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REPORT

ON

THE ENGINEER GOLD MINE.

ATLIN MINING DIVISION

BRITISH COLUMBIA

NTS 104M/8E

59°29' N, 134°14' W

FOR

NU-ENERGY DEVELOPMENT CORP. LTD.

Vernon, B.C.
June 9th 1975

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K. L. Daughtry & Associates Ltd.

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INTRODUCTION

The Engineer Gold Mine, in the Atlin Mining Division of northwestern British Columbia, was noted for spectacular high-grade gold mineralization occurring in small pockets in numerous quartz veins. The rapid rise in the price of gold has prompted the re-evaluation of many such dormant properties in the past two years. Nu-Energy Development Corp. Ltd. recently acquired the Engineer Mine property, and this report was prepared at the request of this Company.

The report, which proposes a programme of sampling and evaluation, is based upon available data on the mine, which are unfortunately fragmentary and incomplete, and upon an examination of the property on May 27th 1975 by the writers, accompanied by D. Wright, mining contractor. The bulk of the report has been written by K.L, Daughtry, P.Eng., Geologist. C.K. Ikona, P.Eng., Mining Engineer, collaborated on those portions dealing with the condition of the workings, the proposed rehabilitation programme, and the budget.

Most of the information has been drawn from various reports of the Geological Survey of Canada and the British Columbia Minister of Mines. A few old mine plans and occasional assay values relating to widely separated areas of mineralization are available, but much of the information is contradictory and could only be used as a general guide.

PROPERTY

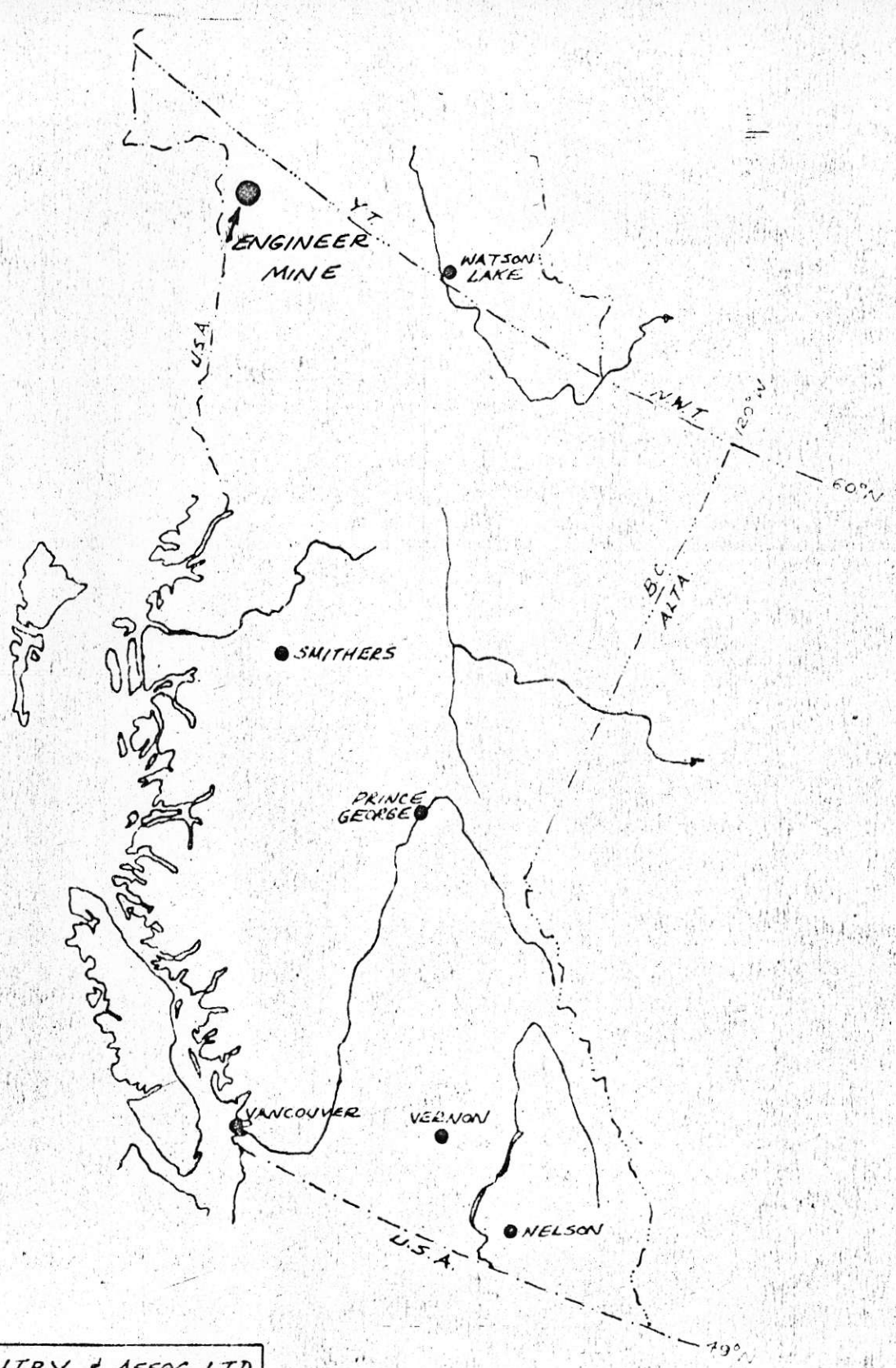
The various surface and underground workings of the former Engineer gold mine are on five Crown-granted mineral claims in the Atlin Mining Division, British Columbia. The mineral rights on these claims are owned by Nu-Energy Development Corp. Ltd. (N.P.L.), 1046 Deep Cove Road, North Vancouver, B.C.

The claims, with corresponding lot numbers, are:

Engineer No.1 (L.19)	49.0 acres
Northern Partnership No.1 (L.918)	45.46 acres
Northern Partnership No.2 (L.20)	45.6 acres
Northern Partnership No.3 (L.106)	33.6 acres
Northern Partnership No.4 Fr. (L.209)	14.58 acres

LOCATION, ACCESS, TOPOGRAPHY

The Engineer property is on the east shore of Taku Arm of Tagish Lake in the northwestern corner of British Columbia, 35 miles south of the Yukon boundary and 28 miles east of the Alaska border. The town of Atlin, B.C. is 20 miles east-northeast of the property, and Carcross, Yukon, is 50 miles to the north-northwest. Co-ordinates of the centre of the claim block are



K.L. DAUGHTRY & ASSOC. LTD
NU-ENERGY DEVEL. CORP. LTD.
LOCATION MAP ENGINEER MINE
JUNE 1975 FIG. NO. 1

59° 29' north latitude and 134° 14' west longitude. (Figure 1).

At present, access to the property during the summer season is either by road to Atlin and thence by float-plane or helicopter to the Engineer Mine (21 air miles), or by road or rail to Carcross and thence by boat (63 miles), or air (53 miles) to the property. Carcross is on the White Pass and Yukon Railway with connections to Whitehorse (45 miles) and Skagway, Alaska (68 miles) on tidewater. Whitehorse, Yukon, a major supply centre, 106 or 50 miles by road from Atlin and Carcross respectively, has regular CP Air service to the south.

Taku Arm is at an elevation of 2152 feet above sea level. The highest point on the claim block is the eastern limit of the Northern Partnership No.3 claim, about 3500 feet above sea level. The property occupies the lowermost western slope of Engineer Mountain. The mountainside rises in benches from the lake, with alternating steep rises and level flats.

HISTORY

Free gold was discovered in quartz stringers on the shore of the lake, on what is now the Engineer No.1 claim, by a survey party of the White Pass and Yukon Railway in 1899. Thirteen claims were staked and the Engineer Mining Company of Skagway was formed.

Between 1900 and 1902 several hundred feet of underground workings and numerous surface open cuts were completed on several of the gold-quartz veins discovered by that time. A few tons of ore were shipped and a small stamp mill was brought to the property. Apparently funds became exhausted as the mill never operated and the property lay dormant until 1906 when the claims were allowed to lapse.

In 1906, Edwin Brown and partners of Atlin staked the ground and in 1907 they sold it to the Northern Partnership Syndicate of Atlin, headed by James Alexander.

From 1908 to 1911 the Northern Partnership conducted extensive surface prospecting and trenching. Numerous rich showings of gold in quartz veins were discovered, and mining from open cuts commenced in 1909. The stamp mill was set up and operated, and in 1910 the season's run of all rock milled was 140 tons yielding $8,000 from prospecting, development, and mining (gold at $20.67 per ounce).

In 1912 Alexander acquired full title to the property, and began a systematic programme of exploration and development. This work continued until 1918 when Alexander died in a shipwreck while travelling outside to negotiate the sale of the property. During this period the mill continued to treat ore from open cuts

and development work. In 1913, 300 tons from the "E" Vein were milled yielding about $26,000 in bullion, or about 4.2 ounces of gold per ton.

Development work after 1912 was concentrated on the "E" Vein. A 175-foot shaft and three levels were opened up by 1915, with several thousand tons of ore blocked out. By 1918, the shaft on "E" Vein was 210 feet deep and four levels were developed. A main haulage tunnel was begun on a fifth level to connect with the shaft from the mill. At the time of Alexander's death, at least 25 mineralized veins had been discovered.

The property lay dormant from 1919 to 1922 due to a dispute over title. In 1923 New York interests acquired the mine and development resumed. At this time, access to the property was by steamer from Carcross for 6 months of the year, and by overland trail from Atlin in the winter.

Engineer Gold Mines Ltd. was incorporated in 1924 and extensive development employing up to 60 men began. A power plant and transmission line were built, and a 50 ton-per-day concentrator was installed at the portal of the main 5 Level tunnel. That tunnel was driven 1200 feet to the "E" Vein and a raise connected the 5 Level to the earlier shaft and Levels 1 to 4. Also in 1924, three diamond drill holes totalling nearly 2,000 feet were drilled to test Hub A, Hub B, and a series of veins east of the "E" Vein.

By 1925, up to 140 men were employed. The mill and power plant were improved and a large camp was completed. The concentrator began operating in November at 50 tons per day, and by year end 1700 tons were mined and milled yielding 1814 ounces of gold and 843 ounces of silver. In 1925 this ore was worth $22 per ton at a gold value of $20.67 per ounce. A total of 4000 feet of underground work was completed, and a 1000-foot contract was let to test one of the hubs.

In retrospect, it appears that such ambitious development of the mine was premature considering the amount of ore in sight and the exploration work completed to that time. At 50 tons per day, the blocked out ore on the "E" Vein could only have lasted a matter of months and unless new ore was developed to keep pace, reserves could be expected to be exhausted within a year or so. This proved to be the case.

In 1926, 7757 ounces of gold were produced before the mine was closed to permit the sinking of an exploration shaft on one of the hubs. Production resumed in the spring of 1927, and about 1500 ounces of gold were produced by the fall when developed ore reserves were apparently exhausted. An interior shaft was then sunk from the 5 Level to the 6, 7 and 8 Levels.

From 1927 to 1931, exploration and development continued

on the lower levels with favourable results reported. Ore was said to have been discovered and reserves established between Levels 5 and 8 on the "E" and Double Decker veins. Scattered records found at the site indicate that production from at least 5 stopes on various levels was in progress late in 1929. Work was suspended in 1931 and was not resumed.

In 1932-33, lessees selectively mined some of the rich small veins on surface. In 1934 the assets of the company were bought by Mining Corporation at a sheriff's sale.

Little information is available on the property from 1934 to the present. Small hand operations were conducted in 1944-46 and 1952, with a total of about 600 tons mined. The property was acquired by the principals of Tagish Gold Mines Ltd. in 1962 or 1963. Nu-Energy Development recently acquired the property through a merger with Tagish Gold Mines.

No reliable data on production from the Engineer Mine are available for the earlier period of mining from the small veins. According to Government records between 1913 and 1932 about 17,418 ounces of gold were produced.

GEOLOGY

The Engineer Mine is near the western margin of a graben-like or synformal northwesterly-trending belt of volcanic greywacke, siltstone, argillite, slate, conglomerate and limestone belonging to the Lower Jurassic Laberge group. The Laberge rocks are underlain by Palaeozoic volcanic rocks about 2 miles south of the Mine, and by older metamorphic rocks on the west side of Taku Arm.

On the property the layered rocks are predominantly brownish to dark-greenish to black, variably pyroclastic, fine-grained greywacke, argillite and slate. Altered tuffs occur a short distance north of the claim block.

Regionally the Laberge strata lie in open folds, but in the area of the Engineer Mine folding is tighter with steeper attitudes common. The sediments and tuffs are commonly faulted, folded and distorted, but have a general strike of about N30^{o}W and dip about 35^{o}NE.

On Engineer Mountain, east of the Mine, the Laberge rocks are unconformably overlain by an unusual volcanic breccia composed predominantly of granitic rock fragments. Similar, and possibly related, granite-porphyry dykes occur, along with andesitic dykes, both of which predate mineralized quartz veins.

A Tertiary(?) granitic stock intrudes all of the above rocks southeast of the Mine and about 1 mile east of the lake. Two outcrops of granodiorite, presumably related to this stock, occur on the claim block near the southern boundary.

Two strong shear zones cut the sediments and dykes on the Engineer property. These shear zones strike between N20°W and N35°W and dip nearly vertical. Subsidiary fractures and shear zones, usually filled with quartz and calcite, trend from 20° to 40° from the main shear zones. Two large oval quartz stockworks or "hubs" occur, one on each of the main shear zones. Some of the subsidiary veins and shears appear to radiate from these hubs. Previous workers have believed the fracturing to be related to the intrusion of the stock to the south.

During the recent examination of 5 Level, the writers noted numerous carbonate and/or quartz-filled slips and fractures, varying in thickness from hairline to several inches. Shear zones, up to several feet wide and similar in appearance to the larger shear zones, were also noted.

The gold deposits on the Engineer Mine occur in the main shear zones, hubs, and quartz veins, often where the fissures cut the darkest-coloured country rock.

GOLD DEPOSITS

Gold is present in several types of occurrence on the Engineer Mine property. (Silver invariably accompanies the gold, but is of relatively minor value.)

Hubs:

Two pipe like stockworks of quartz veins, called hubs, occur on the Engineer No.1 (Hub A) and Northern Partnership No.4 (Hub B) claims. (Figure 3). Hub A is 240 by 160 feet, and is composed of quartz and intercalated and silicified shale and slate. Frequently one to two inch bands of quartz and wall-rock alternate. Hub B is 20 by 80 feet and is similar in appearance to Hub A.

Minute specks of free gold occur in the hubs but to date no commercial values have been demonstrated. Values were reported by the owners in 1910 to range from trace to 0.5 ounces per ton gold.

Shear Zones:

Extending southeasterly and northwesterly from the hubs, two shear zones traverse the property. Shear Zone A is at least 4000 feet long and is marked on surface by a pronounced topographic depression striking S30^{o}E from Hub A. Where encountered underground, the shear zone is between 20

and 40 feet wide and consists mainly of crushed and brecciated slates containing veins and stringers of quartz. Silicification is locally intense.

The shear zone is mineralized throughout with veinlets and fine disseminations of pyrite. Gold values are variable, and are variously described by earlier workers as "good", "low grade but indicative", "good over widths of 6 to 14 feet with lower values over the whole zone", "low-grade ore", "commercial grade ore over appreciable width", etc. Such subjective comments indicate the presence of significant gold mineralization in the shear zone, but it is impossible to evaluate the potential on the basis of the available data. A small grab sample of shear zone material collected by the writers assayed 0.035 ounces gold and 0.12 ounces silver per ton.

Shear Zone B apparently extends both southeasterly and northwesterly from Hub B. Little data is available on this zone, but it is probably up to 50 feet wide and is similar to Shear Zone A.

Quartz-Calcite Veins:

Numerous quartz-calcite stringers, veins, and shear zones strike off the main shear zones at angles between 20° and 45°. These veins may be grouped into two types: those

which appear to radiate from the hubs, and those which appear to be subsidiary to the main shear zones. On surface, these veins range from seams to 2 feet wide, and some veins tend to widen with depth. Most of the smaller veins are filled with quartz, with minor calcite, and mineralized with free gold, pyrite, calaverite (gold telluride) and allemontite (intergrown native antimony and arsenic).

The quartz is well-crystallized, with prisms often terminating in open spaces in vugs or comb-structures. The metallic minerals have been deposited in these open spaces and in seams and fractures in the quartz.

Gold occurs as fine grains, scales and dendritic forms, which may coalesce into leaves up to ½-inch across. Disseminated fine grains of gold also occur in association with calaverite. Oxidation on surface is only slight, due to the general scarcity of sulphide minerals in the veins. Calcite-rich veins may be somewhat enriched at surface due to the solution and removal of carbonate minerals.

Spectacular gold mineralization occurs in pockets, bunches and small shoots up to 8 inches across, which are formed where cross-fractures intersect the veins. These pockets of high grade gold are erratically distributed in the veins, and the mineable ore shoots are actually sections of

vein in which these pockets are more numerous. Values in some of the pockets in surface exposures of various veins were reported to have returned over 100 ounces per ton gold, with only trace amounts or minor values in intervening sections of the veins. The highest values were reported to occur in the Double Decker (No.1), No.2, "E" (No.8), No.7, and A4 Veins. Other veins, including the Boulder, Andy and Blue, have high grade occurrences and were considered in earlier reports to offer the best potential.

"E" Vein:

This vein is also referred to in old reports as the No.7, No.8 and Engineer Veins. On the basis of available data, the "E" Vein appears to be the same as the No.8 Vein, and the No.7 Vein is a parallel structure about 120-150 feet to the northwest.

The "E" Vein strikes N30°E and dips between 80°NW and vertical. The vein is a clean fissure having sharp, gouge-filled contacts with the wall-rock. The vein matter is predominantly brecciated and altered wall-rock cemented by calcite and quartz. Mineralization comprises free gold generally associated with mariposite (chrome mica), allemontite and stibnite.

Government records indicate that representative vein material on the 1 Level assayed 14.96 ounces gold and 9.9 ounces silver per ton. A 12-inch sample across the vein assayed 8.4 ounces gold and 5.6 ounces silver per ton. A rich ore shoot, 30 feet long and up to 18 inches wide occurred immediately southwest of the shaft between surface and 4 Level. Within this shoot heavy stibnite mineralization in a quartz-calcite gangue assayed 71.5 ounces gold and 50.5 ounces silver per ton across 12 inches.

Most production to date has come from the "E" Vein where about 15,000 tons were mined between surface and 5 Level (Figure 5). The unsorted ore and waste were milled and yielded an average of about 1 ounce of gold per ton. Development of ore did not keep pace with mining, and by the time the ore shoots were mined-out down to the 5 Level, no new ore was prepared for mining on the lower levels. Figure 5 suggests that the ore shoots continued below 5 Level on the "E" Vein and assays on 7 Level indicate the presence of several short sections of typically erratic high-grade values.

Double Decker Vein:

This Vein is also known as No.1 Vein in old reports. Next to the "E" Vein, the Double Decker has had the most

exploration and development. At least several thousand tons of production has come from the 5 Level and surface workings. The Double Decker Vein strikes between N15°E and N40°E and dips from 60° to 80° SE. It has an average width of 2 feet on surface, but widens to 4 feet on 8 Level. Free gold occurs in fractures and open spaces in quartz. The only available assays are from 8 Level where several short sections of significant gold values occur. The best of these is on either side of the cross-cut to the shaft (Figure 4) where an 80-foot length of vein averages 1.20 ounces per ton gold, presumably across the full width of the drift. This section includes a 33-foot length averaging 2.87 ounces per ton gold. Apparently some mining was in progress in this section in 1929.

UNDERGROUND DEVELOPMENT AND CONDITION OF WORKINGS

Extensive trenching and open-cutting was developed on many of the veins, notably the "E", Double Decker, No.2, Boulder, Andy, Blue, Hub A, Hub B, and related veins. (Figure 3).

Underground, most exploration and development work was concentrated on the "E" and Double Decker veins, and Hub B. The Boulder, Andy, Blue, No.2, and No.6 veins, and Shear Zone A have all been explored by drifting. (Figure 4).

A total of almost 20,000 feet of underground workings, excluding stopes, have been completed. This includes more than 18,000 feet of drifts and cross-cuts, and over 1500 feet of shafts, raises and winzes.

The writers inspected the 5 Level workings on May 27th 1975. In general these are in good to excellent condition with only minor rehabilitation to be expected.

This rehabilitation would include retimbering and refurbishing of the portal and dump trestles, reballasting of rails, ventilation of some areas of the mine where natural ventilation does not exist and minor retimbering of small areas within the adits. In addition some effort will be required to clear ice from the first 200 feet of the entrance. The winze from

7 to 8 Levels was not accessible at the time of inspection due to a small cave below a drawpoint on the "E" Vein. It is expected, however, that this winze, and the 6, 7 and 8 Levels accessible from the winze, are flooded and will require pumping.

Virtually all of the 5, 6, 7 and 8 Level workings, totalling over 13,000 feet, are potentially useful for future exploration.

CONCLUSIONS AND RECOMMENDATIONS

Two main types of gold mineralization are present at the Spencer Mine. Small, erratically distributed pockets of high grade gold ore occur in the numerous narrow quartz veins and stringers throughout the claim block. A much larger tonnage potential is present in the mineralized shear zones, where low-grade pyritic mineralization is reported.

Past production figures suggest that ore shoots of up to a few thousand tons of the high-grade ore can be expected to occur on various of the small veins, including the "E", Double Decker, No.7, A4, No.2, Boulder, Andy and Blue Veins. In the past the only substantial development work has been on the "E" and Double Decker Veins.

Mineralization in the shear zones constitutes the best potential for sustained production. However, until exploration and sampling are conducted, this potential cannot be evaluated.

The Engineer Gold Mines Ltd. operation went into production in the 1920's with only a few months of ore reserves blocked out. These reserves were exhausted before additional ore was prepared and the operation failed in 1931. Surface and underground exploration carried out to that time is reported to have discovered several promising areas, but no further work has been done.

The potential for the discovery of mineable gold deposits is considered good, and an exploration programme is definitely warranted.

The underground workings should be rehabilitated to permit examination, evaluation, and exploration. All surface workings should be surveyed and sampled, and additional trenching and stripping conducted where warranted. Detailed geological studies are imperative with the emphasis on the structure and wall-rock favourability of the various veins and shear zones. Drilling, both from surface and underground should be anticipated, as well as additional drifting and crosscutting to explore areas of interest.

PROPOSED BUDGET

Mobilize and demobilize, set-up camp, clean up mine yard, rehabilitate portal area, remove ice, etc.	$26,000
Rehabilitate 5 Level track, retimber, install air and fan lines, muck out cave, etc.	$26,000
Pump out internal shaft and lower levels, rehabilitate manways, install air and fan lines, etc.	$16,000
Map and sample surface and underground workings, geology, engineering, reporting	$23,000
Purchase supplies and non-rental equipment	$20,000
Supervision and management, including travel	$13,000
Contingency allowance	$17,000
Total proposed budget	$141,000

Respectfully submitted,

Vernon, B.C.
June 9th 1975

K. L. Daughtry, P.Eng.

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-	Various survey plans, maps, and fragmentary data of Engineer Gold Mines Ltd., 1924-1929

STATEMENT OF QUALIFICATIONS

I, KENNETH L. DAUGHTRY, of R. R. 4, Vernon, British Columbia, DO HEREBY CERTIFY that:

1. I am a Consulting Geologist in mineral exploration.

2. I have been practising my profession for ten years in Canada, the United States, and Ireland.

3. I am a graduate of Carleton University, Ottawa, with a Bachelor of Science degree in Geology and Chemistry.

4. I am a member of the Associations of Professional Engineers of British Columbia and Ontario, and a Fellow of the Geological Association of Canada.

5. This report is based upon a thorough study and compilation of available data on the Engineer Mine, and upon a personal examination of the property in May, 1975.

6. I have no interest, direct or indirect, in the properties or shares of Nu-Energy Development Corp. Ltd., nor do I expect to receive any such interest at any time.