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E & MJ MARKETS METAL AND MINERAL
issued December 19, 1957

Vol. 28 Pages 3 & 10

AMERICAN QUICKSILVER INSTITUTE TO REPRESENT INDUSTRY

San Francisco (McGraw-Hill San Francisco News Bureau): A new organization has been set up to act as a spokesman for the quicksilver industry.

Called the American Quicksilver Institute, it is headed by S. R. Smith, president of Sonoma Quicksilver Mines Inc, Guerneville, Calif. Louis D. Gordon, secretary of the Nevada Mining Association will act as secretary-treasurer.

Directors, in addition to Smith and Gordon, are Arthur L. Albee, president of Bonanza Oil & Mines Corp. Sutherlin, Ore.: Gordon I Gould, president of Gordon I Gould Co., San Francisco; M. H. Kline, vice president of Rare Metals Corp, Salt Lake City; C. Hyde Lewis, president of New Idria Mining & Chemical Co., Idria, Calif.; R. F. O'Bryan, president of California Quicksilver Mines Inc., Willows, Calif.; C. N. Schuette, consulting mining engineer, Sebastopol, Calif; and S. H. Williston, vice president of Cordero Mining Co., Palo Alto, Calif.

The institute will represent the industry on such issues as tariffs and government regulations. Its first action was to send a telegram to GSA Administrator Franklin G. Floete protesting the recent change in quicksilver flask specifications. Signed by President Smith, the message protested "this harsh, unreasonable and unwarranted attitude of your office" and urged him "to reconsider this unfair action." The new specifications, it added, "call for a special bottle manufactured by one outfit only at an excessive price, not available to industry in sufficient amount and in enough time to supply (the industry's) requirements."

One of the institute's aims is to keep the Government and the consuming industry familiarized with physical and chemical characteristics of mercury and with its uses. The organization also will sponsor research and development work aimed at finding new uses for the metal.

Founders of the institute claim it represents 95% of the country's mercury industry.

400

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

September 25, 1956

Memorandum

To: DMEA Operating Committee

From: H. W. Davis, Branch of Ferrous Metals and Ferroalloys
Through: Charles W. Merrill, Chief,
Division of Minerals

Subject: Suggested Resubmission and Reconsideration of Application of Rare Metals Corp. of America, Docket No. DMEA 4093

The subject application for DMEA exploration aid on the Pine Flat and Diamond Flat deposits was denied because, according to the field team examination, the inferred average thickness of the two deposits is about 15 feet; the total minable tonnage is about 2 million; the 8 samples taken from the discovery cuts showed nickel content ranging from 0.34 to 1.09 percent; the reserves are widely scattered; and the indicated reserves, both in quantity and grade, do not measure up to the requirements necessary to justify a reduction plant.

Subsequently, a report "A Reconnaissance of Nickel Deposits of Southwest Oregon and Northwest California", has been submitted. This report contains information on field work started in March 1954 and completed late in September 1955. According to the report it is reasonable to assume that the Pine Flat deposit contains 4 to 5 million tons of material, with a probable average assay of 0.75 to 1.0 percent nickel, and that assay of samples from 17 auger holes at the Diamond Flat deposit indicate an average value of about 0.8 to 0.9 percent nickel and assuming average depth of good laterite and 5 feet of rocky laterite, it is estimated that at least 2 million tons of material are available.

Accordingly, it is suggested that DMEA review the application of the Rare Metals Corp. in the light of the favorable report on the Southwest Oregon-Northwest California district.

RECEIVED
SEP 25 19

A copy of the report, "A Reconnaissance of Nickel Deposits of Southwest Oregon and Northwest California," is attached for review. The report is for official use only. Please return it to the Branch of Ferrous Metals and Ferroalloys after it has served your purpose.

H. W. Davis

Attachment

Copy to: Ferrous Metals
H. W. Davis
Div. of Minerals (2)
Wing G. Agnew, Chief, Spokane
Field Office, Reg. I, Spokane, Wash.
Mark L. Wright, Acting Reg. Dir.,
Reg. I, Albany, Oregon
R. B. Maurer, Acting Reg. Dir.,
Reg. II, San Francisco, Calif.
T. H. Kiilsgaard, U.S.G.S.,
Room 5222 Interior Bldg.
Files

400

JUL 2 - 1956

Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City, Utah (Zone 11)

Re: Docket No. DMEA 4093 - Nickel, Cobalt, Chrome
Rare Claims 1-12
Del Norte County, California

Gentlemen:

Your application for aid for an exploration project and other data available to us in Washington concerning the above referenced property have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of our information, although noting nickel, cobalt, and chrome mineralization on the Rare claims, indicates to us that the probability of disclosing significant ore reserves is not sufficiently promising to justify Government participation. Under these circumstances, we regret to advise you that your application is denied.

We wish to thank you for your interest in the Defense Minerals Exploration Administration program and for bringing this property to our attention.

Sincerely yours,

G. O. Mittendorf

Administrator

ADMcMahon/fec 6/26/56
cc to: Docket
Code 400
Admr. Read. File
Oper. Comm.
FT. REG. II
Messrs. H. W. Davis, USBM
T. H. Kiilsgaard, USGS

June 26, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $25,980.05
Docket No. DMEA 4093 - Nickel, Cobalt and Chromium
Rare Metals Corporation of America
Rare Claims, 1-12
Del Norte County, California

Denial of the subject application is recommended by this Division based on the following information:

(1) The applicant, Rare Metals Corporation of America, Tenth Floor, First Security Building, Salt Lake City, 11, Utah, requested exploration assistance in the amount of $25,980.05 for churn-drilling, sampling, assaying, supervision, consultants and miscellaneous costs.

(2) The applicant controls by right of location twelve lode claims named Rare No. 1 through No. 12 and recorded in the Del Norte County Courthouse at Crescent City, California, in Book 19, pages 15-31. Rare claims Nos. 1 to 9 inclusive are located in sec. 31, T. 19 N., R. 2 E., and sec. 6, T. 18 N., R. 2 E.; Rare claims Nos. 10, 11, and 12 are in sec. 8, T. 18 N., R. 2 E., Humboldt Base and Meridian.

(3) The proposed program is to test the thickness and grade (nickel, cobalt and chromium content) of two small lateritic deposits, about two miles apart, with 2,875 feet of churn drilling in 80 holes. The applicant estimates several million tons of lateritic nickel-cobalt ore, containing more than 1 percent nickel, 0.1 percent to 0.3 percent cobalt, and 2 percent chromium.

(4) The nickel-cobalt deposit on Pine Flat Mountain is a lateritic soil mantle ranging in thickness from a few inches to over 20 feet, and probably averages more than 10 feet over an area of 80 acres. The upper five feet of the laterite mass (a brick red soil) averages about 0.7% nickel; the next layer (a yellow or ocher colored material, a few inches to 20 feet thick) averages

approximately 1.0% nickel; and this laterite contains about 0.1% cobalt, 3 percent chromium and 37 percent iron. Below this lateritic material is decomposed peridotite containing some garnierite bearing silica-boxwork.

There are no measured or indicated reserves of nickel-bearing material containing over 1.5 percent nickel exposed at the property. Insufficient work has been done to justify a close estimate of tonnage grade, but assays of samples from widely scattered hand-auger test holes and shallow pits show that the deposits are too thin and have an average nickel content too low to be of economic interest; this conclusion is supported by the M. A. Hanna Company geologists who also made an examination of the property.

(5) The Field Team concludes that the proposed churn-drilling program would test the deposit adequately, but would serve chiefly to establish the tonnage and grade of the deposits more accurately. The estimated reserves of nickel and cobalt-bearing material in the district are too small and widely scattered to warrant construction of a reduction plant in the vicinity, and the grade of the material is too low to warrant transportation to the existing plant at Riddle, Oregon. Therefore, they recommend that the subject application be denied. The Commodity Divisions of the U. S. Geological Survey and Bureau of Mines concur in the recommendation.

W. S. Martin, Chief
Iron and Ferro-Alloys Division

AHMcMahon/foc
6/27/56

cc to: Docket
Code 400 ✓
Admr. Read. File
Oper. Comm.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

400

RECEIVED
JUN 25 1956

June 25, 1956

Re: Docket No. DMEA 4093
(Nickel, Cobalt-Chrome)
Rare Metals Corp. of America
Del Norte County, Calif.

Memorandum

To: W. S. Martin, Chief, Iron and Ferroalloys Division, Defense Minerals Exploration Administration

From: H. W. Davis, Branch of Ferrous Metals and Ferroalloys

Subject: Review of field examination

According to the field team examination, it is inferred that the average thickness of the two deposits is about 15 feet and the total minable tonnage is about two million. Eight samples taken from the discovery cuts during the examination showed nickel content ranging from 0.34 percent to 1.09 percent. Moreover, the reserves are widely scattered.

The indicated reserves, both in quantity and grade, do not measure up to the requirements necessary to justify a reduction plant and the grade of the ore is too low to warrant transportation to the reduction plant at Riddle, Oreg.

For the above reasons, I concur in the recommendation of the field team that the application for DMEA exploration aid be denied.

H. W. Davis

Copy to: Ferrous Metals
H. W. Davis
R. W. Geehan
Div. of Minerals
Thor H. Kiilsgaard, U.S.Geol. Survey
Files

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

RECEIVED
JUN 25 1956

June 25, 1956

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(Nickel, Cobalt-Chrome)
Rare Metals Corp. of America
Del Norte County, Calif.

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For the above reasons, I concur in the recommendation of the field team that the application for DMEA exploration aid be denied.

H. W. Davis

Copy to: Ferrous Metals
H. W. Davis
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Div. of Minerals
Thor H. Kiilsgaard, U.S.Geol. Survey
Files

400

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

1605 Evans Avenue
Reno, Nevada

June 11, 1956

WSM

Memorandum

To: Operating Committee, DMEA, Interior Building, Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4093 (Nickel, Cobalt-Chrome)
Rare Metals Corporation of America
Rare- 1-12 Claims
Del Norte County, California

Reference is made to your letter of December 23, 1955 requesting a field examination of subject property.

Attached are four copies of a report by H. K. Stager, Geological Survey and H. W. Jones in which it is recommended that the application for DMEA exploration aid be denied.

Roscoe Smith and I concur in the recommendation.

S. Ricker

Attach.

SRicker:gh
cc: R. M. Smith
File

RECEIVED
JUN 13 1956

Reviewed by
DMEA OPERATING COMMITTEE

(date)

RECEIVED
JUN 13 1956

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION II

APPLICATION REPORT

DMEA 4093 (nickel-cobalt)
Rare Metals Corporation of America
Rare claims (Pine Flat deposit)
Del Norte County, California

by

H. W. Jones
U. S. Bureau of Mines

H. K. Stager
U. S. Geological Survey

June 7, 1956

Reviewed by
DMEA OPERATING COMMITTEE

(date)

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Proposed Exploration	9

ILLUSTRATIONS

Figure 1 . . . . . Location map

2 . . . . . Sketch map of Pine Flat deposit

INTRODUCTION

The Rare Metals Corporation of America, Tenth Floor, First Security Building, Salt Lake City 11, Utah, applied for Government assistance in a $25,980 program under the Defense Minerals Exploration Administration, docket DMEA-4093. They propose to explore for nickel and cobalt on the Rare claims, Pine Flat Mountain, Del Norte County, California. The applicant estimates several million tons of lateritic nickel-cobalt ore, containing more than 1 percent nickel, 0.1 percent to 0.3 percent cobalt, and 2 percent chromium, and wishes to further test the property to determine the thickness and grade of the deposit in order to justify a mill to handle a large tonnage at low cost.

A field examination was requested by the Operating Committee, and was made by H. W. Jones, U. S. Bureau of Mines, and H. K. Stager and R. M. Smith, U. S. Geological Survey, on April 17, 1956, accompanied by Mr. John R. Reynolds, chief engineer, representing the applicant. Samples were taken at several locations to check the grade of the surface material.

The property has been examined by Mr. Salem Rice of the California State Division of Mines, and by geologists of the M. A. Hanna Company, operators of the Nickel Mountain deposit

at Riddle, Oregon. Mr. Rice feels the deposit has some merit but the Hanna Company considers the deposit too small and low grade to be of economic interest.

CONCLUSIONS AND RECOMMENDATIONS

The Rare claims contain a residual soil mantle of low grade nickel and cobalt-bearing laterite. The applicants propose to test the thickness and grade of two small laterite deposits, about two miles apart, with 2,875 feet of churn drilling in 80 holes. The program would serve only to more accurately establish the tonnage and grade of the deposits, but probably would change the inferred reserve figures only slightly.

The reserves of nickel and cobalt-bearing material in the district are too small and widely scattered to warrant the construction of a reduction plant in the vicinity and the grade of the material is too low to warrant transportation to the existing reduction plant at Riddle, Oregon.

It is recommended that Government assistance under the DMEA program be denied.

LOCATION, ACCESSIBILITY, AND LOCAL RESOURCES

The group of Rare claims are in the most northwestern part of Del Norte County, California, immediately adjacent to the Oregon line, on the summit of Pine Flat Mountain

at an altitude of 2,500 feet. Rare claims 1 to 9 inclusive, referred to as Pine Flat Area, are in sec. 31, T. 19 N., R. 2 E., and sec. 8, T. 18 N., R. 2 E.; Rare 10, 11, and 12 (Diamond Flat) are in sec. 8, T. 18 N., R. 2 E., Humboldt Base and Meridian.

The claims are reached by travelling east from Smith River on the Forest Service maintained Low Divide road, 17.2 miles. The Pine Flat deposit is on the summit and is bisected by the road. The last 15 miles are steep but are passable with a standard type automobile.

Rainfall is heavy in the region during winter months and makes all travel difficult off the main roads. There are no living quarters at the property. Manpower, supplies, materials, and equipment are available in Crescent City, or at Grants Pass, Oregon. Water is available from small springs on Pine Flat. The electrical power line from Grants Pass to Crescent City is about 10 miles south of the property.

HISTORY AND PRODUCTION

The claims were staked in 1954 and bulldozer cuts 10 feet deep were dug as discovery work. The more favorable areas were tested by 33 widely scattered hand-auger holes, most of which were stopped by boulders before reaching bedrock.

No nickel ore has been mined in the area.

PROPERTY AND OWNERSHIP

The property consists of 12 unpatented lode claims, named Rare No. 1 through 12, held by the Rare Metals Corporation. They are recorded in the Del Norte County Courthouse at Crescent City, California in Book 19, pages 15-31. The area covered by the claims is shown in fig. 2.

GENERAL GEOLOGY

The rock exposed in the claim area is peridotite and is part of a northwest-trending belt of ultrabasic rocks that is about 8 miles wide in the Pine Flat Mountain area. This belt is from 1 to 15 miles wide and about 70 miles long. It is bounded on the west by sedimentary rocks that probably belong to the Franciscan formation of Jurassic to Cretaceous age and on the east by volcanic and sedimentary rocks of the Galice formation of Jurassic age.

The peridotite is an olivine-rich saxonite containing scattered clots of enstatite crystals in an even-grained groundmass of olivine. The saxonite is distinguished by a characteristic weathering of the olivine and enstatite, leaving the enstatite crystals protruding from the otherwise smooth surface. It is locally serpentinized to dark green serpentine.

The tops of the ridges within the belt of ultrabasic rocks are the remnants of a Tertiary land surface of low relief and are mantled by dark red lateritic soil. This soil probably at one time covered most or all of the ultrabasic rocks in the area. Regional uplift since Tertiary time has caused rejuvination of the streams, the cutting of deep canyons, and removal of the laterite soil. It is within the remnants of the Tertiary erosion surface that concentrations of nickel-cobalt minerals occur.

THE DEPOSIT

The nickel-cobalt deposit on Pine Flat Mountain is a nickel-cobalt bearing lateritic soil derived from the deep chemical weathering of ultrabasic rocks. The soil mantle ranges in thickness from a few inches to over 20 feet and probably averages more than 10 feet thick over an area of about 80 acres (fig. 2).

The upper five feet of the laterite zone contains from 0.3 to 1.4 percent nickel and probably averages about 0.7 percent. It is a brick red soil composed principally of powdery and concretionary hydrous iron oxides. Beneath this red soil zone is a zone of yellow or ocher colored material from a few inches to over 20 feet thick that contains from about 0.7 to 2.0 percent nickel, and probably averages about 1 percent. Below this lateritic

material is decomposed peridotite and locally some silica bearwork of undetermined grade. The laterite also contains about 0.1 percent cobalt, 3 percent chromium, and 37 percent iron. The nickel and cobalt-bearing mineral has not been distinguished or identified in the laterite. Traces of the nickel silicate, garnierite, were observed along fracture surfaces in weathered peridotite and serpentine but not in economic quantities. Small residual nodules of chromite are present on the laterite surface and grains of chromite are common in the peridotite.

The two thickest and most important laterite bodies on Pine Flat Mountain are about two miles apart at altitudes of 1,800 and 2,500 feet (fig. 2). The upper body is known as the Pine Flat deposit and has a surface area of about 35 acres. It probably averages over 10 feet thick and is the thicker part of a larger area of lateritic soil cover with a total surface area of about 150 acres and an average thickness of about 5 feet. The lower body is known as the Diamond Flat deposit and has a surface area of about 45 acres. It is on the surface of a large landslide mass on the southeast side of Pine Flat Mountain in the canyon of the North Fork of the Smith River (fig. 2). It also probably averages over 10 feet thick and is the thicker part of a larger laterite area that covers about 80 acres.

The deposit is similar to the laterite deposit at Nicaro, Cuba, except for lower nickel and iron content and less serpentine. It is also similar to the deposit at Riddle, Oregon, but lacks the thick layer of garnierite-bearing silica boxwork that constitutes a major part of the ore at Riddle. The cobalt and chromium content of the deposit is about the same as at Nicaro but higher than the Riddle deposit. Thus the Pine Flat ore would probably be more amenable to an ammonia leach process, similar to the one in use at Nicaro, than to the Riddle electrical smelting process.

SAMPLING

Eight samples were taken from the discovery cuts (fig. 2) during the examination.

Sample No.	Depth below surface	% Ni	% Co	% Cr_2O_3	% Fe	Description
299	0-5'	1.09	0.10	2.28	34.20	Disc. pit, Rare 12, vert. cut.
300	0-5'	0.61	0.04	3.20	42.72	Disc. pit, Rare 11, vert. cut.
301	5'-7'	0.69	0.04	4.92	44.59	Disc. pit, Rare 11.
302	0-8'	0.67	0.08	3.83	43.55	Disc. pit, Rare 7.
303	2'-5'	0.34	0.01	0.33	4.62	Disc. pit, Rare 6, silicious boxwork.
304	0-5'	0.58	0.09	2.21	33.68	Disc. cut, Rare 4, top half.
305	5'-10'	0.72	0.06	2.03	27.77	Disc. cut, Rare 4, lower portion.
306	4'-7'	1.04	0.14	2.34	33.74	Disc. cut, Rare 3, very shallow cut.

Sample analyses from 10 localities were obtained from the applicant. Assays from these samples ranged from 0.74 to 2.05 percent nickel content. In locations where check samples were taken, the applicant's assays were consistently high.

ORE RESERVES

There are no measured or indicated reserves of nickel-bearing material containing over 1.5 percent nickel exposed at the property. The applicant estimates that the reserves are "several million" tons of lateritic material that contains from 1 to 2 percent nickel, from 0.1 to 0.3 percent cobalt, and perhaps as much as 2 percent chromium.

Insufficient work has been done to justify a close estimate of tonnage or grade, but assays of material obtained from the widely scattered hand-auger test holes and shallow pits show that the deposits are too thin and have an average nickel content too low to be of economic interest.

A laterite soil five feet or more thick blankets about 230 acres of Pine Flat Mountain but only about 80 acres is material of possible minable grade and thickness. At about 27 cubic feet per ton there is about 150,000 tons of material per foot of depth in the two main deposits. It is inferred that the average thickness of these two deposits is about 15 feet and

the total minable tonnage is about two million tons. The reserves necessary to justify a reduction plant of the size required for economical exploitation of a deposit of this type are estimated to be at least ten million tons of 1.5 percent nickel ore. A deposit that has a surface area of only 80 acres would require an average depth of about 75 feet to contain the minimum tonnage. The Pine Flat deposits do not contain material of this average thickness or nickel content.

PROPOSED EXPLORATION

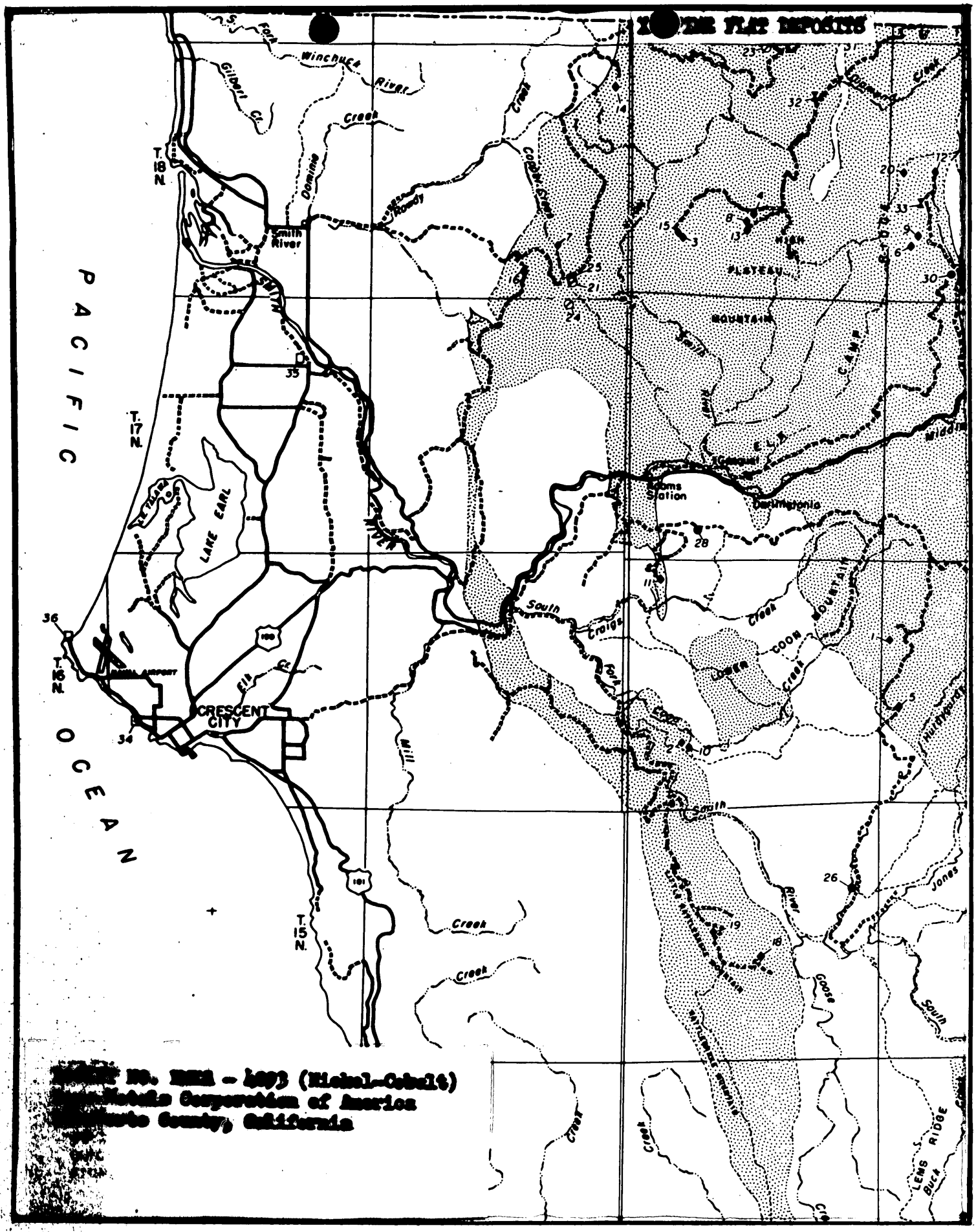
The applicants have proposed a program consisting of about 80 churn-drill holes, averaging 35 feet each, to test the thickness and nickel content of the soil mantle and the underlying rock. They estimate the costs to be as follows:

Churn drilling and bulldozing	$ 9,412.50
Labor, supervision, and consultants	5,277.00
Operating materials and supplies	388.00
Miscellaneous (assaying, accounting, taxes)	10,902.50
Total	$25,980.00

Some shallow hand-auger test holes, ranging in depth from a few feet to as much as 21 feet, have been put down by the applicants and the cuttings from these holes were sampled

and assayed. The depths were limited by boulders in the laterite, and the information obtained by this drilling, and from the shallow bulldozer cuts put in as discovery pits, was of little value and served more to discredit the potential of the deposit than to support it.

The proposed churn-drilling program would be adequate to test the thickness and average metal content of the deposit. However, it is not probable that the deposit is more than twice the inferred thickness of 15 feet and the drilling would have to show an average thickness of five times this figure to indicate the minimum tonnage required for an economical mining operation. Neither is it probable that the estimated grade of the material would be raised or lowered more than one or two tenths of a percent while an increase of at least five tenths is required to be significant.

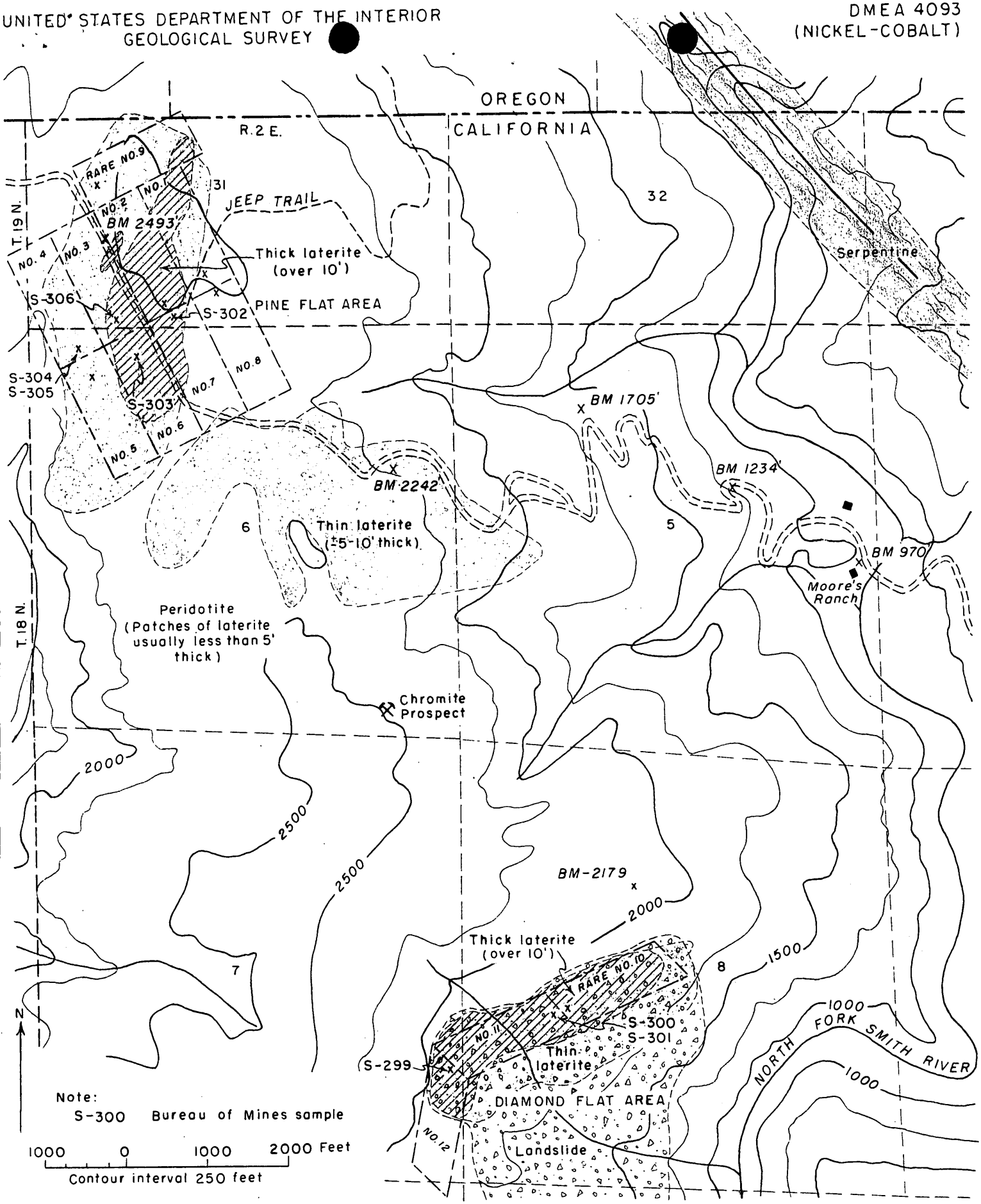


[illegible] No. MMA - 1093 (Nickel-Cobalt)
[illegible] Corporation of America
[illegible] County, California

FIG. 1 LOCATION MAP CALIFORNIA

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA 4093
(NICKEL-COBALT)



SKETCH MAP OF THE PINE FLAT MOUNTAIN NICKEL-COBALT DEPOSIT
DEL NORTE COUNTY, CALIFORNIA

Figure 2

RECEIVED
JUN 13 1956

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION II

APPLICATION REPORT

DMEA 4093 (nickel-cobalt)
Rare Metals Corporation of America
Rare claims (Pine Flat deposit)
Del Norte County, California

by

H. W. Jones
U. S. Bureau of Mines

H. K. Stager
U. S. Geological Survey

June 7, 1956

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The reserves of nickel and cobalt-bearing material in the district are too small and widely scattered to warrant the construction of a reduction plant in the vicinity and the grade of the material is too low to warrant transportation to the existing reduction plant at Riddle, Oregon.

It is recommended that Government assistance under the DMEA program be denied.

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at an altitude of 2,500 feet. Rare claims 1 to 9 inclusive, referred to as Pine Flat Area, are in sec. 31, T. 19 N., R. 2 E., and sec. 6, T. 18 N., R. 2 E.; Rare 10, 11, and 12 (Diamond Flat) are in sec. 8, T. 18 N., R. 2 E., Humboldt Base and Meridian.

The claims are reached by travelling east from Smith River on the Forest Service maintained Low Divide road, 17.2 miles. The Pine Flat deposit is on the summit and is bisected by the road. The last 15 miles are steep but are passable with a standard type automobile.

Rainfall is heavy in the region during winter months and makes all travel difficult off the main roads. There are no living quarters at the property. Manpower, supplies, materials, and equipment are available in Crescent City, or at Grants Pass, Oregon. Water is available from small springs on Pine Flat. The electrical power line from Grants Pass to Crescent City is about 10 miles south of the property.

HISTORY AND PRODUCTION

The claims were staked in 1954 and bulldozer cuts 10 feet deep were dug as discovery work. The more favorable areas were tested by 33 widely scattered hand-auger holes, most of which were stopped by boulders before reaching bedrock.

No nickel ore has been mined in the area.

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GENERAL GEOLOGY

The rock exposed in the claim area is peridotite and is part of a northwest-trending belt of ultrabasic rocks that is about 8 miles wide in the Pine Flat Mountain area. This belt is from 1 to 15 miles wide and about 70 miles long. It is bounded on the west by sedimentary rocks that probably belong to the Franciscan formation of Jurassic to Cretaceous age and on the east by volcanic and sedimentary rocks of the Galice formation of Jurassic age.

The peridotite is an olivine-rich saxonite containing scattered clots of enstatite crystals in an even-grained groundmass of olivine. The saxonite is distinguished by a characteristic weathering of the olivine and enstatite, leaving the enstatite crystals protruding from the otherwise smooth surface. It is locally serpentinized to dark green serpentine.

The tops of the ridges within the belt of ultrabasic rocks are the remnants of a Tertiary land surface of low relief and are mantled by dark red lateritic soil. This soil probably at one time covered most or all of the ultrabasic rocks in the area. Regional uplift since Tertiary time has caused rejuvination of the streams, the cutting of deep canyons, and removal of the laterite soil. It is within the remnants of the Tertiary erosion surface that concentrations of nickel-cobalt minerals occur.

THE DEPOSIT

The nickel-cobalt deposit on Pine Flat Mountain is a nickel-cobalt bearing lateritic soil derived from the deep chemical weathering of ultrabasic rocks. The soil mantle ranges in thickness from a few inches to over 20 feet and probably averages more than 10 feet thick over an area of about 80 acres (fig. 2).

The upper five feet of the laterite zone contains from 0.3 to 1.4 percent nickel and probably averages about 0.7 percent. It is a brick red soil composed principally of powdery and concretionary hydrous iron oxides. Beneath this red soil zone is a zone of yellow or ocher colored material from a few inches to over 20 feet thick that contains from about 0.7 to 2.0 percent nickel, and probably averages about 1 percent. Below this lateritic

material is decomposed peridotite and locally some silica boxwork of undetermined grade. The laterite also contains about 0.1 percent cobalt, 3 percent chromium, and 37 percent iron. The nickel and cobalt-bearing mineral has not been distinguished or identified in the laterite. Traces of the nickel silicate, garnierite, were observed along fracture surfaces in weathered peridotite and serpentine but not in economic quantities. Small residual nodules of chromite are present on the laterite surface and grains of chromite are common in the peridotite.

The two thickest and most important laterite bodies on Pine Flat Mountain are about two miles apart at altitudes of 1,800 and 2,500 feet (fig. 2). The upper body is known as the Pine Flat deposit and has a surface area of about 35 acres. It probably averages over 10 feet thick and is the thicker part of a larger area of lateritic soil cover with a total surface area of about 150 acres and an average thickness of about 5 feet. The lower body is known as the Diamond Flat deposit and has a surface area of about 45 acres. It is on the surface of a large landslide mass on the southeast side of Pine Flat Mountain in the canyon of the North Fork of the Smith River (fig. 2). It also probably averages over 10 feet thick and is the thicker part of a larger laterite area that covers about 80 acres.

The deposit is similar to the laterite deposit at Nicaro, Cuba, except for lower nickel and iron content and less serpentine. It is also similar to the deposit at Riddle, Oregon, but lacks the thick layer of garnierite-bearing silica boxwork that constitutes a major part of the ore at Riddle. The cobalt and chromium content of the deposit is about the same as at Nicaro but higher than the Riddle deposit. Thus the Pine Flat ore would probably be more amenable to an ammonia leach process, similar to the one in use at Nicaro, than to the Riddle electrical smelting process.

SAMPLING

Eight samples were taken from the discovery cuts (Fig. 2) during the examination.

Sample No.	Depth below surface	% Ni	% Co	% Cr_2O_3	% Fe	Description
299	0-5'	1.09	0.10	2.28	34.20	Disc. pit, Rare 12, vert. cut.
300	0-5'	0.61	0.04	3.20	42.72	Disc. pit, Rare 11, vert. cut.
301	5'-7'	0.69	0.04	4.92	44.59	Disc. pit. Rare 11.
302	0-8'	0.67	0.08	3.83	43.55	Disc. pit. Rare 7.
303	2'-5'	0.34	0.01	0.33	4.62	Disc. pit, Rare 6, silicious boxwork.
304	0-5'	0.58	0.09	2.21	33.68	Disc. cut, Rare 4, top half.
305	5'-10'	0.72	0.06	2.03	27.77	Disc. cut, Rare 4, lower portion.
306	4'-7'	1.04	0.14	2.34	33.74	Disc. cut, Rare 3, very shallow cut.

Sample analyses from 10 localities were obtained from the applicant. Assays from these samples ranged from 0.74 to 2.05 percent nickel content. In locations where check samples were taken, the applicant's assays were consistently high.

ORE RESERVES

There are no measured or indicated reserves of nickel-bearing material containing over 1.5 percent nickel exposed at the property. The applicant estimates that the reserves are "several million" tons of lateritic material that contains from 1 to 2 percent nickel, from 0.1 to 0.3 percent cobalt, and perhaps as much as 2 percent chromium.

Insufficient work has been done to justify a close estimate of tonnage or grade, but assays of material obtained from the widely scattered hand-auger test holes and shallow pits show that the deposits are too thin and have an average nickel content too low to be of economic interest.

A laterite soil five feet or more thick blankets about 230 acres of Pine Flat Mountain but only about 80 acres is material of possible minable grade and thickness. At about 27 cubic feet per ton there is about 150,000 tons of material per foot of depth in the two main deposits. It is inferred that the average thickness of these two deposits is about 15 feet and

the total minable tonnage is about two million tons. The reserves necessary to justify a reduction plant of the size required for economical exploitation of a deposit of this type are estimated to be at least ten million tons of 1.5 percent nickel ore. A deposit that has a surface area of only 80 acres would require an average depth of about 75 feet to contain the minimum tonnage. The Pine Flat deposits do not contain material of this average thickness or nickel content.

PROPOSED EXPLORATION

The applicants have proposed a program consisting of about 80 churn-drill holes, averaging 35 feet each, to test the thickness and nickel content of the soil mantle and the underlying rock. They estimate the costs to be as follows:

Churn drilling and bulldozing	$ 9,412.50
Labor, supervision, and consultants	5,277.00
Operating materials and supplies	388.00
Miscellaneous (assaying, accounting, taxes)	10,902.50
Total	$25,980.00

Some shallow hand-auger test holes, ranging in depth from a few feet to as much as 21 feet, have been put down by the applicants and the cuttings from these holes were sampled

and assayed. The depths were limited by boulders in the laterite, and the information obtained by this drilling, and from the shallow bulldozer cuts put in as discovery pits, was of little value and served more to discredit the potential of the deposit than to support it.

The proposed churn-drilling program would be adequate to test the thickness and average metal content of the deposit. However, it is not probable that the deposit is more than twice the inferred thickness of 15 feet and the drilling would have to show an average thickness of five times this figure to indicate the minimum tonnage required for an economical mining operation. Neither is it probable that the estimated grade of the material would be raised or lowered more than one or two tenths of a percent while an increase of at least five tenths is required to be significant.

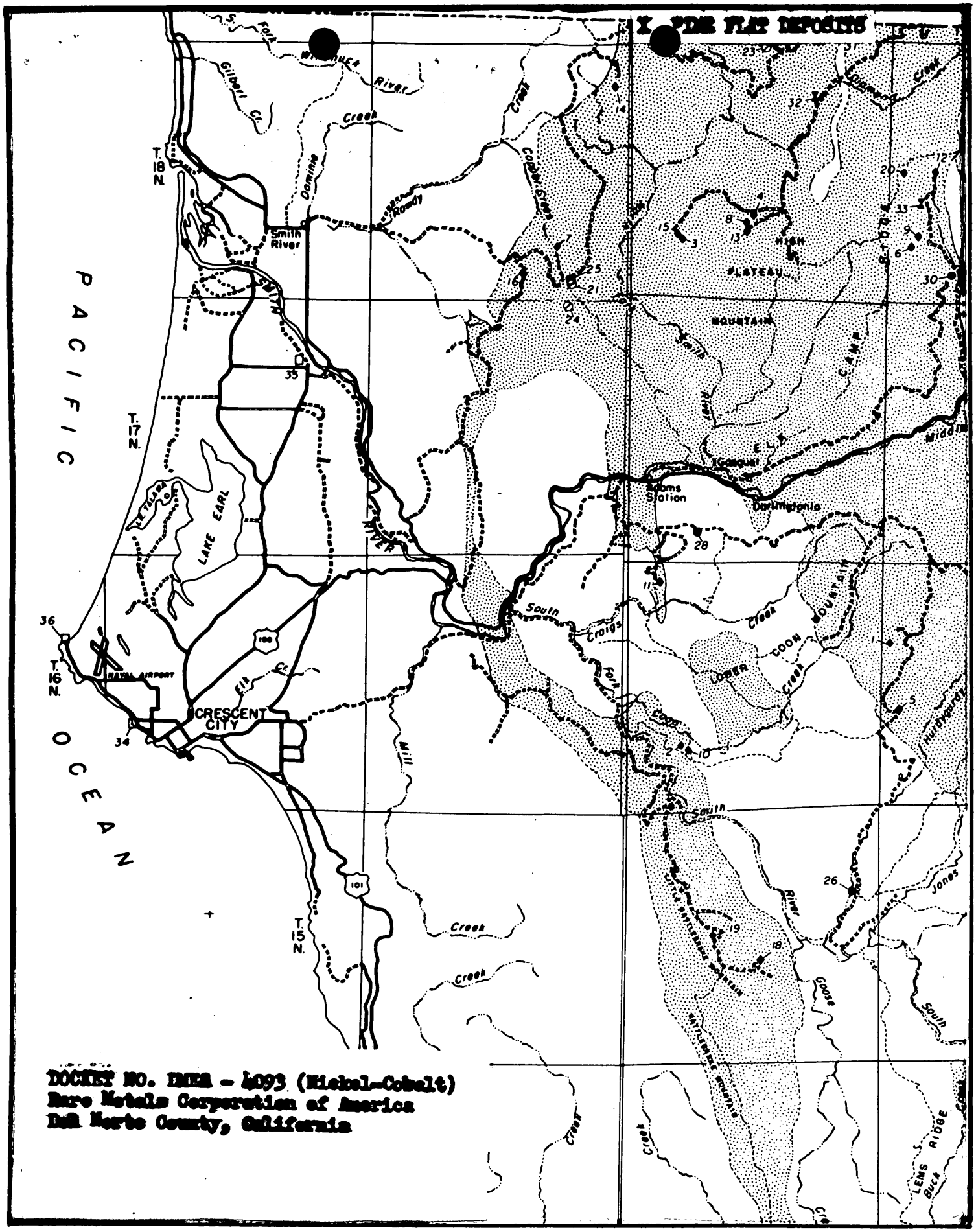

FIG. 1 LOCATION MAP CALIFORNIA

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
JUN 22 1956

June 21, 1956

Copy retained 200

Re: DMEA 4093
Rare Metals Corp. of America
Rare 1-12 claims
Del Norte Co., Calif.
$25,980.00 - Nickel-cobalt

Memorandum

To: M. L. Martin, Defense Minerals Exploration Administration

From: N. S. Nelson, U. S. Geological Survey

Subject: Review of Field Team report

The applicant requested assistance in exploring 3 lateritic nickel deposits by drilling. Almost no work has been done on the deposits, but rough outlines suggested a tonnage of upwards of 200,000 to the vertical foot might be inferred. The inferred grade is 1% nickel, 0.1 to 0.3% cobalt and 2% chromium.

The proposed drilling was designed to determine whether or not the grade and tonnage of the deposits justify a reduction works.

The examiners accept the tonnage and grade inferred by the applicant, but conclude the tonnage and grade are not such as to justify a reduction plant and as the proposed drilling could not be expected to change the estimate materially the application should be denied. The Field Team concurs with that recommendation.

I concur with the recommendations of the examiners and the Field Team.

N. S. Nelson

NENELSON:btr
G 6/21/56

cc: Director's reading file (4212), Nelson
Branch reading file
DMEA(3)
Chron. file
Docket file
H. W. Davis, 3519

IN REPLY REFER TO:

400

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

December 30, 1955

Re: DMEA 4093
Rare Metals Corp.
Pine Flat Claims
Del Norte Co., Calif.
$25,980.05 - Nickel,
cobalt,
chrome

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Volume - weight factor used in review of Dec. 16, 1955.

In the review of the application dated Dec. 16, 1955 the factor 27 cubic feet to the dry ton was used in figuring the possible tonnage per vertical foot of laterite in the deposits outlined by the applicant and the possible tonnage assuming a 20-foot average depth. The outlines and the depth taken are hypothetical since neither have been established by exploratory work. The factor used is said to be one taken in figuring certain Cuban laterites.

It is now known that the figure 20 cubic feet to the dry ton is also used. R.I. 5099 Nickel -Cobalt Resources of Cuba 1955, p. 59. The tonnage figures of the Dec. 16, 1955 review would be increased materially by using 20 instead of 27 as:

Pine Flat A,	85,800	instead of	63,600
Pine Flat 3	3,915	instead of	2,900
Diamond Flat	111,170	instead of	82,800
	200,885		149,300

and assuming a 20-foot thickness it would mean there is a possible 4,000,000 tons in the three deposits instead of 3,000,000 tons.

N.E.Nelson:btr
G 12/30/55

N. E. Nelson

N. E. Nelson

cc: Director's reading, 4212
Branch reading, 4212 GSA
DMEA (3)
Docket file
H. W. Davis, Rm. 3519 Interior

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JAN 4

400

DEC 23 1955

Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City 11, Utah

Re: Docket No. DMEA-4093, Nickel-Cobalt-Chrome
Rare 1-12 Claims
Del Norte County, California

Gentlemen:

The above-docketed application for exploration assistance for nickel, cobalt, and chrome ores has been reviewed by the Iron and Ferro-Alloys Division of the Defense Minerals Exploration Administration and referred to Mr. Spangler Ricker, Executive Officer, DMEA Field Team, Region II, 1607 Evans Avenue, Reno, Nevada, for a field examination of the property.

Any assistance that you can give the members of the Field Team will be appreciated.

Sincerely yours,

C. O. Mittendorf

Administrator

cc: Docket
Code 400
Oper. Comm.
Adm. Reading File
T. Kiilsgaard, USGS
H. W. Davis, USBM
FT, Region 2

ADMcMahon/ls
12/21/55

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

IN REPLY REFER TO:
400

RECEIVED
DEC 19 1955

December 16, 1955

Re: DMEA 4093
Rare Metals Corp.
Pine Flat claims
Del Norte Co., Calif.
$25,980.05 - Nickel, Cobalt, Chrome

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: H. E. Nelson, U. S. Geological Survey

Subject: Review of application.

The applicant requests aid in exploring a lateritic nickel-cobalt deposit by churn drilling. Three separate deposits are involved, two in the Pine Flats area and the third about 1½ miles to the southeast in the Diamond Flat area.

The larger of the two Pine Flats deposits, as tentatively outlined, has a length of 3,300 feet and is 900 feet wide at the widest point and averages 580 feet wide. The area outlined totals 32.5 acres, which at 27 cubic feet to the ton would make 63,600 tons per vertical foot. The smaller body, 680 feet long and 140 feet wide, would make 2,900 tons to the vertical foot.

The Diamond Flat deposit has an outlined length of 3,600 feet and a width of 800 feet at one point. The average width is 680 feet. The deposit covers 49 acres and should make 82,800 tons to the vertical foot.

Should the three areas be proven to be as large as outlined the tonnage per vertical foot would be:--

Deposit	Tonnage
Pine Flat A	63,600
Pine Flat B	2,900
Diamond Flat	82,800
Total	149,300

Probably 7 cuts have been made and "several" auger holes have been put down. Obviously little real information has been obtained and the outlines are largely conjectural. No assays are given, but "preliminary sampling indicates that this lateritic material should contain from 1 to 2 percent nickel, from 0.1 to 0.3% cobalt, and perhaps 2 percent chromium. It is thought that there is a very good possibility of developing several million tons of material of this grade. . . . In places, the laterite is known to be more than 20 feet thick." An average thickness of 20 feet would mean about 3,000,000 tons in the three deposits.

Laterite may be underlain by "bonwerk" type ore and such is suggested here.

The subject deposits cannot be evaluated without much work. Perhaps the widely spaced drilling proposed is warranted since the deposits are representative of others in the same general area.

Referral to the Field Team is indicated and recommended.

H. E. Nelson

N. E. Nelson

NENelson:iml
G-12/16/55

cc: Director's reading, 4212
Branch reading, 4212
BMEA (3)
Docket file
N. W. Davis, 3519

400

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

December 14, 1955

Re: Docket No. 4093
Rare Metals Corporation of America, First Security Bldg., Salt Lake City 11, Utah - $25,980.05 - nickel-cobalt

Memorandum

To: W. S. Martin, Chief, Iron and Ferroalloys Division, Defense Minerals Exploration Administration

From: H. W. Davis, Branch of Ferrous Metals and Ferroalloys

Subject: Review of application

The applicant's proposal pertains to a loan of $25,980.05 for the proposed exploration of a laterite deposit in Del Norte County, Calif. Other than location mark and a number of bulldozer cuts, there have been no openings made on the property.

M. H. Kline, formerly Chief, Branch of Rare and Precious Metals, Bureau of Mines, is Vice President and Assistant General Manager of the company.

Inasmuch as there is no known published information concerning the deposit, which is undeveloped, insufficient information is available upon which to base an opinion concerning a loan; consequently, it is recommended that the application be referred to the Field Team for its review and recommendations.

H. W. Davis

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DEC 14 1955

Docket

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

September 25, 1956

Memorandum

WSM

To: DMEA Operating Committee

From: H. W. Davis, Branch of Ferrous Metals and Ferroalloys
Through: Charles W. Merrill, Chief, Division of Minerals

Subject: Suggested Resubmission and Reconsideration of Application of Rare Metals Corp. of America, Docket No. DMEA 4093

The subject application for DMEA exploration aid on the Pine Flat and Diamond Flat deposits was denied because, according to the field team examination, the inferred average thickness of the two deposits is about 15 feet; the total minable tonnage is about 2 million; the 8 samples taken from the discovery cuts showed nickel content ranging from 0.34 to 1.09 percent; the reserves are widely scattered; and the indicated reserves, both in quantity and grade, do not measure up to the requirements necessary to justify a reduction plant.

Subsequently, a report "A Reconnaissance of Nickel Deposits of Southwest Oregon and Northwest California", has been submitted. This report contains information on field work started in March 1954 and completed late in September 1955. According to the report it is reasonable to assume that the Pine Flat deposit contains 4 to 5 million tons of material, with a probable average assay of 0.75 to 1.0 percent nickel, and that assay of samples from 17 auger holes at the Diamond Flat deposit indicate an average value of about 0.8 to 0.9 percent nickel and assuming average depth of good laterite and 5 feet of rocky laterite, it is estimated that at least 2 million tons of material are available.

Accordingly, it is suggested that DMEA review the application of the Rare Metals Corp. in the light of the favorable report on the Southwest Oregon-Northwest California district.

RECEIVED
SEP 25 1956

A copy of the report, "A Reconnaissance of Nickel Deposits of Southwest Oregon and Northwest California," is attached for review. The report is for official use only. Please return it to the Branch of Ferrous Metals and Ferroalloys after it has served your purpose.

H. W. Davis

H. W. Davis

Attachment

Copy to: Ferrous Metals
H. W. Davis
Div. of Minerals (2)
Wing G. Agnew, Chief, Spokane
Field Office, Reg. I, Spokane, Wash.
Mark L. Wright, Acting Reg. Dir.,
Reg. I, Albany, Oregon
R. B. Maurer, Acting Reg. Dir.,
Reg. II, San Francisco, Calif.
T. H. Kiilsgaard, U.S.G.S.,
Room 5222 Interior Bldg.
Files

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SEP 25 1956

DOCKET
SURNAME
McMahon
Martin
Killgaard
Selfridge
Robinson

400

JUL 2 - 1956

Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City, Utah (Zone 11)

Re: Docket No. DMEA 4093 - Nickel, Cobalt, Chrome
Rare Claims 1-12
Del Norte County, California

Gentlemen:

Your application for aid for an exploration project and other data available to us in Washington concerning the above referenced property have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of our information, although noting nickel, cobalt, and chrome mineralization on the Rare claims, indicates to us that the probability of disclosing significant ore reserves is not sufficiently promising to justify Government participation. Under these circumstances, we regret to advise you that your application is denied.

We wish to thank you for your interest in the Defense Minerals Exploration Administration program and for bringing this property to our attention.

Sincerely yours,

G. A. Mittendorf

Administrator

ADMcMahon/foc 6/26/56
cc to: Docket
Code 400
Admr. Read. File
Oper. Comm.
FT. REG. II
Messrs. H. W. Davis, USBM
T. H. Kiilsgaard, USGS

RCS.

DOCKET
SURNAME
McMahon
Martin
Kielgaard
Gilman

400

June 26, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $25,980.05
Docket No. DMEA 4093 - Nickel, Cobalt and Chrome
Rare Metals Corporation of America
Rare Claims, 1-12
Del Norte County, California

Denial of the subject application is recommended by this Division based on the following information:

(1) The applicant, Rare Metals Corporation of America, Tenth Floor, First Security Building, Salt Lake City, 11, Utah, requested exploration assistance in the amount of $25,980.05 for churn-drilling, sampling, assaying, supervision, consultants and miscellaneous costs.

(2) The applicant controls by right of location twelve lode claims named Rare No. 1 through No. 12 and recorded in the Del Norte County Courthouse at Crescent City, California, in Book 19, pages 15-31. Rare claims Nos. 1 to 9 inclusive are located in sec. 31, T. 19 N., R. 2 E., and sec. 6, T. 18 N., R. 2 E.; Rare claims Nos. 10, 11, and 12 are in sec. 8, T. 18 N., R. 2 E., Humboldt Base and Meridian.

(3) The proposed program is to test the thickness and grade (nickel, cobalt and chrome content) of two small laterite deposits, about two miles apart, with 2,875 feet of churn drilling in 80 holes. The applicant estimates several million tons of lateritic nickel-cobalt ore, containing more than 1 percent nickel, 0.1 percent to 0.3 percent cobalt, and 2 percent chromium.

(4) The nickel-cobalt deposit on Pine Flat Mountain is a lateritic soil mantle ranging in thickness from a few inches to over 20 feet, and probably averages more than 10 feet over an area of 80 acres. The upper five feet of the laterite zone (a brick red soil) averages about 0.7% nickel; the next layer (a yellow or ocher colored material, a few inches to 20 feet thick) averages

approximately 1.0% nickel; and this laterite contains about 0.1% cobalt, 3 percent chromium and 37 percent iron. Below this lateritic material is decomposed peridotite containing some garnierite bearing silica-benmark.

There are no measured or indicated reserves of nickel-bearing material containing over 1.5 percent nickel exposed at the property. Insufficient work has been done to justify a close estimate of tonnage grade, but assays of samples from widely scattered hand-auger test holes and shallow pits show that the deposits are too thin and have an average nickel content too low to be of economic interest; this conclusion is supported by the M. A. Hanna Company geologists who also made an examination of the property.

(5) The Field Team concludes that the proposed churn-drilling program would test the deposit adequately, but would serve chiefly to establish the tonnage and grade of the deposits more accurately. The estimated reserves of nickel and cobalt-bearing material in the district are too small and widely scattered to warrant construction of a reduction plant in the vicinity, and the grade of the material is too low to warrant transportation to the existing plant at Riddle, Oregon. Therefore, they recommend that the subject application be denied. The Commodity Divisions of the U. S. Geological Survey and Bureau of Mines concur in the recommendation.

W. S. Martin, Chief
Iron and Ferro-Alloys Division

ADMcMahon/foc
6/27/56

cc to: Docket
Code 400
Admr. Read. File
Oper. Comm.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

June 26, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $25,980.05
Docket No. DMEA 4093 - Nickel, Cobalt and Chrome
Rare Metals Corporation of America
Rare Claims, 1-12
Del Norte County, California

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W S Martin

W. S. Martin, Chief
Iron and Ferro-Alloys Division

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

RECEIVED
JUN 25 1956

June 25, 1956

Re: Docket No. DMEA 4093
(Nickel, Cobalt-Chrome)
Rare Metals Corp. of America
Del Norte County, Calif.

Memorandum

To: W. S. Martin, Chief, Iron and Ferroalloys Division, Defense Minerals Exploration Administration

From: H. W. Davis, Branch of Ferrous Metals and Ferroalloys

Subject: Review of field examination

According to the field team examination, it is inferred that the average thickness of the two deposits is about 15 feet and the total minable tonnage is about two million. Eight samples taken from the discovery cuts during the examination showed nickel content ranging from 0.34 percent to 1.09 percent. Moreover, the reserves are widely scattered.

The indicated reserves, both in quantity and grade, do not measure up to the requirements necessary to justify a reduction plant and the grade of the ore is too low to warrant transportation to the reduction plant at Riddle, Oreg.

For the above reasons, I concur in the recommendation of the field team that the application for DMEA exploration aid be denied.

H. W. Davis
H. W. Davis

Copy to: Ferrous Metals
H. W. Davis
R. W. Geehan
Div. of Minerals
Thor H. Kiilsgaard, U.S.Geol. Survey
Files

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

RECEIVED
JUN 25 1956

June 25, 1956

Re: Docket No. DMEA 4093
(Nickel, Cobalt-Chrome)
Rare Metals Corp. of America
Del Norte County, Calif.

Memorandum

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H. W. Davis

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R. W. Geehan
Div. of Minerals
Thor H. Kiilsgaard, U.S.Geol. Survey
Files

Docket

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
JUN 22 1956

June 21, 1956

Re: DMEA 4093
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Rare 1-12 claims
Del Norte Co., Calif.
$25,980.00 - Nickel-cobalt

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To: W. S. Martin, Defense Minerals Exploration Administration

WSM

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I concur with the recommendations of the examiners and the Field Team.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
JUN 22 1956

June 21, 1956

Re: [illegible] 4093
[illegible]are [illegible]etals [illegible]orp. of [illegible]erica
[illegible]are 1-[illegible] claims
[illegible]el Norte Co., [illegible]alif.
[illegible]25,980.00 - Nickel-cobalt

Memorandum

To: [illegible]. [illegible] Martin, Defense Minerals Exploration Administration

From: [illegible]. [illegible] Nelson, U. S. Geological Survey

Subject: Review of Field Team report

The applicant requested assistance in exploring 3 lateritic nickel deposits by drilling. Almost no work has been done on the deposits, but rough outlines suggested a tonnage of upwards of 2[illegible],000 to the vertical foot might be inferred. The inferred grade is 1[illegible] nickel, 0.1 to 0.3[illegible] cobalt and 2[illegible] chromium.

The proposed drilling was designed to determine whether or not the grade and tonnage of the deposits justify a reduction works.

The examiners accept the tonnage and grade inferred by the applicant, but conclude the tonnage and grade are not such as to justify a reduction plant and as the proposed drilling could not be expected to change the estimate materially the application should be denied. The Field Team concurs with that recommendation.

I concur with the recommendations of the examiners and the Field Team.

N. E. Nelson

NEN:NSO:btr
G 6/21/56

cc: Director's reading file (4212). Nelson
Branch reading file
DMEA(3)
Chron. file
Docket file
H. [illegible]. Davis, 3519

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
JUN 22 1956

June 21, 1956

Re: [illegible] 4093
[illegible] Metals Corp. of America
[illegible] 1-[illegible] claims
[illegible] Norte Co., Calif.
$25,980.00 - Nickel-cobalt

Memorandum

To: [illegible] Martin, Defense Minerals Exploration Administration

From: [illegible] Nelson, U. S. Geological Survey

Subject: Review of Field Team report

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W. S. Nelson

WSNELSON:btr
6/21/56

cc: Director's reading file (4212) - Nelson
Branch reading file
DMEA(3)
Chron. file
Docket file
H. L. Davis, 3519

DMEA DOCKET

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

1605 Evans Avenue
Reno, Nevada

June 11, 1956

Memorandum

To: Operating Committee, DMEA, Interior Building, Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4093 (Nickel, Cobalt-Chrome)
Rare Metals Corporation of America
Rare- 1-12 Claims
Del Norte County, California

Reference is made to your letter of December 23, 1955 requesting a field examination of subject property.

Attached are four copies of a report by H. K. Stager, Geological Survey and H. W. Jones in which it is recommended that the application for DMEA exploration aid be denied.

Roscoe Smith and I concur in the recommendation.

S. Ricker

Attach.

RECEIVED
JUN 13 1956

Reviewed by
DMEA OPERATING COMMITTEE
6-18-56
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION II

APPLICATION REPORT

DMEA 4093 (nickel-cobalt)
Rare Metals Corporation of America
Rare claims (Pine Flat deposit)
Del Norte County, California

by

H. W. Jones
U. S. Bureau of Mines

H. K. Stager
U. S. Geological Survey

June 7, 1956

RECEIVED
JUN 13 1956

Reviewed by
DMEA OPERATING COMMITTEE
6-18-56
(date)

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ILLUSTRATIONS

Figure 1 . . . . . Location map

2 . . . . . Sketch map of Pine Flat deposit

INTRODUCTION

The Rare Metals Corporation of America, Tenth Floor, First Security Building, Salt Lake City 11, Utah, applied for Government assistance in a $25,980 program under the Defense Minerals Exploration Administration, docket DMEA-4093. They propose to explore for nickel and cobalt on the Rare claims, Pine Flat Mountain, Del Norte County, California. The applicant estimates several million tons of lateritic nickel-cobalt ore, containing more than 1 percent nickel, 0.1 percent to 0.3 percent cobalt, and 2 percent chromium, and wishes to further test the property to determine the thickness and grade of the deposit in order to justify a mill to handle a large tonnage at low cost.

A field examination was requested by the Operating Committee, and was made by H. W. Jones, U. S. Bureau of Mines, and H. K. Stager and R. M. Smith, U. S. Geological Survey, on April 17, 1956, accompanied by Mr. John R. Reynolds, chief engineer, representing the applicant. Samples were taken at several locations to check the grade of the surface material.

The property has been examined by Mr. Salem Rice of the California State Division of Mines, and by geologists of the M. A. Hanna Company, operators of the Nickel Mountain deposit

at Riddle, Oregon. Mr. Rice feels the deposit has some merit but the Hanna Company considers the deposit too small and low grade to be of economic interest.

CONCLUSIONS AND RECOMMENDATIONS

The Rare claims contain a residual soil mantle of low grade nickel and cobalt-bearing laterite. The applicants propose to test the thickness and grade of two small laterite deposits, about two miles apart, with 2,875 feet of churn drilling in 80 holes. The program would serve only to more accurately establish the tonnage and grade of the deposits, but probably would change the inferred reserve figures only slightly.

The reserves of nickel and cobalt-bearing material in the district are too small and widely scattered to warrant the construction of a reduction plant in the vicinity and the grade of the material is too low to warrant transportation to the existing reduction plant at Riddle, Oregon.

It is recommended that Government assistance under the DMEA program be denied.

LOCATION, ACCESSIBILITY, AND LOCAL RESOURCES

The group of Rare claims are in the most northwestern part of Del Norte County, California, immediately adjacent to the Oregon line, on the summit of Pine Flat Mountain

at an altitude of 2,500 feet. Rare claims 1 to 9 inclusive, referred to as Pine Flat Area, are in sec. 31, T. 19 N., R. 2 E., and sec. 8, T. 18 N., R. 2 E.; Rare 10, 11, and 12 (Diamond Flat) are in sec. 8, T. 18 N., R. 2 E., Humboldt Base and Meridian.

The claims are reached by travelling east from Smith River on the Forest Service maintained Low Divide road, 17.2 miles. The Pine Flat deposit is on the summit and is bisected by the road. The last 15 miles are steep but are passable with a standard type automobile.

Rainfall is heavy in the region during winter months and makes all travel difficult off the main roads. There are no living quarters at the property. Manpower, supplies, materials, and equipment are available in Crescent City, or at Grants Pass, Oregon. Water is available from small springs on Pine Flat. The electrical power line from Grants Pass to Crescent City is about 10 miles south of the property.

HISTORY AND PRODUCTION

The claims were staked in 1954 and bulldozer cuts 10 feet deep were dug as discovery work. The more favorable areas were tested by 33 widely scattered hand-auger holes, most of which were stopped by boulders before reaching bedrock.

No nickel ore has been mined in the area.

PROPERTY AND OWNERSHIP

The property consists of 12 unpatented lode claims, named Rare No. 1 through 12, held by the Rare Metals Corporation. They are recorded in the Del Norte County Courthouse at Crescent City, California in Book 19, pages 15-31. The area covered by the claims is shown in fig. 2.

GENERAL GEOLOGY

The rock exposed in the claim area is peridotite and is part of a northwest-trending belt of ultrabasic rocks that is about 8 miles wide in the Pine Flat Mountain area. This belt is from 1 to 15 miles wide and about 70 miles long. It is bounded on the west by sedimentary rocks that probably belong to the Franciscan formation of Jurassic to Cretaceous age and on the east by volcanic and sedimentary rocks of the Galice formation of Jurassic age.

The peridotite is an olivine-rich saxonite containing scattered clots of enstatite crystals in an even-grained groundmass of olivine. The saxonite is distinguished by a characteristic weathering of the olivine and enstatite, leaving the enstatite crystals protruding from the otherwise smooth surface. It is locally serpentinized to dark green serpentine.

The tops of the ridges within the belt of ultrabasic rocks are the remnants of a Tertiary land surface of low relief and are mantled by dark red lateritic soil. This soil probably at one time covered most or all of the ultrabasic rocks in the area. Regional uplift since Tertiary time has caused rejuvination of the streams, the cutting of deep canyons, and removal of the laterite soil. It is within the remnants of the Tertiary erosion surface that concentrations of nickel-cobalt minerals occur.

THE DEPOSIT

The nickel-cobalt deposit on Pine Flat Mountain is a nickel-cobalt bearing lateritic soil derived from the deep chemical weathering of ultrabasic rocks. The soil mantle ranges in thickness from a few inches to over 20 feet and probably averages more than 10 feet thick over an area of about 80 acres (fig. 2).

The upper five feet of the laterite zone contains from 0.3 to 1.4 percent nickel and probably averages about 0.7 percent. It is a brick red soil composed principally of powdery and concretionary hydrous iron oxides. Beneath this red soil zone is a zone of yellow or ocher colored material from a few inches to over 20 feet thick that contains from about 0.7 to 2.0 percent nickel, and probably averages about 1 percent. Below this lateritic

material is decomposed peridotite and locally some silica boxwork of undetermined grade. The laterite also contains about 0.1 percent cobalt, 3 percent chromium, and 37 percent iron. The nickel and cobalt-bearing mineral has not been distinguished or identified in the laterite. Traces of the nickel silicate, garnierite, were observed along fracture surfaces in weathered peridotite and serpentine but not in economic quantities. Small residual nodules of chromite are present on the laterite surface and grains of chromite are common in the peridotite.

The two thickest and most important laterite bodies on Pine Flat Mountain are about two miles apart at altitudes of 1,800 and 2,500 feet (fig. 2). The upper body is known as the Pine Flat deposit and has a surface area of about 35 acres. It probably averages over 10 feet thick and is the thicker part of a larger area of lateritic soil cover with a total surface area of about 150 acres and an average thickness of about 5 feet. The lower body is known as the Diamond Flat deposit and has a surface area of about 45 acres. It is on the surface of a large landslide mass on the southeast side of Pine Flat Mountain in the canyon of the North Fork of the Smith River (fig. 2). It also probably averages over 10 feet thick and is the thicker part of a larger laterite area that covers about 80 acres.

The deposit is similar to the laterite deposit at Nicaro, Cuba, except for lower nickel and iron content and less serpentine. It is also similar to the deposit at Riddle, Oregon, but lacks the thick layer of garnierite-bearing silica boxwork that constitutes a major part of the ore at Riddle. The cobalt and chromium content of the deposit is about the same as at Nicaro but higher than the Riddle deposit. Thus the Pine Flat ore would probably be more amenable to an ammonia leach process, similar to the one in use at Nicaro, than to the Riddle electrical smelting process.

SAMPLING

Eight samples were taken from the discovery cuts (fig. 2) during the examination.

Sample No.	Depth below surface	% Ni	% Co	% Cr_2O_3	% Fe	Description
299	0-5'	1.09	0.10	2.28	34.20	Disc. pit, Rare 12, vert. cut.
300	0-5'	0.61	0.04	3.20	42.72	Disc. pit, Rare 11, vert. cut.
301	5-7'	0.69	0.04	4.92	44.59	Disc. pit. Rare 11.
302	0-8'	0.67	0.08	3.83	43.55	Disc. pit. Rare 7.
303	2'-5'	0.34	0.01	0.33	4.62	Disc. pit, Rare 6, silicious boxwork.
304	0-5'	0.58	0.09	2.21	33.68	Disc. cut, Rare 4, top half.
305	5'-10'	0.72	0.06	2.03	27.77	Disc. cut, Rare 4, lower portion.
306	4'-7'	1.04	0.14	2.34	33.74	Disc. cut, Rare 3, very shallow cut.

Sample analyses from 10 localities were obtained from the applicant. Assays from these samples ranged from 0.74 to 2.05 percent nickel content. In locations where check samples were taken, the applicant's assays were consistently high.

ORE RESERVES

There are no measured or indicated reserves of nickel-bearing material containing over 1.5 percent nickel exposed at the property. The applicant estimates that the reserves are "several million" tons of lateritic material that contains from 1 to 2 percent nickel, from 0.1 to 0.3 percent cobalt, and perhaps as much as 2 percent chromium.

Insufficient work has been done to justify a close estimate of tonnage or grade, but assays of material obtained from the widely scattered hand-auger test holes and shallow pits show that the deposits are too thin and have an average nickel content too low to be of economic interest.

A laterite soil five feet or more thick blankets about 230 acres of Pine Flat Mountain but only about 80 acres is material of possible minable grade and thickness. At about 27 cubic feet per ton there is about 150,000 tons of material per foot of depth in the two main deposits. It is inferred that the average thickness of these two deposits is about 15 feet and

the total minable tonnage is about two million tons. The reserves necessary to justify a reduction plant of the size required for economical exploitation of a deposit of this type are estimated to be at least ten million tons of 1.5 percent nickel ore. A deposit that has a surface area of only 80 acres would require an average depth of about 75 feet to contain the minimum tonnage. The Pine Flat deposits do not contain material of this average thickness or nickel content.

PROPOSED EXPLORATION

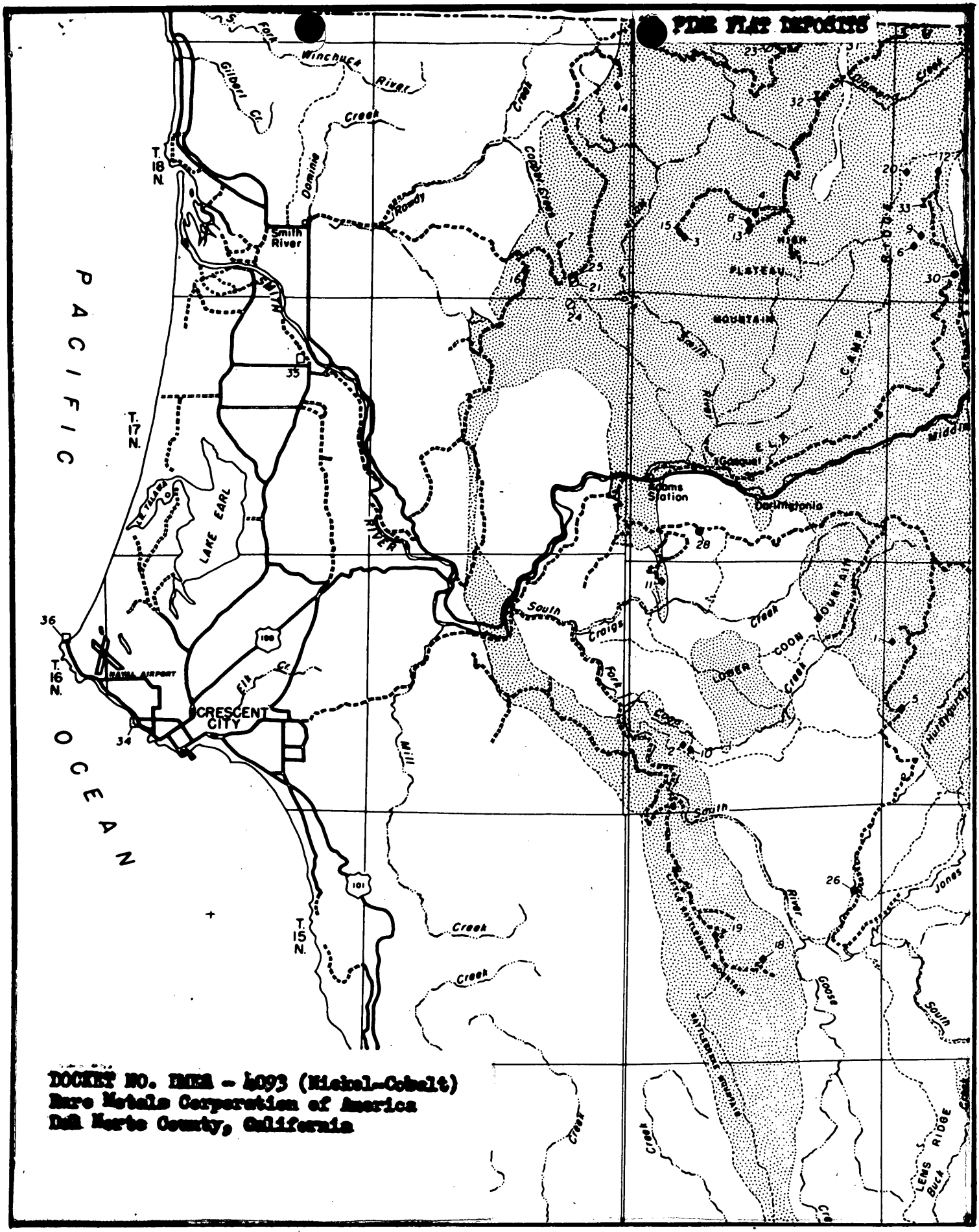
The applicants have proposed a program consisting of about 80 churn-drill holes, averaging 35 feet each, to test the thickness and nickel content of the soil mantle and the underlying rock. They estimate the costs to be as follows:

Churn drilling and bulldozing	$ 9,412.50
Labor, supervision, and consultants	5,277.00
Operating materials and supplies	388.00
Miscellaneous (assaying, accounting, taxes)	10,902.50
Total	$25,980.00

Some shallow hand-auger test holes, ranging in depth from a few feet to as much as 21 feet, have been put down by the applicants and the cuttings from these holes were sampled

and assayed. The depths were limited by boulders in the laterite, and the information obtained by this drilling, and from the shallow bulldozer cuts put in as discovery pits, was of little value and served more to discredit the potential of the deposit than to support it.

The proposed churn-drilling program would be adequate to test the thickness and average metal content of the deposit. However, it is not probable that the deposit is more than twice the inferred thickness of 15 feet and the drilling would have to show an average thickness of five times this figure to indicate the minimum tonnage required for an economical mining operation. Neither is it probable that the estimated grade of the material would be raised or lowered more than one or two tenths of a percent while an increase of at least five tenths is required to be significant.

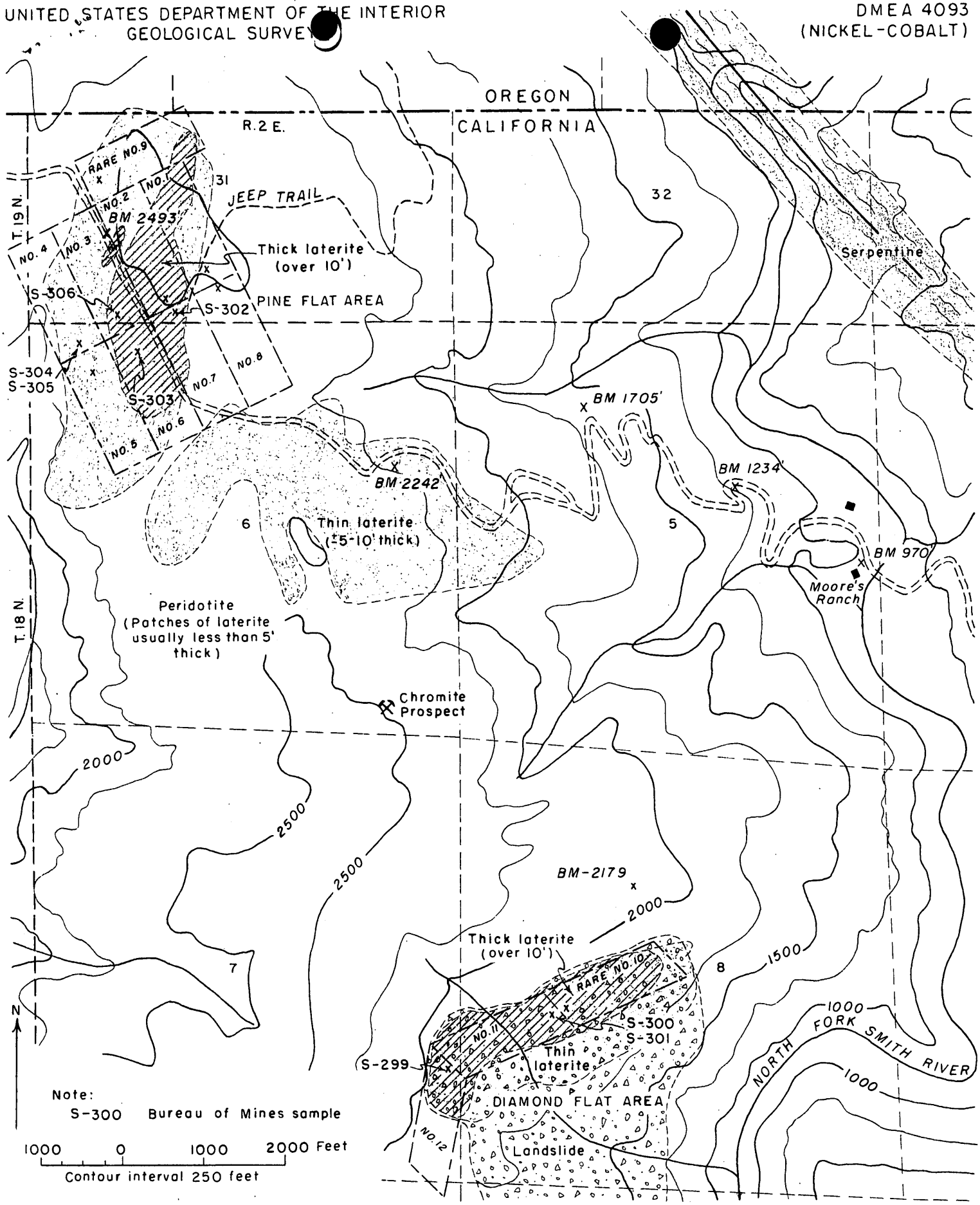


DOCKET NO. IMER - 4093 (Nickel-Cobalt)
Rare Metals Corporation of America
Del Norte County, California

FIG. 1 LOCATION MAP CALIFORNIA

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DMEA 4093
(NICKEL-COBALT)



SKETCH MAP OF THE PINE FLAT MOUNTAIN NICKEL-COBALT DEPOSIT
DEL NORTE COUNTY, CALIFORNIA

Figure 2

RECEIVED
JUN 13 1956

5/23/56

Mr. Martin:

Mr. Kline will be in to-morrow morning to talk with you about his application DMEA 4093.

He was here 5/29/56. There was not much to say because the FT report had not arrived. He will see Richer about that. He is thinking of Udimet, an alloy of Fe Ni Cr Co

FO'C

IN REPLY REFER TO:

Attached

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

December 30, 1955

Re: DMEA 4093
Rare Metals Corp.
Pine Flat Claims
Del Norte Co., Calif.
$25,980.05 - Nickel,
cobalt,
chrome

WSM

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Volume - weight factor used in review of Dec. 16, 1955.

In the review of the application dated Dec. 16, 1955 the factor 27 cubic feet to the dry ton was used in figuring the possible tonnage per vertical foot of laterite in the deposits outlined by the applicant and the possible tonnage assuming a 20-foot average depth. The outlines and the depth taken are hypothetical since either have been established by exploratory work. The factor used is said to be one taken in figuring certain Cuban laterites.

It is now known that the figure 20 cubic feet to the dry ton is also used. R. I. 5099 Nickel - Cobalt Resources of Cuba 1955, p. 59. The tonnage figures of the Dec. 16, 1955 review would be increased materially by using 20 instead of 27 as:

Pine Flat A,	85,800	instead of	63,600
Pine Flat 3	3,915	instead of	2,900
Diamond Flat	111,170	instead of	82,800
	200,885		149,300

and assuming a 20-foot thickness it would mean there is a possible 4,000,000 tons in the three deposits instead of 3,000,000 tons.

N. E. Nelson

N. E. Nelson

Copy retained 400

RECEIVED
JAN 4 1956

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

December 30, 1955

Re: DMEA 4093
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N.E.Nelson:btr
G 12/30/55

N. E. Nelson

cc: Director's reading, 4212
Branch reading, 4212 GSA
DMEA (3)
Docket file
H. W. Davis, Rm. 3519 Interior

N. E. Nelson

RECEIVED
JAN 4 1956

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

December 30, 1955

Re: [illegible] 4093
Rare Metals Corp.
Pine Flat Claims
Del Norte Co., Calif.
[illegible]25,980.05 - Nickel,
cobalt,
chrome

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N.E.Nelson:btr
G 12/30/55

N. E. Nelson

cc: Director's reading, 4212
Branch reading, 4212 GSA
DMEA (3)
Docket file
H. W. Davis, Rm. 3519 Interior

N. E. Nelson

RECEIVED
JAN 4 [illegible]

DOCKET
Surname:
McMahon
Martin
Selfridge
F. Johnson

400

Mr. Spangler Ricker, Executive Officer
DMEA Field Team, Region II
1607 Evans Avenue
Reno, Nevada

DEC 23 1955

Re: Docket No. DMEA-4093, Nickel-Cobalt-Chrome
Rare Metals Corporation of America
Rare I-12 Claims
Del Norte County, California

Dear Mr. Ricker:

The above-docketed application for exploration assistance is being referred to your office for a field examination of the property.

Copies of memoranda dated December 14 and December 16, 1955, by H. W. Davis, Bureau of Mines, and N. E. Nelson, Geological Survey, respectively, relating to the project, are enclosed for your information.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (GCS)

Enclosures

APPROVED:

/s/ Robert W. Geohan (GCS)
Member, Bureau of Mines

Thor H. Kiilsgaard (GCS)
Member, Geological Survey

cc: Docket
Code 400
Oper.Comm.
Adm. Read. File
T. Kiilsgaard, USGS
H. W. Davis, USBM
FT, Reg. 2

ADMcMahon/ls
12/21/55

R.L.S.

400

DOCKET
Surname:
McMahon
Martin
Kilsgaard
Gechan
Selfridge
Johnson

DEC 23 1955

Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City 11, Utah

Re: Docket No. DMEA-4093, Nickel-Cobalt-Chrome
Rare 1-12 Claims
Del Norte County, California

Gentlemen:

The above-docketed application for exploration assistance for nickel, cobalt, and chrome ores has been reviewed by the Iron and Ferro-Alloys Division of the Defense Minerals Exploration Administration and referred to Mr. Spangler Ricker, Executive Officer, DMEA Field Team, Region II, 1607 Evans Avenue, Reno, Nevada, for a field examination of the property.

Any assistance that you can give the members of the Field Team will be appreciated.

Sincerely yours,

C. O. Mitterdorf

Administrator

cc: Docket
Code 400
Oper. Comm.
Adm. Reading File
T. Kiilsgaard, USGS
H. W. Davis, USBM
FT, Region 2

ADMcMahon/ls
12/21/55

R.C.S.

Docket

~~IN REPLY REFER TO:~~

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
DEC 19 1955

December 16, 1955

Re: DMEA 4093
Rare Metals Corp.
Pine Flat claims
Del Norte Co., Calif.
$25,980.05 - Nickel, Cobalt, Chrome

WSM

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of application.

The applicant requests aid in exploring a lateritic nickel-cobalt deposit by churn drilling. Three separate deposits are involved, two in the Pine Flats area and the third about 1½ miles to the southeast in the Diamond Flat area.

The larger of the two Pine Flats deposits, as tentatively outlined, has a length of 3,300 feet and is 900 feet wide at the widest point and averages 520 feet wide. The area outlined totals 39.4 32.5 acres, which at 27 cubic feet to the ton would make 63,600 63,555 ~~Wlynat 52,423~~ tons per vertical foot. The smaller body, 680 feet long and 140 feet wide, would make 2,900 3,540 3526 tons to the vertical foot.

The Diamond Flat deposit has an outlined length of 3,600 feet and a width of 800 feet at one point. The average width is 620 feet. The deposit covers 49 acres and should make 82,800 tons to the vertical foot. 51.2 82,666

Should the three areas be proven to be as large as outlined the tonnage per vertical foot would be:--

Deposit	Tonnage	
Pine Flat A	63,600	63,555
Pine Flat B	2,900	3526
Diamond Flat	82,800	82,666
Total	149,300	149,747

Probably 7 cuts have been made and "several" augur holes have been put down. Obviously little real information has been obtained and the outlines are largely conjectural. No assays are given, but "preliminary sampling indicates that this lateritic material should contain from 1 to 2 percent nickel, from 0.1 to 0.3% cobalt, and perhaps 2 percent chromium. It is thought that there is a very good possibility of developing several million tons of material of this grade. . . . In places, the laterite is known to be more than 20 feet thick." An average thickness of 20 feet would mean about 3,000,000 tons in the three deposits.

Laterite may be underlain by "boxwork" type ore and such is suggested here.

The subject deposits cannot be evaluated without much work. Perhaps the widely spaced drilling proposed is warranted since the deposits are representative of others in the same general area.

Referral to the Field Team is indicated and recommended.

N. E. Nelson

N. E. Nelson

Docket

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

December 14, 1955

WSM

Re: Docket No. 4093
Rare Metals Corporation of America, First Security Bldg., Salt Lake City 11, Utah - $25,980.05 - nickel-cobalt

Memorandum

To: W. S. Martin, Chief, Iron and Ferroalloys Division, Defense Minerals Exploration Administration

From: H. W. Davis, Branch of Ferrous Metals and Ferroalloys

Subject: Review of application

The applicant's proposal pertains to a loan of $25,980.05 for the proposed exploration of a laterite deposit in Del Norte County, Calif. Other than location mark and a number of bulldozer cuts, there have been no openings made on the property.

M. H. Kline, formerly Chief, Branch of Rare and Precious Metals, Bureau of Mines, is Vice President and Assistant General Manager of the company.

Inasmuch as there is no known published information concerning the deposit, which is undeveloped, insufficient information is available upon which to base an opinion concerning a loan; consequently, it is recommended that the application be referred to the Field Team for its review and recommendations.

H. W. Davis
H. W. Davis

RECEIVED
DEC 14 1955

December 12, 1955

Subject: DMEA-4093
Re: Exploration Assistance

Rare Metals Corporation of America
First Security Building,
Salt Lake City, Utah

Gentlemen:

The receipt of your application dated December 1, 1955 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA 4093 and referred to the Iron & Ferro Alloys Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

December 12, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region II.

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region II.

DMEA-4093 Rare Metals Corporation of America

Robert E. Adams
Chief, Operation's Control
and Statistics Division

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

RECEIVED
DEC 12 1955

1605 Evans Avenue
Reno, Nevada

December 8, 1955

Memorandum

To: Operating Committee, DMEA, Interior Bldg., Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Application Loan (Nickel-cobalt)
Rare Metals Corporation of America
Pine Flat Nickel-Cobalt Deposit
Del Norte County, California

Attached are three sets of MF-103, Application for Aid forms relative to above subject. The fourth set has been retained in our files.

S. Ricker

Attach.

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S. Ricker

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SRicker:gh
cc: R. M. Smith
File

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

RECEIVED
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APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. DMEA 4093
Metal or Mineral Nickel-Cobalt
Date Received 12/12/55
Estimated Cost $25,980.05
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address:

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract

(*b*) State any mine name by which the property is known.

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

5. *The exploration project.*—(a) State the mineral or minerals for which you [illegible] to explore .....

.....

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contact veins, ore-bearing beds, etc.

(*c*) The work will start within ..... days and be completed within ..... months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

☐ Money ☐ Use of equipment owned by you ☐ Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated DECEMBER 1, 1955

RARE METALS CORPORATION OF AMERICA
(Applicant)

By M H Kline

M. H. KLINE, VICE PRESIDENT

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

FORM
MF-103

UNITED STATES DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

RECEIVED
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I. NAME OF APPLICANT.

(A) RARE METALS CORPORATION OF AMERICA

TENTH FLOOR, FIRST SECURITY BUILDING

SALT LAKE CITY 11, UTAH

(B) A CORPORATION, INCORPORATED IN THE STATE OF DELAWARE AND QUALIFIED TO DO BUSINESS IN CALIFORNIA.

(C) PAUL KAYSER, PRESIDENT

C. L. PERKINS, VICE PRESIDENT & GENERAL MANAGER

H. F. STEEN, VICE PRESIDENT & GENERAL SUPERINTENDENT

HOWARD BOYD, VICE PRESIDENT AND ASST. GENERAL COUNSEL

FRED T. WAGNER, VICE PRESIDENT & ASSOCIATE GENERAL COUNSEL

VIRGIL RITTMANN, SECRETARY-TREASURER

BOX 1492, EL PASO, TEXAS

M. H. KLINE, VICE PRESIDENT & ASST. GENERAL MANAGER

H. ANNE KIDD, ASST. SECRETARY

TENTH FLOOR, FIRST SECURITY BUILDING, SALT LAKE CITY, UTAH

(D) NOT APPLICABLE

3. APPLICANT'S
PROPERTY RIGHTS

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

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3. APPLICANT'S PROPERTY RIGHTS.

(A) LODE CLAIMS RARE 1, 2, 3, 7, 8, AND 9 ARE PROBABLY MOSTLY IN SECTION 31, T.19N., R.2E., HUMBOLT MERIDIAN; RARE 4, 5, AND 6 ARE PROBABLY IN SECTION 6, T.18N., R.2E., HUMBOLT MERIDIAN; RARE 10, 11, AND 12 ARE PROBABLY IN SECTION 8, T.18N., R.2E., HUMBOLT MERIDIAN; ALL IN DEL NORTE COUNTY, CALIFORNIA.

(B) CLAIMS RARE 1 TO 9 INCLUSIVE ARE ON WHAT IS GENERALLY REFERRED TO AS PINE FLAT. RARE 10, 11, AND 12 ARE ON DIAMOND FLAT. IN THIS REPORT THE TWO DEPOSITS ARE OFTEN COLLECTIVELY CALLED THE PINE FLAT DEPOSITS.

(C) THE 12 LODE CLAIMS OF THIS GROUP ARE ALL UNPATENTED AND ARE HELD BY RARE METALS CORPORATION BY THE RIGHT OF LOCATION.

(D) NOT APPLICABLE

(E) NO LIENS OR ENCUMBRANCES.

(F)

NAME OF CLAIM	LOCATED	DATE	RECORDED BOOK	PAGE
RARE NO. 1	7/9/54	7/22/54	19	15
RARE NO. 2	7/9/54	7/22/54	19	16
RARE NO. 3	7/9/54	7/22/54	19	17
RARE NO. 4	7/9/54	7/22/54	19	22
RARE NO. 5	7/9/54	7/22/54	19	20
RARE NO. 6	7/9/54	7/22/54	19	19
RARE NO. 7	7/9/54	7/22/54	19	23
RARE NO. 8	7/9/54	7/22/54	19	25

3. (F) CONTINUED

NAME OF CLAIM	LOCATED	DATE	RECORDED BOOK	PAGE
RARE No. 9	7/18/54	7/22/54	19	26
RARE No. 10	7/19/54	7/22/54	19	28
RARE No. 11	7/19/54	7/22/54	19	29
RARE No. 12	7/19/54	7/22/54	19	31

4. PHYSICAL DESCRIPTION

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

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4. PHYSICAL DESCRIPTION.

(A) OTHER THAN THE LOCATION WORK AND A NUMBER OF BULLDOZER CUTS, THERE HAVE BEEN NO OPENINGS MADE ON THE PROPERTY.

(B) THIS IS A NEW, RELATIVELY UNDEVELOPED PROPERTY. CHANNEL SAMPLING FROM THE FACES OF THE DISCOVERY CUTS AND SAMPLES FROM SEVERAL HAND-AUGER HOLES INDICATE THAT LOW-GRADE LATERITIC NICKEL-COBALT ORE COVERS A CONSIDERABLE PART OF THE SURFACE AREA OF THESE HOLDINGS. PRELIMINARY SAMPLING INDICATES THAT THIS LATERITIC MATERIAL SHOULD CONTAIN FROM 1 TO 2 PERCENT NICKEL, FROM 0.1 TO 0.3 PERCENT COBALT, AND PERHAPS 2 PERCENT CHROMIUM. IT IS THOUGHT THAT THERE IS A VERY GOOD POSSIBILITY OF DEVELOPING SEVERAL MILLION TONS OF MATERIAL OF THIS GRADE.

(C) THE PINE FLAT DEPOSITS ARE TYPICAL OF THE LATERITIC NICKEL DEPOSITS FOUND IN OTHER PARTS OF THE WORLD. THESE BRIGHT RED LATERITES HAVE BEEN DERIVED FROM THE CHEMICAL WEATHERING OF SERPENTINIZED PERIDOTITE. THE LATERITES GENERALLY OCCUR IN AREAS OF MODERATE RELIEF WHERE THEY HAVE BEEN PROTECTED FROM EROSION.

THE NICKELIFEROUS LATERITES ON PINE FLAT AND DIAMOND FLAT OCCUR AS IRREGULARLY SHAPED, BLANKET-LIKE DEPOSITS OF LOW-GRADE ORE UNDERLAIN BY MATERIAL OF HIGHER GRADE. A FEW SHALLOW HAND-AUGER HOLES INDICATE THAT THE TOP FIVE (5) FEET OF THESE DEPOSITS WILL USUALLY ASSAY LESS THAN 1 PERCENT NICKEL.

4. (c) CONTINUED

WITH ADDITIONAL DEPTH, THE NICKEL CONTENT OF THE LATERITES INCREASES TO AS MUCH AS 2 PERCENT. IN PLACES, THE LATERITE IS KNOWN TO BE MORE THAN 20 FEET THICK.

THE SURFACE MANIFESTATIONS OF THE LARGE NICKEL DEPOSITS NEAR RIDDLE, OREGON, ARE QUITE SIMILAR TO THOSE AT PINE FLAT. IT IS RELIABLY REPORTED THAT THE LARGE-SCALE MINING AND SMELTING OPERATIONS OF THE HANNA COMPANY ON THE RIDDLE ORE ARE PROVING TO BE VERY SUCCESSFUL. IT IS ALSO UNDERSTOOD THAT THE HANNA COMPANY HAS LOCATED CLAIMS ON SEVERAL OF THE OTHER LATERITE DEPOSITS IN THE PINE FLAT AREA.

EXTENSIVE EXPLORATION AND DEVELOPMENT ON THE RIDDLE DEPOSITS HAS DISCLOSED THAT THE NICKELIFEROUS LATERITES ARE UNDERLAIN BY A LAYER OF SO-CALLED "BOXWORK" TYPE ORE AS MUCH AS 70 FEET THICK. THIS "BOXWORK" ORE CONSISTS OF AN INTRICATE LATTICE BOXWORK OF QUARTZ-GARNIERITE IN A MATRIX OF YELLOWISH-RED LIMONITE. GARNIERITE IS A BRIGHT GREEN, HYDROUS NICKEL-MAGNESIUM SILICATE AND IS THE PRINCIPAL ORE MINERAL IN THE DEPOSIT. THE "BOXWORK" ORE BEING MINED BY HANNA CARRIES FROM 2 TO 3 PERCENT NICKEL AND CONSTITUTES THE BULK OF THE FURNACE FEED. NUMEROUS FRAGMENTS OF "BOXWORK" ORE CAN BE OBSERVED ON THE SURFACE OF THE PINE FLAT DEPOSIT. THERE HAS NOT BEEN SUFFICIENT EXPLORATION PERFORMED AT PINE FLAT, HOWEVER, TO DETERMINE WHETHER OR NOT THE LATERITES ARE UNDERLAIN BY BODIES OF NICKEL-RICH "BOXWORK" ORE OR THE NICKEL CONTENT OF THE

4. (c) CONTINUED

UNDERLYING PERIDOTITES.

THE PURPOSE OF THIS PROPOSED EXPLORATION IS TO DETERMINE THE TONNAGE AND GRADE OF THE LATERITES AND TO SEE IF THEY ARE UNDERLAIN BY "BOXWORK" TYPE ORE.

Prospecting?

(D) THE PINE FLAT DEPOSITS MAY BE REACHED BY EITHER THE LOW DIVIDE ROAD FROM SMITH RIVER, CALIFORNIA, OR VIA THE WIMER ROAD FROM O'BRIEN, OREGON. BOTH OF THESE ROADS ARE OF DIRT AND GRAVEL CONSTRUCTION AND ARE MAINTAINED BY THE FOREST SERVICE. THEIR USE DURING WINTER MONTHS, OR AFTER HEAVY RAIN STORMS, IS NOT RECOMMENDED. IT IS ABOUT 18 MILES FROM SMITH RIVER TO THE PROPERTY. IT IS NEARLY 30 MILES FROM O'BRIEN.

THE NEAREST SOURCE OF SUPPLY IS CRESCENT CITY, CALIFORNIA, 14 MILES SOUTH OF SMITH RIVER.

LABOR WOULD HAVE TO BE RECRUITED FROM OUTSIDE POINTS AND CAMP FACILITIES BUILT AT THE PROPERTY TO ACCOMMODATE A PERMANENT CREW.

(E) MANPOWER, SUPPLIES, MATERIALS, AND EQUIPMENT ARE AVAILABLE IN EITHER THE CRESCENT CITY, CALIFORNIA, OR GRANTS PASS, OREGON, AREAS.

DOMESTIC WATER COULD BE SECURED FROM SPRINGS ON PINE FLAT. ANY LARGE QUANTITIES WOULD HAVE TO COME FROM THE NORTH FORK OF SMITH RIVER, ABOUT TWO MILES TO THE EAST AND 1,500 FEET LOWER IN

4. (E) CONTINUED

ELEVATION THAN PINE FLAT.

THE HIGH TENSION POWER LINE FROM GRANTS PASS TO CRESCENT CITY IS PROBABLY NOT OVER 10 MILES AIR LINE FROM THE PROPERTY.

5. THE EXPLORATION PROJECT

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

FORM
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5. THE EXPLORATION PROJECT.

(A) THE PROJECT IS PROPOSED FOR THE EXPLORATION OF NICKEL-COBALT-CHROME LATERITES WHICH COULD, BY DIRECT SMELTING, BE CONVERTED INTO A FERRO-NICKEL-COBALT-CHROME ALLOY FOR USE IN THE STEEL INDUSTRY.

(B) IT IS PROPOSED TO SAMPLE THE NICKELIFEROUS LATERITES AND TO EXPLORE FOR "BOXWORK" TYPE ORE UNDER THE LATERITES BY MEANS OF CHURN DRILLING. THE ENCLOSED MAPS SHOW THE PROPOSED DRILL-HOLE LOCATIONS. ALL HOLES WILL BE CAREFULLY SAMPLED ON 1- TO 5-FOOT INTERVALS, DEPENDING ON THE CHARACTERISTICS OF THE MATERIAL BEING PENETRATED.

(C) THE WORK WILL START WITHIN 30 DAYS AND BE COMPLETED WITHIN 4 MONTHS FROM THE DATE OF AN EXPLORATION PROJECT CONTRACT.

(D) RARE METALS CORPORATION IS AN OPERATING MINING COMPANY WITH A COMPATENT STAFF OF EXPERIENCED ENGINEERS, GEOLOGISTS, AND OPERATING PERSONNEL. THE ACTUAL EXPLORATION WORK WILL BE UNDER THE SUPERVISION OF HAROLD HORST, CHIEF OF THE EXPLORATION DIVISION, RARE METALS CORPORATION. MR. HORST GRADUATED IN GEOLOGY FROM THE UNIVERSITY OF INDIANA IN 1949. FROM 1949 TO 1954 HE WORKED AS A MINING ENGINEER AND COMMODITY-INDUSTRY ANALYST FOR THE U. S. BUREAU OF MINES. IN 1954 MR. HORST JOINED RARE METALS CORPORATION OF AMERICA.

6. ESTIMATE OF COSTS

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

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6. ESTIMATE OF COSTS.

(A)	INDEPENDENT CONTRACTS	$ 9,412.50
(B)	LABOR, SUPERVISION AND CONSULTANTS	5,277,00
(C)	OPERATING MATERIALS AND SUPPLIES	388.00
(D)	OPERATING EQUIPMENT	-0-
(E)	REHABILITATION AND REPAIRS	-0-
(F)	NEW BUILDINGS, IMPROVEMENTS, INSTALLATIONS	-0-
(G)	MISCELLANEOUS	10,902.55
(H)	CONTINGENCIES	-0-
	TOTAL	$25,980.05

(DETAIL OF ABOVE ESTIMATE FOLLOWS.)

6. ESTIMATE OF COSTS.

(A) INDEPENDENT CONTRACTS.

1. BULLDOZER RENTAL FOR ROAD CONSTRUCTION AND DRILL-SITE PREPARATION.

D-7 CAT., 100 HRS. @ $13.50/HR.	$ 1,350.00
2. CHURN DRILLING	
PINE FLAT AREA, 45 HOLES AVER. 25 FEET DEEP 45x25' = 1,125' @ $2.50/FT.	2,812.50
DIAMOND FLAT AREA, 35 HOLES AVER. 50 FEET DEEP 35x50' = 1,750' @ $3.00/FT.	5,250.00
TOTAL INDEPENDENT CONTRACTS	$ 9,412.50

6. (B) LABOR, SUPERVISION, CONSULTANTS.

SUPERVISION:

THE EXPLORATION PROGRAM WILL BE UNDER THE DIRECTION OF A FULL-TIME ENGINEER-GEOLOGIST.

1 ENGINEER-GEOLOGIST, 3 MO. @ $450/MO.	$ 1,350.00
EXPENSE ACCOUNT, 90 DAYS @ $8/DAY	720.00

LABOR:

THE SERVICES OF AN EXPERIENCED SAMPLE FOREMAN AND ONE COMMON LABORER WILL BE REQUIRED. WORK WILL BE ON A 6-DAY PER WEEK BASIS.

1 SAMPLE FOREMAN $2.25/HR. EQUALS $497/MO. 3 MONTHS @ $497/MO.	$ 1,491.00
EXPENSE ACCOUNT, 90 DAYS @ $6/DAY	540.00
1 LABORER (SAMPLER) $1.75/HR. EQUALS $392/MO. 3 MONTHS @ $392	1,176.00
TOTAL - LABOR, SUPERVISION AND CONSULTANTS	$ 5,277.00

6. (C) OPERATING MATERIALS AND SUPPLIES.
FUEL AND OIL FOR 1 PICKUP TRUCK AND 1 PASSENGER CAR.

3 MONTHS @ 3,600 MILES/MO.@ 8¢/MILE	$ 288.00
TUBS, DRYING PANS, SAMPLE SPLITTERS, ETC.	100.00
TOTAL - OPERATING MATERIALS AND SUPPLIES	$ 388.00

(D) NONE

(E) NONE

(F) NONE

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
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6. (G) MISCELLANEOUS.

EMPLOYMENT TAXES. 15% OF TOTAL WAGES OF 15% x $4,017.00	$ 602.55
ASSAYING. EST. 1,000 SAMPLES TO BE ASSAYED FOR CO, NI, CR, & FE. @ $10/SAMPLE	10,000.00
ACCOUNTING. 3 MONTHS @ $100/MO.	300.00
TOTAL MISCELLANEOUS	$ 10,902.55

(H) NONE

TOTAL COST OF PROJECT $ 25,980.05

25% COMPANY PARTICIPATION $ 6,495.01
75% DMEA PARTICIPATION 19,485.04

7. FINANCING

7. (A) THE APPLICANT WILL BE PREPARED TO FURNISH ITS SHARE OF THE COST OF THE PROPOSED PROJECT IN ACCORDANCE WITH THE REGULATIONS ON GOVERNMENT PARTICIPATION.

   (B) THE APPLICANT PROPOSES TO FURNISH ITS SHARE OF THE COSTS BY MONEY.

MAPS

RARE METALS CORPORATION OF AMERICA
Salt Lake City, Utah

Geologic Sketch Map of PINE FLAT NICKEL-COBALT DEPOSIT DIAMOND GROUP Del Norte County, Calif.

SCALE: 1" = 100'	DATE: Aug. 1954	REVISIONS:
DRAWN BY: J.R.R.	CHECKED BY:	
TRACED BY: S.O.	APPROVED BY:	
DRAWING NO.		

18 miles to Smith River, California
RARE No. 9
Peridotite
RARE No. 4
RARE No. 3
RARE No. 2
RARE No. 1
Rock & Laterite
Good Laterite
Good Laterite
Peridotite
Road
Rock & Laterite
Peridotite
Peridotite
RARE No. 5
RARE No. 6
Road
RARE No. 7
RARE No. 8
Steep Rim
Rock & Laterite
Box Work
Rock & Laterite
4 miles to Moore's Ranch on Smith River
LEGEND
Rock & Laterite
Good Laterite
Box Work
Peridotite
Proposed Drill Holes
Geologic Contact
Discovery Cuts
Peridotite
RARE METALS CORPORATION OF AMERICA
Salt Lake City, Utah
Geologic Sketch Map
of
PINE FLAT NICKEL-COBALT DEPOSIT
Del Norte County, Calif.
SCALE: 1" = 100'
DATE: Aug. 1954
REVISIONS:
DRAWN BY: J.R.R.
CHECKED BY:
TRACED BY: S.O.
APPROVED BY:
DRAWING NO.