AFG-100
Ni/Fe

STATE OF OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1069 State Office Building - Portland, Oregon 97201

REQUEST FOR SAMPLE INFORMATION

The State law governing free analysis of samples sent to State Assay Laboratories requires that certain information be furnished the laboratory regarding samples sent for assay or identification. A copy of the law will be found on the back of this blank. Please fill in the information requested completely, and submit it along with your sample. Keep a copy of the information on each sample for your own reference.

N.V. Peterson
P.O. Box 417
Grants Pass, Oregon 97526

Please print your name and address in space above

Date sample is sent: September 10, 1971

Name of claim sampled:

Name of property owners

Are you hiring labor? _____ Are you milling or shipping ore? _____

Location of property or source of sample. (If legal description is not known, give location with reference to known geographical point.)

County Douglas Mining district Riddle

Township _____ Range _____ Section _____ Quarter section _____

How far from passable road and name of road

	Channel (length)	Grab	Assay for	Description
Sample No. 1			Ni/Fe	Green Diamond Project
Sample No. 2				

(Samples for assay should be at least 1 lb. in weight; clay samples for ceramic testing at least 5 lbs.) IMPORTANT: A vein sample should be taken in an even channel across the vein from wall to wall. Location of sample in the workings, together with the width measured, should be recorded.

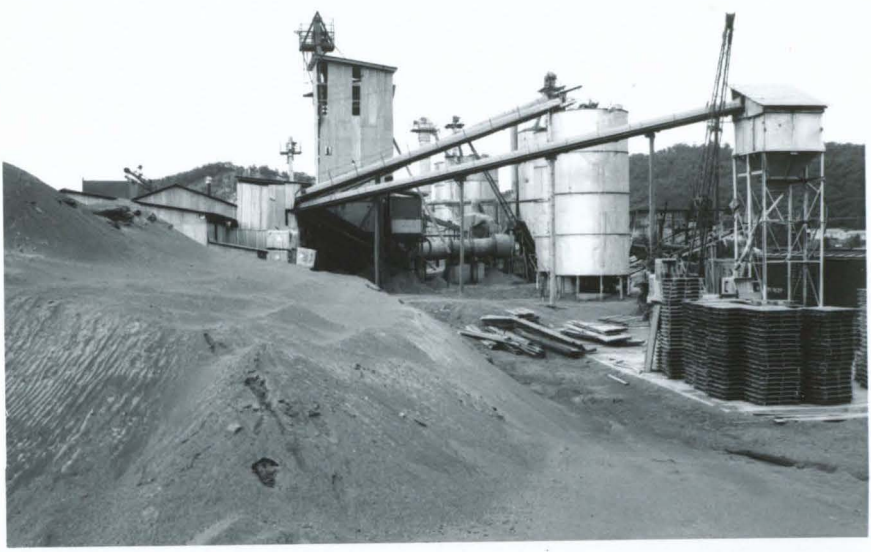
(Signed) /s/ Norman V. Peterson

DO NOT WRITE BELOW THIS LINE - FOR OFFICE USE ONLY - USE OTHER SIDE IF DESIRED

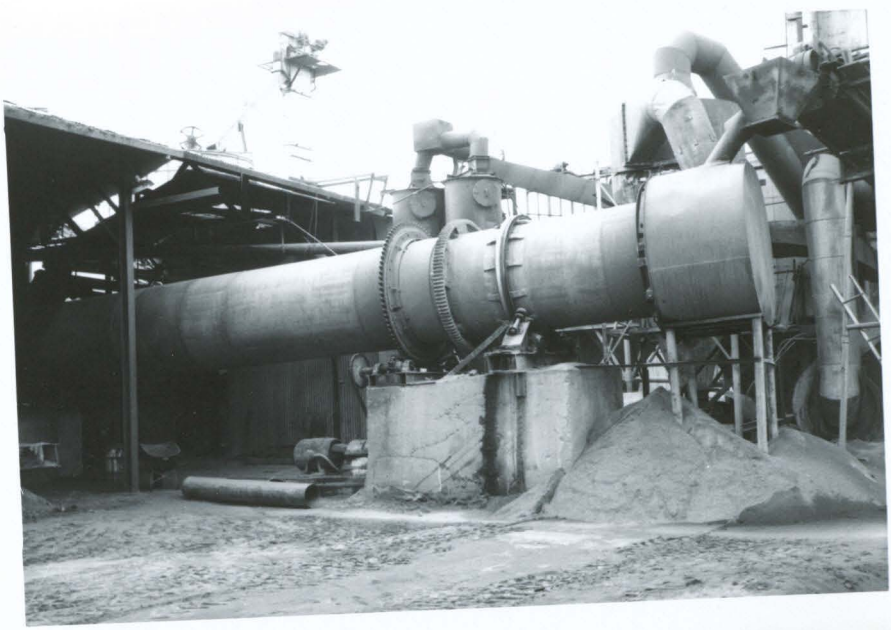
AFG-100
Description Flattened nodules of ferro-nickel (?)

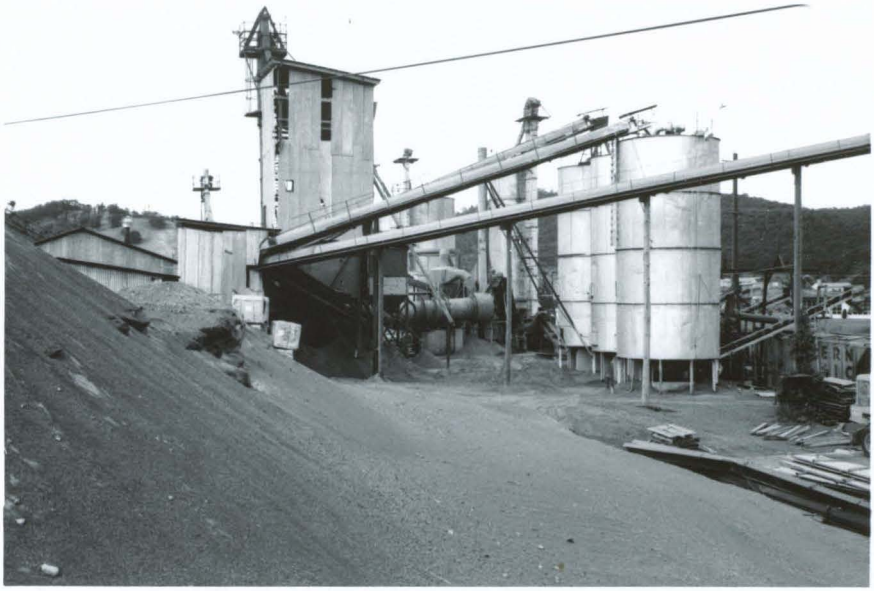
Sample Number	GOLD		SILVER		NICKEL	IRON		
	oz./T.	Value	oz./T.	Value	Ni	Fe		
P-36882	- -	- -	- -	- -	12.34%	34.71%	- -	- -

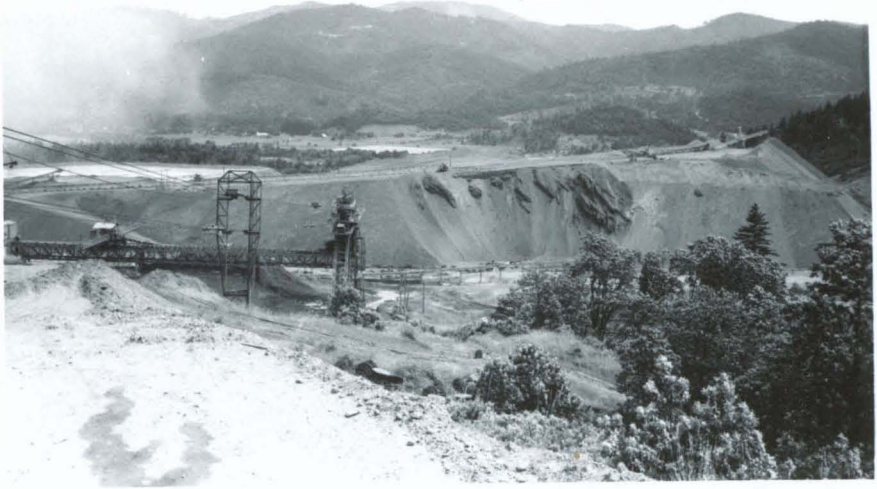
Report mailed 9-17-71




SOUTHERN
PACIFIC





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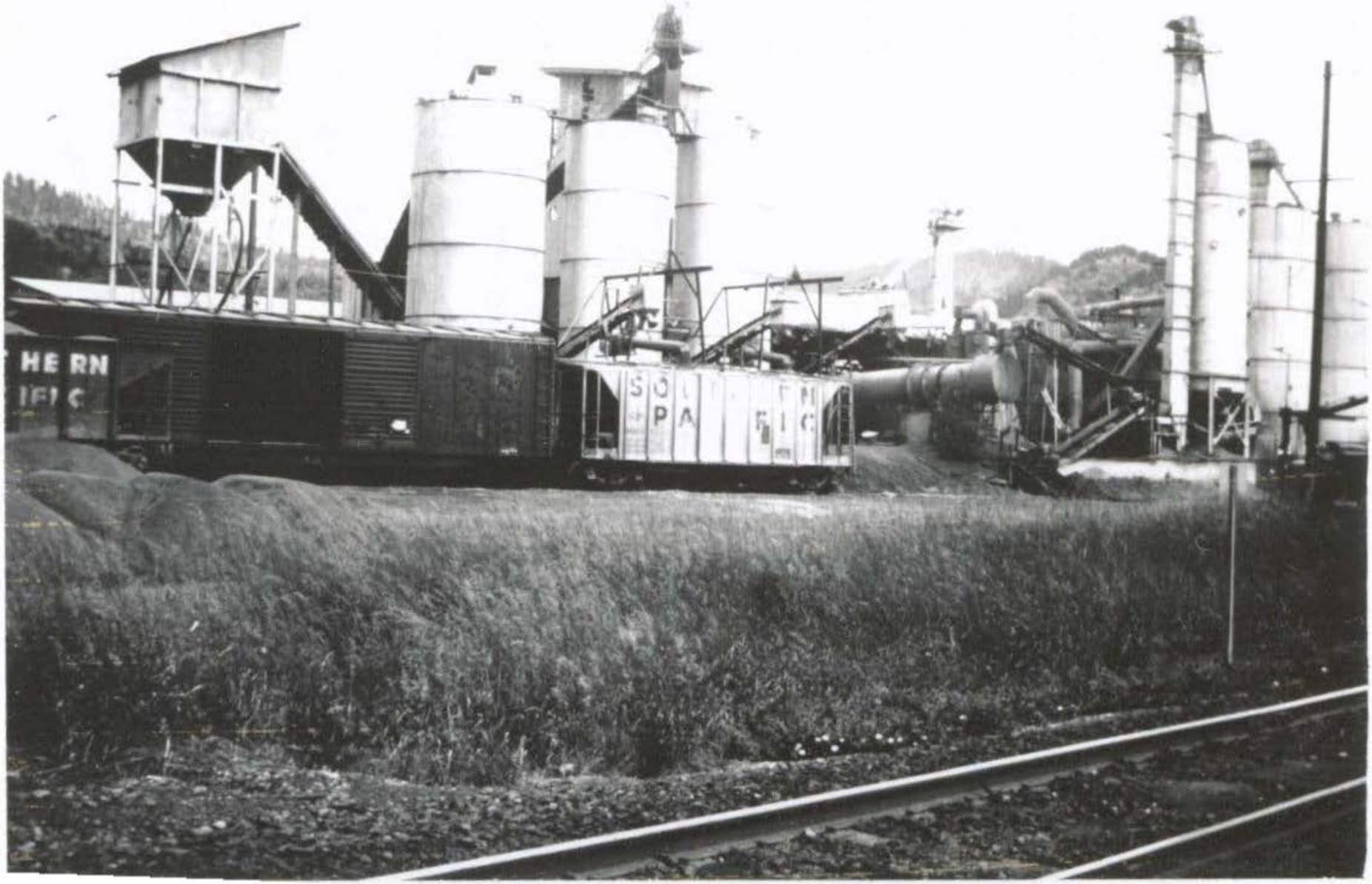
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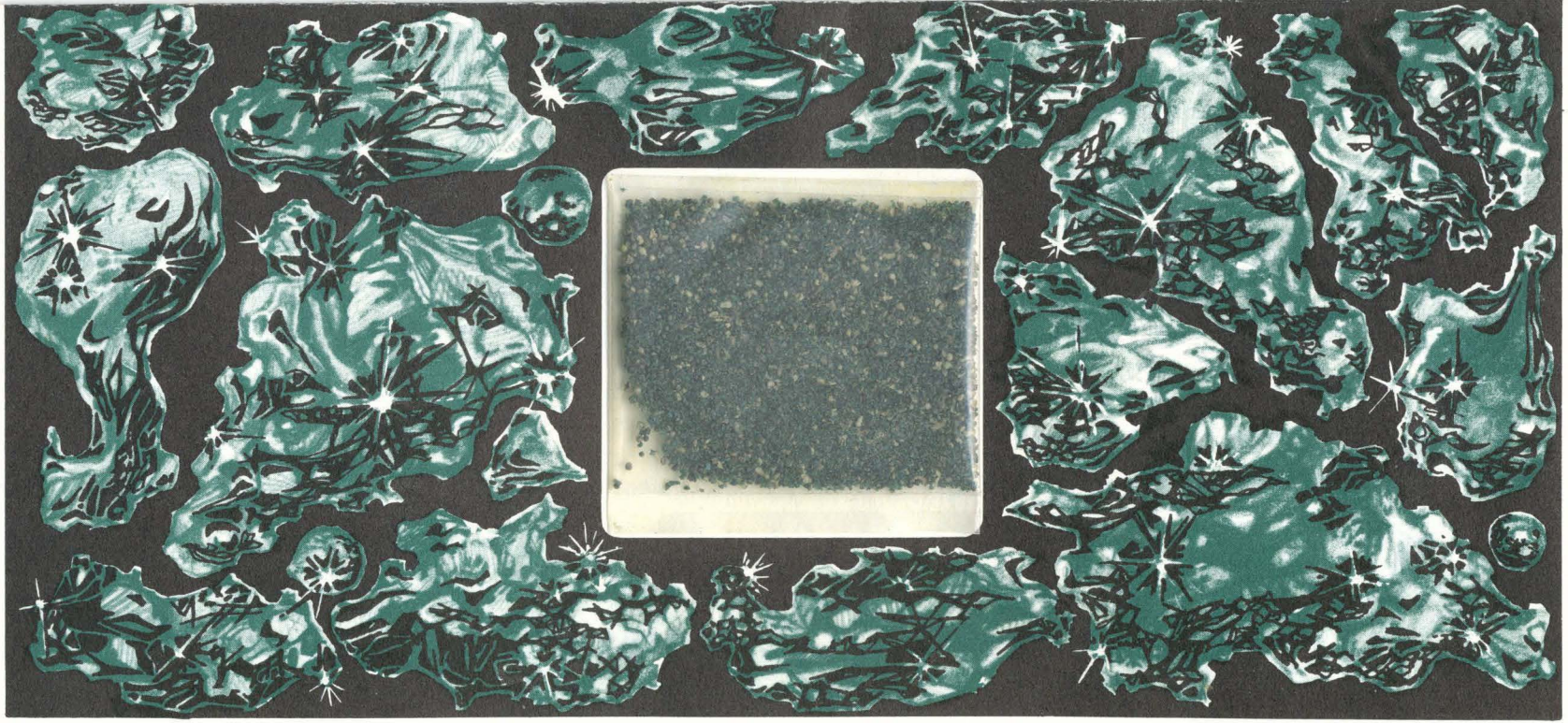
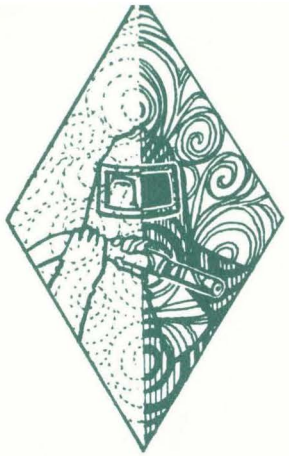


GREEN DIAMOND·THE GRIT THAT PRODUCES WHITE METAL ETCH



THE GREEN DIAMOND STORY

Green Diamond Abrasive Grit is Nickel Slag, after extraction of Nickel Metal from Garnerite Ore. The ore concentrate is melted in large electric furnaces and tapped out at 3200 Degrees Fahrenheit. In the process, all the elements are fused so that only a trace of Free Silica remains.

This large supply of slag is the only deposit of Nickel Slag in the United States. Our abundant supply in stockpile assures many years of high grade blasting grit.

Our processing plant is one of the most modern operations of this type in the West. We are equipped to serve you promptly and efficiently from our plant at Riddle, Oregon.

SIEVE ANALYSIS — GREEN DIAMOND STOCK GRADES

CUMULATIVE % RETAINED U.S. MESH	COARSE 10-20	UTILITY SPEC MIL 22262 SHIPS	MEDIUM NAVY NO. 3	FINE 16-36 NO. 1	FINE MIL SPEC 22262 SHIPS
8	0-2	0-5			
10	0-15	10-20	0-		
12	15-20	20-30	0-10		
16	60-75	50-60	10-20	0-5	
20	75-95	70-80	55-70	10-20	0-10
30	95-98	80-90	75-85	60-80	20-60
35	98-100	90-98		80-90	60-80
40		98-100	95-100	90-100	80-100
60		100	100	100	90-100
80					98-100
ETCH MICRO INCHES	470	*430	*410	*370	*260
80 PSI NOZZLE					

*MEETS NAVY SPECIFICATION.

GREEN DIAMOND GRIT CHEMICAL AND PHYSICAL ANALYSIS

CHEMICAL ANALYSIS	PERCENT
Iron Oxide	23.0
Calcium Oxide	0.6
Potassium	0.5
Aluminum Oxide	1.0
Magnesinum Oxide	23.0
Chromic Oxide	1.0
Combined Silica Dioxide	51.0
Free Silica	0.3
Sulfur	0.001
Chloride	0.01
Lead Arsenate	0.00
Carbonates	None
Gypsum	None

PHYSICAL ANALYSIS	PERCENT
Moisture Content	0.15
Loss on Ignition	+0.2
Oil Content	0.002
Specific Gravity	2.73
Hardness, MOH'S	7.5
Water Solubles %	0.02
Clay	None

Prepared by Abbot A. Hanks Laboratories. Approved and tested by a U. S. Navy Testing Laboratory and qualified to meet Specification MIL 22262 (SHIPS)

MINING-MINERALS MANUFACTURING CO.

office: 1485 Bayshore Blvd. • San Francisco, California 94124 • (415) 467-0780

plant: P.O. Box 211 • Riddle, Oregon 97469 • (503) 874-2560

in Douglass Co

This industry is ~~an~~ a good example of mineral conservation practice in that it utilizes ~~material otherwise~~ a waste product.

A relatively new and expanding industry in Douglass County that utilizes a waste product from the Hanna Nickel smelter is a good example of mineral conservation practice. The Minerals Manufacturing Co. of Riddle, Oregon produces A low cost, high quality sandblasting grit, ~~an~~ roofing granules and ~~fine~~ other specialty sands ~~from~~ from granulated smelter slag.

From a modest beginning in 1961 with 3 employees, the Plant has grown to employ approx 30 operation with a production of 3000 tons a month

GREEN DIAMOND ABRASIVES

A low cost, high quality sandblasting grit and roofing granules are the main finished products of the Mining - Minerals Manufacturing Company of Riddle, Oregon.

From a modest beginning in 1961 with 3 employees the plant (fig. 1) which processes granulated slag from the Hanna Nickel Smelter has grown to a 10 employee operation with a production of 2000 tons a month.

Sandblasting grit in a variety of sizes that comply with government and industry specifications is the major product and it is marketed in bulk and bags in California and the Pacific Northwest.

Roofing granules, the next most important product, are marketed in bulk ~~mainly~~ in the Pacific Northwest, ~~area.~~ mainly in Portland.

Minor amounts of grit have been sold for use in non-skid coatings and road sanding material. ~~New uses pursued and an expanded market for products of this unique slag are being actively pursued.~~ and new

The Hanna Smelter during the smelting and refining of ore from Nickel Mountain generates large quantities of slag which must be disposed of. The molten slag is quenched and explosively broken into gray-green spheres, and granules by jets of high pressure water as it is poured into granulation ~~pits~~ near the smelter. The granular material is then conveyed to the ever growing multi-million ton slag pile that now constitutes an almost inexhaustable source of raw material for the Mining Minerals Manufacturing Co.

sharp irregular shards

bins

The Green Diamond plant is located about $3\frac{1}{2}$ miles east of the Hanna Smelter along the same spur of the Southern Pacific Railroad that serves the smelter. The raw gray-green granulated slag arrives in bottom dump rail cars and after coarse screening is dried, sized, and conveyed to appropriate storage tanks for bulk loading or bagging as "Green Diamond Abrasives".

OK

Another circuit of the flow sheet includes crushing and additional sizing for production of roofing granules and other specialty products.

The recent addition of more efficient dust collecting devices insures operation within the minimum standards for air pollution set by the Oregon Department of Environmental Quality.

Chemically the slag is a glass composed of silica (51 percent), magnesium oxide (23 percent) and iron oxide 23 percent. Chromic oxide and aluminum oxide average about 1 percent each. Other elements occur in only trace amounts.

The slag appears to be quite durable both mechanically and chemically. There is little or no chemical alteration on exposure to weather. It is also known to possess good refractory properties.

Continued research into potential new uses of this growing by-product resource should result in expanded markets and increased production.

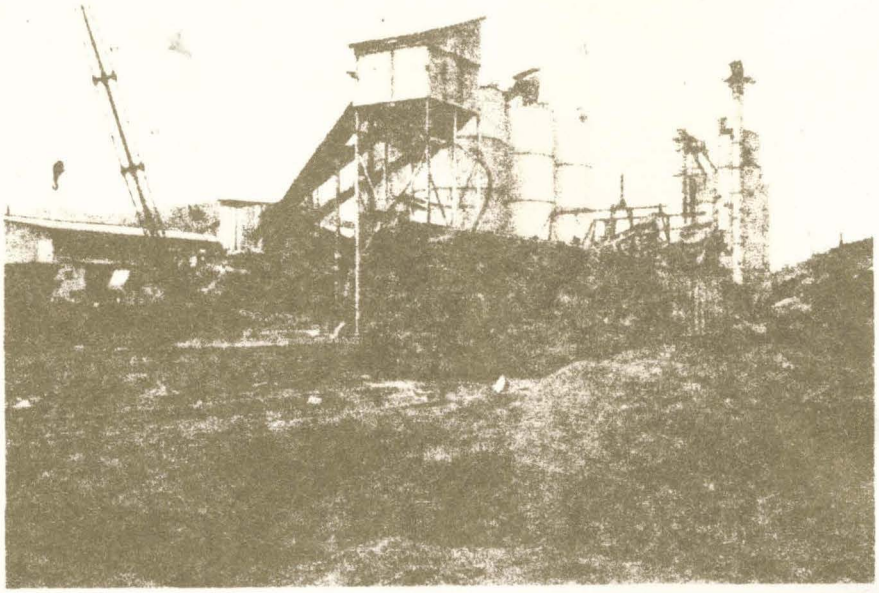


fig. 1 A general view of the "Green Diamond" plant at Riddle, Oregon 1971. The large storage tanks with their associated conveyors are the bulk loading facility, rotary dryer and screening circuits are behind the storage tanks. The bagging facility is at the left. Piles of granulated slag in the foreground.

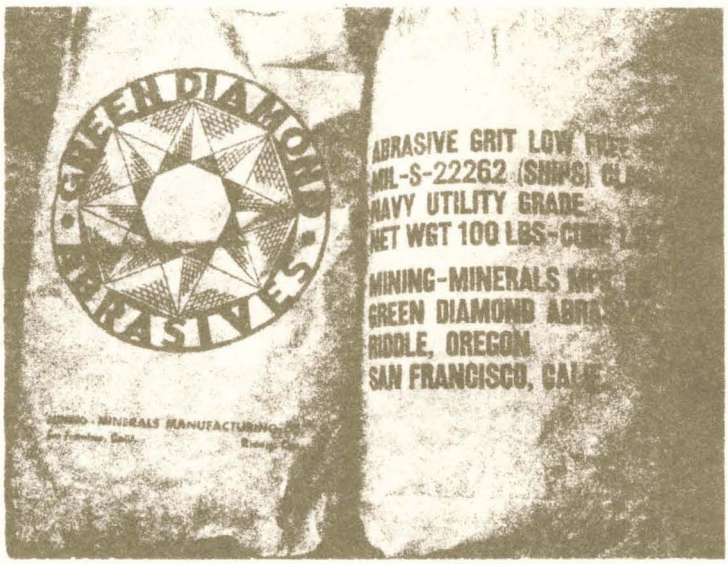


fig. 2 Sandblasting grit in a variety of sizes is marketed as "Green Diamond" in 100 lb. bags.

From a modest beginning in 1961 with 3 employees the ~~Dallas~~ Mining-Mineral Manufacturing Co. of Riddle, Oregon has increased ~~their grade~~

The Mining-Mineral Manufacturing company of Riddle Oregon

Green Diamond Abrasives

Slag is the product of a metal smelter-

The non-metallic by layer consisting essentially of silicates and aluminosilicates of

A substance formed in any one of several ways by chemical action and fusion at furnace operating temperatures.

During smelting + refining operations

gangue minerals and the flux and/or the oxidized impurities.

Granulated slag - molten slag broken up into granules and quick quenches.

(1) running the molten slag into a pit of water
(2) use a high pressure ~~jet of~~ water to break up the stream of molten slag as it falls into the pit.
(3) a mechanical revolving device with small amounts of water.

The glassy granular material formed when molten blast furnace slag is rapidly chilled as by immersion in water.

AFG - 52 Ni
AFG - 53 Ni

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N.V. Peterson
P.O. Box 417
Department of Geology & Mineral Ind.
Grants Pass, Oregon 97526

Please print your name and address in space above

Date sample is sent: June 11, 1971

Name of claim sampled: None

Name of property owners _____

Are you hiring labor? _____ Are you milling or shipping ore? _____

Location of property or source of sample. (If legal description is not known, give location with reference to known geographical point.)

County Douglas Mining district Riddle

Township 30 S Range 6 W Section 28 Quarter section _____

How far from passable road and name of road _____

	Channel (length)	Grab	Assay for	Description
Sample No. 1		X	Ni	Reject slag
Sample No. 2		X	Ni	initial raw slag

(Samples for assay should be at least 1 lb. in weight; clay samples for ceramic testing at least 5 lbs.) IMPORTANT: A vein sample should be taken in an even channel across the vein from wall to wall. Location of sample in the workings, together with the width measured, should be recorded.

(Signed) /s/ Norman V. Peterson

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Description # 1 AFG-52 Fe - Mg slag from Hanna Smelter - reject from green diamond screening plant.

2 AFG-53 Same as #1 material as received from Hanna slag pile .

Sample Number	GOLD oz./T.	GOLD Value	SILVER oz./T.	SILVER Value	NICKEL Ni			
AFG-52 P-36472					0.01%			
AFG-53 P-36473					0.07%	1.4 lbs/ton		

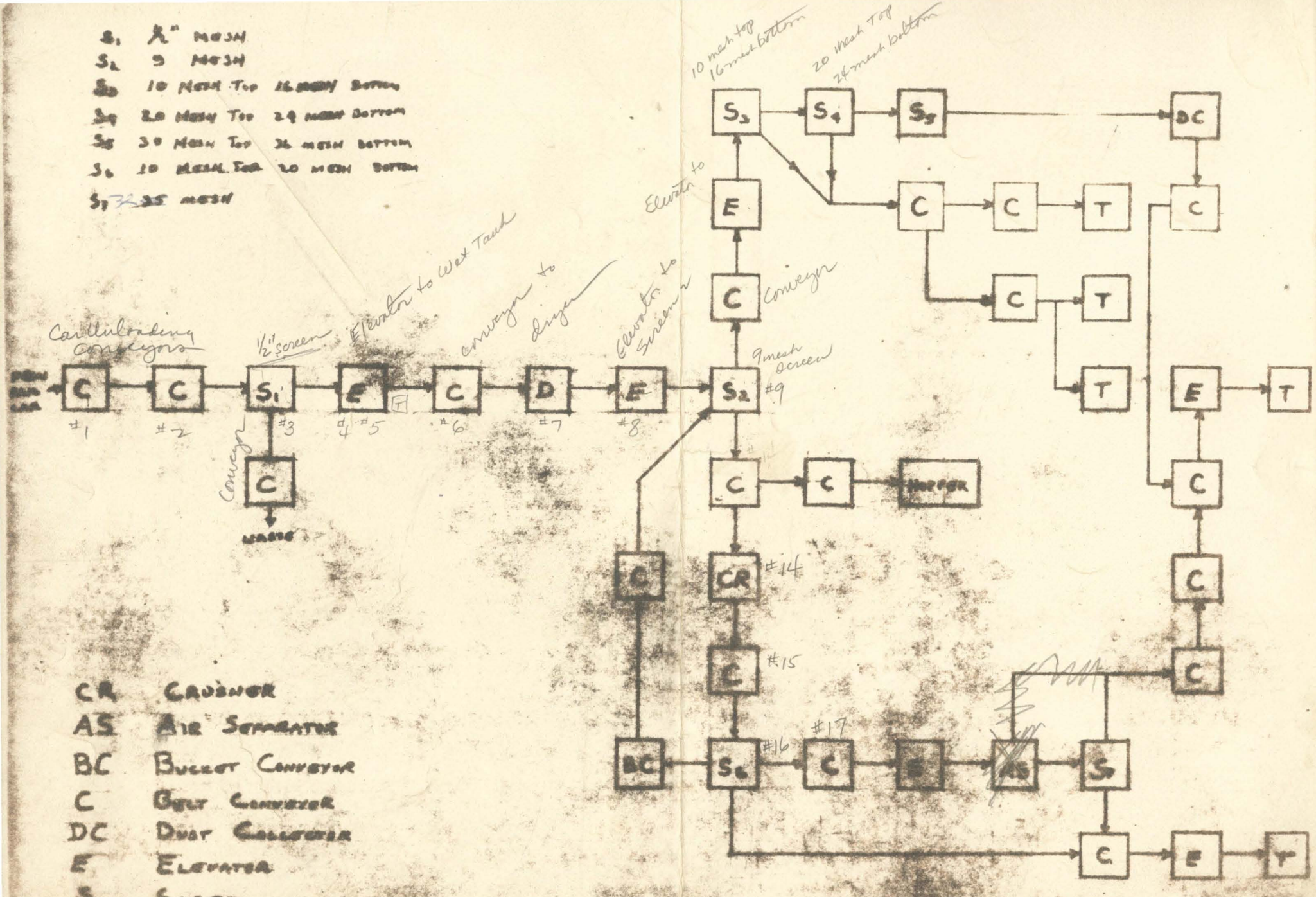
Report mailed June 16, 1971

RECEIVED
JUL - 8 1969
Air Pollution

Equipment Listing

1. #1 Car Unloading Conveyor
2. #2 Car Unloading Conveyor
3. Scalping Screen
4. Wet Elevator
5. Wet Tank
6. Dryer Feed Conveyor
7. Dryer
8. Screen Feed Elevator
9. Coarse Screen (Symons)
10. Screen House Feed Conveyor
11. Screen House Elevator
12. Crusher Feed Belt Conveyor
13. Waste Conveyor
14. Crusher
15. Screen Feed Conveyor
16. Granule Screen (Allis-Chalmers)
17. Granule Conveyor
18. Separator Feed Conveyor
19. Separator Feed Elevator
20. ~~Air Separator~~
21. Granule Screen (~~Leahy~~) HUMMER
22. Granule Elevator
23. Granule Storage Tank
24. Granule Dust Belt
25. Dust Conveyor
26. Reese Dust Collector (4000 cfm)
27. Dust Conveyor
28. Dust Collector } Little more [illegible]
29. Dust Collector
30. Cyclone (Condition, will be [illegible])
31. Dust Conveyor
32. American Dust Collector (10,000 cfm) Insulated
33. Dust Elevator
34. Dust Storage Tank
35. Blower (½ of American Dust Collector)
36. Blower (½ Of American Dust Collector)
37. Blower (Reese Dust Collector)
38. Scalping Conveyor
39. Coarse Return Conveyor
40. Ball Mill
41. Screw Conveyor
42. Exhaust Stack with Washer

S_1 ¼" MESH
S_2 9 MESH
S_3 10 MESH TOP 16 MESH BOTTOM
S_4 20 MESH TOP 24 MESH BOTTOM
S_5 30 MESH TOP 36 MESH BOTTOM
S_6 10 MESH TOP 20 MESH BOTTOM
S_7 35 MESH



CR CRUSHER
AS AIR SEPARATOR
BC BUCKET CONVEYOR
C BELT CONVEYOR
DC DUST COLLECTOR
E ELEVATOR
S SCREEN
T STORAGE TANK
D DRYER