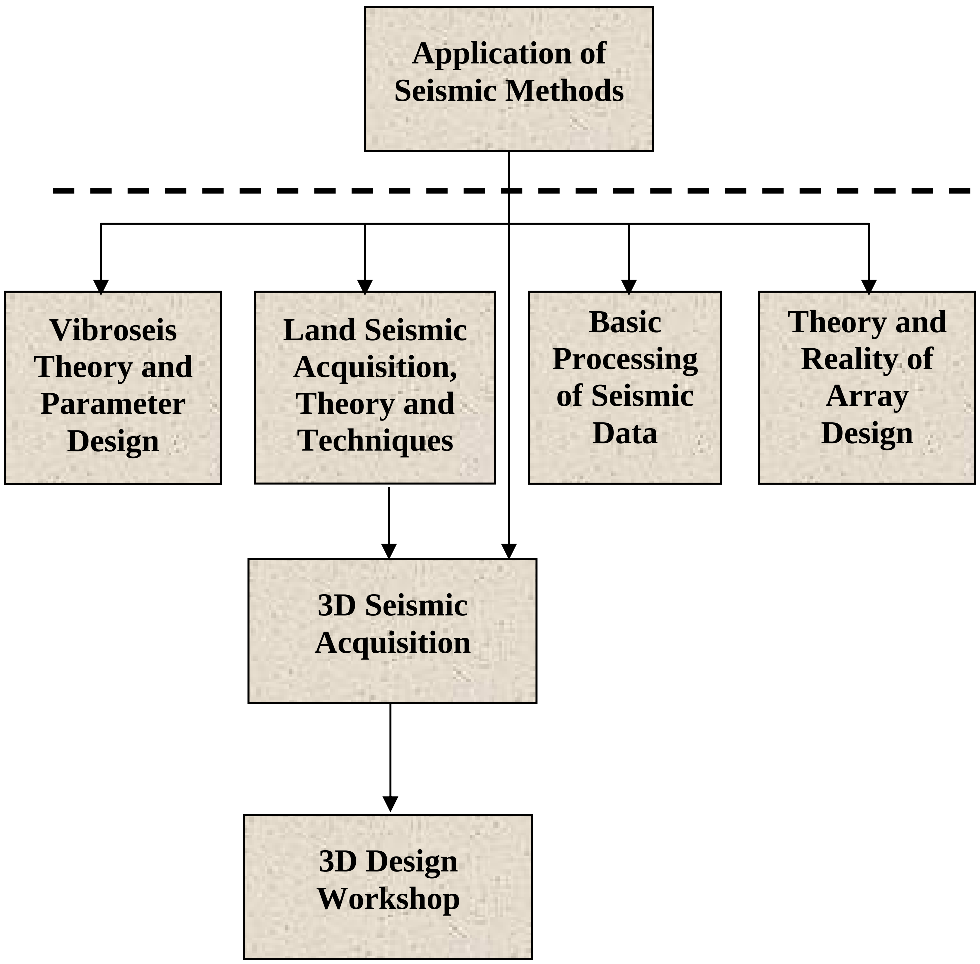
Mustagh Resources Ltd.

ANNOUNCES SEISMIC COURSES TO BE OFFERED IN CALGARY BY NORM COOPER DURING 2007

COURSE FLOW



WHO SHOULD ATTEND:

Non-geophysicists or Junior geophysicists

Experienced geophysicists and/or those who have taken the Application of Seismic Methods course.

Experienced geophysicists and those who have taken either the Application of Seismic Methods or the Land Seismic Acquisitions course.

Experienced geophysicists who have taken the 3D Seismic Acquisition course.

SCHEDULE		**PRICE ($ CAN)**
AOSM:	May 7-11, Jul 2-6, Sept 10-14	$2200 + GST = $2332
BP:	May 1-4, Jun 26-29, Sept 4-7	$2000 + GST = $2120
LSATAT:	May 22-23, Jul 17-18, Sept 18-19	$1100 + GST = $1166
VTAPD:	May 28-29, Jul 23-24, Oct 2-3	$1100 + GST = $1166
3DSA:	May 24-25, Jul 19-20, Sept 20-21	$1200+ GST = $1272
3D Design Workshop:	May 31, Jul 26, Oct 5	$700 + GST = $742
Array Design Seminar:	May 30, Jul 25, Oct 4	$500 + GST = $530

For a complete outline of the courses and registration, please visit our Webpage: www.mustagh.com or call Yajaira Herrera @ +1 (403) 265-5255.

COURSE DESCRIPTIONS

"Application of Seismic Methods". Is an overview of reflection seismic methods that lasts 5 days and is for non-geophysicists or junior geophysicists who are interested in a good understanding of the seismic tool. The interplay of acquisition, processing and interpretation is emphasized. Some of the areas covered are: basic background geology, rock properties, resolution and bandwith, energy loss mechanisms, the receiver, energy source, correlation and vibroseis, design of vibroseis parameters, convolution and deconvolution, the CDP method and stacking charts, basic processing, aliasing, instrumentation, array theory and evaluation of noise, 3D design and case histories.

"Land Seismic Acquisition, Theory and Techniques". It is a two-day course in 2D acquisition tools and methods designed for the experienced geophysicist. It reviews technical and operational considerations to optimize programs for your exploration targets. Each program parameter is discussed and its impact on the success of the program is examined. An appreciation of the impact of field techniques on the quality of the final interpreted product will be emphasized. In more depth, some of the subjects discussed are: the energy source, receivers, CDP Method and stacking charts, instrumentation, spatial sampling and aliasing, evaluation of noise and array designs, and what to do during the field visit. This course also offers a half-day workshop in 2D parameter determination. It is assumed that participants have a thorough understanding of and experience using the seismic method.

"Vibroseis Theory and Parameter Design". Is a two-day course for experienced geophysicists, Vib technicians and those who have taken the Application of Seismic Methods course, that provides an overview of the myriad of parameters available in modern vibroseis programs. The significance of each parameter is discussed and guidance is provided for optimizing parameters for your objectives. This course also reviews the physical and electronic construction of the vibrator system, the correlation technique, sweep effort and production time, tapers, non-linear sweeps, dual source vibroseis, as well as modern techniques such as HI-FI and slip sweep. By developing a sound understanding of the working of vibrators, participants will gain an appreciation for the techniques used to quality control vibroseis operations.

"3-D Seismic Acquisition, Design and Quality Control". Develops a logical sequence of procedures used to determine the optimum 3-D parameters to meet your exploration objectives. The success of 3-D programs depends a great deal on achieving the correct spatial and statistical sampling of the wavefield taking into consideration the realistic implementation of the design. The areas studied in this two day course are: overview of the 3D technique, considerations of the geology and the seismic program, 3D design, fold, offset considerations, line spacing, bin size, skids and offsets, 3D model types, channel requirements, array theory, advanced 3D techniques and case histories. This course is recommended for experienced geophysicists.

“3-D Design Workshop” The purpose of this one-day workshop is to provide the students with the hands-on experience required to design 3D surveys. From beginning to end the participants will be guided throughout the complex task of determining the best design parameters for orthogonal and MegaBin surveys based on the exploration objectives such as the zones of interest, surface limitations, seismic acquisition, economics, etc using Mustagh’s DirectAid software. It is recommended for geophysicists experienced in 3D design who have taken the 3D Seismic Acquisition course.

“Theory and Reality of Array Design for 2D and 3D Seismic Programs” This half-day seminar is prompted by the controversy over the benefits and detriments of arrays in modern seismic programs. It will provide a discussion of all aspects of array implementation with specific regard to the impact on both signal and noise. A review of theory will be complemented by practical considerations and guidelines for field operations will be addressed. Various aspects will be covered, including geophone arrays (potted vs. distributed), vibroseis arrays, digital sensors and arrays in a 3-D world. Participants will receive a handy software tool for signal and arrays analysis.

“Basic Processing of Seismic Data” It is a 4 day course that covers the basics of seismic signal processing. It offers an overview of seismic concepts, signal and noise analysis of shot records, first breaks and datum corrections, stacking charts and CDP method, deconvolution, velocity analysis, surface consistent statics, F-K transforms and filters, and post and pre-stack migration. This course is suggested for those wanting a familiarity with seismic processing and is not intended as a training ground for processors.

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3D SEISMIC ACQUISITION, DESIGN AND QUALITY CONTROL
COURSE OUTLINE

- **Introduction**
- **Overview of the 3D Technique**
  - Summary of 2D
  - Swath shooting
  - 3D imaging
  - Basic statistics comparing 2D and 3D
  - Basic aspects of a 3D program and definition of terms
  - Rolling the patch and building the fold
  - Determining 3D fold
  - Geometric imprinting
- **3D Design Considerations**
  - Overall survey size and shape
    - Cover beyond the anomaly
    - Margin of poor statistics
    - Migration aperture and Fresnel zone
    - Alignment with strike/dip or land boundaries
    - Avoiding migration artifacts
  - Deciding on the desired fold
    - Signal to noise enhancement
    - 3D advantages of migration
    - 3D advantages of offset distribution
    - Is fold our most important parameter?
  - Offset considerations
    - Maximum limits
      - Interference with muted first breaks
      - Moveout stretch
      - Mode conversion
      - Energy loss due to spherical divergence
    - Minimum limits
      - Sufficient moveout for velocity analysis
      - Sufficient moveout for multiple discrimination
      - Refraction analysis
      - Amplitude vs Offset analysis)
  - Source / Receiver line spacings
    - Desired fold within offset limits (fold driven vs bin driven designs)
    - Fold at shallow events
    - Aspect ratio
    - Desired wave field sampling in all domains
    - Trade offs and compromises
  - Bin size
    - As related to surface sampling
    - Aliasing of structural dips
    - Aliasing of lateral velocity changes (diffractions)
    - Aliasing of NMO at far offsets
    - Aliasing of coherent noise
    - Interpretation confidence for small features
  - Advanced Techniques: Bin geometry
    - Fractionated bins
    - Bin balancing – offset intelligence
    - Fractionation of bins by mid-point scattering
  - Skidding and offsetting
  - Velocity and azimuth
  - Statistics and surface consistent algorithms
  - 3D Parameters & land seismic acquisition
    - Offset
    - Fold
    - Group interval
    - Source interval
    - Spread geometry
    - Channels required
    - Source type: dynamite, vibroseis
- **Trapped Mode and Guided Waves, A common noise problem**
- **3D Megabin vs Orthogonal Grid**
- **Analysis of Statistics**
  - SL and RL constant, GI varies
  - Variable RL and SL, GI constant, constant aspect ratio RL/SL
  - Variable aspect ratio RL/SL, fold constant
  - Narrow patch implications
- **Basic 3D Model Types**
  - Offset grid
  - Fractionated grid
  - Double Brick grid
  - Triple Brick grid
  - Diagonal grid
  - Megabin grid
  - Random grid
  - Planned Random grid
  - When is a Brick Wall Weak?
- **Spatial Sampling and Aliasing**
  - Seismic record from space
  - F-K plots and geophone interval
  - Geophone arrays as spatial anti-alias filters
  - F-K filtering
    - Filtering of well sampled data
    - Problems of filtering sparsely sampled data
    - Mild filtering to pass all signal
    - Harsh filtering to attenuate all noise
- **Array Theory**
  - Array Design
    - Simple linear array design
    - Optimizing a two sub-array system
    - Optimizing a three sub-array system
  - Vibrator arrays
  - Estimating signal wavelengths
    - Calculating apparent wavelength vs offset plus frequency
    - 3D Response In Line, Cross Line, Combined
    - Ghosting in the dynamite signature
- **3D Design Work Example, Integration of Design Concepts and Trade Offs**
    - Patch analysis
    - Crossline summary
    - Fold histogram
- **Case Histories**
    - 3D Seismic and Horizontal Drilling
    - 3D Seismic Out of Plane Resolution
    - Unnecessary dry holes
    - How little we know about geology

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LAND SEISMIC ACQUISITION, THEORY AND TECHNIQUES
COURSE OUTLINE

- **Introduction**
  - The Fundamental Seismic Principle
  - Resolution and Bandwith
  - Energy Loss Mechanisms

- **The Energy Source**
  - Desired source qualities
  - Dynamite
    - Conventional, Poulter
    - Other surface charges
  - Vibroseis
    - Structure of a typical vibrator unit
    - Servo-valve power stage
    - Ground force signal, Correlation
  - Airgun
    - In water, On land
  - Others
    - P-Shooter, Hydra-Pulse, Vacu-Pulse
    - Betsy, Mini-Sosie, Marthor

- **The Receiver**
  - Desired receiver qualities
  - The geophone
    - Frequency, Damping, Coupling
  - The geophone string
    - Electrical advantage
    - Statistical advantage
    - Superposition advantage
    - Spatial anti-alias filter
    - Determination of coherent noise

- **CDP Method and Stacking Charts**
  - The superposition principle
  - The Multi-channel record
  - Calculation of nominal fold
  - Stacking charts
  - Bent lines

- **Analogue, Digital and Aliasing**
  - Analogue signal recording
  - Digital signal recording
  - Aliasing in time

- **Seismic Instrumentation**
  - Need for greater dynamic range
  - Basic structure of IFP instruments
  - Distributed telemetry systems
    - Cables losses, Advantages, Disadvantages
  - Delta Sigma systems
    - Delta Sigma and noise shaping
    - 2^{nd} order modulator
    - Delta Sigma and decimation filtering
    - Delta Sigma and 24-bit recording
    - Delta Sigma and dynamic range
  - ARAM, I/O, Sercel
  - I/O Digital sensor
  - Instrument tests and quality control

- **Spatial Sampling and Aliasing**
  - The seismic record in space
  - F-K plots and geophone intervals
  - Geophone arrays as spatial anti-alias filter
  - F-K filtering

- **Review of the Seismic Record**
  - Direct wave, refractions and other linear events
  - Reflections and multiples, velocity analysis
  - Other noise events
  - Offset considerations

- **Trapped Mode**

- **Evaluation of Noise**
  - Assorted noise
  - Ghost
  - Charge seize and depth tests
  - Random noise and determination of fold
  - Analysis of coherent noise
  - Array Theory
    - Signal to noise ratio in the wave number domain
    - Simple linear array design
    - Effective array length
    - Array response
    - Spatial convolution of linear arrays
    - Vibrator arrays
  - Estimating signal wavelengths
    - Apparent wavelength vs offset plus frequency
    - 3D Response In Line, Cross Line, Combined
  - Ghosting in the dynamite signature

- **What to do in the Field Visit**
  - In the dog-house

- **½ Day Workshop**
  - Parameter determination

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BASIC PROCESSING OF SEISMIC DATA
COURSE OUTLINE

- **Introduction**
- **Overview**
  Review of basic seismic principles
  Sampling the wavefield
  Aliasing in time and space
  Bandwidth, phase and resolution
  Energy loss mechanisms
  3D basics
  Acquisition tools and techniques
  Land versus Marine
  Recent developments
- **Modeling**
  Synthetic seismograms
  Ray tracing
  Full Wave Equation models
    Acoustic
    Elastic
    Anisotropic
- **Review of some shot records**
  What is signal?
  What is Noise?
    Random, time variant
    Source variant
    Receiver variant
    Offset variant (source generated)
  Multiples
    Marine
    Land
  Trapped Mode
    Guided waves
- **First Breaks and LVL**
  Direct waves
  Refractors
  LVL and datum corrections
  Detailed refraction surveys
  Uphole surveys
  Survey tolerances
- **CDP Method**
  Basic principles
  Stacking charts
  Bent line processing and binning
  Stack array
  Gaps, skids and offsets
- **Gain Recovery**
  Exponential
  AGC
  Surface consistent
  AVO considerations
- **Deconvolution**
  Convolutional model
  Basic deconvolution
  Prewhitening
  Operator length
  Surface Consistent
  AVO considerations
- **Velocity Analysis**
  NMO
  Semblance
  Common offset stacks
  Common velocity stacks
  Stretch mute
  Multiples
  High order moveout
  Anisotropy and eta terms
  AVO considerations
- **Statics**
  Surface consistent
  Iteration
  Non-surface consistent
  Correlation Trim statics
- **Filtering and Noise Suppression**
  Temporal
  Spatial
  Geophone arrays as spatial anti-alias filters
  F-K filtering
    Filtering of well sampled data
    Problems of filtering sparsely sampled data
    Mild filtering to pass all signal
    Harsh filtering to attenuate all noise
  FX Prediction and Projection
  Karhunnen-Loeve (Eigen filtering)
  AVO friendly verus non-friendly methods
- **Migration**
  Basic Principles and Kirchoff methods
  Migration velocities
  Aperture
  FK (Stolt)
  Finite Difference
  Post-Stack
  Pre-stack Time
    Migration to gathers
    Migration to non-natural bins
  Depth Imaging
- **Other considerations**
  Spectral Balancing
  Inversion
  AVO applications
  AVA applications
  Converted waves
  VSPs
- **Case Histories**
  3D Seismic and Horizontal Drilling
  3D Seismic Out of Plane Resolution
  Unnecessary dry holes
  How little we know about geology

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VIBROSEIS THEORY AND PARAMETER DESIGN
COURSE OUTLINE

- **Introduction**
- **The Fundamental Seismic Principle**
  - Average velocity
  - Modes of acoustic energy propagation
    - Compressional wave, Shear wave
    - Raleigh wave, Others
  - Rock properties
    - Interval velocity
    - Density
    - Poisson's ratio
  - Propagation of a P-wave
  - A simple seismic experiment
  - A basic reflection model
    - Effect of wavelet length
    - Effect of signal to noise ratio
- **Basic Signal Theory**
  - Properties of the cosine wave
  - Fourier decomposition
  - The effect of phase
  - The effect of amplitude
  - Principles of filtering
- **Resolution and Bandwith**
  - Simple wedge model – variable bandwith
  - Simple wedge model – variable phase
  - Simple wedge model – variable signal/noise ratio
  - Bandwith
- **Energy Loss Mechanisms**
  - Reflection coefficients and transmission losses
  - Mode conversion and energy partition
  - Spherical divergence
  - Absorption
- **The Energy Source**
  - Desired source qualities
  - Dynamite vs Vibroseis
  - Vibroseis – Structural aspects
  - Vibroseis – Hydraulic aspects
  - Vibroseis – Electrical aspects
  - Vibroseis – Signal theory
- **Correlation and Vibroseis**
  - Overview of correlation
  - Sweep length and noise
  - Noise suppression tools
    - Sweep length
    - Number of sweeps
    - Noise edit algorithms
    - Number of vibrators
    - Array effect
  - Types of noise
  - Balancing sweep effort with production time
    - Sweep effort
    - Pad time
    - Sweep length vs number of sweeps
    - Number of sweeps vs daily production
    - Sweeps vs vibrators
  - Tapers
    - Effect on sidelobes
    - Effect on signal energy and bandwith
    - Tapers as filters
    - Effect on machinery
  - Non-Linear sweeps
    - Linear vs +3 dB/oct Hi-Dwell non-linear sweep
    - +3 dB/oct with tapers
    - +6 dB/oct with tapers
    - -3 dB/oct with tapers
    - Comparison of linear, +3dB/oct & +6 dB/oct sweeps
    - Linear vs Non-linear sweeps –Effect on tapers
    - Linear, +3dB/oct, +6dB/oct and star tapers
    - Linear, +3dB/oct, +6dB/oct and sweep rate
    - Linear, +3dB/oct, +6dB/oct vs –3dB/oct
  - Vari-Sweep
  - Coupling
    - Upsweep vs downsweep
    - Effect of coupling
  - Time delay to onset a distortion
  - Harmonic distortion
  - Benefits of sweep length
  - SerQC plots
- **Evaluation of Noise**
  - Analysis of coherent noise
  - Array Design
    - Simple linear array design
    - Optimizing a two sub-array system
    - Optimizing a three sub-array system
    - Spatial convolution and sub-arrays
- **Trapped Mode and Guided Waves, A common noise problem**
- **Dual Source Vibroseis**
  - Plus-Minus method
  - Up-Down method
  - Vari-Sweep
  - Dual sourcing (Ping-Pong)
  - Slip sweep
- **Sei-Fi Technology**
  - Introduction
  - Data Acquisition: Techniques and equipment
  - Data Processing: Separation and Inversion
  - Pre-stacked and stacked data examples
  - summary

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APPLICATION OF SEISMIC METHODS
COURSE OUTLINE

- **Introduction**
- **Basic Background Geology**
  - Composition of the earth and crustal rock types
  - Sedimentary basins – The layer cake model
  - Some basic structures in a sedimentary basin
  - Fluid migration and hydrocarbons traps
  - Typical hydrocarbon trap types
- **The Fundamental Seismic Principle**
  - Average velocity; the time distance translator
  - Modes of acoustic energy propagation
    - Compressional wave, Shear wave
    - Raleigh wave, Others
  - Rock properties
    - Interval velocity, Density, Poisson's ratio
  - Propagation of a P-wave
  - A simple seismic experiment
  - A basic reflection model
    - Effect of wavelet length and signal to noise ratio
- **Basic Signal Theory**
  - Properties of the cosine wave
  - Fourier decomposition, The effect of phase
  - The effect of amplitude, Principles of filtering
- **Resolution and Bandwith**
  - Simple wedge model – variable bandwith
  - Simple wedge model – variable phase
  - Simple wedge model – variable signal/noise ratio
  - Bandwith
- **Energy Loss Mechanisms**
  - Reflection coefficients and transmission losses
  - Mode conversion and energy partition
  - Spherical divergence, Absorption
- **The Energy Source**
  - Desired source qualities
  - Dynamite
    - Conventional,
  - Vibroseis
    - Structure of a typical vibrator unit
    - Ground force signal
    - Correlation & basic sweep theory
      - Basic correlation of a linear sweep
      - Effects of sweep length and noise
  - Airgun
    - In water, On land
  - Others
    - P-Shooter, Hydra-Pulse, Vacu-Pulse
    - Betsy, Mini-Sosie, Marthor
- **The Receiver**
  - Desired receiver qualities
  - The geophone
    - Frequency, Damping, Coupling
  - The geophone string
    - Electrical, statistical & superposition advantages
    - Spatial anti-alias filter
    - Determination of coherent noise
- **Convolution and Deconvolution**
  - The synthetic model, Convolution
  - The synthetic seismogram and dispersion
  - Deconvolution
- **CDP Method and Stacking Charts**
  - The superposition principle
  - The Multi-channel record
  - Calculation of nominal fold
  - Stacking charts, Bent lines
- **Basic Processing**
  - Geometry, Stacking charts, Gathers
  - First breaks and LVL statics, Deconvolution
  - Reflection and multiples, Velocity analysis
  - Surface consistent statistics and other algorithms
  - Trim statics, Stack, Migration aperture
- **Analogue, Digital and Aliasing**
  - Analogue signal recording, Digital signal recording
  - Aliasing in time
- **Seismic Instrumentation**
  - Earth absorption
  - Need for greater dynamic range
  - Basic structure of IFP instruments
    - Successive approximation A-D converter
      - Dynamic range of A-D converter
    - IFP amplifier, Multiplexer
    - Analogue filters
      - Hi Pass filter, Low Pass filter
      - Anti-Alias filter, Notch filter
    - Pre-Amplifiers
  - Distributed telemetry systems
    - Cables losses, Advantages, Disadvantages
  - Delta Sigma systems
    - Delta Sigma and noise shaping
    - 2^{nd} order modulator
    - Delta Sigma and decimation filtering
    - Delta Sigma and 24-bit recording
    - Delta Sigma and dynamic range
  - ARAM 24, I/O System II, Sercel 388, Opseis Eagle
  - I/O Digital sensor
  - Instrument tests and quality control
- **Array Theory**
    - Apparent wavelength and wavenumber
    - Signal to noise ratio in the wave number domain
    - Simple linear arrays and effective length
    - Combined arrays and spatial convolution
    - Vibrator arrays
  - Estimating signal wavelengths
    - Apparent wavelength vs offset plus frequency
    - 3D Response In Line, Cross Line, Combined
    - Ghosting in the dynamite signature
- **Trapped Mode**

- **Spatial Sampling and Aliasing**
  The seismic record in space
  F-K plots and geophone intervals
  Geophone arrays as spatial anti-alias filter
  F-K filtering

- **Dual Source Vibroseis**
  Plus-Minus method
  Up-Down method
  Vari-Sweep
  Dual sourcing (Ping-Pong)
  Slip sweep
  Sei-Fi Technology

- **Overview of the 3D Technique**
  Summary of 2D
  Swath shooting
  3D imaging
  Basic statistics comparing 2D and 3D
  Basic aspects of a 3D program and definition of terms
  Rolling the patch and building the fold
  Determining 3D fold
  Geometric imprinting

- **3D Design Considerations**
  Overall survey size and shape
    Cover beyond the anomaly
    Margin of poor statistics
    Migration aperture and Fresnel zone
    Alignment with strike/dip or land boundaries
    Avoiding migration artifacts
  Deciding on the desired fold
    Signal to noise enhancement
    3D advantages of migration
    3D advantages of offset distribution
    Is fold our most important parameter?
  Offset considerations
    Maximum limits
      Interference with muted first breaks
      Moveout stretch
      Mode conversion
      Energy loss due to spherical divergence
    Minimum limits
      Sufficient moveout for velocity analysis
      Sufficient moveout for multiple discrimination
      Refraction analysis
      Amplitude vs Offset analysis)
  Source / Receiver line spacings
      Desired fold within offset limits (fold driven vs bin driven designs)
      Fold at shallow events
      Aspect ratio
      Desired wave field sampling in all domains
      Trade offs and compromises
  Bin size
    As related to surface sampling
    Aliasing of structural dips
    Aliasing of lateral velocity changes (diffractions)
    Aliasing of NMO at far offsets
    Interpretation confidence for small features

  Advanced Techniques: Bin geometry
    Fractionated bins
    Bin balancing – offset intelligence
    Fractionation of bins by mid-point scattering
  Skidding and offsetting
  Velocity and azimuth
  Statistics and surface consistent algorithms

- **Basic 3D Model Types**
  Offset grid
  Fractionated grid
  Double Brick grid
  Triple Brick grid
  Diagonal grid
  Megabin grid
  Random grid
  Planned Random grid

- **Case Histories**
    3D Seismic and Horizontal Drilling
    3D Seismic Out of Plane Resolution
    Unnecessary dry holes
    How little we know about geology

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THEORY AND REALITY OF ARRAY DESIGN
FOR 2D AND 3D SEISMIC PROGRAMS
SEMINAR OUTLINE

- **Introduction**

  Reasons for multiple versus single component groups

- **Array Theory**

  Simple linear, compound linear (vibroseis), weighted, Savit, Chebyshev, Newman and Mahoney

- **In-group Statics and Differential NMO**

- **Aliasing demo – Spatial sampling and aliasing**

- **Azimuth Considerations**

- **Summary (the Master Card commercial)**

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SEISMIC OVERVIEW FOR MANAGERS AND NON-GEOPHYSICISTS
2-DAY COURSE OUTLINE

Day One

1. **Overview and Introduction (8:30-9:00)**
   Introduce Mustagh and instructor(s)
   Introduce participants and background
   Roll of seismic in exploration cycle
   "Pictures" of the subsurface
   Various displays
   - List of numbers
   - Trace
   - Section
   - Chair display
   - Time slices

2. **Seismic Fundamentals (9:00-10:00)**
   Elastic Waves – Compressional and Shear
   Surface and boundary waves
   Simple model of wavefield
   Measuring the wavefield at the surface
   The seismic field record
   An example of stacking

   - 15 Minute Coffee Break -

3. **Basic Principles (10:15-12:00)**
   What is a wavelet?
   What is Bandwidth?
   What are vertical and lateral resolution?
   Resolution versus detectability

   - 1 Hour Lunch Break -

4. **Limits of Seismic (1:00-2:30)**
   Transmission losses in a variety of basins
   Mode conversion and AVO
   Spherical divergence
   Absorption – a non-linear loss
   Why is seismic imaging limited?
   Field record versus Stacked data
   Apparent wavelengths
   Measuring the Wavefield

   - 15 Minute Coffee Break -

5. **Types of Noise (2:45-4:45)**
   Random – time variant
   Source Generated – offset variant
   - Trapped Mode
   - Guided waves
   - Scattered surface waves
   - Ground Roll
   - Shear converted surface waves

   Case histories
   Defence tools?
   - Acquisition
   - Processing
   - Interpretation

Day Two

6. **Geometry principles (8:30-10:00)**
   CDP method
   Normal Move out
   2D Fold
   3D Fold
   Case History (Out-of-Plane effects)

   - 15 Minute Coffee Break -

7. **Basic Processing Corrections (10:15-12:00)**
   The synthetic trace
   Geometry
   Amplitudes in time and offset
   Deconvolution
   Normal Move out
   Statics
   Pre-stack gather
   Migration
   - Post-stack
   - Pre-stack

   - 1 Hour Lunch Break -

8. **Interpretation Basics (1:00-2:30)**
   Structural
   - Time versus Depth
   - Lateral position accuracy

   Stratigraphic
   - Wavelet characteristics
   - Post-stack
   - Pre-stack

   Geologic input and calibration
   Case Histories

   - 15 Minute Coffee Break -

9. **The Value of Seismic (2:45-4:15)**
   Cost Factors
   - Target depth
   - Geographic location
   - Geophysical objectives
   - Noise conditions

   Image Quality and Confidence
   - Design parameters
   - Quality of implementation
   - Quality of Processing
   - Target depth
   - Geologic complexity
   - Noise conditions

   Value
   - Finding desired features
   - Avoiding undesired features

10. **Discussion and Wrap-up (4:15-4:45)**