

سامية محمد مصطفى



شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



سامية محمد مصطفى



شبكة المعلومات الجامعية



شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



سامية محمد مصطفى



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



سامية محمد مصطفى



شبكة المعلومات الجامعية



بعض الوثائق الأصلية تالفة



سامية محمد مصطفى



شبكة المعلومات الجامعية



بالرسالة صفحات
لم ترد بالأصل



DEPARTMENT OF GEOLOGY
FACULTY OF SCIENCE
MINUFIYA UNIVERSITY



OPTIMIZING SOME SEISMIC ACQUISITION AND PROCESSING PARAMETERS QARUN AREA WESTERN DESERT

THESES

SUBMITTED TO THE DEPARTMENT OF GEOLOGY,
FACULTY OF SCIENCE, MINUFIYA UNIVERSITY
PARTIAL FULFIMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER
OF SCIENCE IN GEOPHYSICS

BY

KARAM MOHAMED HAFEZ

B.Sc. GEOLOGY (1991)

DIP. GEOPHYSICS (1995)

لجنة التكميم

د. محمد عبد الغنى الحفناوى
د. مصطفى حليم النزيل
د. محمد ايتى حاتم
د. ماسر محمد محمد

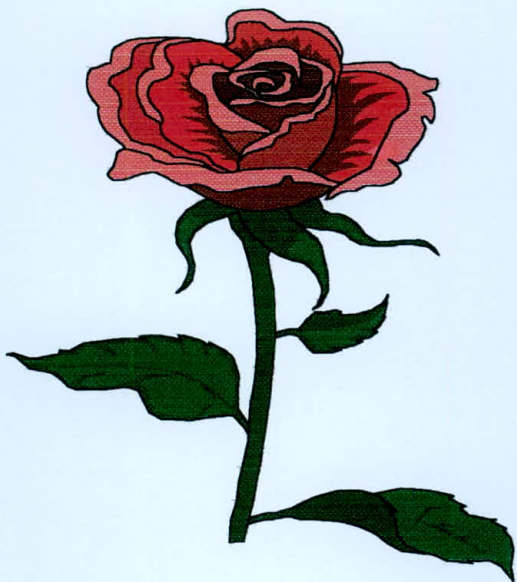
SUPERVISOR

DR. HASSAN M. Y. EL-SHAYEB
ASSIS. PROF. OF GEOPHYSICS
FACULTY OF SCIENCE
MINUFIYA UNIVERSITY

DR. ALY M. BAKR
SN. STAFF GEOPHYSICIST
APACHE QARUN CORPOR.
PETROLEUM COMPANY

July
2002

M. F. Bayoum
3/8/2002



TO MY PARENTS
AND MY WIFE

LIS OF ABBREVIATIONS

AGC	Automatic gain control
CDP	Common Depth Point
CMP	Common mid point
DB	Decibel
DB/OCT	Decibel/Octave
Decon	Deconvolution
DMO	Dip moveout
2D	Two Dimensional Seismic
3D	Three Dimensional Seismic
E	East
ENE	East Northeast
E(K)	Response of linear array
F	Temporal frequency
FT	Feet
Ft./sec.	Feet /seconds
Hz	Hertz
K	Spatial frequency
LB	Lower Bahariya
Msec.	Milliseconds
Mig.	Migration
m.d.	millidarcy
m/s	Meter/seconds
N	North
NE	Northeast
NE-SW	Northeast-Southwest
NMO	Normal move out
NW-SE	Northwest-Southeast
OCT	Octave
PGS	PGS Tensor
R	Receiver point
Sec	Seconds
SEG	Society of Exploration Geophysicis
S/N	Signal to Noise ratio
SW	Southwest
T	Periodic time of signal
V	Apparent velocity of wave
Vel	Velocity
Vps	Vibration poi

V_w	Velocity of seismic wave in weather layers
V_b	Velocity of seismic wave in bed rock
ΔX	Element Spacing in noise test
λ	Apparent wavelength of noise wave
α	The incident angle of wave
β	The refracted angle of wave
φ	The incident angle of wave in critical refraction

CONTENTES

ACKNOWLEDGMENT	PAGE
CHAPTER 1: INTRODUCTION	1
(1-1) General	1
(1-2) Location	2
(1-3) Literature Review.....	3
(1-4) Aim of study	5
(1-5) Geologic setting	10
(1-5.1)Stratigraphy	10
(1-5.2)Structure	11
(1-5.3)Topography	13
CHAPTER 2: DATA BASE	15
(2-1) 2D Seismic Data	15
(2-1.1) SQ 2D seismic data	15
(2-1.2) 94 2D seismic data	17
(2-1.3) 95 2D seismic data	22
(2-1.4) 96 2D seismic data	27
(2-2) 3D Seismic Data	33
(2-2.1) 1995 3D seismic data	33

(2-2.2) Pilot 3D seismic data	38
(2-2.2) Phase 1 3D seismic data	42
CHAPTER 3: ANALYSIS AND SUPPRESION OF SEISMIC NOISE	48
(3-1) Introduction	48
(3-2) Noise test	50
(3-3) Array design principles	52
(3-4) Array combination and the roll of thumb.....	54
(3-5) Array response	58
(3-6) Noise test in Qarun area.....	58
(3-7) Study different array response in Qarun area.....	67
CHAPTER 4: STATICS	77
(4-1) What are statics	77
(4-2) Types of static corrections	80
(4-2.1) Uphole statics.....	80
(4-2.2) Refraction statics	82
(4-2.3) Tomostatics	89
(4-3) Types of static problems in Qarun area.....	92
(4-4) Sever effect of static in seismic prospecting Qarun area	96

CHAPTER 5: DIFFERENT 3D SIESMIC DESIGN IN QARUN AREA.....110

(5-1) Introduction110

(5-1.1) Land acquisition geometry.....113

(5-1.2) 3D Data processing.....115

(5-2) 3D In Qarun area.....115

(5-3) Todi's Stacking velocity inversion.....127

CHAPTER 6: CONCLUSION AND RECOMMENDATION.....139

LIST OF FIGURES

<u>FIGURE</u>	<u>TITLE</u>	<u>PAGE</u>
(1-1)	Location map representing the area of study.....	3
(1-2)	Thick sedimentary section.....	6
(1-3)	Thin sedimentary section.....	7
(1-4)	Bad 3D shot record.....	9
(1-5)	Main geological Unites and there corresponding seismic characters.....	12
(1-6)	Photomap of the study area.....	14
(2-1)	Source array pattern of 1994 2D seismic data.....	19
(2-2)	Receiver array pattern of 1994 2D seismic data.....	20
(2-3)	Source array pattern of 1995 2D seismic data.....	24
(2-4)	Receiver array pattern of 1995 2D seismic data.....	25
(2-5)	Source array pattern of 1996 2D seismic data.....	30
(2-6)	Receiver array pattern of 1996 2D seismic data.....	31
(2-7)	Source array pattern of 1995 3D seismic data.....	35
(2-8)	Receiver array pattern of 1995 3D seismic data.....	36
(2-9)	Receiver & Source array patterns of 1997 Pilot 3D seismic data.....	41
(2-10)	Source array pattern of 1998 Phase1 3D seismic data.....	45
(2-11)	Receiver array pattern of 1998 Phase1 3D seismic data.....	46
(3-1)	Two types of noise test layout.....	51

(3-2)	Portion of a continuous section for an in-line wave test.....	53
(3-3)	Combined spectra effect.....	56
(3-4)	Convolution of 4 vibroseis with 8 sweep.....	57
(3-5)	Array response for 6 geophones spaced at 15.5 feet.....	59
(3-6)	L shaped spread with 120 channels.....	60
(3-7)	Row data with AGC applied to VPs.....	62
(3-8)	The data after vertical summing of 12 stations.....	63
(3-9)	Analysis of noise in Qarun area.....	64
(3-10)	Analysis of true signal in Qarun area.....	66
(3-11A)	Source array pattern of 1994 (2D) seismic data.....	68
(3-11B)	Source array response of 1994 (2D) seismic data.....	69
(3-12A)	Source array pattern of 1995 (2D) seismic data.....	70
(3-11B)	Source array response of 1995 (2D) seismic data.....	71
(3-13A)	Source array pattern of 1996 (2D) seismic data.....	72
(3-11B)	Source array response of 1996 (2D) seismic data.....	73
(3-13C)	Receiver array pattern of 1996 (2D) seismic data.....	74
(3-11D)	Receiver array response of 1996 (2D) seismic data.....	75
(3-11E)	Convolution (source + receiver) array response of 1996 (2D) seismic data	76
(4-1)	Static model.....	78
(4-2A)	Short wavelength & long wavelength statics.....	80
(4-2B)	Statics and average velocity	80

(4-3)	Uphole static interpolation.....	81
(4-4)	A near surface model for static corrections.....	81
(4-5)	Computing static model.....	83
(4-6)	Schematic shot record with seismic wave travel.....	83
(4-7)	Snell law and critical refraction.....	84
(4-8)	Refraction ray path for horizontal & dipping reflector.....	85
(4-9)	Geometry of the Plus-Minus methods.....	87
(4-10)	Pull up & pull down of seismic reflectors.....	92
(4-11A)	Basaltic outcrops and its effects in data Quality.....	94
(4-11B)	Pull down of seismic reflectors under channel deposits.....	95
(4-12)	Static solution using constant replacement velocity (1700m/s)	97
(4-13)	Two way time structure contour map with anomaly at line 96- 14	98
(4-14)	Elevation static map with anomaly in the area of line 96-14	100
(4-15)	Static solution using refraction static.....	101
(4-16)	Two way time structure contour map using refraction static data	102
(4-17)	Static solution using Tomostatic static.....	103
(4-18)	Uninterpreted seismic line 96-10 using Replacement velocity (1700m/s)	105
(4-19)	Interpreted seismic line 96-10 using Replacement velocity (1700m/s)	106