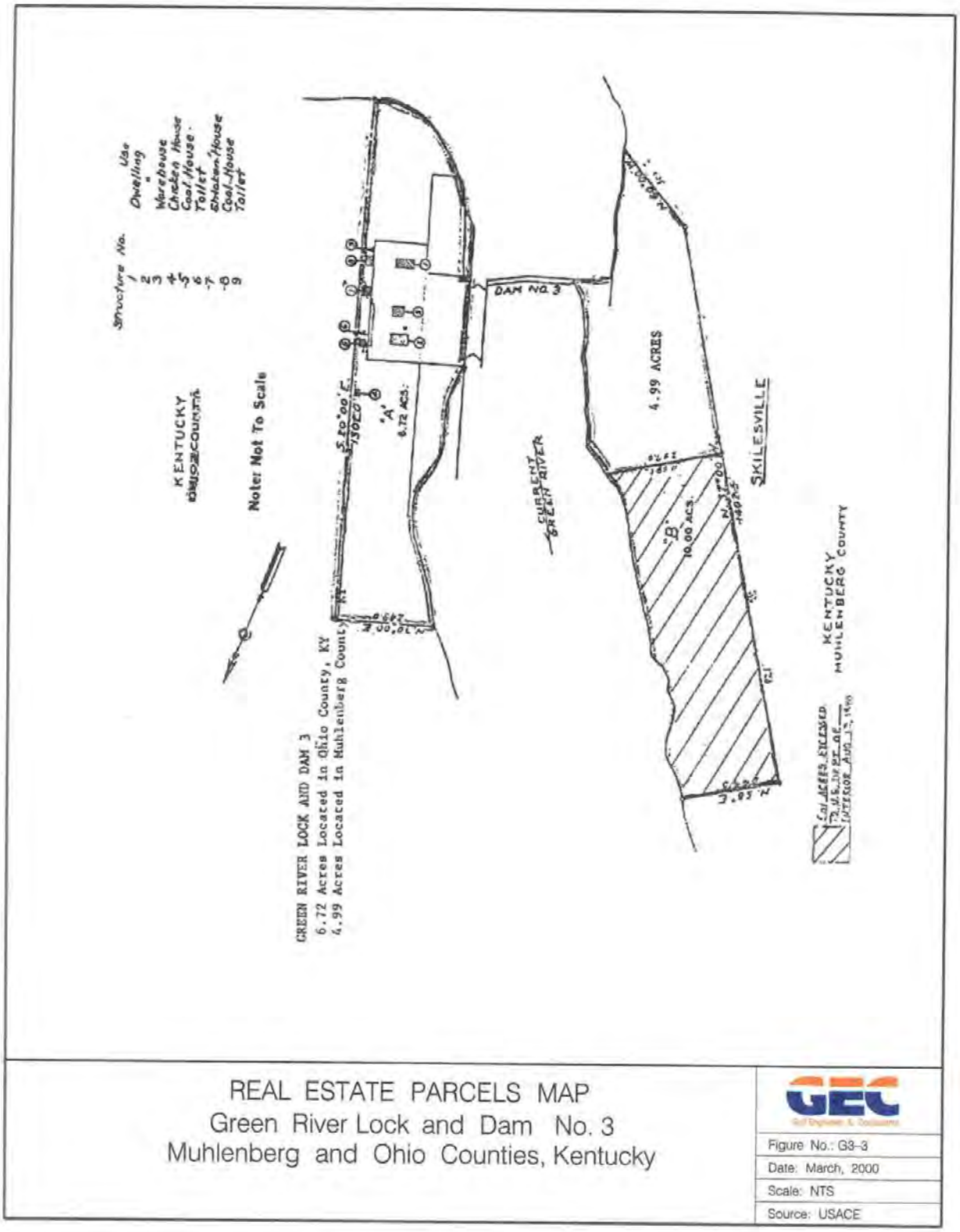
Parcel B, comprised of 10.00 acres located in Muhlenberg County, Kentucky, was ceded to the United States by the state of Kentucky on February 29, 1886.

A portion of Parcel B, consisting of 5.01 acres, was conveyed to Muhlenberg County for use as a public park and recreation. The United States reserved the mineral rights, a perpetual flowage easement, right-of-way for construction and maintenance, and the right to erode the riverbank. The deed provides that title shall revert to the United States if needed for national defense purposes.

The United States currently owns and 4.99 acres in fee simple along with 5.01 acres of perpetual flowage easement and right-of-way for construction and maintenance in Muhlenberg County and 6.72 acres in fee simple in Ohio County.

There are no outgrants associated with the site.

Figure G3-3. Real Estate Parcels Map



3.5 Current Use of the Property

G3 is currently deactivated and considered excess to the needs of the U.S. Government. The Corps is considering disposing of the federal interest in the facility due to a lack of any continued authorized project purpose. There are no Corps employees or contractors at the site, although the 6.72-acre tract is mowed during summer months.

The property on the right descending bank is an attractive nuisance and is used for illegal dumping. Household trash was observed throughout the property, and the three remaining structures have been severely vandalized.

The highest and best use of the 6.72 acres in Ohio County is considered residential. An appraisal of the property has estimated the value at $10,000. The highest and best use of the 4.99 acres in Muhlenberg County is considered recreational. An appraisal of the property has estimated the value at $6,000. A value of $1 has been assigned to each of the easements.

3.6 Adjoining Property

Land adjacent to the 6.72 acres in Ohio County is residential and agricultural to the east and undeveloped scrub shrub woodland to the north. Land adjacent to the 4.99 acres in Muhlenberg County is residential.

Based on G.E.C.'s review of the quadrangle map, aerial photographs, and land title records, land-use in the vicinity of G5 appears little changed over the last 47 years. A portion of the 1953 quadrangle is presented in Figure G3-4.

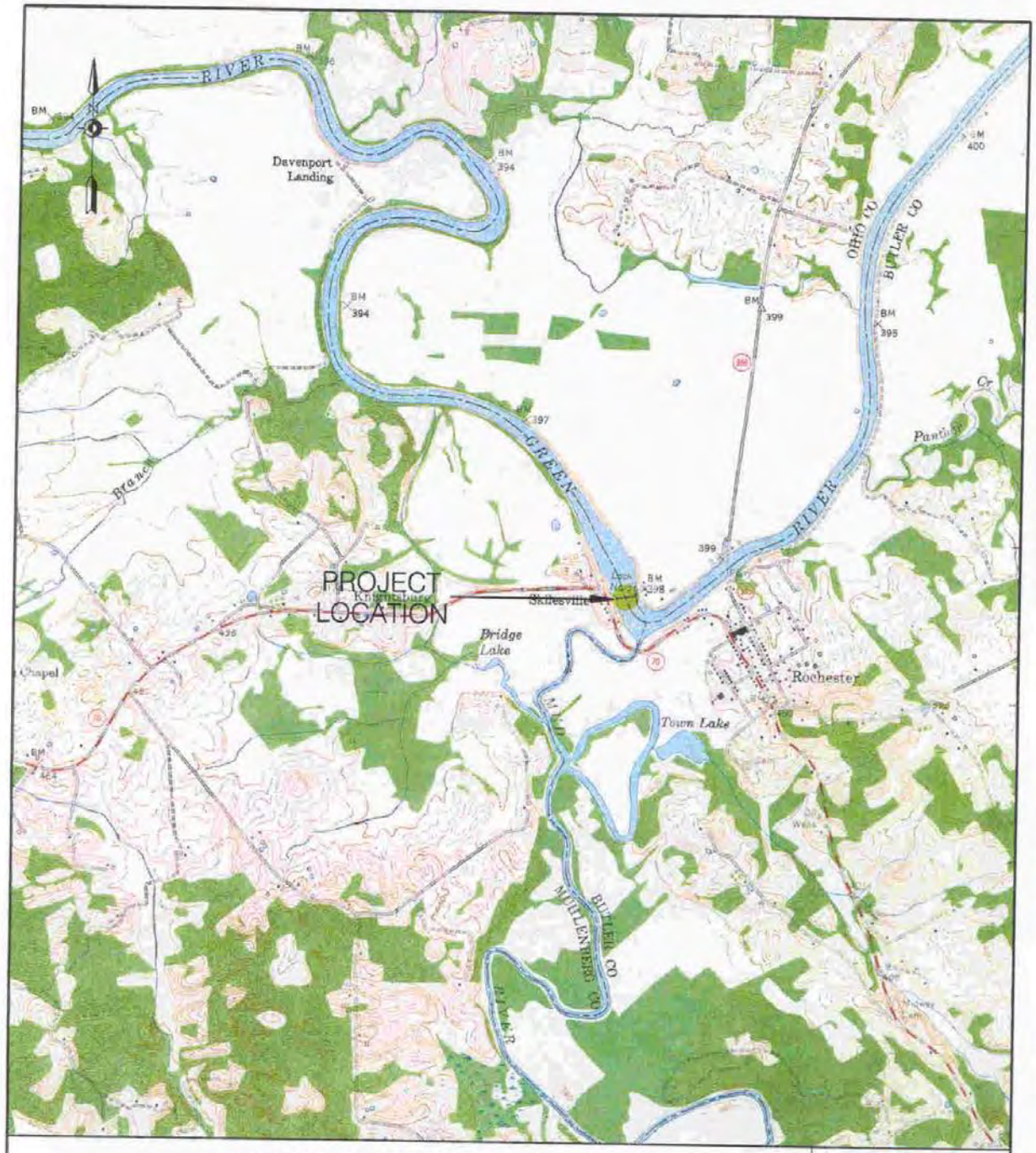
4.0 RECORDS REVIEW

A search of federal, state, and local government environmental databases was conducted in order to obtain and review records and documents that would aid in identifying known or potential environmental concerns at, or in the vicinity of, G3. ASTM E1527-97 provides a list of records that should be reviewed and the minimum search distances to use. AR 200-1 requires a search of Department of the Army records.

4.1 Sites Identified During Records Review

Table G3-1 presents a summary of the sites found in each database during the records review.

Figure G3-4. Historic Topographic Map



HISTORIC TOPOGRAPHIC MAP
Green River Lock and Dam No. 3
Muhlenberg and Ohio Counties, Kentucky

USGS 7.5' Series Quadrangle Rochester, Kentucky 1953

GEC
Geo Engineers & Consultants

Figure No.: G3-4
Date: March, 2000
Scale: 1" = 24,000'
Source: USACE

Table G3-1. Federal and State Database Review Summary

Database	< 0.13 Mile	0.13-0.25 Mile	0.25-0.50 Mile	0.50-1.0 Mile	Total
NPL	0	0	0	0	0
RCRIS-CA	0	0	0	0	0
RCRIS-TSD	0	0	0	-	0
CERCLIS	0	0	0	-	0
CERCLIS (S)	0	0	0	-	0
SWLF	0	0	0	-	0
WELLS	0	0	0	-	0
VIOLATERS	0	0	-	-	0
TRIS	0	0	-	-	0
UST/AST	0	1	-	-	1
ERNS	0	-	-	-	0
GNRTR	0	-	-	-	0

Source: G.E.C., February 2000. (-) Outside ASTM-recommended search radius.

The database review resulted in one plottable site within the ASTM-recommended minimum search distance and 13 unplottable sites. Unplottable sites are those with insufficient location information such that they can only be identified as being within the same zip code as G3. G.E.C. made every effort to locate these sites and assess their relevance to the project.

Of the 13 unplottabe sites, 5 are UST/AST sites. The remaining eight are solid waste landfill facilities.

5.0 FINDINGS

5.1 Hazardous Substances

This section applies to the storage, handling, transportation, and disposal of substances deemed hazardous under the Resource Conservation Recovery Act (RCRA) at G3.

No evidence of such activity at the site, such as stained soil or distressed vegetation, was noted during the field investigation nor discovered in the process of the federal and state database review.

5.2 Polychlorinated Biphenyls

There are no pole-mounted electrical transformers located at the site and electrical utilities have been disconnected from the residence. It is G.E.C.'s opinion that no hazard is posed to human health or the environment.

5.3 Petroleum Products / Petroleum Derivatives

G.E.C. could find no information in the course of the records review or field investigation that the facility ever stored significant amounts of petroleum products and/or derivatives or that a release of such material ever occurred. Accordingly, it is G.E.C.'s opinion that there are no hazards to human health or the environment.

5.4 Lead

Chipped, cracked, and flaked paint was observed at the site, on bollards, cleats, and rails associated with the lock, and on the three remaining structures. Should the paint contain lead, conditions at G3 could pose a hazard to human health, and removal or disturbance of any of the fittings would have to be conducted in accordance with state and local regulations.

5.5 Asbestos

Possible asbestos containing material, in the form of ceiling tiles, was observed in the former residence. Should the tiles contain asbestos, conditions in the residence could pose a hazard to human health. Disturbance or removal of the residence would have to be conducted in accordance with state and local regulations.

5.6 Air Quality

Other than the possible asbestos containing material, there are no apparent air quality issues associated with the property.

5.7 Public Safety

With the exception of the timber portion of the downstream guide wall, which appears to be in a state of failure, the majority of the project appears to be in satisfactory condition. The wall has settled and rotated riverward, and it appears the wall will fail completely in the near future.

The walls of the lock, constructed of cut stone masonry, show signs of significant surficial weathering, however they show no evidence of settlement or movement. The esplanade, although cracked, can still adequately support light cars and trucks. However, due to obvious falling/drowning hazards, and because the site is not secure from public access, there may be liability associated with ownership of the site.

5.8 Potential Sites of Concern

G.E.C. was able to locate all of the UST/AST sites (one plottable and five unplottable) and they are outside the ASTM-recommended search distance.

G.E.C. was unable to locate any of the eight solid waste landfill facilities, however they were not observed in the vicinity of the site. This was confirmed by information provided during interviews, when local residents indicated that none of the sites were located near G3. As a result, it

is G.E.C.s opinion that none of the 14 sites are likely to have had any impact on environmental conditions at G3.

5.9 Federal and State Agency Evaluations

5.9.1 Wetlands

A Department of the Interior National Wetlands Inventory Map dated 1988, a portion of which is presented in Figure G3-5, indicates a forested palustrian wetland at the site, in the form of narrow riparian zones adjacent to the river. G.E.C. confirmed this during the field investigation.

5.9.2 Cultural Resources

A Phase I Cultural Resources Reconnaissance was performed in 1998 for the site to determine if any archaeological resources would be impacted by federal disposal of the property. The reconnaissance found no evidence of prehistoric or undisturbed historic era cultural remains. Efforts are currently underway to document the existing structures at the facility. To date, the District has completed a brief historical overview of the Green and Barren rivers navigational system and prepared archival quality photo documentation of all extant structures. It is anticipated that the report containing this information will be completed July 2000. The District expects that the facility will be determined eligible for inclusion in the National Register of Historic Places and will require an as yet undetermined level of additional research and documentation.

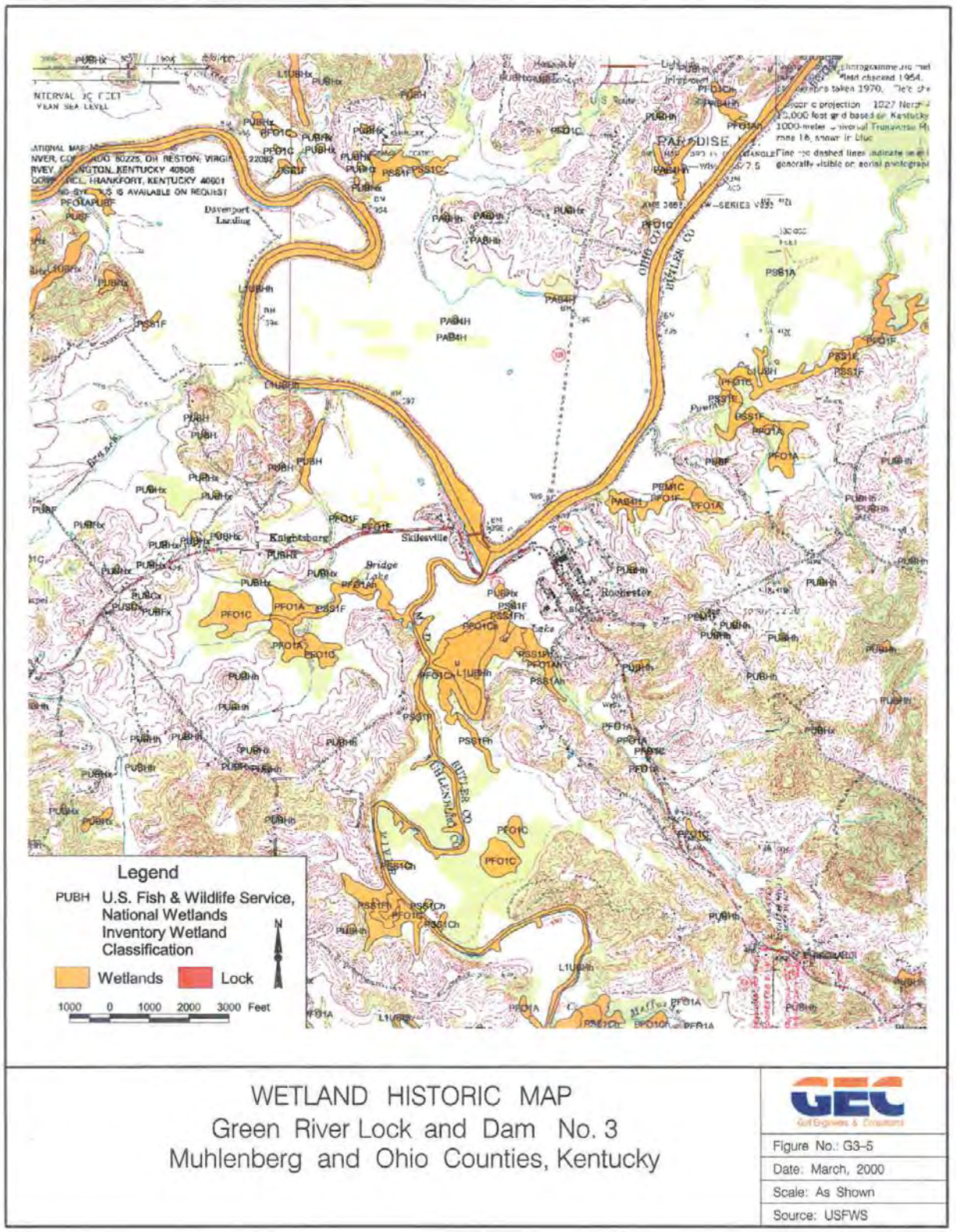
5.9.3 Threatened and Endangered Species

Threatened and endangered species occur in the Green and Barren rivers and on adjacent terrestrial habitat. The Federally endangered Kentucky cave shrimp (*Palaemonias ganteri*) is endemic to the Mammoth Cave system, portions of which are located within the pool created by G6, and the U.S. Fish and Wildlife Service (USFWS) has designated portions of the Roaring River passage of the Flint-Mammoth Cave system in the Edmonson County portion of Mammoth Cave National Park as critical habitat for the species.

Caves in the study area also provide habitat for the federally endangered gray bat and Indiana bat, which use the caves as hibernacula. One cave within the study area is known to support a gray bat maternity colony, and future surveys in additional caves may find other maternity colonies. Suitable habitat for Indiana bat maternity colonies also exists throughout the project area, and additional studies may confirm their presence.

The study project area also contains habitat for a variety of federally listed species of birds. Wintering populations of federally threatened bald eagles (*Haliaeetus leucocephalus*) have been observed, and nesting pairs have been confirmed in areas to the west. Such nesting pairs will probably inhabit the project area in the future as the species continues to expand its range. The

Figure G3-5. NWI Map.



Federally endangered American peregrine falcon (*Falco peregrinus anatum*) also occurs as a migrant or transient in the study area.

Endangered freshwater mussels in the study area include the rough pigtoe (*Pleurobema plenum*), orange-footed pearly mussel (*Plethobasus cooperianus*), northern riffleshell (*Epioblasma torulosa rangiana*), pink mucket pearly mussel (*Lampsilis abrupta*), and the fanshell (*Cyprogenia stegaria*). Recently deceased specimens of the ring pink (*Obovaria retusa*) and clubshell (*Pleurobema clava*) have also been observed, indicating their presence in the project area as well. Other listed mussel species that might still occur in the project area include the fat pocketbook (*Potamilus capax*), tuberculed-blossom pearly mussel (*Epioblasma torulosa torulosa*), cracking pearly mussel (*Hemistena lata*), and purple catspaw pearly mussel (*Edpioblasma sulcata sulcata*). The orange-footed pearly mussel, ring pink, and purple catspaw pearly mussels still reproduce in the Green River, and it is thought that this is one of the few, perhaps the only, rivers where this occurs.

Federally threatened plants found in the study area include Price's potato bean (*Apios priceana*) and Eggert's sunflower (*Helianthus eggertii*).

Rare species for which potential habitat exists in the project area include the southeastern bat (*Myotis austroriparius*), Rafinesque's big-eared bat (*Plecotus rafinesquii*), eastern small-footed bat (*Myotis leibii*), eastern woodrat (*Neotoma floridana*), Bachman's sparrow (*Aimophila aestivalis*), eastern sand darter (*Ammocrypta pellucida*), northern cave fish (*Amblyopsis spelaea*), southern cave fish (*Typhlichthys subterraneus*), longhead darter (*Percina macrocephala*), blue sucker (*Cycleptus elongatus*), hellbender, Kirtland's water snake (*Clonophis kirtlandi*), cooperbelly water snake (*Nerodia erythrogaster* var. *neglecta*), spectacle case pearly mussel (*Cumberlandia monodonta*), Kentucky creekshell mussel (*Villosa ortnanni*), rabbit's foot pearly mussel (*Ouadrula cylindrica*), purple liliput pearly mussel (*Toxolasma lividus*), pale false foxglove (*Agalinis skinneriana*), royal catchfly (*Silene regia*), and Gattinger's lobelia (*Lobelia appendiculata* var. *gattingeri*). These species are not currently considered candidate species, however, they could be listed in the future if their numbers decline and threats to their survival persist.

6.0 SUMMARY AND CONCLUSION

G3 is located just downstream of Rochester, Kentucky, 108.5 miles above the mouth of the Green River. The site occupies approximately 4.99 acres in Muhlenberg County, and 6.72 acres in Ohio County. Improvements at the site include the lock and dam, and the remains of a residence, warehouse, garage, well, and septic tank, all on the right descending bank. The original lock was built in 1833-1836 and acquired by the United States on February 4, 1895. Locking operations were discontinued in September 1981.

The Corps is considering disposing of the federal interest in the facility due to a lack of any continued authorized project purpose, and G.E.C. was contracted to conduct an EBS in order to facilitate the possible disposal. In accordance with applicable requirements contained in AR 200-1 and ASTM E1527-97, G.E.C. reviewed Department of the Army records and federal, state, and local databases, federal and state agency evaluations, conducted historical research of the site and surrounding area, interviewed pertinent personnel, and performed a site investigation in order to characterize environmental conditions at the site.

There is no evidence that hazardous materials were ever stored, handled, transported, or disposed of at the site.

There is no evidence suggesting the presence of PCBs at the site.

There is no evidence that the facility ever stored significant amounts of petroleum products and/or derivatives or that a release of such material ever occurred.

Chipped, cracked, and flaked paint was observed at the site, on bollards, cleats, and rails associated with the lock, and on the three remaining structures. Should the paint contain lead, conditions at G3 could pose a hazard to human health, and removal or disturbance of any of the fittings would have to be conducted in accordance with state and local regulations.

Possible asbestos containing material, in the form of ceiling tiles, was observed in the former residence. Should the tiles contain asbestos, conditions in the residence could pose a hazard to human health. Disturbance or removal of the residence would have to be conducted in accordance with state and local regulations.

There appear to be no air quality concerns at the site other than the possible asbestos-containing material.

With the exception of the timber portion of the downstream guide wall, which appears to be in a state of failure, the majority of the project appears to be in satisfactory condition. However, due to obvious falling/drowning hazards, and because the site is not secure from public access, there may be liability associated with continued ownership of the site.

Fourteen sites of potential concern were found during the federal and state database review. G.E.C. located six of the 14 and they are outside of the ASTM-recommended search distances. There is reason to believe the remaining eight sites are also located well away from the site. In any event, it is unlikely that any of the 14 sites has had an impact on conditions at G3.

G.E.C. observed forested palustrian wetlands at the site, and threatened and endangered species are known to occur in the vicinity.

A Phase I Cultural Resources Survey has concluded there is no evidence of prehistoric or undisturbed historic era cultural remains in the vicinity of the site, however the improvements at G3 may themselves be potentially eligible for listing in the National Register of Historic Places.

In accordance with Finding of Suitability to Transfer (FOST) Requirements for Notification, Covenants, and Access, G3 is a Category 1 site, an area where no release or disposal of hazardous substances or petroleum products has occurred, and no migration of these substances from adjacent areas has occurred.

Section G4

GREEN RIVER LOCK AND DAM NO. 4

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1.0 INTRODUCTION

G4 is located at Woodbury, Butler County, Kentucky, 149.0 miles above the mouth of the Green River. Government-owned property at the site consists of the lock and lock walls, and a USGS gauging station on a 0.01-acre tract located on the left descending (west) bank.

The Corps is considering disposing of the federal interest in the 0.01 acre, and the purpose of this EBS is to characterize the environmental baseline condition of the property in order to facilitate the possible disposal and to identify any potential environmental impacts posed by a transfer of the property from the Corps ownership.

2.0 METHODOLOGY

2.1 Federal, State, and Local Records

The Vista report for this project is presented in Appendix G4-A.

2.2 Site Investigation

G.E.C. personnel conducted a thorough investigation of the property on January 25, 2000. An EBS checklist completed during the investigation is presented in Appendix G4-B. Photographs taken during the investigation are presented in Appendix G4-C.

2.3 Historical Use Information

For this project G.E.C. reviewed maps dating back to 1954. Maps reviewed:

7.5' Morgantown, Kentucky	1954
7.5' Morgantown, Kentucky	1973

3.0 SITE DESCRIPTION

3.1 Location

G4 is located at Woodbury, in Butler County, Kentucky, 149.0 miles above the mouth of the Green River. The site is accessed by Kentucky Highway 403/263. A site location map is presented in Figure G4-1 and an aerial photograph is presented in Figure G4-2.

3.2 Site and Vicinity Characteristics

The 0.01-acre site is located on the left descending bank of the Green River immediately upstream of the former lock and dam project. Access to the property is not secured.

Elevation at the property is 400-405 feet, and storm water flows towards the Green River. The riverbank is forested, and herbaceous vegetation and woody shrubs cover the terrace. There are no minerals of any value at the site.

3.3 Structures, Roads, and Other Improvements

The USGS gauging station and the underground electrical utility that supplies its power are the only improvements.

Figure G4-1. Site Location Map

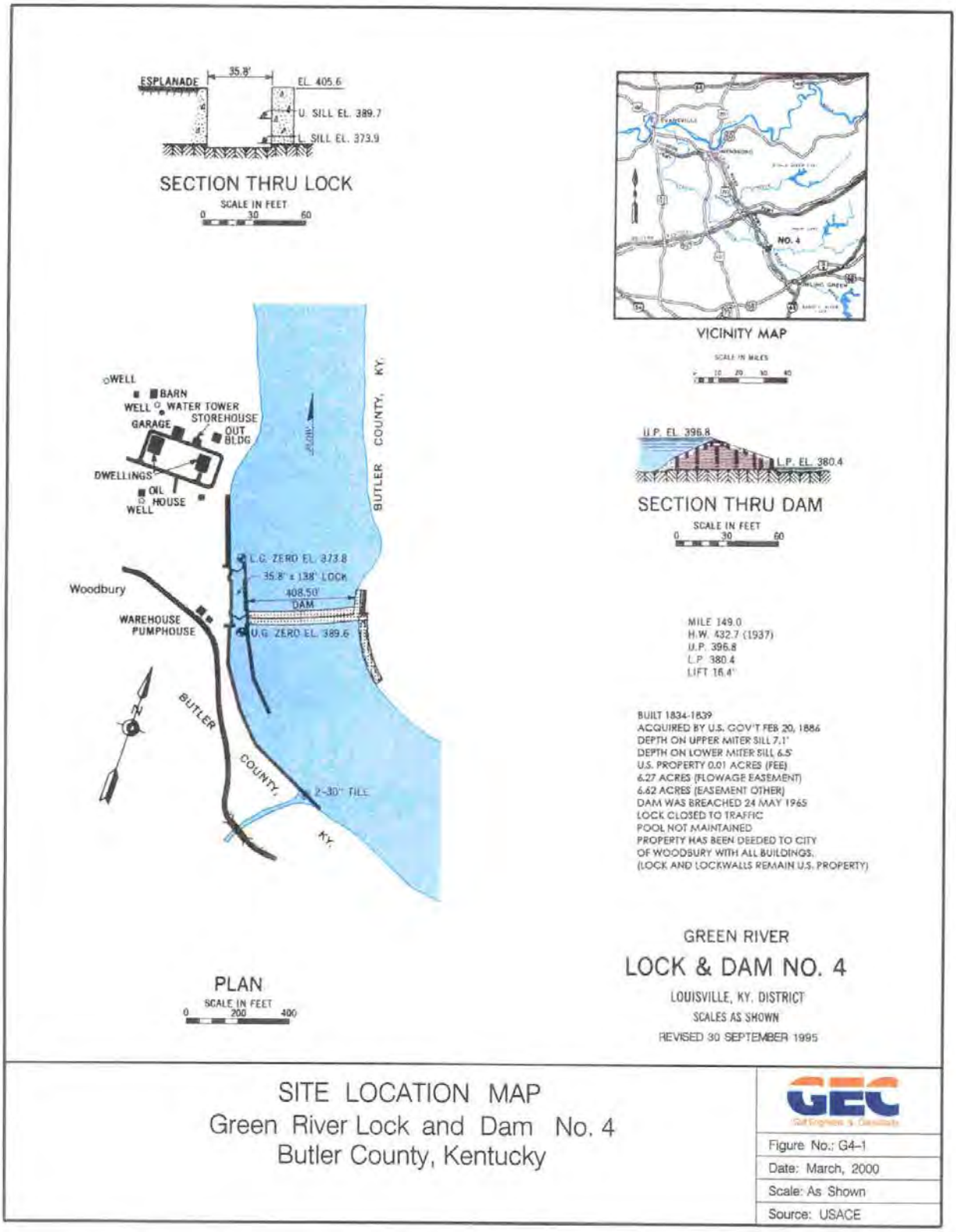
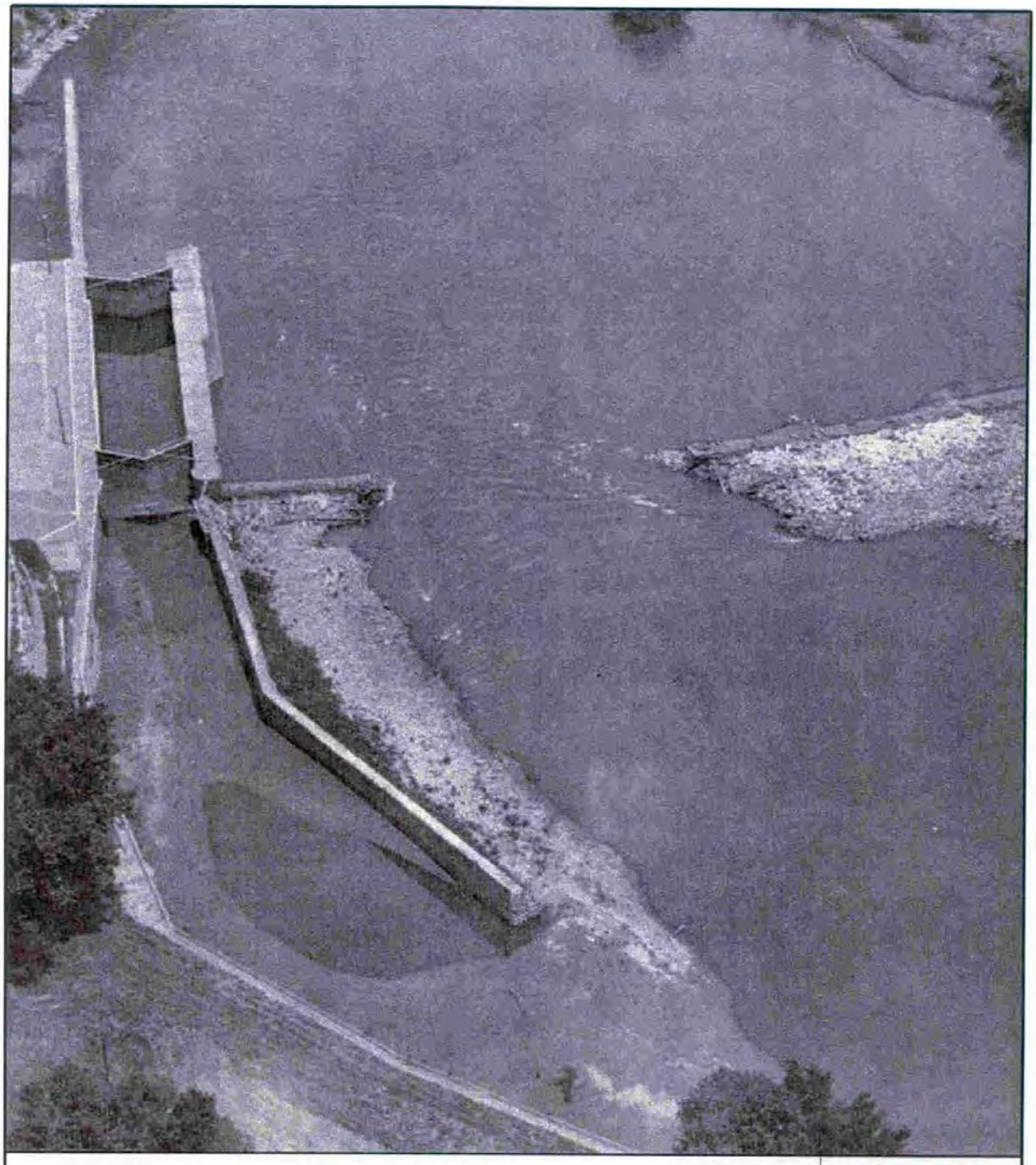


Figure G4-2. Aerial Photograph



AERIAL PHOTOGRAPH
Green River Lock and Dam No. 4
Butler County, Kentucky

GEC
Geo Engineers & Consultants

Figure No.: G4-2
Date: March, 2000
Scale: N/A
Source: USACE

3.4 Past Use of the Property

Figure G4-3 presents locations of the parcels described in this section. Parcel A, consisting of 1.70 acres, was acquired from the Evansville and Bowling Green Packet Company by Commissioner's Deed dated September 25, 1911, recorded in deed book 19, page 366 in the records of Butler County.

Parcel B, 0.50 acres, was acquired from J. W. Newton by Commissioner's Deed dated September 25, 1911, recorded in deed book 19, page 362 in the records of Butler County.

Parcel C, 0.60 acres fee, was acquired from E. C. and Ida L. Kuykendall by Commissioner's Deed dated September 25, 1911, recorded October 11,1911, in deed book 19, page 358 in the records of Butler County.

Parcel D, 13.70 acres fee, was acquired from H. S. McGinis by Commissioner's Deed dated September 25, 1900, recorded in deed book 19, page 353 in the records of Butler County.

Parcel E, 8.61 acres fee, was acquired from the Commonwealth of Kentucky by an act of the general assembly approved February 20, 1886, ceding the same to the United States, and the Green and Barren River Navigation Company by deed dated August 31, 1888.

Parcel F, 1.66 acres fee, was acquired in the same manner as parcel E.

A 3.6-acre portion of Parcels A, C, and E, and all 1.66 acres of Parcel F, for a total of 5.26 acres, were conveyed to Butler County, Kentucky for use as a public park and recreation by quitclaim deed dated November 25, 1987. The United States reserved the mineral rights, a perpetual flowage easement, and right-of-way easement over the entire 5.26 acres. The deed provided that title to the land shall revert to the United States if needed for national defense purposes.

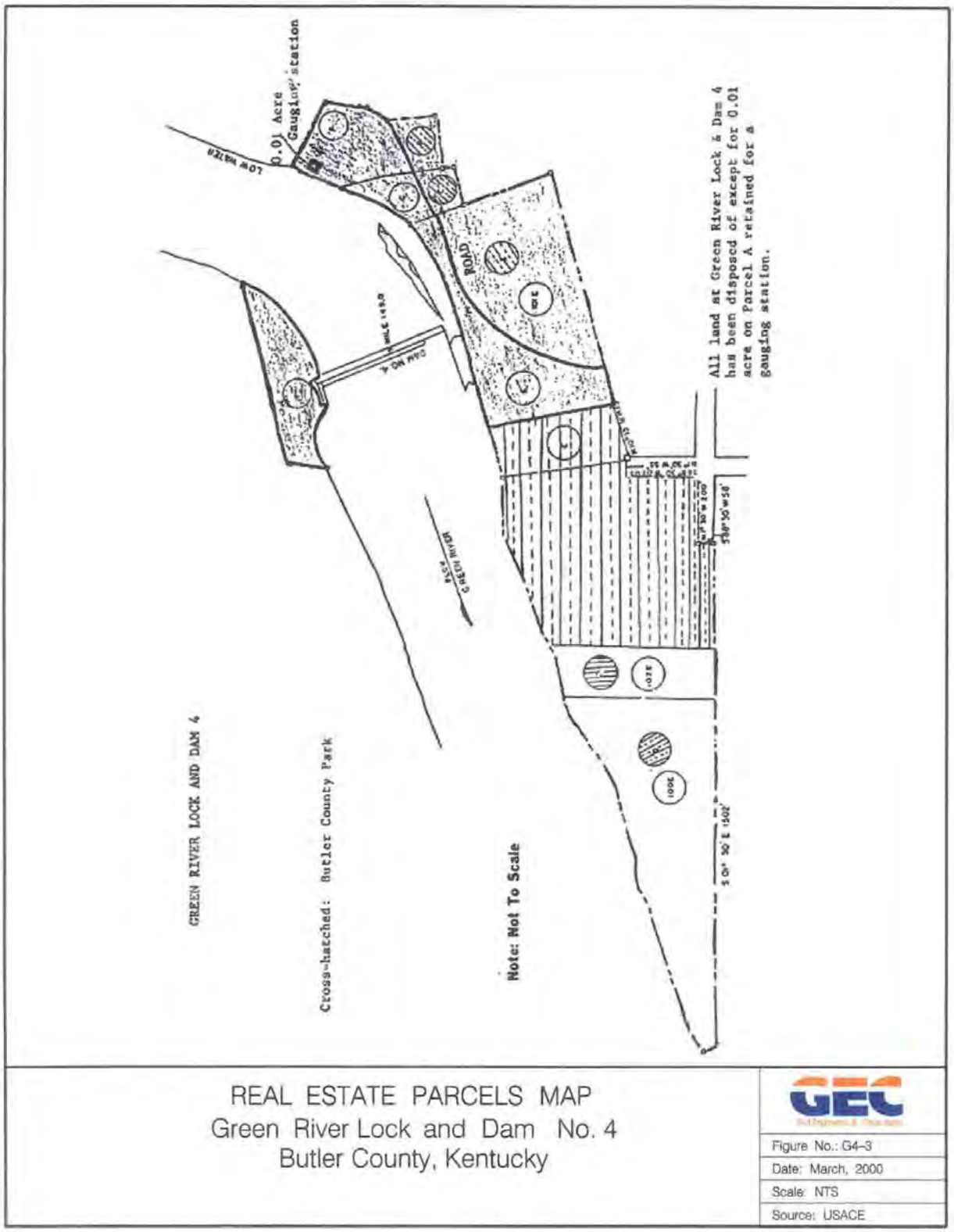
The United States retained 0.01 acre on Parcel A for the gauging station.

A 6.27-acre portion of Parcel D was conveyed to Harrry Barrett by quitclaim deed dated April 9, 1955. An easement for a right-of-way (not to exceed a width of 16 feet) extending over the government reservation and along the west boundary from the existing street was also granted. The United States reserved a perpetual flowage easement over the entire 6.27 acres.

A 1.89-acre portion of Parcel D was conveyed to N. B. Hudson by quitclaim deed dated December 20, 1973. The deed also granted an easement for a right-of-way (not to exceed a width of 16 feet) for joint and concurrent use with others over the government reservation and along the west boundary from the existing street. No reservations to the United States were included in the quitclaim deed.

A 8.59-acre portion of Parcels D and E was conveyed to Butler County, Kentucky for use as a public park and recreation by quitclaim deed dated January 10, 1975, recorded January 13, 1975, in

Figure G4-3. Real Estate Parcels Map



deed book 93, page 619 in the records of Butler County. Conveyance was subject to a perpetual easement for right-of-way extending along the west boundary from the north end of an unnamed street on the north end of the town of Woodbury, Kentucky, to a 6.27-acre tract conveyed to Harry Barrett by the Department of the Army. The United States reserved all mineral interests. The deed provided that title shall revert to the United States if needed for national defense purposes.

A 4.73-acre tract consisting of portions from Parcels C and E and all of Parcel B was conveyed to Euda C. and Coweta House quitclaim deed dated March 20, 1958, recorded April 7, 1958, in deed book 72, page 462 in the records of Butler County. The United States reserved a perpetual easement for ingress and egress.

The United States currently owns 0.01 acre in fee simple, 11.53 acres of perpetual flowage easement, 9.99 acres of right-of-way, and the mineral interests on 13.85 acres.

There are no outgrants associated with the property.

3.5 Current Use of the Property

The 0.01-acre tract is occupied by a USGS gauging station and the Corps is considering disposing of federal interest in the property. There are no Corps employees or contractors at the site.

3.6 Adjoining Property

Adjacent land use consists of the former lock and dam site and pastureland.

Based on G.E.C.'s review of quadrangle maps, aerial photographs, and land title records, land-use in the vicinity of G4 appears little changed over the last 46 years. A portion of the 1954 quadrangle is presented in Figure G4-4.

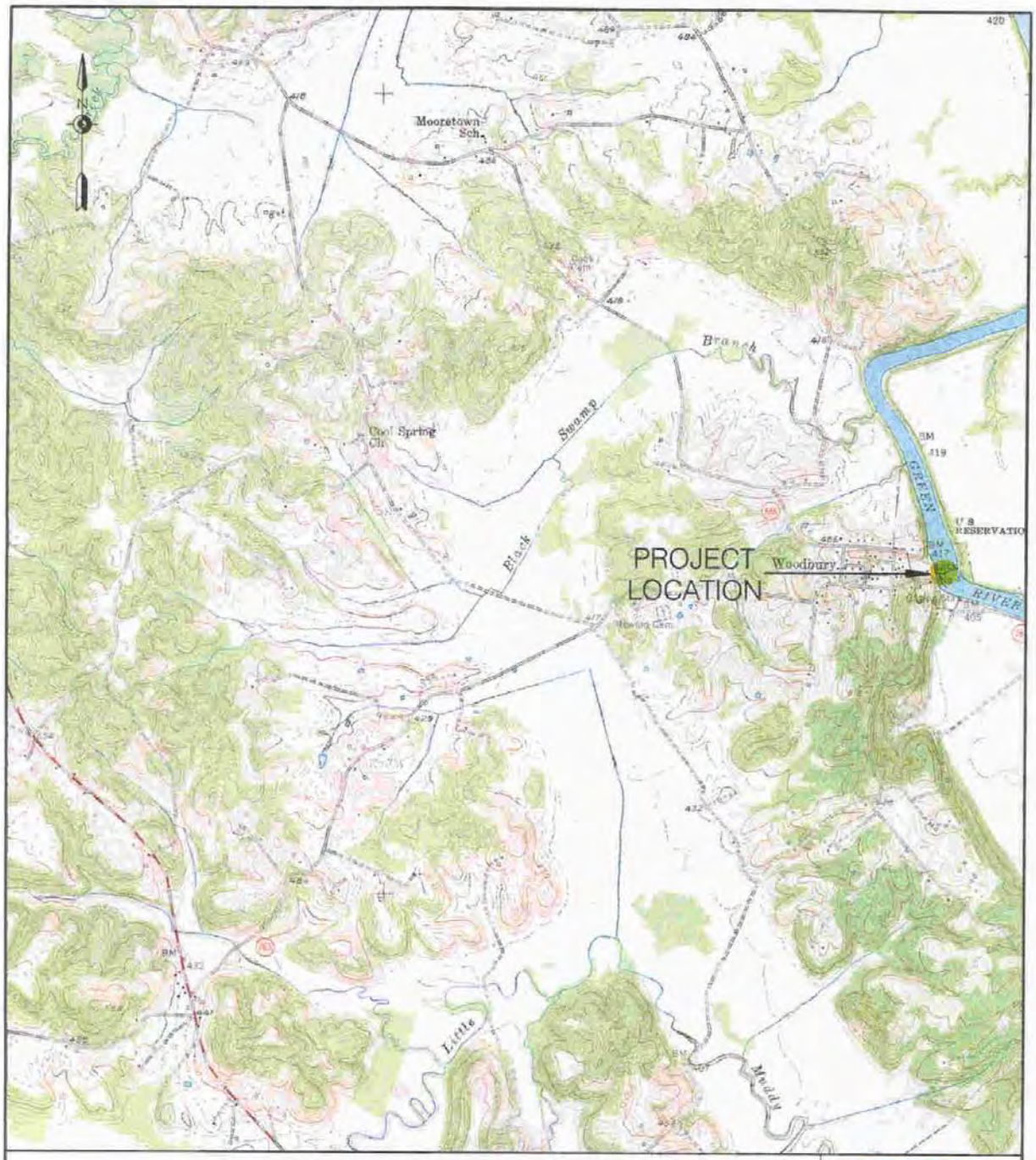
4.0 RECORDS REVIEW

A search of federal, state, and local government environmental databases was conducted in order to obtain and review records and documents that would aid in identifying known or potential environmental concerns at, or in the vicinity of, G4. ASTM E1527-97 provides a list of records that should be reviewed and the minimum search distances to use. AR 200-1 requires a search of Department of the Army records.

4.1 Sites Identified During Records Review

Table G4-1 presents a summary of the sites found in each database during the records review.

Figure G4-4. Historic Topographic Map.



HISTORIC TOPOGRAPHIC MAP
Green River Lock and Dam No. 4
Butler County, Kentucky

USGS 7.5' Series Quadrangle Morgantown, Kentucky 1954

GEC Gulf Engineers & Consultants

Figure No.: G4-4
Date: March, 2000
Scale: 1" = 24,000'
Source: USACE

Table G4-1. Federal and State Database Review Summary

Database	< 0.13 Mile	0.13-0.25 Mile	0.25-0.50 Mile	0.50-1.0 Mile	Total
NPL	0	0	0	0	0
RCRIS-CA	0	0	0	0	0
RCRIS-TSD	0	0	0	-	0
CERCLIS	0	0	0	-	0
CERCLIS (S)	0	0	0	-	0
SWLF	0	0	0	-	0
WELLS	0	0	0	-	0
VIOLATERS	0	0	-	-	0
TRIS	0	0	-	-	0
UST/AST	0	0	-	-	0
ERNS	0	-	-	-	0
GNRTR	0	-	-	-	0

Source: G.E.C., February 2000. (-) Outside ASTM-recommended search radius.

The database review resulted in no plottable sites within the ASTM E1527-97 recommended minimum search distance and six unplottable sites. Unplottable sites are those with insufficient location information such that they can only be identified as being within the same zip code as G4. G.E.C. made every effort to locate these sites and assess their relevance to the project. Of the six sites, three are UST/AST sites. The remaining three are solid waste landfill facilities.

5.0 FINDINGS

5.1 Hazardous Substances

This section applies to the storage, handling, transportation, and disposal of substances deemed hazardous under the Resource Conservation Recovery Act (RCRA) at G4.

No evidence of such activity at the site, such as stained soil or distressed vegetation, was noted during the field investigation nor discovered in the process of the federal and state database review.

5.2 Polychlorinated Biphenyls

There are no pole-mounted electrical transformers located at the site, and it is G.E.C.'s opinion that no hazard is posed.

5.3 Petroleum Products / Petroleum Derivatives

G.E.C. could find no information in the course of the records review or field investigation that petroleum products and/or derivatives were stored at the gauging station or that a release of such materials ever occurred. Accordingly, it is G.E.C.'s opinion that there are no hazards.

5.4 Lead

Chipped, cracked, and flaked paint was observed on the door of the gauging station. Should the paint contain lead, conditions could pose a hazard to human health. Disturbance or removal of the structure would have to be conducted in accordance with state and local regulations.

5.5 Asbestos

There appear to be no asbestos concerns at the property.

5.6 Air Quality

There are no apparent air quality issues associated with the property.

5.7 Public Safety

The gauging station is not secured from public access and does present a potential fall hazard.

5.8 Potential Sites of Concern

G.E.C. was able to locate the three UST/AST sites and they are well outside the ASTM-recommended search distance.

G.E.C. was unable to locate the three solid waste landfill facilities, however they were not observed to be in the vicinity of the site.

It is G.E.C.s opinion that none of the six unplottable sites are likely to have had any impact on environmental conditions at G4.

5.9 Federal and State Agency Evaluations

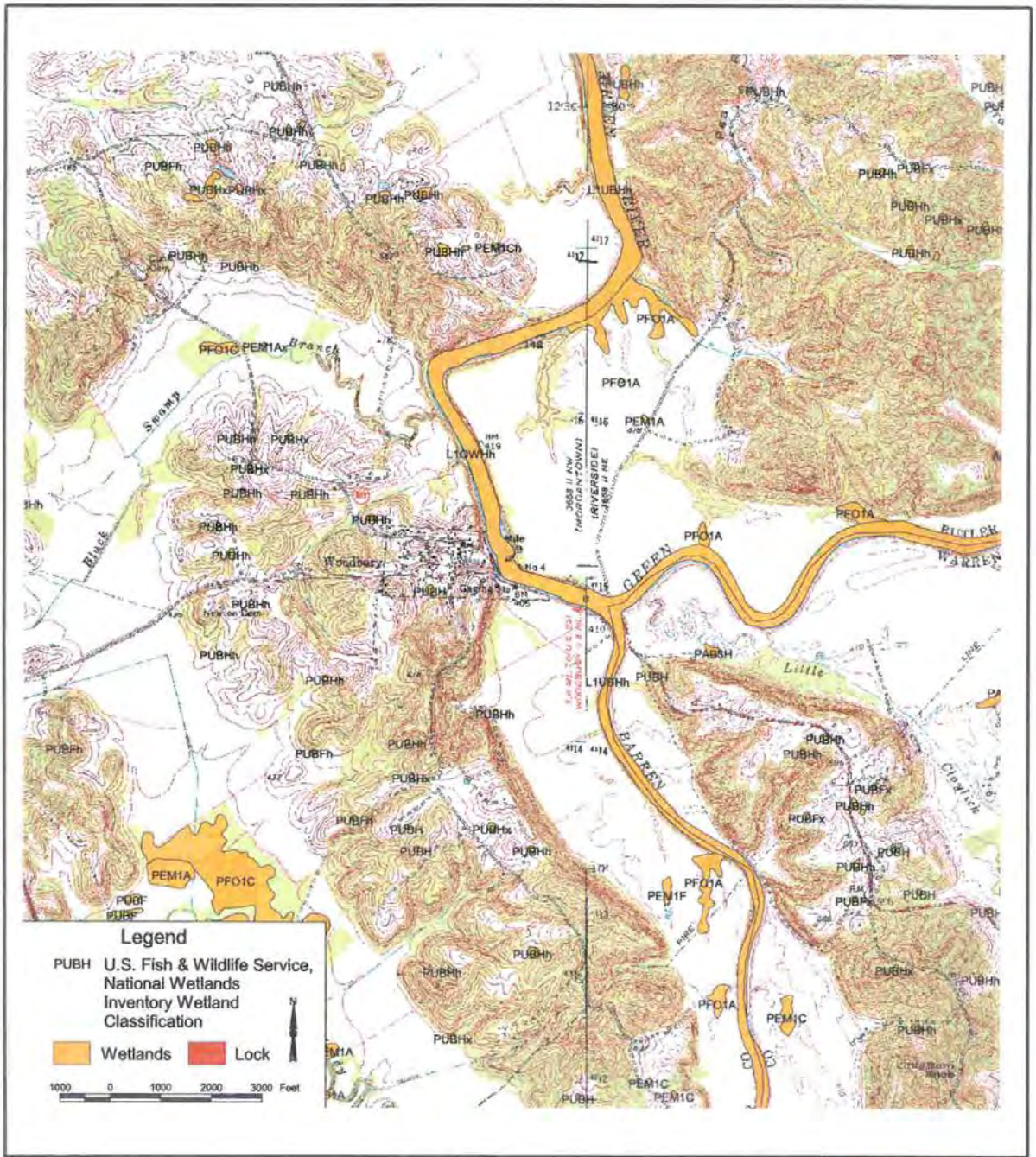
5.9.1 Wetlands

A Department of the Interior National Wetlands Inventory Map dated 1988, a portion of which is presented in Figure G4-5, indicates that there are no wetlands on the property. G.E.C.'s survey of the site during the field investigation confirmed this.

5.9.2 Cultural Resources

A Phase I Cultural Resources Reconnaissance was performed in 1998 for the site to determine if any archaeological resources would be impacted by federal disposal of the property. The reconnaissance found no evidence of prehistoric or undisturbed historic era cultural remains. Efforts are currently underway to document the existing structures at the facility. To date, the District has completed a brief historical overview of the Green and Barren rivers navigational system and prepared archival quality photo documentation of all extant structures. It is anticipated that the report containing this information will be completed July 2000. The District expects that the facility will be determined eligible for inclusion in the National Register of Historic Places and will require an as yet undetermined level of additional research and documentation.

Figure G4-5



WETLAND LOCATION MAP
Green River Lock and Dam No. 4
Butler County, Kentucky

GEC Geo Engineer & Consultants

Figure No.: G4-5
Date: March, 2000
Scale: As Shown
Source: USFWS

5.9.3 Threatened and Endangered Species

Threatened and endangered species occur in the Green and Barren rivers and on adjacent terrestrial habitat. The federally endangered Kentucky cave shrimp (*Palaemonias ganteri*) is endemic to the Mammoth Cave system, portions of which are located within the pool created by G6, and the U.S. Fish and Wildlife Service (USFWS) has designated portions of the Roaring River passage of the Flint-Mammoth Cave system in the Edmonson County portion of Mammoth Cave National Park as critical habitat for the species.

Caves in the study area also provide habitat for the federally endangered gray bat and Indiana bat, which use the caves as hibernacula. One cave within the study area is known to support a gray bat maternity colony, and future surveys in additional caves may find other maternity colonies. Suitable habitat for Indiana bat maternity colonies also exists throughout the project area, and additional studies may confirm their presence.

The study project area also contains habitat for a variety of federally listed species of birds. Wintering populations of federally threatened bald eagles (*Haliaeetus leucocephalus*) have been observed, and nesting pairs have been confirmed in areas to the west. Such nesting pairs will probably inhabit the project area in the future as the species continues to expand its range. The Federally endangered American peregrine falcon (*Falco peregrinus anatum*) also occurs as a migrant or transient in the study area.

Endangered freshwater mussels in the study area include the rough pigtoe (*Pleurobema plenum*), orange-footed pearly mussel (*Plethobasus cooperianus*), northern riffleshell (*Epioblasma torulosa rangiana*), pink mucket pearly mussel (*Lampsilis abrupta*), and the fanshell (*Cyprogenia stegaria*). Recently deceased specimens of the ring pink (*Obovaria retusa*) and clubshell (*Pleurobema clava*) have also been observed, indicating their presence in the project area as well. Other listed mussel species that might still occur in the project area include the fat pocketbook (*Potamilus capax*), tuberculed-blossom pearly mussel (*Epioblasma torulosa torulosa*), cracking pearly mussel (*Hemistena lata*), and purple catspaw pearly mussel (*Edpioblasma sulcata sulcata*). The orange-footed pearly mussel, ring pink, and purple catspaw pearly mussels still reproduce in the Green River, and it is thought that this is one of the few, perhaps the only, rivers where this occurs.

Federally threatened plants found in the study area include Price's potato bean (*Apios priceana*) and Eggert's sunflower (*Helianthus eggertii*).

Rare species for which potential habitat exists in the project area include the southeastern bat (*Myotis austroriparius*), Rafinesque's big-eared bat (*Plecotus rafinesquii*), eastern small-footed bat (*Myotis leibii*), eastern woodrat (*Neotoma floridana*), Bachman's sparrow (*Aimophila aestivalis*),

eastern sand darter (*Ammocrypta pellucida*), northern cave fish (*Amblyopsis spelaea*), southern cave fish (*Typhlichthys subterraneus*), longhead darter (*Percina macrocephala*), blue sucker (*Cycleptus elongatus*), hellbender, Kirtland's water snake (*Clonophis kirtlandi*), cooperbelly water snake (*Nerodia erythrogaster* var. *neglecta*), spectacle case pearly mussel (*Cumberlandia monodonta*), Kentucky creekshell mussel (*Villosa ortnanni*), rabbit's foot pearly mussel (*Ouadrula cylindrica*), purple liliput pearly mussel (*Toxolasma lividus*), pale false foxglove (*Agalinis skinneriana*), royal catchfly (*Silene regia*), and Gattinger's lobelia (*Lobelia appendiculata* var. *gattingeri*). These species are not currently considered candidate species, however, they could be listed in the future if their numbers decline and threats to their survival persist.

6.0 SUMMARY AND CONCLUSION

G4 is located at Woodbury, Butler County, Kentucky, 149.0 miles above the mouth of the Green River. Government-owned property at the site consists of the lock and lock walls, and a USGS gauging station on a 0.01-acre tract located on the left descending (west) bank.

The Corps is considering disposing of the federal interest in the property due to a lack of any continued authorized project purpose, and G.E.C. was contracted to conduct an EBS in order to facilitate the possible disposal. In accordance with applicable requirements contained in AR 200-1 and ASTM E1527-97, G.E.C. reviewed Department of the Army records and federal, state, and local databases, federal and state agency evaluations, conducted historical research of the site and surrounding area, interviewed pertinent personnel, and performed a site investigation in order to characterize environmental conditions at the site.

There is no evidence that hazardous materials were ever stored, handled, transported, or disposed of at the site.

There is no evidence suggesting the presence of PCBs at the site.

There is no evidence that the site ever stored significant amounts of petroleum products and/or derivatives or that a release of such materials ever occurred.

Chipped, cracked, and flaked paint was observed on the door of the gauging station. Should the paint contain lead, conditions could pose a hazard to human health.

There appear to be no asbestos or air quality concerns at the site.

The gauging station presents a fall hazard and there may be liability associated with its ownership.

Six unplottable potential sites of concern were found during the federal and state database review. G.E.C. located three of the six and they are well outside of the ASTM-recommended search

distances. There is reason to believe the remaining three sites are also located well away from the site. In any event, it is unlikely that any of the six sites has had an impact on conditions at G4.

No wetlands are located at the site, but threatened and endangered species are known to occur in the vicinity.

A Phase I Cultural Resources Survey has concluded there is no evidence of prehistoric or undisturbed historic era cultural remains in the vicinity of the site, however the improvements at G4 may themselves be potentially eligible for listing in the National Register of Historic Places.

In accordance with Finding of Suitability to Transfer (FOST) Requirements for Notification, Covenants, and Access, Green River Lock and Dam No. 4 is a Category 1 site, an area where no release or disposal of hazardous substances or petroleum products has occurred, and no migration of these substances from adjacent areas has occurred.

Section G5

GREEN RIVER LOCK AND DAM NO. 5

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1.0 INTRODUCTION

G5 is located near Glenmore, in Butler and Warren counties, Kentucky, 168.1 miles above the mouth of the Green River. The site occupies approximately 27.064 acres on the right descending bank (north bank, Butler County), and 5.21 acres located on the left descending bank (south bank, Warren County). Improvements at the site include the lock and dam, the remains of an earlier lock, an operations building, and a spring house, all on the right descending bank. The original lock was put into operation on January 17, 1900 and taken out of service in 1934. The current lock and dam were built in 1933-1934 with operations commencing on December 22, 1934. The structure was deactivated on August 31, 1951.

The Corps is considering disposing of the federal interest in G5 due to a lack of any continued authorized project purpose. The purpose of this EBS is to characterize the environmental baseline condition of the property in order to facilitate the possible disposal and to identify any potential environmental impacts posed by a transfer of the property from Corps ownership.

2.0 METHODOLOGY

2.1 Federal, State, and Local Records

The Vista report for this project is presented in Appendix G5-A.

2.2 Site Investigation

G.E.C. personnel conducted a thorough investigation of the property on January 25, 2000. An EBS checklist completed during the investigation is presented in Appendix B1-B. Photographs taken during the investigation are presented in Appendix B1-C.

2.3 Historical Use Information

For this project G.E.C. reviewed maps dating back to 1954. Maps reviewed:

7.5' Reedyville, Kentucky	1954
7.5' Reedyville, Kentucky	1954, Photo-inspected 1979

3.0 SITE DESCRIPTION

3.1 Location

G5 is located near Glenmore, in Butler and Warren counties, Kentucky, 168.1 miles above the mouth of the Green River. The site is accessed via Kentucky highways 185 and 67. A site location map is presented in Figure G5-1 and an aerial photograph is presented in Figure G5-2.

3.2 Site and Vicinity Characteristics

The 27.064-acre site on the right descending bank is accessed by taking Lock No. 5 Road north from Kentucky Highway 185. The site consists primarily of a terrace comprised of brush and woods at the base of a steep, wooded hillside.

Figure G5-1. Site Location Map.

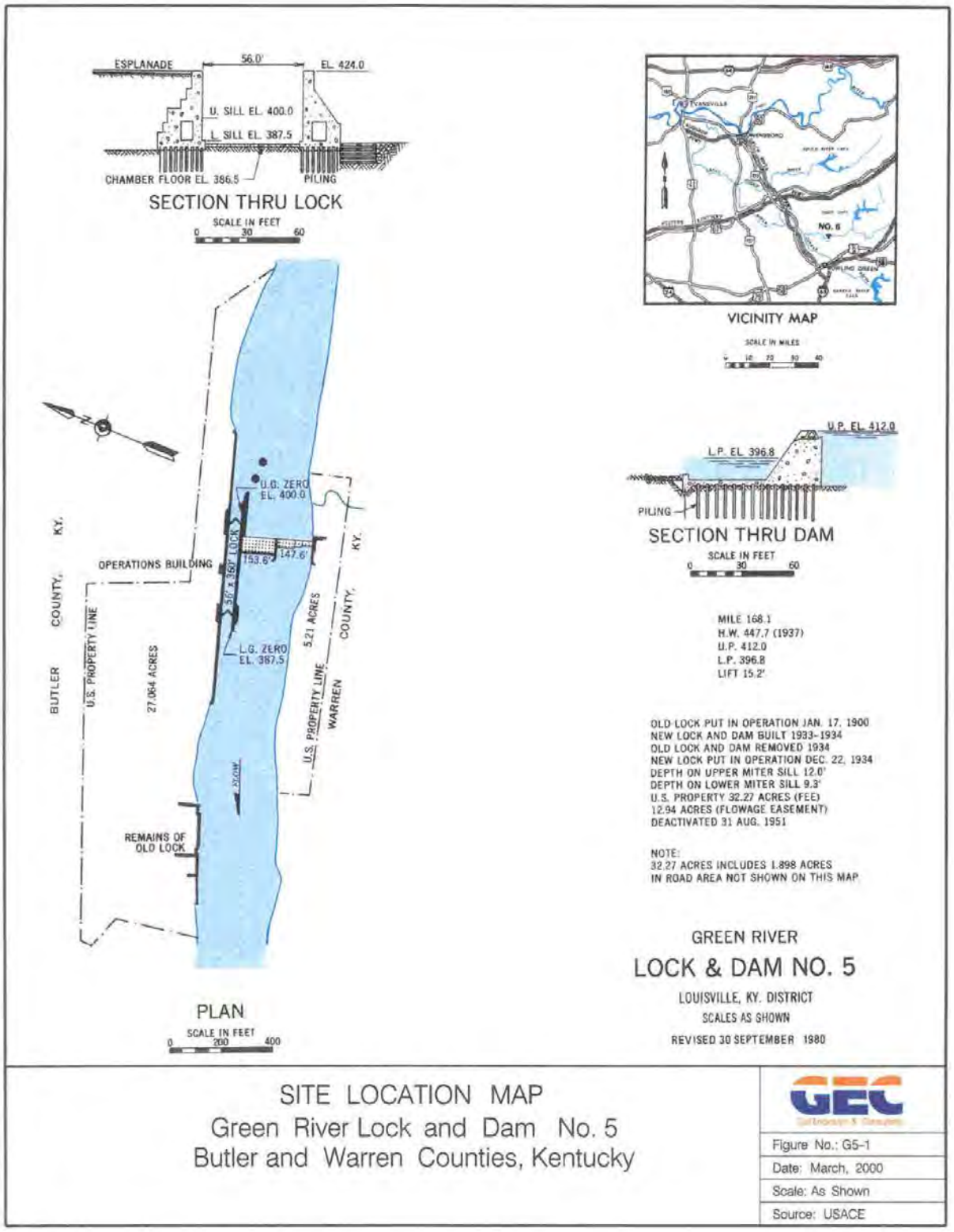
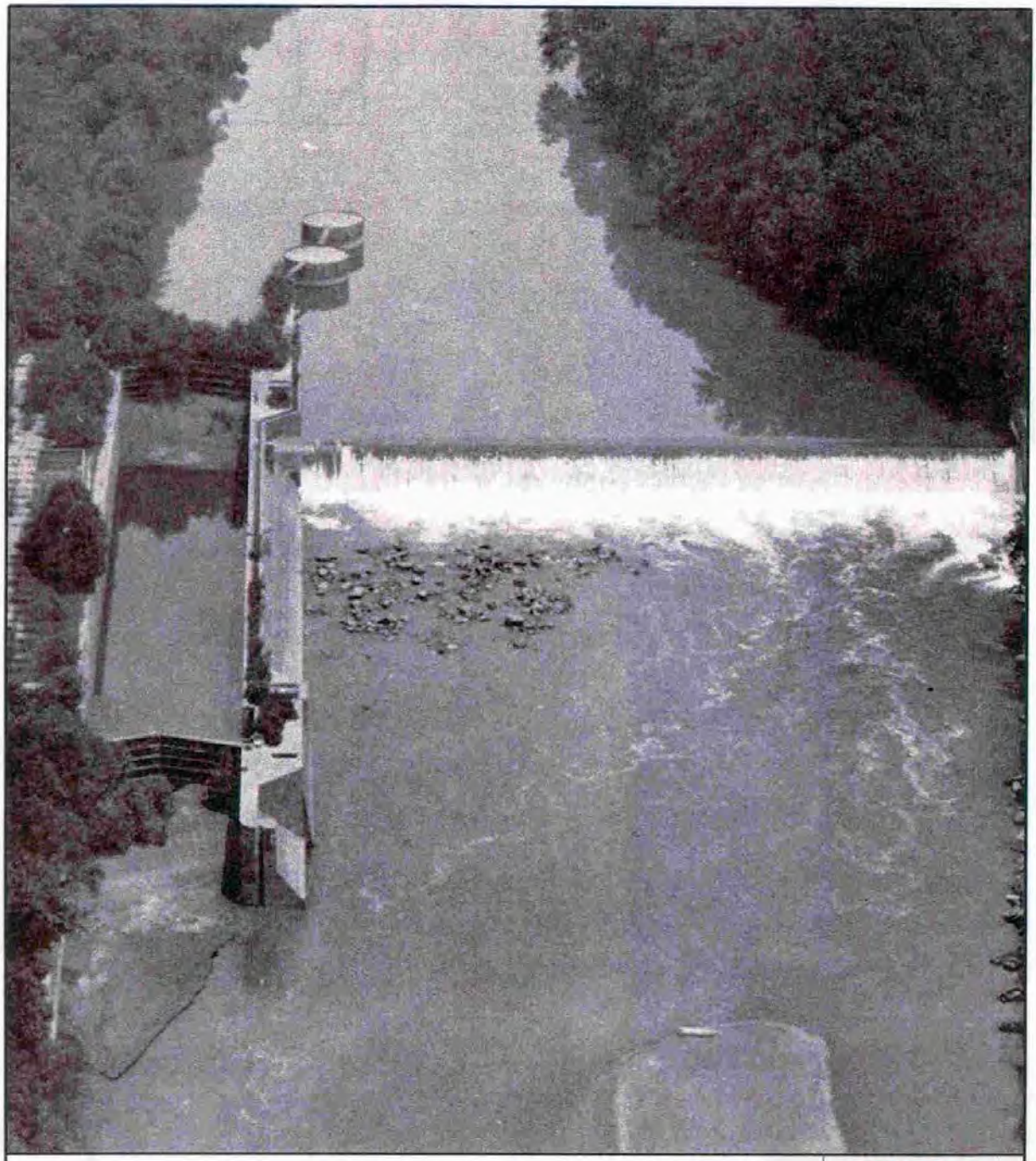


Figure G5-2. Aerial Photograph



AERIAL PHOTOGRAPH
Green River Lock and Dam No. 5
Butler and Warren Counties, Kentucky

GEC
Gulf Engineers & Consultants

Figure No.: G5–2
Date: March, 2000
Scale: N/A
Source: USACE

The 5.21-acre site on the left descending bank is accessed by taking an unnamed improved gravel road north from Kentucky Highway 67. The site was apparently heavily wooded but has recently been timbered. The topography transitions from steep hillside to level terrace.

G5 was constructed at the turn of the century to provide slack water navigation on the Green River. The original lock was put into operation on January 17, 1900, and taken out of service in 1934. The current lock and dam were built in 1933-1934, with operations commencing on December 22, 1934. The structure was deactivated on August 31, 1951. Improvements at the site include the lock and dam, the remains of an earlier lock, an operations building, and a spring house, all on the right descending bank. There are no minerals of any value at the site.

Elevation at the property is 430-435 feet, and storm water runoff flows across the property into the Green River.

3.3 Structures, Roads, and Other Improvements

Both tracts are fenced but neither is gated.

Overhead electrical service transits the 27.064-acre tract, however no electrical transformers are present. No utilities were observed at the 5.21-acre tract.

The facility originally contained several improvements, including residences, a barn, and field office, all on the right descending bank. None of the structures remain, however old sidewalks, a stairway, two earth-filled cisterns, and the remains of three foundations were observed during the site inspection.

The only remaining improvements at the site include the lock and dam, the remains of an earlier lock, an operations building, and a spring house. The lock is 56 feet wide and 360 feet long, and the dam is a fixed-type. Upper pool elevation is 412.0 feet and lower pool elevation is 396.8 feet.

3.4 Past Use of the Property

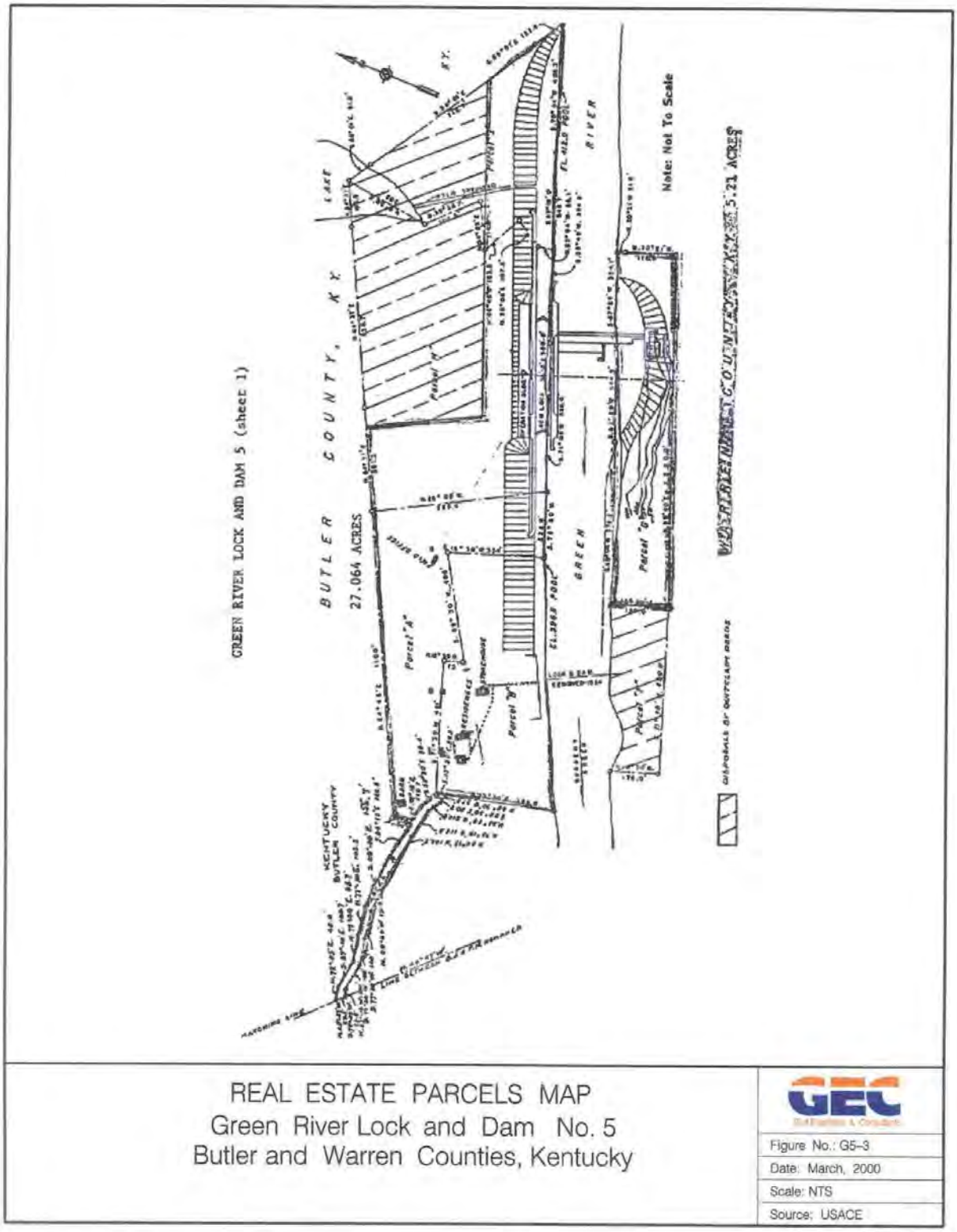
Figure G5-3 presents locations of the parcels described in this section. Parcel A, 6.70 acres, was acquired from D. J. Honaker, et al. by deed dated January 3, 1902, recorded March 24, 1902, in deed book 10, page 510 in the records of Butler County.

Parcel B, 7.276 acres, was acquired from D. J. Honaker, et al. by deed dated October 16, 1895, recorded in deed book 7, page 304 in the records of Butler County.

Parcel C, 1.298 acres, was acquired for road access from P. M. Honaker by deed dated October 16, 1895, recorded in deed book 7, page 302 in the records of Butler County.

Parcel D, 0.55 acres, was acquired from P. M. Honaker by deed dated December 4, 1903, recorded in deed book 14, page 216, in the records of Butler County.

Figure G5-3. Real Estate Parcels Map



Parcel E, 0.05 acres, was acquired from John Stephens, et al. by deed dated December 4, 1903, recorded in deed book 14, page 218, in the records of Butler County.

Parcel F, 2.45 acres in Warren County, Kentucky, was acquired by declaration of taking.

Parcel G, 5.21 acres, was acquired from R. H. Runner, et al. by deed dated December 7, 1933, recorded March 17, 1934, in deed book 173, page 311, in the records of Warren County.

Parcel H, 14.82 acres, was acquired from Ethel Honaker, et al. by deed dated January 11, 1934, recorded March 3, 1934, in deed book 43, page 280, in the records of Butler County.

Parcel I, 6.86 acres, was acquired from Lizzie G. Hays, et al. by deed dated August 18, 1933, recorded September 9, 1933, in deed book 43, page 134, in the records of Butler County.

The original G5 was removed and replaced with new structures in 1934. The new lock and dam was not rebuilt to handle the large Ohio River towboats but it was enlarged to dimensions of 56 feet by 360 feet. It was also reconstructed of concrete masonry and the dam was provided with a movable a-frame crest.

The structure was deactivated on August 31, 1951.

All of Parcel F, consisting of 2.45 acres, was conveyed to J. D. Spalding by quitclaim deed dated April 9, 1955. The United States reserved a perpetual flowage easement and right-of-way for all government owned roads and utilities.

Portions of Parcels H and I consisting of 10.49 acres were conveyed to E. E. Hays by quitclaim deed dated April 9, 1955. A 30-foot right-of-way easement was also granted, extending across the United States government reservation from the existing road at the northwest corner thereof. The right-of-way was forfeited due to nonuse or abandonment for a period of two consecutive years. The United States reserved a perpetual flowage easement and right-of-way for all government-owned roads and utilities.

There are no outgrants associated with the property.

3.5 Current Use of the Property

G5 is currently deactivated and considered excess to the needs of the U.S. Government. The Corps is considering disposing of the federal interest in the facility due to a lack of any continued authorized project purpose. There are no Corps employees or contractors at the site.

The property on the right descending bank is an attractive nuisance and is used for illegal dumping. Household trash was observed throughout the property, and the operations building has been vandalized.

The 5.21-acre tract has recently been timbered, and there was also evidence of illegal dumping at the property.

The highest and best use of the 25.164 acres (27.064 acres less the 1.90-acre road) in Butler County is considered to be recreational, with timber as a secondary use. The highest and best use of the 1.90-acre roadway is considered to be continued use as a road. An appraisal of the property has estimated the value of the 25.164 acres at $14,000. A value of $1 has been assigned to each of the easements.

The highest and best use of the 5.21 acres in Warren County is considered to be timber with a secondary use of recreational. An appraisal of the property has estimated the value of the 5.21 acres at $3,500. A value of $1 has been assigned to each of the easements.

3.6 Adjoining Property

Land adjacent to the 27.064-acre tract consists of woodland and pasture. A large residential subdivision is also in development, north of the property.

Land adjacent to the 5.21-acre tract consists of pasture and a few residential sites.

Based on G.E.C.'s review of quadrangle maps, aerial photographs, and land title records, land-use in the vicinity of G5 appears little changed over the last 46 years. A portion of the 1954 quadrangle is presented in Figure G5-4.

4.0 RECORDS REVIEW

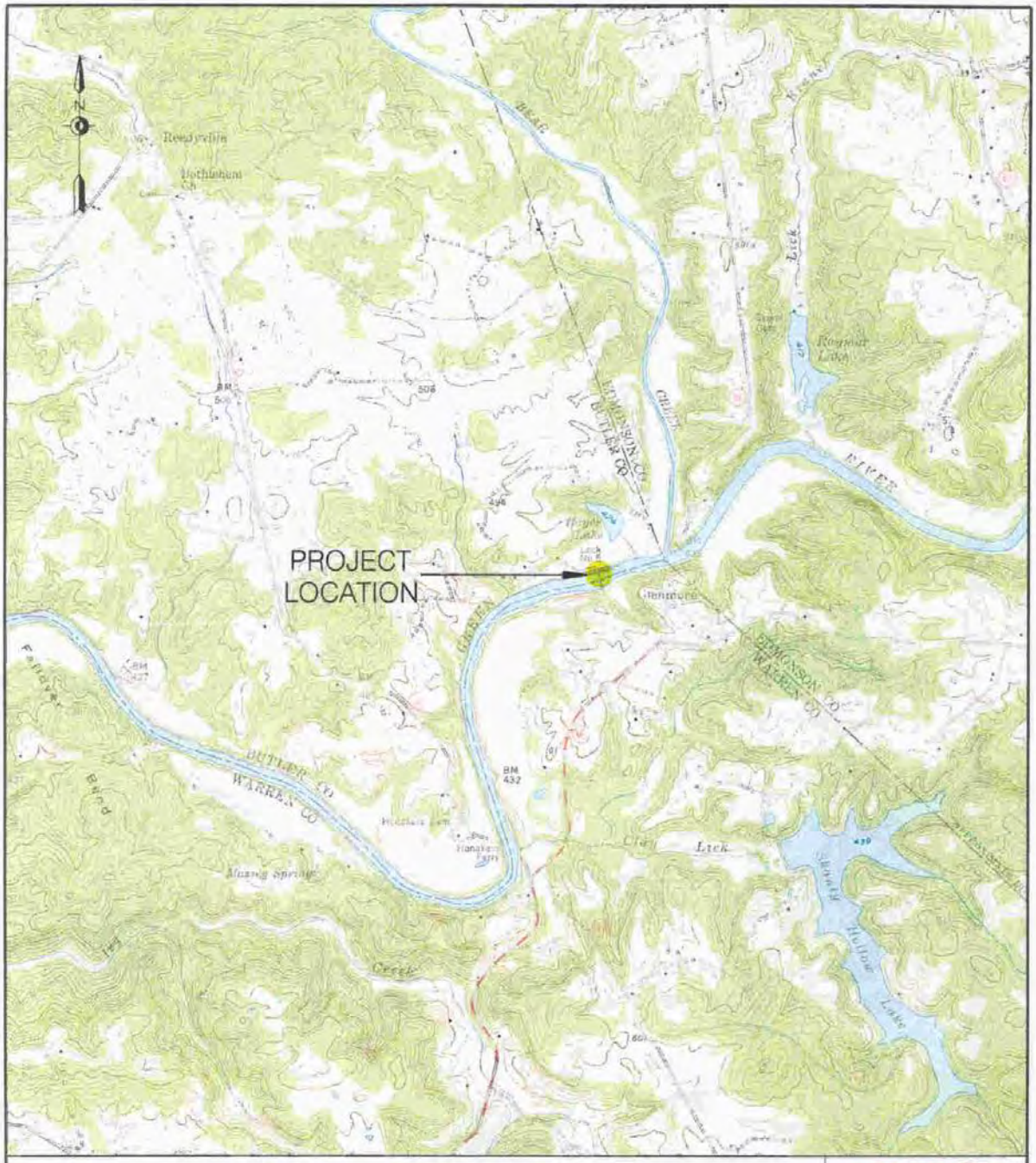
A search of federal, state, and local government environmental databases was conducted in order to obtain and review records and documents that would aid in identifying known or potential environmental concerns at, or in the vicinity of, G5. ASTM E1527-97 provides a list of records that should be reviewed and the minimum search distances to use. AR 200-1 requires a search of Department of the Army Records.

4.1 Sites Identified During Records Review

Table G5-1 presents a summary of the sites found in each database during the records review. The database review resulted in no plottable sites within the ASTM E1527-97 recommended minimum search distance and 11 unplottable sites. Unplottable sites are those with insufficient location information such that they can only be identified as being within the same zip code as G5. G.E.C. made every effort to locate these sites and assess their relevance to the project.

Of the 11 sites, 5 are UST/AST sites. The remaining six are solid waste landfill facilities.

Figure G5-4. Historical Topographic Map



HISTORIC TOPOGRAPHIC MAP
Green River Lock and Dam No. 5
Butler and Warren Counties, Kentucky

USGS 7.5' Series Quadrangle Reedyville, Kentucky 1954

GEC
Gulf Engineers & Consultants

Figure No.: G5-4
Date: March, 2000
Scale: 1" = 24,000'
Source: USACE

Table G5-1. Federal and State Database Review Summary

Database	< 0.13 Mile	0.13-0.25 Mile	0.25-0.50 Mile	0.50-1.0 Mile	Total
NPL	0	0	0	0	0
RCRIS-CA	0	0	0	0	0
RCRIS-TSD	0	0	0	-	0
CERCLIS	0	0	0	-	0
CERCLIS (S)	0	0	0	-	0
SWLF	0	0	0	-	0
WELLS	0	0	0	-	0
VIOLATERS	0	0	-	-	0
TRIS	0	0	-	-	0
UST/AST	0	0	-	-	0
ERNS	0	-	-	-	0
GNRTR	0	-	-	-	0

Source: G.E.C., February 2000. (-) Outside ASTM-recommended search radius.

5.0 FINDINGS

5.1 Hazardous Substances

This section applies to the storage, handling, transportation, and disposal of substances deemed hazardous under the Resource Conservation Recovery Act (RCRA) at G5.

No evidence of such activity at the site, such as stained soil or distressed vegetation, was noted during the field investigation nor discovered in the process of the federal and state database review.

5.2 Polychlorinated Biphenyls

There are no pole-mounted electrical transformers located at the site and electrical utilities have been disconnected from the operations building, however hydraulic oil released to the environment (Section 5.3) has the potential to contain PCBs. If the structure is removed, analytical investigations of soils under the structure could be warranted.

5.3 Petroleum Products / Petroleum Derivatives

During the field investigation G.E.C. observed hydraulic oil stains in the operations building and at several locations in the lock chamber. The stains are a result of vandalism to the hydraulic piping system, and hydraulic oil has been released to the environment.

G.E.C. found no other evidence or information that the facility ever stored significant amounts of other petroleum products and/or derivatives or that releases of such material occurred.

It is G.E.C.'s opinion any hazard to human health or the environment posed by the hydraulic oil releases is low.

5.4 Lead

Chipped, cracked, and flaked paint was observed at the site, on bollards, cleats, and rails associated with the lock, and on the door of the operations building. Should the paint contain lead, conditions at G5 could pose a hazard to human health. Disturbance of or removal of the structures would have to be conducted in accordance with state and local regulations.

5.5 Asbestos

There appear to be no asbestos concerns at the property.

5.6 Air Quality

There are no apparent air quality issues associated with the property.

5.7 Public Safety

The lock walls and dam, which are concrete, appeared to be in satisfactory condition. Some minor weathering and spalling of surficial concrete was observed, as were cracks, but the lock walls do not show evidence of settlement or movement. However, due to obvious falling/drowning hazards, and because the site is not secure from public access, there may be liability associated with continued ownership of the site.

5.8 Potential Sites of Concern

G.E.C. was able to locate four of the five UST/AST sites and they are well outside the ASTM- recommended search radius. Although the remaining tank was not located, it was not observed anywhere in the vicinity of the site.

G.E.C. was unable to locate any of the six solid waste landfill facilities, however they were not observed in the vicinity of the site.

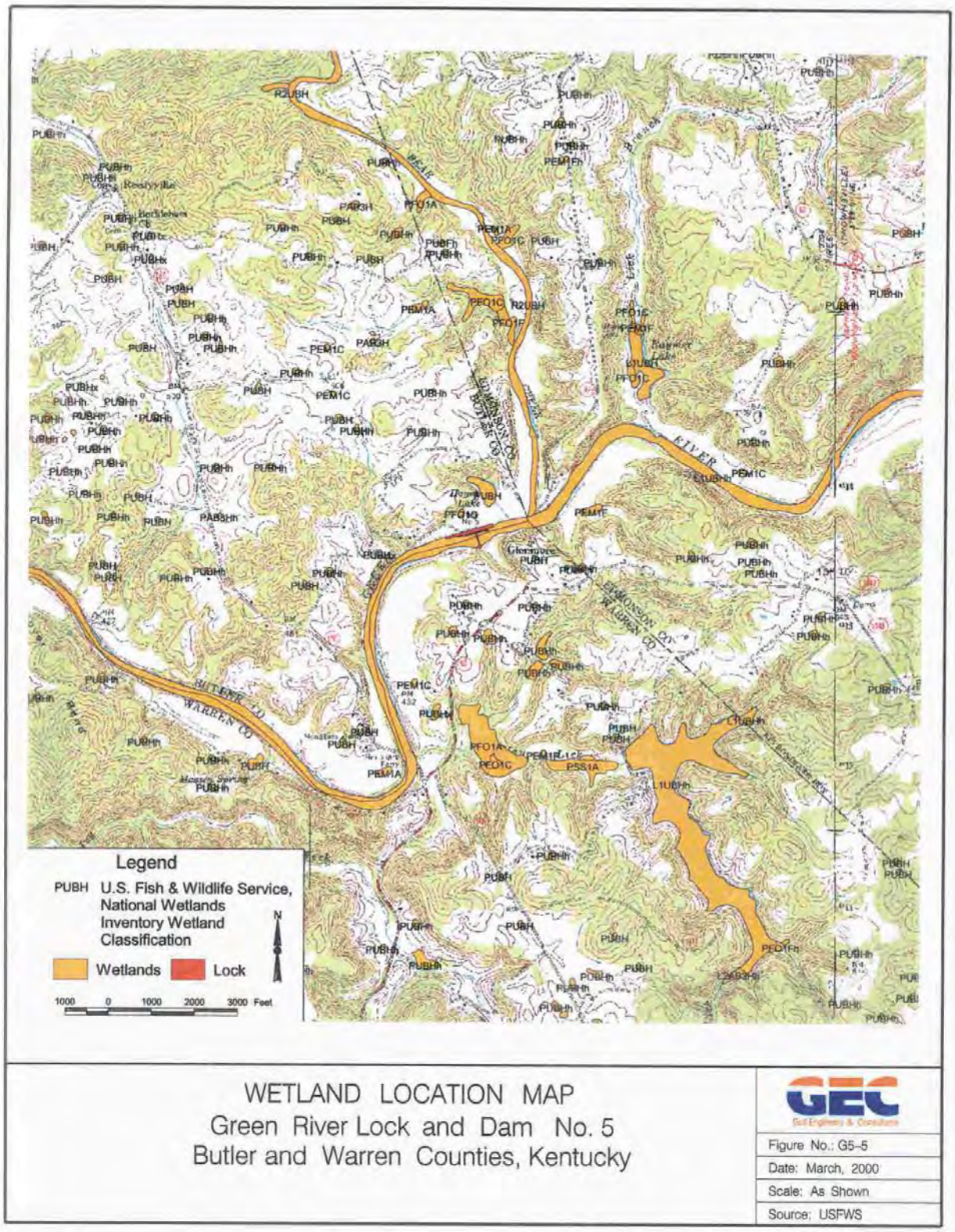
Accordingly, it is G.E.C.s opinion that none of the 11 unplottable sites are likely to have had an impact on environmental conditions at G5.

5.9 Federal and State Agency Evaluations

5.9.1 Wetlands

A Department of the Interior National Wetlands Inventory Map dated 1988, a portion of which is presented in Figure G5-5, indicates a forested palustrian wetland at the site, in the form of narrow riparian zones adjacent to the river. G.E.C. confirmed this during the field investigation.

Figure G5-5. NWI Map



5.9.2 Cultural Resources

A Phase I Cultural Resources Reconnaissance was performed in 1998 for the site to determine if any archaeological resources would be impacted by federal disposal of the property. The reconnaissance found no evidence of prehistoric or undisturbed historic era cultural remains. Efforts are currently underway to document the existing structures at the facility. To date, the District has completed a brief historical overview of the Green and Barren rivers navigational system and prepared archival quality photo documentation of all extant structures. It is anticipated that the report containing this information will be completed July 2000. The District expects that the facility will be determined eligible for inclusion in the National Register of Historic Places and will require an as yet undetermined level of additional research and documentation.

5.9.3 Threatened and Endangered Species

Threatened and endangered species occur in the Green and Barren rivers and on adjacent terrestrial habitat. The federally endangered Kentucky cave shrimp (*Palaemonias ganteri*) is endemic to the Mammoth Cave system, portions of which are located within the pool created by G6, and the U.S. Fish and Wildlife Service (USFWS) has designated portions of the Roaring River passage of the Flint-Mammoth Cave system in the Edmonson County portion of Mammoth Cave National Park as critical habitat for the species.

Caves in the study area also provide habitat for the federally endangered gray bat and Indiana bat, which use the caves as hibernacula. One cave within the study area is known to support a gray bat maternity colony, and future surveys in additional caves may find other maternity colonies. Suitable habitat for Indiana bat maternity colonies also exists throughout the project area, and additional studies may confirm their presence.

The study project area also contains habitat for a variety of federally listed species of birds. Wintering populations of federally threatened bald eagles (*Haliaeetus leucocephalus*) have been observed, and nesting pairs have been confirmed in areas to the west. Such nesting pairs will probably inhabit the project area in the future as the species continues to expand its range. The Federally endangered American peregrine falcon (*Falco peregrinus anatum*) also occurs as a migrant or transient in the study area.

Endangered freshwater mussels in the study area include the rough pigtoe (*Pleurobema plenum*), orange-footed pearly mussel (*Plethobasus cooperianus*), northern riffleshell (*Epioblasma torulosa rangiana*), pink mucket pearly mussel (*Lampsilis abrupta*), and the fanshell (*Cyprogenia stegaria*). Recently deceased specimens of the ring pink (*Obovaria retusa*) and clubshell (*Pleurobema clava*) have also been observed, indicating their presence in the project area as well.

Other listed mussel species that might still occur in the project area include the fat pocketbook (*Potamilus capax*), tuberculed-blossom pearly mussel (*Epioblasma torulosa torulosa*), cracking pearly mussel (*Hemistena lata*), and purple catspaw pearly mussel (*Edpioblasma sulcata sulcata*). The orange-footed pearly mussel, ring pink, and purple catspaw pearly mussels still reproduce in the Green River, and it is thought that this one of the few, perhaps the only, rivers where this occurs.

Federally threatened plants found in the study area include Price's potato bean (*Apios priceana*) and Eggert's sunflower (*Helianthus eggertii*).

Rare species for which potential habitat exists in the project area include the southeastern bat (*Myotis austroriparius*), Rafinesque's big-eared bat (*Plecotus rafinesquii*), eastern small-footed bat (*Myotis leibii*), eastern woodrat (*Neotoma floridana*), Bachman's sparrow (*Aimophila aestivalis*), eastern sand darter (*Ammocrypta pellucida*), northern cave fish (*Amblyopsis spelaea*), southern cave fish (*Typhlichthys subterraneus*), longhead darter (*Percina macrocephala*), blue sucker (*Cycleptus elongatus*), hellbender, Kirtland's water snake (*Clonophis kirtlandi*), cooperbelly water snake (*Nerodia erythrogaster* var. *neglecta*), spectacle case pearly mussel (*Cumberlandia monodonta*), Kentucky creekshell mussel (*Villosa ortnanni*), rabbit's foot pearly mussel (*Ouadrula cylindrica*), purple liliput pearly mussel (*Toxolasma lividus*), pale false foxglove (*Agalinis skinneriana*), royal catchfly (*Silene regia*), and Gattinger's lobelia (*Lobelia appendiculata* var. *gattingeri*). These species are not currently considered candidate species, however, they could be listed in the future if their numbers decline and threats to their survival persist.

6.0 SUMMARY AND CONCLUSION

G5 is located near Glenmore, Kentucky, 168.1 miles above the mouth of the Green River. The site occupies approximately 27.064 acres in Butler County and 5.21 acres in Warren County. Improvements at the site include the lock and dam, the remains of an earlier lock, an operations building, and a spring house, all on the right descending bank. The original lock was put into operation on January 17, 1900 and taken out of service in 1934. The current lock and dam was built in 1933-1934 with operations commencing on December 22, 1934. The structure was deactivated on August 31, 1951.

The Corps is considering disposing of the federal interest in the facility due to a lack of any continued authorized project purpose, and G.E.C. was contracted to conduct an EBS in order to facilitate the possible disposal. In accordance with applicable requirements contained in AR 200-1 and ASTM E1527-97, G.E.C. reviewed Department of the Army records and federal, state, and local databases, federal and state agency evaluations, conducted historical research of the site and

surrounding area, interviewed pertinent personnel, and performed a site investigation in order to characterize environmental conditions at the site.

There is no evidence that hazardous materials were ever stored, handled, transported, or disposed of at the site.

There are no pole-mounted electrical transformers located at the site and electrical utilities have been disconnected from the operations building, however hydraulic oil released to the environment (Section 5.3) has the potential to contain PCBs. If the structure is removed, analytical investigations of soils under the structure could be warranted.

There is no evidence that the site ever stored significant amounts of petroleum products and/or derivatives, however G.E.C. observed hydraulic oil stains in the operations building and new lock chamber. The stains are a result of vandalism to hydraulic piping systems at the facility. Although hydraulic oil was released to the environment, it is G.E.C.'s opinion that any hazard posed to human health or the environment is low.

Chipped, cracked, and flaked paint was observed at the site, on bollards, cleats, and rails associated with the lock, and on the three remaining structures. Should the paint contain lead, conditions at G3 could pose a hazard to human health, and removal or disturbance of any of the fittings would have to be conducted in accordance with state and local regulations.

There appear to be no asbestos or air quality concerns at the site.

Due to obvious falling/drowning hazards, and because the site is not secure from public access, there may be liability associated with continued ownership of the site.

Eleven unplottable sites of potential concern were found during the federal and state database review. G.E.C. located four of the 11 and they are well outside of the ASTM-recommended search distance. There is reason to believe the remaining seven sites are also located well away from the site. In any event, it is unlikely that any of the 11 sites has had an impact on conditions at G5.

G.E.C. observed forested palustrian wetlands at the site, and threatened and endangered species are known to occur in the vicinity.

A Phase I Cultural Resources Survey has concluded there is no evidence of prehistoric or undisturbed historic era cultural remains in the vicinity of the site, however the improvements at G5 may themselves be potentially eligible for listing in the National Register of Historic Places.

In accordance with Finding of Suitability to Transfer (FOST) Requirements for Notification, Covenants, and Access, G5 is a Category 2 site, an area where only release or disposal of petroleum products has occurred.

Section G6

GREEN RIVER LOCK AND DAM NO. 6

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1.0 INTRODUCTION

G6 is located just upstream of Brownsville, in Edmonson County, Kentucky, 181.7 miles above the mouth of the Green River. The site occupies approximately 18.0 acres on the right descending bank (west bank), and 0.83 acres located on the left descending bank (east bank). Improvements at the site include the lock and dam, a spring house located on the 0.83-acre tract, and a USGS gauging station located on the 18-acre tract, upstream of the lock. Operations commenced on January 1, 1906 and ceased on August 1, 1951. The structure was deactivated on August 31, 1951.

The Corps is considering disposing of the federal interest in G6 due to a lack of any continued authorized project purpose. The purpose of this EBS is to characterize the environmental baseline condition of the property in order to facilitate the possible disposal and to identify any potential environmental impacts posed by a transfer of the property from Corps ownership.

2.0 METHODOLOGY

2.1 Federal, State, and Local Records

The Vista report for this project is presented in Appendix G6-A.

2.2 Site Investigation

G.E.C. personnel conducted a thorough investigation of the property on January 25, 2000. An EBS checklist completed during the investigation is presented in Appendix G6-B. Photographs taken during the investigation are presented in Appendix G6-C.

2.3 Historical Use Information

For this project G.E.C. reviewed maps dating back to 1954. Maps reviewed:

7.5' Brownsville, Kentucky	1954
7.5' Brownsville, Kentucky	1965

3.0 SITE DESCRIPTION

3.1 Location

G6 is located just upstream of Brownsville, in Edmonson County, Kentucky, 181.7 miles above the mouth of the Green River. The site is accessed by Kentucky Highway 259. A site location map is presented in Figure G6-1 and a aerial photograph is presented in Figure G6-2.

3.2 Site and Vicinity Characteristics

The 18.0-acre site on the lock side is accessed by Edmonson County Road 183. The county road changes to gravel and dead-ends at the United States property line. The site consists primarily of a terrace at the base of a hillside. The riverbank is forested, and herbaceous vegetation and woody shrubs cover the terrace.

Figure G6-1. Site Location Map

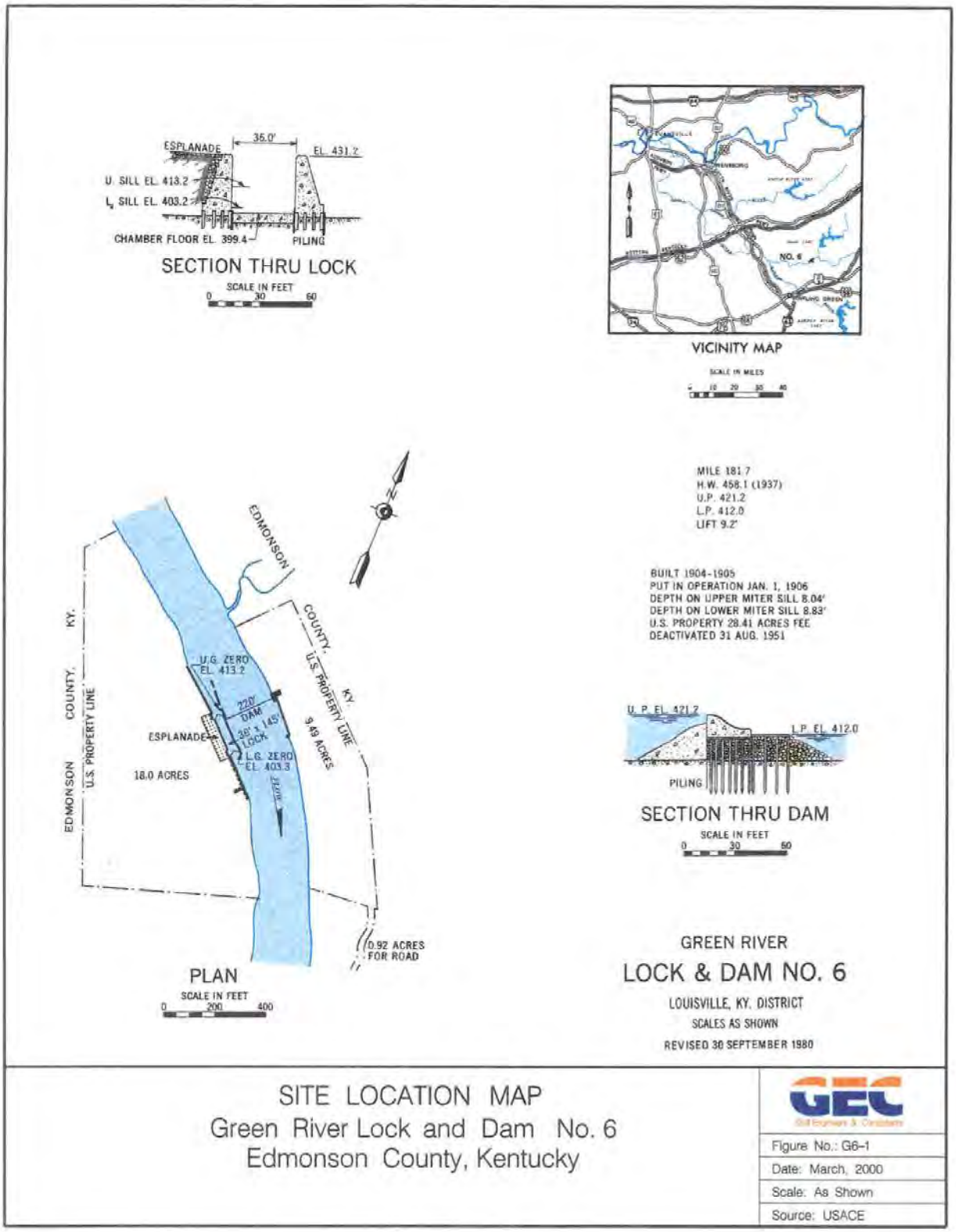
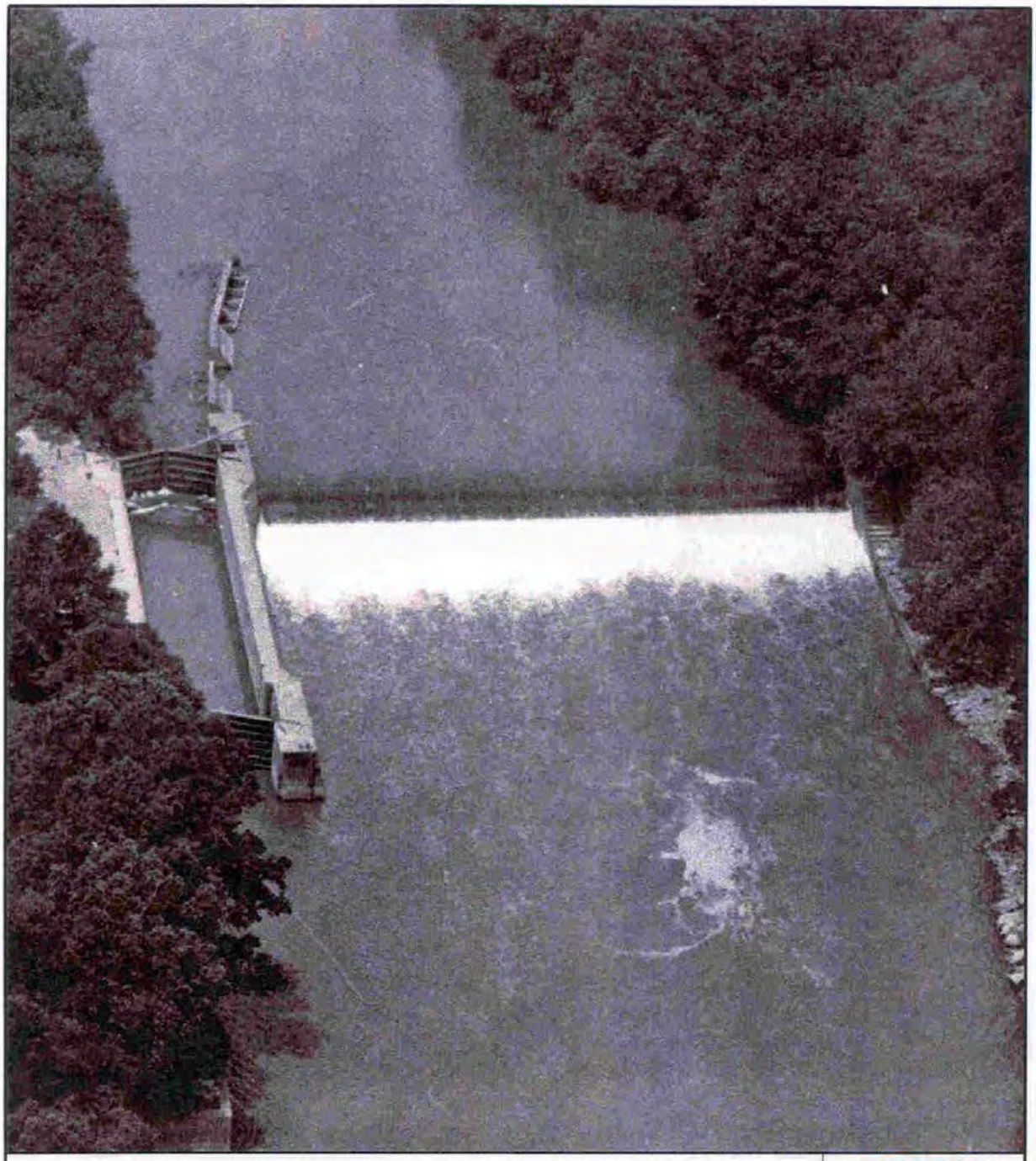


Figure G6-2. Aerial Photograph



AERIAL PHOTOGRAPH
Green River Lock and Dam No. 6
Edmonson County, Kentucky

GEC
Gulf Engineers & Consultants

Figure No.: G6-2
Date: March, 2000
Scale: N/A
Source: USACE

The 0.83-acre site was originally part of a larger tract of which a large portion (6.22 acres), was transferred U.S. Department of the Interior, National Park Service. The site is heavily wooded with steep topography, and lies between the river and land belonging to Mammoth Cave National Park. It is accessed via Houchins Ferry Road and James Road from the east side of Brownsville. The final approach to the site via James Road is gated.

G6 was constructed at the turn of the century to provide slack water navigation on the Green River. Operations commenced on January 1, 1906 and ceased on August 1, 1951. The only remaining improvements at G6 are the lock and dam, spring house, and gauging station. There are no minerals of any value at the site.

Elevation at the property is 490 – 495 feet, and storm water runoff flows across the property into the Green River.

3.3 Structures, Roads, and Other Improvements

The 18-acre tract on the right descending bank is fenced on the north and west, but not on the south. The 0.83-acre site on the east side of the river is not fenced.

Utilities observed on the 18-acre tract include overhead electrical service and electrical transformer for the gauging station. An underground telephone line also appears to transit the site. No utilities were observed on the left descending bank.

The facility originally contained several improvements, including two dwellings, a well house, an office/tool house, two toilets, a garage/cold house, two barns, two chicken houses, and a spring house. None of the structures remain, however old sidewalks, a stairway, and remains of a foundation were observed during the site inspection.

The only improvements remaining are the lock, dam, spring house, and gauging station. The lock is 36 feet wide and 145 feet long, and the dam is a fixed-type. Upper pool elevation is 421.2 feet and lower pool elevation is 412.0 feet.

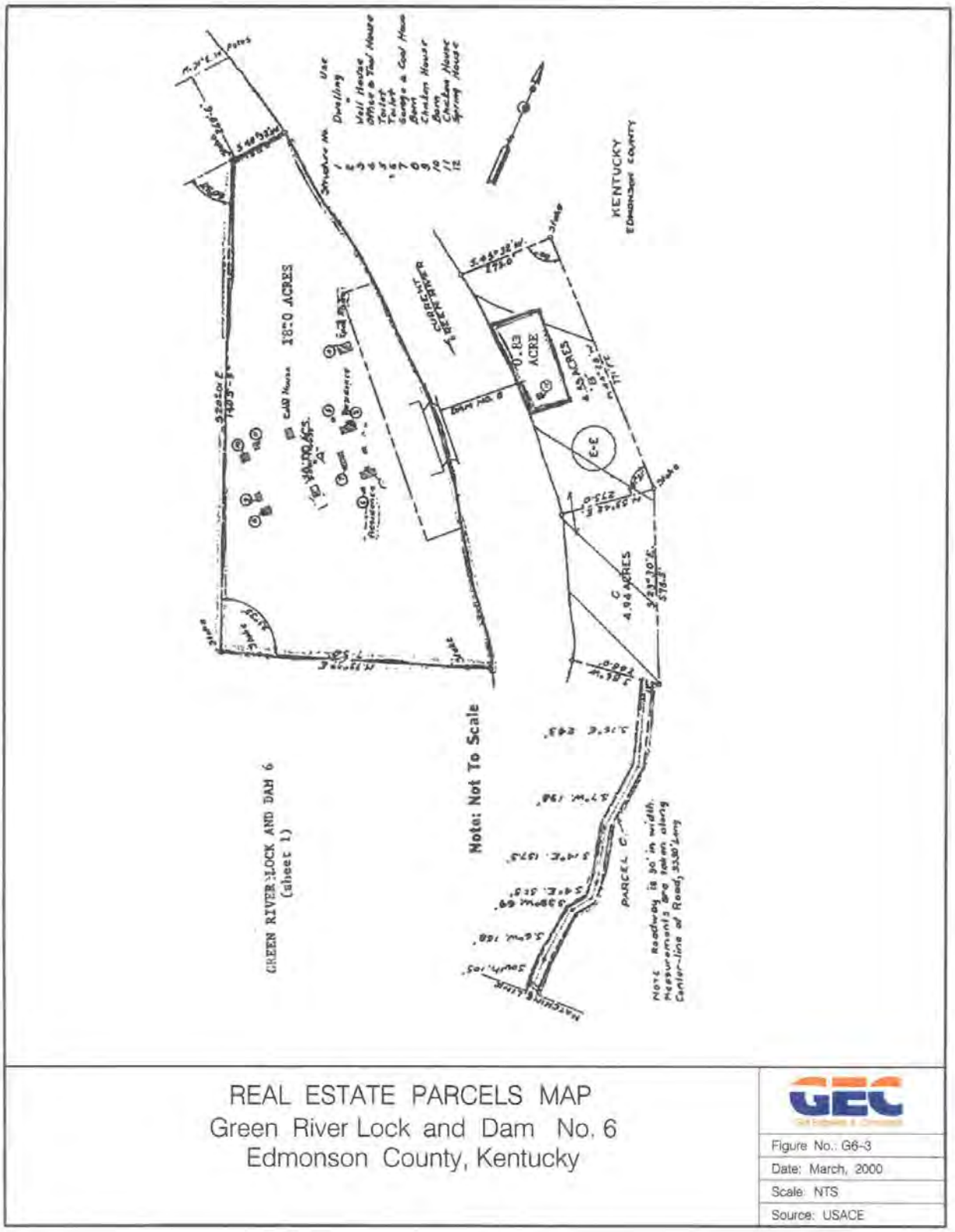
3.4 Past Use of the Property

Construction of G6 was authorized by the River and Harbor Act of July 13, 1902. It was built 1904-1905 put into operation on January 1, 1906.

Figure G6-3 presents locations of the parcels described in this section. Parcel A, 18.00 acres, was acquired from Jessee T. Alexander, et al. by deed dated January 11, 1904, recorded January 14, 1904, in deed book V, page 541 in the records of Edmonson County.

Parcel B, 4.55 acres, was acquired from Joseph G. Madison, et al. by deed dated March 9, 1903, recorded December 29, 1903, in deed book V, page 516 in the records of Edmonson County.

Figure G6-3. Real Estate Parcels Map



Parcel C, the 30-foot wide road on the abutment side of the Green River, was acquired from C. M. James, et al. by deed dated September 7, 1909, recorded November 10, 1909, in deed book 7, page 612 in the records of Edmonson County.

Parcel D was acquired for continuation of a the 30-foot wide road from A. D. Cook, et al. by deed dated September 7, 1909, recorded in deed book 7, page 607 in the records of Edmonson County.

Operations ceased at the Green River Lock and Dam No. 6, with the lock gates closed, on August 1, 1951. At the time, the Corps favored allowing the structure to remain in place, thereby preserving the pool, to provide recreational value. The structure was deactivated on August 31, 1951.

G6 deteriorated and in 1974-1975, the Corps poured concrete in order to stabilize the upstream lock gates. The structure continued to deteriorate and in July, 1988, increasing flows around and under the lock and dam were noticed. The Corps opened an invitation for bids to repair the structure that same year.

In 1989, repairs were made to the structure by placing a sheet pile cutoff upstream of the upper gates and into the right descending bank. The upper gates were also partially encased in concrete. This work was performed as the result of major seepage through the lock chamber, and end-around seepage occurring through the bank.

A 6.22-acre tract, comprised of most of Parcel B and a portion of Parcel C, was transferred on September 2, 1988, to the United States Department of the Interior, National Park Service. Approximately 0.83 acres of Parcel B, along with the right of egress and ingress over the 6.22 acres conveyed, was retained for maintenance of the dam.

There are no outgrants associated with the property.

3.5 Current Use of the Property

G6 is currently deactivated and considered excess to the needs of the U.S. Government. The Corps is considering disposing of the federal interest in the facility due to a lack of any continued authorized project purpose. There are no Corps employees or contractors at the site.

The property on the right descending bank is an attractive nuisance and is used for illegal dumping. Household trash, construction debris, tires, and various five-gallon containers were observed throughout the site. Additionally, there is an abandoned and decaying houseboat in the river, upstream of the upper pool approach wall, along the right descending bank. There was no evidence of dumping on the left descending bank, the area appears to be hunted extensively.

The highest and best use of the 18 acres lock side is considered to be recreational. In a few years timber may be a viable secondary use. An appraisal of the property has estimated the value at $17,000.

The highest and best use of the 0.83 acre and roadway on the abutment side of the lock and dam is considered to be recreational, as a part of the existing national park and roadway. An appraisal of the property has estimated the value of the 0.83 acre and the roadway at $1 each.

3.6 Adjoining Property

Land north of the 18-acre tract on the right descending bank has been recently been cleared, apparently for use as a home site.

An improved road is under construction along the west property line of the 18-acre tract to provide access to the home site.

Land south of the 18-acre tract on the right descending bank is used for pasture.

Land on all sides of the 0.83-acre tract is undeveloped, recreational hardwood forest.

Based on G.E.C.'s interviews and a review of quadrangle maps, aerial photographs, and land title records, land-use in the vicinity of G6 appears little changed over the last 46 years. A portion of the 1954 quadrangle is presented in Figure G6-4.

4.0 RECORDS REVIEW

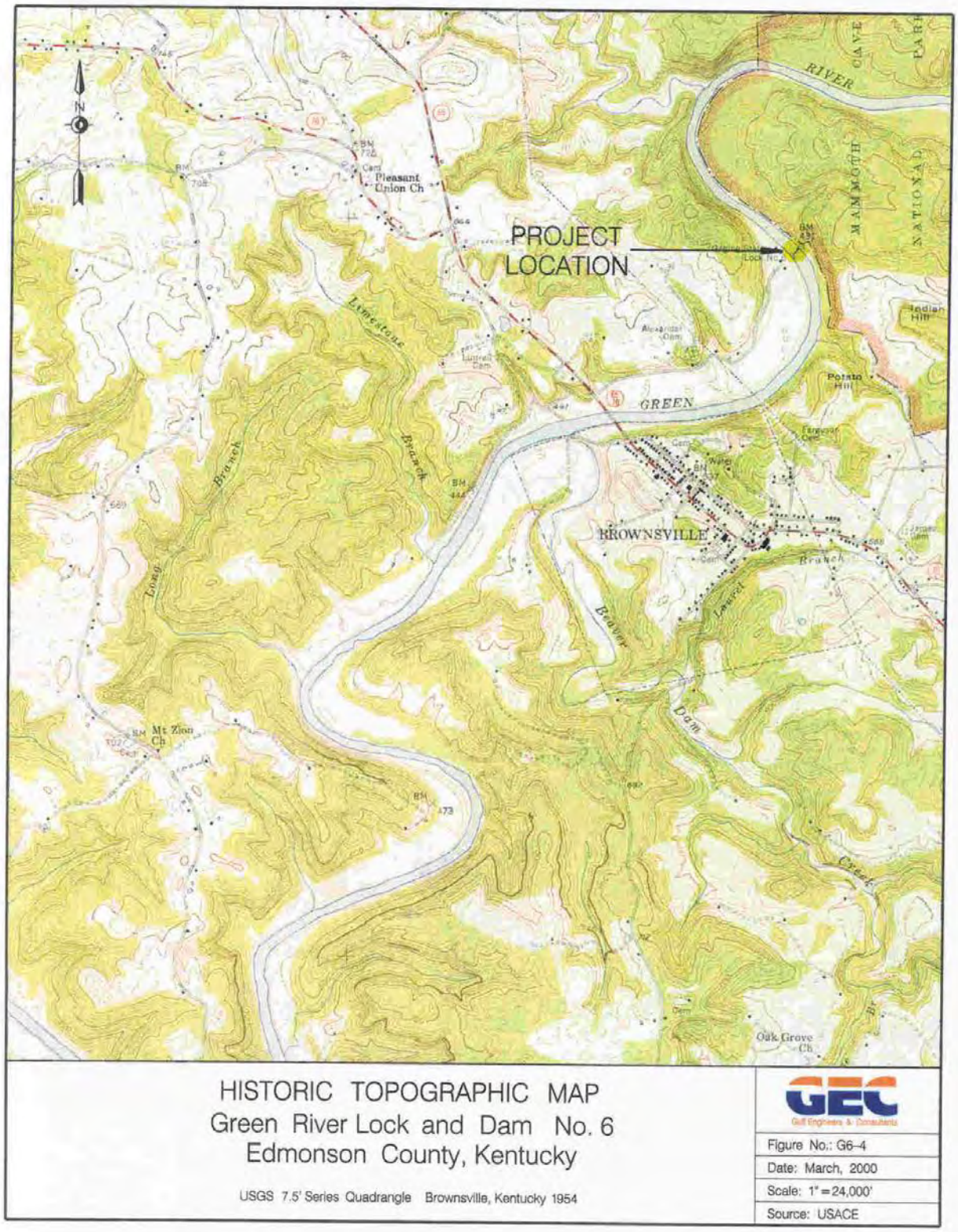
A search of federal, state, and local government environmental databases was conducted in order to obtain and review records and documents that would aid in identifying known or potential environmental concerns at, or in the vicinity of, G6. ASTM E1527-97 provides a list of records that should be reviewed and the minimum search distances to use. AR 200-1 requires a search of Department of the Army records.

4.1 Sites Identified During Records Review

Table G6-1 presents a summary of the sites found in each database during the records review. The database review resulted in no plottable sites within the ASTM E1527-97 recommended minimum search distances and 21 unplottable sites. Unplottable sites are those with insufficient location information such that they can only be identified as being within the same zip code as G6. G.E.C. made every effort to locate these sites and assess their relevance to the project.

Of the 21 sites, 18 are UST/AST sites. The remaining three are solid waste landfill facilities.

Figure G6-4. Historic Topographic Map



HISTORIC TOPOGRAPHIC MAP
Green River Lock and Dam No. 6
Edmonson County, Kentucky

USGS 7.5' Series Quadrangle Brownsville, Kentucky 1954

GEC Gulf Engineers & Consultants

Figure No.: G6-4
Date: March, 2000
Scale: 1" = 24,000'
Source: USACE

Table G6-1. Federal and State Database Review Summary

Database	< 0.13 Mile	0.13-0.25 Mile	0.25-0.50 Mile	0.50-1.0 Mile	Total
NPL	0	0	0	0	0
RCRIS-CA	0	0	0	0	0
RCRIS-TSD	0	0	0	-	0
CERCLIS	0	0	0	-	0
CERCLIS (S)	0	0	0	-	0
SWLF	0	0	0	-	0
WELLS	0	0	0	-	0
VIOLATERS	0	0	-	-	0
TRIS	0	0	-	-	0
UST/AST	0	0	-	-	0
ERNS	0	-	-	-	0
GNRTR	0	-	-	-	0

Source: G.E.C., February 2000. (-) Outside ASTM-recommended search radius.

5.0 FINDINGS

5.1 Hazardous Substances

This section applies to the storage, handling, transportation, and disposal of substances deemed hazardous under the Resource Conservation Recovery Act (RCRA) at G6.

No evidence of such activity at the site, such as stained soil or distressed vegetation, was noted during the field investigation nor discovered in the process of the federal and state database review.

5.2 Polychlorinated Biphenyls

There is one pole-mounted electrical transformer located at the site and it appears to be marked with a PCB warning label. However, no leaks or stains were observed, and it is G.E.C.'s opinion that little hazard is posed to human health or the environment, however if its removal is required pursuant to any disposal action, it should be done so in accordance with state and local regulations.

5.3 Petroleum Products / Petroleum Derivatives

A two-inch pipe resembling a fill pipe was discovered on the 0.83-acre tract during the field investigation. The pipe extended approximately 1.5-2 feet above grade and might suggest the presence of a UST.

G.E.C. could find no information indicating the use of USTs at G6 during the review of federal and state databases nor in the records provided by the District. Because there were no

structures on the left descending bank other than the spring house, it is G.E.C.'s opinion that the pipe is probably not indicative of a UST.

Furthermore, information gathered in the course of this study indicates that the facility never stored significant amounts of petroleum products and/or derivatives or that a release of such material ever occurred. It is G.E.C.'s opinion that there are no hazards to human health or the environment.

5.4 Lead

Chipped, cracked, and flaked paint was observed at the site, on bollards, cleats, and rails associated with the lock, and on the door of the gauging station. Should the paint contain lead, conditions at G6 could pose a hazard to human health. Disturbance or removal of the fittings would have to be conducted in accordance with state and local regulations.

5.5 Asbestos

There appear to be no asbestos concerns at the property.

5.6 Air Quality

There are no apparent air quality issues associated with the property.

5.7 Public Safety

G6 may be the most deteriorated of the locks and dams addressed in this EBS. From a stability standpoint there appear to be items of concern with respect to public safety, and there may be liability associated with continued ownership of the site.

Most notable is the seepage occurring through, and around, the lock. Sinkholes are evident on the right descending bank, and water can be seen seeping under the land wall into the lock chamber and through the sheet pile wall.

The lower pool approach wall, where it runs into the bank, appears to have settled and has rotated outward at the top. The upper pool approach wall appears to be in a state of failure.

The concrete walls also appear to be deteriorating, and a large number of large cracks have formed, allowing a corrosion path to the reinforcement.

5.8 Potential Sites of Concern

G.E.C. was able to locate 14 of the 18 UST/AST sites and they are well outside the ASTM-recommended search radius. Although the remaining four were not located, they were not observed anywhere in the vicinity of the site.

G.E.C. was unable to locate the three solid waste landfill facilities, however information gathered during interviews with local residents indicated that all three facilities are probably located well outside the ASTM recommended search radius.

Accordingly, it is G.E.C.s opinion that none of the 21 unplottable sites are likely to have had any impact on environmental conditions at G6.

5.9 Federal and State Agency Evaluations

5.9.1 Wetlands

A Department of the Interior National Wetlands Inventory Map dated 1988, a portion of which is presented in Figure G6-5, indicates a forested palustrian wetland at the site, in the form of narrow riparian zones adjacent to the river. G.E.C. confirmed this during the field investigation.

5.9.2 Cultural Resources

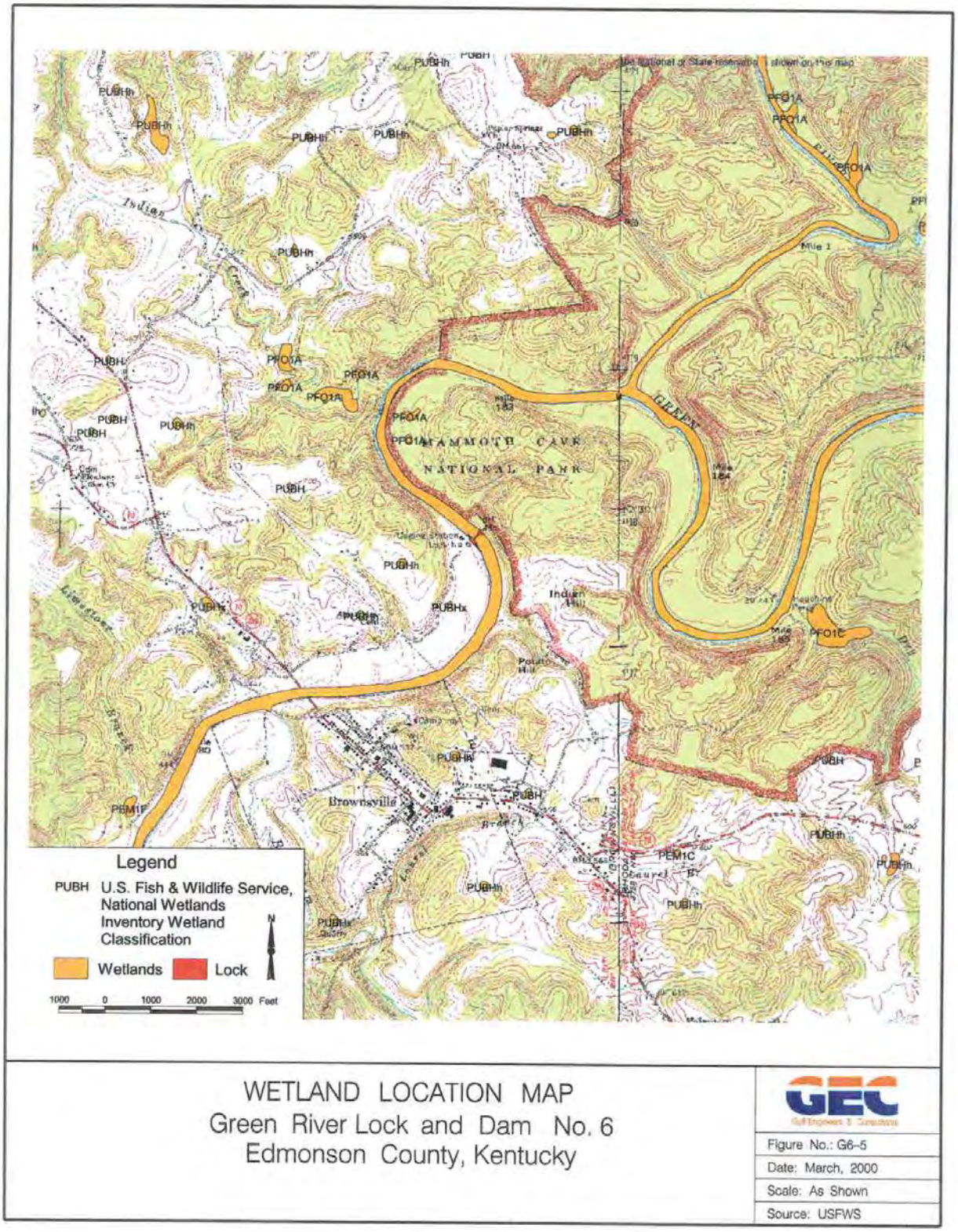
A Phase I Cultural Resources Reconnaissance was performed in 1998 for the site to determine if any archaeological resources would be impacted by federal disposal of the property. The reconnaissance found no evidence of prehistoric or undisturbed historic era cultural remains. Efforts are currently underway to document the existing structures at the facility. To date, the District has completed a brief historical overview of the Green and Barren rivers navigational system and prepared archival quality photo documentation of all extant structures. It is anticipated that the report containing this information will be completed July 2000. The District expects that the facility will be determined eligible for inclusion in the National Register of Historic Places and will require an as yet undetermined level of additional research and documentation.

5.9.3 Threatened and Endangered Species

Threatened and endangered species occur in the Green and Barren rivers and on adjacent terrestrial habitat. The federally endangered Kentucky cave shrimp (*Palaemonias ganteri*) is endemic to the Mammoth Cave system, portions of which are located within the pool created by G6, and the U.S. Fish and Wildlife Service (USFWS) has designated portions of the Roaring River passage of the Flint-Mammoth Cave system in the Edmonson County portion of Mammoth Cave National Park as critical habitat for the species.

Caves in the study area also provide habitat for the federally endangered gray bat and Indiana bat, which use the caves as hibernacula. One cave within the study area is known to support a gray bat maternity colony, and future surveys in additional caves may find other maternity colonies. Suitable habitat for Indiana bat maternity colonies also exists throughout the project area, and additional studies may confirm their presence.

Figure G6-5. NWI Map



The study project area also contains habitat for a variety of federally listed species of birds. Wintering populations of federally threatened bald eagles (*Haliaeetus leucocephalus*) have been observed, and nesting pairs have been confirmed in areas to the west. Such nesting pairs will probably inhabit the project area in the future as the species continues to expand its range. The Federally endangered American peregrine falcon (*Falco peregrinus anatum*) also occurs as a migrant or transient in the study area.

Endangered freshwater mussels in the study area include the rough pigtoe (*Pleurobema plenum*), orange-footed pearly mussel (*Plethobasus cooperianus*), northern riffleshell (*Epioblasma torulosa rangiana*), pink mucket pearly mussel (*Lampsilis abrupta*), and the fanshell (*Cyprogenia stegaria*). Recently deceased specimens of the ring pink (*Obovaria retusa*) and clubshell (*Pleurobema clava*) have also been observed, indicating their presence in the project area as well. Other listed mussel species that might still occur in the project area include the fat pocketbook (*Potamilus capax*), tuberculed-blossom pearly mussel (*Epioblasma torulosa torulosa*), cracking pearly mussel (*Hemistena lata*), and purple catspaw pearly mussel (*Edpioblasma sulcata sulcata*). The orange-footed pearly mussel, ring pink, and purple catspaw pearly mussels still reproduce in the Green River, and it is thought that this one of the few, perhaps the only, rivers where this occurs.

Federally threatened plants found in the study area include Price's potato bean (*Apios priceana*) and Eggert's sunflower (*Helianthus eggertii*).

Rare species for which potential habitat exists in the project area include the southeastern bat (*Myotis austroriparius*), Rafinesque's big-eared bat (*Plecotus rafinesquii*), eastern small-footed bat (*Myotis leibii*), eastern woodrat (*Neotoma floridana*), Bachman's sparrow (*Aimophila aestivalis*), eastern sand darter (*Ammocrypta pellucida*), northern cave fish (*Amblyopsis spelaea*), southern cave fish (*Typhlichthys subterraneus*), longhead darter (*Percina macrocephala*), blue sucker (*Cycleptus elongatus*), hellbender, Kirtland's water snake (*Clonophis kirtlandi*), cooperbelly water snake (*Nerodia erythrogaster* var. *neglecta*), spectacle case pearly mussel (*Cumberlandia monodonta*), Kentucky creekshell mussel (*Villosa ortnanni*), rabbit's foot pearly mussel (*Ouadrula cylindrica*), purple liliput pearly mussel (*Toxolasma lividus*), pale false foxglove (*Agalinis skinneriana*), royal catchfly (*Silene regia*), and Gattinger's lobelia (*Lobelia appendiculata* var. *gattingeri*). These species are not currently considered candidate species, however, they could be listed in the future if their numbers decline and threats to their survival persist.

6.0 SUMMARY AND CONCLUSION

G6 is located just upstream of Brownsville, in Edmonson County, Kentucky. The site occupies approximately 18.0 acres on the right descending bank and 0.83 acres located on the left

descending bank. Improvements at the site include the lock and dam, a spring house, and a USGS gauging station. Operations commenced on January 1, 1906 and ceased on August 1, 1951. The structure was deactivated on August 31, 1951.

The Corps is considering disposing of federal interest in the facility due to a lack of any continued authorized project purpose, and G.E.C. was contracted to conduct an EBS in order to facilitate the possible transfer. In accordance with applicable requirements contained in AR 200-1 and ASTM E1527-97, G.E.C. reviewed Department of the Army records and federal, state, and local databases, federal and state agency evaluations, conducted historical research of the site and surrounding area, interviewed pertinent personnel, and performed a site investigation in order to characterize environmental conditions at the site.

There is no evidence that hazardous materials were ever stored, handled, transported, or disposed of at the site.

There is evidence suggesting the possible presence of PCBs in a pole-mounted electrical transformer at the site.

There is no evidence that the site ever stored significant amounts of petroleum products and/or derivatives or that a release of such materials ever occurred.

Chipped, cracked, and flaked paint was observed at the site, on bollards, cleats, and rails associated with the lock, and on the door of the gauging station. Should the paint contain lead, conditions at G6 could pose a hazard to human health.

There appear to be no asbestos or air quality concerns at the site.

The lock and dam are deteriorated and there appear to be items of concern with regard to public safety. As a result, there may be liability associated with continued ownership of the site.

Twenty-one unplottable sites of concern were found during the federal and state database review. G.E.C. located 14 of the 21 and they are well outside of the ASTM-recommended search distances, and there is reason to believe the remaining seven sites are also located well away from the site. In any event, it is unlikely that any of the 21 sites has had an impact on conditions at G6.

G.E.C. observed forested palustrian wetlands at the site, and threatened and endangered species are known to occur in the vicinity.

A Phase I Cultural Resources Survey has concluded there is no evidence of prehistoric or undisturbed historic era cultural remains in the vicinity of the site, however the improvements at G6 may themselves be potentially eligible for listing in the National Register of Historic Places.

In accordance with Finding of Suitability to Transfer (FOST) Requirements for Notification, Covenants, and Access, Green River Lock and Dam No. 6 is a Category 1 site, an area where no

release or disposal of hazardous substances or petroleum products has occurred, and no migration of these substances from adjacent areas has occurred.