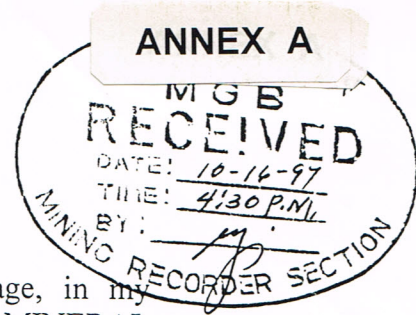


SECRETARY'S CERTIFICATE

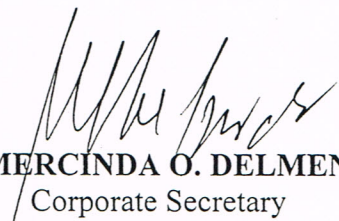
I, **GUMERCINDA O. DELMENDO**, of legal age, in my capacity as Corporate Secretary of **BASE METALS MINERAL RESOURCES CORPORATION**, a corporation duly organized and existing under Philippine laws, with office address at the 4<sup>th</sup> Floor, Trans-Phil House, Chino Roces Avenue corner Bagtikan Street, Makati City, after being sworn to in accordance with law, do hereby certify that in a meeting held on 11 August 1997, the Board adopted the following resolutions:

RESOLVED that Mr. Frank N. Lubbock, Mr. Martin Buckingham, Mr. Jim Keogh and Mr. Terrence H. Byberg be authorized to represent the Company in all dealings and transactions with the Department of Environment and Natural Resources, to sign and execute mineral agreements and all documents in connection with the mineral properties of the Company, with full power and authority to delegate and designate representatives and agents to sign and represent the company.


RESOLVED FURTHER that the following are authorized representatives of the Company in dealing with the Department of Environment and Natural Resources in the entire Philippines:

Norman H. Tiongson	Ernesto A. Laoagan
Val. Bongalos	Samuel Afdal
Luc Gatchalian	Rolando Amores
Victor Cronologia	Chester Obispo
Elizabeth Cruz	Roan Dabuet
Fernando Cortez	Sergio Sanchez
Francisco Ylagan	Danilo Latuga

IN WITNESS WHEREOF, I affix my signature this \_\_\_nd day of August 1997 at Makati City.

  
**GUMERCINDA O. DELMENDO**  
 Corporate Secretary

SUBSCRIBED AND SWORN to before me this 15 OCT. 1997 day of April 1997 at Makati City, affiant exhibiting to me her Community Tax Certificate No. 4786937-D issued at Manila on 27 January 1997.

  
**DANILO B. BANARES**  
 NOTARY PUBLIC

Republic of the Philippines  
**DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
 MINES AND GEO-SCIENCES BUREAU  
 REGION V, LEGASPI CITY

TECHNICAL DESCRIPTION

OF THE AREA APPLIED/PROPOSED FOR  
 MINERAL PRODUCTION SHARING AGREEMENT (APSA)-V-0029

APPLICANT: **Base Metals Mineral Resources Corporation**

SITUATED IN THE:

Barrios of Syndicate, Panique, Bangon and Puro  
 Municipality of Aroroy  
 Province of Masbate  
 Island of Masbate

BOUNDED ON THE:

North: "Elise" B-18, "Sweetheart" B-6, "Eastern Fr." B-97, "King" B-1, "Have Got" B-2, "El Oro" B-100, "El Dinero" B-94, "Nebraska" B-3, "Nancy" B-8, "Panique" B-99, "Mable" B-7, "Holy Moses" B-4, "Imitation" B-96, "St. Luis" B-95, "Limestone" B-98, "Salida Fr." B-90, "Buena Suerte", B-60 "Montana" B-91, "Idaho Fr." B-92, "Colorado" B-62, "Mountain View" B-86, "Bay View" B-85 mining claims of Atlas Consolidated Mining & Development Corporation and Timberland.

East : "Grand View", B-85, "Bay View" B-87, "Mountain View" B-86, "Colorado" B-62, "Buenavista Fr." B-84, mining claims of Atlas Consolidated Mining & Development Corporation, "Point-24" Lla-142254-D mining claim of Kirra Mining Exploration Co., "Rocky-97" Lla-141986-D mining claim of Moomba Mining Exploration Co., "Gold-3" DLS-3363-D, "Gold-2" DLS-3921-D, "Gold-1" DLS-3920-D mining claims of Atlas Consolidated Mining & Dev. Corporation and Timberland.

South: "Timberland", "Dabu-3" DLS-4152-D, "Dabu-2" DLS-4151-D mining claims of Atlas Consolidated Mining and Development Corporation.

West : "Doming" DLS-32-D, "Corazon" DLS-29-D, "Aquarius" DLS-26-D, "Montana" B-91, "Idaho" B-92, "Aries" DLS-23-D mining claims of Atlas consolidated Mining & Dev. Corporation. "Columbine" LP-3317-D, "Fraction Fr." LP-3328-D mining claim of Masbate Goldfields, Inc.

Beginning at a point marked "1" = 1, DLS-33-D on plan being S.10°21'42" W., 2,846.78 m. from Triangulation Station Bagadila, 1911-51.

Thence:	N.00°05'W.,	1,240.77 M. to point	2	=	1a,	DLS-30-D
Thence:	N.27°31'W.,	42.83 M. to point	3	=	3,	LP-2922-D
Thence:	N.62°29' E.,	22.25 M. to point	4	=	1b,	DLS-30-D
Thence	N. 0°05'W.,	986.15 M. to point	5	=	1b,	DLS-27-D
Thence:	S .34°50' E.,	68.28 M. to point	6	=	1c,	DLS-27-D
Thence:	N.55°06' E.,	100.62 M. to point	7	=	1d,	DLS-27-D
Thence:	N.55°12' E.,	199.39 M. to point	8	=	1e,	DLS-27-D
Thence:	N 34°50'W	107.90 M. to point	9	=	1f	DI S-27-D



Thence:	N.24°42' W.,	125.51 M. to point	13	=	5,	LP-2930-D
Thence:	S.55°10' W.,	45.34 M. to point	14	=	6,	LP-2930-D
Thence:	N.20°30' W.,	205.44 M. to point	15	=	1,	DLS-2930-D
Thence:	N.59°57' E.,	168.80 M. to point	16	=	1a,	LP - 24-D
Thence:	N.00°05' W.,	203.33 M. to point	17	=	1b,	DLS-24-D
Thence:	N.45°05' E.,	26.95 M. to point	18	=	1c,	DLS-24-D
Thence:	N.31°11' W.,	116.50 M. to point	19	=	1,	LP-2929-D
Thence:	N.59°57' E.,	237.48 M. to point	20	=	1d,	DLS-24-D
Thence:	N.44°55' W.,	233.12 M. to point	21	=	1e,	DLS-24-D
Thence:	N.00°05' W.,	52.62 M. to point	22	=	2,	DLS-24-D
Thence:	N.89°55' E.,	44.60 M. to point	23	=	2a,	DLS-24-D
Thence:	S.31°46' E.,	248.73 M. to point	24	=	2b,	DLS-24-D
Thence:	N.59°57' E.,	24.58 M. to point	25	=	2c,	DLS-24-D
Thence:	N.15°13' W.,	211.72 M. to point	26	=	2d,	DLS-24-D
Thence:	N.89°55' E.,	266.42 M. to point	27	=	3,	DLS-24-D
Thence:	S.00°05' E.,	85.77 M. to point	28	=	3a,	DLS-24-D
Thence:	S.59°57' W.,	179.81 M. to point	29	=	3b,	DLS-24-D
Thence:	S.45°45' W.,	32.00 M. to point	30	=	3c,	DLS-24-D
Thence:	S.33°08' E.,	289.45 M. to point	31	=	3,	LP-2929-D
Thence:	S.19°28' E.,	302.40 M. to point	32	=	3,	LP-2928-D
Thence:	S.59°57' W.,	300.00 M. to point	33	=	4,	LP-2928-D
Thence:	S.30°03' E.,	300.01 M. to point	34	=	2c,	DLS-27-D
Thence:	N.59°57' E.,	7.13 M. to point	35	=	2d,	DLS-27-D
Thence:	S.26°47' E.,	53.96 M. to point	36	=	3a,	DLS-27-D
Thence:	S. 0°05' E.,	99.74 M. to point	37	=	3b,	DLS-27-D
Thence:	N66°08' W.,	198.27 M. to point	38	=	3c,	DLS-27-D
Thence:	S.34°50' E.,	11.06 M. to point	39	=	3d,	DLS-27-D
Thence:	S.39°36' E.,	108.16 M. to point	40	=	3e,	DLS-27-D
Thence:	S.54°25' W.,	8.99 M. to point	41	=	3f,	DLS-27-D
Thence:	S.55°12' W.,	199.39 M. to point	42	=	3g,	DLS-27-D
Thence:	S.23°51' W.,	68.09 M. to point	43	=	3h,	DLS-27-D
Thence:	S.66°08' E.,	299.99 M. to point	44	=	3i,	DLS-27-D
Thence:	N.23°50' E.,	64.58 M. to point	45	=	3j,	DLS-27-D
Thence:	S.18°10' W.,	78.95 M. to point	46	=	3k,	DLS-27-D
Thence:	S.71°52' E.,	30.84 M. to point	47	=	3l,	DLS-27-D
Thence:	S. 0°05' E.,	81.88 M. to point	48	=	3m,	DLS-27-D
Thence:	N.89°55' E.,	152.60 M. to point	49	=	3n,	DLS-27-D
Thence:	N.46°51' E.,	34.32 M. to point	50	=	3,	LP-2924-D
Thence:	S.71°52' E.,	82.12 M. to point	51	=	4,	LP-2924-D
Thence:	N.18°08' E.,	124.27 M. to point	52	=	3,	LP-2923-D
Thence:	S.39°42' E.,	203.64 M. to point	53	=	4,	LP-2923-D
Thence:	N.50°19' E.,	3.96 M. to point	54	=	5,	LP-2923-D
Thence:	S.44°39' E.,	375.64 M. to point	55	=	3,	LP-2925-D
Thence:	S.45°21' W.,	227.01 M. to point	56	=	4,	LP-2925-D
Thence:	N43°09' W.,	297.23 M. to point	57	=	1,	LP-2925-D
Thence:	S.46°51' W.,	182.76 M. to point	58	=	1,	LP-2924-D
Thence:	S.46°50' W.,	94.79 M. to point	59	=	3b,	DLS-30-D
Thence:	S.27°31' E.,	104.45 M. to point	60	=	3c,	DLS-30-D
Thence:	S.43°09' E.,	198.56 M. to point	61	=	3d,	DLS-30-D
Thence:	N.46°51' E.,	231.83 M. to point	62	=	3e,	DLS-30-D
Thence:	S.44°39' E.,	6.44 M. to point	63	=	3f,	DLS-30-D
Thence:	S.45°21' W.,	291.61 M. to point	64	=	3g,	DLS-30-D
Thence:	N27°31' W.,	220.79 M. to point	65	=	3i,	DLS-30-D
Thence:	N27°31' W.,	104.45 M. to point	66	=	3j,	DLS-30-D

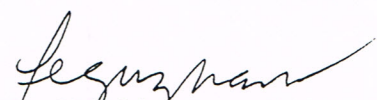


Thence:	S.27°31' E.,	300.00 M. to point	70	=	1,	LP-2922-D
Thence:	S.62°29' W.,	300.00 M. to point	71	=	2,	LP-2922-D
Thence:	S.27°31' E.,	300.00 M. to point	72	=	8,	LP-2920-D
Thence:	N62°29' E.,	313.00 M. to point	73	=	1,	LP-2920-D
Thence:	S.05°43' E.,	303.07 M. to point	74	=	2,	LP-2920-D
Thence:	S.84°16' W.,	44.90 M. to point	75	=	3,	LP-2920-D
Thence:	N63°05' W.,	127.87 M. to point	76	=	4,	LP-2920-D
Thence:	S26°55' W.,	304.80 M. to point	77	=	3d,	DLS-33-D
Thence:	S.63°05' E.,	304.80 M. to point	78	=	3e,	DLS-33-D
Thence:	N26°55' E.,	254.90 M. to point	79	=	3f,	DLS-33-D
Thence:	N26°50' E.,	49.90 M. to point	80	=	4,	LP-2919-D
Thence:	N63°05' W.,	176.93 M. to point	81	=	5,	LP-2919-D
Thence:	N84°17' E.,	259.88 M. to point	83	=	6,	LP-2919-D
Thence:	S.30°20' E.,	232.49 M. to point	84	=	1d,	DLS-34-D
Thence:	N59°40' E.,	300.00 M. to point	85	=	1e,	DLS-34-D
Thence:	S.30°20' E.,	4.80 M. to point	86	=	1f,	DLS-34-D
Thence:	N59°40' E.,	304.80 M. to point	87	=	1g,	DLS-34-D
Thence:	N30°20' W.,	304.80 M. to point	88	=	2,	LP-2917-D
Thence:	S59°40' W.,	227.85 M. to point	89	=	3,	LP-2917-D
Thence:	N45°21' E.,	254.37 M. to point	90	=	4,	LP-2917-D
Thence:	N45°21' E.,	300.00 M. to point	91	=	1c,	DLS-31-D
Thence:	N44°39' W.,	375.65 M. to point	92	=	1,	LP-2921-D
Thence:	N45°21' E.,	300.00 M. to point	93	=	2,	LP-2921-D
Thence:	N44°39' W.,	600.00 M. to point	94	=	4,	LP-2927-D
Thence:	S.45°21' W.,	2.85 M. to point	95	=	5,	LP-2927-D
Thence:	N39°42' W.,	150.56 M. to point	96	=	6,	LP-2927-D
Thence:	N45°21' E.,	290.72 M. to point	97	=	1,	LP-2927-D
Thence:	S.44°29' E.,	300.00 M. to point	98	=	2,	LP-2927-D
Thence:	S.44°39' E.,	300.00 M. to point	99	=	4,	LP-2926-D
Thence:	S.45°21' W.,	289.79 M. to point	100	=	2,	DLS-31-D
Thence:	N89°54' E.,	348.81 M. to point	101	=	2a,	DLS-31-D
Thence:	N89°55' E.,	100.00 M. to point	102	=	3,	DLS-31-D
Thence:	S. 0°05' E.,	620.00 M. to point	103	=	3b,	DLS-31-D
Thence:	S. 0°06' E.,	301.81 M. to point	104	=	4,	DLS-31-D
Thence:	S. 0°05' E.,	600.00 M. to point	105	=	3b,	DLS-34-D
Thence:	S. 0°06' E.,	321.80 M. to point	106	=	4,	DLS-34-D
Thence:	S.89°55' W.,	605.83 M. to point	107	=	4b,	DLS-34-D
Thence:	S.89°54' W.,	426.38 M. to point	108	=	4a,	DLS-33-D
Thence:	S.30°20' E.,	19.42 M. to point	109	=	4,	LP-2918-D
Thence:	S.59°40' W.,	300.00 M. to point	110	=	3,	LP-2918-D
Thence:	N30°20' W.,	194.38 M. to point	111	=	4d,	DLS-33-D
Thence:	S.89°55' W.,	432.39 M. to point	1	=	1,	DLS-33-D

which is the point of beginning.

Containing an area of 289.9466 Hectares.

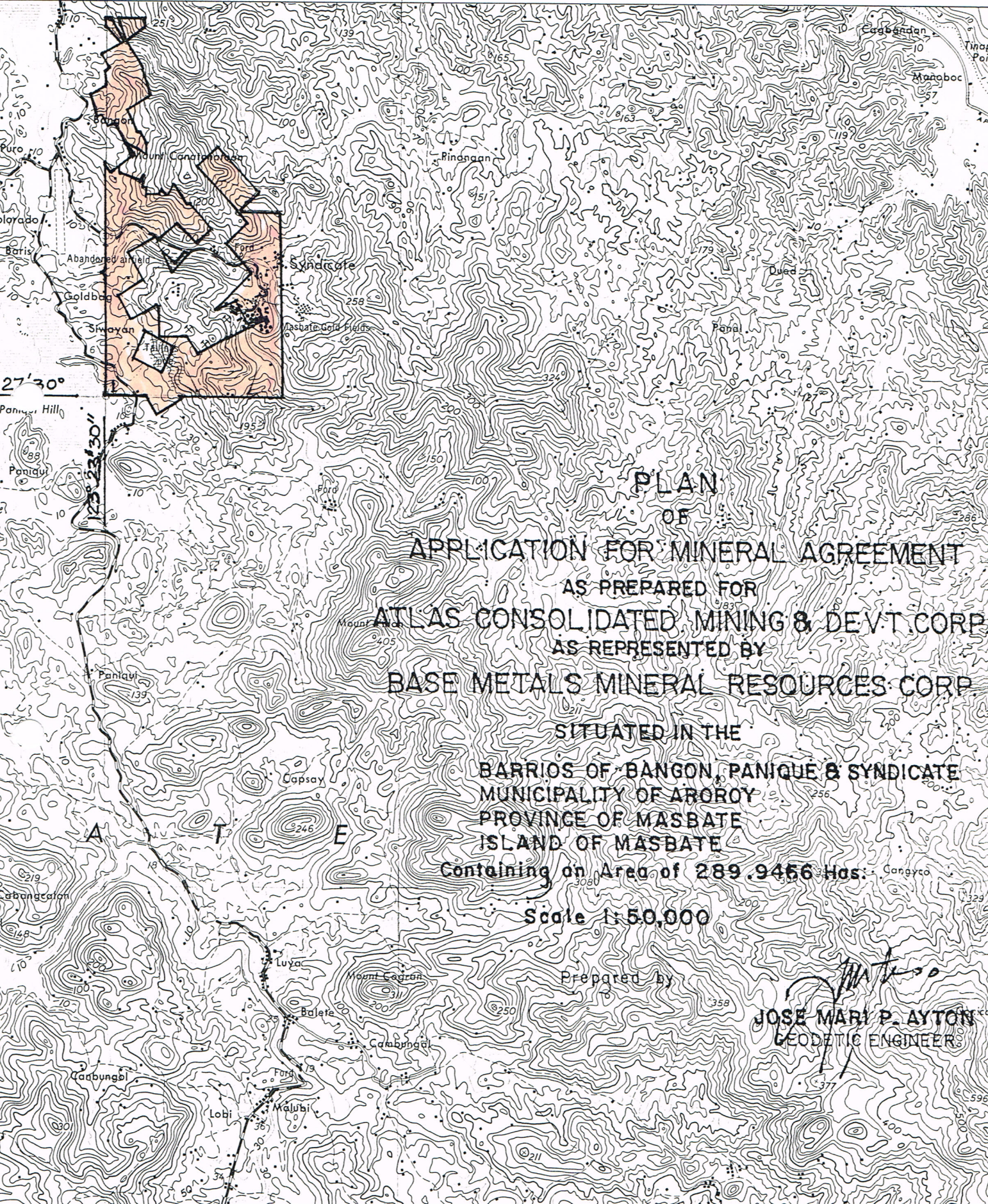
Date Prepared:

  
FRANCISCO E. de GUZMAN  
Deputized Geodetic Engineer



AROROY 2.6 KM.

25'



27°30'

115°23'30"

PLAN  
OF  
APPLICATION FOR MINERAL AGREEMENT  
AS PREPARED FOR  
ATLAS CONSOLIDATED MINING & DEV'T. CORP.  
AS REPRESENTED BY  
BASE METALS MINERAL RESOURCES CORP.

SITUATED IN THE  
BARRIOS OF BANGON, PANIQUE & SYNDICATE  
MUNICIPALITY OF AROROY  
PROVINCE OF MASBATE  
ISLAND OF MASBATE

Containing an Area of 289.9456 Has.

Scale 1:50,000

Prepared by

*Jose Mari P. Ayton*  
JOSE MARI P. AYTON  
GEODETIC ENGINEER

A T E



**TWO (2) -YEAR EXPLORATION WORK PROGRAM  
FOR THE PROPOSED APPLICATION FOR  
MINERAL PRODUCTION SHARING AGREEMENT (APSA-V-0029) OF  
BASE METALS MINERAL RESOURCES CORPORATION (BMMRC)  
LOCATED IN BARANGAYS BANGON, PURO, SYNDICATE, PANIQUE AND CAPSAY,  
MUNICIPALITY OF AROROY,  
PROVINCE OF MASBATE**

---

**I. INTRODUCTION:**

Mining Claims areas applied are immediate areas around the perfected mining claims of Base Metals Mineral Resources Corporation (BMMRC) close to the general vicinity of the planned operating center of the same company.

These areas have known ore potential mainly quartz vein extensions from active mining areas by the previous mine operator, *Atlas Consolidated Mining and Development Corporation (ACMDC)*.

**II. GENERAL INFORMATION:**

Name of Proponent/Applicant	: BMMRC
Mailing Address	: 4 <sup>th</sup> Floor Trans-Phil House Bagtikan St., Cor. Chino Roces Ave., Makati City
Ore Minerals to be explored	: Gold, copper, sulfides, etc.
Total Area	: 289.9466 Hectares
Name of application	: Mineral Production Sharing Agreement
Project Location	: Barangays Bangon, Puro, Syndicate, Panique, and Capsay, Municipality of Aroroy, Province of Masbate

**III. PROJECT LOCATION:**

The gold-silver prospect applied for is situated at Barangays Bangon, Syndicate, Panique and Capsay within the municipal jurisdiction of Aroroy, province of Masbate. It is about 6 kilometers Southwest of Aroroy Poblacion.

The area boundary is at 12°27'30" to 12°29'30" latitude and at 123°23'00" to 123°24'30" longitude.

**IV. CLIMATE AND VEGETATION:**

The climate is generally dry during the months of February to May, while the rainy season sets in June and continues up to January.

Vegetation are generally cogonal, mostly pasture lands on the Western side, and coconut plantation, patchy upland rice and ipil-ipil trees on the eastern side. Wild bananas thrive anywhere. Forested areas are patchy, localized in few areas only.



## V. PROPOSED TWO-YEAR EXPLORATION WORK PROGRAM:

The two (2) years exploration work program presents the phases of activities to be undertaken on the applied area for a span of two (2) years.

### FIRST YEAR

Previous exploration activities had already defined the areas for drilling. Reverse circulation (RC) drilling will be the main activity on the first year.

Drilling will be pursued mainly at the Northern and Southern end of Colorado Vein No. 5 primarily to block additional mineable ore reserves.

Priority drilling will likewise focus in confirming the average grade of the various waste dumps.

Dumps drilling is in line with the current BMMRC study of recovering the gold contained from this low grade materials for either Heap Leaching process or large capacity CIP plant fed.

The combined RC drilling meterage for the first year is 6,822 broken down as follows.

	<u>No. of Holes</u>	<u>Meterage</u>
Colorado Vein No. 5 (north)	14	724 m.
Colorado Vein No. 5 (South)	26	1,480
Main Vein Dumps	98	2,219
Basalt Dump 90/60	77	1,672
Colorado Dump 270	36	727
<b>Sub - Total</b>	<b>251 holes</b>	<b>6,822 m.</b>

(See attached details of the proposed drill holes).

### SECOND YEAR

Geologic mapping, trenching, sampling and drilling will be the main activities on the first half of the year. Surface trenching and sampling will be undertaken at the Grand View subparallel Vein structure projected for about 300 meters strike length. A total of 10 trenches (20 meters long each) will be dug at 30 meters interval.

Similarly, a total of 8 trenches (15 meters long each), at 30 meters apart will be dug following about 250 meters Boston Vein extension to the south. This two (2) areas are highly prospective for additional ore reserve.

Diamond drilling will be the main activities in the second half of the year. Core drilling method will be required to drill the deeper sections of the known veins and extensions at Dabu-

### Summary of Activities

<u>AREA</u>	<u>NO. OF TRENCHES</u>	<u>METERAGE</u>
Grand View	10	200 m
Boston	8	120 m
<b>Sub- total</b>	<b>18</b>	<b>320 m</b>

<u>Drilling</u>	<u>No. of Drill Holes</u>	<u>Meterage</u>
Dabu-Panique	8	1,070 m
Binstar U.G.	17	1,945 m
<b>Sub- total</b>	<b>25</b>	<b>3,015 m</b>

### VI. TWO (2) – YEAR WORK PROGRAM BUDGET SUMMARY:

<b>EXPLORATION EXPENSES</b>	<b>YEAR 1</b>	<b>YEAR 2</b>	<b>TOTAL</b>
Labor and Supervision	522,000	757,000	1,279,000
Samples/ Assay Cost	500,000	300,000	800,000
Field Supplies	120,000	120,000	240,000
Contract RC Drilling	5,500,000		5,500,000
Contract Core Drilling		12,000,000	12,000,000
<b>Total</b>	<b>6,642, 000</b>	<b>13,177,000</b>	<b>19,819,000</b>

### VII. ENVIRONMETAL IMPACTS:

In as much exploration activities would only be undertaken, its impact to the environment is expected to be minimal although the following alternatives may occur.

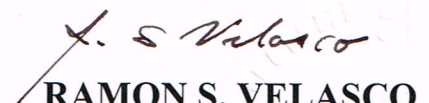


- a) Vegetation might have to be removed to give way to trails, traverses, survey Stations, test pits, trenches, etc., as soon as exploration works commences.
- b) Introduction of exploration drill holes, test pits, trenches and other excavation workings may disturbed, the topography of the area. This will be both minimal and strongly controlled limited.

**The following measures will be undertaken to mitigate the impact of the exploration works to the environment.**

- a) Cutting of trees should be avoided as much as possible.
- b) Construction of roads and exploration sites would be in a manner as to avoid ugly cuts in the landscape.
- c) All trenches, test pits and open excavation would be refilled after exploration works.
- d) Severe restriction and avoidance of vegetation clearance by fire.
- e) Sanitary condition would be maintained in all camp sites.
- f) A good public relation in the area would be adopted and enforced.

**Prepared by :**

  
**RAMON S. VELASCO**  
Corporate Geologist  
PTR No. 5713925 U  
Issued on September 1, 1997  
Issued at Aroroy, Masbate

## COLORADO PROPOSED DIAMOND DRILL HOLES

DRILL HOLE NUMBER	PANEL SECTION	NORTHING	EASTING	AZIMUTH	COLLAR ELEVATION	INCLINATION	DEPTH
5-47N-A	47N	27278	29887	245°	195.5	50°	50
5-47N-B	47N	27278	29887	65°	197.5	50°	30
5-45N-A	45N	27258.5	29913.5	245°	201.5	50°	70
5-43N-A	43N	27216	29897	245°	185.5	50°	50
5-41N-A	41N	27207	29945	245°	193.5	45°	70
5-39N-A	39N	27270	29942	245°	211	50°	50
5-39N-B	39N	27189	29975	245°	213.5	50°	39
5-37N-A	37N	27137	29941	245°	217	50°	50
5-35N-A	35N	27130	29992	245°	240	50°	50
5A-19N-A	19N	26906	30082	245°	300	-60°	60
5A-15N-A	15N	26850	30105	245°	311	-50°	60
5A-7N-A	7N	26730	30135	245°	285	50°	50
5A-5N-A	5N	26708	30155	245°	277	55°	45
5A-3N-A	3N	26688	30183	245°	269.5	50°	50
5-3S-A	3S	26597	30205	245°	206.2	50°	45
5-5S-A	5S	26574	30224	245°	202	50°	40
5-7S-A	7S	26545	30234	245°	195	50°	30
5-7S-B	7S	26565	30271	245°	196.5	50°	75
5-9S-A	9S	26528	30266	245°	195	50°	50
5-11S-A	11S	26500	30280	245°	182	60°	50
5-13S-A	13S	26467	30278	245°	163	50°	30
5-13S-B	13S	26477	30298	245°	167	60°	65
5-15S-A	15S	26446	30302	245°	143	50°	50
5-17S-A	17S	26417	30315	245°	143	50°	40
5-19S-A	19S	26390	30326	245°	137	50°	30
5-19S-B	19S	26401	30346	245°	126	50°	50
5-21S-A	21S	26362	30338	245°	131	50°	30
5-21S-B	21S	26372	30357	245°	115	50°	50
5-23S-A	23S	26350	30379	245°	104	50°	75
5-25S-A	25S	26331	30406	245°	105	50°	90
5-27S-A	27S	26305	30421	245°	100	50°	90
5-29S-A	29S	26279	30405	245°	29	50°	80
5-31S-A	31S	26218	30382	65°	100	50°	80
5-33S-A	33S	26218	30448	245°	58	50°	55
5-35S-A	35S	26197	30472	245°	81	55°	65
5-37S-A	37S	26168	30483	245°	62	50°	55
5-39S-A	39S	26151	30514	245°	57	50°	60
5-41S-A	41S	26110	30503	65°	51	50°	70



**MASBATE MINE DUMP STUDY**  
**COLORADO PROPOSED RC DRILL HOLE**

**A. Phase I RC Drilling @ 50.0 m. Drill Spacing**

DH No.	NORTHING	EASTING	METERAGE (M.)	ELEVATION (M.)
CDA-AA2	27132.366	30113.520	24	270
CDA-AA4	27181.834	30122.041	22	268
CDA-B1	27088.476	30075.428	19	271
CDA-B3	27138.195	30083.565	28	260
CDA-B5	27187.974	30092.899	31	261
CDA-B7	27235.836	30101.405	20	264
CDA-D1	27089.665	30045.072	20	266.8
CDA-D3	27139.744	30053.665	20	243.8
CDA-D5	27188.703	30062.342	27	241.5
CDA-D7	27238.502	30071.013	18	246.5
CDA-F1	27095.623	30015.421	12	253.5
CDA-F3	27144.683	30023.919	19	234
CDA-F5	27194.255	30032.822	20	222
CDA-F7	27243.647	30041.496	10	225
CDA-H1	27125.029	29990.040	13	240
CDA-H3 3	27174.579	29998.942	30	226
CDA-H5 1	27224.377	30007.970	10	205.5
CDA-J1 2	27180.073	29968.964	20	216.2
CDA-J2 1	27229.594	29977.943	10	192.8
CDA-L1 A	27223.513	29946.389	15	184
CDA-LN1 1	27242.433	29919.170	13	176
Total Number of Holes - 21 holes				
Total Meterage - 401 meters				

**B. Phase II RC Drilling (In-Fill) @ 25.0 m. Interval**

DH No.	NORTHING	EASTING	METERAGE (M.)	ELEVATION (M.)
CDB-AA1	27107.899	30109.131	17	268.2
CDB-AA3	27156.577	30117.682	24	268
CDB-AA5	27206.069	30126.152	17	268
CDB-B2	27112.865	30079.563	29	270
CDB-B4	27162.411	30088.440	26	254
CDB-B6	27211.802	30096.911	32	267.8
CDB-D2	27114.564	30049.356	22	257
CDB-D4	27163.342	30057.602	22	236
CDB-D6	27213.629	30066.779	28	248
CDB-F2	27119.530	30019.815	18	245.5
CDB-F4	27168.870	30028.362	25	228.8
CDB-F6	27219.180	30037.131	13	220
CDB-H2	27150.312	29994.551	13	229
CDB-H4	27200.190	30003.426	20	208
CDB-J3	27205.535	29973.601	20	196.5



**MASBATE DUMP STUDY**  
**MAIN VEIN PROPOSED RC DRILL HOLE**

DH No.	NORTHING	EASTING	DEPTH (M.)	ELEVATION (M.)
MVDA-B2	24657.912	30568.988	29	77.3
MVDA-B4	24701.645	30593.939	28	90
MVDA-B6	24535.662	30498.962	16	101.5
MVDA-B8	24483.435	30467.760	15	120
MVDA-C1	24667.048	30516.819	40	90
MVDA-C3	24711.036	30542.482	46	110
MVDA-C5	24754.057	30567.026	28	112
MVDA-D1	24691.948	30473.645	34	95
MVDA-D3	24736.445	30498.901	46	105
MVDA-D5	24779.619	30524.564	17	110
MVDA-E2	24717.561	30430.928	34	112
MVDA-E4	24760.989	30456.235	15	108
MVDA-F1	24723.900	30377.438	27	114
MVDA-G1	24710.101	30312.413	20	120
MVDA-G2	24731.968	30324.456	20	119.2
MVDA-I1	24649.449	30161.781	26	131
MVDA-I3	24691.556	30186.376	17	134
MVDA-I5	24735.645	30211.175	23	150
MVDA-I7	24778.667	30236.431	19	150.5
MVDA-J10	24790.803	30186.295	19	104
MVDA-J2	24617.090	30086.135	22	130
MVDA-J4	24660.823	30111.493	38	131
MVDA-J6	24703.590	30135.478	21	151
MVDA-J8	24747.375	30160.937	27	152
MVDA-K1	24642.651	30043.316	28	94
MVDA-K3	24685.571	30067.861	28	117
MVDA-K5	24728.898	30093.066	19	128
MVDA-K7	24772.123	30118.068	12	133.5
MVDA-K9	24816.060	30143.324	7	140
MVDA-L2	24710.776	30024.941	3	99.7
MVDA-L4	24753.900	30050.400	12	118.4
MVDA-M1	24822.127	30031.872	15	115
MVDA-M3	24865.403	30056.569	15	134.5
MVDA-M4	24949.463	30105.100	7	158



DH No.	NORTHING	EASTING	DEPTH (M.)	ELEVATION (M.)
MVDA-N1	24846.976	29988.495	12	108
MVDA-N3	24890.557	30013.243	19	135
MVDA-N5	24977.262	30063.908	14	159
MVDA-O1	24872.080	29945.880	21	105.5
MVDA-03	24915.153	29970.679	30	134
MVDA-05	24959.242	29995.426	20	137
MVDA-P2	24897.182	29902.159	27	102
MVDA-P3	24941.118	29926.*938	45	134
MVDA-P5	24983.480	29952.032	30	134.4
MVDA-Q2	24922.120	29859.137	33	97
MVDA-Q4	24966.260	29884.067	20	100.5
MVDA-Q6	25030.000	29920.868	12	106
MVDA-R1	24947.311	29816.165	24	82.3
MVDA-R3	24991.146	29841.046	24	95.5
MVDA-R5	25032.994	29865.330	27	108
MVDA-R7	25077.292	29891.022	26	106
MVDA-S1	25015.782	29798.535	20	82
MVDA-S3	25058.850	29822.760	20	89
MVDA-S5	25102.280	29847.949	18	87.3
MVDA-S7	24144.589	29872.789	8	88



**MASBATE DUMP STUDY**  
**BASALT DUMP PROPOSED RC DRILL HOLE**

A. Phase I RC Drilling @ 50.0 m. Drill Spacing

DH No.	NORTHING	EASTING	METERAGE (M.)	ELEVATION (M.)
BDB-02-2	25495.892	30800.631	18	54
BDB-03-1	25434.599	30750.522	25	72
BDB-03-3	25485.213	30750.694	31	72.3
BDB-03-5	25535.011	30750.388	39	74
BDB-04-2	25443.597	30700.591	23	72
BDB-04-4	25494.565	30700.557	30	72.5
BDB-04-6	25544.518	30700.607	37	72
BDB-05-2	25440.468	30650.582	15	68.5
BDB-05-4	25490.750	30650.578	25	72
BDB-05-6	25540.829	30650.525	23	62
BDB-06-2	25462.024	30600.726	15	69
BDB-06-4	25512.255	30600.595	22	66
BDB-07-2	25461.819	30550.775	14	69.5
BDB-07-4	25511.465	30550.623	11	59.4
BDB-08-2	25463.085	30500.358	17	82
BDB-08-4	25512.454	30500.614	12	62.5
BDB-09-1	25363.411	30450.916	18	93.5
BDB-09-3	25412.370	30450.615	29	89
BDB-09-5	25462.424	30450.715	28	81
BDB-10-2	25332.904	30400.897	21	104.8
BDB-10-4	25382.881	30400.819	30	112
BDB-10-6	25432.807	30400.716	19	95
BDB-10-8	25482.479	30400.589	25	84.2
BDB-11-2	25457.869	30350.584	30	110
BDB-11-4	25507.746	30350.685	30	93.5
BDB-12-2	25496.610	30300.750	29	114
BDB-12-4	25545.977	30300.727	28	106.5
BDB-13-1	25466.993	30250.878	15	120.5
BDB-13-3	25517.224	30250.697	20	111.5
BDB-13-5	25566.973	30250.747	12	104
BDB-14-2	25467.017	30200.824	25	129
BDB-14-4	25517.248	30200.846	15	118
BDB-14-6	25567.048	30200.795	10	118
BDB-15-2	25459.974	30150.916	20	142
Total Number Of Holes = 35 holes				



**MASBATE DUMP STUDY**  
**BASALT DUMP PROPOSED RC DRILL HOLE**

B. Phase II RC Drilling (In-Fill) @ 25.0 m. Interval

DH No.	NORTHING	EASTING	METERAGE (M.)	ELEVATION (M.)
BDA-02-1	25470.112	30800.180	15	54.5
BDA-02-3	25521.006	30800.426	17	50.7
BDA-03-2	25459.867	30750.367	28	72
BDA-03-4	25509.843	30750.162	35	73
BDA-03-6	25559.186	30750.291	24	57
BDA-04-1	25418.783	30700.184	19	71.5
BDA-04-3	25468.864	30700.385	26	72.5
BDA-04-5	25519.476	30700.277	33	72
BDA-04-7	25569.453	30700.148	24	57
BDA-05-1	25415.351	30650.355	14	69.7
BDA-05-3	25465.226	30650.353	21	71.5
BDA-05-5	25515.508	30650.223	30	72
BDA-05-7	25565.815	30650.092	21	59.5
BDA-06-1	25436.575	30600.323	13	71
BDA-06-3	25486.069	30600.273	17	66
BDA-06-5	25537.342	30600.136	20	64
BDA-07-1	25436.980	30550.343	14	76
BDA-07-3	25486.956	30500.189	17	68
BDA-08-1	25437.028	30500.213	21	90.2
BDA-08-3	25487.514	30500.309	12	71.5
BDA-09-2	25387.914	30450.384	25	60
BDA-09-4	25437.001	30450.337	24	92
BDA-09-6	25487.029	30450.233	18	81.5
BDA-10-1	25308.190	30400.108	25	70
BDA-10-3	25357.914	30400.260	23	116.8
BDA-10-5	25408.324	30400.307	28	106
BDA-10-7	25457.718	30400.385	23	108.5
BDA-10-9	25507.898	30400.305	27	91.5
BDA-11-1	25432.905	30350.331	24	83.5
BDA-11-3	25482.780	30350.330	25	115.5
BDA-11-5	25533.215	30350.325	23	98
BDA-12-1	25471.975	30300.342	20	113.5
BDA-12-3	25522.028	30300.289	34	114
BDA-12-5	25571.142	30300.369	21	102
BDA-13-2	25492.590	30250.441	15	112
BDA-13-4	25542.491	30250.389	22	112
BDA-13-6	25592.721	30250.259	10	105.5
BDA-14-1	25442.255	30200.595	23	134
BDA-14-3	25493.021	30200.588	20	121.5
BDA-14-5	25542.336	30200.387	13	118
BDA-14-7	25592.416	30200.537	15	128
BDA-15-1	25435.262	30150.212	15	128



**BASE METALS MINERAL RESOURCES CORPORATION  
MASBATE GOLD MINES**

**PROPOSED DUMPS RC DRILL HOLES**

AREA	PHASE - I		PHASE - II		COMBINED	
	NO. OF HOLES	METERAGE	NO. OF HOLES	METERAGE	NO. OF HOLES	METERAGE
<b>MAIN VEIN</b>						
Dump 90						
Dump 130 HW	15	382	12	278	27	660
Dump 110 SE	14	395	12	319	26	714
PW Dump - 1	7	105	8	156	15	261
PW Dump - 2	17	341	13	243	30	584
<b>Sub-Total</b>	<b>53</b>	<b>1,223</b>	<b>45</b>	<b>996</b>	<b>98</b>	<b>2,219</b>
<b>BASALT</b>						
Dump 90 / 60	34	761	43	911	77	1,672
<b>COLORADO</b>						
Dump 270	21	401	15	326	36	727
<b>TOTAL</b>	<b>108</b>	<b>2,535</b>	<b>103</b>	<b>2,083</b>	<b>211</b>	<b>4,618</b>



**MASBATE DUMP STUDY**  
**MAIN VEIN PROPOSED RC DRILL HOLE**

<b>DH No.</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>DEPTH (M.)</b>	<b>ELEVATION (M.)</b>
MVDB-B1	24636.912	30556.453	20	63.8
MVDB-B3	24680.187	30581.236	31	84.5
MVDB-B5	24724.230	30606.828	16	89
MVDB-B7	24512.952	30484.811	13	108
MVDB-C2	24689.610	30529.266	45	102
MVDB-C4	24732.481	30554.458	34	106
MVDB-C6	24776.217	30579.798	19	114
MVDB-D2	24714.036	30485.739	38	104.3
MVDB-D4	24757.419	30511.538	28	111
MVDB-E1	24695.953	30418.034	32	105
MVDB-E3	24738.824	30443.125	26	112
MVDB-F2	24745.919	30390.295	17	114
MVDB-I2	24670.413	30173.094	19	131
MVDB-I4	24714.051	30198.943	12	134
MVDB-I6	24755.946	30222.667	21	150.2
MVDB-J1	24596.603	30073.264	12	95.7
MVDB-J3	24640.237	30098.655	37	122
MVDB-J5	24682.748	30123.138	30	132
MVDB-J7	24726.431	30148.275	21	139.5
MVDB-J9	24768.434	30172.812	24	152
MVDB-K2	24664.717	30055.637	24	99
MVDB-K4	24707.736	30080.116	20	121
MVDB-K8	24794.288	30130.140	12	138.5
MVDB-L1	24690.213	30012.561	6	97
MVDB-L3	24732.673	30037.095	5	107.4
MVDB-M2	24843.959	30043.997	19	127
MVDB-N2	24869.151	30001.075	20	127
MVDB-N4	24912.323	30025.707	16	138
MVDB-O2	24894.546	29958.000	27	124
MVDB-04	24937.413	29982.684	23	135
MVDB-06	24980.997	30007.974	15	141



DH No.	NORTHING	EASTING	DEPTH (M.)	ELEVATION (M.)
MVDB-P1	24875.594	29889.487	30	97
MVDB-P4	24961.892	29939.411	37	134
MVDB-P6	25004.707	29963.994	25	135
MVDB-Q1	24900.734	29846.312	28	85.3
MVDB-Q3	24943.655	29871.504	30	102
MVDB-Q5	24987.235	29896.234	18	103
MVDB-Q7	25053.326	29934.901	20	112.2
MVDB-R2	24968.184	29828.180	32	96.8
MVDB-R4	25012.071	29853.264	17	94
MVDB-R6	25055.500	29878.301	25	106
MVDB-S2	25037.061	29810.497	20	85.5
MVDB-S4	25080.797	29835.836	20	86.5
MVDB-S6	25123.561	29860.317	12	88



## BINSTAR PROPOSED DIAMOND DRILL HOLES

DRILL HOLE NUMBER	PANEL SECTION	NORTHING	EASTING	AZIMUTH	COLLAR ELEVATION	INCLINATION	DEPTH
BIN-40N-1	40N	30685	25256	225°	96 m.	-45°	200 m.
BIN-36N-1	36N	30608	25203	225°	82.5 m.	-45°	200 m.
BIN-32N-1	32N	30600	25136	225°	80 m.	-45°	160 m.
BIN-28N-1	28N	30617	25075	225°	77 m.	-45°	150 m.
BIN-24N-1	24N	30640	25032	225°	59.5 m.	-45°	160 m.
BIN-20N-1	20N	30672	24975	225°	64 m.	-45°	190 m.
BIN-16N-1	16N	30628	24887	75°	104.5 m.	-60°	120 m.
BIN-14N-1	14N	30645	24860	225°	103 m.	-55°	95 m.
BIN-8N-1A	8N	30670	24774	75°	85 m.	-45°	95 m.
BIN-8N-1B	8N	30726	24800	75°	86 m.	-45°	45 m.
BIN-4N-1A	4N	30671	24710	75°	69 m.	55°	60 m.
BIN-4N-1B	4N	30694	24720	225°	77 m.	60°	100 m.
BIN-2S-1A	2S	30707	30707	75°	53 m.	60°	70 m.
BIN-2S-1B	2S	24605	24605	225°	53 m.	70°	75 m.
BIN-6S-1A	6S	30749	30749	75°	54 m.	50°	55 m.
BIN-6S-1B	6S	24572	24572	225°	54 m.	60°	60 m.
BIN-8S-1	8S	30790	24567	225°	74 m.	45°	110 m.

## DABU-PANINQUE PROPOSED DIAMOND DRILL HOLES

DRILL HOLE NUMBER	PANEL SECTION	NORTHING	EASTING	AZIMUTH	COLLAR ELEVATION	INCLINATION	DEPTH
DP-8S-1	8S	30181	24287	65°	45.0 m.	45°	90 m.
DP-12S-1	12S	30221	24235	65°	45.0 m.	45°	90 m.
DP-16S-1	16S	30270	24193	65°	45.0 m.	45°	100 m.
DP-20S-1	20S	30317	24148	65°	41.0 m	45°	110 m.
DP-24S-1	24S	30350	24098	65°	38.5 m	45°	160 m.
DP-28S-1	28S	30467	24086	65°	78.0 m	45°	180 m.
DP-32S-1	32S	30523	24086	65°	83.0 m	45°	190 m.
DP-36S-1	36S	30593	24015	65°	123.0 m	45°	150 m.



TWO YEAR EXPLORATION PROGRAM

ACTIVITIES	FIRST YEAR												SECOND YEAR												REMARKS
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Drill Site Preparation		█																							Drill site surveying - Bulldozing
RC Drilling			█																						Schedule include mobilization and downtime
Drill Site Preparation			█																						Drill site surveying - Bulldozing
RC Drilling				█																					Schedule include mobilization and downtime
Preparation						█																			Drill site surveying - Bulldozing
g							█																		Schedule include mobilization and downtime
d Mapping												█													Detailed mapping and trench lay-out
ching/Sampling													█												Trenching at 60 m. apart/infill at 30 m.
ension - Mapping														█											Detailed mapping & trench lay-out
ension - Trenching/Sampling															█										Trenching at 60 m. apart/infill at 30 m.
nd - Drill Site Preparation																█									Drill site surveying - Bulldozing
nd - Diamond Drilling																	█								Schedule include mobilization and downtime
l - Drill Site Preparation																		█							Drill site surveying - Bulldozing
- Diamond Drilling																					█				Schedule include mobilization and downtime

Republic of the Philippines  
Department of Environment and Natural Resources  
**MINES AND GEOSCIENCES BUREAU**  
North Avenue, Diliman, Quezon City

## ENVIRONMENTAL WORK PROGRAM

### 1.0 NAME AND ADDRESS OF PROJECT PROPONENT

1.1 **Name of Proponent** : Base Metals Mineral Resources Corporation

1.2 **Address of Proponent**

Office : 4<sup>th</sup> Floor Trans Phil House Bldg.  
1177 Chino Roces Ave. cor. Bagtikan St.  
Makati City 1231

Minesite : Sitio Bari-is, Puro, Aroroy, Masbate, 5414

Tel. No. : 896-2041

Fax No. : 895-1356

### 2.0 TYPE AND NATURE OF PROJECT

#### 2.1 Project Description

This MPSA application (APSA-V-0029) is for a gold exploration project over four potential areas identified as Holy Cross, Basalt/ Holy Moses, Colorado areas and Libra, all in Aroroy, Masbate.

The objectives are; 1) To block more ore reserves and supplement the ore reserve requirement for the Feasibility Study; and 2) To evaluate the lower extension of the orebody for underground operation.

The amount needed to implement the proposed exploration work is approximately PhP 21.8009 Million. This includes budget for the environmental work program and socio-economic development programs, distributed yearly as follows:

	<i>Exploration Work</i>	<i>Environmental work</i>	<i>Total</i>
<i>First Year</i> :	6.6420	0.6642	7.3062
<i>Second Year</i> :	13.1770	1.3177	14.4947
<b><i>Total</i></b> :	<b>19.8190</b>	<b>1.9819</b>	<b>21.8009</b>

### 3.0 GENERAL LOCATION AND AREA TO BE COVERED BY THE PROPOSED PERMIT/CONTRACT AREA:

#### 3.1 Location and Accessibility

The proposed exploration project is in Brgys. Bangon, Syndicate and Panique within the Municipality of Aroroy, Province of Masbate and bounded by the coordinates 123° 22' 58" to 123° 24' 30" and 12° 27' 20" to 12°



From Manila, the area is accessible by air to Masbate, Masbate. Daily regular flights are available and travel time is about one hour and twenty minutes.

From Masbate town proper, the area is accessible by land thru a 67 kms. gravel provincial roads. Pump boats from Masbate town to Aroroy town are also available.

### 3.2 Total Area Covered by the Application

The site covers twenty (20) mining claims of 289.9466 hectares broken down as follows (see attached map on Annex A):

#### A. Claims with Leased Contract issued after the 1987 constitution

	Claims	Area ( <i>hectares</i> )
1.	King Fr.	2.641
2.	Malino	9.000
3.	Ed Fr.	5.447
4.	Horblendite Fr.	6.782
5.	Kate	9.000
6.	Pearl	9.000
7.	Lewes	9.000
8.	Andesite	8.958
9.	Cripple Creek	8.452
10.	Independence	9.000
11.	Anaconda	9.000

#### B. Claims with Declaration of Location/Mining Lease Application

	Claim	Areas ( <i>hectares</i> )
1.	Oak Fr.	2.6153
2.	Basalt	8.8427
3.	Serpentine	6.5666
4.	Gemini	6.3812
5.	Pisces	20.5035
6.	Libra	24.4292
7.	Leo	30.8840
8.	Angeles	62.8669
9.	Virgilio	40.5778

<i>Total Area (hectares)</i>	=	289.9466
<i>Location of Claims</i>	=	Barangays Bangon, Syndicate and Panique, Municipality of Aroroy, Province of Masbate
<i>Kinds of Minerals</i>	=	Gold, Silver and other Associated Minerals
<i>Total No. of Claims</i>	=	20

## 4.0 DESCRIPTION OF THE EXISTING ENVIRONMENT WHERE WORK IS PROPOSED TO BE UNDERTAKEN :

### 4.1 Land Environment

The information and data provided herein are based on available baseline data

#### **4.1.1 Topography/Physiography**

The exploration areas are generally characterized by moderate to rolling topography with many conspicuous domal/conical promontories, flanked by relative flat terrain. The prominent topographical height reaches 325 meters above sea level. More rugged topography with sharp ridges is noted at the eastern and southern portion of the project areas extending to the boundaries of the comprising barangays.

#### **4.1.2 Land Use/Capability**

The proposed areas are classified as mineral lands. The surrounding areas are suited for grazing, hence the presence of many cattle ranches. Although an estimated 1/10 of its total land area is flat and suitable for agricultural/vegetative crops, the residents prefer the quick and more lucrative gold panning as their means of livelihood.

Makeshifts houses made of nipa, bamboo and light wooden materials are found along areas where slopes are more favorable and closer to the access road.

#### **4.1.3 Pedology**

The topographical relief features distinct vegetation growth, reflective of the dominant soil type found in the applied area. The mountainous eastern and southern sections of the project area have shallow soil accumulations (clays and talus), mainly due to moderate and steeply sloping ground.

The eastern mountain areas generally represent the mineralized ground where most of the exploration activities will be conducted. Poor vegetation growth at this section is largely due to thin and mineralized soil cover. Slight to moderate erosion are confined on rill and gullies.

The unmineralized western part of the applied area are characterized by flat to very gently sloping grounds, mostly grasslands and patchy ricefields in alluvium soil.

### **4.2 Water Environment**

#### **4.2.1 Water Quality**

Monthly water samplings are made on practically all sources of water. This is made to ascertain potability and/or contamination of its sources to ensure the safety and health of its users and protection of the environment as well.

The following is the Average Water Sampling Results from March to October 1997 for reference.



## ENVIRONMENTAL WATER SAMPLES

### Average Results of Water Samples from March to October 1997

		Total Cyanide (ppm)	PH	TSS (mg/l)	TDS (mg/l)	GOLD (ppm)	MERCURY (ppm)
Max. Tolerable Limits >>		<.001	6.0-9.0	50	1,000	-	0.0020
LOCATION							
1.	Syndicate Area	NIL	7.44	32.63	120	0	0.0030
2.	Earth Dam	NIL	7.43	35.71	131.25	0	0
3.	Pump House	NIL	7.46	46.38	182.50	0	0.0010
4.	Old Tailings Pond	NIL	7.40	-	-	0	-
5.	Pajes Well	NIL	7.16	-	-	0	-
6.	Medina Well	NIL	7.23	-	-	0	-
7.	Guinobatan River (downstream)	NIL	7.49	-	-	0	-
8.	Bigno Well	NIL	6.79	-	-	0	-
9.	Canencia Well	NIL	6.85	-	-	0	-
10.	Sujede Well	NIL	6.90	-	-	0	-
11.	Paraiso Well	NIL	6.99	-	-	0	-
12.	Ducot Well	NIL	6.91	-	-	0	-
13.	Emergency Tailings Pond	NIL	7.30	-	-	0	0.0025
14.	Anseca Pool	NIL	7.80	-	-	0.01	0

#### 4.2.2 Hydrology

During the rainy season, run-off water in the area is high due to frequent typhoons and prolonged monsoon rains aggravated by rugged topography. The watershed of the Bangon and Guinobatan major river areas drained essentially by dendritic drainage network which flows Northwestward to Port Barrera Sea. Rare instances of river swelling and flooding occurs, normally at the height of strong typhoons. The Guinobatan River is the main source of both domestic and industrial water of the local residents and the mining community all year round. Annual water measurement were obtained from a weir installed midstream of the Guinobatan River. From historic record, the annual average water inflow during the rainy season far exceeds 6000 gpm, while dry season average inflow is about 1000 gpm. Excellent climate and uninhabited watershed areas contribute to continues water supply to the inhabitants. The proposed exploration areas, however, are outside the watershed.

#### 4.3 Climatology/Meteorology

The climate is relatively humid with annual rainfall varying from 24 to 26 cms. The average rainfall data were obtained from the Philippine Atmospheric, Geophysical and Astronomical Services administration or PAG-ASA, Masbate Station, rainfall amount from 1961 to 1995. Rainy season is from June to January with dry season for the rest of the months. The area has an excellent climate and good air circulation due to the absence of heavy vehicular traffic, high-rise buildings and other industries.

The temperature is warm during the months of February, March, April and May. From June to January, the climate is generally cool with coolest period during December and January.

#### 4.4 Geological/Geomorphological Environment

##### 4.4.1 General Geology and Geomorphology

flanked by relatively flat terrain which are blanketed by agglomerates, lithified tuff and some volcanoclastics about the watermost flank. These data are based on the feasibility study undertaken by the company.

Two prominent topographical high in the vicinity marked the location of the Main Vein area (Holy Cross & Basalt/Holy Moses), 156m. above sea level and farther 1 km north and across the main river (Rio Guinobatan), another contemporary gold mine (Colorado) located at Canatonatoan Peak 325 m. elevation.

The principal mineral to be explored is gold, classified into two genetic types of ore deposits; gold-bearing quartz vein and placer. The gold-bearing quartz veins are localized and confined within the northeast trending tensional joints or faults in the grandiorite stock..

In general, the highest grade gold ore follows the contact of the grandiorite and ultramafic complex. The ore minerals consist principally of native gold with some galena, sphalerite and chalcopryrite. Quartz is the dominant gangue mineral. The type of rock that is present underground (from old tunnels of Atlas Consolidated Mining and Development Corporation) are serpentinized peridotite, granodiorite, aplite and lamprophyre. Granodiorite is by far the predominant rock. Biotite flakes impart foliation to the rock and they are crinkled in such a way that the crinkles constitute lineation. The principal sulfides consist of pyrite, sphalerite, chalcopryrite and galena. These minerals are intimately associated with native gold and some silver.

The placer type refers to the river deposits which represents the continuous and successive depositions of detrital materials derived mainly from the weathering and disintegration of surrounding rock units in the area. They are mostly made up of fragments of altered rocks, ultramafics, intrusives and extrusives and associated sedimentary rocks. These materials were transported by surface waters occurring as veins or as discrete particles in the country rock must have undergone the same process. During the process of panning, the gold particles intimately associated with fine magnetite minerals and other heavy minerals are recovered.

The prospect is bounded by the Guinobatan river at its south eastern periphery and the river at its south eastern periphery. The river drained westward at the central section as defined by the valley between Mt. Canatonatoan (Colorado) and the high relief promontories of Basalt/Holy Moses mining areas. Farther 7 km. Southwest is the bigger Lanang river which is subparallel to Rio Guinobatan, its head waters drained farther 20 km. the southern minesite of Bart-Ag, IXL and David Sun areas. Both rivers empty at the flat marshy grounds of Port Barrera Cove.

Except for some occasional trees, the area is generally covered with cogon. The cultivated ground along slopes and flat areas within the claims are planted with a few coconut while the rest are bare.

#### **4.4.2 Structural Setting**

The locations of all of the five (5) gold mining districts are along the



country. The Masbate vein system is thought to be a north-west split or branch of the rift zone which controlled the mega fractures and the alignment of the volcanic plugs. These splits and branches of the rift zone could have potential for gold mineralization.

The Main Vein area is transected by several north-west-trending tension fractures and is apparently situated on an elevated fault block reflecting the great upward push by extensive and continuous volcanic activity. The north-west recurrent shear zones are further complicated by the post-tension fractures.

The understanding of the fracturing system is the key to the potential auriferous quartz vein-fault system. The main tension NNW fracture is reflected by the general trend of the Wyoming and Doris veins; while WSW recurrent shear zones are the Breccia, El Sol and Holy Moses Veins. The WNW post-tension fractures are represented by minor veins (Gold Bug, Kansas and Dabu).

#### **4.4.3 Lithology**

1. *Metasedimentary Rocks (MS)*: Consist of mildly metamorphosed sandstone and siltstone interbeds occupying the eastern boundary of the mine site, is the oldest rock formation exposure.
2. *Tuffaceous Agglomerate (TA)*: The most widespread in the area and vicinity which occupies the northern and western flanks on the site. It is the assemblage of inter-grading meta-tuff and agglomerate.
3. *Andesitic Agglomerate (AA)*: They are located distinctly within the Main Vein and appeared in close association with the Andesite flows and dikes of later volcanic plug assimilating the agglomerate.
4. *Hornblende-Augite Andesite Porphyry (HAA)*: Intruded mostly the pyroclastics in close proximity with the quartz veining, consisting of lath-shaped hornblende and short stubby augite phenocrysts in an andesitic groundness.

#### **4.4.5 Mineralization and Hydrothermal Alteration**

Free gold and silver metal deposition is controlled by silica-flooding and argillization. However, the gold-silver metals are more concentrated in the quartz veins and/or in the silicified and intensely argillized wall rocks in the form of ultra-fine (10-20 microns) disseminations.

Silicification ranges from pure fracture-filling to pervasive-replacement within the fracture and about 1-3 meters beyond, argillization (bleaching) is most intense. Further away, chloritization and pyritization predominates and the gold and silver values die out. Ore values are only within the quartz veins and the argillized zones.

Calcite dilutes the gold concentration and chalcopyrite is occasionally seen.

cellular and resembles a honeycomb structure with black and sooty coatings. It is from these veins where tonnage and grade estimation can throw us off because of its light and friable character and of its unusually high (on occasion, above 20 g/dmt) gold values. Au and Mn ions, being more stable, were left behind and reconcentrated in the cavities.

The consistently higher grade values (above 3 g/dmt) are usually hosted in the brecciated and re-cemented quartz veins. The vein mass is composed of quartz and silicified rock fragments re-cemented in quartz. The process of silica-flooding, silification and brecciation has been recurrent thereby enriching further the vein mass. These brecciated veins are located at or near the intersection of the major quartz veins (Wyoming-Doris and Breccia) and Breccia vein itself. Although the veins are not more than 90 meters wide, the intersection measures 150 meters across. The resulting vein structure assumes a pipe-like shape and also happens to be the most ideal orebody configuration for open pit mining.

The tuffaceous agglomerate appeared more receptive to quartz veining and replacement than its lithic to lapilli tuff counterpart considering the relative degree of porosity-permeability. Furthermore the formation could have been at the epithermal-low pressure setting in the stratification sequence of host rocks.

## **4.5 Biological Environment**

### **4.5.1 Terrestrial plants and animals**

#### **i. Animals**

Cattle ranches are abundant in the surrounding areas. Herds of cows are seen outside the proposed contract areas grazing for green vegetation. Though some of these ranches are inside other MPSA applications, these are outside and far from the proposed exploration projects under APSA V-0029.

Domesticated animals such as carabaos, horses, cows, goats, pigs and chicken are also found in the area. Their number is limited since the site is not an agricultural land and very few residents are engage in farming. A few specie of migrating birds are seen in the areas but is not home to any form of exotic or rare animal species that requires protection. The ecological niche occupied by the native fauna is almost taken over by the introduced animal species. Wildlife, such as deer, wild boar, monitor lizard and monkeys are no longer in the area.

#### **ii. Plants**

The area is generally covered with cogon grasses and shrubs suited for grazing. Mangroves and swampy areas are found in the northwestern side of the mining claims along the coastal areas of Port Barrera. Occasional trees can be seen along the banks of creeks, brooks, streams and rivers. The hills and valleys are practically barren except for patches of rice and corn farmlands, vegetative crops, and coconut trees which grow in clusters.



#### **4.5.2 Marine Plants and Animals**

A number of fish species such as carp, bangus and tilapia can be found in the Lanang and Guinobatan Rivers.

#### **4.6 Socio-Economic Environment**

The development of the Municipality of Aroroy lags behind in comparison to the booming and buzzing urban centers in the neighboring provinces. Except for the few elite residents, the economic and social conditions of the majority are below standard. About 10% of the town folks depend on gold panning as their main source of livelihood. Other residents are engaged in fishing, small scale business like buying and selling, eateries, sari-sari store and transportation business utilizing jeepneys and motorized bancas. Some are employed in the government offices.

Residential houses are mostly concentrated in the barrio site of Bangon and Puro. Makeshifts houses are scattered within the areas but will not be affected by the exploration activities. Electricity is not available in the area. Privately owned generators are the only source of power

The company will undertake a more detailed study on the environment as part of its exploration work program. The study will be comprehensive and will be submitted to the Bureau within the two year exploration period. This will include detailed data presentation of the existing conditions of the surface and subsurface water, water quality, current water use, marine environment adjacent to the proposed project site, current land use (particularly discussion on the forest reserve and contract reforestation are close to the project), soil chemical characteristics, coastal use, socio-economic profile to include people's perception on the proposed project, present biological (flora & fauna) environment, near shore and marine environment and other relevant information.

### **5.0 DESCRIPTION OF EXPLORATION WORK**

#### **5.1 Description of Exploration Methods and Equipment to be used**

##### **5.1.1 Geological Mapping**

The areas covered by APSA V-0029 application are in a contiguous prospective mineralized zones, which includes Colorado Vein 5 at the north, Basalt/Holy Moses vein system at the east and Holy cross vein at the south west section.

Compass - tape traverse will be undertaken to map the vein exposure of the prospective areas with enough rock outcrop exposures on ridges and creeks.

Rock outcrop sampling on vein and altered mineralized zones will be done by channeling with moil and sledge hammer, for initial assay for gold grade determination.

##### **5.1.2 Geophysical Method**

In some structural discontinuity of exposures as in Colorado vein 5 and Holy Cross vein, Self Potential (SP) survey will be conducted to

### 5.1.3 Exploration Drilling/Others

Follow-up trenching on prospective anomalous Self Potential zones will be conducted to expose and verify mineralized zones of vein structures.

After the delineation of mineralized zones at surface exposures, Diamond and RC drilling will be undertaken to block the ore reserve of the prospective area.

The diamond or core drilling method will be utilized to drill deeper holes. Core drilling method relies heavily on lube oil, grease, diesel fuel, bentonite drilling muds, gels and various mud additives as the main chemical agents used during drilling operations.

The reverse circulation or RC drilling method will be utilized to drill and sample shallow holes. RC drilling method operates on compressed air supplied by compressor as the drilling medium. Unlike core drilling, RC drilling operations uses lube oil, grease, diesel fuel and drilling foams to stabilize caving holes.

The following major equipment will be used:

- a. Drill equipment – RCD and DD
- b. Trucks
- c. Bulldozers
- d. Water pumps

### 5.2 Preliminary Processing of Sample

Collected sample from the field outcrop exposures; from trenches and drill core re-cutting samples will be split at the sample/core house for duplicate preserved reference and the other samples submitted to Assay Laboratory for gold assay analysis.

### 5.3 Map Showing the Location of the Proposed Work Area in relation to readily identified geographic and environment features

See attached map on Annex A

### 5.4 Estimated Exploration Cost

EXPLORATION EXPENSES	YEAR 1	YEAR 2	TOTAL
LABOR AND SUPERVISION	522,000	757,000	1,279,000
SAMPLES/ASSAY COST	500,000	300,000	800,000
FIELD SUPPLIES	120,000	120,000	240,000
CONTRACT DRILLING	5,500,000	-	5,500,000
CONTRACT CORE DRILLING	-	12,000,000	12,000,000
TOTAL	6,642,000	13,177,000	19,819,000
+ 10% Contingency	664,200	1,317,700	1,981,900



## **6.0 IDENTIFICATION OF POTENTIAL ENVIRONMENT EFFECTS**

### **6.1 On Land**

With the road network already existing during the operation of Atlas Consolidated Mining and Development Corporation (ACMDC), there is no significant potential environmental effects identified on constructing access roads. The planned exploration activities will only involve the construction of short and narrow feeder roads.

The possible environmental effect may come during movement of drilling equipment and drillsite preparations. The drilling operations will strip rock materials and the vegetation growth within the confines of the drilling site. Drilling operations will produce some noise and fumes/dust. There will be minimal surface disturbance and soil contamination considering that existing roads and short extensions will be utilized for access to the drill sites.

The exploration campsites will be properly maintained with proper sanitation to allow full reclamation. Non-biodegradable waste (e.g. container drums, lube oils, grease and other exploration waste will be removed from the exploration site and disposed of properly. The exploration team will be quartered at the existing mine facilities since the housing compound is close to the exploration sites.

### **6.2 Changes in hydrology**

Major flooding will be a remote possibility due to a limited watershed and drainage network. There will be no major ecological alteration. Vegetation that will be destroyed will be replenished or compensated by the present reforestation/afforestation project of the company. Existing hydrologic cycle will thus be maintained. Water used in drilling is returned uncontaminated.

### **6.3 On the ecology.**

Vegetative cover in the project area composed mainly of cogon grasses, trees of low commercial value and a number of fruit trees. This would affect only small areas since drilling activities will be conducted at areas where potential deposits are needed for confirmation.

## **7.0 ENVIRONMENTAL MANAGEMENT MEASURES:**

**7.1** Creation of Company Environmental Management Officers who will be responsible for monitoring and implementing programs for regulatory compliance.

**7.2** To protect any special habitat of flora and fauna in the area, hunting of wildlife and rare animal/bird species shall be strictly prohibited in the area. Kaingin and setting fire on vegetation shall be restricted.

**7.3** All trenches will be fenced off. Topsoil will be separated from the subsoil to prevent formation of "acid mine drainage" and loss of plant nutrients. Drainage system will be incorporated to minimize erosion and landslides. Test pits and major excavation will be backfilled and recontoured in such a way that slope failure will not occur and the area

- 7.4 Cutting of trees will be avoided as much as possible.
- 7.5 At the exploration sites, drill sumps will be lined with impervious materials to prevent the possibility of contaminating the soil. The effluents from the drill equipment will be directed into a collecting sump for proper disposal.
- 7.6 Areas compacted as a result of the activities shall be ripped prior to re-vegetation and restored, as much as possible, to its original topography.
- 7.7 All excavated materials will be contained for subsequent backfilling, re-vegetation and prevention of ARD.
- 7.8 Drill sumps shall be cleaned of possible contaminants prior to backfilling of original materials.
- 7.9 Vegetation that will be destroyed will be replenished or compensated by reforestation/afforestation projects. A nursery may be maintained for this purpose.
- 7.10 The exploration activities will ensure that the ranches and coconut plantations in the vicinity and the nearby coastal areas, will not be affected.
- 7.11 The drill sites will be located, as much as possible, away from natural drainage system.
- 7.12 Information Education Campaigns will be implemented for the communities during the exploration stage and an assessment of public perception to the project will be undertaken. The activities will be coordinated with the affected residents.
- 7.13 Damages resulting from the exploration activities will be compensated.
- 7.14 The environmental management budget is 10% of the total cost of exploration work program.

Prepared by:

  
DANILO LATUGA  
Mines Division Manager

3/12/98







