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Guidebook to the 1974 Spring Field Trip of the Nebraska Geological Society

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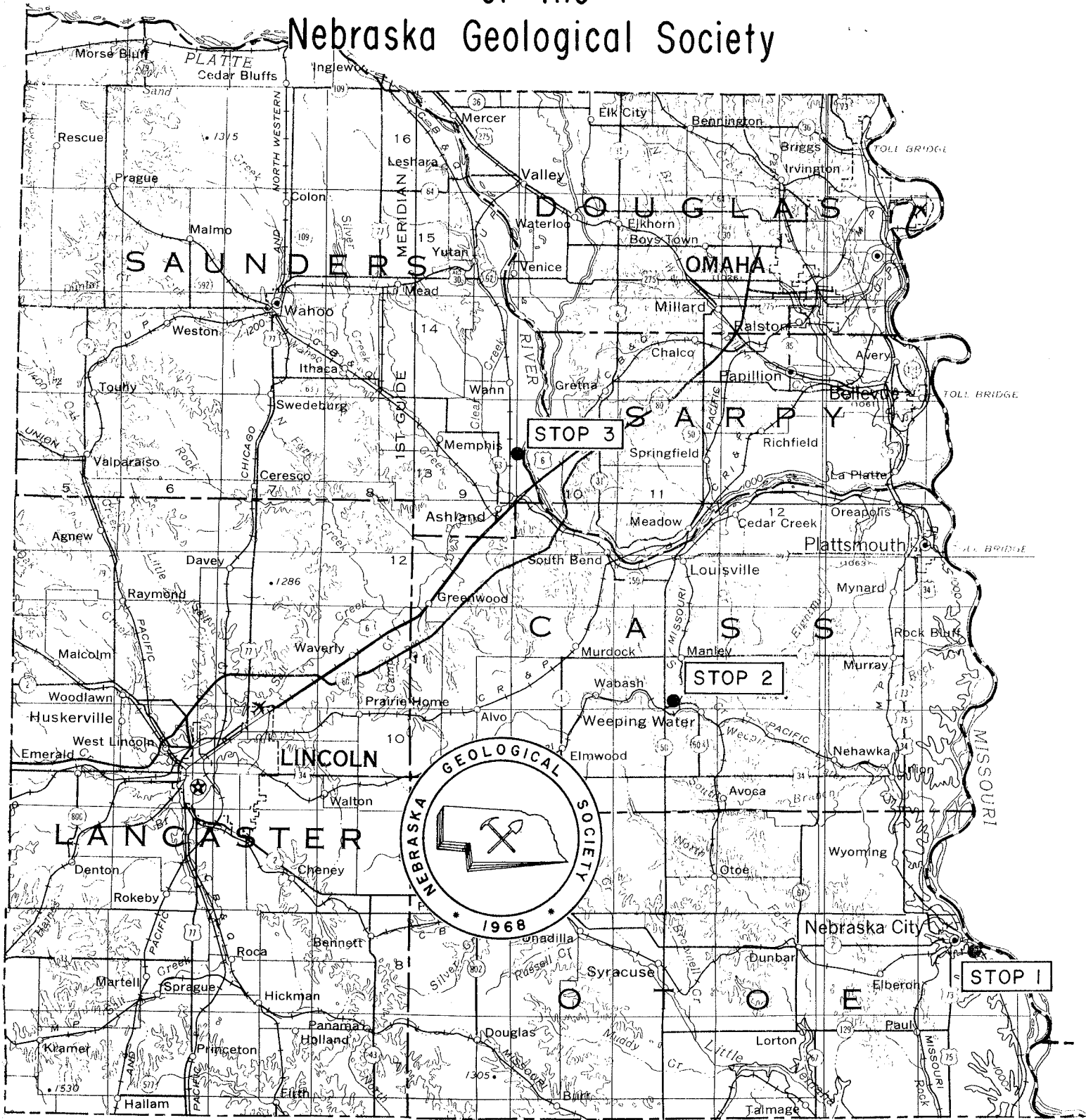
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Guidebook to the 1974 Spring Field Trip of the Nebraska Geological Society



Topographic Map of Eastern Nebraska Showing Location of Stops



A NEBRASKA GEOLOGIC SOCIETY
FIELD TRIP

MINERAL AGGREGATE INDUSTRIES
IN SOUTHEAST NEBRASKA

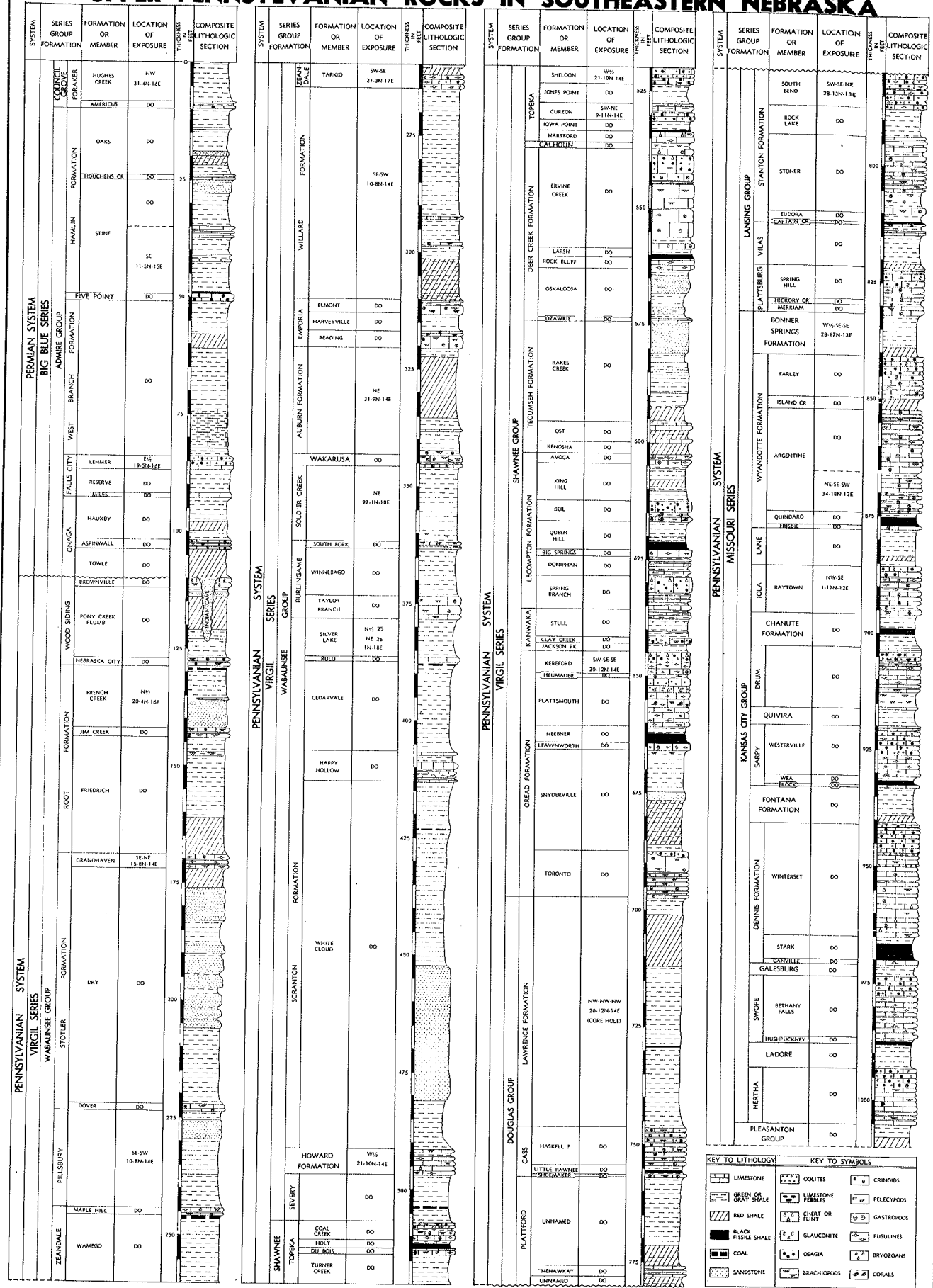
FRIDAY-MAY 10TH

ITINERARY

- 9:00 a.m. Meet at the small park east of Nebraska City, 0.9 miles east of Intersection of Hwy 2 & 73, 75 on the north side of Hwy 2.
- 9:15 a.m. STOP 1-- Nebraska City--Lightweight Aggregate Plant and Quarry (Western Brick and Aggregate Co.) Shales of Pennsylvanian Age are expanded to make lightweight aggregate products for use in such things as concrete work and bridge decks.
- 11:15 a.m. STOP 2-- Weeping Water--Limestone Tunnel Mine (Kerford Limestone Company). The limestone is mined for concrete aggregate, roadstone, rip-rap, agricultural lime and mineral filler.
- 1:00 p.m. LUNCH--Bring your own lunch or eat in Weeping Water Cafe.
- 2:30 p.m. STOP 3--Ashland--Sand and Gravel Operations (Western Sand Gravel). This is a wet pit operation using boats and hydraulic pumps.
- 4:00 p.m. END

Transportation will be via private automobile. Please bring a hard hat if you have one. Remember lunch will not be provided. Please be on time (9:00 a.m.) in Nebraska City.

COMPOSITE SECTION OF OUTCROPPING LOWER PERMIAN AND UPPER PENNSYLVANIAN ROCKS IN SOUTHEASTERN NEBRASKA



KEY TO LITHOLOGY		KEY TO SYMBOLS	
[Symbol]	LIMESTONE	[Symbol]	COALITES
[Symbol]	GREEN OR GRAY SHALE	[Symbol]	BRACHIOPODS
[Symbol]	RED SHALE	[Symbol]	CRINOIDS
[Symbol]	BLACK FISSILE SHALE	[Symbol]	PELECYPODS
[Symbol]	COAL	[Symbol]	CHERT OR FLINT
[Symbol]	SANDSTONE	[Symbol]	GASTROPODS
[Symbol]		[Symbol]	GLAUCONITE
[Symbol]		[Symbol]	FUSULINES
[Symbol]		[Symbol]	OSAGIA
[Symbol]		[Symbol]	BRYOZOANS
[Symbol]		[Symbol]	CORALS

R. R. BURCHETT

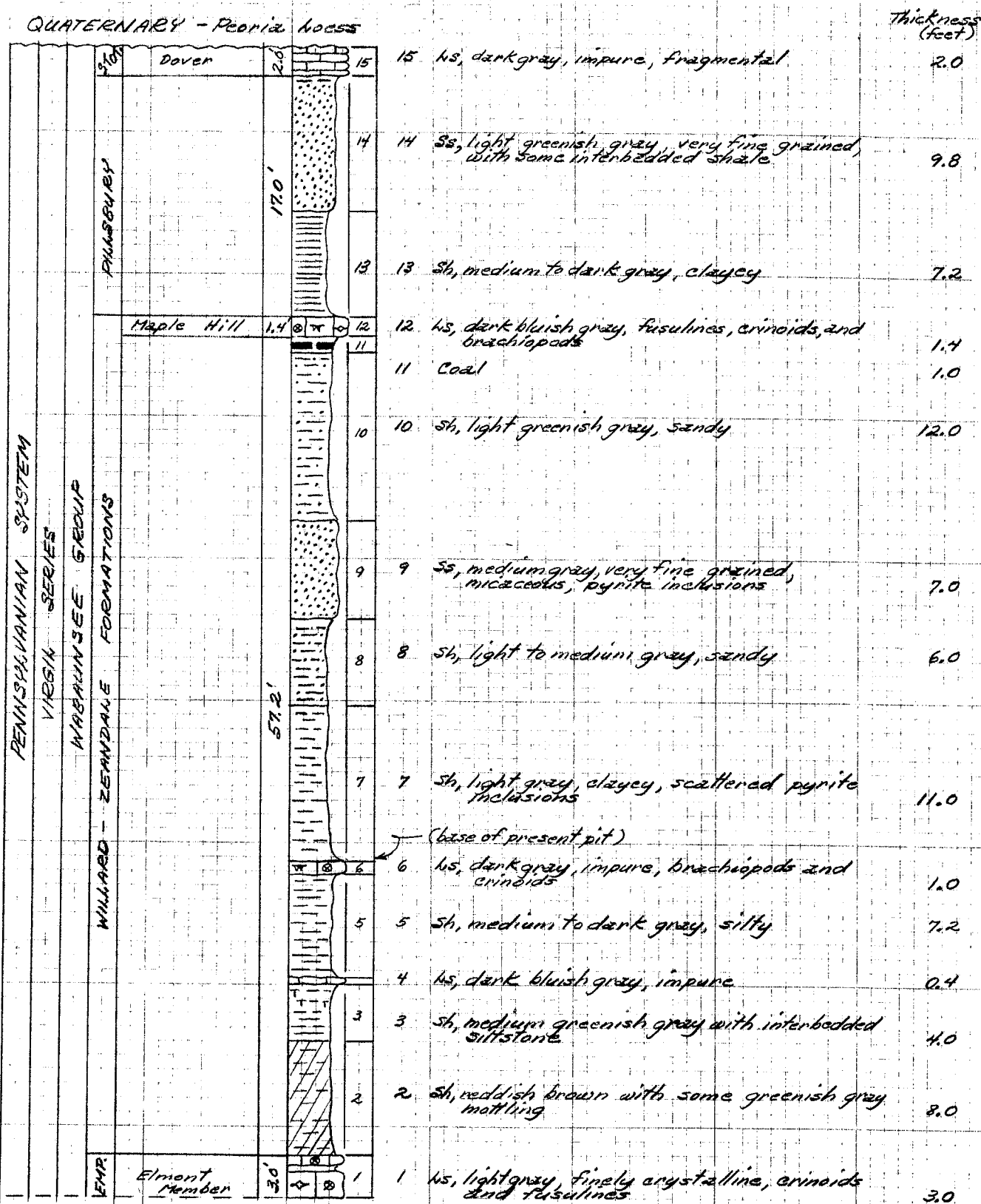
STOP No. 1A

WESTERN BRICK AND AGGREGATE COMPANY PIT

Location: Approximately 1.3 miles east and 0.5 miles south of the courthouse in
Nebraska City, Otoe County, Nebraska.
SE-SW sec. 10, T. 8N., R. 14E.

Elevation: Top of unit # 12 (993 feet above mean sea level)

QUATERNARY - Peoria loess



STOP No. 1B

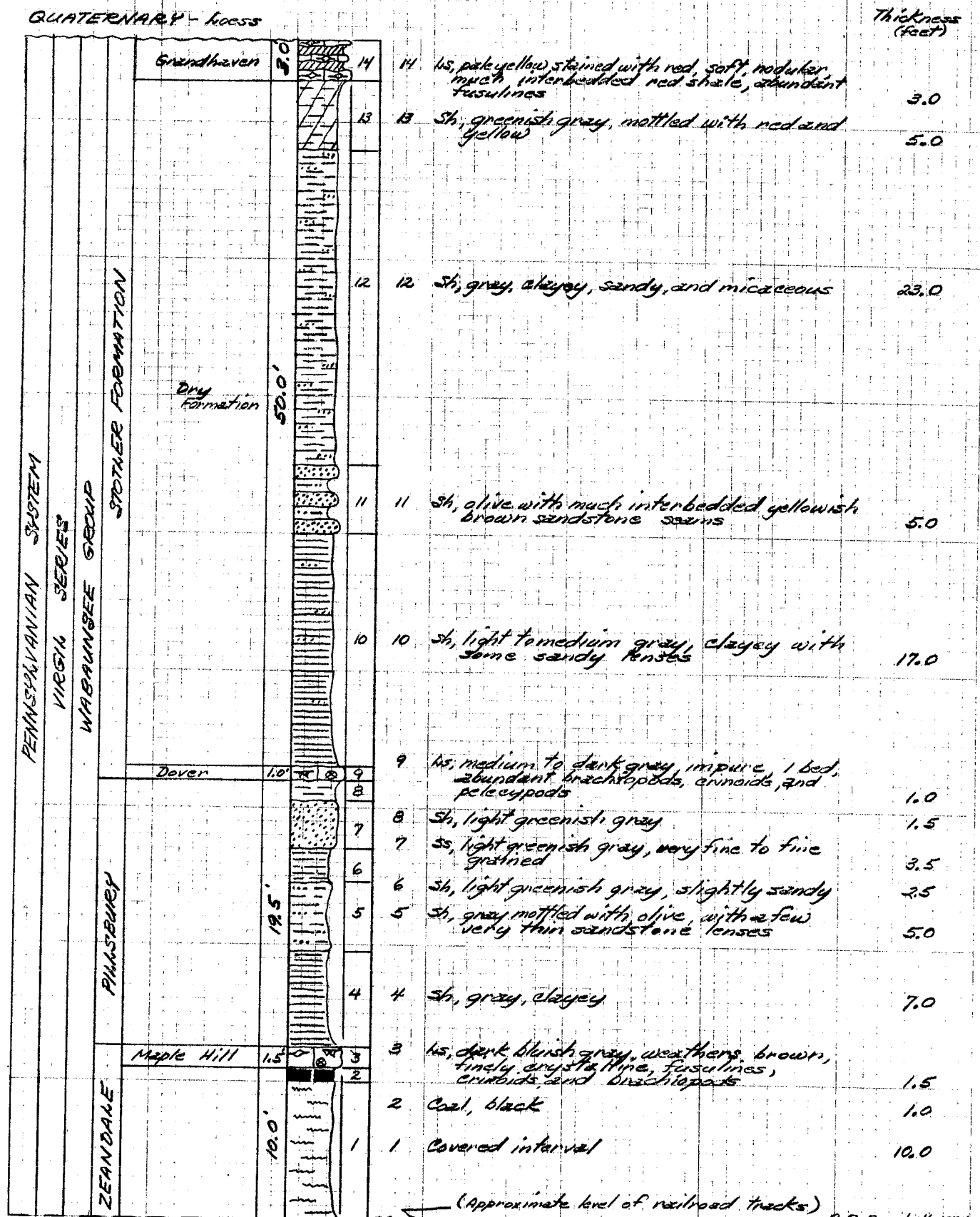
WESTERN BRICK AND AGGREGATE COMPANY PIT

Location: Approximately 1.8 miles east and 0.9 miles south of the courthouse in Nebraska City, Otoe County, Nebraska.

SE-NE sec. 15, T. 8 N., R. 14 E.

Elevation: Top of unit # 3 (934 feet above mean sea level)

QUATERNARY - loess



R.R. Burchett 1944

STOP No. 2

KERFORD LIMESTONE COMPANY MINE

Location: Approximately 1.5 miles west of cemetery in Weeping Water, Cass County, Nebraska.

SW-SE sec. 34, T. 10N., R. 11E.

Elevation: Top of unit # 1 (1045 feet above mean sea level)

QUATERNARY

Thickness (feet)

Formation	Member	Thickness (feet)	Unit #	Description	Thickness (feet)	
TECUMSEH FORMATION	Rekas Creek Member	12.0'	26	26 siltstone, light brown, sandy	7.0	
			25	25 sh, light greenish gray	2.0	
			24	24 sh, reddish gray	3.0	
	Ost Member	6.0'	23	23 ls, light gray stained red, finely crystalline, with interbedded red shale, crinoids, brachiopods, and fusulines	6.0	
		1.5'	22	22 sh, reddish gray	0.5	
	King Hill Member	Kumsha Avoca	1.5'	21	21 ls, light gray, finely crystalline, brachiopods	1.5
				20	20 sh, light greenish gray	1.0
		King Hill Member	8.0'	19	19 sh, pale reddish gray	6.0
				18	18 sh, light greenish gray	1.0
				17	17 ls, light yellowish gray, very finely crystalline, fusulines and crinoids	3.0
BELL MEMBER	Bell Member	6.0'	16	16 sh, yellowish brown, calcareous, horn corals	2.0	
			15	15 ls, yellowish brown, soft, horn corals	1.0	
	Queen Hill Member	5.0'	14	14 sh, light to medium gray	3.0	
			13	13 sh, black, carbonaceous	2.0	
	Big Springs	1.5'	12	12 ls, bluish gray, finely crystalline, fusulines abundant	1.5	
		3.0'	11	11 sh, gray, brachiopods, nodular ls lenses in upper part	3.0	
	Spring Hill Member	7.5'	10	10 ls, light gray, very finely crystalline, thin bedded in lower part, massive in upper part, oolitic in upper part, scattered brachs (Roof of Mine)	7.5	
			9	9 sh, greenish gray, combines w/unit # 7	0.5	
MAY CLAY CRACK JACKSON	Kerford	2.0'	8	8 ls, bluish gray, brachiopods and Mn replaced fossils, only present locally	1.0	
		3.0'	7	7 sh, greenish gray, combines w/unit # 9	0.5	
	Heumader	3.0'	6	6 ls, bluish gray, very finely crystalline, abundant fusulines & oolites	2.0-5.0	
			5	5 sh, light greenish gray mottled with red (locally 3.0' thick)	0.05	
	OREAD FORMATION	Plattsmouth Member	21.5'	4	4 ls, bluish gray, very finely crystalline, thin to medium bedded, strophic structures, brachiopods, fusulines and crinoids	19.5
			3	3 ls, gray, shaly, brachiopods, and crinoids (Floor of Mine)	2.0	
Haebner Member		4.5'	2	2 sh, gray	2.0	
			1	1 sh, black, fissile to platy	2.5	
Heavenworth		2.0'	0	0 ls, bluish gray, crystalline, fusulines	2.0	

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STATE OF NEBRASKA GEOLOGICAL SURVEY

Western Sand & Gravel has operational pits located near Ashland, Fremont, and South Bend, Nebraska with the main operation being located near Ashland (Two miles north on Hiway #63 and 1/2 mile east).

At the Ashland location, there are three systems used in obtaining the various required gradation's of aggregate. One system is by gravity screening where the sand & gravel is pumped into a bin, and as it drops thru the various screens, the proper gradation is attained. The second system is also by screening, but in this system the material is pumped up into a rotor screen where several sets of screens are on the outer perimeter of the drum, and with the drum rotating at an angle, the material is screened to the proper gradation. The third system is where the sand & gravel is collected in a metering bin, and the proper gradation of the aggregate is achieved thru pre-timed control of pistons within the base of the bin, and then releasing the material. In some respects, the latter could be classified as "Computerization in the Mining of Sand & Gravel."

There is very little dry excavation of sand & gravel within the State of Nebraska. Well over 98% is produced thru pumping. In the operation at Ashland, as well as any other part of the State, pump boats are used in the various screening systems. The boats are equipped with what is called a ladder and in this area the ladders are around 100 feet long. The ladder is equipped with a jet pump which is to dislodge the "inplace aggregate." Also on the ladder is a digger chain which is continuous around the ladder and it's purpose is to assist in the breaking up of the material, push out of the way or bring to the surface boulders and other unusable materials. Thru the center of the ladder is the main suction line which of course brings the usable material to the surface and then to the lake bank and screening units for gradation and processing.

Within the Ashland area, the soil profile averages anywhere from several inches to no more than three feet in thickness. The soil group is that of the Luton - Haynie. From the base of the soil to bedrock, the material consists of Pleistocene sand & gravel with an average thickness of around 85 feet. The sand & gravel rests on the Dakota sandstone and shales.