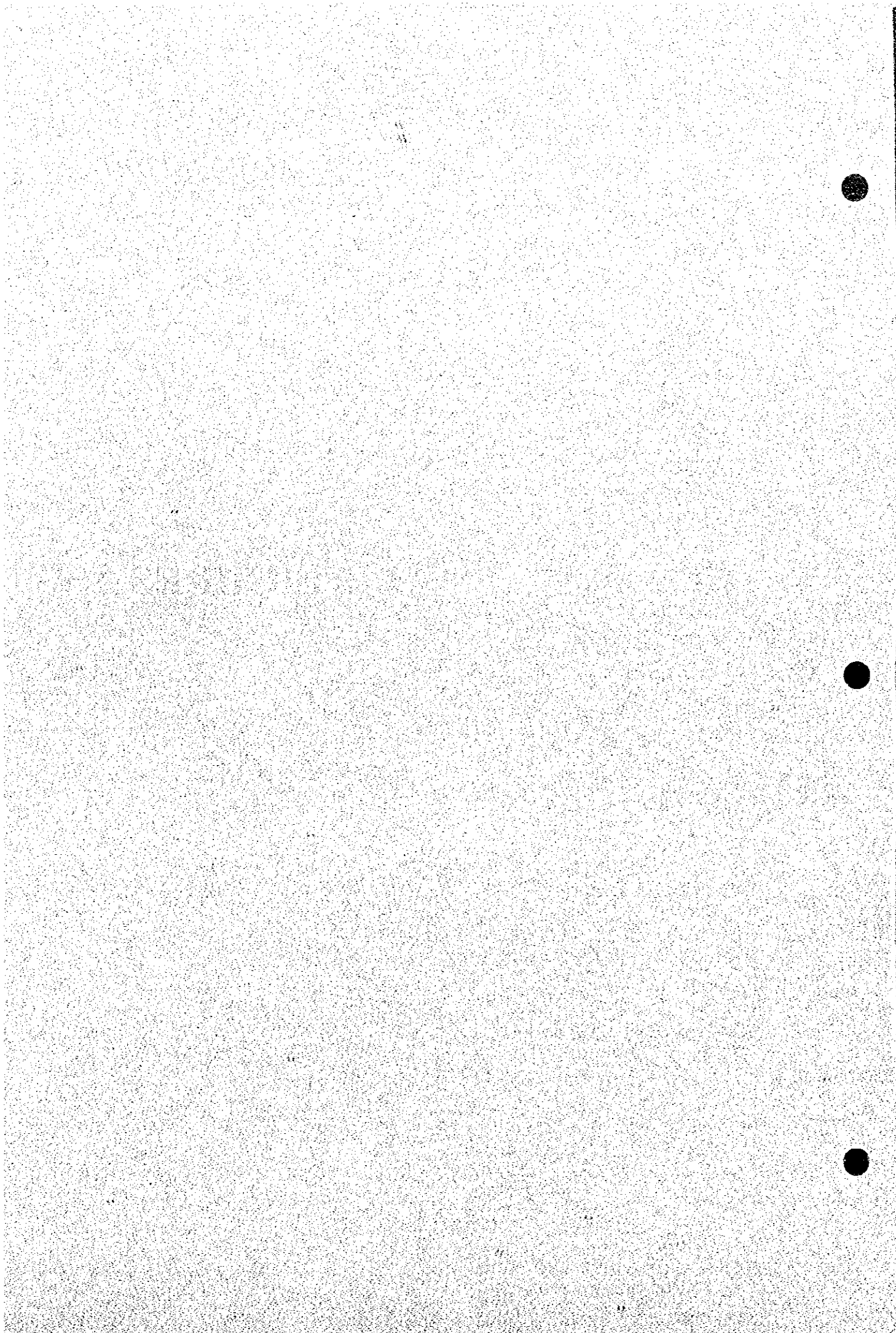
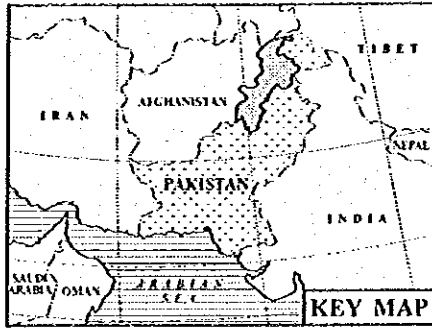


*MAIN REPORT*

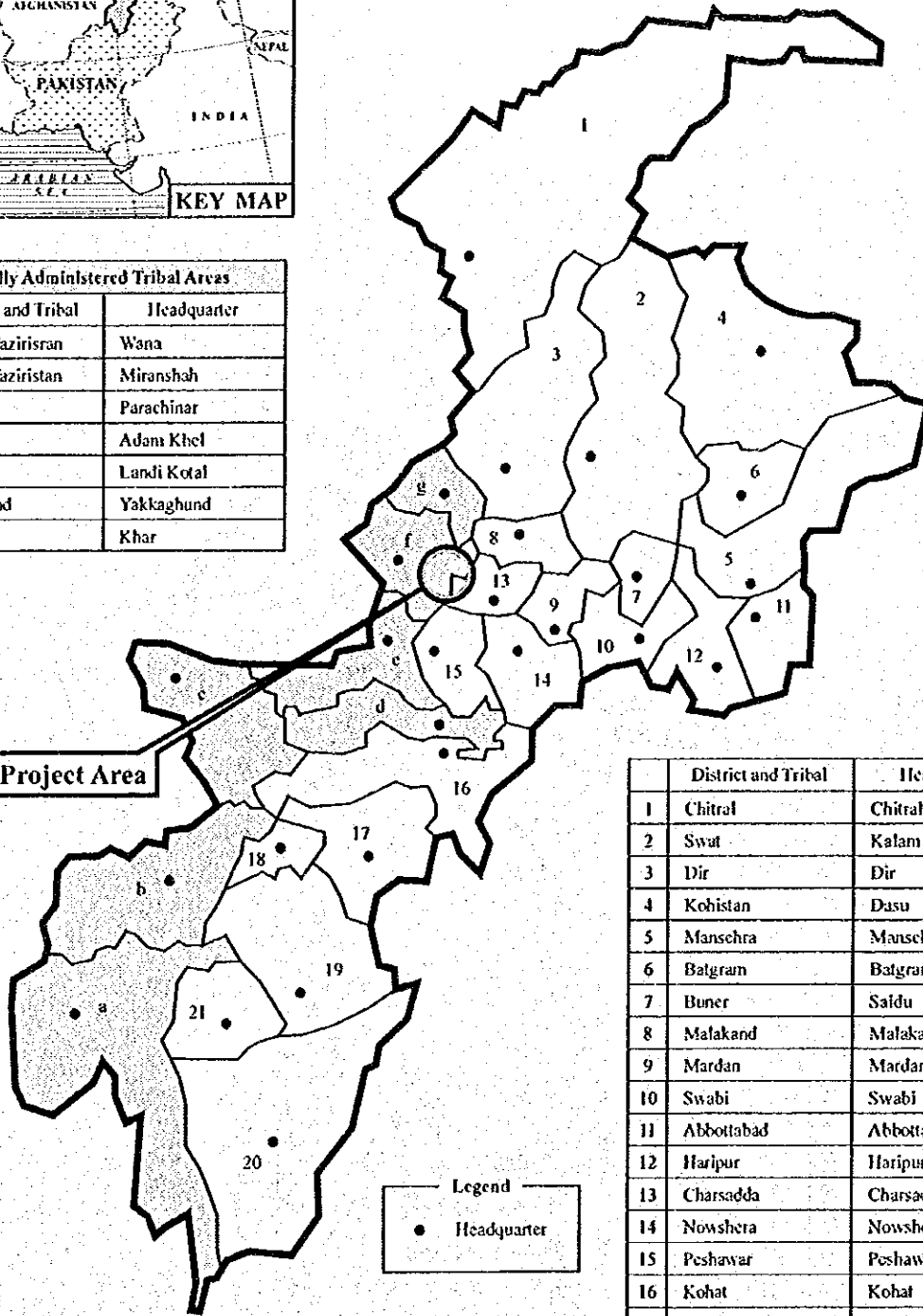
**FIGURES**





Federally Administered Tribal Areas		
	District and Tribal	Headquarter
a	South Waziristan	Wana
b	North Waziristan	Miranshah
c	Kurram	Parachinar
d	Orakzai	Adani Khel
e	Khyber	Landi Kotal
f	Mohmand	Yakkaghund
g	Bajaur	Khar

**Munda Project Area**

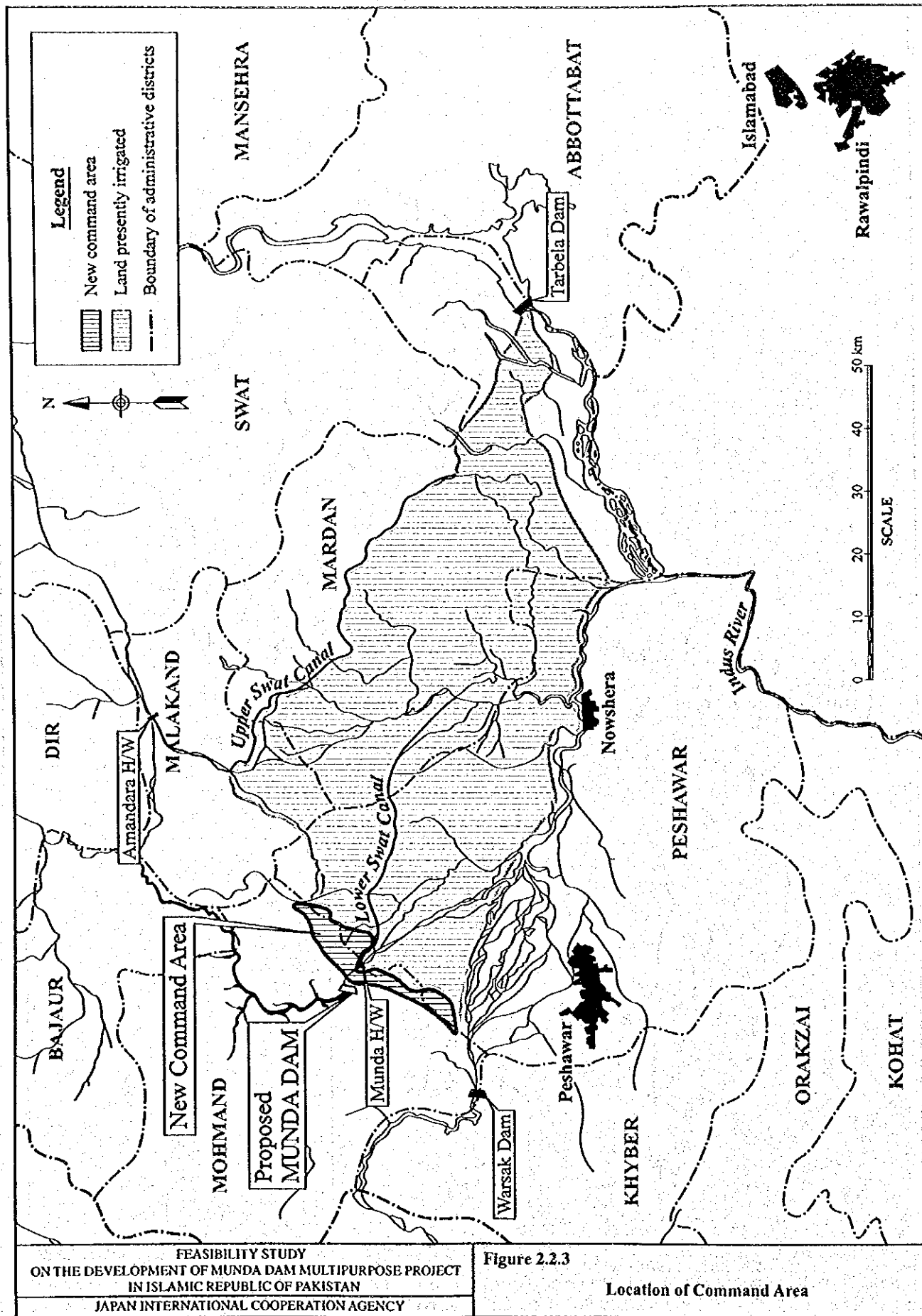


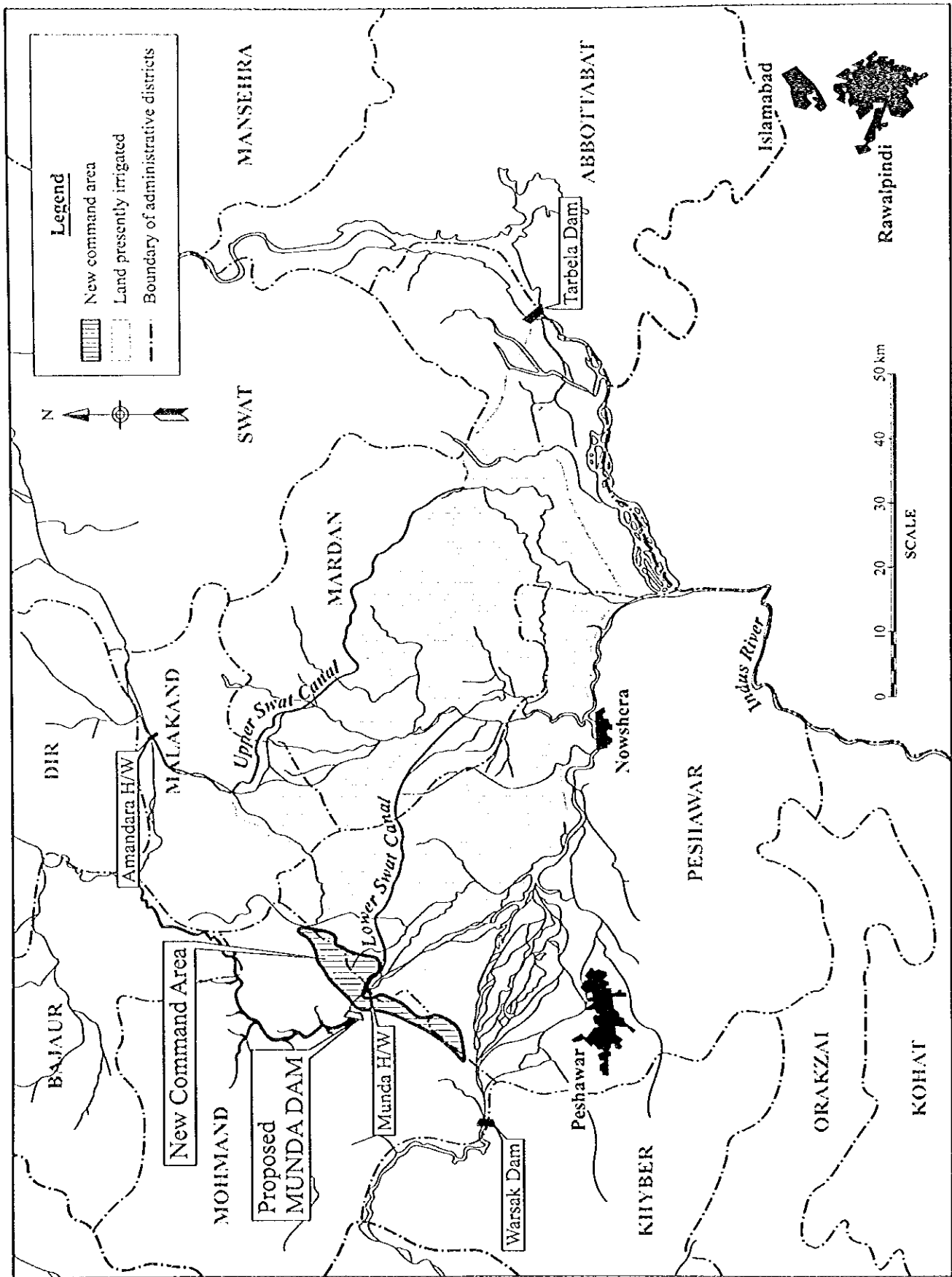
	District and Tribal	Headquarter
1	Chitral	Chitral
2	Swat	Kalam
3	Dir	Dir
4	Kohistan	Dasu
5	Manshara	Manshara
6	Batgram	Batgram
7	Buner	Saidu
8	Malakand	Malakand
9	Mardan	Mardan
10	Swabi	Swabi
11	Abbottabad	Abbottabad
12	Haripur	Haripur
13	Charsadda	Charsadda
14	Nowshera	Nowshera
15	Peshawar	Peshawar
16	Kohat	Kohat
17	Karak	Karak
18	Bannu	Bannu
19	Lakki Marwat	Lakki Marwat
20	Dera Ismail Khan	Dera Ismail Khan
21	Tank	Tank

Note: The boundaries of some new districts and the locations of some headquarters are approximate.

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ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT  
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Figure 2.2.2  
NWFP Administrative Districts and FATA Tribal Areas

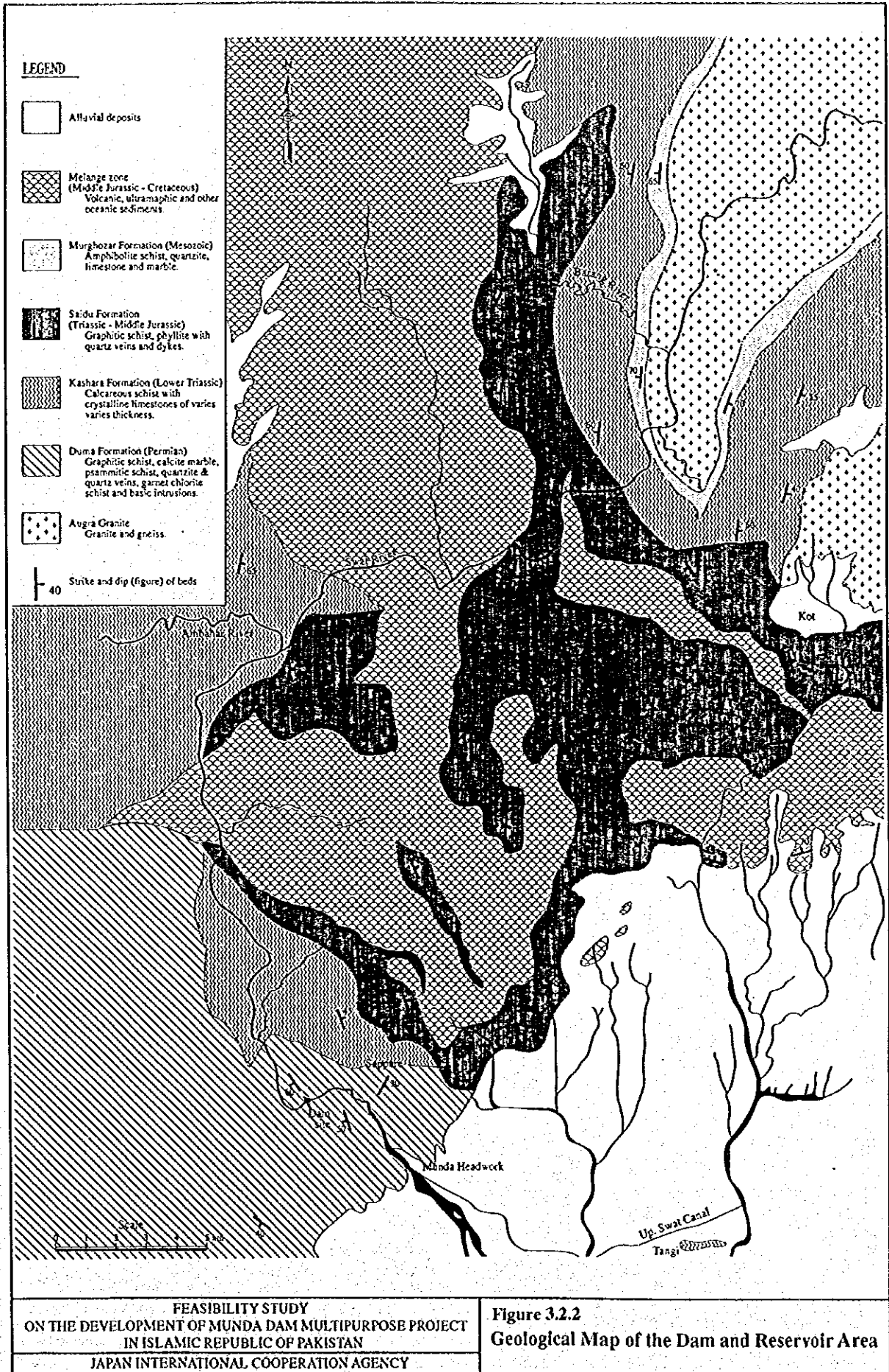


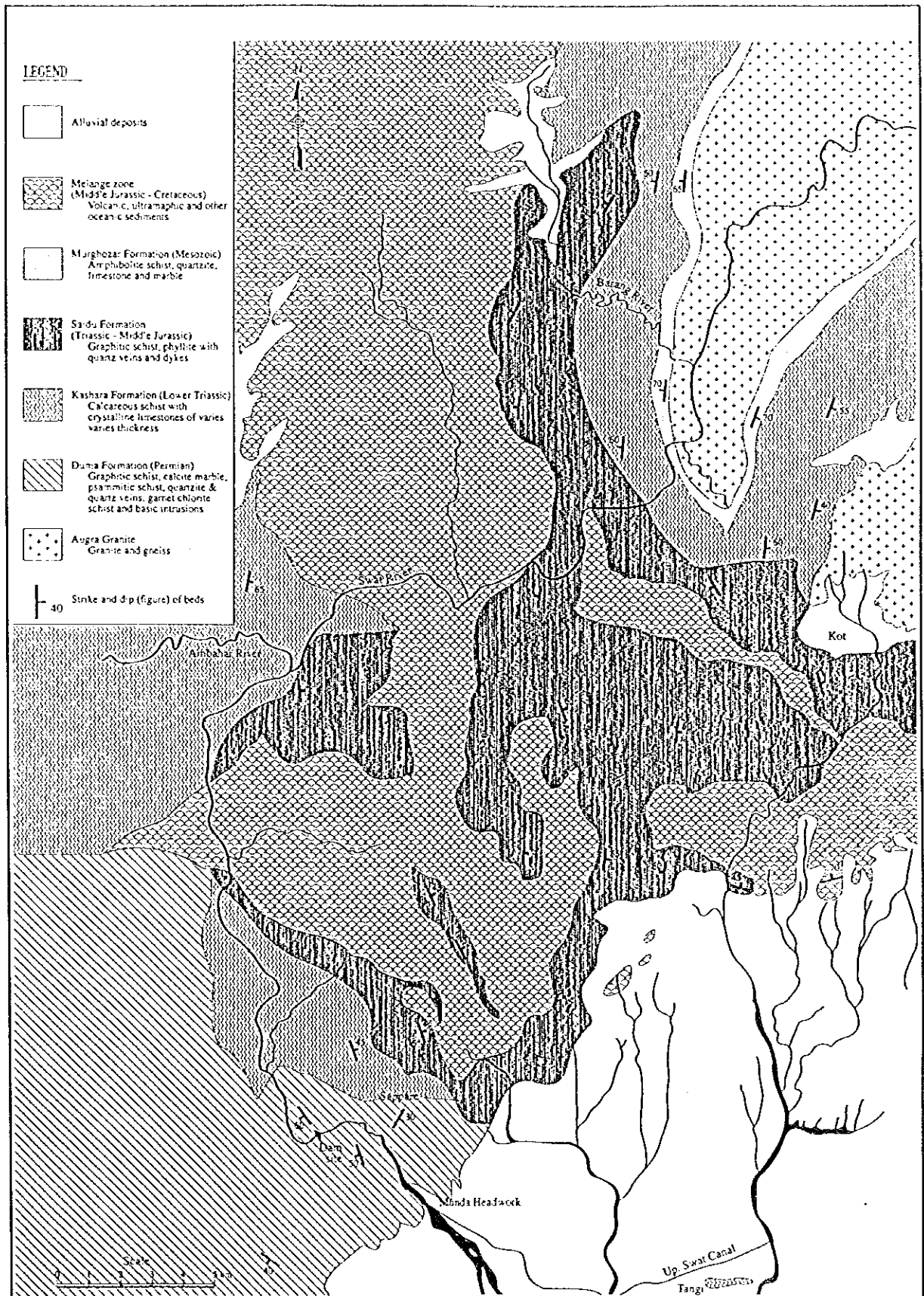


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Figure 2.2.3

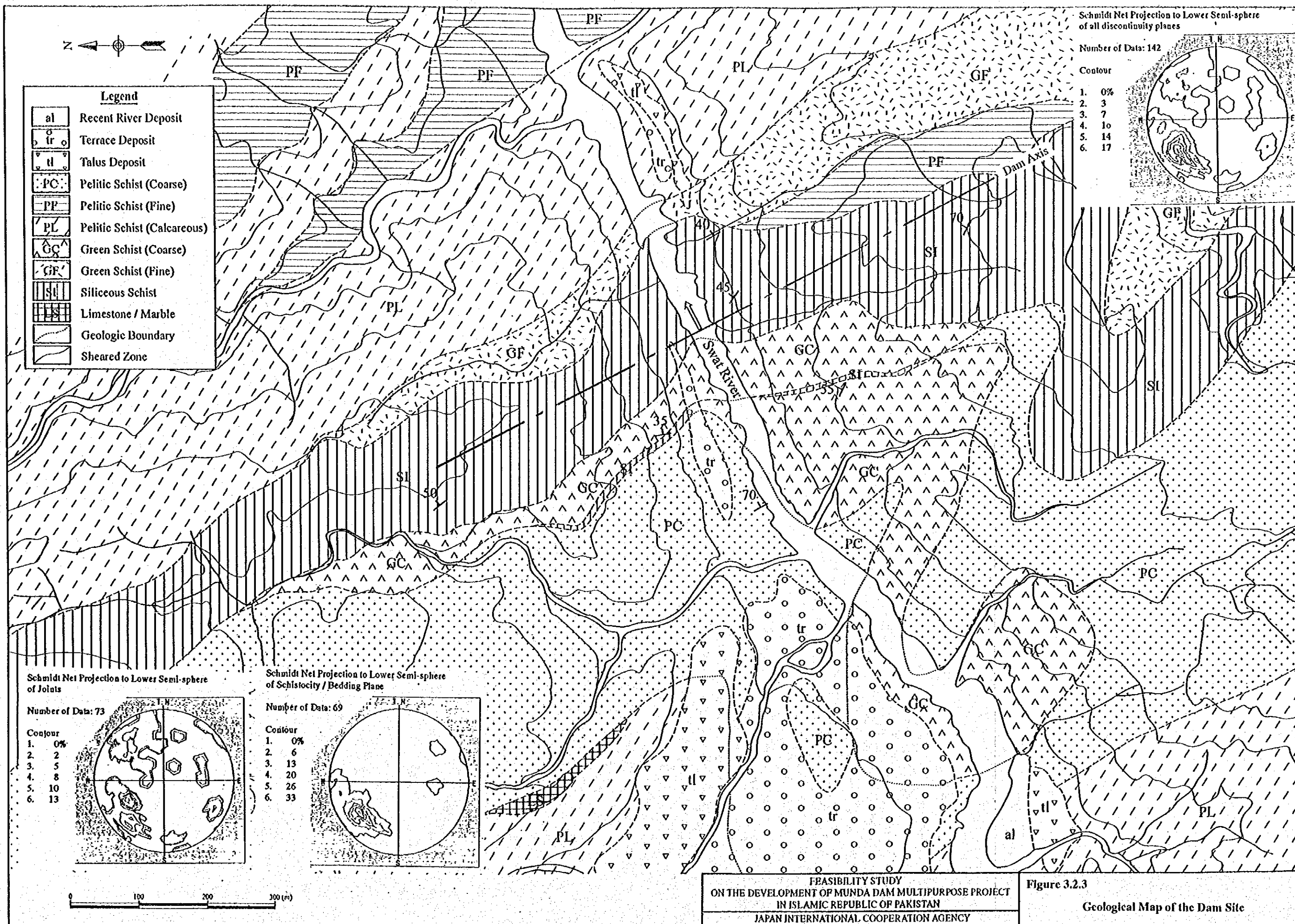
Location of Command Area





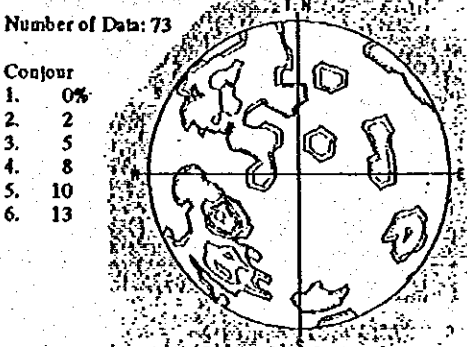
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Figure 3.2.2  
Geological Map of the Dam and Reservoir Area

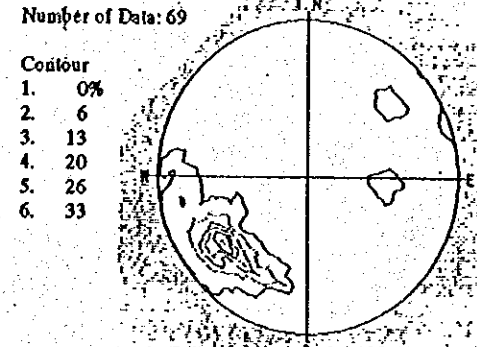


- Legend**
- al Recent River Deposit
  - tr Terrace Deposit
  - tl Talus Deposit
  - PC Pelitic Schist (Coarse)
  - PF Pelitic Schist (Fine)
  - PL Pelitic Schist (Calcareous)
  - GC Green Schist (Coarse)
  - GF Green Schist (Fine)
  - SI Siliceous Schist
  - LS Limestone / Marble
  - Geologic Boundary
  - Sheared Zone

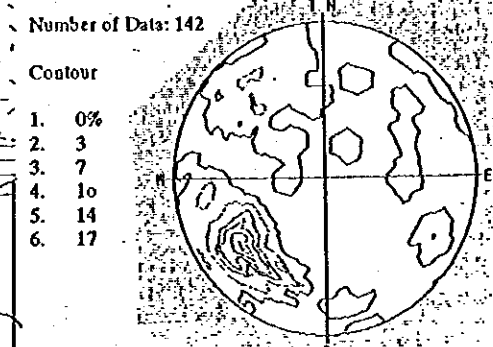
Schmidt Net Projection to Lower Semi-sphere of Joints



Schmidt Net Projection to Lower Semi-sphere of Schistosity / Bedding Plane



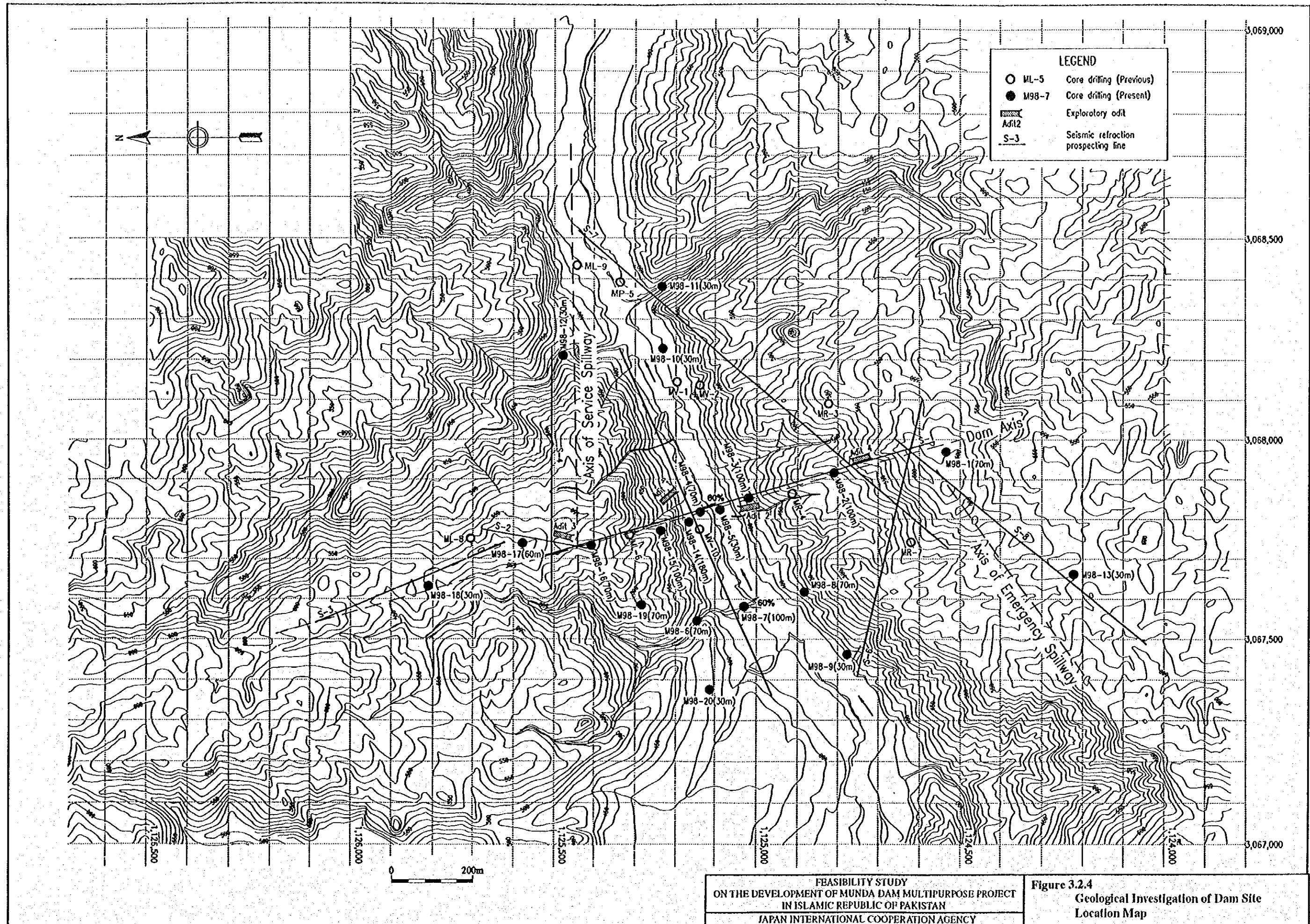
Schmidt Net Projection to Lower Semi-sphere of all discontinuity planes



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Figure 3.2.3  
Geological Map of the Dam Site

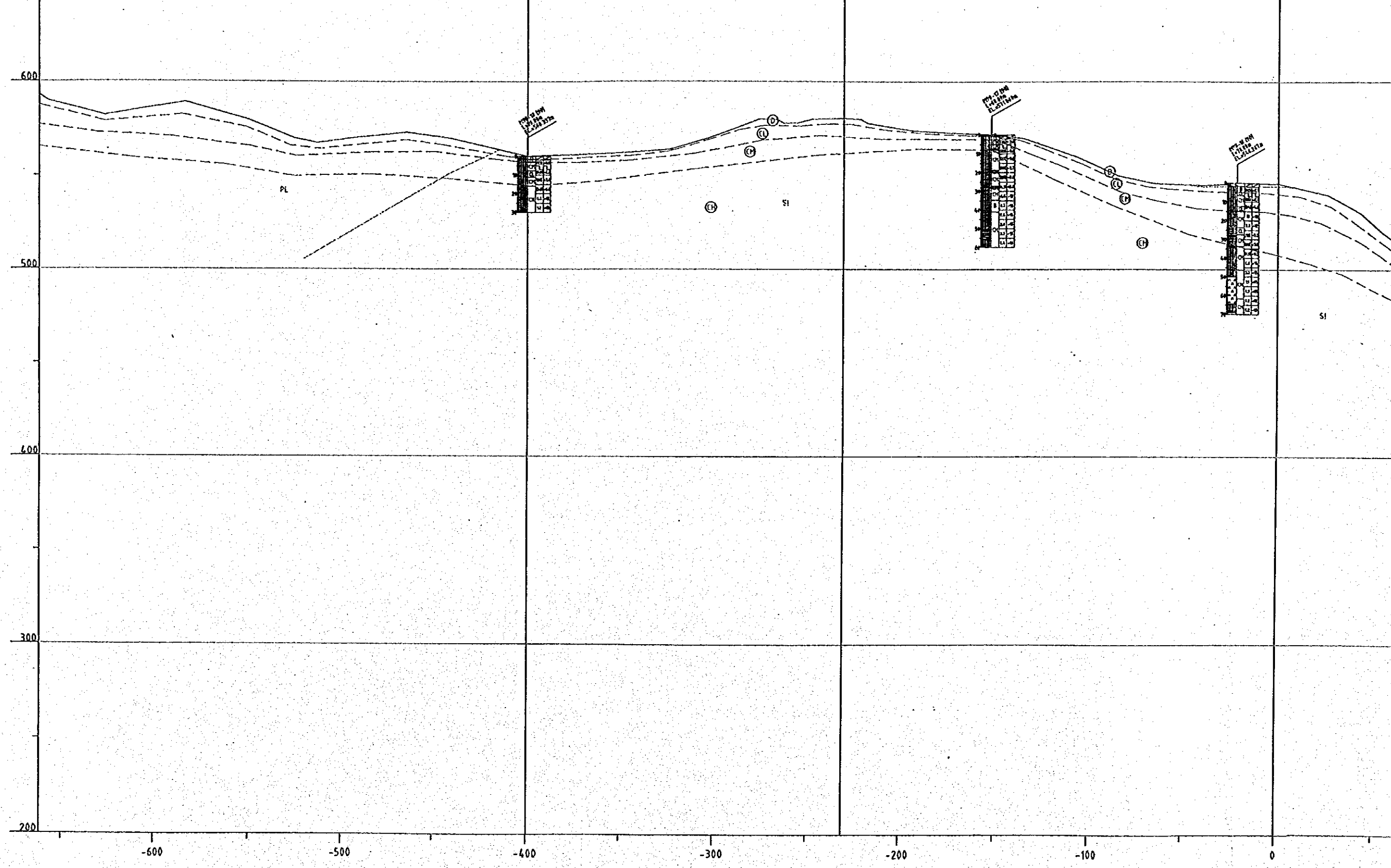




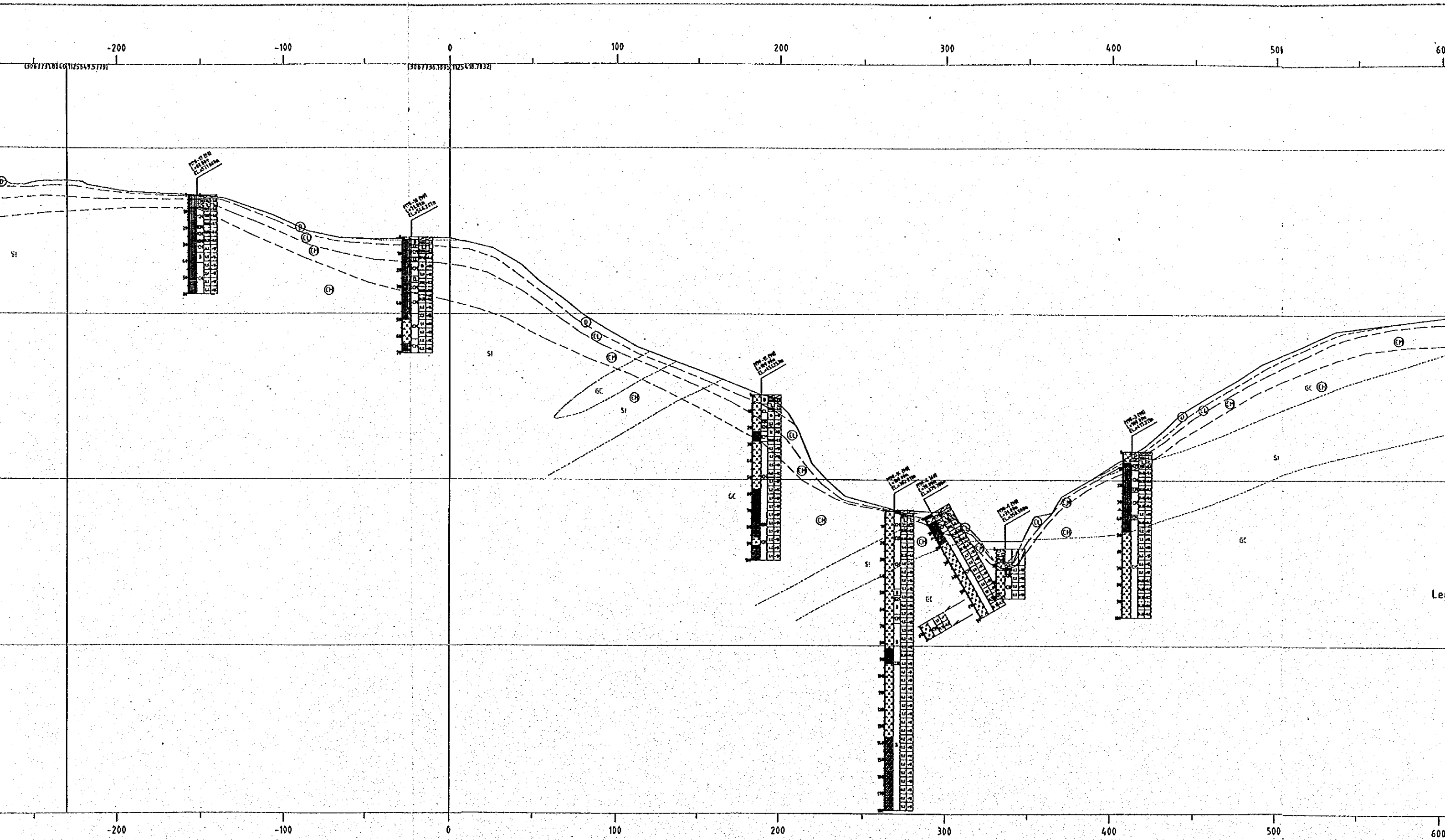
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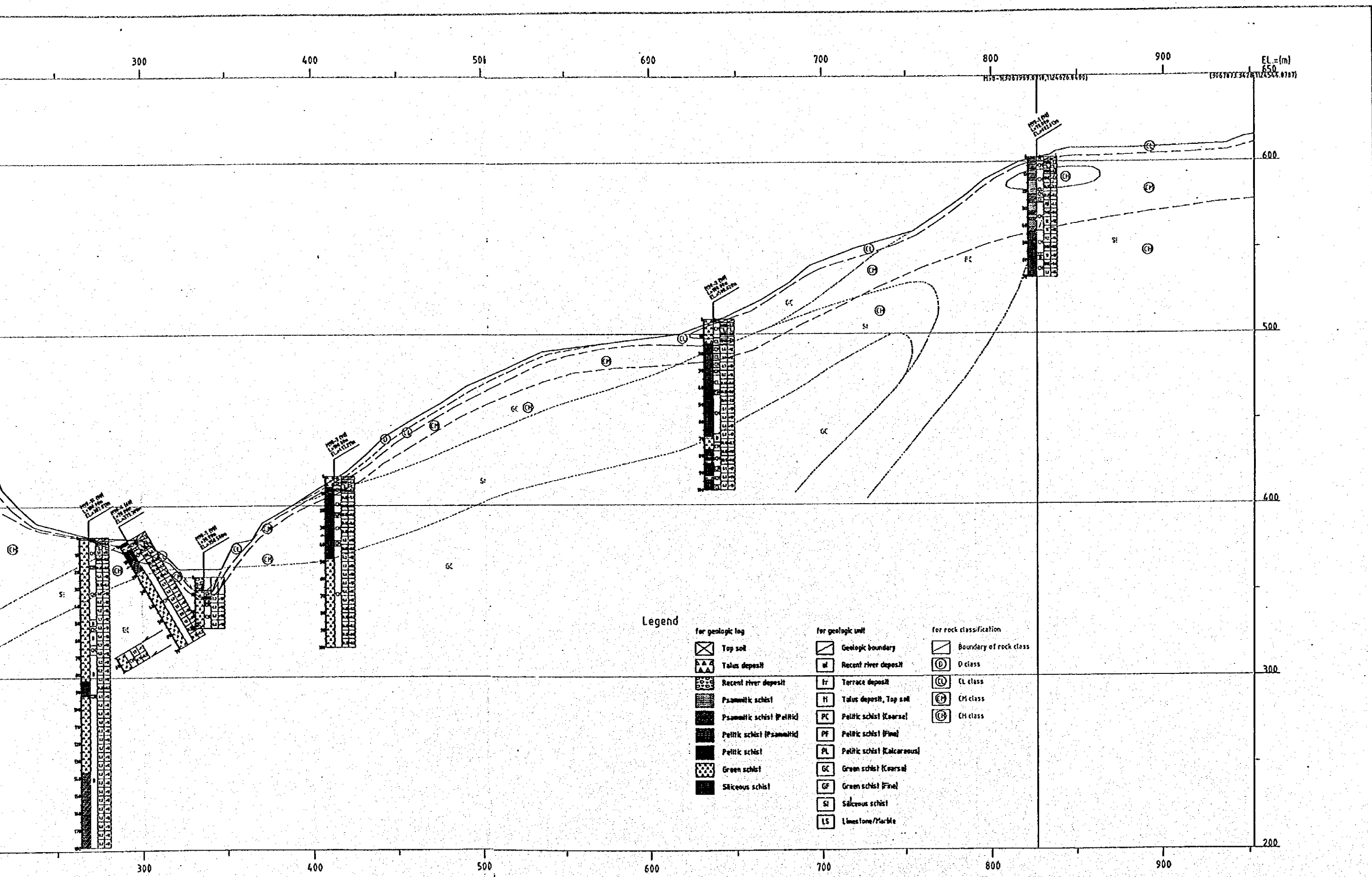
Figure 3.2.4  
 Geological Investigation of Dam Site  
 Location Map

EL.-(m) 650  
13867847.8376 1126972.6996  
P.58-1813867837.0916 1126972.6996  
138677310916 11258893.7791  
138677367837 1125438.7832



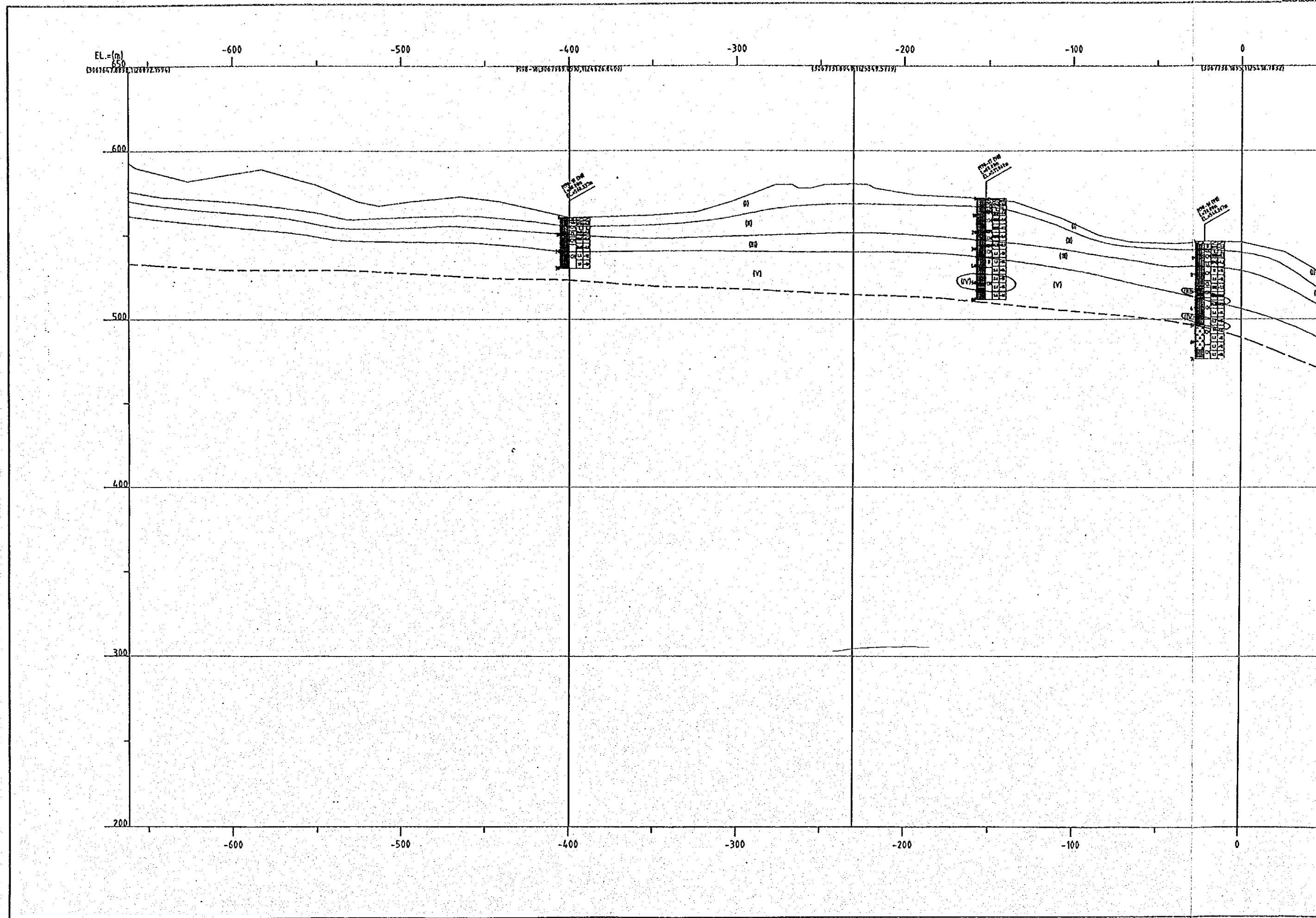
3.3-1



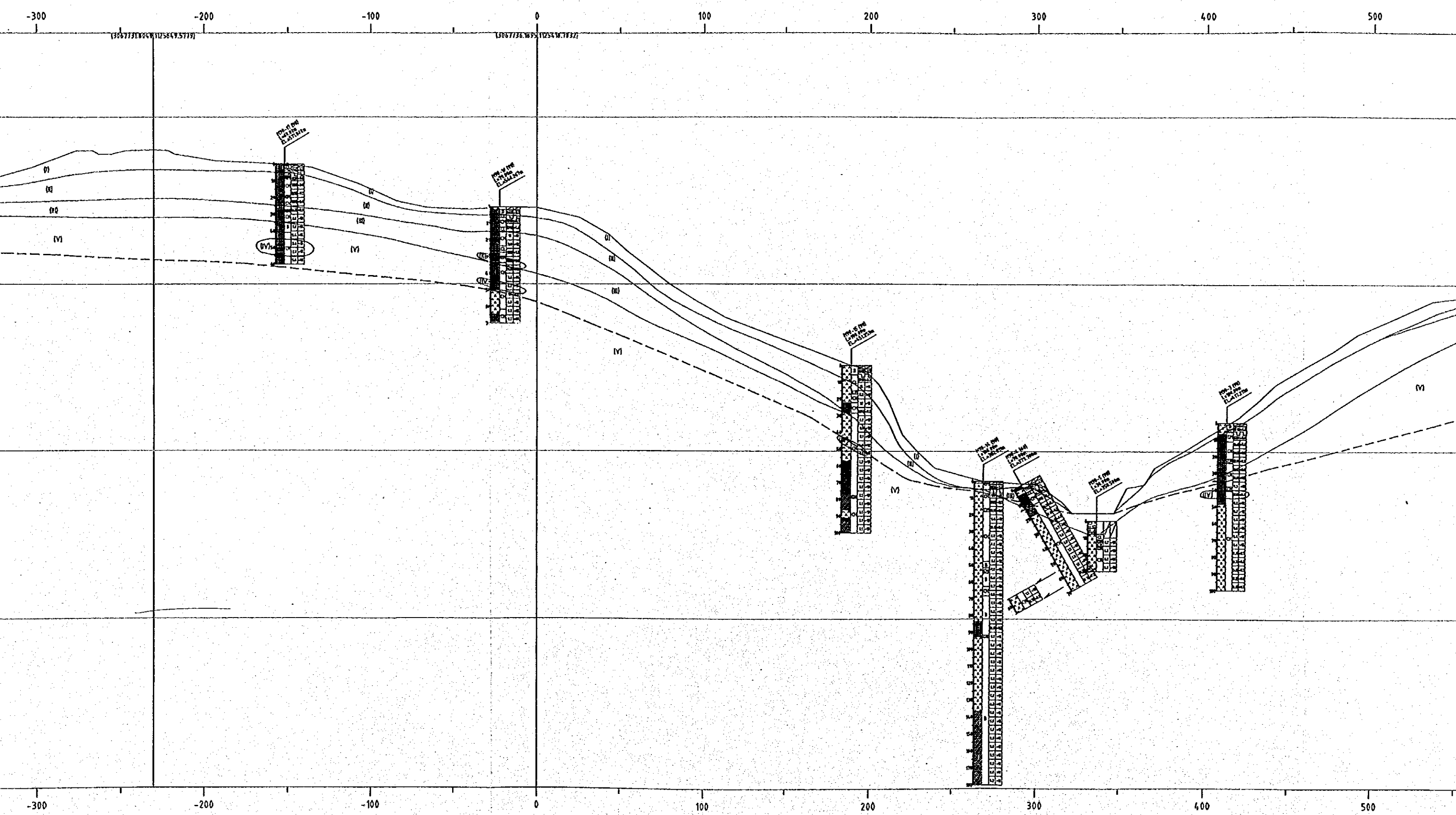


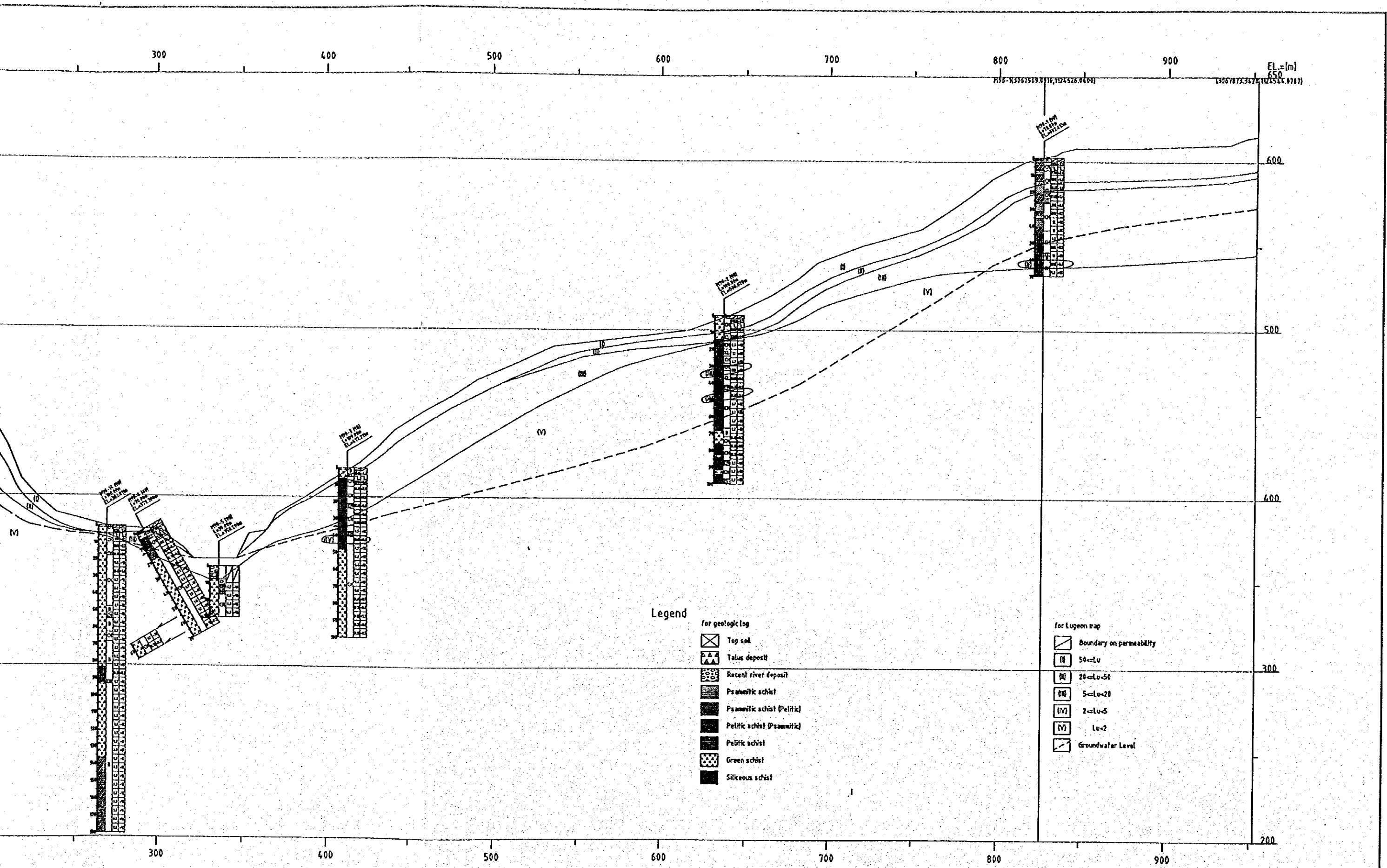
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Figure 3.2.5  
 Geological Profile on Dam Axis with Rock  
 Classification



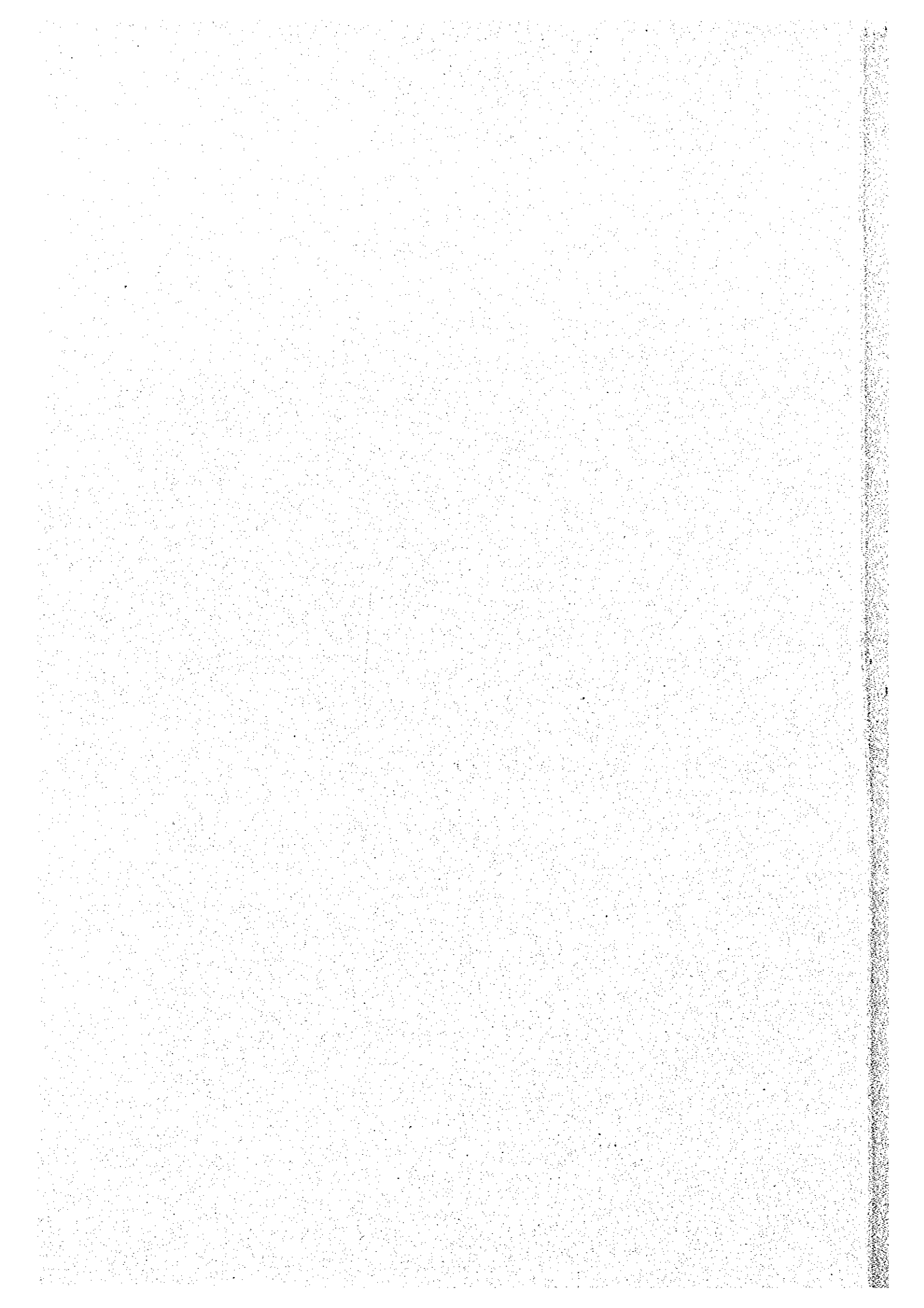
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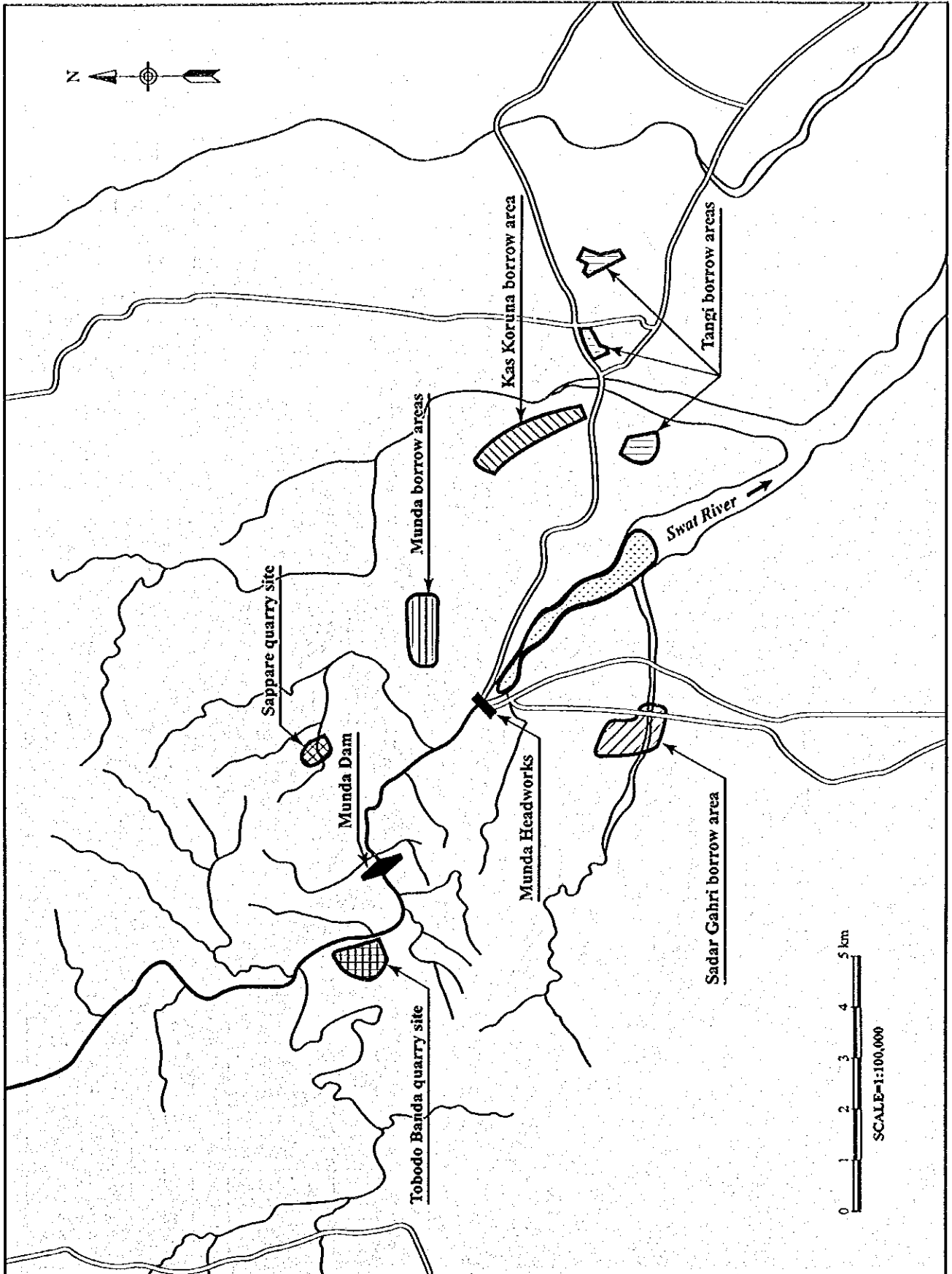


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Figure 3.2.6  
 Lugeon Map on Dam Axis

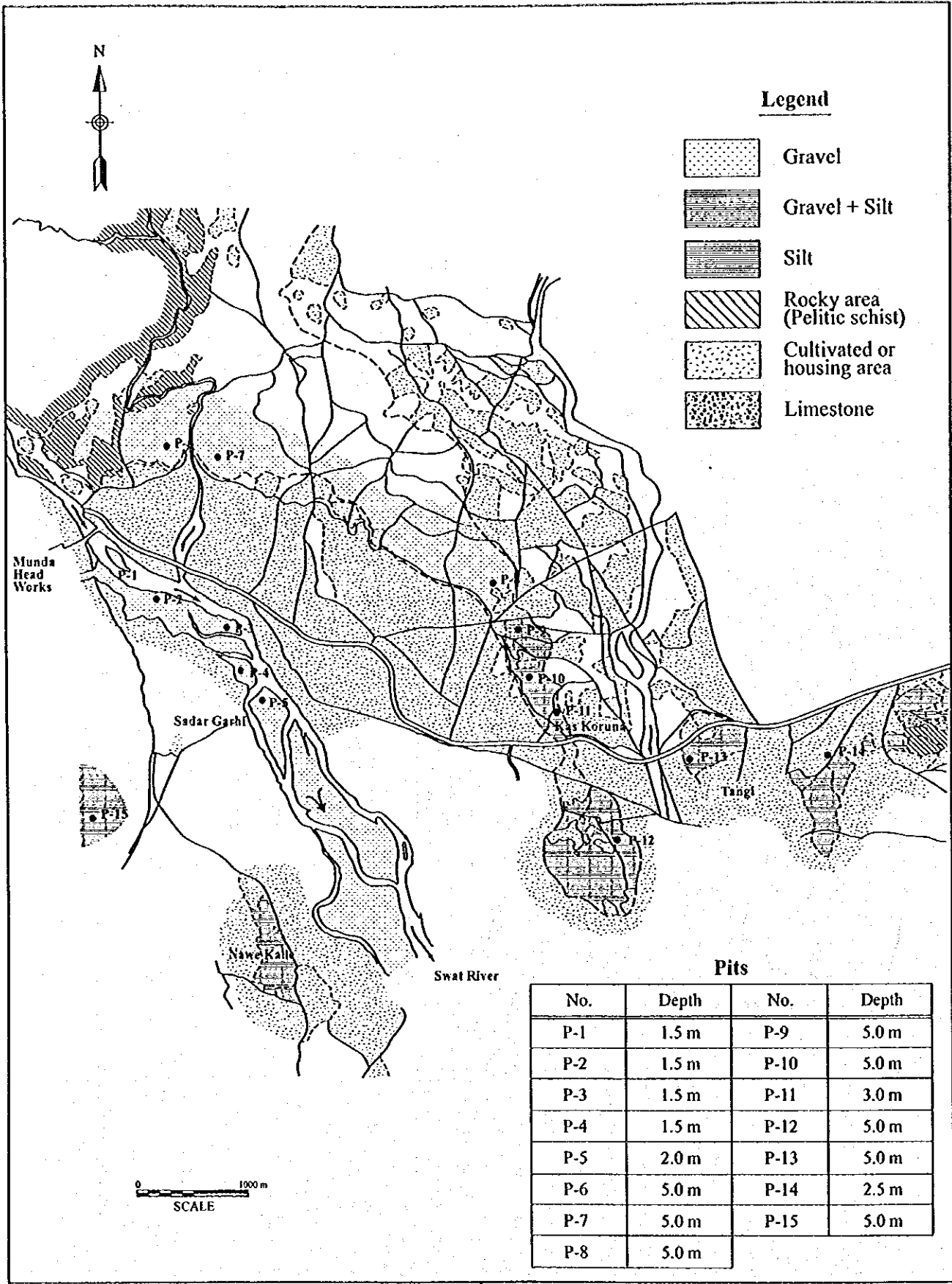






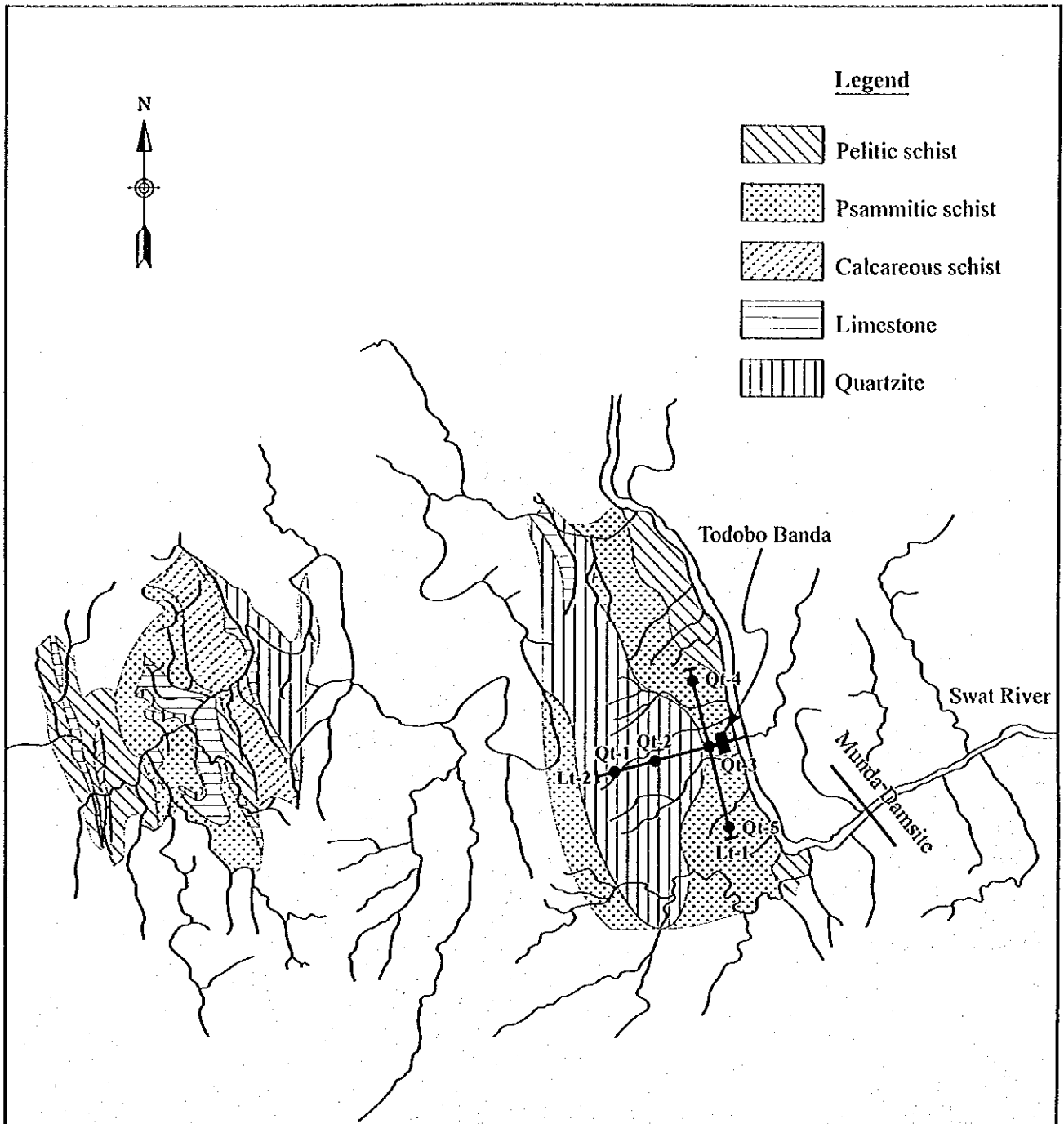
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Figure 3.2.7  
 Location Map of Quarry Sites and Borrow Areas



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Figure 3.2.8  
 Geological Map of Borrow Areas and  
 Location Map of Test Pits

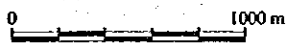


**Seismic Prospecting Line**

No.	Length
Lt-1	1,080 m
Lt-2	850 m

**Drill Holes**

No.	Depth
Qt-1	50 m
Qt-2	100m
Qt-3	50 m
Qt-4	50 m
Qt-5	50 m

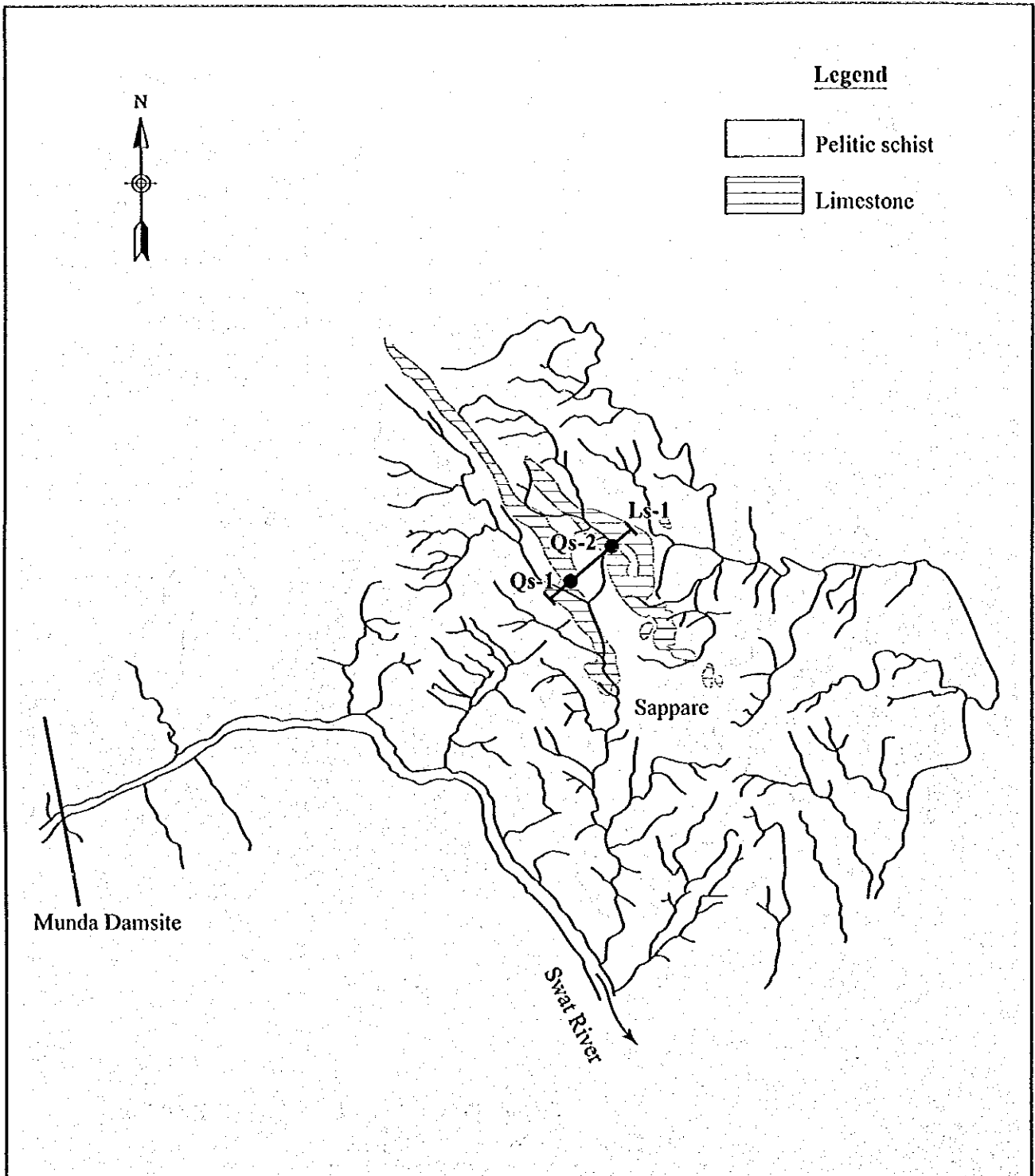


**SCALE**

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**Figure 3.2.9**

**Geological Map of Todobo Banda Quarry Site**

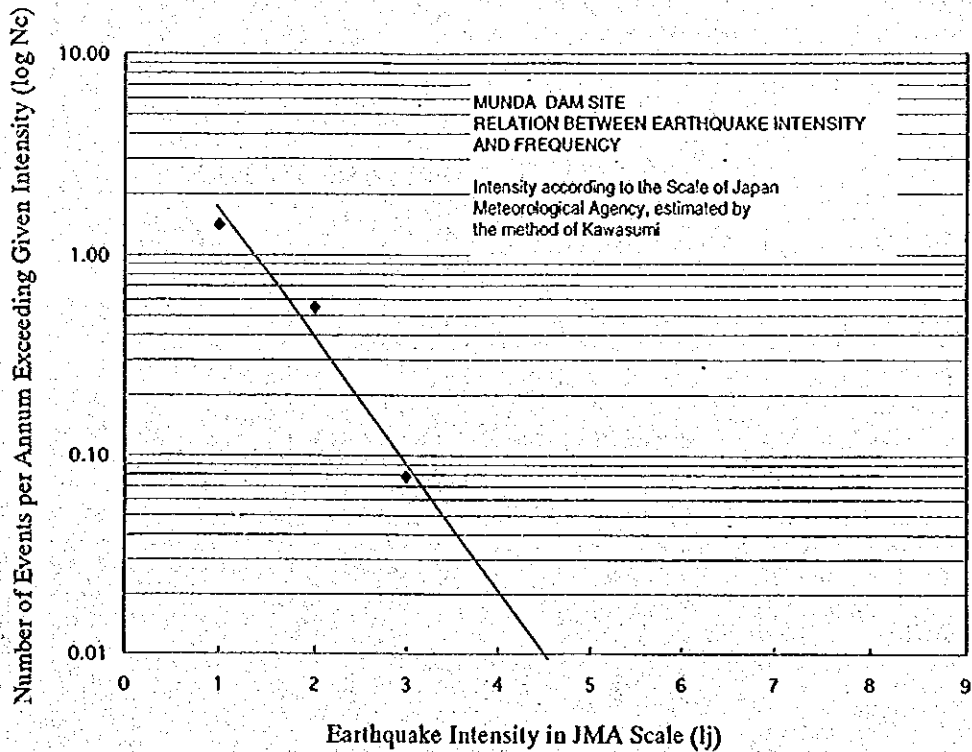
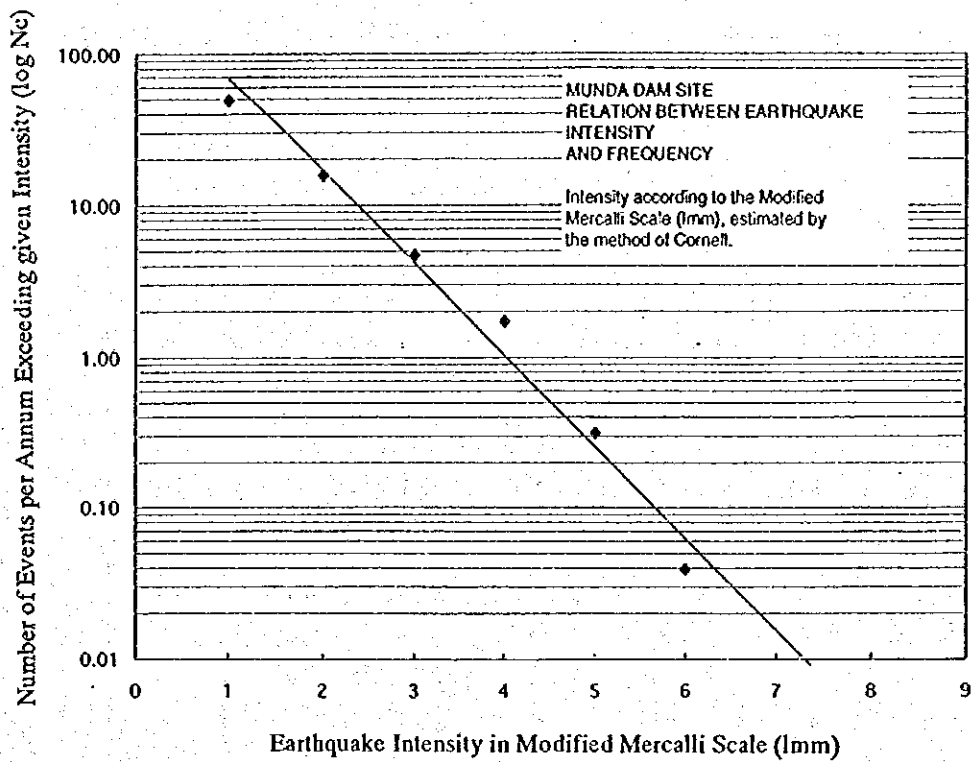


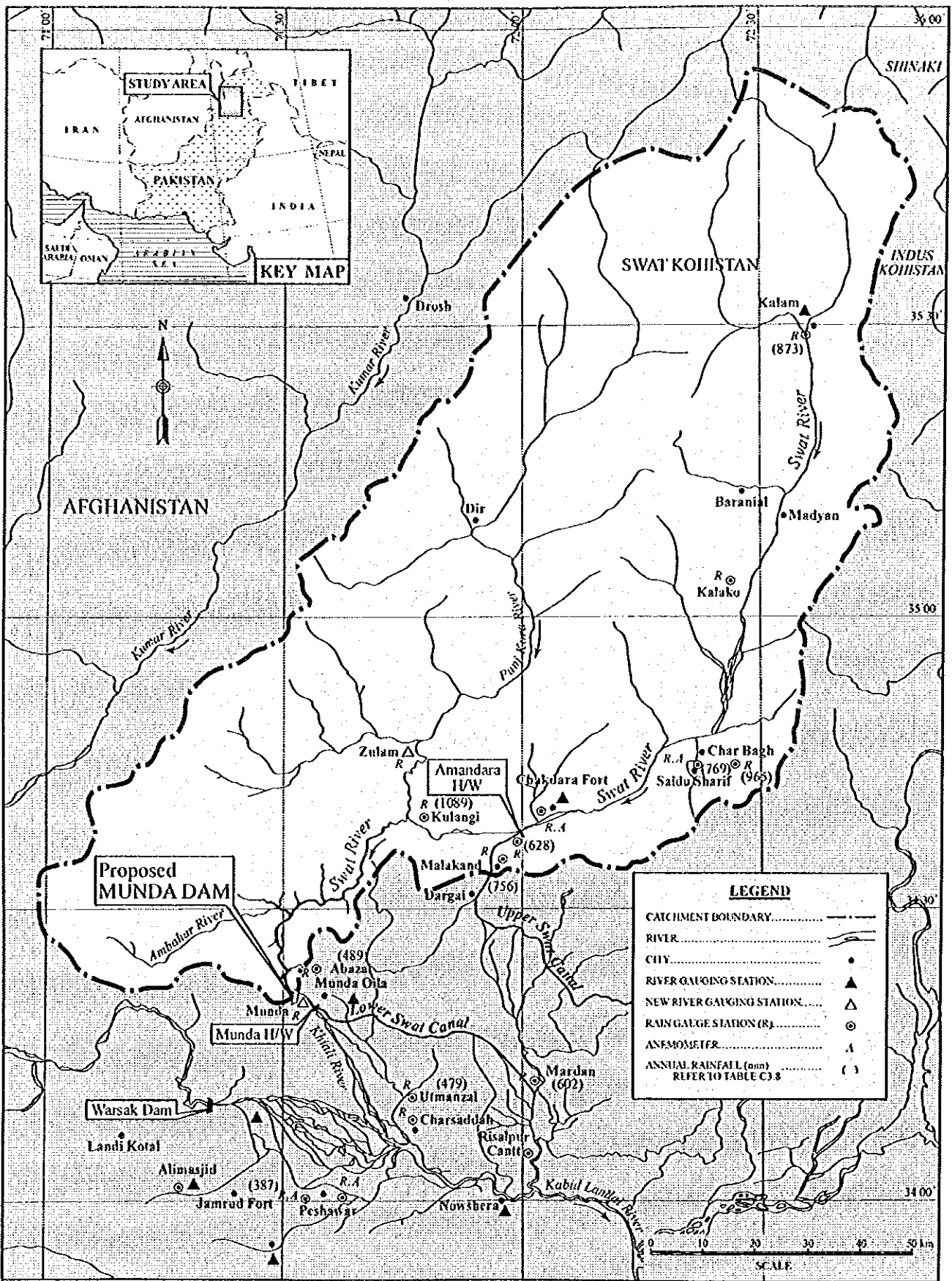
Seismic Prospecting Line		Drill Holes	
No.	Length	No.	Depth
Ls-1	520 m	Qs-1	50 m
		Qs-2	100m

0 1000 m  
SCALE

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Figure 3.2.10  
Geological Map of Sappare Quarry Site





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Figure 3.3.1  
 Existing Hydrometeorological Stations along Swat River

Figure 3.3.2  
**Inventory of the Meteorological Data Collected**  
 during Field Investigation Stage

	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	Data sources					
<b>1. Temperature, Pressure, Humidity, Wind</b>																																												
1. Peshawar (Monthly Av)																																												IRR(F)
2. Saidu Sharif																																												PMS
3. Kalam																																												SWHP
4. Mardan																																												SWHP
<b>2. Rainfall</b>																																												
1. Kalam																																												SWHP
2. Charbagh																																												IRR(F)
3. Kullangi																																												IRR(F)
4. Abazai																																												IRR(F)
5. Peshawar																																												IRR(F)
6. Umanzai																																												IRR(F)
7. Amandira																																												IRR(F)
8. Malakand																																												IRR(F)
9. Saidu Sharif																																												IRR(F)
10. Mardan																																												PMS
11. Karora																																												SWHP
12. Tolakan																																												IRR(F)
<b>Hourly</b>																																												
1. Kalam																																												SWHP
2. Mardan																																												IRR(F)
3. Saidu Sharif																																												IRR(F)
<b>3. Evaporation</b>																																												
Daily																																												
1. Kalam																																											SWHP	
2. Mardan																																											SWHP	

Data Sources:  
 IRR(F) Irrigation Department NWFP  
 SWHP Surface Water Hydrology Project WAPDA  
 PMS Pakistan Meteorological Services

○ Data available from Pre F/S on Average Monthly Basis (ref. 4)  
 ◼ Data collected during Field Investigation Stages

	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	Data sources															
Discharge																																												IRR(F)														
1. Munda (Discharge) (H-Q curve) (Water Level)							○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	IRR(F)										
2. Kalam (Discharge) (H-Q curve) (Water Level)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	SWHP SWHP SWHP					
3. Chakdara (Discharge) (H-Q curve) (Water Level) (Hourly Hydrograph)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	SWHP SWHP SWHP SWHP				
4. Nowshera (Discharge) (H-Q curve) (Water Level)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	SWHP SWHP SWHP		
5. Warsak (Discharge) (H-Q curve) (Water Level)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	SWHP	
6. Lower Swat Canal	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	IRR(F)	
7. Doaba Canal	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	IRR(F)

○ Data available from Pre F/S on Average Monthly Basis (ref. 4)  
 ○ Data available WAPDA Reports on Average Monthly Basis (ref. 3)  
 ○ Data collected during Field Investigation Stages on Daily Basis  
 ■ Data Sources:  
 IRR(F) Irrigation Department NWFP  
 SWHP Surface Water Hydrology Project WAPDA

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Figure 3.3.3  
 Inventory of the Hydrological Data Collected  
 during Field Investigation Stage