North Tintic District

63536.04

The Anaconda Company

GEOLOGICAL DEPARTMENT

Report on

SCRANTON MINE

Tooele County, Utah

By

L. A. Hansen

April - 1960

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INTRODUCTION

The Scranton property has been examined by various members of the Anaconda and International Geological Departments.

Mr. R. C. Thomas made a brief examination of the Scranton property in September of 1951 when the writer accompanied him.

Under instructions from Mr. R. B. Mulchay, the writer, Mr. R. C. Thomas, Mr. R. W. Knostman and Mr. G. H. Abplanalp initiated a detailed mapping program in the latter part of April, 1960 which continued through November 17, 1960. Four rotary drill holes were completed during the period November 18 through January 11, 1961. All accessible tunnels and other underground workings were mapped and the surface was mapped from a distance of 3000 feet north of the Del Monte portal to 2700 feet south of the Magazine portal, or for a north-south distance of 7000 feet.

LOCATION and DESCRIPTION

The 21 patented claims of the Scranton property are located in Sections 5, 8, 9 and 17, T 9 S, R 3 W, Tooele County, Utah. The claims are owned by the Scranton Zinc and Lead Company; Section 2, T 9 S, R 4 W, is also owned as a plant site and source of water. A water well in Section 2 is reported to have found considerable water at 404 feet. The mines are 18 miles by road from Eureka over approximately 12 miles of paved highway and 6 miles of dirt road.

EQUIPMENT and PHYSICAL SUPPLIES

There is no equipment at the Scranton mines excepting a little light weight rail on the lower levels, and two or three 20-gallon sinking buckets. Two small buildings and one large two-story bunk house could be renovated for use.

A rather sparse but large stand of Pinyon pines and Rocky Mountain cedars cover a majority of the mining claims. Both types were used in the mine.

The nearest water is from the well (Section 2, etc.) already mentioned previously; however, the vegetation in Scranton canyon one mile or less east of the mine is very suggestive of a near water supply.

All power equipment and lines have long been removed. The nearest power supply is 13 miles east of the Scranton mines and is a 44,000 volt line. Utah Power and Light Company reports the sub-station at Eureka would be about as close as the line east of the Scranton mines.

The nearest railroad, Union Pacific, is approximately 6 miles west.

DEVELOPMENT

The major workings consist of the Del Monte Mine, the Magazine Tunnel and the Essex tunnels from north to south.

Four surface tunnels and five lower levels make up the Del Monte Mine and are located on the north side of Scranton Canyon. The tunnels are the Del Monte, Biddlecomb, Bartlett and Grand Cross. With an approximate elevation for the Del Monte portal taken as 6,600 feet, the highest of these tunnels, the Grand Cross would be at an elevation of 6,701 feet.

The Del Monte tunnel is the main tunnel from which five lower levels were developed through the Wolf incline to the Wolf level, the Knapp incline to the Knapp 1 and 2 levels, and the Knapp winze to the Knapp 3 and 4 levels. The levels extend progressively nearly 1200 feet to the north from the most southerly development in the Del Monte tunnel level. The most northerly development is in the Knapp No. 2 level, the last 150 feet of which was not mapped. Part of the Bartlett tunnel was caved and inaccessible. The elevation of the lowermost Knapp No. 4 level is 6,301 feet or approximately 300 feet below the Del Monte level.

The Magazine tunnel penetrates the south side of Scranton canyon and ties through a raise to the Essex tunnel from the south. The portal of the Essex tunnel is on the north side of a south fork off the main Scranton canyon. The South Essex was driven into the south side of the south fork. Approximate elevations are 6,450, 6,500 and 6,518 feet for the Magazine, Essex and South Essex portals respectively.

The Magazine portal is approximately 1,300 feet south of the Del Monte portal and the South Essex portal is over 1,250 feet south of the Magazine portal. Little more than 100 feet of the South Essex development southerly was accessible and some workings above the Magazine and north of the Essex were not reached.

The total area enclosing the development extends over 3,850 feet in a N 10° E-S 10° W direction along the east side of the Scranton fault-fissure system. The development extends over a distance of 400 feet vertically (in the Del Monte area) and over 400 feet east of the Scranton fault-fissure system. Some fair to strong mineralization still remains in most of the workings.

A single compartment shaft has been sunk 300 feet below a collar elevation of approximately 6,425 feet with two crosscuts east and west off the bottom. The shaft is approximately 800 feet south and 180 feet west of the Del Monte portal and is nearly 200 feet below the lowermost workings. The crosscuts extend 155 feet west and 135 feet east; both were mapped by M. B. Kildale and F. W. Anderson in 1931. The west drift is apparently 150 feet short of the Scranton fault-fissure system.

HISTORY and PRODUCTION

The Scranton group claims are reported to have been located between 1886 and 1891 and patented between 1893 and 1913. Ownership was acquired by the Scranton Zinc and Lead Company in 1953. The property was leased to McFarland and Hullinger in June, 1960, and the lease was assigned to The Anaconda Company in August, 1960. Six claims were staked in pairs for The Anaconda Company extending the Scranton group 4500 feet north to Edwards canyon.

The greater part of the production is reported to have been mined prior to 1915; however, most of the zinc oxide production was apparently shipped during World War I. Virtually all production after 1915 is reported to have been mined by lessees. Most of the ore shipped was sold as lead ore, zinc ores or as combination lead and zinc ore (Butler, Loughlin, Heikes, etc.).

According to the Guidebook to the Geology of Utah, No. 12, production of oxidized lead-zinc over the period 1902 to 1955 totaled 62,411 tons with an average of 0.7 oz. of silver, 9.5 per cent lead and 16.7 per cent zinc.

Scranton production data in Anaconda files covering the period 1902 to 1926 are as follows:

	Tons	Au	Ag	Pb	Zn	Fe	Net Smelter Returns
Lead Ore	17,972	Tr.	2.0	23.4	3.0	23.0	$ 204,915
Zinc ore	39,012	Tr.	0.5	9.4	31.6	14.0	399,479
Iron ore	990					58.5	3,527
Total	57,974						$ 607,921

GENERAL GEOLOGY

Structure

The Scranton mines property is situated on the west limb of the gently plunging North Tintic anticline. The axis of the anticline strikes from nearly north-south to 20° west of north, going from south to north. Superimposed on the major anticline are several minor synclines and anticlines which are essentially conformable to the major anticline in axial attitude.

The beds in the west flank of the North Tintic anticline strike regionally east of north and dip moderately west at 15 to 35°. On the east flank of the North Tintic anticline the beds strike just west of north and are for the most part overturned--dipping steeply back to the west.

Numerous faults cut the North Tintic anticline into many blocks. The Scranton mines are located along the east margin of the Scranton fault which is a steep fault with small displacement striking 10 to 15° east of north. The mineralization is controlled by complementary northeast-striking fault-fissures on the east side of the Scranton structure along with favorable bed intercepts.

Igneous

No igneous rock was seen during the mapping in the Scranton mines area; however, two diabase plugs are reported to be within one mile of the Scranton property, and lamprophyre dikes have been reported 1-1/2 to 2 miles southwest from the Scranton property.

Stratigraphy

Stratigraphic sections were compiled from mapping and were measured in several areas in the North Tintic District.

The Scranton mines are in the upper 200 feet of 720 to 790 feet of blue-gray limestone. Overlying this limestone series is 445 feet of sandstone which is locally limy, silty and slightly cherty to cherty. The upper Madison of the Tintic District consists of essentially the same limestones as the upper limestones which contain the mineralized beds at the Scranton mines; however, there are more chert and fewer silty partings at Tintic.

At Tintic the basal Deseret is composed of approximately 200 feet of dense, siliceous shales and siltstones; the colors will vary from light gray to black with pinkish, red and violet tints and with some phosphatic coloration. Sandy beds along with some impure sandy limestones are found in the next 400 feet above the shaly siltstones of the Tintic District--especially northward. This limestone-sandstone and limestone-siltstone contact was checked in the North Tintic District from north to south and east to west. Consequently the writer is convinced that the limestone containing the Scranton mines development should be correlated with the upper Madison limestone of the Tintic District. The writer is equally convinced that the overlying sandy series is equivalent to the lower Deseret limestone formation, and that a facies change exists from the southeast to the northwest resulting in a coarser detrital and more silty material and less limestone as one progresses from the Tintic District to the northwest through the North Tintic District. A stratigraphic section for the Scranton mines area and correlation with the Tintic District section is included with the report. The section was compiled from the immediate mines area and from an area four miles east and one mile north of the Scranton mines, where a complete section was measured from the Humbug down through the Bluebell formations.

LOCAL GEOLOGY and MINERALIZATION

The Scranton fault-fissure strikes 10 to 15 degrees east of north and dips steeply west (70 to 85°) in the upper workings but rolls back to a steep east dip between the Knapp No. 1 and 2 levels. Local rolls occur taking the dip to a minimum of 57 degrees. The relative displacement is down to the west. In the vicinity of the mine, a throw of 165 to 180 feet has been measured. However, surface mapping approximately 2,300 feet north of the Del Monte portal indicates a throw of slightly greater than 400 feet. The throw has not been worked out in the southern mapping.

Several fault-fissures exist to the east of the Scranton structure; these fissures strike a little more easterly than the Scranton and dip to the east. The movement is normal dropping the blocks down repeatedly to the east. One small fault approximately 50 feet east of the Scranton drops the beds down to the west; however, none of these faults exceeded much over 30 feet in throw and have generally dropped the beds only a few feet.

The mineralization consists of dolomite, jasperoid or sintery silica, calcite, aragonite, possibly barite, siderite, manganosiderites, rhodonite and/or rhodochrosite, psilomelane, pyrolusite, limonite, hematite, cerussite, anglesite ?, smithsonite, calamine and minor galena.

Two horizons located approximately 40 and 80 feet below the sandy series have produced bedding ore. Both ore horizons have been dolomitized in the areas of mineralization and near the Scranton fissure dolomitization appears to be continuous to the lowermost levels. Surface and underground mapping shows the dolomitization lensing in and out of bedding horizons and trending across beds following jointing and fissuring.

There is an obvious increase of fissures and jointing in the dolomitized blocks and a breccia pattern of coarse crystalline dolomite surrounding fragments of dark gray, siliceous, crystalline dolomite and limestone was seen throughout the extent of the mineralized areas mapped.

The light gray crystalline dolomite exhibits curved rhombohedral crystal faces and is pinkish and rusty stained in part. Locally pink and white dolomite and calcite surround in angular patterns the light gray crystalline dolomite which may in turn contain the darker angular spots of darker, finer, silty dolomite and limestone. As the areas of more intense mineralization are approached, these breccias or pseudobreccias, such as they may be, pick up more oxides of manganese and iron. The better ore zones are generally crimson red from iron oxides; however, assays of over 25% zinc and 15% lead were taken where little or no iron or manganese were present.

The dense silica referred to as "sintery-jasperoidal silica" is densely siliceous and in part somewhat vesicular, banded to dense, light gray to brown, rusty red and black as various amounts of iron and manganese are present. These sintery silicas were seen in veins and irregular pods and trends within the larger oxide bodies. At least four jasperoidal veins or fissure fillings are exposed in the Del Monte workings. The Del Monte, Biddlecomb, Bartlett and Grand Cross tunnels were driven at least in part along these jasperoids where they strike from 10 degrees east of north to nearly 45 degrees east of north. Apparently all closely parallel the Scranton structure as they are followed to the north; however, these jasperoids dip easterly and apparently mark the positions of prior fissures which offset the beds down to the east. Near the heart of the Del Monte mine at least one of these jasperoids or sintery silicas is found to swing to the northwest and dips irregularly from 30 to 90 degrees to the north.

Where the down-dip projection of the jasperoids and fissuring has been mapped in the limestones below the 80-foot or "Daylight" bedding horizon, they pinch down to relatively small calcite-aragonite filled fissures and show little other mineralization. The exception is shown by the lowermost Knapp No. 4 level where dolomitization and associated high shattering is at least 200 feet below the sandy section. Dolomitization exists on both sides of the Scranton fissure where exposed on the Knapp 3 and 4 levels.

Some degree of zoning is apparent but the zoning is at least in part secondary. The stopes of the southern properties are reported to have contained better lead ore up-rake and better zinc down-rake. However, the upper levels of the Del Monte mine are reported to have produced lead ores up-rake, combination ores down-rake and lead ores again still farther down with also increased iron values.

The extreme northern surface mapping (2300 feet north of the Del Monte portal) stops on the margin of an impressive exposure of brecciated, iron-stained jasperoids, dolomites and limestones. The Scranton fault-fissure projects east of this area which is again in the upper Madison.

South of the Essex workings float and outcrop of iron-stained, brecciated jasperoid and dolomite have been traced south up the ridge for nearly 2000 feet and thence east along the ridge for at least 1000 feet. This surface mineral is east of the Scranton fault, and was not mapped.

The following sequence of events seem apparent from the mapping:

1. Pre-mineral Scranton and lateral complementary movement plus cross fracturing.

2. Dolomitization following selective bedding horizons and following Scranton and related fissure trends.

3. The dolomitized material was then highly jointed, fissured and locally brecciated. Only the major fault fissures penetrate significantly into the underlying limestones.

4. The highly shattered dolomitized horizons received a filling of lead, zinc, iron and manganese sulphides with associated minor accessories and jasperoidal-sintery silica. A portion of the silica was locally added to the fractured cherty contact between the limestone and sandstone. The silica may have preceded or post-dated the sulphides, but the association seems to be close.

5. Post-mineral fracturing and fault movement including movement on the Scranton structure with consequent deep almost complete oxidation and redistribution of the zinc to lower horizons. Considerable clay-altered fillings and calcite, aragonite, dolomite and iron and manganese carbonates again cemented fractured dolomite and limestone; some of the carbonate breccia cement must have been associated with the sulphide stage.

This summary is from megascopic observation and so is thereby limited.

SAMPLING and DRILLING RESULTS

The Del Monte tunnel level and lower levels were sampled, and the results indicated strong mineralization leads on three levels.

1. The Del Monte tunnel level - assays from the "Combination stope" range from minor values of lead and zinc to nearly 10% zinc and 6% lead. A 20-foot horizontal composite on the south side of the stope averaged 5.95% lead and 1.3% zinc. The sampling is across fissuring in the upper Del Monte ore horizon. Strong mineralization continues north and south of the stope. Samples farther south of the stope ranged to 25% zinc in thinner beds only slightly iron stained.

2. The Wolf level - assays range to better than 11% lead and 5% zinc. One composite of 7 feet in bedding oxide to the extreme north averaged 4.12 oz. Ag, 9.6% lead and minor zinc. Two strong mineral zones extend to the north.

3. Knapp No. 1 level - approximately 5 feet of jasperoid and oxide trending southeast and dipping to the north assayed 8.6% lead and 0.8% zinc; the footwall of this mineral is one foot of light gray banded silica which assayed 5.40 oz. silver, 15.8% lead and 0.8% zinc. Another structure approximately 100 feet south of this zone assayed minor lead and silver and 14.4% zinc; the two zones will intersect to the east of the first assays; 3.25% copper was also present near the silver values.

4. Knapp No. 2 level - samples taken below the projection of the Knapp No. 1 assays range to nearly 24% zinc though

less mineral is exposed and is apparently weaker in general.

Though assays ranged to nearly 12% zinc going down to the Knapp No. 4 level, the mineralization as developed appears to weaken noticeably.

The assays discussed represent the highlights of the remaining mineralization. Six drill sites were located, of which four were drilled by rotary-air, truck-mounted rigs.

Rotary Drill Hole No. 1 was drilled on the Del Monte dump from an elevation of approximately 6,601 feet and located approximately 75 feet south and 95 feet west of the Del Monte portal. The hole was to pick up the down-dropped limestone and its two known favorable ore horizons at 40 and 80 feet below the contact or referred to herein as the Del Monte and Daylight ore horizons. The contact was penetrated at 163.5 feet where the drill went immediately into dolomite with minor iron-stained carbonates. The hole went into limestone at 180 feet and was stopped at 304 feet in dark gray limestone with silty partings.

Rotary Drill Hole No. 2 was drilled from an elevation of 6,673 feet and approximately 117 feet north and 100 feet east from the Del Monte portal. This hole hit an old stope at 46 feet so the rig was moved to Hole Site 2A approximately 14 feet north and 10 feet west to pick up a down-faulted block of the same mineral. The hole drilled 13 feet of mineralization from 70 to 83 feet which averaged 7.0% zinc; the better mineral from 74 to 80 feet averaged 13.2% zinc. Ten feet of mineralization was again encountered from 110 to 120 feet, but assay returns were only from 1 to 6% zinc; however, crimson red oxides were present apparently from high iron. Minor mineral-ization was encountered intermittently to the bottom and several weak assays of zinc were taken; however, these could be due to cave. The hole left the dolomitized rock at 150 feet and was stopped at 196 feet in dark gray limestone with silty partings.

Rotary Drill Hole No. 3 was drilled from an elevation of approximately 6,812 feet about 195 feet north and 300 feet east of the Del Monte portal. Oxide and carbonate mineralization was drilled from 133 to 151 feet for a total of 18 feet; the oxide was crimson red from 144 feet to 151 feet. However, assays showed little more than 2% zinc, and the hole went out of the dolomitized rock at about 165 feet. Air return was lost from 175 to 179 feet which may have marked the Daylight ore horizon. The hole was stopped at 210 feet in dark gray limestone with silty partings.

Rotary Drill Hole No. 4 was drilled from an approximate elevation of 6,810 feet and 615 feet north and 100 feet east of the Del Monte portal. This hole was again on the west side of the Scranton fault-fissure. The contact between the sandstone and limestone was hit in a sheared broken zone from 403 to 410 feet. Some oxide-carbonate fissure filling was drilled in the sandy section. Some dolomitized material was drilled from 428 to 435 feet and weak oxide from 445 to 450 feet and again from 479 to 483 feet; however, only trace assays were obtained from this hole. The hole was stopped at 510 feet in gray crystalline limestone with rusty silty partings.

SUMMARY and CONCLUSIONS

In conclusion the following features and situations are listed.

1. The areal extent within which lead and zinc oxide ores have been mined exceeds 3800 feet north and south, 400 feet vertically and 400 feet laterally forming a long ore run with an intersection of fissuring and favorable bedding.

2. Dolomitization, jasperoidal silica, and iron oxides outcrop over a greater area than described in 1, far exceeding the 7,000 feet mapped along the strike length of the Scranton. The dolomitization and jasperoidal silica were found associated with every ore occurrence that was mapped.

3. The local plunge of mineralization in the heart of the Del Monte mine; the intimate association of silver and lead values with the light gray sintery-jasperoidal ? silica and almost out of place copper of 3.25%; the plunging dolomitization enclosing same--all suggest a local concentration of mineralization along the Scranton system. The writer believes two other zones may exist just beyond the accomplished mapping--one north and one south.

4. The writer is convinced that the Scranton mines were developed in the upper Madison limestone and consequently the top ore producer of the Tintic District, the Bluebell dolomite, is believed to be approximately 650 feet below the shaft or 950 feet below the shaft collar. The Bluebell likewise shouldn't be over 1,000 feet below the bottom of any hole drilled or over 1,000 feet below the Knapp No. 4 level--assuming an average bedding dip of 25 to 30 degrees. The basal light crystalline limestone of the Madison which is one of the better Tintic producers would be more than 400 feet above the Bluebell dolomite, again having assumed correction for bedding dip.

5. Even though the two holes drilled west of the Scranton fissure did not hit ore mineral, the writer has seen and mapped (a portion of) strong mineral on the west side of the Scranton in the extreme northern area mapped.

6. The strong mineralization drilled in hole 3 plus brecciation and surface mineral shows in the Del Monte and Daylight ore horizons north and east of this hole indicate potential development of these horizons in that direction.

The writer therefore recommends at least one deep drill hole to penetrate through the upper Bluebell horizon from a location near the Del Monte mine, but pending a little more consideration for maximum target potential. The writer also feels the project is worthy of 3 or 4 more shallow holes. These holes would check the upper Del Monte and Daylight horizons in areas exhibiting strong mineralization on the surface.

1. Northeast of Hole No. 3 and at or near the site already prepared and originally discussed as Hole No. 5.

2. A shallow hole in the mineralization mentioned in the extreme north--the necessity of an additional day or two of surface mapping would preclude the choice for the drill site at this time.

3. A shallow hole in the extreme southern area requiring like preparation as for Site 2.

Respectfully submitted,

L. A. Hansen

LAH/lh
Feb. 8, 1961

References

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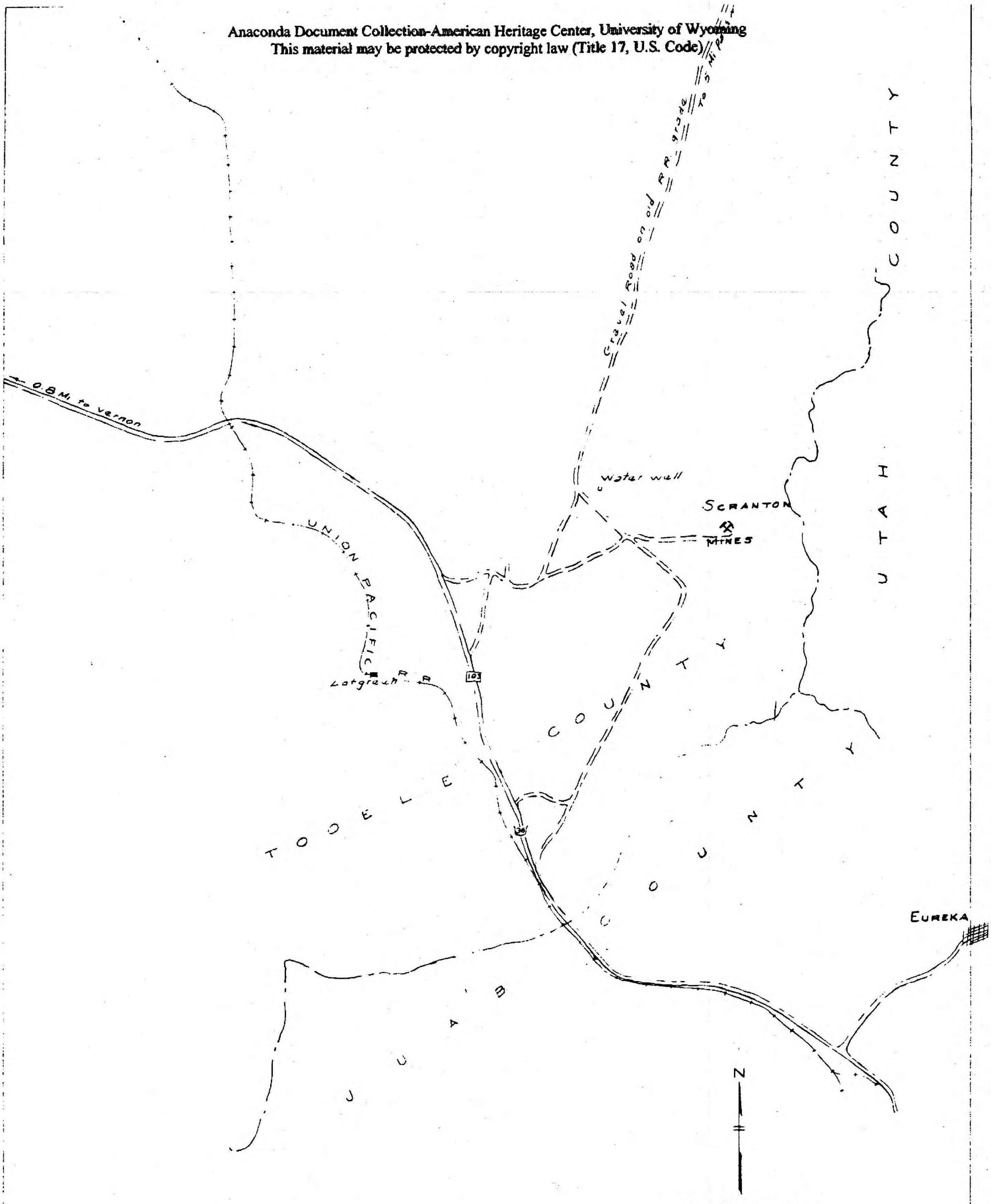

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SCRANTON MINES

Tooele County, Utah

Scale 1" = 2 miles

January 1961 L. A. H.