

# Sana'a Basin Water Management Project

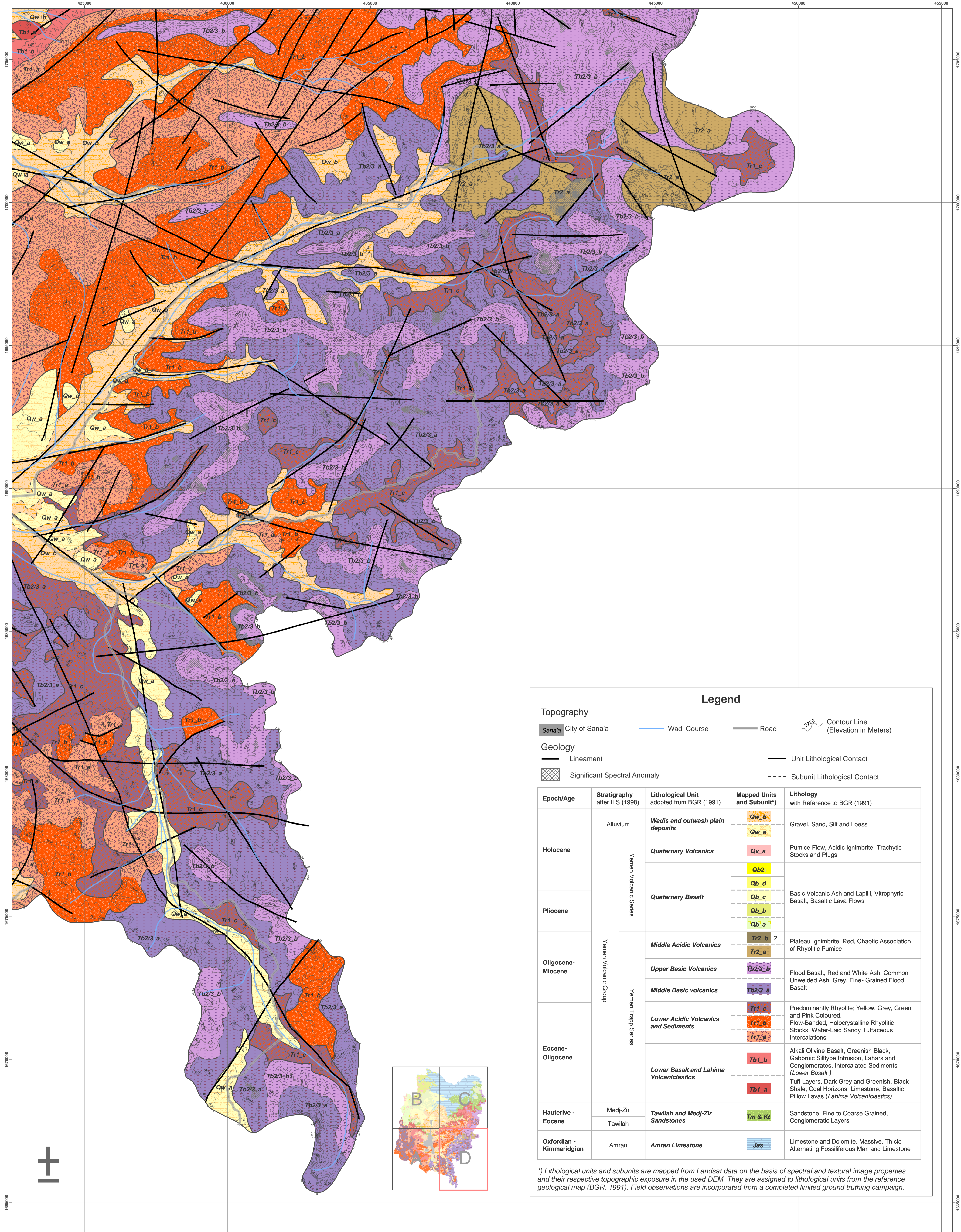
Satellite Imagery / Data Analysis Study along with Ground Truth and Meteorological Monitoring

IDA Credit 3774-YEM  
Contract No RFP No 2/04

-Republic of Yemen-



## Compiled Geological Map Sheet D



**Legend**

**Topography**

- Sana'a City of Sana'a
- Wadi Course
- Road
- Contour Line (Elevation in Meters)

**Geology**

- Lineament
- Unit Lithological Contact
- Significant Spectral Anomaly
- Subunit Lithological Contact

Epoch/Age	Stratigraphy after ILS (1998)	Lithological Unit (1991)	Mapped Units and Subunit*	Lithology with Reference to BGR (1991)
Holocene	Alluvium	Wadis and outwash plain deposits	Qw_b Qw_a	Gravel, Sand, Silt and Loess
		Quaternary Volcanics	Qv_a Qb2	Pumice Flow, Acidic Ignimbrite, Trachytic Stocks and Plugs
	Pliocene		Quaternary Basalt	Qb_c Qb_b Qb_a
		Oligocene-Miocene	Middle Acidic Volcanics	Tr2_b ? Tr2_a
Upper Basic Volcanics	Tb2/3_b			Flood Basalt, Red and White Ash, Common Unwelded Ash, Grey, Fine- Grained Flood Basalt
	Middle Basic volcanics		Tb2/3_a	
Lower Acidic Volcanics and Sediments			Tr1_c Tr1_b Tr1_a	Predominantly Rhyolite; Yellow, Grey, Green and Pink Coloured, Holocrystalline Rhyolitic Stocks, Water-Laid Sandy Tuffaceous Intercalations
	Eocene-Oligocene	Lower Basalt and Lahima Volcaniclastics	Tb1_b Tb1_a	Alkali Olivine Basalt, Greenish Black, Gabbroic Sillite Intrusion, Lahars and Conglomerates, Intercalated Sediments (Lower Basalt ) Tuff Layers, Dark Grey and Greenish, Black Shale, Coal Horizons, Limestone, Basaltic Pillow Lavas (Lahima Volcaniclastics)
Hauterive - Eocene			Medj-Zir Tawilah	Tawilah and Medj-Zir Sandstones
Oxfordian - Kimmeridgian	Amran	Amran Limestone	Jas	Limestone and Dolomite, Massive, Thick; Alternating Fossiliferous Marl and Limestone

\*) Lithological units and subunits are mapped from Landsat data on the basis of spectral and textural image properties and their respective topographic exposure in the used DEM. They are assigned to lithological units from the reference geological map (BGR, 1991). Field observations are incorporated from a completed limited ground truthing campaign.

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Projection UTM, Zone 38  
Spheroid WGS84, Datum WGS84

Mapping Base:  
Remote Sensing Data:  
Landsat ETM Colour Composite 741; Spatial Resolution 30m; Path/Row: 166/49 from 20.09.2001  
Spot 5 Colour Merge Mosaic; Spatial Resolution 2.5m; Path/Row: 146218; 146219 from 05.09.2004  
Digital Terrain Model: NASA Shuttle Radar Topography Mission (SRTM) 2000; Spatial Resolution 90 m; C-Band  
Geological Reference Maps and Data:  
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International Lexicon of Stratigraphy, Volume III, Republic of Yemen: Second Edition, Completely Revised, Updated and Expanded, 1998. IUGS Publications No.34, by Ziad R. Beynon, Mustafa A. Al-Sun, Hamed El Nakhai, Ismail N. Al-Garad, Rasheed S. Barabai, Abdul Salter O. Nani and Mohammad H. Al-Aswath

