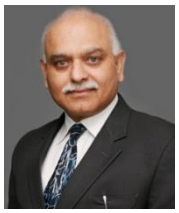


1.	**Proposed Position:** Geologist	
2.	**Name of Staff:** ChanderShekhar Khokhar	
3.	**Date of Birth:**10th June 1957	
4.	**Nationality:**Indian	
5.	**Educational Qualification:**	
	1976 – 1979 1979 - 1980 1992 - 1993	B.Sc. (Hons.) in Geology, Center of Advanced Studies, Punjab University Chandigarh M.Sc.(Hons.) in Geology, Center of Advanced Studies, Punjab University Chandigarh Diploma in Electronics, National Institute of Training and Management, Delhi

6		**Specialist Courses/Training Undergone**	
	year	**Institution**	**Detail of course/ Training**
	2010	Indian Institutes of Technology, Roorkee	Training course on Mathematical Modeling of ground water systems
	2007	Central Soil & Material Research Station (CSMRS)	Workshop on Tala Hydroelectric Project
	2007	Central Soil & Material Research Station	Investigations for safety of dams
	2007	Central Soil & Material Research Station	Training course on land slides
	2005	Central Soil & Material Research Station	Training course on Rock Engineering for Hydroelectric Projects
	2001	In House in RITES	Auditor's training on ISO 9001:2000, internal audit
	1996	Indian National Cartographic Association	International congress on earth resource management
	1996	Indian Socity of Engineering Geology	Symposium on Modern Practices in Geo-techniques.
	1996	ClsonEngg. USA, through AMIL, Delhi	Workshop on the use of non-destruction testing
	1995	Confederation of Indian	Training on water management.

6.	**Membership of Professional Societies:**
	• Life Member, Indian Society for Rock Mechanics and Tunneling Technology (Member

		Industry, Chennai	
	1995	Indian Society For Training & Development, Delhi	Work shop on Small Hydro Schemes Relevance , Strategies & Opportunities
	1994	Indian Society For Rock Mechanics & Tunneling Technology with CSMRS	National Work shop on Rock Slope Stability and disaster mitigation
	1994	CSMRS with.Mr. Patrick Hartkorn of M/s Interfels, Germany	Workshop on Geotechnical instrumentation
	1994	Indian Society For Rock Mechanics & Tunneling Technology with CSMRS	Workshop on underground space utilization.
	1993	CSMRS- NGI Institutional Cooperation Programme, ISRMTT, Delhi	Workshop On Norwegian Method Of Tunneling
	1993	All India Management Association	Computing For Young Managers
	1992	Indian Society For Rock Mechanics & Tunneling Technology with CSMRS & UNDP	Training Course On In-Situ Stress Measurements In Rock For Water Resources Projects
	1985	UNDP (FAO) Expert (under saline water project, Karnal, Haryana	Training on Electrical and Radio Active Geophysical Logging of boreholes and resistivity surveys for Groundwater exploration
	1984	Central Ground Water Board, Hydrabad	Training Course On Geophysical Logging Of Water Wells
	1984	Bhaba Atomic research Center Bombay	Training on safe handling of radioactive sources in Instruments for ground water exploration

	Executive Council). • Life Member, Indian Society of Engineering Geology. • Life Member, Indian Geotechnical Society • Member, Indian Science Congress. • Member International Association of Hydrogeologists. • Member "MED 21" Diamond core and water well drilling sectional committee of BUREAU OF INDIAN STANDARDS (http://bis.org.in) • Member of a committee (CED-48-Rock Mechanics) of Bureau of Indian Standards for reviewing and drafting / formulating new standards in the field of Rock Mechanics.
7.	**Publication:**
	• V.V.S. Gurunadha Rao, R.L. Dhar, T. Jaichand, C.S. Khokhar "Mass Transport Modeling for assessement of groundwater contamination around Mathura oil refinery, Mathura, Uttar Pradesh, India" Environmental Geology 39 (10) September 1999. Publisher Springer-Verlag • C.S. Khokhar & others "Geophysical survey for ground water exploration in Beet Area of Garshankar Hoshiarpur (Punjab)" Presented at 83rd Indian Science Congress 1995, Patiala (Pb.) • Geophysical survey and ground water management in the complex aquifer in parts of Jhajjar district, Haryana, WAC-2011. • Application of MODFLOW for groundwater seepage problems in the subsurface tunnels, J.Ind.Geophys.Union (October 2015) v.19,no.4,pp422-432. • Cross passage construction methods for twin-tube tunnel projectsin urban areas: Indorock 2017: Seventh Indian Rock Conference 25-27 Oct 2017. • Optimization of support system for Tunnels on the basis of BRT monitoring: presented in international conference on underground space 27-28 June 2022.

Jan 2020–Till date	**AECOM** **Position held: Consultant** **Location of Assignments: India**
	Project: Construction of 7 Tunnels 3547musing NATM including Cut & Cover, ballastless railway track, Civil Work on approaches, Minor Bridges, Slope Protection Works and Allied Works between Ch.Km3.5 and Km 20of Bhanupali-Bilaspur-Beri New Railway Line in Districts Rupnagar of Punjab and Bilaspur of Himachal Pradesh States, India
	Project:Detailed Design and Project Management for Construction of 9 km tunnel by NATM with parallel escape tunnel, bridges, yards and formation works from Chainage 73+489 to 83+899 (10.410km) under Package-6 in connection with new single line Broad Gauge rail link between Rishikesh and Karanprayag (125Km) in the State of Uttarakhand, India
Jan 2016–Dec 2019	**AECOM** **Position held: Executive Director** **Location of Assignments: India**
	Project:DetailedDesign and Project Management for Construction of two tunnels of

	7.2Km and 9.2Km length by NATM with parallel escape tunnels, bridges, yards and formation works from Chainage 83+899 to 101+310 (17.411km) under Package-7 in connection with new single line broad gauge rail link between Rishikesh and Karanprayag (125km) in the state of Uttarakhand, India
	Project: DDC for Investigation & Detailed Design Consultancy for five tunnels from 140 to 1100m length by NATM, and construction supervision of Tunnels, Bridges, Formation, P. Way, S&T and Overhead Electrification between Barkhera (excluding) and Budni (excluding) 3rd BG railway line (26.5 KMs) on Bhopal - Itarsi section in Bhopal Division of West Central Railway in Madhya Pradesh State. India.
	Chief Design Engineer (NATM) for 33.5Km Mumbai Metro Line-3, having 26 underground stations and cross passages with NATM.
	6.4 Km twin tube under sea road tunnel by TBM in Coastal road project Mumbai for Municipal corporation of Greater Mumbai.
	Design of 3 tunnels by NATM for double line corridor between Panvel – Karjat (33km) for Mumbai Rail Vikas Corporation ltd. (MRVC).
	Due diligence of 9 km 2 lane Road Tunnel from Chenani to Nashri on NH-44.
	Project Seabird phase IIA. The largest naval infrastructure project for India, it involves creation of a naval base at Karwar on the west coast of India.
	3 water conductor pressure tunnels by TBM; MendhvanKhind tunnel 1700m, Vasai Creek tunnel 900m, Tungareshwar Tunnel 4435m, for the project: Surya Regional water supply scheme for bulk water supply to western sub region of MMR for Mumbai Metropolitan Region Development Authority.
	Detailed Feasibility Study and framing up DPR for the construction of twin tube, 3 lanes each highway tunnel 10.2 Km between Tikujiniwadi in thane city and Borivali in Mumbai for connecting Thane Ghodbunder road to western express highway in the state of Maharashtra
Nov 2010–Dec 2015	**AECOM** **Position held: Technical Director** **Location of Assignments: India**
	Responsible for geological and geotechnical data processing and evaluation of projects. Involved in the Kokata East West metro project with 9Km of tunneling and six underground stations, also involved in Chennai metro Phase-1 underground works with 19 stations and 24 Km of twin tunnels and cross passages.
	Detailed Design and construction supervision of Tunnel-1(3019m), T-2(1381m), T-4 (1329m), T-5(1305m), T-6(1237m)&T-6A(1014m) by NATM in connection with Jiribam – Tupul New Railway Line Project in the state of Manipur.
	Detailed Design and construction supervision of Tunnel No.3 (4.9Km) by NATM in connection with Jiribam – Tupul New Railway Line Project in the state of Manipur.
	Detailed Design and Construction Supervision of 20 Tunnels by NATM from T-12 to T-27 (270m to 4.6Km length) with total length of 20.4Km in connection with Jiribam – Tupul New BG Single Railway Line Project in the state of Manipur.

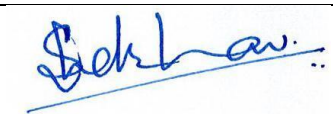
	Project: Detailed Design Consultancy, 3D Monitoring & Supervision of Tunnel T-3 (1.3Km), T-4 (4Km), T-5 (2Km) T-6(4Km) by NATN in connection with Construction of Sivok (West Bengal) to Rangpo (Sikkim) new Single line BG Railway Line Project.
July 2009–Nov 2010	**RITES Ltd.** (A Govt. of India Enterprise) **Position held: Sr.Dy. General Manager** **Location of Assignment:India**
2009 - 2010	Chief Geologist for Udhampur Srinagar Baramulla Rail Link project (USBRL) in the state of J&K, India. Responsible for geological and geotechnical investigations being conducted for about 80 tunnels by NATM and many bridges including viaducts and major bridges. Investigations included geological mapping, drilling operations, core logging, geophysical surveys with seismic refraction, resistivity profiling, in-situ tests PLT, BBT and CBT. Geological evaluation of tunnel excavations. Representing RITES in technical advisory committee for tunnels in KRCL section.
Jan 2004 – Jul 2009	**RITES Ltd.** (A Govt. of India Enterprise) **Position held: Dy. General Manager** **Location of Assignments:India and West Africa**
	Responsibilities included: • Planning and managing the teams working on different projects relating to Railways and helping them in the field with data collection. • Data processing using dedicated software and preparation of technical reports.
	Preliminary investigations for 800km new Rail link between Dakar to Ziganchor via Tambakonda in **Senegal, Africa**.
2009 - 2010	Studies carried out for heavy seepage problem in Tunnel No. 3 on Udhampur - Katra section of USBRL project in J&K India. These included preparation of geological and hydrogeological model of the tunnel environment and mathematical modelling for simulation of different solutions.
2004- 2009	Katra – Quazigund new rail line project in J&K, India, Himalayas: Geological and Geotechnical investigations for tunnels bridges & embankments, including**,** team member (Geologist) of JV (RITES & Geo-consult Austria) for 10.9Km Tunnel across Pir Panjals. Underconstruction using NATM.
2007- 2009	GI for new B.G. rail line from Jiribam to Tupal (98km), Manipur, India.
2008	Studies carried out for squeezing and upheaval problem of T-1 which included surface mapping and inside investigations on Udhampur - Katra section of USBRL project J&K India.
2008	Geotechnical investigations including surface mapping, seismic refraction, resistivity profiling for underground oil storage project, Padur, Karnatka, India for Indian Strategic Petroleum Reserves Ltd.
2008	Geophysical and geological studies for underpass across runway of Delhi airport, for

	DMRC Delhi, India.
2008	GI for NF Railway for rail cum road bridge over river Brahmputra at Bogibeel, Dibrugarh, India.
2004 - 2007	GI for 218km Kutch branch canal including borrow area studies for Sardar Sarovar Narmada Nigam Ltd, Gujarat, India.
2007	GI for three skew bridges along the proposed coal complex yard, one bridge at OBBP yard area and deep cutting at OBBP yard, including railway siding of Rourkela Steel Plant, for Steel Authority of India Ltd. Rourkela, Orissa. India.
2007	Geophysical study for proposed Metro Rail Corridor of Airport Express Metro Line, for DMRC, Delhi, India.
2007	GI for HPCL for their purposed underground LPG storage cavern, which included geological studies, geophysical survey and hydro fracturing at Mangalore, India.
2005 - 2006	Detailed Engineering investigation for study on integrated Border Development and upgrading of facilities along Indo-Bangladesh Border, including proposed bridge on Jamuna River near Hilli.
2004 - 2005	Geotechnical investigations for Kolkota Metro, India.
2005	Geological surface mapping, 3D geological logging of Railway tunnel in Jamalpur, Bihar, India.
2004	Geotechnical investigations for Delhi Metro Phase –II Inderprastha to Sanjay Gandhi Transport Nagar corridor.
2004	Detailed investigations for Kosi Rail bridge across river Kosi for East Central Railway, Bihar, India.
Aug 1994– Dec 2003	**RITES Ltd.** (A Govt. of India Enterprise) **Position held: Manager** **Location of Assignments: India and Mauritius**
	Responsibilities included: • Planning and managing the projects related to Railway, Road and Hydroelectric, tunnels, bridges and groundwater, including involvement in field work. • Data processing using dedicated software and preparation of technical reports.
2002 - 2003	GI for DMRC Phase II, Barakhamba – New Delhi – NOIDA, India.
2002 - 2003	GI for DMRC Phase II, Central Secteriate to Vasant Kunj, Delhi , India.
2002	GI for NF Railway, New BG line from Mayanaguri to Jogighopa 235Km , Assam – West Bengal , India.
2002	DPR for 500km length of NH section in Gujarat North South - East West Corridor

	Ph-III, for NHAI, Gujarat, India.
2001 - 2002	DPR for National Highway sections of Gujarat India. a. Jetpur – Gondal, Gujrat b. Radhanpur – Deesa, Gujrat c. Adesar – Radhanpur, Gujrat.
2000-2002	Lumding Badarpur (185km) NF Railway gauge conversion project where worked as geologist responsible for geological appreciation of the new alignment in terms of new 13 tunnels and bridge locations through geological mapping geophysical survey and drilling operations.
1999- 2000	Geological and geophysical studies for Agartala – Kumargahat (67km stretch) new BG Rail link project NF Railway, which included investigations for 31 tunnels and 101 cutting locations. Tripura, India
1999	GI which included drilling, PLT, geophysical and geological studies for Rihand Thermal Power project, NTPC, Uttar Pradesh, India.
1999	Ground water regime studies for ash pond area of Talcher Super Thermal Power project, NTPC, Orissa, India.
1993-2005	Geological evaluation of different subsurface and above ground project components like diversion structure, head race tunnel, surge shaft, penstock and underground power houses, for hydroelectric projects in India, a. Allian-Duhangan,(In Himalayas, Himachal Pradesh) b. Malana (In Himalayas, Himachal Pradesh) c. Harsar (In Himalayas, Himachal Pradesh) d. Bharmour (In Himalayas, Himachal Pradesh) e. Tidong (In Himalayas, Himachal Pradesh)
1998	GI which included drilling, PLT, geophysical and geological studies for Talcher Super Thermal Power project, NTPC, Orissa, India.
1998	Geological studies for LNG terminal of Petronet LNG Ltd Cochin, India
1998	Underground pollution transport modeling for Mathura oil Refinery.India
1997	Geological and geophysical studies for an Indian Navy Port, Port Blair, India.
1997	Geotechnical investigations for Midlands Dam in Mauritius for the Ministry of Local Govt. and Public Utilities, Water resources Unit, (6 months).**Mauritius.**
1997	Team member with Russian team for Seismic reflection survey for oil exploration in Ganga Valley for ONGC, India.
1996	Environmental impact assessment and geotechnical investigation including geophysical survey for 132 KV transmission lines. CEB, (6 months).**Mauritius.**
1995 - 1996	Sea water intrusion studies between Trivanmiyur and Muttukkadu, Chennai. For Madras Metropolitan Water Supply and Sewerage Board. This southern coastal area

	was investigated for sea water intrusion, aquifer behaviour, groundwater balance studies and remedial measures with regular checkingof the intrusion proposed once per year.
1995	Construction of collector wells on Pondicherry sea shore. Responsible for site identification to construction through design, Pondicherry, India.
1995	Geological and Geophysical studies for gas base power project in Guna, Madhya Pradesh, India.
1993 – 1994	**RITES Ltd.** **Position held:Project Manager** **Location of Assignments: India**
	Responsibilities included: • Planning and managing the projects related to Railway, Road and Hydroelectric, Tunnels, bridges and groundwater. • Preparation of reports after computerized processing of field generated data. • Geophysical investigations for hydroelectric, irrigation and ground water projects. • Monitoring the progress and giving technical guidance to teams conducting drilling operations for geo-tech investigations.
1994	Geological appreciation of Baiterni Hydro power project , Orissa, India
1994	GI for tunnel for Ansirrigation project where in , J & K , India
1992 - 1994	Geological evaluation for approximately 11km of the **Rohtang tunnel located in the higher Himalayas** crossing permanent snow bound mountain ranges, for a period of two years. The scope included (in 125m + 125m drifts), conducting **3D geological logging of the underground opening,**flat jack tests, Goodman jack tests, overcoring, drilling operations, geophysical logging in drill holes and seismic survey at portals.
1991 – 1993	**RITES Ltd.** **Position held: Assistant Manager** **Location of Assignments: India and Nepal**
	Responsibilities included: • Planning and managing the projects related to Railway, Road and Hydroelectric, Tunnels, bridges and groundwater. • Preparation of reports after processing of field generated data. • Geophysical investigations for Railway, Road and groundwater projects. • Monitoring the progress and giving technical guidance to teams conducting drilling operations for geo-tech investigations, tube wells etc. • Conducting electrical and radioactive logging on boreholes. • Conducting geotechnical field in-situ tests, like flatjack, Goodmanjack, overcoring etc.
1992	Continuous monitoring of sub surface temperatures for one year for design of air conditioning system of underground stations for Delhi Metro, India.
1992	Geophysical studies for Ghandhar Gas Power plant for NTPC, India.

1992	Identification of tube wells/hand pump sites by geological and geophysical assessment in Banke and Bardia districts of Nepal, for UNICEF, Nepal– 6 months.
1991	Exploration, design and management plan of groundwater for Rohni (a suburb of Delhi), India.
1991	Seismic refraction survey for Underground section of Delhi metro Phase I, India
1983 – 1991	**Haryana State Minor Irrigation and Tubewells Corporation**(A Govt. of Haryana Undertaking) **Position held:Junior Geophysicist** **Location of Assignments: Haryana State, India**
	Responsible for: • Administrative and technical matters related to geophysical sub-division. • Conducting electrical and radioactive logging of drill holes using sophisticated logger made available under UNDP-FAO program for construction of tube wells. • Conducting resistivity surveys, shallow as well as very deep, using high tech instruments made available under UNDP-FAO program; for ground water exploration. • Responsible for site identification to construction through drilling, in-situ testing and designing, for tube wells. • Ground water balance studies in different parts of Haryana State. • Ground water flow studies through injecting tracer elements (under UNDP project) • Data processing and report writing.
1982 – 1985	Associated with saline water project, Haryana. UNDP-FAO, (IND/81/010). The project was to study and understand the saline water problem in Haryana and suggest remedial measures.
1982 – 1983	**Haryana State Minor Irrigation and Tubewells Corporation**(A Govt. of Haryana Undertaking) **Position held: Technical Assistant** **Location of Assignments: Haryana State, India**
	Responsible for • Design and construction of tubewells. • Conducting resistivity and electric and radioactive logging operations on drill holes for water supply. • Conducting resistivity survey for ground water exploration. • Conducting aquifer performance tests and other field tests for water supply projects. • Mapping of aquifer systems. • Data processing and report writing.
1982 - 1991	Executed the projects for more than 1000 tube wells; supervising the drilling, design of assembly, logging (electrical caliper and radioactive) operations and construction.

Certification:			
1.		I am willing to work on the project and would be available during whole duration of the assignment.	
2.		I, the undersigned, certify that to the best of my knowledge and belief, this biodata correctly describes myself, my qualifications and my experience.	
		Signature of the Candidate: 	
			Place: Gurgaon Date: 02-12-2022
		Signature of the Authorised Representative of the firm:	
			Place: Date: