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STEPHEN SWAIM

SEISMIC REFRACTION SURVEY ON THE DYCER CREEK PROPERTY, LIVINGSTONE CREEK AREA, YUKON TERRITORY

Mike Power, M.Sc., P.Geoph.

PLACER CLAIMS

BRENDA 1-8	P47031 - P47038
BRENDA 9-10	P47100 - P47101
DYCER 1-32	P41976 - P42007
DYCER 33-51	P42008 - P42026

120192

Location: 61°27'N, 134° 14'W
NTS: 105 E8
Mining District: Whitehorse, YT.
Date: October 4, 2001

This report has been examined by the Geological Evaluation Unit under Section 41 Yukon Placer Mining Act and is recommended as allowable representation work in the amount of $ 14,195.

[illegible] Exploration and [illegible]
Affairs Program for Commissioner of Yukon Territory

SUMMARY

The Dycer Creek Property consists of 61 placer claims staked on Dycer and Mendocina Creeks in the Livingstone Creek area, Whitehorse Mining District, Yukon. Creeks to the south have produced placer gold since the early 1900's. Pay gravels are preserved beneath Quaternary periglacial lacustrine clays and silts which cap the auriferous pre-glacial and interglacial gravels.

A program of line cutting and seismic refraction surveys was performed on Dycer Creek to map the bedrock topography and determine the thickness of overburden. Nine lines with a total distance of 1.08 line-km were cut and surveyed. Lines were sited orthogonal to Dycer Creek. The refraction seismic survey was conducted with a 24 channel seismograph using phones spaced at 5 m and shots spaced at 60 m. Five shots were fired per spread. These consisted of explosive charges, placed on surface and electrically initiated. Two shots were fired 60 m off either end of the line , 2 shots were fired 5 m off either end of the lines and 1 shot was fired at mid-spread. The data was of fair to good quality with poor shot records recorded from distant shots on steep topography. Significant static shifts caused by low velocity overburden in the creek valley were also recorded. The seismic data was interpreted using a delay time method. Surface topography and refractor elevations are plotted in cross sections and in composite bedrock topography and overburden thickness maps.

The seismic refraction survey identified a persistent bedrock depression which appears to be a buried channel incised into bedrock (paleochannel). The present location of Dycer Creek is up to 50 m south of the location of the paleochannel. This, together with the greater thickness of overburden indicated on the northern (right) limit of Dycer Creek suggests that mass wasting from the slopes bordering Dycer Creek to the north is affecting the geomorphology of this portion of Dycer Creek.

TABLE OF CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

Amerok Geosciences Ltd. was retained by Stephen Swaim to conduct seismic refraction surveys on placer claims on Dycer Creek (Dycer Creek Property). A total of 1.1 line-km were surveyed on 9 lines between September 7 to 14, 2001. The surveys were conducted to map bedrock topography in order to locate potential placer deposits. This report describes the personnel and equipment, survey specifications, data processing and results.

2.0 LOCATION AND ACCESS

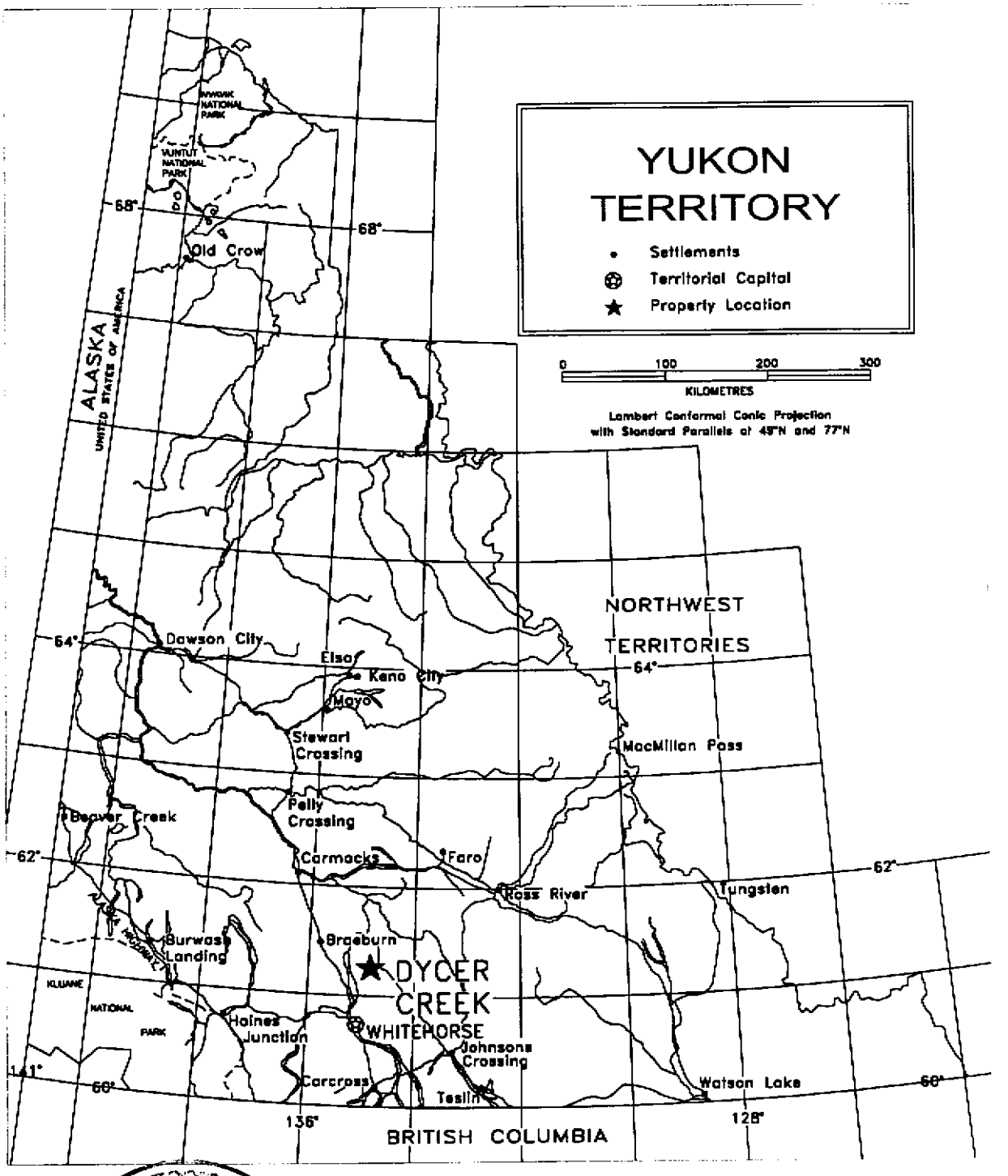
The Dycer Creek Property is centred at 61°27'N, 134° 14'W, approximately 10 km northeast of the Livingstone Airstrip on the South Big Salmon River. The property is located approximately 80 km northeast of Whitehorse (Figure 1). It is accessible by fixed wing aircraft from Whitehorse using the 1600 m unmanned Livingstone Creek airstrip. The property is also accessible by winter road from Whitehorse along a route stretching from Long Lake up the east side of Lake Laberge, east across the Teslin River and Semenof Hills to the Livingstone Creek strip and thence north to Mendocina and Dycer Creeks.

3.0 PROPERTY

The Dycer Creek Property consists of 61 un-surveyed placer claims staked under the Yukon Placer Mining Act in the Whitehorse Mining District and wholly owned by Stephen Swaim. The location of the work described in this report relative to the claim boundaries is shown in Figure 2 and claim information[1] is summarized below:

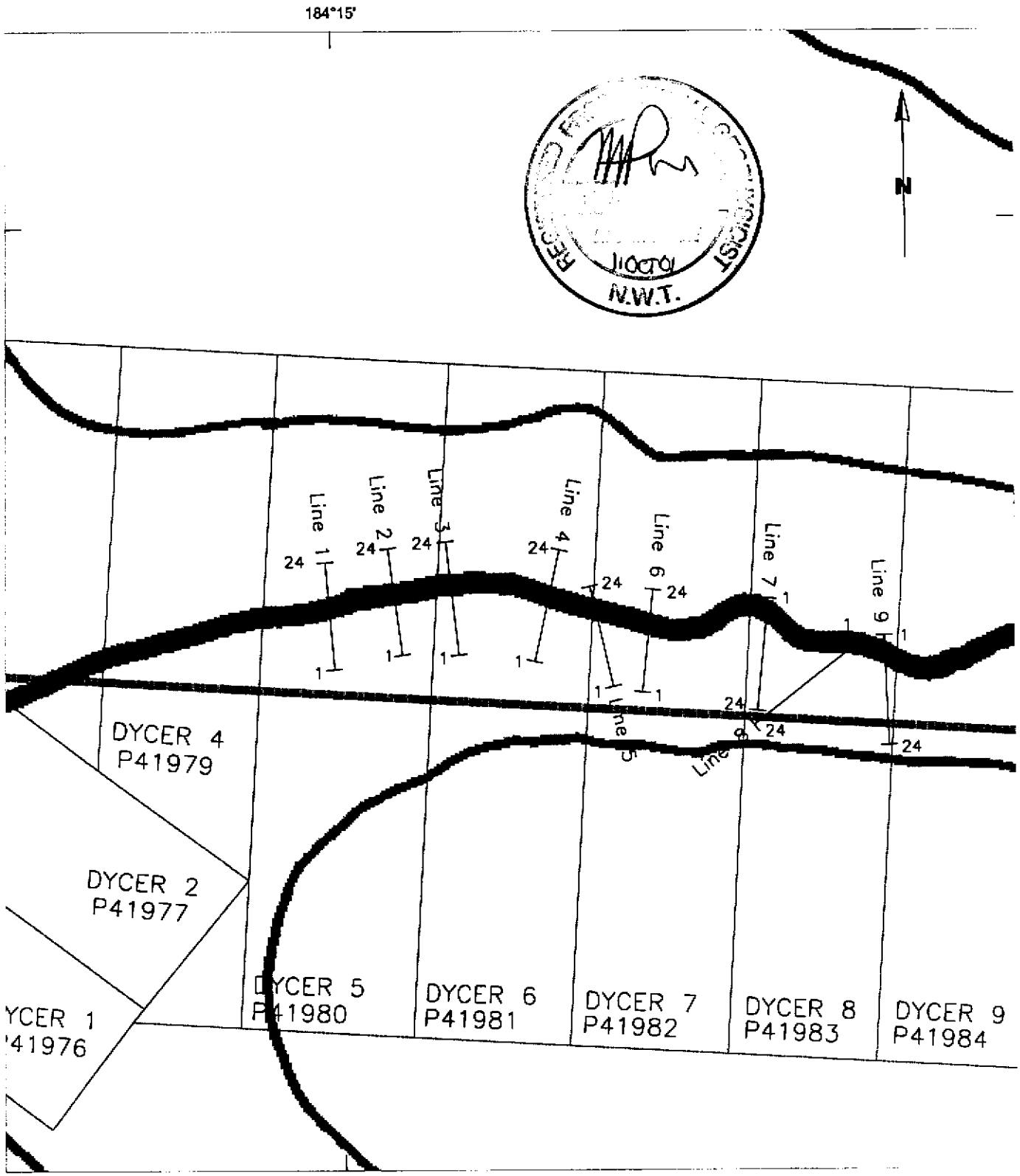
Claim	Record Number	Expiry Date
BRENDA 1-8	P47031 - P47038	January 25, 2001
BRENDA 9-10	P47100 - P47101	August 23, 2002
DYCER 1-32	P41976 - P42007	October 21, 2001
DYCER 33-51	P42008 - P42026	October 21, 2001

[1]Claim information provided by the Whitehorse Mining Recorder on September 28, 2001.



RECEIVED PROFESSIONAL ENGINEERS OCT 10 01 N.W.T.

STEPHEN SWAIM	**DYCER CREEK PROPERTY**	
PROPERTY LOCATION	**MINING DISTRICT: WHITEHORSE**	
	NTS: 105 E/8	**Datum: NAD 27**
	Job: SSM-45-YT	**SCALE 1: 6,000,000**
Aurora Geosciences Ltd.	**DATE: 04 Oct 01**	**FIGURE: 1**



LEGEND

1 — 24

Seismic Line Showing Phone Locations

0 — 200m

metres

STEPHEN SWAIM	**DYCER CREEK PROPERTY**	
SEISMIC LINE LOCATION MAP	**MINING DISTRICT: WHITEHORSE**	
	NTS: 105 K/16	**Datum: NAD 83**
	Job: SSM-45-YT	**SCALE 1: 5,000**
Aurora Geosciences Ltd.	**DATE: 04 Oct 01**	**FIGURE: 2**

4.0 PHYSIOLOGY AND PLACER GEOLOGY

The physiology and placer geology of the Dycer Creek area has been described by McConnell (1901), Bostock (1931), Levson (1992) and Gordey and Makepiece (2000). The property is on the western boundary of the Big Salmon Range of the Pelly Mountains at elevations ranging from 900 to 1200 m. The Big Salmon Ranges, east of the property rise from a dissected plateau with base level of 1400 m to craggy cirques at elevations of up to 2000 m approximately 15 km east of the property. Drainages generally flow west although they are locally diverted to the north, possibly by bedrock structures.

The property area is subject to continental climatic conditions with short, occasionally damp summers from June through September and cold, dry winters from October through April. Temperatures range from 15° C during the summer period of mid-June through mid-August to -40° C during the coldest months of winter.

5.0 BEDROCK GEOLOGY

The Dycer Creek Property is located in the Yukon Tanana Terrane of the northern Cordillera. The area drained by Dycer Creek is underlain by a Proterozoic through Paleozoic assemblage of metamorphosed mafic to ultramafic rocks. Rocks strike predominantly north-northwest in the area of the property. The assemblage is bounded by the Big Salmon Fault in the lowlands of the Big Salmon River. This fault is mapped 1200 m west of the Mendocina Creek Property and strikes north-northwest, running along the front of the plateau containing the Big Salmon Range. Bedrock units in the area of the property are summarized in Table I.

Table I. Bedrock rock units - Mendocina / Dycer Creek area
(modified after Gordey and Makepiece (1999))

Formation (age)	Description
Qs Quaternary sediments (Quaternary)	unconsolidated glacial, glaciofluvial and glaciolacustrine deposits; colluvium and landslide debris
CPA1 Anvil Formation (Triassic)	variably altered and foliated, locally augite-phyric basalt (local pillows), diorite and gabbro, chloritic greenstone, amphibolitic greenstone and amphibolite; minor

Formation (age)	Description
SDA2 Askin Group (Middle Silurian to Middle Devonian)	dolomite, silty and sandy dolomite, limestone; medium to thick bedded, medium grained mature orthoquartzite; dolomitized laminated mudstone
DMN2 Nasina Assemblage (Devonian - Mississippian)	marble
DMN4 Nasina Assemblage (Devonian - Mississippian)	quartzite, micaceous quartzite, quartz muscovite and minor metaconglomerate
ODRC2 Road River Formation (Ordovician - Devonian)	recessive, black, limey or dolomitic thin-bedded to platy graphitic siltstone and fine grained impure quartzite with interbedded graphitic silty shale.
CPI4 Ingenika Formation (Proterozoic to Lower Cambrian)	thin bedded slate, siltstone, quartzite and minor limestone with local medium to coarse grained, feldspathic sandstone to orthoquartzite;
PPA1 Slide Mountain(?) (Upper Proterozoic to Paleozoic)	chlorite schist, amphibolite, banded amphibolite gneiss, garnet amphibolite; minor chloritic quartz-mica schist, graphitic quartz-mica schist, quartzite, and limestone
PPA Slide Mountain(?) (Upper Proterozoic to Paleozoic)	metamorphosed mafic rocks; amphibolite and ultramafic rocks (Nisling, Nasina, and Slide Mountain assemblages)

6.0 QUATERNARY & PLACER GEOLOGY

The surficial and Quaternary geology of the Livingstone Creek area including Mendocina and Dycer Creeks is described in Levson (1992) and Klassen and Morison (1987). Quaternary sediments in the study area consist of till blankets, glaciofluvial and glaciolacustrine sediments and glacial outwash deposits. Recent colluvium locally covers these deposits in areas undergoing mass wasting.

The major gold bearing creeks in the district including Livingstone, Summit and Lake Creeks drain east from headwaters in the plateau through broad U-shaped valleys down to narrow (20 to 50 m) rock walled canyons and turn sharply to the north upon reaching a linear depression running along the eastern side of the valley containing the Big Salmon River. A similar depression north of this feature is bounded on the west by hills up to 50 m high, on the east by the rising hills of the

plateau and extends for 6 km from Livingstone Creek in the south to Lake Creek in the North. The linear depression is parallel to the Big Salmon Fault, and to the general strike of stratigraphy in the area; it appears to be a bedrock-controlled feature.

There are several theories concerning the origin and preservation of placer deposits in the Livingstone Creek area. Gold appears to be derived from mesothermal quartz veins within underlying schists and phyllites. Auriferous placer deposits occur in coarse interglacial gravels preserved beneath fine grained glaciolacustrine deposits. The pay gravels contain boulders of local rock and granite, are poorly sorted, subangular to subrounded, and are reportedly iron stained in many localities (Bostock, 1931). Levson (1992) points out that thick sediments derived from ice marginal lakes blanket the placer deposits and likely assisted in preserving them. McConnell (1901) asserts that the orientation of the gold-bearing drainages transverse to the mean direction of local ice flow may also have played a part in the preservation of placer deposits in the area. In summary, auriferous placer deposits in the Livingstone Creek area are found in coarse, commonly iron stained gravels on bedrock within the active stream beds and on benches marginal to the present drainages. The placer deposits are preserved beneath a sequence of sands, silts, gravel and lesser clay, locally up to 60 m thick. Individual pay streaks are in the order of 3 to 5 m thick and 10 to 20 m wide.

The Mendocina and Dycer Creek drainages are on the northern limit of the historical mining areas in the Livingstone Creek district. Little Violet Creek is the next drainage south of Mendocina Creek and, while shorter, is parallel to it. Little Violet Creek has seen placer production since the turn of the century and was one of the few active creeks during the 1930's (Bostock 1957). The only recorded instance of recent work in the Mendocina and Dycer Creek drainages was an exploration program conducted by Wayne Tatman during August 1990 (Placer Mining Section, 1991). A seven man crew excavated a number of test pits on the left limit of Dycer Creek using a CAT D6 bulldozer, and CAT 931 and 977 loaders. Only thin overburden (< 3m) was encountered in the pits.

7.0 SURVEY GRID

The location of the seismic survey grid is shown in Figure 2. Survey lines were sited to cross the current creek channel at right angles with a line spacing of 50 to 60 m. The lines were cut 1.5 m wide and the stations were straight chained and not slope corrected. The start and end points of the lines were located with the non-differential GPS receiver. The topography along the survey lines and the elevation differences between lines were surveyed with the laser range finder. Start and end points of the survey lines were permanently marked by the crew in the field.

8.0 PERSONNEL AND EQUIPMENT

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

Georges Belcourt	Geophysicist
Ron Stack	Helper

They were equipped with the following instruments and equipment:

Instruments: 1 - Strataview 24 Channel digital engineering seismograph.
1 - Impulse laser rangefinder

Data processing: 486DX66 laptop computer, colour printer.

Other: Camp, ATV, radios, blasting cables, explosives, spare parts, tools, Garmin 12XL non-differential GPS.

The geophysical crew spent a total of 7 days on the property. The geophysical survey log is attached as Appendix B.

9.0 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: 2 to 8 sticks of Forcite or Geogel initiated with seismic grade electrical caps (CIL seisdets).

10.0 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 placer exploration and describes the methods used to interpret the data.

10.1 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.

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:

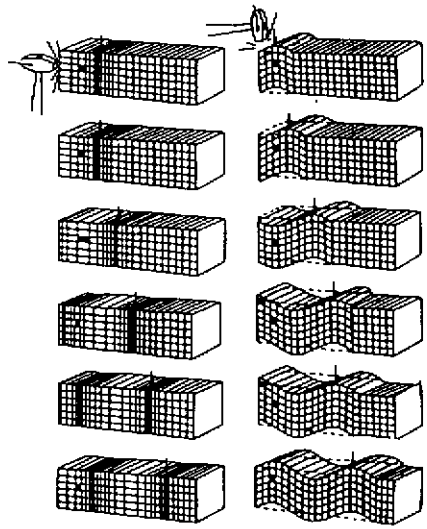
$$V_s = \sqrt{\frac{\mu}{\rho}} \qquad (2)$$

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 placer seismic refraction work is summarized in Table II. P-waves are the fastest and strongest waves measured by conventional seismic instruments and the remainder

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



(b) Seismic ray reflection and refraction

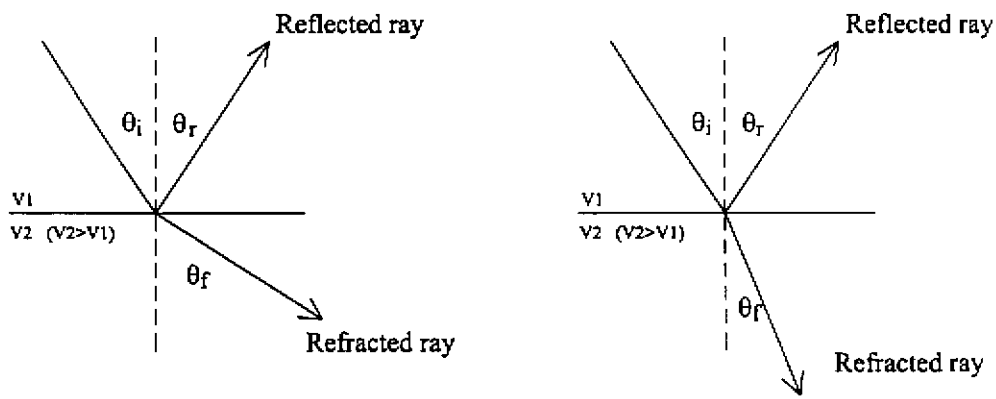


Figure SR-1. Seismic wave motion and behaviour at boundaries.

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:

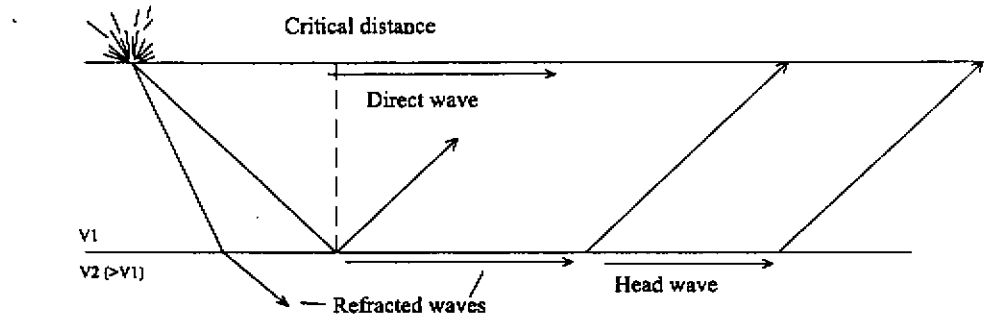
$$\frac{\sin\theta_i}{v_i} = \frac{\sin\theta_f}{v_f} \qquad (4)$$

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.

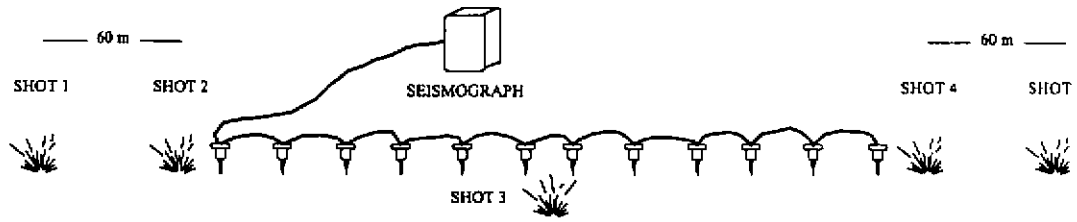
Table II. P-wave velocities of common rocks and sediments
(after Sheriff and Geldart (1995))

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

(a) Refraction of seismic waves



(b) Refraction seismic spread showing location of shotpoints



(c) Shot record and travel time (T-X_ curves for Shot 2

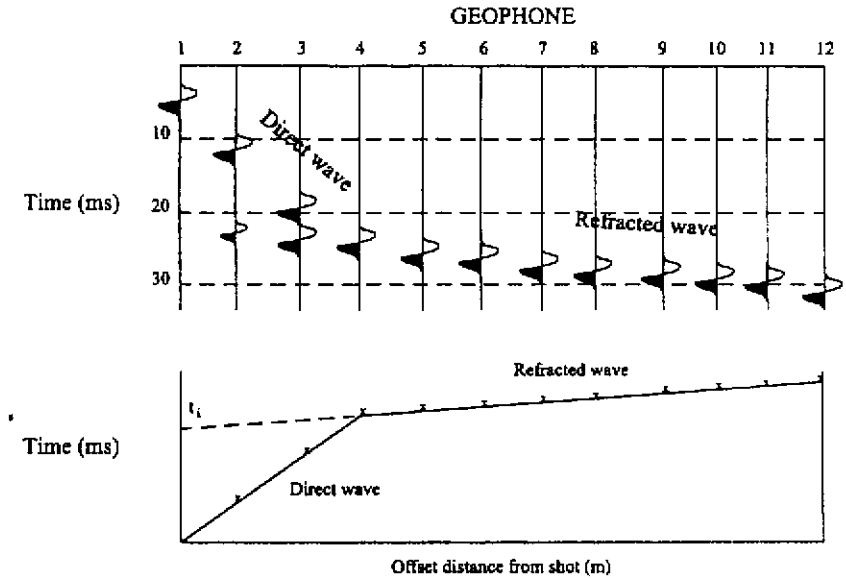


Figure SR-2. Seismic refraction method.

Shale or schist	2000 - 5000

10.2 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 placer 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 placer 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.

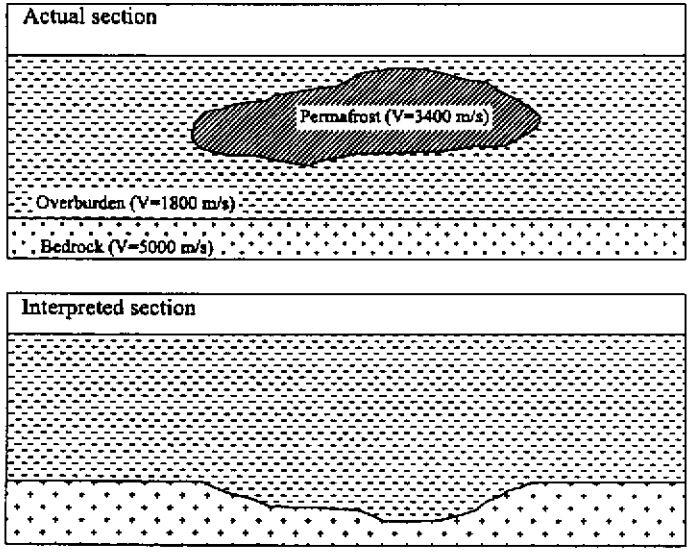
The seismic energy travels through the earth via a number of paths. In Figure SR-2(a) we consider the simple case of flat bedrock beneath overburden. A direct wave travels from the energy source directly through the low velocity near surface material. Near the energy source, this is the first wave to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

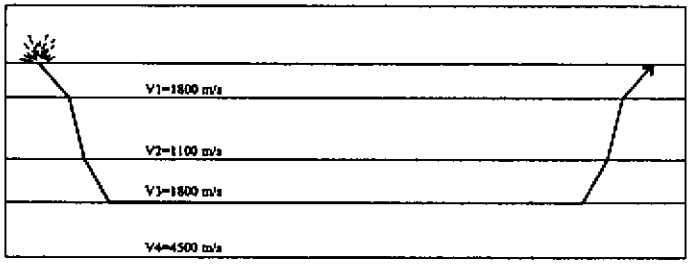
Seismic refraction data is collected by putting energy into the ground at a number of "shot points" while keeping the geophone array fixed. It is fairly common practice in seismic refraction work to take 5 shots: 2 at a considerable distance from either end of the geophone array, 2 at either end of the 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

(a) Variation in top layer velocity



(b) Velocity inversion



(c) Blind layer problem

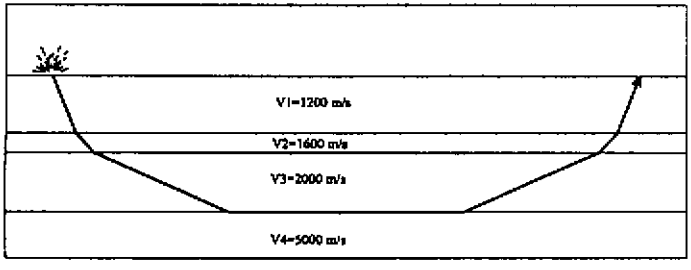


Figure SR-3. Problems with the seismic refraction method.

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:

$$t = \frac{x}{v_2} + t_i \qquad (5)$$

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:

$$\theta_c = \arcsin\frac{v_1}{v_2} \qquad (6)$$

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

$$z = \frac{v_1 t_i}{2\cos\theta_c} \qquad (7)$$

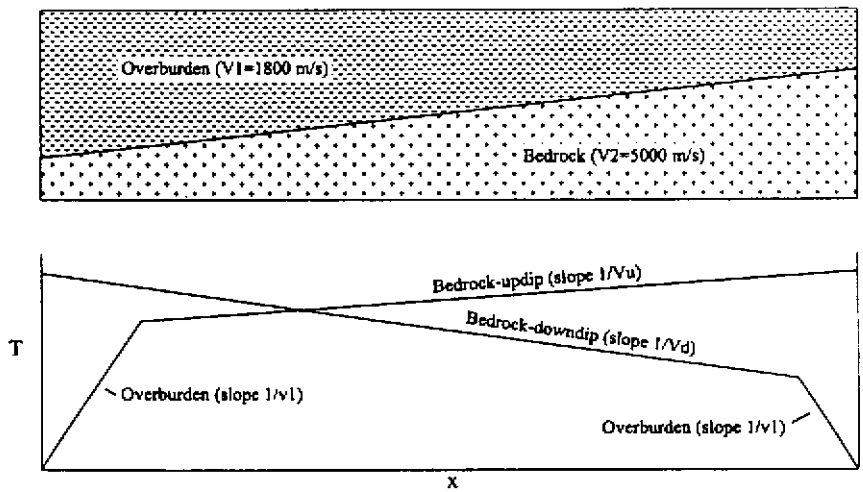
This method works only on the very simplest case of flat bedrock beneath homogeneous overburden. Seismic refraction interpretation methods must account for several velocity layers (eg. dry overburden, wet overburden, bedrock) and be able to map irregular boundaries. A following section describes delay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

10.3 Sources of error

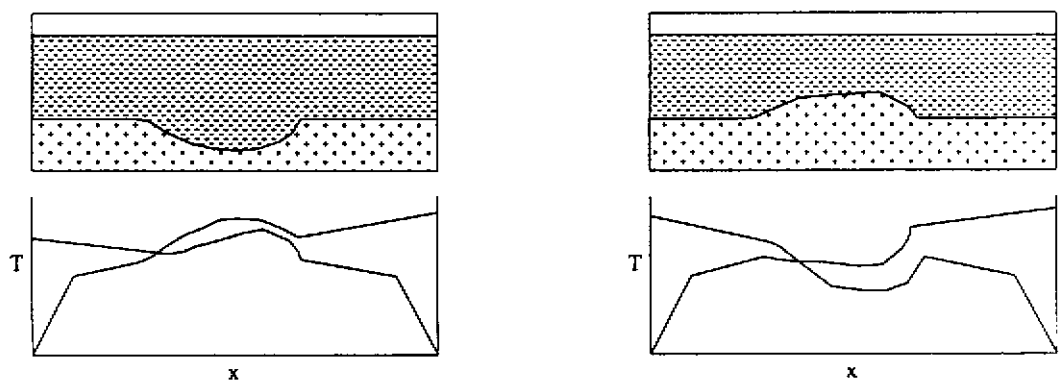
Seismic refraction surveys are prone to several sources of error. The first class of problems are directly related to acquisition problems and the second concern violation of the underlying assumptions behind the interpretation of refraction data.

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.

(a) Refraction response from dipping bedrock



(b) Effect of refractor relief



(c) Definition of delay time

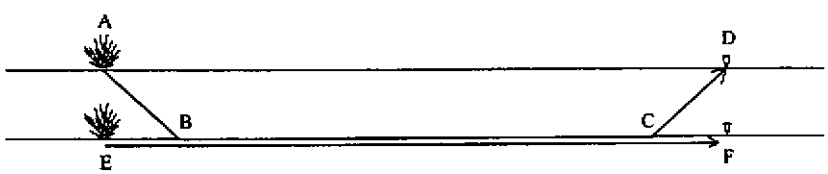


Figure SR-4. Refraction interpretation.

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.

10.4 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 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 a computerized application of delay time analysis to seismic refraction data. This method has been repackaged for commercial use as the Rimrock Geophysics SIP (seismic interpretation program) software package and was used to invert the data collected during this project. 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.

The results of the inversion show the locations of the calculated ray entry and exit points (cloud plots). In a good solution, these tend to be clustered about the mean refractor location; in a poor solution these are scattered. An additional check on accuracy is to compare the overburden velocities for adjacent spreads; in most areas these should not change significantly.

11.0 DATA PROCESSING

The seismic data was interpreted using the following procedure:

1. Shot records were examined, filtered and gain adjusted to amplify first arrivals. Thereafter, first breaks (first deflections) were picked and manually adjusted using software on the seismograph.

2. Topographic survey data along each line and between lines was processed to yield elevations relative to a local datum and distances between phones and shots along each line.

3. First breaks, phone and shot distances and elevations were entered into the SIP package by line in separate directories.

4. First breaks were assigned to layers using a three layer model discussed in the subsequent section of this report. Minor adjustments to some arrivals were made where it was apparent that local statics were shifting arrivals at any geophone or where one arrival was obviously an outlier.

5. The inversion program was run and the layer assignments adjusted until a best fit model was derived which minimized the spread in the cloud charts.

6. Final output from each line was printed and the digital output compiled.

7. Final results from each line showing phone locations, shot locations

and depths to layers were assembled in a summary spreadsheet.

8. Lines were registered to NAD27 UTM coordinates using the measured locations of the line end-points.

9. A vertical translation to adjust the local seismic survey elevation datum to the NTS orthometric datum was calculated using the topographic maps and the known location of the survey lines. Line 7 phone 9 has a local survey elevation of 9.2 m and an orthometric elevation of 940 m indicated on NTS 105 E/8.

10. A vertical adjustment of +930.8 m was added to all the model elevations to shift the apparent elevations of the subsurface refractors to elevations above mean sea level.

11. The bedrock elevations and overburden thicknesses were contoured and plotted in plan maps using the Geosoft (5.01) package.

12.0 RESULTS

The field shot records are contained in Appendix E, the final models are included in Appendix F and the final automated inversion results from the seismic survey are contained in Appendix G. In general, the seismic data was of fair to good quality. Problems were caused by the steep topography and by attenuation in unconsolidated overburden. The velocities of the upper layers are quite low compared with those encountered elsewhere in the Livingstone Creek area.

A three layer case was used in the interpretation as this appeared to best fit the observed travel time curves and the placer geology on the creek. Three seismic velocity layers are normally found in a placer setting:

1. Unconsolidated, non water saturated overburden. Velocities are typically 300 to 900 m/s.

2. Consolidated, non-water saturated to saturated overburden. Velocities are typically 1200 to 1800 m/s.

3. Bedrock: In the Livingstone Creek area, these can vary from 3500 to 6000 m/s depending upon the rock type.

The velocities generated during the interpretation procedure fall within these ranges and confirm the applicability of the model. On several lines, velocities were fixed because a lack of data points prevented an accurate determination of the velocity from the travel time curves.

Refraction seismic line profiles for all lines are attached in Appendix F. Two plots

are provided for each line. The cloud plots show the calculated refractor entry and exit points with a best fit curve through the entry and exit points for each refractor. The second plot shows the refractor locations with the intervening layers shaded to indicate their thickness. The interpreted top of bedrock is the lowest profile or boundary in the section. The relative error in bedrock elevations across each section is estimated to be in the order of 10% to 15% of the indicated depth - barring errors from misidentified refractors. Greater errors may be present at the edge of the sections where the coverage is poor.

Figures 3 and 4 show the modelled bedrock topography and calculated overburden thickness for the area covered by the seismic lines. The current stream channel location is shown for reference. It is readily apparent that the current stream channel is 30 to 50 m south of the apparent location of the incised paleochannel. In particular, it appears that the paleochannel may lie north of the north ends of Lines 8 and 9.

13.0 CONCLUSIONS

The results of the seismic refraction survey conducted on the Dycer Creek Property support the following conclusions:

a. The apparent location of the original stream channel as indicated by the bedrock topography is slightly north of the current location of Dycer Creek.

b. The apparent depth of overburden varies from 7 to 24 metres along the present course of Dycer Creek.

c. It is possible that pre-glacial pay gravels are present on this portion of Dycer Creek given the considerable overburden thickness indicated by the seismic survey.

d. It appears that overburden is thicker on the northern (right) limit of Dycer Creek and this, together with the apparent southern migration of the modern creek channel, suggests that mass wasting from the northern slopes is affecting this portion of Dycer Creek.

14.0 RECOMMENDATIONS

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

a. The results of the seismic surveys should be tested by drilling or shafting at one or two locations where the apparent depth to bedrock is shallow.

b. If the results of the seismic surveys are confirmed by drilling or excavation, further drilling or shafting should be conducted over the deepest portion of the creek channel indicated by the bedrock topography maps and line profiles. It is at this location that the paleochannel is likely located and the best gold grades may be encountered.

Respectfully submitted,
AURORA GEOSCIENCES LTD.

Michael A. Power, MSc. P.Geo.
Geophysicist, V.T.

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APPENDIX A. CERTIFICATE

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

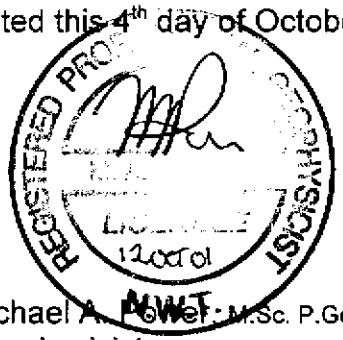
1. I hold a B.Sc. (Honours) in Geology granted in 1986 and M.Sc. in Geophysics granted in 1988, both from the University of Alberta.

2. I have been actively involved in mineral 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 directed the geophysical survey program 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 Stephen Swaim.

Dated this 4th day of October, 2001 in Whitehorse, Yukon Territory.



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

APPENDIX B. SURVEY LOG

Period: September 8-14, 2001

Personnel: Georges Belcourt
Ron Stack

Sat 8 Sept 01	Mobe into Livingstone airstrip with Big Salmon Air. One flight on the 206 and one on the 185. Wilf meets us with his 4x4 truck and drives us to Dycer creek camp(trailer). Leaves us with quad for the job. Setup camp. Much water in dycer creek, should have brought hip waders. Find jobsite, flag lines to cut, cut and survey with laser rangefinder 1 line. Wx: Rain. Production: Line-cutting 1 line
Sun 9 Sept 01	Cut and survey in stations on 4 lines. Quad trail is very useable. Not many tall trees to fall for foot access across the creek. Wx: cloudy in AM, clearing by mid morning and warm in PM, light rain on and off. Production: Line-cutting 4 lines
Mon 10 Sept 01	Cut and survey in stations on 4 lines. Quad trail crosses the creek between lines 6, 7 and twice between lines 8, 9. Still much water in the creek but crossable with the quad. Wx: light rain. Sunny and warmer in afternoon. Production: Line-cutting 4 lines
Tue 11 Sept 01	Survey Seismic lines 1, 2, & 3. 24 channel/115 m spread with 5 shots per spread. Much moss cover on the shady side of the creek, compact shovels did not work(bad design). No problems other than tough to pick first breaks in field. Battery holding up well. Wx: very warm, cloudy and windy. Production: Seismic 3 lines
Wed 12 Sept 01	Survey Seismic lines 4, 5, & 6. Again slow going placing phones into good soil. Running low on printer paper in the seismograph. Wx: very warm, partly cloudy and windy. Production: Seismic 3 lines
Thu 13 Sept 01	Survey Seismic lines 7, 8, & 9. Slow crossovers due to the fording of the creek with all of the gear. Ran out of paper on the

last shot of line 7, no spare roll in camp. Wx: cloudy, foggy, wind and snow.

Production: Seismic 3 lines

Fri 14 Sept 01 Mobe out. Drive to Wilf's camp on the quad to pick up the truck. Find truck at the airstrip, leave quad and take truck back to Dycer camp. Wilf + two helpers required to get gear across Dycer Creek without losing ATV. Pack up gear, take truck back to airstrip and call Big Salmon Air for early flight (4:30pm). Return truck to Wilf, plane arrives after 6pmback to Whitehorse.

Summary:

Line cutting & topographic surveys:	1.08 line-km
Seismic surveys:	1.08 line-km

Personnel:

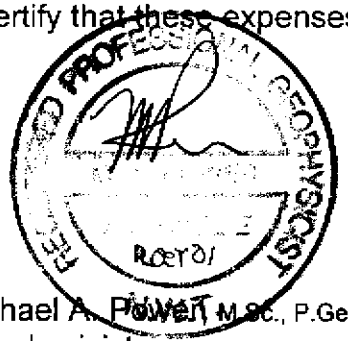
Georges Belcourt
3520 Raccine Road
Yellowknife NT
X1A 3J2

Ron Stack
Box 10086
Whitehorse YT
Y1A 7A1

APPENDIX C. STATEMENT OF EXPENDITURES

Mobilization / demobilization / instrument preparation	$375
Air charter	$883
Line cutting and topographic survey crew - all in less camp/ATV: 4.0 days @ $920	$3,680
Seismic survey - all in less camp / ATV 3.0 days @ $1653	$4,959
Explosives	$797
Camp rental: 7 days @ $100	$700
ATV rental: 7 days @ $125	$875
Report	$1,926
Total expenses	*$14,195*

I certify that these expenses are correct to the best of my knowledge.



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

APPENDIX D. INSTRUMENT SPECIFICATIONS

GEOMETRICS

StrataView RX Specifications

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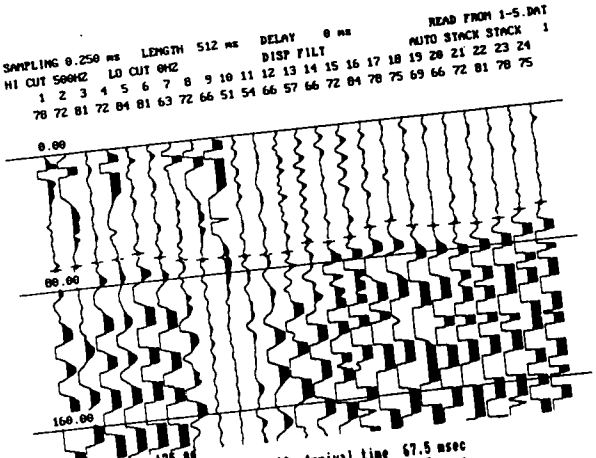
R Series Specifications

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).

APPENDIX E. SHOT RECORDS



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Channel	4	Phone location	15.00	Arrival time	63.0 msec
Channel	5	Phone location	20.00	Arrival time	66.5 msec
Channel	6	Phone location	25.00	Arrival time	69.5 msec
Channel	7	Phone location	30.00	Arrival time	70.5 msec
Channel	8	Phone location	35.00	Arrival time	70.5 msec
Channel	9	Phone location	40.00	Arrival time	71.0 msec
Channel	10	Phone location	45.00	Arrival time	71.5 msec
Channel	11	Phone location	50.00	Arrival time	71.5 msec
Channel	12	Phone location	55.00	Arrival time	67.0 msec
Channel	13	Phone location	60.00	Arrival time	68.0 msec
Channel	14	Phone location	65.00	Arrival time	66.5 msec
Channel	15	Phone location	70.00	Arrival time	62.0 msec
Channel	16	Phone location	75.00	Arrival time	59.5 msec
Channel	17	Phone location	80.00	Arrival time	63.5 msec
Channel	18	Phone location	85.00	Arrival time	65.0 msec
Channel	19	Phone location	90.00	Arrival time	65.0 msec
Channel	20	Phone location	95.00	Arrival time	66.0 msec
Channel	21	Phone location	100.00	Arrival time	64.5 msec
Channel	22	Phone location	105.00	Arrival time	60.5 msec
Channel	23	Phone location	110.00	Arrival time	58.0 msec
Channel	24	Phone location	115.00	Arrival time	

LINE 6 SHOT 5

CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK 1

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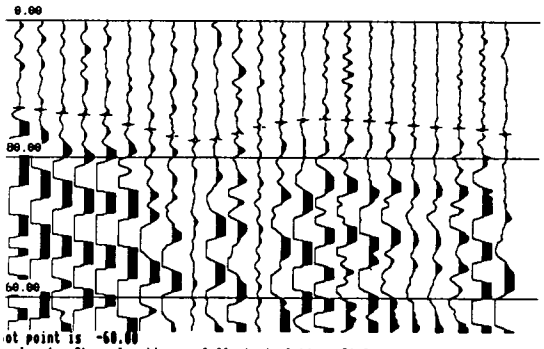

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nel	10	Phone location	45.00	Arrival time	70.0 msec
nel	11	Phone location	50.00	Arrival time	69.5 msec
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nel	13	Phone location	60.00	Arrival time	62.0 msec
nel	14	Phone location	65.00	Arrival time	59.0 msec
nel	15	Phone location	70.00	Arrival time	57.5 msec
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nel	19	Phone location	90.00	Arrival time	59.0 msec
nel	20	Phone location	95.00	Arrival time	60.5 msec
nel	21	Phone location	100.00	Arrival time	61.5 msec
nel	22	Phone location	105.00	Arrival time	62.0 msec
nel	23	Phone location	110.00	Arrival time	63.0 msec
nel	24	Phone location	115.00	Arrival time	65.5 msec

HI CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK

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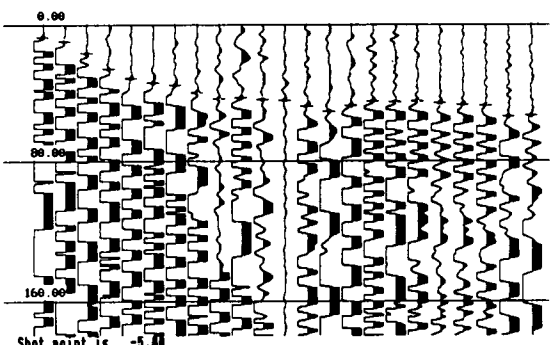

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Channel	23	Phone location	110.00	Arrival time	53.5 msec
Channel	24	Phone location	115.00	Arrival time	53.0 msec

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CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK 1

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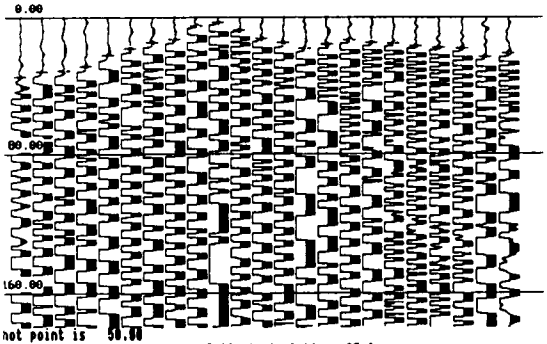

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nel	18	Phone location	85.00	Arrival time	15.3 msec
nel	19	Phone location	90.00	Arrival time	15.5 msec
nel	20	Phone location	95.00	Arrival time	17.0 msec
nel	21	Phone location	100.00	Arrival time	18.0 msec
nel	22	Phone location	105.00	Arrival time	18.0 msec
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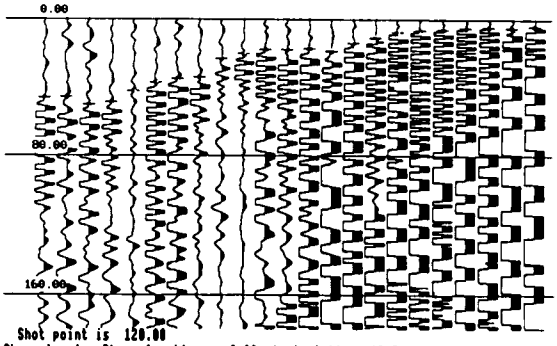
SAMPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-4.D
HI CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK

1	2	3	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
78	75	84	66	60	75	72	60	48	54	63	63	69	72	72	54	78	84	81	84	78	84	66



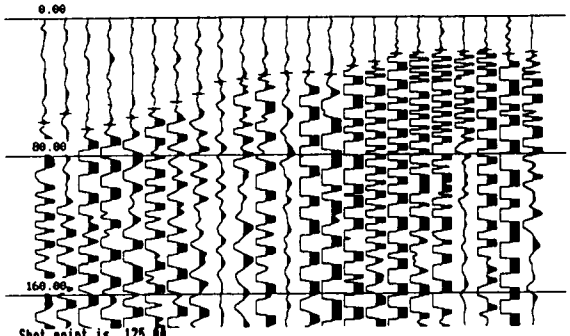
Shot point is 120.00

Channel	1	Phone location	0.00	Arrival time	46.5 msec
Channel	2	Phone location	5.00	Arrival time	46.0 msec
Channel	3	Phone location	10.00	Arrival time	50.5 msec
Channel	4	Phone location	15.00	Arrival time	49.0 msec
Channel	5	Phone location	20.00	Arrival time	42.5 msec
Channel	6	Phone location	25.00	Arrival time	37.5 msec
Channel	7	Phone location	30.00	Arrival time	35.5 msec
Channel	8	Phone location	35.00	Arrival time	34.5 msec
Channel	10	Phone location	45.00	Arrival time	23.5 msec
Channel	11	Phone location	50.00	Arrival time	20.5 msec
Channel	12	Phone location	55.00	Arrival time	18.3 msec
Channel	13	Phone location	60.00	Arrival time	18.0 msec
Channel	14	Phone location	65.00	Arrival time	17.8 msec
Channel	15	Phone location	70.00	Arrival time	19.0 msec
Channel	16	Phone location	75.00	Arrival time	14.8 msec
Channel	17	Phone location	80.00	Arrival time	11.8 msec
Channel	18	Phone location	85.00	Arrival time	7.5 msec
Channel	19	Phone location	90.00	Arrival time	6.5 msec
Channel	20	Phone location	95.00	Arrival time	6.0 msec
Channel	21	Phone location	100.00	Arrival time	5.0 msec
Channel	22	Phone location	105.00	Arrival time	4.5 msec
Channel	23	Phone location	110.00	Arrival time	5.0 msec
Channel	24	Phone location	115.00	Arrival time	4.0 msec

LINE 7 SHOTS 1-4

SAMPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-5.DAT
HI CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK 1

1	2	3	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
78	72	84	75	72	75	69	60	48	60	63	57	66	72	75	66	81	81	87	57	72	78	60

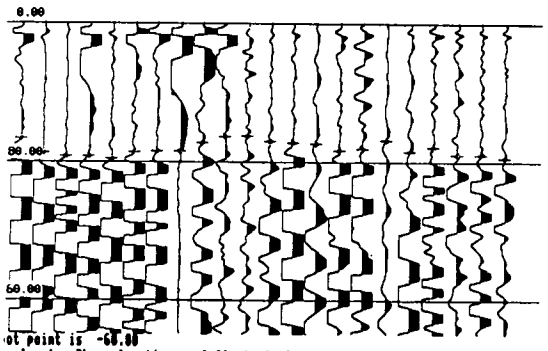


Shot point is 175.00

Channel	1	Phone location	0.00	Arrival time	60.5	msec
Channel	2	Phone location	5.00	Arrival time	55.5	msec
Channel	3	Phone location	10.00	Arrival time	64.5	msec
Channel	4	Phone location	15.00	Arrival time	62.3	msec
Channel	5	Phone location	20.00	Arrival time	58.0	msec
Channel	6	Phone location	25.00	Arrival time	53.3	msec
Channel	7	Phone location	30.00	Arrival time	49.0	msec
Channel	8	Phone location	35.00	Arrival time	44.5	msec
Channel	10	Phone location	45.00	Arrival time	37.5	msec
Channel	11	Phone location	50.00	Arrival time	36.0	msec
Channel	12	Phone location	55.00	Arrival time	33.5	msec
Channel	13	Phone location	60.00	Arrival time	32.5	msec
Channel	14	Phone location	65.00	Arrival time	32.0	msec
Channel	15	Phone location	70.00	Arrival time	33.5	msec
Channel	16	Phone location	75.00	Arrival time	28.5	msec
Channel	17	Phone location	80.00	Arrival time	26.0	msec
Channel	18	Phone location	85.00	Arrival time	21.0	msec
Channel	19	Phone location	90.00	Arrival time	21.0	msec
Channel	20	Phone location	95.00	Arrival time	19.5	msec
Channel	21	Phone location	100.00	Arrival time	20.5	msec
Channel	22	Phone location	105.00	Arrival time	19.5	msec
Channel	23	Phone location	110.00	Arrival time	22.0	msec
Channel	24	Phone location	115.00	Arrival time	21.0	msec

LINE 7 SHOT 5

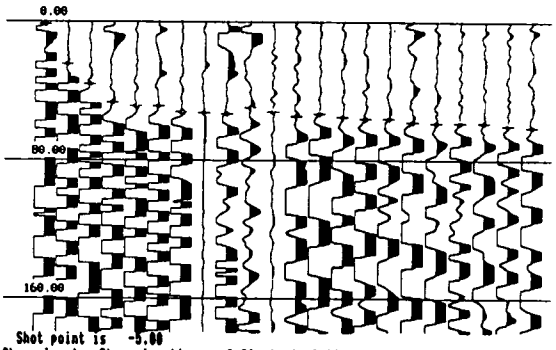
MPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-1.DAT
CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK 1
1 2 3 4 5 6 7 8 9 12 13 14 15 16 17 18 19 20 21 22 23 24
81 63 66 66 69 78 66 60 60 60 66 75 84 72 87 81 63 78 84 81 81 78



ot point is -60.00

nel	1	Phone location	0.00	Arrival time	66.0 msec
nel	2	Phone location	5.00	Arrival time	74.5 msec
nel	3	Phone location	10.00	Arrival time	76.5 msec
nel	4	Phone location	15.00	Arrival time	76.5 msec
nel	5	Phone location	20.00	Arrival time	78.0 msec
nel	6	Phone location	25.00	Arrival time	74.0 msec
nel	7	Phone location	30.00	Arrival time	73.5 msec
nel	8	Phone location	35.00	Arrival time	73.5 msec
nel	9	Phone location	40.00	Arrival time	68.5 msec
nel	12	Phone location	55.00	Arrival time	65.0 msec
nel	13	Phone location	60.00	Arrival time	64.5 msec
nel	14	Phone location	65.00	Arrival time	67.5 msec
nel	15	Phone location	70.00	Arrival time	68.5 msec
nel	16	Phone location	75.00	Arrival time	69.0 msec
nel	17	Phone location	80.00	Arrival time	73.0 msec
nel	18	Phone location	85.00	Arrival time	72.0 msec
nel	19	Phone location	90.00	Arrival time	67.0 msec
nel	20	Phone location	95.00	Arrival time	73.5 msec
nel	21	Phone location	100.00	Arrival time	71.0 msec
nel	22	Phone location	105.00	Arrival time	75.5 msec
nel	23	Phone location	110.00	Arrival time	75.5 msec
nel	24	Phone location	115.00	Arrival time	77.5 msec

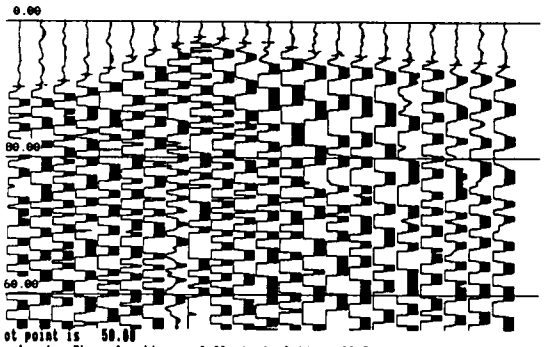
SAMPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-2.DA
HI CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK
1 2 3 4 5 6 7 8 9 12 13 14 15 16 17 18 19 20 21 22 23 24
81 57 66 54 60 69 57 27 57 57 54 78 78 81 87 75 87 81 81 84 81 84



Shot point is -5.00

Channel	1	Phone location	0.00	Arrival time	1.5 msec
Channel	2	Phone location	5.00	Arrival time	24.0 msec
Channel	3	Phone location	10.00	Arrival time	35.5 msec
Channel	4	Phone location	15.00	Arrival time	46.0 msec
Channel	5	Phone location	20.00	Arrival time	48.0 msec
Channel	6	Phone location	25.00	Arrival time	48.0 msec
Channel	7	Phone location	30.00	Arrival time	51.5 msec
Channel	8	Phone location	35.00	Arrival time	52.0 msec
Channel	9	Phone location	40.00	Arrival time	52.5 msec
Channel	12	Phone location	55.00	Arrival time	49.0 msec
Channel	13	Phone location	60.00	Arrival time	51.5 msec
Channel	14	Phone location	65.00	Arrival time	54.0 msec
Channel	15	Phone location	70.00	Arrival time	52.5 msec
Channel	16	Phone location	75.00	Arrival time	54.5 msec
Channel	17	Phone location	80.00	Arrival time	55.5 msec
Channel	18	Phone location	85.00	Arrival time	55.5 msec
Channel	19	Phone location	90.00	Arrival time	57.5 msec
Channel	20	Phone location	95.00	Arrival time	58.0 msec
Channel	21	Phone location	100.00	Arrival time	58.0 msec
Channel	22	Phone location	105.00	Arrival time	58.0 msec
Channel	23	Phone location	110.00	Arrival time	59.5 msec
Channel	24	Phone location	115.00	Arrival time	60.5 msec

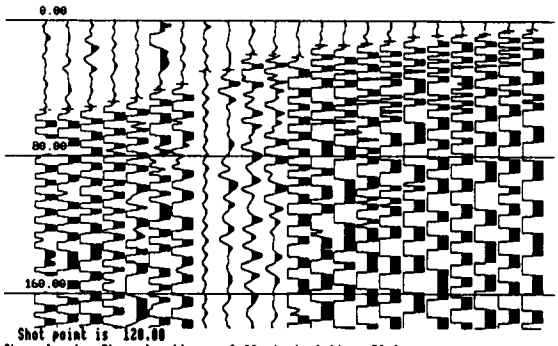
MPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-3.DAT
CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK 1
1 2 3 4 5 6 7 8 9 12 13 14 15 16 17 18 19 20 21 22 23 24
75 78 75 60 69 72 66 66 57 60 66 84 84 87 87 81 87 84 84 87 81 81



ot point is 50.00

nel	1	Phone location	0.00	Arrival time	38.5 msec
nel	2	Phone location	5.00	Arrival time	37.5 msec
nel	3	Phone location	10.00	Arrival time	35.3 msec
nel	4	Phone location	15.00	Arrival time	31.5 msec
nel	5	Phone location	20.00	Arrival time	27.5 msec
nel	6	Phone location	25.00	Arrival time	20.5 msec
nel	7	Phone location	30.00	Arrival time	17.0 msec
nel	8	Phone location	35.00	Arrival time	13.0 msec
nel	9	Phone location	40.00	Arrival time	9.0 msec
nel	12	Phone location	55.00	Arrival time	10.0 msec
nel	13	Phone location	60.00	Arrival time	12.5 msec
nel	14	Phone location	65.00	Arrival time	12.0 msec
nel	15	Phone location	70.00	Arrival time	15.0 msec
nel	16	Phone location	75.00	Arrival time	17.0 msec
nel	17	Phone location	80.00	Arrival time	19.5 msec
nel	18	Phone location	85.00	Arrival time	20.0 msec
nel	19	Phone location	90.00	Arrival time	21.0 msec
nel	20	Phone location	95.00	Arrival time	22.0 msec
nel	21	Phone location	100.00	Arrival time	22.5 msec
nel	22	Phone location	105.00	Arrival time	24.5 msec
nel	23	Phone location	110.00	Arrival time	23.0 msec
nel	24	Phone location	115.00	Arrival time	25.0 msec

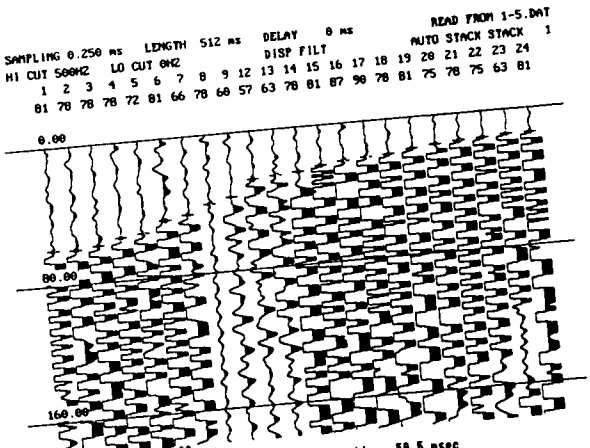
SAMPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-4.DA
HI CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK
1 2 3 4 5 6 7 8 9 12 13 14 15 16 17 18 19 20 21 22 23 24
81 78 81 75 69 81 66 75 57 54 57 75 90 81 84 78 78 78 81 63 84 78



Shot point is 120.00

Channel	1	Phone location	0.00	Arrival time	53.0 msec
Channel	2	Phone location	5.00	Arrival time	52.0 msec
Channel	3	Phone location	10.00	Arrival time	51.3 msec
Channel	4	Phone location	15.00	Arrival time	48.3 msec
Channel	5	Phone location	20.00	Arrival time	46.0 msec
Channel	6	Phone location	25.00	Arrival time	41.0 msec
Channel	7	Phone location	30.00	Arrival time	37.5 msec
Channel	8	Phone location	35.00	Arrival time	30.3 msec
Channel	9	Phone location	40.00	Arrival time	25.0 msec
Channel	12	Phone location	55.00	Arrival time	20.0 msec
Channel	13	Phone location	60.00	Arrival time	20.5 msec
Channel	14	Phone location	65.00	Arrival time	21.5 msec
Channel	15	Phone location	70.00	Arrival time	14.5 msec
Channel	16	Phone location	75.00	Arrival time	14.0 msec
Channel	17	Phone location	80.00	Arrival time	13.5 msec
Channel	18	Phone location	85.00	Arrival time	12.0 msec
Channel	19	Phone location	90.00	Arrival time	9.5 msec
Channel	20	Phone location	95.00	Arrival time	8.0 msec
Channel	21	Phone location	100.00	Arrival time	8.3 msec
Channel	22	Phone location	105.00	Arrival time	7.0 msec
Channel	23	Phone location	110.00	Arrival time	5.5 msec
Channel	24	Phone location	115.00	Arrival time	5.3 msec

LINE 8 SHOTS 1-4



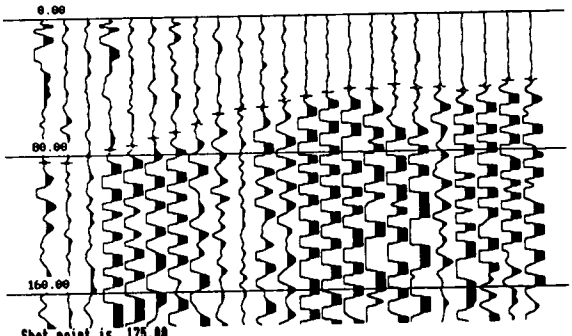
Shot Point is 175.00

Channel	1	Phone location	0.00	Arrival time	59.5 msec
Channel	2	Phone location	5.00	Arrival time	60.0 msec
Channel	3	Phone location	10.00	Arrival time	58.5 msec
Channel	4	Phone location	15.00	Arrival time	55.3 msec
Channel	5	Phone location	20.00	Arrival time	53.8 msec
Channel	6	Phone location	25.00	Arrival time	47.3 msec
Channel	7	Phone location	30.00	Arrival time	45.3 msec
Channel	8	Phone location	35.00	Arrival time	40.0 msec
Channel	9	Phone location	40.00	Arrival time	37.0 msec
Channel	12	Phone location	55.00	Arrival time	28.0 msec
Channel	13	Phone location	60.00	Arrival time	27.0 msec
Channel	14	Phone location	65.00	Arrival time	26.0 msec
Channel	15	Phone location	70.00	Arrival time	23.0 msec
Channel	16	Phone location	75.00	Arrival time	22.3 msec
Channel	17	Phone location	80.00	Arrival time	21.3 msec
Channel	18	Phone location	85.00	Arrival time	20.0 msec
Channel	19	Phone location	90.00	Arrival time	18.0 msec
Channel	20	Phone location	95.00	Arrival time	17.3 msec
Channel	21	Phone location	100.00	Arrival time	16.3 msec
Channel	22	Phone location	105.00	Arrival time	15.8 msec
Channel	23	Phone location	110.00	Arrival time	14.8 msec
Channel	24	Phone location	115.00	Arrival time	14.5 msec

LINE 8 SHOT 5

SAMPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-5.DAT
HI CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK 1

1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24
78	57	72	81	78	81	72	66	57	54	63	57	69	75	72	78	69	75	69	69	63	72	69



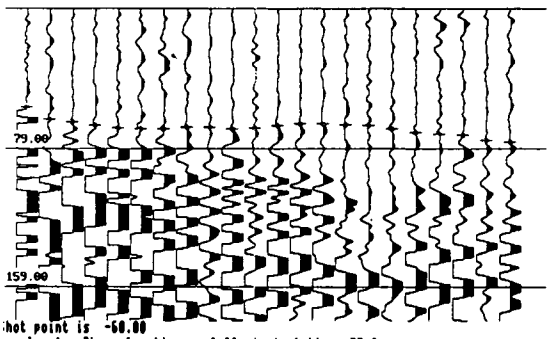
Shot point is 175.00

Channel	1	Phone location	0.00	Arrival time	83.5 msec
Channel	2	Phone location	5.00	Arrival time	84.0 msec
Channel	3	Phone location	10.00	Arrival time	80.0 msec
Channel	4	Phone location	15.00	Arrival time	76.5 msec
Channel	5	Phone location	20.00	Arrival time	74.5 msec
Channel	6	Phone location	25.00	Arrival time	70.0 msec
Channel	7	Phone location	30.00	Arrival time	67.0 msec
Channel	8	Phone location	35.00	Arrival time	62.5 msec
Channel	9	Phone location	40.00	Arrival time	56.5 msec
Channel	11	Phone location	50.00	Arrival time	54.0 msec
Channel	12	Phone location	55.00	Arrival time	53.0 msec
Channel	13	Phone location	60.00	Arrival time	49.5 msec
Channel	14	Phone location	65.00	Arrival time	47.0 msec
Channel	15	Phone location	70.00	Arrival time	45.0 msec
Channel	16	Phone location	75.00	Arrival time	43.0 msec
Channel	17	Phone location	80.00	Arrival time	43.5 msec
Channel	18	Phone location	85.00	Arrival time	41.0 msec
Channel	19	Phone location	90.00	Arrival time	43.5 msec
Channel	20	Phone location	95.00	Arrival time	43.0 msec
Channel	21	Phone location	100.00	Arrival time	45.5 msec
Channel	22	Phone location	105.00	Arrival time	43.3 msec
Channel	23	Phone location	110.00	Arrival time	40.0 msec
Channel	24	Phone location	115.00	Arrival time	39.0 msec

LINE 9 SHOTS 5

MPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-1.DAT
CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK 1

1	2	3	4	5	6	7	8	9	12	13	14	15	16	17	18	19	20	21	22	23	24
84	69	72	72	75	81	72	66	54	63	57	66	69	75	75	63	69	84	78	78	81	84

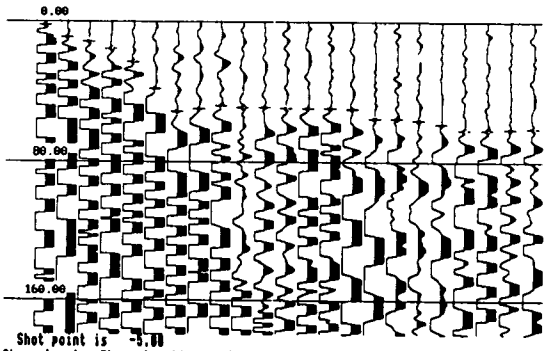


hot point is -60.00

nnel	1	Phone location	0.00	Arrival time	55.0 msec
nnel	2	Phone location	5.00	Arrival time	62.0 msec
nnel	3	Phone location	10.00	Arrival time	63.5 msec
nnel	4	Phone location	15.00	Arrival time	65.5 msec
nnel	5	Phone location	20.00	Arrival time	67.0 msec
nnel	6	Phone location	25.00	Arrival time	67.5 msec
nnel	7	Phone location	30.00	Arrival time	67.5 msec
nnel	8	Phone location	35.00	Arrival time	66.5 msec
nnel	9	Phone location	40.00	Arrival time	66.5 msec
nnel	12	Phone location	55.00	Arrival time	67.5 msec
nnel	13	Phone location	60.00	Arrival time	67.0 msec
nnel	14	Phone location	65.00	Arrival time	65.5 msec
nnel	15	Phone location	70.00	Arrival time	64.5 msec
nnel	16	Phone location	75.00	Arrival time	64.5 msec
nnel	17	Phone location	80.00	Arrival time	65.0 msec
nnel	18	Phone location	85.00	Arrival time	65.5 msec
nnel	19	Phone location	90.00	Arrival time	67.5 msec
nnel	20	Phone location	95.00	Arrival time	69.5 msec
nnel	21	Phone location	100.00	Arrival time	70.5 msec
nnel	22	Phone location	105.00	Arrival time	71.0 msec
nnel	23	Phone location	110.00	Arrival time	74.0 msec
nnel	24	Phone location	115.00	Arrival time	75.0 msec

SAMPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-2.
HI CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK

1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24
75	57	45	51	69	78	54	63	63	54	60	60	75	81	78	78	72	75	84	81	81	84	84

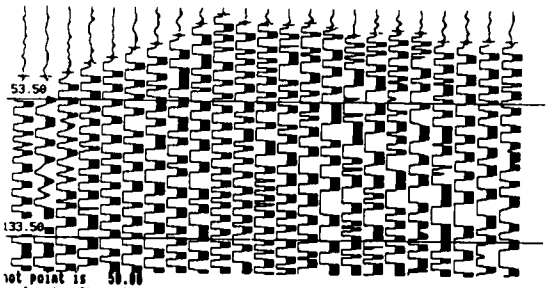


Shot point is -5.00

Channel	1	Phone location	0.00	Arrival time	2.0 msec
Channel	2	Phone location	5.00	Arrival time	9.0 msec
Channel	3	Phone location	10.00	Arrival time	11.5 msec
Channel	4	Phone location	15.00	Arrival time	15.5 msec
Channel	5	Phone location	20.00	Arrival time	23.0 msec
Channel	6	Phone location	25.00	Arrival time	38.0 msec
Channel	7	Phone location	30.00	Arrival time	51.0 msec
Channel	8	Phone location	35.00	Arrival time	49.0 msec
Channel	9	Phone location	40.00	Arrival time	47.5 msec
Channel	11	Phone location	50.00	Arrival time	48.5 msec
Channel	12	Phone location	55.00	Arrival time	48.5 msec
Channel	13	Phone location	60.00	Arrival time	49.3 msec
Channel	14	Phone location	65.00	Arrival time	49.3 msec
Channel	15	Phone location	70.00	Arrival time	49.3 msec
Channel	16	Phone location	75.00	Arrival time	49.5 msec
Channel	17	Phone location	80.00	Arrival time	55.0 msec
Channel	18	Phone location	85.00	Arrival time	55.0 msec
Channel	19	Phone location	90.00	Arrival time	56.0 msec
Channel	20	Phone location	95.00	Arrival time	50.0 msec
Channel	21	Phone location	100.00	Arrival time	61.0 msec
Channel	22	Phone location	105.00	Arrival time	61.5 msec
Channel	23	Phone location	110.00	Arrival time	61.0 msec
Channel	24	Phone location	115.00	Arrival time	60.0 msec

MPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-3.DAT
CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK 1

1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24
66	63	66	72	72	75	66	66	63	48	54	63	72	81	78	78	75	78	84	84	84	87	84

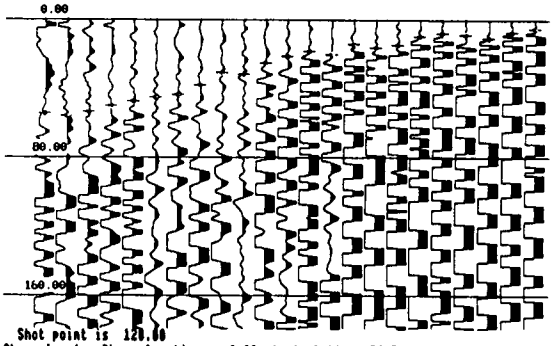


ot point is 50.00

nel	1	Phone location	0.00	Arrival time	40.5 msec
nel	2	Phone location	5.00	Arrival time	40.5 msec
nel	3	Phone location	10.00	Arrival time	38.0 msec
nel	4	Phone location	15.00	Arrival time	32.5 msec
nel	5	Phone location	20.00	Arrival time	29.0 msec
nel	6	Phone location	25.00	Arrival time	23.0 msec
nel	7	Phone location	30.00	Arrival time	20.5 msec
nel	8	Phone location	35.00	Arrival time	15.5 msec
nel	9	Phone location	40.00	Arrival time	8.5 msec
nel	11	Phone location	50.00	Arrival time	3.0 msec
nel	12	Phone location	55.00	Arrival time	7.5 msec
nel	13	Phone location	60.00	Arrival time	8.0 msec
nel	14	Phone location	65.00	Arrival time	8.5 msec
nel	15	Phone location	70.00	Arrival time	7.5 msec
nel	16	Phone location	75.00	Arrival time	10.0 msec
nel	17	Phone location	80.00	Arrival time	14.5 msec
nel	18	Phone location	85.00	Arrival time	13.0 msec
nel	19	Phone location	90.00	Arrival time	11.5 msec
nel	20	Phone location	95.00	Arrival time	12.5 msec
nel	21	Phone location	100.00	Arrival time	17.5 msec
nel	22	Phone location	105.00	Arrival time	17.5 msec
nel	23	Phone location	110.00	Arrival time	17.0 msec
nel	24	Phone location	115.00	Arrival time	17.5 msec

SAMPLING 0.250 ms LENGTH 512 ms DELAY 0 ms READ FROM 1-4.D
HI CUT 500HZ LO CUT 0HZ DISP FILT AUTO STACK STACK

1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24
84	81	84	75	78	69	69	63	60	54	66	57	75	54	78	81	72	84	87	78	78	84	78



Shot point is 120.00

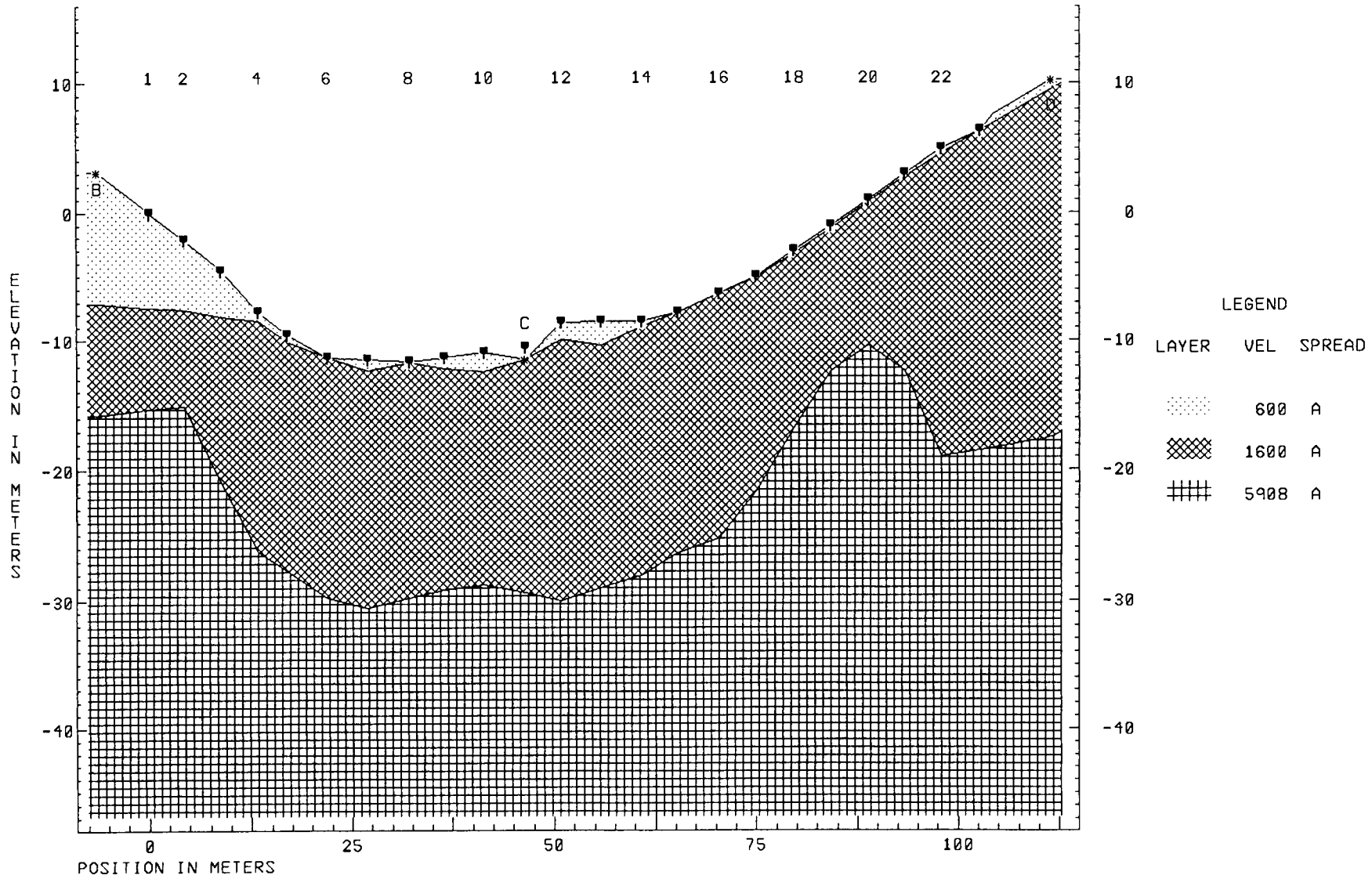
Channel	1	Phone location	0.00	Arrival time	54.5 msec
Channel	2	Phone location	5.00	Arrival time	56.0 msec
Channel	3	Phone location	10.00	Arrival time	53.5 msec
Channel	4	Phone location	15.00	Arrival time	50.0 msec
Channel	5	Phone location	20.00	Arrival time	47.5 msec
Channel	6	Phone location	25.00	Arrival time	45.0 msec
Channel	7	Phone location	30.00	Arrival time	43.5 msec
Channel	8	Phone location	35.00	Arrival time	38.0 msec
Channel	9	Phone location	40.00	Arrival time	30.5 msec
Channel	11	Phone location	50.00	Arrival time	31.5 msec
Channel	12	Phone location	55.00	Arrival time	25.0 msec
Channel	13	Phone location	60.00	Arrival time	21.0 msec
Channel	14	Phone location	65.00	Arrival time	18.0 msec
Channel	15	Phone location	70.00	Arrival time	20.0 msec
Channel	16	Phone location	75.00	Arrival time	14.0 msec
Channel	17	Phone location	80.00	Arrival time	16.0 msec
Channel	18	Phone location	85.00	Arrival time	14.5 msec
Channel	19	Phone location	90.00	Arrival time	9.5 msec
Channel	20	Phone location	95.00	Arrival time	7.5 msec
Channel	21	Phone location	100.00	Arrival time	8.5 msec
Channel	22	Phone location	105.00	Arrival time	10.5 msec
Channel	23	Phone location	110.00	Arrival time	7.0 msec
Channel	24	Phone location	115.00	Arrival time	5.0 msec

LINE 9 SHOTS 1-4

APPENDIX F. MODEL PLOTS

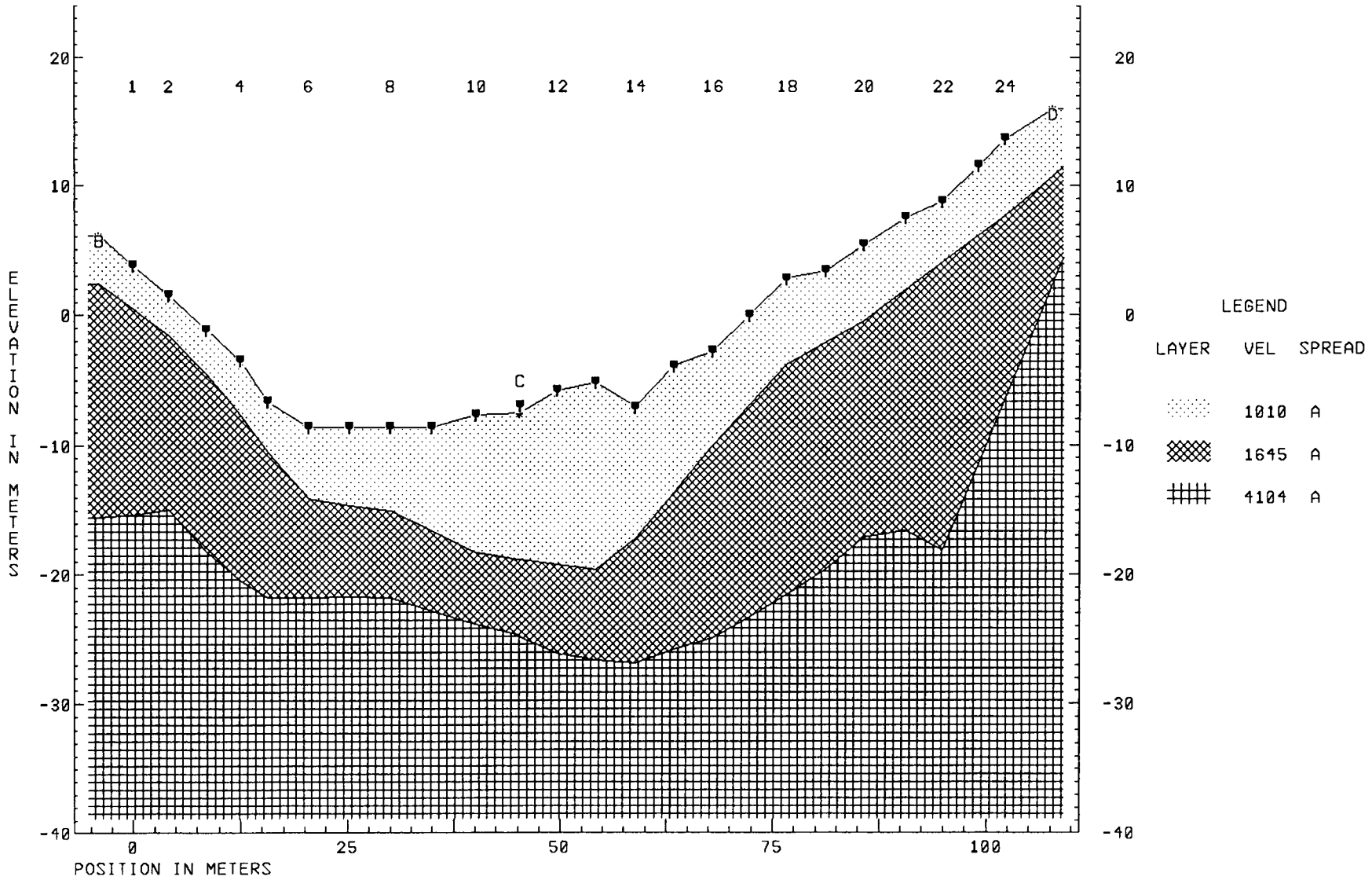
FILE LINE1.SIP
DYCER CREEK - LINE 1

SPREAD A



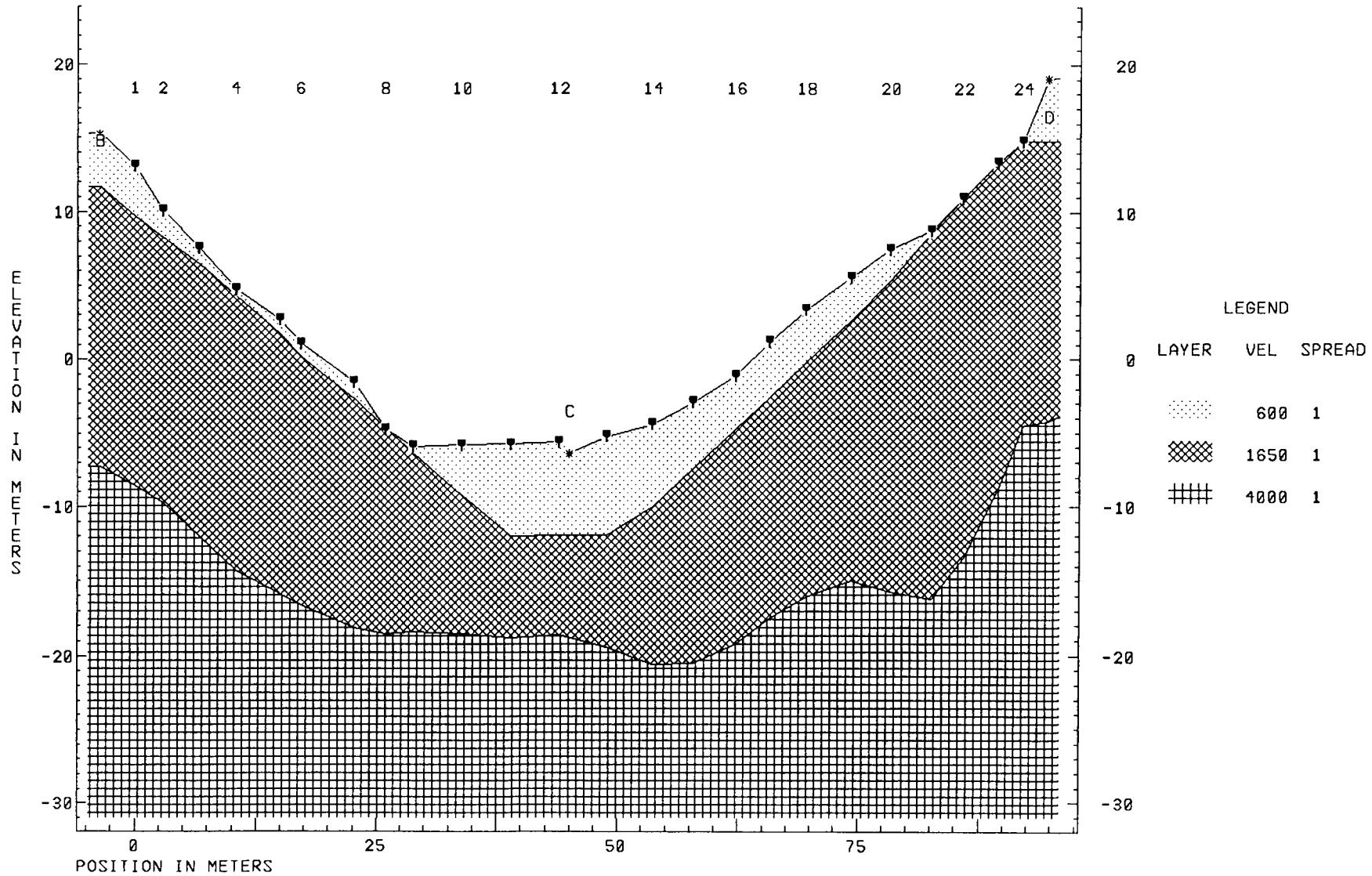
FILE LINE2.SIP
DYCER CREEK - LINE 2

SPREAD A



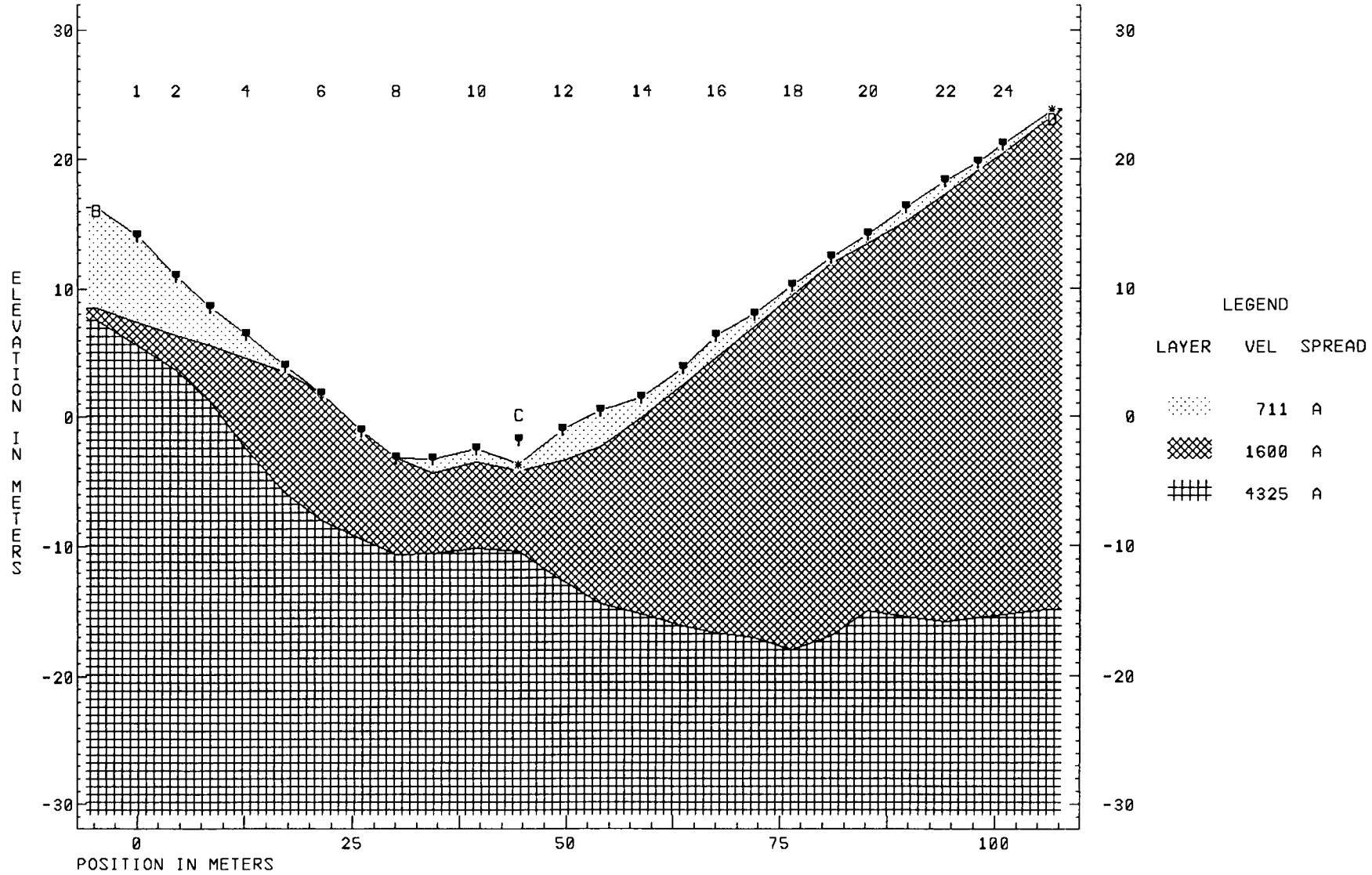
FILE LINE3.SIP
DYCER CREEK LINE 3

SPREAD 1



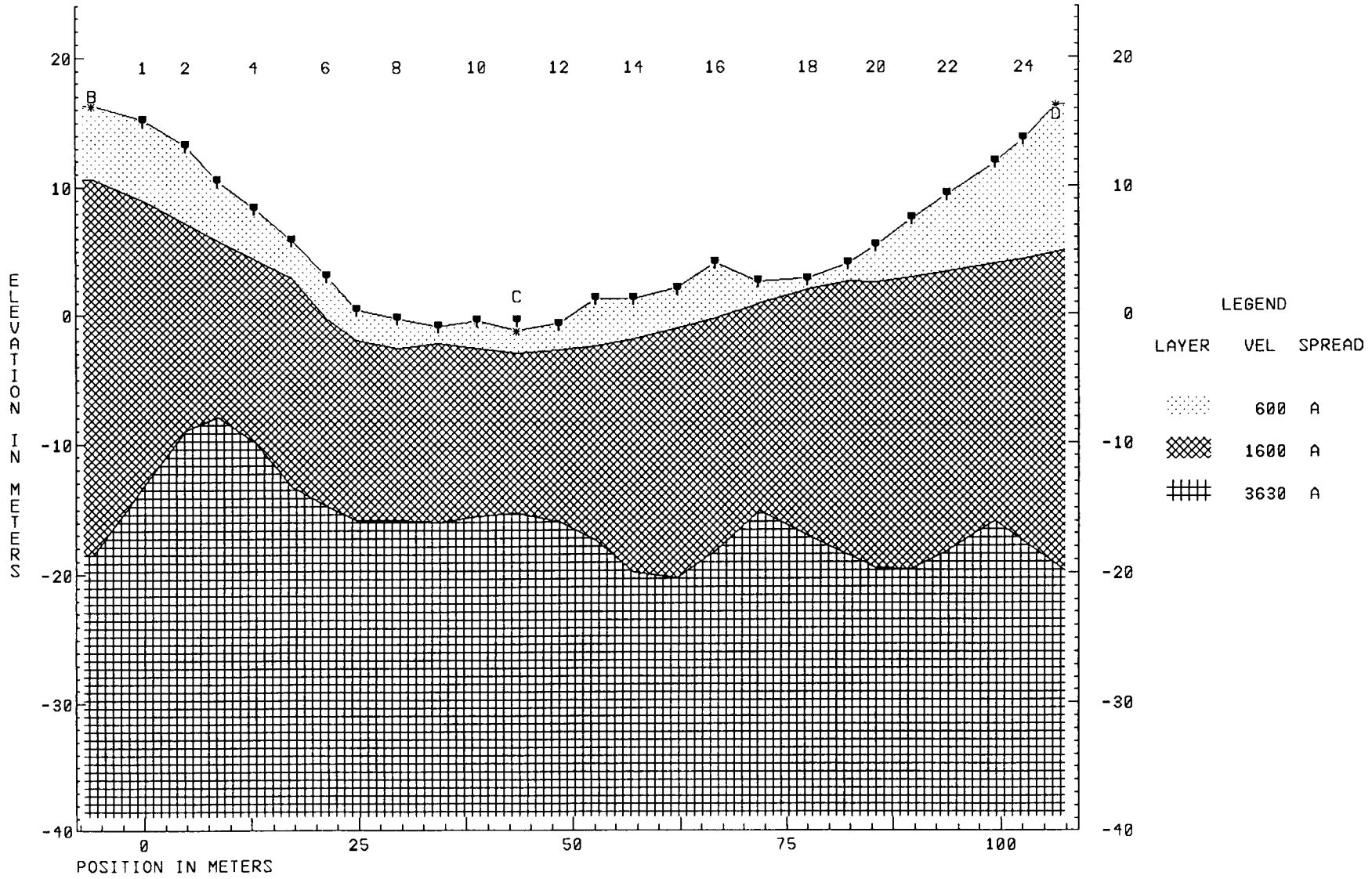
FILE LINE4.SIP
DYCER CREEK - LINE 4

SPREAD A



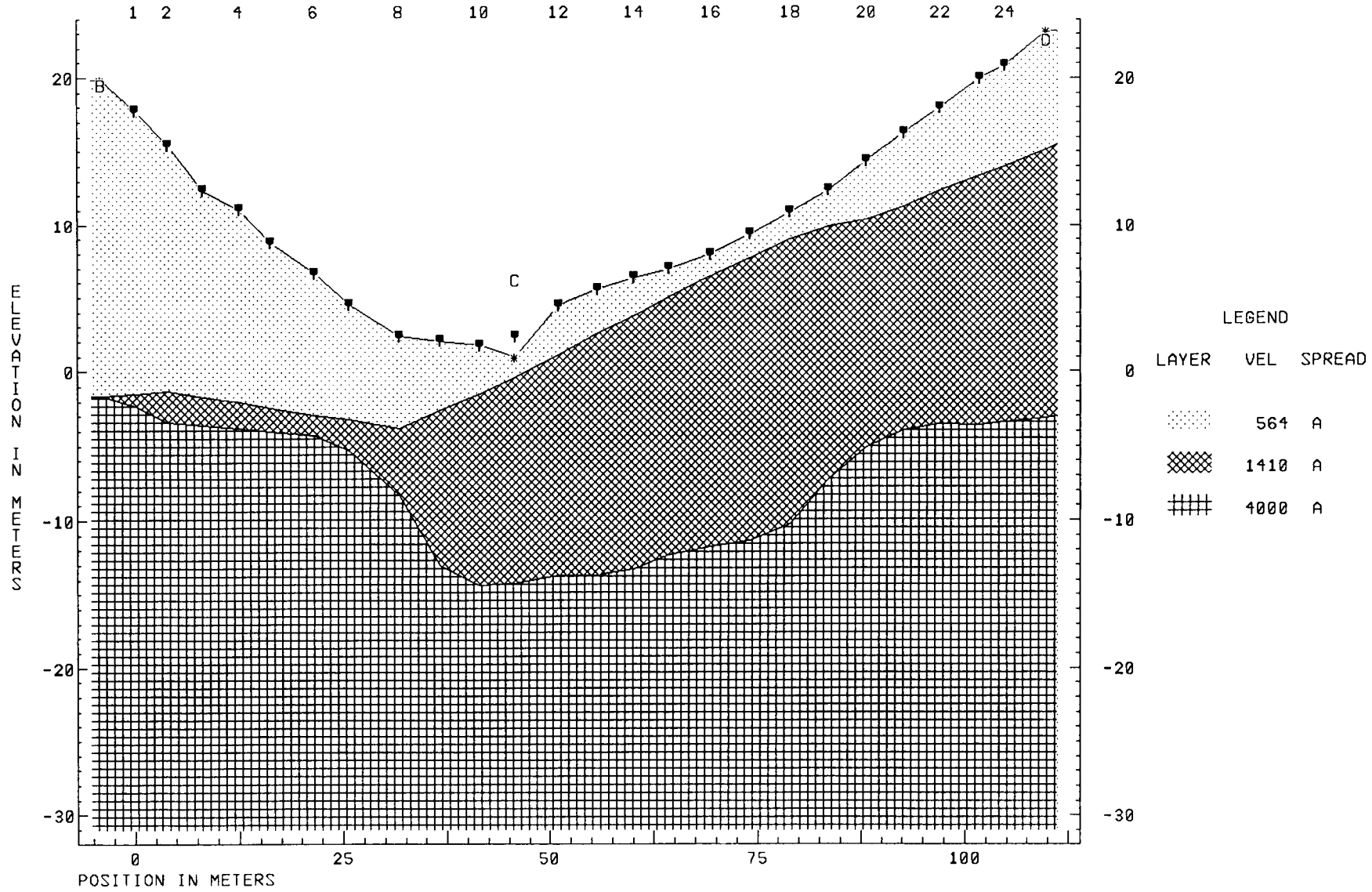
FILE LINE5.SIP
DYCER CREEK - LINE 5

SPREAD A



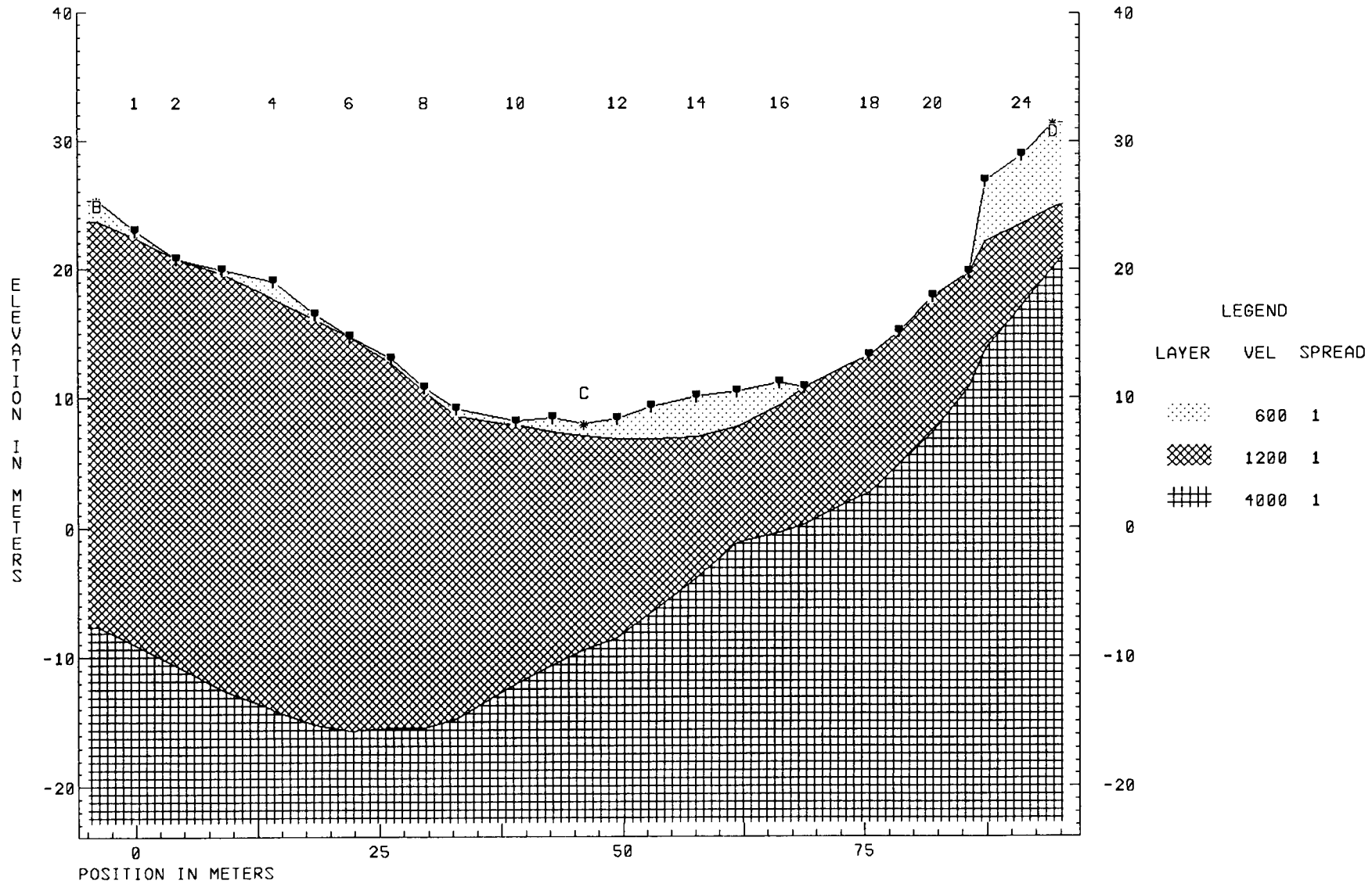
FILE LINE6.SIP
DYCER CREEK - LINE 6

SPREAD A



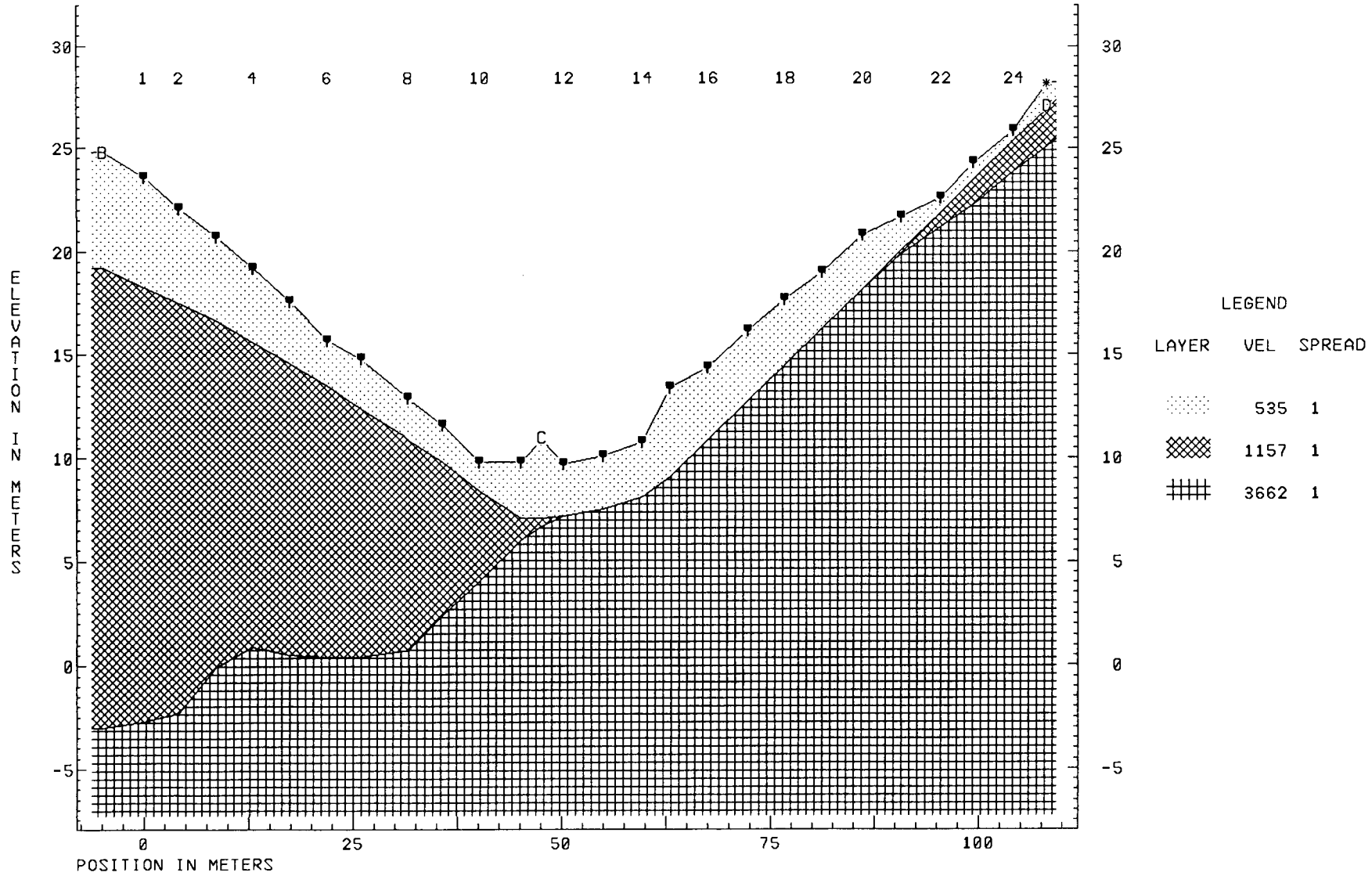
FILE LINE7.SIP
DYCER CREEK LINE 7

SPREAD 1



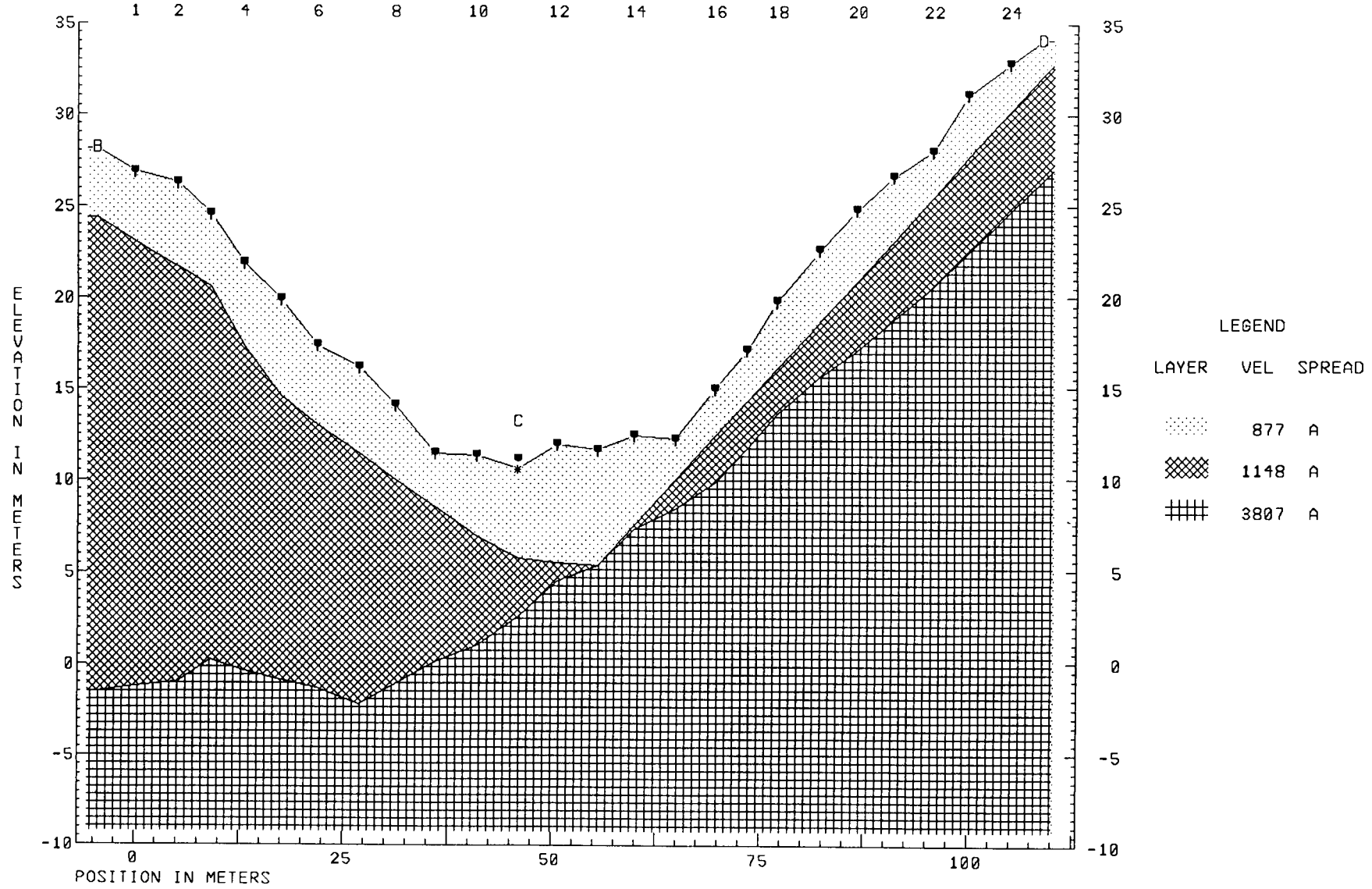
FILE LINE8.SIP
DYCER CREEK LINE 8

SPREAD 1



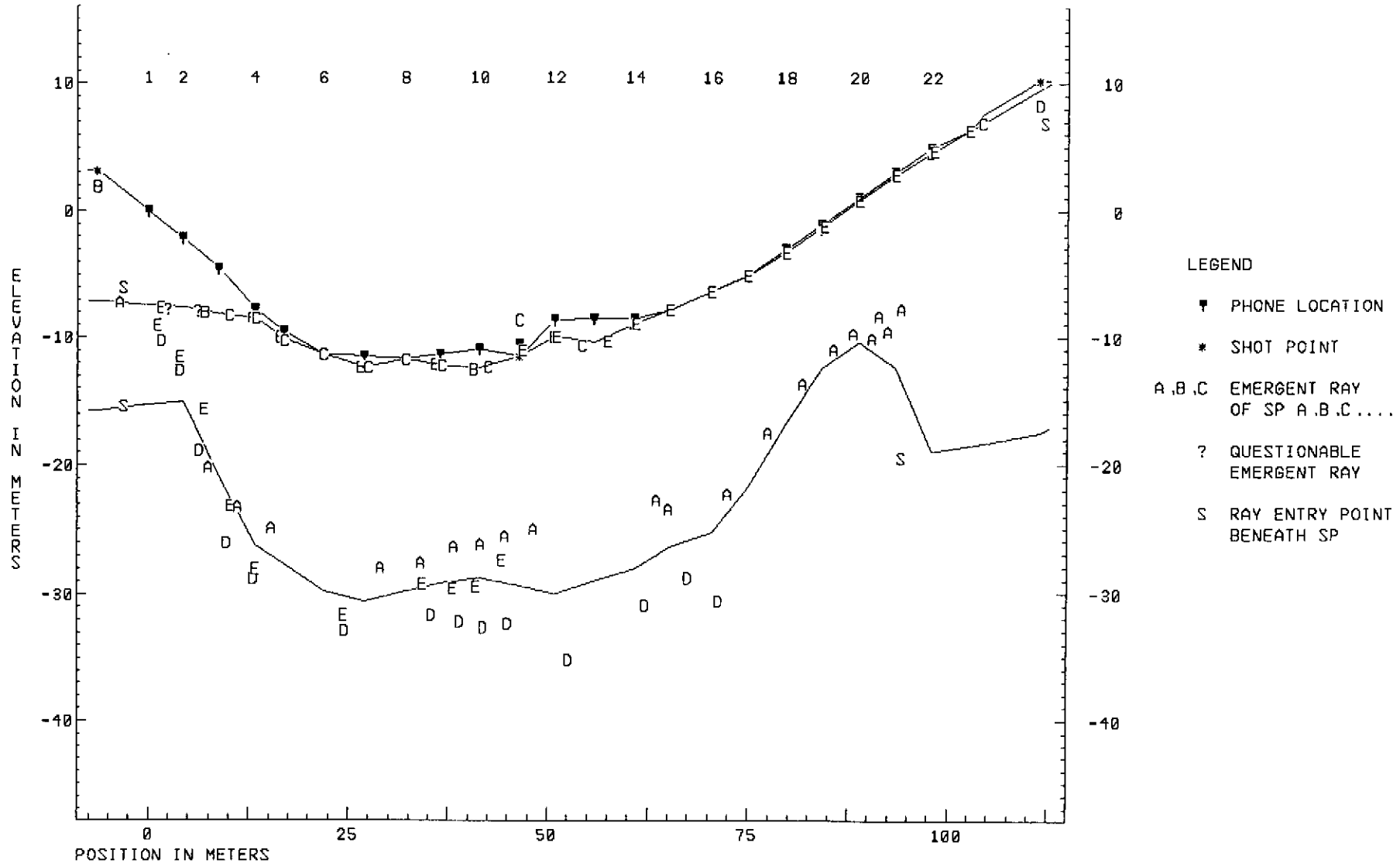
FILE LINE9.SIP
DYCER CREEK - LINE 9

SPREAD A



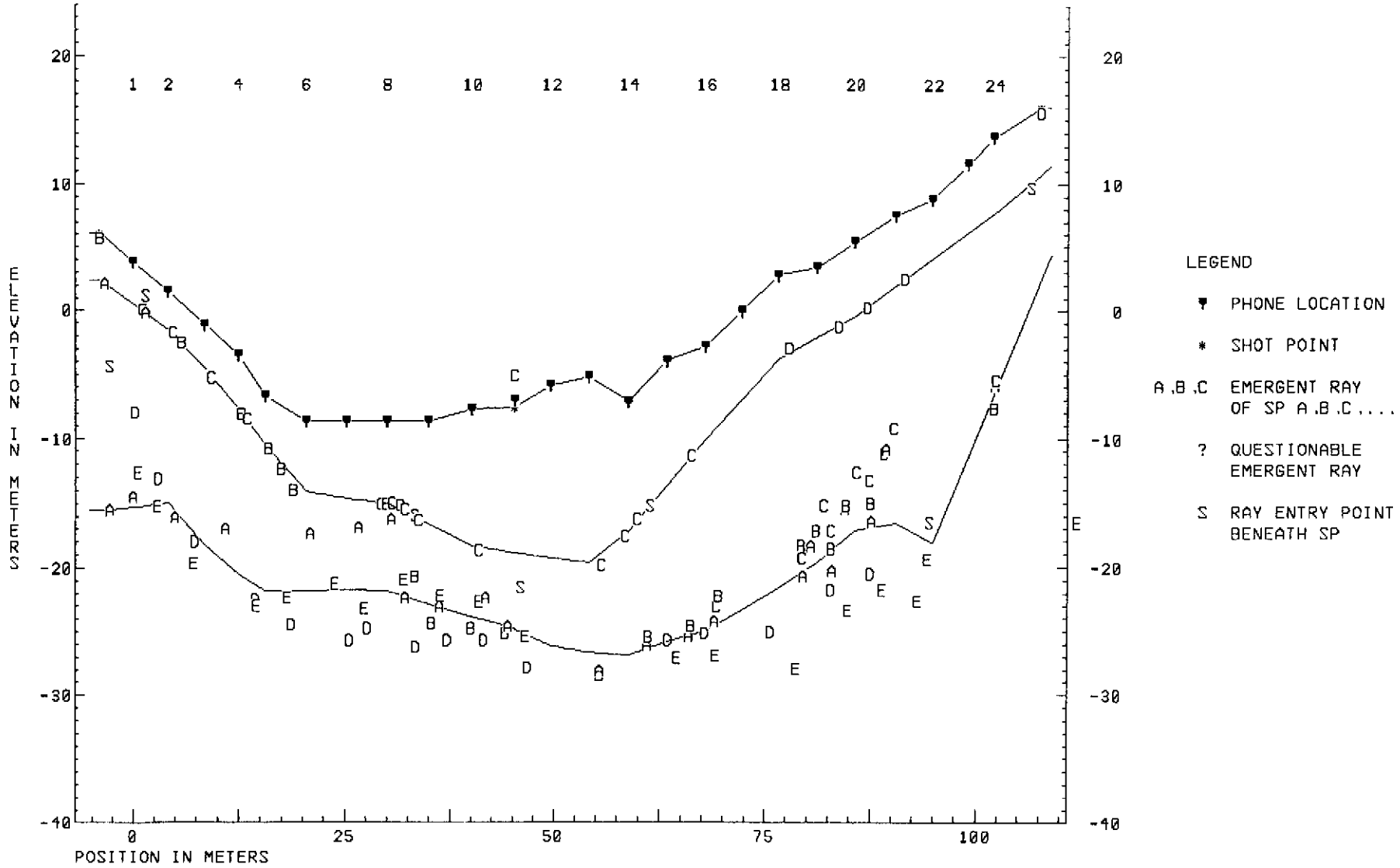
FILE LINE1.SIP
DYCER CREEK - LINE 1

SPREAD A



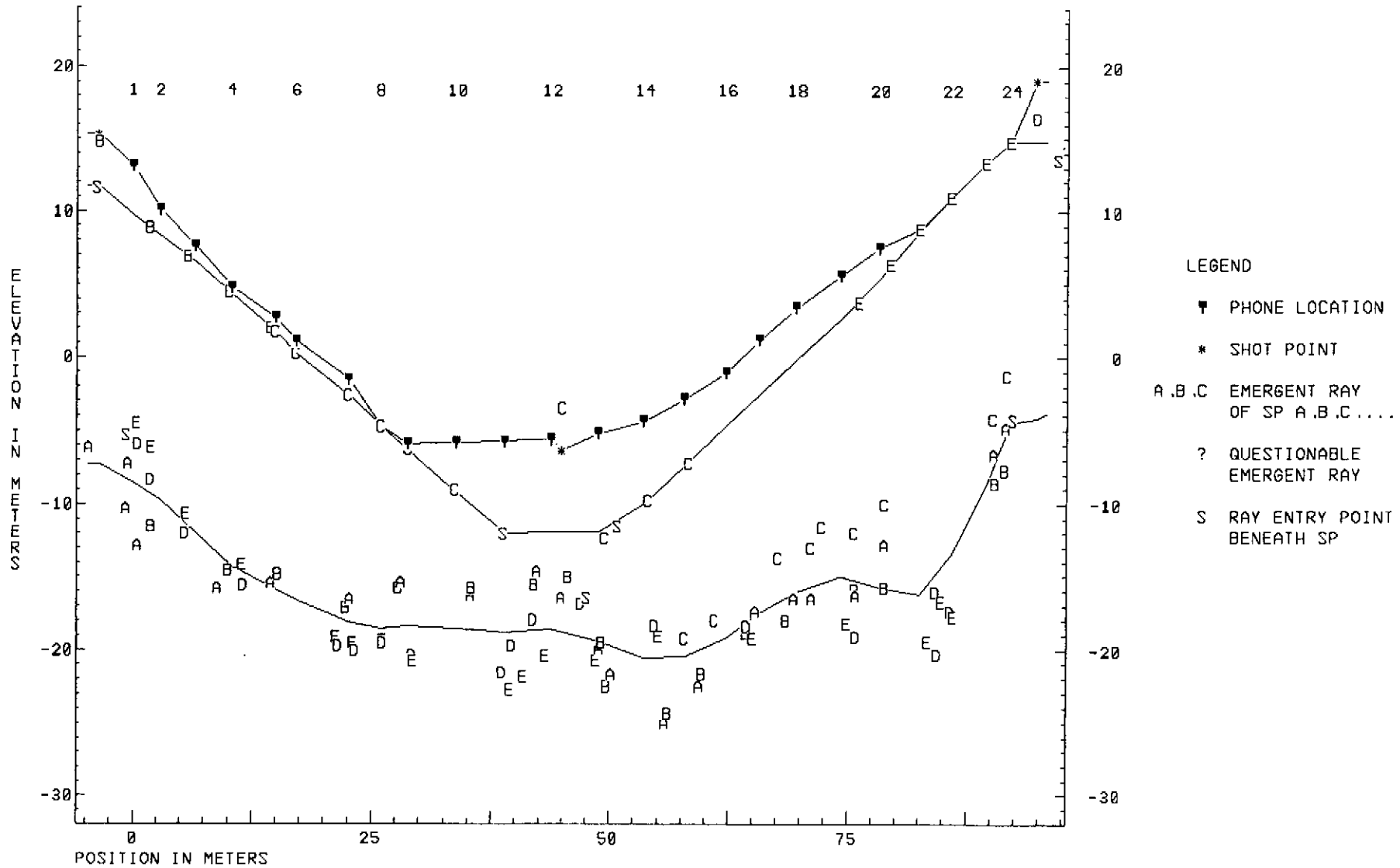
FILE LINE2.SIP
DYCER CREEK - LINE 2

SPREAD A



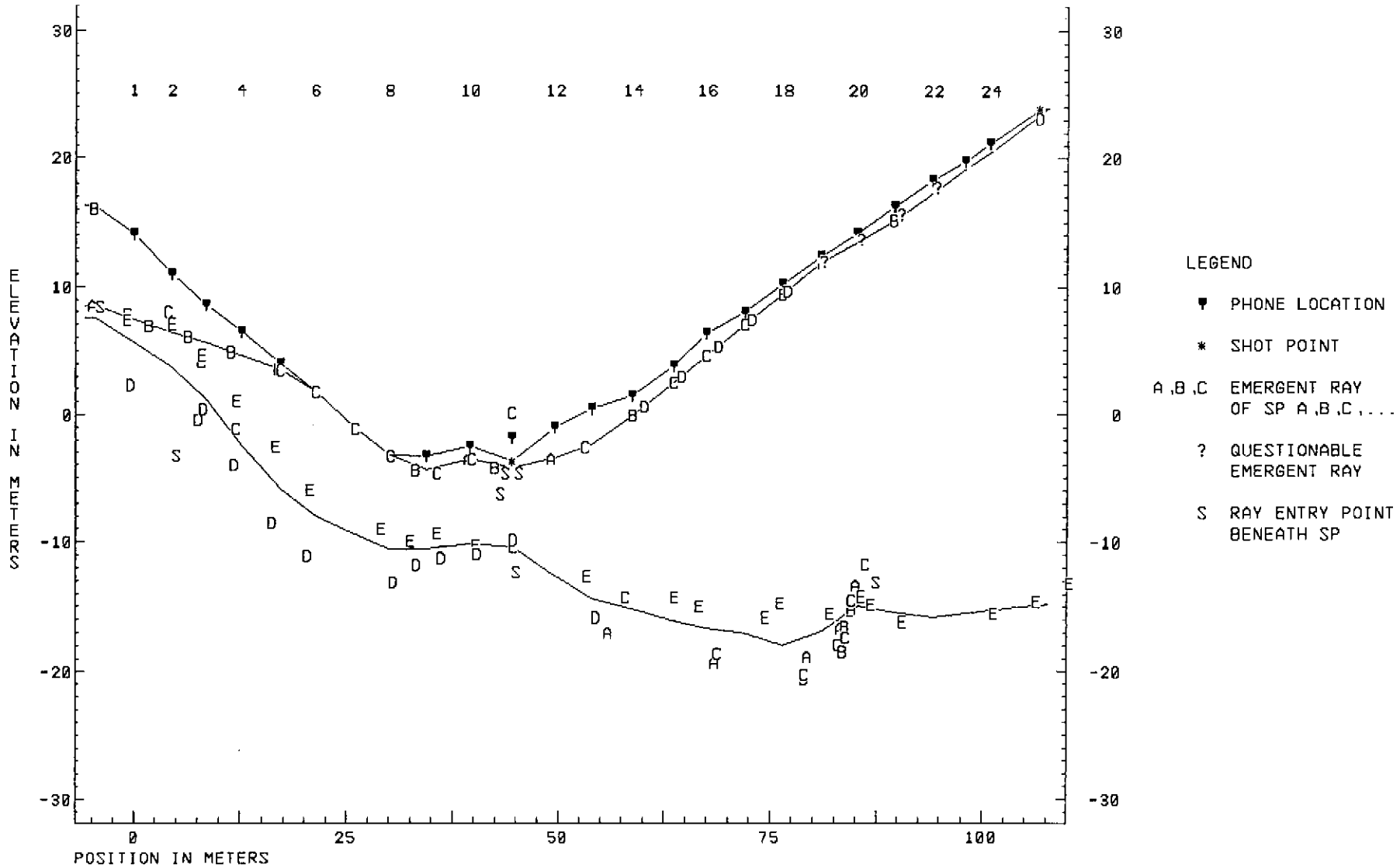
FILE LINE3.SIP
DYCER CREEK LINE 3

SPREAD 1



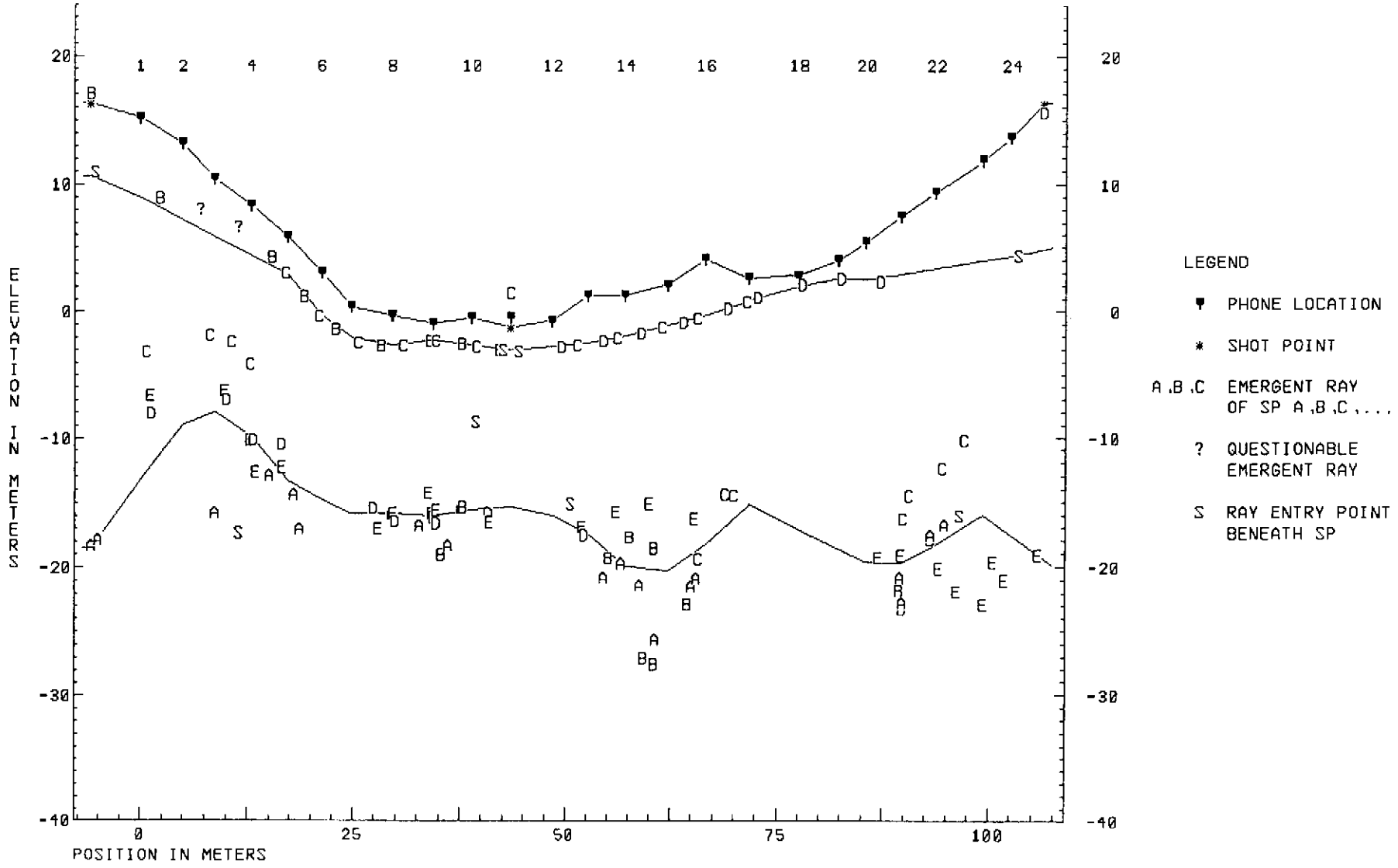
FILE LINE4.SIP
DYCER CREEK - LINE 4

SPREAD A



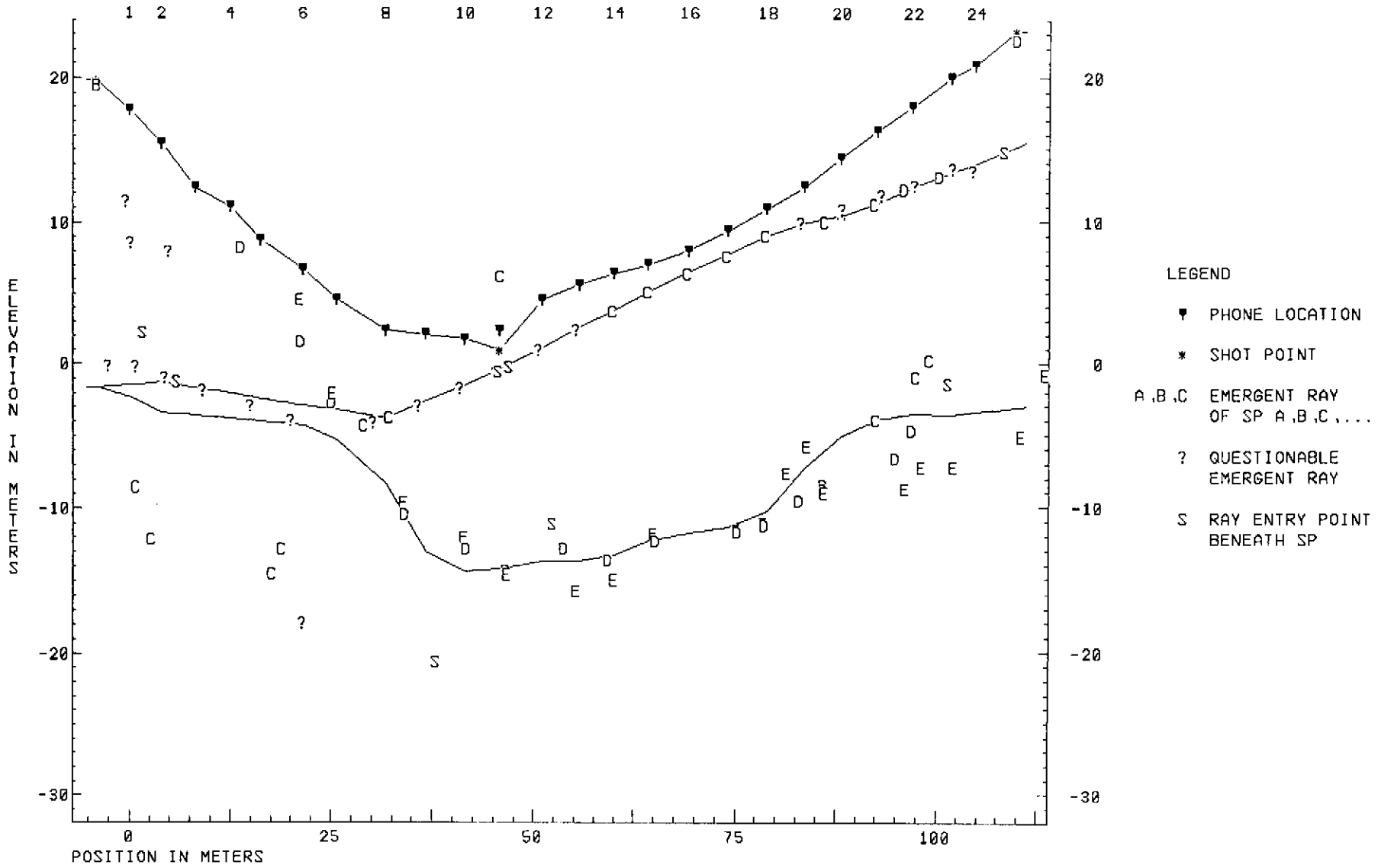
FILE LINES.SIP
DYCER CREEK - LINE 5

SPREAD A



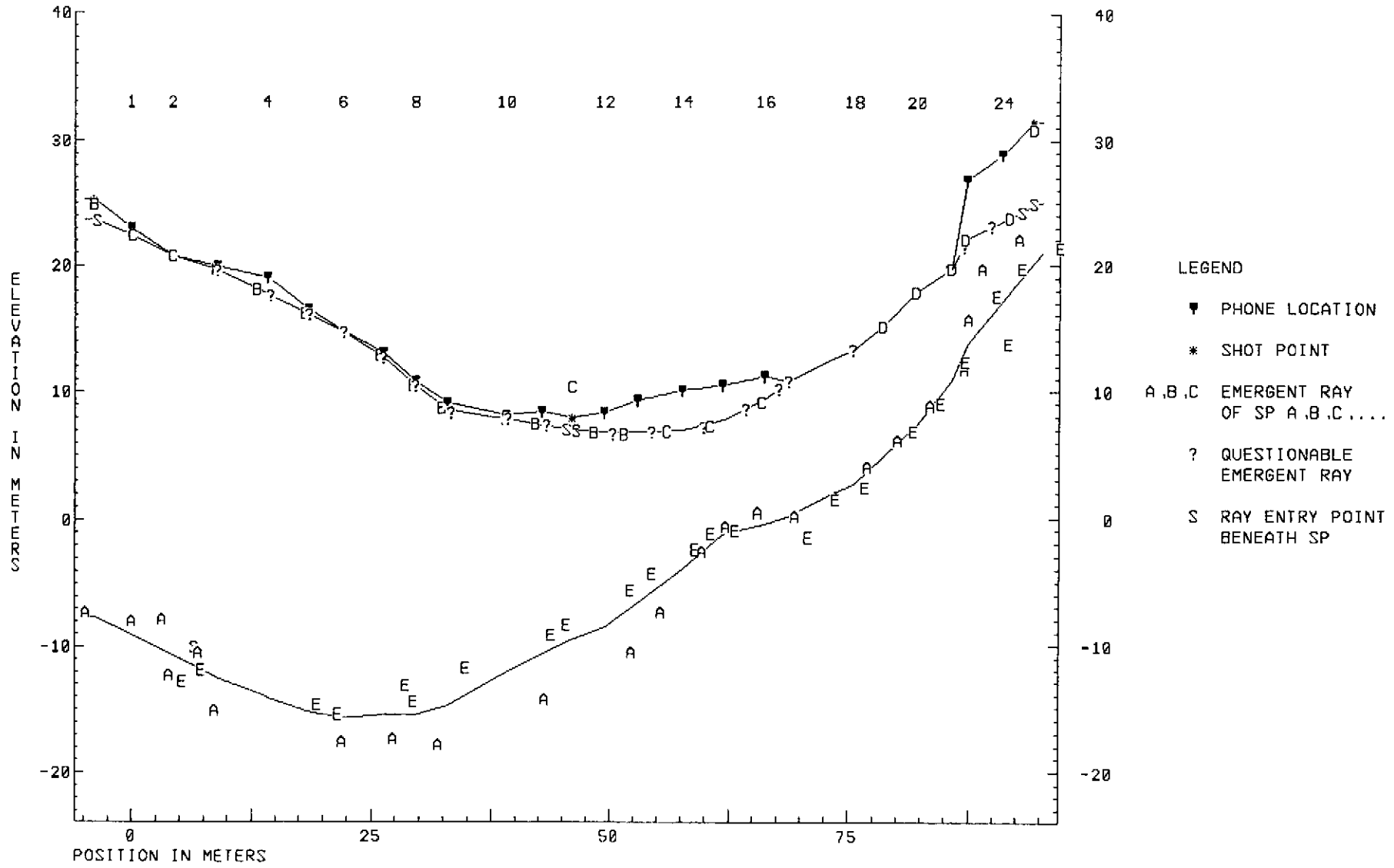
FILE LINE6.SIP
DYCER CREEK - LINE 6

SPREAD A



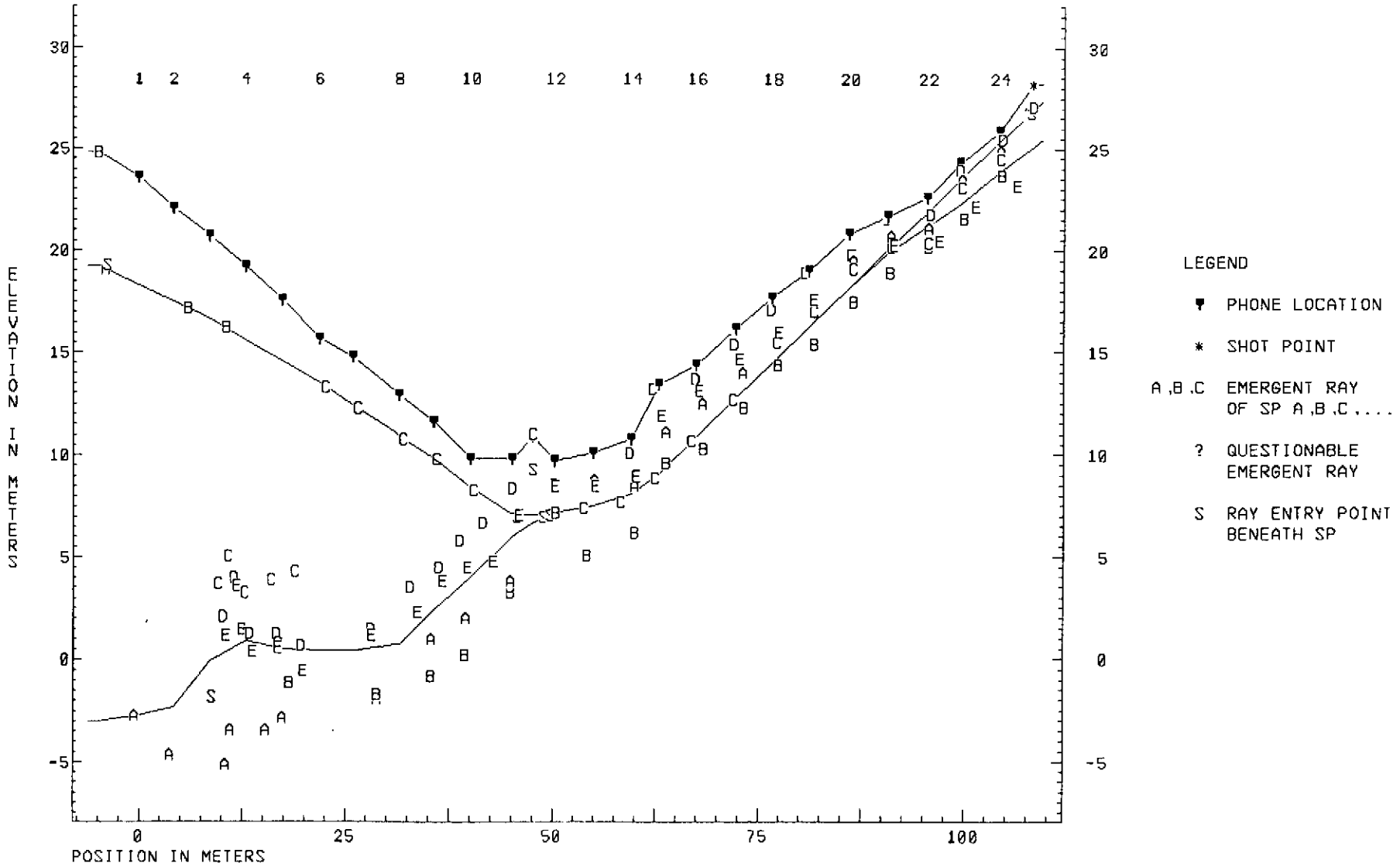
FILE LINE7.SIP
DYCER CREEK LINE 7

SPREAD 1



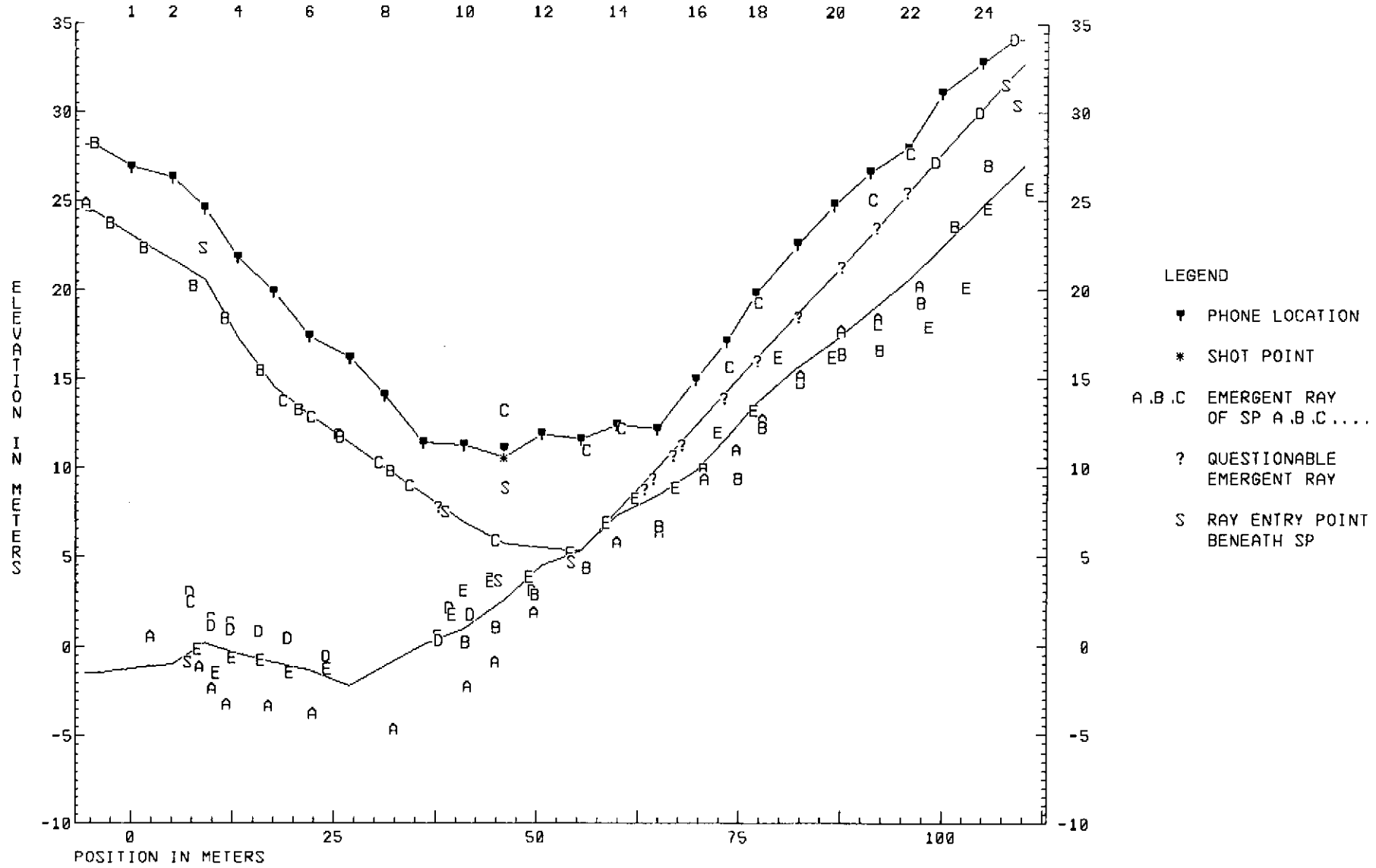
FILE LINE8.SIP
DYCER CREEK LINE 8

SPREAD 1



FILE LINE9.SIP
DYCER CREEK - LINE 9

SPREAD A



APPENDIX G. INVERSION RESULTS

SIPT2 V-4.1 -- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE1.SIP PRINT FILE: C:\DATA\DYCER\LINE1\LINE1.OUT RUN DATE AND TIME:
09-27-1998 at 09:15

TITLE: Dycer Creek - Line 1

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

			Elev	Horiz	Time	Point 1		Point 2		Elevations			Trace Off	L				
Sprds	Exit	Layers	V-Over	m/col	m/row	ms/col	Elev	X-Loc	Elev	X-Loc	Top	Bottom	BLim	TLim	Print	SP	Dip	
1	6	3	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0	0	

VELOCITY OVERRIDES for LINE1.SIP

	Spread 1	
Layer	Vv	Vh
1	600	600
2	1600	1600

SHOTPOINT AND GEOPHONE INPUT DATA for LINE1.SIP

Spread A, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 1, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	36.0	-62.4	0.0	0.0	0.0	0.0	0
B	3.2	-6.3	0.0	0.0	0.0	0.0	1
C	-11.5	46.4	5.0	0.0	0.0	0.0	0
D	10.3	111.5	0.0	0.0	0.0	0.0	2
E	42.6	165.0	0.0	0.0	0.0	0.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A	SP B	SP C	SP D	SP E
				---T---L	---T---L	---T---L	---T---L	---T---L
1	0.0	0.0	0.0	28.0 2	4.5 1	23.5 2	49.5 3	66.0 3
2	-2.1	4.3	0.0	31.0 2	12.5 2	23.0 2	49.0 3	65.5 3
3	-4.5	8.8	0.0	35.0 2	17.5 2	26.5 2	51.0 3	65.0 3
4	-7.7	13.3	0.0	36.0 2	20.5 2	27.5 2	51.0 3	65.5 3
5	-9.5	16.9	0.0	39.5 3	25.5 2	26.5 2	50.0 3	67.0 3
6	-11.3	21.9	0.0	40.5 3	26.5 2	22.5 2	49.0 3	65.5 3
7	-11.5	27.0	0.0	42.0 3	28.0 2	16.5 2	47.5 3	62.5 3
8	-11.6	32.2	0.0	43.0 3	29.0 2	10.5 2	46.5 3	61.5 3
9	-11.3	36.4	0.0	44.5 3	31.0 2	6.5 2	47.5 3	61.5 3
10	-10.9	41.4	0.0	45.0 3	34.5 2	4.0 2	47.0 3	59.0 3
11	-10.5	46.4	0.0	45.0 3	35.5 2	4.0 1	48.0 3	57.5 2
12	-8.6	50.9	0.0	47.0 3	38.5 2	11.5 1	46.5 3	55.5 2
13	-8.5	55.8	0.0	47.5 3	40.0 2	16.5 2	45.5 3	53.0 2
14	-8.5	60.8	0.0	48.0 3	40.5 2	19.0 2	45.0 3	54.0 2
15	-7.8	65.2	0.0	49.5 3	43.0 2	20.0 2	43.0 2	53.0 2
16	-6.3	70.4	0.0	51.0 3	43.0 2	22.0 2	43.5 2	53.0 2
17	-5.0	75.0	0.0	49.5 3	45.0 2	25.5 2	42.5 2	52.0 2
18	-3.0	79.6	0.0	49.5 3	47.0 2	26.5 2	39.5 2	50.0 2
19	-1.0	84.2	0.0	50.0 3	48.0 2	26.5 2	39.5 2	49.0 2
20	1.0	88.8	0.0	51.0 3	50.0 2	28.5 2	37.5 2	49.0 2
21	3.0	93.4	0.0	52.0 3	52.0 0	29.5 2	33.5 2	48.0 2
22	5.0	98.0	0.0	55.0 3	54.0 0	31.0 2	17.0 1	44.5 2
23	6.4	102.7	0.0	56.0 3	56.5 0	32.5 2	4.5 0	43.0 2
24	7.6	104.4	0.0	55.5 3	58.0 0	33.0 2	0.0 0	0.0 0

Layer 1 Velocity from direct arrivals

Spread A	SP	Geo	DD	V	Avg V

```
          B   1    7.1   1570
                          1570
          C  11    5.1   1275
          C  12    7.3    637
                           956
          D  22   14.5    853
                           853
-------------------------------------
Wtd Avg Velocity computed for Layer 1 =  1084
-------------------------------------
Override Velocity assigned to Layer 1

 Spread       A
             ----
              600
-------------------------------------------------------------

Layer 2 Velocity computed by regression of raw uncorrected arrivals

 Spread A
   V    Ti   Geos  <-SP->  Geos  Ti     V       Avg V  Avg Ti  Pts
------ ---- ----  ---  ---- ---- -----  ------ ------  ---
              A    1  4 -10.7   1840      1840  -10.7    4
              B    2 20  12.0   2410      2410   12.0   19
  1862  4.1   1 10   C   13 24  14.3   3187      2408    9.2   22
  3228 29.2  15 21   D                    3228   29.2    7
  4677 29.2  11 23   E                    4677   29.2   13
                                  -----         --
                              Avg =  2693   for   65 Pts

Layer 2 Velocity computed by Hobson-Overton method

 Spread A         Avg  Std Err  4 Highest Std Err at geophones
SPs  Geos    V    TdSP Overall  Err Geo   Err Geo   Err Geo   Err Geo
---- ----  -----  --- -------  --------  --------  --------  --------
A C  1  4   8049   2.6  0.948   1.273   2 -1.057   1 -0.752   4  0.537  3
B C  2 10   1708   3.1  2.570   4.915   2 -3.477   4 -2.997   6  2.460 10
B D 15 20   3541  -8.1  1.255   1.749  15 -1.669  16 -1.260  17  1.078 18
B E 11 20   3967  -1.0  1.257   2.446  13 -1.986  11 -1.654  16 -0.949 17
C D 15 21   3232 -14.4  1.108  -1.695  19  1.377  18  1.142  21 -1.141 16
C E 13 23   3770  -8.2  0.958  -1.668  21  1.235  18 -1.158  16  1.129 23
      ----
   Avg =  3672 for  47 Pts

-------------------------------------
Wtd Avg Velocity computed for Layer 2 =  3272
-------------------------------------------------------------------
Override Velocity assigned to Layer 2

 Spread       A
             ----
             1600
-------------------------------------------------------------

Layer 3 Velocity computed by regression of raw uncorrected arrivals

 Spread A
   V    Ti   Geos  <-SP->  Geos  Ti     V       Avg V  Avg Ti  Pts
------ ---- -----  ---  ----- ---- ------  ------ ------  ---
              A    5 24  22.7   5229      5229   22.7   20
 11339 40.7   1 14   D                    11339   40.7   14
  5264 34.7   1 10   E                     5264   34.7   10
                                  -----         --
                              Avg =  6323   for   44 Pts

Layer 3 Velocity computed by Hobson-Overton method

 Spread A         Avg  Std Err  4 Highest Std Err at geophones
SPs  Geos    V    TdSP Overall  Err Geo   Err Geo   Err Geo   Err Geo
---- -----  -----  ---- -------  --------  --------  --------  --------
```

A D 5 14 6539 -8.6 0.989 -2.063 11 1.466 8 -1.121 5 0.944 7
A E 5 10 3334 -7.6 0.591 1.162 7 -0.560 6 -0.464 9 0.326 8

Avg = 5337 for 16 Pts

Wtd Avg Velocity computed for Layer 3 = 5908

Arrival times Td corrected to datum. (Datum Elev = -10.852 + 0.113x) for LINE1.SIP

Spread A				SP A	SP B	SP C	SP D	SP E
Datum Elev				-17.9	-11.6	-5.6	1.7	7.7
Geo	.	X-Loc	Cor T	0.0	-24.6	9.8	-14.3	0.0
---	---	---	---	--Td--	--Td--	--Td--	--Td--	--Td--
1	-10.9	0.0	-18.1	9.9	-38.2	15.2	17.1	47.9
2	-10.4	4.3	-13.8	17.2	-25.9	19.0	20.9	51.7
3	-9.9	8.8	-8.9	26.1	-16.0	27.4	27.7	56.1
4	-9.4	13.3	-2.8	33.2	-6.9	34.5	33.9	62.7
5	-8.9	16.9	0.9	40.4	1.8	37.2	36.6	67.9
6	-8.4	21.9	4.9	45.4	6.8	37.1	39.5	70.4
7	-7.8	27.0	6.1	48.1	9.5	32.4	39.3	68.6
8	-7.2	32.2	7.3	50.3	11.7	27.6	39.5	68.8
9	-6.8	36.4	7.6	52.1	14.0	23.9	40.7	69.1
10	-6.2	41.4	7.8	52.8	17.7	21.6	40.5	66.8
11	-5.6	46.4	8.1	53.1	19.0	21.9	41.8	65.6
12	-5.1	50.9	5.8	52.8	19.7	27.1	38.0	61.3
13	-4.6	55.8	6.5	54.0	21.9	32.8	37.7	59.5
14	-4.0	60.8	7.5	55.5	23.4	36.3	38.2	61.5
15	-3.5	65.2	7.1	56.6	25.5	36.9	35.8	60.1
16	-2.9	70.4	5.6	56.6	24.0	37.4	34.8	58.6
17	-2.4	75.0	4.3	53.8	24.7	39.6	32.5	56.3
18	-1.9	79.6	1.8	51.3	24.2	38.1	27.0	51.8
19	-1.4	84.2	-0.6	49.4	22.8	35.7	24.5	48.4
20	-0.9	88.8	-3.1	47.9	22.3	35.2	20.1	45.9
21	-0.3	93.4	-5.6	46.4	21.8	33.7	13.6	42.4
22	0.2	98.0	-8.0	47.0	21.4	32.8	-5.4	36.5
23	0.7	102.7	-9.5	46.5	22.4	32.8	-19.3	33.5
24	0.9	104.4	-11.2	44.3	22.2	31.6	0.0	0.0

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE1.SIP

Spread A				SP A	SP B	SP C	SP D	SP E
Elev				0.0	-6.7	-11.5	9.6	0.0
Geo	.	X-Loc	Cor T	16.4	16.4	0.0	1.2	1.2
---	---	---	---	--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	-7.2	0.0	12.0	-17.6	0.0	11.5	36.3	37.7
2	-7.6	4.3	9.1	-11.7	-13.0	13.9	38.7	40.1
3	-8.1	8.8	6.0	-4.6	-4.9	20.5	43.8	42.7
4	-8.4	13.3	1.2	1.2	2.9	26.3	48.6	48.0
5	-10.1	16.9	1.0	17.4	8.0	25.5	47.8	49.7
6	-11.3	21.9	0.1	19.4	10.0	22.4	47.7	49.1
7	-12.3	27.0	1.3	19.6	10.2	15.2	45.0	44.9
8	-11.7	32.2	0.2	21.7	12.3	10.3	45.0	44.9
9	-12.2	36.4	1.5	21.9	13.1	5.0	44.8	43.7
10	-12.4	41.4	2.5	21.5	15.6	1.5	43.3	40.2
11	-11.1	46.4	1.0	22.9	18.0	0.0	45.7	44.5
12	-9.9	50.9	2.2	23.7	19.8	0.0	43.0	41.3
13	-10.4	55.8	3.2	23.2	20.4	13.3	41.1	37.9
14	-8.9	60.8	0.7	26.2	23.4	18.3	43.1	41.4
15	-7.8	65.2	0.0	28.4	26.6	20.0	41.8	41.0
16	-6.3	70.4	0.0	29.9	26.5	22.0	42.2	41.0
17	-5.1	75.0	0.1	28.3	28.4	25.4	41.1	39.9
18	-3.2	79.6	0.4	28.0	30.1	26.1	37.9	37.6

19	-1.3	84.2	0.6	28.3	31.0	25.9	37.7	36.5
20	0.8	88.8	0.4	29.5	33.2	28.1	35.9	36.7
21	2.8	93.4	0.3	30.6	0.0	29.2	32.0	35.8
22	4.6	98.0	0.6	33.3	0.0	30.4	0.0	31.9
23	6.4	102.7	0.0	34.9	0.0	32.5	0.0	31.0
24	6.9	104.4	1.1	33.3	0.0	31.9	0.0	0.0

Dycer Creek - Line 1

Spread A Points of emergence of refracted rays below target geophones for LINE1.SIP

Geo		SP A	SP B	SP C	SP D	SP E
---		---------L	---------L	---------L	---------L	---------L
1	X-Loc	-3.6 2	--- 1	2.5 2	1.6 3	1.1 3
	Elev	-7.2	---	-7.7 ?	-10.2	-9.0
2	X-Loc	1.6 2	1.6 2	6.2 2	4.0 3	4.0 3
	Elev	-7.6	-7.6	-7.9 ?	-12.6	-11.5
3	X-Loc	7.1 2	7.1 2	10.1 2	6.3 3	6.9 3
	Elev	-8.0	-8.0	-8.2	-18.8	-15.6
4	X-Loc	13.0 2	13.0 2	13.4 2	9.7 3	10.3 3
	Elev	-8.3	-8.3	-8.4	-26.0	-23.1
5	X-Loc	7.4 3	16.4 2	17.0 2	13.1 3	13.3 3
	Elev	-20.1	-9.9	-10.2	-28.8	-28.0
6	X-Loc	11.1 3	21.9 2	21.9 2	24.5 3	24.4 3
	Elev	-23.2	-11.3	-11.3	-32.8	-31.6
7	X-Loc	15.3 3	26.5 2	27.5 2	35.3 3	34.3 3
	Elev	-24.8	-12.3	-12.3	-31.6	-29.2
8	X-Loc	28.9 3	32.2 2	32.2 2	38.9 3	38.1 3
	Elev	-27.9	-11.7	-11.7	-32.1	-29.6
9	X-Loc	34.0 3	35.9 2	36.7 2	41.9 3	41.0 3
	Elev	-27.5	-12.1	-12.2	-32.6	-29.4
10	X-Loc	38.2 3	40.6 2	42.5 2	45.0 3	44.2 3
	Elev	-26.3	-12.5	-12.3	-32.3	-27.4
11	X-Loc	41.5 3	46.3 2	--- 1	52.6 3	46.8 2
	Elev	-26.1	-11.1	---	-35.2	-11.0
12	X-Loc	44.6 3	50.7 2	--- 1	67.5 3	51.1 2
	Elev	-25.5	-9.9	---	-28.8	-9.9
13	X-Loc	48.2 3	54.3 2	54.3 2	62.2 3	57.5 2
	Elev	-25.0	-10.6	-10.6	-30.9	-10.3
14	X-Loc	63.5 3	60.7 2	60.7 2	71.3 3	61.0 2
	Elev	-22.7	-8.9	-8.9	-30.6	-8.9
15	X-Loc	65.0 3	65.2 2	65.2 2	65.2 2	65.2 2
	Elev	-23.4	-7.8	-7.8	-7.8	-7.8
16	X-Loc	72.4 3	70.4 2	70.4 2	70.4 2	70.4 2
	Elev	-22.2	-6.3 ?	-6.3	-6.3	-6.3
17	X-Loc	77.4 3	75.0 2	75.0 2	75.0 2	75.0 2
	Elev	-17.5	-5.1 ?	-5.1	-5.1	-5.1
18	X-Loc	81.7 3	79.6 2	79.6 2	79.8 2	79.8 2
	Elev	-13.7	-3.2 ?	-3.2	-3.2	-3.2
19	X-Loc	85.6 3	84.1 2	84.1 2	84.5 2	84.5 2
	Elev	-10.9	-1.4 ?	-1.4	-1.2	-1.2
20	X-Loc	88.1 3	88.8 2	88.8 2	89.0 2	89.0 2
	Elev	-9.7	0.8 ?	0.8	0.8 ?	0.8
21	X-Loc	91.3 3	— 0	93.4 2	93.5 2	93.5 2
	Elev	-8.3	---	2.8	2.9	2.9
22	X-Loc	90.4 3	— 0	97.9 2	— 1	98.3 2
	Elev	-10.1	---	4.6	---	4.7
23	X-Loc	92.4 3	— 0	102.7 2	--- 0	102.7 2
	Elev	-9.5	---	6.4	---	6.4
24	X-Loc	94.1 3	--- 0	104.4 2	--- 0	--- 0
	Elev	-7.7	---	6.9	---	—

Spread A Points of entry of refracted rays below source shotpoints:

L=2	Right	X-Loc	-3.1	-3.1	46.2	---	---
		Elev	-6.0*	-6.0	-11.2?	---	---
L=2	Left	X-Loc	---	---	46.5	112.1	112.1
		Elev	---	---	-11.1?	6.9	6.9*
L=3	Right	X-Loc	-3.1	-3.1	---	---	---

	Elev	-15.4*	-15.4	---	---	---
L=3	Left	X-Loc	---	---	---	94.2	94.2
		Elev	---	---	---	-19.4	-19.4*

Dycer Creek - Line 1

Spread A Depth and Elev of layers directly beneath SPs and Geos for LINE1.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
B	-6.3	3.2	10.3	-7.1	19.0	-15.8
C	46.4	-11.5	0.0	-11.5	17.9	-29.4
D	111.5	10.3	0.7	9.6	27.8	-17.5
Geo						
1	0.0	0.0	7.4	-7.4	15.3	-15.3
2	4.3	-2.1	5.5	-7.6	13.0	-15.1
3	8.8	-4.5	3.6	-8.1	16.4	-20.9
4	13.3	-7.7	0.7	-8.4	18.5	-26.2
5	16.9	-9.5	0.6	-10.1	18.2	-27.7
6	21.9	-11.3	0.0	-11.3	18.5	-29.8
7	27.0	-11.5	0.8	-12.3	19.1	-30.6
8	32.2	-11.6	0.1	-11.7	18.2	-29.8
9	36.4	-11.3	0.9	-12.2	17.9	-29.2
10	41.4	-10.9	1.5	-12.4	17.9	-28.8
11	46.4	-10.5	0.6	-11.1	18.9	-29.4
12	50.9	-8.6	1.3	-9.9	21.4	-30.0
13	55.8	-8.5	1.9	-10.4	20.5	-29.0
14	60.8	-8.5	0.4	-8.9	19.6	-28.1
15	65.2	-7.8	0.0	-7.8	18.6	-26.4
16	70.4	-6.3	0.0	-6.3	19.0	-25.3
17	75.0	-5.0	0.1	-5.1	16.7	-21.7
18	79.6	-3.0	0.2	-3.2	13.8	-16.8
19	84.2	-1.0	0.3	-1.3	11.4	-12.4
20	88.8	1.0	0.2	0.8	11.4	-10.4
21	93.4	3.0	0.2	2.8	15.4	-12.4
22	98.0	5.0	0.4	4.6	24.0	-19.0
23	102.7	6.4	0.0	6.4	24.9	-18.5
24	104.4	7.6	0.7	6.9	25.9	-18.3

LINE1.SIP

Velocities used, Spread A

	Layer 1	Layer 2	Layer 3
Vertical	600	1600	
Horizontal		1600	5908

SIPT2 V-4.1 --- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE2.SIP PRINT FILE: C:\DATA\DYCER\LINE2\LINE2.OUT RUN DATE AND TIME: 09-27-1998 at 09:17

TITLE: Dycer Creek - Line 2

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

Sprds	Exit	Layers	Elev V-Over	Horiz m/col	Time m/row	Time ms/col	Point 1 Elev	Point 1 X-Loc	Point 2 Elev	Point 2 X-Loc	Elevations Top	Elevations Bottom	Trace Off BLim	Trace Off TLim	Print	SP Dip
1	6	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0 0

SHOTPOINT AND GEOPHONE INPUT DATA for LINE2.SIP

Spread A, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 1, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	31.7	-59.8	0.0	0.0	0.0	0.0	0
B	6.1	-4.0	0.0	0.0	0.0	0.0	1
C	-7.5	45.3	5.0	0.0	0.0	0.0	0
D	16.0	107.8	0.0	0.0	0.0	0.0	2
E	46.2	158.5	0.0	0.0	0.0	-10.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A ---T---L	SP B ---T---L	SP C ---T---L	SP D ---T---L	SP E
1	3.8	0.0	0.0	28.8 2	8.8 1	34.8 2	55.5 3	65.0 3
2	1.5	4.2	0.0	30.8 2	11.3 2	32.0 2	56.0 3	62.5 3
3	-1.1	8.5	0.0	31.3 3	14.5 2	30.5 2	56.0 3	62.0 3
4	-3.5	12.5	0.0	29.6 3	19.3 2	29.5 2	56.5 3	61.0 3
5	-6.7	15.6	0.0	28.3 3	21.0 2	25.3 2	55.5 3	57.0 3
6	-8.6	20.4	0.0	28.3 3	20.2 2	21.8 2	55.0 3	54.0 3
7	-8.6	25.3	0.0	28.8 3	21.9 2	14.8 2	53.0 3	55.0 3
8	-8.6	30.1	0.0	29.5 3	23.5 2	10.0 2	53.0 3	51.0 3
9	-8.6	35.0	0.0	30.3 3	25.0 2	11.5 2	51.5 3	51.5 3
10	-7.7	40.1	0.0	39.3 3	31.0 3	9.0 2	51.5 3	52.0 3
11	-7.0	45.3	0.0	42.3 3	37.5 3	5.0 1	53.0 3	54.0 3
12	-5.8	49.6	0.0	43.3 3	39.8 3	12.0 1	50.5 3	56.0 3
13	-5.2	54.2	0.0	47.3 3	41.7 3	23.5 2	49.0 3	55.0 3
14	-7.1	58.8	0.0	48.8 3	43.0 3	26.5 2	46.5 3	54.0 3
15	-3.9	63.4	0.0	49.8 3	42.8 3	30.8 2	45.5 3	51.5 3
16	-2.8	68.0	0.0	50.5 3	43.3 3	32.0 2	44.5 3	50.0 3
17	0.0	72.3	0.0	52.3 3	43.8 3	37.3 3	43.5 2	54.0 0
18	2.8	76.6	0.0	53.8 3	44.8 3	38.5 3	36.5 2	56.0 0
19	3.4	81.2	0.0	55.8 3	47.5 3	38.5 3	32.0 2	51.0 3
20	5.4	85.6	0.0	56.0 3	48.0 3	38.5 3	29.0 2	48.0 3
21	7.5	90.6	0.0	55.5 3	47.8 3	38.3 3	19.5 1	46.5 3
22	8.8	94.9	0.0	54.8 3	48.3 3	38.0 3	7.5 1	45.0 3
23	11.6	99.1	0.0	54.3 3	48.3 3	38.8 3	0.0 0	44.0 3
24	13.7	102.2	0.0	53.0 3	48.8 3	38.8 3	0.0 0	41.0 3

Layer 1 Velocity from direct arrivals

Spread	SP	Geo	DD	V	Avg V
B	1	4.6	524		
				524	
C	11	5.0	1005		
C	12	6.8	568		
				786	
D	21	19.2	984		
D	22	14.8	1970		
				1477	

Wtd Avg Velocity computed for Layer 1 = 1010

Layer 2 Velocity computed by regression of raw uncorrected arrivals

Spread A V	Ti	Geos	<-SP->	Geos	Ti	V	Avg V	Avg Ti	Pts
		A	1 2	1.2	2390	2390	1.2	2	
		B	2 9	9.7	2602	2602	9.7	8	
1379	2.2	1 10	C	13 16	16.9	1497	1411	9.6	14
987	3.1	17 20	D			987	3.1	4	
						Avg =	1565	for 28 Pts	

Layer 2 Velocity computed by Hobson-Overton method

Spread A SPs	Geos	V	Avg Std Err TdSP	Overall	4 Highest Std Err at geophones Err	Geo	Err	Geo	Err	Geo
A C	1 2	1951	-15.8	0.000	0.000	2	-0.000	1		
B C	2 9	1707	-1.5	1.663	2.688	8	-2.632	9	-1.849	6 1.537 7
		Avg =	1756	for 10 Pts						

Wtd Avg Velocity computed for Layer 2 = 1645

Layer 3 Velocity computed by regression of raw uncorrected arrivals

Spread A V	Ti	Geos	<-SP->	Geos	Ti	V	Avg V	Avg Ti	Pts
		A	3 24	-2.2	2634	2634	-2.2	22	
		B	10 24	25.9	4303	4303	25.9	15	
		C	17 24	37.2	38768	38768	37.2	8	
5611	38.1	1 16	D			5611	38.1	16	
5821	32.5	1 24	E			5821	32.5	22	
						Avg =	4444	for 83 Pts	

Layer 3 Velocity computed by Hobson-Overton method

Spread A SPs	Geos	V	Avg Std Err TdSP	Overall	4 Highest Std Err at geophones Err	Geo	Err	Geo	Err	Geo
A D	3 16	3051	-24.0	3.365	7.466	3	-5.803	9	-5.105	8 3.129 14
A E	3 24	3870	-10.2	2.118	3.407	10	3.179	15	3.128	16 -3.083 23
B D	10 16	2755	-9.4	1.582	2.228	14	-2.199	16	-1.878	10 1.460 13
B E	10 24	4800	-1.7	0.974	-1.823	10	1.328	16	1.200	15 -1.187 23
C E	17 24	5055	-2.2	0.614	0.816	24	0.806	20	-0.729	23 -0.571 22
		Avg =	3869	for 60 Pts						

Wtd Avg Velocity computed for Layer 3 = 4104

Arrival times Td corrected to datum. (Datum Elev = -8.058 + 0.135x) for LINE2.SIP

Spread A			SP A	SP B	SP C	SP D	SP E
Datum Elev			-16.1	-8.6	-1.9	6.5	13.4
Geo	.	X-Loc	Cor T	0.0	-14.6	5.5	-9.4	0.0
			--Td--	--Td--	--Td--	--Td--	--Td--
1	-8.1	0.0	-11.7	17.1	-17.5	28.6	34.4	53.3
2	-7.5	4.2	-8.9	21.9	-12.2	28.6	37.7	53.6

3	-6.9	8.5	-5.8	25.5	-5.8	30.3	40.9	56.2
4	-6.4	12.5	-2.8	26.8	1.9	32.2	44.3	58.2
5	-6.0	15.6	0.7	29.0	7.2	31.6	46.8	57.7
6	-5.3	20.4	3.3	31.6	8.9	30.6	48.9	57.3
7	-4.6	25.3	3.9	32.7	11.3	24.2	47.5	58.9
8	-4.0	30.1	4.6	34.1	13.5	20.1	48.2	55.6
9	-3.3	35.0	5.2	35.5	15.7	22.2	47.3	56.7
10	-2.6	40.1	5.0	44.3	21.5	19.5	47.1	57.0
11	-1.9	45.3	5.0	47.3	28.0	15.5	48.6	59.0
12	-1.4	49.6	4.4	47.7	29.6	21.9	45.5	60.4
13	-0.7	54.2	4.4	51.7	31.6	33.4	44.0	59.4
14	-0.1	58.8	6.9	55.7	35.4	38.9	44.0	60.9
15	0.5	63.4	4.4	54.2	32.6	40.7	40.5	55.9
16	1.1	68.0	3.9	54.4	32.6	41.4	39.0	53.9
17	1.7	72.3	1.7	54.0	30.9	44.5	35.8	55.7
18	2.3	76.6	-0.5	53.3	29.7	43.5	26.6	55.5
19	2.9	81.2	-0.5	55.3	32.5	43.5	22.1	50.5
20	3.5	85.6	-1.9	54.1	31.6	42.1	17.7	46.1
21	4.2	90.6	-3.3	52.2	30.0	40.5	6.8	43.2
22	4.8	94.9	-4.0	50.8	29.8	39.5	-5.9	41.0
23	5.3	99.1	-6.2	48.1	27.5	38.1	0.0	37.8
24	5.8	102.2	-7.9	45.1	26.4	36.4	0.0	33.1

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE2.SIP

Spread A				SP A	SP B	SP C	SP D	SP E
Elev				0.0	2.2	-18.8	10.8	0.0
Geo	.	X-Loc	Cor T	3.9	3.9	11.2	5.1	5.1
---	---	-----	-----	--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	0.6	0.0	3.2	2.2	0.0	20.4	47.2	53.0
2	-1.5	4.2	2.9	4.5	4.5	17.9	48.0	50.8
3	-4.5	8.5	3.4	17.3	7.2	15.9	47.5	49.8
4	-7.7	12.5	4.1	14.9	11.3	14.2	47.3	48.1
5	-10.5	15.6	3.7	14.0	13.4	10.3	46.7	44.5
6	-14.1	20.4	5.4	12.3	10.9	5.1	44.5	39.8
7	-14.6	25.3	5.9	12.3	12.1	-2.3	42.0	40.3
8	-15.0	30.1	6.4	12.6	13.3	-7.6	41.5	35.8
9	-16.6	35.0	7.9	11.8	13.2	-7.6	38.5	34.8
10	-18.3	40.1	10.5	18.2	16.6	-12.8	35.9	32.7
11	-18.8	45.3	11.9	19.8	21.7	0.0	36.0	33.3
12	-19.2	49.6	13.1	19.6	22.8	0.0	32.3	34.1
13	-19.6	54.2	14.3	22.4	23.5	-2.0	29.6	31.9
14	-17.2	58.8	10.0	28.2	29.1	5.3	31.4	35.2
15	-13.6	63.4	9.6	29.6	29.3	10.0	30.8	33.1
16	-10.0	68.0	7.2	32.8	32.3	13.6	32.2	34.0
17	-6.9	72.3	6.8	34.9	33.1	19.2	31.6	0.0
18	-3.8	76.6	6.5	36.7	34.4	20.8	24.9	0.0
19	-2.1	81.2	6.1	39.1	37.5	21.2	20.8	36.1
20	-0.4	85.6	5.7	39.7	38.4	21.6	18.2	33.5
21	2.0	90.6	5.4	39.5	38.5	21.7	0.0	32.3
22	4.1	94.9	5.6	38.6	38.8	21.2	0.0	30.6
23	6.2	99.1	5.8	37.9	38.6	21.8	0.0	29.4
24	7.7	102.2	6.0	36.5	39.0	21.6	0.0	26.3

Dycer Creek - Line 2

Spread A Points of emergence of refracted rays below target geophones for LINE2.SIP

Geo		SP A	SP B	SP C	SP D	SP E
---		---------L	---------L	---------L	---------L	---------L
1	X-Loc	-3.4 2	--- 1	1.1 2	0.2 3	0.5 3
	Elev	2.1	---	0.1	-7.9	-12.6
2	X-Loc	1.5 2	1.5 2	4.8 2	3.0 3	2.9 3
	Elev	-0.1	-0.1	-1.7	-13.1	-15.2
3	X-Loc	-2.9 3	5.8 2	9.3 2	7.3 3	7.2 3
	Elev	-15.5	-2.5	-5.2	-17.9	-19.6

4	X-Loc	0.0 3	9.2 2	13.5 2	14.5 3	14.6 3
	Elev	-14.5	-5.1	-8.4	-22.4	-22.9
5	X-Loc	5.0 3	12.9 2	29.4 2	18.7 3	18.2 3
	Elev	-16.0	-8.0	-15.0	-24.4	-22.3
6	X-Loc	11.0 3	16.0 2	30.6 2	25.6 3	23.9 3
	Elev	-16.9	-10.7	-14.9	-25.6	-21.2
7	X-Loc	20.9 3	17.5 2	33.8 2	27.7 3	27.4 3
	Elev	-17.3	-12.3	-16.3	-24.7	-23.1
8	X-Loc	26.7 3	18.9 2	31.6 2	33.5 3	32.0 3
	Elev	-16.8	-13.9	-15.1	-26.2	-20.9
9	X-Loc	30.5 3	29.9 2	55.7 2	37.2 3	36.4 3
	Elev	-16.2	-15.0	-19.8	-25.6	-22.1
10	X-Loc	32.2 3	33.3 3	58.5 2	41.5 3	40.9 3
	Elev	-22.3	-20.6	-17.5	-25.6	-22.6
11	X-Loc	36.2 3	35.3 3	--- 1	46.8 3	46.5 3
	Elev	-23.0	-24.3	---	-27.8	-25.3
12	X-Loc	41.7 3	40.0 3	--- 1	63.5 3	64.6 3
	Elev	-22.3	-24.7	---	-25.6	-27.0
13	X-Loc	44.5 3	44.1 3	32.1 2	67.9 3	69.2 3
	Elev	-24.5	-25.1	-15.4	-25.1	-26.9
14	X-Loc	55.5 3	55.4 3	40.9 2	75.7 3	78.7 3
	Elev	-28.0	-28.4	-18.6	-25.0	-27.9
15	X-Loc	61.1 3	61.2 3	59.9 2	82.9 3	84.8 3
	Elev	-26.0	-25.4	-16.2	-21.7	-23.3
16	X-Loc	66.0 3	66.2 3	66.3 2	87.5 3	88.9 3
	Elev	-25.3	-24.5	-11.3	-20.5	-21.7
17	X-Loc	69.0 3	69.5 3	69.3 3	77.9 2	--- 0
	Elev	-24.1	-22.2	-23.0	-2.9	---
18	X-Loc	79.6 3	79.3 3	79.4 3	83.8 2	--- 0
	Elev	-20.6	-18.3	-19.2	-1.2	---
19	X-Loc	83.0 3	82.9 3	82.9 3	87.2 2	93.2 3
	Elev	-20.2	-18.5	-17.1	0.3	-22.6
20	X-Loc	87.6 3	87.5 3	87.4 3	91.6 2	94.3 3
	Elev	-16.4	-15.0	-13.2	2.5	-19.4
21	X-Loc	80.5 3	81.1 3	82.0 3	--- 1	112.1 3
	Elev	-18.3	-17.1	-15.2	---	-16.5
22	X-Loc	84.5 3	84.6 3	85.9 3	--- 1	116.4 3
	Elev	-15.4	-15.2	-12.6	---	-15.1
23	X-Loc	89.4 3	89.2 3	90.3 3	--- 0	120.8 3
	Elev	-10.8	-11.1	-9.2	---	-12.7
24	X-Loc	102.3 3	102.2 3	102.4 3	--- 0	122.4 3
	Elev	-5.8	-7.6	-5.4	---	-9.0

Spread A Points of entry of refracted rays below source shotpoints:

L=2	Right	X-Loc	1.5	1.5	61.4	---	---
		Elev	1.2*	1.2	-15.2	---	---
L=2	Left	X-Loc	---	---	33.3	106.6	---
		Elev	---	---	-15.9	9.8	---
L=3	Right	X-Loc	-2.8	-2.8	46.0	---	---
		Elev	-4.3*	-4.3	-21.5	---	---
L=3	Left	X-Loc	---	---	---	94.6	94.6
		Elev	---	---	---	-16.5	-16.5*

Dycer Creek - Line 2

Spread A Depth and Elev of layers directly beneath SPs and Geos for LINE2.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
---	-----	-----	-----	-----	-----	-----
B	-4.0	6.1	3.7	2.4	21.7	-15.6
C	45.3	-7.5	11.3	-18.8	17.3	-24.8
D	107.8	16.0	5.2	10.8	13.5	2.5
Geo						

1	0.0	3.8	3.3	0.5	19.1	-15.3
2	4.2	1.5	3.0	-1.5	16.4	-14.9

3	8.5	-1.1	3.4	-4.5	17.1	-18.2
4	12.5	-3.5	4.2	-7.7	17.0	-20.5
5	15.6	-6.7	3.8	-10.5	15.1	-21.8
6	20.4	-8.6	5.5	-14.1	13.2	-21.8
7	25.3	-8.6	6.0	-14.6	13.1	-21.7
8	30.1	-8.6	6.4	-15.0	13.2	-21.8
9	35.0	-8.6	8.0	-16.6	14.2	-22.8
10	40.1	-7.7	10.6	-18.3	16.1	-23.8
11	45.3	-7.0	11.8	-18.8	17.8	-24.8
12	49.6	-5.8	13.4	-19.2	20.3	-26.1
13	54.2	-5.2	14.4	-19.6	21.4	-26.6
14	58.8	-7.1	10.1	-17.2	19.8	-26.9
15	63.4	-3.9	9.7	-13.6	21.9	-25.8
16	68.0	-2.8	7.2	-10.0	22.1	-24.9
17	72.3	0.0	6.9	-6.9	23.3	-23.3
18	76.6	2.8	6.6	-3.8	24.4	-21.6
19	81.2	3.4	5.5	-2.1	23.0	-19.6
20	85.6	5.4	5.8	-0.4	22.5	-17.1
21	90.6	7.5	5.5	2.0	24.1	-16.6
22	94.9	8.8	4.7	4.1	26.9	-18.1
23	99.1	11.6	5.4	6.2	23.0	-11.4
24	102.2	13.7	6.0	7.7	20.2	-6.5

LINE2.SIP

Velocities used, Spread A

	Layer 1	Layer 2	Layer 3
Vertical	1010	1645	
Horizontal		1645	4104

SIPT2 V-4.1 --- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE3.SIP PRINT FILE: C:\DATA\DYCER\LINE3\LINE3.OUT RUN DATE AND TIME: 09-27-1998 at 09:18

TITLE: DYCER CREEK LINE 3

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

			Elev	Horiz	Time	Point 1		Point 2		Elevations			Trace Off	L				
Sprds	Exit	Layers	V-Over	m/col	m/row	ms/col	Elev	X-Loc	Elev	X-Loc	Top	Bottom	BLim	TLim	Print	SP	Dip	
1	6	3	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0	0	

VELOCITY OVERRIDES for LINE3.SIP

	Spread 1	
Layer	Vv	Vh
1	600	600
2	1650	1650
3	4000	4000

SHOTPOINT AND GEOPHONE INPUT DATA for LINE3.SIP

Spread 1, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 0, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	44.6	-54.6	0.0	0.0	0.0	0.0	0
B	15.3	-4.2	0.0	0.0	0.0	0.0	1
C	-6.3	45.0	5.0	0.0	0.0	0.0	0
D	19.1	108.0	0.0	0.0	0.0	0.0	2
E	48.4	152.7	0.0	0.0	0.0	0.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A	SP B	SP C	SP D	SP E
				---T---L	---T---L	---T---L	---T---L	---T---L
1	13.1	0.0	0.0	27.3 3	13.5 1	16.0 0	57.0 3	72.5 3
2	10.1	4.2	0.0	26.0 3	17.5 2	18.5 0	54.5 3	69.0 3
3	7.6	8.6	0.0	25.5 3	18.5 2	19.0 0	53.0 3	68.5 3
4	4.8	13.4	0.0	25.3 3	22.0 2	19.5 0	52.0 3	67.5 3
5	2.7	18.4	0.0	28.5 3	27.0 2	22.0 2	52.0 3	68.5 3
6	1.1	21.1	0.0	30.1 3	31.0 3	21.0 2	51.0 3	67.5 3
7	-1.5	27.1	0.0	30.8 3	32.0 3	17.0 2	48.0 3	65.0 3
8	-4.7	31.7	0.0	27.8 3	29.5 3	9.5 2	45.0 3	62.5 3
9	-5.9	34.9	0.0	27.8 3	31.0 3	8.5 2	44.0 3	62.5 3
10	-5.8	40.0	0.0	30.0 3	33.0 3	7.0 2	44.0 3	63.5 3
11	-5.7	45.0	0.0	34.0 3	36.0 3	4.5 1	44.0 3	64.0 3
12	-5.6	50.0	0.0	35.3 3	38.8 3	8.0 1	42.0 3	63.5 3
13	-5.2	54.9	0.0	40.0 3	41.0 3	12.0 2	42.0 3	60.0 3
14	-4.4	59.7	0.0	43.5 3	45.5 3	16.5 2	41.0 3	59.0 3
15	-2.9	64.2	0.0	46.0 3	49.5 3	23.0 2	43.5 3	59.5 3
16	-1.1	69.0	0.0	50.8 3	52.5 3	31.5 3	46.0 3	62.0 3
17	1.2	73.2	0.0	50.3 3	52.0 3	32.5 3	43.5 3	61.0 3
18	3.4	77.6	0.0	49.0 3	51.5 3	32.0 3	41.0 3	59.0 3
19	5.6	82.8	0.0	52.5 3	54.5 3	34.5 3	41.5 2	59.0 2
20	7.5	87.2	0.0	50.5 3	56.5 3	34.3 3	38.5 2	56.0 2
21	8.8	91.7	0.0	51.3 3	55.5 3	34.3 3	35.0 2	55.0 2
22	11.0	95.7	0.0	52.3 3	56.5 3	34.0 3	30.0 2	53.5 2
23	13.4	100.0	0.0	50.5 3	55.5 3	34.8 3	26.0 2	50.0 2
24	14.8	103.0	0.0	51.0 3	57.0 3	34.0 3	17.5 1	45.0 2

Layer 1 Velocity from direct arrivals

Spread 1	SP	Geo	DD	V	Avg V
B	1	4.2	311		
			311		
C	11	7.9	1750		
C	12	5.2	645		
			1197		
D	24	5.0	286		
			286		

Wtd Avg Velocity computed for Layer 1 = 748

Override Velocity assigned to Layer 1

Spread	1
	600

Layer 2 Velocity computed by regression of raw uncorrected arrivals

Spread 1 V	Ti	Geos	<-SP->	Geos	Ti	V	Avg V	Avg Ti	Pts
		B	2 5	10.8	1463	1463	10.8	4	
1155	-5.1	5 10	C	13 15	2.7	705	952	-1.2	9
1056	19.0	19 23	D			1056	19.0	5	
1572	15.7	19 24	E			1572	15.7	6	
						Avg = 1157	for	24 Pts	

Layer 2 Velocity computed by Hobson-Overton method

Not enough points.

Wtd Avg Velocity computed for Layer 2 = 1157

Override Velocity assigned to Layer 2

Spread 1

1650

Layer 3 Velocity computed by regression of raw uncorrected arrivals

Spread 1

V	Ti	Geos	<-SP->	Geos	Ti	V	Avg V	Avg Ti	Pts
			A	1 24	0.4	2619	2619	0.4	24
			B	6 24	16.3	2174	2174	16.3	19
			C	16 24	30.6	12038	12038	30.6	9
4805	33.4	1 18	D				4805	33.4	18
5368	44.2	1 18	E				5368	44.2	18
							Avg = 3417	for	88 Pts

Layer 3 Velocity computed by Hobson-Overton method

Spread 1 Avg Std Err 4 Highest Std Err at geophones

SPs	Geos	V	TdSP	Overall	Err	Geo	Err	Geo	Err	Geo	Err	Geo
A D	1 18	3239	-19.8	1.531	3.098	14	-2.700	10	2.580	1	-2.130	9
A E	1 18	3294	-24.1	2.554	-4.629	10	-4.526	12	-3.726	11	-3.190	9
B D	6 18	3088	-2.5	1.187	2.786	14	1.695	15	-1.392	18	-1.164	10
B E	6 18	2946	-5.7	2.032	3.577	15	-2.926	11	2.761	14	-2.609	12
C D	16 18	3062	-7.8	0.393	0.556	17	-0.286	16	-0.269	18		
C E	16 18	4793	-17.1	0.142	0.201	17	-0.103	16	-0.097	18		

Avg = 3229 for 68 Pts

Wtd Avg Velocity computed for Layer 3 = 3303

Override Velocity assigned to Layer 3

Spread 1

4000

Arrival times Td corrected to datum. (Datum Elev = -0.031 + 0.057x) for LINE3.SIP

Spread 1				SP A	SP B	SP C	SP D	SP E
Datum Elev				-2.6	-0.2	2.5	5.4	7.3
Geo	.	X-Loc	Cor T	0.0	-25.9	14.7	-22.9	0.0
				--Td--	--Td--	--Td--	--Td--	--Td--
1	-0.0	0.0	-21.9	5.4	-34.3	8.8	12.2	50.6
2	0.1	2.9	-16.6	9.4	-25.0	16.6	15.0	52.4
3	0.3	6.6	-12.1	13.4	-19.5	21.6	18.0	56.4
4	0.6	10.5	-7.1	18.2	-10.9	27.2	22.0	60.4
5	0.8	15.0	-3.1	25.4	-2.0	33.6	26.0	65.4
6	0.9	17.2	-0.3	29.8	4.9	35.5	27.8	67.2
7	1.3	22.6	4.6	35.4	10.7	36.3	29.7	69.6
8	1.4	25.9	10.2	38.0	13.8	34.5	32.3	72.7
9	1.6	28.8	12.5	40.3	17.6	35.7	33.6	75.0
10	1.9	33.9	12.8	42.8	19.9	34.6	33.9	76.3
11	2.2	38.9	13.1	47.1	23.3	32.4	34.2	77.1
12	2.5	43.9	13.5	48.8	26.4	36.2	32.6	77.0
13	2.8	48.8	13.3	53.3	28.4	40.0	32.4	73.3
14	3.0	53.6	12.4	55.9	32.0	43.6	30.5	71.4
15	3.3	57.8	10.3	56.3	33.9	48.0	30.9	69.8
16	3.5	62.3	7.7	58.5	34.3	53.9	30.8	69.7
17	3.7	65.8	4.2	54.5	30.3	51.4	24.8	65.2
18	3.9	69.6	0.9	49.9	26.5	47.6	19.0	59.9
19	4.2	74.3	-2.3	50.2	26.3	46.9	16.3	56.7

20	4.4	78.3	-5.1	45.4	25.5	43.9	10.5	50.9
21	4.7	82.6	-6.9	44.4	22.7	42.1	5.2	48.1
22	4.9	85.9	-10.2	42.1	20.4	38.5	-3.1	43.3
23	5.1	89.5	-13.9	36.6	15.7	35.6	-10.8	36.1
24	5.2	92.1	-16.0	35.0	15.1	32.7	-21.4	29.0

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE3.SIP

Spread 1		SP A	SP B	SP C	SP D	SP E
Elev		0.0	11.7	-11.9	16.4	0.0

Geo		X-Loc	Cor T	6.1	6.1	9.4	4.5	4.5
---	---	---	---	--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	9.7	0.0	5.6	18.5	0.0	0.0	46.9	45.1
2	8.3	2.9	3.0	19.9	8.5	0.0	47.1	44.3
3	6.5	6.6	1.9	20.4	10.5	0.0	46.7	44.8
4	4.3	10.5	0.8	21.3	15.1	0.0	46.7	44.9
5	1.7	15.0	1.6	23.7	19.3	11.0	46.0	45.2
6	0.2	17.2	1.4	25.5	23.5	10.2	45.1	44.3
7	-2.6	22.6	1.9	25.8	24.1	5.7	41.7	41.4
8	-4.7	25.9	0.0	24.6	23.4	0.1	40.5	40.7
9	-6.3	28.8	0.6	24.0	24.3	-1.5	38.9	40.1
10	-9.2	33.9	5.7	21.1	21.2	-8.1	33.8	36.0
11	-12.0	38.9	10.5	20.4	19.4	0.0	29.1	31.8
12	-11.9	43.9	10.8	21.3	21.9	0.0	26.7	30.9
13	-11.9	48.8	11.2	25.7	23.7	-8.6	26.4	27.1
14	-10.0	53.6	9.3	31.1	30.2	-2.1	27.3	28.0
15	-7.4	57.8	7.5	35.3	35.9	6.1	31.5	30.2
16	-4.7	62.3	6.8	40.8	39.6	15.3	34.7	33.4
17	-2.6	65.8	6.3	40.9	39.7	16.8	32.8	33.0
18	-0.2	69.6	5.7	40.2	39.8	16.9	30.9	31.6
19	2.7	74.3	4.9	44.4	43.5	20.2	32.1	29.1
20	5.4	78.3	3.5	43.9	46.9	21.4	30.6	27.6
21	8.7	82.6	0.1	48.0	49.3	24.8	30.4	29.9
22	11.0	85.9	0.0	49.1	50.4	24.6	25.5	28.5
23	13.4	89.5	0.0	47.3	49.4	25.4	21.5	25.0
24	14.8	92.1	0.0	47.8	50.9	24.6	0.0	20.0

DYCER CREEK LINE 3

Spread 1 Points of emergence of refracted rays below target geophones for LINE3.SIP

Geo		SP A	SP B	SP C	SP D	SP E
---		---------L	---------L	---------L	---------L	---------L
1	X-Loc	-13.2 3	--- 1	--- 0	0.5 3	0.3 3
	Elev	-3.5	---	---	-5.9	-4.5
2	X-Loc	-9.3 3	1.8 2	--- 0	1.8 3	1.9 3
	Elev	-5.0	8.9	---	-8.3	-6.1
3	X-Loc	-4.7 3	5.8 2	--- 0	5.5 3	5.6 3
	Elev	-6.1	6.9	---	-12.0	-10.6
4	X-Loc	-0.6 3	10.1 2	--- 0	11.6 3	11.5 3
	Elev	-7.2	4.5	---	-15.5	-14.1
5	X-Loc	-0.8 3	14.4 2	14.9 2	21.5 3	21.3 3
	Elev	-10.3	2.1	1.8	-19.7	-19.1
6	X-Loc	0.4 3	1.9 3	17.1 2	23.2 3	23.0 3
	Elev	-12.8	-11.5	0.3	-20.0	-19.5
7	X-Loc	8.9 3	10.0 3	22.5 2	26.1 3	26.1 3
	Elev	-15.7	-14.5	-2.6	-19.5	-19.3
8	X-Loc	14.5 3	15.2 3	25.9 2	29.2 3	29.3 3
	Elev	-15.4	-14.8	-4.7	-20.4	-20.7
9	X-Loc	22.7 3	22.3 3	28.8 2	38.6 3	39.4 3
	Elev	-16.5	-17.1	-6.2	-21.5	-22.7
10	X-Loc	28.1 3	27.8 3	33.7 2	39.7 3	40.9 3
	Elev	-15.3	-15.7	-9.0	-19.7	-21.8
11	X-Loc	35.3 3	35.4 3	--- 1	41.9 3	43.3 3
	Elev	-16.2	-15.7	---	-17.9	-20.4

12	X-Loc	42.3 3	42.0 3	— 1	47.0 3	48.6 3
	Elev	-14.6	-15.5	---	-16.8	-20.7
13	X-Loc	44.9 3	45.6 3	49.5 2	54.7 3	55.1 3
	Elev	-16.4	-15.0	-12.3	-18.3	-19.1
14	X-Loc	48.9 3	49.1 3	54.0 2	64.4 3	65.0 3
	Elev	-19.9	-19.5	-9.7	-18.4	-19.2
15	X-Loc	50.2 3	49.7 3	58.2 2	75.9 3	74.9 3
	Elev	-21.7	-22.5	-7.2	-19.1	-18.2
16	X-Loc	55.8 3	56.1 3	57.8 3	84.4 3	83.4 3
	Elev	-25.0	-24.3	-19.2	-20.3	-19.4
17	X-Loc	59.4 3	59.7 3	61.0 3	85.8 3	86.1 3
	Elev	-22.5	-21.7	-18.0	-17.4	-17.7
18	X-Loc	71.2 3	71.2 3	71.1 3	84.2 3	84.8 3
	Elev	-16.5	-16.5	-13.0	-16.0	-16.7
19	X-Loc	75.9 3	75.8 3	75.7 3	76.2 2	76.2 2
	Elev	-16.3	-15.9	-12.0	3.8	3.8
20	X-Loc	78.9 3	78.9 3	78.9 3	79.5 2	79.5 2
	Elev	-12.8	-15.7	-10.0	6.4	6.4
21	X-Loc	65.3 3	64.3 3	67.7 3	82.6 2	82.6 2
	Elev	-17.4	-18.9	-13.7	8.8 ?	8.8
22	X-Loc	69.4 3	68.5 3	72.3 3	85.9 2	85.9 2
	Elev	-16.5	-18.0	-11.6	11.0	11.0
23	X-Loc	90.3 3	90.4 3	90.2 3	89.5 2	89.5 2
	Elev	-6.6	-8.6	-4.2	13.4	13.4
24	X-Loc	91.6 3	91.5 3	91.7 3	— 1	92.1 2
	Elev	-4.8	-7.7	-1.3	—	14.8

Spread 1 Points of entry of refracted rays below source shotpoints:

L=2	Right	X-Loc	---	-3.9	50.8	—	---
		Elev	—	11.6	-11.5	---	---
L=2	Left	X-Loc	---	—	38.7	96.9	96.9
		Elev	---	---	-12.0	13.6	13.6*
L=3	Right	X-Loc	-0.8	-0.8	47.6	—	---
		Elev	-5.3*	-5.3	-16.4	---	---
L=3	Left	X-Loc	---	---	---	92.3	92.3
		Elev	---	---	---	-4.3	-4.3*

DYCER CREEK LINE 3

Spread 1 Depth and Elev of layers directly beneath SPs and Geos for LINE3.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
---	---	---	---	---	---	---
B	-3.6	15.3	3.6	11.7	22.6	-7.3
C	45.0	-6.3	5.6	-11.9	12.5	-18.8
D	94.7	19.1	4.3	14.8	23.3	-4.2
Geo						

1	0.0	13.1	3.4	9.7	21.7	-8.6
2	2.9	10.1	1.8	8.3	19.8	-9.7
3	6.6	7.6	1.1	6.5	19.6	-12.0
4	10.5	4.8	0.5	4.3	19.1	-14.3
5	15.0	2.7	1.0	1.7	18.6	-15.9
6	17.2	1.1	0.9	0.2	17.7	-16.6
7	22.6	-1.5	1.1	-2.6	16.6	-18.1
8	25.9	-4.7	0.0	-4.7	13.8	-18.5
9	28.8	-5.9	0.4	-6.3	12.5	-18.4
10	33.9	-5.8	3.4	-9.2	12.7	-18.5
11	38.9	-5.7	6.3	-12.0	13.1	-18.8
12	43.9	-5.6	6.3	-11.9	13.0	-18.6
13	48.8	-5.2	6.7	-11.9	14.2	-19.4
14	53.6	-4.4	5.6	-10.0	16.2	-20.6
15	57.8	-2.9	4.5	-7.4	17.6	-20.5
16	62.3	-1.1	3.6	-4.7	18.1	-19.2
17	65.8	1.2	3.8	-2.6	18.7	-17.5
18	69.6	3.4	3.6	-0.2	19.5	-16.1

19	74.3	5.6	2.9	2.7	20.6	-15.0
20	78.3	7.5	2.1	5.4	23.2	-15.7
21	82.6	8.8	0.1	8.7	25.0	-16.2
22	85.9	11.0	0.0	11.0	24.5	-13.5
23	89.5	13.4	0.0	13.4	22.2	-8.8
24	92.1	14.8	0.0	14.8	19.3	-4.5

LINE3.SIP

Velocities used, Spread 1

	Layer 1	Layer 2	Layer 3
Vertical	600	1650	
Horizontal		1650	4000

SIPT2 V-4.1 --- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE4.SIP PRINT FILE: C:\DATA\DYCER\LINE4\LINE4.OUT RUN DATE AND TIME: 09-27-1998 at 13:58

TITLE: Dycer Creek - Line 4

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

Sprds	Exit	Layers	Elev V-Over	Horiz m/col	Time m/row	Time ms/col	Point 1 Elev	Point 1 X-Loc	Point 2 Elev	Point 2 X-Loc	Elevations Top	Elevations Bottom	Trace Off L BLim	TLim	Print	SP Dip
1	6	3	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0 0

VELOCITY OVERRIDES for LINE4.SIP

	Spread 1	
Layer	Vv	Vh
2	1600	1600

SHOTPOINT AND GEOPHONE INPUT DATA for LINE4.SIP

Spread A, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 1, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	45.9	-50.9	0.0	0.0	0.0	0.0	0
B	16.3	-4.7	0.0	0.0	0.0	0.0	1
C	-3.7	44.5	5.0	0.0	0.0	0.0	0
D	23.9	106.7	0.0	0.0	0.0	0.0	2
E	46.6	155.3	0.0	0.0	0.0	0.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A ---T---L	SP B ---T---L	SP C ---T---L	SP D ---T---L	SP E
1	14.1	0.0	0.0	25.5 2	8.0 1	18.0 3	58.5 3	80.5 3
2	11.0	4.6	0.0	28.3 2	15.0 2	17.0 3	59.5 3	80.0 3
3	8.6	8.5	0.0	25.0 2	15.5 2	17.8 3	57.0 3	79.0 3
4	6.5	12.7	0.0	28.8 2	19.0 2	19.3 3	56.5 3	78.5 3
5	4.0	17.2	0.0	31.8 2	21.5 2	19.3 2	56.0 3	77.0 3
6	1.8	21.4	0.0	35.3 2	22.0 2	15.3 2	54.0 3	76.0 3
7	-1.1	26.0	0.0	32.8 2	23.0 2	10.7 2	52.0 3	75.5 3
8	-3.2	30.1	0.0	30.0 2	24.5 2	8.0 2	48.0 3	74.0 3
9	-3.3	34.4	0.0	31.0 2	25.0 2	8.0 2	47.0 3	73.0 3
10	-2.5	39.5	0.0	36.0 2	28.0 2	7.0 2	45.6 3	73.0 3
11	-1.8	44.5	0.0	40.5 2	32.5 2	5.5 1	44.0 3	73.0 3
12	-1.0	49.6	0.0	45.5 2	38.5 2	9.3 1	48.5 3	73.0 3
13	0.5	54.0	0.0	48.3 2	41.0 2	12.0 2	47.0 0	72.5 3
14	1.5	58.8	0.0	46.7 2	42.0 2	11.5 2	40.0 2	72.0 3
15	3.8	63.6	0.0	48.5 2	43.0 2	14.8 2	40.0 2	72.5 3
16	6.3	67.5	0.0	55.0 2	49.0 2	21.5 2	45.0 2	74.0 3
17	8.0	72.0	0.0	59.5 2	54.0 2	25.0 2	45.0 2	74.0 3
18	10.2	76.4	0.0	62.5 3	56.0 2	30.0 3	42.0 2	73.0 3
19	12.4	80.9	0.0	63.0 3	58.0 2	33.0 3	40.0 2	74.0 3
20	14.2	85.2	0.0	66.0 3	61.0 3	38.5 3	40.0 2	74.0 3
21	16.3	89.6	0.0	66.3 3	62.5 2	38.5 3	33.5 2	72.5 3
22	18.3	94.1	0.0	67.0 3	64.0 3	40.5 3	30.0 2	71.5 3
23	19.8	98.0	0.0	68.8 3	65.5 3	41.0 3	22.0 1	69.5 3
24	21.2	100.9	0.0	68.3 3	65.5 3	39.0 3	9.5 1	0.0 0

Layer 1 Velocity from direct arrivals

Spread	SP	Geo	DD	V	Avg V
A	B	1	5.2	649	

```
                                649
          C  11   5.3   973
          C  12   7.6   821
                                897
          D  23   9.6   437
          D  24   6.4   673
                                555
-------------------------------------
Wtd Avg Velocity computed for Layer 1 =   711

Layer 2 Velocity computed by regression of raw uncorrected arrivals

 Spread A
   V    Ti   Geos <-SP-> Geos  Ti     V       Avg V  Avg Ti  Pts
------ ---- ----- --  ---- --  ---- ------  ------  ------  ---
                A   1 17 -5.5   2217      2217    -5.5    17
                B   2 21  4.1   1660      1660     4.1    19
  1734  1.2  5 10   C  13 17  1.0   1310      1511     1.1    11
  3912 31.0 14 22   D                      3912    31.0     9
                                        ------  ------
                                Avg =   1952    for    56 Pts

Layer 2 Velocity computed by Hobson-Overton method

 Spread A        Avg  Std Err  4 Highest Std Err at geophones
SPs Geos    V   TdSP Overall  Err Geo   Err Geo   Err Geo   Err Geo
--- ---- ------ ---- ------- --------  --------  --------  --------
A C  5 10   3385 -0.4  1.921   2.597  6 -2.312  9 -2.165  5  1.636  7
A D 14 17   3306 -13.7 0.759  -1.081 16  0.829 17  0.583 14 -0.331 15
B C  5 10   2400  4.6  1.019   1.660  8 -1.099  9  1.081  7 -0.840  5
B D 14 21   2260 -6.7  1.901   3.226 14 -2.560 16  2.234 21 -1.568 17
C D 14 17   3526 -18.0 0.340  -0.546 16  0.318 15  0.252 17 -0.025 14
      ------
   Avg =  2884 for  27 Pts

-------------------------------------
Wtd Avg Velocity computed for Layer 2 =   2409
-------------------------------------------------------------------
Override Velocity assigned to Layer 2

 Spread       A
        ------
         1600
-------------------------------------------------------------------

Layer 3 Velocity computed by regression of raw uncorrected arrivals

 Spread A
   V    Ti   Geos <-SP-> Geos  Ti     V       Avg V  Avg Ti  Pts
------ ---- ----- --  ---- --  ---- ------  ------  ------  ---
                A  18 24 23.9   3410      3410    23.9     7
                B  20 24 33.8   3289      3289    33.8     4
 10685 21.8  1  4   C  18 24 19.3   2747      3764    20.6    11
  2857 22.2  1 12   D                      2857    22.2    12
 13388 65.9  1 23   E                     13388    65.9    23
                                        ------  ------
                                Avg =   4707    for    57 Pts

Layer 3 Velocity computed by Hobson-Overton method

 Spread A        Avg  Std Err  4 Highest Std Err at geophones
SPs Geos    V   TdSP Overall  Err Geo   Err Geo   Err Geo   Err Geo
--- ---- ------ ---- ------- --------  --------  --------  --------
A E 18 23   4282 -22.4 0.960   1.352 18  1.204 23 -1.201 19 -0.789 22
B E 20 23   3044 -17.3 0.357  -0.493 22  0.344 23  0.149 20
C E 18 23   3192 -26.8 0.765   1.493 20 -1.097 19 -0.239 23 -0.130 22
      ------
   Avg =  3598 for  15 Pts

-------------------------------------
```

Wtd Avg Velocity computed for Layer 3 = 4325

Arrival times Td corrected to datum. (Datum Elev = 0.345 + 0.128x) for LINE4.SIP

Spread A			SP A	SP B	SP C	SP D	SP E
Datum Elev			-6.2	-0.3	6.0	14.0	20.2
Geo	.	X-Loc	Cor T	0.0	-23.3	13.7	-13.9	0.0
				--Td--	--Td--	--Td--	--Td--	--Td--
1	0.3	0.0	-19.4	6.1	-34.7	12.3	25.2	61.1
2	0.9	4.6	-14.2	14.1	-22.5	16.5	31.4	65.8
3	1.4	8.5	-10.1	14.9	-17.9	21.4	33.0	68.9
4	2.0	12.7	-6.4	22.4	-10.7	26.6	36.2	72.1
5	2.5	17.2	-2.0	29.8	-3.8	31.0	40.0	75.0
6	3.1	21.4	1.8	37.1	0.5	30.8	41.9	77.8
7	3.7	26.0	6.7	39.5	6.4	31.1	44.8	82.2
8	4.2	30.1	10.4	40.4	11.6	32.1	44.5	84.4
9	4.7	34.4	11.3	42.3	13.0	33.0	44.4	84.3
10	5.4	39.5	11.1	47.1	15.8	31.8	42.8	84.1
11	6.0	44.5	11.0	51.5	20.2	30.2	41.1	84.0
12	6.7	49.6	10.8	56.3	26.0	33.8	45.4	83.8
13	7.3	54.0	9.5	57.8	27.2	35.2	42.6	82.0
14	7.9	58.8	9.0	55.7	27.7	34.2	35.0	81.0
15	8.5	63.6	6.6	55.1	26.3	35.1	32.7	79.1
16	9.0	67.5	3.8	58.8	29.5	39.0	34.8	77.8
17	9.6	72.0	2.2	61.7	32.9	40.9	33.3	76.2
18	10.1	76.4	-0.1	62.4	32.6	43.6	28.0	72.9
19	10.7	80.9	-2.4	60.6	32.3	44.3	23.7	71.6
20	11.2	85.2	-4.2	61.8	33.5	48.0	21.9	69.8
21	11.8	89.6	-6.3	60.0	32.9	45.9	13.2	66.2
22	12.4	94.1	-8.3	58.7	32.4	45.9	7.7	63.2
23	12.9	98.0	-9.7	59.1	32.5	45.0	-1.7	59.8
24	13.3	100.9	-11.2	57.1	31.0	41.5	-15.6	0.0

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE4.SIP

Spread A			SP A	SP B	SP C	SP D	SP E
Elev			0.0	8.6	-4.2	23.4	0.0
Geo	.	X-Loc	Cor T	10.8	10.8	0.7	0.8	0.8
				--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	7.4	0.0	9.5	-2.8	0.0	7.8	48.3	46.4
2	6.4	4.6	6.4	3.0	-2.2	9.8	52.3	49.0
3	5.6	8.5	4.6	1.5	0.1	12.4	51.6	49.8
4	4.6	12.7	2.7	7.3	5.6	15.9	53.1	51.2
5	3.5	17.2	0.7	12.2	10.0	17.9	54.6	51.7
6	1.8	21.4	0.0	16.4	11.2	14.6	53.2	51.4
7	-1.1	26.0	0.0	13.9	12.2	10.0	51.2	50.9
8	-3.2	30.1	0.1	11.1	13.7	7.2	47.2	49.3
9	-4.4	34.4	1.6	10.6	12.7	5.7	44.7	46.8
10	-3.5	39.5	1.4	15.7	15.8	4.9	43.4	47.0
11	-4.2	44.5	3.4	18.2	18.3	0.0	39.8	45.0
12	-3.4	49.6	3.4	23.2	24.3	0.0	44.3	45.0
13	-2.3	54.0	3.9	25.5	26.3	7.3	0.0	44.0
14	-0.1	58.8	2.3	25.6	29.0	8.5	37.0	45.1
15	2.5	63.6	1.8	27.8	30.4	12.2	37.4	46.1
16	4.6	67.5	2.4	33.7	35.8	18.3	41.8	47.0
17	7.0	72.0	1.4	39.2	41.8	22.8	42.8	48.0
18	9.4	76.4	1.2	47.0	44.0	28.1	40.1	47.2
19	11.9	80.9	0.7	48.0	46.5	31.5	38.5	48.7
20	13.5	85.2	1.1	50.6	49.1	36.6	38.1	48.3
21	15.2	89.6	1.5	50.5	50.2	36.2	31.2	46.4
22	17.3	94.1	1.4	51.3	51.9	38.4	27.9	45.5
23	19.2	98.0	0.9	53.6	53.8	39.4	0.0	44.0
24	20.5	100.9	1.0	53.0	53.8	37.3	0.0	0.0

Dycer Creek - Line 4

Spread A Points of emergence of refracted rays below target geophones for LINE4.SIP

Geo		SP A	SP B	SP C	SP D	SP E
1	X-Loc	-5.0 2	— 1	-0.8 3	-0.4 3	-0.8 3
	Elev	8.5	—	7.9	2.3	7.4
2	X-Loc	1.8 2	1.8 2	4.1 3	8.1 3	4.6 3
	Elev	6.9	6.9	8.0	0.5	7.1
3	X-Loc	6.4 2	6.4 2	7.9 3	7.6 3	8.0 3
	Elev	6.1	6.1	4.1	-0.4	4.7
4	X-Loc	11.4 2	11.4 2	12.0 3	11.7 3	12.1 3
	Elev	4.9	4.9	-1.1	-4.0	1.1
5	X-Loc	16.9 2	16.9 2	17.2 2	16.1 3	16.6 3
	Elev	3.6	3.6	3.5	-8.5	-2.5
6	X-Loc	21.4 2	21.4 2	21.4 2	20.3 3	20.7 3
	Elev	1.8	1.8	1.8	-11.1	-5.9
7	X-Loc	26.0 2	26.0 2	26.0 2	30.4 3	29.0 3
	Elev	-1.1	-1.1	-1.1	-13.1	-9.0
8	X-Loc	30.1 2	30.1 2	30.2 2	33.2 3	32.5 3
	Elev	-3.2	-3.2	-3.3	-11.8	-9.9
9	X-Loc	33.1 2	33.1 2	35.6 2	36.1 3	35.6 3
	Elev	-4.4	-4.4	-4.6	-11.2	-9.3
10	X-Loc	39.3 2	39.3 2	39.7 2	40.3 3	40.2 3
	Elev	-3.5	-3.5	-3.5	-10.9	-10.2
11	X-Loc	42.4 2	42.4 2	— 1	44.6 3	44.6 3
	Elev	-4.2	-4.2	—	-9.8	-10.4
12	X-Loc	49.1 2	49.1 2	— 1	54.5 3	53.4 3
	Elev	-3.5	-3.5	—	-15.8	-12.6
13	X-Loc	53.2 2	53.2 2	53.2 2	— 0	63.8 3
	Elev	-2.6	-2.6	-2.6	—	-14.3
14	X-Loc	58.8 2	58.8 2	58.8 2	60.1 2	66.7 3
	Elev	-0.1	-0.1	-0.1	0.6	-15.0
15	X-Loc	63.6 2	63.6 2	63.6 2	64.6 2	76.2 3
	Elev	2.5	2.5	2.5	3.0	-14.7
16	X-Loc	67.5 2	67.5 2	67.5 2	68.8 2	74.4 3
	Elev	4.6	4.6	4.6	5.3	-15.8
17	X-Loc	72.0 2	72.0 2	72.0 2	72.8 2	82.0 3
	Elev	7.0	7.0	7.0	7.4	-15.5
18	X-Loc	55.8 3	76.4 2	57.9 3	77.0 2	85.7 3
	Elev	-17.0	9.4	-14.3	9.7	-14.2
19	X-Loc	68.4 3	80.9 2	68.7 3	81.3 2	86.8 3
	Elev	-19.3	11.9	-18.6	12.0 ?	-14.8
20	X-Loc	79.3 3	79.0 3	79.0 3	85.7 2	90.6 3
	Elev	-18.9	-20.6	-20.3	13.7 ?	-16.1
21	X-Loc	83.1 3	89.5 2	82.9 3	90.4 2	101.4 3
	Elev	-16.7	15.2	-17.9	15.7 ?	-15.5
22	X-Loc	84.5 3	83.5 3	83.8 3	94.7 2	106.4 3
	Elev	-15.1	-18.5	-17.4	17.8 ?	-14.6
23	X-Loc	85.0 3	83.7 3	84.5 3	— 1	110.3 3
	Elev	-13.3	-16.5	-14.5	—	-13.2
24	X-Loc	86.1 3	84.4 3	86.1 3	— 1	— 0
	Elev	-11.8	-15.3	-11.7	—	—

Spread A Points of entry of refracted rays below source shotpoints:

L=2	Right	X-Loc	-4.0	-4.0	45.3	—	—
		Elev	8.4*	8.4	-4.6	—	—
L=2	Left	X-Loc	—	—	43.7	106.7	—
		Elev	—	—	-4.6	23.6	—
L=3	Right	X-Loc	5.0	5.0	45.0	—	—
		Elev	-3.2*	-3.2	-12.3	—	—
L=3	Left	X-Loc	—	—	43.1	87.4	87.4
		Elev	—	—	-6.2	-13.1	-13.1*

Dycer Creek - Line 4

Spread A Depth and Elev of layers directly beneath SPs and Geos for LINE4.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
B	-4.7	16.3	7.8	8.5	8.7	7.6
C	44.5	-3.7	0.5	-4.2	6.7	-10.4
D	106.7	23.9	0.5	23.4	38.8	-14.9
Geo						
1	0.0	14.1	6.7	7.4	8.5	5.6
2	4.6	11.0	4.6	6.4	7.3	3.7
3	8.5	8.6	3.0	5.6	7.4	1.2
4	12.7	6.5	1.9	4.6	9.0	-2.5
5	17.2	4.0	0.5	3.5	9.9	-5.9
6	21.4	1.8	0.0	1.8	9.8	-8.0
7	26.0	-1.1	0.0	-1.1	8.3	-9.4
8	30.1	-3.2	0.0	-3.2	7.4	-10.6
9	34.4	-3.3	1.1	-4.4	7.2	-10.5
10	39.5	-2.5	1.0	-3.5	7.6	-10.1
11	44.5	-1.8	2.4	-4.2	8.6	-10.4
12	49.6	-1.0	2.4	-3.4	11.6	-12.6
13	54.0	0.5	2.8	-2.3	14.9	-14.4
14	58.8	1.5	1.6	-0.1	16.7	-15.2
15	63.6	3.8	1.3	2.5	19.9	-16.1
16	67.5	6.3	1.7	4.6	23.0	-16.7
17	72.0	8.0	1.0	7.0	25.1	-17.1
18	76.4	10.2	0.8	9.4	28.2	-18.0
19	80.9	12.4	0.5	11.9	29.3	-16.9
20	85.2	14.2	0.7	13.5	29.2	-15.0
21	89.6	16.3	1.1	15.2	31.7	-15.4
22	94.1	18.3	1.0	17.3	34.1	-15.8
23	98.0	19.8	0.6	19.2	35.3	-15.5
24	100.9	21.2	0.7	20.5	36.5	-15.3

LINE4.SIP

Velocities used, Spread A

	Layer 1	Layer 2	Layer 3
Vertical	711	1600	
Horizontal		1600	4325

SIPT2 V-4.1 --- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE5.SIP PRINT FILE: C:\DATA\DYCER\LINE5\LINE5.OUT RUN DATE AND TIME: 09-27-1998 at 09:21

TITLE: Dycer Creek - Line 5

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

			Elev	Horiz	Time	Point 1		Point 2		Elevations				Trace Off	L			
Sprds	Exit	Layers	V-Over	m/col	m/row	ms/col	Elev	X-Loc	Elev	X-Loc	Top	Bottom	BLim	TLim	Print	SP	Dip	
1	6	3	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0	0	

VELOCITY OVERRIDES for LINE5.SIP

Spread 1

Layer	Vv	Vh
1	600	600
2	1600	1600

SHOTPOINT AND GEOPHONE INPUT DATA for LINE5.SIP

Spread A, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 1, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	39.6	-54.8	0.0	0.0	0.0	0.0	0
B	16.3	-6.0	0.0	0.0	0.0	0.0	1
C	-1.2	43.5	5.0	0.0	0.0	0.0	0
D	16.3	106.4	0.0	0.0	0.0	0.0	2
E	40.9	156.1	0.0	0.0	0.0	0.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A	SP B	SP C	SP D	SP E
				--T--L	--T--L	--T--L	--T--L	--T--L
1	15.2	0.0	0.0	36.0 3	22.0 1	34.0 3	78.0 3	71.0 3
2	13.2	4.9	0.0	35.0 3	36.5 2	33.0 3	77.0 3	71.0 3
3	10.5	8.7	0.0	34.0 3	42.5 2	29.0 3	76.0 3	70.8 3
4	8.4	12.9	0.0	33.0 3	44.0 2	28.0 3	73.5 3	71.3 3
5	5.9	17.2	0.0	33.0 3	43.0 2	24.0 2	69.0 3	66.0 3
6	3.1	21.3	0.0	33.0 3	44.0 2	23.0 2	68.0 3	64.5 3
7	0.4	24.8	0.0	29.0 3	48.0 2	14.0 2	66.5 3	60.5 3
8	-0.3	29.5	0.0	28.0 3	47.5 2	10.0 2	64.0 3	56.5 3
9	-0.9	34.3	0.0	28.5 3	47.5 2	8.0 2	62.5 3	56.0 3
10	-0.4	38.8	0.0	30.0 3	46.5 2	8.0 2	59.5 3	55.0 3
11	-0.4	43.5	0.0	32.5 3	47.0 2	5.0 1	61.0 3	55.0 3
12	-0.7	48.4	0.0	33.0 3	50.0 3	8.0 1	61.5 2	53.0 3
13	1.3	52.6	0.0	36.0 3	53.0 3	14.0 2	60.0 2	53.5 3
14	1.3	57.1	0.0	40.5 3	58.5 3	18.0 2	58.0 2	53.0 3
15	2.1	62.2	0.0	44.5 3	60.0 3	22.0 2	57.0 2	55.0 3
16	4.1	66.6	0.0	47.0 3	62.0 3	26.0 2	55.0 2	56.0 3
17	2.6	71.7	0.0	46.5 3	60.5 3	28.0 2	54.8 2	52.5 3
18	2.8	77.5	0.0	46.0 3	65.5 3	30.0 3	48.5 2	51.5 3
19	4.0	82.3	0.0	49.8 3	74.0 3	33.0 3	49.0 2	52.3 3
20	5.4	85.5	0.0	58.0 3	77.0 3	42.0 3	53.0 2	52.0 3
21	7.5	89.7	0.0	59.6 3	77.5 3	43.0 3	54.0 1	52.1 3
22	9.4	93.7	0.0	60.0 3	78.5 3	44.0 3	43.0 1	53.0 3
23	11.9	99.3	0.0	61.5 3	79.0 3	47.0 3	21.5 1	53.0 3
24	13.7	102.6	0.0	64.0 3	0.0 0	48.0 3	9.5 1	54.0 3

Layer 1 Velocity from direct arrivals

Spread A	SP	Geo	DD	V	Avg V

```
          B   1    6.1    277
                              277
          C  11    5.1   1013
          C  12    7.0    877
                              945
          D  21   18.9    350
          D  22   14.5    336
          D  23    8.4    389
          D  24    4.6    485
                              390
-------------------------------------
Wtd Avg Velocity computed for Layer 1 =   532
-------------------------------------
Override Velocity assigned to Layer 1

 Spread       A
             ----
              600
-------------------------------------------------------------

Layer 2 Velocity computed by regression of raw uncorrected arrivals

 Spread A
   V    Ti   Geos  <-SP->  Geos  Ti     V       Avg V  Avg Ti  Pts
 -----  ---  -----  ---  -----  ---  -----  -----  -----  ---
                B    2 11  37.9   4761        4761   37.9   10
  1136  -0.5  5 10   C    13 17  6.2   1278      1197    2.9   11
  3163  42.0  12 20  D                        3163   42.0    9
                                             -----   ---
                                  Avg =   2122   for    30 Pts

Layer 2 Velocity computed by Hobson-Overton method

 Spread A          Avg  Std Err  4 Highest Std Err at geophones
SPs  Geos    V    TdSP Overall  Err  Geo   Err  Geo   Err  Geo   Err  Geo
---  -----  ----  ---  -------  ---------  ---------  ---------  ---------
B C  5 10   1936  21.4  3.422   4.762  7  -4.066  6  -3.997 10   3.583  8
C D  13 17  1882 -21.1  0.968   1.305 16  -1.271 17  -0.945 13   0.622 14
       ---
   Avg =  1911 for  11 Pts

-------------------------------------
Wtd Avg Velocity computed for Layer 2 =   2033
-------------------------------------------------------------
Override Velocity assigned to Layer 2

 Spread       A
             ----
              1600
-------------------------------------------------------------

Layer 3 Velocity computed by regression of raw uncorrected arrivals

 Spread A
   V    Ti   Geos  <-SP->  Geos  Ti     V       Avg V  Avg Ti  Pts
 -----  ---  -----  ---  -----  ---  -----  -----  -----  ---
                A    1 24  4.9   3046        3046   4.9    24
                B    12 23 14.9   1577        1577   14.9   12
  2167  12.8  1 4    C    18 24  9.3   1507      1695   11.1   11
  2049  26.7  1 11   D                        2049   26.7   11
  5287  36.8  1 24   E                        5287   36.8   24
                                             -----   ---
                                  Avg =   2572   for    82 Pts

Layer 3 Velocity computed by Hobson-Overton method

 Spread A          Avg  Std Err  4 Highest Std Err at geophones
SPs  Geos    V    TdSP Overall  Err  Geo   Err  Geo   Err  Geo   Err  Geo
---  -----  ----  ---  -------  ---------  ---------  ---------  ---------
A C  1 4    8051  0.0  0.697  -0.979  2   0.901  3   0.331  1  -0.253  4
```

```
A D  1 11   6365 -36.3 1.565 -2.098  7 -2.012  8  1.900  5  1.729 10
A E  1 24   3771 -16.3 2.692  7.387  1  4.997 20  4.293 21  3.794  2
B E 12 23   3071  16.2 2.616  4.552 20 -3.727 23 -3.686 17  3.363 19
C E 18 24   3482  -4.1 2.567  4.470 20 -2.869 19  2.738 21 -2.282 18
      ----
   Avg =  4378 for  58 Pts

-----------------------------------
Wtd Avg Velocity computed for Layer 3 =  3630
-----------------------------------------------------------------
```

Arrival times Td corrected to datum. (Datum Elev = 4.818 + 0.004x) for LINE5.SIP

Spread A			SP A	SP B	SP C	SP D	SP E
Datum Elev			4.6	4.8	5.0	5.2	5.4
Geo	.	X-Loc	Cor T	0.0	-19.2	10.3	-18.5	0.0
---	---	-----	-----	--Td--	--Td--	--Td--	--Td--	--Td--
1	4.8	0.0	-17.3	18.7	-14.5	27.0	42.2	53.7
2	4.8	4.9	-13.9	21.1	3.4	29.4	44.6	57.1
3	4.9	8.7	-9.4	24.6	13.9	29.9	48.1	61.4
4	4.9	12.9	-5.9	27.1	18.9	32.4	49.1	65.4
5	4.9	17.2	-1.7	31.3	22.1	32.6	48.8	64.3
6	4.9	21.3	3.0	36.0	27.8	36.3	52.5	67.5
7	4.9	24.8	7.5	36.5	36.3	31.8	55.5	68.0
8	4.9	29.5	8.7	36.7	37.0	29.0	54.2	65.2
9	4.9	34.3	9.7	38.2	38.1	28.0	53.7	65.7
10	5.0	38.8	8.9	38.9	36.3	27.2	49.9	63.9
11	5.0	43.5	9.0	41.5	36.8	24.3	51.5	64.0
12	5.0	48.4	9.5	42.5	40.3	27.8	52.5	62.5
13	5.0	52.6	6.2	42.2	40.0	30.5	47.7	59.7
14	5.0	57.1	6.2	46.7	45.5	34.5	45.7	59.2
15	5.0	62.2	4.9	49.4	45.7	37.2	43.4	59.9
16	5.1	66.6	1.6	48.6	44.4	37.9	38.1	57.6
17	5.1	71.7	4.1	50.6	45.5	42.4	40.4	56.6
18	5.1	77.5	3.8	49.8	50.2	44.1	33.8	55.3
19	5.1	82.3	1.9	51.7	56.7	45.2	32.4	54.2
20	5.1	85.5	-0.5	57.5	57.4	51.8	34.1	51.5
21	5.1	89.7	-3.9	55.7	54.4	49.4	31.6	48.2
22	5.2	93.7	-7.1	52.9	52.3	47.2	17.4	45.9
23	5.2	99.3	-11.2	50.3	48.6	46.1	-8.2	41.8
24	5.2	102.6	-14.2	49.8	0.0	44.1	-23.2	39.8

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE5.SIP

Spread A			SP A	SP B	SP C	SP D	SP E
Elev			0.0	10.6	-3.0	4.9	0.0
Geo	.	X-Loc	Cor T	9.5	9.5	3.0	19.1	19.1
---	---	-----	-----	--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	9.0	0.0	10.4	33.8	0.0	20.6	48.6	46.8
2	7.2	4.9	8.8	34.4	18.1	21.1	49.1	48.3
3	5.9	8.7	7.6	34.6	25.3	18.3	49.3	49.3
4	4.4	12.9	6.3	34.9	28.1	18.6	48.1	51.1
5	2.9	17.2	5.0	36.2	28.5	16.0	45.0	47.2
6	-0.3	21.3	5.7	35.5	28.8	14.3	43.3	45.0
7	-2.0	24.8	4.0	33.2	34.4	6.9	43.4	42.6
8	-2.6	29.5	3.8	32.4	34.1	3.1	41.1	38.8
9	-2.2	34.3	2.1	34.6	35.9	2.9	41.3	40.1
10	-2.6	38.8	3.7	34.5	33.3	1.3	36.8	37.5
11	-3.0	43.5	4.4	36.3	33.1	0.0	37.6	36.8
12	-2.8	48.4	3.6	37.7	36.9	0.0	38.9	35.6
13	-2.5	52.6	6.3	37.9	37.1	4.7	34.6	33.4
14	-1.9	57.1	5.4	43.3	43.5	9.5	33.5	33.8
15	-1.1	62.2	5.3	47.4	45.2	13.7	32.7	35.9
16	-0.3	66.6	7.3	47.9	45.2	15.7	28.7	34.9

17	0.9	71.7	2.9	51.8	48.1	22.1	32.8	35.8
18	2.0	77.5	1.4	52.9	54.6	25.6	28.1	36.3
19	2.6	82.3	2.4	55.6	62.1	27.6	27.6	36.1
20	2.5	85.5	4.9	61.3	62.5	34.1	29.0	33.3
21	2.9	89.7	7.5	60.3	60.4	32.4	0.0	30.7
22	3.4	93.7	10.0	58.2	58.9	30.9	0.0	29.1
23	4.0	99.3	13.5	56.2	55.9	30.4	0.0	25.6
24	4.3	102.6	15.6	56.6	0.0	29.4	0.0	24.6

Dycer Creek - Line 5

Spread A Points of emergence of refracted rays below target geophones for LINE5.SIP

Geo		SP A	SP B	SP C	SP D	SP E
---		----------L	----------L	----------L	----------L	----------L
1	X-Loc	-21.4 3	--- 1	0.7 3	1.2 3	1.1 3
	Elev	-16.3	---	-3.1	-8.0	-6.6
2	X-Loc	-15.3 3	2.3 2	8.1 3	10.0 3	9.8 3
	Elev	-16.4	9.0	-1.8	-6.9	-6.2
3	X-Loc	-11.1 3	7.0 2	10.6 3	12.7 3	12.7 3
	Elev	-17.9	8.1 ?	-2.3	-10.0	-10.1
4	X-Loc	-6.0 3	11.4 2	12.8 3	13.2 3	13.4 3
	Elev	-18.3	6.7 ?	-4.1	-10.1	-12.6
5	X-Loc	8.6 3	15.4 2	17.0 2	16.5 3	16.5 3
	Elev	-15.7	4.3	3.1	-10.4	-12.2
6	X-Loc	-5.1 3	19.2 2	21.0 2	27.3 3	27.9 3
	Elev	-17.8	1.3	-0.3	-15.4	-17.0
7	X-Loc	18.6 3	22.9 2	25.6 2	29.9 3	29.7 3
	Elev	-17.0	-1.3	-2.4	-16.4	-15.8
8	X-Loc	15.0 3	28.3 2	30.8 2	34.3 3	33.7 3
	Elev	-12.8	-2.6	-2.6	-16.1	-14.2
9	X-Loc	18.0 3	34.0 2	34.7 2	34.6 3	34.6 3
	Elev	-14.3	-2.2	-2.2	-16.6	-15.6
10	X-Loc	29.4 3	37.7 2	39.4 2	40.8 3	40.9 3
	Elev	-15.9	-2.5	-2.7	-15.8	-16.5
11	X-Loc	32.7 3	42.1 2	--- 1	52.2 3	51.9 3
	Elev	-16.7	-3.0	---	-17.5	-16.9
12	X-Loc	34.0 3	34.1 3	--- 1	49.5 2	56.0 3
	Elev	-15.9	-15.8	---	-2.8	-15.7
13	X-Loc	37.6 3	37.8 3	51.4 2	54.5 2	60.0 3
	Elev	-15.4	-15.3	-2.6	-2.3	-15.1
14	X-Loc	36.0 3	35.2 3	56.1 2	59.0 2	65.3 3
	Elev	-18.3	-19.0	-2.1	-1.7	-16.3
15	X-Loc	54.5 3	55.1 3	61.5 2	64.0 2	87.0 3
	Elev	-20.8	-19.3	-1.2	-0.8	-19.2
16	X-Loc	56.6 3	57.6 3	65.6 2	69.3 2	89.7 3
	Elev	-19.7	-17.7	-0.5	0.3	-19.1
17	X-Loc	58.8 3	60.5 3	71.4 2	72.7 2	94.1 3
	Elev	-21.4	-18.5	0.8	1.1	-20.1
18	X-Loc	65.5 3	64.5 3	68.9 3	77.9 2	96.2 3
	Elev	-20.9	-22.9	-14.4	2.1	-21.9
19	X-Loc	64.9 3	60.5 3	69.9 3	82.6 2	99.3 3
	Elev	-21.5	-27.6	-14.5	2.6	-22.9
20	X-Loc	60.6 3	59.3 3	65.8 3	87.2 2	101.7 3
	Elev	-25.6	-27.1	-19.4	2.4	-21.0
21	X-Loc	89.8 3	89.8 3	89.9 3	--- 1	100.5 3
	Elev	-22.7	-23.2	-16.3	---	-19.6
22	X-Loc	89.6 3	89.4 3	90.6 3	--- 1	105.7 3
	Elev	-20.8	-21.8	-14.5	---	-19.1
23	X-Loc	93.1 3	93.1 3	94.6 3	--- 1	111.5 3
	Elev	-17.5	-17.8	-12.4	---	-17.6
24	X-Loc	94.8 3	--- 0	97.1 3	--- 1	115.1 3
	Elev	-16.7	---	-10.2	---	-17.2

Spread A Points of entry of refracted rays below source shotpoints:

L=2	Right	X-Loc	---	-5.5	44.4	---	---
		Elev	---	11.0	-3.1	---	---

L=2	Left	X-Loc	---	---	42.5	103.4	---
		Elev	---	---	-3.0	4.4	---
L=3	Right	X-Loc	11.4	11.4	50.6	---	---
		Elev	-17.3*	-17.3	-15.1	---	---
L=3	Left	X-Loc	---	---	39.3	96.5	96.5
		Elev	---	---	-8.7	-16.0	-16.0*

Dycer Creek - Line 5

Spread A Depth and Elev of layers directly beneath SPs and Geos for LINE5.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
B	-6.0	16.3	5.7	10.6	34.8	-18.5
C	43.5	-1.2	1.8	-3.0	14.1	-15.3
D	106.4	16.3	11.4	4.9	35.7	-19.4
Geo						
1	0.0	15.2	6.2	9.0	28.4	-13.2
2	4.9	13.2	6.0	7.2	22.1	-8.9
3	8.7	10.5	4.6	5.9	18.4	-7.9
4	12.9	8.4	4.0	4.4	18.3	-9.9
5	17.2	5.9	3.0	2.9	19.2	-13.3
6	21.3	3.1	3.4	-0.3	17.9	-14.8
7	24.8	0.4	2.4	-2.0	16.3	-15.9
8	29.5	-0.3	2.3	-2.6	15.6	-15.9
9	34.3	-0.9	1.3	-2.2	15.1	-16.0
10	38.8	-0.4	2.2	-2.6	15.2	-15.6
11	43.5	-0.4	2.6	-3.0	14.9	-15.3
12	48.4	-0.7	2.1	-2.8	15.3	-16.0
13	52.6	1.3	3.8	-2.5	18.7	-17.4
14	57.1	1.3	3.2	-1.9	21.2	-19.9
15	62.2	2.1	3.2	-1.1	22.4	-20.3
16	66.6	4.1	4.4	-0.3	22.4	-18.3
17	71.7	2.6	1.7	0.9	17.8	-15.2
18	77.5	2.8	0.8	2.0	19.9	-17.1
19	82.3	4.0	1.4	2.6	22.6	-18.6
20	85.5	5.4	2.9	2.5	25.0	-19.6
21	89.7	7.5	4.6	2.9	27.2	-19.7
22	93.7	9.4	6.0	3.4	27.7	-18.3
23	99.3	11.9	7.9	4.0	27.9	-16.0
24	102.6	13.7	9.4	4.3	31.3	-17.6

LINE5.SIP

Velocities used, Spread A

	Layer 1	Layer 2	Layer 3
Vertical	600	1600	
Horizontal		1600	3630

SIPT2 V-4.1 --- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE6.SIP PRINT FILE: C:\DATA\DYCER\LINE6\LINE6.OUT RUN DATE AND TIME:
09-27-1998 at 09:22

TITLE: Dycer Creek - Line 6

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

Sprds	Exit	Layers	Elev V-Over	Horiz m/col	Time m/row	Time ms/col	Point 1 Elev	Point 1 X-Loc	Point 2 Elev	Point 2 X-Loc	Elevations Top	Elevations Bottom	Trace Off BLim	TLim	Print	SP Dip
1	6	3	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0 0

VELOCITY OVERRIDES for LINE6.SIP

	Spread 1	
Layer	Vv	Vh
3	4000	4000

SHOTPOINT AND GEOPHONE INPUT DATA for LINE6.SIP

Spread A, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 1, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	46.0	-53.0	0.0	0.0	0.0	0.0	0
B	19.9	-4.1	0.0	0.0	0.0	0.0	1
C	1.0	45.8	5.0	0.0	0.0	0.0	0
D	23.2	109.9	0.0	0.0	0.0	0.0	2
E	48.1	158.3	0.0	0.0	0.0	0.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A ---T---L	SP B ---T---L	SP C ---T---L	SP D ---T---L	SP E
1	17.8	0.0	0.0	17.0 2	4.3 1	62.5 3	61.0 3	67.5 3
2	15.5	4.0	0.0	20.0 2	5.0 2	62.0 3	58.0 3	66.5 3
3	12.4	8.2	0.0	23.0 2	5.3 2	59.5 3	57.0 3	65.5 3
4	11.1	12.5	0.0	24.5 2	6.0 2	58.0 3	55.0 3	65.0 3
5	8.8	16.2	0.0	23.0 2	8.3 2	58.0 3	55.0 3	63.0 3
6	6.7	21.5	0.0	24.5 2	11.3 2	55.0 2	59.0 3	66.5 3
7	4.6	25.7	0.0	26.5 2	11.8 2	46.0 2	58.8 3	69.5 3
8	2.4	31.7	0.0	27.5 2	13.3 2	37.5 1	60.0 3	70.5 3
9	2.1	36.6	0.0	30.0 2	13.8 2	18.0 1	60.0 3	70.5 3
10	1.8	41.4	0.0	30.0 2	15.5 2	15.0 1	59.0 3	71.0 3
11	2.4	45.8	0.0	35.0 2	21.5 2	8.5 1	56.0 3	71.5 3
12	4.5	51.0	0.0	39.5 2	27.3 2	12.0 1	58.0 3	71.5 3
13	5.6	55.7	0.0	45.0 2	31.0 2	15.0 2	56.0 3	67.0 3
14	6.4	60.1	0.0	46.5 2	34.8 2	19.0 2	56.5 3	68.0 3
15	7.0	64.3	0.0	47.5 2	35.8 2	21.5 2	55.0 3	66.5 3
16	8.0	69.3	0.0	50.5 2	39.0 2	24.5 2	53.0 3	62.0 3
17	9.4	74.1	0.0	53.5 2	40.5 2	27.3 2	52.0 3	59.5 3
18	10.9	78.9	0.0	57.0 2	43.8 2	32.5 2	51.0 3	63.5 3
19	12.4	83.6	0.0	60.5 2	44.2 2	34.5 2	50.5 3	65.0 3
20	14.4	88.1	0.0	65.0 3	51.8 3	40.5 2	50.0 3	65.0 3
21	16.3	92.7	0.0	64.0 3	52.3 3	43.5 2	44.0 2	66.0 3
22	18.0	97.0	0.0	64.5 3	53.0 3	44.5 3	38.0 2	64.5 3
23	20.0	101.8	0.0	64.8 3	51.3 3	45.0 3	23.0 1	60.5 3
24	20.9	104.8	0.0	63.8 3	51.5 3	45.0 3	16.0 1	58.0 3

Layer 1 Velocity from direct arrivals

Spread	A SP	Geo	DD	V	Avg V

```
 -- --- ------ ------ ------
 B   1    4.6   1071
                    1071
 C   8   15.0    401
 C   9   10.5    585
 C  10    6.7    447
 C  11    5.2    611
 C  12    8.0    668
                    542
 D  23    8.7    379
 D  24    5.6    350
                    364
```

Wtd Avg Velocity computed for Layer 1 = 564

Layer 2 Velocity computed by regression of raw uncorrected arrivals

```
 Spread A
   V    Ti   Geos <-SP-> Geos  Ti     V       Avg V  Avg Ti  Pts
 ------ ---- ----- --- ----- ---- ------  ------ ------ ---
                A    1 19 -17.5  1911       1911  -17.5   19
                B    2 19  -5.4  1766       1766  -5.4    18
  492  3.3  6  7   C   13 21  6.2  1342       1022   4.7    11
  771 20.0 21 22   D                          771  20.0     2
                                          ------  ---
                                  Avg =  1493   for   50 Pts
```

Layer 2 Velocity computed by Hobson-Overton method

```
 Spread A        Avg  Std Err  4 Highest Std Err at geophones
SPs Geos    V   TdSP Overall  Err Geo   Err Geo   Err Geo   Err Geo
--- ----- ------ ---- ------ ------- -------- -------- --------
A C  6  7   830-101.3 0.000  0.000  7 -0.000  6
B C  6  7   961 -47.2 0.000  0.000  6 -0.000  7
       ------
    Avg =   895 for  4 Pts
```

Wtd Avg Velocity computed for Layer 2 = 1410

Layer 3 Velocity computed by regression of raw uncorrected arrivals

```
 Spread A
   V    Ti   Geos <-SP-> Geos  Ti     V       Avg V  Avg Ti  Pts
 ------ ---- ----- --- ----- ---- ------  ------ ------ ---
                A   20 24  70.3  25876      25876   70.3     5
                B   20 24  55.8  26300      26300   55.8     5
 3469 48.5  1  5   C   22 24  41.1  15623       4898   44.8     8
10631 49.6  1 20   D                          10631   49.6    20
16825 59.3  1 24   E                          16825   59.3    24
                                          ------  ---
                                  Avg =  11645   for   62 Pts
```

Layer 3 Velocity computed by Hobson-Overton method

```
 Spread A        Avg  Std Err  4 Highest Std Err at geophones
SPs Geos    V   TdSP Overall  Err Geo   Err Geo   Err Geo   Err Geo
--- ----- ------ ---- ------ ------- -------- -------- --------
A E 20 24   4759 -16.0 1.522  2.029  20 -1.877  21 -1.664  22  0.886  24
B E 20 24   4989 -17.4 0.970  1.248  20 -1.150  21  1.054  24 -0.727  22
C E 22 24   2359 -14.0 0.057  0.080  23 -0.050  24 -0.030  22
       ----
    Avg =   4294 for  13 Pts
```

Wtd Avg Velocity computed for Layer 3 = 9473

Override Velocity assigned to Layer 3

Spread A
4000

Arrival times Td corrected to datum. (Datum Elev = 6.411 + 0.068x) for LINE6.SIP

Spread A				SP A	SP B	SP C	SP D	SP E
Datum Elev				2.8	6.1	9.5	13.8	17.1
Geo	.	X-Loc	Cor T	0.0	-24.4	15.1	-16.6	0.0
				--Td--	--Td--	--Td--	--Td--	--Td--
1	6.4	0.0	-20.2	-3.2	-40.3	57.4	24.2	47.3
2	6.7	4.0	-15.6	4.4	-35.0	61.4	25.8	50.9
3	7.0	8.2	-9.6	13.4	-28.7	65.0	30.8	55.9
4	7.3	12.5	-6.8	17.7	-25.2	66.3	31.6	58.2
5	7.5	16.2	-2.3	20.7	-18.4	70.8	36.1	60.7
6	7.9	21.5	2.1	26.6	-11.0	72.2	44.5	68.6
7	8.1	25.7	6.3	32.8	-6.3	67.4	48.5	75.8
8	8.6	31.7	10.9	38.4	-0.2	63.5	54.3	81.4
9	8.9	36.6	12.0	42.0	1.4	45.1	55.4	82.5
10	9.2	41.4	13.1	43.1	4.2	43.2	55.5	84.1
11	9.5	45.8	12.6	47.6	9.7	36.2	52.0	84.1
12	9.9	51.0	9.5	49.0	12.4	36.6	50.9	81.0
13	10.2	55.7	8.1	53.1	14.7	38.2	47.5	75.1
14	10.5	60.1	7.2	53.7	17.6	41.3	47.1	75.2
15	10.8	64.3	6.7	54.2	18.1	43.3	45.1	73.2
16	11.1	69.3	5.5	56.0	20.1	45.1	41.9	67.5
17	11.4	74.1	3.6	57.1	19.7	46.0	39.0	63.1
18	11.7	78.9	1.5	58.5	20.9	49.1	35.9	65.0
19	12.1	83.6	-0.6	59.9	19.2	49.0	33.3	64.4
20	12.4	88.1	-3.6	61.4	23.8	52.0	29.8	61.4
21	12.7	92.7	-6.4	57.6	21.5	52.2	21.0	59.6
22	13.0	97.0	-8.9	55.6	19.7	50.7	12.5	55.6
23	13.3	101.8	-11.9	52.9	15.0	48.2	-5.5	48.6
24	13.5	104.8	-13.1	50.7	14.0	47.0	-13.7	44.9

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE6.SIP

Spread A				SP A	SP B	SP C	SP D	SP E
Elev				0.0	-1.6	-0.4	15.2	0.0
Geo	.	X-Loc	Cor T	38.2	38.2	2.5	14.2	14.2
				--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	-1.5	0.0	34.3	-69.7	0.0	25.7	12.5	8.3
2	-1.3	4.0	29.8	-62.2	-63.0	29.7	14.1	11.8
3	-1.7	8.2	26.9	-56.3	-59.8	30.1	15.9	13.7
4	-2.0	12.5	24.0	-51.9	-56.2	31.5	16.8	16.1
5	-2.4	16.2	21.5	-50.9	-51.4	34.0	19.4	16.6
6	-2.9	21.5	17.9	-45.8	-44.8	34.6	27.0	23.7
7	-3.2	25.7	15.0	-40.9	-41.4	28.5	29.6	29.6
8	-3.8	31.7	10.9	-35.8	-35.8	0.0	34.9	34.7
9	-2.6	36.6	8.9	-31.3	-33.3	0.0	37.0	36.7
10	-1.5	41.4	6.9	-29.3	-29.6	0.0	38.0	39.3
11	-0.4	45.8	5.0	-22.4	-21.7	0.0	36.8	41.6
12	1.1	51.0	5.2	-18.1	-16.1	0.0	38.6	41.4
13	2.6	55.7	5.4	-12.8	-12.6	7.1	36.4	36.7
14	3.8	60.1	4.5	-10.4	-7.9	11.9	37.8	38.6
15	5.1	64.3	3.3	-8.3	-5.7	15.6	37.5	38.3
16	6.5	69.3	2.7	-4.6	-1.9	19.3	36.1	34.4
17	7.7	74.1	3.0	-1.9	-0.7	21.8	34.8	31.6
18	9.0	78.9	3.3	1.3	2.3	26.6	33.5	35.3
19	9.9	83.6	4.4	3.7	1.7	27.6	32.0	35.8
20	10.4	88.1	7.1	7.2	6.5	30.8	28.7	33.0
21	11.3	92.7	8.8	4.5	5.3	32.1	21.0	32.3
22	12.4	97.0	9.9	4.0	4.9	32.1	13.9	29.7

23	13.4	101.8	11.7	2.5	1.4	30.8	0.0	24.0
24	14.0	104.8	12.2	1.0	1.2	30.3	0.0	21.0

Dycer Creek - Line 6

Spread A Points of emergence of refracted rays below target geophones for LINE6.SIP

Geo		SP A	SP B	SP C	SP D	SP E
1	X-Loc	-7.5 2	--- 1	0.7 3	0.2 3	0.2 3
	Elev	-0.2 ?	---	-8.5	8.6 ?	8.6 ?
2	X-Loc	-2.6 2	-2.6 2	2.7 3	4.8 3	4.8 3
	Elev	-0.1 ?	-0.1 ?	-12.1	8.0 ?	8.0 ?
3	X-Loc	0.8 2	0.8 2	18.7 3	-0.4 3	-0.4 3
	Elev	-0.2 ?	-0.2 ?	-12.8	11.5 ?	11.5 ?
4	X-Loc	4.3 2	4.3 2	17.6 3	8.3 3	8.1 3
	Elev	-0.9 ?	-0.9 ?	-14.5	12.0 ?	12.6 ?
5	X-Loc	9.0 2	9.0 2	21.4 3	13.7 3	12.9 3
	Elev	-1.8 ?	-1.8 ?	-17.9 ?	8.3	11.0 ?
6	X-Loc	14.9 2	14.9 2	29.0 2	21.1 3	21.0 3
	Elev	-2.9 ?	-2.9 ?	-4.3	1.6	4.6
7	X-Loc	19.9 2	19.9 2	32.1 2	25.0 3	25.1 3
	Elev	-3.9 ?	-3.9 ?	-3.7	-2.7	-2.0
8	X-Loc	30.2 2	30.2 2	--- 1	34.0 3	33.9 3
	Elev	-4.1 ?	-4.1 ?	---	-10.4	-9.6
9	X-Loc	35.7 2	35.7 2	--- 1	41.6 3	41.3 3
	Elev	-2.9 ?	-2.9 ?	---	-12.8	-12.0
10	X-Loc	40.8 2	40.8 2	--- 1	46.5 3	46.6 3
	Elev	-1.7 ?	-1.7 ?	---	-14.3	-14.6
11	X-Loc	45.3 2	45.3 2	--- 1	53.7 3	55.3 3
	Elev	-0.6 ?	-0.6 ?	---	-12.8	-15.7
12	X-Loc	50.6 2	50.6 2	--- 1	59.2 3	59.9 3
	Elev	1.0 ?	1.0 ?	---	-13.6	-15.0
13	X-Loc	55.3 2	55.3 2	55.3 2	65.1 3	64.8 3
	Elev	2.4 ?	2.4 ?	2.4	-12.3	-11.8
14	X-Loc	59.8 2	59.8 2	59.8 2	75.2 3	75.1 3
	Elev	3.7 ?	3.7 ?	3.7	-11.7	-11.6
15	X-Loc	64.1 2	64.1 2	64.1 2	78.5 3	78.4 3
	Elev	5.1 ?	5.1 ?	5.1	-11.2	-11.1
16	X-Loc	69.1 2	69.1 2	69.1 2	82.8 3	81.3 3
	Elev	6.4 ?	6.4 ?	6.4	-9.5	-7.6
17	X-Loc	73.8 2	73.8 2	73.8 2	85.9 3	83.8 3
	Elev	7.6 ?	7.6 ?	7.6	-8.8	-5.8
18	X-Loc	78.6 2	78.6 2	78.6 2	85.8 3	86.0 3
	Elev	9.0 ?	9.0 ?	9.0	-8.4	-9.0
19	X-Loc	83.1 2	83.1 2	83.1 2	94.8 3	96.1 3
	Elev	9.9 ?	9.9 ?	9.9	-6.6	-8.7
20	X-Loc	88.1 3	88.3 3	86.0 2	96.9 3	98.1 3
	Elev	10.6	10.9 ?	10.0	-4.7	-7.2
21	X-Loc	93.2 3	93.2 3	92.2 2	95.9 2	102.0 3
	Elev	11.8 ?	11.8 ?	11.2	12.2	-7.2
22	X-Loc	97.3 3	97.3 3	92.4 3	100.3 2	110.5 3
	Elev	12.5 ?	12.5 ?	-3.9	13.1	-5.1
23	X-Loc	101.9 3	101.9 3	97.4 3	--- 1	113.5 3
	Elev	13.7 ?	13.7 ?	-0.9	---	-0.8
24	X-Loc	104.4 3	104.4 3	99.1 3	--- 1	115.6 3
	Elev	13.5 ?	13.5 ?	0.2	---	1.4

Spread A Points of entry of refracted rays below source shotpoints:

L=2	Right X-Loc	5.8	5.8	46.8	---	---
	Elev	-1.2*	-1.2	-0.2	---	---
L=2	Left X-Loc	---	---	45.5	108.3	---
	Elev	---	---	-0.5	14.8	---
L=3	Right X-Loc	1.6	1.6	52.2	---	---
	Elev	2.3*	2.3	-11.1	---	---
L=3	Left X-Loc	---	---	37.8	101.3	101.3

Elev	---	---	-20.6	-1.4	-1.4*

Dycer Creek - Line 6

Spread A Depth and Elev of layers directly beneath SPs and Geos for LINE6.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
B	-4.1	19.9	21.5	-1.6	21.5	-1.6
C	45.8	1.0	1.4	-0.4	15.2	-14.2
D	109.9	23.2	8.0	15.2	26.3	-3.1
Geo						
1	0.0	17.8	19.3	-1.5	20.1	-2.3
2	4.0	15.5	16.8	-1.3	18.9	-3.4
3	8.2	12.4	14.1	-1.7	16.0	-3.6
4	12.5	11.1	13.1	-2.0	14.9	-3.8
5	16.2	8.8	11.2	-2.4	12.8	-4.0
6	21.5	6.7	9.6	-2.9	11.0	-4.3
7	25.7	4.6	7.8	-3.2	9.9	-5.3
8	31.7	2.4	6.2	-3.8	10.7	-8.3
9	36.6	2.1	4.7	-2.6	15.1	-13.0
10	41.4	1.8	3.3	-1.5	16.2	-14.4
11	45.8	2.4	2.8	-0.4	16.6	-14.2
12	51.0	4.5	3.4	1.1	18.2	-13.7
13	55.7	5.6	3.0	2.6	19.3	-13.7
14	60.1	6.4	2.6	3.8	19.7	-13.3
15	64.3	7.0	1.9	5.1	19.3	-12.3
16	69.3	8.0	1.5	6.5	19.8	-11.8
17	74.1	9.4	1.7	7.7	20.8	-11.4
18	78.9	10.9	1.9	9.0	21.2	-10.3
19	83.6	12.4	2.5	9.9	19.7	-7.3
20	88.1	14.4	4.0	10.4	19.5	-5.1
21	92.7	16.3	5.0	11.3	20.2	-3.9
22	97.0	18.0	5.6	12.4	21.5	-3.5
23	101.8	20.0	6.6	13.4	23.6	-3.6
24	104.8	20.9	6.9	14.0	24.3	-3.4

LINE6.SIP

Velocities used, Spread A

	Layer 1	Layer 2	Layer 3
	---	---	---
Vertical	564	1410	
Horizontal		1410	4000

SIPT2 V-4.1 --- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE7.SIP PRINT FILE: C:\DATA\DYCER\LINE7\LINE7.OUT RUN DATE AND TIME: 09-27-1998 at 13:59

TITLE: DYCER CREEK LINE 7

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

Sprds	Exit	Layers	Elev V-Over	Horiz m/col	Time m/row	Time ms/col	Point 1 Elev	Point 1 X-Loc	Point 2 Elev	Point 2 X-Loc	Elevations Top	Elevations Bottom	Trace Off L BLim	TLim	Print	SP Dip
1	6	3	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0 0

VELOCITY OVERRIDES for LINE7.SIP

	Spread 1	
Layer	Vv	Vh
1	600	600
2	1200	1200
3	4000	4000

SHOTPOINT AND GEOPHONE INPUT DATA for LINE7.SIP

Spread 1, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 0, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	52.1	-52.5	0.0	0.0	0.0	0.0	0
B	25.3	-4.5	0.0	0.0	0.0	0.0	1
C	8.0	46.1	5.0	0.0	0.0	0.0	0
D	31.5	107.1	0.0	0.0	0.0	0.0	2
E	57.1	155.9	0.0	0.0	0.0	0.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A ---T---L	SP B ---T---L	SP C ---T---L	SP D ---T---L	SP E
1	23.0	0.0	0.0	51.0 3	7.0 1	35.3 2	46.5 0	65.5 3
2	20.8	4.8	0.0	52.0 3	9.5 2	32.0 2	48.0 0	65.0 3
3	19.9	9.6	0.0	54.0 3	16.5 2	31.8 2	50.5 2	64.5 3
4	19.1	14.9	0.0	55.0 3	25.5 2	29.3 2	49.0 2	62.3 3
5	16.5	19.9	0.0	57.0 3	31.0 2	22.7 2	42.5 2	58.0 3
6	14.8	23.9	0.0	60.5 3	33.5 2	18.8 2	37.5 2	53.3 3
7	13.1	28.3	0.0	63.5 3	35.0 2	15.0 2	31.5 2	49.0 3
8	10.8	32.4	0.0	65.0 3	39.5 2	13.0 2	29.0 2	44.5 3
9	9.2	36.1	0.0	64.4 3	41.0 2	9.0 2	28.0 2	41.0 3
10	8.2	42.3	0.0	66.0 3	43.0 2	5.0 2	23.5 2	37.5 3
11	8.5	46.1	0.0	63.5 3	42.5 2	3.0 2	20.5 2	36.0 3
12	8.4	52.7	0.0	63.0 3	43.5 2	7.5 1	18.3 2	33.5 3
13	9.3	56.3	0.0	62.0 3	44.0 2	12.5 2	18.0 2	32.5 3
14	10.1	61.1	0.0	59.0 3	47.5 2	15.3 2	17.8 2	32.0 3
15	10.5	65.3	0.0	57.5 3	50.5 2	18.5 2	19.0 2	33.5 3
16	11.2	69.7	0.0	57.0 3	47.0 2	16.3 2	14.0 2	28.5 3
17	10.8	72.3	0.0	57.5 3	44.5 2	13.5 2	11.0 2	26.0 3
18	13.3	79.5	0.0	58.0 3	45.0 2	15.3 2	7.5 2	21.8 3
19	15.2	83.2	0.0	59.0 3	44.5 2	15.5 2	6.5 2	21.0 3
20	17.9	87.5	0.0	60.5 3	45.5 2	17.0 2	6.0 2	19.5 3
21	19.8	91.7	0.0	61.5 3	46.5 2	18.0 2	5.0 2	20.5 3
22	23.1	94.6	0.0	62.0 3	47.0 2	18.8 2	4.5 2	19.5 3
23	26.9	98.7	0.0	63.0 3	53.5 2	23.8 2	5.0 2	22.0 3
24	28.9	102.9	0.0	65.5 3	53.0 2	21.5 2	4.0 1	21.0 3

Layer 1 Velocity from direct arrivals

Spread 1	SP	Geo	DD	V	Avg V

```
          -- --- ------ ----- -----
          B   1    4.5   643
                             643
          C  12    6.0   801
                             801
          D  24    4.2  1050
                            1050
-----------------------------------------
Wtd Avg Velocity computed for Layer 1 =   831
-----------------------------------------
Override Velocity assigned to Layer 1

 Spread       1
          -----
            600
-----------------------------------------------------------------------
```

Layer 2 Velocity computed by regression of raw uncorrected arrivals

```
 Spread 1
   V    Ti   Geos <-SP-> Geos  Ti     V       Avg V  Avg Ti  Pts
 ----- ---- ----- --- ----- --- -----  ------ ------ ------ ---
               B    2 24  20.7   2886      2886   20.7   23
  1253  -1.4  1 11   C   13 24  11.9   5758      2117    5.3   23
  1763  -5.5  3 23   D                      1763   -5.5   21
                                  ------      ---
                              Avg =  2179   for   67 Pts
```

Layer 2 Velocity computed by Hobson-Overton method

```
 Spread 1         Avg  Std Err  4 Highest Std Err at geophones
SPs  Geos    V    TdSP Overall  Err  Geo   Err  Geo   Err  Geo   Err  Geo
-- ----- ------ --- ------- -------- ---- -------- ---- -------- ---- ----
B C  2 11   1218  8.9 2.966 -5.152  11   3.784   5   3.714   6  -3.337   3
B D  3 23   2327 15.7 7.288 -18.705  3  -12.611   4   9.725  10   9.204  11
C D 13 23    3383  5.9 0.768  1.852  23  -0.981  21  -0.734  22   0.642  18
       -----
    Avg =  2340 for  42 Pts

-----------------------------------
Wtd Avg Velocity computed for Layer 2 =   2269
-----------------------------------------------------------------------
Override Velocity assigned to Layer 2

 Spread       1
          -----
            1200
-----------------------------------------------------------------------
```

Layer 3 Velocity computed by regression of raw uncorrected arrivals

```
 Spread 1
   V    Ti   Geos <-SP-> Geos  Ti     V       Avg V  Avg Ti  Pts
 ------ ---- ----- --- ----- --- ------  ------ ------ ------ ---
               A    1 24  52.6  13853     13853   52.6   24
  1751  -17.5  1 24   E                     1751  -17.5   24
                                  -----       ---
                              Avg =  3109   for   48 Pts
```

Layer 3 Velocity computed by Hobson-Overton method

```
 Spread 1         Avg  Std Err  4 Highest Std Err at geophones
SPs  Geos    V    TdSP Overall  Err  Geo   Err  Geo   Err  Geo   Err  Geo
-- ----- ------ --- ------- -------- ---- -------- ---- -------- ---- ----
A E  1 24   3066 20.8 6.301 12.485  10  10.946   9  10.028   8   9.289  11
       -----
    Avg =  3066 for  24 Pts

-----------------------------------
Wtd Avg Velocity computed for Layer 3 =   3088
```

Override Velocity assigned to Layer 3

Spread	1
	4000

Arrival times Td corrected to datum. (Datum Elev = 13.911 + 0.030x) for LINE7.SIP

Spread 1				SP A	SP B	SP C	SP D	SP E
Datum Elev				12.6	13.8	15.3	16.7	18.0
Geo	.	X-Loc	Cor T	0.0	-19.2	12.2	-24.6	0.0
---	---	---	---	--Td--	--Td--	--Td--	--Td--	--Td--
1	13.9	0.0	-15.1	35.9	-27.3	32.3	6.8	50.4
2	14.0	4.3	-11.3	40.7	-20.9	32.9	12.1	53.7
3	14.2	9.0	-9.5	44.5	-12.2	34.4	16.4	55.0
4	14.3	14.2	-7.9	47.1	-1.6	33.5	16.5	54.4
5	14.5	18.5	-3.4	53.6	8.4	31.5	14.5	54.6
6	14.6	22.1	-0.4	60.1	14.0	30.6	12.5	52.9
7	14.7	26.2	2.7	66.2	18.5	29.8	9.6	51.7
8	14.8	29.6	6.7	71.7	27.0	31.8	11.1	51.2
9	14.9	32.9	9.5	73.9	31.3	30.7	12.9	50.5
10	15.1	39.0	11.5	77.5	35.3	28.6	10.4	49.0
11	15.2	42.8	11.2	74.7	34.5	26.3	7.1	47.2
12	15.4	49.4	11.7	74.7	36.0	31.3	5.4	45.2
13	15.5	52.9	10.3	72.3	35.2	35.0	3.7	42.8
14	15.6	57.6	9.2	68.2	37.6	36.7	2.4	41.2
15	15.8	61.8	8.8	66.3	40.1	39.4	3.2	42.3
16	15.9	66.2	7.8	64.8	35.7	36.3	-2.8	36.3
17	16.0	68.7	8.6	66.1	33.9	34.3	-5.0	34.6
18	16.2	75.5	4.8	62.8	30.6	32.2	-12.3	26.6
19	16.3	78.6	1.8	60.8	27.1	29.4	-16.3	22.8
20	16.4	82.0	-2.5	58.0	23.8	26.6	-21.1	17.0
21	16.5	85.7	-5.5	56.0	21.8	24.6	-25.1	15.0
22	16.5	85.7	-11.0	51.0	16.8	19.9	-31.1	8.5
23	16.5	87.3	-17.3	45.7	17.0	18.7	-36.9	4.7
24	16.6	91.0	-20.4	45.1	13.4	13.2	-41.0	0.6

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE7.SIP

Spread 1				SP A	SP B	SP C	SP D	SP E
Elev				0.0	23.7	7.1	25.2	0.0
Geo	.	X-Loc	Cor T	2.6	2.6	1.4	10.6	10.6
---	---	---	---	--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	22.4	0.0	1.1	47.3	0.0	32.8	0.0	53.9
2	20.8	4.3	0.0	49.4	6.9	30.6	0.0	54.4
3	19.6	9.0	0.4	50.9	13.4	29.9	39.5	53.5
4	17.7	14.2	2.3	50.0	20.5	25.5	36.1	49.4
5	16.1	18.5	0.7	53.7	27.7	20.6	31.3	46.8
6	14.7	22.1	0.1	57.7	30.7	17.2	26.8	42.6
7	12.7	26.2	0.7	60.1	31.6	12.8	20.2	37.7
8	10.5	29.6	0.5	61.9	36.4	11.1	18.0	33.5
9	8.6	32.9	1.0	60.8	37.4	6.6	16.4	29.4
10	7.9	39.0	0.5	62.9	39.9	3.1	12.5	26.5
11	7.4	42.8	1.8	59.1	38.1	-0.2	8.2	23.7
12	6.8	49.4	2.6	57.7	38.2	0.0	5.1	20.3
13	6.8	52.9	4.2	55.1	37.1	6.8	3.2	17.7
14	7.0	57.6	5.1	51.2	39.7	8.7	2.1	16.3
15	7.8	61.8	4.5	50.3	43.3	12.5	3.9	18.4
16	9.4	66.2	3.1	51.3	41.3	11.8	0.4	14.9
17	10.8	68.7	0.0	54.9	41.9	12.1	0.4	15.4
18	13.3	75.5	0.0	55.4	42.4	13.9	-3.1	11.2
19	15.2	78.6	0.0	56.4	41.9	14.1	-4.1	10.4

20	17.9	82.0	0.0	57.9	42.9	15.6	-4.6	8.9
21	19.8	85.7	0.0	58.9	43.9	16.6	-5.6	9.9
22	19.8	85.7	5.5	53.9	38.9	11.9	-11.6	3.4
23	22.2	87.3	7.9	52.5	43.0	14.5	-13.4	3.6
24	23.6	91.0	8.8	54.0	41.5	11.2	0.0	1.6

DYCER CREEK LINE 7

Spread 1 Points of emergence of refracted rays below target geophones for LINE7.SIP

Geo		SP A	SP B	SP C	SP D	SP E
---		---------L	---------L	---------L	---------L	---------L
1	X-Loc	-9.3 3	— 1	0.1 2	--- 0	7.2 3
	Elev	-5.9	---	22.4	---	-11.9
2	X-Loc	-4.8 3	4.3 2	4.3 2	— 0	5.3 3
	Elev	-7.3	20.8	20.8	---	-12.8
3	X-Loc	0.0 3	8.8 2	9.0 2	9.0 2	21.5 3
	Elev	-8.0	19.7	19.6	19.6 ?	-15.4
4	X-Loc	3.1 3	13.1 2	14.5 2	14.5 2	19.4 3
	Elev	-7.8	18.1	17.6	17.6 ?	-14.6
5	X-Loc	6.9 3	18.1 2	18.6 2	18.6 2	29.4 3
	Elev	-10.5	16.2	16.1	16.1 ?	-14.4
6	X-Loc	3.9 3	22.0 2	22.2 2	22.2 2	28.6 3
	Elev	-12.3	14.7	14.7	14.7 ?	-13.1
7	X-Loc	8.7 3	25.8 2	26.2 2	26.2 2	34.8 3
	Elev	-15.1	12.9	12.7	12.7 ?	-11.7
8	X-Loc	21.9 3	29.3 2	29.6 2	29.6 2	43.8 3
	Elev	-17.6	10.6	10.5	10.5 ?	-9.1
9	X-Loc	27.3 3	32.3 2	33.3 2	33.3 2	45.5 3
	Elev	-17.3	8.8	8.4	8.4 ?	-8.3
10	X-Loc	32.0 3	38.9 2	39.2 2	39.2 2	52.2 3
	Elev	-17.8	7.9	7.9	7.9 ?	-5.6
11	X-Loc	43.1 3	42.1 2	43.3 2	43.3 2	54.4 3
	Elev	-14.2	7.5	7.4	7.4 ?	-4.2
12	X-Loc	52.3 3	48.3 2	— 1	50.4 2	58.9 3
	Elev	-10.5	6.8	---	6.7 ?	-2.4
13	X-Loc	55.4 3	51.5 2	51.5 2	54.4 2	60.6 3
	Elev	-7.3	6.7	6.7	6.8 ?	-1.1
14	X-Loc	59.7 3	56.0 2	56.0 2	59.9 2	63.1 3
	Elev	-2.5	6.9	6.9	7.2 ?	-0.9
15	X-Loc	62.1 3	60.5 2	60.5 2	64.3 2	70.8 3
	Elev	-0.6	7.3	7.3	8.6 ?	-1.4
16	X-Loc	65.5 3	65.9 2	65.9 2	67.7 2	73.7 3
	Elev	0.5	9.2	9.2	10.2 ?	1.5
17	X-Loc	69.4 3	68.7 2	68.7 2	68.7 2	76.7 3
	Elev	0.2	10.8 ?	10.8	10.8 ?	2.5
18	X-Loc	76.9 3	75.5 2	75.5 2	75.5 2	81.7 3
	Elev	4.1	13.3 ?	13.3	13.3 ?	6.9
19	X-Loc	80.1 3	78.6 2	78.6 2	78.6 2	84.6 3
	Elev	6.2	15.2 ?	15.2	15.2	9.1
20	X-Loc	83.5 3	82.0 2	82.0 2	82.0 2	87.1 3
	Elev	8.9	17.9 ?	17.9	17.9	12.4
21	X-Loc	87.0 3	85.7 2	85.7 2	85.7 2	91.6 3
	Elev	11.8	19.8 ?	19.8	19.8	13.8
22	X-Loc	87.4 3	85.5 2	85.5 2	87.1 2	90.4 3
	Elev	15.7	19.7 ?	19.7 ?	22.1	17.6
23	X-Loc	88.9 3	87.0 2	87.0 2	91.7 2	93.1 3
	Elev	19.8	21.5 ?	21.5 ?	23.8	19.8
24	X-Loc	92.8 3	89.9 2	89.9 2	— 1	97.1 3
	Elev	22.1	23.1 ?	23.1 ?	---	21.4

Spread 1 Points of entry of refracted rays below source shotpoints:

L=2 Right	X-Loc	---	-3.6	46.5	---	---
	Elev	---	23.6	7.0	---	---
L=2 Left	X-Loc	---	---	45.5	94.3	---

	Elev	---	---	7.1	25.0	---	
L=3	Right X-Loc	6.5	6.5	---	---	---	
	Elev	-10.1*	-10.1	---	---	---	
L=3	Left X-Loc	---	---	---	93.1	93.1	
	Elev	---	---	---	24.3	24.3*	

DYCER CREEK LINE 7

Spread 1 Depth and Elev of layers directly beneath SPs and Geos for LINE7.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
B	-3.9	25.3	1.6	23.7	33.0	-7.7
C	46.1	8.0	0.9	7.1	17.5	-9.5
D	94.3	31.5	6.7	24.8	11.3	20.2
Geo						
1	0.0	23.0	0.6	22.4	32.1	-9.1
2	4.3	20.8	0.0	20.8	31.5	-10.7
3	9.0	19.9	0.3	19.6	32.5	-12.6
4	14.2	19.1	1.4	17.7	33.2	-14.1
5	18.5	16.5	0.4	16.1	31.7	-15.2
6	22.1	14.8	0.1	14.7	30.5	-15.7
7	26.2	13.1	0.4	12.7	28.6	-15.5
8	29.6	10.8	0.3	10.5	26.3	-15.5
9	32.9	9.2	0.6	8.6	24.0	-14.8
10	39.0	8.2	0.3	7.9	20.3	-12.1
11	42.8	8.5	1.1	7.4	19.1	-10.6
12	49.4	8.4	1.6	6.8	16.9	-8.5
13	52.9	9.3	2.5	6.8	15.9	-6.6
14	57.6	10.1	3.1	7.0	14.0	-3.9
15	61.8	10.5	2.7	7.8	11.7	-1.2
16	66.2	11.2	1.8	9.4	11.6	-0.4
17	68.7	10.8	0.0	10.8	10.6	0.2
18	75.5	13.3	0.0	13.3	10.6	2.7
19	78.6	15.2	0.0	15.2	10.3	4.9
20	82.0	17.9	0.0	17.9	10.5	7.4
21	85.7	19.8	0.0	19.8	8.9	10.9
22	85.7	23.1	3.3	19.8	12.2	10.9
23	87.3	26.9	4.7	22.2	13.1	13.8
24	91.0	28.9	5.4	23.5	11.7	17.2

LINE7.SIP

Velocities used, Spread 1

	Layer 1	Layer 2	Layer 3
Vertical	600	1200	
Horizontal		1200	4000

SIPT2 V-4.1 --- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE8.SIP PRINT FILE: C:\DATA\DYCER\LINE8\LINE8.OUT RUN DATE AND TIME: 09-27-1998 at 15:34

TITLE: DYCER CREEK LINE 8

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

Sprds	Exit	Layers	Elev V-Over	Horiz m/col	Time m/row	Time ms/col	Point 1 Elev	Point 1 X-Loc	Point 2 Elev	Point 2 X-Loc	Elevations Top	Elevations Bottom	Trace Off BLim	Trace Off TLim	Print	SP Dip
1	6	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0 0

SHOTPOINT AND GEOPHONE INPUT DATA for LINE8.SIP

Spread 1, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 0, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	51.8	-53.0	0.0	0.0	0.0	0.0	0
B	24.8	-5.0	0.0	0.0	0.0	0.0	1
C	10.9	47.6	5.0	0.0	0.0	0.0	0
D	28.2	114.1	0.0	0.0	0.0	0.0	2
E	49.3	164.7	0.0	0.0	0.0	5.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A ---T---L	SP B ---T---L	SP C ---T---L	SP D ---T---L	SP E
1	23.6	0.0	0.0	66.0 2	1.5 0	38.5 3	53.0 3	64.5 3
2	22.1	4.5	0.0	74.5 3	24.0 1	37.5 3	52.8 3	65.0 3
3	20.7	9.1	0.0	76.5 3	35.5 2	35.3 3	51.3 3	63.5 3
4	19.2	13.7	0.0	76.5 3	46.0 2	31.5 3	48.3 3	60.3 3
5	17.6	18.4	0.0	78.0 3	48.0 3	27.5 3	46.0 3	58.8 3
6	15.7	23.4	0.0	74.0 3	48.0 3	20.5 2	41.0 3	52.3 3
7	14.8	27.5	0.0	73.5 3	51.5 3	17.0 2	37.5 3	50.3 3
8	12.9	33.4	0.0	71.5 3	52.0 3	13.0 2	33.0 3	45.0 3
9	11.6	37.8	0.0	68.5 3	52.5 3	9.0 2	29.0 3	42.0 3
10	9.8	42.5	0.0	67.0 3	51.0 3	9.0 2	25.0 3	39.0 3
11	9.8	47.6	0.0	68.2 3	50.0 3	9.0 1	23.0 3	36.0 3
12	9.7	52.7	0.0	65.0 3	50.5 3	10.0 1	22.0 3	33.0 3
13	10.1	57.4	0.0	64.5 3	51.5 3	12.5 2	20.5 3	32.0 3
14	10.8	62.1	0.0	67.5 3	53.0 3	12.0 2	17.5 3	31.0 3
15	13.4	66.3	0.0	68.5 3	52.5 3	15.0 2	14.5 3	28.8 3
16	14.4	70.9	0.0	69.0 3	54.5 3	17.0 2	14.8 3	27.3 3
17	16.2	76.1	0.0	71.0 3	55.5 3	19.5 2	13.5 3	26.3 3
18	17.7	80.7	0.0	72.0 3	55.5 3	20.0 3	12.0 3	25.8 3
19	19.0	85.4	0.0	73.0 3	57.5 3	21.0 3	9.5 3	23.8 3
20	20.8	90.6	0.0	73.5 3	58.0 3	22.0 3	8.8 3	22.3 3
21	21.7	95.4	0.0	74.0 3	58.0 3	22.5 3	8.3 3	21.3 3
22	22.6	100.2	0.0	75.5 3	58.0 3	24.5 3	7.8 3	20.8 3
23	24.3	104.5	0.0	75.5 3	59.5 3	23.8 3	5.5 3	19.8 3
24	25.9	109.5	0.0	77.5 3	60.5 3	25.8 3	5.3 2	19.5 3

Layer 1 Velocity from direct arrivals

Spread 1	SP	Geo	DD	V	Avg V
	B	2	9.5	395	
					395
	C	11	5.6	626	
	C	12	5.8	583	
					604

Wtd Avg Velocity computed for Layer 1 = 535

Layer 2 Velocity computed by regression of raw uncorrected arrivals

Spread 1

V	Ti	Geos	<-SP->	Geos	Ti	V	Avg V	Avg Ti	Pts
		B	3 4	3.3	438	438	3.3	2	
1428	1.4	6 10	C	13 17	7.4	2174	1724	4.4	10
						Avg = 1157	for	12 Pts	

Layer 2 Velocity computed by Hobson-Overton method

Not enough points.

Wtd Avg Velocity computed for Layer 2 = 1157

Layer 3 Velocity computed by regression of raw uncorrected arrivals

Spread 1

V	Ti	Geos	<-SP->	Geos	Ti	V	Avg V	Avg Ti	Pts
		A	2 24	72.6	150784	150784	72.6	23	
		B	5 24	44.9	7433	7433	44.9	20	
1621	9.1	1 5	C	18 24	14.2	5191	2707	11.7	12
1944	-5.1	1 23	D			1944	-5.1	23	
2057	-14.5	1 24	E			2057	-14.5	24	
						Avg = 3314	for	102 Pts	

Layer 3 Velocity computed by Hobson-Overton method

Spread 1 SPs	Geos	V	TdSP	Avg Std Err Overall	Err Geo	4 Highest Std Err at geophones Err Geo	Err Geo	Err Geo	Err Geo
A C	2 5	2056	30.9	0.375	-0.602	4 0.397	5 0.201	2 0.004	3
A D	2 23	3920	35.4	1.602	-4.654	13 -3.431	12 2.177	19 1.832	5
A E	2 24	4042	35.3	1.223	-3.088	13 -2.186	2 1.723	8 -1.448	12
B D	5 23	3404	29.1	2.890	-7.114	5 -4.854	6 -4.319	22 3.673	10
B E	5 24	3592	30.1	2.950	-8.317	5 -4.332	6 -4.100	24 3.086	9
C D	18 23	4894	9.3	0.537	0.844	19 -0.749	18 -0.506	21 0.436	20
C E	18 24	4910	5.9	0.590	-0.865	18 0.791	22 -0.645	23 0.637	20

Avg = 3838 for 101 Pts

Wtd Avg Velocity computed for Layer 3 = 3662

Arrival times Td corrected to datum. (Datum Elev = 15.030 + 0.035x) for LINE8.SIP

Spread 1				SP A	SP B	SP C	SP D	SP E
Datum Elev				13.5	14.9	16.7	18.8	20.4
Geo	.	X-Loc	Cor T	0.0	-18.6	10.8	-17.5	0.0
				--Td--	--Td--	--Td--	--Td--	--Td--
1	15.0	0.0	-16.0	50.0	-33.1	33.3	19.4	48.5
2	15.2	4.2	-12.9	61.6	-7.5	35.4	22.3	52.1
3	15.3	8.6	-10.0	66.5	6.9	36.1	23.7	53.5
4	15.5	13.0	-6.9	69.6	20.5	35.4	23.8	53.4
5	15.6	17.4	-3.7	74.3	25.7	34.7	24.8	55.1
6	15.8	22.0	0.2	74.2	29.6	31.5	23.7	52.5
7	15.9	26.0	2.1	75.6	35.0	30.0	22.1	52.4
8	16.1	31.6	6.1	77.6	39.5	29.9	21.5	51.1
9	16.3	35.8	8.8	77.3	42.7	28.6	20.2	50.8
10	16.4	40.1	12.4	79.4	44.8	32.3	19.9	51.4
11	16.6	45.2	12.7	80.9	44.2	32.6	18.2	48.7
12	16.8	50.3	13.3	78.3	45.2	34.1	17.7	46.3

13	17.0	55.0	12.8	77.3	45.7	36.2	15.8	44.8
14	17.1	59.7	11.8	79.3	46.2	34.7	11.8	42.8
15	17.2	63.0	7.2	75.7	41.1	33.0	4.1	36.0
16	17.4	67.5	5.6	74.6	41.5	33.4	2.9	32.9
17	17.6	72.3	2.6	73.6	39.5	32.9	-1.5	28.9
18	17.7	76.7	0.0	72.0	36.9	30.9	-5.5	25.8
19	17.9	81.2	-2.1	70.9	36.8	29.7	-10.1	21.7
20	18.0	86.1	-5.1	68.4	34.3	27.7	-13.9	17.2
21	18.2	90.8	-6.5	67.5	32.9	26.8	-15.8	14.8
22	18.4	95.5	-7.9	67.6	31.5	27.5	-17.6	12.9
23	18.5	99.5	-10.8	64.7	30.1	23.8	-22.8	9.0
24	18.7	104.2	-13.5	64.0	28.4	23.1	-25.7	6.0

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE8.SIP

Spread 1				SP A	SP B	SP C	SP D	SP E
Elev				0.0	19.5	7.1	26.9	0.0
Geo	.	X-Loc	Cor T	9.8	9.8	7.0	2.5	2.5
---	---	-----	-----	--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	18.4	0.0	9.8	1.6	0.0	21.7	40.7	39.4
2	17.5	4.2	8.6	38.6	0.0	21.9	41.7	41.1
3	16.7	8.6	7.5	41.7	18.1	20.7	41.2	40.6
4	15.6	13.0	6.5	42.7	29.7	18.0	39.3	38.5
5	14.6	17.4	5.3	45.3	32.8	15.1	38.1	38.1
6	13.5	22.0	4.2	42.5	34.0	9.3	34.3	32.8
7	12.4	26.0	4.5	41.7	37.2	5.5	30.5	30.5
8	10.9	31.6	3.7	40.5	38.5	2.3	26.8	26.0
9	9.8	35.8	3.3	37.9	39.4	-1.3	23.2	23.4
10	8.4	40.1	2.6	37.1	38.6	-0.6	19.9	21.1
11	7.1	45.2	5.0	35.9	35.1	0.0	15.4	15.6
12	7.2	50.3	4.7	33.0	36.0	0.0	14.8	13.0
13	7.5	55.0	4.8	32.4	36.8	0.6	13.1	11.8
14	8.1	59.7	5.0	35.2	38.2	-0.0	10.0	10.7
15	9.1	63.0	8.0	33.2	34.7	-0.0	4.0	5.5
16	10.9	67.5	6.6	35.1	38.0	3.3	5.6	5.3
17	12.8	72.3	6.3	37.4	39.4	6.2	4.7	4.7
18	14.5	76.7	5.6	39.1	40.1	7.4	3.9	4.9
19	16.3	81.2	4.8	40.9	42.9	9.1	2.2	3.7
20	18.2	86.1	4.0	42.2	44.2	11.0	2.3	3.0
21	20.1	90.8	3.2	43.4	44.9	12.2	2.5	2.7
22	21.9	95.5	2.5	45.7	45.7	15.0	2.8	3.0
23	23.5	99.5	1.8	46.4	47.9	15.0	1.2	2.7
24	25.3	104.2	1.0	49.2	49.6	17.7	1.7	3.1

DYCER CREEK LINE 8

Spread 1 Points of emergence of refracted rays below target geophones for LINE8.SIP

Geo		SP A	SP B	SP C	SP D	SP E
---		---------L	---------L	---------L	---------L	---------L
1	X-Loc	-4.0 2	--- 0	10.9 3	11.6 3	11.9 3
	Elev	19.1	---	5.1	4.0	3.6
2	X-Loc	-0.6 3	--- 1	9.7 3	10.3 3	10.6 3
	Elev	-2.7	---	3.7	2.1	1.2
3	X-Loc	3.7 3	6.0 2	12.9 3	13.5 3	13.8 3
	Elev	-4.6	17.2	3.3	1.3	0.4
4	X-Loc	11.1 3	10.6 2	16.1 3	16.7 3	16.9 3
	Elev	-3.4	16.3	3.9	1.3	0.6
5	X-Loc	10.5 3	12.5 3	19.0 3	19.7 3	19.9 3
	Elev	-5.1	1.5	4.3	0.7	-0.5
6	X-Loc	15.4 3	16.9 3	22.6 2	28.1 3	28.2 3
	Elev	-3.4	0.8	13.3	1.5	1.2
7	X-Loc	17.4 3	18.3 3	26.6 2	32.9 3	33.8 3

	Elev	-2.8	-1.1	12.3	3.5	2.3
8	X-Loc	28.8 3	28.9 3	32.1 2	36.3 3	36.8 3
	Elev	-1.9	-1.7	10.8	4.5	3.8
9	X-Loc	35.4 3	35.4 3	36.1 2	38.8 3	39.8 3
	Elev	1.0	-0.8	9.8	5.8	4.5
10	X-Loc	39.6 3	39.5 3	40.5 2	41.6 3	42.9 3
	Elev	2.0	0.2	8.3	6.7	4.8
11	X-Loc	44.9 3	44.9 3	--- 1	45.1 3	46.0 3
	Elev	3.8	3.3	---	8.4	7.1
12	X-Loc	50.4 3	50.4 3	--- 1	50.3 3	50.4 3
	Elev	7.2	7.2	---	8.6	8.5
13	X-Loc	55.2 3	54.2 3	53.9 2	55.1 3	55.3 3
	Elev	8.8	5.1	7.4	8.8	8.5
14	X-Loc	60.0 3	60.0 3	58.4 2	59.5 3	60.3 3
	Elev	8.5	6.2	7.7	10.1	9.0
15	X-Loc	63.8 3	63.9 3	62.5 2	62.3 3	63.4 3
	Elev	11.1	9.6	8.9	13.2	11.9
16	X-Loc	68.2 3	68.4 3	67.0 2	67.4 3	67.9 3
	Elev	12.5	10.3	10.7	13.7	13.1
17	X-Loc	73.1 3	73.2 3	72.0 2	72.1 3	72.8 3
	Elev	14.0	12.3	12.7	15.4	14.7
18	X-Loc	77.3 3	77.4 3	77.3 3	76.6 3	77.5 3
	Elev	15.7	14.4	15.5	17.1	16.0
19	X-Loc	81.8 3	81.8 3	81.8 3	80.7 3	81.8 3
	Elev	17.1	15.4	17.0	18.9	17.6
20	X-Loc	86.6 3	86.6 3	86.6 3	85.2 3	86.4 3
	Elev	19.5	17.5	19.1	21.4 ?	19.8
21	X-Loc	91.1 3	91.0 3	91.1 3	90.6 3	91.5 3
	Elev	20.7	18.9	20.2	21.6	20.3
22	X-Loc	95.6 3	95.6 3	95.6 3	95.9 3	96.9 3
	Elev	21.1	20.2	20.4	21.8	20.5
23	X-Loc	99.7 3	99.9 3	99.7 3	99.5 3	101.3 3
	Elev	23.5	21.6	23.1	24.0	22.2
24	X-Loc	104.3 3	104.4 3	104.3 3	104.6 2	106.3 3
	Elev	24.9	23.7	24.5	25.5	23.2

Spread 1 Points of entry of refracted rays below source shotpoints:

L=2	Right	X-Loc	-3.8	-3.8	49.7	---	---
		Elev	19.3*	19.3	7.1	---	---
L=2	Left	X-Loc	---	---	45.8	108.0	---
		Elev	---	---	7.0	26.8	---
L=3	Right	X-Loc	8.8	8.8	48.8	---	---
		Elev	-1.8*	-1.8	7.0	---	---
L=3	Left	X-Loc	---	---	47.7	107.6	107.6
		Elev	---	---	9.3	26.8?	26.8*

DYCER CREEK LINE 8

Spread 1 Depth and Elev of layers directly beneath SPs and Geos for LINE8.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
---	---	---	---	---	---	---
B	-4.9	24.8	5.6	19.2	27.8	-3.0
C	47.6	10.9	3.8	7.1	4.2	6.7
D	108.2	28.2	1.3	26.9	3.1	25.1
Geo						

1	0.0	23.6	5.3	18.3	26.3	-2.7
2	4.2	22.1	4.6	17.5	24.4	-2.3
3	8.6	20.7	4.0	16.7	20.8	-0.1
4	13.0	19.2	3.6	15.6	18.3	0.9
5	17.4	17.6	3.0	14.6	17.1	0.5
6	22.0	15.7	2.2	13.5	15.3	0.4
7	26.0	14.8	2.4	12.4	14.4	0.4
8	31.6	12.9	2.0	10.9	12.2	0.7
9	35.8	11.6	1.8	9.8	9.2	2.4

10	40.1	9.8	1.4	8.4	5.8	4.0
11	45.2	9.8	2.7	7.1	3.8	6.0
12	50.3	9.7	2.5	7.2	2.5	7.2
13	55.0	10.1	2.6	7.5	2.6	7.5
14	59.7	10.8	2.7	8.1	2.7	8.1
15	63.0	13.4	4.3	9.1	4.3	9.1
16	67.5	14.4	3.5	10.9	3.5	10.9
17	72.3	16.2	3.4	12.8	3.4	12.8
18	76.7	17.7	3.2	14.5	3.2	14.5
19	81.2	19.0	2.7	16.3	2.7	16.3
20	86.1	20.8	2.6	18.2	2.6	18.2
21	90.8	21.7	1.6	20.1	1.8	19.9
22	95.5	22.6	0.7	21.9	1.4	21.2
23	99.5	24.3	0.8	23.5	2.0	22.3
24	104.2	25.9	0.5	25.4	2.0	23.9

LINE8.SIP

Velocities used, Spread 1

	Layer 1	Layer 2	Layer 3
Vertical	535	1157	
Horizontal		1157	3662

SIPT2 V-4.1 --- SEISMIC REFRACTION INTERPRETATION PROGRAM --- RIMROCK GEOPHYSICS, INC.

DATA FILE: LINE9.SIP PRINT FILE: C:\DATA\DYCER\LINE9\LINE9.OUT RUN DATE AND TIME:
09-27-1998 at 09:25

TITLE: Dycer Creek - Line 9

PROGRAM CONTROL DATA Printer Plot Scales Datum Plane Control Points Plot Control Special Control Parameters

			Elev	Horiz	Time	Point 1		Point 2		Elevations			Trace Off	L				
Sprds	Exit	Layers	V-Over	m/col	m/row	ms/col	Elev	X-Loc	Elev	X-Loc	Top	Bottom	BLim	TLim	Print	SP	Dip	
1	6	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.5	10.0	0	0	0	

SHOTPOINT AND GEOPHONE INPUT DATA for LINE9.SIP

Spread A, 5 Shotpoints, 24 Geophones, X-Shift = 0.0, X-True = 1, Units: Meters.

SP	Elev	X-Loc	Y-Loc	Depth	UpHole T	Fudge T	End SP
A	55.1	-53.0	0.0	0.0	0.0	0.0	0
B	28.1	-4.5	0.0	0.0	0.0	0.0	1
C	10.6	45.9	5.0	0.0	0.0	0.0	0
D	34.1	108.9	0.0	0.0	0.0	0.0	2
E	62.8	157.0	0.0	0.0	0.0	0.0	0

Arrival Times + Fudge T and Layers represented

Geo	Elev	X-Loc	Y-Loc	SP A	SP B	SP C	SP D	SP E
				---T---L	---T---L	---T---L	---T---L	
1	26.9	0.0	0.0	55.0 2	2.0 2	40.5 3	54.5 3	83.5 3
2	26.3	5.1	0.0	62.0 2	5.0 2	40.5 3	56.0 3	84.0 3
3	24.6	9.0	0.0	63.5 3	11.5 2	38.0 3	53.5 3	80.0 3
4	21.9	13.1	0.0	65.5 3	13.5 2	32.5 2	50.0 3	76.5 3
5	19.9	17.5	0.0	67.0 3	23.0 2	29.0 2	47.5 3	74.5 3
6	17.4	21.9	0.0	67.5 3	29.5 2	23.0 2	45.0 3	70.0 3
7	16.2	26.9	0.0	67.5 3	37.6 2	20.5 2	43.5 3	67.0 3
8	14.1	31.2	0.0	66.5 3	41.0 2	15.5 2	38.0 3	62.5 3
9	11.4	35.9	0.0	66.5 3	43.0 2	8.5 2	35.0 3	56.5 3
10	11.3	40.9	0.0	67.5 3	48.0 3	6.0 2	31.0 3	55.0 3
11	11.1	45.9	0.0	67.0 3	48.5 3	3.0 2	31.5 3	54.0 3
12	11.9	50.6	0.0	65.5 3	48.5 3	7.5 1	26.5 2	53.0 3
13	11.6	55.4	0.0	64.5 3	49.3 3	8.0 3	21.0 2	49.5 3
14	12.4	59.8	0.0	64.5 3	49.3 3	8.5 3	19.0 2	47.0 3
15	12.2	64.9	0.0	65.0 3	49.3 3	9.2 3	18.0 2	45.0 3
16	15.0	69.6	0.0	65.5 3	49.5 3	10.0 3	17.5 2	43.0 3
17	17.1	73.4	0.0	67.5 3	55.0 3	14.5 3	16.0 2	43.5 3
18	19.8	77.0	0.0	69.5 3	55.0 3	13.0 3	14.5 2	41.0 3
19	22.6	82.1	0.0	70.5 3	56.0 3	11.5 3	9.5 2	43.5 3
20	24.8	86.6	0.0	71.0 3	58.0 3	12.5 3	7.5 2	43.0 3
21	26.6	91.0	0.0	74.0 3	61.8 3	17.5 3	8.5 2	45.5 3
22	28.0	95.8	0.0	75.0 3	61.5 3	17.5 3	10.5 2	43.3 3
23	31.1	100.0	0.0	0.0 0	61.0 3	17.0 3	7.0 2	40.0 3
24	32.8	105.0	0.0	0.0 0	60.8 3	17.5 3	5.0 1	39.8 3

Layer 1 Velocity from direct arrivals

Spread A	SP	Geo	DD	V	Avg V
C	12	7.0	931		
				931	
D	24	4.1	822		
				822	

Wtd Avg Velocity computed for Layer 1 = 877

Layer 2 Velocity computed by regression of raw uncorrected arrivals

Spread A

V	Ti	Geos		<-SP->	Geos	Ti	V	Avg V	Avg Ti	Pts
			A	1 2	-32.4	687	687	-32.4		2
			B	1 9	-5.0	856	856	-5.0		9
1028	-0.9	4 10	C				1028	-0.9		7
3022	2.6	12 23	D				3022	2.6		12

Avg = 1240 for 30 Pts

Layer 2 Velocity computed by Hobson-Overton method

Spread A SPs	Geos	V	TdSP	Avg Std Err Overall	Err	4 Highest Std Err at geophones Geo	Err	Geo	Err	Geo	Err	Geo
B C	4 9	919	1.1	1.650	-2.235	4	2.112	6	-1.954	9	1.714	7

Avg = 919 for 6 Pts

Wtd Avg Velocity computed for Layer 2 = 1148

Layer 3 Velocity computed by regression of raw uncorrected arrivals

V	Ti	Geos		<-SP->	Geos	Ti	V	Avg V	Avg Ti	Pts
			A	3 22	58.9	12946	12946	58.9		20
			B	10 24	32.9	3713	3713	32.9		15
3783	28.0	1 3	C	13 24	5.9	5103	4770	17.0		15
1522	-13.8	1 11	D				1522	-13.8		11
2247	5.2	1 24	E				2247	5.2		24

Avg = 3191 for 85 Pts

Layer 3 Velocity computed by Hobson-Overton method

Spread A SPs	Geos	V	TdSP	Avg Std Err Overall	Err	4 Highest Std Err at geophones Geo	Err	Geo	Err	Geo	Err	Geo
A D	3 11	2793	23.2	1.389	-2.414	11	-1.984	3	1.910	10	1.231	5
A E	3 22	3675	13.4	3.181	-7.111	3	5.465	10	5.441	9	-4.364	21
B E	10 24	4272	12.0	1.706	4.053	18	3.356	17	-2.633	24	-2.366	12
C E	13 24	6385	-22.6	2.077	4.030	17	3.688	18	-2.768	13	-2.164	20

Avg = 4274 for 56 Pts

Wtd Avg Velocity computed for Layer 3 = 3807

Arrival times Td corrected to datum. (Datum Elev = 16.415 + 0.058x) for LINE9.SIP

Spread A				SP A	SP B	SP C	SP D	SP E
Datum Elev				13.3	16.2	19.1	22.7	25.5
Geo	.	X-Loc	Cor T	0.0	-13.6	9.7	-13.0	0.0
				--Td--	--Td--	--Td--	--Td--	--Td--
1	16.4	0.0	-12.0	43.0	-23.6	38.2	29.6	71.5
2	16.7	5.1	-10.9	51.1	-19.6	39.2	32.1	73.1
3	16.9	9.0	-8.7	54.8	-10.9	38.9	31.8	71.3
4	17.2	13.1	-5.4	60.1	-5.5	36.8	31.6	71.1
5	17.4	17.5	-2.8	64.2	6.6	35.9	31.7	71.7
6	17.7	21.9	0.3	67.8	16.2	33.0	32.4	70.3
7	18.0	26.9	2.0	69.5	26.0	32.2	32.6	69.0
8	18.2	31.2	4.7	71.2	32.1	29.9	29.7	67.2

9	18.5	35.9	8.1	74.6	37.5	26.3	30.1	64.6
10	18.8	40.9	8.5	76.0	42.9	24.2	26.6	63.5
11	19.1	45.9	9.1	76.1	44.0	21.8	27.6	63.1
12	19.4	50.6	8.5	74.0	43.4	25.7	22.0	61.5
13	19.6	55.4	9.2	73.7	44.8	26.8	17.2	58.7
14	19.9	59.8	8.5	73.0	44.2	26.7	14.6	55.5
15	20.2	64.9	9.1	74.1	44.8	28.0	14.1	54.1
16	20.5	69.6	6.2	71.7	42.1	25.9	10.8	49.2
17	20.7	73.4	4.1	71.6	45.5	28.2	7.1	47.6
18	20.9	77.0	1.2	70.7	42.6	23.9	2.8	42.2
19	21.2	82.1	-1.6	68.9	40.8	19.6	-5.1	41.9
20	21.4	86.6	-3.8	67.2	40.5	18.3	-9.3	39.2
21	21.7	91.0	-5.6	68.4	42.6	21.6	-10.1	39.9
22	22.0	95.8	-6.9	68.1	41.0	20.3	-9.3	36.4
23	22.2	100.0	-10.1	0.0	37.2	16.5	-16.1	29.9
24	22.5	105.0	-11.7	0.0	35.4	15.4	-19.7	28.1

Arrival times Tc corrected to top of Layer 2 and Elev of top of Layer 2 for LINE9.SIP

Spread A				SP A	SP B	SP C	SP D	SP E
Elev				0.0	24.7	5.7	32.2	0.0
Geo	.	X-Loc	Cor T	3.8	3.8	5.6	2.2	2.2
---	---	-----	-----	--Tc--	--Tc--	--Tc--	--Tc--	--Tc--
1	23.1	0.0	4.4	0.0	-6.2	30.5	47.9	51.6
2	21.7	5.1	4.5	-1.3	-3.3	30.4	49.3	52.0
3	20.6	9.0	4.6	39.9	3.1	27.9	46.7	47.9
4	17.3	13.1	5.2	41.3	4.4	21.7	42.6	43.8
5	14.6	17.5	6.1	41.9	13.1	17.3	39.2	40.9
6	13.0	21.9	5.1	43.4	20.6	12.4	37.7	37.4
7	11.4	26.9	5.4	43.1	28.3	9.5	35.9	34.1
8	10.0	31.2	4.6	42.9	32.5	5.3	31.2	30.4
9	8.5	35.9	3.3	44.1	35.8	-0.4	29.4	25.7
10	6.9	40.9	5.0	43.5	39.2	-4.5	23.8	22.6
11	5.7	45.9	6.1	41.9	38.5	-8.7	23.2	20.4
12	5.5	50.6	6.7	39.8	38.0	0.0	17.6	18.8
13	5.3	55.4	7.2	38.3	38.2	-4.8	11.6	14.8
14	7.5	59.8	6.9	38.6	38.6	-4.0	9.9	12.6
15	10.0	64.9	6.5	39.5	38.9	-2.9	9.3	11.0
16	12.4	69.6	6.2	40.3	39.5	-1.8	9.1	9.3
17	14.3	73.4	5.9	42.6	45.3	3.0	7.9	10.1
18	16.1	77.0	5.6	44.9	45.5	1.8	6.7	7.9
19	18.7	82.1	5.3	46.2	46.9	0.7	2.0	10.8
20	20.9	86.6	4.9	47.1	49.2	2.0	0.4	10.6
21	23.1	91.0	4.6	50.4	53.4	7.3	1.7	13.4
22	25.5	95.8	4.2	51.8	53.4	7.7	4.1	11.6
23	27.7	100.0	3.9	0.0	53.2	7.5	0.9	8.6
24	30.2	105.0	3.0	0.0	54.0	9.0	0.0	9.4

Dycer Creek - Line 9

Spread A Points of emergence of refracted rays below target geophones for LINE9.SIP

Geo		SP A	SP B	SP C	SP D	SP E
---		--------L	--------L	--------L	--------L	--------L
1	X-Loc	-5.6 2	-5.6 2	7.3 3	7.2 3	8.2 3
	Elev	24.9	24.9	2.5	3.0	-0.1
2	X-Loc	-2.7 2	-2.7 2	9.8 3	9.9 3	10.4 3
	Elev	23.8	23.8	1.6	1.2	-1.4
3	X-Loc	2.3 3	1.5 2	12.2 3	12.2 3	12.5 3
	Elev	0.6	22.4	1.4	1.0	-0.6
4	X-Loc	8.4 3	7.6 2	18.7 2	15.7 3	15.9 3
	Elev	-1.1	20.3	13.8	0.9	-0.7
5	X-Loc	10.0 3	11.5 2	22.1 2	19.2 3	19.5 3
	Elev	-2.3	18.4	12.9	0.5	-1.4

6	X-Loc	11.8 3	15.8 2	25.5 2	24.0 3	24.1 3
	Elev	-3.2	15.5	11.9	-0.5	-1.2
7	X-Loc	16.9 3	20.6 2	30.5 2	37.8 3	37.7 3
	Elev	-3.3	13.3	10.3	0.4	0.6
8	X-Loc	22.4 3	25.7 2	34.3 2	39.1 3	39.5 3
	Elev	-3.7	11.8	9.0	2.2	1.8
9	X-Loc	32.4 3	31.9 2	37.8 2	41.8 3	40.9 3
	Elev	-4.6	9.8	7.8	1.8	3.1
10	X-Loc	41.4 3	41.2 3	44.8 2	44.2 3	44.3 3
	Elev	-2.2	0.3	5.9	3.8	3.6
11	X-Loc	44.9 3	45.0 3	37.8 2	49.4 3	49.0 3
	Elev	-0.8	1.1	7.8 ?	3.1	3.9
12	X-Loc	49.6 3	49.7 3	--- 1	63.3 2	54.1 3
	Elev	1.9	2.9	---	8.8 ?	5.2
13	X-Loc	56.1 3	56.1 3	56.1 3	64.4 2	58.5 3
	Elev	4.4	4.4	11.0	9.4 ?	6.9
14	X-Loc	59.9 3	59.9 3	60.4 3	66.9 2	62.1 3
	Elev	5.8	5.8	12.2	10.7 ?	8.3
15	X-Loc	65.1 3	65.1 3	65.1 3	68.0 2	67.1 3
	Elev	6.4	6.7	12.6 ?	11.3 ?	8.9
16	X-Loc	70.7 3	70.6 3	69.7 3	73.2 2	72.3 3
	Elev	9.4	9.9	15.6 ?	13.9 ?	12.0
17	X-Loc	74.6 3	74.8 3	73.8 3	77.2 2	76.8 3
	Elev	11.0	9.4	15.7	16.0 ?	13.2
18	X-Loc	77.8 3	77.8 3	77.4 3	82.2 2	79.7 3
	Elev	12.7	12.3	19.3	18.5 ?	16.2
19	X-Loc	82.5 3	82.5 3	82.5 3	87.6 2	86.4 3
	Elev	15.2	14.8	23.2 ?	21.3 ?	16.2
20	X-Loc	87.5 3	87.6 3	86.9 3	91.9 2	92.0 3
	Elev	17.7	16.4	25.5 ?	23.5 ?	18.1
21	X-Loc	92.0 3	92.2 3	91.4 3	95.7 2	98.3 3
	Elev	18.4	16.6	25.1	25.5 ?	17.9
22	X-Loc	97.1 3	97.3 3	96.0 3	99.1 2	103.0 3
	Elev	20.3	19.3	27.7	27.2	20.2
23	X-Loc	--- 0	101.5 3	100.2 3	104.6 2	105.7 3
	Elev	---	23.6	31.9 ?	30.0	24.6
24	X-Loc	--- 0	105.7 3	105.0 3	--- 1	110.8 3
	Elev	---	27.0	34.9 ?	---	25.7

Spread A Points of entry of refracted rays below source shotpoints:

L=2	Right	X-Loc	8.8	8.8	54.3	---	---
		Elev	22.4*	22.4	4.7	---	---
L=2	Left	X-Loc	---	---	38.7	107.8	---
		Elev	---	---	7.5	31.6	---
L=3	Right	X-Loc	7.0	7.0	46.0	---	---
		Elev	-0.8*	-0.8	8.9	---	---
L=3	Left	X-Loc	---	---	45.2	109.3	109.3
		Elev	---	---	3.7	30.4	30.4*

Dycer Creek - Line 9

Spread A Depth and Elev of layers directly beneath SPs and Geos for LINE9.SIP

	Surface		Layer 2		Layer 3	
SP	X-Loc	Elev	Depth	Elev	Depth	Elev
---	-----	-----	-----	-----	-----	-----
B	-4.5	28.1	3.7	24.4	29.6	-1.5
C	45.9	10.6	4.9	5.7	8.0	2.6
D	108.9	34.1	1.9	32.2	7.7	26.4
Geo						

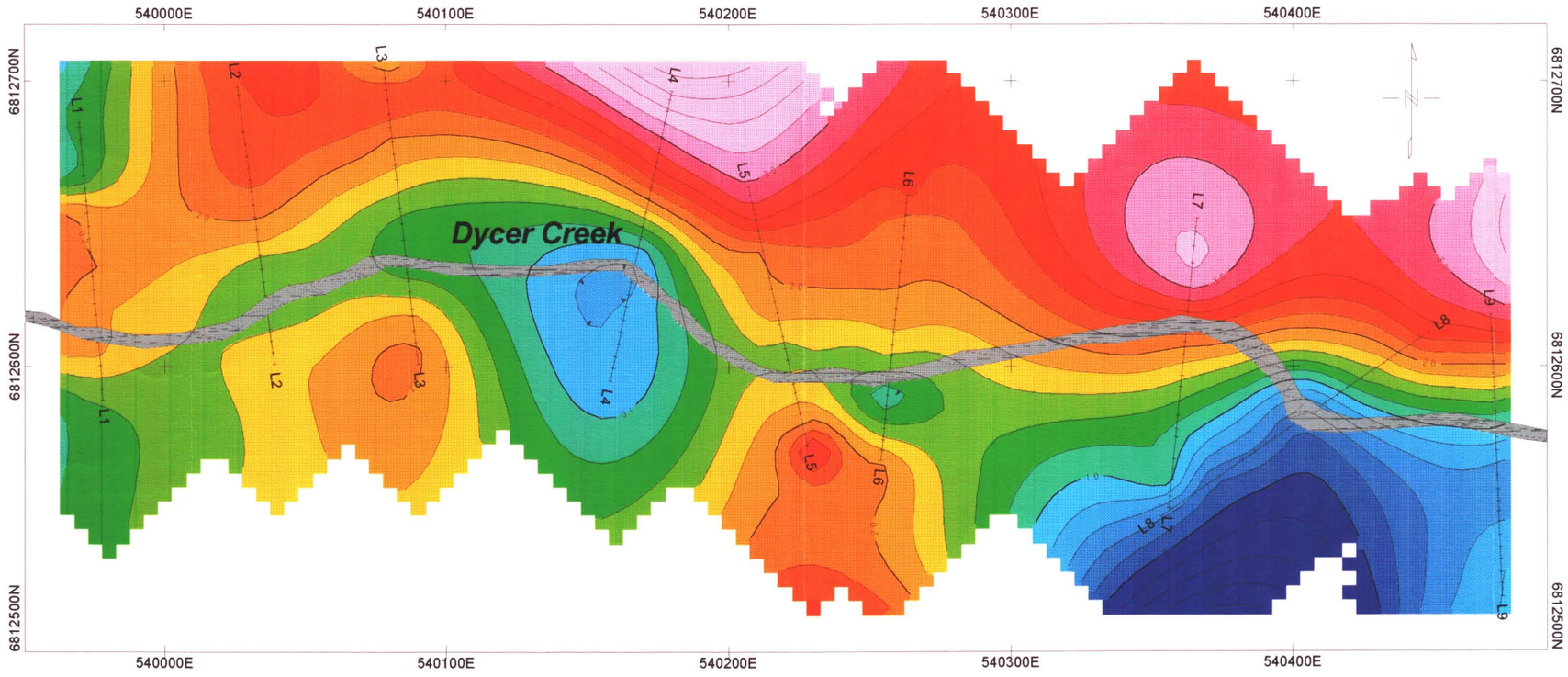
1	0.0	26.9	3.8	23.1	28.1	-1.2
2	5.1	26.3	4.6	21.7	27.3	-1.0
3	9.0	24.6	4.0	20.6	24.4	0.2
4	13.1	21.9	4.6	17.3	22.3	-0.4
5	17.5	19.9	5.3	14.6	20.8	-0.9
6	21.9	17.4	4.4	13.0	18.7	-1.3

7	26.9	16.2	4.8	11.4	18.4	-2.2
8	31.2	14.1	4.1	10.0	15.2	-1.1
9	35.9	11.4	2.9	8.5	11.3	0.1
10	40.9	11.3	4.4	6.9	10.3	1.0
11	45.9	11.1	5.4	5.7	8.5	2.6
12	50.6	11.9	6.4	5.5	7.4	4.5
13	55.4	11.6	6.3	5.3	6.3	5.3
14	59.8	12.4	4.9	7.5	5.1	7.3
15	64.9	12.2	2.2	10.0	3.8	8.4
16	69.6	15.0	2.6	12.4	5.2	9.8
17	73.4	17.1	2.8	14.3	5.4	11.7
18	77.0	19.8	3.7	16.1	6.2	13.6
19	82.1	22.6	3.9	18.7	7.0	15.6
20	86.6	24.8	3.9	20.9	7.7	17.1
21	91.0	26.6	3.5	23.1	7.8	18.8
22	95.8	28.0	2.5	25.5	7.4	20.6
23	100.0	31.1	3.4	27.7	8.6	22.5
24	105.0	32.8	2.6	30.2	8.1	24.7

LINE9.SIP

Velocities used, Spread A

	Layer 1	Layer 2	Layer 3
Vertical	877	1148	
Horizontal		1148	3807



Scale 1:1500

25 0 25 50 75 100

metres

32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0

Thickness
(m)

OVERBURDEN THICKNESS CONTOUR MAP

Horizon: Surface z - Lower refractor z

Grid cell size: 5 m

Filters: 3 point moving average

Contour intervals: 2 m / 10 m

SEISMIC REFRACTION SURVEY

Instrument: Geometrics Strataview S-24

Channels: 24

Phone spacing: 5 m

Shot locations: 60 m off either end of each line
end of lines
mid spread

Source: Explosives / surface charges

Record length: 512 ms

Sampling: 0.5 ms

Pre-acquisition filters: 500 Hz high-cut

Topography: Elevations surveyed with laser range finder.
Lines located with non-differential GPS

Interpretation: Rimrock SIP package (delay time method)

STEPHEN SWAIM

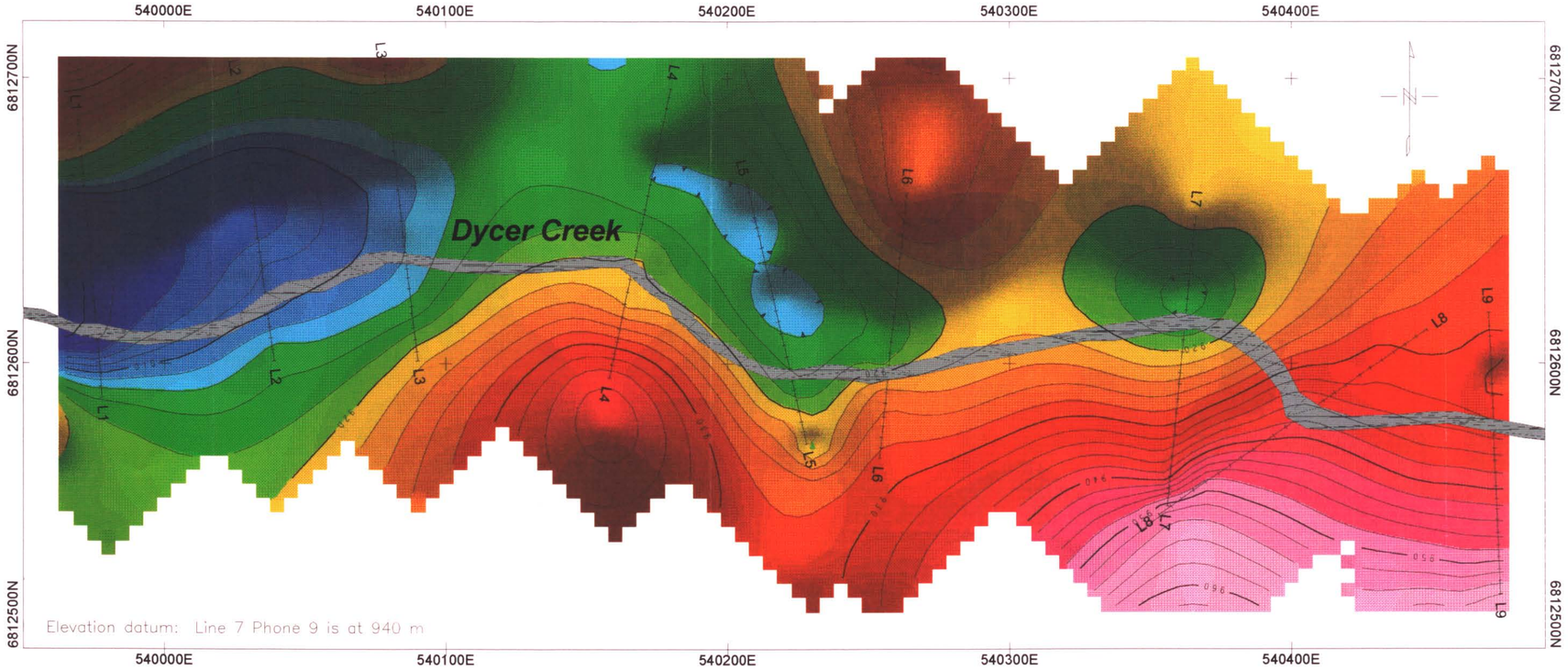
Dycer Creek Seismic Survey
Overburden Thickness Map
Figure 4.

NTS: 105 E/8
Datum: NAD27

120192

Mining District: Whitehorse
Date: 02 Oct 2001

Aurora Geosciences Ltd.



Scale 1:1500

25 0 25 50 75 100

metres

954.0
948.0
942.0
938.0
934.0
932.0
930.0
928.0
926.0
924.0
922.0
920.0
918.0
916.0
914.0
912.0
910.0
906.0
904.0

Bedrock topography
(metres above MSL)

BEDROCK CONTOUR MAP

Horizon: Top of lowermost refractor

Grid cell size: 5 m

Filters: 3 point moving average

Contour intervals: 2 m / 10 m

SEISMIC REFRACTION SURVEY

Instrument: Geometrics Strataview S-24

Channels: 24

Phone spacing: 5 m

Shot locations: 60 m off either end of each line
end of lines
mid spread

Source: Explosives / surface charges

Record length: 512 ms

Sampling: 0.5 ms

Pre-acquisition filters: 500 Hz high-cut

Topography: Elevations surveyed with laser range finder. Lines located with non-differential GPS

Interpretation: Rimrock SIP package (delay time method)

(2)

STEPHEN SWAIM

Dycer Creek Seismic Survey
Bedrock Topography
Figure 3.

120192

NTS: 105 E/8
Datum: NAD27

Mining District: Whitehorse
Date: 02 Oct 2001

Aurora Geosciences Ltd.