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LOST CREEK (WAMSUTTER) SCHROECKINGERITE DEPOSIT SWEETWATER COUNTY, WYOMING

By
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By D. G. Wyant

Summary

The Lost Creek schroeckingerite deposit in Sweetwater County, Wyo., has attracted attention in the past both as an occurrence of comparatively rare minerals and more recently as a possible source of uranium ore.

During the summer of 1948 a newly-formed company by the name of Uranium, Inc., explored part of the deposit by bulldozer trenching and drilling under the technical direction of the Minerals Engineering Company of Grand Junction, Colo. Examination of the significant exposures of the schroeckingerite deposit indicated that the uraniferous beds are discontinuous and that their areal distribution is erratic. The overburden has an average thickness of 2.5 feet.

Introduction

Location

The original discovery of schroeckingerite (dakeite) in southern Wyoming was made on the bluffs of Lost Creek which flows south from the Sweetwater Mountains into the Continental Divide Basin, otherwise known as the Red Desert of Wyoming. The known deposits are situated mostly in secs. 30 and 31, T. 26 N., R. 94 W., 6th principal meridian, Sweetwater County, Wyo., the location of which is 43 miles by desert road north of the town of Wamsutter. The general features of the area are shown on plate 1 which was reproduced in part from a map furnished by the Minerals Engineering Company of Grand Junction, Colo.

Property

The property includes a number of placer claims and lands leased from the State of Wyoming and situated in secs. 19 to 21, inclusive, and 28 to 33, inclusive, in T. 26 N., R. 94 W., Sweetwater County, Wyo.

The original discoverer of the deposit, Mrs Minnie McCormick of Wamsutter, Wyo., and her associates, obtained leases on state-owned lands, and also located a number of placer claims. Early in 1948 the above holdings were leased by Mrs. McCormick to Uranium, Inc.

In the spring and early summer of 1948, Uranium, Inc., began physical exploration of the deposit and arranged to have the Minerals Engineering Company of Grand Junction, Colo., supervise the work.

Examination

The Geological Survey had previously inspected the deposit but after various interviews with the officials of Uranium, Inc., it was decided to make a second examination after bulldozing operations by that company had progressed sufficiently to uncover new evidence. In accordance with the above, the property was re-examined October 1 to 14, 1948, by D. G. Wyant of the Geological Survey in company with C. C. Towle of the Atomic Energy Commission.

The purpose of this examination was to make a preliminary appraisal of the area as a potential producer of uranium in the light of the newly-completed trenching and to formulate tentative plans for further exploratory work, if such were considered feasible.

Full use was made of maps loaned by the Minerals Engineering Company, and the Survey and Commission geologists worked in close collaboration.

This work was done as part of a program of exploration for uranium sponsored by The U. S. Atomic Energy Commission.

Previous Examinations and References

A brief examination of the locality was made during the summer of 1944, by J. O. Harder and D. G. Wyant of the Geological Survey._/ One

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_/Harder, J. O. and Wyant, D. G., Preliminary report on a trace elements reconnaissance in the western states: U. S. Geol. Survey Trace Elements Investigations Rept. 4, 1944, pp. 21, 22.

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of the samples collected during the examination contained 0.022 percent uranium. They recommended that the area be studied in more detail.

In the summer of 1944, a representative of the contractor for the Manhattan Engineer District examined the deposit. _/ According to this

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_/ Report of field examination of the schroeckingerite deposits at Lost Creek, Sweetwater County, Wyoming; Report by contracting agency for the Manhattan Engineer District, March 1945.

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geologist, the schroeckingerite is confined to clays which unconformably overlie the Wasatch formation of Eocene age. He suggests that the uranium may have been derived from the nearby Wind River Mountain complex of granites, schists, and gneisses, and deposited along the then-existing stream channels.

A. L. Slaughter and J. M. Nelson of the Geological Survey made a more detailed examination of the deposit during the summer of 1945. _/

_/ Slaughter, A. L. and Nelson, J. M., Trace elements reconnaissance in South Dakota and Wyoming: Preliminary report, U. S. Geol. Survey Trace Elements Investigations Rept. 20, March 1946, pp. 30 - 37, inclusive.

In an effort to locate the source of the schroeckingerite, Slaugher and Nelson explored a large area surrounding the known deposit and reported the following findings.

1. No visible schroeckingerite was found outside the known deposit.
2. Clays similar to those containing schroeckingerite, occurring one-half mile south of the known deposit, were found to contain 0.005 percent equivalent uranium.
3. Fluorescent pebbles of flint, chert, and opal collected two miles northwest of the deposit contained 0.030 percent equivalent uranium.
4. Samples of coals and interbedded shales occurring in an area 18 to 20 miles south of the deposit assayed 0.010 to 0.015 percent equivalent uranium, and 0.002 to 0.004 percent uranium.
5. Lavas in the Leucite Hills, approximately 25 miles northeast of Rock Springs, were found to contain 0.004 to 0.007 percent equivalent uranium.
6. Some pre-Cambrian granites, schists, and gneisses of the Wind River Mountains near Lander, Wyo., contain 0.001 to 0.006 percent equivalent uranium. Slaughter and Nelson concluded that the widespread, moderately radioactive rocks of the Red Desert area may have been the source of the uranium in the Lost Creek schroeckingerite.

In July 1948, after considerable exploratory work had been done in the area by Uranium, Inc., under the supervision of the Minerals Engineering Company, M. M. N. Shaw of the latter company wrote a report in which he expresses the opinion that the schroeckingerite was deposited in the shoreline muds of a Cenozoic lake. Samples taken from the deposits by Shaw contained from 0.05 to 0.33 percent U_3O_8 with an average of 0.13 percent.

Geology

At Lost Creek, schroeckingerite occurs in clays and sands which are probably of Wasatch age or younger and which are unconformably overlain by various thicknesses of sand and gravel assumed to belong to the Pleistocene or Recent.

The mineral is yellow, platy, and micaceous. In the clay beds it occurs in the form of rounded aggregates up to one inch in diameter, but when found in sand or sandy clay it is finely disseminated. In one trench partly filled with water, the damp walls were coated with a white efflorescent salt except near the water line where the bright yellow schroeckingerite was easily discernible.

The schroeckingerite is distributed erratically and appears to be more concentrated in clay beds two to twenty-four inches thick. The clay beds themselves are sinuous and discontinuous and vary widely in thickness, which fact complicates systematic exploration by the ordinary methods.

In general the beds have a northwest-southeast strike and dip from 14 to 27 degrees northeast. Some of the Uranium, Inc., trenches exposed two stratigraphically distinct schroeckingerite-bearing beds of clay separated by gray, argillaceous sand. The mineralized stratum is often found in direct contact with a distinct band of iron oxide which may represent an old soil horizon.

The deposit as a whole lies near the center of the so-called Continental Divide Basin, a large topographic depression surrounded by mountains.

The sequence of clays and interbedded sand beds is unconformably overlain by a coarse-grained arkosic sand formation. In nearly all of the trenches the unconformable contact is distinguished by lobes or wedges of arkosic sand extending into the underlying clay, thereby suggesting filled mud cracks.

Origin

Although a number of theories have been advanced by different authors to explain the origin of the Wyoming schroeckingerite, none of them has been tested sufficiently for unqualified acceptance. The origin of the deposits, if it could be definitely established, would serve as a valuable guide to future exploratory work. Following are four of the more plausible theories:

1. The schroeckingerite formed at and near the surface of the ground as an effloresecent precipitate from solutions seeping upward from below owing to capillary action.

2. The uranium in the schroeckingerite was derived from the surrounding granites, gneisses, and schists of the Wind River type, transported in solution, and finally deposited in the clays along the banks of streams issuing from the mountains.

3. The uranium was derived from the radioactive coals and shales existing in the surrounding areas.

4. The schroeckingerite was deposited, presumedly by evaporation of lake water, along the shores of a lake that covered the area during Cenozoic time.

Any theory of origin to be acceptable must account for the overlapping of the various mineralized clay beds as shown in aerial photographs as well as the frequently steep dips (up to 27 degrees) which indicate special conditions of deposition or post-mineral folding.

Exploration

Trenches and Test Holes

The representative of the contractor for the Manhattan Engineer District, who examined the deposit in 1944, drilled a number of shallow holes in a relatively small area. According to available records, the only other systematic exploration of the deposits was done during the summer of 1948 for Uranium, Inc., under the technical direction of the Minerals Engineering Company. Their work consisted of 3,850 feet of bulldozer trenching to an average depth of five feet within the limits of a northwest-southeast-trending strip of ground 3,600 feet long by 500 feet wide. In addition to the trenching, a few test pits and shallow drill holes were put down outside the above-mentioned area.

The trenching exposed a total of 1,350 lineal feet of mineralized beds averaging one foot in thickness along the trench walls. An additional 100 feet of mineralized beds was found exposed along the east bank of Lost Creek. The locations of the trenches and test holes are shown on plates 1 and 2.

Sampling

Thirty-seven or more samples taken by the Minerals Engineering Company from their excavations were analyzed by the Brown Engineering Company of Grand Junction, Colo. The locations of these samples and the analytical results are shown on plates 1 and 2.

Towle and Wyant, working together, obtained forty samples during their investigation which were analyzed in the Geological Survey's laboratories at Denver. The data concerning these samples are shown on plates 1 and 2 which also show the locations and contents of the Union Mines Development Company samples. Table No. 1 contains analyses and data pertinent to the U.S.G.S.-A.E.C. samples, and the analyses of samples taken by the Minerals Engineering Company are shown in Table No. 2.

Grade

Only 28 of the U.S.G.S.-A.E.C. samples represent the exact thickness of the bed. These samples (No's. TW-1 to 5, incl., 7-B, 8, 12-A, 12-B, 19 to 32 incl., 34, 35, 37, 38 and 39) indicate a weighted average, on the basis of bed thickness, of 0.0764 percent U_3O_8.

Conclusions and Recommendations

The relatively small number of representative samples taken from a specific block of ground in the Lost Creek area indicate a shallow deposit of ore which, under present conditions, is of sufficient grade to be of interest. The block of ground which does not represent the entire deposit,

was explored by trenching to a maximum depth of eight feet only, and indications point to the possibility of additional ore below this depth. The shallow depth to which ore has been exposed by recent exploration indicates that exploration of the entire area to similar depths could be done at relatively low cost. Exploration to somewhat greater depth would be possible at only a moderately greater cost. The shallow depth also makes the deposit attractive for mining.

It is recommended that the area be explored by test pitting, post-hole auger drilling, or bulldozer trenching along lines radiating from the area already tested. After commercial limits of the deposit have been established the area within them should be drilled, trenched, or pitted on a grid pattern to furnish data for a more accurate estimate of reserves.

Core drilling is not advisable in this instance as satisfactory cores can not be expected, because of the unconsolidated nature of the ground.

Bulldozer trenching, although it affords the best opportunity to gather underground information, becomes expensive at depths of over eight feet, especially in an area of low relief. The cost of test pitting by hand labor is correspondingly high. Therefore it is suggested that a power-driven post-hole auger be given a trial to determine its suitability for the purpose.

TABLE NO. 1
LOST CREEK SCHROECKINGERITE DEPOSIT
U.S.G.S. - A.E.C. SAMPLES

Sample Number	THICKNESS: Ore Bed (ins.)	THICKNESS: Sample (ins.)	THICKNESS: Overburden (feet)	DESCRIPTION	PERCENT: e U_3O_8	PERCENT: U_3O_8
TW-1	12	12	1.5	Clay-shale, near top of bluff.	0.028	0.015
TW-2	15	15	6.5	Clay-shale, near bottom of bluff.	0.012	0.011
TW-3	6	6	3.0	Clay-shale, schroecking-erite visible.	0.078	0.075
TW-4	10	10	1.5	Clay-shale, schroeckingerite visible.	0.153	0.130
TW-5	6	6	3.5	Clay-shale, schroecking-erite visible.	0.070	0.062
TW-6*	12	54	4.0	Clay-shale, overlain by sand and gravel.	0.013	0.005
TW-7-A*	-	15	-	Sand and gravel overburden	0.007	0.002
TW-7-B	6	6	1.3	Clay, slightly sandy.	0.110	0.107
TW-8	8	8	2.5	Clay-shale, schroecking-erite visible	0.054	0.054
TW-9*	12	60	4.0	Clay-shale, overlain by sand and gravel.	0.013	0.009
TW-10*	missing	54	-	Unconsolidated sand and gravel.	0.007	0.002
TW-11*	"	60	-	Unconsolidated sand and gravel.	0.017	0.012
TW-12-A	15	15	1.5	Clay-shale, schroecking-erite visible.	0.064	0.057
TW-12-B	10	10	1.3	Clay-shale.	0.013	0.005
TW-13*	missing	48	-	Unconsolidated sand and gravel.	0.013	0.007
TW-14*	missing	54	-	Unconsolidated sand and gravel.	0.009	0.005
TW-15*	missing	48	-	Unconsolidated sand and gravel.	0.007	0.005
TW-16*	12	36	2.0	Clay-shale, overlain by sand and gravel.	0.015	0.009
TW-17*	12	48	3.0	Clay-shale, schroecking-erite overlain by sand.	0.212	0.165
TW-18*	10	48	3.0	Clay-shale, schroecking-erite overlain by sand.	0.101	0.088
TW-19	12	12	2.2	Clay-shale, schroecking-erite visible.	0.189	0.177
TW-20	10	10	3.0	Clay-shale, schroecking-erite visible.	0.130	0.118
TW-21	12	12	2.5	Clay-shale, schroeckingerite visible.	0.130	0.112
TW-22	18	18	3.0	Clay-shale, schroecking-erite visible.	0.091	0.064
TW-23	12	12	1.5	Clay-shale, schroecking-erite and white salt visible.	0.034	0.028

TABLE NO. 1
LOST CREEK SCHROECKINGERITE DEPOSIT
U.S.G.S. - A.E.C. SAMPLES

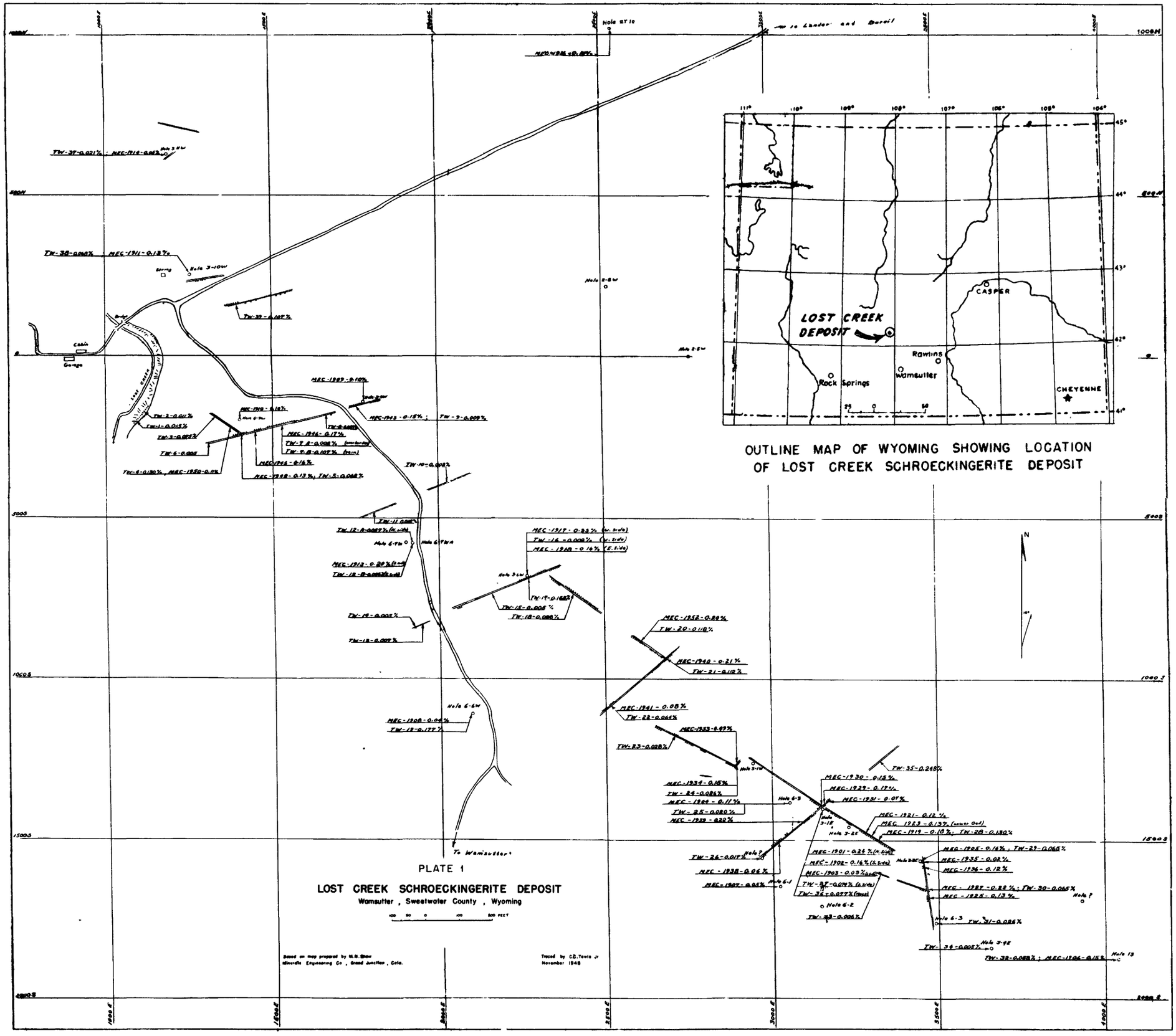
2

Sample Number	THICKNESS Ore Bed (ins.)	Sample (ins.)	Overburden (feet)	DESCRIPTION	PERCENT e U_3O_8	U_3O_8
TW-24	15	15	2.8	Clay-shale, schroeckingerite visible.	0.038	0.026
TW-25	8	8	2.5	Clay-shale, schroeckingerite visible.	0.259	0.200
TW-26	14	14	1.2	Clay-shale, schroeckingerite visible.	0.224	0.165
TW-27	15	15	2.2	Clay-shale, schroeckingerite visible.	0.078	0.074
TW-28	15	15	2.0	Clay-shale, schroeckingerite visible.	0.153	0.130
TW-29	9	9	1.8	Clay-shale, schroeckingerite visible.	0.094	0.065
TW-30	10	10	2.0	Clay-shale, schroeckingerite and white salt visible.	0.078	0.065
TW-31	12	12	1.7	Clay-shale, schroeckingerite and white salt visible.	0.028	0.026
TW-32	8	8	2.2	Clay slightly sandy.	0.073	0.058
TW-33*	missing	60	-	Unconsolidated sand and gravel.	0.009	0.006
TW-34	15	15	2.0	Clay-shale, schroeckingerite and white salt visible.	0.009	0.005
TW-35	6	6	6.0	Clay-shale	0.283	0.248
TW-36*	Grab sample of material from hole 3-1E			(See sample TW 27)	0.087	0.077
TW-37	8	8	2.5	Clay-shale, sparse schroeckingerite and white salt.	0.031	0.021
TW-38	10	10	0.5	Clay-shale, schroeckingerite visible	0.072	0.068
TW-39	11	11	2.3	Clay shale.	0.130	0.107

* Composite sample of vertical channel cut.

TABLE NO. 2
LOST CREEK SCHROECKINGERITE DEPOSIT
MINERALS ENGINEERING CO. SAMPLES

Sample Number		Percent U_3O_8	Sample Number		Percent U_3O_8
MEC 1901	Hole 3-1E North side	0.24	MEC 1925	Trench	0.13
MEC 1902	Hole 3-1E South side	0.16	MEC 1927	Trench	0.22
MEC 1903	Hole 3-1E South side	0.03	MEC 1929	Trench	0.17
MEC 1904	Hole 6-3	0.11	MEC 1930	Trench	0.15
MEC 1905	Hole 3-3E	0.16	MEC 1931	Trench	0.07
MEC 1906	Hole 13	0.15	MEC 1933	Trench	0.09
MEC 1907	Hole 6-1	0.05	MEC 1934	Trench	0.15
MEC 1908	Hole 6-6E	0.04	MEC 1935	Trench	0.02
MEC 1909	Hole 3-9E	0.10	MEC 1936	Trench	0.12
MEC 1910	Hole 6-9W	0.10	MEC 1938	Trench	0.06
MEC 1911	Hole 3-10W	0.13	MEC 1939	Trench	0.22
MEC 1913	Hole 6-7.5A	0.28	MEC 1940	Trench	0.21
MEC 1914	Hole 3-11W	0.05	MEC 1941	Trench	0.08
MEC 1916	Hole 3-10W	0.10	MEC 1943	Trench	0.15
MEC 1917	Hole 3-6E West side	0.33	MEC 1945	Trench	0.16
MEC 1918	Hole 3-6E East side	0.16	MEC 1946	Trench	0.17
MEC 1919	Trench	0.18	MEC 1948	Trench	0.13
MEC 1921	Trench	0.12	MEC 1950	Trench	0.11
MEC 1923	Trench	0.13	MEC 1952	Trench	0.20



OUTLINE MAP OF WYOMING SHOWING LOCATION OF LOST CREEK SCHROECKINGERITE DEPOSIT

150 A

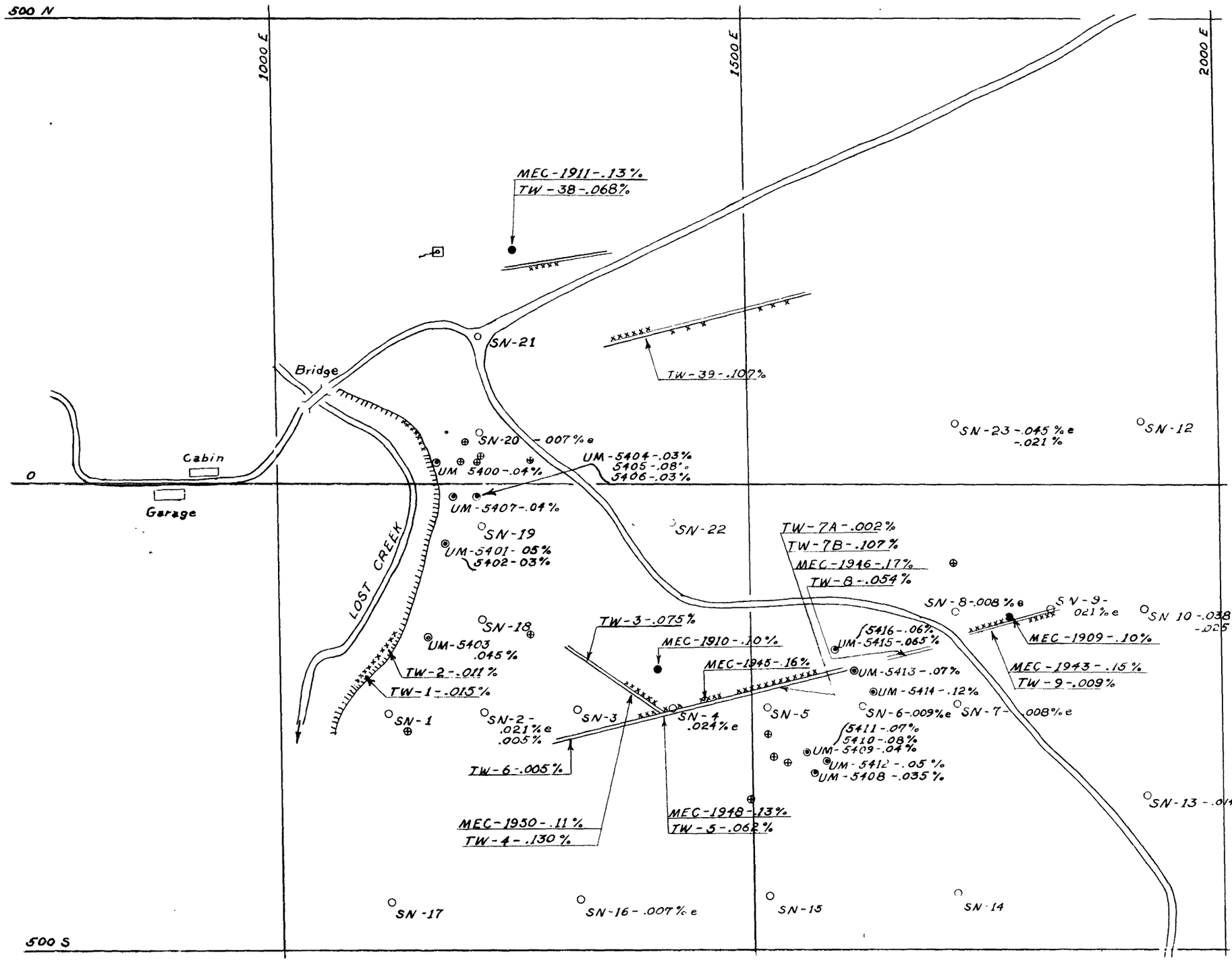


PLATE 2
EXPLANATION .

	Trench .
XXXXXXX	Length of mineralized bed.
○	Drill hole by Slaughter - Nelson.
●	Drill hole by Minerals Engineering Co.
⊙	Drill hole by G.B. Guillotte with schroeckingerite - bearing clay.
⊕	Drill hole by G.B. Guillotte with no schroeckingerite - bearing clay.
MEC - 1950	Minerals Engineering Co. (see Plate 1.).
TW - 14	C.C. Towle Jr. - D.G. Wyant (see Plate 1).
UM - 5401	Sample taken by G B Guillotte, Union Mines Inc., 1945.
SN - 7	Sample taken by A.L. Slaughter - J.M. Nelson (U.S.G.S.), 1945.

Note : %e = percent equivalent U_3O_8
% = percent U_3O_8

SCALE
100 50 0 100 200 FEET

ASSAY MAP TO ACCOMPANY PLATE 1

END OF DOCUMENT