GEOLOGICAL SURVEY OF INDIA

FINAL REPORT ON REGIONAL GEOCHEMICAL SURVEY FOR BASE METALS AND LITHIUM IN SALAL AREA, UDHAMPUR DISTRICT, JAMMU AND KASHMIR

(Field Season 1995-96 &1996-97)

By
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Project: Mineral Investigation (J & K),
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ABSTRACT

Regional geochemical survey for base metals and lithium was taken up in parts of Udhampur district with the objective to geochemically assess promising areas/ zones for base metal mineralisation in the Sirban Group of rocks and for lithium in the overlying bauxite crust during F. S. 1995-96 and 1996-97.

During the course of investigation, an area of 350 Sq. Km was geochemically surveyed on 1:50,000 scale in Katra- Muttal- Pres- Sersandu- Salal- Panasa- Paoni- Ransuh- Chakar area along with collection of 804 Samples for base metal and lithium determination involving 17 Cu.m pitting/ trenching. Besides, 70 samples were collected for petrological studies.

The main rock types exposed in the area belong to Sirban Group (Riphean), Jangalgali Formation (Cretaceous- Eocene) Subathu Formation (Palaeocene- Eocene), Murree Group (Upper Eocene to Lr. Miocene) and Siwalik Group (Middle Miocene to Lower Pleistocene)

The regional structure in the area is a doubly plunging NW-SE trending anticline with rocks of Sirban Group in the core and younger Tertiaries fringing it. There is a major thrust along the Southern side of the anticline along which Jangalgali and Subathu Formation have been eliminated and the younger Murrees/ Siwaliks come directly in contact with the rocks of Sirban Group.

Specks and dissemination of galena mineralisation are reported in calcite/ quartz veins within the rocks of Sirban Group. Besides, small pockets and lenses of sulphide mineralisation have been observed in these rocks in Press, Khairikot, Sersandu, Matah Thanapal, Sangar, Manju, Gai and Ransuh- Khori area. In the Anji Khad section near its confluence with Lalor Khad, a mineralised zone about 1m wide and traceable for about150 m occurs in the form of chalcopyrite and pyrite disseminations, stringers, pockets within these rocks. Beside, base metals, magnesite and barite also occur within these rocks.

Sample have been collected for base metals from the above referred to zones from Sirban Group and from ironstone shale and pyritous limestone of Subathu Formation. For Lithium samples were collected from the Jangalgali formation.

Analytical results have indicated high values of Li (averaging 883.80 ppm), V (averaging 202.30ppm), Cr (averaging 209.96 ppm), Zr (averaging 718.12ppm) and P_2O_5 (averaging 1606ppm) in the pisolitic and non- pisolitic bauxite columns. In view of the persistent lithium

values and presence of wide spread bauxite column (palaeoplanar surface) at a number of places, the prospect for lithium appears to be quite promising.

Investigation for lithium was undertaken in bauxite column constituting the upper part of Jangalgali Formation unconformably overlying rocks of Sirban Group.

The bauxite crust represents a palaeoplanar surface whose eroded remnants are observed intermittently throughout the belt from Muttal to Salal and further north- west upto Chakar on the dip slopes of Sirban Group of rocks nut a larger part of bauxite planar surface, still unexplored, is preserved below the Subathus in the synclinal structure. The former alone were investigated for lithium and associated metals during the present work.

The solubility tests on lithium has indicated that the lithium is amenable to dissolution only by hydrofluorisation with perchloric acid, which means metal is present either in silicates or in the lattices of bauxite minerals. Mineralogical studies have failed to identify the mineral phase except in one sample where cockeite lithium- mica) was indicated.

As regard base metals, higher values for lead (upto 14%) and zinc (upto 7.60 %), have been indicated in spot samples only and no economically viable zones, could be located

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INTRODUCTION

In pursuance of item no. MIP/NR/ J& K /1995/007 of annual programmes of the Geological Survey of India for FS1995-96 & 1996-97, regional geochemical survey for base metals and lithium was taken up in parts of Udhampur district with the objective to geochemically assess promising area/ zones for base metal mineralisation in Sirban Group of rocks and for lithium in the overlying bauxite crust. The item was taken up in the background of reported occurrence of base metal in Sirban Group of rocks and detection of high lithium values in the samples collected from the bauxite column (Kalsotra, 1992).

During the course of investigation, an area of 350 sq. km. was geochemically surveyed on 1:50, 000 scale, 804 samples were collected for base metals and lithium determinations and 17 cu. M. Pitting/ trenching was done. Besides, 70 samples were collected for petrological studies. The year wise break up of the work done vies-a- visa targets is given below (Plate-I)

TABLE I

Target		Achievement	Area
Geochemical Survey on			
1:150,000 scale	150 sq. Km	185 sq. km	Katara- Muttal- Jangal
BRS	300 Nos.	409 Nos.	gali – Sukhwal Gali-
PT	10 cu. M	11 cu. M	Pres- Sersandu Salal
PS	30 Nos.	35 Nos.	Area
F.S. 1996-97			
Gechemfical Survy on			
1:150,000 scale	150 sq. Km	165 sq. Km	Salal- Thanpal- Panasa-
BRS	300 Nos.	395 Nos	Matah- Paoni- Sangar-
PT	5 cu. M	6 cu.m	Saro-da- bas- Ransuh-
PS	30 Nos.	35 Nos.	Chakar area

1.1 LOCATION:

The area of investigation falls in survey of India Toposheet Nos. 43 L/13, 43 P/1, 43O/4, 43K/12 and 43 K/16 and is bounded by N. Lat. 35° 58' 00" and 33° 12' 00" and E. Long 74°34' 00" and 75°00'00"

1.2 ACCESSIBILITY:

The area extends from Muttal in the south- east to Riasi- Salal in the north- west and further westward upto Ransuh- Chakar area. Muttal and important village is connected with Katra by 21-

km. long metalled road. It is also connected with Tikri located on NH- 1A by a11 km long all weather road. Reasi, the Tehsil headquarters is 80-km northwest of Jammu and is connected with it by metalled road via Katra branching off NH-1A at Domel at a distance of 32 km from Jammu.

1.3 PHYSIOGRAPHY:

Sirban Group of rocks in the area represent a rugged and mountainous topography with deep gorges and cliffs and forms NW-SE trending with altitude alter varying from 400 m to 2700 m above MSc The Trikuta stands out as a prominent ridge with highest point at 2708 m. The other prominent peaks in the area east of Chenab are Bardan (1753m) and Kaunsal Dhar (2090m). In the area west of Chenab, the Mundi Dhar, the extension of Trikuta stands out as prominent ridge with prominent peaks of Khandwar (2000m), Jhungi (1866m), Mundi (1916m) Sangamarg (1883m) and Ikhni (1970m). The rocks of Jangalgali and Subathu Formations occupy comparatively low topography than the Murrees in the north and Sirban Group in south.

1.4 DRAINAGE:

The Chenab River and its tributaries form the major drainage in the area. It flows in the westerly direction upto Arnas and takes a bend near Thanpal and flows in southerly direction cutting across Sirban Group. Here the river makes a major loop, which has been dammed across for construction of Salal Project.

The main tributaries of Chenab River in the eastern side are Samad Khad, Sersandu Khad, and Sarangdhar near Bakkal. Anji Khad and Pei Khad are other tributaries, which join Chenab near Reasi. The area east and southeast of Sukhwalgali forms the catchment of river and the main streams flowing in the area are Dada Nala, Dudher Khad, and Jhajhar nala. These nalas together with the main streams constitute trellis type of drainage.

In the Western part, Ans and Rad Khad are the main tributaries of the Chenab and in Ransuh- Chakar area, Pauna Tawi Khad is the main drainage, which in turn is a tributary of Thandapaniwali Tawi river.

Plenty of fresh water springs are seen in the rocks of Subathu Formation and Murree Group but they are rare in Sirban Group and there is an acute Shortage of drinking water especially during summer months in the terrain.

1.5 CLIMATE:

The area experiences a temperate to subtropical climate. The weather during the summer period of April to June is very hot at lower altitude while the high hills have pleasant weather conditions. The rainy season extends from July to end of September and during this period the area receives sufficient rainfall and the upper reaches remain foggy.

During the winter months i.e., from December to February the precipitation is in the form of occasional showers and light snowfall.

1.6 FLORA AND FAUNA:

Sirban Group of rocks bear scanty vegetation especially on its southern slope which support sparsely distributed pine trees and as such appear more or less barren from a distance. Along the northern slopes, clusters of pine trees along with Banz (Iri,) Kainth, and Kan trees are noticed. Besides, walnut in the higher reaches and mango and sour pomegranate (Anar), Garna, Amla, Pipal, Ber and Sisham in the Lower reaches are commonly seen. Thorny bushes shrubs and certain medicinal herbs are other common plants.

The main crops include wheat, maize, paddy, potatoes, and pulses barley and oil seeds. The higher slopes served as good pastures during summer and rainy seasons.

The wild life in the area include black bear, barking deer, monkey, languor, wolf, leopard, jackal, python and snake. The domestic animals are buffalo, cow, ox, horse, sheep and goat.

1.7 PREVIOUS WORK:

The Reasi Inlier/ Sirban Group Inlier in the Tertiary belt has been visited by many geologists from time to time and a few minerals were observed in the rocks of Sirban Group and Coal in the Tertiary belt.

Medlicott (1876) carried out the pioneering work and reported the occurrences of crushed coal in the area. He name the dolomitic Limestone occurring in Reasi area as "Great Limestone" and assigned Jurassic age to it.

Simpson (1903) gave the geological sequence of the area and visited the old workings for galena at Sersendu.

Middlemiss (1928) mapped a part of the Reasi Inlier for appraisal of coal, bauxite, iron ore and base metals. According to him, the Sirban Limestone of Reasi, forms a dome, and he compared it with the Infra- Triassic Formation of Hazara region.

Wadia (1937), assigned Upper Carboniferous age to the Sirban Limestone on the basis of faunal assemblage recorded from the Agglomeratic slates interstratified with Lower beds of Sirban Limestone.

Mehta and Srivastava (1959) carried out geological investigation of the coalfield of Ladda (Jangalgali area) by drilling in field season 1957-58.

Bhat and Nanda (1957) carried out mapping of the Sirban Limestone occurring between Muttal and Salal to find out its suitability for the manufacture of the Portland cement. They reported that flaggy Limestone occurring towards the upper part of the Sirban limestone is suitable for manufacture of the cement.

Banerjee (1959) carried out underground mapping of a few of the old mines in the Sersandu area. He is of the opinion that mineralisation is in the form of gash veins. For delineating the possible mineralisation pockets, he suggested chip sampling and geophysical survey by resistively method.

Dasgupta (1962) carried out detailed prospecting including the study of 30 old mines in old mines in Sersandu- Khairikot sector. He calculated the possible ore reserves of the order of 0.7 million tones with Pb percentage varying between 1 and 2.5 He recommended further work in the area by drilling and driving of adits.

Dhall and Srivastava (1964), Dhall (1965) and Dhall and Subramanium (1966) carried out detailed mapping and investigation for base metals in Sirban Group of rocks. They considered that the flat limb of the structural terrace located at Sersandu might be favourable locality for further prospecting by. Drilling. Seven boreholes were drilled involving a total of 603.55-m. pf drilling. Mineralisation of only sporadic nature was encountered in the BoreHoles. The prospect of finding a continuous zone of mineralisation was considered to be poor.

Pathak (1972-74), Lal and Jamwal (1979) and Lal etc. Al (1980 and 1981) carried out the appraisal of bauxite occurrences in different part of the area.

Dhall and Lal (1975) carried out geochemical prospecting for lead and zinc in Sersandu-Pres area. Seven anomaly zones were identified between Khairikot and Rohotkot with Zinc values often exceeding 4000 ppm. In the area between Pres and Rohotkot, high spot values of lead and zinc were indicated. They recommended geochemical survey in the adjoining areas of Sersandu and geophysical survey in Khairikot- Rohotkot sector.

Lal and Lal (1978) carried out sampling in the Eocene shales overlying the Sirban Limestone for finding out possibility of $P_2 O_5$ contents in the rocks. They also carried out preliminary sampling of bauxite.

Raha (1978) studied Sirban Limestone and assigned it Precambrian age on the basis of stromatolites present in it. The lead isotope dating of galena from Sersandu area carried out by Raha and others has also indicated Precambrian affinity (967 Ma)

Jamwal and Thappa (1990-91) and Thappa and Shali (1992-93) carried out detailed mapping of the Sirban Limestone in the Tertiary belt and reported the presence of sphalerite and galena mineralisation in the area and recommended further work for base metals in the northern part of the Sirban Limestone. They elevated the status of Sirban Limestone to group level and classified Sirban Limestone. They elevated the status of Sirban Limestone to group level and classified Sirban group into Trikuta and Khairikot Formations.

Acharya (1979) carried out petrographic studies of chert breccia subjacent to the bauxite crust and identified as rhyolite.

Kalsotra (1992) carried out trace elements study of Jammu bauxite crust and chert breccia and reported high values of lithium form it. According to him, the chert breccia is correlatable with welded tuff occurring at the contact of Panjal Volcanics (Lower Permian) and Zewan Formation (Upper Permian) Verma and Sharma, 1983.

1.8 ACKNOWLEDGEMENT:

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2. GEOLOGY

The rock types exposed in the area of investigation belong to Sirban Group, Jangalgali Formation ('Bauxite series') Subathu Formation Murree and Siwalik Groups. The contact between Sirban Group and Jangalgali Formation is unconformable. The Jangalgali Formation in unconformably overlain by Subathu Formation. The lithostratigraphic succession is given below (Table-2)

TABLE-2
LITHOSTRATIGRAPHIC SUCCESSION IN MUTTAL-SALAL-RANSUH AREAS OF UDHAMPUR DISTRICT, JAMMU AND KASHMIR (MODIFIED AFTER MOHALLAL (1984-85,1985-86) AND THAPPA & SHALI (1992-93)

Group/formation	Lithology	Age
Middle Siwali	Light greensih grey sandstone with red, pink, greenish and grey shale and siltstone	Pilocene
Lower Murree	Reddish, purplish grey, greenish shale, siltstone and sandstone with subordiante pseudoconglomerate	Lower Miocene to Upper Eocene
Subathu	Reddish, purplish, grey, greenish shale siltstone and sandstone with subordinate pseudoconglomerate, conglomerate and pebbly beds.	Eocene
	Unconformity	
SIRBAN: Khairikot	Light grey quartzite, variegated shale and dark grey slate and stromatolitic limestone with calcareous shale	PROTENRONOIC
SIRBAN: Trikuta	Massive cherty and non cherty dolomite with stromatolites, flaggy limestone with chert and slate bands.	PROTENRONOIC

SIRBAN GROUP:

The Sirban Group comprises a thick sequence of carbonates with subordinate arenites and argillites exposed throughout the area of investigation extending from Ransuh- Chakar in the NW to Muttal in SE. It is the oldest sequence occurring as inlier within the Tertiary belt of the outer Himalaya. The Group is divisible into two formations namely Trikuta and Khairikot (Thappa and Shali; 1992-93)

TRIKUTA FORMATION:

It is essentially a calcareous sequence comprising cherty and non cherty dolomite, calc-argillite, calc-arenite, slate, flaggy limestone and stromatolitic limestone/ dolomite is the dominant lithounits of this formation which under thin sections show anhedral, subhedral, and euhedral grains of calcite and sparite with sutured boundary. The grains are cemented together by calcite/ dolomite material. Along the southern side of the Sirban Group inlier, the Dolomite is completely pulverized at placed along a thrust on the southern side of the inlier.

The flaggy limestone is another important lithounit of this formation and occurs at three levels. The limestone under thin section shows subhedral to euhedral grains of calcite.

KHAIRIKOT FORMATION:

The Trikuta Formation is conformably overlain by Khairikot Formation, which is essentially an areno-argillaceous sequence comprising chert breccia, quartzite, and slate and variegated shales and subordinate stromatolitic dolomite. The Formation is well developed in Khairikot and is traceable from east of Pres to Sersandu area.

JANGALGALI FORMATION ('BAUXITE SERIES'):

The Jangalgali Formation rests unconformably over the Khairikot Formation and where the latter is missing, it rests unconformably over the Trikuta Formation. It comprises chert quartzite breccia, thin bedded quartzite, ferruginous sandstone and bauxite column (aluminous clay, pisolitic and non-pisolitic bauxite). The formation occurs as thin linear lenses sandwiched between rocks of Sirban Group and overlying Subathu Formation. The basal part of the Formation consists of chert quartzite breccia, grey to brownish in colour, occasionally greenish and contains angular to subangular clasts of quartzite, chert, dolomite and vein quartz which appear to have been derived from the rocks of underlying Sirban group and are embedded in gritty arenaceous matrix. The green/ brownish breccia contains glassy material, thereby suggesting volcano- sedimentary origin. The brownish to reddish igneous material is seen in a 80-m thick horizon near Kanthan Bridge which extend further westward. The intrusive effect is prominent in Kanthan, Thanpal, Matah, Sangar- Gai- Ransuh- Chakar area.

Under thin section, the breccia shows ill sorted angular to subangular fragments, mostly of quartz, chert and minor plagioclase embedded in a matrix comprising fine to medium grained subangular to subrounded grains of quartz sericite and occasionally micaceous material. Thin section at places show trachytic texture, feldspar and plagioclase are mainly sanidine and albite. Besides, augite, hornblende, aegirine and rarely olivine are also seen. Tectonic impact is seen in the form of elongation of plagioclase feldspar grains and absence of twin lamellae. Groundmass is iron rich and major part is penetrated along the cracks of the mineral grains and appears to be trachyte in composition.

The breccia horizon is overlain by ferruginous sandy shale/ sandstone. It is grey, reddish, brown to yellowish in colour, medium to coarse grained, arkosic in nature and generally weathered and passes upward into grey bauxite column. At places the sandstone is seen grading laterally into breccia horizon, Impersistent bands of dirty white quartzite with pitted surface also occur in it and it gradually grades into overlying quartzitic sandstone bands which are brownish to grey in colour, medium to coarse grained, gritty at places with thin layers of shale. It is medium too coarse grained and is arkosic in nature.

The upper of Jangalgali Formation is a bauxite column comprising grey aluminous clay in the basal part followed upward successively by grey non-pisolitic bauxite and pisolitic bauxite. The passage from one unit to another is transitional. In fact the Jammu bauxite crust, represent a palaeoplanar surface that was transgressed by the Subathu Sea. During the Himalayan orogeny, the bauxite crust was folded along with associated strata and after erosion, the bauxite now forms isolated outcrops on dip slopes of Sirban Group of rocks while a good part of the bauxite crust is lying intact below the Subathus.

The bauxite column crops out near Muttal and continued westward to Jangalgali-Sukhwalgali section and is exposed intermittently upto Salal, where it is well develop. The bauxite column extends further westward upto Thanpal, where it is cut off by a fault and olive shales of Subathu Formation come in direct contact with the rocks of Sirban Group. It reappears in Baldhanu-Panasa area but further westward in Rad- Ikhai section, it is again cut off by a fault, bringing Subathus in direct contact with Sirban Group. It reappears again in Saro-da-Bas area and continues upto Chakar area, where it is widespread but thereafter it continues as a linear band exposed intermittently in Ransuh- Khori- Krul area.

The pisolitic layers is grey to bluish grey in colour and forms the protective cover over the other units of bauxite column and range in thickness from 20 cm to 1.50m. The pisolites in it are rounded to oval shaped and comprise core of aluminous and ferruginous material. The non pisolitic unit is hard, grey to yellowish grey in colour with thickness varying from 0.50m to 2.00m. It contains occasional minute pisolites of grey colour. The aluminous clay which forms the basal unit of the bauxite column is harder in the upper part but softer in the lower part. It is grey in colour with yellowish to brownish streaks and range in thickness from 0.50 m to 2.50 m. The chief constituents of bauxite column are Kaolinite, boehamite and diaspore with Kaolinite dominant in clay unit and monohydrates forming the prominent constituent of the upper two units. The iron content is comparatively high in the top pisolitic layer. In Panasa and Ransuh area, residual pebbles, cobbles and boulders of bauxite are seen over the top of bauxite crust. This indicates that a considerable time has lapsed between the bauxitisation and transgression of sea during Eocene period.

The Jangalgali Formation ('bauxite series') has been assigned Cretaceous- Eocene age on the basis of fossils (Lal, 1984-85, 1985-86)

SUBATHU FORMATION:

The Jangalgali Formation is unconformably overlain by the rocks of Subathu Formation. Where Jangalgali Formation is missing, Subathus overlies the rocks of Sirban Group. The Subathu Formation consists mainly of carbonaceous shale, grey ferruginous sandstone and bands nummulitic nodular. Specks and nodules of pyrite and phosphate occur as lenses in intricately folded carbonaceous shale. This formation had good exposure in Thanpal, Chinkah, Baldhanu, Panasa, Lorcha, Chakar, Ransuh, Khori and Krul areas.

LOWER MURREE:

The Subathu Formation is overlain by a thick monotonous sequence of Lower Murree Formation comprising alternations of sandstone, siltstone, and shale with subordinate bands of pseudo-conglomerate and conglomerate. The sandstone is purple, green and slight grey in colour, fine to medium grained, micaceous in nature and exhibit feeble current bedding and ripple marks. The siltstone is reddish brown to purple and contains calcite veins. Shale is purple and green in colour and is traversed calcite veins. The pseudo- conglomerate forms thin impersistent bands and lenses. Bands of clay and pseudo- conglomerate are common in the Lower Murree Formation.

MIDDLE SIWALIK:

Middle Siwalik rocks consists of light greenish grey and brownish sandstone, siltstone and red to pink shales. The sandstone is fine to medium grained and micaceous at places. It encloses clay pallets. The siltstone bands are dark brown in colour, micaceous and often grades into very fine grained, brownish sandstone. Reddish clays are often interbedded with sandstone and siltstone.

3. STRUCTURE

The regional structure in the area of investigation is a south- easterly plunging anticlinorium with Sirban Group of rocks occurring in the core and younger Tertiaries fringing it. The northern limb of the anticline is normal, whereas southern limb is faulted bringing the Sirban Group of rocks over the younger Tertiary rocks with elimination of Subathu and Jangalgali Formations, the latter are present only as caught up patches at few places. The thrust contact between the Sirban Group and the Tertiary rocks, named as 'Reasi Thrust' is of great magnitude and corresponds to the Main Boundary Fault. The Sirban Group is traversed by a number of strike as well as transverse faults trending in NW-SE, NE-SW, N-S and E-W direction and can be identified by crushed zones and fault breccia. The fault in the Sirban Group are very conspicuous as the dolomite is shattered and pulverized giving rise to fault gouge.

The major anticline orium in the north- western part is thrown into series of folds forming asymmetrical anticlines and synclines plunging towards WNW and NW, rocks of Murree Group occupying the synclinal troughs and the Sirban Group occupying the anticlinal cores.

Jointing has played an important role in the drainage and geomorphic evolution in the Sirban Group Terrain. Three distinct sets of joints have been noticed in the area with attitudes as follows:

NE-SW NW-SE E-W	With moderate to steep dips, northerly as well as southerly.

Evidences of neotectonic activity are seen in the nala north of Samdrein on the eastern side of the Jhajar nala, where the Subathu rocks occur as caught up patches along the 'Reasi Thrust'. These rocks are seen to rest over the Murree rocks (red shale and sandstone) which in turn rest over the scree material at an angle of 35° Similar evidences are seen in the form of tilting of Quaternary terrace deposits in the Mari Nala section.

4. GEOCHEMICHAL SURVEY FOR BASE METALS AND LITHIUM

The geochemical survey for base metals and lithium was undertaken in the area extending form Katra- Muttal-Salal on the eastern side of Chenab river (Plate -II) to Ransuh-Chakar area on the western side of the Chenab river (Plate- III). The main objective of the investigation was to geochemically assess the area for base metals mineralisation in Sirban Group and for Lithium in the overlying bauxite crust not withstanding that only eroded remnants of bauxite crust were examined whereas large part of this crust lying intact below the Subathus is unexplored.

MAPPING:

Traverse geological mapping was carried out in the Sirban Group Inlier and overlying Jangalgali and Subathu Formations in Katra- Muttal- Press- Garan-Sersandu- Salal area (Plate-I) on the eastern side of the Chenab river and in Thanpal- Panasa- Paoni- Ransuh- Chakar area (Plate-II) on the western side of the Chenab river.

SAMPLING:

During the course of geochemical survey, samples were collected for base metals from promising zones within Sirban Group Inlier i.e., zones traversed by quartz/ calcite veins, ferruginous coated/ gossanised patches and pulverized zones with disseminations of sulphides
And zones showing OLE workings. Samples have also been collected from the upper part of the Sirban Group and overlying chert quartzite breccia traversed by igneous material. Besides, a few samples were also collected from ironstone shale and pyritiferous nummulitic limestone from Subathu Formation.

Samples for Lithium were collected from different lithounits of Jangalgali Formation (Including bauxite column) from different areas.

Samples for base metals were collected mainly as spot samples representing an area of about 5 m diameter but in case of gossanised mineralised zones, systematic samples have been collected at 2 m and 5m interval across the mineralised zones along different lines.

PROCESSING OF SAMPLES:

Each samples weighing about 1 kg was crushed and sieved to minus 100 mesh. Later, the sieved material was further reduced by coning and quartering to prepare two sets of samples each weighing about 100 gm. In a limited number of samples three sets of samples were prepared for different chemical Laboratories. All the samples were packed in polythene bags. One set was retained as duplicate samples, of whereas of the other two sets one each was sent to G.S.I., Chemical Laboratories Faridabad and Jammu.

5. CHEMICAL ANALYSIS

A total of 804 nos. of samples were collected from different lithounits of Sirban Group and from Jangalgali and Subathu Formations. All the samples were sent for chemical analysis and the results have been incorporated in Appendices I and II. The break up of the samples is as follows:

Total number of samples	804 nos.
Samples analysed for Lithium	332 nos.
Samples analysed for base metals	472 nos.

Samples for lithium were collected from Jangalgali formation and are as under Total number of samples from Jangalgali Formation 332 nos.

a. Pislotic bauxite	83 nos.
b. Non- pisolitic bauxite	77 nos.
c. Bauxitic clay	56 nos.
d. Sandstone/ quartzite/tuff	33 nos.
e. Brecciated quartzite	83 nos.

Out of 472 of samples analysed for base metal, 437 nos. were collected from prospective zones of Sirban Group and 35 no from Subathu Formation. Details of these samples are given below-

Samples break up of Sirban Group::

Dolomite/ Dolomitic Limestone with steatitite and magnisite at few places	232 nos.
Quartzite	41 nos.
Flaggy Limestone	34 nos.
Shale/Slate	18 nos.
Vein quartz	6 nos.

Calcite vein	1 nos.
Tuff	4 nos.
Chert band	7 nos.
Mineralized/ gossanised zone	70 nos.
Makol/ Fault breccia	77 nos.
Terrace	6 nos.
Slag	4 nos.
Basic/ Metabasic	7 nos.
Samples break up of Subathu Formation:	S
Nummilitic limestone with slate	10 nos.
Iron stone shale	25 nos.

LITHIUM:

The Samples collected from the lithounits of Jangalgali Formation during F.S. 1995-96 &1996-97 have indicated the following values of lithium and other elements which are described lithounit wise as under:

a. Pisolitic bauxite- (83 nos.)

Elements	Range	Average	No. of Samples showing values beyond detection limit
SiO_2	6.6 to 57.7%	34.37%	
Al_2O_3	9.6 to 56.00%	40.04%	
Fe_2O_3	1.3 to 27.7%	7.45%	
TiO_2	0.4 to 3.42%	1.84 %	
P_2O_5	126 to 5067 ppm	1505.03 ppm	
Li	88 to 3247 ppm	883.80 ppm	
V	80 ti 424 ppm	202.30 ppm	
Cr	30 to 396 ppm	209.96 ppm	
Cu	<5 to 650 ppm	21.7 ppm	41 samples < I ppm
Zn	14 to 455 ppm	54.64 ppm	
Pb	<10 to 334 ppm	92.25 ppm	8 samples < 10 ppm
Bi	<10 to 74 ppm	20.82 ppm	29 samples <10 ppm
Zr	402 to 1619 ppm	718.12 ppm	

b.Non- pisolitic bauxite- (77 nos.)

Elements	Range	Average	No. of Samples showing values beyond detection limit
SiO_2	8.2 to 48.7%	36.30%	
Al_2O_3	12.2to 56.00 %	40.15%	
Fe_2O_3	< 1.0 to 36.5%	6.04%	
TiO_2	0.69 to 3.52%	1.82 %	
P_2O_3	267 to 5067 ppm	1606.40 ppm	
Li	186 to 3529	749.66 ppm	
V	66 to 590 ppm	186.34 ppm	
Cr	94 to 662 ppm	206.58 ppm	
Cu	<5 to 120 ppm	26.49 ppm	33 samples < 5 ppm
Zn	17 to 231 ppm	51.97 ppm	
Pb	<10 to 189 ppm	82.63 ppm	4 samples <10 ppm
Bi	10 to 49 ppm	22.16 ppm	21 samples <10 ppm
Zr	154 to 1430 1 ppm	688.97 ppm	

c. Bausitic clay- (56 nos.)

Elements	Range	Averange	No. of Samples showing values values beyond detection
SiO_2	5.0 to 80.0%	49.85%	
Al_2O_3	<1.0 to 56.00%	32.35%	
Fe_2O_3	<1.0 to 29.7%	4.46%	13 samples < 1.0%
TiO_2	0.68 to 3.9 %	1.49%	
P_2O_5	<100 to 2817 ppm	938.7 ppm	
Li	<10 to 877 ppm	321.4 ppm	
V	51 to 357 ppm	126.17 ppm	
Cr	51 to 336 ppm	147.5 ppm	
Cu	<5 to 48 ppm	19.4 ppm	4 samples <5 ppm
Zn	14 to 631 ppm	61.23 ppm	
Pb	<10 to 534 ppm	73.86 ppm	1 sample <10 ppm
Bi	<10 to 44 ppm	21.4 ppm	9 samples <20 ppm
Zr	294 to 1312 ppm	613.24 ppm	

d. Sandstone/ quartzite/ Tuff (33 nos)

Elements	Range	Averange	No. of Samples showing values values beyond detection limit
SiO_2	20.0 to 94.3%	72.15%	
Al_2O_3	<1.0 to 54.2%	12.42%	
Fe_2O_3	<1.0 to 6.6%	2.50%	
TiO_2	0.04 to 2.38%	0.65%	
P_2O_5	<100 to 2392 ppm	645.0 ppm	14 samples <100 ppm
Li	<10 to 1725 ppm	155.46 ppm	4 samples <10 ppm
V	<10 to 510 ppm	76.82 ppm	3 samples <10 ppm
Cr	10 to 236 ppm	62.62 ppm	
Cu	<5 to 203 ppm	23.33 ppm	5 Samples <5
Zn	<5 to 455 ppm	90.2 ppm	1 samples <5
Pb	<10 to1600 ppm	99.35 ppm	8 samples <10 ppm
Bi	<10 to 25 ppm	15.59 ppm	1 samples <10 ppm
Zr	127 to 674 ppm	34.86 ppm	

E Brecciated quartzite/chert quartzite breccia- (83 nos)

Elements	Range	Averange	No. of Samples showing values beyond detection limit
SiO_2	25.9 to 95.4%	73.06%	
Al_2O_3	<1.0 to 38.2%	9.8%	2 Samples<10
Fe_2O_3	<1.0 to 36.6%	7.15%	14 samples <1.0
TiO_2	0.04 to 2.67%	0.48%	
P_2O_5	<100 to 2689 ppm	551.37 ppm	21 samples < 100 ppm
Li	<10 to 1362 ppm	88.79 ppm	4 samples <10 ppm
V	<10 to 325 ppm	54.42 ppm	4 samples <10 ppm
Cr	<10 to 274 ppm	55.11 ppm	1 samples <10 ppm
Cu	<5 to 163 ppm	41.45 ppm	2 samples <5 ppm
Zn	<5 to 1323 ppm	146.02 ppm	1 samples <5 ppm
Pb	<5 to 1199 ppm	91.56 ppm	18 samples <10 ppm
Bi	<10 to 35 ppm	16.3 ppm	45 samples <10 ppm
Zr	<20 to 905 ppm	229.09 ppm	2 samples <20 ppm

In the aforesaid chemical data, it cab be seen that consistently high values of Li and Zr have been recorded in the bauxite column of the entire bauxite belt, which on an average show 337.47 ppm Li and 656.53 ppm Zr in the basal bauxite clay, 749.66 ppm Li and 688.97 ppm Zr in the non-pisolitic bauxite, and 883.80 ppm Li and 718.12 ppm Zr in the top pisolitic bauxite zone. Further there is progressive enrichment of these elements as well as of vanadium and lead from bottom to top of the bauxite column. On the other hand, no definite pattern of the copper, lead and zinc could be found in the rocks of Sirban Group and these values here are of isolated nature.

As described earlier, the investigation for lithium and base metals was carried out in two adjoining areas. I.e., Muttal- Jangalgali- Sukhwalgali- Press- Sersandu- Salal area during F. S. 1995-96 (Plate- I) and Salal- Thanpal- Panasa- Paoni- Saro da Bas- Ransuh- Chakar area during F.S. 1996-97 (Plate-II).

Details of Lithium and values area wise are described below:

A Values of Lithium and relate elements in Muttal- Jangalgali- Sukhwalgali- Press- Sersandu area from different Lithounits of Jangalgali Formation (Appendix I) are as under :

A. Pisolitic Bauxite- (23 Nos.)

Elements	Range	Averange	No. of Samples showing values beyond detection limit
SiO_2	17.2 to 42.5%	33.02	
$Al_2 O_3$	33.0 to 54.5%	40.89	
$Fe_2 O_3$	1.5 to 14.0 %	6.74%	
TiO_2	1.02 to 3.42 %	1.94%	
$P_2 O_5$	126 to 3938 ppm	1559.68 ppm	
Li	314 to 1798 ppm	1026.45 ppm	
V	131 to 386 ppm	251.27 ppm	
Cr	134 to 293 ppm	213.27 ppm	
Cu	5 to 100 ppm	46.16 ppm	10 Nos. <5 ppm
Zn	21 to 103 ppm	42.09 ppm	
Pb	10 to 239 ppm	117.5 ppm	8 nos. <10 ppm
Bi	10 to 74 ppm	25.92 ppm	8 nos. <10 ppm
Zr	439 to 1396 ppm	760.45 ppm	

a. Non- Pisolitic bauxite- (24 nos.)

Elements	Range	Average	No. of Samples showing values beyond detection limit.
SiO_2	32.8 to 60.5%	44.4%	
$Al_2 O_3$	13.0 to56.0%	28.30%	
$Fe_2 O_3$	1.4 to25.4%	7.6%	
TiO_2	0.68 to2.21%	1.26%	
$P_2 O_5$	<100 to2817 ppm	750.4 ppm	2 nos <100 ppm
Li	<10 to1523 ppm	373.6 ppm	1 no <10 ppm
V	5 to 244 ppm	139.65 ppm	
Cr	51 to 159 ppm	119.00 ppm	
Cu	5 to 118 ppm	35.0 ppm	
Zn	23 to 631 ppm	153.7 ppm	

Pb	<10 to 102 ppm	55.3 ppm	2 nos <10 ppm
Bi	<10 to 28 ppm	17.17 ppm	5 nos <10 ppm
Zr	23 to 1284 ppm	654.4 ppm	

d. Sandstone/ quartzite/ tuff (14 nos.)

Elements	Range	Average	No. of Samples showing values beyond detection limit
SiO_2	20.0 to 94.3%	63. 8%	
Al_2O_3	1.0 to 54.2%	15.53 %	2 nos < 1.0 %
Fe_2O_3	1.0 to 6.6%	2.98 %	5 nos <1.0 %
TiO_2	0.06 to 2.38%	0.92 %	
P_2O_5	100 to 2392 ppm	746.7 ppm	1 nos <100 ppm
Li	10 to 1725 ppm	285.3 ppm	2 nos <10 ppm
V	10 to 510 ppm	110.8 ppm	3 nos <10 ppm
Cr	18 to 236 ppm	86.4 ppm	
Cu	5 to 203 ppm	36.70 ppm	2 nos <5 ppm
Zn	16 to 1282 ppm	169.2 ppm	
Pb	13 to 1600 ppm	145.35 ppm	
Bi	10 to 19 ppm	14.88 ppm	5 nos <10 ppm
Zr	127 to 674 ppm	356.6 ppm	

e. Brecciated quartzite (40 Nos.)

Elements	Range	Average	No. os Samples showing values beyond detection limit
SiO_2	26.00 to 95.4 %	74.55%	
Al_2O_3	1.0 to 35.6 %	8.23%	2 nos <1.0 %
Fe_2O_3	1.0 to 34.7 %	5.65%	4 nos <1.0 %
TiO_2	0.04 to 2.67%	0.44%	
P_2O_5	<100 to 2689 ppm	644.5 ppm	5 nos <100 ppm
Li	<10 to 311 ppm	66.75 ppm	4 nos <10 ppm
V	<10 to 325 ppm	46.33 ppm	4 nos <10 ppm
Cr	<10 to 274 ppm	56.7 ppm	1 no. <10 ppm
Cu	10 to 163 ppm	62.72 ppm	
Zn	9 to 1323 ppm	208.1 ppm	
Pb	<10 to 1199 ppm	109.5 ppm	6 nos. < ppm
Bi	<10 to 27 ppm	15.86 ppm	10 nos <10 ppm
Zr	20 to 651 ppm	158.36 ppm	2 nos<20 ppm

In the Muttal- Salal area, Aforesaid high values of Li (average 1026.45 ppm).V (average 251.27 ppm), Cr (average 213.27 ppm), Zr (average 760.45 ppm) and P_2O_5 (average 1559. 68 ppm) have been recorded from the bauxite column. Anomalous values of these elements have also been recorded from the other lithounits of Jangalgali formation, but those values are comparatively lower than the bauxite column. In the bauxite column, pisolitic bauxite has shown higher values.

B. Values of Lithium and related elements in Salal- Thanpal- Panasa- Saro da Bas- Ransuh Chakar area from different lithounits of Jangalgali Formation (Appendix- II) are as under.

A Pisolitic bauxite- (60 nos.)

Elements	Range	Average	No. of samples showing values beyond detection limit.
SiO_2	6.6 to 57.7 %	34.88 %	
Al_2O_3	9.6 to 56.00 %	39.71 %	
Fe_2O_3	1.3 to 27. 7%	7.73 %	
TiO_2	0.4 to 2.98 %	1.80 %	
P_2O_5	405 to 5067 ppm	1485.6 ppm	
Li	88 to 3247 ppm	831.5 ppm	
V	80 to 424 ppm	184.34 ppm	
Cr	36 to 390 ppm	208.75 ppm	
Cu	5 to 650 ppm	11.6 ppm	31 nos <5 ppm
Zn	14 to 455 ppm	59.25 ppm	
Pb	18 to 334 ppm	74.7 ppm	
Bi	<10 to 41 ppm	19.0 ppm	21 nos <10 ppm
Zr	462 to 1618 ppm	702.6ppm	

b. Non.- pisolitic bauxite – (53 nos)

Elements	Range	Average	No. of Samples showing vlues beyond detection limit
SiO_2	8.2 to 48.7 %	37.30 %	
Al_2O_3	12.2 to 36.56%	40.41 %	
Fe_2O_3	<1.0 to 36.5 %	6.00 %	4 nos < 1.0 %
TiO_2	0.69 to 3.52 %	1.79 %	
P_2O_5	383 to 20029 ppm	1766.5 ppm	
Li	107 to 877 ppm	706.15 ppm	
V	66 to 594	166.9 ppm	
Cr	94 to 662 ppm	205.7 ppm	
Cu	< 5 to 119 ppm	14.9 ppm	31 nos <5 ppm
Zn	17 to 231 ppm	51.8 ppm	
Pb	21 to 189 ppm	82.9 ppm	
Bi	< 10 to 49 ppm	21.7 ppm	11 samples <10 ppm
Zr	154 to 1430 ppm	664.3 ppm	

C. Bauxitic clay- (47 nos)

Elements	Range	Average	No. of Samples showing values beyond dection limit
SiO_2	5.9 to 80.0 %	50.9 %	
Al_2O_3	18.5 to 56.0 %	33.12 %	
Fe_2O_3	<1.0 to 12.8%	2.58%	11 nos <1.0 %
TiO_2	0.13 to 3.9 %	1.54%	
P_2O_5	<100 to 5304 ppm	969.4 ppm	4 samples < 100 ppm
Li	14 to 877 ppm	312.5 ppm	
V	27 to 357 ppm	123.6 ppm	
Cr	73 to 336 ppm	152.9 ppm	
Cu	<5 to 42.0 ppm	13.3 ppm	24 nos<5 ppm
Zn	14 to 282 ppm	43.5 ppm	
Pb	<10 to 534 ppm	76.7 ppm	1 nos <10 ppm

Bi	<10 to 44 ppm	21.87ppm	14 nos <10 ppm
Zr	123 to 1312 ppm	605.36 ppm	9 no <10 ppm

a. Sandstone/ Quartzite/ Tuff (19 nos)

Elements	**Range**	**Average**	**No. of Samples showing values beyond detection limit**
SiO_2	44.3 to 90.2%	72.44 %	
Al_2O_3	2.1 to 37.5 %	8.82 %	
Fe_2O_3	<1.0 to 4.7 %	2.04 %	13 nos <1.0 ppm
TiO_2	0.09 to 1.38 %	0.48 %	
P_2O_5	<100 to 1784 ppm	585.5 ppm	13 nos <100 ppm
Li	<10 to 316 ppm	63.8 ppm	21 nos <10 ppm
V	15 to 166 ppm	57.15 ppm	
Cr	10 to 103 ppm	45.1 ppm	
Cu	<5 to 42 ppm	13.3 ppm	3 nos <5 ppm
Zn	<5 to 254 ppm	28.8 ppm	1 no <5 ppm
Pb	<10 to 65 ppm	41.3 ppm	8 nos <10 ppm
Bi	<10 to 25 ppm	16.7 ppm	13 nos <10 ppm
Zr	148 to 621 ppm	318.8 ppm	

E. Brecciated quartzite/ chert quartzite breccia- (43 nos)

Elements	**Range**	**Average**	**No. of Samples showing values beyond detection limit**
SiO_2	25.9 to 91.2 %	66.36 %	
Al_2O_3	3.6 to 38.2 %	14.38 %	
Fe_2O_3	<1.0 to 36.6 %	9.16 %	
TiO_2	0.12 to 2.36 %	0.78 %	
P_2O_5	<100 to 1119 ppm	430.7 ppm	16 samples <100 ppm
Li	10 to 1362 ppm	108.65 ppm	
V	17 to 325 ppm	61.2 ppm	
Cr	10 to 221 ppm	49.8 ppm	
Cu	<5 to 84 ppm	20.7 ppm	2 nos <5 ppm
Zn	<5 to 423 ppm	86.9 ppm	1 nos <5 ppm
Pb	<10 to 248 ppm	71.9 ppm	12 nos <10 ppm
Bi	<10 to 35 ppm	18 ppm	35 nos <10 ppm
Zr	104 to 905 ppm	291.5 ppm	

In the Salal- Ransuh area, high values of Li (average 831.5 ppm), V (average 184.35 ppm), Cr(average 208.36 ppm), Zr (average 702.6 ppm) and P_2O_5 (average 1485.6ppm) have been recorded from the pisolitic bauxite. The other lithounits of Jangalgali Formation have shown comparatively lower values. In the bauxite column itself, pisolitic bauxite has shown higher values.

Comparison of analytical results of the two areas of investigation, indicates that in Muttal-Salal area, the analytical results show higher concentration of lithium than in Salal- Ransuh area. However the spot values for Li are higher in Salal- Ransuh area (88 to 3247 ppm), than in Muttal-Salal area (314 to 1798ppm). It holds well in case of other elements also. The P_2O_5 Values, in general, are higher in Salal- Ransuh area.

On the basis of analytical data, it be said that the higher values of lithium are persistent throughout the belt (where bauxite column is exposed). Secondly, bauxite column has wide and more exposures in Salal- Ransuh area. This area appears to be a better prospect for lithium.

BASE METAL:

Samples collected from the Sirban Group Inlier and Subathu Formation for bas metal determinations have indicated the following values of base metals.

Elements	Range	Average.	No. of Samples showing values beyond detection limit
Cu	<10 to 740 ppm	53.08 ppm	187 samples <10 ppm
Zn	<10 to 76,000 ppm	12403.9 ppm	1 samples <10 ppm
Pb	<50 to 1,40,000 ppm	4069.8 ppm	335 samples <50 ppm

Detail break-up of analytical values of base metals of 302 nos. of samples collected from different lithounits from Muttal –Jangalgali- Sukhwalgali- Pres- Sersandu- Salal area, F.S. 1195-96 (Appendix-I)

a. Dolomite/ Dolomitic Limestone/ Steatite (2 nos.) Magnesite (4 nos.): (155 nos.)

Elements	Range	Average	No. of Samples showing values beyond detection limit
Cu	<10 to 570 ppm	109.56 ppm	108 samples <10 ppm
Zn	25 to 30,000 ppm	698.7 ppm	-
Pb	<50 to 33, 000 ppm	1031.16 ppm	119 samples <10 ppm

b. Quartzite (29 nos.):

Elements	Range	Average	No. of Samples showing values beyond detection limit
Cu	<10 to 203 ppm	33.29 ppm	12 samples <10 ppm
Zn	<50 to 32,00 ppm	2270 ppm	10 samples < 50 ppm
Pb	<50 to 1600 ppm	380.62 ppm	21 samples <50 ppm

c. Flaggy Limestone (32 nos.):

Elements	Range	Average	No. of Samples showing values beyond detection limit
Cu	<10 to 240 ppm	62.77 ppm	14 samples<10 ppm
Zn	30 to 400 ppm	283.12 ppm	-

Pb	<50 to 600 ppm	263.33 ppm	12 samples <50 ppm

d. Shale/Slate (13 nos.):

Elements	Range	Average	No. of Samples showing values beyond detection limit
Cu	<10 to260 ppm	47.4ppm	3 samples <10 ppm
Zn	25 to 250 ppm	110.54 ppm	-
Pb	<50 to150 ppm	150 ppm	12 samples <50 ppm

e. Vein Quartz

Elements	Range	Average	No. of Samples showing values beyond detection limit
Cu	<10 to 10 ppm	10 ppm	1 samples <10 ppm 1 Sample missing
Zn	3 to 1300 ppm	800 ppm	1 sample missing
Pb	<50 ppm	<50 ppm	2 samples <50 ppm 1 sample missing

f. Calcite vein (1 no.) :

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 ppm	< 10 ppm	1 samples <10 ppm
Zn	150 ppm	150 ppm	-
Pb	<50 ppm	< 50 ppm	1 samples <50 ppm

g. Tuff (1 nos.)

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	< 5 to 15 ppm	15 ppm	2 samples < 5 ppm 1 samples <10 ppm
Zn	34 to 150 ppm	70.25 ppm	-
Pb	<50 to 180 ppm	129 ppm	2 samples <50 ppm

h. chert band (5 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	10 to 300 ppm	68 ppm	-
Zn	90 to 300 ppm	152 ppm	-
Pb	<50 to 100 pm	100 ppm	3 samples <50 ppm

i. Mineralised/ Gossanised zones (30 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 135 ppm	36.03 ppm	1 samples <10 ppm

Zn	30 to 76,000 ppm	22,185.66 ppm	-
Pb	<50 to 1,40,000 ppm	15,790 ppm	10 samples <50 ppm

J. Makot (2 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 ppm	<10 ppm	2 samples <10 ppm
Zn	50 to 120 ppm	85 ppm	-
Pb	<50 to 100 ppm	100 ppm	1 samples <50 ppm

k. Terrace (6 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 20 ppm	18 ppm	1 sample <10 ppm
Zn	50 to 100 ppm	81.66 ppm	-
Pb	<50 ppm	<50 ppm	6 samples<50 ppm

Subathu Formation:

1. **Nummulitic Limestone (7 nos.):**

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 290 ppm	194.16 ppm	1 sample <10 ppm
Zn	60 to 1200 ppm	458.57 ppm	-
Pb	<50 to 120 ppm	120 ppm	5 nos <50 ppm

m. Ironstone Shale (15 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 90 ppm	19 ppm	5 samples <10 ppm
Zn	50 to 24,000 ppm	1745.33 ppm	-
Pb	<50 ppm	<50 ppm	15 samples <50 ppm

It needs to be mentioned here that in Muttal- Jangalgali- Pres- Sersandu- Sukhwalgali- Salal area, there are small pockets (confined to calcite/ quartz veins) lenses, specks and disseminations of lead and zinc mineralisation. Galena also occurs in small pockets confined to veins localised along faults. As regard, sphalerite mineralisation, it occurs in the forms of small lenses, specks and as minor veinlets. Samples collected from these zones have indicated high values (Cu upto 570 ppm, Zn upto 76,000 ppm, Pb upto 140, 000ppm). Besides, some high anomalous values of copper, lead and zinc have also been recorded from dolomite/ dolomitic limestone and quartzite hands. These high anomalous values have been recorded from the areas adjoining to the mineralised zones and indicate the effect of impregnating mineralising solutions. However, these values are spot high only and do not form any zone. Briefly, it can be said that the base metals mineralisation in the area has very limited Arial extent and does not appear to be economically viable.

Detail break-up of analytical values of base metals of 170 nos. of samples collected from different lithounits from Salal- Thanpal –Paoni- Saro do Bas- Ransuh- Chakar area, F. S. (1996-97) (Appendix- II).

a. Dolomite/ Dolomitic Limestone (77 nos.) :

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 320 ppm	31.87 ppm	13 samples <10 ppm
Zn	10 to 1500 ppm	207.66 ppm	-
Pb	<50 to 8500 ppm	614.25 ppm	57 samples <50 ppm

b. Quartzite (12 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 75 ppm	33.14 ppm	5 samples < 10 ppm
Zn	<50 to 264 ppm	264 ppm	11 samples < 50 ppm
Pb	<10 to 1000 ppm	264.2 ppm	7 samples < 10 ppm

C. Flaggy Limestone (2 nos):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 ppm	<10 ppm	1 samples <10 ppm
Zn	50 to 120 ppm	87ppm	-
Pb	<50 ppm	<50 ppm	5 samples <50 ppm

D Shale/ Slate (5 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 tp 50 ppm	24.5 ppm	1 sample <10 ppm
Zn	6 to 150 ppm	87 ppm	-
Pb	<50 ppm	<50 ppm	5 samples <50 ppm

e. Veins quartz (3 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 10 ppm	10 ppm	22 sample <10 ppm
Zn	<10 to 120 ppm	85 ppm	1 sample <10 ppm
Pb	<50 to 100 ppm	90 ppm	1 sample <50 ppm

f. Chert bands (2 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	10 to 20 ppm	15 ppm	-
Zn	90 to 300 ppm	152 ppm	-
Pb	<50 ppm	<50 ppm	2 sample <50 ppm

g. Mineralised/ Gossanised Zones (40 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 90 ppm	25.71 ppm	5 samples < 10 ppm
Zn	30 to 24, 000 ppm	474.25 ppm	-
Pb	<50 to 80,000 ppm	7196.59 ppm	17 nos <50 ppm 1 nos. in traces

b. Makol (5 nos):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 80 ppm	45 ppm	3 samples < 10 ppm
Zn	80 to 1650 ppm	476 ppm	-
Pb	<50 to 450 ppm	265 ppm	3 samples <50 pp,

I Slag (4 nos.) :

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10 to 45 ppm	30 ppm	1 sample < 10 ppm
Zn	410 to 1200 ppm	410 ppm	-
Pb	<50 to 80 ppm	80 ppm	3 samples <50 ppm

c. Basic/ metabasic (7 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<15 to 740 ppm	157.85 ppm	-
Zn	150 to 200 ppm	181.42 ppm	-
Pb	<50 ppm	<50 ppm	7 samples< 50 ppm

Subathu Formation:

k. Nummulitic Limestone (3 nos.):

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	10 to 15 ppm	11.66 ppm	-
Zn	40 to 100 ppm	63.33 ppm	-
Pb	<50 ppm	<50 ppm	3 samples< 50 ppm

I. Ironstone shale (10 nos.):

Elements	Range	Average	No. of Samples showing values beyond detection limit
Cu	10 to 25 ppm	165 ppm	-
Zn	70 to 800 ppm	345 ppm	-
Pb	<50 to 400 ppm	107.14 ppm	3 samples < 50 ppm

In Salal- Thanpal- Panasa- Paoni-Saro da Bas Ransuh- Chakar area also, lead and zinc mineralisation occurs as specks and disseminations associated with vein quartz but because of limited Arial extent, the higher values (Cu upto 740 ppm, Zn upto 24,000 ppm & Pb upto 80,000 ppm) indicated are spot highs and do not form any economically viable zone.

In Muttal – Salal area, there are many occurrences of lead- zinc mineralisation, with a number of old workings still present, whereas there are only a few such occurrences in the Salal- Ransuh area.

Briefly, it can be said that though localised yet lead- zinc mineralisation was more pronounced in Muttal- Salal area.

6. MINERALISATION

The base metal mineralisation, occurs in the cherty dolomitic limestone consisting upper part of Trikuta Formation of Sirban Group and occasionally in the quartzite (Khairikot Formation of Sirban Group). Specks and disseminations of galena are present in calcite/ quartz veins within flaggy limestone, dolomite and quartzite of the Sirban Group in Pres- Khairikot- Sersandu area. These veins are along bedding planes as well as Transverses to it in an irregular manner and range in thickness from a few mm to about a meter. Disseminations of galena are also seen in Lain-Sukhwalgali area. Galena also occurs as small pockets within veins localised along minor faults.

In Lower Darabi area, massive sphalerite mineralisation has been reported in the form of small pockets and lenses, along bedding and joint planes of the carbonates of Sirban Group (Gupta 1962). A sample of massive sphalerite has analysed Zn- 57 %, Ag 5 ppm, Pb-567 ppm, Cu- 75 ppm, Zr-30 ppm, Cd-2314 ppm and Ba-25 ppm. But at present, only float ore is seen near the area of investigation and there is no surface manifestation of mineralisation. Litho samples from the area (F. S. 1995-96) have analysed Cu- 15 ppm to 170 ppm, Zn-30 ppm to 400 ppm and Pb-300 ppm to 40,000 ppm have been analysed.

In Anji Khad section, near its confluence with the Lalor Khad, the mineralisation in the form of chalcopyrite and pyrite, highly gossanised and limonitised on the surface, occur within cherty dolomite of the Trikuta Formation. The mineralised zone is exposed intermittently for about 150 m. Sample from the zone analysed Cu- 15 ppm to 170 ppm, Zn-30 ppm to 400 ppm and Pb-250 ppm to 600 ppm.

In the area west of Chenab, a number of gossanised zones associated with veins quartz are seen in Sirban Group but these zones are of very small dimensions and do not appear to be of any economical significance. Besides, specks of galena are also seen associated with vein quartz in the upper part of the Trikuta Formation. Two samples from Thanpal area from this zone have indicated Cu-5 ppm to 35 ppm, Zn-350 ppm to 600 ppm and Pb-70,000 ppm to 80, 000 ppm. In Matah area, old workings and slag are seen and in Rad Khad area, specks of galena are seen but these are very small zones.

In the area, further north- westward, gossanised zones are seen in the Trikuta Formation in Manju, Gai and Khori area. In Khori area, gossanised zones measuring 12 m x 11m has been marked in the dolomite horizon of Trikuta Formation. These are specks of galena within the gossanised zones. Analytical results of samples from the area have indicated values of Cu-<10 ppm to 35 ppm, Zn-100ppm to 2400 ppm and Pb-100ppm to 1400ppm.

In the area of investigation, the association of 'Makol' (Fault Gauge) with galena mineralisation has led the old miners to concentrate particularly in areas where 'Makol' had been detected at the surface is promising for galena mineralisation.

B.1 Analytical values of Base metals of 302 nos. of samples collected from Muttal- Jangalgali- Sukhwalgali- Press-Sersandu- Salal area (appendix I

Elements	Range	Average	No. of samples showing values beyond detection limit

Cu	10 to 570 ppm	72.3ppm	158 nos <10 ppm
Zn	20 to 76000 ppm	2476.3 ppm	
Pb	<50 to 1,40,000 ppm(1 value)	5559.8 ppm	232 nos <50 ppm

It needs to be mentioned here that in this area there are small pockets (confined to veins) lenses, pecks and disseminations of lead and zinc mineralisation mainly. Specks and disseminations of galena are present in calcite/quartz veins. Galena also occurs in small pockets confined to veins localised along faults. As regards sphalerite mineralisation, it occurs in the form of small lenses, specks and as minor veinlets. Briefly it can be said that base metals mineralisation in the area has very limited area extent and does not appear to be economically viable.

B.2 Analytical values of Base metals of 170 nos. of samples collected from Salal-Thanpal-Panasa-Paoni-Saro da Bas Ransuh- Chakar area (Appendix- II)

Elements	Range	Average	No. of samples showing values beyond detection limit
Cu	<10to 740 ppm	34.4 ppm	29 nos <10 ppm
Zn	<10 to 24,000 ppm	281.5 ppm	1 no<10 ppm
Pb	<50 to 80, 000 ppm	2624.3 ppm	103 no,50 ppm (2 traces)

In this area also, lead and zinc mineralisation occurs as specks and dissemination associated with veins quartz but because of limited area extent, the higher values indicated are spot highs and do not form any economically viable zone.

In Muttal- Salal area, there are many occurrence of Lead- Zinc mineralisation, with a number of old workings still present, whereas there are only a few such occurrences in the Salal-Ransuh area.

Briefly, it can be said that though localised yet Lead- Zinc mineralisation was more pronounced in Muttal- Salal area.

Beside base metals, other mineral occurrences met with in the area are briefly described below:

Coal occurs as thin lenses within Subathu Formation. In the south- eastern part, coal was being mined from Lain- Jangalgali- Sukhwalgali- Thalwal area and in the north-western part from Khori- Chakar area by Jammu and Kashmir Govt, but the mining has been suspended because of uncertainty of the continuity of the coal as well as its uneconomical nature, being away from road head.

The solubility tests on lithium conducted by the Northern Region, chemical Laboratory of Geological Survey of India has indicated that the lithium is 100 percent amenable to dissolution only by hydrofluorisation with the perchloric acid; which obviously means the metal is present either in silicate form of in the lattices of bauxite minerals. Mineralogical studies carried out so far through X-ray, DTA and electronic microscope on a number of samples have failed to identify the lithium mineral excepting in one samples, where cockeite was indicated by X-ray diffraction analysis at. Northern Region Laboratory.

Bauxite is suitable for the manufacture of moderate heat refractory bricks and as indicated earlier had been investigated by Geological Survey of India.

Pockets of barites occur within the Trikuta Formation in the area East of Dada Nala (Lain-Jangalgali area). The veins of barites upto 2 cm are associated with limestone bands exposed SE of Sersandu

Magnesite deposit occurs within Trikuta Formation in Painthal- Katra area with minor pockets reported from a number of exposures i.e. North of Garan, Bainganga etc. A small lens of steatite has also been noticed on the left bank of Dada Nala in Lain area as also similar minor occurrences reported elsewhere in the Trikuta Formation.

7. CONCLUSION AND RECOMMENDATIONS

The area investigated forms part of the Sirban Group, Jangalgali, and Subathu Formations. The following conclusions have been drawn on the basis of field observation and analytical results:

i. The regional structure in the area is south- easterly plunging anticline with Sirban Group of rocks in the core and younger Tertiaries fringing it. The northern limb of the anticline is normal whereas southern limb is faulted with the elimination of Jangalgali and Subathu Formations.

ii. The association of ' Makol' (Fault gauge) with galena mineralisation has led the OLE miners to concentrate particularly in areas where 'Makol' had been detected at the surface as seen in the Jangalgali, Khairikot, Sersandu, Thanpal & Paoni areas. So the area, where 'Makol' is present on the surface, is promising for galena mineralisation.

iii. Base metal mineralisation in the area occurs as specks, disseminations, pocket and lenses as seen in the Renaka Kot, Lain, Khairikot, Sukhwalgali, Sersandu, Thanpal, Matah, Khori, Ransuh and Chakar areas, Besides, minor gossanised zones have been observed in carbonates of Sirban Group at Thanpal, Matah, Manju and Khori area.

iv. Old working have been observed in the areas of investigation at Khairikot, Sersandu, Thanpal, Rad Khad, Matah and Sangamarg, suggestive of localised mineralisation in the area.

v. The Jammu bauxite crust fossilised between Sirban Group of rocks and Subathu Formation, represents a palaeoplanar surface whose eroded remnants (isolated exposures) are widespread on the dip slopes of the former whereas the large part of intact bauxite crust lying below the Subathus is still unexposed especially along the synformal cores.

vi. Base metal mineralisation in Sirban Group and chert quartzite breccia appears to be related to the intrusive activity.

vii. Intrusive activity mainly trachytic in composition in the vent part has best manifestation in Salal- Kanthan area where vent is exposed and further westward upto Thanpal and in the north- western part, it has maximum manifestation in Sangarmarg area (especially in Manju- Gai area) and in the Khori area.

viii. The solubility on Lithium has indicated that the lithium is amenable to dissolution only be hydrofluorisation with perchloric acid, which means the metal is present either in silicate or in the lattices of bauxite mineral. Mineralogical studies have failed to identify the mineral phase except in one samples where cockeite was indicated.

ix. Bauxite has good spread (exposure) in Salal, Saro da Bas and Chakar areas. Besides, it has also reasonably good spread in Panasa area.

x. Higher values of Li, V, Cr, Zr and $P_2 O_5$ have been recorded from the bauxite column especially from the pisolitic and non- pisolitic bauxite.

xi. The higher values of Lithium are persistent through out the belt (Where bauxite is exposed) in the bauxite column)

xii. Lithium prospect in the bauxite column in the area investigation appears to be promising.

xiii. The bauxite column in Salal- Panasa- Sangarmarg (Saroda Bas) and Chakar areas appears to be promising horizon for Lithium and may be taken up for further detailed work.

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LOCALITY INDEX

Locality	North Latitude	East Longitude	Sheet. No.
Adh Kunwari	33° 00' 40	74° 56' 40"	43K/16
Arnas	33° 11' 00"	74° 49' 15"	43K/16
Aujh	33° 11' 55"	74° 36' 15"	43K/12
Bakkal	33° 08' 45"	74° 54' 00"	43K/16
Baldhanu	33° 11' 00"	74° 46' 00"	43K/16
Barkundi Gali	33° 06' 45"	74° 53' 30"	43K/16
Batal Gala	33° 08' 15"	74° 50' 00"	43K/16
Bharakh	33° 07' 40"	74° 38' 40"	43K/12
Bida	33° 07' 15"	74° 49' 30"	43K/16
Chakar (Kotla)	33° 11' 00"	74° 36' 00"	43K/12
Chapparbari	33° 11' 30"	74° 35' 30"	43K/12
Chinakah	33° 11' 00"	74° 48' 00"	43K/16
Chiralakot	33° 05' 45"	74° 50' 00"	43K/16
Chiraye	32° 59' 00"	75° 01' 00"	43K/1
Dadura	32° 59' 00"	74° 58' 30"	43K/13
Dhar	33° 06' 30"	74° 50' 30"	43K/16
Dingakot	33° 05' 45"	74° 57' 00"	43K/16
Dokhada	32° 59' 30"	74° 02' 30"	43K/1
Domel	32° 53' 00"	74° 57' 30"	43K/13
Gai	33° 09' 30"	74° 37' 30"	43K/12
Gaintha (Devigarh)	33° 05' 06"	74° 57' 30"	43K/16
Garan	33° 05' 10"	74° 52' 00"	43K/16
Ikhni	33° 11' 45"	74° 37' 00"	43K/12
Jammu	32° 44' 00"	74° 52' 00"	43K/14
Jangalgali	33° 01' 15"	74° 01' 55"	43K/4
Jyotipuram	33° 06' 30"	74° 50' 30"	43K/16
Kanthan	33° 10' 15"	74° 51' 10"	43K/16
Katra	32° 59 40"	74° 56' 00"	43K/13
Khairikot	33° 06' 50"	74° 56' 45"	43K/16
Khandwar	33° 07' 00"	74° 54' 15"	43K/16
Khori	33° 09' 20"	74° 37' 10"	43K/12
Kothri	33° 05' 00"	74° 59' 00"	43K/16
Krul	33° 08' 40"	74° 37' 00"	43K/12
Kund (Jangalgali)	33° 00' 40"	75° 02' 25"	43O/4
Lain	32° 59' 30"	75° 02' 00"	43P/1
Malhad	33° 10' 05"	74° 40' 00"	43K/12
Malkot	32° 05' 45"	74° 55' 45"	43K/16
Manju	33° 09' 50"	74° 37' 00"	43K/12
Mari	35° 05' 45"	74° 51' 30"	43K/16
Matah	33° 09' 00"	74° 44' 10"	43K/12
Muttal	32° 09' 05"	75° 01' 55"	43P/1
Pabu Sui	33° 08' 10"	74° 53' 10"	43K/16
Painthal	32° 58' 30"	73° 58' 30"	43K/13
Panasa	33° 11' 10"	74° 45' 30"	43K/16
Panchari Gali	33° 05' 30"	74° 57' 15"	43K/16
Paoni	33° 05' 20"	74° 42' 00"	43K/12
Pres	33° 05' 40"	74° 55' 50"	43K/16
Ransuh	33° 10' 00"	74° 45' 30"	43K/16
Remindi	33° 03' 45"	74° 58' 00"	43K/16
Renkakot	33° 06' 20"	74° 49' 15"	43K/16

Locality	North Latitude	East Longitude	Sheet. No.
Reasi	33° 05' 00"	74° 50' 00"	43K/16
Rohatkot	33° 06' 30"	74° 55' 30"	43K/16
Salal	33° 09' 30"	74° 49' 15"	43K/16
Samdreni	33° 59' 00"	75° 00' 00"	43P/1
Sangarmarg	33° 11' 30"	74° 38' 00"	43K/12
Saro da Bas	33° 10' 46"	74° 39' 55"	43K/12
Sersandu	33° 08' 30"	74° 53' 30"	43K/16
Sukhwalgali	33° 02' 05"	74° 59' 55"	43K/16
Thanpal	33° 10' 15"	74° 47' 30"	43K/16
Thalwal	33° 03' 40"	74° 58' 55"	43K/16
Tikri	32° 55' 60"	74° 59' 10"	43L/13
Udhampur	33° 55' 30"	75° 08' 00"	43P/1

APPENDIX-I

LITHO-ANALYTICAL LOGS OF SAMPLES FROM KATRA- MUTTAL-JANGAGALI-SUKHWALGALI- PRS- KHAIRIKOT-SERSANDU-SALAL AREA OF UDHAMPUR DISTRICT COLLECTED DURING F.S.1995-96

"Regional geochemical Survey for bas Metals and Lithium in Salal area, Udhampur District, J & K"

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
1	GS/96/1	Dolomitic limestone	1.78	-	0.40	31.36	21.20	-	-	-	-	-	-		216	550			<50		
2	GS/96/2	-do -	7.36	-	1.32	31.36	16.80	-	-	-	-	-	-		216	600			<50		
3	GS/96/3	Quartz. Breccia	89.7	3.7	1.6	<1.0	<1.0	<0.5	1.15	237	14	318	21	63	10	12	42	24	35	13	651
4	GS/96/4	Bauxite Clay	46.5	35.8	2.0	<1.0	<1.0	1.0	1.28	435	24	319	60	125	12	28	121	69	<10	<10	832
5	GS/96/5	Quartzite	83.4	6.1	2.9	<1.0	<1.0	0.6	1.75	436	14	335	50	115	16	31	88	44	26	19	583
6	GS/96/6	Sandstone	80.0	6.7	6.6	<1.0	<1.0	0.8	0.34	200	31	49	27	32	35	134	79	31	29	11	228
7	GS/96/7	Dolomite	2.2	<1.0	1.8	28.4	19.1	<0.5	0.03	<100	<10	12	<10	23	27	144	41	68	66	<10	339
8	GS/96/8	Non-pisolitic Bauxite	9.9	56.0	2.4	<1.0	<1.0	<0.5	3.47	2487	1122	149	378	372	15	119	852	119	127	<10	962
9	GS/96/9	Bauxitic clay	32.8	20.3	29.4	<1.0	1.2	1.0	0.97	887	150	90	126	108	30	115	197	208	54	10	408
10	GS/96/10	Pisolitic bauxite	30.2	42.5	5.2	<1.0	<1.0	<0.5	1.87	1443	1600	182	356	293	<5	28	49	53	183	<10	681
11	GS/96/11	Non Pisolitic bauxite	11.9	48.8	15.6	<1.0	<1.0	<0.5	3.31	1258	870	109	487	411	<5	85	165	199	90	<10	1041
12	GS/96/12	Dolomitic limeston	3.35	-	11.72	11.70	16.40	-	-	-	-	-	-	-	180	600	-	-	90	-	--
13	GS/96/13	Brecciated quartzite	26.0	23.7	34.7	<1.0	<1.0	1.9	1.09	222	311	37	325	154	48	124	186	134	161	<10	438
14	GS/96/14	Pisolitic bauxite	17.2	53.2	2.1	<1.0	<1.0	0.6	3.75	1310	1230	178	294	427	<5	29	461	142	103	25	1246
15	GS/96/15	Non Pisolitic bauxite	36.2	40.2	4.0	<1.0	<1.0	<0.5	1.92	657	1841	213	255	240	<11	27	177	37	99	12	605
16	GS/96/16	Non	22.2	45.7	1.2	6.2	<1.0	1.2	2.32	4957	1864	194	124	261	<5	52	347	56	75	19	230

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
		pisolitic bauxite																			
17	GS/96/17	Nummuliti c limestone	10.45	-	1.96	30.8	1.6	-	-	-	-	-	-	-	285	700	-	-	<50	-	-
18	GS/96/18	Brecciated quartzite	47.5	18.5	16.2	<1.0	1.8	2.6	0.90	706	125	121	75	82	97	185	167	113	14	<10	384
19	GS/9/6/19	Pisolitic bauxite	32.0	38.6	4.5	2.6	<1.0	0.7	2.19	2600	1428	179	316	210	<5	37	381	42	90	14	619
20	GS/96/20	Non pisolitic bauxite	37.0	36.6	4.6	1.1	<1.0	0.7	1.83	1240	1003	123	271	210	<5	42	343	41	118	11	597
21	GS/96/21	Dolomitic limestone	11.24	-	1.76	20.72	18.8	-	-	-	-	-	-	-	170	1400	-	-	350	-	-
22	GS/96/22	Brecciated quartzite	75.4	10.1	4.7	<1.0	1.2	1.4	0.66	1107	22	74	67	150	30	69	233	17	12	<10	229
23	GS/96/23	Calcareous slate	20.0	1.0	<1.0	25.8	15.5	<0.5	0.06	200	<10	15	<10	30	13	25	41	76	14	14	234
24	GS/96/24	Arenaceous shale	61.5	13.9	5.1	1.8	2.1	2.2	0.67	1469	51	83	66	130	26	92	182	57	20	<10	244
25	GS/96/25	Aluminou clay	60.5	13.0	5.6	1.8	1.6	2.3	0.68	519	44	74	82	106	23	69	386	108	17	<10	294
26	GS/96/26	Pisolitic bauxite	33.8	40.0	8.2	<1.0	<1.0	0.5	2.33	1021	1375	143	220	230	<5	39	118	42	<10	<10	757
27	GS/96/27	Dolomitic limestone with vein quartz	9.23	-	0.40	26.88	14.80	-	-	-	-	-	-	-	240	500	-	-	<50	-	-
28	GS/96/28	Dolomitic limestone with vein quartz	10.44	-	4.28	24.64	15.60	-	-	-	-	-	-	-	260	700	-	-	<50	-	-
29	GS/96/29	Dolomitic limestone	32.78	-	4.52	20.72	Trace	-	-	-	-	-	-	-	255	100	-	-	<50	-	-
30	GS/96/30	Dolomitic Limestone with shale partings	11.12	-	0.48	29.12	16.00	-	-	-	-	-	-	-	300	400	-	-	<50	-	-
31	GS/96/31	Quartzite	-	-	-	-	-	--	-	-	-	-	-	-	10	250	-	-	<50	-	-
32	GS/96/32	Ferruginou	-	-	-	-	-	-	-	-	-	-	-	--	15	80	-	-	<50	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
		s coated shale quartzite																			
33	GS/96/33	Non pisolitic baxite	36.4	30.6	19.0	<1.0	<1.0	1.2	1.46	421	241	72	149	125	14	114	107	393	22	<10	544
34	GS/96/34	Pisolitic bauxite	42.5	34.6	6.5	<1.0	<1.0	1.1	1.66	462	531	99	151	184	6	52	179	47	17	<10	60
35	GS/96/35	Shelly limestone	-	-	-	-	-	-	-	-	-	-	-	-	15	60	-	-	<50	-	-
36	GS/9/6/36	Calcareous shale	35.7	-	16.2	1.1	0.4	-	-	-	-	-	-	-	260	200	-	-	150	-	-
37	GS/96/37	Quartzite breccia	-	-	-	-	--	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
38	GS/96/38	Tuff	-	-	-	-	--	-	-	-	-	-	-	-	<10	60	-	-	<50	-	-
39	GS/96/39	Tuff	33.2	45.9	2.0	<1.0	<1.0	0.05	2.38	2050	1187	274	170	211	<5	34	49	49	78	11	674
40	GS/96/40	Pebbly quartzite	59.4	21.0	5.3	<1.0	<1.0	1.0	1.15	1611	174	83	107	124	30	81	229	48	3.4	<10	427
41	GS/96/41	Tuff	26.1	54.2	2.0	<1.0	<1.0	<0.5	2.34	2392	1725	292	124	236	<5	37	129	60	118	18	662
42	GS/96/42	Non pisolitic bauxite	46.3	35.5	1.9	<1.0	<1.0	0.6	2.20	321	628	114	164	163	22	38	186	165	33	14	767
43	GS/96/43	Pisolitic bauxite	41.0	38.5	3.0	<1.0	<1.0	0.5	2.18	126	1491	199	1476	208	<5	21	97	30	<10	<10	787
44	GS/96/44	Non pisolitic bauxite	15.6	56.0	<1.0	<1.0	<1.0	<0.5	2.55	1344	1472	256	192	310	<5	32	161	164	<10	11	844
45	GS/96/45	Pisolitic bauxite	35.8	38.5	7.7	<1.0	<1.0	0.5	1.38	242	1757	232	366	248	<5	31	92	21	<10	<10	581
46	GS/96/46	Non pisolitic bauxite	40.7	41.2	3.2	<1.0	<1.0	1.4	1.03	589	484	114	138	136	7	51	262	75	<10	<10	418
47	GS/96/47	Bauxitic clay	56.0	22.6	5.6	<1.0	<1.0	1.5	0.68	106	147	100	244	51	48	105	137	148	49	<10	346
48	GS/96/48	Steatite	42.9	-	3.0	2.8	29.6	-	-	-	-	-	-	-	190	100	-	-	<50	-	-
49	GS/96/49	Steatite	23.4	-	1.1	20.2	25.2	-	-	-	-	-	-	-	165	700	-	-	150	-	-
50	GS/96/50	Dolomitic limestone	10.3	-	2.9	25.8	23.6	-	-	-	-	-	-	--	150	1000	--	-	150	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
51	GS/96/51	Vein quartz		Missing																	-
52	GS/96/52	Ironstone shale	-	-	-	-	-	-	-	-	-	-	-	-	<10	20	-	-	<50	-	-
53	GS/96/53	Ironstone shale	-	-	-	-	-	-	-	-	-	-	-	-	10	0.24%	-	-	<50	-	-
54	GS/9/6/54	Ironstone shale	-	-	-	-	-	-	-	-	-	-	-	-	10	200	-	-	<50	-	-
55	GS/96/55	Quartzite	-	-	-	-	-	-	-	-	-	--	-	-	15	50	--	-	<50	-	-
56	GS/96/56	Dolomite	8.2	-	1.3	28.6	26	-	-	-	-	-	-	-	200	1500	-	-	<50	-	-
57	GS/96/57	Dolomitic limestone	-	-	-	-	-	-	-	-	-	--	-	-	10	150	-	-	<50	-	-
58	GS/96/58	Tuff	-	-	-	-	-	-	-	-	-	--	-	-	15	150	-	-	<50	-	-
59	GS/96/59	Flaggy limestone	-	-	-	-	-	-	-	-	-	--	-	-	15	150	-	-	<50	-	-
60	GS/96/60	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	150	-	-	<50	-	-
61	GS/96/61	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	15	150	-	-	<50	-	-
62	GS/96/62	Vesicular band within flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	<20	150	-	-	<50	-	-
63	GS/96/63	Dolomite limestone	-	-	-	-	-	-	-	-	-	-	-	-	<10	160	-	-	<50	--	
64	GS/96/64	Dolomite with vein quartz	-	-	-	-	-	-	-	-	-	-	-	-	<10	100	-	-	<50	-	
65	GS/96/65	Flaggy	-	-	-	-	-	-	-	-	-	-	-	-	<10	200	-	-	<50	-	

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
		limestone																			
66	GS/96/66	Flaggy limestone with shale partings-	-	-	-	-	-	-	-	-	-	-	-	-	<10	250	-	-	<50	-	
67	GS/96/67	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
68	GS/96/68	Magnite	-	-	-	-	-	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
69	GS/96/69	-----do------	-	-	-	-	-	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
70	GS/96/70	Tuff	-	-	-	-	-	-	-	-	-	-	-	-	15	130	-	-	<50	-	-
71	GS/96/71	Magnesite	-	-	-	-	-	-	-	-	-	-	-	-	<10	350	-	-	<50	-	-
72	GS/96/72	----do-----	-	-	-	-	-	-	-	-	-	-	-	-	<10	320	-	-	<50	-	-
73	GS/96/73	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	<10	140	-	-	<50	-	-
74	GS/96/74	Calcite Vein	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
75	GS/96/75	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	10	210	-	-	<50	-	-
76	GS/96/76	Calcite vein	-	-	-	-	-	-	-	-	-	-	-	-	15	250	-	-	<50	-	-
77	GS/96/77	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	15	220	-	-	<50	-	-
78	GS/96/78	Pebbly bed	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
79	GS/96/79	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	10	300	-	-	<50	-	
80	GS/96/80	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	<10	500	-	-	<50	-	-
81	GS/96/81	Vein quartz	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
82	GS/96/82	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
83	GS/96/83	----do-----	-	-	-	-	-	-	-	-	-	-	-	-	<10	130	-	-	<50	-	-
84	GS/96/84	-----do-----	-	-	-	-	-	-	-	-	-	-	-	-	10	110	-	-	<50	-	-
85	GS/96/85	'Makol' (Fault gouge)	-	-	0.2	23.5	13.2	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
86	GS/96/86	Limestone with chert band	1.36	-	0.5	32.48	19.6	-	-	-	-	-	-	-	180	1000	-	-	<50	-	-
87	GS/96/87	Brcciated quartzite	75.2	7.7	8.8	<1.0	<1.0	<0.5	0.37	147	108	35	35	36	21	117	53	39	12	10	221
88	GS/96/88	Quartzite	78.1	12.6	<1.0	<1.0	<1.0	<0.5	0.62	388	88	39	36	82	10	20	19	138	14	<10	369
89	GS/96/89	Quartzite	82.2	9.5	<1.0	<1.0	<1.0	0.7	0.48	311	52	42	45	66	12	16	21	168	13	<10	354
90	GS/96/90	Non pisolitic Bauxite	46.4	39.3	<1.0	<1.0	<1.0	<0.5	1.77	267	370	135	151	156	<5	28	73	220	<10	<10	959

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
91	GS/96/91	Non pisolitic Bauxite	44.9	39.8	<1.0	<1.0	<1.0	<0.5	1.93	855	433	121	118	123	<5	23	99	392	71	11	848
92	GS/96/92	Pisolitic bauxite		Missing																	
93	GS/96/93	Ironstone shale	-	-	-	-	-	-	-	-	-	-	-	-	<10	800	-	-	<50	-	-
94	GS/96/94	Pisolitic bauxite	41.1	39.7	3.9	<1.0	<1.0	<0.5	2.15	1109	825	166	131	134	<5	24	82	43	<10	<10	886
95	GS/96/95	Non pisolitic bauxite	44.2	38.6	3.6	<1.0	1.0	<0.5	1.64	233	482	150	197	242	<5	30	71	38	<10	<10	1033
96	GS/96/96	Iron stone shale	-	-	-	-	--	-	-	-	-	-	-	-	<10	90	-	-	<50	-	-
97	GS/96/97	Iron stone shale	-	-	-	-	-	-	-	-	-	-	-	-	20	100	-	-	<50	-	-
98	GS/96/98	Nummuliti c limestone	3.37	-	1.2	52.1	1.6	-	-	-	-	-	-	-	165	1200	-	-	<50	-	-
99	GS/96/99	Flaggy limestone	7.6	-	0.2	51.5	0.4	--	-	-	-	-	-	-	240	600	-	-	<50	-	-
100	GS/96/100	Dolomitic limestone	51.6	-	2.0	23.0	2.0	-	-	-	-	-	-	-	510	1600	--	-	33000	-	-
101	GS/96/101	Gossanised vein with in flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	15	720	-	-	<50	-	-
102	GS/96/102	Pisolitic bauxite	30.4	37.1	12.9	<1.0	<1.0	<0.5	2.86	1193	1127	249	193	161	<5	34	85	80	<10	<10	1653
103	GS/96/103	Non pisolitic bauxite	50.1	31.9	4.0	<1.0	<1.0	<0.5	0.56	271	51	42	42	29	19	81	63	69	<50	<10	297
104	GS/96/104	Ironstone shale	-	-	-	-	-	-	-	-	-	-	-	-	10	50	-	-	<50	-	--
105	GS/96/105	Slate	-	-	-	-	-	-	-	-	-	-	-	--	15	70	-	-	<50	-	-
106	GS/96/106	Quartzite	-	-	-	-	-	-	-	-	-	-	-	-	15	90	-	-	<50	-	-
107	GS/96/107	Brecciated quartz.	84.3	5.7	1.5	<1.0	<1.0	0.8	0.31	290	<10	43	14	28	26	23	147	12	36	<10	222
108	GS/96/108	Ironstone shale	-	-	-	-	---	-	-	-	--	-	--	-	<10	50	-	-	<50	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
109	GS/96/109	Ironstone shale	-	-	-	-	--	-	--	-	--	-	--	-	10	100	-	-	<50	-	-
110	GS/96/110	Quartzite	83.2	8.5	1.0	<1.0	<1.0	<0.5	2.67	236	29	216	100	135	24	19	107	53	17	16	573
111	GS/96/111	Dolomit	18.96	-	13.5	23.5	14.8	-	-	-	-	-	-	-	190	800	-	-	<50	-	-
112	GS/96/112	Pisolitic bauxite	25.5	33.0	26.1	<1.0	<1.0	<0.5	1.19	1843	445	24	259	240	<5	56	223	47	<10	<10	439
113	GS/96/113	Pisolitic bauxite	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-
114	GS/96/114	Non piolitic bauxite	36.5	29.3	19.3	<1.0	<1.0	0.9	1.06	268	217	23	174	130	<5	46	248	12	<10	<10	328
115	GS/96/115	Slate	-	-	-	-	-	-	-	-	-	-	-	-	<10	60	-	-	<50	-	-
116	GS/96/116	Bauxitic clay	43.6	29.8	11.7	<1.0	<1.0	1.5	1.05	410	188	46	123	106	5	49	488	17	<10	<10	319
117	GS/96/117	Breeciated quartz	75.0	<1.0	1.0	<1.0	<1.0	<0.5	0.07	249	<1.0	<10	<10	274	19	9	28	14	31	<10	160
118	GS/96/118	Breeciated quartz	95.4	<1.0	1.0	<1.0	<1.0	<0.5	0.04	328	<1.0	<10	<10	18	26	12	32	19	25	16	152
119	GS/96/119	Breeciated quartz	92.2	2.0	<1.0	<1.0	<1.0	<0.5	0.08	203	<1.0	<10	<10	<10	11	15	28	10	44	13	175
120	GS/96/120	Flaggy limestone	6.5	-	1.2	26.9	2.8	-	-	-	-	-	-	-	150	600	-	--	90	-	-
121	GS/96/121	Gosanised zone within dolomite	-	-	-	-	-	-	-	-	-	-	-	-	20	80	-	--	<50	-	-
122	GS/96/122	Gossanised zone within dolomite	-	-	-	-	-	-	-	-	-	--	-	-	20	50	-	--	600	-	-
123	GS/96/123	Gossanised zone within dolomite	-	-	-	-	-	-	-	-	-	-	-	-	25	80	-	-	<50	-	-
124	GS/96/124	Gossanised zone within dolomite	-	-	-	-		-	-	-	-	-	-	-	20	50	-	-	<50	-	-
125	GS/96/125	Gossanised zone within dolomite	-	-	-	-	-	-	-	-	-	-	-	-	30	50	-	-	200	-	-
126	GS/96/126	Gossanised zone within	-	-	-	-	-	-	-	-	-	-	-	-	0	180	-	-	<50	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
		dolomite																			
127	GS/96/127	Gossanised zone within dolomite	-	-	-	-	-	-	-	-	-	-	-	-	40	50	-	-	100	-	-
128	GS/96/128	Gossanised zone within dolomite	-	--	-	-		-	-	-	-	-	-	-	35	30	-	-	<50	-	-
129	GS/96/129	Gossanised zone within dolomite	-	-	-	-	-	-	-	-	-	-	-	-	15	40	-	-	<50	-	-
130	GS/96/130	Gossanised zone within dolomite	-	-	-	-	-	-	-	-	-	-	-	-	30	40	-	-	<50	--	-
131	GS/96/131	Dolomitic limestone	23.5	-	15.4	21.8	10.0	-	-	-	-	-	-	-	170	400	-	-	<50	-	-
132	GS/96/132	Dolomitic limestone	10.3	1.6	<1.0	26.4	16.3	<0.5	0.07	243	10	<10	<10	25	18	99	96	62	28	17	162
133	GS/96/133	Dolomitic limestone	20.3	2.8	1.2	31.9	6.2	<0.5	0.11	335	26	12	<10	30	16	95	79	<10	39	20	265
134	GS/96/134	Flaggy limestone	37.2	-	5.0	25.2	6.4	-	-	-	-	-	-	-	230	400	-	-	<50	-	-
135	GS/96/135	Flaggy limestone	33.3	-	17.4	29.7	4.8	-	-	-	-	-	-	-	250	400	-	-	<50	-	-
136	GS/96/136	Chert	92.8	-	0.9	1.7	Nil	-	-	-	-	-	-	-	300	300	-	-	<50	-	-
137	GS/96/137	Chert/red chert band within dolom.	-	-	-	-	-	-	-	-	-	-	-	-	10	120	-	-	<50	-	-
138	GS/96/138	Calcareous slate	-	-	-	-	-	-	-	-	-	-	-	-	10	160	-	-	<50	-	-
139	GS/96/139	Quartzite	-	-	-	-	-	-	-	-	-	-	-	-	25	250	-	-	<50	-	-
140	GS/96/140	Ironstone shale	-	-	-	-	-	-	-	-	-	-	-	-	10	180	-	-	<50	-	-
141	GS/96/141	Shelly limestone	6.7	-	2.8	47.0	0.2	-	-	-	-	-	-	-	290	200	-	-	<50	-	-
142	GS/96/142	Quartzite	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
143	GS/96/143	Dolomite	30.3	-	1.7	24.1	14.8	-	-	-	-	-	-	-	140	400	-	-	<50	-	-
144	GS/96/144	--do--	12.6	-3.9	3.0	26.3	18.0	-	-	-	-	-	-	-	230	500	-	-	<50	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
145	GS/96/145	Quartzite breccia	53.9	-	4.2	13.9	4.5	0.9	0.12	2689	44	10	13	22	16	42	209	31	<10	11	169
146	GS/96/146	Slate with quartzite	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
147	GS/96/147	Quartzite	-	-	-	-	-	-	-	-	-	-	-	-	<10	110	-	-	<50	-	-
148	GS/96/148	Nummuliti c limestone	9.9	-	1.8	39.2	2.0	-	-	-	-	-	-	-	220	500	-	-	120	-	-
149	GS/96/149	Shelly limestone	18.4	-	1.8	38.1	4.0	-	-	-	-	-	-	-	190	500	-	-	120	-	-
150	GS/96/150	Dolomitic limestone	8.6	-	3.3	39.2	28.8	-	-	--	-	-	-	-	270	400	-	-	120	-	-
151	GS/96/151	Ironstone shale	-	-	-	-	-	-	-	-	-		-	-	10	150	-	-	<50	-	-
152	GS/96/152	Quartzite breccia	88.3	6.2	1.2	<1.0	<1.0	<0.5	0.32	<100	25	24	23	52	16	19	65	29	<10	10	275
153	GS/96/152 3	Slates	-	-	-	-	-	-	-	-	-	-	-	-	15	150	-	-	<50	-	-
154	GS/96/154	Quartzite breccia	38.0	35.6	8.1	<1.0	<1.0	<0.5	1.28	1338	410	73	169	207	21	45	40	40	65	<10	545
155	GS/96/155	Limestone	20.9	-	0.9	20.7	15.2	-	-	-	-	-	-	-	190	150	-	-	120	-	-
156	GS/96/156	Quartzite	82.4	9.3	<1.0	<1.0	<1.0	1.0	0.64	145	44	65	51	67	19	631	114	50	20	<10	344
157	GS/96/157	dolomite	6.6	-	0.5	33.6	17.2	-	-	-	-	-	-	-	180	1500	-	-	<50	-	-
158	GS/96/158	Quartzite	76.1	8.0	1.7	<1.0	<1.0	<0.9	0.54	<100	24	66	37	45	16	593	139	38	47	<10	372
159	GS/96/159	---do---	72.1	11.2	1.4	<1.0	<1.0	<1.1	0.72	182	26	78	67	64	7	2498	179	65	82	<10	447
160	GS/96/160	Quartzite	68.9	12.3	1.8	<1.0	<1.0	<1.4	0.71	147	51	82	67	78	7	885	188	52	28	<10	388
161	GS/96/161	Bauxite clay									35	-	-	-	-	-	-	-	-	-	-
162	GS/96/162	Quartzite	94.3	<1.0	1.0	<1.0	<1.0	<0.5	0.10	<100	<10	13	<10	18	33	1282	17	13	1600	17	152
163	GS/96/163	Quartzite with slate band	90.9	4.0	<1.0	<1.0	<1.0	<0.5	0.19	<100	24	21	19	34	12	55	42	15	35	<10	157
164	GS/96/164	Quartzite breccia	86.6	3.5	5.0	<1.0	<1.0	<0.5	0.55	1048	30	14	50	35	38	591	27	<10	122	13	90
165	GS/96/165	Quartzite breccia	91.3	1.2	1.9	<1.0	<1.0	<0.5	0.06	156	12	<10	<10	19	17	1295	20	12	1199	12	73
166	GS/96/166	Slate	-	-	-	-	-	-	-	-	--	-	-	-	35	250	-	-	<50	-	-
167	GS/96/167	Galena within	-	-	-	-	-	--	-	-	-	-	-	-	50	4.4%	-	-	14%	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
		Dolomite																			
168	GS/96/168	Sphalerite with dolomite	-	-	--	-	-	-	-	-	-	-	-	-	70	7.6%	-	-	0.35%	-	-
169	GS/96/169	Sphalerite with dolomite	-	-	-	-	-	-	-	-	-	-	-	-	70	7.2%	-	-	500	-	-
170	GS/96/170	Mineralised zone within dolomite	-	-	-	-	-	-	-	-	-	-	-	-	55	4.4%	-	-	0.22%	-	-
171	GS/96/171	Sphalerite Mineralisation within dolomite	-	-	-	-	-	-	-	-	-	-	-	--	135	6.8%	-	-	300	-	-
172	GS/96/172	Sphalerite Mineralisation within dolomite	-	-	-	-	-	-	-	-	-	-	-	-	35	2.4%	-	-	900	-	-
173	GS/96/173	Dolomite with minera-lisation	-	-	-	-	--	-	-	-	-	-	-	-	15	0.8%	-	-	300	-	-
174	GS/96/174	Dolomite with minera-lisation	-	-	-	-	-	-	-	-	-	-	-	-	75	4.2%	-	-	500	-	-
175	GS/96/175	Iron stone shale	-	-	-	-	-	-	-	-	-	-	-	-	10	18	-	--	<50	-	-
176	GS/96/176	Gossanised zone	-	-	-	-	-	-	-	-	-	-	-	-	50	1.4%	-	-	0.12%	-	-
177	GS/96/177	Quartzite breccia	-	-	-	-	-	-	-	-	-	-	-	-	<10	750	-	-	<50	-	-
178	GS/96/178	Quartzite breccia	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
179	GS/96/179	Quartzite	-	-	-	-	-	-	-	-	-	-	-	-	<10	500	-	-	50	-	-
180	GS/96/180	Calcareous slate	27.3	1.0	1.0	18.9	11.9	0.5	04	100	14	10	10	21	18	505	30	112	110	16	219
181	GS/96/181	Slate	-	-	-	-	-	-	-	-	-	-	-	-	--	70	-	-	<50	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
182	GS/96/182	Limestone with vein quartz	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8%	-	-	<50	-	-
183	GS/96/183	Flaggy limestone with minerali-sation (Sphalerite)	-	-	-	-	-	-	-	-	-	-	-	-	--	4.2%	-	-	300	-	-
184	GS/96/184	Flaggy limestone with minerali-sation (Sphalerite)	-	-	-	-	-	-	-	-	-	-	-	-	-	5.0%	-	-	2%	-	-
185	GS/96/185	Flaggy limestone with minerali-sation (Sphalerite)	-	-	-	-	-	-	-	-	-	-	--	-	-	3.2%	-	-	3%	-	-
186	GS/96/186	Flaggy limestone with minerali-sation (Sphalerite)	-	-	-	-	-	-	-	-	-	-	-	-	-	3.2%	-	-	2.5%	-	-
187	GS/96/187	Flaggy limestone with minerali-sation (Sphalerite)	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6%	-	-	4.0%	-	-
188	GS/96/188	Flaggy limestone with minerali-sation (Sphalerite)	-	-	-	-	-	-	-	-	-	-	-	-	--	6.0%	-	-	2.0%	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
189	GS/96/189	Flaggy limestone with minerali-sation (Sphalerite)	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0%	-	-	3.0%	-	-
190	GS/96/190	Quartzite	-					-	-	-	-	-	-	-	<10	0.4%	-	-	600	-	-
191	GS/96/191	----do------	-	-	-	-	-	-	-	-	-	-	-	--	<10	50	-	-	<50	-	-
192	GS/96/192	Dolomitic limestone	-	-	-	-	-	-	-	-	-	-	-		<10	200	-	-	<50	-	-
193	GS/96/193	Flaggy liemsetone with vein quartz	-	-	-	-	-	-	-	-	-	--	-	-	15	0.4%	-	-	600	-	-
194	GS/96/194	Flaggy liemsetone with vein quartz	-	-	-	-	-	-	-	-	-	-	-	-	<10	30	-	-	<50	-	-
195	GS/96/195	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	<10	120	-	-	400	-	-
196	GS/96/196	---do----	-	-	-	-	-	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
197	GS/96/197	----do---	-	-	-	-	-	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
198	GS/96/198	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	15	150	-	-	<50	-	-
199	GS/96/199	Red Chert within flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	150	-	-	100	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
200	GS/96/200	Quartzite	-	-	-	-	-	-	-	-	-	-	-	-	<10	0.32%	-	--	450	-	-
201	GS/96/201	Dolomite limestone	-	-	-	-	-	-	-	-	-	-	-	-	<10	150	-	-	75	-	-
202	GS/96/202	Dolomite limestone	-	-	-	-	-	-	-	-	-	-	--	-	<10	100	-	-	<50	-	-
203	GS/96/203	Dolomite limestone	-	-	-	-	-	-	-	-	-	-	--	-	10	200	-	-	100	-	-
204	GS/96/204	Dolomite limestone	-	-	-	-	-	-	-	-	-	-	--	-	<10	50	-	-	<50	-	-
205	GS/96/205	Domitic limestone with chert band	-	-	-	-	-	-	-	-	-	-	-	-	10	100	-	-	<50	-	-
206	GS/96/206	Red chert band within flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	100	--	-	<50	-	-
207	GS/96/207	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	20	120	-	-	<50	-	-
208	GS/96/208	Red chert band	-	-	-	-	-	-	-	-	-	-	-	-	10	90	-	-	<50	-	-
209	GS/96/209	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	70	-	-	<50	-	-
210	GS/96/210	Dolmitic limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	200	-	-	75	-	-
211	GS/96/211	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	100	-	-	<50	-	-
212	GS/96/212	Quartzite	-	-	-	-	-	-	-	-	-	-	-	-	10	60	-	-	<50	-	-
213	GS/96/213	Dolomitic limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	80	-	-	<50	-	-
214	GS/96/214	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	90	-	-	<50	-	-
215	GS/96/215	Flaggy limestone with mineral-isation	-	-	-	-	-	-	-	-	-	-	-	-	15	70	-	-	<50	-	-
216	GS/96/216	Dolomitic limestone	-	-	-	-	-	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
217	GS/96/217	Dolomite with chert band	-	-	-	-	-	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
218	GS/96/218	Dolomitic limestone	-	-	-	-	-	-	-	-	-	-	-	-	<10	60	-	-	<50	-	-
219	GS/96/219	Dolomitic limestone with chert band	-	-	-	-	-	-	-	-	-	-	-	-	10	150	-	-	<50	-	-
220	GS/96/220	Dolomitic	-	-	-	-	-	-	-	-	-	-	--	--	<10	100	-	-	<50	-	-
221	GS/96/221	dolomite	-	-	0.2	1.1	Trace	-	-	-	-	-	-	-	<10	30	-	-	<350	-	-
222	GS/96/222	Slate	-	-	0.3	2.8	Trace	-	-	-	-	-	-	-	25	70	-	-	<50	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
223	GS/96/223	Quartzite	-	-	1.0	2.8	1.0	-	-	-	-	-	-	-	25	60	-	-	<50	-	-
224	GS/96/224	Brecciated quartzirte	-	-	0.7	2.8	Trace	-	-	-	-	-	-	-	20	70	-	-	100	-	-
225	GS/96/225	Dolomitie	-	-	5.7	26.9	2.4	-	-	-	-	-	-	-	20	140	-	-	<50	-	-
226	GS/96/226	Pisolitic bauxite	42.2	36.7	3.3	<1.0	<1.0	<0.5	1.38	745	428	81	194	174	71	33	28	63	63	23	673
227	GS/96/227	Non pisolitic bauxite	43.6	36.8	1.5	<1.0	<1.0	<0.5	1.28	717	318	70	294	248	68	31	13	52	59	20	635
228	GS/96/228	Quartzite	92.3	1.4	<1.0	<1.0	<1.0	<0.5	0.04	120	10	<10	<10	19	97	58	<10	18	20	20	33
229	GS/96/229	Quartzite breccia	88.3	4.5	<1.0	<1.0	<1.0	<50	0.05	<100	26	11	14	22	91	24	14	21	<10	20	62
230	GS/96/230	Ironstone shale	-	-	33.9	1.4	Trace	-	-	-	-	-	-	-	90	120	-	-	<50	-	-
231	GS/96/105A	Slate	-	-	4.0	4.2	Trace	-	-	-	-	-	-	-	50	70	-	-	<50	-	-
232	GS/96/105B	Quartzite	-	-	0.4	2.8	Trace	--	-	-	-	-	-	-	<10	25	-	-	<50	-	-
233	GS/96/136A	Quartzite	-	-	-	-	Trace	-	-	-	-	-	-	-	<10	30	-	--	<50	-	-
234	GS/96/136 B	Slate	-	-	3.4	2.8	Trace	-	-	-	-	-	-	-	25	70	-	-	<50	-	-
235	GS/96/197A	Quartzite	-	-	0.4	1.4	Trace	-	-	--	-	-	-	-	<10	40	-	-	<50	-	-
236	GS/96/197B	----do---	--	-	1.9	4.2	1.0	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
237	GS/96/231	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	<10	60	-	-	<50	-	-
238	GS/96/232	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	10	300	-	-	<50	-	-
239	GS/96/233	Flaggy limestone	-	-	1.5	27.4	4.8	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
240	GS/96/233	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	20	50	-	-	<50	-	-
260	GS/96/254	Flaggy limestone	-	-	0.3	2.2	0.8	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
261	GS/96/255	Dolomite	-	-	0.6	29.7	19.6	-	-	-	-	-	-	-	10	50	-	-	<50	-	--
262	GS/96/256	Limestone with mineralisation	-	-	5.6	27.4	2.8	-	--	-	-	-	-	-	30	70	-	-	<50	-	-
263	GS/96/257	Flaggy limestone with red chert	-	-	2.5	11.8	8.0	-	-	-	-	-	-	-	70	100	-	-	<50	-	-
264	GS/96/258	Dolomite	-	-	0.4	2.8	0.8	-	-	-	-	-	-	-	<10	50	-	-	50	-	-
265	GS/96/259	Dolomite with chert band	-	-	1.5	10.8	Trace	-	-	-	-	-	-	-	20	100	-	-	<50	-	-
266	GS/96/260	Fault Breccia	-	-	0.6	14.0	9.2	-	-	-	-	-	-	-	<10	120	-	-	100	-	-
267	GS/96/261	Dolomite	-	-	0.4	29.1	20.0	-	-	-	-	-	-	-	<10	120	-	-	100	-	-
268	GS/96/262	Dolomite with chert band	-	-	0.2	45.9	7.2	-	-	-	-	-	-	-	<10	80	-	-	100	-	-
269	GS/96/263	Dolomite with chert band	-	-	0.2	31.4	19.2	-	-	-	-	-	-	-	<10	100	-	-	100	-	-
270	GS/96/264	Dolomite	-	-	0.2	29.7	17.6	-	-	-	-	-	-	-	<10	60	-	-	100	-	-
271	GS/96/265	Dolomite	-	-	0.5	16.2	6.0	-	-	-	-	-	-	-	<10	60	-	-	100	-	-
272	GS/96/266	Dolomite with vein quartz	-	-	0.4	26.9	16.4	-	-	-	-	-	-	-	<10	70	-	-	100	-	-
273	GS/96/267	Dolomite	-	-	2.4	29.7	11.6	-	-	-	-	-	-	-	<10	200	-	-	100	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
274	GS/96/268	---do-----	-	-	0.2	38.1	14.8	-	-	-	-	-	-	-	<10	50	-	-	100	-	-
275	GS/96/269	---do---	-	-	0.6	23.5	11.6	-	-	-	-	-	-	-	200	100	-	-	100	-	-
276	GS/96/270	Dolomite	-	-	0.6	20.2	17.2	-	-	-	-	--	-	-	<10	50	-	-	100	-	-
277	GS/96/271	---do---	-	-	2.0	30.8	21.6	-	-	-	-	--	-	-	<10	50	-	-	100	-	-
278	GS/96/272	---do--	-	-	0.6	12.3	5.6	-	-	-	-	--	-	-	<10	70	-	-	100	-	-
279	GS/96/273	---do---	-	-	3.1	16.2	2.0	-	-	-	--	--	-	-	<10	70	-	-	100	-	-
280	GS/96/274	Flaggy limestone	-	-	0.9	21.3	6.0	-	-	-	-	-	-	-	<10	50	-	-	100	-	-
281	GS/96/275	Dolomite	-	-	0.8	8.4	20.8	-	-	-	-	-	-	-	<10	150	-	-	100	-	-
282	GS/96/276	----do---	-	-	0.6	24.1	3.2	-	-	-	-	-	-	-	<10	90	-	-	100	-	-
283	GS/96/277	----do---	-	-	0.3	19.6	12.0	-	-	-	-	-	-	-	<10	60	-	-	100	-	-
284	GS/96/278	---do---	-	-	4.8	3.9	2.4	-	-	-	-	-	-	-	<10	350	-	-	100	-	-
285	GS/96/279	-----do---	-	-	0.3	12.3	4.4	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
286	GS/96/280	----do---	-	-	0.9	20.7	6.0	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
287	GS/96/281	-----do---	-	-	0.2	24.6	14.0	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
288	GS/96/282	-----do---	-	-	0.3	21.8	17.6	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
289	GS/96/283	-----do----	-	-	--	-	-	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
290	GS/96/284	Dolomite with vein quartz	-	-	0.4	17.4	10.0	-	-	-	-	-	-	-	<10	80	-	-	<50	-	-
291	GS/96/285	Dolomite	-	-	.0.3	12.3	25.6	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
292	GS/96/286	----do---	-	-	0.7	18.5	12.0	-	-	--	-	-	-	-	<10	25	-	-	<50	-	-
293	GS/96/287	Dolomite with carbonaceous shale	-	-	-	-	-	-	-	-	-	-	-	-	<40	100	-	-	75	-	-
294	GS/96/288	Mineralized zone with dolomite	-	-	25.8	21.3	1.2	-	-	-	-	-	-	-	50	60	-	-	200	-	-
295	GS/96/289	Dolomite	-	-	-	-	-	-	-	-	-	-	-	-	20	50	-	-	75	-	-
296	GS/96/290	Flaggy limestone	-	-	-	-	-	-	-		-	-	-	-	25	80	-	-	<50	-	-
297	GS/96/291	Dolomite	-	-	0.3	19.6	17.2	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
298	GS/96/292	---do---	-	-	0.6	3.9	2.0	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
299	GS/96/293	---do--	-	-	0.4	3.4	2.0	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
300	GS/96/294	---do--	-	-	0.4	11.2	10.0	-	-	-	-	-	-	-	<10	60	-	-	<50	-	-
301	GS/96/295	---do--	--	-	0.6	2.2	3.2	-	-	-	-	-	-	-	<10	60	-	-	<50	-	-
302	GS/96/296	----do---	-	-	15.7	15.7	10.8	-	-	-	-	-	-	-	<10	100	-	--	<50	-	-
303	GS/96/297	Dolomite with chert band	-	-	18.5	18.5	12.4	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
304	GS/96/298	Dolomite limestone with chert band	-	-	0.6	17.29	14.8	-	-	-	-	-	-	-	<10	30	-	-	<50	-	-
305	GS/96/299	Dolomite limestone with chert band	-	-	2.0	20.7	11.2	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
306	GS/96/300	Dolomite with quartzite bands	-	-	0.4	10.6	12.8	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
307	GS/96/301	Dolomite	-	-	0.5	15.7	0.8	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
308	GS/96/302	----do---	-	-	1.0	11.2	8.0	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
309	GS/96/303	Dolomite with quartzite band	-	-	0.4	24.6	14.0	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
310	GS/96/304	Calcareous sandstone	-	-	0.2	25.2	4.0	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
311	GS/96/305	Dolomitic limestone	-	-	0.3	30.8	20.8	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
312	GS/96/306	Dolomitic limestone	-	-	0.3	21.8	14.8	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
313	GS/96/307	Dolomitic limestone	-	-	0.1	29.7	26.8	-	-	-	-	-	-	-	<10	30	-	-	<50	-	-
314	GS/96/308	Dolomitic limestone	-	-	0.9	29.1	16.8	-	-		-	-	-	-	<10	250	-	-	<50	-	-
315	GS/96/309	Dolomitic limestone	-	-	0.3	18.0	12.8	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
316	GS/96/310	Dolomitic limestone	--	-	0.1	33.0	18.8	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
317	GS/96/311	Dolomitic limestone	-	-	1.0	16.8	14.4	-	-	-	-	-	-	-	<10	70	-	-	<50	-	-
318	GS/96/312	Dolomitic limestone	-	-	0.5	18.5	12.4	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
319	GS/96/313	Dolomitic limestone	-	-	0.5	30.8	18.4	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
320	GS/96/314	Dolomite	-	-	0.2	19.0	13.2	-	-	-	-	-	-	-	<10	1400	-	-	<50	-	-
321	GS/96/315	Dolomtic limestone	-	-	1.6	42.0	8.40	-	-	-	-	-	-	-	<10	250	-	-	100	-	-
322	GS/96/316	Dolomite with chert	-	-	3.1	22.4	11.6	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
323	GS/96/317	Flaggy limestone with red chert	-	-	0.4	40.9	1.6	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
324	GS/96/318	Dolomite	-	-	0.6	30.2	17.2	-	-	-	--	-	-	-	<10	250	-	-	<50	-	-
325	GS/96/319	----do---	-	-	0.7	10.1	6.8	-	-	-	-	-	-	-	20	250	-	-	<50	-	-
326	GS96/320	Dolomite with chert	-	-	0.3	19.0	2.8	-	-	-	-	-	-	-	<10	70	-	-	<50	-	-
327	GS/96/321	Dolomite with red chert	-	-	0.4	32.0	18.0	-	-	-	-	-	-	-	<10	120	-	-	<50	-	-
328	GS/96/322	Pisolitic bauxite	41.9	35.2	3.3	<1.0	<1.0	<0.5	1.49	700	314	62	209	167	100	35	25	50	66	18	536
329	GS/96/323	Non pisolitic bauxite	41.7	35.9	3.1	<1.0	<1.0	<0.5	1.39	7.52	356	63	206	169	58	33	20	49	88	11	520
330	GS/96/324	Pisolitic bauxite	35.4	39.1	4.3	<1.0	<1.0	<0.5	1.54	849	1414	140	158	149	36	40	36	45	79	23	556
331	GS/96/325	Non pisolitic bauxite	14.1	56.0	2.0	<1.0	<1.0	<0.5	2.54	1779	849	162	188	256	120	43	73	164	121	37	981

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
332	GS/96/326	Pisolitic bauxite	38.8	40.9	3.1	<1.0	<1.0	<0.5	1.60	2462	1024	148	235	200	91	32	52	48	49	23	688
333	GS/96/327	Non pisolitic bauxite	42.1	36.4	2.0	<1.0	<1.0	<0.5	1.32	914	394	86	316	261	51	32	19	68	86	21	624
334	GS/96/328	Pisolitic bauxite	24.3	46.7	11.2	<1.0	<1.0	<0.5	1.84	2004	1024	107	282	210	31	76	56	88	97	21	668
335	GS/96/ 136-C	Dolomite	-	-	4.7	14.0	3.0	-	-	-	-	-	-	-	20	135	-	-	<50	-	-
336	GS/96/329	Dolomite with vein quartz	-	-	-	-	-	-	-	-	-	-	-	-	10	40	-	-	<50	-	-
337	GS/96/330	Dolomitic limestone	-	-	1.8	29.1	5.6	-	-	-	-	-	-	-	<10	30	-	-	<50	-	-
338	GS/96/331	Flaggy limestone	-	-	-	-	-	-	-	-	-	-	-	-	10	80	-	-	<50	-	-
339	GS/96/332	Dolomite	-	-	0.2	25.2	25.2	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
340	GS/96/333	Dolomite with slate	-	-	0.3	33.6	16.8	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
341	GS/96/334	Dolomite with chert	-	-	0.1	28.0	16.8	-	-	-	-	-	-	-	<10	30	-	-	<50	-	-
342	GS/96/335	Dolomitic limestone	-	-	1.1	38.6	13.6	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
343	GS/96/336	Dolomite	-	-	0.1	29.1	-	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
344	GS/96/337	----do---	-	-	0.8	31.4	-	-	-	-	-	-	-	-	<10	30	-	-	<50	-	-
345	GS/96/338	Dolomite with chert	-	-	0.7	17.9	-	-	-	-	-	-	-	-	<10	30	-	-	<50	-	-
346	GS/96/339	Dolomite	-	-	1.2	22.4	-	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
347	GS/96/340	-----do---	-	-	0.5	25.2	-	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
348	GS/96/341	Flaggy limestone	-	-	2.20	30.2	-	-	-	-	-	-	-	-	<10	150	-	-	<50	-	-
349	GS/96/342	Dolomite	-	-	0.3	40.3	-	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
350	GS/96/343	Dolomite with chert	-	-	0.1	30.8	-	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
351	GS/96/344	Dolomite	-	-	0.3	33.6	-	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
352	GS/96/345	----do---	-	-	0..3	19.1	-	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
353	GS/96/346	----do---	-	-	0.4	28.0	21.2	-	-	-	-	-	-	-	<10	40	-		<50	-	-
354	GS/96/347	Brecciated quartzite	83.1	5.0	1.2	<1.0	<1.0	0.8	0.20	<100	22	40	26	27	73	56	71	<20	10	<10	28
355	GS/96/348	Brecciated quartzite with igneaus material	65.9	13.0	4.2	1.9	1.0	1.4	0.58	2558	190	79	102	88	123	112	129	78	<10	15	207
356	GS/96/349	Brecciated quartzite with igneaus material	74.6	5.8	11.4	<1.0	<1.0	1.06	0.23	272	28	56	32	31	101	135	121	36	35	21	58
357	GS/96/350	Brecciated	69.4	11.1	3.7	1.4	<1.0	0.9	0.56	913	166	62	101	85	131	96	144	75	72	11	301

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
		quartzite with igneaus material																			
358	GS/96/351	Brecciated quartzite with igneaus material	80.0	6.5	2.6	1.2	<1.0	1.3	0.29	343	61	54	49	51	98	114	115	44	<10	15	96
359	GS/96/352	Brecciated quartzite with igneaus material	80.8	6.2	3.2	<1.0	<1.0	1.5	0.25	976	47	57	37	32	53	169	117	36	14	15	53
360	GS/96/353	Brecciated quartzite with igneaus material	77.5	7.9	4.5	<1.0	<1.0	2.2	0.33	434	34	76	41	36	41	407	139	57	<10	15	109
361	GS/96/354	Brecciated quartzite with igneaus material	80.2	4.8	5.0	<1.0	<1.0	1.4	0.19	775	28	42	31	26	66	649	94	56	313	21	<20
362	GS/96/355	Flaggy limestone	-	-	2.6	2.5	2.4	-	-	-	-	-	-	-	15	100	-	-	<50	-	-
363	GS/96/356	Brecciate quartzite	76.5	5.1	5.8	<1.0	<1.0	1.5	0.20	448	29	44	31	30	163	172	111	61	76	11	31
364	GS/96/357	Brecciated quartzite	59.8	13.1	4.9	4.8	<1.0	0.6	0.49	876	304	46	186	119	44	174	107	54	271	<10	137
365	GS/96/358	----do---	68.8	2.2	<1.0	4.0	1.7	0.6	0.10	208	28	29	14	24	70	34	59	37	37	15	<20
366	GS/96/359	Brecciated quartzite with igneaus material	88.7	2.8	1.4	<1.0	<1.0	0.5	0.10	126	42	21	23	22	76	70	72	18	134	16	41
367	GS/96/360	----do---	74.5	5.4	6.8	<1.0	<1.0	1.7	0.20	469	25	48	32	28	43	109	117	67	45	17	21
368	GS/96/361	Brecciated quartzite	78.8	2.9	2.3	<1.0	<1.0	0.7	0.10	108	30	22	30	28	53	102	79	38	116	13	55
369	GS/96/362	Brecciated quartzite with ingneaus material	59.7	13.4	6.3	1.0	<1.0	1.3	0.66	1225	152	72	108	92	38	131	176	138	46	<10	286
370	GS/96/363	Dolomite	-	-	0.7	29.1	19.6	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
371	GS/96/364	Brecciated rock with igneasu material	62.4	5.3	18.7	1.5	<1.0	0.6	0.23	2487	42	<10	49	29	37	1323	55	107	222	18	27
372	GS/96/365	Limestone	-	-	0.4	26.3	16.8	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
373	GS/96/366	Brecciated quartzite	81.3	1.8	1.0	<1.0	<1.0	<0.5	0.08	679	12	27	16	23	37	16	29	<20	56	27	31
374	GS/96/367	Pisolitic bauxite	42.8	34.9	3.2	<1.0	<1.0	<0.5	1.58	1526	389	84	207	180	27	34	23	<20	121	48	683

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
375	GS/96/368	----do---	18.9	34.9	3.9	<10	<1.0	<0.5	3.42	3938	617	142	251	209	<5	67	77	58	239	74	1371
376	GS/96/369	Dolomite	-	54.5	1.3	26.3	22.0	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
377	GS/96/370	Flaggy limestone	-	-	0.8	20.7	10.8	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
378	GS/96/371	---do---	-	-	0.2	14.6	14.4	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
379	GS/96/372	----do---	-	-	0.7	23.5	14.4	-	-	-	-	-	-	-	<10	200	-	-	<50	-	-
380	GS/96/373	Non pisolitic bauxite	32.0	42.2	8.4	<1.0	<1.0	<0.5	1.72	1545	997	119	233	189	12	67	49	43	109	14	605
381	GS/96/374	--do---	37.0	32.6	10.6	<1.0	<1.0	<0.5	1.59	1598	641	89	232	174	78	88	50	48	67	11	634
382	GS/96/375	Pisolitic bauxite	36.1	35.3	7.4	<1.0	<1.0	0.6	1.07	1210	678	101	232	189	92	57	56	58	62	12	477
383	GS/96/376	Non pisolitic bauxite/bauxite clay	35.1	35.4	8.1	<1.0	<1.0	0.5	1.47	836	861	89	214	157	45	77	25	28	82	13	509
384	GS/96/377	Pisolitic bauxite	29.8	39.7	10.1	<1.0	<1.0	<0.5	1.44	1562	913	112	323	288	25	52	59	62	88	14	561
385	GS/96/378	Pisoliltic bauxite	24.1	41.3	14.0	<1.0	<1.0	<0.5	1.34	2054	984	104	342	260	16	61	65	64	93	13	478
386	GS/96/379	Non pisolitic bauxite	41.3	37.3	2.2	<1.0	<1.0	<0.5	1.44	917	509	100	294	338	5	31	18	61	86	21	682
387	GS/96/380	Pisolitic bauxite	24.1	49.8	9.0	<1.0	<1.0	<0.5	2.0	1911	890	114	386	231	17	103	55	26	146	28	792
388	GS/96/381	Non pisolitic bauxite	39.7	39.9	1.7	<1.0	<1.0	<0.5	1.79	1352	624	161	156	206	6	56	43	104	102	19	976
389	GS/96/382	---do---	25.3	44.2	15.3	<1.0	<1.0	<0.5	1.65	1949	1166	106	292	229	10	70	56	33	108	10	637
390	GS/96/383	Non pisolitic bauxite /bauxitic clay	42.3	37.4	1.1	<1.0	<1.0	<0.5	1.74	1478	373	194	146	159	15	45	73	140	102	28	1245
391	GS/96/384	Brecciated quartzite	85.4	7.1	<1.0	<1.0	<1.0	<0.5	0.17	593	53	35	35	37	21	39	22	33	56	14	35
392	GS/96/385	Cherty dolomite	-	-	0.2	30.8	20.0	-	-	-	-	-	-	-	<10	60	-	-	<50	-	-
393	GS/96/386	Dolomite		-	0.3	30.8	20.8	-	-	-	-	-	-	-	<10	40	-	-	<50	-	-
394	GS/96/387	---do---	-	-	0.4	31.6	19.6	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
395	GS/96/388	---do--	-	-	0.6	28.6	21.2	-	-	-	-	-	-	-	<10	80	-	-	<50	-	-
396	GS/96/389	----do--	-	-	0.1	30.8	21.2	-	-	-	-	-	-	-	<10	90	-	-	<50	-	-
397	GS/96/390	Dolomite with chert	-	-	0.5	22.2	18.4	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
398	GS/96/391	Flaggy limestone	-	-	1.0	34.7	8.0	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
399	GS/96/392	Brecciated quartzite	92.3	1.8	<1.0	<1.0	<1.0	<0.5	0.06	384	26	27	<10	1-	27	27	45	17	30	12	36
400	GS/96/339-A	Nummulitic limestone	-	-	0.84	8.9	1.60	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
401	GS/96/393	Brecciated quartzite	86.8	4.8	1.3	<1.0	<1.0	1.0	0.24	<100	24	43	23	31	18	42	81	13	59	13	176

S. No.	Sample No.	Rock Type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% Ti O_2	g/t P_2O_5	g/t Li	g/t -B	g/t V	g/t Cr	g/t Cu	g/t Zn	g/t Ba	g/t Ce	g/t Pb	g/t Bi	g/t Zr
402	GS/96/205-A	Dolomite	-	-	2.6	31.4	20.4	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
403	GS/96/205-B	--do---	-	-	0.6	30.8	24.4	-	-	-	-	-	-	-	<10	120	-	-	<50	-	-
404	GS/96/212	---do--	-	-	0.6	31.9	14.8	-	-	-	-	-	-	-	<10	50	-	-	<50	-	-
405	GS/T/96/1	Terrace (clasts embedded in clayey silty matrix	-	-	-	-	-	-	-	-	-	-	-	-	<10	100	-	-	<50	-	-
406	GS/T/96/2	Terrace (clasts embedded in clayey silty matrix	-	-	-	-	-	-	-	-	-	-	-	-	20	80	-	-	<50	-	-
407	GS/T/96/3	Terrace (clasts embedded in clayey silty matrix	-	-	-	-	-	-	-	-	-	-	-	-	20	100	-	-	<50	-	-
408	GS/T/96/4	Terrace (clasts embedded in clayey silty matrix	-	-	-	-	-	-	-	-	-	-	-	-	20	80	-	-	<50	-	-
409	GS/T/96/5	Terrace (clasts embedded in clayey silty matrix	-	-	-	-	-	-	-	-	-	-	-	-	20	80	-	-	<50	-	-
410	GS/T/96/6	Terrace (clasts embedded in clayey silty matrix	-	-	-	-	-	-	-	-	-	-	-	-	10	50	-	-	<50	-	-

APPENDIX-II

LITHO-ANLYTICAL LOGS OF SAMPLES FROM SALAL- THANPAL-PAONI- SAR DO BAS-RANSUH AREA OF UDHAMPUR DISTRICT COLLECTED DURING FIELD SEASON 1996-97

"Regional Geochemical Survey for Base Metals and Lithium in Salal area, Udhampur District, J&K"

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
1	RG/97/1	Sandstone	85.6	6.0	<1.0	<1.0	<1.0	<0.5	0.22	<100	30	30	29	10	11	<10	<10	154
2	RG/97/2	Chert quartzite breccia	88.9	3.9	1.2	<1.0	<1.0	<0.5	0.10	<100	10	23	25	5	11	12	<10	104
3	RG/97/3	Quartzite breccia	90.5	4.1	1.1	<1.0	<1.0	<0.5	0.10	197	30	17	14	6	5	<10	<10	122
4	RG/97/4	Pisolitic bauxite	35.8	46.7	2.6	<1.0	<1.0	<0.5	2..31	1493	1726	164	209	<5	22	66	<1.0	1216
5	RG/97/5	Non pisolitiec bauxite	41.2	39.4	2.6	<1.0	<1.0	<0.5	2..59	1294	1255	146	202	<5	26	56	<1.0	1572
6	RG/97/6	Bauxitic clay	43.8	39.8	1.3	<1.0	<1.0	<0.5	1.97	1206	843	119	168	<5	23	51	11	900
7	RG/97/7	Quartzite Breccia	91.2	3.8	<1.0	<1.0	<1.0	<0.5	0.07	<100	25	23	21	5	<5	<10	<10	203
8	RG/97/8	Pisolitic bauxite	38.1	45.5	1.7	<1.0	<1.0	<0.5	2.87	1434	1910	162	205	<5	21	66	<10	1618
9	RG/97/9	Quartzite breccia	89.9	6.8	<1.0	<1.0	<1.0	<0.5	0.29	<100	46	28	23	6	16	30	<10	246
10	RG/97/10	Bauxitic clay	46.4	36.9	1.1	<1.0	<1.0	<0.5	1.53	1390	475	62	141	<5	27	69	15	696
11	RG/97/11	Non Pisolitic bauxite	43.3	39.8	1.1	<1.0	<1.0	<0.5	1.69	1339	608	70	148	<5	24	61	16	679
12	RG/97/12	Pisolitic bauxite	25.2	56.0	1.3	<1.0	<1.0	<0.5	2.54	2219	863	139	251	<5	36	105	15	954
13	RG/97/13	Pisolitic bauxite	28.7	46.9	7.8	<1.0	<1.0	<0.5	1.68	3000	986	217	216	<5	40	101	15	683
14	RG/97/14	Pisolitic bauxite	35.7	40.5	7.9	<1.0	<1.0	<0.5	1.26	1496	997	176	210	<5	41	79	13	614
15	RG/97/15	Non pisolitic bauxite	45.9	40.6	2.1	<1.0	<1.0	<0.5	1.33	1232	455	222	248	<5	25	78	17	671
16	RG/97/16	Pisolitic bauxite	27.2	46.9	9.1	<1.0	<1.0	<0.5	1.63	2198	811	190	196	<5	52	107	15	556
17	RG/97/17	Bon pisolitic bauxite	44.0	39.2	1.6	<1.0	<1.0	<0.5	1.75	1471	439	121	178	<5	40	95	17	1156
18	RG/97/18	Bauxitic clay	44.7	38.9	1.4	<1.0	<1.0	<0.5	1.66	1476	363	137	164	<5	42	99	15	1089
19	RG/97/19	Quartzite breccia	80.1	13.2	<1.0	<1.0	<1.0	<0.5	0.38	208	84	63	67	6	20	37	<10	293
20	RG/97/20	Pisolitic bauxite	18.1	56.0	2.7	1.4	<1.0	<0.5	2.63	2477	853	252	227	6	76	160	21	927
21	RG/97/21	Non Pisolitec bauxite	20.9	56.0	2.2	<1.0	<1.0	<0.5	2.37	2512	764	122	247	<5	46	144	20	831
22	RG/97/22	Sandstone	87.1	5.0	1.1	1.0	<1.0	<0.5	0.15	<100	29	27	27	9	19	61	<10	185
23	RG/97/23	Pisolitic bauxite	45.2	37.7	3.8	<1.0	<1.0	<0.5	1.57	1073	276	174	178	<5	54	105	11	651
24	RG/97/24	Non Pisolitic bauxite	45.2	38.0	3.9	<1.0	<1.0	<0.5	1.31	1080	282	168	164	9	92	176	11	590
25	RG/97/25	Quartzite breccia	85.7	6.6	1.1	1.3	<1.0	<0.5	0.16	<100	30	34	36	10	27	15	<10	246
26	RG/97/26	Quartzite	90.2	3.9	<1.0	<1.0	<1.0	1.0	0.18	<100	12	22	16	11	12	<10	<10	277
27	RG/97/27	Slate within quartz-s;ate sequence	79.3	10.7	1.5	<1.0	<1.0	1.9	0.31	<100	17	37	32	11	29	<10	<10	292
28	RG/97/28	Shelly nodular limestone	-	-	3.1	36.4	4.0	-	-	-	-	-	-	15	50	<50	-	-
29	RG/97/29	Shelly nummlitic limestone	-	-	4.7	43.1	2.8	-	-	-	-	-	-	10	100	<50	-	-
30	RG/97/30	Quartzite breccia zone intruded by ingeous material	80.7	5.9	5.7	1.7	1.1	1.0	0.23	<100	30	41	33	23	170	51	<10	183
31	RG/97/31	Quartzite breccia	89.0	4.2	1.0	<1.0	<1.0	0.6	0.13	<100	34	24	18	13	31	31	<10	147
32	RG/97/32	Quartzite breccia with igneous material	79.0	5.6	10.4	<1.0	<1.0	0.7	0.18	150	32	30	25	29	237	46	<10	201
33	RG/97/33	--do--	78.5	5.6	6.7	1.4	1.0	1.0	0.20	362	15	39	27	65	210	296	<10	219
34	RG/97/34	Quartzite breccia	86.3	6.9	2.0	1.0	<1.0	0.6	0.30	<100	52	48	37	64	192	104	<10	223
35	RG/97/35	Pisolitic bauxitic	37.6	40.9	4.5	2.5	1.4	<0.5	2.21	1592	487	240	228	15	74	107	10	810
36	RG/97/36	Non pisolitic bauxite	32.6	48.0	4.8	<1.0	<1.0	<0.5	2.40	1840	515	211	231	6	53	106	12	834

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
37	RG/97/37	Pisolitic bauxite	36.1	38.6	4.1	3.0	1.8	<0.5	1.93	1408	447	187	222	12	70	78	12	651
38	RG/97/38	Pisolitic bauxite	33.5	40.7	3.6	3.6	1.9	<0.5	1.81	1744	437	179	227	12	67	86	14	644
39	RG/97/39	Non Pisolitic bauxite	44.7	38.5	2.0	<1.0	<1.0	<0.5	1.80	1288	485	140	191	7	33	62	15	594
40	RG/97/40	Non Pisolitic bauxite	42.2	36.2	4.3	2.6	1.5	<0.5	1.85	1324	505	190	203	9	60	75	10	599
41	RG/97/41	Pisolitic bauxite	46.1	25.9	4.4	5.9	3.3	0.7	1.28	1905	325	157	165	19	107	64	11	481
42	RG/97/42	Non pisolitic bauxite	40.3	35.3	4.5	3.6	2.2	0.7	1.45	1903	350	125	160	15	101	54	14	455
43	RG/97/43	Bauxitic clay	45.8	39.4	1.1	<1.0	<1.0	<0.5	1.47	1087	267	203	142	6	30	56	12	557
44	RG/97/44	Pisolitic bauxite	33.2	21.9	26.6	1.7	1.2	<0.5	0.86	802	479	130	121	11	84	28	<10	583
45	RG/97/45	Quartzite breccia	80.5	6.0	6.4	<1.0	<1.0	1.1	0.20	133	36	31	22	15	192	<10	<10	194
46	RG/97/46	-----do----	73.6	8.3	4.9	1.2	1.0	1.7	032	1119	37	38	33	11	111	<10	<10	195
47	RG/97/47	--do---	73.7	6.9	7.4	1.0	<1.0	1.4	0.27	617	37	36	30	31	109	<10	<10	200
48	RG/97/48	Quartzite breccia	90.6	3.6	1.5	<1.0	<1.0	0.6	0.19	<100	13	16	11	13	159	<10	<10	376
49	RG/97/49	Quartzite	77.2	7.2	2.9	1.6	1.2	1.2	0.31	278	41	39	36	20	264	<10	<10	196
50	RG/97/50	Arenaceous slate(1/2m) with quartz slate sequence	87.4	5.3	1.2	<1.0	<1.0	0.9	0.19	<100	21	20	15	10	68	<10	<10	213
51	RG/97/51	Non pisolitic bauxite	45.3	36.4	<1.0	<1.0	<1.0	<0.5	2.08	887	518	78	131	7	21	50	16	541
52	RG/97/52	Bauxitic clay	46.4	38.6	<1.0	<1.0	<1.0	<0.5	1.82	1000	413	67	139	5	21	57	16	502
53	RG/97/53	Quartzite breccia	88.5	6.7	<1.0	<1.0	<1.0	<0.5	0.22	<100	29	20	23	<5	7	<10	<10	170
54	RG/97/54	Iron stone shale	91.1	2.1	<1.0	<1.0	<1.0	<0.5	0.09	<100	<10	15	14	7	<5	<10	<10	148
55	RG/97/55	Crushed dolomitic limestone	2.47	-	1.40	29.40	24.0	-	-	-	-	-	-	5	700	<50	-	-
56	RG/97/56	Flaggy limestone	6.85	-	1.30	49.00	5.0	-	-	-	-	-	-	8	120	<50	-	-
57	RG/97/57	Quartzite (1/2m) within quartz-slate sequence	91.1	2.1	<1.0	<1.0	<1.0	<0.5	0.09	<100	<10	15	14	5	<5	<10	<10	148
58	RG/97/58	Slate (1/2m) with quartz-slate sequence	80.4	10.0	<1.0	<1.0	<1.0	0.5	0.61	<100	32	51	53	22	6	<10	<10	503
59	RG/97/59	Bauxitic clay	45.8	37.3	<1.0	<1.0	<1.0	<0.5	2.18	1189	386	83	144	<5	20	79	21	666
60	RG/97/60	Non pisolitic bauxite	29.7	49.2	1.8	<1.0	<1.0	<0.5	3.52	1798	1074	131	197	21	24	96	29	828
61	RG/97/61	Pisolitic bauxite	46.8	36.7	1.4	<1.0	<1.0	<0.5	2.20	961	199	91	273	6	24	61	20	734
62	RG/97/62	Ironstone shale	24.90	-	49.6	2.8	1.0	-	-	-	-	-	-	10	410	<50	-	-
63	RG/97/63	----do----	29.10	-	50.0	1.4	1.0	-	-	-	-	-	-	15	450	<50	-	-
64	RG/97/64	Vein quartz	59.9	-	1.2	12.6	9.0	-	-	-	-	-	-	<10	120	<50	-	-
65	RG/97/65	Crushed dolomite	32.7	-	2.0	14.0	1.0	-	-	-	-	-	-	20	200	80	-	-
66	RG/97/66	Tectonic breccia	2.2	-	0.7	33.6	15.0	-	-	-	-	-	-	<10	130	80	-	-
67	RG/97/67	Crushed dolomite	0.35	-	0.6	32.2	23.0	-	-	-	-	-	-	10	200	80	-	-
68	RG/97/68	---do---	14.8	-	1.0	19.6	21.0	-	-	-	-	-	-	<10	200	80	-	-
69	RG/97/69	-----do---	2.0	-	0.2	29.4	22.0	-	-	-	-	-	-	<10	450	80	-	-
70	RG/97/70	Dolomite	12.6	-	0.5	29.4	22.0	-	-	-	-	-	-	10	120	150	-	-
71	RG/97/71	----do---	36.8	-	1.0	26.6	19.0	-	-	-	-	--	-	<10	160	80	-	-
72	RG/97/72	Quartzite band within Trikuta Formation	11.5	-	0.3	2.3.8	21.0	-	-	-	-	-	-	<10	120	80	-	-
73	RG/97/73	Slate	54.5	-	0.3	28.0	19.0	-	-	-	-	-	-	<10	120	<50	-	-
74	RG/97/74	Mineralized zone (<1/2m)	54.9	-	3.9	5.6	3.0	-	-	-	-	-	-	15	120	<50	-	-
75	RG/97/75	Vein quartz with box work	41.2	-	14.1	12.6	8.0	-	-	-	-	-	-	25	180	80	-	-
76	RG/97/76	---do---	33.1	-	8.4	16.8	12.0	-	-	-	-	-	-	15	200	<50	-	-
77	RG/97/77	----do--	39.7	--	3.7	16.8	11.0	-	-	-	-	-	-	<10	180	120	-	-
78	RG/97/78	Red chert within flaggy limestone	0.2	-	1.6	54.7	1.0	-	-	-	-	-	-	<10	500	<50	-	-

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
79	RG/97/79	Crushed dolomite	62.6	-	2.1	1.4	Trace	-	-	-	-	--	-	<10	20	<50	-	-
80	RG/97/80	Dolomite	208	-	2.9	22.4	22.0	-	-	-	-	-	-	<10	120	<50	-	-
81	RG/97/81	Chert quartzite breccia	87.3	3.6	4.2	<1.0	<1.0	<0.5	0.10	<100	50	37	14	59	135	51	<10	130
82	RG/97/82	Sandstone overlying quartz breccia	45.7	1.7	<1.0	29.5	18.0	<0.5	0.04	<100	<10	17	22	9	33	35	<10	262
83	RG/97/83	Chert quartzite brecciea	59.4	25.6	<1.0	<1.0	<1.0	<0.5	1.82	587	221	49	117	7	14	39	11	789
84	RG/97/84	Sandstone	45.2	1.5	<1.0	29.1	19.5	<0.5	0.02	<100	<10	18	22	9	30	31	10	261
85	RG/97/85	Sandstone underlying bauxite coloumn	49.5	1.5	<1.0	23.8	15.1	<0.5	0.02	<100	<10	17	20	8	34	47	10	269
86	RG/97/86	Crushed dolomite	17.7	-	0.8	26.6	14.0	-	-	-	-	-	-	<10	120	<50	-	-
87	RG/97/87	Dolomite	69.5	-	10.0	1.40	3.0	-	-	-	-	-	-	200	200	350	-	-
88	RG/97/88	Crushed dolomite	79.6	-	2.0	1.40	5.0	-	-	-	-	-	-	<10	40	<50	-	-
89	RG/97/44-A	Pisolitic bauxite	32.5	42.3	3.0	3.8	2.1	<0.5	1.24	2226	667	96	1.63	13	128	115	26	540-
90	RG/97/89	Crushed dolomite	3.3	-	0.4	28.0	24.0	-	-	-	-	-	-	<10	160	<50	-	-
91	RG/97/90	Dolomite with vein quartz 2-3	95.5	-	0.9	1.4	1.0	-	-	-	-	-	-	<10	<10	80	-	-
92	RG/97/91	Crushed dolomite/fault breccia	7.9	-	1.2	28.0	22.0	-	-	-	-	-	-	<10	400	<50	-	-
93	RG/97/92	Crushed dolomite with mineralization	7.6	-	2.2	19.6	13.0	-	-	-	-	-	-	30	600	7.00%	-	-
94	RG/97/93	---do---	6.8	-	3.1	25.2	18.0	-	-	-	-	-	-	5	350	8.00%	-	-
95	RG/97/94	Crushed dolomite	6.0	-	2.3	15.4	30.0	-	-	-	-	-	-	<10	500	170	-	-
96	RG/97/95	Chert quartzite breccia	85.9	5.8	2.6	<1.0	<1.0	<0.5	0.20	<100	34	30	24	7	27	<10	<10	164
97	RG/97/96	Bauxite clay	44.1	42.2	4.3	<1.0	<1.0	0.6	0.58	314	63	105	85	9	39	24	<10	270
98	RG/97/97	Non pisolitic bauxite	48.3	12.2	3.3	12.9	<1.0	<0.5	0.69	1658	57	66	94	15	27	36	15	343
99	RG/97/98	Bauxite	45.6	33.5	7.1	<1.0	<1.0	<0.5	0.82	2059	308	134	167	<5	48	98	13	402
100	RG/97/99	Bauxite clay	44.4	35.1	2.2	<1.0	<1.0	<0.5	1.35	1132	342	113	136	7	30	89	16	623
101	RG/97/100	Non pisolitic bauxite	15.3	56.0	3.9	<1.0	<1.0	<0.5	3.52	2252	316	145	140	9	57	189	34	869
102	RG/97/101	pisolitic bauxite	21.3	56.0	2.6	<1.0	<1.0	<0.5	2.33	2147	985	182	161	<5	32	193	29	759
103	RG/97/102	Non pisolitic bauxite	35.6	37.0	14.5	<1.0	<1.0	0.8	1.49	907	279	117	104	7	43	47	<10	748
104	RG/97/103	pisolitic bauxite	12.0	55.1	16.6	<1.0	<1.0	<0.5	2.06	2410	186	224	238	12	57	149	19	913
105	RG/97/104	---do---	11.1	56.0	3.6	<1.0	<1.0	<0.5	6.10	2214	512	80	164	5	48	146	36	1316
106	RG/97/105	----do---	26.9	34.9	23.3	<1.0	<1.0	<0.5	1.10	1502	435	322	396	11	73	53	<10	449
107	RG/97/106	Non pisolitic bauxite	38.1	36.6	10.1	<1.0	<1.0	0.6	0.98	3574	303	198	262	12	52	106	10	398
108	RG/97/107	Bauxite clay	38.1	36.7	10.2	<1.0	<1.0	<0.5	1.06	1297	312	202	230	9	43	121	12	483
109	RG/97/108	Gassonized zone	29.9	-	33.5	1.4	1.0	-	-	-	-	-	--	15	100	<50	-	-
110	RG/97/109	---do---	18.5	-	60.6	1.4	1.0	-	-	-	-	-	-	50	250	120	-	-
111	RG/97/110	----do---	16.8	-	59.8	1.4	1.0	-	-	-	-	-	-	25	200	<50	-	-
112	RG/97/111	Nummulitic limestone	27.5	-	10.2	1.4	1.0	-	-	-	-	-	-	10	40	<50	-	-
113	RG/97/112	pisolitic bauxite	26.8	51.5	5.1	<1.0	<1.0	<0.5	2.13	2513	713	196	165	<5	34	119	22	-
114	RG/97/113	Non pisolitic bauxite	8.2	41.4	36.5	<1.0	<1.0	<0.5	1.90	1240	186	203	173	5	59	71	<10	703
115	RG/97/114	---do---	16.5	56.0	7.8	<1.0	<1.0	<0.5	3.35	1809	315	234	202	<5	47	116	33	730
116	RG/97/115	pisolitic bauxite	39.9	42.4	4.9	<1.0	<1.0	<0.5	1.00	1080	600	137	120	<5	28	97	15	1043
117	RG/97/116	Pisolitic` bauxite	35.5	37.8	13.0	<1.0	<1.0	<0.5	1.15	1022	762	257	221	<5	41	68	<10	558
118	RG/97/117	Ironstone shale	4.1	-	63.6	1.4	Traces	-	-	-	-	-	-	15	280	80	-	-
119	RG/97/118	Pisolitic` bauxite	55.1	22.3	6.6	<1.0	Traces	1.0	1.21	868	121	121	130	8	47	34	<10	490
120	RG/97/119	Bauxite clay	40.1	38.0	7.7	<1.0	<1.0	<0.5	1.10	1218	354	153	171	<5	39	87	<10	459

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
121	RG/97/120	Pisolitic Bauxite	33.2	39.2	13.9	<1.0	<1.0	<0.5	1.30	1651	692	199	213	6	46	69	<10	562
122	RG/97/121	Non pisolitic Bauxite	26.2	32.4	25.9	<1.0	<1.0	0.6	1.23	945	439	244	264	9	65	45	<10	556
123	RG/97/122	Pisolitic Bauxite	28.8	31.0	23.0	<1.0	<1.0	<0.5	1.20	1203	344	338	368	5	85	58	<10	474
124	RG/97/123	Non pisolitic bauxite	34.1	32.4	17.3	<1.0	<1.0	0.6	1.25	1024	337	136	121	<5	78	46	<10	418
125	RG/97/124	--do---	14.9	56.0	9.0	<1.0	<1.0	<0.5	2.46	2518	253	594	540	5	46	138	22	832
126	RG/97/125	Pisolitic Bauxite	606	55.8	22.5	<1.0	<1.0	<0.5	2.22	2354	88	424	397	10	61	334	14	817
127	RG/97/126	Bauxite Clay	41.5	40.9	3.5	<1.0	<1.0	1.0	1.09	1258	365	323	279	<5	30	92	16	420
128	RG/97/127	Pisolitic Bauxite	34.9	41.5	7.8	<1.0	<1.0	<0.5	1.52	2051	827	202	214	<5	34	84	14	693
129	RG/97/128	Non Pisolitic Bauxite	44.4	39.1	2.1	<1.0	<1.0	<0.5	1.45	1135	437	489	662	<5	23	67	19	677
130	RG/97/129	Bauxitic clay	5.9	56.0	4.0	<1.0	<1.0	<0.5	3.90	2817	160	351	336	12	55	176	40	1136
131	RG/97/130	Chert quartzite breccia	81.3	10.8	2.5	<1.0	<1.0	1.2	0.56	106	28	58	58	13	31	<10	<10	356
132	RG/97/131	Pisolitic bauxite	41.7	35.8	6.2	<1.0	<1.0	<0.5	1.03	4621	251	137	158	8	39	27	<10	517
133	RG/97/132	Non pisolitic bauxite	44.1	36.9	5.5	<1.0	<1.0	<0.5	1.13	4991	288	136	169	<5	42	61	12	480
134	RG/97/133	Ironstone shale	44.8	-	31.3	5.6	2.0	-	-	-	-	-	-	20	430	80	-	-
135	RG/97/134	Sandstone	44.3	37.5	4.7	<1.0	<1.0	<0.5	1.38	1784	316	134	163	<5	40	65	<10	561
136	RG/97/135	Pisolitic bauxite	39.4	35.6	10.6	<1.0	<1.0	<0.5	1.24	967	283	162	181	6	59	67	<10	504
137	RG/97/136	Fault breccia	43.7	-	24.2	12.6	5.0	-	-	-	-	-	-	<10	120	<50	-	-
138	RG/97/137	Dolomitic limestone	53.9	-	22.1	7.0	4.0	-	-	-	-	-	-	15	100	<50	-	-
139	RG/97/138	Gossanized zone	82.3	-	6.1	1.4	1.0	-	-	-	-	-	-	50	40	<50	-	-
140	RG/97/139	-----do----	66.9	-	7.2	7.0	3.0	-	-	-	-	-	-	15	80	100	-	-
141	RG/97/140	Fault breccia zone	71.0	-	10.7	7.0	1.0	-	-	-	-	-	-	10	80	<50	-	-
142	RG/97/141	Chert band	84.5	-	7.9	1.4	4.0	-	-	-	-	-	-	20	80	<50	-	-
143	RG/97/142	Gossanized zone with flaggy limestone	90.4	-	4.5	1.4	1.0	-	-	-	-	-	-	<10	30	<50	-	-
144	RG/97/143	Flaggy limestone	-	-	18.0	44.8	1.6	-	-	-	-	-	-	<10	50	<50	-	-
145	RG/97/144	Gossanized zone with dolomite	35.4	-	9.9	29.04	2.0	-	-	-	-	-	-	10	120	<50	-	-
146	RG/97/145	----------do----	62.7	-	30.1	1.4	3.0	-	-	-	-	-	-	10	40	<50	-	-
147	RG/97/146	--------do-----	81.6	-	10.0	2.8	2.0	-	-	-	-	-	-	15	10	<50	-	-
148	RG/97/147	Slag	22.8	-	66.4	2.8	1.0	-	-	-	-	-	-	<10	40	<50	-	-
149	RG/97/148	--do---	25.4	-	55.7	9.8	Trace	-	-	-	-	-	-	45	120	<50	-	-
150	RG/97/149	Red chert with haematite mineralization	49.9	-	41.0	2.8	2.0	-	-	-	-	-	-	10	50	<50	-	-
151	RG/97/150	Gossainised zone	52.3	-	21.0	9.8	3.0	-	-	-	-	-	-	10	80	<50	-	-
152	RG/97/151	Gossanised zone	62.3	-	24.7	2.8		-										
153	RG/97/152	Gossanised dolomite	14.4	-	7.0	30.8		-	-	-	-	-	-					
154	RG/97/153	Gossanised dolomite	59.6	-	1.9	9.8		-	-	-	-	-	-					
155	RG/97/154	Gossanised dolomite	85.5	-	4.5	1.4		-	-	-	-	-	-					
156	RG/97/155	Gossanised dolomite	51.8	-	2.6	9.8	2.0	-	-	-	-	-	-					
157	RG/97/156	Gossanised dolomite	89.3	-	1.5	2.8	17.0	-	-	-	-	-	-					
158	RG/97/157	Metabasic	41.6	-	16.7	8.4	8.0	-	-	-	-	-	-					
159	RG/97/158	Metabasic	47.2	-	11.1	9.8	1.0	-	-	-	-	-	-					
160	RG/97/159	Crushed dolomite	23.2	-	1.5	25.2	6.0	-	-	-	-	-	-					
161	RG/97/160	Crushed dolomite	36.6	-	1.5	12.6	2.0	-	-	-	-	-	-					
162	RG/97/161	Crushed dolomite	62.9	-	0.7	9.8	6.0	-	-	-	-	-	-					
163	RG/97/162	Crushed dolomite	1.9	-	1.9	30.8	18.0	-	-	-	-	-	-					

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
164	RG/97/163	Crushed dolomite	20.9	-	1.1	25.2	17.0	-	-	-	-	-	-					
165	RG/97/164	Crushed dolomite	11.9	-	0.8	26.6	19.0	-	-	-	-	-	-					
166	RG/97/165	Vein quartz	81.3	-	0.9	4.2	5.0	-	-	-	-	-	-					
167	RG/97/166	Crushed dolomite	49.9	-	31.9	2.8	4.0	-	-	-	-	-	-					
168	RG/97/167	Dolomite	33.3	-	0.7	18.2	15.0	-	-	-	-	-	-					
169	RG/97/168	Crushed dolomite	13.8	-	1.2	26.6	18.0	-	-	-	-	-	-					
170	RG/97/169	Crushed Dolomite	2.9	-	0.6	30.8	22.0	-	-	-	-	-	-					
171	RG/97/170	Crushed dolomite	1.9	-	2.2	32.2	19.0	-	-	-	-	-	-	15	120	<50	-	-
172	RG/97/171	Crushed dolomite	0.3	-	1.0	29.4	24.0	-	-	-	-	-	-	15	200	<50	-	-
173	RG/97/172	Crushed dolomite	8.0	-	1.5	28.0	19.0	-	-	-	-	-	-	15	110	<50	-	-
174	RG/97/173	Crushed dolomite	0.1	-	1.4	16.8	32.0	-	-	-	-	-	-	15	220	<50	-	-
175	RG/97/174	Basic rock	46.5	-	16.5	7.0	3.0	-	-	-	-	-	-	740	200	<50	-	-
176	RG/97/175	Metabasic rock	26.3	-	10.2	12.6	4.0	-	--	-	-	-	-	50	170	<50	-	-
177	RG/97/176	Metabasic (Tectonised)	44.3	-	13.4	9.8	4.0	-	-	-	-	-	-	90	150	<50	-	-
178	RG/97/177	Metabasic rock	38.2	-	14.9	9.8	Trace	-	-	-	-	-	-	80	200	<50	-	-
179	RG/97/178	Metabasic rock	40.7	-	15.7	8.4	2.0	-	-	-	-	-	-	15	200	<50	-	-
180	RG/97/179	Crushed dolomite	27.9	-	0.7	22.4	17.0	-	-	-	-	-	-	20	100	<50	-	-
181	RG/97/180	Crushed dolomite with vein quartz	53.4	-	1.7	8.4	6.0	-	-	-	-	-	-	25	100	<50	-	-
182	RG/97/181	Dolomite/Quartzite	30.6	-	0.7	19.6	15.0	-	-	-	-	-	-	10	60	<50	-	-
183	RG/97/182	Crushed dolomite	0.1	-	0.6	30.8	23.0	-	-	-	-	-	-	10	100	<50	-	-
184	RG/97/183	Crushed dolomite	0.8	-	0.7	35.0	20.0	-	-	-	-	-	-	10	100	<50	-	-
185	RG/97/184	Crushed dolomite	0.1	-	0.8	30.8	23.0	-	-	-	-	-	-	10	50	<50	-	-
186	RG/97/185	Crushed dolomite	0.4	-	0.6	30.8	22.0	-	-	-	-	-	-	10	50	<50	-	-
187	RG/97/186	Crushed dolomite with vein quartz	4.9	-	0.4	30.8	19.0	-	-	-	-	-	-	<10	60	<50	-	-
188.	RG/97/187	Crushed dolomite	23.0	--	0.4	22.4	17.0	-	-	-	--	-	-	<10	90	<50	-	-
189	RG/97/188	Crushed dolomite	5.3	-	0.4	29.4	20.0	-	-	-	-	-	-	<10	120	<50	-	-
190	RG/97/189	Quartzite	7.4	-	0.9	28.0	21.0	-	-	-	-	-	-	75	50	<50	-	-
191	RG/97/190	Crushed dolomite within ½ m wide zone of mineralisation	78.7	-	5.1	4.2	3.0	-	-	-	-	-	-	15	5.0	<50	-	-
192	RG/97/191	Crushed dolomite with mineralised zone	68.0	-	8.2	2.8	Trace	-	-	-	-	-	-	20	70	<50	-	-
193	RG/97/192	Crushed dolomite with gossanised zone	48.2	-	4.4	9.8	3.0	-	-	-	-	-	-	20	40	<50	-	-
194	RG/97/193	Crushed dolomite with Gossanised patches	69.7	-	13.4	2.8	1.0	-	-	-	-	-	-	30	80	<50	-	-
195	RG/97/194	Crushed dolomite	19.7	-	0.8	25.2	16.0	-	-	-	-	-	-	15	40	<50	-	-

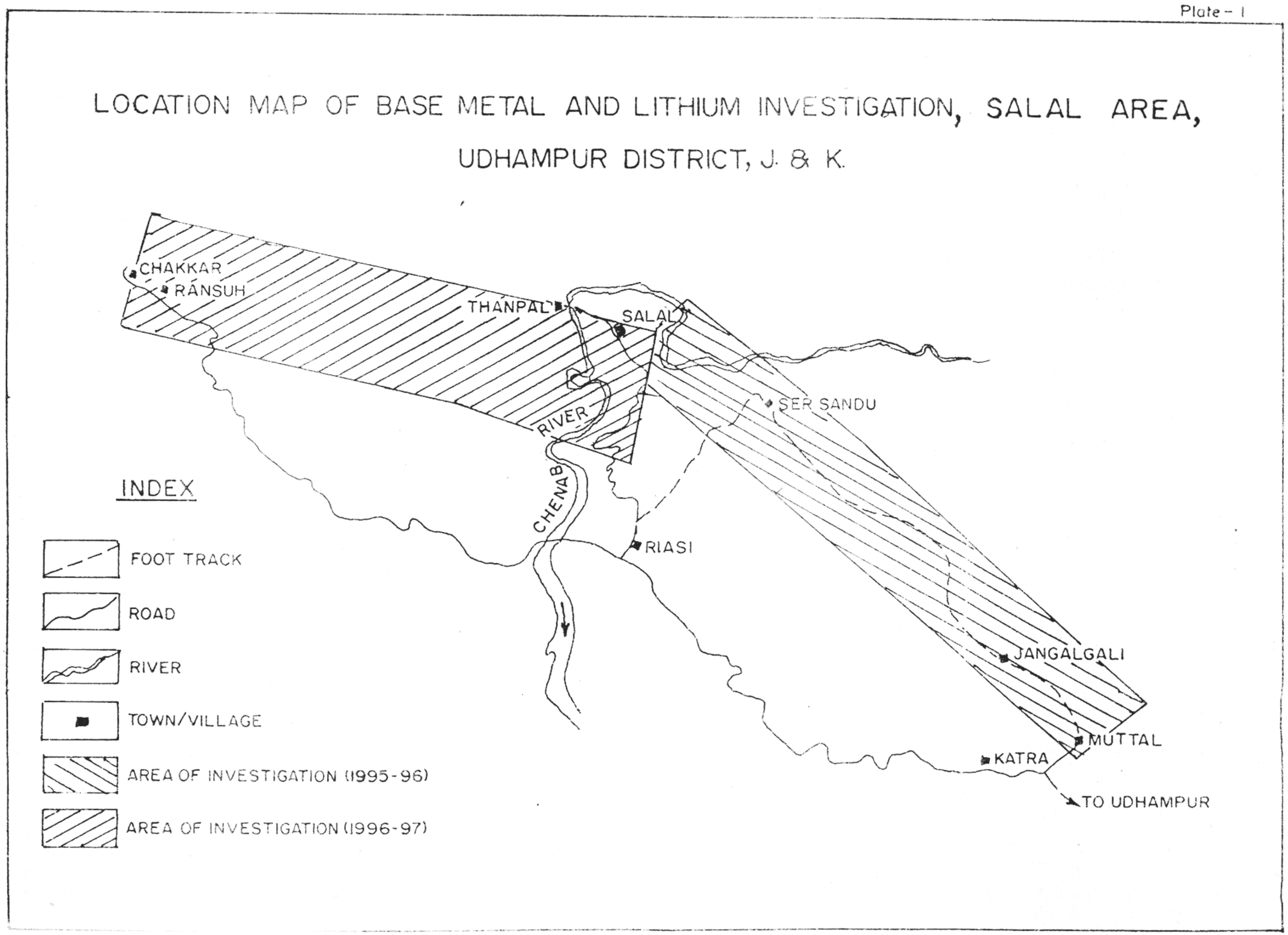
S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
196	RG/97/195	Dolomite	57.0	-	8.2	1.4	2.0	-	-	-	-	-	-	30	650	<50	-	
197	RG/97/196	Crushed dolomite	0.9	-	0.4	30.8	22.0	-	-	-	-	-	-	30	150	<50	-	-
198	RG/97/197	Crushed dolomite	28.0	-	0.3	23.8	15.0	-	-	-	-	-	-	30	100	<50	-	-
199	RG/97/198	Crushed dolomite	4.6	-	0.4	35.0	18.0	-	-	-	-	-	-	30	100	<50	-	-
200	RG/97/199	Crushed dolomite	23.7	-	0.7	22.4	18.0	-	-	-	-	-	-	35	200	<50	-	-
201	RG/97/200	Crushed dolomite	5.0	-	0.3	28.0	22.0	-	-	-	-	-	-	50	450	<50	-	-
202	RG/97/201	Crushed dolomite	0.6	-	0.2	30.8	22.0	-	-	-	-	-	-	25	100	<50	-	-
203	RG/97/202	Crushed dolomite	7.8	-	1.5	32.2	14.0	-	-	-	-	-	-	100	130	<50	-	-
204	RG/97/203	Crushed dolomite with vein quartz	8.8	-	0.3	28.0	20.0	-	-	-	-	-	-	30	100	<50	-	-
205	RG/97/204	Gossanised zone	3.1	-	1.1	29.4	18.0	-	-	-	-	-	-	90	100	<50	-	-
206	RG/97/205	Crushed dolomite	0.1	-	0.3	28.4	25.0	-	-	-	-	-	-	25	100	<50	-	-
207	RG/97/206	Crushed dolomite	25.9	-	0.2	32.2	19.0	-	-	-	-	-	-	30	100	<50	-	-
208	RG/97/207	Crushed dolomite	1.7	-	0.2	22.4	18.0	-	-	-	-	-	-	15	100	<50	-	-
209	RG/97/208	Crushed dolomite	15.8	-	0.1	25.2	20.0	-	-	-	-	-	-	10	90	<50	-	-
210	RG/97/209	Crushed dolomite with vein quartz.	56.7	-	0.2	12.6	8.0	--	-	-	-	-	-	15	90	<50	-	-
211	RG/97/210	Crushed dolomite	-	-	0.5	29.1	12.8	-	-	--	-	-	-	30	120	<50	-	-
212	RG/97/211	Crushed dolomite	-	-	0.5	33.0	18.4	-	-	-	-	-	-	40	250	<50	-	-
213	RG/97/212	Crushed dolomite	-	-	0.7	26.9	17.6	-	-	-	-	-	-	40	150	<50	-	-
214	RG/97/213	Crushed dolomite	-	-	0.5	28.0	19.6	-	-	-	-	-	-	25	100	<50	-	-
215	RG/97/214	Crushed dolomite	-	-	0.6	28.6	19.2	-	-	-	-	-	-	35	120	<50	-	-
216	RG/97/215	Crushed dolomite	-	-	0.2	24.6	16.0	-	-	-	-	-	-	10	80	<50	-	-
217	RG/97/216	Quartzite	-	-	0.28	30.2	21.2	-	-	-	-	-	-	25	1000	<50	--	-
218	RG/97/217	Crushed dolomite	-	-	0.3	30.2	21.2	-	-	-	-	-	-	25	250	<50	-	-
219	RG/97/218	Quartzite	-	-	0.5	28.0	19.2	-	-	-	-	-	-	30	100	<50	-	-
220	RG/97/219	Dolomite	-	-	1.2	32.5	18.4	-	-	-	--	-	-	65	1400	1400	-	-
221	RG/97/220	Crushed dolomite	-	-	0.1	0.6	0.8	-	-	-	-	-	-	15	100	<50	-	-
222	RG/97/221	Crushed dolomite	-	-	0.1	33.6	Trace	-	-	-	-	-	-	25	150	75	-	-
223	RG/97/222	Crushed dolomite	-	-	0.2	1.1	Trace	-	-	-	-	-	-	20	60	<50	-	-
224	RG/97/223	Crushed dolomite	-	-	0.3	1.7	1.6	-	-	-	-	-	-	40	750	70	-	-
225	RG/97/224	Crushed dolomite	-	-	0.2	1.1	0.8	-	-	-	-	-	-	25	320	80	-	-
226	RG/97/225	Crushed dolomite	-	-	0.4	5.6	0.8	-	-	-	-	-	-	35	480	170	-	-
227	RG/97/226	Crushed dolomite	-	-	0.2	1.1	1.2	-	-	-	-	-	-	20	140	<50	-	-
228	RG/97/227	Crushed dolomite	-	-	0.6	8.4	0.4	-	-	-	-	-	-	40	300	160	-	-
229	RG/97/228	Fault guage material	-	-	1.4	3.7	2.4	-	-	-	-	-	-	80	1650	450	-	-
230	RG/97/229	Valcanoclastic rock	60.5	12.9	10.0	<1.0	2.1	2.1	0.48	207	83	67	48	17	483	120	<10	291
231	RG/97/230	Valcanoclastic rock	39.7	24.8	18.2	<1.0	1.2	2.1	1.18	546	229	126	101	24	665	1062	<10	484
232	RG/97/231	Quartzite breccia Reddish)	25.9	21.4	36.6	<1.0	<1.0	0.5	0.86	119	116	325	144	18	95	75	<10	425
233	RG/97/232	Bauxitic clay	44.1	38.3	3.3	<1.0	<1.0	0.5	1.75	641	358	143	215	10	37	91	22	736
234	RG/97/233	Non pisolitic bauxite	19.4	56.0	2.2	<1.0	<1.0	<0.5	2.58	1475	1304	216	344	<5	37	121	32	986
235	RG/97/234	Pisolitic bauxite	27.0	45.9	5.0	<1.0	<1.0	0.5	1.94	1139	1281	263	302	<5	47	105	23	822
236	RG/97/235	Slag	-	-	47.8	3.4	6.0	-	-	-	-	-	-	20	1200	80	-	-
237	RG/97/236	---do---	-	-	41.0	5.0	2.0	-	-	-	-	-	--	25	280	<50	-	-
238	RG/97/237	Mineralized	-	-	39.9	Trace	4.4	-	-	-	-	-	-	35	200	<50	-	-
239	RG/97/238	Ironstone shale	-	-	38.2	1.68	2.4	-	--	-	-	-	-	25	360	<50	-	-

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
240	RG/97/239	Non pisolitic bauxite	24.7	51.3	5.9	<1.0	<1.0	0.5	2.57	1454	1393	315	244	<5	47	123	26	852
241	RG/97/240	Non pisolitic bauxite	18.7	56.0	2.6	<1.0	<1.0	0.5	2.50	1450	1171	228	224	<5	33	129	29	823
242	RG/97/241	Bauxitic clay	43.7	43.0	1.1	<1.0	<1.0	0.5	2.01	749	532	125	191	<5	33	86	26	706
243	RG/97/242	Pisolitic bauxite	32.3	42.5	6.0	<1.0	<1.0	0.5	2.23	998	1664	180	202	<5	45	79	30	761
244	RG/97/243	Non pisolitic bauxite	34.9	43.7	1.6	<1.0	<1.0	<0.5	2.48	962	1304	119	166	<5	31	86	41	755
245	RG/97/244	Bauxite clau	40.8	37.2	2.2	<1.0	<1.0	0.5	2.06	536	691	129	161	<5	78	85	38	361
246	RG/97/245	Qurtzite breccia	49.0	10.2	26.4	1.0	<1.0	1.0	0.47	318	76	61	52	17	351	86	<10	251
247	RG/97/246	Qurtzite breccia	65.3	12.3	10.3	<1.0	<1.0	1.0	0.63	416	87	75	54	27	135	107	17	297
248	RG/97/247	Non pisolitic bauxite	43.2	38.8	1.5	<1.0	<1.0	<0.5	1.43	817	897	191	208	<5	26	87	36	546
249	RG/97/248	Bauxitic clay	42.8	32.7	8.3	<1.0	<1.0	1.2	1.26	693	575	157	163	7	282	534	29	510
250	RG/97/249	Pisolitic bauxite	32.2	41.4	10.2	<1.0	<1.0	0.5	1.63	1026	1918	168	193	<5	58	103	32	617
251	RG/97/250	Non pisolitic bauxite	45.0	38.6	3.1	<1.0	<1.0	<0.5	1.51	965	1254	97	185	<5	23	85	43	558
252	RG/97/251	Bauxite clay	43.0	38.0	1.1	<1.0	<1.0	0.5	1.63	955	503	105	185	<5	25	100	44	541
253	RG/97/252	Pisolitic bauxite	35.4	38.9	6.6	1.2	1.0	<0.5	1.41	956	1750	175	199	<5	38	114	41	571
254	RG/97/253	Pisolitic bauxite	29.3	45.2	3.9	<1.0	<1.0	<0.5	2.79	1008	3247	136	187	<5	14	66	33	932
255	RG/97/254	Non Pisolitic bauxite	22.9	47.9	9.4	<1.0	<1.0	<0.5	5.19	1118	3529	142	199	<5	24	78	49	1430
256	RG/97/255	Bauxitic clay	44.7	38.0	1.0	<1.0	<1.0	1.00	1.95	724	312	158	139	7	25	56	34	983
257	RG/97/256	Sandstone	64.0	23.0	<1.0	<1.0	<1.0	0.8	1.23	459	144	166	110	<5	16	46	25	565
258	RG/97/257	Mineralized zone	-	-	9.3	0.6	0.4	-	-	-	-	-	-	10	100	<50	-	-
259	RG/97/258	Mineralized zone	-	-	51.7	Trace	2.0	-	-	-	-	-	-	25	1600	650	-	-
260	RG/97/259	Dolomitic limestone	-	-	46.4	0.6	1.6	-	-	-	-	-	-	25	1500	420	-	-
261	RG/97/260	Dolomitic limestone	-	-	61.8	0.6	0.8	-	-	-	-	-	-	20	1500	750	-	-
262	RG/97/261	Dolomitic limestone	-	-	72.8	1.1	0.8	-	-	-	-	-	-	35	1650	380	-	-
263	RG/97/262	Dolomitic limestone	-	-	41.0	2.2	8.4	-	-	-	-	-	-	25	1500	380	-	-
264	RG/97/263	Lead Mineralization zone	-	-	24.9	20.7	8.0	-	-	-	-	-	-	20	2400	1400	-	-
265	RG/97/264	Mineralization zone	-	-	7.7	26.9	12.8	-	-	-	-	-	-	<10	1200	100	-	-
266	RG/97/265	Mineralization zone	-	--	52.7	1.7	14.8	-	-		-	-	-	15	2000	105	-	-
267	RG/97/266	Mineralization zone	-	-	7.8	27.4	18.0	-	-	-	-	--	-	10	650	110	-	-
268	RG/97/267	Mineralization zone	-	-	51.4	1.1	10.4	-	-	-	-	-	-	20	950	930	-	-
269	RG/97/268	Ironstone shale	-	-	27.6	16.2	8.4	-	-	-	-	-	-	15	500	80	-	-
270	RG/97/269	Iron stone shale	-	-	60.8	0.6	1.6	-	-	-	-	-	-	25	800	400	-	-
271	RG/97/270	Pisolitic bauxite	28.0	49.8	3.2	<1.0	<1.0	0.6	2.60	1244	1073	220	339	<5	32	83	34	1026
272	RG/97/271	Non pisolitic bauxite	33.8	40.2	4.5	1.7	1.4	1.4	2.30	1043	1138	147	213	10	231	189	34	912
273	RG/97/272	Conglomerate	22.5	32.3	26.0	1.3	1.0	0.7	1.69	748	695	155	157	10	516	164	<10	697
274	RG/97/273	Shale	-	-	39.4	trace	0.4	-	-	-	-	-	-	50	150	<50	-	-
275	RG/97/274	Pisolite bauxite	36.6	34.9	13.1	<1.0	<1.0	0.6	1.91	795	961	961	191	<5	72	106	25	697
276	RG/97/275	Non pisolitic bauxite	40.7	35.5	6.5	1.1	<1.0	<0.5	1.48	4217	410	410	160	<5	44	78	26	526
277	RG/97/276	Bauxitic clay	42.7	34.7	1.4	<1.0	<1.0	2.0	1.86	823	198	198	166	<5	28	71	29	801
278	RG/97/277	Chert quartzite breccia	43.7	37.8	3.1	<1.0	<1.0	<0.5	1.73	1038	528	528	191	<5	32	76	35	666
279	RG/97/278	Ironstone shale	-	-	25.72	2.24	0.8	-	-	-	-	-	-	25	150	60	-	-
280	RG/97/279	Quartzite breccia	84.2	6.0	<1.0	<1.0	<1.0	0.9	0.18	<100	32	29	19	9	12	44	12	148
281	RG/97/280	Volcanoclastic chert breccia	59.4	3.8	25.6	<1.0	<1.0	0.7	0.16	1100	33	37	17	17	423	248	<10	136
282	RG/97/281	Chert quartzite breccia	83.6	4.1	<1.0	<1.0	<1.0	0.7	0.12	<100	29	23	15	6	18	31	<10	130
283	RG/97/282	Quartzite breccia	73.6	14.4	1.6	<1.0	<1.0	0.6	0.51	148	99	46	40	8	33	54	14	257
284	RG/97/283	Bauxitic clay	44.3	36.9	<1.0	<1.0	<1.0	0.7	2.13	803	423	145	206	<5	25	88	32	793
285	RG/97/284	Non Pisolitic bauxite	24.0	52.2	5.1	<1.0	<1.0	0.6	254	1347	1269	184	277	<5	141	159	40	948
286	RG/97/285	Pisolitic bauxite	25.9	47.8	6.9	<1.0	<1.0	<0.5	1.83	1239	989	235	259	<5	64	119	27	777

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
287	RG/97/286	Ironstone shale	-	-	10.8	2.24	Trace	-	-	-	-	-	-	15	70	50	-	-
288	RG/97/287	Conglomerate	23.2	50.9	6.6	<1.0	<1.0	<0.5	2.25	2417	1794	168	310	<5	52	147	34	814
289	RG/97/261-A	Mineralized zone	-	-	10.8	2.2	Trace	-	-	-	-	-	-	15	70	50	-	-
290	RG/97/288	Mineralized/gossanized zone	-	-	59.1	0.56	1.2	-	-	-	-	-	-	40	350	640	-	-
291	RG/97/289	Mineralized/gossanized zone	-	-	59.4	1.7	0.4	-	-	-	-	-	-	45	400	900	-	-
292	RG/97/290	Mineralized/gossanized zone	-	-	47.8	1.1	0.8	-	-	-	-	-	-	45	370	720	-	-
293	RG/97/291	Mineralized/gossanized zone	-	-	51.7	2.2	0.4	-	-	-	-	-	-	15	200	80	-	-
294	RG/97/292	Chert quartzite breccia	74.3	14.8	<1.0	<1.0	<1.0	1.0	0.67	398	89	112	123	14	18	71	20	347
295	RG/97/293	Quartzitre (Pitted)	78.4	9.9	<1.0	<1.0	<1.0	0.9	0.53	<100	39	62	41	29	21	51	20	301
296	RG/97/294	Sandstone	78.4	10.2	<1.0	<1.0	<1.0	0.9	0.50	<1000	43	48	28	7	10	34	14	300
297	RG/97/295	Bauxite clay	46.6	37.3	1.0	<1.0	<1.0	1.0	1.65	791	179	157	165	<5	29	104	34	561
298	RG/97/296	Non Pisolitic bauxite	38.6	31.7	13.7	<1.0	<1.0	0.7	1.61	4011	258	206	257	9	109	100	22	568
299	RG/97/297	Pisolitic baxite	40.4	30.4	14.0	1.0	<1.0	0.8	1.41	5067	250	213	253	9	106	47	<10	520
300	RG/97/298	Quartzite	76.3	9.2	<1.0	<1.0	<1.0	0.9	0.46	<100	3	7	43	4	14	<10	<10	253
301	RG/97/299	Sandstone	74.4	12.1	<1.0	<1.0	<1.0	1.1	0.61	114	46	75	42	9	11	19	<10	323
302	RG/97/300	Bauxitic clay	44.5	41.4	<1.0	<1.0	<1.0	0.6	1.15	332	107	109	109	7	14	22	<10	443
303	RG/97/301	Non Pisolitic bauxite	45.5	39.3	1.4	<1.0	<1.0	<0.5	0.97	<100	136	61	87	6	14	12	<10	394
304	RG/97/302	Pisolitic bauxite	36.7	36.0	12.3	<1.0	<1.0	0.7	1.73	660	519	181	244	7	80	44	<10	681
305	RG/97/303	Pisolitic bauxite	38.5	41.1	5.6	<1.0	<1.0	0.5	1.98	1046	1905	188	246	8	71	74	<10	778
306	RG/97/304	Non Pisolitic bauxite	36.1	36.6	7.8	2.9	<1.0	<0.5	1.34	20029	1034	224	155	<5	44	42	<10	181
307	RG/97/305	Bauxitic clay	46.0	37.0	1.4	<1.0	<1.0	1.6	1.91	925	365	162	144	<5	20	42	<10	650
308	RG/97/306	Pisolitic bauxite	41.5	38.4	3.9	<1.0	<1.0	0.6	1.82	850	789	125	170	<5	26	48	<10	651
309	RG/97/307	Pisolitic bauxite	44.9	34.6	6.2	<1.0	<1.0	<0.5	1.79	794	663	115	170	7	35	56	<10	697
310	RG/97/308	Pisolitic bauxite	47.0	34.9	2.0	<1.0	<1.0	<0.5	1.91	781	851	120	163	15	27	85	18	709
311	RG/97/309	Bauxite clay	42.7	25.5	12.8	<1.0	1.2	2.9	1.65	1988	180	272	244	18	144	30	<10	359
312	RG/97/310	Non pisolitic bauxite	48.7	25.6	10.1	<1.0	<1.0	0.7	1.31	1241	378	147	184	7	8	43	<10	478
313	RG/97/311	Quartzite	84.8	4.8	2.3	<1.0	<1.0	<0.5	0.20	<100	43	46	77	42	31	<10	<10	167
314	RG/97/312	Quartzite	83.3	4.2	<1.0	<1.0	<1.0	0.5	0.16	<1000	<10	28	20	5	7	<10	<10	169
315	RG/97/313	Pisolitic bauxite	37.7	29.6	19.1	<1.0	<1.0	13.	0.40	549	45	90	36	65	455	74	<10	225
316	RG/97/314	Non Pisolitic bauxite	32.7	49.0	3.2	<1.0	<1.0	<0.5	2.59	1100	1405	162	167	<5	37	77	28	862
317	RG/97/315	Pisolitic Bauxite	38.5	31.2	14.8	<1.0	<1.0	0.7	1.20	3168	396	230	220	6	78	49	<10	563
318	RG/97/316	----do---	57.5	24.6	4.3	<1.0	<1.0	<0.5	1.23	587	449	151	142	<5	24	29	11	585
319	RG/97/317	Bauxitic clay	46.0	36.5	1.1	<1.0	<1.0	0.8	1.90	492	312	100	152	<5	22	45	18	821
320	RG/97/318	Sandstone	79.1	10.4	<1.0	<1.0	<1.0	0.8	0.38	<100	47	54	47	10	12	18	<10	238
321	RG/97/319	Chert quartzite breccia	75.5	8.9	3.9	<1.0	<1.0	0.5	0.35	402	43	66	36	66	52	102	<10	302
322	RG/97/320	Chert quartzite breccia	66.5	3.8	20.5	<1.0	<1.0	<0.5	0.12	<100	23	34	33	18	52	<10	<10	146
323	RG/97/321	Pisolitic bauxite	42.1	31.1	0.7	<1.0	<1.0	0.7	1.64	1514	270	170	255	5	57	40	<10	606
324	RG/97/322	Non Pisoltic bauxite	47.2	36.7	1.4	<1.0	<1.0	<0.5	2.08	561	311	84	159	5	23	50	18	701
325	RG/97/323	Bauxitic clay	46.7	35.9	1.0	<1.0	<1.0	<0.5	2.01	628	237	101	161	<5	22	57	22	714
326	RG/97/324	Non pisolitic bauxite	47.5	37.8	<1.0	<1.0	<1.0	<0.5	1.75	736	270	100	152	<5	20	72	21	559
327	RG/97/325	Valcanoclastic rock	-	-	15.4	2.2	0.4	-	-	-	-	-	-	100	250	100	-	-
328	RG/97/326	Gossanised patches	-	-	5.7	1.7	Trace	-	-	-	-	-	-	<10	100	Trace	-	-
329	RG/97/327	Gossanised patches	-	-	24.5	1.1	0.4	-	-	-	-	-	-	35	350	380	-	-

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
330	RG/97/328	Gossanised intrusive rock	-	-	23.8	1.7	0.4	-	-	-	-	-	-	45	400	290	-	-
331	RG/97/329	Volcanoclastic rock	-	-	8.2	06	Trace	-	-	-	-	-	-	<10	40	Trace	-	-
332	RG/97/330	Non Pisolitic bauxite	47.0	37.5	4.3	<1.0	<1.0	0.7	0.27	363	46	30	14	5	36	51	<10	183
333	RG/97/331	Non Pisolitic bauxite	49.3	37.2	2.4	<1.0	<1.0	1.7	0.24	<100	14	41	22	13	21	83	<10	178
334	RG/97/332	Bauxitic clay	50.0	37.0	3.6	<1.0	<1.0	0.5	0.13	<100	30	30	47	14	38	94	<10	130
335	RG/97/333	Sandstone	84.8	3.6	1.8	<1.0	<1.0	<0.5	0.19	<100	16	34	22	13	12	12	<10	163
336	RG/97/334	Quartzite breccia	70.2	9.2	10.4	<1.0	<1.0	1.0	0.41	210	70	49	22	28	87	<10	<10	217
337	RG/97/335	Bauxite clay	43.0	37.5	8.3	<1.0	<1.0	1.2	0.24	5304	27	55	20	7	59	<10	<10	129
338	RG/97/336	Non Pisolitic Bauxite	40.2	29.3	18.2	<1.0	<1.0	<0.5	0.19	220	46	30	12	<5	173	<10	<10	169
339	RG/97/337	Non Pisolitic Bauxite	47.7	30.0	12.7	<1.0	<1.0	1.0	0.25	195	72	27	10	<5	130	10	<10	218
340	RG/97/338	Chert pisolitic bauxite	67.0	10.0	8.8	<1.0	1.0	1.7	0.70	127	39	58	54	20	77	16	<10	340
341	RG/97/339	Non Pisolitic Bauxite	44.3	37.1	6.7	<1.0	<1.0	1.1	0.26	<100	61	34	25	25	143	32	<10	173
342	RG/97/340	Non Pisolitic Bauxite	43.0	34.9	7.8	<1.0	<1.0	1.1	0.81	297	170	87	82	17	60	38	<10	390
343	RG/97/341	Non Pisolitic Bauxite	38.2	28.8	16.0	1.0	<1.0	0.9	1.75	383	511	84	121	119	139	127	<10	573
344	RG/97/342	Bauxitic clay	66.9	18.9	1.2	<1.0	<1.0	2.6	1.01	190	163	78	73	25	39	33	<10	471
345	RG/97/343	Ironstone shale	Missing.															
346	RG/97/344	Pisolitic bauxite	44.9	38.4	3.4	<1.0	<1.0	<0.5	1.85	574	777	148	170	<5	19	52	15	751
347	RG/97/345	Non Pisolitic bauxite	47.2	29.4	15.5	<1.0	<1.0	0.6	133	560	251	411	330	31	36	68	<10	634
348	RG/97/346	Bauxitic clay	47.3	38.0	1.1	<1.0	<1.0	2.2	1.93	1015	203	179	139	5	24	86	23	947
349	RG/97/347	Sandstone	70.9	20.8	1.0	<1.0	<1.0	1.5	1.11	659	84	106	86	8	13	57	12	621
350	RG/97/348	Chert quartzite breccia	74.4	13.5	4.8	<1.0	<1.0	0.7	0.59	114	51	54	40	12	31	24	<10	304
351	RG/97/349	Chert quartzite breccia	42.7	38.3	7.0	<1.0	<1.0	<0.5	2.50	516	1362	147	150	<5	24	46	22	905
352	RG/97/350	Quartzite (Pitted)	80.4	6.9	1.9	<1.0	<1.0	0.6	0.33	<100	39	34	22	<5	6	<10	<10	352
353	RG/97351	Sandstone	80.9	8.8	<1.0	<1.0	<1.0	0.8	0.43	<100	36	75	70	5	5	11	<10	276
354	RG/97/352	Pisolitic bauxite	39.1	33.3	12.2	<1.0	<1.0	<0.5	1.61	729	551	119	155	<5	57	46	<10	640
355	RG/97/353	Non Pisolitic bauxite	45.2	36.7	1.6	<1.0	<1.0	<0.5	1.43	731	251	96	140	<5	27	59	17	511
356	RG/97/354	Bauxitic clay	46.7	37.4	<1.0	<1.0	<1.0	0.6	1.70	724	193	89	151	<5	22	52	14	622
357	RG/97/355	Pisolitic bauxite	43.0	36.5	3.7	<1.0	<1.0	<0.5	1.58	748	592	126	189	<5	29	66	14	646
358	RG/97/356	Non Pisolitic bauxite	46.6	37.2	1.1	<1.0	<1.0	<0.5	1.86	768	294	92	182	<5	24	48	10	694
359	RG/97/357	Bauxitic clay	46.0	39.1	<1.0	<1.0	<1.0	<0.5	2.08	868	329	142	262	<5	27	72	22	814
360	RG/97/358	Quartzite breccia	34.2	27.8	24.3	<1.0	<1.0	<0.5	1.15	555	198	131	99	40	125	100	<10	508
361	RG/97/359	Chert quartzite breccia	74.5	11.7	2.6	<1.0	<1.0	0.5	0.43	135	74	53	23	22	29	35	<10	216
362	RG/97/360	Pisolite bauxite	32.5	48.1	2.9	<1.0	<1.0	<0.5	2.12	1303	1723	194	248	<5	25	80	13	783
363	RG/97/361	Non Pisolitic bauxite	39.9	42.3	1.4	<1.0	<1.0	<0.5	2.33	931	1491	122	230	<5	17	72	20	810
364	RG/97/362	Bauxitic clay	46.0	36.5	<1.0	<1.0	<1.0	<0.5	1.84	476	394	86	208	<5	25	34	19	693
365	RG/97/363	Pisolitic bauxite	55.0	27.6	3.6	<1.0	<1.0	0.6	1.35	1062	656	124	138	<5	38	27	<10	636
366	RG/97/364	Non Pisolitic bauxite	45.9	36.1	<1.0	<1.0	<1.0	<0.5	1.77	398	324	160	188	<5	26	21	18	796
367	RG/97/365	Bauxitic clay	46.8	38.5	<1.0	<1.0	<1.0	0.6	1.98	391	317	161	188	5	28	46	22	741
368	RG/97/366	Chert quartzite breccia	76.4	11.4	<1.0	<1.0	<1.0	0..5	0.42	<100	78	61	25	11	18	<10	<10	216
369	RG/97/367	Pisolitic bauxite	42.8	36.4	5.2	<1.0	<1.0	<0.5	1.37	405	493	140	152	<5	45	25	10	640
370	RG/97/368	Non Pisolitic bauxite	45.8	37.3	1.3	<1.0	<1.0	<0.5	1.75	488	305	159	206	<5	24	30	20	696
371	RG/97/369	Bauxite clay	46.8	37.4	<1.0	<1.0	1.2	0.6	2.02	408	258	95	169	<5	28	33	25	829
372	RG/97/370	Pisolitic bauxite	41.0	29.5	9.2	4.4	1.2	1.0	1.46	807	865	144	149	5	72	29	16	558
373	RG/97/371	Non Pisolitic bauxite	42.6	40.4	1.4	<1.0	<1.0	0.6	1.88	605	1064	1064	145	<5	24	34	16	673
374	RG/97/372	Bauxitic clay	45.4	38.0	<1.0	<1.0	<1.0	0.5	2.20	1073	413	413	263	27	27	89	21	846
375	RG/97/373	Non Pisolitic bauxite	77.0	13.2	<1.0	<1.0	<1.0	0.7	0.41	219	82	82	24	16	14	53	11	226
376	RG/97/374	Pisolitic bauxite	28.7	27.4	27.7	1.5	1.6	0.8	1.44	1442	866	866	259	<5	153	18	<10	516

S No.	Sample No.	Rock type	% SiO_2	% Al_2O_3	% Fe_2O_3	% CaO	% MgO	% K_2O	% TiO_2	g/t P_2O_5	g/t Li	G/t V	g/t Cr	g/t Cu	g/t Zn	g/t Pb	g/t Bi	g/t Zr
377	RG/97/375	Non Pisolitic bauxite	25.8	56.0	1.6	<1.0	<1.0	0.5	2.74	2064	1398	1398	207	<5	32	121	23	772
378	RG/97/376	Bauxiteic clay	42.4	38.8	3.6	<1.0	<1.0	<0.5	1.61	753	811	811	112	9	38	52	11	581
379	RG/97/377	Chert quartzite breccia	33.8	29.6	23.0	<1.0	<1.0	0.9	0.85	963	244	244	169	84	67	96	<10	403
380	RG/97/378	Pisolitoc bauxite	37.1	41.8	5.5	<1.0	<1.0	<0.5	2.55	665	1931	1931	179	<5	28	51	16	794
381	RG/97/379	Non Pisolititic bauxite	19.6	50.6	1.5	5.7	2.9	0.5	2.36	958	1045	1045	188	<5	33	50	11	757
382	RG/97/380	Bauxitic clay	44.1	38.0	<1.0	<1.0	<1.0	<0.5	2.19	1347	513	513	283	11	27	101	19	782
383	RG/97/381	Chert quartzite breccia	66.3	10.5	9.2	<1.0	<1.0	0.7	0.36	278	51	51	29	28	37	30	<10	197
384	RG/97/382	Pisolitic bauxite	37.1	41.6	5.2	<1.0	<1.0	<0.5	2.28	696	1761	1761	172	11	40	57	13	722
385	RG/97/383	Non pisolitic bauxite	23.4	56.0	1.0	<1.0	<1.0	<0.5	2.64	1366	1190	1190	215	<5	31	82	22	809
386	RG/97/384	Bauxitic clay	45.8	37.1	<1.0	<1.0	<1.0	0.5	1.72	400	488	488	264	<5	26	26	10	626
387	RG/97/385	Quartzite breccia	66.7	16.3	2.1	<1.0	<1.0	0.7	0.58	265	103	103	42	12	22	27	<10	297
388	RG/97/386	Pisoltic bauxite	30.5	49.9	1.1	<1.0	<1.0	<0.5	2.98	1205	836	836	237	5	35	87	14	886
389	RG/97/387	Non Pisolitic bauxite	35.3	34.4	7.9	<1.0	<1.0	0.7	2.20	811	1047	1047	198	<5	57	24	<10	848
390	RG/97/388	Buxitic clay	36.7	40.6	2.4	<1.0	<1.0	0.5	2.68	962	877	877	239	5	38	65	11	860
391	RG/97/389	Cher quartzite breccia	69.3	6.5	11.2	<1.0	<1.0	0.6	0.21	<100	49	45	16	38	169	153	<10	159
392	RG/97/390	Non Pisolitic bauxite	45.8	34.3	3.6	<1.0	<1.0	<0.5	174	636	453	280	214	29	38	30	<10	715
393	RG/97/391	Non Pisolitic bauxite	39.6	42.0	1.5	<1.0	<1.0	<0.5	2.24	1031	1042	130	227	<5	52	91	13	802
394	RG/97/392	Bauxite clay	44.1	38.5	2.2	<1.0	<1.0	0.8	1.76	590	111	129	97	42	41	82	10	1317
395	RG/97/393	Chert quartzite breccia	46.3	35.7	<1.0	<1.0	<1.0	0.5	2.36	1047	330	165	221	21	39	95	13	846



G.S.I Op. J & K . D.O. No. 21/99, Jammu .

Plate – II

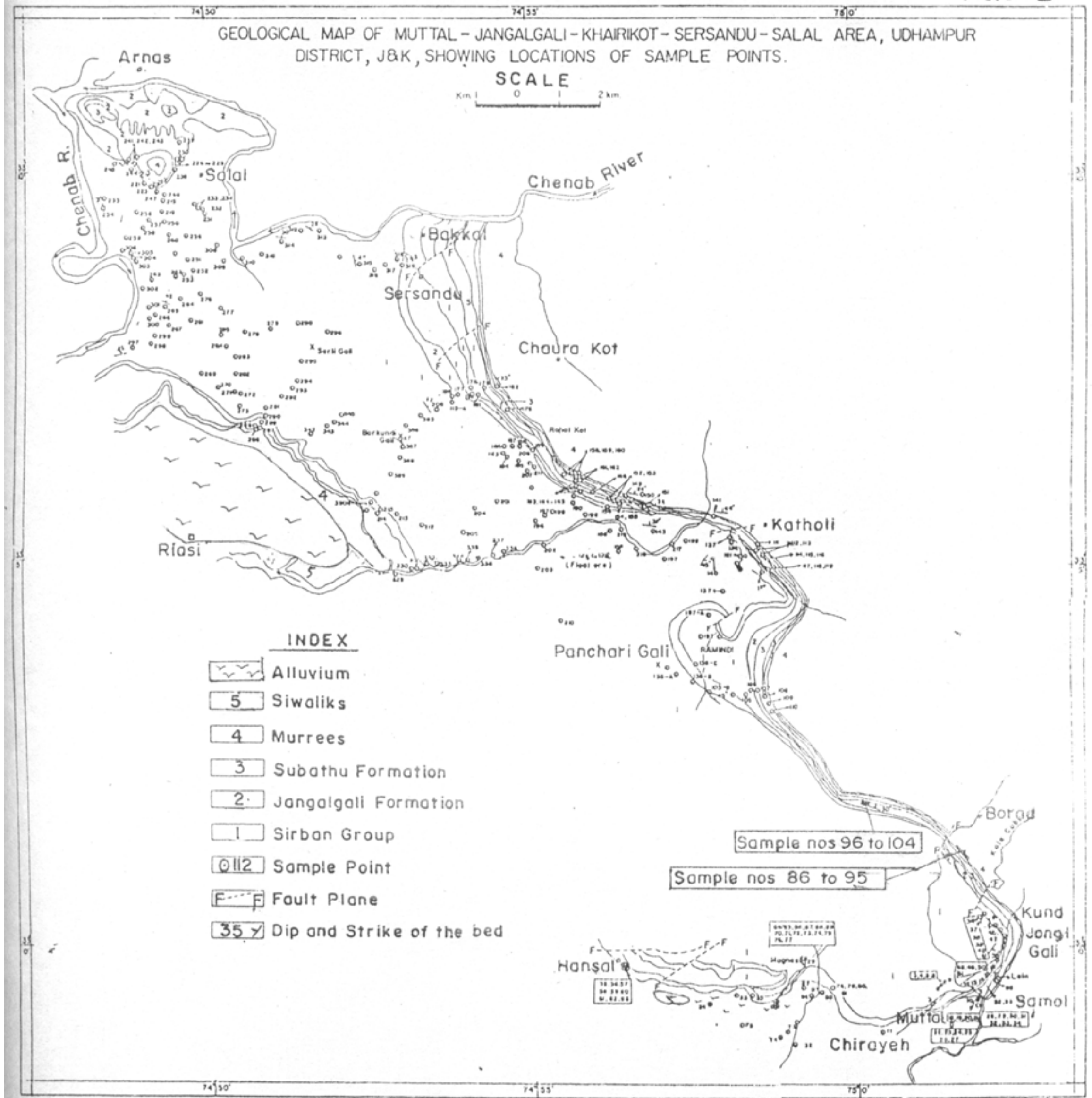


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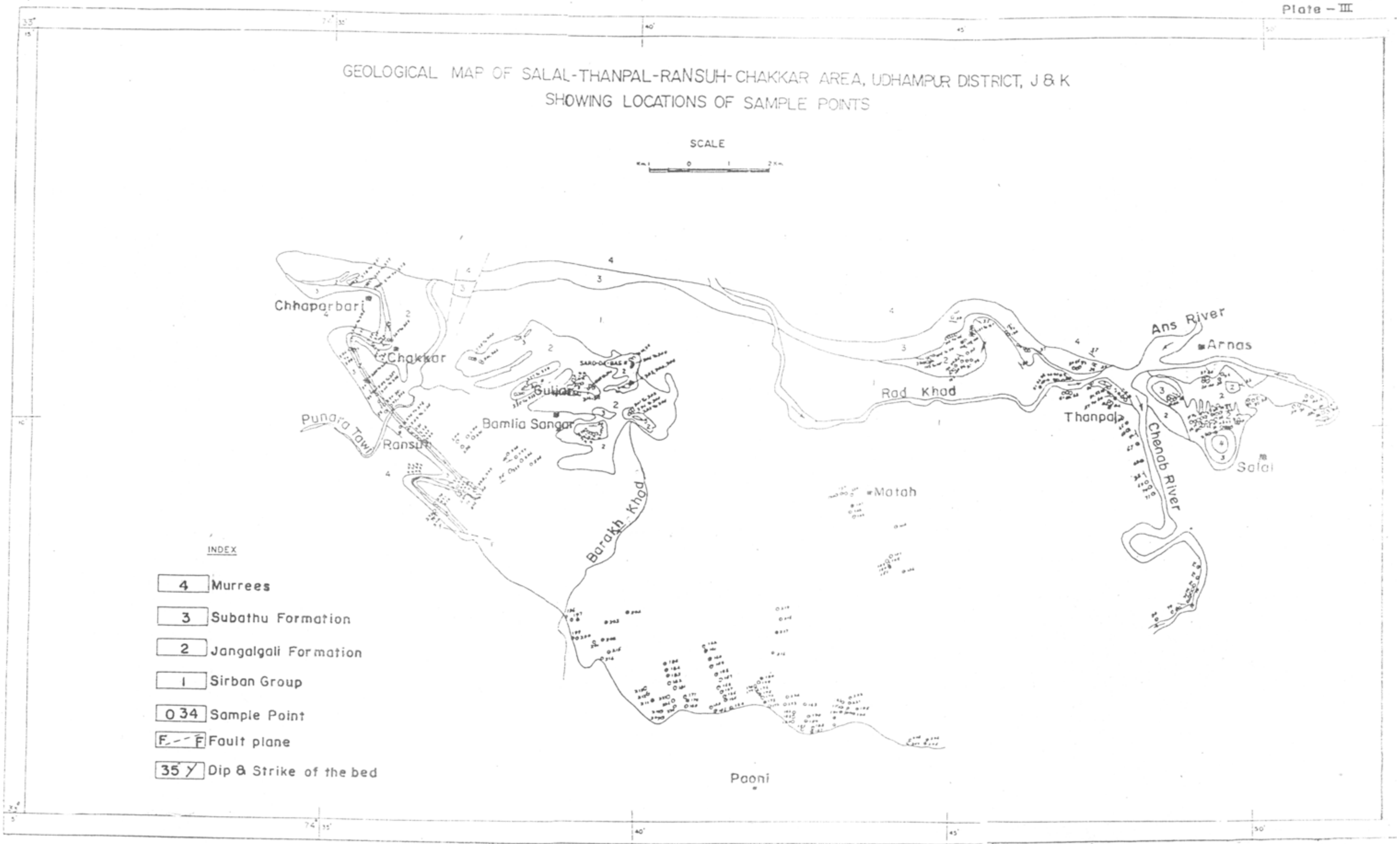
Plate – III



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F.S. 1996–97