

UPDATED FORM – I
&
PRE-FEASIBILITY REPORT

Of
**1000 TPD GOLD ORE PROCESSING PLANT
GANAJUR GOLD PROJECT**

At
**Ganajur Village, Haveri Taluk,
Haveri District, Karnataka.**

By
Deccan Exploration Services Pvt. Ltd

Prepared By



B.S. ENVI-TECH (P) LTD.
Secunderabad – 500 017.

FORM 1

(As Per New Notification of Mo.E.F dated 1-12-2009 vide SO 3067 (E))

BASIC INFORMATION		
S. No	Item	Details
1	Name of the Project/s	1000 TPD GOLD ORE PROCESSING PLANT DECCAN EXPLORATION SERVICES (P) LIMITED
2	S. No. in the schedule	3(a)
3	Proposed capacity/ area/ length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled	Proposed capacity:1000 TPD Gold Ore Processing Area: 56.67 Ha
4	New/ expansion/ modernization	New
5	Existing capacity/ Area etc.	-
6	Category of Project i.e 'A' or 'B'	A
7	Does it attract the general condition? If yes please specify.	No
8	Does it attract the specific condition? If yes please specify.	No
9	Location	
	Plot/ Survey/ Khasra No	68,69, 71,78A/1, 78A/1B/1,79,80, 86,87,90,91,92,93,
	Village	Ganajur
	Tehsil	Haveri
	District	Haveri
	State	Karnataka
10	Nearest railway station/ airport along with distance in Kms.	Railway Station: Karajgi- 1.1 kms Airport: Hubli- 70 kms
11	Nearest town, city, district head quarters along with distance in kms.	Haveri City (7 km) and District
12	Village panchayaths, Zillaparishad, Municipal Corporation, Local body (Complete postal addresses with telephone nos to be given)	Ganajur Village, Kolar Panchayat, Haveri ZP, Haveri Municipality
13	Name of the applicant	Deccan Exploration Services Pvt. Ltd.
14	Registered address	Deccan Exploration Services Pvt. Ltd.,No 5, 19th Main Road 4th Sector, HSR Lay Out Bangalore-560102(INDIA) Fax: +918067155701
15	Address for correspondence	
	Name	Saradchandra Rao Peshwa
	Designation (Owner /Partner/ CEO)	Director

	Address	Deccan Exploration Services Pvt. Ltd No 5, 19th Main Road, 4th Sector, HSR Lay Out, Bangalore (INDIA).
	Pin code	560 102
	E- mail	peshwa@deccangoldmines.com info@deccangoldmines.com
	Telephone no.	080-67155700
	Fax no.	080-67155701
16	Details of Alternative sites examined, if any location of these sites should be shown on a topo sheet.	The project was accorded TOR.
17	Interlinked projects	Ganajur Gold Mining Project of 29.14 Ha. At Ganajur Village, Haveri Taluk, Haveri District, Karnataka
18	Whether separate application of interlinked project has been submitted?	Yes
19	If yes, date of submission	30-05-2017.
20	If no, reason	Not applicable
21	Whether the proposal involves approval/ clearance under: if yes, details of the same and their status to be given. (a) The Forest (Conservation) Act, 1980 (b) The Wild Life (Protection) Act, 1972 (c) The CRZ Notification, 1991	No
22	Whether there is any Government Order/ Policy relevant/ relating to the site?	No
23	Forest land involved (hectares)	No
24	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? (a) Name of the court (b) Case No (c) Orders/ directions of the court, if any and its relevance with the proposed project.	No

(I) ACTIVITY			
1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)			
S.No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan.	Yes	Present land use of 56.67 Ha is private agricultural land. This land will be converted for industrial purpose.
1.2	Clearance of existing land, vegetation and buildings?	Yes	Site will be cleared from agricultural activities.
1.3	Creation of new land uses?	Yes	As specified under Point 1.1
1.4	Pre-construction investigations e.g. bore houses, soil testing?	Yes	Site investigation for foundation will be done
1.5	Construction works?	Yes	Processing plant along with other infrastructure will be commissioned to process the gold ore extracted from the proposed captive Ganajur Gold Mine.
1.6	Demolition works?	No	None
1.7	Temporary sites used for construction works or housing of construction workers?	No	None
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	The built-up area increases with the erection of processing plant with auxiliaries
1.9	Underground works including mining or tunneling?	No	None
1.10	Reclamation works?	Yes	Tailing dump will be reclaimed as follows: <ul style="list-style-type: none"> • Installation of a waste rock layer, commencing at the perimeter of the TSF top surface and progressing towards the centre • Installation of clay cap on the side slope and top forming a low permeability liner, preventing the ingress of oxygen into the tailings material

			<ul style="list-style-type: none"> • A loamy typically topsoil layer will be installed over the clay cap for the establishment of vegetation.
1.11	Dredging?	No	None
1.12	Offshore structures?	No	None
1.13	Production and manufacturing processes?	Yes	<p>The processing of the gold ore is as follows: The gold in upper surface layers (10-20 meters deep) is oxidized. The deeper layers of ore body contain gold predominantly in sulphide matrix. The oxide ore will be mined first and will be extracted by adopting Crushing-Grinding Gravity separation - Cyanidation - Carbon in Pulp (CIP) - Electrolysis technique. Sulphide ore will be mined and treated by Crushing-Grinding-Gravity separation - Flotation - UFG Sulphide Concentrate - Carbon in Leach (CIL)- Electrolysis process. The stripped gold is then smelted to produce gold bullion.</p>
1.14	Facilities for storage of goods or materials?	Yes	Adequate storage bins will be provided
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	<p>Prior to disposal of the residue from the oxide leach/CIP or sulphide CIL circuit to the TSF, the residual cyanide and arsenic in the process solution will be removed by the Inco method (SO₂/O₂ addition) and ferric sulphate addition (sulphide ore only).</p>
1.16	Facilities for long term housing of operational workers?	No	No housing is proposed
1.17	New road, rail or sea traffic during construction or operation?	Yes	New road will be laid from Mine to plant
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	Yes	New road will be laid from Mine to plant
1.19	Closure or diversion of existing	No	No diversion is involved.

	transport routes or infrastructure leading to changes in traffic movements?		
1.20	New or diverted transmission lines or pipelines?	Yes	A 13.2 km 110 KV power transmission line from the KPTCL state grid will be installed to provide power to the process plant.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	None
1.22	Stream crossings?	No	None
1.23	Abstraction or transfers of water from ground or surface waters?	Yes	To operate the process plant, the requirement of water would be about 3000 KLD. Water will be catered through a 6.5 km pipe line from 'Kolur-Kalasur barrage' built across Varda River as well as through bore wells.
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	None
1.25	Transport of personnel or materials for construction, operation or decommissioning?	No	None
1.26	Long-term dismantling or decommissioning or restoration works?	No	None
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	None
1.28	Influx of people to an area in either temporarily or permanently?	Yes	Manpower of around 100 will be employed.
1.29	Introduction of alien species?	No	None
	Loss of native species or genetic diversity?	No	None
1.31	Any other actions?	No	None

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply)			
S.No.	Information/checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	Yes	56.67 Ha
2.2	Water (expected source & competing users) unit: KLD	Yes	3000 KLD. Water will be catered through a 6.5 km pipe line from 'Kolur-Kalapur barrage' built across Varada River as well as through bore wells.
2.3	Minerals (MT)	Yes	
2.4	Construction material – stone, aggregates, sand / soil (expected source – MT)	Yes	Cement -300 MT Coarse Aggregate-40,000m ³ Fine Aggregate-60,000m ³ .
2.5	Forests and timber (source – MT)	No	Nil-
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	5 MW serviced by HESCOM.
2.7	Any other natural resources (use appropriate standard units)	No	None

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.			
S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	YES	Cyanide-700 kg/day-
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	None
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	The project will bring improvement in the socio-economic levels in the study area.
3.4	Vulnerable groups of people who	No	None

	could be affected by the project e.g. hospital patients, children, the elderly etc.,		
3.5	Any other causes	No	Nil

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S.No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	Yes	Mill tailings to the tune of 0.3 million tonnes per year will get generated as reject from the process plant, after extraction of Gold metal. The tailings will be disposed off separately in a designated Tailings Storage Facility (TSF) of approximately 2.60 million tonnes capacity. The tailings will be disposed-off by pumping in the form of a Slurry.
4.2	Municipal waste (domestic and or commercial wastes)	No	None
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	No	None
4.4	Other industrial process wastes	Yes	Tailings (2.60 million tonnes)
4.5	Surplus product	No	None
4.6	Sewage sludge or other sludge from effluent treatment	No	None
4.7	Construction or demolition wastes	No	None
4.8	Redundant machinery or equipment	No	None
4.9	Contaminated soils or other materials	No	None
4.10	Agricultural wastes	No	None
4.11	Other solid wastes	No	Tailings-2.60 million tonnes

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	No	None

5.2	Emissions from production processes	Yes	Dust – 0.41 kg/hr
5.3	Emissions from materials handling including storage or transport	Yes	Dust – 0.166 kg/hr
5.4	Emissions from construction activities including plant and equipment	No	None
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	No	None
5.6	Emissions from incineration of waste	No	None
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	None
5.8	Emissions from any other sources	No	None
6. Generation of Noise and Vibration, and Emissions of Light and Heat:			
S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Crushers – 90 dB(A)
6.2	From industrial or similar processes	Yes	Processing plant – 90 dB(A)
6.3	From construction or demolition	No	None
6.4	From blasting or piling	No	None
6.5	From construction or operational traffic	Yes	Dumper - 80 to 85 dB(A)
6.6	From lighting or cooling systems	No	None
6.7	From any other sources	No	None
7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:			
S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	No	None

7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	None
7.3	By deposition of pollutants emitted to air into the land or into water	No	None
7.4	From any other sources	Yes	Prior to disposal of the residue from the oxide leach/CIP or sulphide CIL circuit to the TSF, the residual cyanide and arsenic in the process solution will be removed by the Inco method (SO ₂ /O ₂ addition) and ferric sulphate addition (sulphide ore only).
7.5	Is there a risk of long term buildup of pollutants in the environment from these sources?	No	None

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	No	None
8.2	From any other causes	No	None
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	None

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

S. No	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of	Yes	☞ It is anticipated that the

	<p>supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:</p> <ul style="list-style-type: none"> • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industries • supply industries • other 		<p>project would bring following benefits to the people of the surrounding villages:</p> <ul style="list-style-type: none"> ➤ Generation of employment and improved standard of living, health and education; ➤ Establishment of small and medium scale engineering ancillaries, agro based industries with cascading employment opportunities; ➤ Increased revenue to the state by way of royalty, taxes and duties; ➤ Improved green cover; ➤ Superior communication and transport facilities etc.
9.2	Lead to after-use of the site, which could have an impact on the environment	No	None
9.3	Set a precedent for later developments	Yes	Development of good landscape and ecofriendly work culture.
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	None


(II) ENVIRONMENTAL SENSITIVITY			
S. No	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	Nil	
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	Karajgi RF	1.3 km

3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, overwintering, migration	None	-
4	Inland, coastal, marine or underground waters	None	-
5	State, National boundaries	None	-
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	The National Highway (NH-4) Connecting Bangalore-Pune	3.4 km
7	Defense installations	None	-
8	Densely populated or built-up area	None	-
9	Areas occupied by sensitive man-made land uses. <i>(hospitals, schools, places of worship, community facilities)</i>	Siddeshwar a Temple	4.0 km
10	Areas containing important, high quality or scarce resources <i>(ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)</i>	None	-
11	Areas already subjected to pollution or environmental damage. <i>(those where existing legal environmental standards are exceeded)</i>	None	-
12	Areas susceptible to natural hazard which could cause the project to present environmental problems <i>(earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)</i>	None	-

"I hereby give under taking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance give, if any to the project will be revoked at our risk and cost.

Date: 21-06-2017

Place: BANGALORE

Signature of the Applicant (Project proponent/ Authorized signatory)	
Name	SARADCHANDRA RAO PESHWA
Designation	DIRECTOR
Address	Deccan Exploration Services Pvt. Ltd, No 5, 19th Main Road, 4 th Sector, HSR Lay Out, Bangalore-560102. INDIA. Telephone: 08067155700, Fax: +918067155701

PRE-FEASIBILITY REPORT

Of

**1000 TPD GOLD ORE PROCESSING PLANT
GANAJUR GOLD PROJECT**

At

Ganajur Village, Haveri Taluk, Haveri District,
Karnataka.

By

DECCAN EXPLORATION SERVICES PVT LTD

GANAJUR MAIN PROJECT – GOLD ORE PROCESSING PLANT

1) Executive Summary

Project	Gold Ore Processing Plant of 1000 TPD Capacity
Name and address of the company	Deccan Exploration Services Pvt. Ltd.
Registered Office	Deccan Exploration Services Pvt. Ltd. No 5, 19 th Main Road 4 th Sector, HSR Layout Bangalore-560102. (INDIA) Telephone: 080-67155700, Fax: +918067155701
Email	peshwa@deccangoldmines.com info@deccangoldmines.com
Board of Directors	1. Mr K.Karunakaran 2. Mr Saradchandra Rao Peshwa
Location of the Plant	Ganajur Village, Haveri Taluk, Haveri District, Karnataka.
Area	56.67 Ha
Type of Activity	Ore Processing Plant.
Utilities (Power Requirement)	5 MW Load
Manpower Requirement	Executives : 07 Supervisors : 05 Workers : 88 Total : 100
Project Implementation Schedule	Proposed to start by 01-12-2018
Total Project Cost (process Plant and the Mine)	Rs 350 Crores
Means of Finance	30% Equity, 70% through debt

2) INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION

(i) Identification of Project and Project Proponent.

Name of the Project:

Deccan Exploration Services Private Limited (DESPL) is a wholly-owned subsidiary of Deccan Gold Mines Limited, (DGML). DGML is a public limited company listed in Bombay Stock Exchange (BSE Scrip Code: 512068). DESPL explored an area of 1,542 Sq km under a Reconnaissance Permit that resulted in locating several significant gold prospects that include Ganajur Main Gold project and the adjacent prospects in the Ganajur-Karajgi cluster. Ganajur-Karajgi Block is part Ranibennur group of the late Archaean-Dharwar-Shimoga greenstone belt in the western Dharwar Craton. Gold mineralization in the area is hosted within sulphidic BIF.

DESPL was granted the Prospecting License (Ganajur-Karajgi PL Block) over an area of 2.2 sq.kms by the Government of Karnataka vide CI.157:MMM.2005 dated 10.9.2009. DESPL that includes the highly potential Ganajur Main Gold Deposit and its adjoining seven gold prospects. Ganajur Main Gold Deposit is a discovery of DESPL as a result of systematic and scientific exploration carried out during the RP (Reconnaissance Permit) as well as the PL stages.

DESPL recognized the Mining potential of the Ganajur Main Gold Project and submitted a Mining Lease application over an area of 29.13 Ha covering the Ganajur Main Gold Deposit. Ganajur Mining Lease application has been approved by the Ministry Of Mines, Government of India vide letter No 4/113/2010-MIV dated 24th July 2015. The approval is per Section 10(A) (2) (B) of the New MMDR Act 2015 and Section 5(1). Prior to this, the ML application for the Ganajur Project was recommended by the Government of Karnataka.

Deccan Exploration Services Pvt. Ltd, has also signed an MOU with the Government of Karnataka during the Global Investors Meet at Bangalore on 4th of June 2010 for commencement of a 2000TPD Gold Mine and setting up of a 2000 TPD processing plant at Ganajur village. Prior to this Karnataka State High Level Clearance committee (SHLCC) approved the project on 24-05-2011. The State Government through a G.O approved DESPL's request for additional 55 acres of land from 145 acres to 200 acres at Ganajur Village in Haveri District, Karnataka for the proposed

gold mine and processing plant. The G.O. has also facilitated land acquisition process through Karnataka Industrial Areas Development Board (KIADB), for which DESPL has submitted application to the KIADB in March, 2013.

DESPL has proposed to establish a 1000 TPD gold ore processing and beneficiation plant near Ganajur Village. The gold processing plant will be located at a distance of 1.5 kms south of the Mine site. The plant will treat and process the gold ore mined out from the proposed Ganajur Main Gold mine.

DESPL commissioned SRK Mining Services (India) Pvt. Ltd, (SRK) to complete an updated mineral resource estimate and to undertake a Scoping Study and Preliminary Economic Assessment for the Ganajur Main Gold Deposit located in the Ganajur-Karjagi PL Block of Haveri District in the State of Karnataka.

As per this, SRK submitted an updated Mineral Resource Statement in accordance with the Australasian Code for Reporting of Exploration Results known As JORC Standard. SRK estimated a total of 308,000 ounces of gold, out of which 255000 ounces are under indicated category equivalent of 121 of UNFC category. The resource has been estimated upto a depth of 120 metres.

The Scoping study addressed the mine optimization, process design, capital expenditure estimates, operating expenditure estimates, project economics (including key risks and opportunities) and future work programme. The study indicated that the Ganajur Main Gold deposit is open pitable. The project has been found to be economically viable.

Following the positive scoping studies by SRK, DESPL appointed Snowden Mining Industry Consultants Pty Ltd (Snowden), headquartered in Perth to undertake a Definitive Feasibility Study for the project. Feasibility study involved a detailed review of the project and conduct detailed work involving Resource geology and Ore reserves, Mine planning, Geochemistry, Process and metallurgy, Plant designing and engineering, Tailings disposal and design of the tailing dump, Geotechnical engineering, hydrology and hydro-geology, environmental studies etc. Snowden has concluded that the project is robust and economically attractive for commencement of the mine and the processing plant.

(ii) Brief Description of the Nature of the Project.

The gold bearing ore mined out from the proposed Ganajur Main Gold Mine located 1.5 kms from the plant will be transported to the proposed processing plant by trucks and conveyor belt.

The gold ore will be treated in processing plant facility involving several stages to recover the final product that is gold.

The maximum rated capacity of processing plant would be 1000 TPD.

(iii) Need for the Project and its importance to the country.

Gold Mineralization is site specific and only located along favorable geological formations and structures. India is one of the largest importers of gold in the World and the imports mainly to take care of demand from its jewellery industry.

Given the traditional significance given to gold possession in India, it generates one of the highest quantum of demand in the world. In 2015, India accounted for nearly 26% of the global fabrications demand (jewelry, bar & coin and technology). The demand for gold in India is not only the highest in the world but also the fastest growing. With the Indian economy projected to grow at 8% during 12th plan, the demand for gold can only increase further.

India is a traditional and stable market for gold consumption imports of gold in significant quantities will continue. The present and future production of gold will not be sufficient to meet the ever increasing demand. Therefore, efforts will be required to reduce the gap between production and demand.

By 2020, it is expected that the Indian gold demand would average 850 tonnes to 950 tonnes per annum. India's relationship with gold goes beyond income growth: gold is intertwined with India's way of life. And as we look ahead, India's gold market will evolve.

India imports around 1000 tonnes of gold as against indigenous production of less than 5 tonnes. Gold being a scarce commodity, discovering mineable gold deposit has been given top priority by Govt.

of India. As a result of the production of gold from the proposed gold project, there will be significant savings in the foreign exchange and in addition to generating employment opportunities to the local villagers. Moreover, there are many benefits such as local area development, better education, health and sanitation facilities.

(iv) Demand Supply Gap

India is **the largest consumer of gold in the world**, consuming around 26 % of world’s annual production. As against this, the **domestic primary gold production is less than 1 % of its annual requirement**. Virtually 97% of country’s annual demand is imported from global markets. This import of a precious commodity (which does not have a productive use for the economy), puts a severe drain on the foreign exchange assets of the country.

Thus any efforts for increasing gold production in the country must be encouraged. Before the independence of the country, there were many small and medium scale mines in the country and India boasted of primary gold production of around 10 tonnes annually. However in the post-independence period, gold mining was nationalized and it was only Bharat Gold Mines Ltd. and Hutti Gold Mines Ltd., the two PSUs, which undertook mining operations in the country. These two mining companies were not able to operate any small and medium scale mining project. Eventually BGML had to close their operations in 2000s due to their increased cost and depleting reserves.

Gold production in India has been fluctuating with a downward trend in last several years as indicated in the table below:

Gold production chart (India)

Year	Gold Production (Kgs)
2002	3800
2003	3200
2004	3700
2005	3100
2006	2400
2007	3000
2008	2700
2009	2800
2010	2700

2011	2300
2012	1800
2013	1588
2014	1430

(v) Imports Vs. Indigenous Production

During the period from April 2015 – February 2016, gold import stood at about 941.1 tonnes while for the entire 2014-15 fiscal, the same was 900 tonnes. (Source: profitndtv.com and inreuters.com). The annual import bill on gold is between 35 to 40 billion USD. Compared to this the domestic gold production has been less than 2 tonnes per year.

(vi) Export Possibility & Domestic Markets

Since the country, virtually imports its entire gold requirement, any increase in production would lead to savings in foreign exchange reserves and could be treated as deemed exports. Thus there is an urgent need to take steps to boost country’s domestic gold production for meeting its annual demand.

(vii) Employment Generation (Direct and Indirect) Due to Project.

The direct employment potential of the project would be about 100 and an additional 200 people would be indirectly employed through ancillary industries.

Direct employment

The entire unskilled manpower that will be required for the project will be from the local villages. Initially skilled and highly skilled people will be hired from outside and an effort will be made to recognize talented local men who will be given on job training under able guidance for improving their skill sets. Gradually, the skilled people will be replaced by this trained local force.

Manpower to be deployed at the Process Plant

Sl. No.	Manpower	Numbers
1	Executives	7
2	Supervisors	5
3	Workers	88
Total		100

Above table shows that potential of employment generation in the area.

Indirect employment

Regarding employment and income, the indirect effects are likely to be much stronger and widespread due to its multiplier effect. It is expected that the project may bring infrastructural development in the project area, which may lead to indirect employment generation.

Indirect employment opportunities may be created in small scale and household industries, which are going to come up as a result of the present project implementation. It is expected that around 150-200 people will get indirectly employed as a result of the project. Hence, the project is expected to generate substantial indirect employment in other sectors.

3. PROJECT DESCRIPTION

(i) Type of Project (including interlinked and interdependent project, if any)

The proposed 1000 TPD Ganajur Gold Project comprises of Ganajur Main Gold Mine, the Ore Processing and Beneficiation Plant. The Ganajur Main Gold project is an open-pit mining operation with processing of ore as an integral part of the mines as the ore could not be sold in the market. The ore mined out from the mines will be sent to processing plant, where the ore will be finely ground to recover gold. The gold in upper surface layers (10-20 meters deep) is oxidized. The deeper layers of ore body contain gold predominantly in sulphide matrix. The oxide ore will be mined first and will be extracted by adopting Crushing- Grinding- Gravity separation – Cyanidation – Carbon in Pulp – Elution- Electro winning-Smelting. Sulphide ore will be mined and treated by Crushing- Grinding – Flotation – Ultrafine Grinding (UFG) – Carbon in Leach (CIL) – Elution- Electro winning-Smelting. The mill tailings shall be disposed off separately in a designated tailing storage facility (TSF). The tailings shall be disposed by pumping in slurry form.

(ii) Location (map showing general location, specific location and project boundary & project site specific layout) with coordinates.

The proposed Processing Plant is located near Ganajur village and between 14°49'1.01" – 14° 49' 46.76" N Latitude; 75° 24' 14.49" – 75°24'46.17" E Longitudes and is part of survey of India Topo sheet No 48 N/5 in Haveri District of Karnataka. The land details are as follows:

District and State	:	Haveri District, Karnataka
Taluka	:	Haveri Taluk
Village	:	Ganajur
Khasra No./Plot No./	:	68,69,71,78A/1,78A/1B/1, 79,80,86,87,90,91,92,93,
Block Range/Felling Series etc	:	
Thana/ Hobli	:	KARAJGI
Khata No.	:	143, 9999, 11, 326, 305, 306, 307, 443, 69, 122, 373, 123, 32, 15, 79, 39, 6, 282, 396, 289, 288, 436, 68, 109, 19, 505, 503, 500, 501, 299, 999, 110, 89, 255, 55, 149, 25, 26, 96 etc.
Extent of area of the plant (ha)	:	140.03 acres/56.67 ha

The proposed Processing Plant area is private patta land.

Fig - 1 shows the location map of the site.

Key map showing the location of various features around the plant is depicted in **Fig -2** and **Fig-3** shows the study area of 10 km radius around the plant site.

Salient features of Plant are given below

SALIENT FEATURES OF THE PROJECT SITE

Feature	Details w.r.to Plant Site
Altitude	540 m above MSL
Longitude	Between 75° 24' 14.49" – 75°24'46.17" E
Latitude	Between 14°49'1.01" – 14° 49' 46.76" N
Village, Tehsil, District, State	Near Ganajuru Village, Haveri District of Karnataka
Max. Temp.	41.7°C
Min. Temp.	10°C
Relative Humidity	32 - 88%
Annual rainfall	903mm
Topography	Plain and gently undulating
Soil Type	Predominantly clayey
Nearest River	Varada River – 6.0 km - N
Nearest Highway	The National Highway (NH-4) Connecting Bangalore – Pune is at a distance of 3.4 km - SW
Nearest Railway station	Karajgi on Southern Railway Line Connecting Hubli – Bangalore - 3.0 km - W
Nearest Industries	Balehosur Industries – 3.6 km - SSW
Nearest Village	Ganajuru – 2.0 km – WNW
Nearest City	Hubli – 64 km - NNW
Nearest Air port	Hubli – 68 km - NW
Nearest Forest	Karajgi RF – 1.3 km - E
Historical places	Pura Siddeshwara Temple- Haveri located at a distance of 4 kms from the plant site.

***all distances mentioned in the above table are aerial distances**

(iii) Details of alternate technologies considered and the basis of selecting the proposed method

Recovering the precious metal gold from the ore sample envisages grinding the ore to an optimum level of fineness and subjecting it to suitable mineral separation processes.

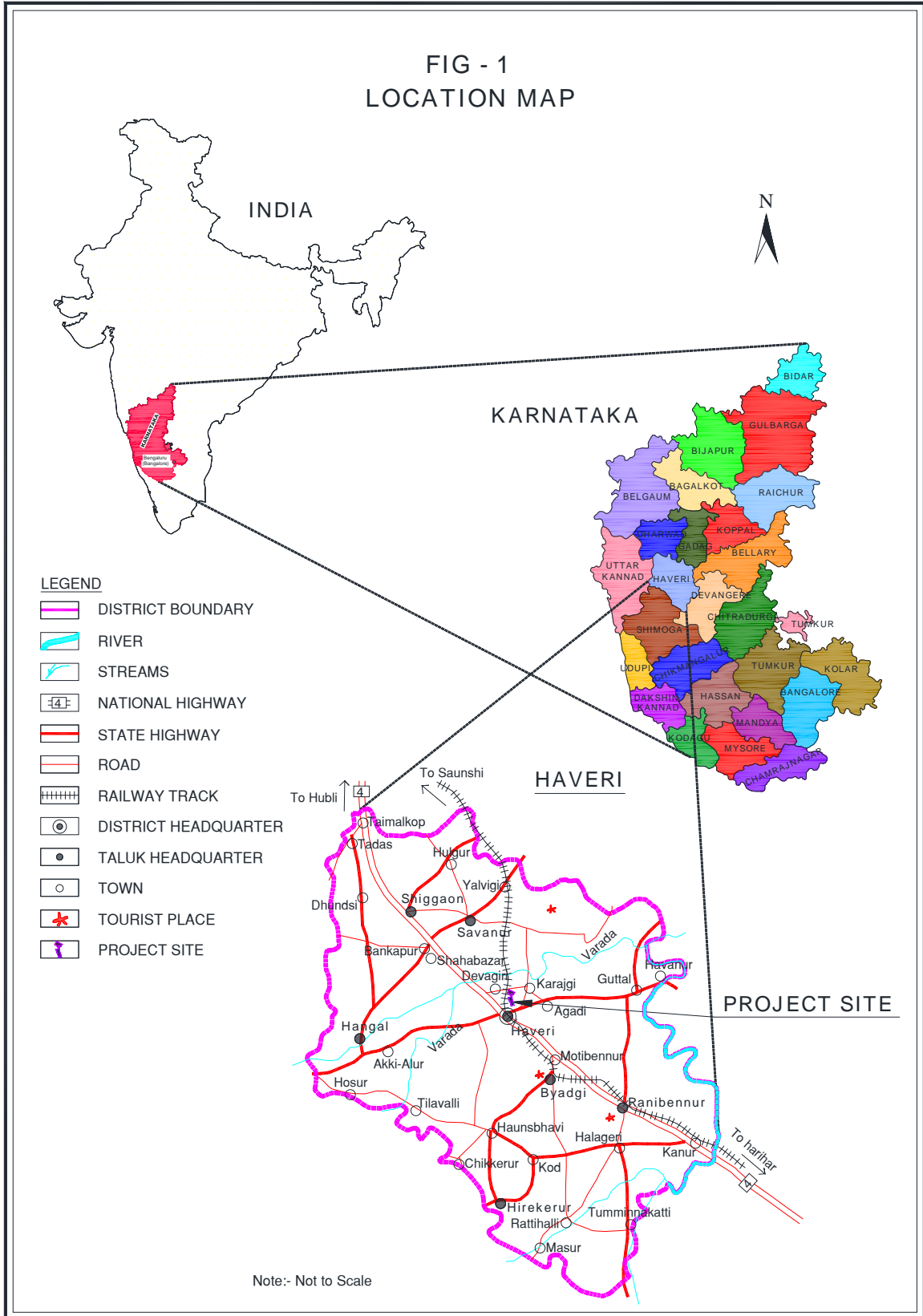
Based on the bench scale studies carried out at ALS-AMMTEC laboratory in Australia, three flow sheets for recovery of gold contained in sulphides matrix were considered and the recovery routes can be either of the following:

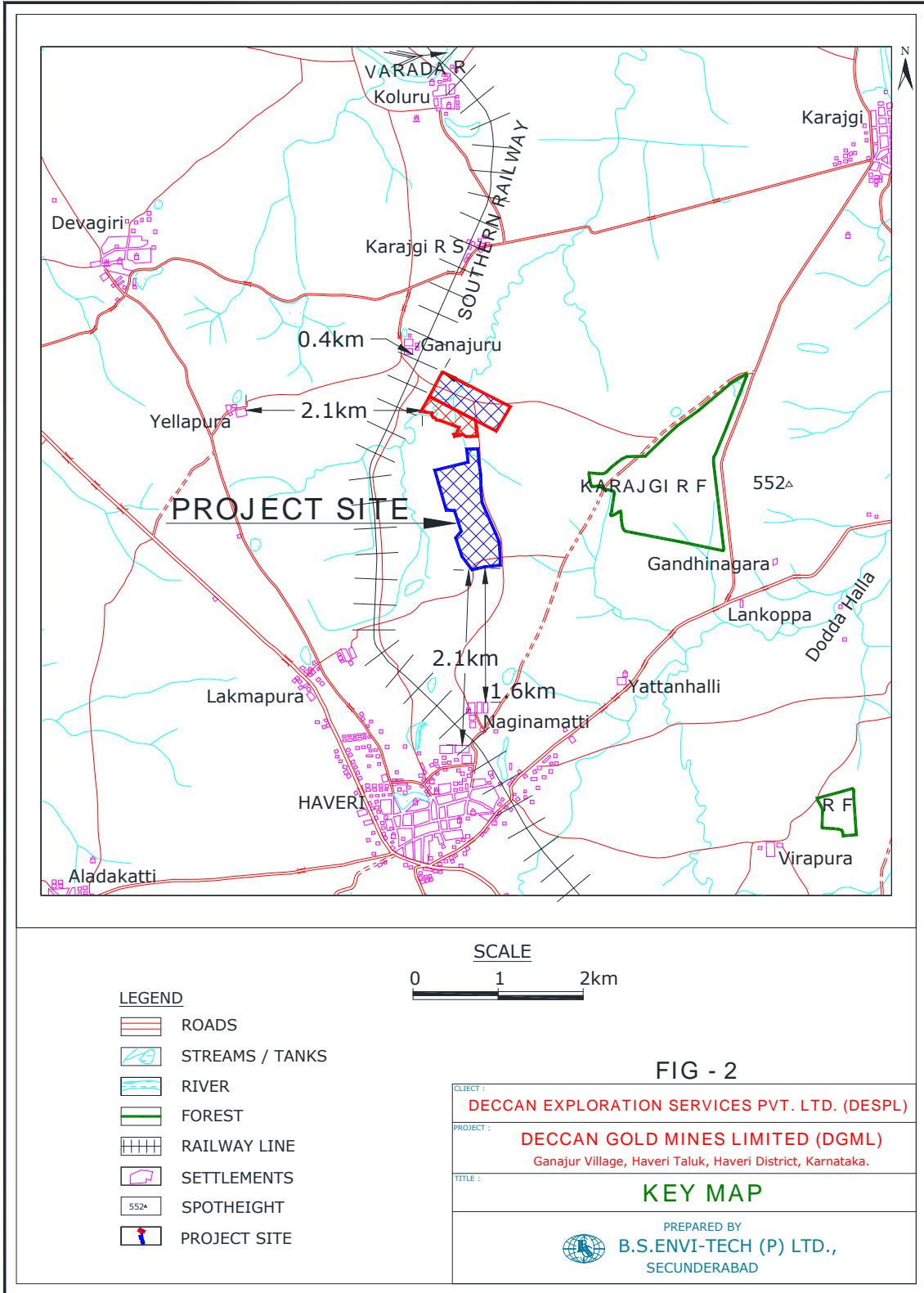
1. Crushing – grinding – gravity – whole ore CIL –elution-electrowinning--smelting (Gold Recovery-75%)
2. Crushing – grinding – flotation – ultrafine grindingsulphides- CIL sulphides–elution- electrowinning-smelting (Gold Recovery-80%)
3. Crushing – grinding – flotation – roasting – CIL - elution-electrowinning-smelting (Gold Recovery- 90%)

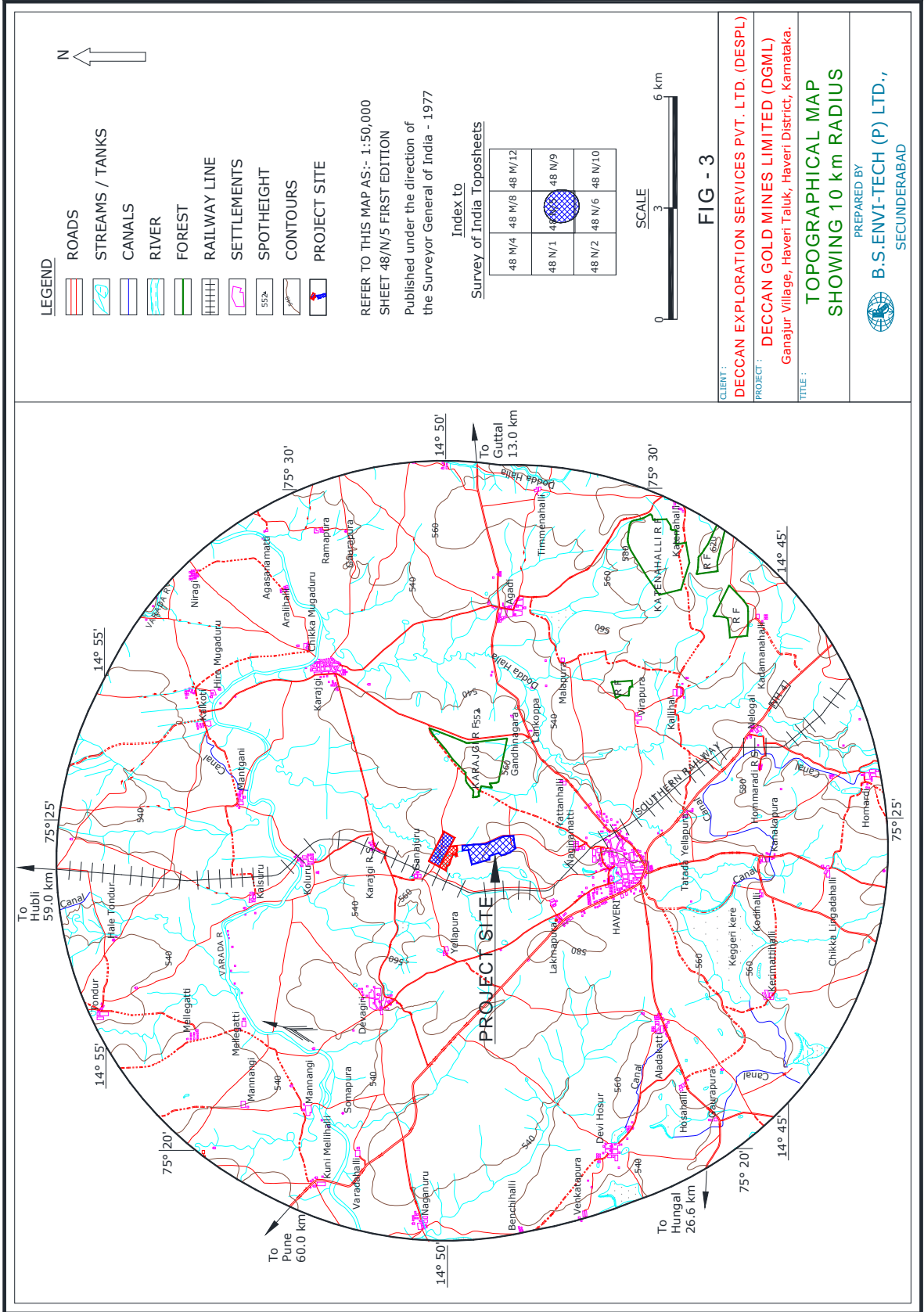
Out of the three routes mentioned the flowsheet involving crushing – grinding – flotation – ultrafine grinding- CIL –elution- electrowinning-smelting route is preferred since it is more economical and environment friendly compared to route 3. It also gives a better gold recovery of 80% compared to route 1.

Recent test work done in 2015 by ALS Global Metallurgy, Australia, indicates that near surface oxide ore is amenable for simpler process route and higher gold recovery of 90%. The gold contained in the oxide ore can be recovered through crushing – grinding- gravity separation – CIP – elution- electrowinning-smelting process and the final gold recovery is about 90%. It is proposed to mine and process the near surface oxide ore at the commencement of the project.

FIG - 1
LOCATION MAP







(iv) Size or Magnitude of operation.

Based on gold ore treatment of 1000 tonnes per day (300,000 tonnes per year) it is estimated that gold production will be 2.7 -3.0 kg per day. Assuming ore resources of 2.6 million tonnes identified so far it is expected that total gold production will be 8.5 tonnes.

DESPL has also identified prospects in and around Ganajur Main Gold deposit which will be explored in detail to augment additional resources of gold and thereby enhancing the life of the project. The mining operations are subject to various constraints like behavior of the ore body (i.e. change in grades making a particular section un-minable, change in dimensions of the ore body-increasing/decreasing the volume of ore to be generated), change in seasons, infrastructure factors like availability of power etc, and thus it will not be easy to achieve the above mentioned maximum rated capacity on annual basis. Processing plant of matching capacity will be established.

(v) Project Description with Process details (a schematic diagram/ Flow chart showing the project layout, components of the project etc. should be given.

DESPL commissioned Indian Bureau of Mines (“IBM”) for a gold study in order to determine whether gold was present in free form in the sample, quantum of free milling gold and to develop suitable method for commercial processing of the ore.

Petrographic study then revealed free gold grains of 12 to 16 microns in size. The sample contained about eight to ten percent pyrite and two to three percent arsenopyrite. Quartz was the main mineral present in the sample which constituted about 40 to 45 percent. Siderite was the next major mineral constituting about 25 to 30 percent. Electron Probe Micro Analyzer (“EPMA”) studies showed the presence of very fine native gold grains occurring in pyrite and arsenopyrite. Also very fine grains of native gold of two to three microns in size were noticed in silicates. Bottle roll cyanidation tests were carried out on the sample. Direct cyanidation of gold ore at 325 mesh size resulted in a recovery of 78 percent gold in the solution. Residue after cyanide leaching assayed 1.23 g/t of gold. An additional recovery of 3.8 percent gold could be achieved on pre-oxidation of the residue after the removal of free milling gold, followed by cyanidation. Results of the tests indicated that the residue loss was mainly due to the occurrence of gold as fine specs in silicates.

Table summarizes the test parameters and the results undertaken by IBM in 2005.

Summary of Metallurgical Test by IBM in 2005.

Process conditions

Grind	325 mesh
Slurry pulp density	50% solids
pH	11(employing lime)
Sodium cyanide quantity added	0.83 kg/tonne of ore
NaCN concentration in the slurry (initial)	0.42%
NaCN consumption	about 0.5 kg/tonne of ore
Reaction time	24hours

Results

Gold recovery	78%
Tailing assay	1.23 g/t Au
NaCN consumption	about 0.5 kg/tonne of ore.

PROCESSING PLANT AND TAILING DUMP

Metallurgical Testwork by ALS-AMMTEC

DESPL has taken several steps in understanding the chemistry and process mineralogy of the gold ore so that it helps in designing a suitable flow sheet for processing the gold ore. A representative sample (200 Kgs) of the Ganajur sulphide gold ore drawn from the drill cores was sent to AMMTEC Laboratory, Perth in Australia for carrying out comprehensive metallurgical testing and gold recovery studies. Similarly another batch of samples from the oxide ore was also sent to the same laboratory for understanding the metallurgical properties.

Based on these encouraging results, further metallurgical investigations at a Feasibility Study level on the Ganajur Main gold resource is being taken up since March 2016. Representative ore samples from diamond drill core within the gold resource were selected along the strike and at depth of the ore body in order to confirm its metallurgical behavior and response and also to test the variability of the gold bearing ore at different locations. A test work programme was developed for testing at

the metallurgical laboratory in Perth, Western Australia with the following objectives:

- Confirm the gold recovery for the oxide and sulphide resource.
- Assess the ore comminution characteristics in order to determine the power requirements and equipment sizing of the crushing and grinding circuits.
- Development of the overall process flowsheet which provides a gold recovery for the Ganajur Main resource at an optimum project NPV.
- Identify and mitigate any potential environmental impacts on processing the Ganajur Main ore.

Some salient test data are summarised below;

Abrasive Index

A sub-sample of the Sulphide Ore Composite was screened at 12.7 mm, with only the -19+12.7 mm fraction required for the abrasion test work. The composite sample was tested to determine the abrasion index value using the standard procedure developed by F.C. Bond. The Bond Abrasion Index (Ai) was determined to be in the range of 0.3002 to 0.5006.

Ball Mill & Rod Mill Work Index

These tests were carried out in ball and rod mill with closed circuit grinding and the feed sizes as mentioned in the table below on sulphide gold ore;

Particulars of Mill Parameter	Ball Mill (700 mls)	Rod Mill (1250 mls)
Product in the Feed in (%)	10.9	8.57
Bulk Density, (t/m ³) of feed material	2.1739	1.9923
Ideal Potential Product (g) or Feed during the test	434.8	1245.2
Speed of the Ball Mill in RPM	5.82	5.20
Average Equilibrium Circulating Load (%)	250	100
Average Product (g/rev)	1.11	3.651
Slurry Density	50%	50%
80 % Passing Feed Size in (µm)	2446	11378
80 % Passing Product Size in µm (mesh)	81 (185)	725
Reduction ratio	30	16

Particulars of Mill Parameter	Ball Mill (700 mls)	Rod Mill (1250 mls)
Ball/Rod Mill Work Index (Kw Hrs/Dry Tonne)	16.9	21.5

Similar tests done in 2015 on oxide ore by ALS Global gave Bond Rod Mill work index of 19.1 kwh/tonne and Bond Ball mill work index of 18.4 kwh/tonne of ore.

Determination of Head Assays

COMPREHENSIVE HEAD ANALYSIS

ANALYTE	UNIT	SULPHIDE ORE COMPOSITE
Au₁	g/t	6.70
Au₂	g/t	7.29
Ag	g/t	1.0
As	ppm	5080
Al	%	1.72
Ba	ppm	100
Be	ppm	0.3
Bi	ppm	< 10
C_{total}	%	4.23
C_{organic}	%	0.27
Ca	%	1.60
Cd	ppm	5
Co	ppm	10
Cr	ppm	40
Cu	ppm	46
Fe	%	19.9
Hg	ppm	0.1
K	ppm	8000
Li	ppm	< 5
Mg	%	1.20
Mn	ppm	700
Mo	ppm	< 5
Na	ppm	1520

ANALYTE	UNIT	SULPHIDE ORE COMPOSITE
Ni	ppm	360
P	ppm	800
Pb	ppm	30
S_{total}	%	4.94
S_{sulfide}	%	3.92
Sb	ppm	4.6
SiO₂	%	48.2
Sn	ppm	< 50
Sr	ppm	100
Te	ppm	0.2
Th	ppm	4
Ti	ppm	800
U	ppm	0.4
V	ppm	6
Y	ppm	6
Zn	ppm	68
Zr	ppm	30

The mineral mass percent in the ore were as in the table below:

Au	traces	Carbonates	15.98
Micas	7.94	Minor Sulphides	0.57
Ag	Not detected	Magnetite	14.93
Chlorite	1.89	Minor phases	0.42
Quartz	48.21	Pyrite	7.55
Feldspars	1.38	Unknown	0.44

Gold Recovery and Flow Sheet Development

Based on the bench scale studies carried out at ALS-AMMTEC laboratory in Australia, the following flowsheet and process description for recovery of gold is proposed.

General

The main processing stages/circuits for the Ganajur project are;

1. Crushing

2. Grinding
3. Flotation
4. Ultrafine Grinding (UFG)
5. Leach/Carbon in Pulp (CIP) – oxide ore and Carbon-In-Leach (CIL)- sulphide ore
6. Elution & Carbon Reactivation
7. Cyanide Destruct & Arsenic Removal
8. Tailings Thickener and Disposal
9. Reagents

The water supply for processing will be harvested each year from the Varada River over a 4 month period during the monsoon season and will be stored on-site in a HDPE lined water storage dam with an approximate volume of 300,000 m³. A pump station at the river and a buried HDPE pipeline will transfer the water to the plant site.

To ensure the safety of the farming community and animals, a security perimeter fence will be installed at the process plant and the TSF. Security personnel will also be employed to manage the interface between the community and the delivery of consumables and reagent supply to the Ganajur project.

Power supply at approximately 5 MVA will be provided via the nearby Kanataka State Transmission 110 kV power line.

A general description for each process stage is outlined below.

Comminution – Crushing and Grinding

The Ganajur ore will be stage crushed from an initial maximum ore feed size of approximately 600mm to 10mm using a jaw crusher and two cone crushers (3 stages) at a nominal feed rate of 100 tph.

The open pit ore will be trucked to the ROM pad which will provide a stockpile capacity for up to 6 months of ore supply to the process plant facility. The ore will be reclaimed by a front end loader and fed to a ROM bin (30m³ capacity) with a sloping grizzly at an aperture of 600mm. Any ore that does not pass the grizzly will be stockpiled for breakage via an excavator fitted with a rock-breaker attachment.

A vibrating feeder under the ROM bin will feed the ore to a single toggle jaw crusher with the feed opening dimensions of 1060 x 700mm (length x width) and the jaw crusher will reduce the ROM ore to approximately 100mm. The primary crushed ore is then conveyed to a double deck vibrating screen (1.87m x 6.10m) fitted with 32mm aperture screens on the top deck and 16mm screens on the bottom deck. The top deck oversize material will be conveyed to a small surge bin ahead of the secondary cone crusher and the bottom deck oversize material also reports to a small surge bin ahead of the tertiary cone crusher.

The closed size settings for the secondary and tertiary crushers will be 32 and 16mm respectively and both the discharged products report to the same conveyor that feeds the vibrating screen. The undersize material from the bottom deck screen at approximately 10mm will be conveyed to a 1000 tonne capacity fine ore bin.

To optimise the crushing efficiency of the cone crushers, the crushers will be choke fed via a level control/feed rate process control loop. To protect the cone crushers, two magnets and metal detectors will be installed ahead of each crusher.

A weightometer on the conveyor to the FOB will enable the control of the ore feed rate to the crushing circuit.

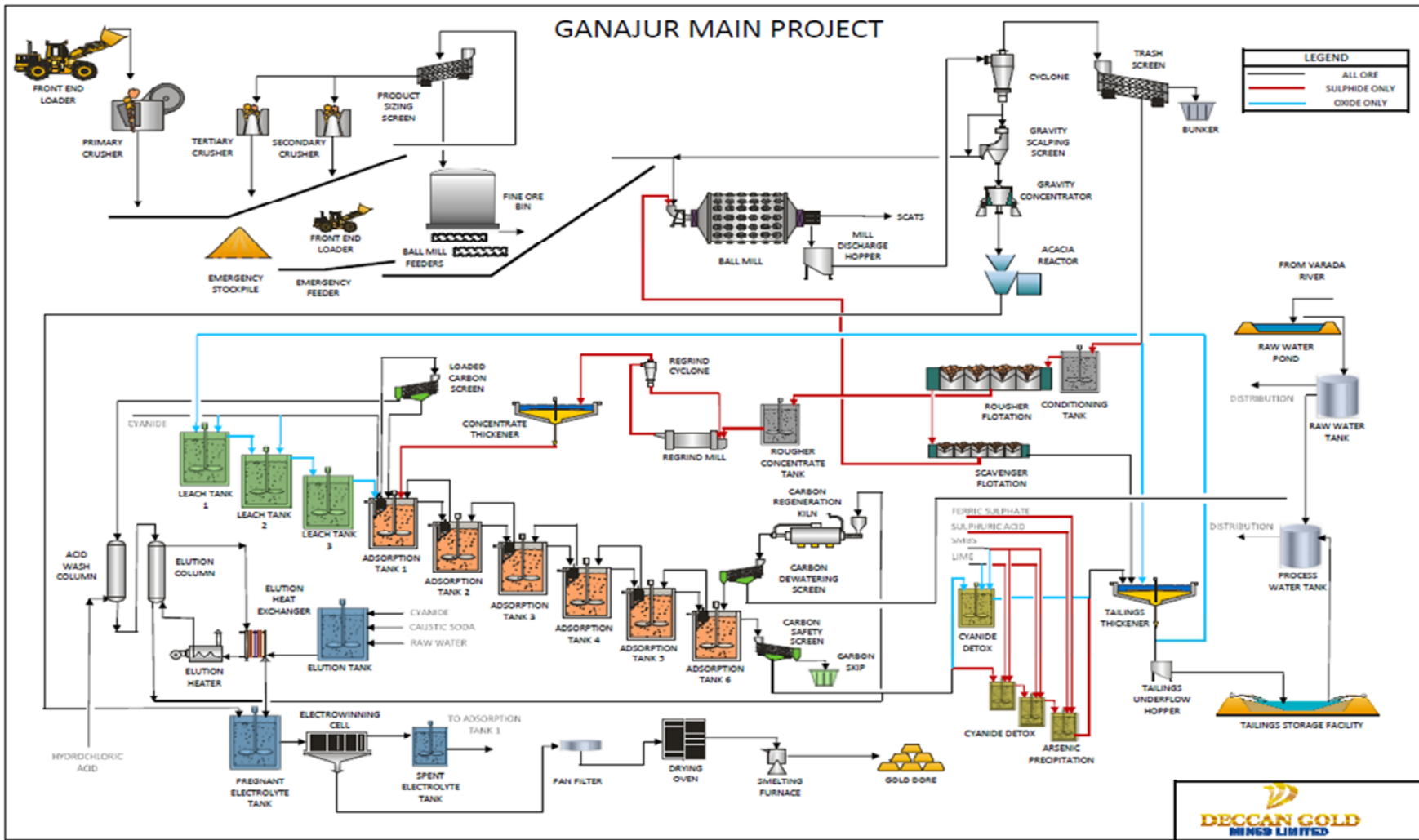
Dust suppression within the crushing circuit will be provided by a dry dust collector (using dust socks which are cleaned via high pressure reverse air jets) and water sprays.

The FOB will use conveyors fitted to two slots, which will feed a single conveyor that transports the fine crushed ore to the grinding circuit.

The grinding circuit will have a single stage ball mill (3.4m diameter x 6.0 m EGL operating with a 1000 kW installed motor) in closed circuit with hydro-cyclones. The ore will be reduced from 10mm to 75 microns – which is the optimum liberation size for the oxide and sulphide ore.

The ball mill will be rubber lined (to maintain low noise levels) and will use 80mm forged steel grinding media. A small gravity circuit using a Knelson concentrator and an Acacia intense leach reactor will recover any coarse free gold from within the grinding circuit.

The cyclone overflow product from the grinding circuit at approximately 35% slurry solids density (%w/w) will report to a vibrating screen (. This vibrating screen removes any oversize trash material ahead of flotation and CIL so as to prevent downstream inter-stage screen blockages.



Flotation – Sulphide Ore

The liberated free gold and sulphides are recovered in this stage via the use of flotation reagents (xanthates). A low weight sulphide concentrate (10-13% by weight or 5 tph) is produced which contains up to 95% of the gold and 97% of sulphide sulphur from the ore.

A small slurry tank ahead of the flotation cells will provide the conditioning of the ore and the flotation reagents (Potassium Amyl Xanthate, Copper Sulphate) prior to flotation.

A total of 9 x 8m³ flotation cells will be installed in the flotation circuit. The first 4 cells will produce a rougher concentrate which will report to the UFG circuit. The remaining 5 cells will produce a scavenger concentrate which will return to the primary ball mill for further liberation of potential composite particles.

The on-site laboratory will provide spot sample analyses (2 hrs) of the flotation circuit products for production control and the optimisation of gold and sulphide recovery.

Automatic slurry level control on the rougher and scavenger cells, adjustable air flow per cell and reagent addition will be the key control variables for this circuit.

Ultrafine Grinding – UFG/CIL – Sulphide Ore

As a significant portion of the gold mineralisation occurs as fine free gold inclusions within the pyrite grains, the pyrite requires further grinding to approximately 10 microns. At this liberation size, the gold particles are exposed and can then be recovered by conventional CIL.

An IsaMill will be selected to perform this fine grinding stage and will use ceramics as the grinding media.

A small slurry tank ahead of UFG will allow some surge capacity between the flotation and UFG circuit.

A total of 4 x 250mm hydro-cyclones will operate in closed circuit with the IsaMill, with half of the cyclones in operation and the remainder on standby.

The cyclone overflow slurry product is very dilute (5% solids slurry density) after the UFG stage and is thickened to 45-50% solids slurry density via an 8 m diameter high rate thickener prior to CIL.

To help minimise the detrimental formation of thiocyanates (SCN) and iron (ferrous) dissolution the addition of lead nitrate and lime slurry for pH control will be made just prior to the addition of sodium cyanide in the CIL train.

A total of 6 by 60 m³ tanks equipped with inter-stage screens and air-lifts for carbon advancement will be in operation in the CIL circuit, which provides a total of 42 h of leach residence time.

The operating pH during CIL will be 10 -10.5. The cyanide concentration will be maintained at approximately 0.2% w/v range in the first CIL tank. A cyanide analyser in the first CIL tank will control the cyanidation addition rate and another cyanide analyser in CIL tank 6 will measure the WAD cyanide ahead of the CN Destruct circuit.

Due to presence of carbonaceous material in the Ganajur ore, all cyanidation leaching requires activated carbon to be present so as to prevent the potential for gold adsorption onto the carbonaceous material, which then reports to the final residue stream. The activated carbon concentration in CIL will range between 20 to 50 gpl.

Cyanidation Leach/CIP – Oxide Ore

The oxide ore after the grinding circuit will be thickened to approximately 50-55% slurry density via the sulphide ore final tailings thickener (converts to a pre-leach thickener when processing oxide ore) and then reports to the cyanidation leach/CIP circuit.

The cyanidation leach consists of 3 x 280 m³ tanks and the CIP stage is via the existing 6 x 60 m³ tanks that are used for the CIL sulphide ore concentrates. The overall leach/CIP retention time is 24 hours.

The cyanidation concentration at the start of oxide ore leaching is maintained at 0.02 to 0.03% w/v sodium cyanide and the pH maintained within the range of 10 - 10.5.

All of the other processing conditions (cyanide measurement, carbon concentration and advancement) will remain the same as per the sulphide concentrates.

Elution and Carbon Reactivation

A conventional 1 tonne elution column capacity AARL (Anglo-American Research Laboratory) elution circuit will recover the gold from the loaded carbon.

An acid column ahead of the elution column will remove carbonates from the carbon with the addition of dilute hydrochloric acid.

The pregnant gold solution from elution passes through an electro winning cell which will recover the gold onto stainless steel cathodes.

The gold will be washed from the cathodes via a high pressure water cleaner, then filtered and smelted in a gas fired barring furnace.

The barren carbon from elution will be reactivated via a gas fired horizontal kiln operating at approximately 700 degrees Celsius , whereby any organics will be removed and the reactivated carbon can then be returned to the CIP/CIL circuit.

The elution circuit equipment and process pipelines are fitted with actuated valves which are controlled by a PLC (programmable logic controller). This ensures the correct sequencing of the elution process and that no acid can accidentally make contact with the cyanide process streams.

Cyanide Destruct and Arsenic Removal

Prior to disposal of the residue from the oxide leach/CIP or sulphide CIL circuit to the TSF, the residual cyanide and arsenic in the process solution will be removed by the Inco method (SO₂/O₂ addition) and ferric sulphate addition (sulphide ore only).

The cyanide destruct circuit on sulphide ore consists of 2 stages of 1 hour residence time mixing tanks operating with the addition of sodium meta-bisulphite (SMBS – SO₂ supply) and oxygen gas. Lime addition is also required to maintain an operating pH of 8.5 to 9.0. The WAD cyanide is converted to harmless cyanates. On oxide ore the cyanide destruct circuit consists of 1 mixing tank of 1 hour of residence time due to the significantly lower cyanide load, compared to the sulphide ore.

The WAD levels will be reduced to less than 10ppm from the Cyanide Destruct circuit, which is well below the ICC standard for discharge into the TSF.

Arsenic removal from the sulphide ore is carried out in a 1 hour residence time mixing tank operating with the addition of ferric sulphate to form a stable arsenical ferrihydrite compound. Sulphuric acid addition is also required to maintain an operating pH of 6-8.

The As levels will be reduced to less than 1ppm in solution after the As removal circuit and with the dilution from the flotation tailings stream will be less than 0.1 ppm on its discharge into the TSF.

Tailings Thickener and Disposal

The flotation tailings stream from the flotation circuit is combined with the sulphide residue stream exiting the Cyanide Destruct/As Removal circuit into an 8 m diameter tailings thickener. The slurry solids will be thickened to 55 to 60% solids by weight and then pumped by tailings pumps to the TSF. The thickener overflow solution will be recycled back

to the process water tank. Flocculant addition will be used to assist in the settling of the residue solids.

The Leach/CIP oxide ore residue after Cyanide Destruct reports directly to the TSF.

The TSF will be an upstream type construction dam operating with an average water recovery of approximately 53%. This water will be recovered by a penstock/decant tower arrangement and will be stored in a small HDPE pond prior to being recycled back to the process water tank.

In the event of a 1:100 year rainfall event, a storm water HDPE lined dam will capture this excessive water and will be re-used as raw water make-up for the process plant.

The tailings will be deposited sub-aerially by a ring main distribution pipeline fitted with spigots arranged around the perimeter of the TSF.

The TSF will be constructed with a double liner system (clay and HDPE) to mitigate seepage into the groundwater and will provide the total storage requirements for the Ganajur project over the 10 year mine life. The TSF will reach a final height of 20m and the progressive embankments will be re-habilitated with mine waste to prevent dust emissions.

(vi) Raw Material/ Consumables Required along with estimated quantity, likely source, marketing area of final product, mode of transport of raw material and finished product.

Since it is a Processing plant, the Gold Ore itself will be the Raw Material. Following consumable will be required in processing operations:

Major Consumables to be used

Reagent/Consumables	Consumption	
	kg/t	Tonnes/Annum
Sodium Cyanide	0.85	254
Quicklime	0.37	111
Activated Carbon	0.03	1.21
Lead Nitrate	0.27	80
Sodium Hydroxide	0.07	21
Hydrochloric Acid	0.45	134
Copper Sulphate	0.57	171
Potassium Amyl Xanthate	0.15	45
Ferric Sulphate	0.74	221
Sulphuric Acid	1.17	350

Sodium Meta Bi Sulphite	0.67	201
Grinding Media - Mill	0.80	240
Grinding Media - UFG	0.12	36
Flocculant	0.10	30
Frother	0.01	3
Oxygen (m3)	0.67	200,906
LPG (litres)	0.35	104,000

The above consumables will be procured from various suppliers spread across different locations and will be transported to the site by means of road transport only. The final product - gold bullion will be sold in the nearest major town i.e. to local jewelers.

(vii) Resource optimization/ recycling and reuse envisaged in project, if any, should be briefly outlined.

Land : The entire process plant, ROM pad, TSF, raw water tank, green belt and other services is expected to occupy a space of around 56.67 hectares. The land footprint has been increased from 38.45 Ha to 56.67 Ha to accommodate the TSF, Water Storage and ROM pad. This increase in the extent of the area had been necessitated following the recent definitive feasibility studies and additional test works.

Water: An effort has been made to reuse the mines water for mineral processing operations and the plant has been designed in such a manner that most of the process water is recycled and reused in the plant.

(viii) Availability of water, its source, Energy/power requirement and source should be given.

Water :

To operate the process plant and other activities including environmental measures, the requirement of water would be about 3000 KLD. Water will be catered through a 6.5 km pipe line from 'Kolar-Kalalur barrage' built across Varada River as well as through bore wells. In the plant, effort has been made to recycle the process water by using thickeners.

Energy / Power Requirement & Source:

The power requirement for the project is estimated to about 5 MW, to be serviced by KPTCL (Karnataka power Transmission Corporation limited).

(ix) Quantity of wastes to be generated (liquid and solid) and scheme for their management / disposal.

Mill Tailings:

Mill tailings to the tune of 0.3 million tonnes per year will get generated as reject from the process plant, after extraction of Gold metal.

The tailings shall be disposed off separately in a designated tailing dump. The tailings shall be disposed-off by pumping in the form of Slurry.

4. SITE ANALYSIS

(i) Connectivity

Ganajur village is well connected by rail and road. The nearest Railway Stations are Haveri and Karajgi located 3.35 km south and 3.1 kms northeast from the proposed plant site respectively. Haveri falls on National Highway No 4 and is about 335kms from Bangalore.

(ii) Land Form, Land use and Land Ownership

Sl no.	Particulars	Extent of Area	Land Form	Land Ownership	Current Land Use	Proposed Land Use
1	Private Land	56.67 hectares	Patta Land	Private	Agriculture	Process Plant, TSF, Water Reservoir, ROM pad, Green belt etc

(iii) Existing infrastructure

The National Highway (NH-4) Connecting Bangalore – Pune is at a distance of 3.4 km in SW from the plant site. The nearest railway station is Karajgi which is at 3.1 km NNE from the Plant site.

Nearest railway line connecting Hubli – Bangalore of Southern Railway line is located at a distance of 1.0 km in W from the Plant site.

(iv) Soil Classification

In the major part of the district red sandy soil is occurring, followed by the medium black soil and deep black soil. The red loamy soil and lateritic soil are seen in very small parts on southern border of the district.

(v) Climatic data from Secondary Sources

The area enjoys sub-tropical climate with temperatures ranging in between 18^o and 40^oC. The rainfall varies from 590 mm to 903 mm. July is the wettest month with normal monthly rainfall in excess of 100mm.

5. PLANNING BRIEF

(i) Planning Concept (type of industries, facilities, transportation etc) town and country Planning / Development authority classification:

(ii) Population Projection

Since there will not be any major influx of people from outside in this region because of the project, there will hardly be any population explosion. Most of the workers will be from surrounding villages only.

(iii) Land Use Planning

Tentative Land Use For Ganajur Gold Ore Processing Project

Particulars	Area in hectares	Total Area in hectares
Mineral ore Storage -ROM pad	7.66	56.67
Mineral Processing Plant	5.27	
ETP	0.7	
Roads and Infrastructure	2.28	
Tailings Dump (TSF)	20.28	
Others such as office, substation, soil stockpile etc	3.49	
Water Reservoir	4.24	
Green Belt	12.75	

(iv) Assessment of Infrastructure Demand (Physical & Social)

There will not be any major influx of people from outside, in this region because of the project, and only local people from surrounding villages will be employed. Further, since the size of the project is very small, no adverse effect on physical and social infrastructure like roads, electricity, water supplies etc due to project is anticipated.

(v) Amenities / Facilities

The size of the project is very small. The project proponent will provide accommodation facilities to a very small number of highly skilled manpower from outside this area, in nearby villages. The site will have ambulance facility for meeting any eventualities at the project site and nearby villages. The site will be provided with mess facility for workers. The project proponent realizes the importance of inclusive development of the area and have accordingly budgeted an outlay for CSR activities. The project proponent intends to work closely with all the stakeholders in this region for stimulating and reviving the rural economy in this region.

6.0 PROPOSED INFRASTRUCTURE

(i)Industrial Area (Processing Area)

A gold processing plant will be located about 1.5 kms South of the mine site, 4.5 kms NE of Haveri town situated on national highway No 4. In this case, there will be following types of common infrastructure (support) facility for both the mines and plant:

- Electric Sub Station
- Mechanical Workshop
- Canteen For Workers
- Contract Assay laboratory
- Store/Warehouse for plant spares and reagents
- Administrative office

(ii)Residential

Since there will be a small number of highly skilled workers – not belonging to this area, they will be provided accommodation in nearby area and as such no residential colony is envisaged in our project planning.

(iii) Green Belt

For the tailing dam areas, around the boundary plantation will be carried out for stabilization. The dump will be properly graded and stabilized with vegetal cover. It is proposed to plant 1500/Ha.

(iv) Social Infrastructure

Ganajur Ore Processing Plant will be a small project. It is expected that the project will lead to much needed employment opportunities in the villages which will contribute to the socio-economic development of this area. The company will have an ambulance stationed at site which can also be used by the villagers in case of any emergency. The company will also take up work for promoting education, sports and cultural activities in the surrounding villages, as a part of its CSR.

(v) Connectivity

Ganajur village is well connected by rail and road. The nearest Railway Stations are Karajgi at a distance of 3.1 kms and Haveri, which is 3.35 kms South of the proposed plant site. Haveri falls on National Highway No 4 and is about 335.0 kms from Bangalore.

(vi) Drinking Water Management (Source and Supply of Water)

Suitable purification and pumping arrangements shall be made for supply of drinking water.

(vii) Sewerage System

Keeping in view proper hygiene, sewerage system shall be implemented.

(viii) Industrial Waste Management

Mill tailings to the tune of 0.3 million tonnes per year will get generated as rejects from the process plant, after extraction of Gold metal.

The tailings shall be disposed off separately in a designated tailings storage facility (TSF) of suitable capacity. The tailings shall be disposed by pumping in slurry form.

(ix) Power Requirement & Supply / Source.

The power required will be around 5 MW and the same will be sourced from KPTCL. Diesel Generators will be provided as back-up power supply for essential loads.

7. Rehabilitation and Resettlement (R & R) Plan

The proposed site is private patta land and devoid of any settlement. There will be only land losers and they will be either employed or will be given other employment opportunities.

8. Project schedule

The project proposed to start by 01-12-2018

9. Analysis of Proposal (Final Recommendations)

Financial And Social Benefits with special emphasis on the benefits to the local people including tribal population, if any, in the area.

Financial Benefits

Besides the company, the State government will be benefited by way of Royalty, Mineral conservation; the local population will reap the benefits of employment, development of the area with modern facilities and general wellbeing.

Social Benefits

Better development of the living areas, better schooling for children, play grounds, health centres, overall better living conditions & employment opportunities.