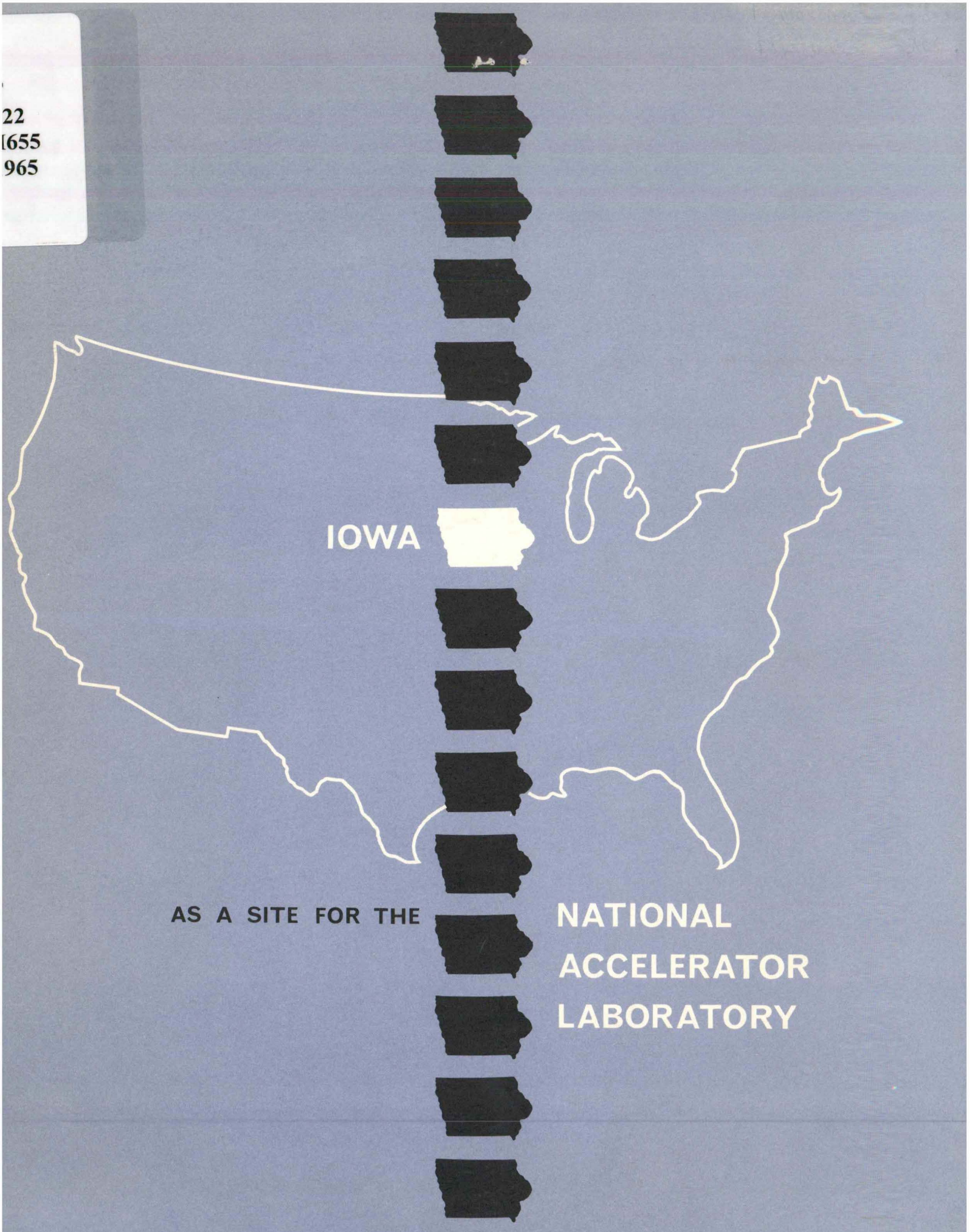

AS A SITE FOR THE NATIONAL ACCELERATOR LABORATORY

National Accelerator Laboratory

Prepared for Atomic Energy Commission

July 1965

The following material was compiled in The University of Iowa Office of Public Information, with the assistance of various faculty and staff members of the University, the Iowa and the U.S. Geological Surveys, the Chambers of Commerce of Cedar Rapids, Iowa City, and Davenport, the Iowa–Illinois Industrial Development Group, the Iowa Development Commission, and various community leaders in the area. Requests for further information may be directed to the Office of Public Information at The University of Iowa, Iowa City.

STATE OF IOWA
OFFICE OF THE GOVERNOR
DES MOINES

HAROLD E. HUGHES
GOVERNOR

July 9, 1965

Dr. Paul W. McDaniel, Director
Division of Research
Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. McDaniel:

It is a great privilege for me, as Governor of the State of Iowa, to join with leading scientists, educators, industrialists, and citizens of our state in urging that Iowa's facilities and capabilities be given thorough consideration as a site for the proposed new national accelerator laboratory of the Atomic Energy Commission.

Contributions by Iowa's two state universities and numerous private industries to the nation's research efforts are already well-known. The work of Dr. James Van Allen of the University of Iowa in Iowa City and Dr. Frank Spedding of the Atomic Energy Laboratory at Iowa State University in Ames needs no introduction.

Iowa's location in the heart of the nation provides easy access to and quick communication with the engineering schools and research facilities in both the "Big 10" and "Big 8" groups. In addition, the area is centrally located with regard to research and production complexes on both the East and West Coasts.

Similarly, although Iowa is geographically linked to such major metropolitan areas as Chicago, Kansas City, St. Louis, Omaha, and Minneapolis-St. Paul, the state has a great deal to offer in the way of uncrowded working conditions and sufficient land for such a laboratory without the burden of long commuting distances.

In addition, an Iowa location would provide the nation with greater security because it would alleviate the heavy concentration of research and industrial facilities which now exists in some of the major population areas of the country.

A university-industrial research climate conducive to the work of the laboratory exists in Iowa. A variety of manufacturing and fabrication industries are already operating in the area. The proposed site being presented for your consideration is supported by the entire state of Iowa, including both of our state universities.

It is with these qualifications in mind that I sincerely urge that the State of Iowa be given primary consideration in your efforts to determine the most suitable site for the proposed national accelerator laboratory.

Sincerely,

Harold E. Hughes

HAROLD E. HUGHES
Governor

HEH/llr

THE UNIVERSITY OF IOWA
IOWA CITY, IOWA 52240

Office of the President

9 July 1965

Dear Dr. Seaborg:

As spokesman for one of the universities cited by Governor Hughes in his letter of transmittal, I should like to join in urging consideration of an Eastern Iowa site for the accelerator.

Pertinent facts have been compiled and are set forth briefly on the following pages. I need hardly tell you that we shall be happy to supplement these at any point desired, and that we hope especially that we may have an opportunity to show the area to you and some of your colleagues in person.

The University of Iowa would welcome to its campus the many talented individuals connected with this unique research endeavor, you may be certain. Should it be established in this area, we would hope to make adjunct appointments to our faculty of qualified staff members from the accelerator laboratories, and we would encourage and facilitate their participation in the University's academic, cultural and recreational activities.

Cooperation with others in responsibilities of national consequence is a tradition at The University of Iowa. I am sure you are aware of our being invited to participate in the founding of the Universities Research Association, Inc., now being developed as the contractual entity for building and operating the proposed accelerator center. We have participated for years in work at the Argonne National Laboratory, and were among the founders of the Midwest Universities Research Association.

The same factors which make this particular region attractive to our faculty members would, I sincerely believe, make it attractive as a place to live for the staff of the national accelerator laboratory. We would suggest that these factors are worthy of serious analysis and consideration as the Commission undertakes this most difficult selection process.

Yours sincerely,

Howard R. Bowen

Howard R. Bowen

Dr. Glenn T. Seaborg, Chairman
United States Atomic Energy Commission
Washington 25, D.C.

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY
Ames, Iowa 50010

OFFICE OF THE PRESIDENT

July 8, 1965

Dr. Glenn T. Seaborg, Chairman
Atomic Energy Commission
Washington, D. C.

Dear Dr. Seaborg:

The Iowa State University of Science and Technology is pleased to endorse and support the proposal to place the 200-bev accelerator in Iowa. There are many compelling reasons why this important facility should be located in the heartland of our country, and Iowa would, we feel, provide a particularly favorable environment and set of resources for the facility.

You are, I am sure, well acquainted with the strong science and engineering research programs available in Iowa through your knowledge of the Ames Laboratory of the Atomic Energy Commission which is closely integrated into the graduate programs of our University. The location in eastern Iowa, close to the University of Iowa and Iowa State University, and centrally located with respect to the great universities and intellectual resources of the Midwest would, we are sure, prove ideal. We sincerely urge that the proposal be given careful and favorable consideration.

Sincerely yours,

W. Robert Parks

W. Robert Parks
President

WRP:jvp

Cross Index

QUICK REFERENCE
TO SITE AND ENVIRONMENTAL INFORMATION

Table of Contents

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List of Illustrations

Introduction: Two Potential Sites

Within the Iowa City-Cedar Rapids-Davenport area of Eastern Iowa, two potential sites commend themselves for consideration by the Commission. While they have many desirable features in common, each has several special attributes which should be of interest. Both sites are evaluated on the following pages in terms of the requirements set forth by the Commission.

One such proposed site is identified herein as the North Liberty Site, taking its name from the village to which it is adjacent, a third of the way between Iowa City and Cedar Rapids. The second site is identified as the Sunbury Site, after the small Cedar County village located just to the north of Interstate 80, at a point approximately half-way between Iowa City and Davenport.

The Proposed North Liberty Site

The basic North Liberty Site as proposed herein comprises a combination of 4,159 acres owned by the U.S. Government and 34 privately owned tracts containing 3,354 acres, for a total of 7,513 acres in Madison township, Johnson County. Of the 4,000-plus government acres under consideration here, those not usable for the basic installation itself could provide sites for auxiliary structures, except for the lowest areas (those closest to the Iowa River) which should be useful as an unpopulated zone to the north.

Immediately contiguous to the proposed site are some 3,000 additional acres of privately-owned land which also meet the specified needs. Hence more than 10,000 acres could be available for the accelerator installation, with nearly half of this area already under federal ownership.

A community development committee, comprised of area business, financial, and industrial leaders, will assure the availability of such privately-owned land as might be needed for the site (see Appendix A).

The basic North Liberty site, as proposed, is shown on the map following this page (Fig. 1). It averages 4 1/2 miles from east to west and 2 1/2 miles north to south. The north and east edges are irregular, as will be perceived. The 3,000-plus acres of additional land noted above lie in a square measuring 2 1/2 miles to a side, with the north end contiguous to the basic proposed site. (It should be noted that an equivalent area of privately-owned land lies immediately west of the "additional land" described in the preceding sentence. In geological characteristics and use the areas are virtually identical. Hence the potential North Liberty site might be considered to total in excess of 13,000 acres).

Much of the federally-owned land is presently utilized for farming and pasture on a "lease-back" arrangement between the government and owners of adjoining private land. The remaining federal land is utilized for recreational purposes and some of it is designated as a game preserve.

Most of the privately-owned land is in crop or pasture, and its present market value is approximately $400 per acre, including buildings. Farmhouses, barns and outbuildings comprise the only capital improvements made upon this land; these would not appear to be useful to the proposed accelerator project.

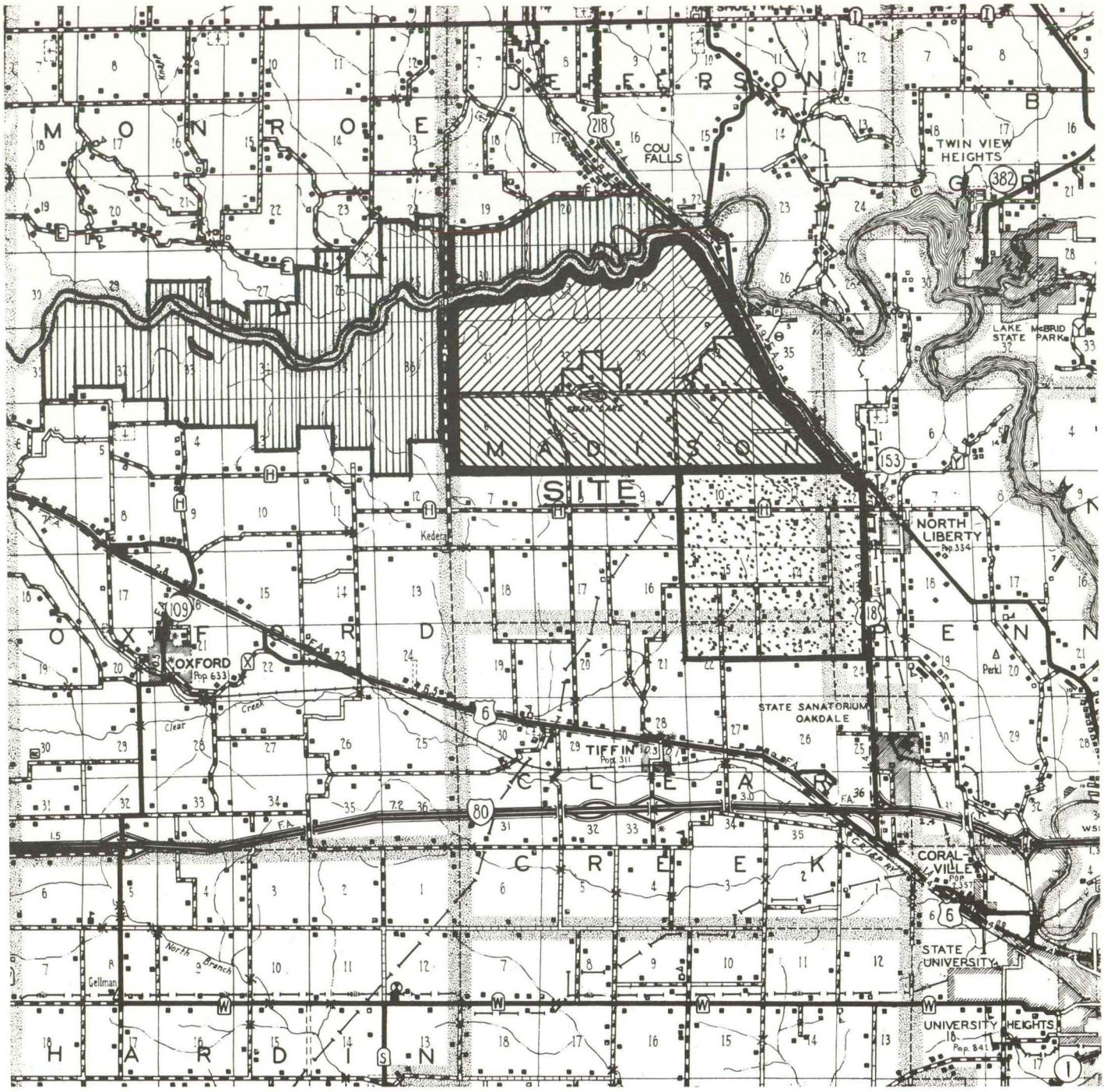


Figure 1. Map of Site Ownership

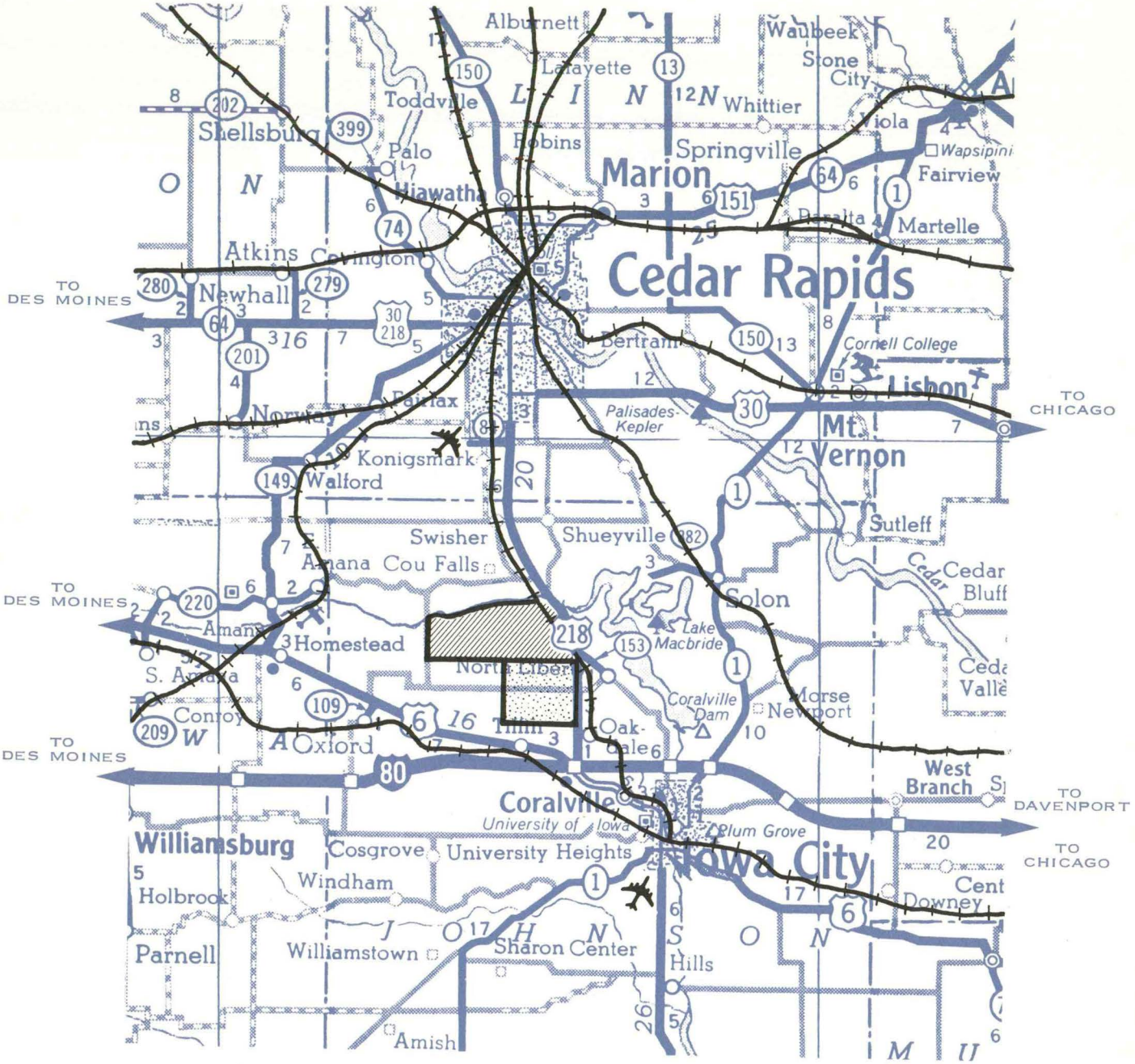


Figure 2. Immediate Environment - North Liberty Site

Topography and Pleistocene Geology

The North Liberty Site area outlined on the Fairfax, Iowa, topographic quadrangle is situated near the southern margin of a lobe of Iowan drift mantle. The topography is generally flat to gently rolling and is well drained. The relief averages 30 feet in the eastern one-half and is up to 60 feet in the western one-half. The surface elevation ranges from 720 to 780 feet above sea level.

The top soil varies locally from dark brown to dark grayish-brown silt loam. A zone of from 10 to 45 feet of oxidized glacial till underlies the soil, and is in turn underlain by approximately 35 to 65 feet of unaltered till. Locally there may be thin lenses of sand and/or gravel within the unaltered till, and a basal sand and gravel unit may occur on top of the bedrock.

Bedrock Geology

The bedrock encountered in the area is dominantly within the Lime Creek Formation. This formation consists of shale and interbedded dolomite or limestone. The thickness may range from 0 to 65 feet within the outlined area.

The Cedar Valley formation underlies the Lime Creek Formation. The Cedar Valley is composed dominantly of bioclastic limestone or dolomitic limestone. It is unconformable with the Lime Creek above and has a maximum thickness of approximately 110 feet in this area. The Cedar Valley Formation is exposed as resistant bluffs in the Iowa City vicinity and forms the foundation of many of the U. I. buildings.

Seismic History

Although seismic activity is commonplace in many parts of the U.S. there is no record of seismic activity in this area.

Water Table

There is very little available information as to the elevation of the water table in the area. The glacial drift is highly impermeable. There is record of only one well completed in the Pleistocene with a static water level of 82 feet. It is reasonable to assume the possible existence of a perched water table within or above the unaltered till, and that the water table will fluctuate with variations in precipitation.

In reference to water levels it is pertinent to mention that the maximum level (spillway) of the nearby Coralville Reservoir is 712 feet above sea level.

Load Bearing Capacity of Glacial Till

Generally, till can carry a static load (dead weight) of 2 to 2 1/2 ton/ft^2. But, because of the heterogeneity of till, extensive testing would have to be done. Factors involved in determining the dynamic loading precludes any generalization on this type of loading strength of till.

Weather

The weather for the North Liberty Site will correspond very closely with the weather for Cedar Rapids. Records on Cedar Rapids weather from 1931 to 1960 reveal the following:

mean temperatures (annual)

Daily Maximum -- 59.7 degrees F.
Daily Minimum -- 38.7 degrees F.
Mean Temperature for the Year -- 48.3 degrees F.

extreme temperatures

Record High -- 109 degrees F. in 1936
Record Low -25 degrees F. in 1936

precipitation totals in inches (annual)

Mean -- 33.27
Greatest Daily -- 6.31 in 1939
Snow (mean) -- 30.3
Maximum Monthly Snow -- 30.9 in 1951
Greatest Daily Snow -- 16.7 in 1954

wind

Prevailing Northwesterly

humidity

July, 9 a.m. -- 53%
October, 9 a.m. -- 45%

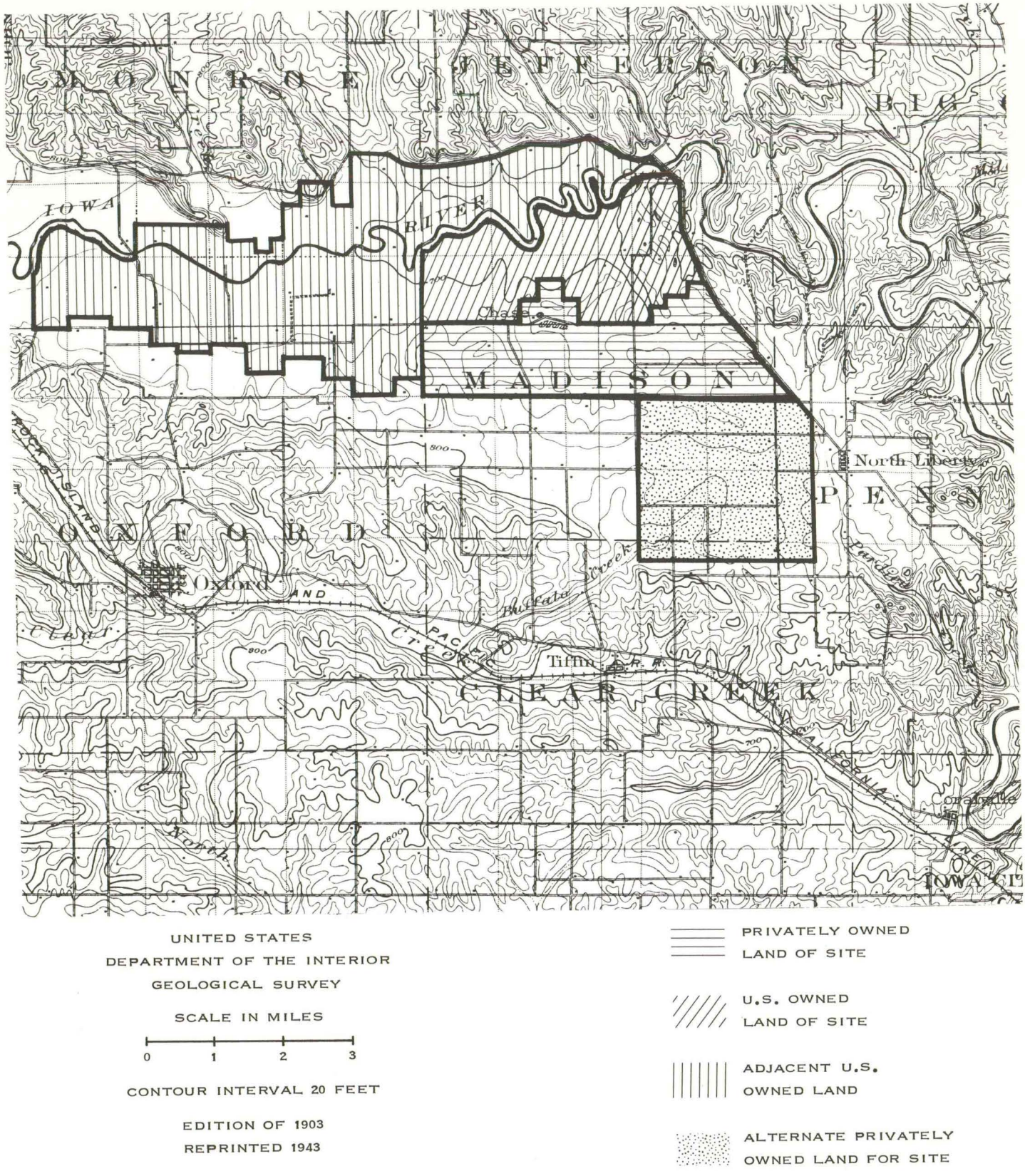


Figure 3. Surface Topography Map of Proposed North Liberty Site

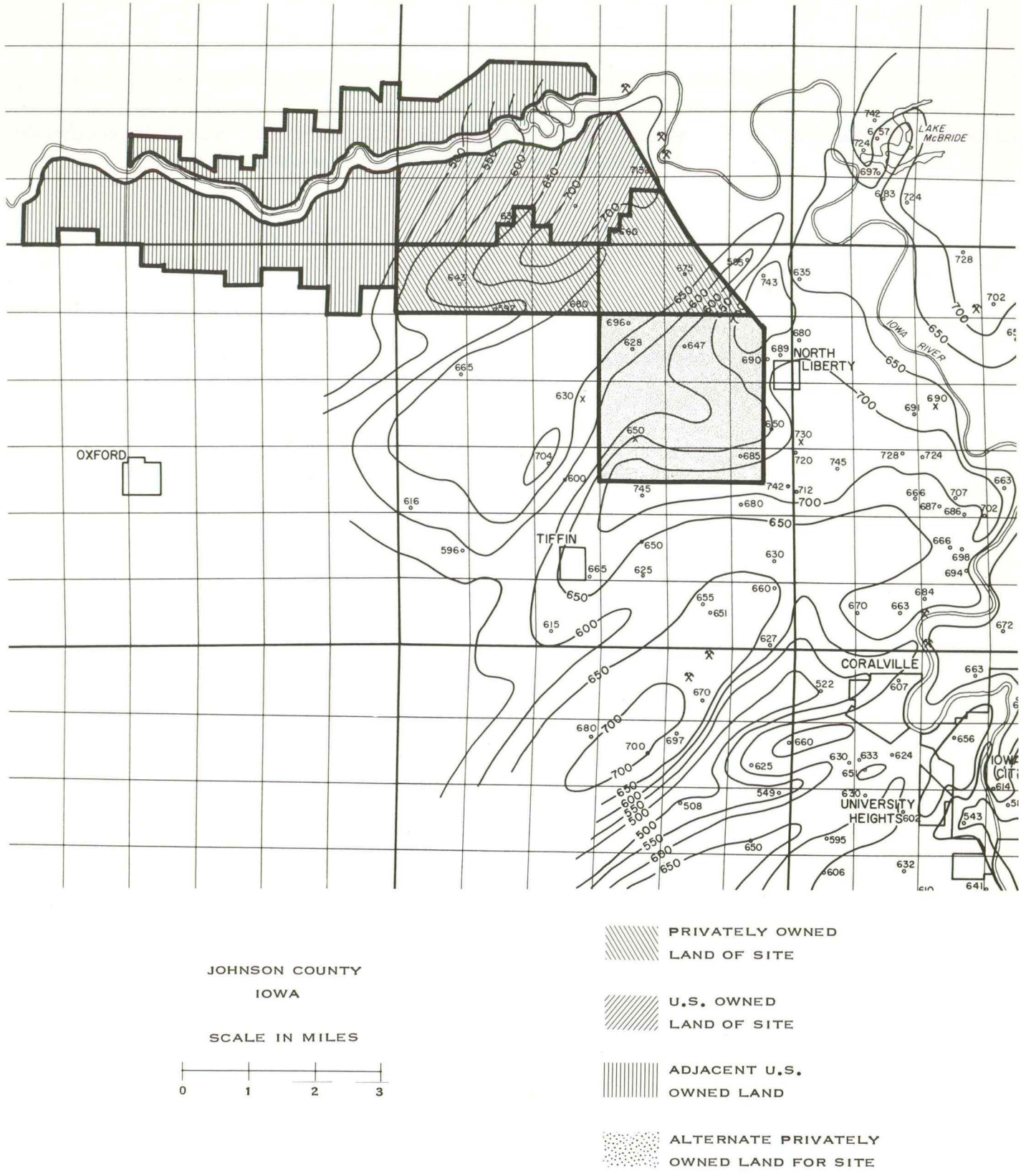


Figure 4. Geological Map of Bedrock Contours for the Proposed Site

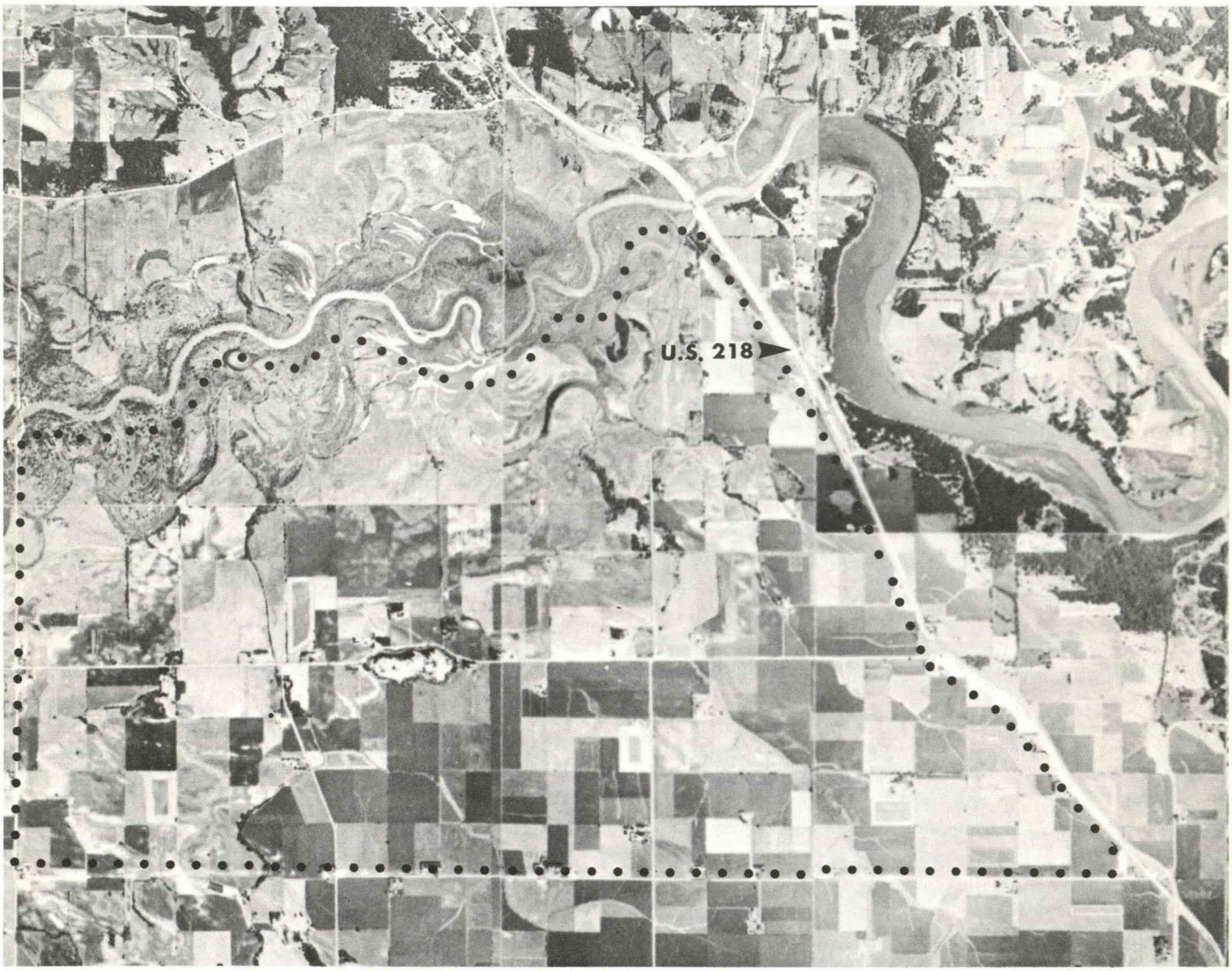
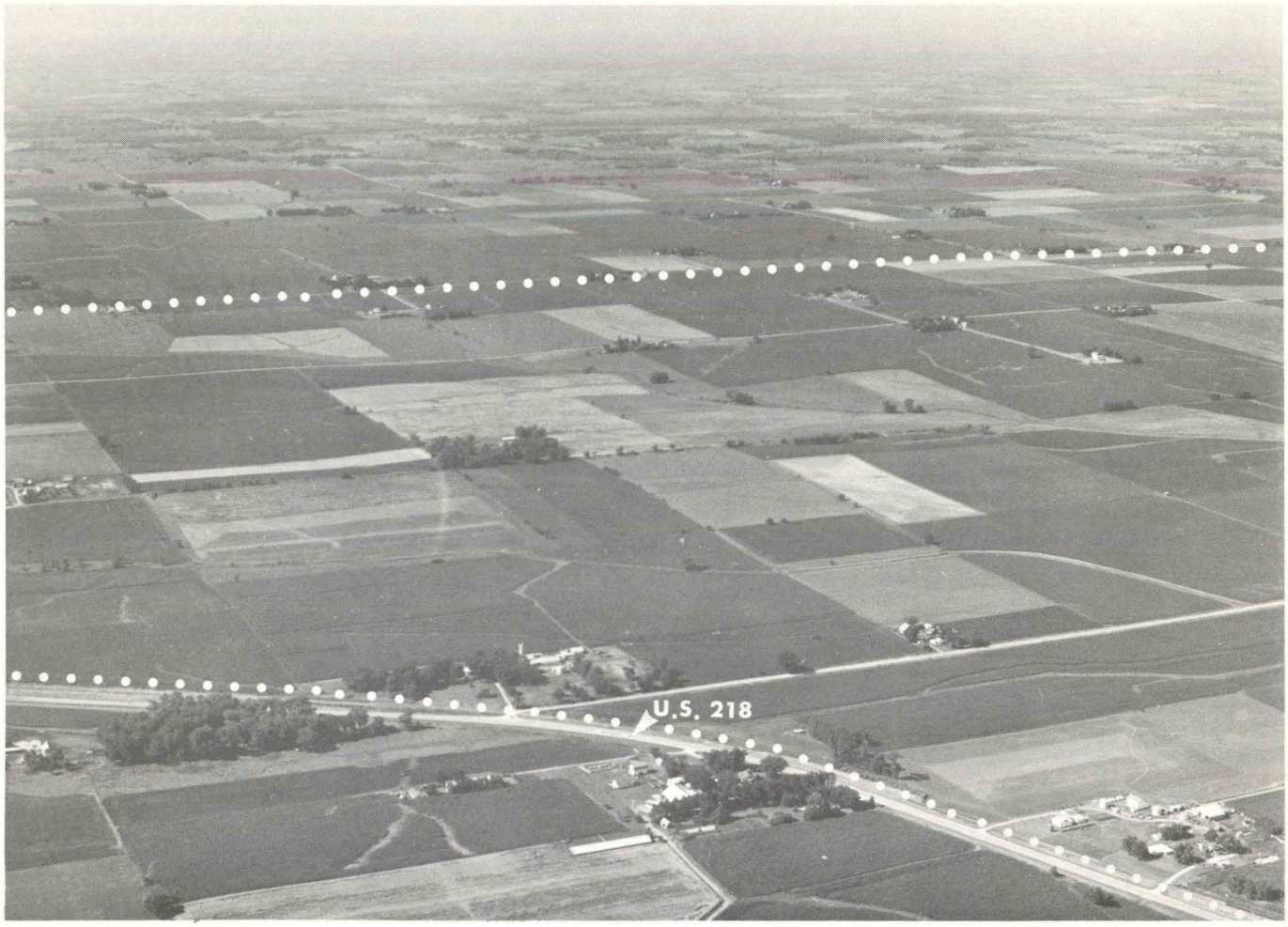


Figure 5. High Altitude View of North Liberty Site (10,000 Feet)



Low Angle Air View

Ground Level View

Figure 6. Views show Flatness and Rural Character of Proposed Site

Availability of Utilities

electrical power --The schedules available as of May 26, 1965, of the characteristics of the electrical loads for the 200 BEV national accelerator laboratory indicate that the major power requirements will be needed in 1973 and that the initial years will require power in varying amounts. The Iowa Electric Light and Power Company submits the following proposal for supplying this electrical power requirement at the North Liberty Site:

1. An adequate source of electrical power will be available on the site whenever needed.

2. Such power will be brought to the site by a two-way feed of 161 KV transmission lines supplied from existing generating stations and a 345 KV substation within 20 miles of the site.

3. By 1973 the Iowa Electric Light and Power Company will interconnect this plant site with the 345 KV transmission system of the M.A.P.P. System, as shown on the attached map (Fig. 8).

4. The Iowa Electric Light and Power Company will construct, own and operate a generating station on the proposed accelerator site. This station will be of sufficient capacity for the full electrical load requirements of the accelerator and its full capacity will be dedicated to the exclusive use of said accelerator.

The above proposal will have the effect of giving three-way service to the proposed accelerator from on-site generation, M.A.P.P. System, and the Iowa Grid, which establishes the greatest assurance of continuity of service possible.

The rate available for this service is as shown on enclosed Rate Schedule GP (see Part I, Appendix B). This schedule enables full use of dedicated capacity for this project at 5.5 mills per Kilowatt-Hour. If full use of the dedicated capacity cannot be utilized then such unused portions shall be credited to the consumer at 2.3 mills per Kilowatt-Hour.

A unit cost table is enclosed also (see Part I, Appendix B), which provides an estimating base for load factors different from those anticipated.

The rate schedules provide for line extensions and transformation to utilization voltage without additional cost to the prospective consumer.

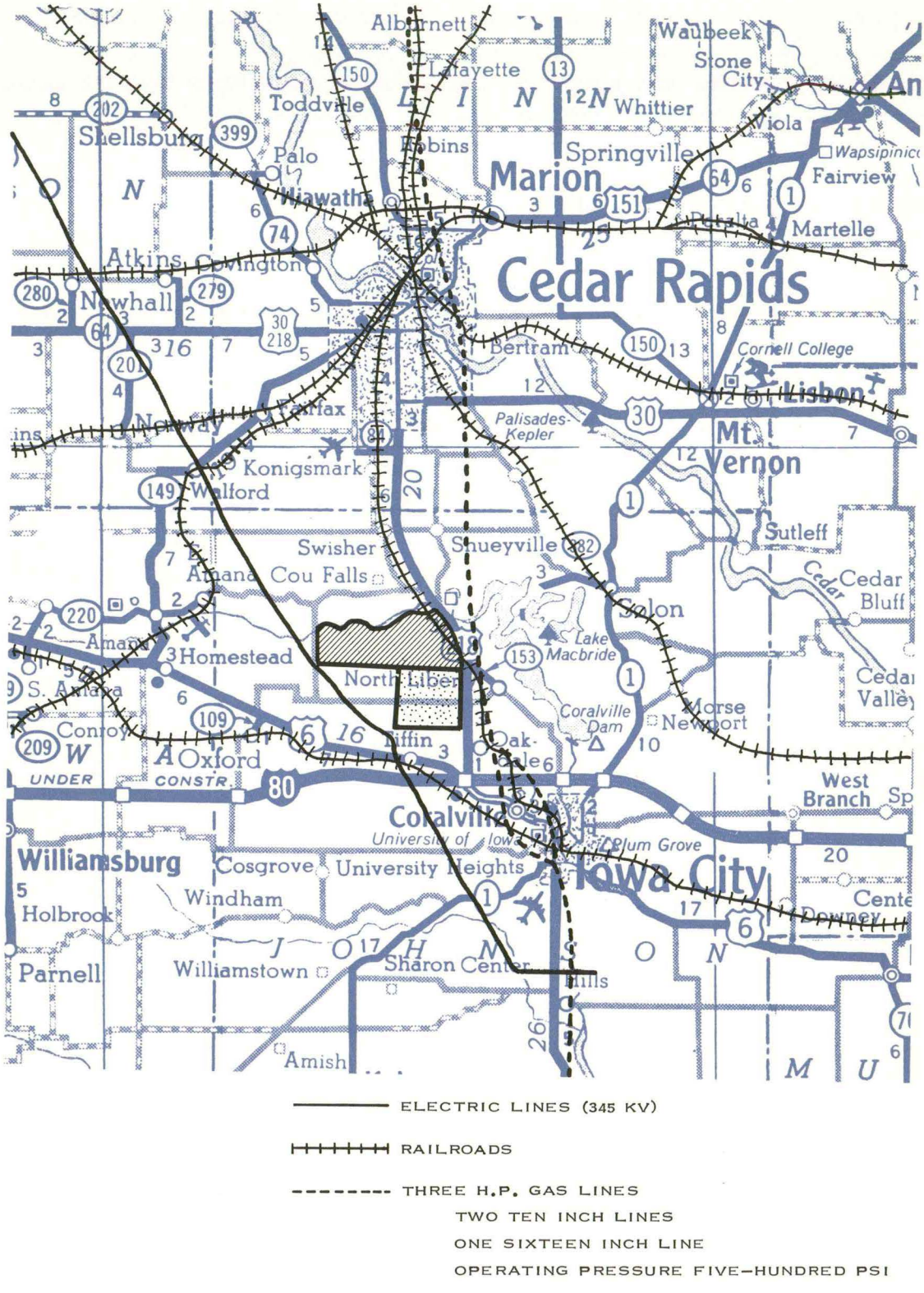


Figure 7. Utilities Map of the North Liberty Site

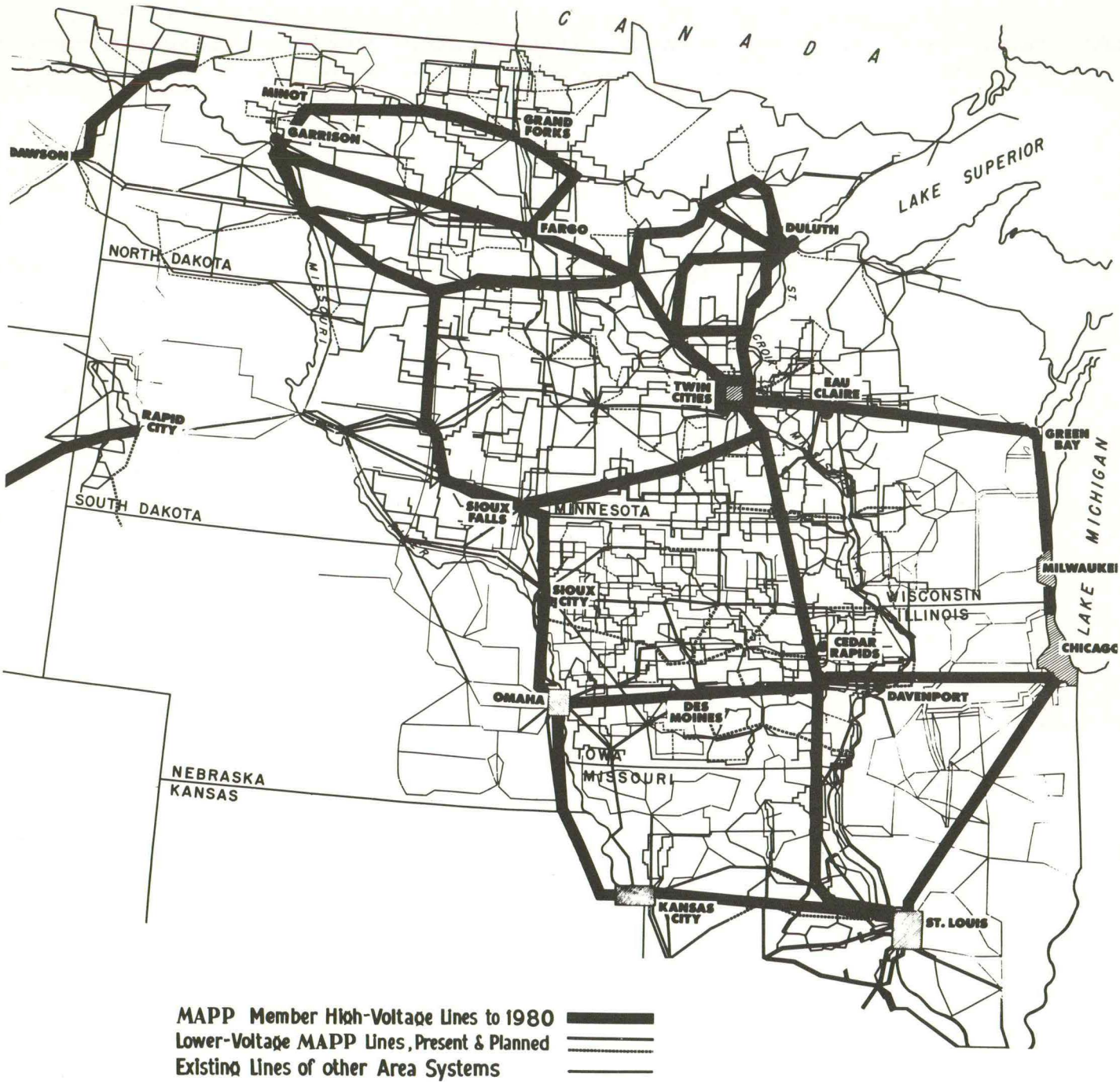


Figure 8. MAPP System Transmission Plans

water supply -- The following statements represent an interpretation of the available hydrologic data in the files of the Iowa and U.S. Geological Surveys.

The proposed North Liberty Site for the national accelerator laboratory is located on the gently rolling upland south of the Iowa River in parts of sections 2, 3, 10, 11, 12, 13, 14, 15 T. 80N., R. 7W., Johnson County, Iowa. The following is a generalized log of the strata anticipated to underlie this area down through the St. Lawrence Dolomite based on an assumed starting elevation of 750 feet above sea level.

Formation	Thickness (ft.)	Depth Range (ft.)
Quaternary System		
Pleistocene Series (glacial drift, might include some sand and gravel)	75-150	0-100±
Devonian System	25±	100-125±
Lime Creek Formation (calcareaus shale)	90±	125-215
Cedar Valley Formation (limestone) Wapsipinicon Formation (limestone) in upper half, dolomite in lower half, slightly cherty and sandy at base)	65	215-280
Silurian System	150	280-430
Niagaran Series (dolomite) Alexandrian Series (dolomite with 10-30% chert)	50	430-480
Ordovician System		
Maquoketa Formation (mostly shale, dolomite zones in middle and at base, dolomite contains minor amounts of chert)	235	480-715
Galena Formation (mostly dolomite, some limestone, some chert in lower half)	215	715-930
Decorah-Platteville Formations (mostly limestone, thin shale within and at the base)	80	930-1010
St. Peter Sandstone	45	1010-1055
Prairie du Chien Formation (dolomite, sandy in upper half, with trace of chert; dolomite with much chert in lower half)	430	1055-1485
Cambrian System		
Jordan Sandstone, contains considerable dolomite	150	1485-1635
St. Lawrence Formation (dolomite, silty)	100±	1635-1735±

All of these figures may have to be adjusted slightly owing to local variations in the structure and thickness of the beds. A higher or lower starting elevation will also modify these depths to some extent.

Moderate quantities of water are derived from the limestone and dolomite beds of Devonian and Silurian age. Larger quantities of water can be obtained by penetrating the entire Devonian-Silurian sequence to the top of the Maquoketa shale. The University of Iowa has several such wells developing between 250 and 560 gpm.

Moderately large quantities of water may be found in the Galena and St. Peter formations. The University well (1927) was completed in the Galena dolomite and was reported to yield 300 gpm. A yield of 50 to 100 gpm. probably can be developed from the St. Peter sandstone, but this formation has yielded water with large concentrations of sulfate and sodium from several deep wells in southeastern Iowa making it a doubtful source.

The most promising source for a large production water well is the Jordan Sandstone and the immediately overlying and underlying dolomites at a depth range of 1400 to 1675 feet. Based on information on wells penetrating this aquifer at Oakdale Sanatorium, Marion, Coralville, Iowa City and West Liberty, yields of 1000 gpm. or more can be obtained. The Oakdale well, nearby to the south of the proposed site, produced 370 gpm. with only 9 feet of drawdown indicating exceptionally favorable aquifer conditions. Most Jordan wells yield between 6 and 15 gallons per foot of drawdown. The static head of the Jordan-St. Lawrence aquifer will probably rise to within 80 feet of the surface. Most new wells penetrating this aquifer are cased and cement grouted from the surface into the upper part of the Prairie du Chien dolomite to adequately shut out all overlying water beds. Mineral analyses indicate the water to be acceptable for drinking and other domestic uses. Several analyses from this aquifer are given on a separate sheet included with this report.

In summary, the initial water requirements for the national accelerator laboratory may be met at the proposed site by one or two wells. Additional wells may be required to satisfy the ultimate need.

The typical water temperature is 65 degrees.

Based on geologic factors at the site, performance of producing wells in the vicinity, and costs experienced in pumping water at The

University of Iowa treatment plant, the estimated cost for meeting the initial and potential water requirements at the proposed North Liberty Site is .9 cent per thousand gallons.

The Iowa River, which flows across the north boundary of the government-owned land in the proposed site, is also an adequate source of water.

-- Water Supply material above prepared by staff members of the Iowa and U.S. Geological Surveys, Iowa City, and the University of Iowa's Department of Preventive Medicine and Environmental Health

natural gas -- In considering the fuel and certain other requirements of the proposed national accelerator laboratory, it should be noted that three high-pressure natural gas lines of the Iowa-Illinois Gas and Electric Co. parallel Highway 218 between Iowa City and Cedar Rapids, and therefore pass along the eastern boundary of the proposed North Liberty Site. Two of the lines are 10 inches in diameter, while the third is a combination of 12- and 16-inch main. The operating pressure on these lines is approximately 500# per square inch.

TABLE 1
IOWA GEOLOGICAL SURVEY
TABULATION OF WATER ANALYSIS
(Dissolved constituents in parts per million)

Town - Well No. Owner	Date of coll	Depth (ft)	Geol source	°F	Diss solids	Fe	Mn	Ca	Mg	K	Na	CO_3	HCO_3	SO_4	Cl	F	NO_3	Hardness cal. as $CaCC_3$			pH	Cond
																		tot.	carb	non carb		
Marion City Well ('58) Linn County	1/21/60	1663	P. du Chien Jordan St. Lawrence	60	523	1.1	<.05	45	51	14	62	0	342	152	10	1.4	.44	322	280	42	7.7	820
U of I Water Treatment Plant ('63)	10/9/63	1550	P. Du Chien Jordan St. Lawrence	66	1160	1.7	<.05	98	48	19	182	0	288	538	51	1.2	1.6	440	236	204	7.5	1610
Iowa City City Well ('62)	11/27/62	1570	P. Du Chien Jordan St. Lawrence	65	1167	.52	<.05	102	52	17	190	0	283	554	54	1.25	<0.1	470	232	238	7.4	1640
Oakdale Sanitorium Well	7/29/42	1756	P. Du Chien Jordan St. Lawrence	66	1085	.2	0.0	109	46	224			293	621	34	0.7	1.3	461	240	221	7.5	
U of I No. 5	11/50	840	Galena	59	909	.35	0	56	29	201			283	339	47	1.6	0	259	232	27	7.7	1260
U of I Currier Hall	6/54	425	Devonian Silurian	54	600	0.2	0	110	43	4.9	38		439	147	3.0	0.2	9.7	452	360	92	7.8	775

The Proposed Sunbury Site

The basic Sunbury Site, as herein proposed, consists of 3,337 acres of farmland. To the south and east of this area is an additional 3,492 acres of gently rolling farmland of approximately the same general geologic characteristics, which would also be available to the proposed national accelerator laboratory as a secondary site area. Hence a total area of 6,829 acres in Cleona and Liberty townships in Scott County are available for development, and would seem to possess favorable geologic conditions as well as the necessary degree of flatness.

The land in both the primary and secondary areas is privately owned. Twenty-five owners would be involved in the acquisition of the primary site, and another 20 in the secondary site (not counting five owners whose property overlaps both site areas).

The Sunbury Site, as proposed, is shown on the map following this page (Fig. 9). The primary site forms a rectangle, indented at the northeast corner, approximately 2-1/2 miles east to west and 2 miles north to south. The addition of the secondary site forms a larger rectangle of the same general configuration, approximately 3-1/2 miles east to west and 3 miles north to south.

Most of this land is in crop or pasture, and its present market value is from $500-700, including capital improvements. These improvements consist of farmhouses, barns, and other outbuildings and would not appear to be useful to the proposed accelerator project.

A community development group in the Quad Cities will assure the availability of such privately owned land as might be needed for the site (see Appendix A).

Topography and Pleistocene Geology

The area under consideration, in northwestern Scott County, Iowa, is outlined on the Bennett and Dixon topographic quadrangles. It is situated on the maturely dissected area of Kansan drift and the surface is gently rolling. The principal stream is Mud Creek, which occupies the southern part of this area and flows northeastward to the Wapsipinicon River. This broad sag was once occupied as a temporary channel by the ancient Mississippi River.

The surface soil is a dark-brown loam which grades locally into a light-gray to gray silty clay loam. A zone of from 10 to 50 feet of oxidized

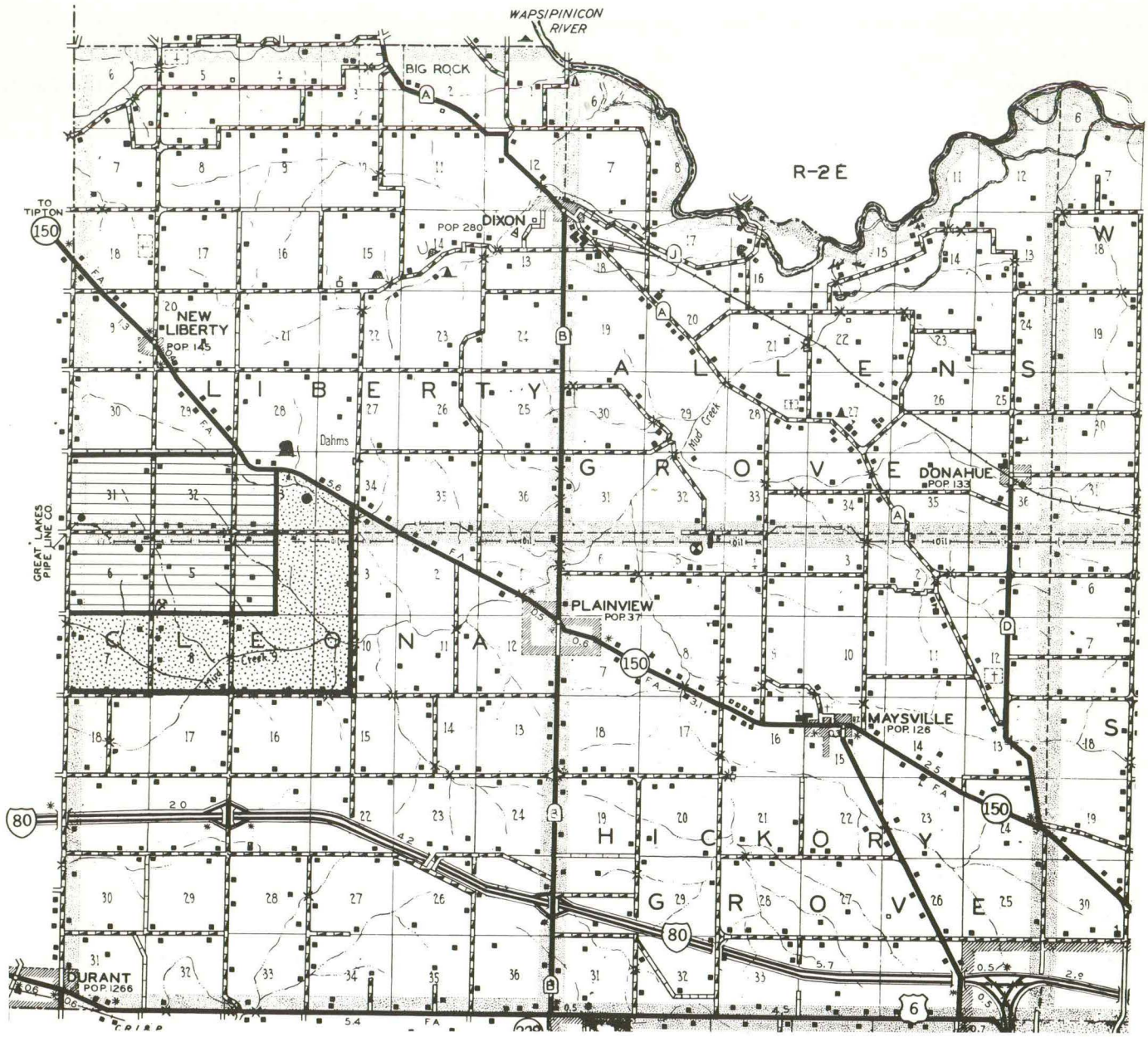


Figure 9. Map of Site Ownership

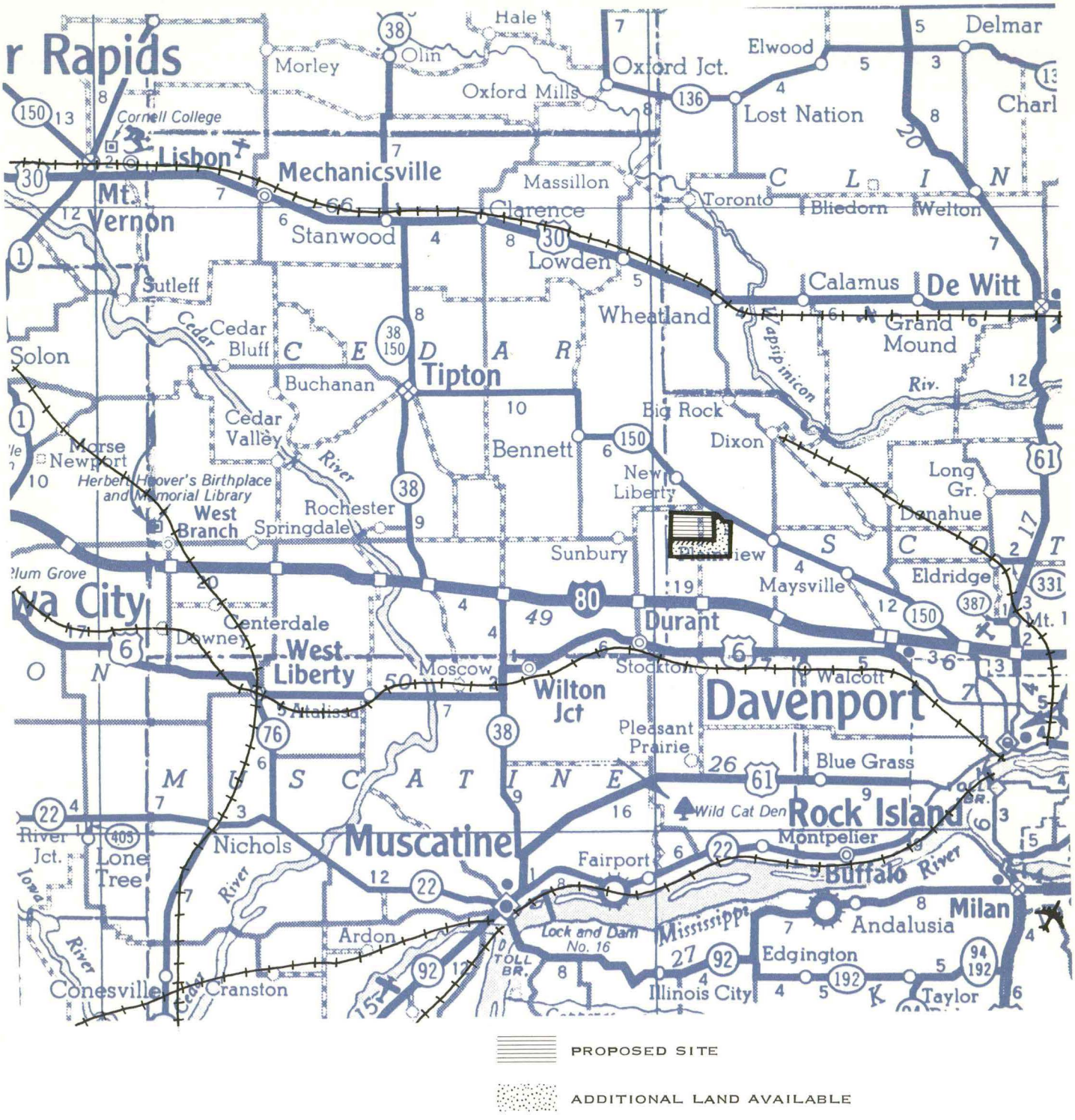


Figure 10. Immediate Environment - Sunbury Site

glacial till underlies the soil. Locally there may be thin lenses of sand and/or gravel within or at the base of the altered till.

Bedrock Geology

The bedrock encountered in the proposed area is dolomite belonging to the Niagaran Formation. In the northern part of the proposed area the bedrock surface is relatively shallow. Water wells in sections 33, T. 80 N., R. 1 E., and 6, T. 79 N., R. 1 E. encountered only 5 and 25 feet of Pleistocene material respectively overlying the Niagaran dolomites. In the valley of Mud Creek and its tributaries as much as 100 feet of Pleistocene material has been encountered overlying the bedrock surface.

The LeClaire reef phase of the Niagaran dolomite is exposed in quarries located in section 33, T. 80 N., R. 1 E. and section 5, T. 79 N., R. 1 E. Both the LeClaire and Anamosa, the inter-reef phase of the Niagaran, are considered to be sound, durable rock for foundation footings.

Seismic History

Although seismic activity is commonplace in many parts of the United States, there is no record of seismic activity in this area.

Water Table

There is very little available information as to the elevation of the water table in the area. The glacial drift is highly impermeable. There is no record of a well completed in the Pleistocene material within the outlined area. Water wells that penetrate the Niagaran dolomite for distances of 50 to 100 feet report a static head of approximately 50 feet below the land surface.

Load Bearing Capacity of Glacial Till

Generally, till can carry a static load (dead weight) of 2 to 2-1/2 ton/ft^2. But, because of the heterogeneity of till, extensive testing would have to be done. Factors involved in determining the dynamic loading preclude any generalization on this type of loading strength of till.

Weather

The weather for the Sunbury Site will correspond very closely with the weather for the Quad Cities. Weather records indicate the following:

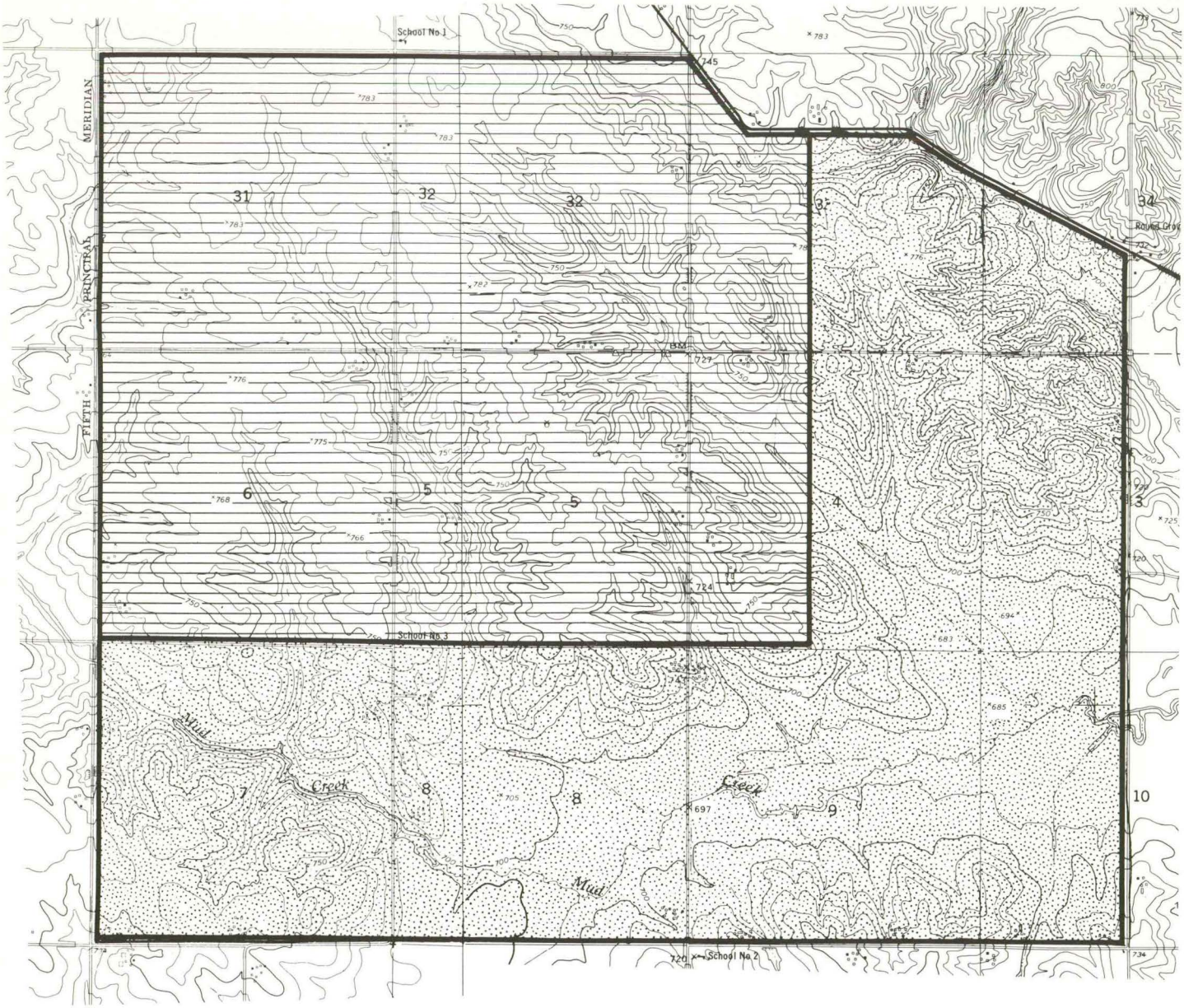


Figure 11. Surface Topography Map of Proposed Sunbury Site

Low Angle Air View (Overall)

Low Angle Air View Shown from the Southeast Corner of the Site

Figure 12. Views Show Flatness and Rual Character of Proposed Site

	Normal
Temperature	
Summer average daily maximum	84.5° F.
Summer average daily minimum	61.6° F.
Winter average daily maximum	34.1° F.
Winter average daily minimum	17.0° F.
Days per year with 90° F. or higher	28
Days per year with 0° F. or lower	10
Precipitation	33.1 inches
Relative humidity	
July, noon	58%
January, midnight	82%
Percent of possible sunshine	58%
Prevailing winds	Westerly

Availability of Utilities

electrical power --The schedules available as of May 26, 1965, of the characteristics of the electrical loads for the proposed national accelerator laboratory indicate that the major power requirements will be needed in 1973 and that the initial years will require power in varying amounts. The Iowa Electric Light and Power Company submits the following proposal for supplying this electrical power requirement at the Sunbury Site:

1. An adequate source of electrical power will be available on the site whenever needed.

2. The Iowa Electric Light and Power Company will construct, own and operate a generating station on the proposed accelerator site. This station will be of sufficient capacity for the full electrical load requirements of the accelerator and its full capacity will be dedicated to the exclusive use of said accelerator.

The rate available for this service is as shown on enclosed Rate Schedule GP (see Part I, Appendix B). This schedule enables full use of dedicated capacity for this project at 5.5 mills per Kilowatt-Hour. If full use of the dedicated capacity cannot be utilized, such unused portions shall be credited to the consumer at 2.3 mills per Kilowatt-Hour.

A unit cost table is enclosed also (see Part I, Appendix B), which provides an estimating base for load factors different from those anticipated.

The rate schedules provide for line extensions and transformation to utilization voltage without additional cost to the prospective consumer.

Figure 13. Utilities Map of the Sunbury Site

water supply -- The following commentary represents an interpretation of the available information in the files of the Iowa and U.S. Geological Surveys.

Based on an upland starting site in the northwestern part of the area, the following is a generalized log of the anticipated underlying rocks down through the St. Lawrence Dolomite (all depths are referred to an assumed land surface elevation of 785 feet above sea level):

Formation	Thickness (ft.)	Depth Range (ft.)
Quaternary System	50-100	0 - 75
Pleistocene Series (thin loess at top, underlain by pebbly glacial drift)		
Silurian System		
Niagaran Series (dolomite)	275	75±- 350
Kankakee-Edgewood Formations (dolomite usually some chert, may be silty at base)	60	350 - 410
Ordovician System		
Maquoketa Formation (mostly shale, some dolomite layers)	200	410 - 610
Galena Formation (dolomite and limestone with 10±o/o chert in lower half)	235	610 - 845
Decorah-Platteville Formations (limestone and dolomite, minor shale; Glenwood Shale 10-15' thick at base)	120	845 - 965
St. Peter Sandstone	60	965 - 1025
Prairie du Chien Formation (dolomite, sandy in upper half, thin Root Valley Sandstone near middle, considerable chert throughout)	365	1025 - 1390
Cambrian System		
Jordan Sandstone, dolomitic	65	1390 - 1455
St. Lawrence Dolomite	100+	1455 - 1555

Some adjustments probably will be necessary on all these depth and thickness figures owing to local variations in the structure and thickness of the formations. A lower starting elevation will also modify these depth figures in proportion to the difference between the assumed and actual starting elevation at the drilling site.

Based on initial water requirements of 2,000 gallons a minute, a deep well through the Jordan Sandstone would seem to be the most promising source for obtaining the desired production. Most wells penetrating this zone develop a minimum of several hundred gallons a minute at moderate drawdown. The output may be increased to 1,000 g.p.m. or more by carefully developing the aquifer. With favorable conditions perhaps as much as 2,000 g.p.m. can be obtained from a single well. It is generally advisable to continue drilling about 50 to 100 feet into the underlying St. Lawrence Dolomite to take advantage of any large crevices that may be encountered there. Although some water will be found in the upper and intermediate formations, these strata usually are cased out from the surface into the upper Prairie du Chien Dolomite and the casing grouted in place with neat cement to provide an effective seal.

Two of the nearest Jordan wells in this area are at Wheatland in southwestern Clinton County and at West Liberty in Muscatine County. The Wheatland well produced 500 g.p.m. with only 31 feet of drawdown. The original static head in 1959 was 172 feet. The newest deep West Liberty well tested at 578 g.p.m. with 83 feet of drawdown from a static head of 98 feet. Mineral analyses indicate the water in both these wells to be acceptable for drinking and other domestic use.

Additional water supplies probably will occur in sandstones of Cambrian age several hundred feet below the Jordan. However, the quantity and quality of water available from these deeper zones is uncertain. A well penetrating below the St. Lawrence would be on an experimental basis.

To summarize, the Jordan Sandstone and associated dolomite strata at a depth range of about 1,350 to 1,500 feet would seem to be the most promising source for large quantities of water at this site. The well should be fully developed for best results.

The typical water temperature is 65 degrees.

Based on geologic factors at the site, performance of producing wells in the vicinity, and the cost of pumping water at The University of Iowa treatment plant, the estimated cost for meeting the initial and potential water requirements at the proposed Sunbury Site is .9 cent per 1,000 gallons.

--Water Supply material above prepared by staff members of the Iowa and U.S. Geological Surveys, Iowa City, and The University of Iowa Department of Preventive Medicine and Environmental Health

natural gas --The Iowa-Illinois Gas and Electric Company will provide for any demands for natural gas at the proposed Sunbury Site. Three parallel high-pressure lines of the Natural Gas Pipeline Company of America are situated 17-19 miles south of the site. The diameters of these lines are 24, 26, and 36 inches, each with an operating pressure of 600 pounds per square inch.

Community and Regional Resources

Transportation

The proposed sites for the national accelerator laboratory are in an area of large uncongested spaces and open country, interspersed with centers of moderate urban population. Transportation by automobile is rapid, so that distances of ten miles or more, for example, can be traversed in less time than it might take to drive three big-city miles.

air service --The site between Iowa City and Cedar Rapids (North Liberty Site) is within 15 to 20 minutes' driving time over federal highway from the Cedar Rapids and Iowa City airports, and about an hour by Interstate from the Moline, Ill., airport, which services the Quad Cities metropolitan area of Davenport and Bettendorf in Iowa and Moline, East Moline, and Rock Island in Illinois.

Via existing roads, the site between Iowa City and Davenport (the Sunbury Site) is 25 miles from the Moline airport or an estimated 40 minutes' driving time. Via Routes 80 (completed) and 280 (scheduled for completion in 1969), it is 18 miles and an estimated 20 minutes' driving time from the Moline airport. The Sunbury Site is approximately an hour's time from the Cedar Rapids airport, mostly by Interstate, and somewhat less time from the Iowa City airport.

United and Ozark Air Lines provide 48 flights daily through the Iowa City and Cedar Rapids airports and 34 flights daily through Moline. Both the Cedar Rapids and Moline facilities have jet capabilities, and at Cedar Rapids plans are under way to extend runways to a total of 10,000 feet.

United expects to begin jet service during the summer of 1966, utilizing 737 and 727 aircraft, and conversion to all-jet service will be accomplished by late 1969. Present service is by Viscount and DC-6B propeller craft.

Ozark expects to begin north-south jet service via DC-9 by mid-1966. Present service is by F-27 and Martin 404 prop-jets and DC-3 propeller craft.

railroads --Both sites are in close proximity to major railroad lines. The North Liberty Site is served by the Cedar Rapids and Iowa City Railway (located along its eastern edge). Within a few miles, this north-south short line connects with the main east-west lines of the Chicago, Rock

Island, and Pacific in Iowa City and the Milwaukee and Chicago and North Western roads in Cedar Rapids. The Sunbury Site is approximately 3-3/4 miles from the Chicago, Rock Island, and Pacific at Durant and approximately 4-1/2 miles from a Milwaukee branch line terminating at Dixon.

highways --The North Liberty Site is approximately five miles (five minutes' driving time) from Interstate 80, a major east-west link in the Interstate system, and U.S. 6. Both highways can be reached by U.S. 218, a north-south route passing along the eastern edge of the proposed site. A four-lane highway connecting Cedar Rapids and Iowa City is in the planning stage, and this link will ultimately become part of a north-south Interstate route.

The southern boundary of the Sunbury Site is approximately 1-1/4 miles from an interchange of Interstate 80; that interchange is 10 miles from the Davenport city limits and 40 miles from the Iowa City city limits. Iowa Highway 150 runs along the northeast corner of the site, and via this route it is 12 miles to the Davenport city limits.

The entire region is served by well-developed federal highways and state systems of primary and secondary roads.

Highways under state jurisdiction have weight and dimension carrying capacities in accordance with policies of the Iowa Highway Commission (see Appendix C), with special permits available for oversize and overweight hauling on these highways in situations not provided for in the regulations. Design capacities of these highways meet standards of the U.S. Department of Commerce and the American Association of State Highway Officials. Regulations covering interstate highways in the area are the same as those for all federal interstate highways.

waterways --The Quad Cities area is on the Mississippi River 9-foot navigation channel maintained by the U.S. Army Corps of Engineers from Minneapolis to the Gulf of Mexico. The channel in the upper Mississippi is open about 9 1/2 months each year. Some 14,000,000 tons of freight moved by barge to or through the Quad Cities during 1964. Sixteen barge docks are in use in the Quad Cities area.

nearby communities -- Communities within 20-50 miles of either site, with current population estimates in parentheses, include: Cedar Rapids (100,000); Iowa City (40,000); the Quad Cities of Davenport and Bettendorf in Iowa and Moline, East Moline, and Rock Island in Illinois (330,000); and Muscatine (22,000).

Research and Development Organizations

In addition to firms in the area that are primarily research and development concerns, a number of the major manufacturing companies in the Cedar Rapids-Iowa City-Quad Cities complex maintain research and development sections. Ten of the more significant R&D firms and company groups are:

Name	No. in R&D	Area of Concentration
Collins Radio Company, Cedar Rapids	1,100	Communications, navigation, control and computer design.
Rock Island Arsenal, Rock Island	375	Weapons.
Bendix Corporation, Pioneer-Central Division, Davenport	225	Missile and space instrumentation, cryogenics, sonic energy.
Eagle Signal, Co., Davenport	75	Timing devices.
Square D Company, Cedar Rapids	70	Electrical switching and control equipment.
Ametek, Moline	65	Laboratory testing equipment.
Army Management Engineering Training Agency, Rock Island	60	Development of all management training for the U.S. Army.
Mast Development Co., Davenport	50	Entire firm devoted to R&D in ozone detecting equipment, random access counters, and optical equipment.
The Turner Co., Cedar Rapids	25	Microphones, audio amplifiers precision design and manufacturing capabilities.
Lunex Co., Bettendorf	6	Basic research in the refinement and manufacture of rare earth metals.

Manufacturing and Fabrication Industries

Some 600 manufacturing concerns are located in the Cedar-Rapids-Iowa City-Quad Cities complex, within 50-60 miles of the proposed sites. Many have precision manufacturing and fabrication capabilities, and in several cases these firms are the largest of their kind in the United States. Large industrial firms in the area include:

Name	No. of Employees	Product
Deere & Co., Moline	10,000	Line of farm equipment, including self-propelled.
Collins Radio Co., Cedar Rapids	9,727	Communications, navigation, control, and computer design and manufacture.
International Harvester Co., Rock Island	8,000	Line of farm equipment, including self-propelled.
Rock Island Arsenal, Rock Island	7,000	A federal installation manufacturing weapons; conducts considerable research and development.
Aluminum Co. of America, Bettendorf	3,200	Many types of aluminum products.
J.I. Case Co., Bettendorf	1,400	Line of farm equipment, including self-propelled.
Iowa Manufacturing Co., Cedar Rapids	1,177	Rock-crushing equipment.
Link-Belt Speeder Corp., Cedar Rapids	1,008	Cranes, power shovels, earth and rock handling equipment.
Bendix Corp., Pioneer-Central Division, Davenport	1,000	Missile and aerospace instrumentation; considerable research and development capability.
Square D Company, Cedar Rapids	700	Electrical switching and control equipment.

Figure 14. Relation of Proposed Iowa Sites to Regional Centers of Population

Educational Resources

The University of Iowa

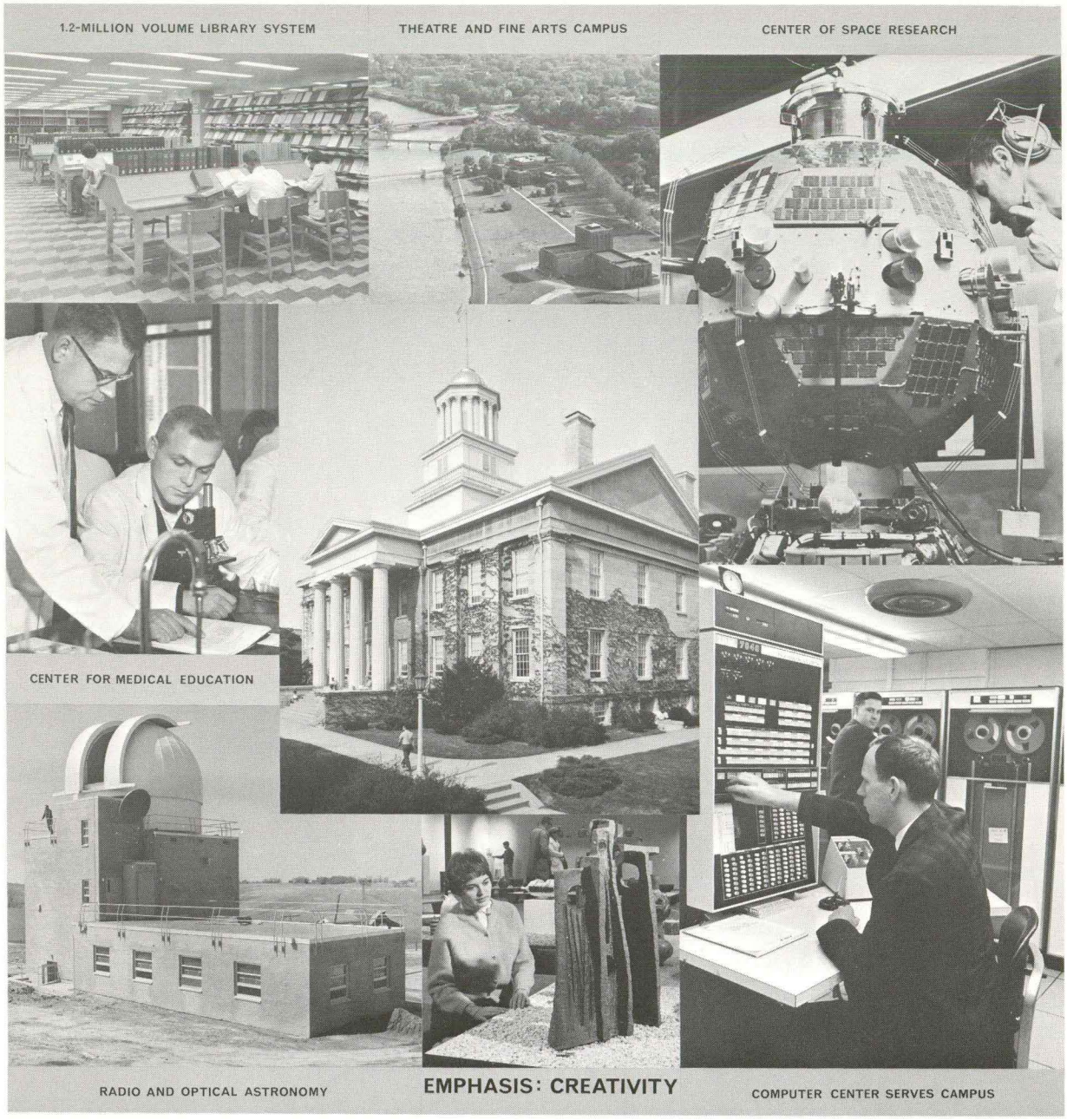
The University of Iowa offers a broad, liberal arts-graduate-professional program to its nearly 15,000 students. It is a member of the Association of American Universities. Its 1964-65 full-time enrollment of 14,480 students places the University 24th in size among the nation's colleges and universities. Currently, it ranks 22nd among all American universities in the number of doctorates conferred in the physical sciences, and 18th in doctorates conferred in all fields.

The University is composed of ten colleges, including more than 80 departments. The colleges are: Liberal Arts, Business Administration, Dentistry, Education, Engineering, Graduate, Law, Medicine, Nursing, and Pharmacy. Within the College of Liberal Arts there are five schools: Art, Journalism, Music, Religion, and Social Work.

The University is in the process of expanding to meet the needs of a growing college-age populace. Within the next ten years or so, it hopes to stabilize enrollment at from 25,000 to 30,000, of which approximately 50 per cent will be advanced graduate and professional students. The University presently enrolls an unusually high percentage of graduate students compared to many institutions of its type--approximately 25 per cent--which illustrates its traditional emphasis on programs of education beyond the baccalaureate level.

The University's geographical location is open-country midwest, which enhances its desirability as a place to live and work (and think!) in a rapidly urbanizing society. Its institutional orientations, however, are not regional but national--and in distinctive instances, international. A member of the Committee on Institutional Cooperation (the Big Ten and the University of Chicago), The University of Iowa has served historically to identify the people of its region with the mainstreams of United States thought and culture.

In many diverse fields of the arts and sciences, the University holds a national and international reputation. Iowa will acknowledge superiority to few other institutions, if any, in such disparate fields as hydraulic engineering, or speech pathology (a specialized field "born" at Iowa) or in the sophistications of space physics and low-energy nuclear research. In the cultural world, printmakers now regard Mauricio Lasansky and the Iowa Print Group as international forerunners in the arts of intaglio printmaking, just as serious writers now regard the Iowa Writers Workshop as a world capital of creative



BUSINESS ADMINISTRATION	478
DENTISTRY	248
ENGINEERING	569
GRADUATE	3,332
LAW	437
LIBERAL ARTS	8,111
MEDICINE	692
NURSING	428
PHARMACY	185
TOTAL 1964–65 ENROLLMENT	14,480

Figure 15. The University of Iowa

writing. In its appearances in Iowa, in Washington, and in New York, the Iowa String Quartet has won a reputation as being one of the nation's most promising.

A major factor in the stability and strength of The University of Iowa as a center of broad midwestern influence in modern thought is the fact that it is a product of century-old human traditions of rural, midwestern life--freedom of thought, warmth in human relationships, respect for individuality. The University's marked degree of interdisciplinary cooperation is an ongoing product of such traditions. For example, the University has shown a willingness to experiment in the "tailor-making" of curricula which cut across departmental barriers. The results may be seen in the success of its programs in speech pathology and audiology, the study of the normal child, communications, and in such fields as comparative literature, American civilization, chemical physics, nuclear science and technology, and urban and regional planning.

In essence, the University's role is to serve as a teaching and research center directed toward the improvement of the economic life, health, and the general welfare of the area it serves and toward the conservation and development of the state's resources--particularly its most important resource, people. It should be noted that the University does not define research narrowly. It has been a pioneer in the acceptance of work in the creative arts in satisfaction of the thesis requirement for advanced degrees. It holds that the term "research" applies to creativity of mind in all fields. Imaginative originality, be it in the fine arts or the sciences, is of a common character and significance in the overall intellectual life of the University.

One test of the measure of the greatness of a university is the quality of its product. In this connection, 35 alumni of The University of Iowa are currently presidents of colleges and universities in 19 different states and two foreign countries. In another area, more than 50 alumni of the School of Music are now heads of departments of music across the country. Various others are deans of schools of fine arts and divisions of humanities; another is a musicologist in the Library of Congress; still another one heads a department of graduate studies in music.

Other strong programs, as representative of the presence of numerous areas of excellence on campus, could be mentioned. Among them would be the Department of English (one of the largest in the nation), the Department of Psychology (second in size, after the

University of California, among universities west of the Mississippi River), the Department of Speech and Dramatic Art (which is one of the top producers of doctorates in dramatic art in the United States), the Department of Physics (noted for its programs of space radiation research under Professor James Van Allen), and the Institute of Hydraulic Research (Professor Hunter Rouse and his staff have attracted students from around the world), and the Division of Mathematical Sciences (including Departments of Mathematics, Statistics, and Computer Science).

The following concerning The University of Iowa may be of special interest:

adjunct appointments --Should the national accelerator laboratory be established in the area, the University would anticipate making adjunct appointments to its faculty of properly qualified accelerator staff members. Such appointments would utilize the same criteria of professional and academic competence that are applied to appointments to the regular University faculty. There is ample precedent at the University for adjunct appointments; for example, a number of staff members at the Veterans Administration Hospital in Iowa City have received them. Anyone holding such an appointment would be entitled to ready access to the University's academic and research facilities, including the libraries, laboratory facilities, and other resources.

Benefits from many other University facilities would, of course, be available to all accelerator staff members, including access to the University's highly regarded medical center, many of its recreational facilities and cultural programs, plus the opportunities for enrollment in on-campus and extension courses.

participation in cooperative atomic research --The University of Iowa has a long history of cooperative participation with other leading universities in atomic and nuclear research. It is an original member of MURA (Midwest Universities Research Association), a group of institutions which have pooled their resources for joint efforts in the nuclear field. It is a member of the participating universities engaged in the operation of the Argonne National Laboratory. It has been invited to be a founding member of the Universities Research Association, Inc., a group formed as the contractual entity to build and operate the proposed new national accelerator laboratory.

cultural opportunities --The University has long been a national leader in the fine arts, with an outstanding Department of Speech and Dramatic Art (including the University Theatre) and excellent Schools of Art and Music. Programs of exhibits, lectures, plays, and musical events originating on campus are maintained throughout the year. Now in its 27th year, the annual Fine Arts Festival presents each summer a series of musical events, art exhibits, lectures, a month of repertory theatre, and the production of a full-scale opera. Outstanding campus musical organizations include the University Symphony, the University Bands, the Chorus, the Iowa String Quartet, the Collegium Musicum, and others. On the faculty are many well known musicians, painters, composers, sculptors, poets, and writers.

In addition to programs originating from within the University, speakers and performers, artists, and musical and dramatic groups of national and international prominence are brought to the campus each year. The Minneapolis Symphony, to mention just one example, presents three concerts each year. Traveling art exhibits, in addition to the work of the University's own faculty and student artists, are regularly shown at the University's galleries.

To further enhance its position as a leader in the fine arts, the University is now developing a $10 million Fine Arts Campus, which will include expanded art galleries, additional theatre facilities, a new School of Music building with Recital Hall, and an all-campus auditorium which will greatly improve the University's capacity to present opera, ballet, and other large-scale productions. The University recently received as a gift one of the Midwest's outstanding art collections--the Elliott Collection--in recognition of its leadership in the arts. Valued at upwards of a million dollars, this collection includes paintings by such masters as Bonnard, Braque, Feininger, Gauguin, Kandinsky, Matisse, Picasso, Utrillo, and many others, as well as an extensive collection of rare prints (Rembrandt, Durer, Goya, etc.), jade, and magnificent antique silver. This collection will provide an excellent supplement to the University's other holdings, which are especially strong in the contemporary American area.

In addition to cultural facilities, the University offers an especially attractive program for sports enthusiasts throughout the year, including Big Ten football, basketball, and baseball, and most of the "minor" sports. The University's stadium seats approximately 60,000 and the basketball court in the Field House can accommodate some 12,000 spectators. Other athletic facilities include tennis courts, a large indoor swimming pool, permanent baseball stadium, running track, and playing fields. The University provides two golf courses which are available to the public--an eighteen hole course of championship quality and a nine-hole course of less difficulty.

The University Medical Center -- The University of Iowa is one of the Midwest's major medical centers. The University operates a number of hospital units, which together provide more than 1,600 beds, as teaching and research arms of the College of Medicine and other health-related professions. The hospitals are staffed with a strong medical faculty, representing every major medical specialty, many of whom are internationally recognized for their work.

The hospitals include General Hospital, a minimal care unit for ambulatory patients, Psychopathic Hospital, the Hospital School (for physically handicapped and mentally retarded children), and the State Sanatorium at nearby Oakdale (for the rehabilitation of patients with chronic diseases and the treatment and rehabilitation of patients with pulmonary tuberculosis).

Patients from all over the state and many other states as well may make use of these medical facilities. Each year, more than 27,000 patients are admitted, and the hospitals receive another 200,000 outpatients.

A number of specialized facilities of particular interest to parents are available in the general health field. These include the previously mentioned Hospital School, which accepts patients on both an inpatient and outpatient basis; the speech and hearing clinics; the Child Development Clinic; the Birth Defects Treatment Center; the Child Psychiatry Unit; and an exceptionally strong program in orthopedics.

In addition to serving as a center for treatment and care, the University medical center maintains continuous programs of research, and through the years has contributed much to the advancement of medical knowledge. The academic and research programs of the College are greatly strengthened by the close association between the College and the rest of the University--a situation not found in many similar institutions, where the medical program is often either separated physically from the rest of the campus or isolated intellectually. At The University of Iowa, the basic medical sciences in the College of Medicine operate and serve on a University-wide basis and in turn receive support, stimulation, and "cross-fertilization" from the rest of the institution. This arrangement helps to explain why the University programs in such areas as physiology, microbiology, anatomy, biochemistry and the other medical sciences are outstanding.

University libraries -- The University of Iowa Library, with more than 1.2 million volumes, is the largest in the state and is growing annually by more than 50,000 volumes. Holdings include a fine collection of periodical files (7,500 periodicals currently received), and an extensive collection of government publications (especially strong in reports from British and Commonwealth nations). The University is an official regional depository for documents of the U.S. government.

The important bibliographies, indexes, and other reference works which students and scholars require in the utilization of source materials are found in each of the subject fields in which advanced work is offered, and the libraries contain strong groups of rare materials on such diverse topics as hydraulics and the French Revolution. Publications not on the shelves, but needed by faculty members and graduate students, are borrowed without charge to them from other large libraries in all sections of the country.

The staff of the University Libraries numbers about 125 full-time members, including 60 librarians, each of whom holds at least two degrees and is familiar wtih several foreign languages (including Chinese, Russian, Hungarian, etc.).

The University of Iowa Library is a member of the Association of Research Libraries, a group of the 75 leading research libraries in the country, and it has been one of the participating members of the Center for Research Libraries (formerly the Midwest Inter-Library Center) since its formation in 1949. It is also the regional participant in a national program designed to reflect holdings of major American Libraries in the National Union Catalog in Washington, D. C.

Computer Center -- The Computer Center is available to all members of the staff and the student body of the University, both for research and class work, and to non-University agencies when appropriate. As an indication of the widespread need for the services provided by the center, some 75 per cent of the departments on campus now use them. Moreover, in recent months the Computer Center has been in use more than 500 hours per month on 8,000 jobs.

The staff of the center consists of some 43 persons, including four with the doctorate and a staff of 12 programmers. A staff of 11 operators operates the computers on a three shift plus weekend basis. In addition, consultants are available to assist users in programming and the use of unit record equipment.

The center presently operates an IBM 7044 with 32 K of memory, eight 729IV magnetic tape units, and a 1301 disc file on a closed batch processing mode. An off-line 1401 with 4K of memory is used to load and unload magnetic tape for the 7044.

To keep pace with the needs of the University community, the center is beginning to phase out the present system and to phase in an IBM 360 system. An IBM 360/30, equipped with 16K bytes of memory, three 30KC magnetic tape units, a 2311 disc pack drive, a card reader and punch, and one 600 LPM printed, will be installed Oct. 1, 1965. In March, 1966, the 1401 will be phased out, with the 1403 line printed being attached to the Model 30.

In addition, a proposal has been submitted to the National Science Foundation for assistance in the purchase of a 360 time sharing system. If assistance is granted, the entire system described above will be replaced in August, 1966, with an IBM 360/65. This installation will be equipped with eight 60KC magnetic tape units, four 2314 disc drives, a drum, 256 K of memory, a 1,100 LPM and a 600 LPM printed, eight remote CRT character display keyboards, and three remote card reader, punch, line-printed stations. It is estimated that this system can handle up to ten times the load of the present IBM 7044/1401 system.

In September, 1967, the 65 main frame would be replaced by the Model 67 main frame. The CRT display units will be increased to 40, and the 1978 units will be increased by one or two. This system will then operate during part of the day on a time sharing system and during other times as a multi-programming priority system. Although it is difficult to forecast beyond 1968, it is believed that these systems, with appropriate modifications in memory and terminal equipment, will suffice until the early 1970's.

If no NSF support is available, the University will finance a more restricted improvement program, affording immediate power increases and further growth as funds become available. Hence, it is proposed in these circumstances, to install a 360/65 with tapes, discs, and 256 K of memory, but with no remote terminals. It is believed that such a system will give at least a power increase of three or four times.

It should also be noted that the University has just established a Computer Science Department charged with promoting education and research in the use and design of computers.

Higher Education in Iowa

In addition to The University of Iowa at Iowa City, which is centrally located between the two proposed sites, there are two other state-supported institutions of higher education in Iowa, 28 private colleges (including two specialized institutions), and 20 public or private junior colleges.

Iowa State University of Science and Technology (Ames) -- Located only 2 1/2 hoursdriving time from Iowa City, ISU is a large multipurpose land-grant institution with a 1964-65 enrollment of 12,451. It is composed of Colleges of Agriculture, Engineering, Home Economics, Graduate, and Sciences and Humanities. There is particular emphasis at the university on scientific and technological education at both graduate and undergraduate levels, and Iowa State has long played a major role in providing the nation with trained manpower in these fields. Well-established doctoral programs and strong programs of research are underway in such departments as aerospace, ceramic, chemical, electrical, mechanical, and nuclear engineering; engineering mechanics; life and behavioral sciences, including bacteriology, biochemistry, bio-physics, botany, plant pathology, zoology, and entymology; chemistry, including analytical, radio, physical, organic, nuclear, and bio-chemistry; bio-medical electronics; mathematics; metallurgy; and statistics. The university has had considerable experience working with industry through its Affiliate Research Programs, its Center for Industrial Research and Service, and through off-campus courses. Special agencies of the university include its Agricultural and Home Economics Experiment Station, the Engineering Experiment Station, the Industrial Science Research Institute, the Statistical Laboratory, the Veterinary Medical Research Institute, the Institute for Atomic Research, and cooperative extension services.

The Institute for Atomic Research includes one of the Atomic Energy Commission's major research laboratories, the Ames Laboratory, which has more than 20 research groups in physics, 20 in chemistry, 10 in engineering, and 10 in metallurgy. New groups have been formed in reactor technology with the recent completion of a new 5 million watt research reactor, the second reactor to be located at the university.

- THE UNIVERSITY OF IOWA
- IOWA STATE UNIVERSITY
- UNIVERSITY OF ILLINOIS
- UNIVERSITY OF WISCONSIN
- UNIVERSITY OF CHICAGO
- ST. LOUIS UNIVERSITY
- WASHINGTON UNIVERSITY
- UNIVERSITY OF MISSOURI
- UNIVERSITY OF NEBRASKA
- ILLINOIS INST OF TECH
- PURDUE
- NORTHWESTERN
- UNIVERSITY OF MINNESOTA
- UNIVERSITY OF KANSAS
- KANSAS STATE
- MICHIGAN STATE
- MICHIGAN UNIVERSITY
- NOTRE DAME
- INDIANA UNIVERSITY
- 9 OF BIG TEN UNIVERSITIES
- 5 OF BIG EIGHT UNIVERSITIES
- 4 OF 41 MEMBERS OF THE ASSOCIATION OF AMERICAN UNIVERSITIES

Figure 16. Major Centers of Graduate Work in the Engineering and Physical Sciences in the Mid-America Region

State College of Iowa (Cedar Falls) --The State College of Iowa is located only 95 miles from Iowa City. Its primary responsibility is the preparation of teachers and other educational personnel for schools, colleges, and universities, and the provision of consultative and other services, including experimentation with instructional content, methods and materials, and for the improvement of the educational program of the state. The college is also open to persons not intending to enter the field of education, and hence offers programs in the liberal and vocational arts. Graduate work is available in the field of education. The 1964-65 enrollment was 5,505.

nearby colleges --A number of four-year and junior colleges in Iowa and a few in Illinois are within two hours by auto of Iowa City. These include:

Burlington	Burlington Community College (junior)
Cedar Rapids	Coe College, Mount Mercy College
Clinton	Clinton Junior College, Mount Saint Clare College (junior)
Davenport	St. Ambrose College, Marycrest College, Augustana (Rock Island, Ill.), and Black Hawk College (junior, Moline, Ill.)
Des Moines	Drake University, College of Osteopathic Medicine and Surgery, Grand View College (junior)
Dubuque	University of Dubuque, Loras College, Clarke College, Wartburg Theological Seminary
Fairfield	Parsons College
Fayette	Upper Iowa University
Grinnell	Grinnell College
Keokuk	Keokuk Community College (junior)
Marshalltown	Marshalltown Community College (junior)
Mount Pleasant	Iowa Wesleyan College
Mount Vernon	Cornell College
Muscatine	Muscatine Community College (junior)
Oskaloosa	William Penn College
Ottumwa	Ottumwa Heights College (junior)
University Park	Vennard College

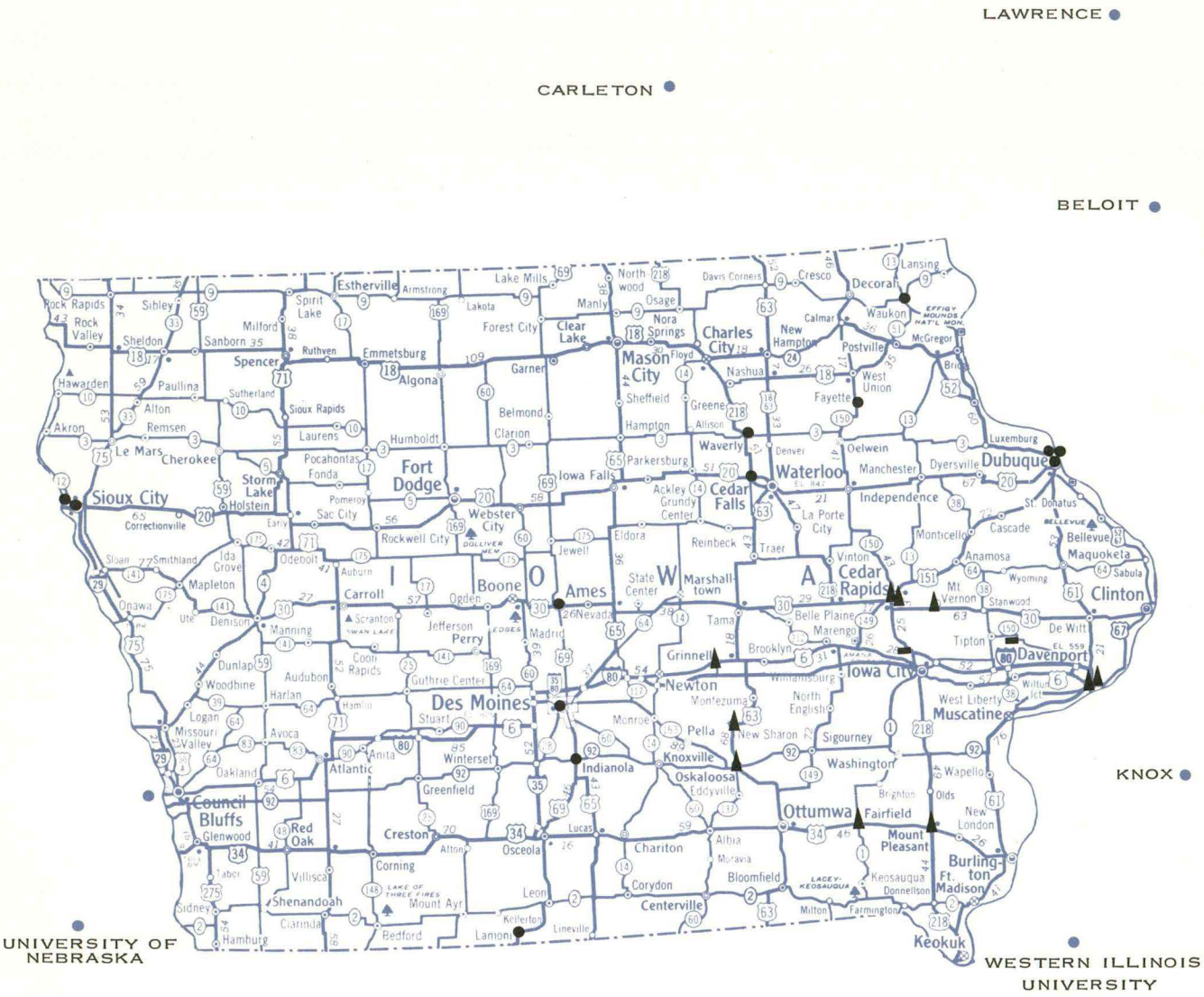


Figure 17. Additional Colleges Near Area of Sites

a record of excellence --Iowa ranks very high in education. This is illustrated by the fact that programs at Iowa's schools in many key fields represent significant portions of the total national educational effort. This is particularly true in the critical advanced degree fields.

In evaluating the following examples drawn from the academic year 1961-62 (from a study by the Midwest Research Institute), it must be kept in mind that only one out of every 65 Americans lives in Iowa:

GENERAL: One out of every 34 Ph.D. degrees was awarded in Iowa. This places Iowa in third position in the nation on a Ph.D.'s per capita basis. On the same basis, California, with a nationally recognized higher education system (while Iowa's is not fully appreciated), is ranked 14th. When private schools are excluded, Iowa ranks first in the nation on a per capita basis in the award of Ph.D.'s by state supported schools.

ENGINEERING: One of every 37 Ph.D. degrees was awarded in Iowa. Iowa State University granted more doctorates than any school west of the Mississippi, excluding three California schools.

METALLURGY: One out of five doctorates was awarded at Iowa State University. Only one other school has a larger program.

PHARMACY: One out of seven Ph.D.'s was awarded at The University of Iowa. Only one other school has a larger program.

CHEMISTRY: One out of 20 Ph.D.'s was awarded in Iowa. Iowa State University has the third largest program and The University of Iowa ranks 27th.

STATISTICS: One out of 14 degrees was awarded in Iowa.

PHYSIOLOGY: One out of 10 doctorates was awarded at The University of Iowa.

BIOCHEMISTRY: One out of 16 doctorates was awarded in Iowa.

ZOOLOGY: The University of Iowa and Iowa State University each awarded one out of every 32 doctorates.

PSYCHOLOGY: The University of Iowa's Ph.D. program ranks second in size west of the Mississippi River.

MUSIC: The University of Iowa has the second largest Ph.D. program in the nation, awarding one of every six Ph.D.'s.

NUTRITION: The University of Iowa is the world's only institution which offers both an M.S. and a Ph.D. degree in nutrition.

AGRICULTURAL ECONOMICS: Iowa State University awarded one of every eight Ph.D.'s.

TRADE AND VOCATIONAL EDUCATION: One-sixth of all doctorates were earned at Iowa State University.

HOSPITAL ADMINISTRATION: The University of Iowa awarded one of every eleven first level professional degrees.

DRAMATIC ARTS: The University of Iowa program is the nation's largest, awarding one of every 13 doctorates.

SPEECH PATHOLOGY: The University of Iowa awards one of every eight doctorates.

Other Community and Area Advantages

The Iowa City-Cedar Rapids area and the Quad Cities region are good places in which to live. These communities feature many of the advantages of metropolitan areas without the accompanying disadvantages. Uncongested streets and neighborhoods are an especially welcome change to those from more populous areas. For example, Iowa City residents live not more than 15 minutes from their jobs, from shopping areas, and other community facilities, and in most cases, commuting distances in the Quad Cities and in Cedar Rapids are not, at their greatest, much farther.

growth -- The proposed sites for the national accelerator laboratory are located in the center of one of the most rapidly growing regions in the Midwest. This growth has brought with it expansion in homebuilding, shopping centers, schools, and churches. Development is continuing and offers assurance that the area could easily assimilate many more than the 2,000 additional families resulting from the establishment of the national accelerator laboratory.

Since World War II, the industrial expansion of the Cedar Rapids and Iowa City area has amounted to many millions of dollars, representing newly located industry and growth of existing firms. As a result, this area has been considered to have more nationally and internationally known manufacturing firms per capita than any other in the United States. Such well known names as Collins Radio Company; Quaker Oats Company; Penick and Ford, Ltd.; Wilson and Co., Inc.; Miehle, Goss, Dexter, Inc.; Amana Refrigeration, Inc.; Procter and Gamble Mfg. Co.; Link Belt Speeder Company; W. R. Grace & Co.; and the Square D Company are among many located in this area.

Similarly, the Quad Cities area contains many well-known industrial firms, such as the Bendix Corporation, the Aluminum Company of America, J.I. Case Co., Caterpillar Tractor Co., Deere & Co., International Harvester Co., and many others. The area is also the site of the Rock Island Arsenal, the U.S. government's largest manufacturing arsenal. When, in 1960, the Aluminum Company of America announced a $10 million expansion (the fourth major one since the plant was built 14 years ago), it reported: "Alcoa's constant effort to keep the Davenport Works without peer in its field has been encouraged by the favorable industrial atmosphere we have experienced in Iowa, and the Quad City area in particular."

In selecting locations or planning expansions, the managements of these industries have been carefully analytical. They have conducted extensive investigations before locating their new facilities or expanding existing facilities. This represents a significant endorsement of the business environment in this area.

Through studies conducted by The University of Iowa's Bureau of Business and Economic Research in the College of Business Administration, it is learned that in the past 60 years, the greatest growth of Iowa has taken place in an area extending from Des Moines to Keokuk in the southeast portion of the state and to Waukon in the northeast. The major share of this expansion has taken place in the Iowa City-Cedar Rapids-Quad City general area.

Finally, population figures and projections provide additional indicators of the area's growth. For example, during the period 1960-1980, Linn County (Cedar Rapids) is expected to increase in population by 125,000, or more than 90 per cent, while Johnson County (Iowa City) is expected to increase by 37,000, or almost 70 per cent. During this same period the city of Davenport alone is expected to gain by 32,000, or more than 35 per cent, and similar gains are probable for the rest of the Quad Cities area.

housing -- Home and apartment building have proceeded at a rapid and increasing rate in the major population centers of the area for a number of years, and no difficulty would be anticipated in absorbing far more families than the proposed number needed to staff the national accelerator laboratory. For example, between 1950 and 1960 the number of dwelling units increased 31 per cent in Cedar Rapids and 23 per cent in Davenport. In the years 1953-63, some 7,700 new dwellings were constructed in Cedar Rapids, valued at more than $81 million, and nearly 4,000 were constructed in Davenport, valued at more than $55 million. In Iowa City, some 1,400 new dwelling permits were issued during the period 1950-60. Within the last year and a half, construction of apartment units has markedly increased, particularly in the Iowa City-Cedar Rapids area. In Iowa City alone, 1,105 new apartment units are expected to be completed in 1965, along with 530 new homes.

An example of recent developments in the area is a program newly proposed for the Lake Macbride area midway between Iowa City and Cedar Rapids, where there are plans to build a 560-acre, multi-million dollar resort community. Facilities would include multiple housing, highway commercial areas, a 200-unit motel (to be expanded eventually to 400 units), convalescent homes, apartment houses, lake marinas, a landing strip, golf and other recreational facilities.

There are sufficient contractors and developers within the area to greatly expand present home and apartment building construction. In addition, all three communities have substantial supplies of rental properties.

transient housing -- Because of its nature as a university city and regional medical center, Iowa City is well-provided with transient housing facilities in comparison to most cities of its size. Presently, there are some 700 hotel and motel rooms, and several large-scale new motel developments are planned for the near future. In the Cedar Rapids area, there are some 1,200 first-class hotel and motel rooms in and adjacent to the city, while in the Quad Cities area, 2,900 such accommodations are available.

schools -- In general, the State of Iowa ranks high in the quality of its schools. Its people are among the most literate in the United States. The public and parochial schools of Iowa City, Cedar Rapids, and the Quad Cities are among the finest in the region. In addition, The University of Iowa operates a highly regarded experimental schools system in Iowa City, with grades ranging from kindergarten through high school.

Within recent years, interest has greatly increased in Iowa in the opportunities afforded by vocational and technical schools. The recent Iowa legislature appropriated $6 million to match or supplement state, federal, or local funds in building four area vocational schools in Iowa. One of the first proposals filed with the State Board of Public Instruction for the establishment of such a school comes from the area including Iowa City and Cedar Rapids.

hospitals -- In addition to the University's extensive medical facilities, a number of other excellent hospitals are available in the area. These include one private hospital in Iowa City (225 beds), four general hospitals in the Quad Cities (1,435 beds), and two large community hospitals in Cedar Rapids. The federal government also operates a 550-bed Veterans Administration Hospital in Iowa City, the staff of which works closely with University of Iowa medical personnel.

cultural activities -- Although The University of Iowa is perhaps the major cultural resource of the area, all three communities are active in the arts, as are many of the nearby colleges. Active community theatres, book clubs, and musical societies of all kinds may be found in each city. Both Cedar Rapids and the Quad Cities support symphony orchestras and art centers, and Davenport has recently constructed new galleries for its growing art collections. The public library systems are extensive.

A number of historical sites add interest and color to the region; for example, the Herbert Hoover Presidential Library and Memorial Park (including the birthplace and grave of the late President) and the famous Amana Villages, founded more than a century ago by German settlers seeking religious freedom and a communal way of life.

recreation -- Ample parks, playgrounds, swimming pools, and other recreational facilities are provided in the region. Two sizeable bodies of water are located near the proposed North Liberty Site. These are Lake Macbride (boating, fishing, swimming, camping, p cnic grounds) and the 17-mile long Coralville Reservoir (boating and fishing). In the Quad Cities area and all along the eastern border of Iowa, the Mississippi River provides ample opportunites for boating, fishing, camping, and water sports. Northward from the Quad Cities, the bluff country along the Mississippi affords some of the most beautiful scenery in the Midwest.

Additional recreational facilities--including golf and swimming--are provided by a number of private and country clubs.

labor -- Generally speaking, the Iowa work force may be characterized as stable, educated, and skilled. Unemployment in the state is relatively low. A recent survey [1] of the work force for a six-county area in eastern Iowa, which includes Iowa City and Cedar Rapids, shows that total employment increased from 71,668 in 1940 to 105,667 in 1960. Projections through 1970 see further growth to a total of 122,827. The study shows further that particularly sharp increases are occurring in the following categories of employment: Professional and Technical, Clerical and Sales, Craftsmen and Foremen, Operatives and Service Workers. Sharp decreases, although far outweighed by employment gains, are occurring in the categories of Farmer and Farm Managers, Private Household, and Farm Laborers and Farm Foremen. Less significant increases are located in the Managers, Officials, and Proprietors category, and less significant decreases are noted in the Laborers category. During this period, very substantial gains are occurring among female workers in such categories as Professional and Technical, Clerical and Sales, Operatives, and Service Workers.

The same survey--this time including an additional two counties largely rural in nature--found that the area in eastern Iowa under discussion showed considerably larger gains in employment than did the state as a whole--41.6 per cent as compared to about 15 per cent. In all categories of employment, the eight-county area percentage increases were greater than those for the state, and the percentage decreases in all classifications of employment were less than those recorded for the state.

A similar picture prevails in the Quad Cities area which, except for short-term swings, has enjoyed high employment over most of the past decade. In fact, unemployment levels for the past four years, which have ranged between 2,050 and 7,600, are in marked contrast to conditions in many other metropolitan areas. Over the last decade the number of residents in the area increased about 15 per cent, but the number of persons in the civilian labor force increased 17.5 per cent, from 98,100 in April, 1950, to 115,000 in March, 1961.

Past performances and projections, therefore, would indicate substantial growth in the work force in the eastern Iowa area, particularly in those occupations requiring specialized skills.

[1] The study was authorized by the Boards of Education of Benton, Cedar, Iowa, Delaware, Johnson, Jones, Linn and Washington counties and presented with a proposal to the State Board of Public Instruction for the establishment of an area vocational school.

Following are examples of average wages and salaries currently being paid for several typical occupations in the region:

	Cedar Rapids[1]	Quad Cities[2]
Building Custodian	$ 2.42/hr.	$ 2.40/hr.
Laborer	2.44 "	2.58 "
Senior Draftsman	3.50 "	3.30 "
File Clerk	57.00/wk.	64.00/wk.
Key Punch Operator	66.00 "	76.00 "
Stenographer	68.00 "	78.50 "
Tabulating Machine Operator (intermediate)	107.00 "	99.00 "
Secretary	84.00 "	92.50 "

[1]Cedar Rapids Chamber of Commerce, Wage Survey, 1965-66

[2]United States Department of Labor, Bureau of Labor Statistics, Occupational Wage Survey, Davenport-Rock Island-Moline; Iowa-Illinois, October, 1964 (BLS Bulletin No. 14320-20)

Appendix A - Letters Concerning Site Acquisition

IOWA ELECTRIC LIGHT AND POWER COMPANY

General Office

CEDAR RAPIDS, IOWA

DUANE ARNOLD
PRESIDENT

July 13, 1965

AVAILABILITY OF LAND INCLUDED IN THE

NORTH LIBERTY, IOWA, SITE, AS PROPOSED

This statement is to assure the Atomic Energy Commission that all of the non-government land included in the area as outlined in the proposed site located in the vicinity of North Liberty, Iowa, will be made available for the BEV Accelerator on either of the following bases:

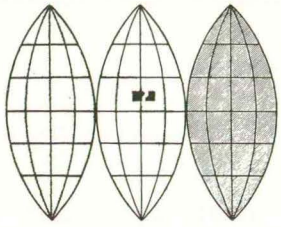
1. At no cost whatsoever to the Atomic Energy Commission, or

2. At whatever cost the Atomic Energy Commission would deem reasonable or desirable to pay.

Local interests will execute all of the purchase negotiations and obligations in the North Liberty, Iowa, site, under either plan.

Duane Arnold

Duane Arnold, President
Iowa Electric Light and Power Company
and
Chairman, Industrial Bureau
Cedar Rapids Chamber of Commerce



Iowa - Illinois Industrial Development Group

FIRST NATIONAL BANK BUILDING, ROCK ISLAND, ILLINOIS, A/C 309 788-7436

July 13, 1965

TO WHOM IT MAY CONCERN:

Officials of Iowa-Illinois Industrial Development Group, a privately financed institution serving the economic expansion interests of the entire Quad City Area, has both the capability and the willingness to negotiate options for the purchase of the site. Officials of IIIDG state that it is their belief that from 3,000 to 4,000 acres could be secured and that they would be prepared to be responsible for securing the options on the site and to cover the costs of so doing.

Further, IIIDG officials are prepared to guarantee that the site can be delivered at a reasonable price, and this includes the possibility that substantial underwriting could be necessary.

If it became necessary to further show evidence of the community's support of the project, IIIDG officers would be willing to consider undertaking the complete underwriting of all land acquisition costs. This would be done, in all likelihood, by conducting a community fund-raising campaign to raise the necessary funds to purchase the property outright for presenting gratis to the Atomic Energy Commission.

Sincerely yours,

William T. Diviney

William T. Diviney,
Manager

WTD:ls

Appendix B - Industrial Power Rate Schedule

Part I. Industrial Power Service Rate Schedule GP

Available: North Liberty Site or Sunbury Site.

Applicable: Applicable, at the option of a consumer, for industrial power service, when the demand is 5,000 KW or greater, and all service is taken at one point of delivery.

Character of Service: A-C, 60 cycles; 3 phase; utilization voltage expected to be 13,800 volts.

Rate: All available kilowatt hours @ 5.5 mills/KWH.
All unused available kilowatt hours credited @ 2.3 mills/KWH.

Minimum Bill: The minimum bill shall be as computed above.

Fuel Adjustment: The Energy Base Rates will be increased or decreased each billing month by the amount obtained when the difference between twenty-four cents (24.0%) and the actual cost per million BTU, adjusted to the nearest one-tenth mill (0.1 mill) of the aforementioned fuel. The cost of fuel includes the vendor's invoice, transportation, storage, handling expense at the station, handling the disposal of ash, and any taxes, insurance or other expense that may be directly assigned to the cost of fuel.

Determination of Annual Demand: The annual demand to be used for billing purposes each month shall be the maximum integrated kilowatt demand recorded by a standard meter during any thirty minute interval.

Determination of Available KWH: The available KWH in any billing month will be determined by multiplying the days of the billing month times 24 hours and then multiplying that product times the maximum annual billing demand.

Determination of Unused Available Kilowatt Hours: The unused available hours in any billing month will be determined by subtracting all Kilowatt-Hours recorded on a standard meter during the billing month from the available Kilowatt-hours determined as shown above.

Power Factor: The above rates are based upon a power factor of 80% or higher.

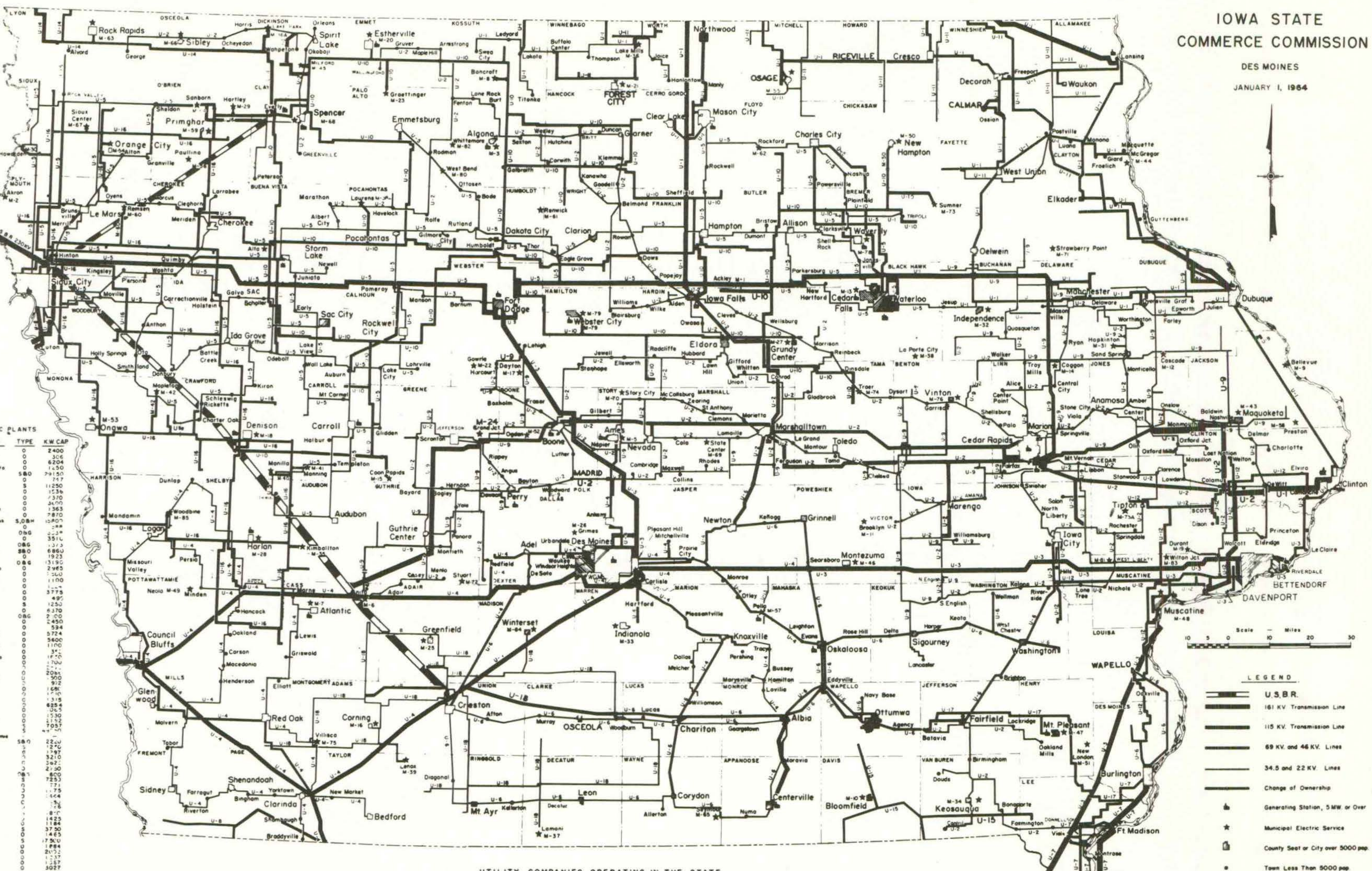
Agreement: A customer desiring service under this rate schedule shall sign the Company's standard written agreement covering terms and conditions of this service.

UNIT COST FOR GP RATE SCHEDULE AT VARIOUS LOAD FACTORS

Load Factor	Mills/KWH
100%	5.500
90%	5.856
80%	6.301
70%	6.874
60%	7.637
50%	8.705
40%	10.308
30%	12.599
20%	17.751
10%	33.208

STATE OF IOWA

PRINCIPAL ELECTRIC TRANSMISSION LINES AND GENERATING STATIONS



MUNICIPAL ELECTRIC PLANTS

NO.	TOWN	COUNTY	TYPE	K.W. CAP
M-1	Ackley	Franklin	O	2400
M-2	Akron	Plymouth	O	306
M-3	Algona	Kossuth	O	6204
M-4	Alta	Buena Vista	O	1250
M-5	Ames	Story	S&O	29150
M-6	Anita	Cass	O	717
M-7	Atlantic	Cass	S	11250
M-8	Bancroft	Kossuth	O	1536
M-9	Bellevue	Jackson	O	1370
M-10	Bloomfield	Davis	O	3600
M-11	Brooklyn	Poweshiek	O	1363
M-12	Cascade	Dubuque	O	2870
M-13	Cedar Falls	Black Hawk	S,O&H	15800
M-14	Coggon	Linn	O	[illegible]
M-15	Coon Rapids	Carroll	O&G	[illegible]
M-16	Corning	Adams	O	3510
M-17	Dayton	Webster	O&G	1373
M-18	Denison	Crawford	S&O	6860
M-19	Durant	Cedar	O	1923
M-20	Estherville	Emmet	O&G	13190
M-21	Forest City	Winnebago	O	2965
M-22	Gowrie	Webster	O	1500
M-23	Graettinger	Palo Alto	O	1100
M-24	Grand Jct	Greene	O	[illegible]
M-25	Greenfield	Adair	O	3775
M-26	Grimes	Polk	O	495
M-27	Grundy Center	Grundy	S	1250
M-28	Harlan	Shelby	O	6370
M-29	Hartley	O'Brien	O&G	2100
M-30	Hawarden	Sioux	O	2450
M-31	Hopkinton	Delaware	O	534
M-32	Independence	Buchanan	O	5724
M-33	Indianola	Warren	O	5600
M-34	Keosauqua	Van Buren	O	1100
M-35	Kimballton	Audubon	O	[illegible]
M-36	Lake Mills	Winnebago	O	1650
M-36A	Lake Park	Dickinson	O	1700
M-37	Lamoni	Decatur	O	[illegible]
M-38	LaPorte City	Black Hawk	O	2066
M-38A	Laurens	Pocahontas	O	1500
M-39	Lenox	Taylor	O	912
M-40	Manilla	Crawford	O	1680
M-41	Manning	Carroll	O	1610
M-42	Mapleton	Monona	O	1315
M-43	Maquoketa	Jackson	O	6254
M-44	McGregor	Clayton	O	1065
M-45	Milford	Dickinson	O	1530
M-46	Montezuma	Poweshiek	O	2152
M-47	Mt Pleasant	Henry	S	7057
M-48	Muscatine	Muscatine	S	[illegible]
M-49	Neola	Pottawattamie		—
M-50	New Hampton	Chickasaw	S&O	2220
M-51	New London	Henry	S	1270
M-52	Ogden	Boone	O	1297
M-53	Onawa	Monona	O	3210
M-54	Orange City	Sioux	O	3622
M-55	Osage	Mitchell	O	2750
M-56	Paullina	O'Brien	O&G	800
M-57	Pella	Marion	S	7253
M-58	Preston	Jackson	O	771
M-59	Primghar	O'Brien	O	1175
M-60	Remsen	Plymouth	O	1444
M-61	Renwick	Humboldt	O	[illegible]
M-62	Rockford	Floyd	O	[illegible]
M-63	Rock Rapids	Lyon	[illegible]	1800
M-64	Sanborn	O'Brien	O	1425
M-65	Seymour	Wayne	O	1184
M-66	Sibley	Osceola	S	3750
M-67	Sioux Center	Sioux	O	1465
M-68	Spencer	Clay	S	17500
M-69	State Center	Marshall	O	1884
M-70	Story City	Story	O	2002
M-71	Strawberry Pt	Clayton	O	1337
M-72	Stuart	Guthrie	O	1357
M-73	Sumner	Bremer	O	3027
M-73A	Tipton	Cedar	O	[illegible]
M-74	Traer	Tama	S&O	1180
M-75	Villisca	Montgomery	O&S	2046
M-76	Vinton	Benton	O	3635
M-78	Waverly	Bremer	O&H	9410
M-79	Webster City	Hamilton	S	20375
M-80	West Bend	Palo Alto	[illegible]	[illegible]
M-81	West Liberty	Muscatine	O	1250
M-82	Whittemore	Kossuth	O	[illegible]
M-83	Wilton Jct	Muscatine	O&G	1750
M-84	Winterset	Madison	O	2880
M-85	Woodbine	Harrison	O	1580

TYPE OF PLANT

G - Gas, H - Hydro, O - Oil, S - Steam

UTILITY COMPANIES OPERATING IN THE STATE

U-1	Interstate Power Company - Dubuque, Iowa	262,000 KW
U-2	Iowa Electric Light and Power Company - Cedar Rapids, Iowa	343,590 KW
U-3	Iowa-Illinois Gas and Electric Company - Davenport, Iowa	267,336 KW
U-4	Iowa Power and Light Company - Des Moines, Iowa	359,795 KW
U-5	Iowa Public Service Company - Sioux City, Iowa	195,146 KW
U-6	Iowa Southern Utilities Company - Centerville, Iowa	95,585 KW
U-7	Union Electric Company - Keokuk, Iowa	124,800 KW
U-8	Northwest Electric Power Cooperative Inc. - Cameron, Mo.	—
U-9	Central Iowa Power Cooperative - Marion, Iowa	84,000 KW
U-10	Corn Belt Power Cooperative - Humboldt, Iowa	103,285 KW
U-11	Dairyland Power Cooperative - La Crosse, Wis.	—
U-12	Eastern Iowa Light and Power Cooperative - Wilton Jct., Iowa	22,000 KW
U-13	Pella Cooperative Electric Ass'n - Pella, Iowa	—
U-14	L and O Power Cooperative - Rock Rapids, Iowa	—
U-15	Northeast Missouri Electric Power Cooperative - Palmyra, Mo.	—
U-16	Northwest Iowa Power Cooperative - Le Mars, Iowa	—
U-17	Southeast Iowa Cooperative Electric Ass'n - Mt Pleasant, Iowa	—
U-18	Southwestern Federated Power Cooperative Inc. - Creston, Iowa	28,288 KW

Appendix C - Legal Weights and Dimensions of Vehicles on Iowa Highways

Revised & Reissued
July 4, 1965

IOWA STATE HIGHWAY COMMISSION
AMES, IOWA

LEGAL WEIGHTS AND DIMENSIONS OF VEHICLES
WHICH MAY OPERATE ON IOWA HIGHWAYS

Following are statements of the maximum weights and dimensions of vehicles which may operate on Iowa highways under provision of Chapter 321.

(a) Length - Single Vehicle - thirty-five (35) feet. (Sec. 321.457)

(b) Length - Tractor-truck semitrailer combination - fifty-five (55) feet.
Combination of vehicles used exclusively for the transportation of vehicles and boats - sixty (60) feet.
Combination of three (3) vehicles coupled together, one of which is a motor vehicle sixty (60) feet.

(c) Length - Passenger bus with three axles - forty (40) feet.
(Two axle bus - thirty-five (35) feet)
(Sec. 321.457)

(d) Front end
Projection - Three (3) feet behond front bumper (Sec. 321.458)

(e) Height - Thirteen feet six inches. (13'6")
(Sec. 321.456)

(f) Width - Eight (8) feet. (Sec. 321.454)

(g) Axle - The gross weight on any one axle of a vehicle or combination of vehicles shall not exceed eighteen thousand (18,000) pounds if equipped with pneumatic tires and fourteen thousand (14,000) pounds if equipped with solid rubber tires. (Sec. 321.463)

(h) Gross
Weight - The total gross weight of a vehicle or combination of vehicles or on a group of <u>any two or more consecutive axles</u> on such vehicles shall not "be in excess of the value (in pounds) given in the following table corresponding to the distance in feet between the extreme axles of the group, measured longitudinally to the nearest foot, or fraction thereof".(Sec. 321.463)

(Iowa State Highway Commission)
(Legal Weights & Dimensions - Vehicles)

Axle Spacing or Wheelbase	Maximum Load	Axle Spacing or Wheelbase	Maximum Load
4 Feet	32,000 Pounds	26 Feet	51,681 Pounds
5 "	32,000 "	27 "	52,594 "
6 "	32,000 "	28 "	53,497 "
7 "	32,000 "	29 "	54,390 "
8 "	32,610 "	30 "	55,260 "
9 "	33,580 "	31 "	56,282 "
10 "	34,930 "	32 "	57,304 "
11 "	36,235 "	33 "	58,326 "
12 "	38,293 "	34 "	59,348 "
13 "	39,291 "	35 "	60,370 "
14 "	40,278 "	36 "	61,392 "
15 "	41,265 "	37 "	62,414 "
16 "	42,265 "	38 "	63,436 "
17 "	43,218 "	39 "	64,458 "
18 "	44,184 "	40 "	65,480 "
19 "	45,139 "	41 "	66,502 "
20 "	46,095 "	42 "	67,524 "
21 "	47,040 "	43 "	68,546 "
22 "	47,985 "	44 "	69,568 "
23 "	48,919 "	45 "	70,590 "
24 "	49,843 "	46 "	71,612 "
25 "	50,767 "	47 "	72,634 "

It will be necessary to check the weights on axle groups, especially the so-called load-bearing axles. In most cases, the weights on these groups of axles will definitely limit the overall gross weight.