

## PROFILE

Geo Appraisal Pvt. Ltd. (previously Geotech India) is a Rajasthan based **Geological, Geotechnical** and **Information Solutions** company providing quality consulting services to clients nationwide. Led by experienced professionals with a broad exposure to the national and international markets, the primary business areas of the company remains focussed on each of these three domains, and especially the interface of these areas of expertise.

## MARKET FOCUS

Although the services we provide are applicable to multiple market segments, our current core strengths lie in servicing clients in the areas outlined below:

- Housing, Commercial & Office Complexes
- Industrial Projects
- Dams, Barrages, Canals & Bridges
- Roads, Railways, Runways, Tunnels & Pipelines
- Towers, Silos, Tanks & Chimneys
- Irrigation & Drainage Works
- Ports & Harbours
- Organizations addressing Urban Infrastructure Development Issues
- Organizations addressing Exploration Of Earth Resources & Environmental Issues

## MARKET DIFFERENTIATOR

We believe that the expertise offered by Geo Appraisal Pvt. Ltd. is distinctive from that of other companies and stand apart because of our:

- Extensive experience
- Broad range of project experience across multiple market segments
- Multi-disciplinary team of Civil Engineers, Geologists, Geophysicists & Information Solutions Specialists.
- Extensive expertise in all aspects of Geological & Geotechnical engineering.
- Follow business practices established and acceptable to government agencies.
- In-house Research & Development team innovating and testing new solutions

## PARTNERSHIPS

With a focus on our core expertise and on complete customer satisfaction, we also leverage strategic business partnerships to provide a complete range of project based services for our clients, providing a single point of operational responsibility, improved efficiency and better project delivery.

## COUNTRIES OF EXPERIENCE

In addition to experience in India, **individuals** at Geo Appraisal Pvt. Ltd bring together a diverse and international work experience across the following countries:

- Nepal
- Ethiopia
- Holland
- Yemen
- Malaysia
- United States of America

## GEOTECHNICAL SERVICES

### Field Investigations

- Boring & Sampling Of Soil (Disturbed & Undisturbed)
- Standard Penetration Test (SPT)
- Dynamic Cone Penetration Test (Dry & Wet)
- Static Cone Penetration Test (Manual & Hydraulic)
- Plate Load Test (Cyclic & Non Cyclic)
- Electrical Resistivity Test
- Seismic Refraction Test
- Dynamic Block Test
- Sub grade Modulus (K) CBR, Field permeability (Constant and Falling Head), Field density (Bulk and Dry), In -Situ Vane Shear.
- Permeability Tests (Using Single/ Double Packers)
- Exploratory Core Drilling & Grouting
- Land Surveying (Topographical and Contour Surveys) – To facilitate finalization of building & plant layout including marking of bench mark, boundary & grid pillars, marking of boreholes and other test location for geotechnical investigation.

### Laboratory Tests

- Grain Size Analysis & Atterberg Limit tests.
- Direct & Triaxial Shear tests.
- Consolidation tests
- CBR, Proctor, Bulk & Dry Density tests.
- Unconfined Compression & Vane Shear tests.
- Porosity, Water Absorption & Permeability tests.
- Determination of Specific Gravity & Moisture Content.
- Free Swell, Shrinkage Limit & Swelling Pressure tests.
- Chemical testing of Soil and Water samples.
- Crushing Strength, Point Load test, Porosity, Density & Moisture content on rock specimens.

### Analysis & Recommendations

- Computerized Slope Stability analysis
- Computerized Settlement calculations
- Computerized Interpretation of Laboratory & Field test data
- Bearing capacity calculations
- Isolated & Strip footings
- Raft Foundation
- Pile Foundations (Bored, Under-reamed, Compaction and Driven)
- Granular Piles (for ground strengthening)
- Special ground strengthening measures including use of geo-textiles.
- Special problems due to complex soil conditions

**GEOLOGICAL &  
GEOPHYSICAL  
SERVICES**

Technology Services

- Exploratory Core Drilling using Hydraulic Diamond core drilling machines
- Water well drilling using Rotary, Percussion & DTH Type Drilling
- Mineral Prospecting
- Geological & Structural Mapping
- Laboratory Testing of Minerals
- Ground water prospecting using Electrical Resistivity Surveys
- Corrodibility studies of soils for laying of pipelines
- Geographic Information Systems & Remote Sensing
- Ground Truth Verification & Global Positioning Systems

**INFORMATION  
SOLUTIONS  
SERVICES**

Technology Domains

- Software Development
- Relational Database Management Systems
- Geographic Information Systems & Remote Sensing
- Global Positioning Systems
- Internet Enabled Systems

Technology Services

- Site / Route Selection and Alternative Analysis
- Customized engineering Software Development
- Data Creation, Analysis and Reporting
- Mapping and Spatio-Temporal Analysis
- Integrated GIS and Data Management Client/Server Applications
- Web-based GIS and Data Management Applications
- Customized Spatial Decision Support Systems
- Integrated Application Development

Project/ Client Services

- User Needs Assessment/ Project Scoping & Budgeting
- Software Training
- Application Training
- GIS Project Management Training

**CORPORATE  
RESOURCES**

**Registered, Laboratory & liaison Offices:** Geo Appraisal Pvt. Ltd. has three offices. It has a registered office and a corporate office at Jodhpur and a liaison office at Delhi. The corporate office and the registered office are owned by the company.

- Registered Office: 206, 2<sup>nd</sup> floor, Razdan Mansion, Jalori Bari, Jodhpur. 342001 Rajasthan. Phone: 91-291-5105556, 5108558. Fax:91-291-5108559
- Laboratory: 69, Sardar club scheme, Jodhpur. 342011Rajasthan. Phone:91-291-2431369
- Workshop: GAPL, Old Jodhpur woollen mills campus, Basni Heavy Industrial Area. Jodhpur. Rajasthan
- Liaison Office: Abhimanyu Mam, c/o T.C.Sharma, 345 Masjid Moth, NDSE II. 110049 New Delhi. Mobile: 9810303118

**Computers & Networking Infrastructure:** All the offices use a networked, Windows based computing environment comprised of the latest systems (8 no high end workstations), supported by scanning devices, colour printers, CD-writers, and backup devices. Connectivity to the outside world is maintained through Internet connections, data transfers using our ftp site, and through the multiple phone/ fax lines available.

**Laboratory Facilities:** We have our own standard soil & rock testing equipments to estimate index and engineering properties of soils. We also have facilities for quantitative and qualitative analysis of soils, water, rock, minerals and ores for number of radicals & elements.

<b>Field Equipment :</b>	Boring and sampling setups	10
	Soil and Rock drillings rigs	3
	Plate load test setups	1
	K value test setups	1
	Electrical resistivity test setups	2
	In-situ Vane shear test apparatus	1
	Static (SPT) & Dynamic Cone (DCPT) test setups	3
	Field CBR test setup	1
	Surveying setups	3
	Vehicles	3

All field equipments enumerated above are owned by the company and hence we feel we are self sufficient in carrying out field investigations. We are in a position to mobilize equipment anywhere in India at a short notice. We understand that technology is changing at a rapid pace. Hence we have formulated a policy wherein we constantly update and enhance our capabilities by renting and purchasing new equipment. The field equipments are maintained at our workshop.

**Software:** We have an in house information solutions division that does in-house research and produces software for automating several technical processes. This division caters to the needs of in-house requirements as well as clients worldwide. We have facilities for computerized interpretation of electrical resistivity survey data using **IPI2WIN** and computerized slope stability analysis using **PCSTABLE5M**.

Our GIS expertise is platform independent and we frequently use software from multiple vendors, integrating appropriate components from **ESRI & AutoDesk**. We also use **Manifold** Products. Remote sensing software experience and capabilities include **ER Mapper**, **ERDAS**, and **Idrisi**. Our in-house custom development of an Open Source Vector-GIS uses **InovaGIS** as the underlying technology.

Relational Database technologies commonly used include **Oracle, SQL Server, and Microsoft Access**, supported by design tools that include **Visual Modeler**, and **ERWIN**. Custom application development and integration environments commonly used are **Visual Basic, C++, ASP, Fortran and Java**.

#### **PRINCIPALS OF THE COMPANY**

##### **S. K. Mam**

*M Tech (Applied Geophysics), MASET  
Managing Director & Team Leader*

Mr. Surendra Kumar Mam has over 30 years of professional / consulting experience in the fields of Geological, Geophysical and Geotechnical related projects. His expertise includes dealing with *Engineering Geology Problems, Applied Geophysics, Earthquake Engineering & Supervision of Exploratory Drilling* operations.

He has had a post graduate level education at IIT Roorkee, India, and later served the university in the earthquake engineering department as a scientist. During his association with the university, he was associated with various geophysical investigations involving micro earthquake measurements & study of crustal deformations for river valley projects. Crustal deformation studies, using tilt and strain meters, were studied for Koyna hydroelectric project in Maharashtra and Umiam dam project in Meghalaya. Seismological investigations (micro earthquake studies) around Tehri dam project site in Uttranchal and investigation for geothermal waters in Puga valley in Laddhak (Jammu & Kashmir) are some of the major projects in which he was involved.

He also served as a geophysicist in Ground water department in Rajasthan and Mines & geology department in Madhya Pradesh. Here he gained expertise in the investigation of ground water and mineral deposits using different geophysical techniques. He was also involved in supervision of drilling operations (both coring and non-coring) for ground water and mineral investigations.

As Managing Director of Geo Appraisal Pvt. Ltd. (previously Geotech India) he has gained wide ranging professional experience in the fields of Geotechnical Engineering, Engineering Geophysics and Exploratory Drilling. His core activities at GAPL involves geotechnical investigations for projects involving infrastructure development, investigation for dam sites under distress and core drilling projects of varying scales and sizes. He has supervised more than 15000 meters of drilling operations for geological and related studies till date. Surveying, being the backbone of most of the projects, is another focus area where he specializes. He has successfully supervised projects related to the fixing of road alignments along Indo-Pak Border in Rajasthan & Gujarat sectors under very hostile conditions. Projects involving topographical surveys and preparation of base maps are other projects where he specializes. His professional experience, in India, includes working with clients such as MES, CPWD, Local PWD agencies, Public Utilities, Industrial Groups, Infrastructure Development Agencies, and Local, State, and Regional Planning Authorities.

In addition to his responsibilities at Geo Appraisal Pvt. Ltd, he currently participated (in collaboration with experts from Holland) in a project involving the use of *Geo Radars*. Mr. Mam also continues to remain actively involved in academia and is presently a leading expert on Groundwater Exploration and related technologies in western Rajasthan.

His wide ranging expertises in various disciplines provide a sound foundation upon which to grow a quality consulting practice.

**Dr. D. V. Talwar**

*B.E (Civil), B.Sc (Photogram. Eng), M.E (Geotechnical Eng.), Ph.D (Geotechnical Eng.)  
Geotechnical & Foundation Engineering Expert*

With over 40 years of experience, he is widely respected in professional circles for his vast experience in addition to his detail oriented, quality conscious approach to Geotechnical engineering and Foundation design projects. Dr. Talwar has extensive research experience. His research on “*Behaviour of reinforced earth in retaining structures and shallow foundations*” fetched him his doctorate. He was also a co-investigator of R&D project entitled “*Geotechnical Investigations, and Design of Highwall slopes for Giral Lignite mines, Barmer (Rajasthan)*”. This project was sponsored by Rajasthan State Mineral Development Corporation. He has a long list of research papers that were published in national and international journals. He was awarded IGS AIMIL prize by Indian Geotechnical Society for the best paper submitted. He has worked as Professor of Civil Engineering in Faculty of Technology, University of Aden, Yemen. He retired as Professor and Head of Geotechnical Engineering Division, Civil Engineering Department, University of Jodhpur. He has supervised a number of M.E & PhD Dissertations.

Dr. Talwar has been responsible for completion of most of the geotechnical related projects initiated at Geo Appraisal Pvt. Ltd. His expertise in laboratory testing and evaluation of test results has proved beneficial in presenting quality geotechnical reports. Dr. Talwar specializes in computerized stability analysis of pit, embankment and Dam slopes. His expertise in slope stability analysis was utilized for designing a road embankment in Great Rann Of Kutch, Guajrat.

**R. B. Nag**

*Msc (Geology)  
Rtd. Director (Engineering Geology) Geological Survey Of India.  
Engineering Geology Expert*

With over 30 years of professional experience in the field of Engineering Geology, Shri. Nag has developed significant expertise in *Engineering Geology, Seismology and Rock Mechanics*. His vast experience in carrying out geological investigations for river valley hydel projects in Jammu & Kashmir, Gujarat, Madhya Pradesh, Punjab and different parts of the country is leveraged by GAPL to provide quality services.

Shri Nag has to his credit about 130 reports submitted on different hydroelectric projects. During his 33 years of association with Geological Survey Of India he worked on projects like Chenani hydel project, Salal Dhiangarh hydel project on river Chenab, Beas Dam project (Beas stage II) on Pong Dam, Sabarmati Reservoir project, Indira Sagar project, Maheshwar project on river Narmada and Sindh hydel project on Sindh river (a tributary to Chambal river) to name a few. His services are also being utilized in projects involving detailed mineral exploration.

**Dr. C.L. Kaul**

*Msc (Geology) PhD (Geology)  
Rtd. Associate Professor, Dept. of Mining Eng, University of Jodhpur  
Engineering Geology Expert*

With over 30 years of professional experience in the field of Engineering Geology, Dr. Kaul has developed significant expertise in geological and structural mapping related to engineering projects. The company leverages his vast experience in gaining insight regarding geological and structural behaviour of project locations. His services are also being utilized in projects involving detailed mineral exploration.

### **Dr. Jagdish Chandra**

*BE (Civil) PhD (Water Resources)*

*Rtd. Professor & Head, Dept. of Civil Eng., University of Jodhpur.*

*Water Resources Expert*

Prof. Dr. Jagdish Chandra has more than 40 years of diversified experience in Civil Engineering. His major projects include pursuing research program sponsored by B.R.N.S Dept. Of Atomic Energy, Govt. Of India, Director Regional Housing Development Centre, Chief Engineer Building Cell University of Jodhpur and AICTE project for modernisation of Hydraulics lab at civil engineering Dept., Jodhpur University. Prof. Chandra has a lot of teaching and research experience. He has also served as Professor and head of hydraulic engineering dept. at AWTI in Ethiopia. He continues to contribute towards the field of water resources by actively engaging in projects of varying scales. The firm mainly utilizes his services in Design of structures affected by seepage flow (earth dams, canals in alluvium) and in hydraulic design of flow structures (bridges, culverts etc.). Over the years Dr. Chandra has proved to be an excellent project manager. He renders his services to the firm as an associate project manager during execution of large scale projects.

### **Mr. Abhimanyu Mam**

*MCA*

*Geoinformatics Specialist*

In this era of information overflow, getting the right data/reports in a timely fashion, is critical to the success of any project. Having experience with data storage (databases), data analysis/statistics and presenting the data through the internet/intranet/extranet, which is becoming the de facto standard for transporting and displaying data, Abhimanyu brings technical skills that ensure a timely deliverance of information, with the highest quality of data integrity.

As a Geoinformatics Specialist, Mr. Mam is involved in integration of technologies and facilitating the exchange of information and its analysis through GIS and Web-based GIS Software Solutions. His expertise includes programming environments like C, C++, HTML and Java, and in software documentation and development procedures using UML for modelling.

He is in charge of GAPL's *Information Solutions* division. This division has ambitious plans to venture into the domain of customized software development specifically aimed at automating and thereby managing several geo-scientific processes. At present this division provides geo-computation assistance using industry standard software and constantly innovates and tests new solutions.

Mr. Mam has the experience of envisioning software called "*Highway Disaster Information Management System*". This work was done for Department of Public Works, Malaysia. This project required the development of a Software Application leveraging GIS, Remote Sensing and Database capabilities. He in association with GAPL has also developed an Open Source GIS Viewer component capable of handling industry standard shape files.

## **SELECT PROJECT EXPERIENCE**

### **GEOLOGICAL & GEOPHYSICAL PROJECTS**

- Carrying out more than 500 metres inclined core drilling for a limestone deposit in village Ras district Ajmer. Average depth of the boreholes 45-50 metres. This work was carried out for Shree Cements Ltd. Beawar in the year 1994-95.
- Geological investigation including 150 metres core drilling for Gambhiri & Alnia Dam site in district Chittorgarh. The work also included geotechnical investigation.

The project was carried out in the year 1995-96 for Consulting Engineering Services Delhi.

- Geological investigation including preparation of geological maps and 200 metre core drilling in marble deposit in village Kelwa district Udaipur. This work was done for M/s Udaipur Marbles in the year 1997-98.
- Drilling of boreholes and core recovery along the main railway track in Makrana district Nagaur for installation of strain metres to assess the effect of blasting in adjoining mining areas on rail track. This work was carried out for Indian Bureau of Mines, Nagpur in the year 1999.
- Inclined core drilling for crystalline limestone deposits at village Nohradhar district Sirmour Himachal Pradesh. This work was carried out for M/s Golcha Gypsum Pvt. Ltd. Jaipur in the year 2003. Total drilling carried out was 300 metres and average depth of boreholes was more than 70 metres. Another 100 metres of core drilling was carried out in soap stone deposit in district Dausa Rajasthan for the same business group.
- Coring and non-coring drilling operations for geotechnical investigations for the last 10 years involved drilling of boreholes using hydraulic diamond core drilling rigs and approximate metre-age of more than 3000. The clients include central and state government organizations like CPWD, Hindustan Petroleum Corporation, MES and private consulting companies.
- Detailed electrical resistivity and hydro-geological investigation in and around Basantgarh copper mines area for availability and assessment of ground water reserves. This work was carried out in 1997 for Hindustan Copper Ltd. Khetri.
- Hydro-geological and geo-electrical resistivity survey for industrial area at Kishangarh district Ajmer. Client: - RIICO Rajasthan.
- Corrodibility studies for Infrastructure development at Jodhpur & Bikaner using electrical resistivity and chemical parameters. The work was carried out for Asian development bank funded RUIDP project in the year 2003.
- Geological, structural, subsoil and slope stability analysis of the world famous Jaisalmer fort for construction of a retaining wall around the hill on which lies the main fort. Client: - Central Public Works Department.

#### GEOTECHNICAL PROJECTS

- Geotechnical investigation for *Asian Development Bank* funded project for infrastructural development of *Jodhpur & Bikaner* city. The work involved detailed soil investigation up to a depth of 25m for structures like railway over bridges, high capacity overhead water reservoirs, sewage treatment plants and construction of roads. Client: - *TCE Consulting Engineers Ltd. (Mumbai)*.
- Slope stability analysis for construction of embankments for water supply and sewage treatment projects in Jodhpur and Bikaner. Client: - *TCE Consulting Engineers Ltd. (Mumbai)*.
- Geotechnical investigation for *Asian Development Bank* funded project for infrastructural development of *Kota and Ajmer* towns. The work involved detailed soil investigation up to a depth of 3 to 25m in rocks for structures like flyovers and high capacity overhead water reservoirs. Client: - *Fugro KND Geotech Ltd. (Mumbai)*.
- Detailed investigation for existing sewerage system including preparation of a detailed base map to be used for design of a fresh sewerage system for cities like Jodhpur, Ajmer and Kota. The complete data was provided in a customized and normalized relational database to be further used for GIS studies. Client: - *Fugro KND Geotech Ltd. (Mumbai)*.
- Detailed soil investigation for construction of multistoried government accommodation for BSF personnel in Ramgarh district Jaisalmer. The investigation involved drilling of boreholes in highly expansive bentonetic soils, evaluation of their index and engineering properties and recommendations of the measures for



countering swelling pressures as high as 60 to 90 t/m<sup>2</sup>. *Client: - Central Public Works Department.*

- Construction and testing of 30cm dia experimental piles in highly expansive bentonetic soils at Ramgarh district Jaisalmer. *Client: - Central Public Works Department.*
- Soil Investigation for construction of Embankment, road and fencing along Indo-Pak International boundary from Boundary pillar No. 921 to 976 and from Boundary pillar No. 1051 to 1100. The area under this investigation falls in the *Great Rann Of Kutch* in Banas Kantha and Kutch districts of Gujrat. The work involved detailed sub soil investigation in highly plastic and compressible clayey / sandy strata, borrow soil investigation for construction of embankment and stability analysis of the slopes of the proposed embankment using advanced computer software. *Client: - Central Public Works Department.*
- Detailed soil investigation for construction of 35m high RCC Light house tower in SirCreek area (Offshore) along Indo-Pak border near the mouth of Arabian Sea. *Client: - Central Public Works Department.*
- Investigation for construction of 25m high steel tower in area having shifting sand as the subsoil. The work involved recommendations on stabilization of dune sands. *Client: - Central Public Works Department.*
- Detailed soil investigation for construction of LPG bottling plant near Kota. The work involved drilling of large number of boreholes in quartzitic sand stones and recommending design and construction parameters for rocky strata. *Client: - Hindustan Petroleum Corporation Ltd.*
- Soil Investigation for construction of 60 to 80m high steel towers for electricity generation purpose using wind energy in district Jaisalmer. *Client:- Suzlon Energy Developers Ltd. (Pune)*
- Detailed soil investigation for construction of microwave towers at Pune & Bhuj. *Client:- Indian Telephone Industries (Banglore)*
- Soil Investigation in Kota military cantonment at about 20 locations up to a depth of about 20 meters for construction of over head tank structures. (April 1996). *Client:- Military Engineering Services*
- Soil Investigation in the technical area of *Uttarlai Air Base*. Distt Barmer. Investigation Included drilling of bore holes and test pits. (Jan 1997). *Client:- Military Engineering Services*

**TOPOGRAPHIC  
SURVEY  
PROJECTS**

- Detailed survey for fixing of road alignment from Shahgarh to Bacchia and lohar in Shahgarh buldge area along Indo-Pak border in district Jaisalmeer. The work involved fixing of road alignment, plotting of longitudinal and cross sections at close intervals for a 150km long proposed road that would connect various border outposts. (1992 -93). *Client:- Central Public Works Department*
- Topographical survey of Indian institute of handloom technology Jodhpur. (1996). *Client:- Central Public Works Department*
- Topographic survey at Arid Forest Research Institute. (1996). *Client:- Central Public Works Department*
- Fixing of road alignment and route survey for construction of embankment cum road (75km long) along Indo-Pak border in Bhuj Sector of Gujrat state. (2002). *Client:- Central Public Works Department*
- Preparation of a detailed topographic map for Osia town district Jodhpur for development of tourist's spots. (2003). *Client:- Central Public Works Department*
- Fly leveling for transfer of Survey Of India benchmark from Barmer in Rajasthan to a point in Rann of Kutch, Gujrat, a distance of more than 200km. *Client:- Central Public Works Department. (2004)*