ASSESSMENT REPORT

On Pup Mineral Claims

Located 2.5 km North of Stewart, BC

On map sheet 103 P-13W 129 degrees 55` 39.7" W, 55 degrees 59` 15" N

Work was done during May of 2005

The Pup Claims are owned by Jim Marx

The Seismic Survey was done by Mike Powers MSc, Whitehorse, YT.

This report is submitted by Jim Marx, Dec 2005

27995

Table of Contents

Introduction

Two blocks of mineral claims were staked in Stewart BC area by this author and his son. Prospecting on this ground has been a family affair over the years. Recently, a Seismic Survey was performed over the claims by Geophysics Mike Powers MSc, Prince George, BC. The total cost of both the Seismic Survey and the preparatory work amounted to $19,711.97.

There was 1,730 metres of Seismic Survey performed and the cost per metre was $11.39. On the Pup Claim block, there was 590 metres of Seismic Survey completed at $11.39 per metre.

It is requested that $6,720.10 of the total cost of $19,711.97 be applied for assessment credits on the Pup Claim Group.

A copy of the Seismic Report is included in the addendum.

- Pup Tenure # 368088 Current Expiry Date: March 9, 2007
- Chase Joe Tenure # 384415 Current Expiry Date: March 10, 2007

History and Location

The Pup and Chase Joe Claims were staked on Oct. 22, 2000. The Claim block lies on Glacier Creek approximately 2.5km North of Stewart, BC. Location of Pup and Chase Joe claims are, 129 degrees 56` 39.7" W, 55 degrees 59` 15" N on map sheet 103 P-13 W, Skeena Mining Division.

Work Performed

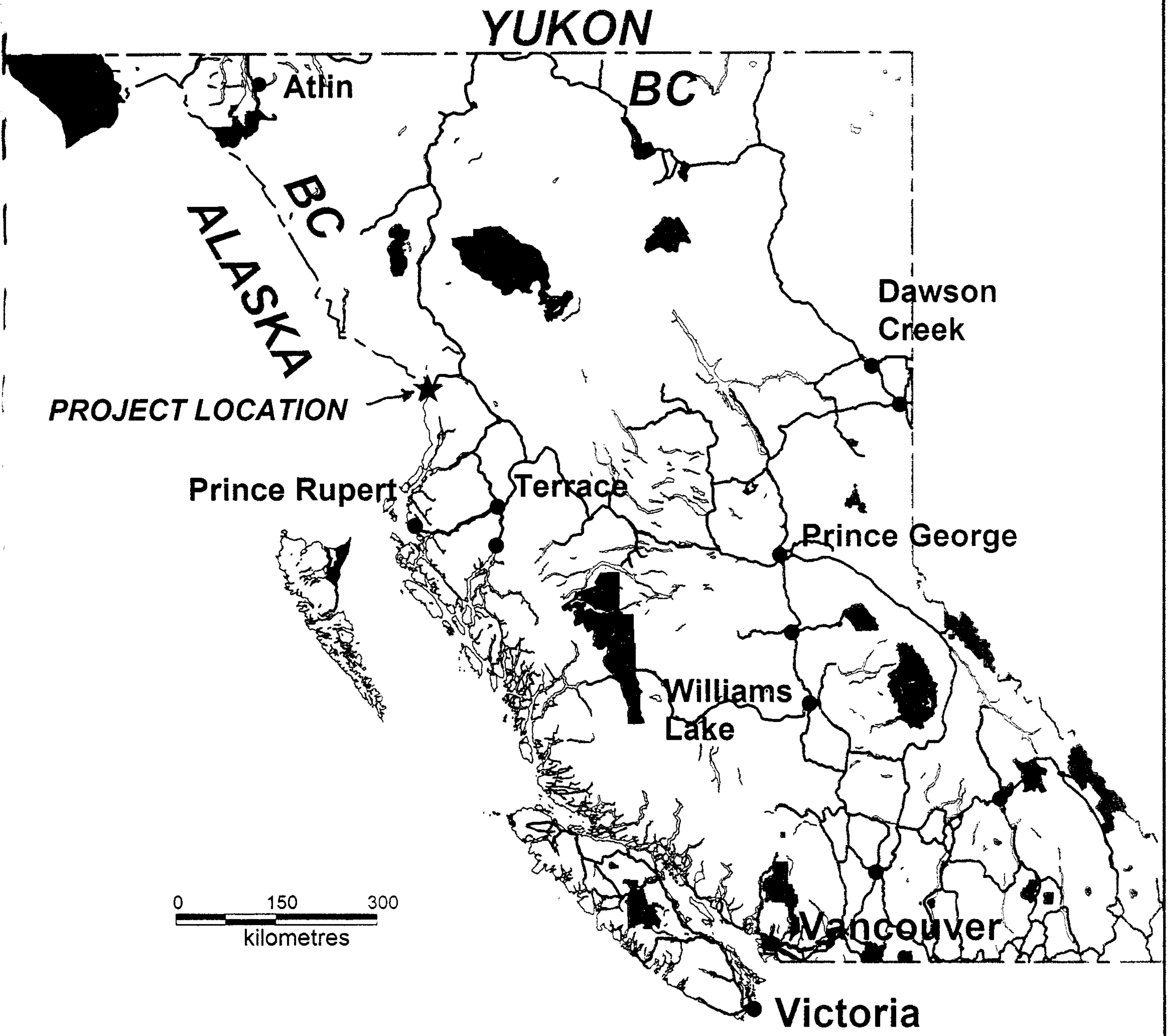
Five hundred and ninety metres of line was cut one metre wide on the Pup and Chase Joe Claims Group. Flagging was put every 10 metres. The flags were measured with hip chains, and marked. Three people were employed using chain saws, compass, and hip chains. They were provided with 4 wheel drive pickup.

As a follow-up, a Seismic Survey was done by Geophysics Mike Powers MSc, Whitehorse, YT. A copy of that report is found in the addendum. Work was performed in May 2005.

Conclusion

The Seismic Survey was very successful in showing the depth of the gravel, soil and overburden down to the bedrock. All bills were paid.

Jim Marx



STEWART DISTRICT
NTS 104A3 /113P13

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LOCATION MAP

Figure 1

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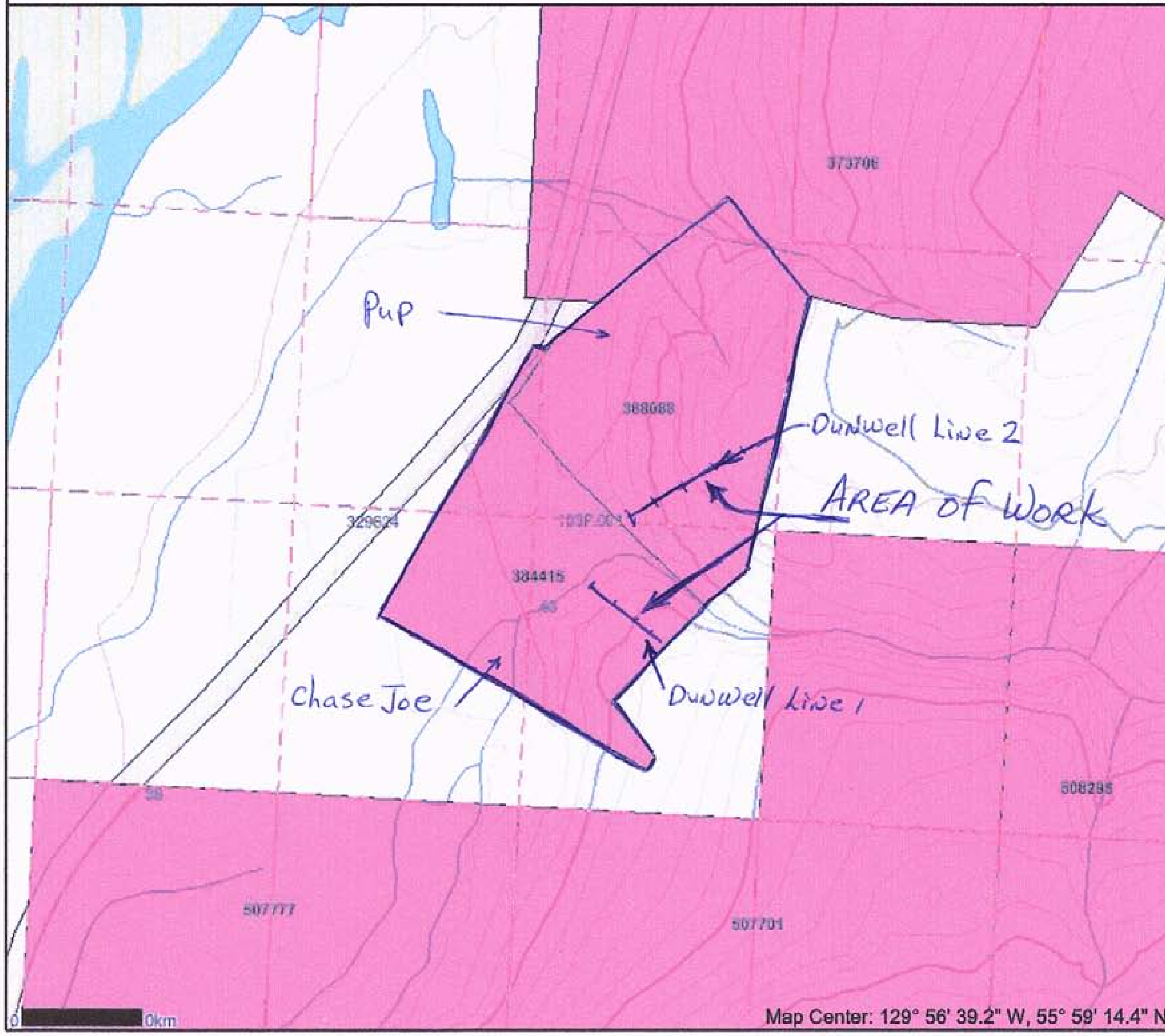
Map created Thu Nov 10 15:28:29 PST 2005



Legend

- Indian Reserves
- National Parks
- Parks
- Mineral Titles Grid
- Mineral Tenures
- Reserves (Sites)
- Placer Claim Designation
- Placer Lease Designation
- No Staking Reserve
- Conditional Reserve
- Release Required Reserve
- Surface Restriction
- Recreation Area
- Others
- Mining Divisions
- Integrated Cadastral Fabric
- BCGS Grid
- Contours (TRIM)
- Contour - Index
- Contour - Index.Indefinite
- Contour - Index.Depression
- Contour - Index.Depression Indefinite
- Contour - Intermediate
- Contour - Intermediate.Indefinite
- Contour - Intermediate.Depression
- Contour - Intermediate.Depression Indefinite
- Areaof Exclusion
- Areaof Indefinite Contours
- Annotation (1:20K)
- Transportation - Points (TRIM)
- Helipad
- Transportation - Lines (TRIM)
- Airfield
- Airport
- Airstrip
- Airport.Abandoned
- Ferry Route
- Road (Gravel Undivided) - 1 Lane
- Road (Gravel Undivided) - 2 Lanes
- Road (Gravel Undivided) - U/C - 1 Lane
- Road (Gravel Undivided) - U/C - 2 Lanes
- Road (Paved Divided) - Not Elevated - 1 Lane Each Way
- Road (Paved Divided) - Not Elevated - 2 Lanes Each Way
- Road (Paved Divided) - U/C - Not Elevated - 2 Lanes Each Way
- Road (Paved Undivided) - Not Elevated - 1 Lane
- Road (Paved Undivided) - Not Elevated - 2 Lanes
- Road (Paved Undivided) - Not Elevated - 4 Lanes
- Road (Paved Undivided) - U/C - Not Elevated - 4 Lanes
- Road (Unimproved)
- Cut (Roadway)
- Embankment/Fill (Roadway)

Scale: 1:10,000

DO NOT USE FOR NAVIGATION

Author's Statement of Qualifications

I, Jim Marx reside in Stewart, BC, and receive mail at:

PO Box 252

Stewart, BC

V0T 1W0

I was involved with all the work stated in this report, I have prepared the report and I know its contents to be true and accurate.

I have completed an Introductory Prospecting Course in 1989 that was put on by the BC Geological Survey and Northwest Community College.

Jim Marx, Prospector
Dec - 2005

Statement of Cost

Seismic Survey (see attached bill)	$17,149.97
Line Cutting	
• Jim Marx, Faller – 2 days at $270 per day	$ 540.00
• Dwayne Marx, Faller – 2 days at $270 per day	$ 540.00
• Jason Hill, Faller – 2 days at $270 per day	$ 540.00
Room and Board six man days at $90.00 per day	$ 540.00
Vehicle Rental, 2 days at $55.00 per day	$ 110.00
Chain Saw rental	
• 1 Husky 61- 24" bar	
• 1 Husky 286 – 28" bar	
• 1 Husky 286 – 28" bar Total:	$ 210.00
Gas, Fuel, Topohill, Expenditures	$ 83.00
	$ 2,563.00
Total Expenditures applied for assessment work:	$ 19,711.97

AURORA GEOSCIENCES LTD
GEOLOGY & GEOPHYSICS

Whitehorse Office
108 Gold Road
Whitehorse, YT
Y1A 2W3
Phone: (867) 668-7672
Fax: (867) 393-3577

INVOICE

GST No.: RT886365816
File: JMX-05-001-BC

Invoice #W5096BC
July 25th, 2005

In account with: **Mr. Jim Marx**
D.J. & J. Enterprises
P.O. Box 252
Stewart, B.C.
V0T 1W0

Re: Refraction Seismic Survey - Stewart Area

Exploration Services

Mobe Demobe	
Fixed cost as per contract	$2,900.00
Survey Days	
5.5 days @ $1,030.00/day	$5,665.00
Data Processing and Report	
Fixed cost as per contract	$4,600.00
Subtotal	**$13,166.00**

Disbursements (GST Included)

1. Yukon Explosives	$2,379.45
2. Yukon Explosives	-$372.20
3. King Edward Hotel (room)	$635.95
4. Harbour Lite General Store (food)	$59.78
5. Harbour Lite General Store (food)	$16.56
6. King Edward Hotel (meals)	$18.37
7. Super Valu (food)	$28.50
Admin 10%	$276.64
Subtotal	**$3,043.05**
GST on Exploration Services & Admin	**$940.91**
Total	**$17,148.97**
Less Advance	**-$8,000.00**
Amount Owing	**$9,148.97**

Terms: Net 15 days. Interest charged at 2% per month on overdue accounts

D. J. & J. ENTERPRISES LTD.

SEISMIC REFRACTION SURVEY OF THE AMERICAN CREEK & DUNWELL AGGREGATE PROPERTIES, STEWART AREA, B.C.

Mike Power, M.Sc., P.Geo.

AGGREGATE LEASES

American Creek North	704496
American Creek South	704469
Dunwell	6403406

Location: 56° 0'N, 129° 54'W
NTS: 104 A 04 / 103 P 13
District: Stewart B.C.
Date: July 27, 2005

SUMMARY

Seismic refraction surveys were conducted on three gravel leases near Stewart, B.C. to determine the depth to bedrock and to estimate the potential volume of gravel in place. Seismic lines were surveyed on the east and west sides of American Creek (American Creek Lines) and both south and north of Glacier Creek on the Dunwell lease (Dunwell Line1 and Dunwell Line 2).

The seismic surveys were conducted with a 24 channel digital engineering seismograph reading from a 24 channel cable with phones spaced at 5 m. Explosives initiated electrically were used as the energy source. Two off-end shots (60 to 120 m offsets), two end-of-line (5 m offsets) and a mid-spread shot were fired at each spread. The topography along the survey lines was surveyed with a laser level / rangefinder.

The data was interpreted in a two stage process incorporating a delay-time method with interpreter assigned layers, followed by an unconstrained tomographic inversion. This yielded a final depth section showing apparent velocity variations with depth and distance along the survey lines. The top of bedrock was assumed to be defined by the 2100 m/s velocity contour or its nearest equivalent. Apparent overburden cross-sectional areas were calculated from the depth sections and rough estimates of potential overburden in place were in turn calculated from the cross-sectional area by extrapolating the results 25 either side of the seismic lines.

The following table summarizes the results of the refraction surveys along the four seismic lines surveyed:

Line	Apparent overburden thickness range (m)	Apparent overburden cross sectional area (m^2)	[1]Potential overburden volume (m^3)
American North	8-30	7,600	380,000
American South	5-60	28,300	1,410,000
Dunwell Line 1	2-20	2,900	145,000
Dunwell Line 2	10-40	8,000	400,00

[1]Potential overburden volume is not to be construed as an estimate of economic gravel resources within the meaning of NI 43-101 or CIMM definitions of reserves and resources.

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LIST OF FIGURES

1.0 INTRODUCTION

Aurora Geosciences Ltd. was retained by D. J. & J. Enterprises Ltd. to conduct seismic refraction surveys on three aggregate leases near Stewart, B.C. The purpose of these surveys was to determine the thickness of the unconsolidated overburden. This report describes the seismic surveys and the results.

2.0 LOCATION AND ACCESS

The gravel leases are located near Stewart B.C. (Figure 1). The American Creek Property is centred at 56° 6' 30" N, 129° 52' 30" W (Figure 2). The property is 22.3 km north of Stewart B.C. along Highway 37A. The Dunwell Property is centred at 55° 59' 20" N, 129° 56' 00" W and is 7.2 km north of Stewart by road along Highway 37A. All lines except Line 1 on the Dunwell Property are accessible by 4-wheel drive vehicles along existing gravel roads.

3.0 PROPERTY

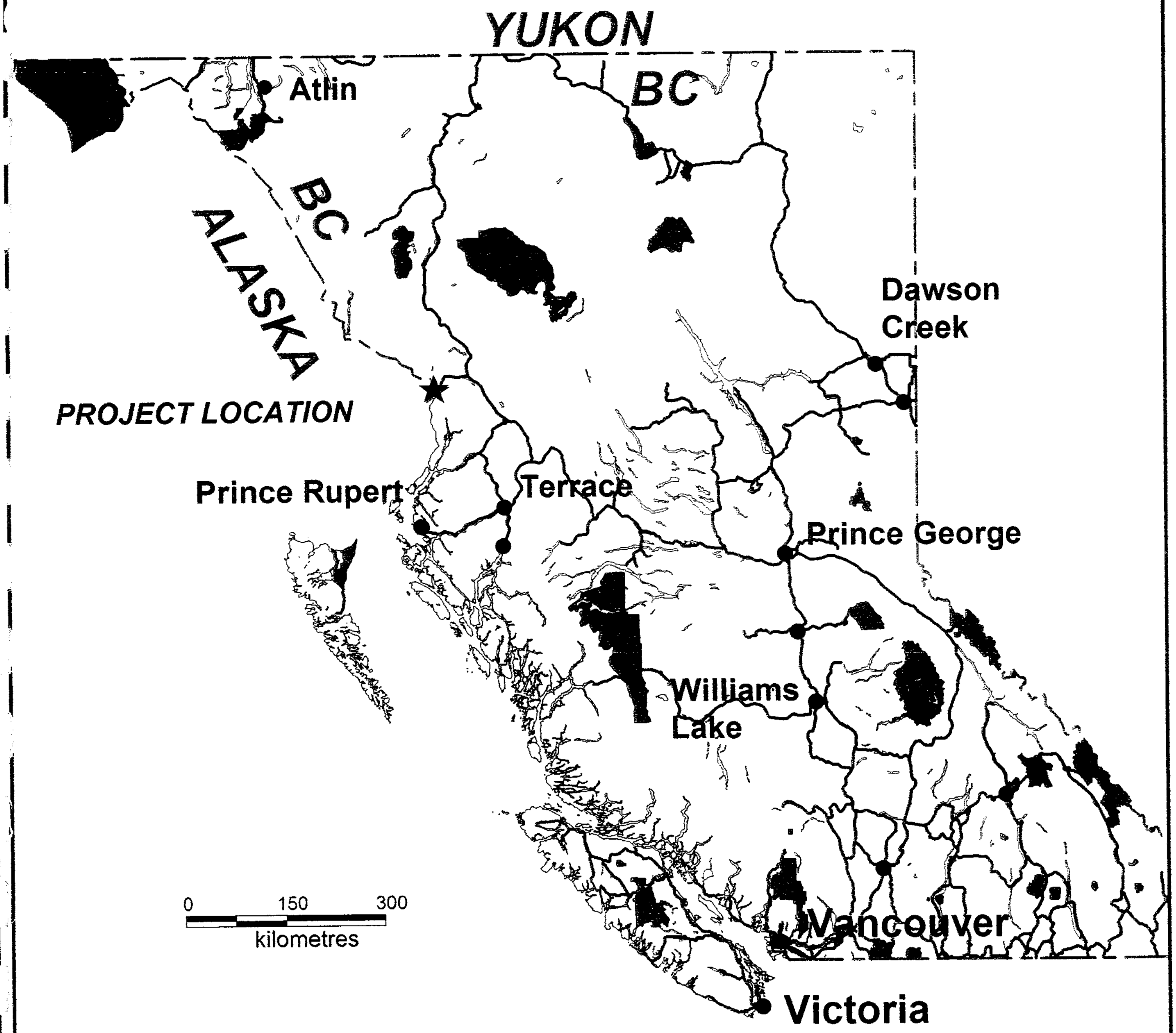
The seismic surveys were performed on the following aggregate leases issued by Land and Water British Columbia Inc.:

Seismic line	Gravel lease[1]
American Creek North	704460
American Creek South	704496
Dunwell Line 1	6403406
Dunwell Line 2	6403406

4.0 PHYSIOLOGY AND SURFICIAL GEOLOGY

The information in this section is drawn from a summary by Hickin *et. al.* (2001). The aggregate properties are situated in the Boundary Ranges of the Coast Mountains in a region subject to active glaciation and isostatic rebound. Gravel deposits were stranded on benches as high as 100 m above the current valley bottom drainages by glacial retreat and isostatic rebound. These gravel deposits are found in smaller tributary drainage basins, perpendicular to the main ice flow in the larger valleys. The aggregates noted by Hickin *et. al.* (ibid) consist of glaciofluvial and fluvial fans and flood plains at lower elevations and some moraine deposits at higher elevations, marginal to retreating glaciers. Colluvial cones and fans

[1]Location information as provided to the author by Jim Marx on 22 July 2005



STEWART DISTRICT
NTS 104A3 /113P13
July 25, 2005

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STEWART GRAVEL PROPERTIES

LOCATION MAP

Figure 1

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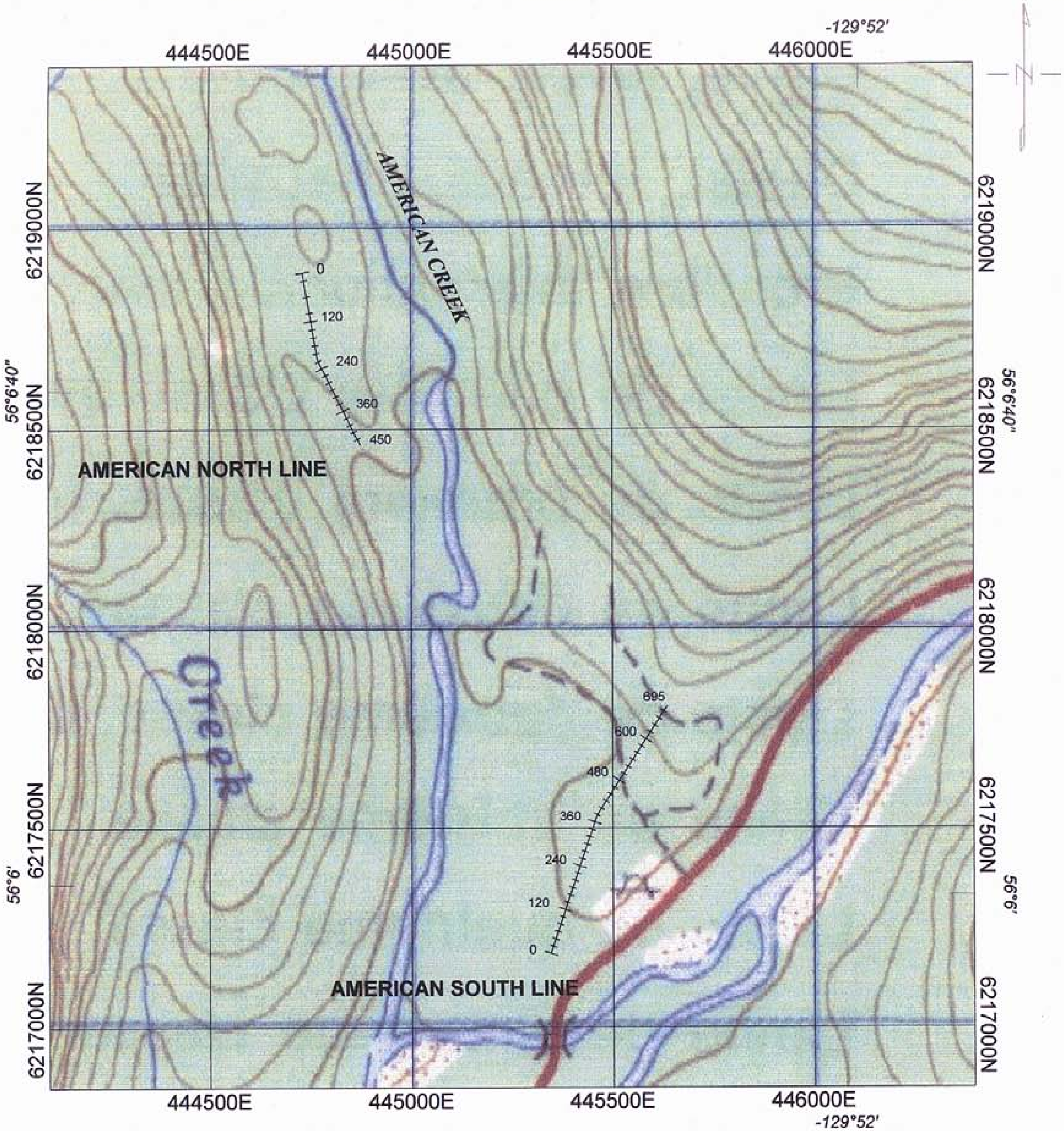

Scale 1:15,000

250 0 250

metres

NAD27 / UTM zone 9N

PROFESSIONAL GEOSCIENTIST M.A. POWER PROVINCE BRITISH COLUMBIA 25Jul05

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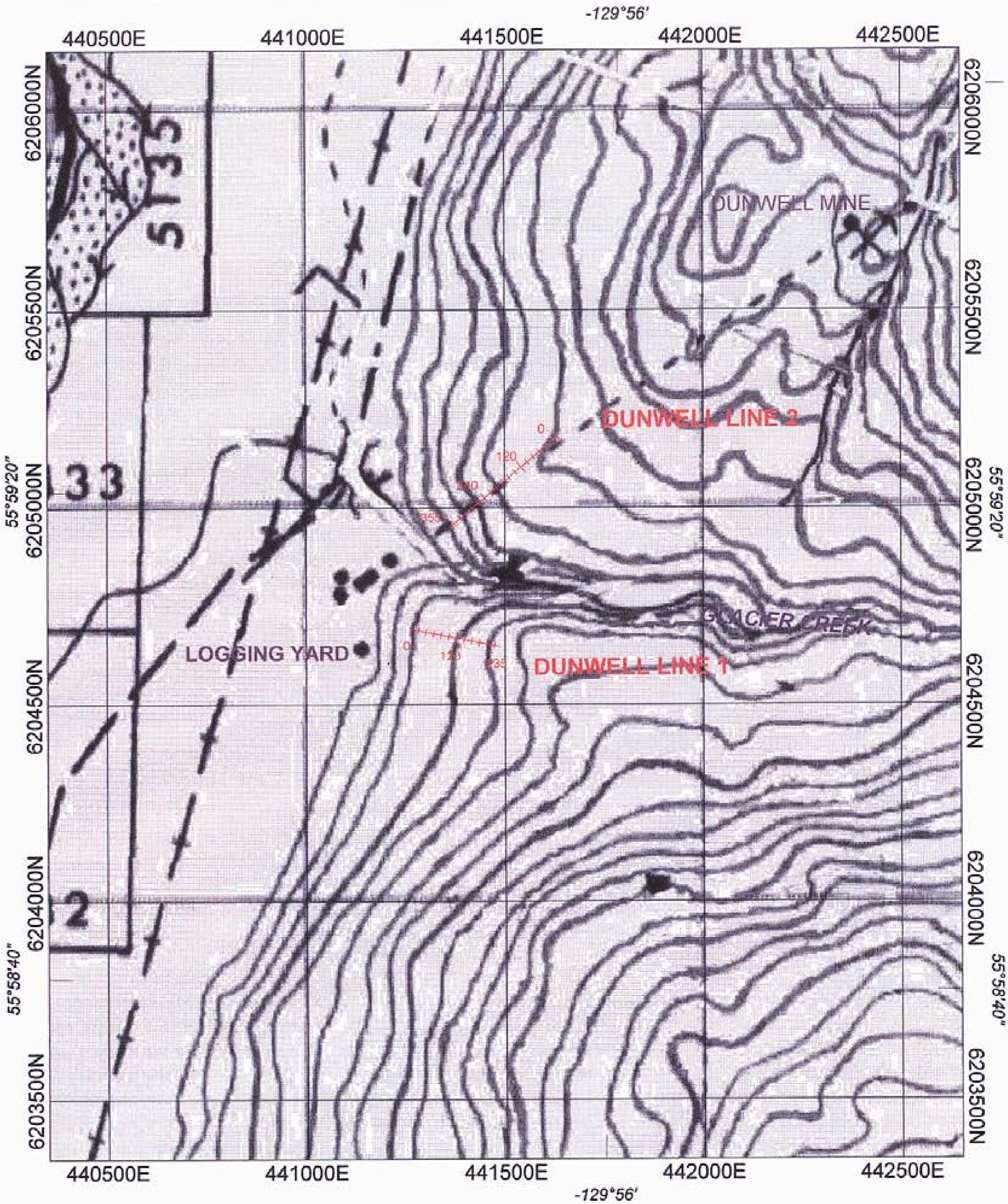
Stewart Area Gravel Exploration Program
American Creek Seismic Surveys
Figure 2. Seismic line locations

NTS: 104A04
Datum: NAD27 (Canada Mean)
Job: JMX-05-01-BC

District: Stewart B.C.
Projection: UTM Zone 9N
Date: 20July05

AURORA GEOSCIENCES LTD.



Scale 1:15000

250 0 250

metres

NAD27 / UTM zone 9N

PROFESSIONAL GEOSCIENTIST
PROVINCE BRITISH COLUMBIA
M.A. POWER

DJ & J ENTERPRISES LTD.

Stewart Area Gravel Exploration Program
Dunwell Area Seismic Surveys
Figure 3. Seismic line locations

NTS: 103P13
Datum: NAD27 (Canada Mean)
Job: JMX-05-01-BC

District: Stewart B.C.
Projection: UTM Zone 9N
Date: 20July05

AURORA GEOSCIENCES LTD.

containing poorly sorted angular aggregate are found along the lower slopes of the valley walls; these likely are the result of erosion and collapse of over-steepened valley walls carved by glacial erosion. The aggregate leases described in this report are located in areas with exposed fluvial gravels in bench deposits marginal to the main Bear River drainage basin. Elevations in the areas covered by the survey lines ranged from 150 to 300 m on the American Creek Property and from 30 to 200 m on the Dunwell Property.

5.0 SURVEY GRID

The location of the seismic survey lines are shown in Figures 2 and 3. The lines were located and cut by Jim Marx and Dwayne Marx prior to the seismic surveys. The lines were cut 1.5 m wide and straight chained (not slope corrected). Stations were flagged in at 10 m intervals along the survey lines. Line 2 on the Dunwell Property was relocated and pickets were placed only every 120 m (1 spread interval) along this line as the survey progressed.

6.0 PERSONNEL AND EQUIPMENT

The seismic survey was conducted by a three man crew consisting of the following personnel:

Mike Power	Geophysicist / blaster
Dwayne Marx	Observer
Jim Marx	Helper

They were equipped with the following instruments and equipment:

<u>Instruments:</u>
- 1 - Strataview 24 Channel digital engineering seismograph.
- 1 - 24 takeout / 10 m spacing refraction cable shortened to 5 m for the survey.
- 1 - Impulse laser range finder

<u>Data processing:</u> P866 laptop computer, colour printer.

<u>Other:</u>
- 3 - VHF radios
- 1 - blasting cables
- 2 - Type 6 powder magazines
- 1 - 1Ton 4x4 truck
- 1 - spare parts, tools

The geophysical crew spent a total of 2.5 man-days on the property. The geophysical survey log is attached as Appendix B. Instrument specifications are appended as Appendix C.

7.0 SURVEY SPECIFICATIONS

The seismic surveys were conducted according to the following specifications:

Phone spacing: 5 m

No. of channels: 24 (total spread length 115 m)

Shot locations: 2 shots at least 60 m off either end of each spread
2 shots at either end of the spread
1 shot at mid-spread

Shots: 3 to 6 kg of PowerFrac™ ammonium nitrate gelatin explosive initiated with Seisdet™ seismic grade electrical blasting caps

Topography: Topography along the survey lines was surveyed the laser range finder and a reflector. Horizontal distances and elevation differences were measured with this instrument. The location of the survey lines was determined from non-differential GPS measurements taken at the start of the survey lines and at permissive locations along the survey lines.

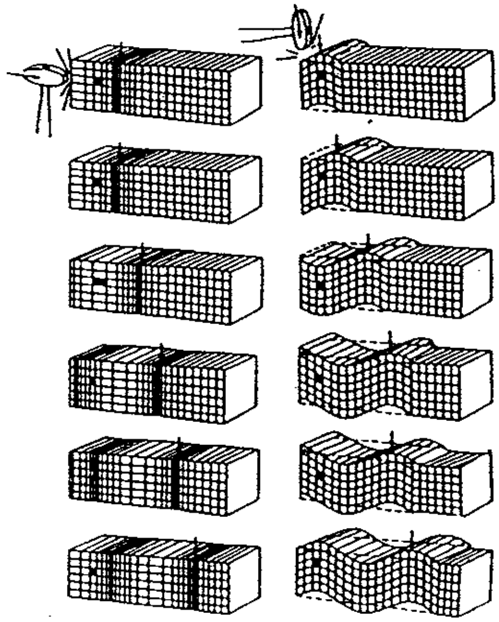
8.0 SEISMIC THEORY

The theory behind the seismic refraction method is summarized in Sheriff and Geldart (1995) and Telford *et. al.* (1990). This section summarizes the basic theory underlying the seismic refraction method as applied in geotechnical exploration and describes the methods used to interpret the data.

8.1 Basic theory

Seismic waves are mechanical perturbations, transmitted by compressing or shearing a medium as the wave passes through it. The elastic strain response of a solid body to stress is governed by Lame's Constants λ and μ. λ is the strain response perpendicular to applied compressional force and is termed the *fluid incompressibility.* In effect it is the amount of elastic "lateral bulge" per unit volume when a mass is compressed. μ is the *shear modulus* or resistance to shearing that the medium possess. Any solid or semi-solid has a measurable shear modulus; a liquid does not as it cannot store elastic energy when sheared. The shear modulus of a rigid rock would be high whereas that of compacted clay would be small.

(a) P-wave and S-wave motion (Press & Siever 1974)



(b) Seismic ray reflection and refraction

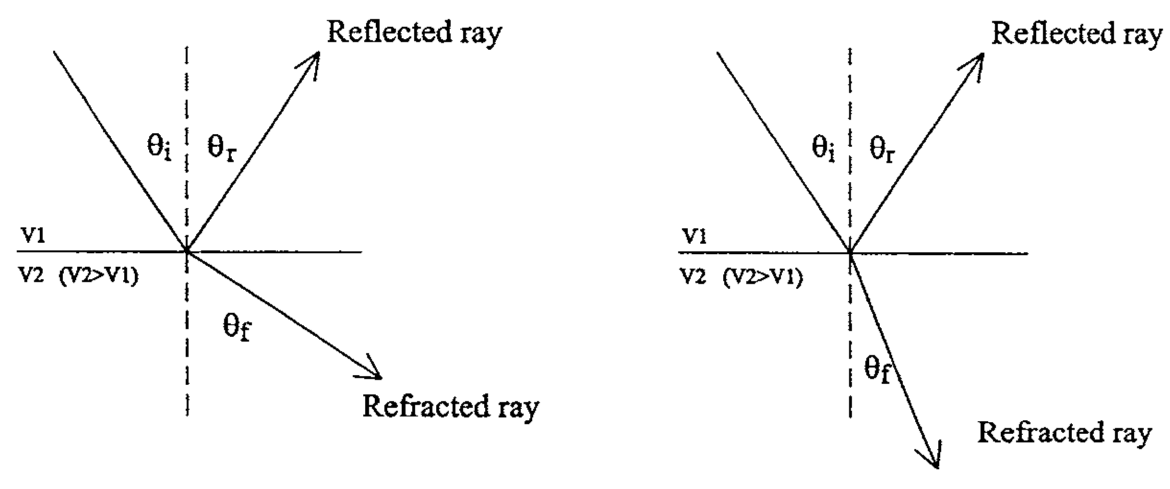


Figure SR-1. Seismic wave motion and behaviour at boundaries.

Seismic wave propagate through a medium in one of two ways, shown in Figure SR-1 (a). Straightforward compression of the medium, similar to the generation of a sound wave, is termed a P-wave because it is the primary or first arrival in an earthquake or seismic record. A second wave is generated in response to stress transverse to the propagation direction of the seismic wave; this is similar to the wave on a string and is termed the S-wave as it is the secondary arrival in the seismic wave train recorded in an earthquake record. The velocity of the P-wave is governed by:

$$V_p = \sqrt{\frac{\lambda + 2\mu}{\rho}} \qquad (1)$$

where ρ is the density of the rock and the other variables are defined as above. The S-wave velocity is:

$$V_s = \sqrt{\frac{\mu}{\rho}} \qquad (2)$$

In water or air, the P-wave velocity reduces to:

$$V_p = \sqrt{\frac{\lambda}{\rho}} \qquad (3)$$

Seismic refraction methods rely upon measuring and analyzing the first P-wave arrivals. It is apparent from the above relations that the velocity of a seismic wave decreases with increasing rock density but in practice, the increase in λ or μ is much greater as density increases and consequently, seismic velocity tends to increase with density. The range of P-wave velocities commonly encountered in geotechnical seismic refraction work is summarized in Table II. P-waves are the fastest and strongest waves measured by conventional seismic instruments and the remainder of this discussion will focus exclusively on their properties.

Seismic waves radiate away from a point source in all directions creating spherical wave fronts traveling through the medium. Huygen's Principle states that any point on a wave front is a point source for succeeding waves. The interference of these waves at any later time defines the new position of the moving wave front. It is useful to simplify a consideration of seismic wave motion by examining a ray path rather than the whole wave. Both the ray and wave obey the same physical laws but they are easier to visualize if the raypath is considered first. The wave front is nothing more than the sum of the possible ray paths.

Seismic waves are both reflected and refracted at the boundary between media with different seismic velocities. As shown in Figure SR-1(b), a portion of the seismic energy will reflect back towards the source and the residual will be transmitted through the boundary and be refracted upon entry into the second medium. For reflection, the angle of incidence - the angle between the incident ray and a normal to the reflecting surface - equals the angle of reflection. Refraction is governed by Snell's Law:

$$\frac{\sin\theta_i}{v_i} = \frac{\sin\theta_f}{v_f} \qquad (4)$$

If the velocity in the lower medium is faster than that of the upper medium $\theta_f > \theta_i$ and the ray will bend towards the velocity boundary. If the velocity in the lower medium is slower than that of the upper medium $\theta_f < \theta_i$ and the ray will bend away from the velocity boundary.

Table II. P-wave velocities of common rocks and sediments
(after Sheriff and Geldart (1995))

Material	P-wave velocity (m/s)
Air	330
Water	1550
Gravel or sand (water saturated)	1500 - 1900
Gravel or sand (dry)	500 - 1500
Ice or permafrost	3500
Granite	4000 - 5500
Gabbro	5000 - 7000
Shale or schist	2000 - 5000

8.2 Seismic refraction surveys

Seismic survey methods involve placing vertical component microphones (geophones) with centre frequencies in the order of 10 Hz to 100 Hz in the ground and recording the arrivals of seismic waves after applying a shock to the ground using an energy source. For geotechnical work, energy sources consist of small explosive charges at surface, 12 gauge shotgun slugs, rifle bullets, dropped weights or sledge hammer blows. The geophones are uniformly spaced at from 2 to 5 m depending upon the resolution required and are strung in line down the seismic survey line. In geotechnical exploration surveys, the seismic lines are cut so as to cross the long axis of the stream bed and the geophone array is thus run across the stream channel to yield a profile of the stream channel once the data is interpreted. A trigger is connected from the energy source or its initiator back to the seismograph to start the seismograph when the energy is released. The trigger can be a switch which is momentarily opened and closed (hammer switch), a pulse from a blasting box or the simple breaking of a circuit if a wire is wrapped around explosives.

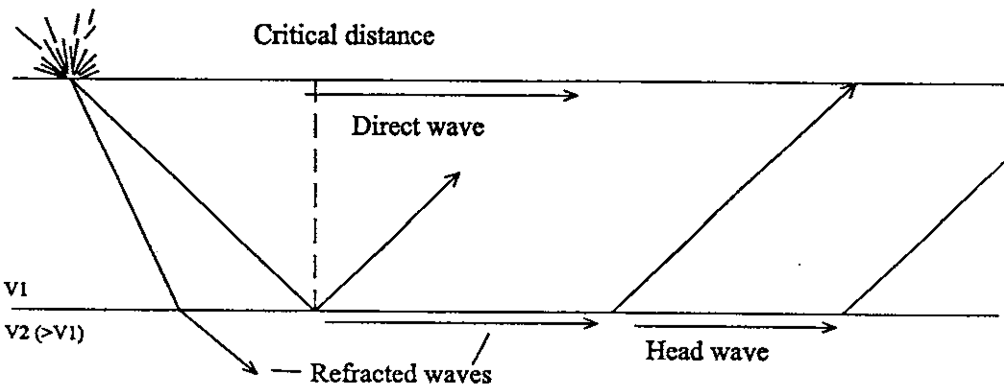
The seismic energy travels through the earth via a number of paths. In Figure SR-2(a) we consider the simple case of flat bedrock beneath overburden. A direct wave travels from the energy source directly through the low velocity near surface material. Near the energy source, this is the first wave to arrive. At greater distances, refracted waves are the first arrivals.

At a distance from the source termed the critical distance, the angle of refraction becomes 90^0 and the refracted energy travels along the bedrock interface, generating upward traveling return waves as it skims along bedrock. The refracted wave will travel along bedrock at the faster velocity of bedrock and at a distance termed the cross-over distance, the first wave to reach the geophone will be the refracted rather than the direct wave. The refracted waves which travel into the lower medium in turn may be critically refracted along higher velocity boundaries in bedrock and also return to the surface although they will be refracted at the bedrock boundary on their return journey.

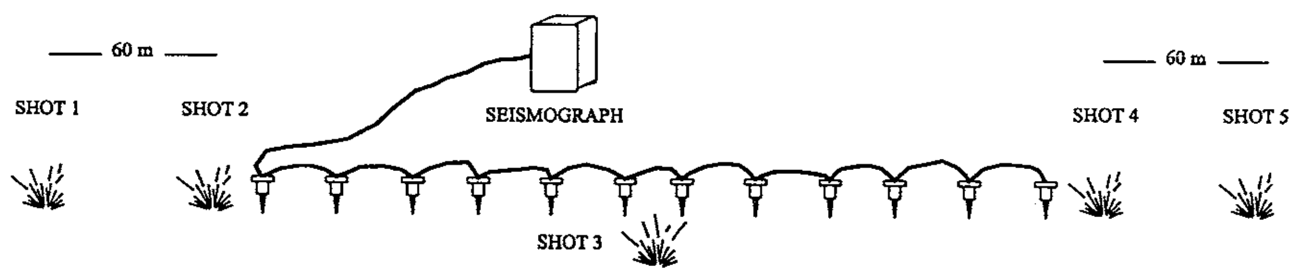
Seismic refraction data is collected by putting energy into the ground at a number of "shot points" while keeping the geophone array fixed. It is fairly common practice in seismic refraction work to take 5 shots: 2 at a considerable distance from either end of the geophone array, 2 at either end of the geophone array and 1 in the middle of the array. The shot pattern is sketched in Figure SR-2(b). Following or prior to the survey it is important to survey in the relative elevations of the geophones and the shot points in order to correct the data for surface elevation changes. If not corrected, these will appear as bedrock topography in the final interpreted section.

Seismic refraction data is processed and plotted in a very simple manner. The shot record or seismogram from each shot is examined to determine when the first energy was received at each geophone. This first deflection (first break) is timed and plotted in a graph of arrival time (vertically) versus distance (horizontally) (Figure SR-2(c)). The break in slope along the T-X curve indicates the cross over distance where the refracted energy overtook the direct wave energy to become the first arrival. Knowing the geometry of the geophone array and shot point, it is possible to analyze the graph and determine the velocity of the gravel and bedrock and from that, determine the depth to bedrock. In the simple case of a flat bedrock surface and overburden with a single velocity (V_1) slower than bedrock (V_2), the velocities of the bedrock and overburden are the reciprocals of the slopes of the lines along the refracted and direct wave arrivals respectively. The equation of the line connecting the refracted arrivals is:

(a) Refraction of seismic waves



(b) Refraction seismic spread showing location of shotpoints



(c) Shot record and travel time (T-X) curve for Shot 2

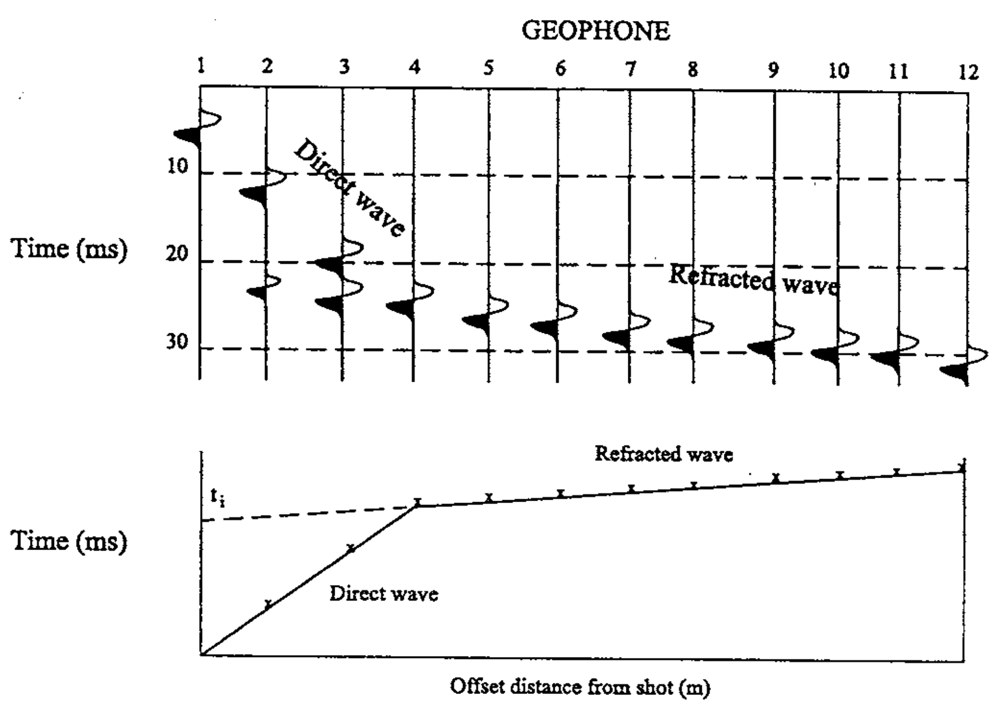


Figure SR-2. Seismic refraction method.

$$t = \frac{x}{v_2} + t_i \tag{5}$$

where t_i is the intercept time and x is the distance from the energy source. The velocities of the overburden and bedrock can be used to determine the critical angle:

$$\theta_c = \arcsin \frac{v_1}{v_2} \tag{6}$$

and this angle can be used to calculate the depth to bedrock from the known velocities and the intercept time:

$$z = \frac{v_1 t_i}{2 \cos \theta_c} \tag{7}$$

This method works only on the very simplest case of flat bedrock beneath homogeneous overburden. Seismic refraction interpretation methods must account for several velocity layers (eg. dry overburden, wet overburden, bedrock) and be able to map irregular boundaries. A following section describes delay time methods commonly used to deal with these circumstances.

8.3 Sources of error

Seismic refraction surveys are prone to several sources of error. The first class of problems are directly related to acquisition and the second are violations of the underlying assumptions behind the interpretation methods.

Sources of error in acquisition include poor elevation surveys, timing errors (either shot or geophone), static errors and phase shifts. The requirement for elevation surveys was discussed above. Small near surface elevation errors can translate into large bedrock topography errors because the near surface velocity is very slow - commonly 1/4 to 1/3 that of the underlying overburden. Thus a one metre error in near surface elevation can translate into a 3 or 4 metre error in bedrock elevation.

Timing errors occur if there is a delay in initiating an energy source (eg. slow cap) or if a phone is not properly planted or the first arrival properly identified. A shot timing error affects all the arrivals from the shot and is sometimes difficult to identify or discriminate from a geological feature. A timing error for an individual geophone is generally more easily spotted and corrected.

Sometimes a geophone is planted in particularly slow ground (eg. squirrel's nest or duff) and all the arrival times recorded at that geophone from every shot appear to be slow. These errors are termed static errors and are often visible in the T-X curve when the arrival at a phone is "pulled up" on every T-X curve.

The final source of error is phase shift or change in shape of the first arriving energy.

The strength and shape of the first arrival will change with offset distance from the source as different waves at different angles of incidence are recorded as first arrivals at each geophone. A common error, particularly with a weak energy source, is to lose a first arrival train and start picking second or third arrivals which are much clearer and coherent, lower down in the seismic record. These errors, if not detected, can results in calculated bedrock depths which are too great and topography which is in error.

The second class of errors directly affects the interpretation method. The seismic refraction method, properly employed and interpreted, will yield depth determinations accurate to within $\pm$ 10% provided the following underlying assumptions are valid:

a. The earth consists of several layers with relatively uniform velocity.

b. The velocity of each layer is lower than the velocity of the layer beneath it.

c. The layer boundaries are relatively smooth and continuous.

d. The layers are thick enough to be resolved by the geophone array being used.

The validity of these assumptions determines the accuracy of the bedrock profile derived from the refraction data. If the velocity of the overburden varies dramatically along a seismic line over a distance equal to or less than a spread length, the interpretation will yield a bedrock surface with relief introduced solely by the varying overburden velocity (Figure SR-3(a)).

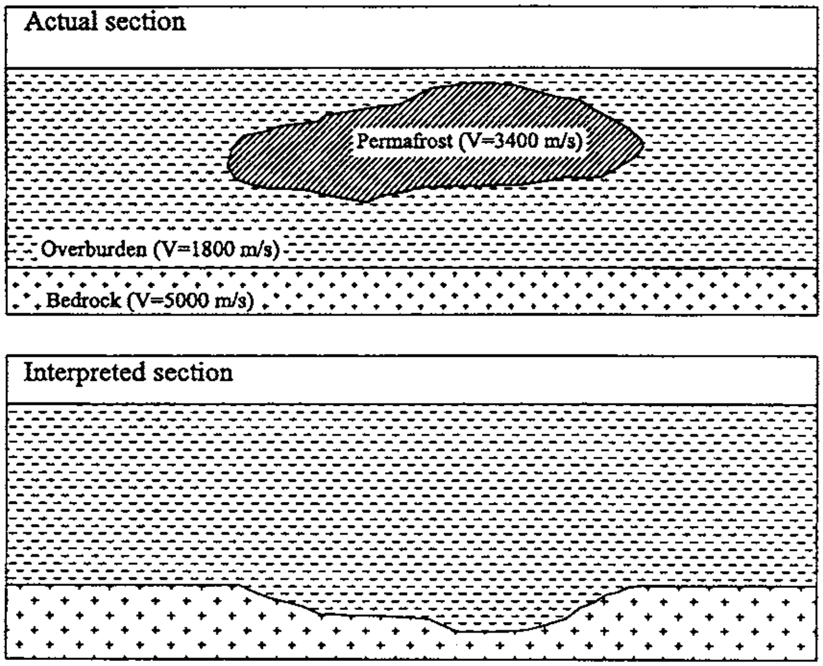
If the overburden contains a low velocity layer, then the refracted wave will bend downwards and there will be no indication of this refraction in the travel time curve (Figure SR-3(b)). Instead, the seismic velocity of the overburden will be over-estimated and the depths to bedrock will be too deep. This situation - termed a velocity inversion - is common in areas with discontinuous permafrost where thawed ground may occur below faster frozen ground and bedrock. This is the principle reason seismic refraction surveys are not recommended in areas affected by discontinuous permafrost.

A third problem occurs if there is a thin, high velocity layer which is too thin to produce a discernable response in the travel time curve. The seismic velocity of the overburden will be underestimated and the calculated depth to bedrock will be too shallow. This situation could be caused by a thin bed of frozen ground in otherwise thawed overburden. It is normally the least significant of the three problems.

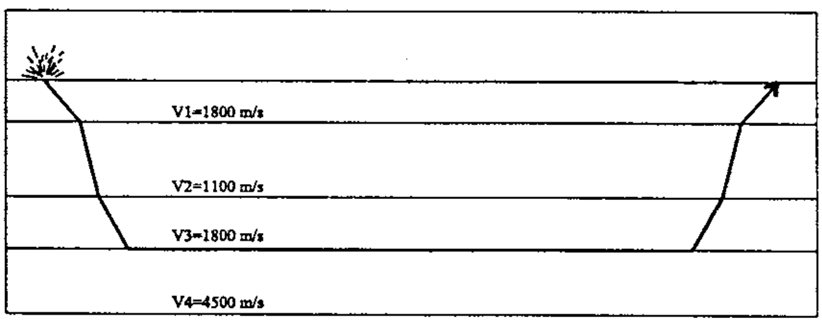
8.4 Refraction interpretation methods

The simple depth determination method outlined in Section 8.2 is suitable only for a very preliminary field approximation of depth. Increasingly complex calculations are required to deal with multiple planar refractors and with refractors of varying dip. It

(a) Variation in top layer velocity



(b) Velocity inversion



(c) Blind layer problem

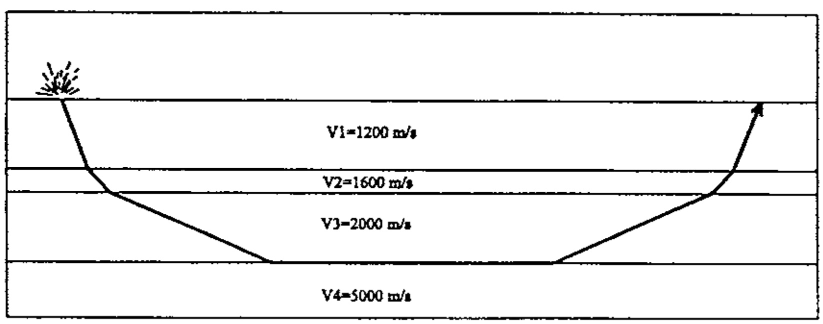
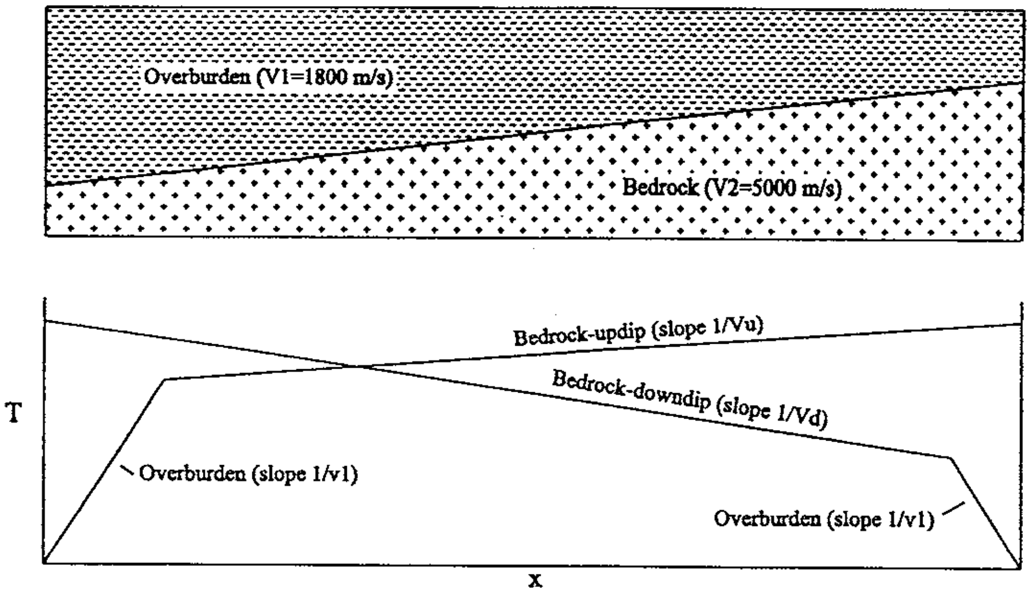
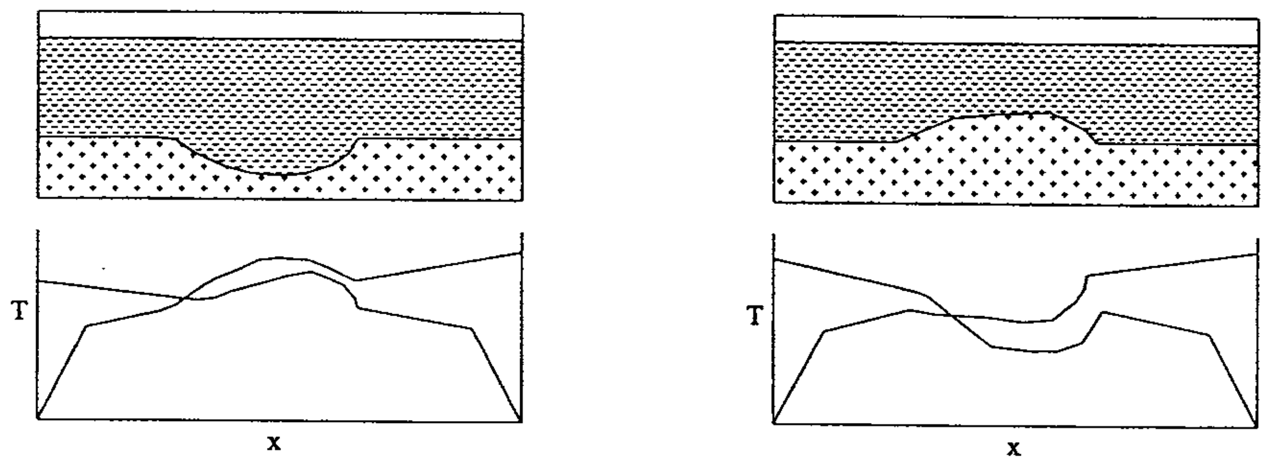


Figure SR-3. Problems with the seismic refraction method.

(a) Refraction response from dipping bedrock



(b) Effect of refractor relief



(c) Definition of delay time

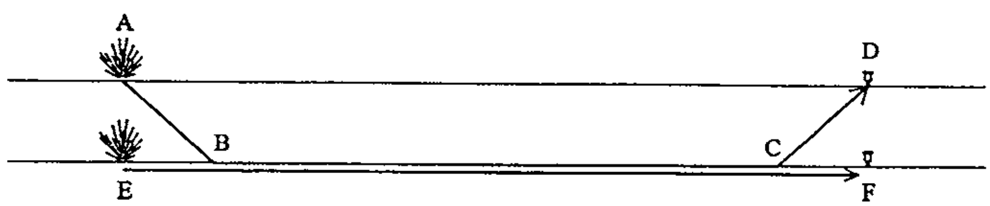


Figure SR-4. Refraction interpretation.

is worthwhile to consider qualitatively several aspects of refractor responses visible in the T-X curves.

Figure SR-4(a) shows the response from a single dipping refractor measured with a single spread and two shots at either end. The portions of the travel time curves from the uppermost layers have the same slope ($1/V_1$) while the slopes of the T-X curves from the refractors differ. The shot placed on the down-dip side of the refractor (ie. shooting up dip) has a faster apparent velocity ($1/V_u$) than the down-dip apparent velocity ($1/V_d$). The average of the two velocities is a close approximation to the true refractor velocity.

So far, this summary has been confined to the refraction response of planar refractors. Figure SR-4(b) illustrates the effect of an irregular refractor on the T-X curves. If the refractor contains either a depression or rise, indications of these will appear in mirror images on the T-X curve. A depression will increase the travel time in the vicinity of the low and a high will decrease the travel time in the area of a high. It is useful to qualitatively identify possible refractor relief in order to assess the results of more formal automated interpretation.

The data described in this report was interpreted using a computerized delay time method. The theory behind this method is summarized in Telford *et. al.* (1990), Sheriff and Geldart (1995) and Scott (1973). The delay time is defined with reference to Figure SR-4(c), considering the simplest possible case. For a shot at point A and a geophone at D, the total travel time includes the time to cover sections AB, BC and CD. Now suppose that the shot point and geophone were moved vertically down to the first refractor and shot from there. The travel time along EF would be much faster, traveling with velocity V2 along the refractor. The delay time is the difference between the travel time along ABCD less the travel time along EF. Since the transit time along BC is common, the delay time can be calculated from:

$$\delta = \left(\frac{AB}{V_1} - \frac{EB}{V_2}\right) + \left(\frac{CD}{V_1} - \frac{CF}{V_2}\right) = \delta_s + \delta_g \qquad (8)$$

where δ_s and δ_g are the shot and geophone delay times respectively. For a horizontal to shallow dipping refractor, the horizontal distance between the shot and geophone (AD) is the same as EF. The velocities V1 and V2 can be determined from the reciprocals of the slopes of the T-X curves. Thus it is easy to calculate the delay time as this will be the observed travel time less the calculated travel time along the refractor:

$$\delta = t_{AD} - \frac{EF}{V_2} \qquad (9)$$

The shot delay time can be calculated for any shot if two or more geophones recorded the shot. Similarly, the geophone delay time at any phone can be calculated if two or shots are recorded at the geophone. Thus it is easy to solve for the shot and phone delay times for any reversed spread (ie. a spread where shots are fired from either side of the geophone.

Scott (1973) describes the computerized application of delay time analysis to seismic refraction data. The basic steps in the algorithm are:

1. Operator assigns layers to various segments of the refractor T-X curve (ie. identify the number of velocity layers and which portions of the travel time curve are from each segment.)

2. Analyze each segment using least-squares analysis to determine a best-fit velocity.

3. Correct geophone arrival times and shot times for local static errors and for elevation above a datum within the top layer. This correction is applied using the calculated upper layer velocity (V1).

4. For the first refractor, calculate total delay times for each shot and calculate individual shot point and geophone delay times. From these, calculate the position of the points where the rays intercept the first refractor (ie. shot entry points and geophone exit points). Average points to determine the mean position of the refractor.

5. Verify the refractor location by ray tracing each shot from the shot point to the geophones. Adjust the position of the refractor by moving the shot entry and geophone exit points iteratively where necessary to optimize the fit.

6. Strip away the delay times and reposition the shots and geophones on the next refractor.

7. Repeat steps 4 through 6 for the second and subsequent refractors until all the layers identified by the operator in step 1 have been processed and a solution for their location determined.

It is critical to the inversion that the interpreter accurately determine the number of layers apparent in the T-X curves. It is possible to derive an apparently good solution to the interpretation problem which is completely incorrect if a layer is missed. The common sources of error in this process are irregular refractors which are misinterpreted as indicating extra layers. Alternatively, two layers may be grouped together and identified as being a single refractor with a depression in it. A knowledge of the local geology is essential in discriminating between the various possible scenarios.

Seismic refraction tomography is a finite element method of determining an optimum velocity model which accounts for the observed first arrival pattern. The method is predicated on the assumption that velocity increases with depth: This is the standard assumption in all refraction interpretation. The earth is then modeled as a pattern of rectangular cells, each with its own seismic velocity. Before starting the inversion, an initial model either specified by the operator or determined from a delay time method is required as input. The inversion process consists of calculating the arrival times generated by the model and adjusting the velocities in the model to minimize the difference between the arrival times predicted by the model and those actually observed during the survey. A final solution is a model which generates first arrival times which agree with the actual observations within the bounds of measurement error. This final model is contoured to generate a 2D section of seismic velocities which can in turn be correlated with known geology.

9.0 INVERSION AND INTERPRETATION PROCEDURE

The seismic data was interpreted using SeisImager Version 2.67, a software package developed by Oyo Corporation. This software incorporates both a delay time method and seismic refraction tomography. The software contains a module for editing and picking the first breaks in the shot record file (PickWin) and a second package for assembling and interpreting the first breaks (PlotRefa). Standard spreadsheet and editing programs (eg. Microsoft Excel and MultiEdit) were used for other data manipulation and panel area calculations were performed with AutoCADD.

The following procedures were used to process and interpret the data:

1. *Topographic survey processing.* The relative horizontal locations of all geophones and shots and the elevation differences between the shots and phone locations was calculated from the laser range finder survey data in Microsoft Excel. The starting coordinate of each seismic line was assigned to the first station surveyed on the line. A nominal elevation of 100 m was assigned to the highest elevation on the survey line and all other elevations are relative to this datum. Stations locations and elevations at stations which were not explicitly surveyed were assigned by linear interpolation from adjacent stations.

2. *Shot record editing.* The location of each geophone and shot point in each shot record was assigned to the SEGY format shot record in Seismimager PickWin. The coordinates which were used were those generated in the previous step. Station elevation data was input separately to the inversion process after importing the individual shot records but the horizontal coordinates of the shot point and geophones was input directly into the SEGY shot record header prior to import. Copies of the shot records printed from the seismograph are in Appendix D.

3. *Pick first arrivals.* The first arriving energy on each trace in each shot

record was interactively picked by the interpreter in PickWin. The amplitude of each trace was adjusted until the best image was obtained and then the first arriving energy was identified. Picks were smoothed in areas where static displacements were evident or where the traces were noisy. The first breaks for all shots fired at a given spread setup were grouped together into a single pick file for that spread. Each pick file thus contains the first arrivals for the five shots at that spread setup.

4. *Data import.* The first arrivals for each spread collected and collated in the previous step were read into the program to assemble a complete data set for the entire seismic line. The elevations for all shots and geophones were then read in from a separate elevation file.

5. *Editing and layer assignment.* Working from on-screen T-X curves, minor adjustments to first arrivals were made to ensure that the curves were smooth. Following this, the first arrivals were assigned to layers based on their curve segment slope in the T-X curves. The data collected in this survey was interpreted using a three layer case. This corresponds to the general case found in nature where dry overburden, water saturated overburden and bedrock generally form three distinct velocity layers. Following this, the portions of the T-X curves from each refraction layer were examined in detail. In cases where the refractions for deeper layers were not parallel, the original shot records were examined to determine the cause of this unusual phenomenon. In such cases, the first arrivals were often edited and adjusted to ensure that the arrivals from the same layer were sub-parallel. The final T-X curves are in Appendix E of this report.

6. *Initial delay time interpretation.* An initial interpretation was made using the time-term delay time inversion algorithm. This method calculates velocity layer boundaries and layer velocities using best-fit regression. The output consists of a starting model which is then used in the subsequent seismic tomography inversion. The validity of the model is assessed primarily by the goodness-of-fit or least squares error which represents the difference between the observed data and the travel times generated by the model. In a good solution this error is minimized. To improve the goodness-of-fit, the delay time model was adjusted by re-examining layer assignments and smoothing any first breaks which showed residual static errors (noise).

7. *Tomographic inversion.* The final model from the delay time inversion was used as the starting model for a subsequent tomographic inversion. These inversions consisted of generally 10 to 12 successive iterations. In generally, the goodness-of-fit between the tomographic model and the observed data improved dramatically during the first few iterations and then improved only slowly thereafter, reflection the minor

changes made in the later stage inversions. The final output from the inversions consisted of 2D depth sections showing contoured seismic velocity along the seismic lines.

8. *Interpretation.* The tomographic models were examined and the top of bedrock picked in the section. This top followed the velocity contour nearest to 2100 m/s, corresponding to the estimated velocity of compacted gravel in this area. Velocities greater than this are assumed to originate from bedrock. The interpreted top of bedrock is delineated with a thick grey line in the inversion sections and the velocity contour used to delineate the top of bedrock is also identified with a thick grey line in the velocity colour scale bar to the right of the depth sections.

9. *Area and volume calculations.* In order to make a preliminary estimate of possible overburden volumes in the area of the seismic lines, the depth inversion sections were digitized in AutoCADD. For each inversion section, a digitized polygon was extracted which was bounded on the top by the surface topography, on the bottom by the picked top of bedrock, and on either side by the ends of the lines. This polygon represents the cross-sectional region of overburden identified by the seismic survey. The possible volume of overburden in the area of each seismic line was calculated by assuming that the cross-sectional area can be safely extended 25 m either side of the seismic line.

10.0 RESULTS

In general, the seismic data was of good quality and first arrivals could be picked with little ambiguity. Raw shot records are compiled in Appendix D. For most spreads, the T-X curves were best interpreted with a three layer model as three distinct line segments were visible in the end-of-line shot records. Time-distance (T-X) plots showing the first arrivals (first breaks in the seismic shot record) versus location for each shot are compiled in Appendix E. These are colour coded by layer showing the layer assignment made by the interpreter during the initial delay time interpretation step.

Interpreted depth sections are contained in Appendix F. Each section shows horizontal distance along the seismic line in metres and elevation in metres. The elevations shown are nominal and are not elevations above mean sea level. The elevation sections show contoured seismic velocity derived from the tomographic inversion of the travel time data. Overburden which is not water saturated generally has a velocity ranging from 300 to 900 m, depending upon the degree of compaction. Soil and duff have a very low seismic velocity whereas dry gravel will show a higher seismic velocity. Water saturated overburden will show a seismic velocity in excess of 1500 m/s. Finally, compacted water saturated gravel can show seismic velocities as high as 2000 m/s and in cases where the gravel has been re-cemented, as high as 2500 m/s. The top of bedrock is arbitrarily assigned a velocity of 2000 to 2100 m/s, depending upon the tomographic contouring in the inversion section. The interpreted top of bedrock is indicated by a thick grey line and the velocity boundary between interpreted top of bedrock and overburden is indicated by a grey line in the velocity scale to the right of the interpretation section.

The interpreted depth to bedrock may be in error due to both measurement error and to a variety of other causes described in the previous sections. The seismic data must be verified by excavation or / or drilling at locations in both shallow and deeper areas of the profiles to verify the accuracy of the bedrock depth interpretation. In addition, the seismic survey cannot conclusively identify the type of overburden present in the section. In unconsolidated overburden, water content rather than lithology exerts primary control on seismic velocity. Subject to these *caveats*, an interpreted area of overburden has been calculated for each depth section. This cross-sectional area of indicated overburden can be extrapolated a short distance either side of the seismic line to yield an estimate of potential overburden volume. In this report, overburden volumes were calculated by extrapolating the cross-sectional area 25 metres either side of the seismic line. This estimate is not a valid estimation of any economic gravel resource and should not be construed as a reserve or resource estimate conforming to National Instrument 43-101 or the Canadian Institute of Mining and Metallurgy definitions for mineral resources and reserves.

American North

The top of bedrock is delineated by the 2158 m/s velocity contour and the overburden section appears to be 8 to 30 m thick along the line. There appears to be a variation in the bedrock lithology along the line with slower bedrock (~3500 m/s) between 140 and 240 m. The seismic line crosses across the centre of the bush road it parallels between 120 and 140 m and this is the likely cause of the higher seismic velocity of the overburden in this portion of the seismic line. The water table appears to be low along this line, perhaps lying almost on bedrock. The area of overburden defined by the seismic survey in the depth section is 7600 m^2 and 380,000 m^3 of overburden may be present in the immediate vicinity of the seismic line.

American South

The top of bedrock is delineated by the 2151 m/s velocity contour and interpreted overburden section varies from 5 to over 60 m thick. There appears to be a large area in which the seismic velocity is between 1700 and 2100 m/s. It is possible that the top of bedrock may lie in this section if bedrock is deeply weathered. There appears to be at least two different bedrock lithologies present - a "slow" bedrock with velocity around 3000 m/s from 130 to 410 m and a surrounding faster bedrock with velocities ranging from 3700 to 4000 m/s. The small apparent rise in bedrock at 30 m is suspect and may be an artifact of the inversion. The water table appears to be high along this line and is likely defined by the 1534 m/s contour. The area of overburden defined by the seismic survey in the depth section is 28,300 m^2 and 1,410,000 m^3 of overburden may be present in the immediate vicinity of the seismic line.

Dunwell Line 1

The top of bedrock is defined by the 2233 m/s velocity contour and the interpreted overburden section varies in thickness from 2 to 20 m. The overburden from 160 to 235 m is likely a thin layer of colluvium and not gravel given its thickness and conformity with interpreted bedrock. Bedrock outcrop was noted in the vicinity of the seismic line in this interval by the author. The water table appears to be low along this line, lying at or near bedrock. The area of overburden defined by the seismic survey in the depth section is 2900 m^2 and 145,000 m^3 of overburden may be present in the immediate vicinity of the seismic line.

Dunwell Line 2

The top of bedrock is defined by the 2128 m/s velocity contour and the interpreted overburden section varies in thickness from 10 to 40 m. There appears to be a region of water saturated overburden near 80 m in a small depression but outside of this area, the water table appears to be low. The top of bedrock appears to be weathered considerably with seismic velocities increasing from about 2500 m/s to 4000 m/s over a depth of 10 m. The area of overburden defined by the seismic survey in the depth section is 8000 m^2 and 400,000 m^3 of overburden may be present in the immediate vicinity of the seismic line.

11.0 CONCLUSIONS

The results of the seismic refraction surveys conducted on the American Creek and Dunwell Properties support the following conclusions:

a. In most areas covered by the surveys, seismic refraction appears to easily define the thickness of the overburden section because of the relatively high velocity of bedrock and the relatively low water table.

b. On the American South line, the presence of a large area with seismic velocity between 1700 and 2100 m/s leads to some ambiguity in the delineation of the top of bedrock. Weathered bedrock can show a seismic velocity as low as 2000 m/s while compacted, cemented and water-saturated gravel can show seismic velocities as high as 2500 m/s. Drilling or excavation is necessary to resolve this ambiguity.

c. The water table appears to be relatively high on the American South line compared to the other lines where the water table may lie on or in bedrock.

d. The overburden volume estimates made in this report are conservative, particularly in the case of the American South line which is sited on a large, relatively uniform topographic ridge and the bedrock profile could be extrapolated further from the seismic line.

12.0 RECOMMENDATIONS

The following recommendations are made based on the conclusions of this work:

a. The seismic refraction results should not be relied upon to estimate volumes of economic gravel without subsequent drilling and / or excavation along the seismic lines to confirm the depths and to verify that gravel is present.

b. Excavations or drill holes should be sited to test the full depth range of the overburden section indicated by the seismic survey. Holes or excavations should be sited in areas where bedrock is inferred to be shallow and in areas where it is inferred to be deep.

Respectfully submitted,
AURORA GEOSCIENCES LTD.

M.A. POWER

Michael A. Power, M.Sc. P.Geo.
Geophysicist

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Telford, W.M., L.P. Geldart and R.E. Sheriff (1990) Applied Geophysics (2nd Edition) New York: Cambridge University Press.

APPENDIX A. CERTIFICATE

I, Michael Allan Power, with residence and business address in Whitehorse, Yukon Territory do hereby certify that:

1. I hold a B.Sc. (Honours) in Geology granted in 1986 and M.Sc. in Geophysics granted in 1988, both from the University of Alberta.

2. I have been actively involved in mineral and geotechnical exploration in the northern Cordillera and in the Northwest Territories since 1988. I am a professional geoscientist registered with the Association of Professional Engineers and Geoscientists of British Columbia (Registration number 21131) and a professional geophysicist registered by the Northwest Territories Association of Professional Engineers, Geologists and Geophysicists (licensee L942).

3. I conducted the geophysical surveys described in this report, interpreted the data collected and prepared this report.

4. I have no interest, direct or indirect, nor do I hope to receive any interest, direct or indirect, in the property of D.J. & J. Enterprises Ltd.

Dated this 27th day of July 2005 in Whitehorse, Yukon Territory.

Michael A. Power, M.Sc. P.Geo.
Geophysicist

APPENDIX B. SURVEY LOG

AURORA GEOSCIENCES LTD. GEOLOGY & GEOPHYSICS

JMX-05-01-BC STEWART SEISMIC SURVEY
May 24 - 31, 2005

Personnel:	Mike Power (MP) - Geophysicist Jim Marx (JM) - Client Dwayne Marx (DM) - Client
Tue 24 May 05	Mobe. Picked up explosives at 0700 and left town thereafter. Arrived in Stewart about 2000 hrs, taking several short rest stops. Powder dropped at American Creek - South.
Wed 25 May 05	Survey. Met JM and DM at 0700. Set up American Creek - South line (south end) and began surveying. Immediately encountered problems with HVB-1 blaster; would not trigger the seismograph. Switched to triggering by circuit. MP blasting, JM and DM recording hereafter. Wx: sunny & warm. Production: 2 spreads (240 m)
Thu 26 May 05	Survey. Met JM and DM onsite at 0700 hrs. Working south to north on American Creek - South. Problems with one battery. Wx: sunny & warm. Production: 3 spreads (360 m)
Fri 27 May 05	Survey. Met JM and DM onsite at 0710 hrs. Finished American Creek - South (1 spread). Moved to American Creek - North and set up the line along the road, moving it slightly. Surveyed 3 spreads on American Creek - North Wx: sunny & warm. Production: 4 spreads (480 m)
Sat 28 May 05	Survey / breakdown. Met JM and DM at American Creek - North line at 0715 hrs. Finished last spread on American Creek - North and moved to Dunwell - Line 2. Line moved to a more favourable site. Set up and surveyed from south to north,

completing one spread and setting up the second. Seismograph failed to boot. Field repairs could not be made. Picked up the line; went back to town. Dismantled seismograph and determined that the problem had to be the fuse (visually intact when inspected in the field). Short circuited the fuse holder and downloaded data. Wx: sunny and warm.

Production: 2 spreads (240 m)

Sun 29 May 05 — Survey. Met JM and DM at Dunwell Line 2 at 0715 hrs. Completed Dunwell Line 2 (2 spreads) and moved gear to Dunwell Line 1. Set up the line for survey. Wx: sunny & warm.

Production: 2 spreads (240 m)

Mon 30 May 05 — Survey. Met JM and DM at Dunwell Line 1 at 0700 hrs. Completed two spreads to finish the line and moved the gear out. Destroyed the last of the explosives. Packed gear. Wx: sunny & warm

Production: 2 spreads (240 m)

Tue 31 May 05 — Demobe. Left Stewart at 0730 hrs and returned to Whitehorse by 2030 hrs with no incidents.

Summary:

Mobe / demobe:	2 days
Survey:	5.5 days
Breakdown:	0.5 days

Line	Distance
American North	455 m
American South	695 m
Dunwell Line1	235 m
Dunwell Line 2	355 m
Total	*1,740 m*

APPENDIX C. INSTRUMENT SPECIFICATIONS

StrataView RX Specifications

R Series Specifications

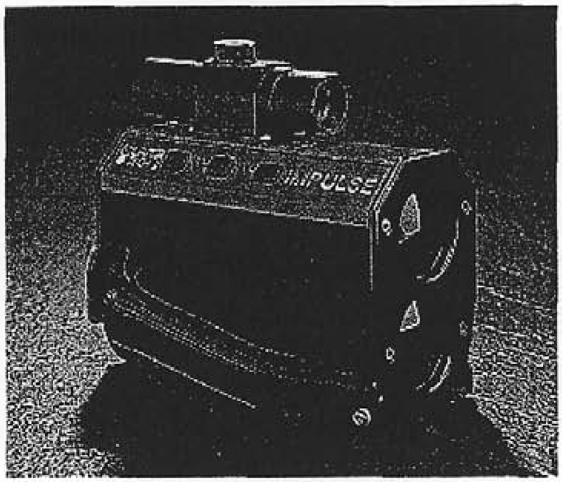
A/D Conversion:	24 bit A/D process using 32 kHz over sampling, digital anti-alias and decimation to users selected sample rate
Dynamic Range:	135 dB theoretical, 113 dB measured @ 2 ms, 3 to 150 Hz
Distortion:	0.005% @ 2 ms, 3 to 150 Hz
Bandwidth:	3.0 to 14 kHz,
Common Mode Rejection:	> -90 dB @
Crosstalk:	-85 dB @ 24 Hz
Noise Floor:	0.25 uV, RFI @ 2 ms, 3 to 150 Hz
Trigger Accuracy:	1 microsecond
Maximum Input Signal:	300 mV, P-P
Preamplifier Gains:	36 dB, followed by 24 dB floating point amplifier
Anti-alias Filters:	Digital, automatically selected to correspond to sample rate. -3 dB corner frequency, down 80 dB at Nyquist, except -74 dB when sampling at 16 kHz and none at 32 kHz.
Sample Interval:	0.032, 0.064, 0.128, 0.25, 0.5, 1.0, 2.0 ms

Record Lengths:	24,000 samples per channel for 12 or 24 channels, 12,000 for 36 channels or more
Line Testing:	Real-time full wave form noise monitor.
Power Consumption:	30 W plus 1.0 W per channel
Data Formats	SEG-2, SEG-Y, real-time to disk, off-line to tape.

Pretrigger Data:	Up to 4096 samples.
Stacker:	Full 32-bit
Acquisition and Display Filters:	Low cut: out, 10, 15, 25, 35, 50, 70, 100, 140, 200, 280, 400 Hz, 24 or 48 dB / Octave, Butterworth. Display filters do not affect data.
Correlator:	Hardware full precision correlator. Operates either before or after stack.
Automatic Gain Control:	Digital AGC with user adjustable window. Display only - does not affect raw data.
Number of channels:	12 to 72 channels per 12V portable module. 12 to 132 channels per rack mount module (NX series only). Modules stackable to form systems up to 600 channels, controlled internally from one keypad or externally by a PC based computer (discuss detailed configurations with the Geometrics' sales department).

ASC Scientific

Impulse Laser Rangefinders



Professional Laser Rangefinder for:

- Distance and Height Measurement
- GPS Offset Mapping & GIS Data Capture (Inter through its built-in RS232 interface)
- Mine Face and Rock Outcrop Profiling
- Timber Cruising
- Space Planning

The IMPULSE is a light-weight, low cost laser for a full range of professional measuring. The Impulse puts the power and speed of a laser rangefinder and optional tilt sensor into the palm of your hand. Simply aim and push a button. The Impulse acquires distance or height in less than a second, all without prisms or reflective targets. The addition of the MapStar Compass Module to the Impulse enables highly accurate offset mapping.

Now it's not only economically possible for you to get the fastest laser-sharp measurements ever, it's also convenient. Reduced size and weight make it possible for field workers to operate the Impulse with one hand and simply clip it onto a belt for quick-access carrying.

The Impulse's point-and-shoot operation and serial output communication combine to simplify a number of surveying and mapping tasks. These include: timber cruising, mine face profiling, GIS data capture, GPS offset mapping, material estimating for job bids, space planning, and general distance and height measurement.

The serial port outputs data directly to available mapping software or the Trimble Pro XR GPS system.

Features

- Rugged, waterproof, one-piece aluminum housing built for every working environment
-

6 digit backlit LCD display provides readability for day and night operation
- Audio and visual indicators assure confidence of positive target acquisition
- Accomplish a variety of tasks with on-board solutions for height, horizontal distance, vertical distance, percent slope and grads
- Determine traverse lengths or perimeters with the internal cumulative distance capability
- The range difference mode applies constant offsets to your measurements or determines the distance between two in-line objects
- When necessary, use range gating to ensure target readings are only within your specified work area
- RS232 serial output gives you the option to store data externally; data is transferred either automatically or by a manual key press
- Built-in electronic filter sees through brush to discriminate reflective targets

Impulse Specifications

Dimensions	15.2 x 6.4 x 12.7 cm (6 x 2.5 x 5 in)
Weight	1 kg (2.2 lb)
Maximum Range	575 m (Impulse & Impulse LR) 2,200 m (Impulse XL)
Accuracy	3 - 5 cm typical (Impulse & Impulse LR) 1 - 2 m (Impulse XL)
Inclinometer Range	± 90 degrees
Inclinometer Accuracy	± 0.1 deg. typical
Power Supply	2 AA batteries providing up to 20 hours of use
Eye Safety	FDA Class 1 (CFR 21)
Environment	Waterproof to IP 67 and NEMA 6

Link to: Comparison of Available Models and Prices

Accessories & Support Packages

A variety of accessories and support packages are available for using the Impulse Laser Rangefinder and MapStar Compass with a monopod/bipod/tripod, with the Trimble Pro XR for GPS data capture, or with an HP48 data collector. Please contact Jason Wallace at jwallace@ascscientific.com or telephone (800) 272-4327 for additional information.

APPENDIX D. SHOT RECORDS

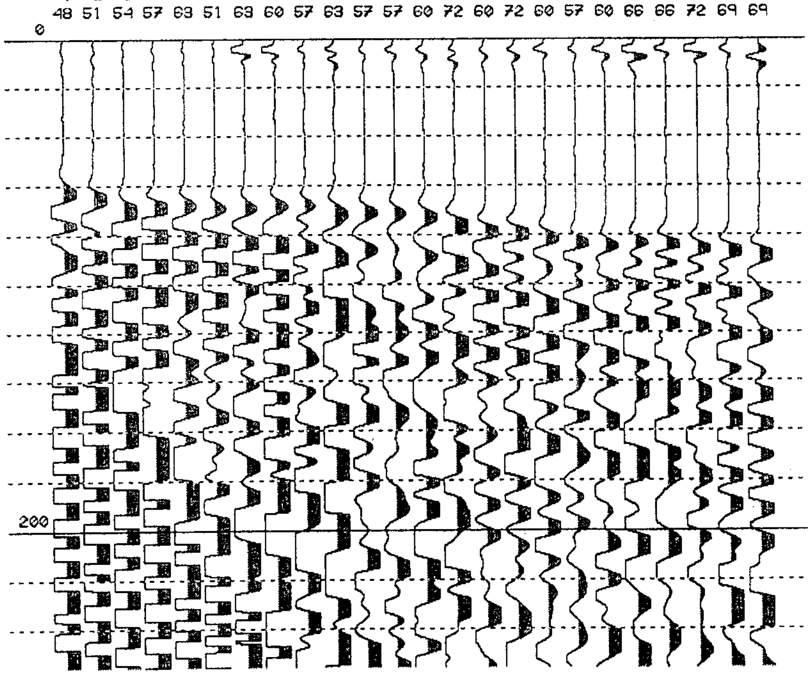
American North

AMERICAN NORTH

GEOMETRICS StrataView

READ FROM 2-1-1.DAT 12:21:52 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -52.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

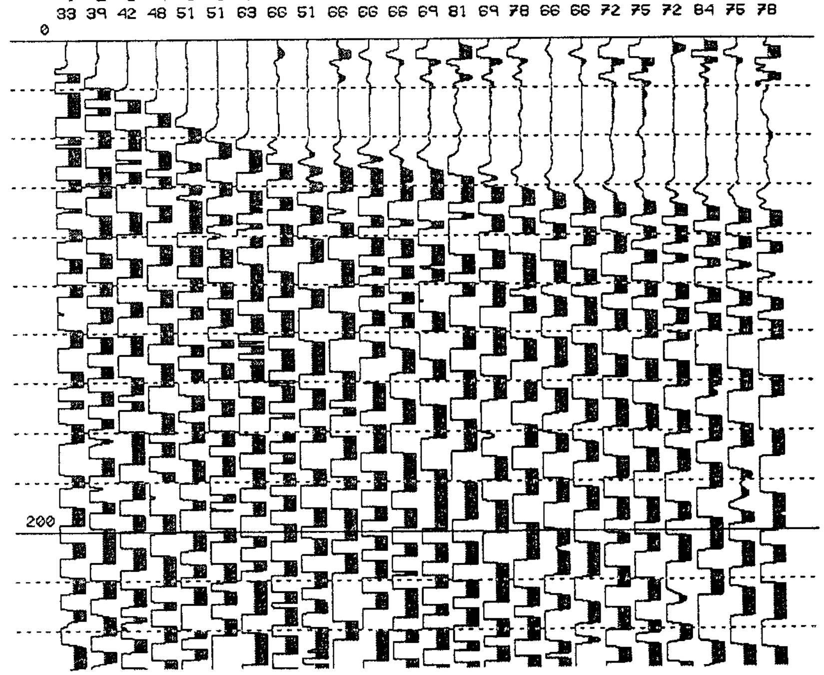
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
48	51	54	57	63	51	63	60	57	63	57	57	60	72	60	72	60	57	60	66	66	72	69	69



GEOMETRICS StrataView

READ FROM 2-1-2.DAT 12:39:16 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
33	39	42	48	51	51	63	66	51	66	66	66	69	81	69	78	66	66	72	75	72	84	75	78

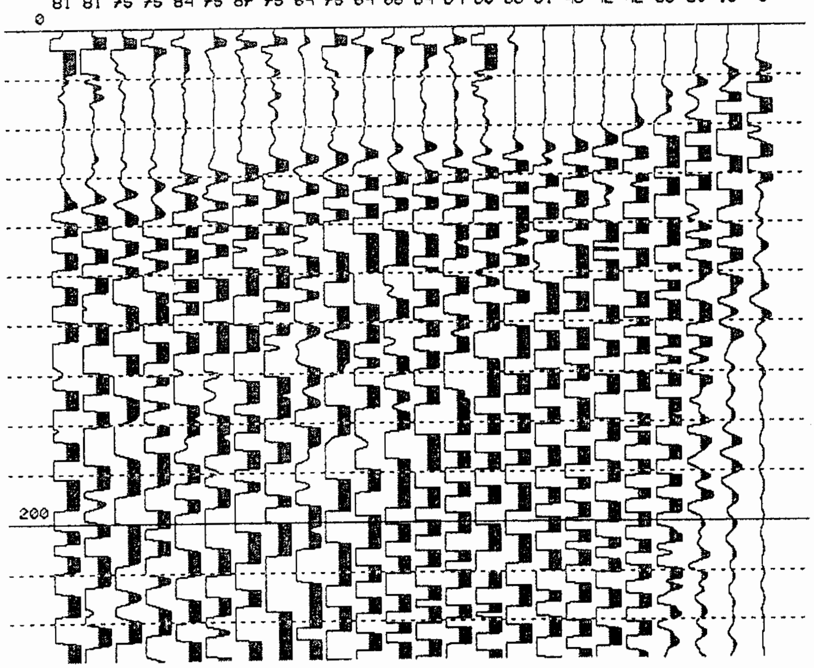


GEOMETRICS

StrataView

READ FROM 2-1-4.DAT
13:04:18 27/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC 120.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
81	81	75	75	84	75	87	75	69	75	69	66	69	69	60	66	51	48	42	42	36	30	15	6

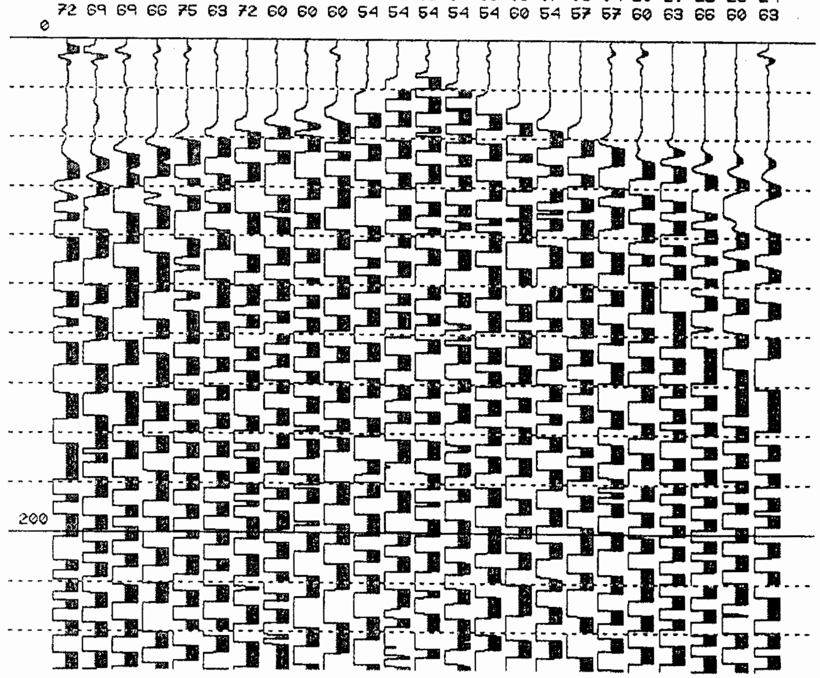


GEOMETRICS

StrataView

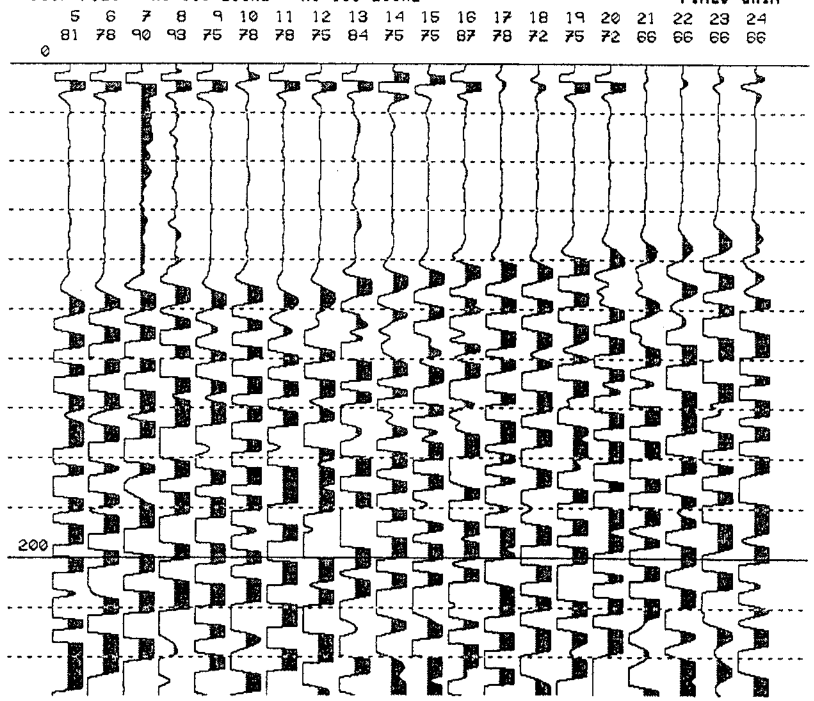
READ FROM 2-1-3.DAT
12:49:55 27/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC 60.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
72	69	69	66	75	63	72	60	60	60	54	54	54	54	54	60	54	57	57	60	63	66	60	63



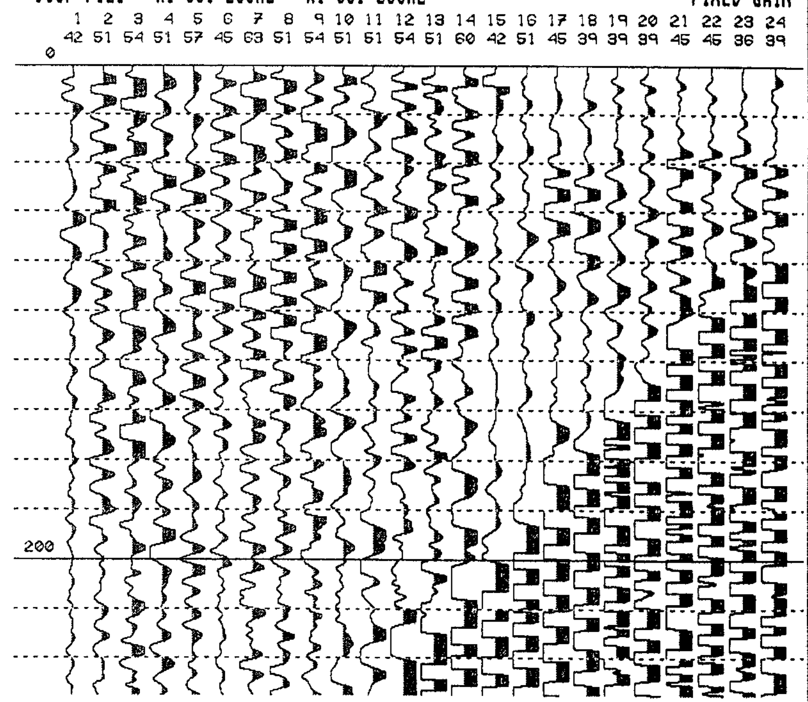
GEOMETRICS StrataView

READ FROM 2-2-2.DAT 15:19:16 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 235.00 PHONE 5 LOC 20.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

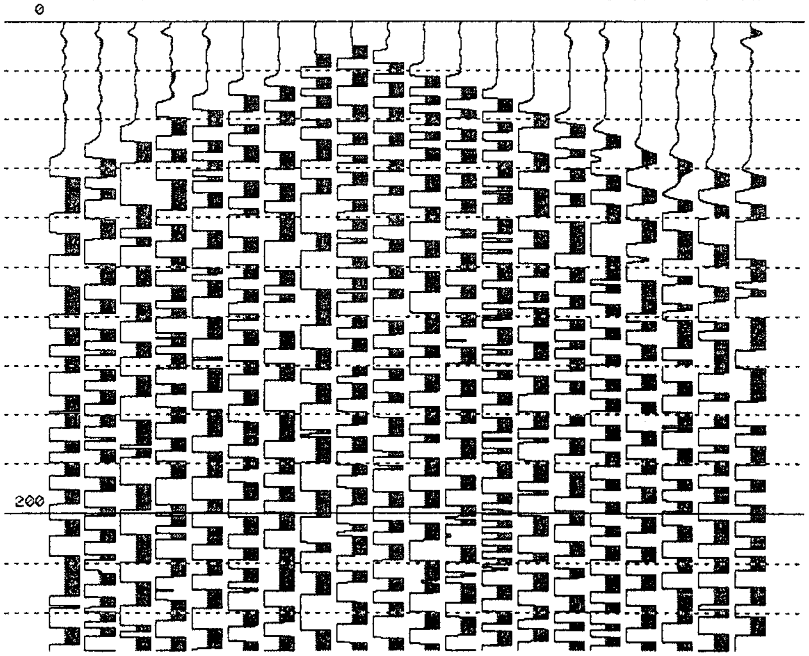
READ FROM 2-1-5.DAT 13:28:05 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 145.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 2
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

READ FROM 2-2-4.DAT 15:39:58 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 5 LOC 20.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

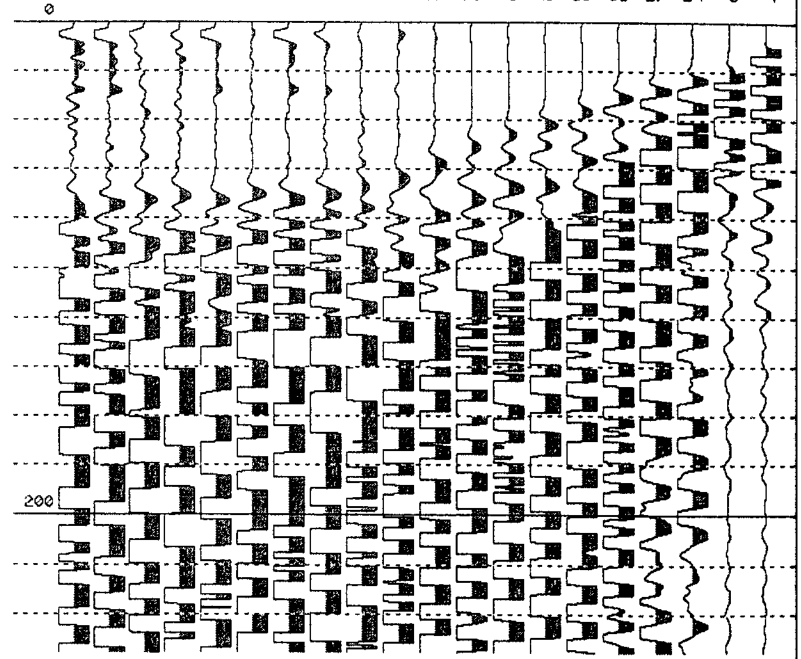
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
69 63 75 75 60 57 54 54 54 54 54 63 54 60 63 66 63 69 69 72



GEOMETRICS StrataVie

READ FROM 2-2-3.DAT 15:30:42 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 120.00 PHONE 5 LOC 20.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
84 78 87 87 72 72 81 75 69 60 57 60 45 45 36 33 27 24 6 9

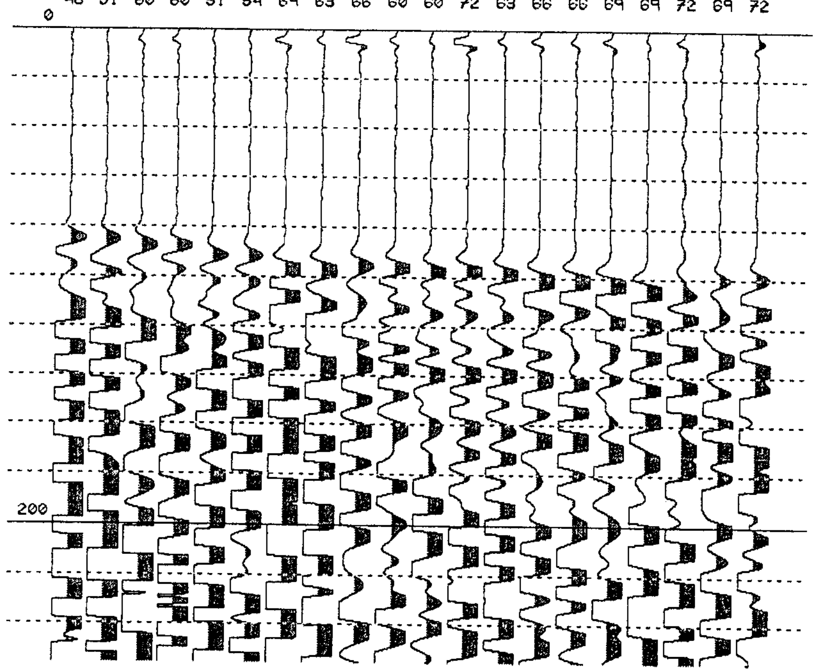


GEOMETRICS

StrataView

READ FROM 2-2-6.DAT
16:11:45 27/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC -60.00
PHONE 5 LOC 20.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN

5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
48	51	60	60	51	54	69	63	66	60	60	72	63	66	66	69	69	72	69	72

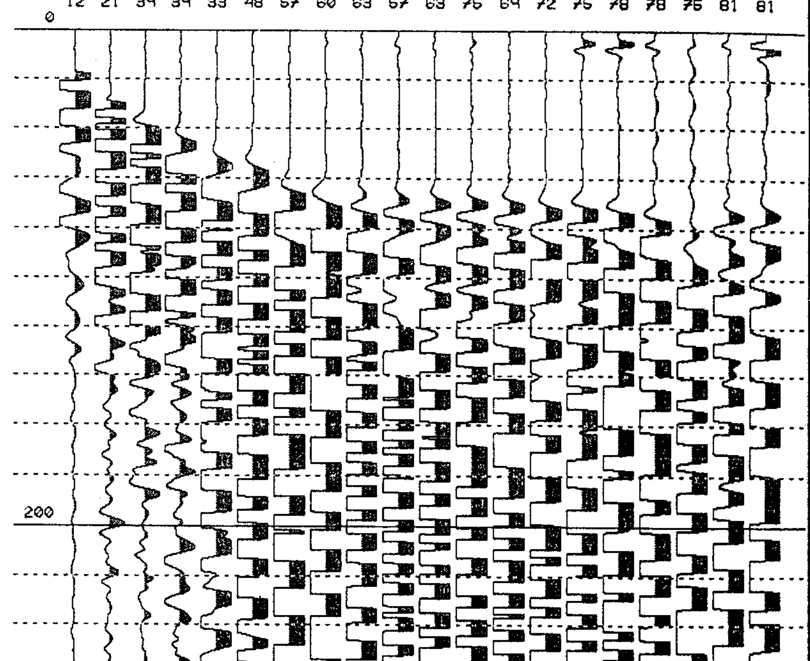


GEOMETRICS

StrataView

READ FROM 2-2-5.DAT
15:50:27 27/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC -5.00
PHONE 5 LOC 20.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN

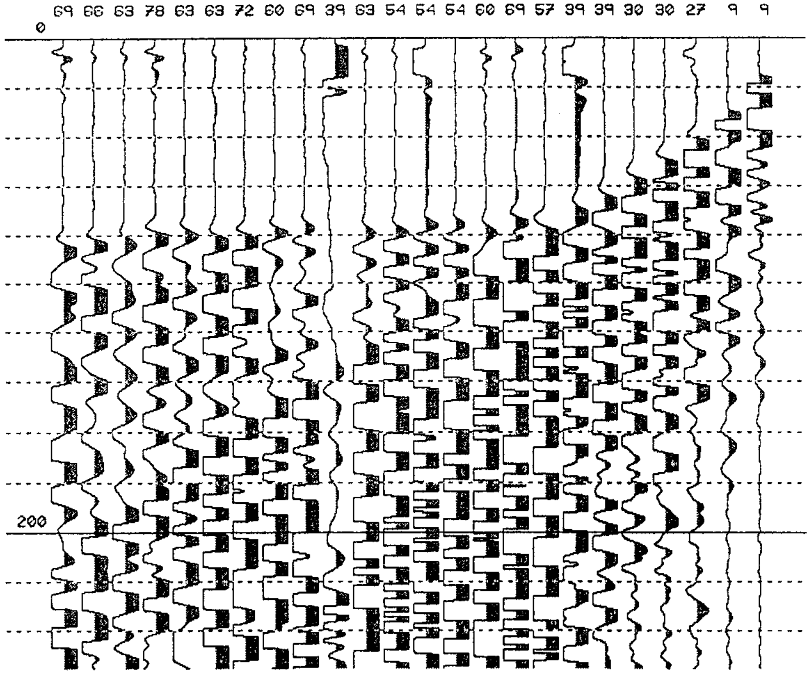
5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
12	21	39	39	33	48	57	60	63	57	63	75	69	72	75	78	78	75	81	81



GEOMETRICS StrataView

READ FROM 2-3-2.DAT 17:28:02 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 120.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

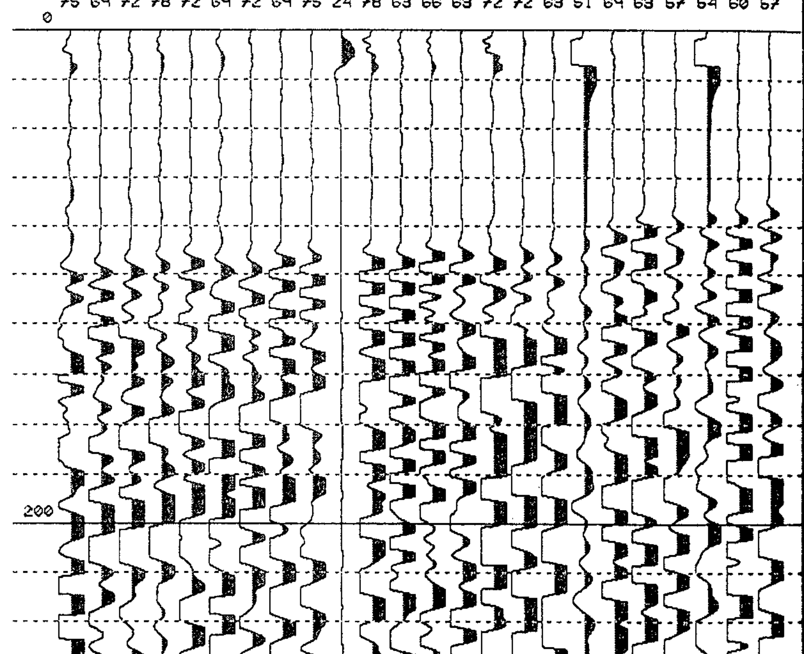
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
69	66	63	78	63	63	72	60	69	39	63	54	54	54	60	69	57	39	39	30	30	27	9	9



GEOMETRICS StrataView

READ FROM 2-3-1.DAT 17:14:45 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 235.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
75	69	72	78	72	69	72	69	75	24	78	63	66	63	72	72	63	51	69	63	57	54	60	57

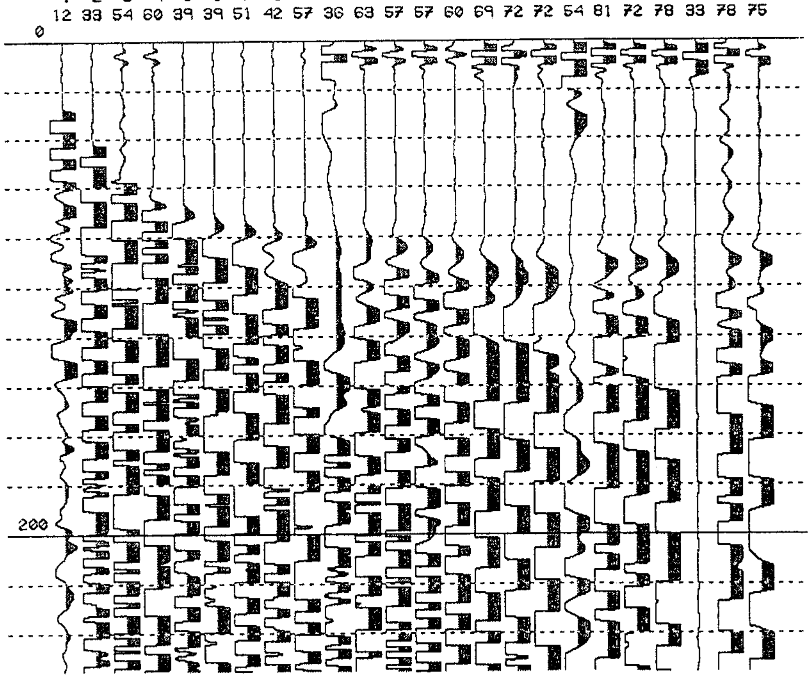


GEOMETRICS

StrataView

READ FROM 2-3-4.DAT
17:58:16 27/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC -5.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ
NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ
HI CUT 250HZ
FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
12	33	54	60	39	39	51	42	57	36	63	57	57	60	69	72	72	54	81	72	78	33	78	75

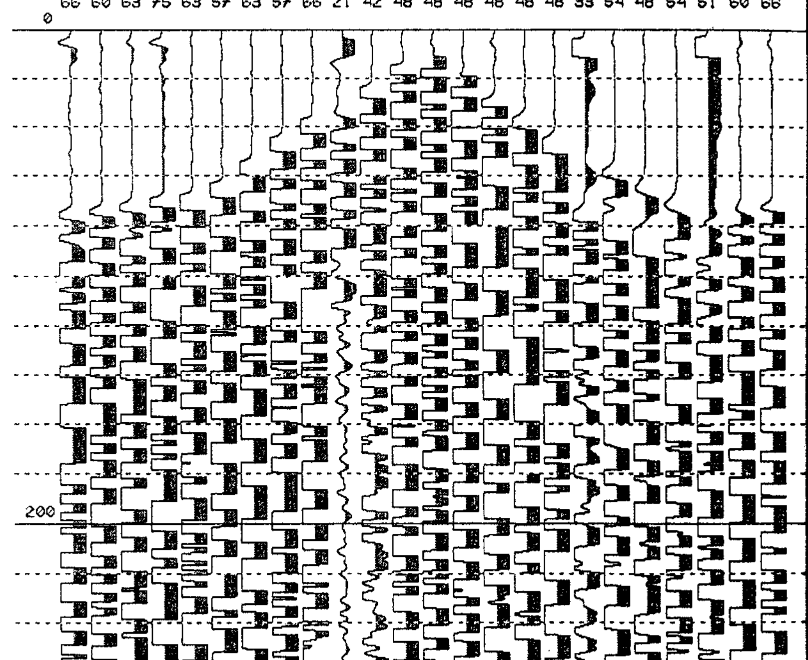


GEOMETRICS

StrataView

READ FROM 2-3-3.DAT
17:43:30 27/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC 60.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ
NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ
HI CUT 250HZ
FIXED GAIN

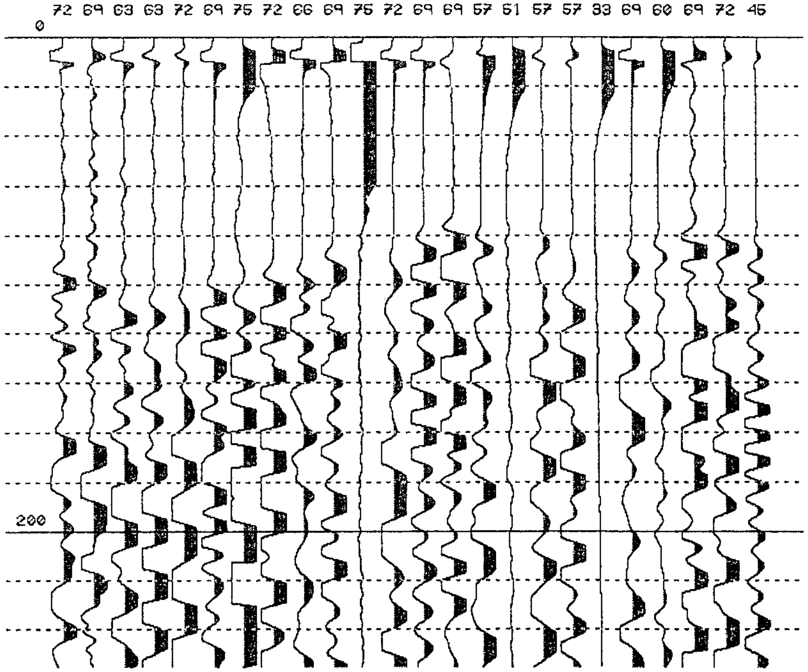
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
66	60	63	75	63	57	63	57	66	21	42	48	48	48	48	48	48	33	54	48	54	51	60	66



GEOMETRICS StrataView

READ FROM 2-4-1.DAT 8:47:59 28/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 235.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

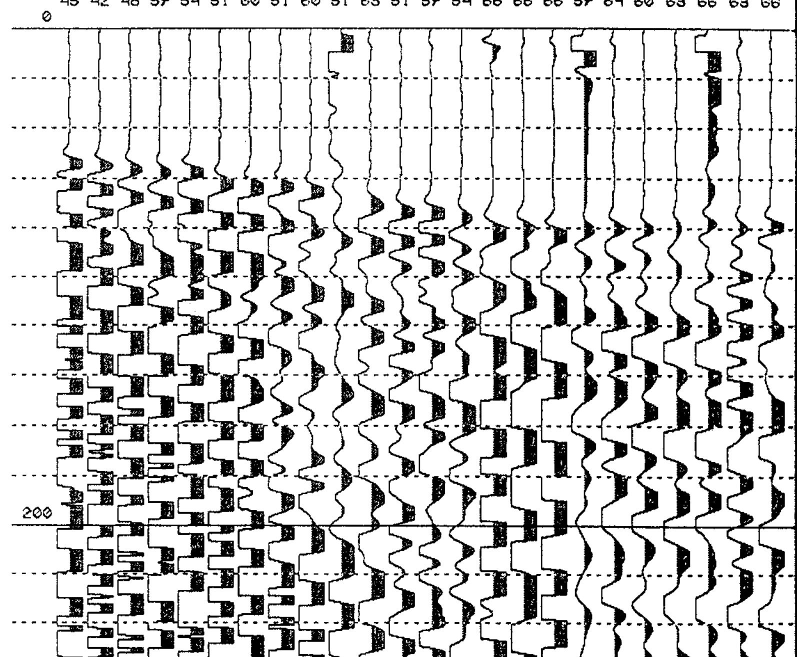
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
72	69	63	63	72	69	75	72	66	69	75	72	69	69	57	51	57	57	33	69	60	69	72	45



GEOMETRICS StrataVie

READ FROM 2-3-5.DAT 18:11:33 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -50.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

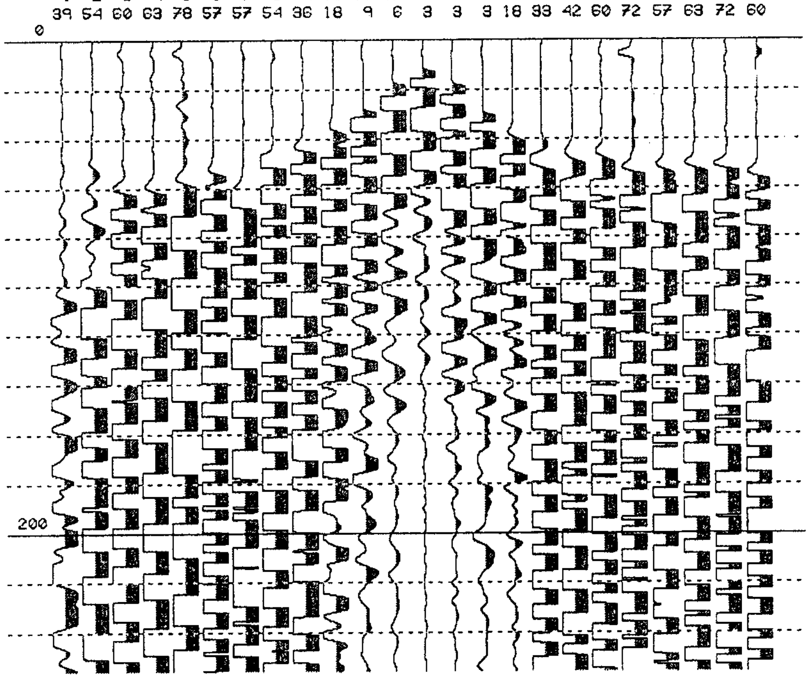
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
45	42	48	57	54	51	60	51	60	51	63	51	57	54	66	66	66	57	69	60	63	66	63	66



GEOMETRICS StrataView

READ FROM 2-4-3.DAT 9:21:04 28/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

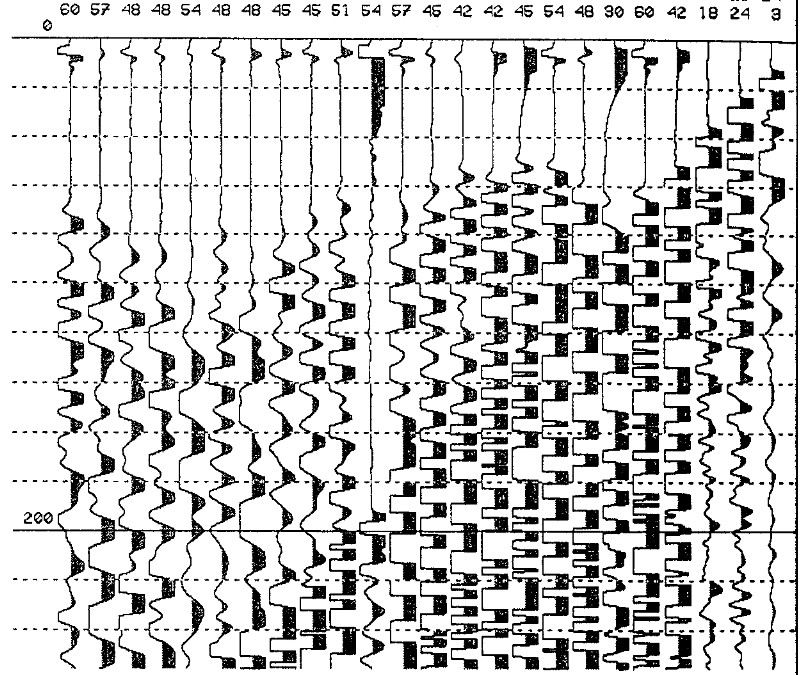
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
39	54	60	63	78	57	57	54	36	18	9	6	3	3	3	18	33	42	60	72	57	63	72	60



GEOMETRICS StrataVie

READ FROM 2-4-2.DAT 9:01:55 28/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 120.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

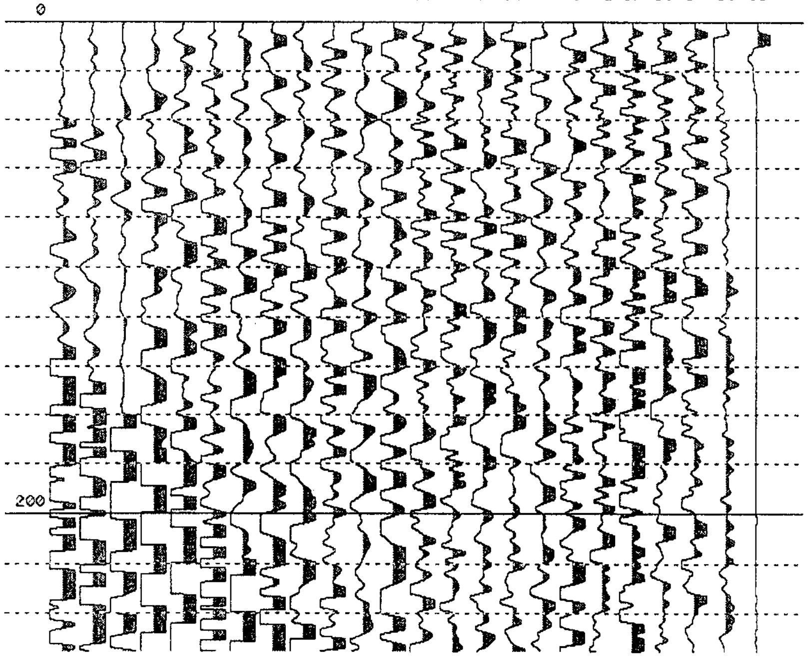
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
60	57	48	48	54	48	48	45	45	51	54	57	45	42	42	45	54	48	30	60	42	18	24	3



GEOMETRICS StrataView

READ FROM 2-4-5.DAT 10:04:21 28/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -50.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 2
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

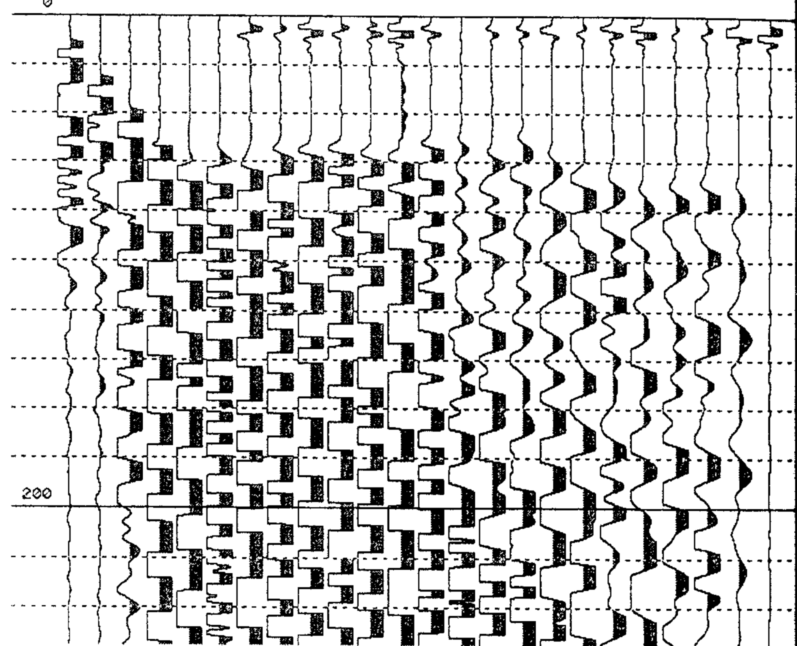
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
33	33	9	27	42	36	36	42	39	42	39	48	51	45	39	51	39	42	48	57	51	54	51	15



GEOMETRICS StrataVie

READ FROM 2-4-4.DAT 9:39:25 28/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
3	3	6	33	42	33	66	51	60	60	60	78	60	45	45	54	51	54	60	66	60	63	63	24

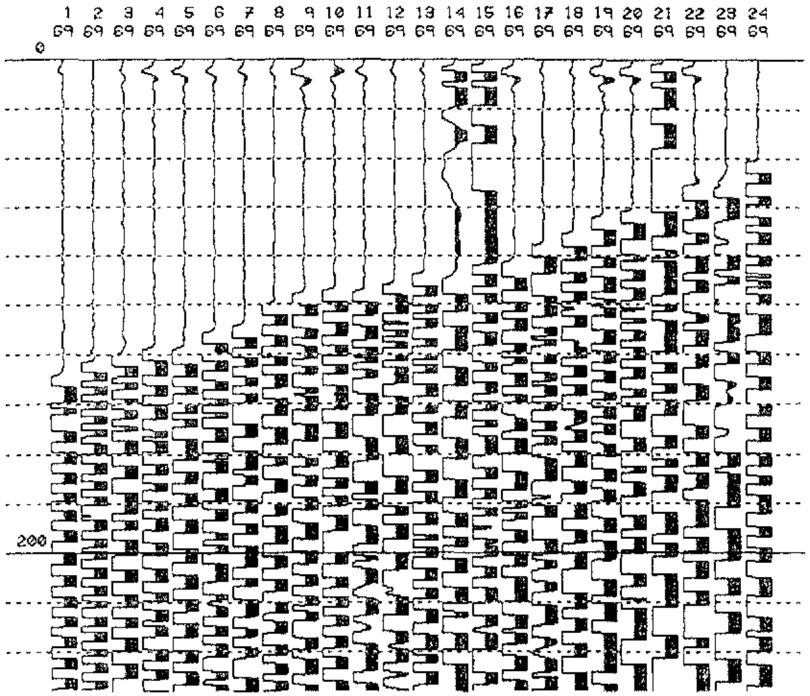


American South

AMERICAN ~~NORTH~~ SOUTH

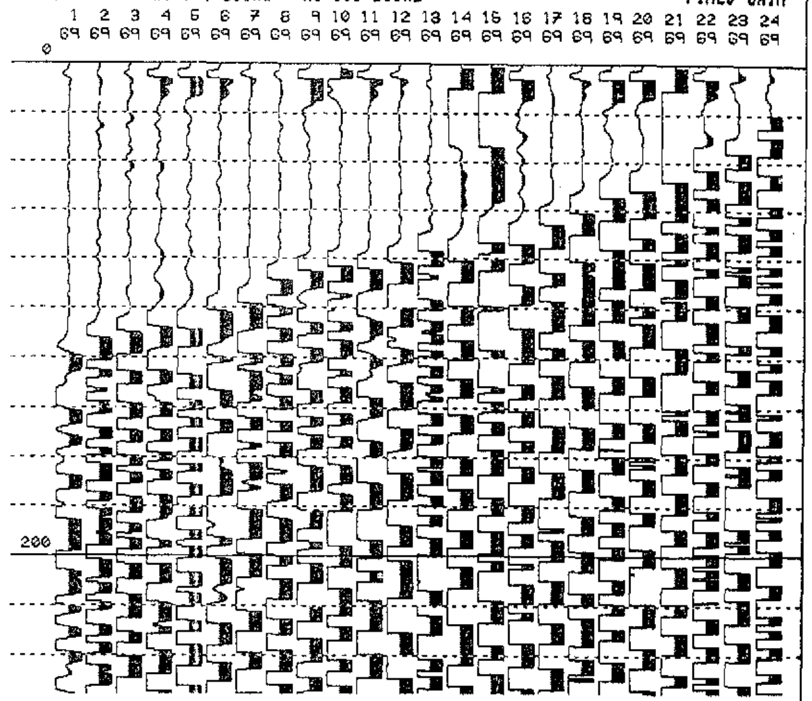
GEOMETRICS StrataView

READ FROM 1-1-1.DAT 12:02:16 25/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 175.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



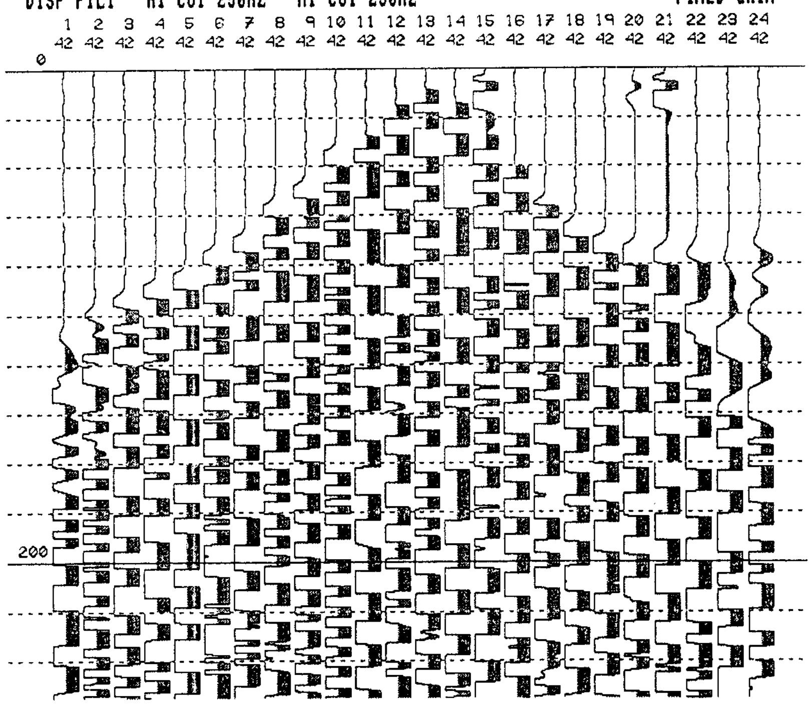
GEOMETRICS StrataView

READ FROM 1-1-2.DAT 12:14:07 25/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 125.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



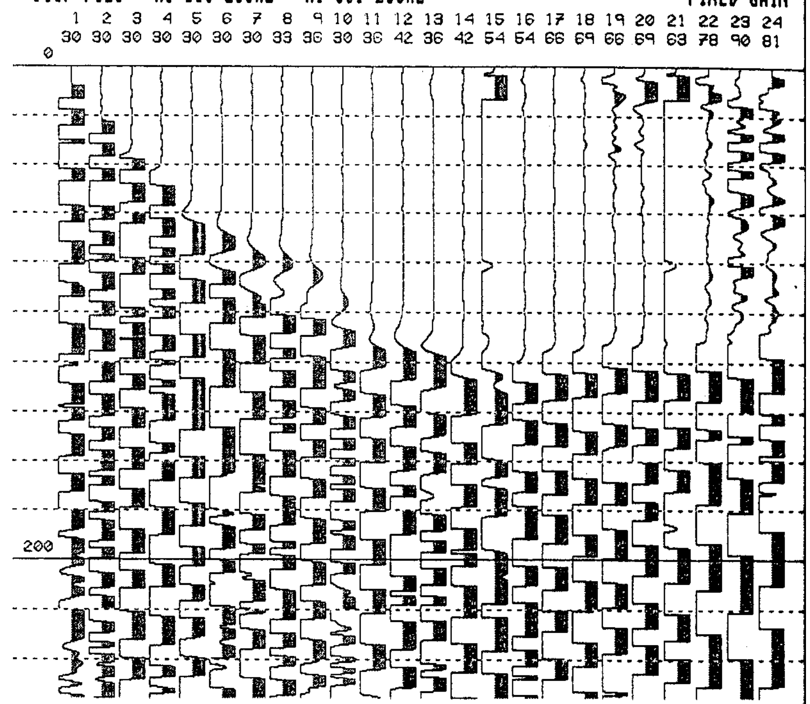
GEOMETRICS StrataView

READ FROM 1-1-3.DAT 12:52:03 25/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



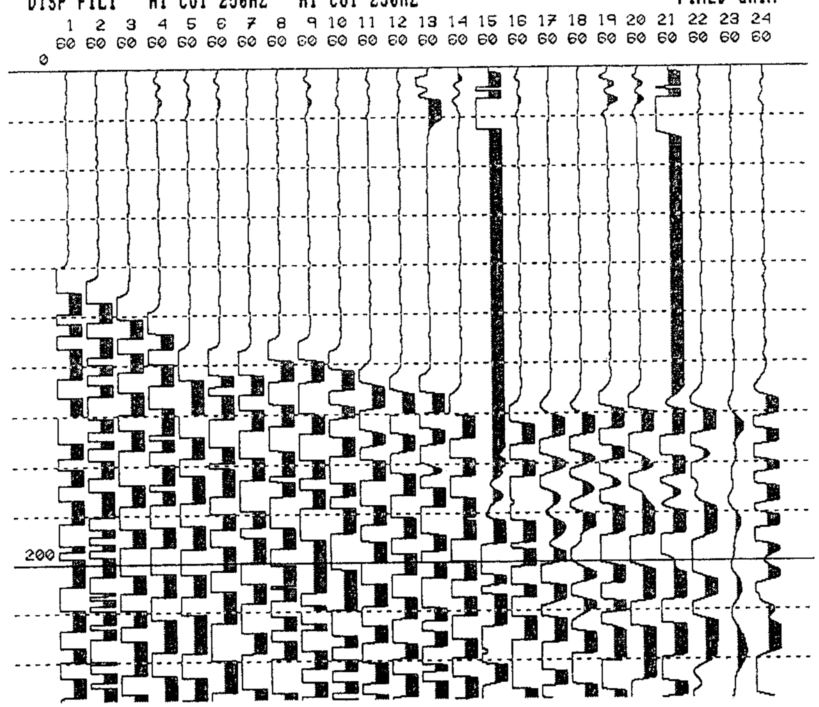
GEOMETRICS StrataVie

READ FROM 1-1-4.DAT 13:20:08 25/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



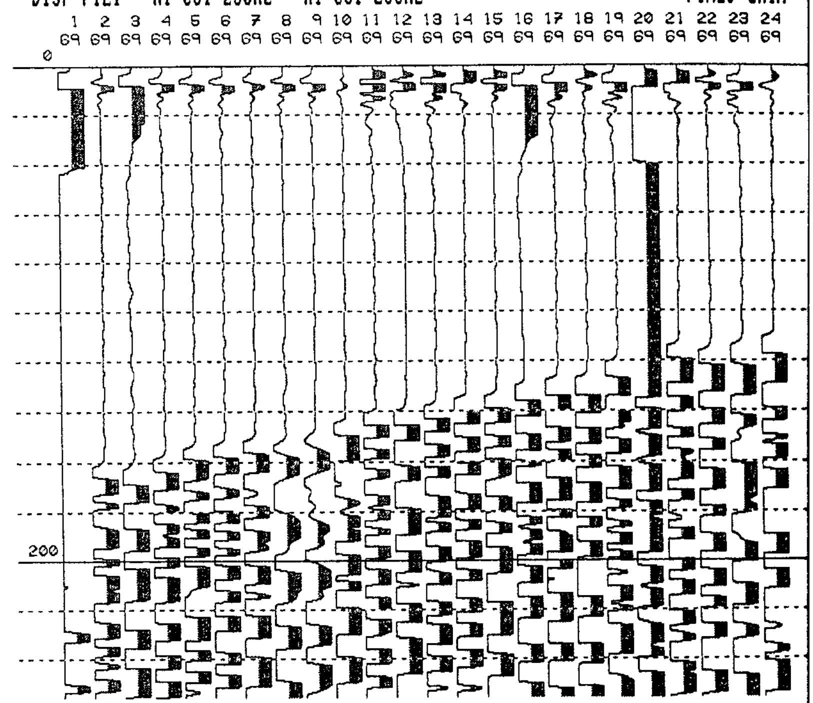
GEOMETRICS StrataView

READ FROM 1-1-5.DAT 13:40:06 25/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -38.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

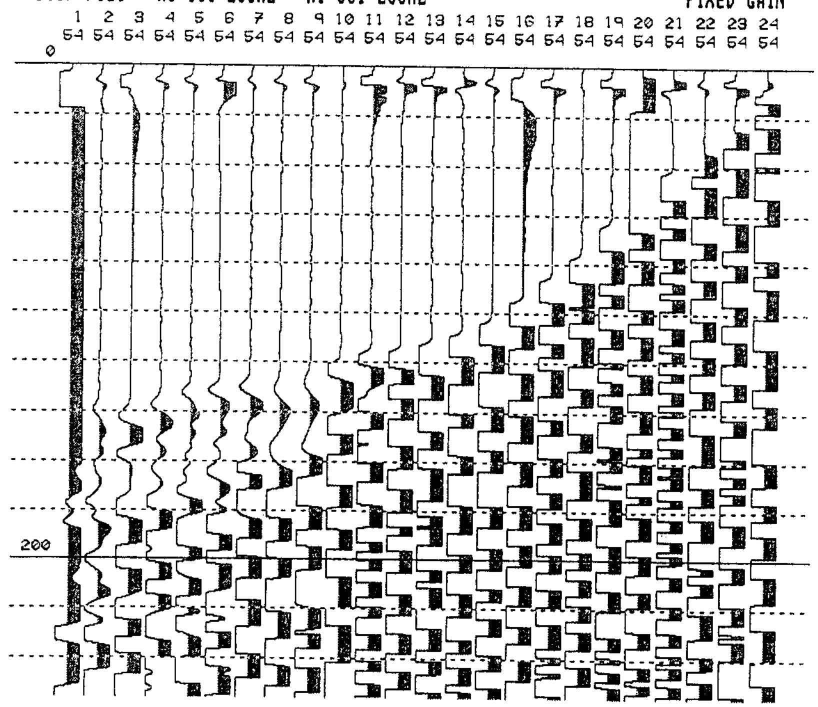
READ FROM 1-2-1.DAT 15:45:18 25/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 235.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS

StrataView

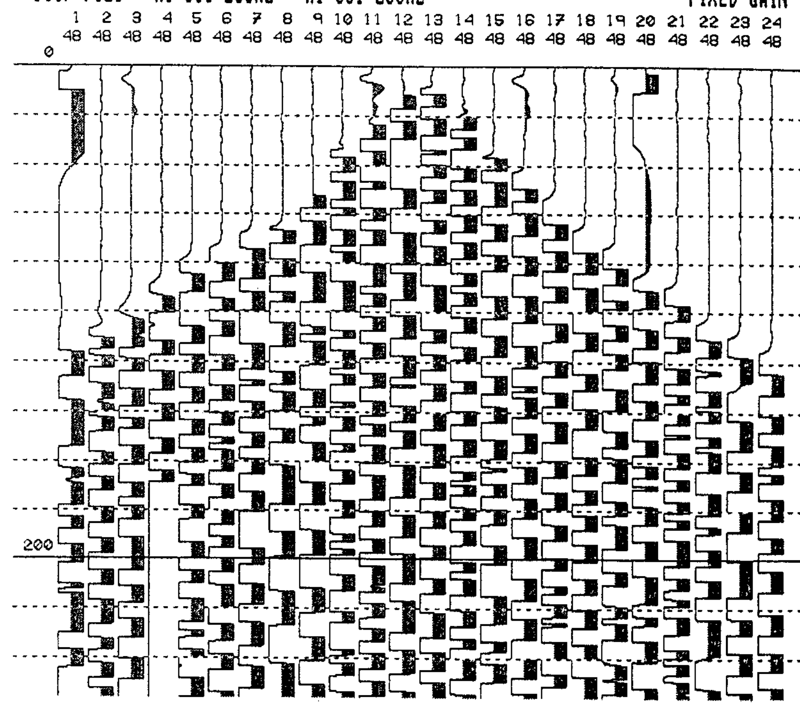
READ FROM 1-2-2.DAT
16:02:58 25/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC 120.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ
NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ
HI CUT 250HZ
FIXED GAIN



GEOMETRICS

StrataVie

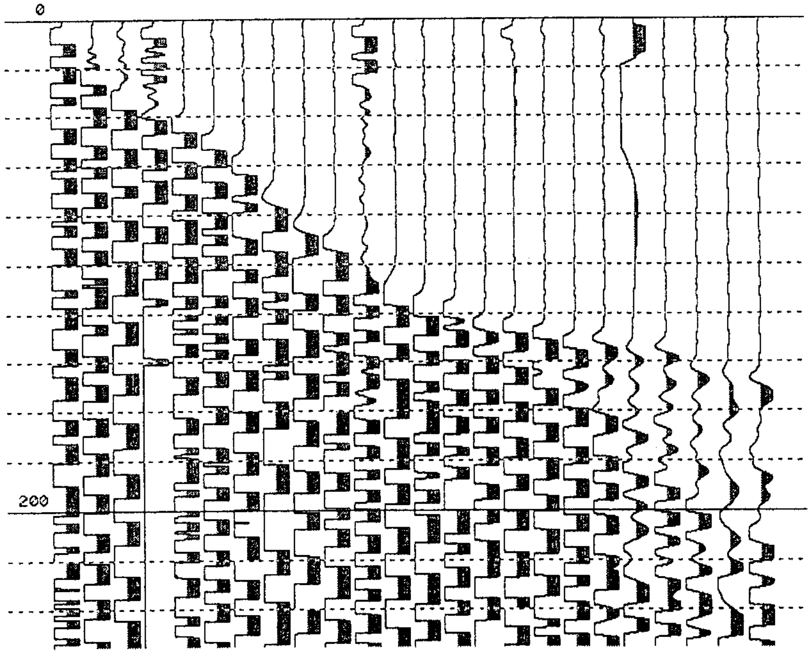
READ FROM 1-2-3.DAT
16:24:00 25/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC 62.50
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ
NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ
HI CUT 250HZ
FIXED GAIN



GEOMETRICS StrataView

READ FROM 1-2-5.DAT 16:42:03 25/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

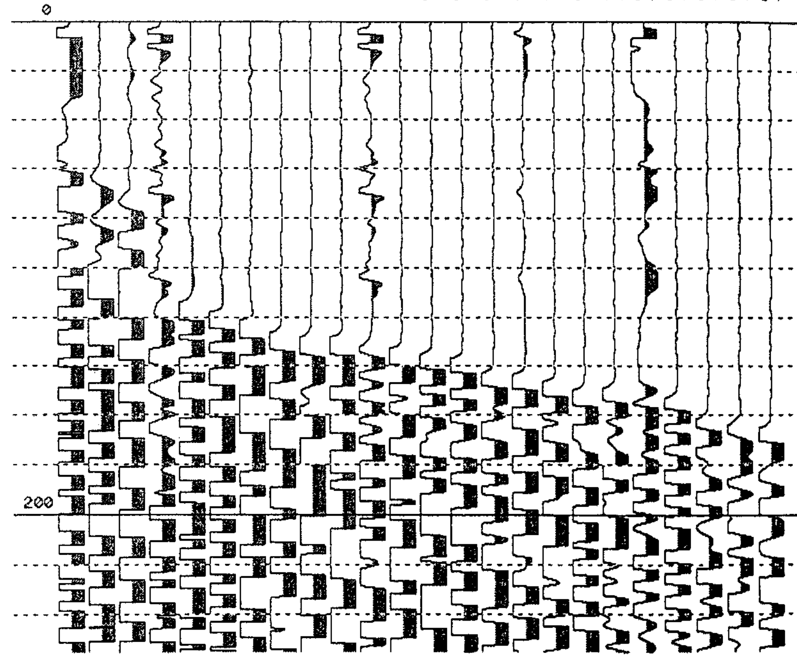
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54 54



GEOMETRICS StrataView

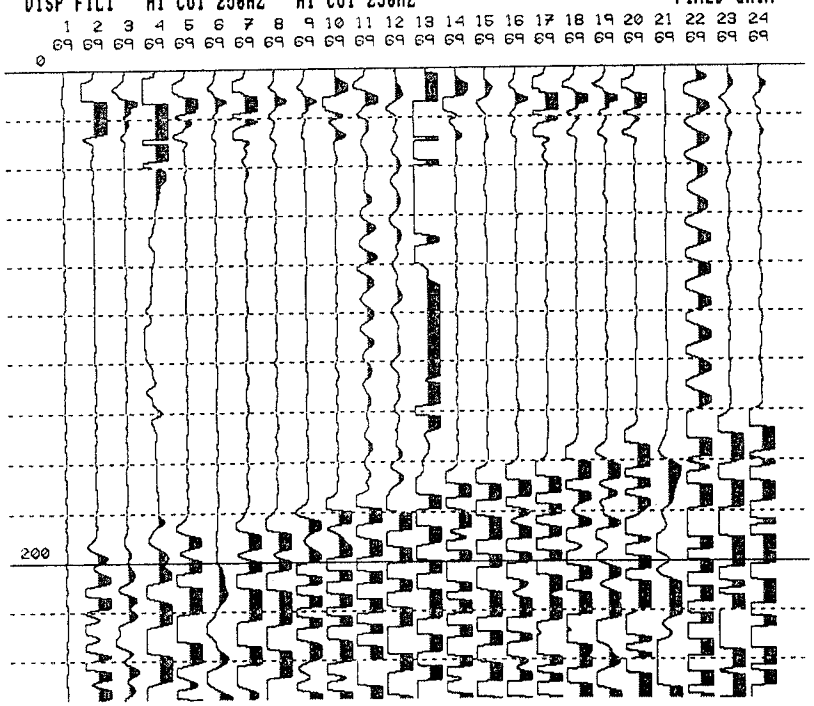
READ FROM 1-2-6.DAT 17:03:47 25/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -45.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69 69



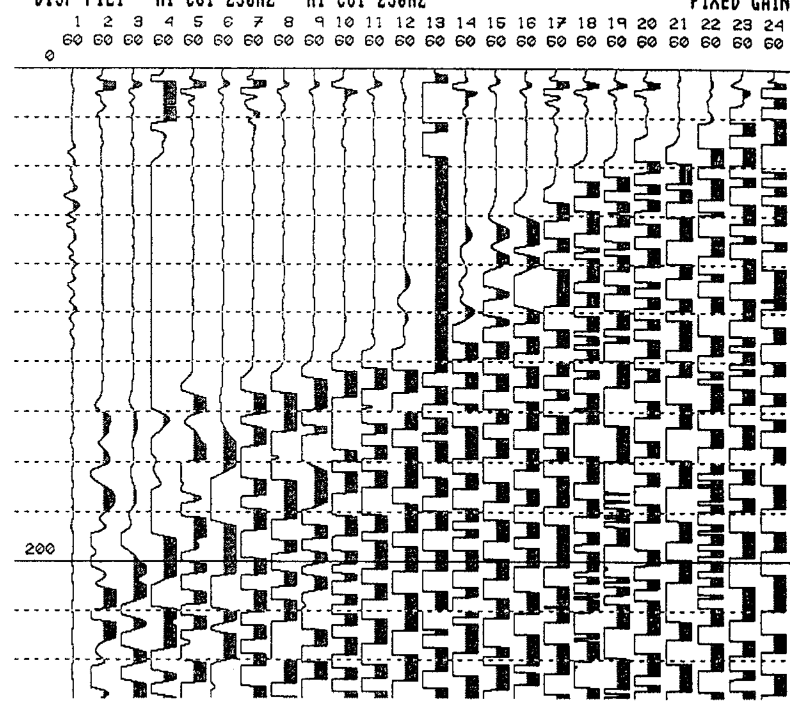
GEOMETRICS StrataView

READ FROM 1-3-1.DAT 9:29:26 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 235.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



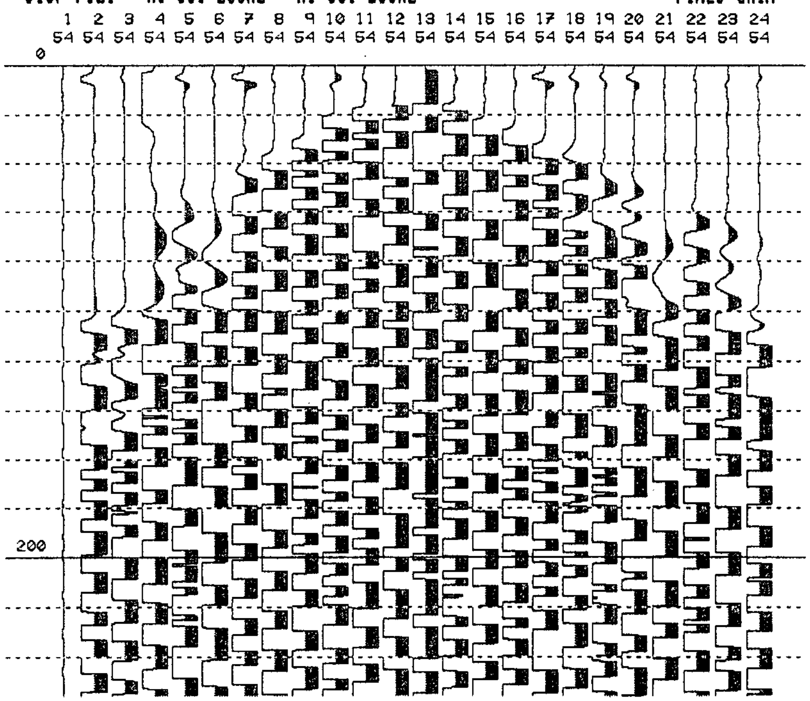
GEOMETRICS StrataView

READ FROM 1-3-2.DAT 9:46:09 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 120.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



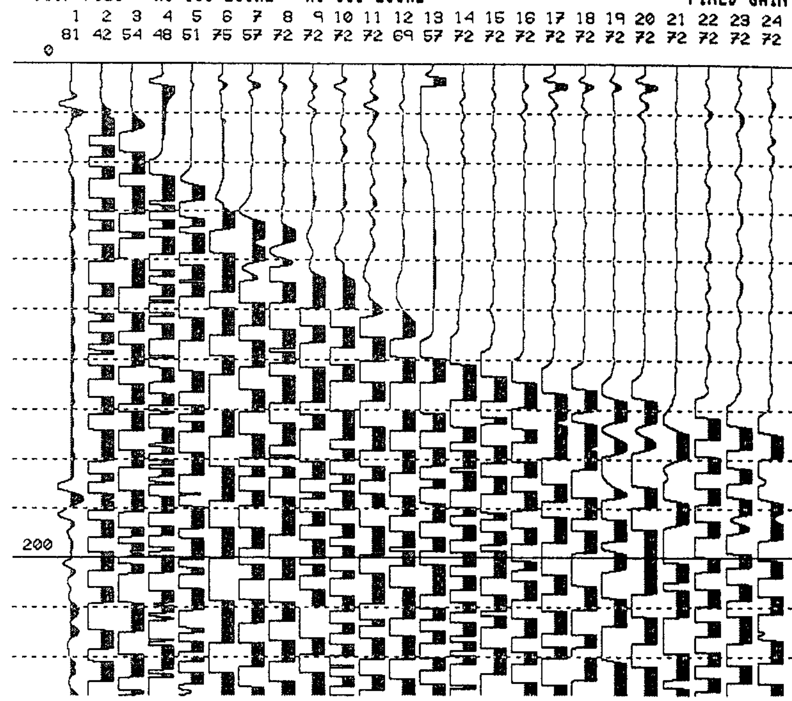
GEOMETRICS StrataView

READ FROM 1-3-3.DAT 10:00:39 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



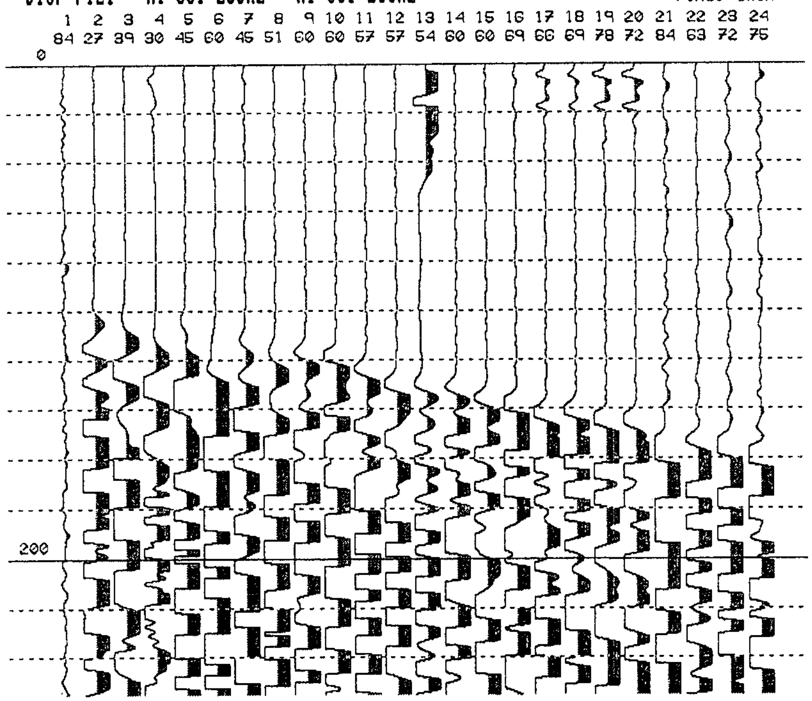
GEOMETRICS StrataVie

READ FROM 1-3-4.DAT 10:18:30 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



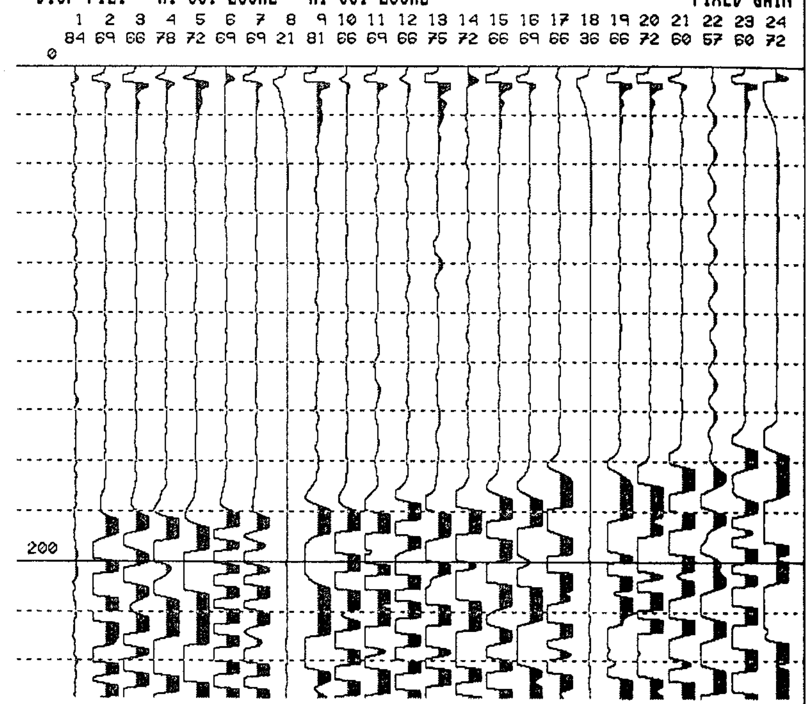
GEOMETRICS StrataView

READ FROM 1-3-5.DAT 10:35:13 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -45.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

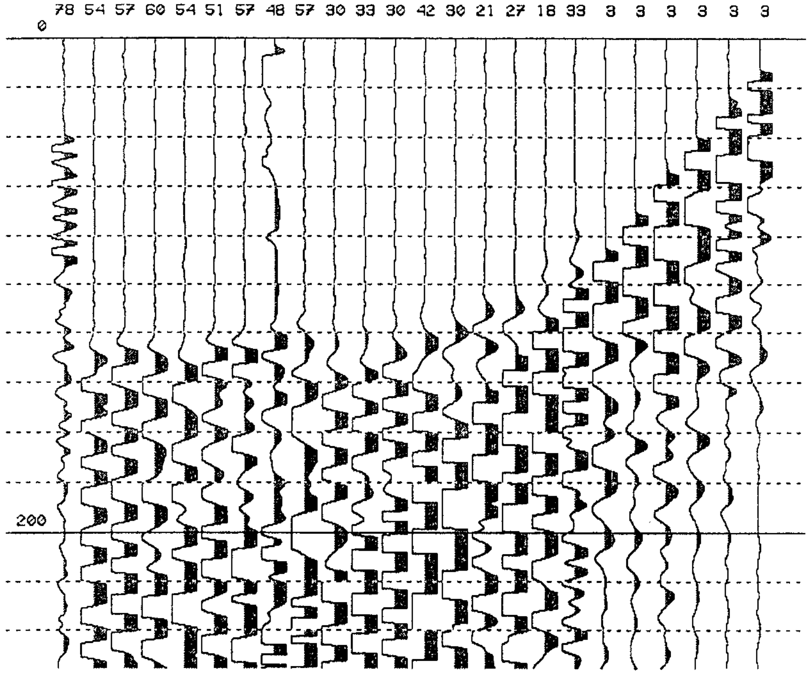
READ FROM 1-4-1.DAT 12:12:14 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 235.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

READ FROM 1-4-2.DAT 12:30:25 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 123.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

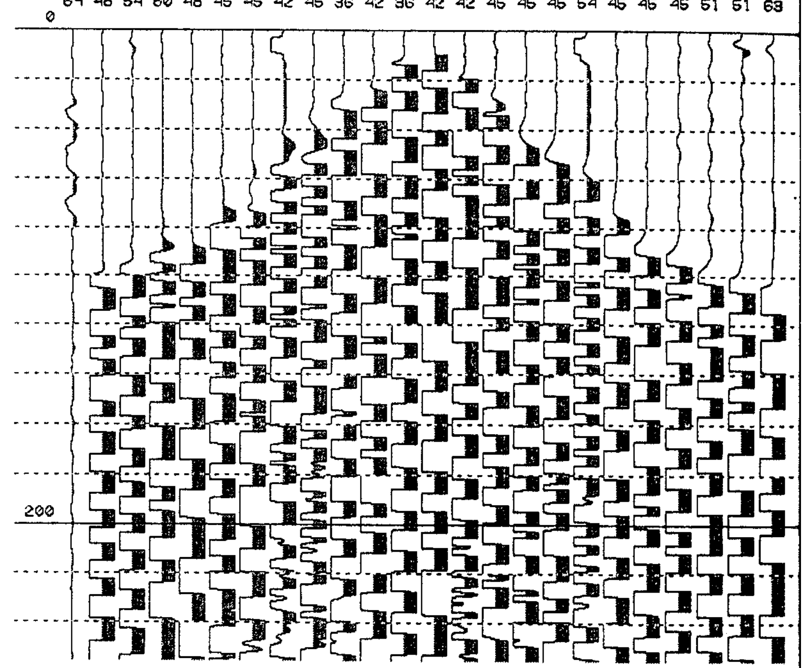
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
78	54	57	60	54	51	57	48	57	30	33	30	42	30	21	27	18	33	3	3	3	3	3	3



GEOMETRICS StrataVie

READ FROM 1-4-3.DAT 12:50:35 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
69	48	54	60	48	45	45	42	45	36	42	36	42	42	45	45	45	54	45	45	45	51	51	63

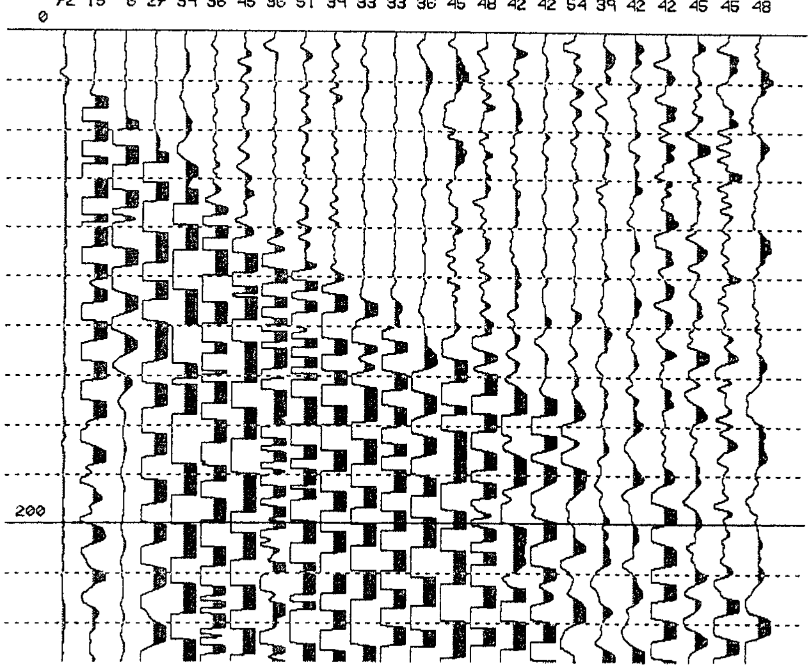


GEOMETRICS

StrataView

READ FROM 1-4-4.DAT
13:04:35 26/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC 0.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 4
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
72	15	6	27	39	36	45	36	51	39	33	33	36	45	48	42	42	54	39	42	42	45	45	48

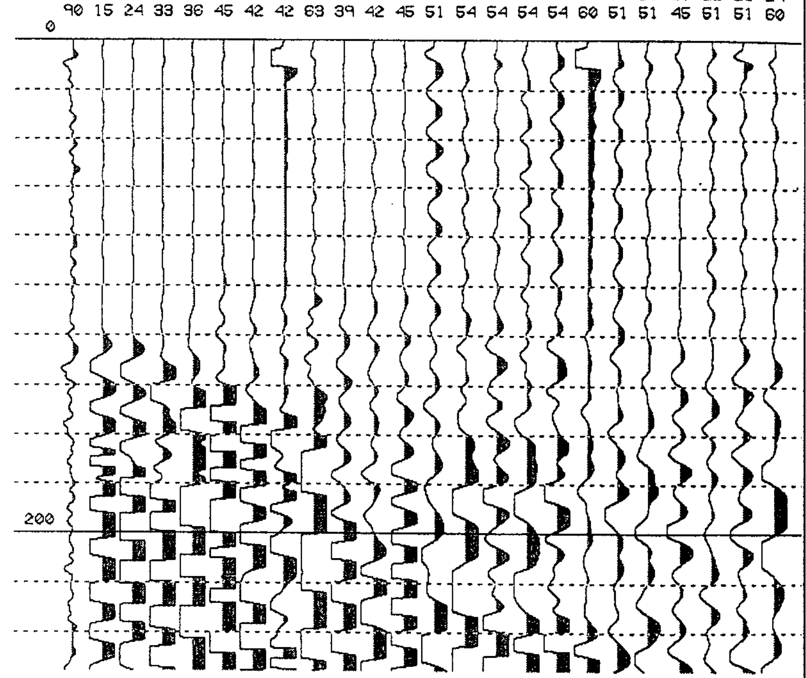


GEOMETRICS

StrataVie

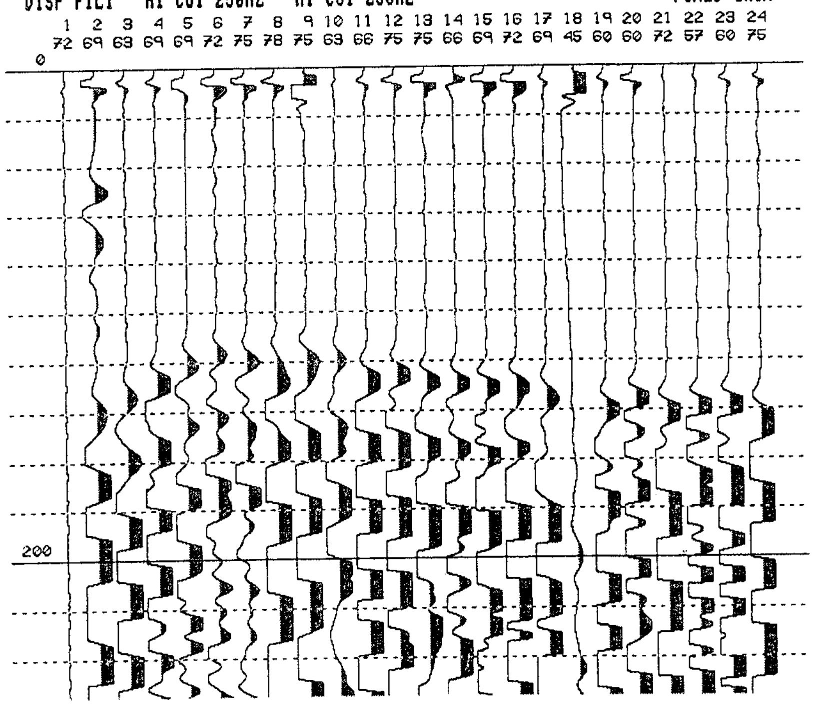
READ FROM 1-4-5.DAT
13:27:30 26/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC -60.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
90	15	24	33	36	45	42	42	63	39	42	45	51	54	54	54	54	60	51	51	45	51	51	60



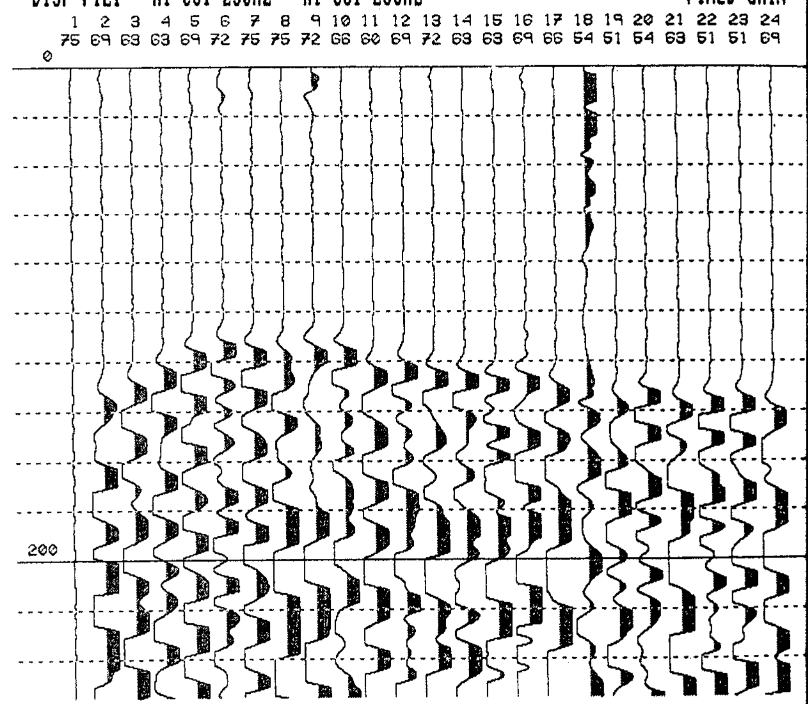
GEOMETRICS StrataView

READ FROM 1-5-1.DAT 15:45:39 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 230.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

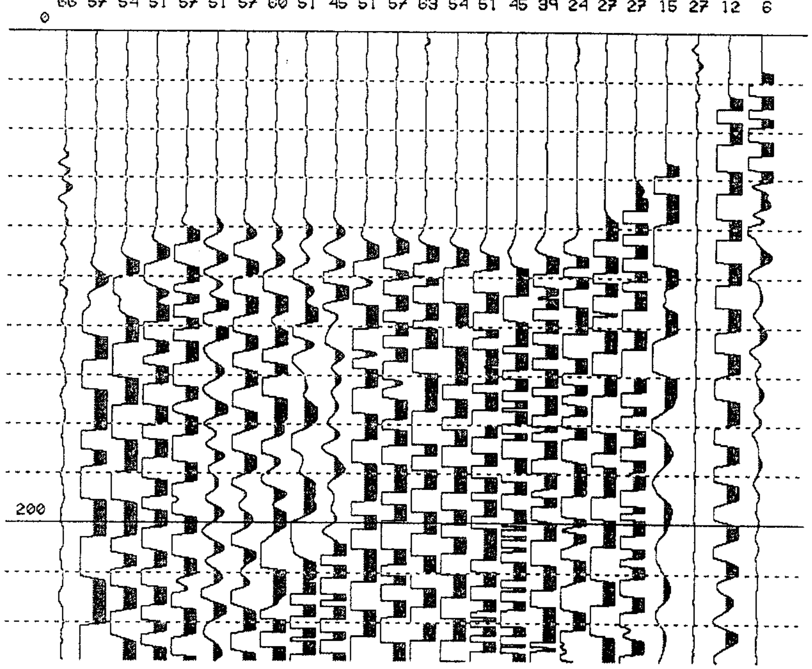
READ FROM 1-5-2.DAT 16:08:48 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC 230.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

READ FROM 1-5-3.DAT
16:22:32 26/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC 123.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN

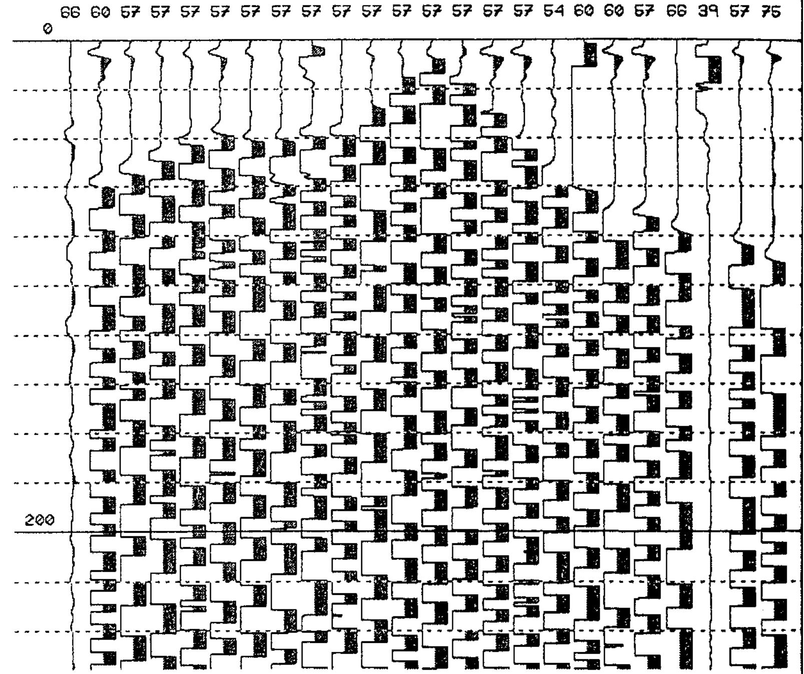
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
66	57	54	51	57	51	57	60	51	45	51	57	63	54	51	45	39	24	27	27	15	27	12	6



GEOMETRICS StrataVie

READ FROM 1-5-4.DAT
16:40:38 26/MAY/2005
LINE NUMBER 01-01
GROUP INTERVAL 5.00
SHOT LOC 60.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN

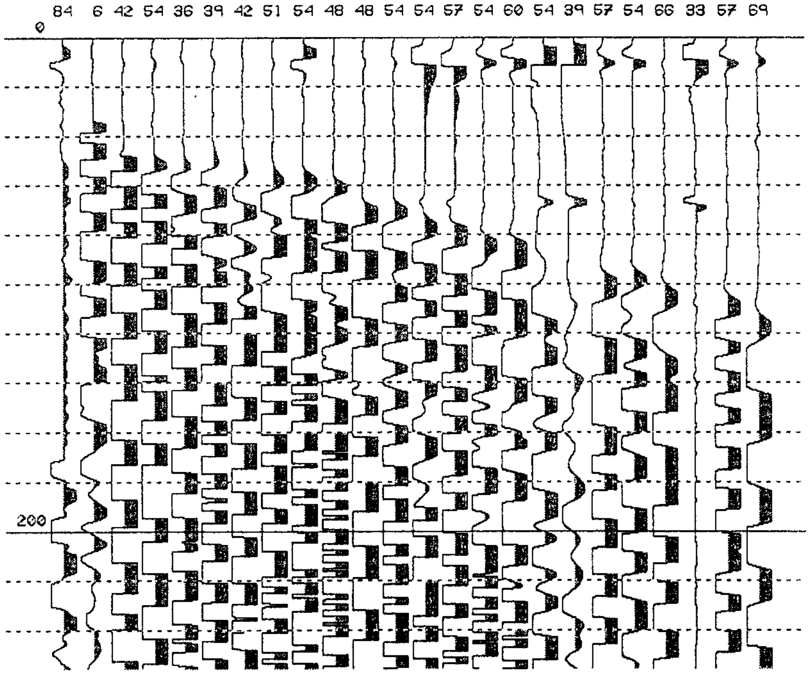
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
66	60	57	57	57	57	57	57	57	57	57	57	57	57	57	57	54	60	60	57	66	39	57	75



GEOMETRICS StrataView

READ FROM 1-5-5.DAT 17:01:21 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

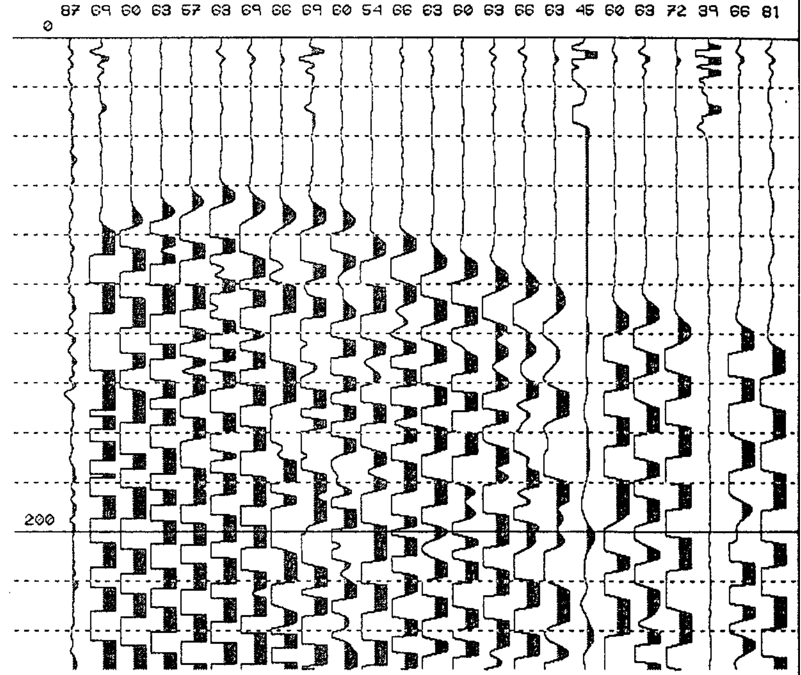
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
84	6	42	54	36	39	42	51	54	48	48	54	54	57	54	60	54	39	57	54	66	33	57	69



GEOMETRICS StrataVie

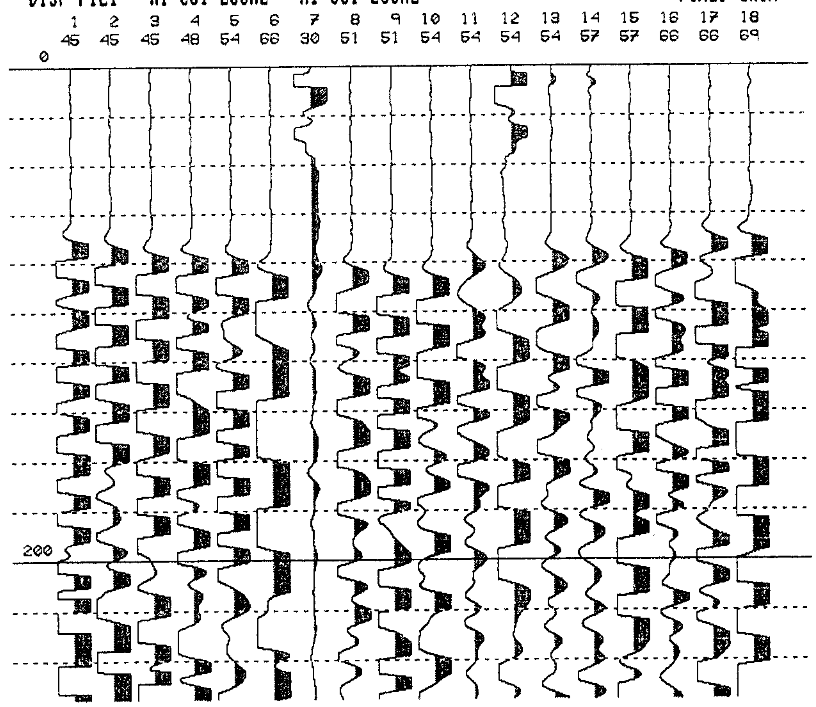
READ FROM 1-5-6.DAT 17:25:23 26/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -35.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
87	69	60	63	57	63	69	66	69	60	54	66	63	60	63	66	63	45	60	63	72	39	66	81



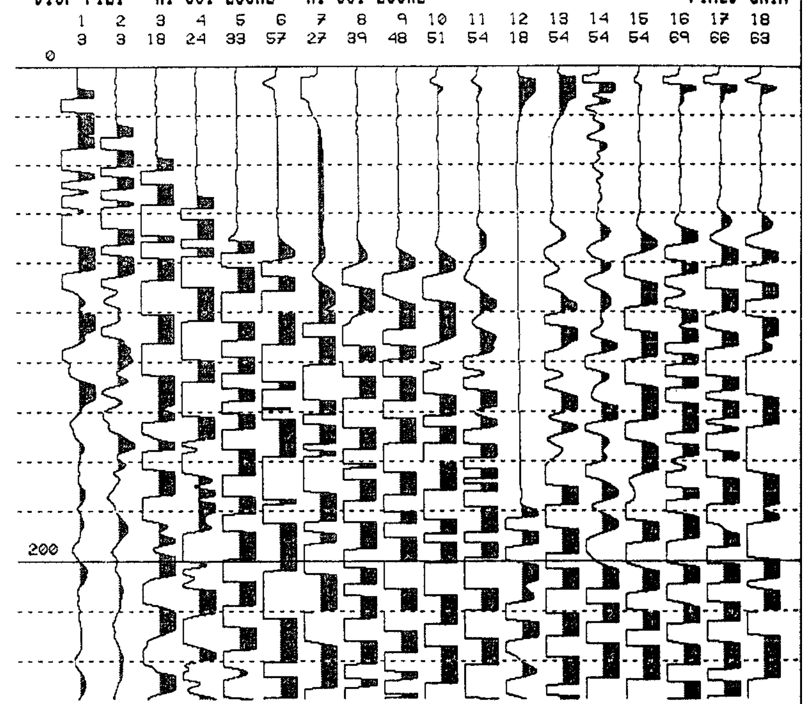
GEOMETRICS StrataView

READ FROM 1-6-2.DAT 9:27:22 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -80.00 PHONE 1 LOC 0.00 PHONE 18 LOC 85.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

READ FROM 1-6-3.DAT 9:45:10 27/MAY/2005
LINE NUMBER 01-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 18 LOC 85.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

READ FROM 1-6-4.DAT 10:04:11 27/MAY/2005

LINE NUMBER 01-01 GROUP INTERVAL 5.00

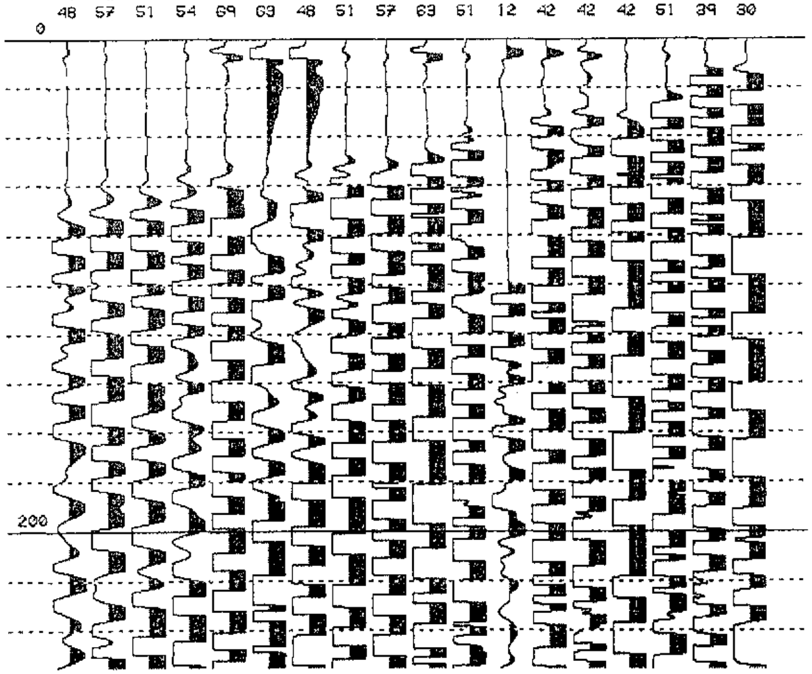
SHOT LOC 90.00 PHONE 1 LOC 0.00 PHONE 18 LOC 85.00

SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS

ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 3

DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
48	57	51	54	69	63	48	51	57	63	61	12	42	42	42	61	39	30



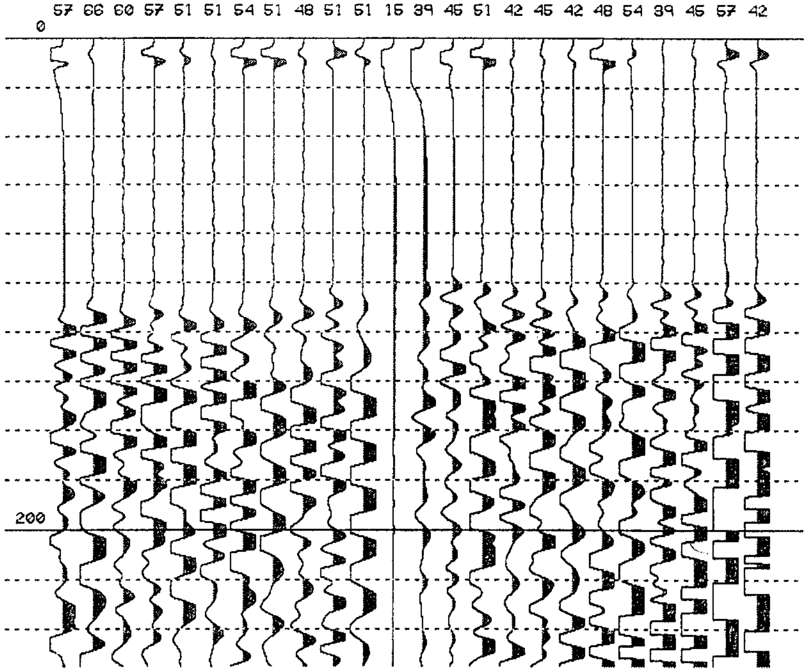
Dunwell Line 1

DUNWELL LINE 1 (WEST)

GEOMETRICS StrataView

READ FROM 4-1-1.DAT 9:24:07 30/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 190.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

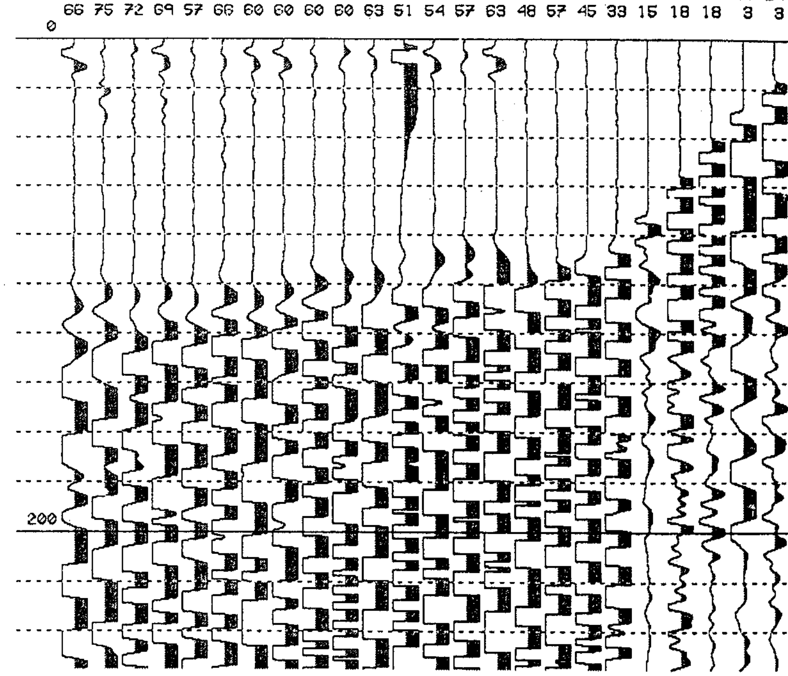
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
57	66	60	57	51	51	54	51	48	51	51	15	39	45	51	42	45	42	48	54	39	45	57	42



GEOMETRICS StrataVie

READ FROM 4-1-2.DAT 9:42:42 30/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 120.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

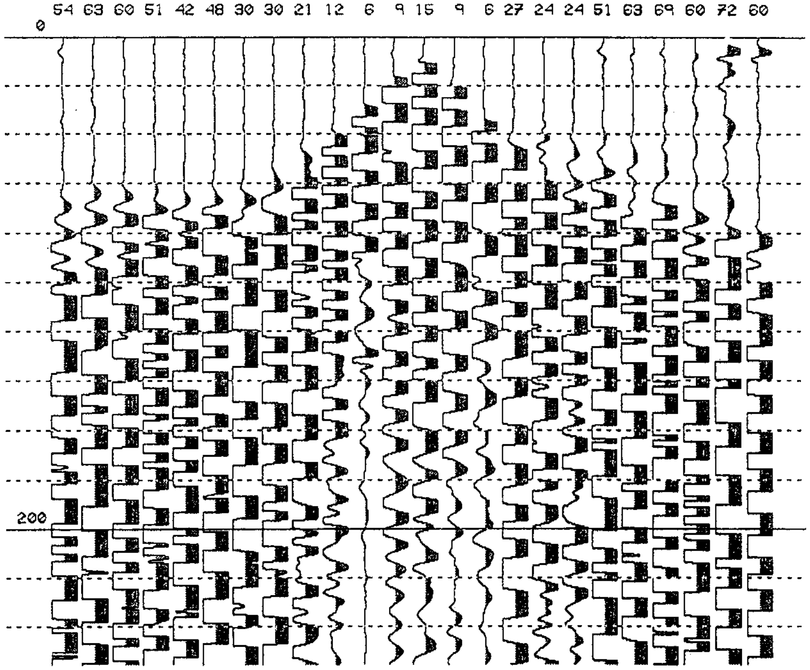
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
66	75	72	69	57	66	60	60	60	60	63	51	54	57	63	48	57	45	33	15	18	18	3	3



GEOMETRICS StrataView

READ FROM 4-1-3.DAT 9:58:36 30/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

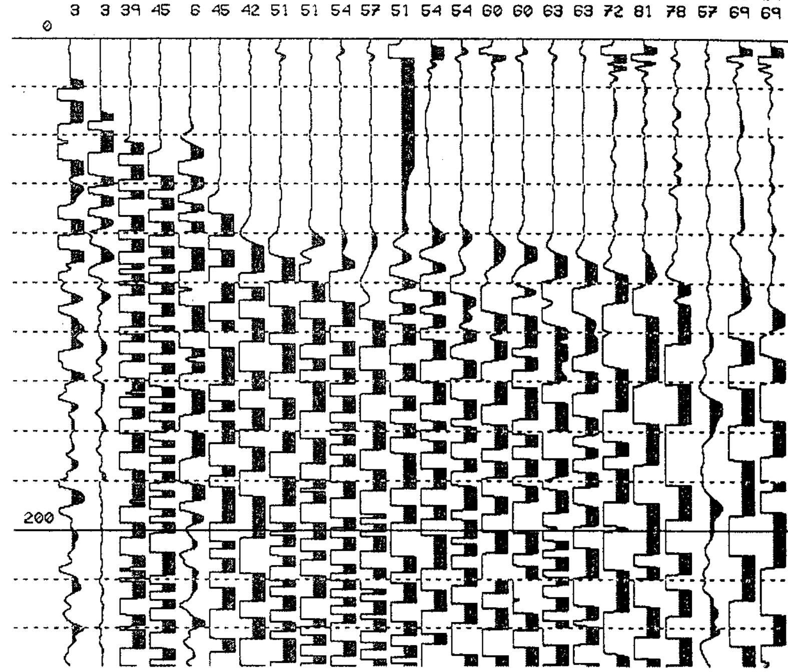
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
54	63	60	51	42	48	30	30	21	12	6	9	15	9	6	27	24	24	51	63	69	60	72	60



GEOMETRICS StrataView

READ FROM 4-1-4.DAT 10:14:06 30/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

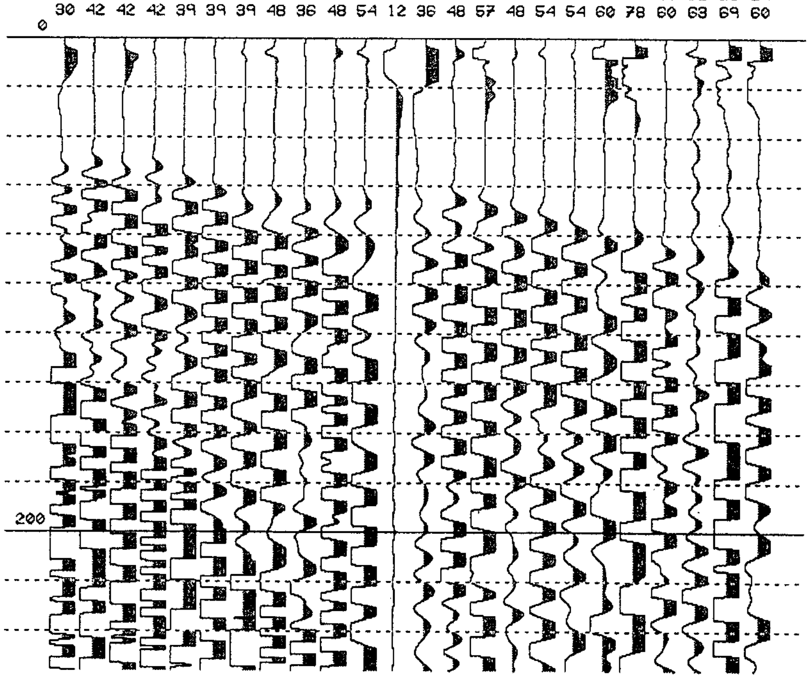
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
3	3	39	45	6	45	42	51	51	54	57	51	54	54	60	60	63	63	72	81	78	57	69	69



GEOMETRICS StrataView

READ FROM 4-1-5.DAT 10:37:00 30/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -45.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

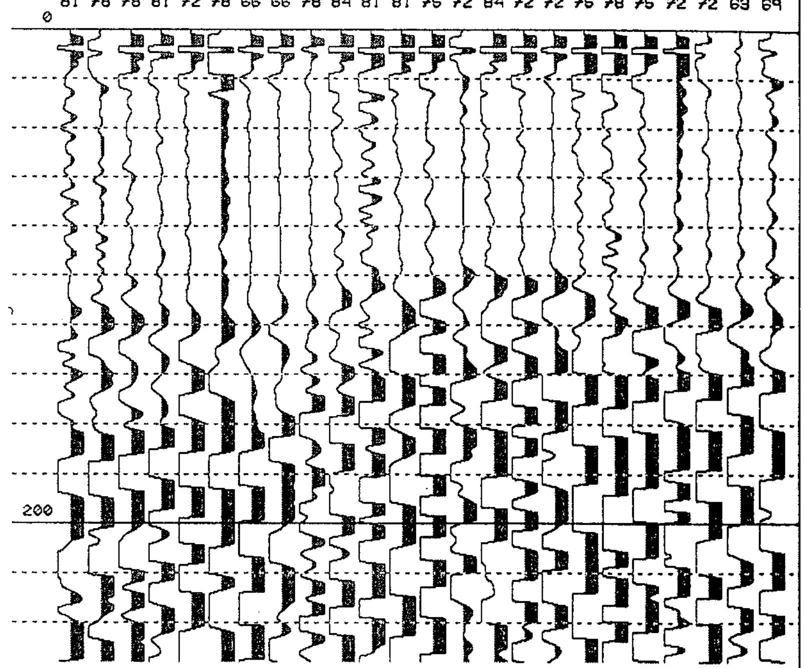
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
30	42	42	42	39	39	39	48	36	48	54	12	36	48	57	48	54	54	60	78	60	63	69	60



GEOMETRICS StrataView

READ FROM 4-2-1.DAT 12:36:13 30/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 235.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

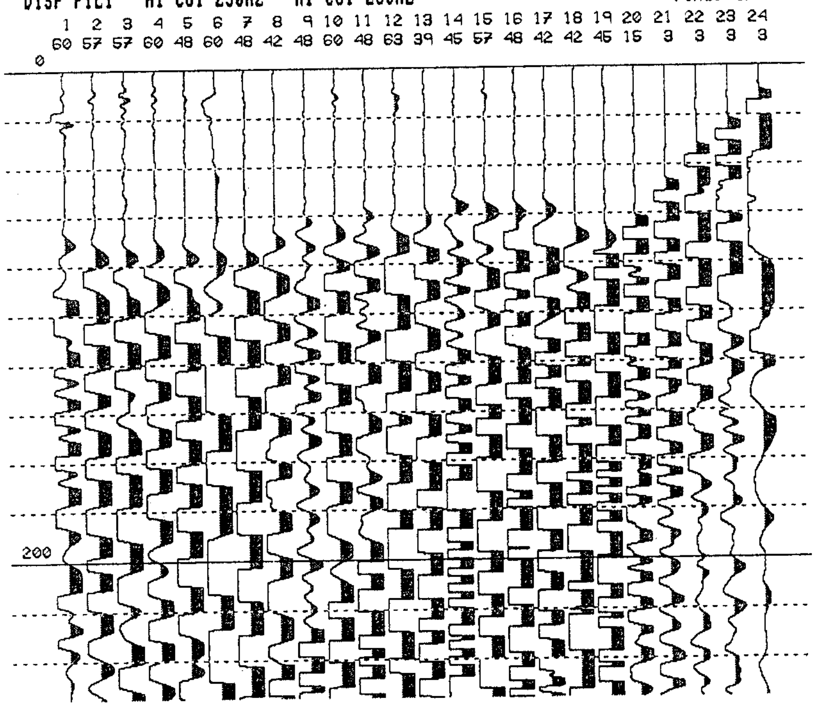
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
81	78	78	81	72	78	66	66	78	84	81	81	75	72	84	72	72	75	78	75	72	72	63	69



GEOMETRICS

StrataView

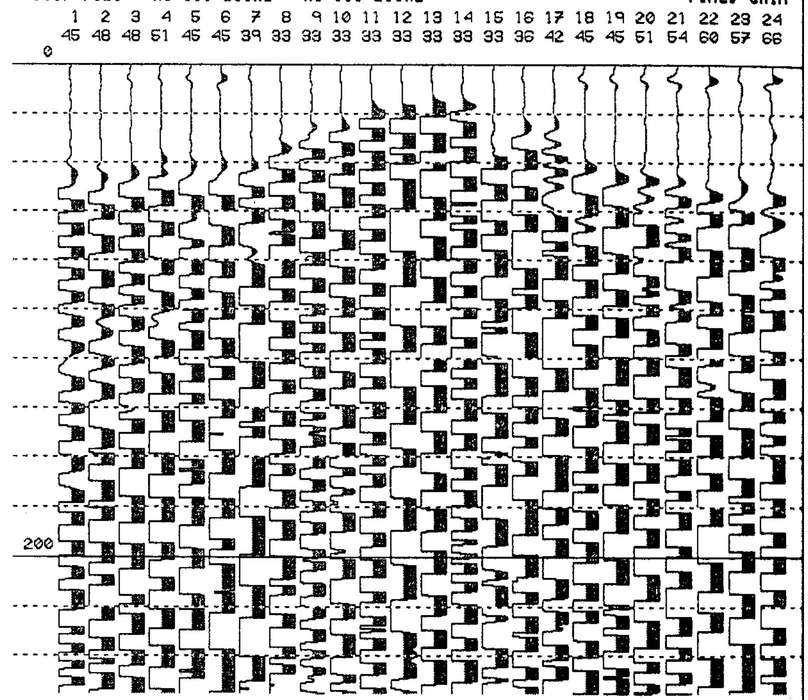
READ FROM 4-2-2.DAT
12:55:35 30/MAY/2005
LINE NUMBER 02-01
GROUP INTERVAL 5.00
SHOT LOC 120.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN



GEOMETRICS

StrataView

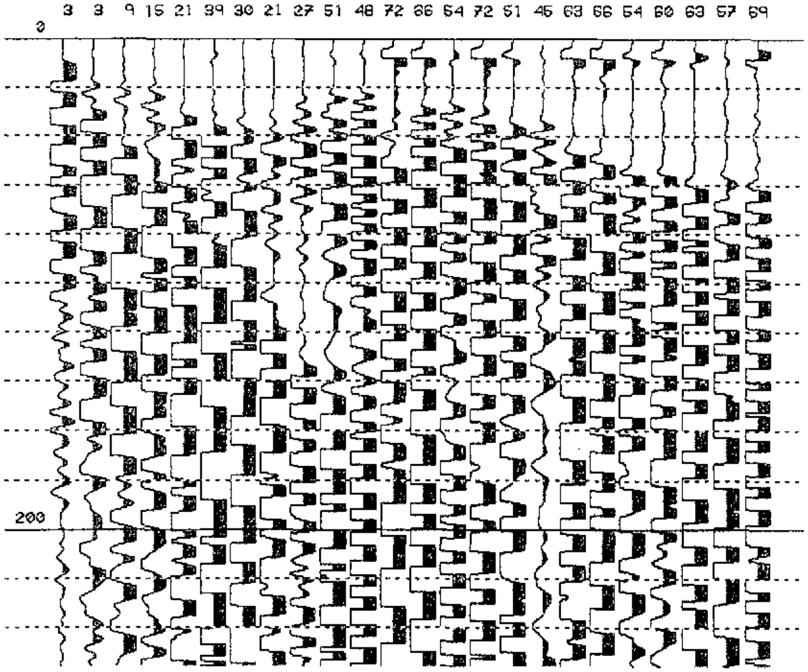
READ FROM 4-2-3.DAT
13:12:59 30/MAY/2005
LINE NUMBER 02-01
GROUP INTERVAL 5.00
SHOT LOC 60.00
PHONE 1 LOC 0.00
PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS
RECORD LEN 256 MS
DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ
STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ
FIXED GAIN



GEOMETRICS StrataView

READ FROM 4-2-4.DAT 13:30:33 30/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

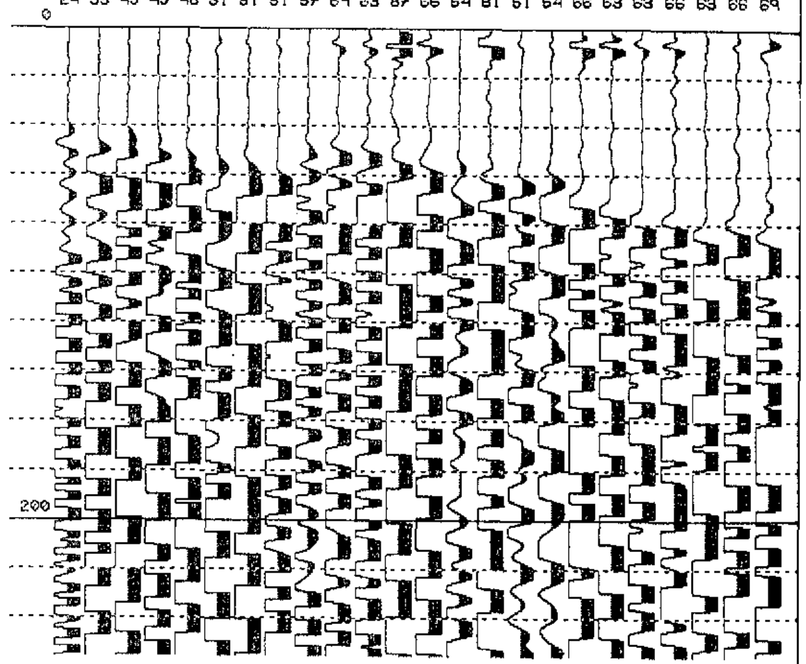
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
3	3	9	15	21	39	30	21	27	51	48	72	66	54	72	51	45	63	66	54	60	63	57	69



GEOMETRICS StrataView

READ FROM 4-2-5.DAT 14:05:00 30/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -39.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
24	33	45	45	48	51	51	51	57	69	63	87	66	54	81	51	54	66	63	63	66	63	66	69



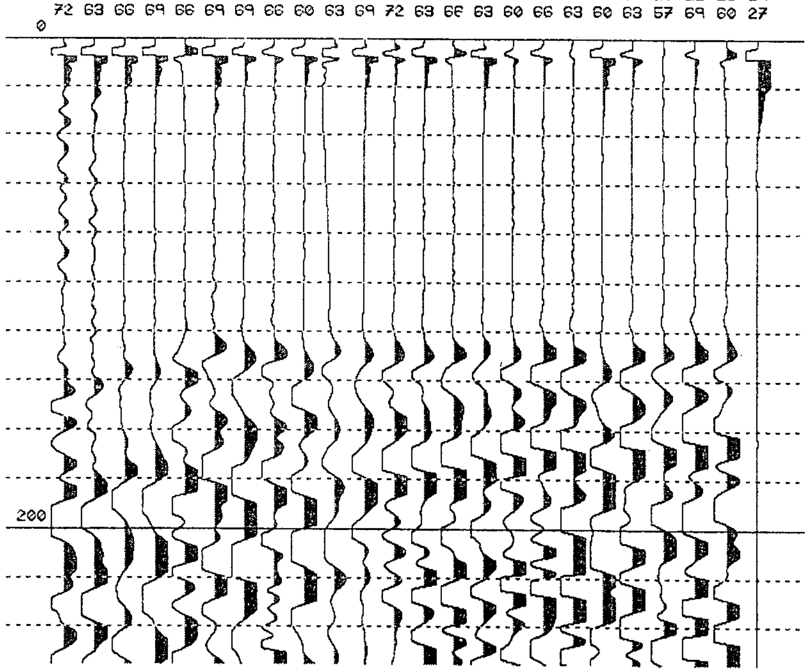
Dunwell Line 2

DUNWELL LINER (EAST)

GEOMETRICS StrataView

READ FROM 1-1-1.DAT 13:27:02 28/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 247.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

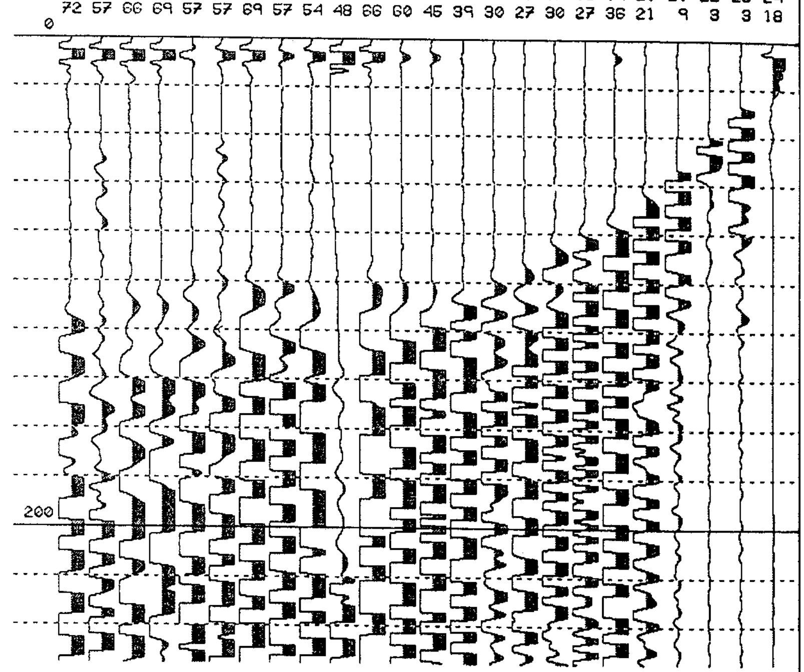
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
72 63 66 69 66 69 69 66 60 63 69 72 63 66 63 60 66 63 60 63 57 69 60 27



GEOMETRICS StrataView

READ FROM 1-1-2.DAT 13:44:53 28/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 120.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
72 57 66 69 57 57 69 57 54 48 66 60 45 39 30 27 30 27 36 21 9 3 3 18

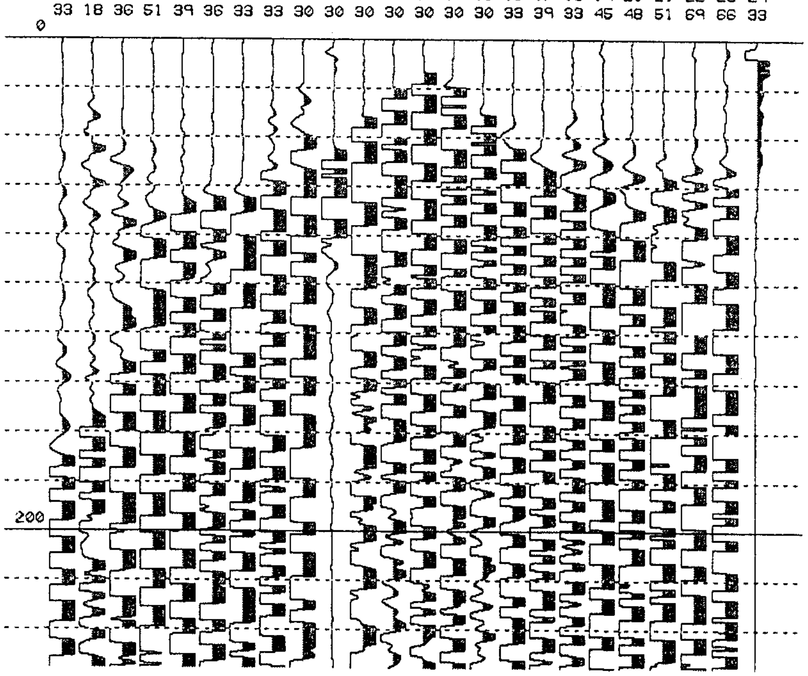


GEOMETRICS

StrataView

READ FROM 1-1-3.DAT
14:03:07 28/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
33	18	36	51	39	36	33	33	30	30	30	30	30	30	30	33	39	33	45	48	51	69	66	33

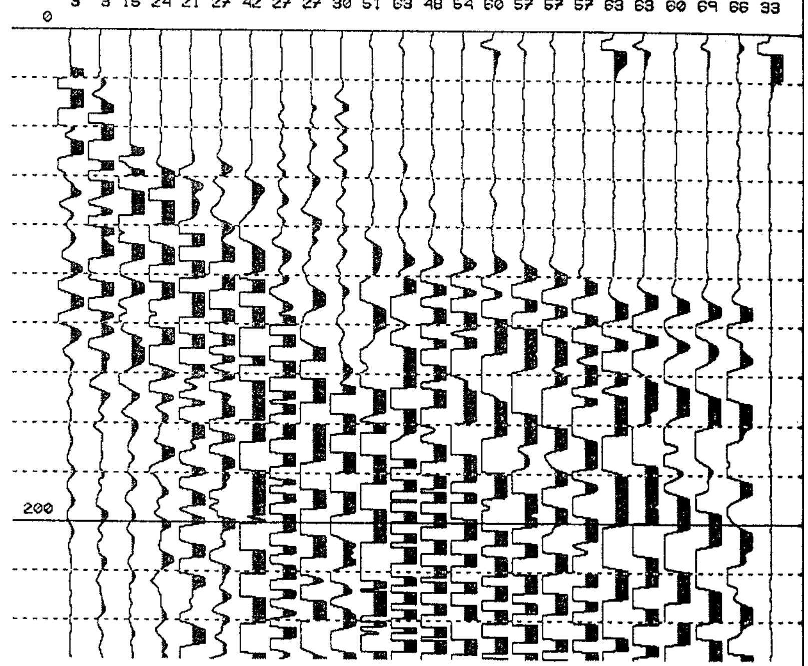


GEOMETRICS

StrataView

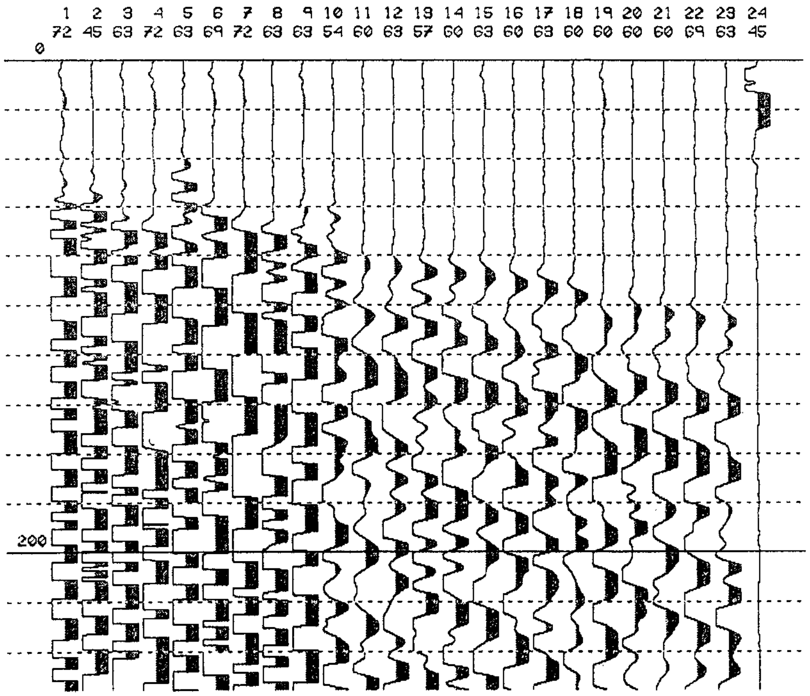
READ FROM 1-1-4.DAT
14:18:45 28/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
3	3	15	24	21	27	42	27	27	30	51	63	48	54	60	57	57	57	63	63	60	69	66	33



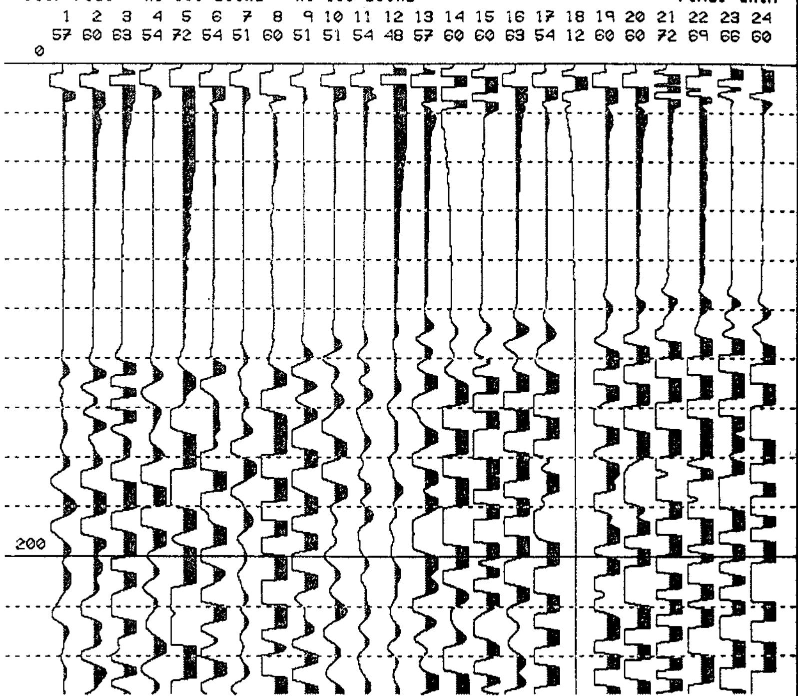
GEOMETRICS StrataView

READ FROM 1-1-5.DAT 14:44:02 28/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -45.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

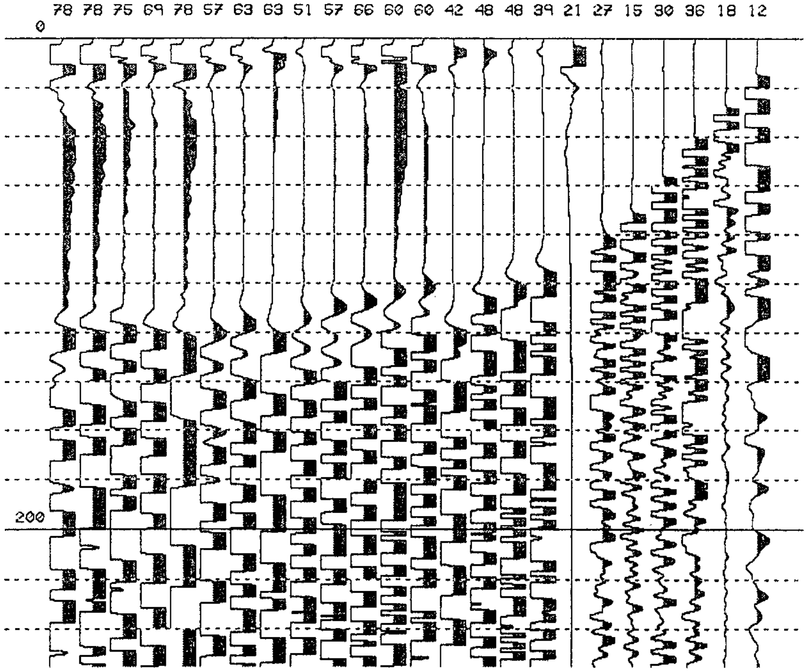
READ FROM 1-2-1.DAT 8:48:44 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 225.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN



GEOMETRICS StrataView

READ FROM 1-2-2.DAT 9:11:17 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 120.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

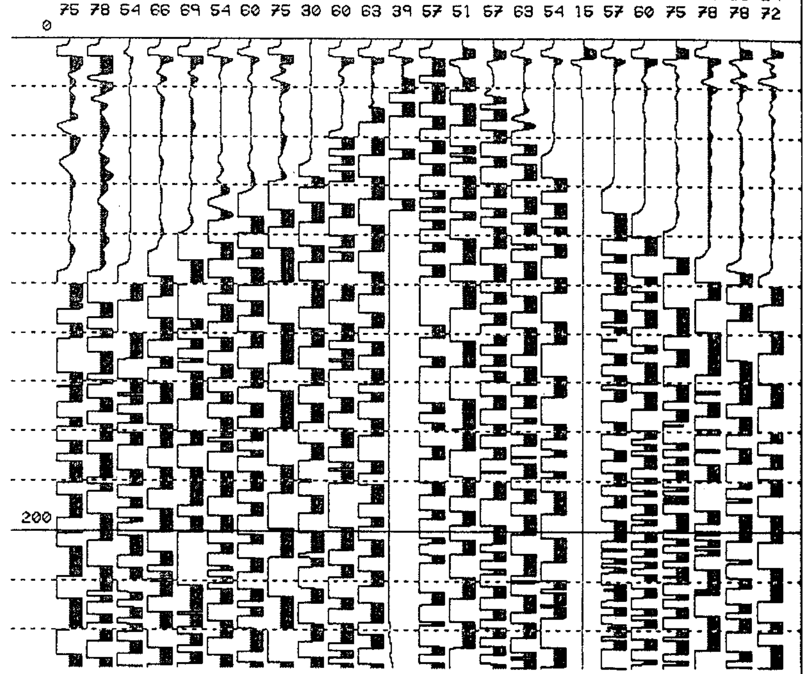
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
78	78	75	69	78	57	63	63	51	57	66	60	60	42	48	48	39	21	27	15	30	36	18	12



GEOMETRICS StrataView

READ FROM 1-2-3.DAT 9:35:02 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

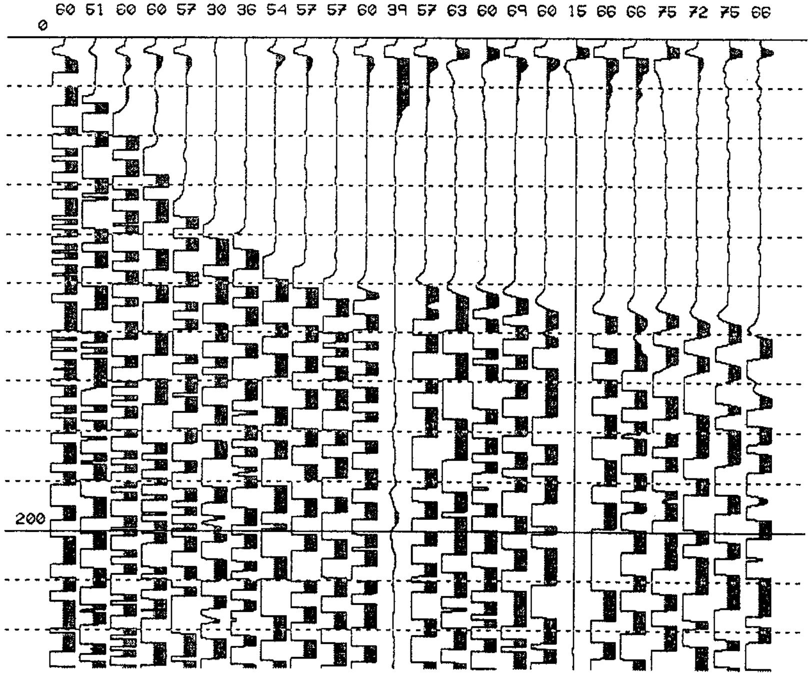
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
75	78	54	66	69	54	60	75	30	60	63	39	57	51	57	63	54	15	57	60	75	78	78	72



GEOMETRICS StrataView

READ FROM 1-2-4.DAT 9:58:08 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

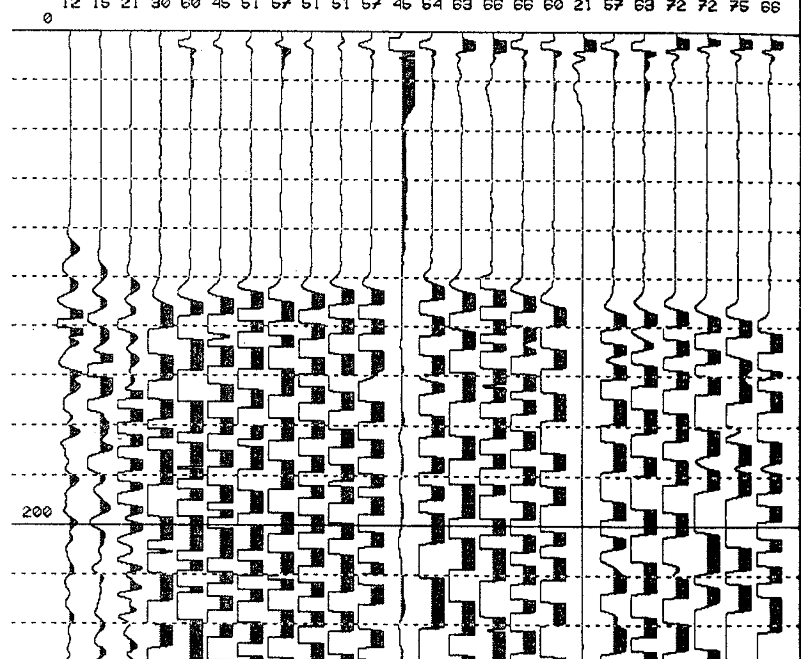
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
60	51	60	60	57	30	36	54	57	57	60	39	57	63	60	69	60	15	66	66	75	72	75	66



GEOMETRICS StrataView

READ FROM 1-2-5.DAT 10:22:03 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -38.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

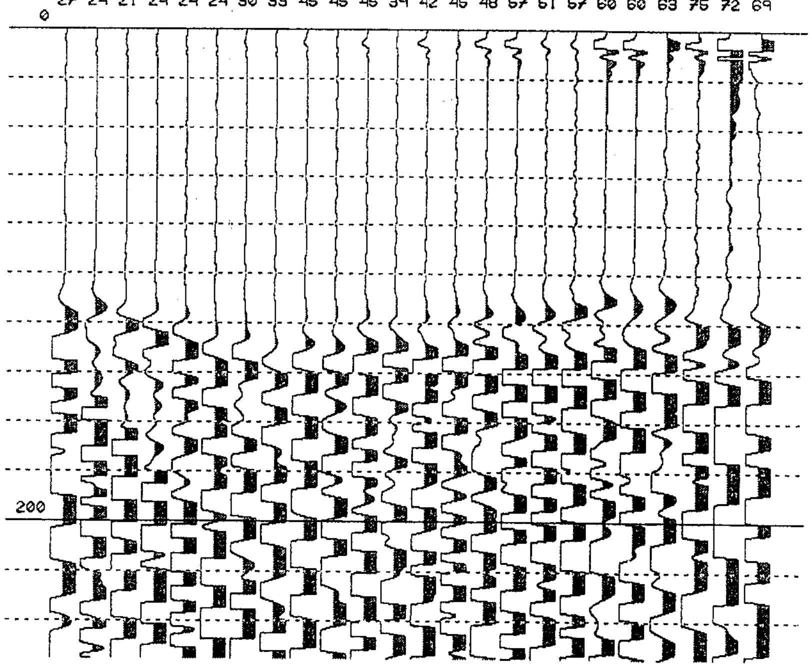
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
12	15	21	30	60	45	51	57	51	51	57	45	54	63	66	66	60	21	57	63	72	72	75	66



GEOMETRICS StrataView

READ FROM 1-3-1.DAT 11:52:55 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -48.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

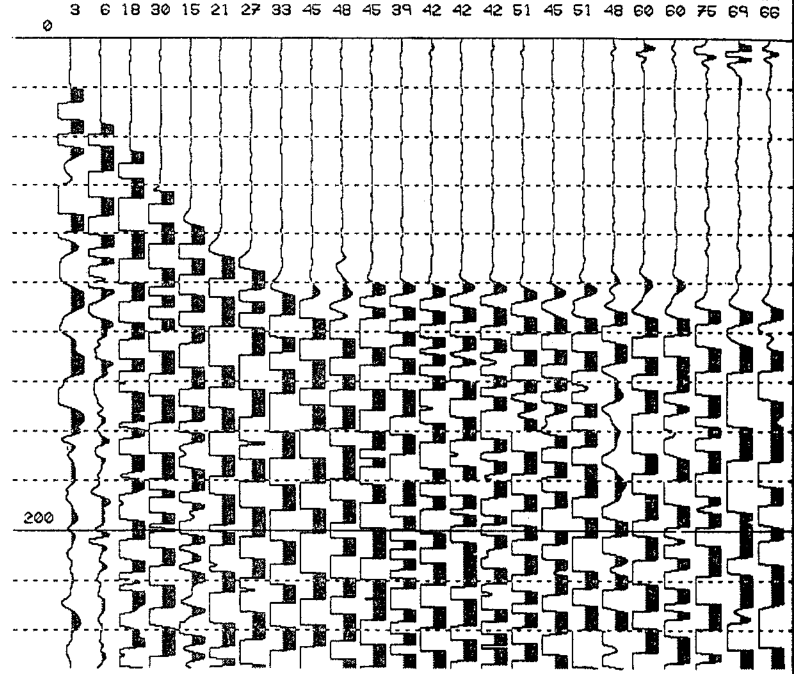
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
27	24	21	24	24	24	30	33	45	45	45	39	42	45	48	57	51	57	60	60	63	75	72	69



GEOMETRICS StrataView

READ FROM 1-3-2.DAT 12:09:07 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

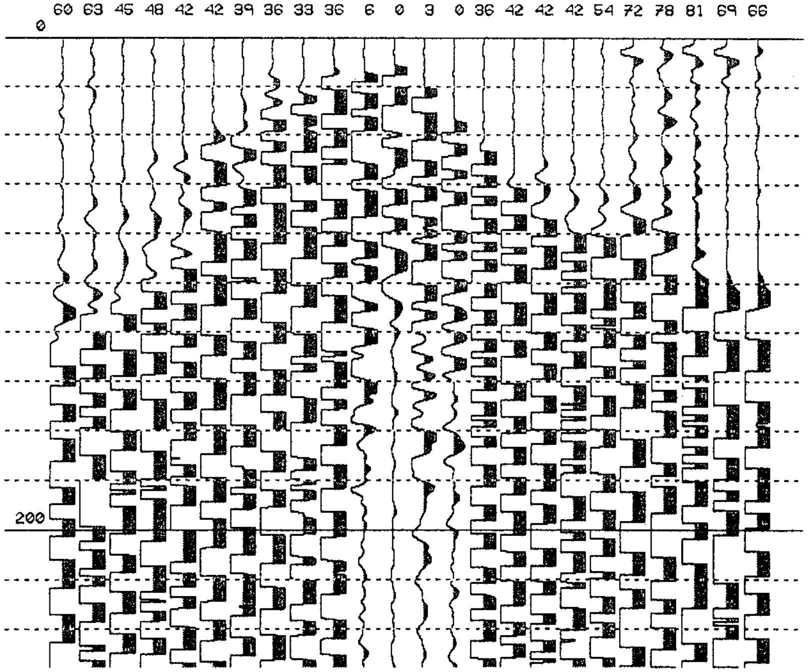
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
3	6	18	30	15	21	27	33	45	48	45	39	42	42	42	51	45	51	48	60	60	75	69	66



GEOMETRICS StrataView

READ FROM 1-3-3.DAT 12:30:39 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 60.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

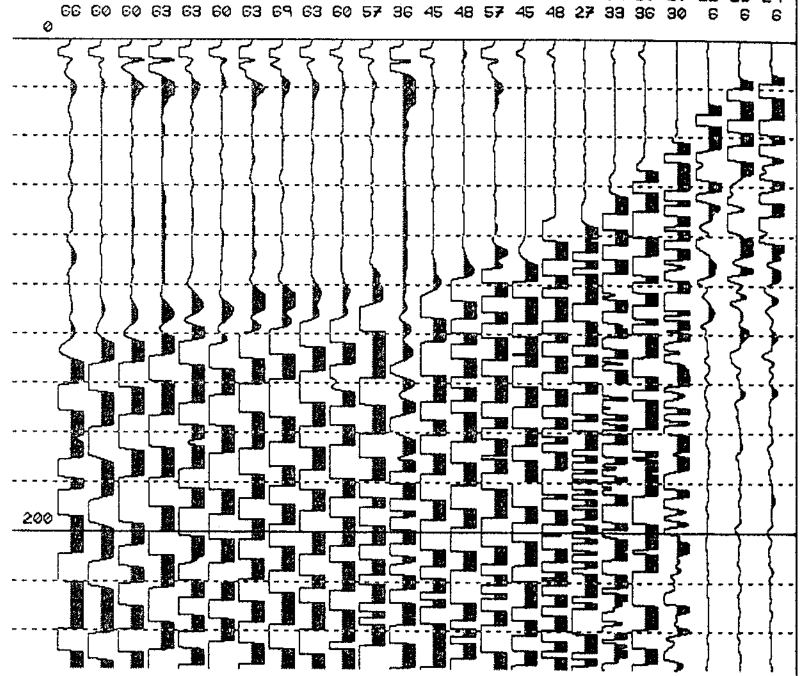
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
60	63	45	48	42	42	39	36	33	36	6	0	3	0	36	42	42	42	54	72	78	81	69	66



GEOMETRICS StrataVie

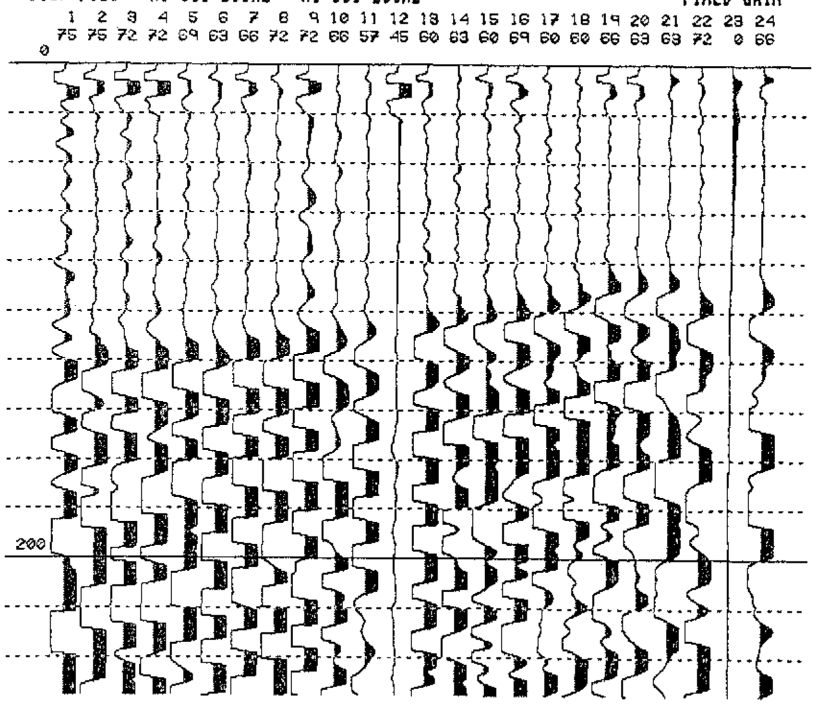
READ FROM 1-3-4.DAT 12:58:09 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC -5.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
66	60	60	63	63	60	63	69	63	60	57	36	45	48	57	45	48	27	33	36	30	6	6	6



GEOMETRICS StrataView

READ FROM 1-3-5.DAT 13:27:29 29/MAY/2005
LINE NUMBER 02-01 GROUP INTERVAL 5.00
SHOT LOC 141.00 PHONE 1 LOC 0.00 PHONE 24 LOC 115.00
SAMPLE INTERVAL 125 uS RECORD LEN 256 MS DELAY 0 MS
ACQ FILT LO CUT 0HZ NOTCH 0HZ STACKS 1
DISP FILT HI CUT 250HZ HI CUT 250HZ FIXED GAIN

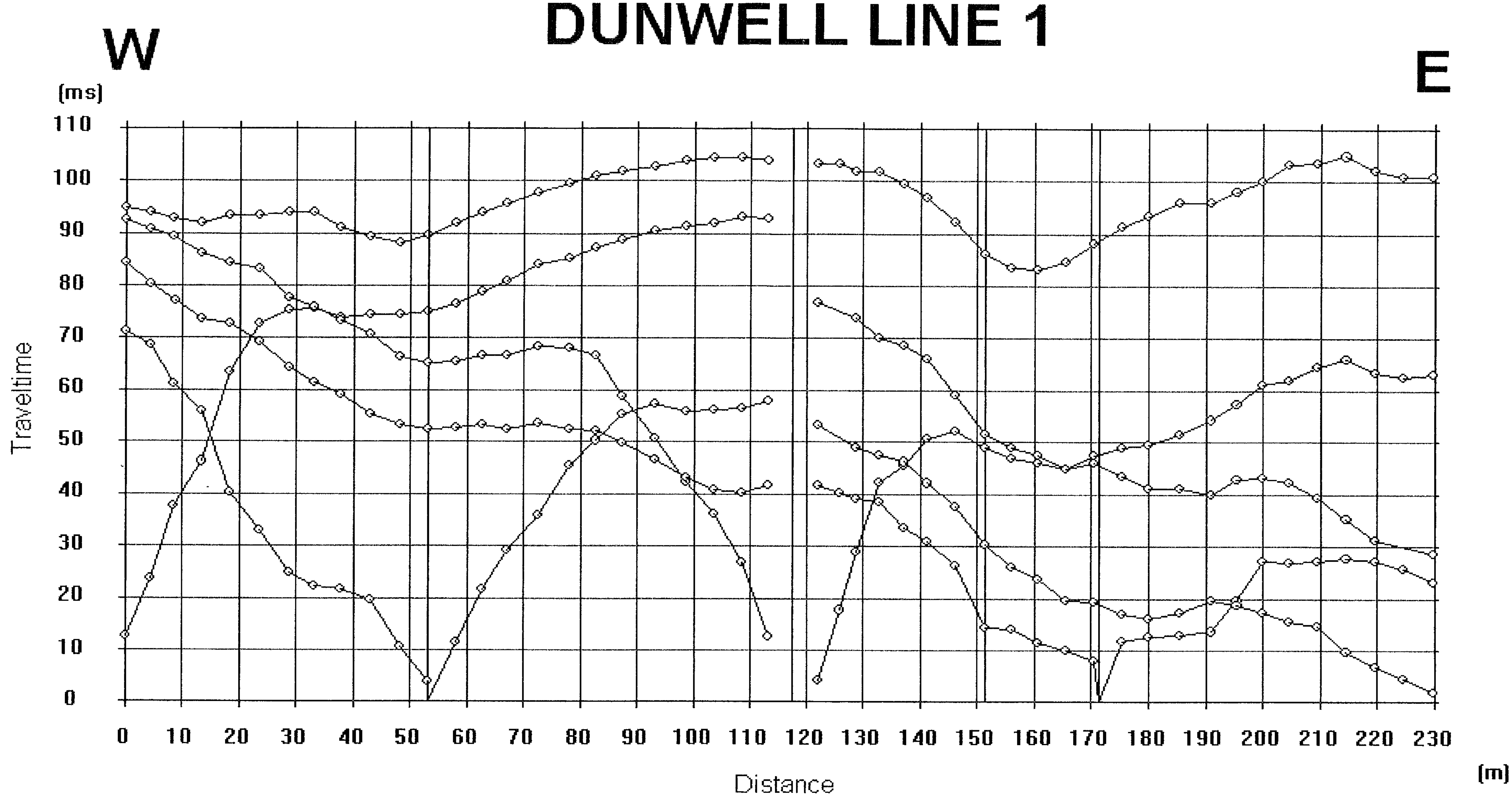


APPENDIX E. T-X PLOTS

AMERICAN NORTH

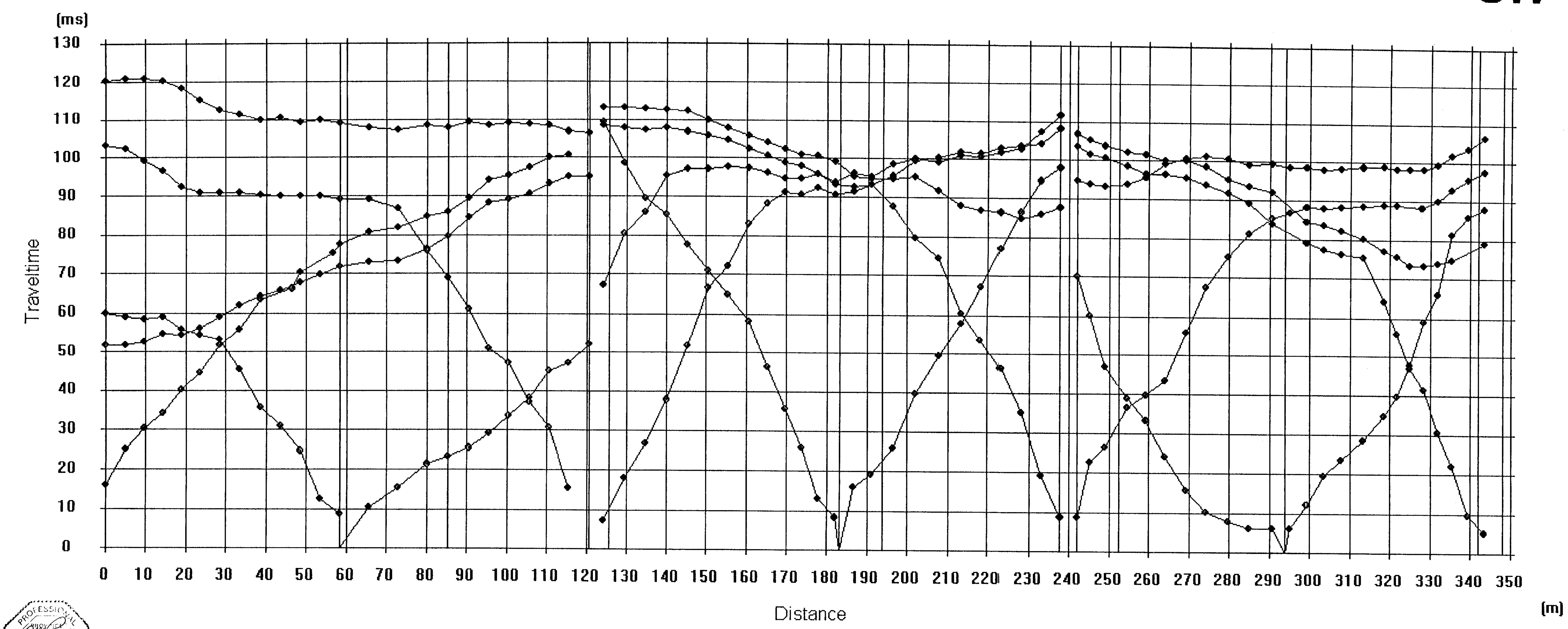
AMERICAN SOUTH

DUNWELL LINE 1

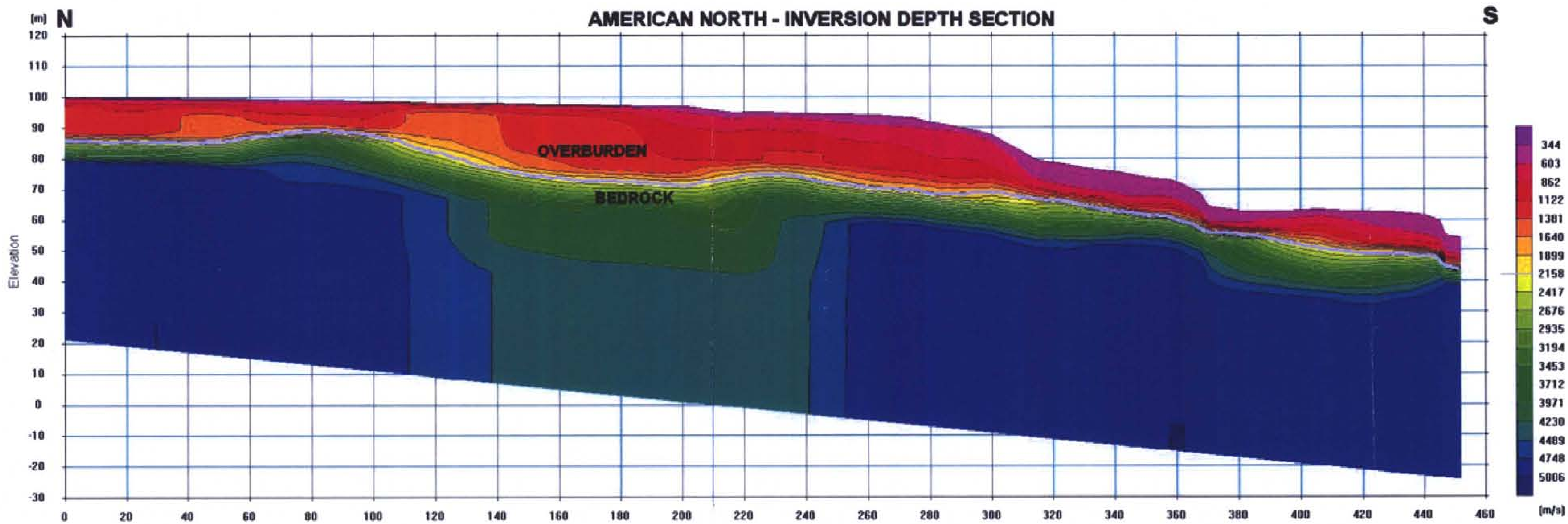


M.A. POWER

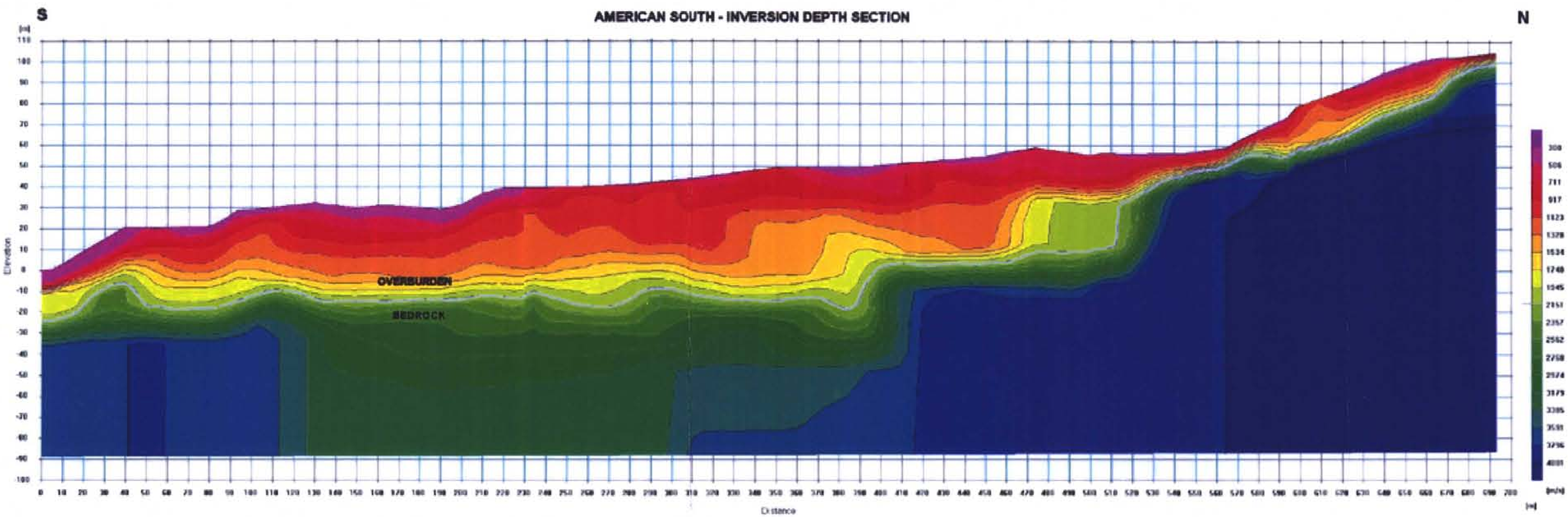
DUNWELL LINE 2

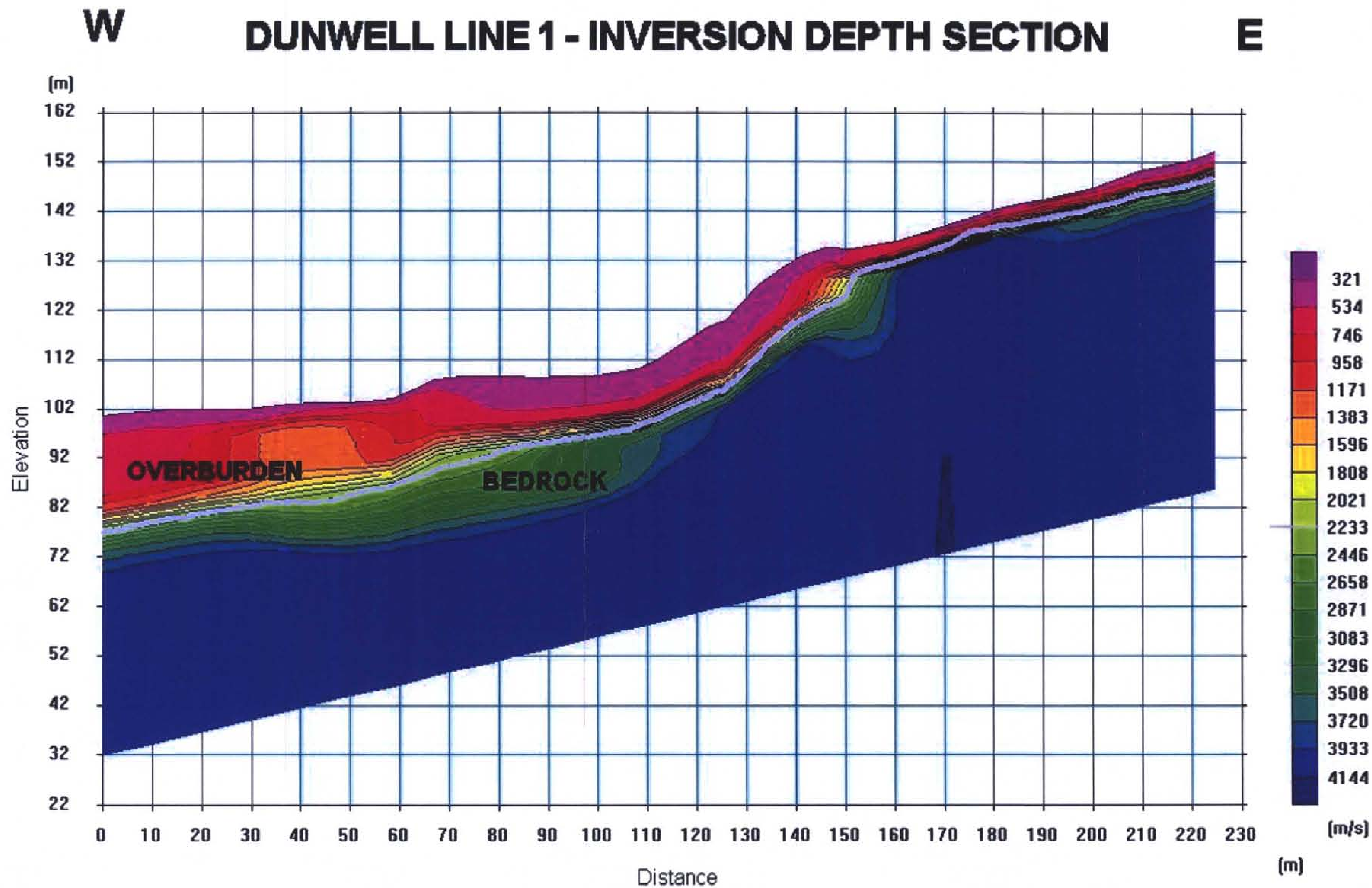


APPENDIX F. INVERSION RESULTS

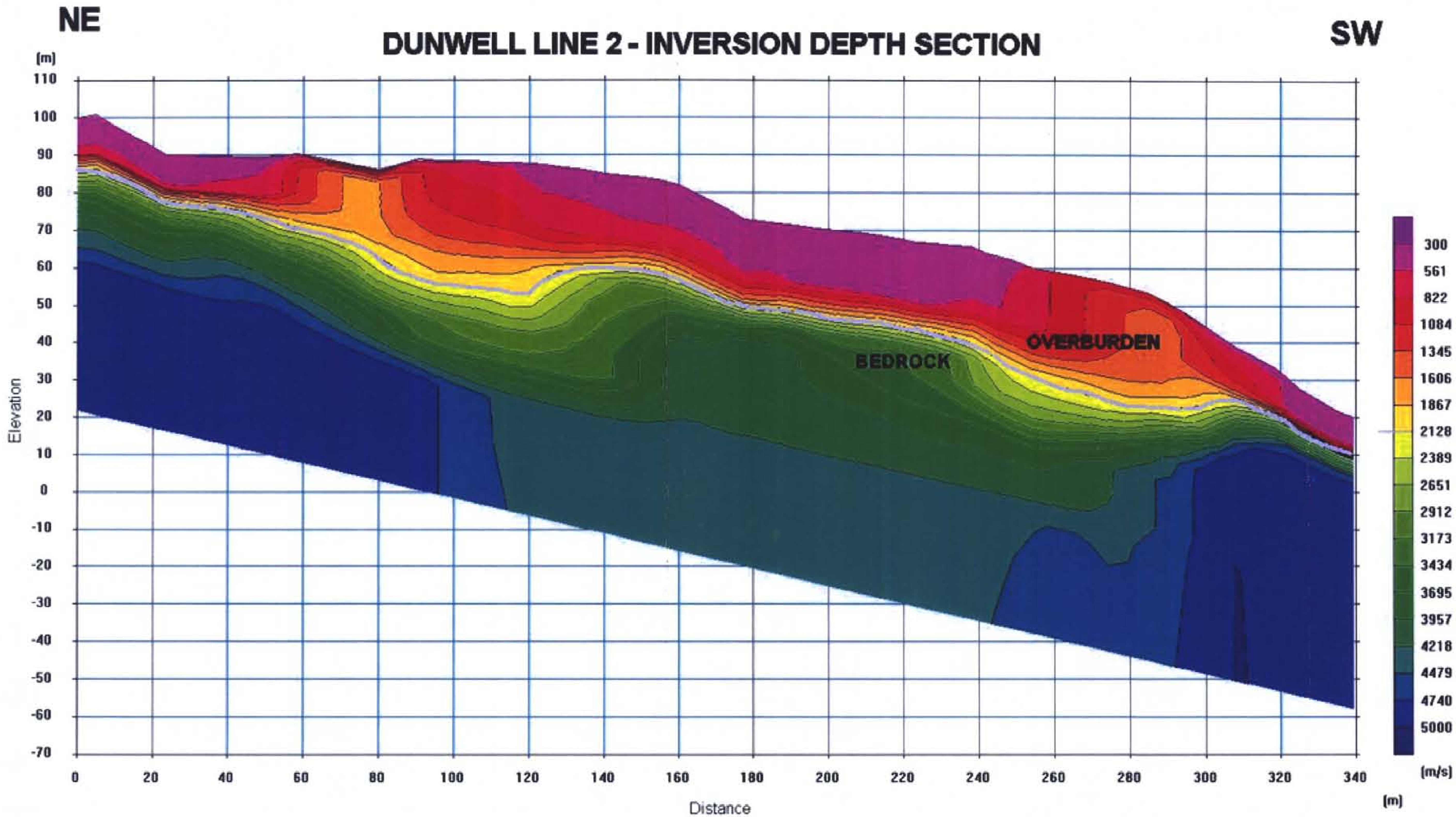


N
AMERICAN NORTH - INVERSION DEPTH SECTION
S
(m)
Elevation
OVERBURDEN
BEDROCK
344
603
862
1122
1381
1640
1899
2158
2417
2676
2935
3194
3453
3712
3971
4230
4489
4748
5006
[m/s]


S
AMERICAN SOUTH - INVERSION DEPTH SECTION
N
OVERBURDEN
BEDROCK
Elevation
Distance
(m)
300
506
711
917
1123
1328
1534
1740
1945
2151
2357
2562
2768
2974
3179
3385
3591
3796
4001
(m/s)



W
DUNWELL LINE 1 - INVERSION DEPTH SECTION
E
(m)
162
152
142
132
122
112
102
92
82
72
62
52
42
32
22
Elevation
OVERBURDEN
BEDROCK
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
Distance
(m)
321
534
746
958
1171
1383
1596
1808
2021
2233
2446
2658
2871
3083
3296
3508
3720
3933
4144
(m/s)


NE
DUNWELL LINE 2 - INVERSION DEPTH SECTION
SW
[m]
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
Elevation
OVERBURDEN
BEDROCK
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
Distance
[m]
300
561
822
1084
1345
1606
1867
2128
2389
2651
2912
3173
3434
3695
3957
4218
4479
4740
5000
[m/s]