

U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science Directorate
Geologic Resources Division



Homestead National Historical Park

GRI Ancillary Map Information Document

Produced to accompany the Geologic Resources Inventory (GRI) Digital Geologic Data for Homestead National Historical Park

home_bedrock_geology.pdf

Version: 7/9/2021

Geologic Resources Inventory Map Document for Homestead National Historical Park

Table of Contents

Geologic Resources Inventory Map Document.....	1
About the NPS Geologic Resources Inventory Program.....	3
GRI Digital Map and Source Map Citation.....	5
Index Map	5
Map Unit List	6
Map Unit Descriptions.....	7
Kd - Dakota Sandstone (Lower Cretaceous).....	7
Pc - Chase Group (Lower Permian).....	7
Pcg - Council Grove Group (Lower Permian).....	7
Ancillary Source Map Information.....	8
Lincoln Quadrangle and part of the Nebraska City Quadrangle.....	8
Correlation of Map Units.....	8
Stratigraphic Column.....	9
Legend	10
Reliability Diagram.....	11
Location Map.....	11
Notes	12
References.....	12
GRI Digital Data Credits.....	13

Geologic Resources Inventory Map Document



Homestead National Historical Park, Nebraska

Document to Accompany Digital Geologic-GIS Data

[home_bedrock_geology.pdf](#)

Version: 7/9/2021

This document has been developed to accompany the digital geologic-GIS data developed by the Geologic Resources Inventory (GRI) program for Homestead National Historical Park, Nebraska (HOME).

Attempts have been made to reproduce all aspects of the original source products, including the geologic units and their descriptions, geologic cross sections, the geologic report, references and all other pertinent images and information contained in the original publication.

This document contains the following information:

- 1) **About the NPS Geologic Resources Inventory Program** – A brief summary of the Geologic Resources Inventory (GRI) Program and its products. Included are web links to the GRI GIS data model, and to the GRI products page where digital geologic-GIS datasets, scoping reports and geology reports are available for download. In addition, web links to the NPS Data Store and GRI program home page, as well as contact information for the GRI coordinator, are also present.
- 2) **GRI Digital Map and Source Citation** – A listing of the GRI digital geologic-GIS map produced for this project along with source map used in their completion. In addition, a brief explanation of how the source map was used is provided.
- 3) **Map Unit List** – A listing of all bedrock geologic map units present on maps for this project, generally listed from youngest to oldest.
- 4) **Map Unit Descriptions** – Descriptions for all bedrock geologic map units.
- 5) **Ancillary Source Map Information** – Additional source map information.
- 6) **GRI Digital Data Credits** – GRI digital geologic-GIS data and ancillary map information document production credits.

For information about using GRI digital geologic-GIS data contact:

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About the NPS Geologic Resources Inventory Program

Background

The Geologic Resources Inventory (GRI) provides geologic map data and pertinent geologic information to support resource management and science-informed decision making in more than 270 natural resource parks throughout the National Park System. Geologic resources for management consideration include both the processes that act upon the Earth and the features formed as a result of these processes. Geologic processes include: erosion and sedimentation; seismic, volcanic, and geothermal activity; glaciation, rockfalls, landslides, and shoreline change. Geologic features include mountains, canyons, natural arches and bridges, minerals, rocks, fossils, cave and karst systems, beaches, dunes, glaciers, volcanoes, and faults.

The GRI is one of 12 inventories funded by the National Park Service (NPS) Inventory and Monitoring Program. The Geologic Resources Division of the NPS Natural Resource Stewardship and Science Directorate administers the GRI. The NPS Geologic Resources Division partners with the Colorado State University Department of Geosciences to produce GRI products. Many additional partners participate in the GRI process by contributing source maps or reviewing products.

The GRI team undertakes three tasks for each park in the Inventory and Monitoring program: (1) conduct a scoping meeting and provide a summary document, (2) provide digital geologic map data in a geographic information system (GIS) format, and (3) provide a GRI report. These products are designed and written for nongeoscientists.

Products

Scoping Meetings: These park-specific meetings bring together local geologic experts and park staff to inventory and review available geologic data and discuss geologic resource management issues. A summary document is prepared for each meeting that identifies a plan to provide digital map data for the park.

Digital Geologic Maps: Digital geologic maps reproduce all aspects of traditional paper maps, including notes, legend, and cross sections. Bedrock, surficial, and special purpose maps such as coastal or geologic hazard maps may be used by the GRI to create digital Geographic Information Systems (GIS) data and meet park needs. These digital GIS data allow geologic information to be easily viewed and analyzed in conjunction with a wide range of other resource management information data.

For detailed information regarding GIS parameters such as data attribute field definitions, attribute field codes, value definitions, and rules that govern relationships found in the data, refer to the NPS Geology-GIS Data Model document available at: <https://www.nps.gov/articles/gri-geodatabase-model.htm>

Geologic Reports: GRI reports synthesize discussions from the original scoping meeting, follow up conference call(s), and subsequent research. Chapters of each report discuss the geologic setting of the park, distinctive geologic features and processes within the park, highlight geologic issues facing resource managers, and describe the geologic history leading to the present-day landscape. Each report also includes a poster illustrating these GRI digital geologic-GIS data.

For a complete listing of GRI products visit the GRI publications webpage: <https://go.nps.gov/gripubs>. GRI digital geologic-GIS data is also available online at the NPS Data Store: <https://irma.nps.gov/DataStore/Search/Quick>. To find GRI data for a specific park or parks select the appropriate park(s), enter "GRI" as a Search Text term, and then select the Search button.

For more information about the Geologic Resources Inventory Program visit the GRI webpage: <https://www.nps.gov/subjects/geology/gri.htm>. At the bottom of that webpage is a "Contact Us" link if you need additional information. You may also directly contact the program coordinator:

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The Geologic Resources Inventory (GRI) program is funded by the National Park Service (NPS) Inventory and Monitoring (I&M) Division. Learn more about I&M and the 12 baseline inventories at the I&M webpage: <https://www.nps.gov/im/inventories.htm>.

GRI Digital Map and Source Map Citation

The GRI digital bedrock geologic-GIS map for Homestead National Historical Park, Nebraska (HOME):

Digital Bedrock Geologic-GIS Map of Homestead National Historical Park and Vicinity, Nebraska (*GRI MapCode HOME*)

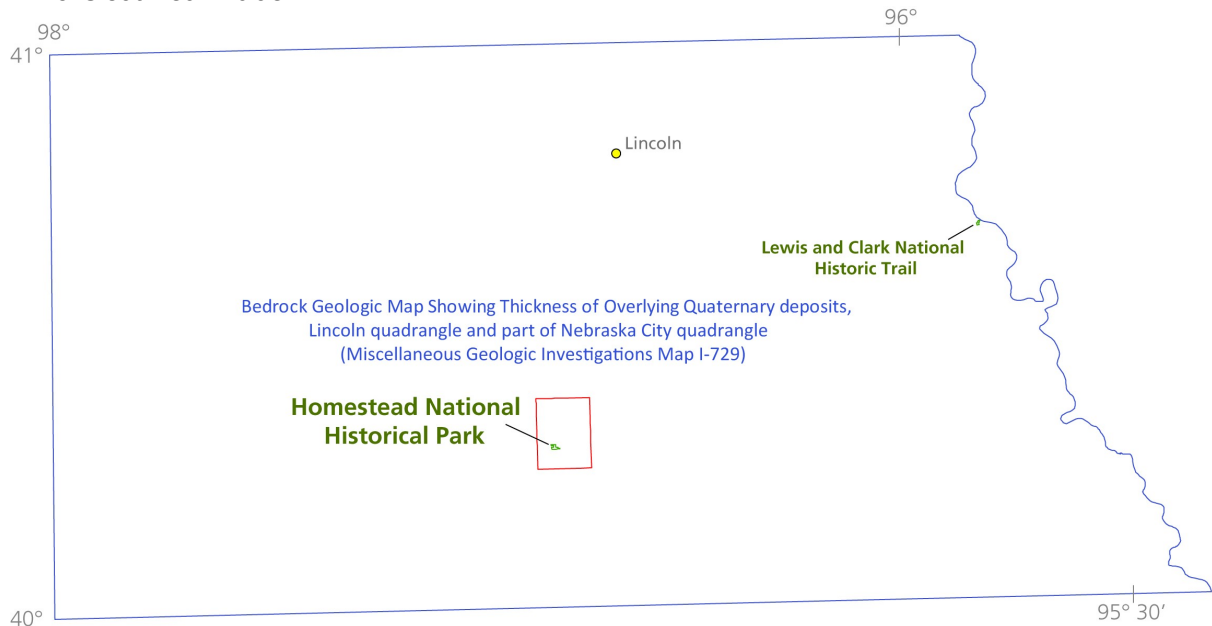
The map was produced from the following source map. Only a portion of the source map extent, the Beatrice West 7.5' Quadrangle, was used, however, all geologic features within this extent were captured.

Burchett, R.R., Dreeszen, V.H., Reed, E.C., and Prichard, G.E., 1972, Bedrock Geologic Map Showing Thickness of Overlying Quaternary Deposits, Lincoln Quadrangle and Part of Nebraska City Quadrangle, Nebraska and Kansas: U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-729, scale 1:250,000 ([Lincoln Quadrangle and part of the Nebraska City Quadrangle](#)). (*GRI Source Map ID 1498*).

Additional information pertaining to the source map is also presented in the GRI Source Map Information (HOMEMAP) table included with the GRI digital geologic-GIS data.

Index Map

The following index map displays the extent of the GRI digital geologic-GIS maps produced for Homestead National Historical Park (HOME). The boundary for Homestead National Historical Park (as of July, 2021) is outlined in green. The extent of the GRI Digital Bedrock Geologic-GIS Map of Homestead National Historical Park and Vicinity (the Beatrice West 7.5' Quadrangle) is outlined in red. The full source map extent of U.S. Geological Survey Miscellaneous Geologic Investigations Map I-729 is outlined in blue.



Index map by James Winter (Colorado State University).

Map Unit List

The bedrock geologic units present in the digital geologic-GIS data produced for Homestead National Historical Park, Nebraska (HOME) are listed below. Units are listed with their assigned unit symbol and unit name (e.g., Kd - Dakota Sandstone). Units are listed from youngest to oldest. Information about each geologic unit is also presented in the GRI Geologic Unit Information (HOMEUNIT) table included with the GRI geologic-GIS data.

Mesozoic Era

Cretaceous Period

[Kd](#) - Dakota Sandstone

Paleozoic Era

Permian Period

[Pc](#) - Chase Group

[Pcg](#) - Council Grove Group

Map Unit Descriptions

Descriptions of all geologic map units, generally listed from youngest to oldest, are presented below. All unit descriptions from: [Lincoln Quadrangle and part of the Nebraska City Quadrangle](#).

Kd - Dakota Sandstone (Lower Cretaceous)

Sandstone and interbedded sandy carbonaceous shale, lenses of sand cemented by iron oxide and siltstone concretions; light gray, yellowish gray, brownish gray, and reddish brown; beds are lenticular, locally crossbedded; sandstone is fine to coarse grained, micaceous, and contains scattered chert pebbles. Equivalent to Dakota Group of the Nebraska Geological Survey, which includes (descending order): the Omadi Sandstone, Skull Creek Shale, Fall River Sandstone, Fuson Shale, and Lakota Sandstone.

Pc - Chase Group (Lower Permian)

Limestone and shale. Limestone is light gray to dark gray, yellowish gray to pale yellowish brown. Two limestones in the upper part are thin bedded to medium bedded, argillaceous, cherty and fossiliferous; two limestones in the lower part are medium bedded to massive bedded, very cherty, and fossiliferous. Shale is gray, green, red, reddish brown, calcareous, arenaceous, fossiliferous; locally fissile. Chase Group equivalent to upper part of Big Blue Series of the Nebraska Geological Survey, which includes (descending order): Nolans Limestone, Odell Shale, Winfield Limestone, Gage Shale, Towanda Limestone, Holmesville Shale, Barneston Limestone, Blue Springs Shale, Kinney Limestone, Wymore Shale, and Wreford Limestone.

Pcg - Council Grove Group (Lower Permian)

Shale and interbedded limestone. Shale is gray, green, red, reddish brown, or maroon, sandy, calcareous, fossiliferous; locally fissile; several fissile black shale beds are in lower 75 feet. Interbedded dark- to light-gray, medium- to thick-bedded, argillaceous, cherty limestone beds are very fossiliferous and locally contain shale partings. Council Grove Group equivalent to middle part of the Big Blue Series of Nebraska Geological Survey, which includes (descending order): Speiser Shale, Funston Limestone, Blue Rapids Shale, Crouse Limestone, Easley Creek Shale, Bader Limestone, Stearns Shale, Beattie Limestone, Eskridge Shale, Grenola Limestone, Roca Shale, Red Eagle Limestone, Johnson Shale, and Foraker Limestone.

Ancillary Source Map Information

The following section present ancillary source map information associated with source used for this project.

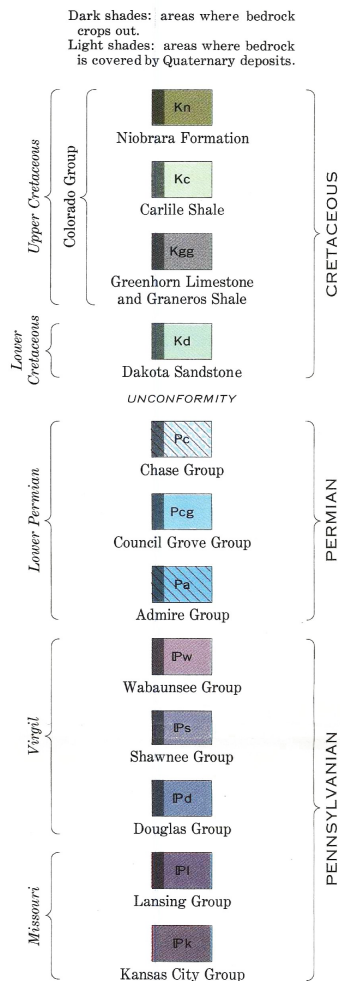
Lincoln Quadrangle and part of the Nebraska City Quadrangle

The formal citation for this source.

Burchett, R.R., Dreeszen, V.H., Reed, E.C., and Prichard, G.E., 1972, Bedrock geologic map showing thickness of overlying Quaternary deposits, Lincoln quadrangle and part of Nebraska City quadrangle, Nebraska and Kansas: U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-729, scale 1:250,000 (*GRI Source Map ID 1498*).

Prominent graphics and text associated with this source are presented below.

Correlation of Map Units



Graphic from source map: [Lincoln Quadrangle and part of the Nebraska City Quadrangle](#)

Stratigraphic Column

SYSTEM SERIES	GROUP OR FORMATION	LITHOLOGY	GENERALIZED DESCRIPTION	THICKNESS, IN FEET
CRETACEOUS	Upper Cretaceous Colorado Group	Niobrara Formation	Chalk and limestone, argillaceous. Chalk is medium gray to yellowish gray; contains interbedded thin or very thin layers of chalky shale; weathers dark yellowish orange, very pale orange, or light gray; contains many fossil clams, oysters, and Foraminifera, and shell fragments. Light- to yellowish-gray and medium-gray argillaceous limestone; contains interbedded thin layers of medium-gray chalky shale; the limestone contains shells of Foraminifera and <i>Inoceramus</i> and shell fragments.	0-350
		Carlile Shale	Shale, limestone, and sandstone. At top, locally about 5 feet thick, gray to pale-yellowish-brown siltstone or very fine grained sandstone. Shale, upper 200 feet, is dark gray to medium gray; locally contains ironstone concretions, and interbedded very thin siltstone layers. Shale, lower 80 feet, is medium gray, calcareous, and contains many very thin and thin bedded, fossiliferous, shaly limestone and calcareous shale layers.	0-275
		Greenhorn Limestone and Graneros Shale	Greenhorn Limestone is medium gray to light gray; contains interbedded argillaceous limestone, marl, and calcareous shale; fossiliferous. Upper and lower boundaries are both gradational and conformable. Thickness 0-30 feet. Graneros Shale is medium gray to dark gray, interbedded with thin layers of silt; upper part, about 40 feet thick, interbedded with thin limestone layers; lower part, about 25 feet thick, contains thin layers of carbonaceous material.	0-100
	Lower Cretaceous	Dakota Sandstone	Sandstone and interbedded sandy carbonaceous shale, lenses of sand cemented by iron oxide, and siltstone concretions; light gray, yellowish gray, brownish gray, and reddish brown; beds are lenticular, locally crossbedded; sandstone is fine to coarse grained, micaceous, and contains scattered chert pebbles. Equivalent to Dakota Group of the Nebraska Geological Survey, which includes (descending order): the Omadi Sandstone, Skull Creek Shale, Fall River Sandstone, Fuson Shale, and Lakota Sandstone.	0-350
	UNCONFORMITY			
		Chase Group	Limestone and shale. Limestone is light gray to dark gray, yellowish gray to pale yellowish brown. Two limestones in the upper part are thin bedded to medium bedded, argillaceous, cherty and fossiliferous; two limestones in the lower part are medium bedded to massive bedded, very cherty, and fossiliferous. Shale is gray, green, red, reddish brown, calcareous, arenaceous, fossiliferous; locally fissile. Chase Group equivalent to upper part of Big Blue Series of the Nebraska Geological Survey, which includes (descending order): Nolans Limestone, Odell Shale, Winfield Limestone, Gage Shale, Towanda Limestone, Holmesville Shale, Barneston Limestone, Blue Springs Shale, Kinney Limestone, Wymore Shale, and Wrexford Limestone.	0-300

PERMANIAN	Lower Permian		Council Grove Group	Shale and interbedded limestone. Shale is gray, green, red, reddish brown, or maroon, sandy, calcareous, fossiliferous; locally fissile; several fissile black shale beds are in lower 75 feet. Interbedded dark- to light-gray, medium- to thick-bedded, argillaceous, cherty limestone beds are very fossiliferous and locally contain shale partings. Council Grove Group equivalent to middle part of the Big Blue Series of Nebraska Geological Survey, which includes (descending order): Speiser Shale, Funston Limestone, Blue Rapids Shale, Crouse Limestone, Easy Creek Shale, Bader Limestone, Stearns Shale, Beattie Limestone, Eskridge Shale, Grenola Limestone, Roca Shale, Red Eagle Limestone, Johnson Shale, and Foraker Limestone.	0-300
			Admire Group	Shale and interbedded limestone. Shale is dark gray to light gray, brown, red, or green, sandy, calcareous, and fossiliferous. Interbedded dark- to light-gray, very thin to medium bedded, argillaceous, very fossiliferous limestone beds. Near top of unit a fine-grained, micaceous sandstone bed underlies a stromatolite limestone bed which has distinctive lobate bedding. Admire Group equivalent to lower part of Big Blue Series of the Nebraska Geological Survey, which includes (descending order): Hamlin Shale, Five Point Limestone, West Branch Shale, Falls City Limestone, and Onaga Shale.	0-150
	Virgil		Wabaunsee Group	Shale, sandstone, and interbedded limestone. Shale is light gray to dark gray, greenish gray, red, or black; contains very thin layers of siltstone; locally very fossiliferous, carbonaceous. Sandstone is brownish gray to yellowish gray, or gray, argillaceous, and micaceous. Limestone is dark gray to medium gray, yellowish gray, thin bedded to thick bedded; very fossiliferous; weathered surface is brownish gray. Contains coal beds less than 1 foot thick. Wabaunsee Group of the Nebraska Geological Survey includes (descending order): Wood Siding Formation, Root Shale, Stotler Limestone, Pillsbury Shale, Zeandale Limestone, Willard Shale, Emporia Limestone, Auburn Shale, Wakarusa Limestone, Soldier Creek Shale, Burlingame Limestone, Scranton Shale, Howard Limestone, and Severy Shale.	0-300
			Shawnee Group	Limestone and shale. Limestone is dark gray to very light gray, yellowish gray, very thin bedded to massive bedded, and fossiliferous; locally the thin beds are argillaceous. Shawnee Group of the Nebraska Geological Survey includes (descending order): Topeka Limestone, Calhoun Shale, Deer Creek Limestone, Tecumseh Shale, LeCompton Limestone, Kanwaka Shale, and Oread Limestone.	0-200
			Douglas Group	Shale and limestone. Shale is dark gray to medium gray, red, or black, fossiliferous, and calcareous. Limestone is dark gray to light gray, thin bedded to thick bedded, fossiliferous, and locally sandy. Douglas Group of the Nebraska Geological Survey includes (descending order): Lawrence Shale, Cass Limestone, and Plattford Shale.	0-100
			Lansing Group	Limestone and shale. Limestone is dark gray to light gray, very thin bedded to massive bedded, sandy, fossiliferous; cherty. Shale is dark gray to light gray, maroon, fossiliferous, and calcareous. Lansing Group of the Nebraska Geological Survey includes (descending order): Stanton Limestone, Vilas Shale, and Plattsburg Limestone.	0-75
	Missouri		Kansas City Group	Limestone and shale. Limestone is dark gray to light gray, brownish gray, very thin bedded to massive bedded, fossiliferous, argillaceous, cherty; contains thin layers of chert, pyrite, and scattered small flakes of mica near base. Shale is dark gray to light gray, greenish gray, black; locally fissile or carbonaceous, calcareous; fossiliferous; locally contains some sand. Kansas City Group of the Nebraska Geological Survey includes (descending order): Bonner Springs Formation, Wyandotte Limestone, Lane Shale, Iola Limestone, Chanute Shale, Drum Limestone, Quivira Formation, Sarpy Formation, Fontana Formation, Dennis Limestone, Galesburg Shale, Swope Limestone, Ladore Shale, and Hertha Limestone.	0-200

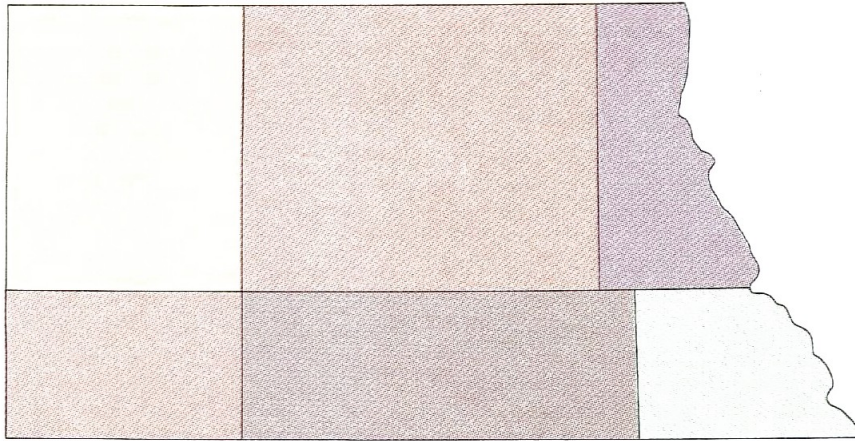
Graphic from source map: [Lincoln Quadrangle and part of the Nebraska City Quadrangle](#)

Legend

	Contact
	Accuracy of placement indicated by reliability diagram
	Fault
	Dashed where approximately located; U, upthrown side; D, downthrown side
	Isopach of Quaternary deposits
	Thickness in hundreds of feet is indicated by numeral. Isopach interval 100 feet. Quaternary deposits consist of loess, till, alluvium, and lake sediments

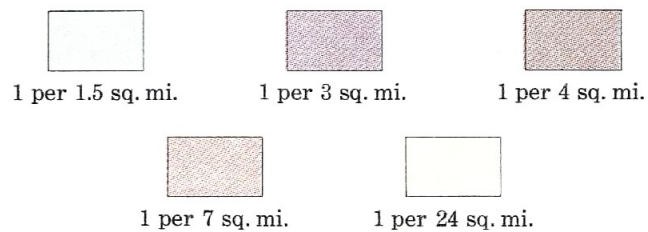
Graphic from source map: [Lincoln Quadrangle and part of the Nebraska City Quadrangle](#)

Reliability Diagram



EXPLANATION

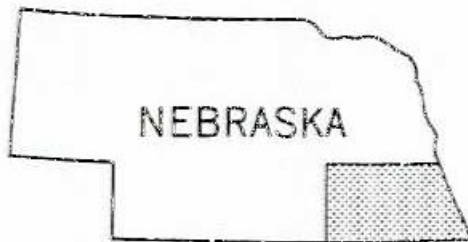
Density of drill-hole control points



RELIABILITY DIAGRAM FOR ISOPACHS OF QUATERNARY DEPOSITS
AND CONFIGURATION OF SUBSURFACE BEDROCK GEOLOGIC
CONTACTS

Graphic from source map: [Lincoln Quadrangle and part of the Nebraska City Quadrangle](#)

Location Map



Graphic from source map: [Lincoln Quadrangle and part of the Nebraska City Quadrangle](#)

Notes

The thickness of Quaternary deposits was determined directly from drill holes at many places in the area. Altitudes of bedrock in outcrops and in drill holes were used to make a contour map of the bedrock surface. The difference in altitude between the bedrock surface and the land surface shown on a topographic map was then used to provide supplemental data for the thickness (isopach) lines. The distribution of about 1,700 primary control points (drill holes) is shown by the reliability diagram. Sources of data used in compiling the map are: 1.) logs of test holes which are a part of the cooperative ground water resources investigations program by the Conservation- and Survey Division, University of Nebraska, and the U.S. Geological Survey; 2.) logs of wells and test holes drilled by contractors; 3.) bedrock outcrops shown on published or unpublished maps or described in field notes in the files of the Nebraska Geological Survey, supplemented by reconnaissance fieldwork.

Text from source map: [Lincoln Quadrangle and part of the Nebraska City Quadrangle](#)

References

Condra, G. E., 1949, The nomenclature, type localities and correlation of the Pennsylvanian subdivisions in eastern Nebraska and adjacent states: Nebraska Geol. Survey Bull., no. 16, 67p.

Condra, G. E., and Reed, E. C., 1959, The geological section of Nebraska: Nebraska Geol. Survey Bull. 14A, 82 p.

References from source map: [Lincoln Quadrangle and part of the Nebraska City Quadrangle](#)

GRI Digital Data Credits

This document was developed and completed by James Winter (Colorado State University) for the NPS Geologic Resources Division (GRD) Geologic Resources Inventory (GRI) Program. Quality control of this document by Stephanie O'Meara (Colorado State University).

The information in this document was compiled from the GRI source map, and intended to accompany the digital geologic-GIS map(s) and other digital data for Homestead National Historical Park, Nebraska (HOME) developed by James Winter and Stephanie O'Meara (Colorado State University) (see the [GRI Digital Map and Source Map Citation](#) section of this document for all sources used by the GRI in the completion of this document and related GRI digital geologic-GIS map). Initial GRI data produced by Heather Stanton (Colorado State University) and David Plume (NPS GRD).

GRI finalization by Stephanie O'Meara and James Winter (Colorado State University).

GRI program coordination and scoping provided by Bruce Heise, Jason Kenworthy and Tim Connors (NPS GRD, Lakewood, Colorado).