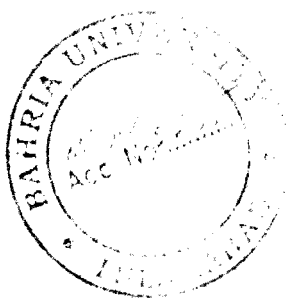
INTERPERTATION OF 2D SEISMIC REFLECTION DATA OF TOBA TEK SINGH AREA, PUNJAB, PAKISTAN



By
HARIS RAZAQ

DEPARTMENT OF EARTH & ENVIRONMENTAL SCIENCES
BAHRIA UNIVERSITY ISLAMABAD
PAKISTAN

Table of Contents

Topics		Page No
Chapter 1	**INTRODUCTION**	1
1.1	**Introduction**	2
1.2	**Introduction To The Toba Tek Singh**	2
1.3	**Objectives**	3
1.4	**General Survey Parameters**	4
1.4.1	875-TTS-215	4
1.4.1.1	Survey Parameters	4
1.4.1.1.1	Sources	4
1.4.1.1.2	Instrument	4
1.4.1.1.3	Cable	5
1.4.1.2	Processing Sequences	5
1.4.1.3	Spread Diagram	6
1.4.1.4	Scales	6
1.4.1.5	Display Parameters	6
1.4.2	875-TTS-216	6
1.4.2.1	Survey Parameters	6
1.4.2.1.1	Source	6
1.4.2.1.2	Instruments	7
1.4.2.1.3	Cable	7
1.4.2.2	Processing Sequence	8
1.4.2.3	Spread Diagram	8
1.4.2.4	Scale	8
1.4.2.5	Display Parameter	8

Topics		Page No
Chapter 2	**SEISMIC METHODS**	9
2.1	**Introduction**	10
2.2	**Basic Principle Of Seismic**	10
2.3	**Types Of Seismic Methods**	11
2.3.1	Refraction Method	11
2.3.1.1	Critical Refraction	12
2.3.2	Reflection Method	13
2.4	**Seismic Waves**	13
2.4.1	Types Of Seismic Waves	13
2.4.1.1	Body Waves	13
2.4.1.1.1	P–Waves (Primary Waves)	14
2.4.1.1.2	S-Waves (Secondary waves)	14
Chapter 3	**SEISMIC DATA ACQUSITION**	15
3.1	**Introduction**	16
3.2	**Energy Sources**	17
3.2.1	Impulsive Energy Sources (Dynamite)	17
3.2.2	Non Impulsive Sources (Vibroseis)	17
3.3	**Profile Array**	17
3.4	**Acquisition Setup**	17
3.5	**Basic Spread**	18
3.5.1	End Spread(end on)	18
3.5.2	In-Line Offset Spread	28
3.5.3	Split Spread	18
3.5.4	Cross Spread	19

Topics Page No

3.5.5 L-Spread 19
3.5.6 Fan Shooting 19
3.6 Recording Instrument 20
3.6.1 Geophone 20

Chapter 4 SEISMIC DATA PROCESSING 21

4.1 Introduction 22
4.1.1 Data Reduction 22
4.1.1.1 Demultiplexing 23
4.1.1.2 Correlation 23
4.1.2.1 Cross Correlation 24
4.1.2.2 Auto Correlation 24
4.1.2 Geometric Correlation 24
4.1.2.1 Static Correlation 24
4.1.2.1.1 Weathering Correlation 24
4.1.2.1.2 Elevation Correction 25
4.1.2.2 Dynamic correction 25
4.2 Filtering 27
4.2.1 Digital Filters 28
4.2.2 Linear Filters 28
4.2.3 Alias Filter 28
4.2.4 Pass Filter 29
4.2.5 Notch Filter 29
4.2.6 F-K Filter 29

Topics Page No

4.3 **Deconvolution** 29

4.4 **Data Refinement** 30

4.4.1 Stacking 30

4.4.2 Migration 30

Chapter 5 **SEISMIC DATA INTERPERTATION** 31

5.1 **Introduction** 32

5.2 **Approaches For Interpretation** 32

5.2.1 Stratigraphic Analysis 33

5.2.2 Structural Analysis 33

5.4 **Seismic Time Section** 33

5.5 **Steps In Interpretation** 33

5.6 **Depth Section** 34

5.6.1 Estimation Of Horizon Depth 34

5.6.1.1 Mean Average Velocity Line Method 34

5.7 **Conclusions** 52

5.8 **References** 53