

GEOLOGICAL ASSESSMENT OF THE WHITES COVE SITE

Digby County, Nova Scotia

Prepared By:

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December 2002

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Overview

The 370-acre Whites Cove (Denton) site is located on the north shore of Digby Neck and North Mountain in Digby County, Nova Scotia (Figure 1). It is approximately 30 kilometers (18.5 miles) west of the town of Digby between Little River and East Ferry. The property can be accessed via Highway 217. The elevation of the site ranges from sea level to 96.0 meters (315 ft.).

The Whites Cove site is being evaluated as a source of high quality construction aggregate. This report will focus on the geological aspects of the construction aggregate project.

The findings in this report are an outgrowth of:

- ◆ Mineral Valuation & Capital, Inc.'s (MVC's) regional and local field investigations
- ◆ A review of geological reports and maps published by the Nova Scotia Department of Natural Resources (NSDNR)
- ◆ Discussions and meetings with personnel of the NSDNR.
- ◆ Analysis of drill hole data obtained on the Whites Cove site
- ◆ MVC's experience with comparable projects

This report is intended to be a summary of MVC's data and interpretations. Additional information is available for review at MVC's offices.

Drilling Information

Four core holes were drilled on the Whites Cove property during April and May of 2002 to provide comprehensive information on the geology of the site. The hole locations are shown on the Whites Cove Site Map (Plate 1).

The four holes were continuously cored. They range in depth from 35.0 (115 ft.) to 74.5 meters (244 ft.). All but one of the four holes was drilled to a depth below sea level. The holes were not plugged so that they could be used for hydrogeological testing and monitoring.

The core was boxed, described, and sampled by a licensed professional geologist. The Drill Hole Completion Reports and the Core Descriptions are appended.

Regional Geologic Setting

Much of this section on the regional geology has been excerpted from NSDNR Report of Activities 2001 published by D.J. Kontak titled "Internal Stratigraphy of the Jurassic North Mountain Basalt, Southern Nova Scotia".

The Whites Cove site is composed of the Jurassic North Mountain Basalt (NMB). The NMB forms a prominent cuesta along the Bay of Fundy, which extends along the length of the Annapolis Valley and the project area. The NMB rocks are well exposed along the coastline and inland. The topographic relief of the area is primarily a reflection of the distribution of the underlying massive basalt flows. The region's prominent topographic features are primarily made up of hard massive basalt flows versus the softer amygdaloidal, vesicle rich basalt flows that weather and erode more easily.

The rocks underlying the NMB are red to pale green-gray, fluvial-lacustrine siltstones and shales of the Late Triassic Wolfville and overlying Blomidon Formations. The rocks that overlay the NMB in the Annapolis Valley are composed of the Jurassic lacustrine limestones of the Scots Bay Formation. The time equivalent red fluvial-lacustrine siltstones and shales of the McCoy Brook Formation overlay the NMB along the north side of the Fundy Basin.

The NMB has been subdivided into three units based on the nature of the basalt flows. The units are called the lower, middle and upper flow units.

The lower flow unit reportedly varies from 40 meters (131 ft.) to 185 meters (607 ft.) and consists of one flow. The unit is a uniform textured, massive, holocrystalline basalt with well developed columnar jointing in the Annapolis Royal area.

The middle flow unit is amygdaloidal, vesicular and zeolite rich in contrast to the massive, and generally vesicle-free, lower and upper flow units. The thickness and the number of flows in the middle flow unit vary considerably. The thickness ranges from 9 meters (30 ft.) to 165 meters (541 ft.) and the unit contains 4 to 15 flows. The unit appears to thin to the southwest.

The thickness of upper flow unit reportedly varies from 0 to 154 meters (505 ft.). The unit has been subdivided into the columnar jointed lower part and the massive upper part, which often contains a honeycomb network of quartz veins.

The regional dip of the NMB is 3 to 8 degrees to the northwest. The NMB is offset at several locations by northeast trending right lateral faults.

Site Geology

The Whites Cove site consists almost exclusively of the upper flow unit of the NMB. Core holes NS-02-01 and NS-02-02 penetrated the contact between the upper flow and middle flow units at drill depths of 60 meters (197 ft.) and 70 meters (230 ft.), respectively (see Figure 2). Core holes NS-02-03 and NS-02-04 drilled through the upper flow unit from the surface to the total depth of the holes.

The upper flow unit is a uniform, hard, massive, vesicle free, medium dark gray to black basalt. The unit attains a maximum thickness of approximately 76 meters (250ft.) on the

A'

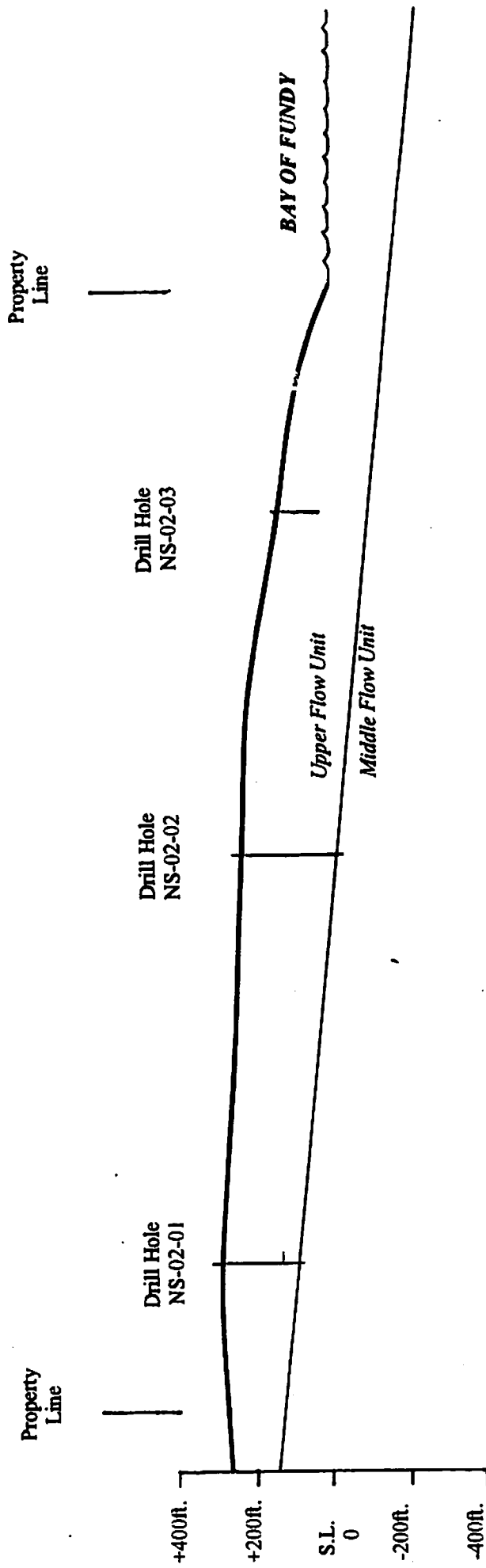


Figure 2 – Cross Section A-A'

Horizontal and Vertical Scale 1in.=400ft.

Whites Cove property. It is virtually unweathered. Vertical, quartz veins were occasionally observed in the upper third of the upper flow unit. Some of these veins showed red iron oxidation and some contained calcite. Horizontal veins and fractures were occasionally observed in the middle portion of the upper flow unit. The basal 10 meters (33ft.) of the upper flow unit displayed some vertical fracturing, which may indicate the presence of a narrow band of columnar jointing.

The top two meters of the middle flow unit were penetrated in drill holes NS-02-01 and NS-02-02. The top of the middle unit consists of a medium dark gray to dark gray, vesicular, amygdaloidal, zeolite rich basalt, which contains rust colored bands.

The NMB dips approximately 6 degrees to the northwest on the site (see Figure 2). No evidence of faulting was observed on, or near, the Whites Cove property.

Construction Aggregate Potential

Physical lab tests, chemical lab tests, and examination of the core samples and outcrop exposures indicate that the Whites Cove site contains an advantaged, large reserve of high quality construction aggregate. The site contains in excess of 200 million tons (English) of in-place stone, which is ideally suited for quarrying, processing, shipping, and construction.

Submitted by:

**John Lizak, Licensed Professional Geologist
Principal**

DRILL HOLE COMPLETION REPORT
LIZAK GEOSCIENCE & ENGINEERING, INC.
 Northeast Office-1805 Evans St.
 Northampton, PA 18067
 Phone 610-262-9120 * Fax 610-262-4212

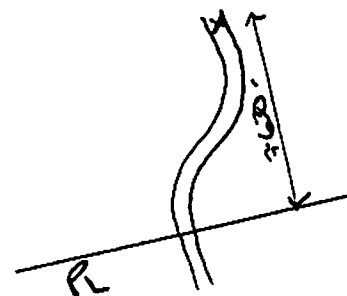
Hole No: NS-02-01 Property/Project: Denton
 Location: ≈ 630 Ft. N. of property line, on road Gr. Elevation: 291.6 Ft.
 Location Surveyed: (Yes) (No) Surveyor's Name: Scotia Surveys Ltd.
 County: Digby State/Province N. Scotia Country: Canada
 Surface Owner: Johnson Option No.: _____
 Spud Date: 4-30-02 Completion Date: 5-2-02
 Hole Size: Surface NW Interval 0-5.0 Ft.
 Main Hole _____ Interval 5.0 Ft. - 63.0 m
 Total Depth: 63.0 m Air to: _____ Water/Mud to: 0-63.0 m
 Cored: (Yes) (No): If yes, intervals 5.0 Ft. - 63.0 m
 Core Barrel Type: NQ I.D. 47.6 mm O.D. 1 7/8" Length 4.0 m
 Lost Circulation at: 63.0 Regained: (Yes) (No) _____
 Static Water Level: Initial - Final _____
 Noticeable Water Invasion: (Yes) (No) Intervals _____
 Casing: Depth 5.0 Ft. Diameter NW Recovered: (Yes) (No)
 Contractor's name and address: Logan Drilling - P.O. Box 189
Stewiacke NS, Canada B0N 2J0
Ph. 902-639-7311
 Hole Plugged: (Yes) (No) Name/address if company differs from contractor _____

Samples and core descriptions by: John Lizak
 Report prepared by: John Lizak Date: 4-30-02

Comments:

4-30-02 Drilled on site @ 1:00 PM; Rig set up; started coring @ 5:30; Drilled to 7:00 PM
5-1-02 On site 7:00 AM - 6:30 PM; Drilled to 46 m
5-2-02 L.C. @ 63.0 m. Could not regain.

Location Sketch

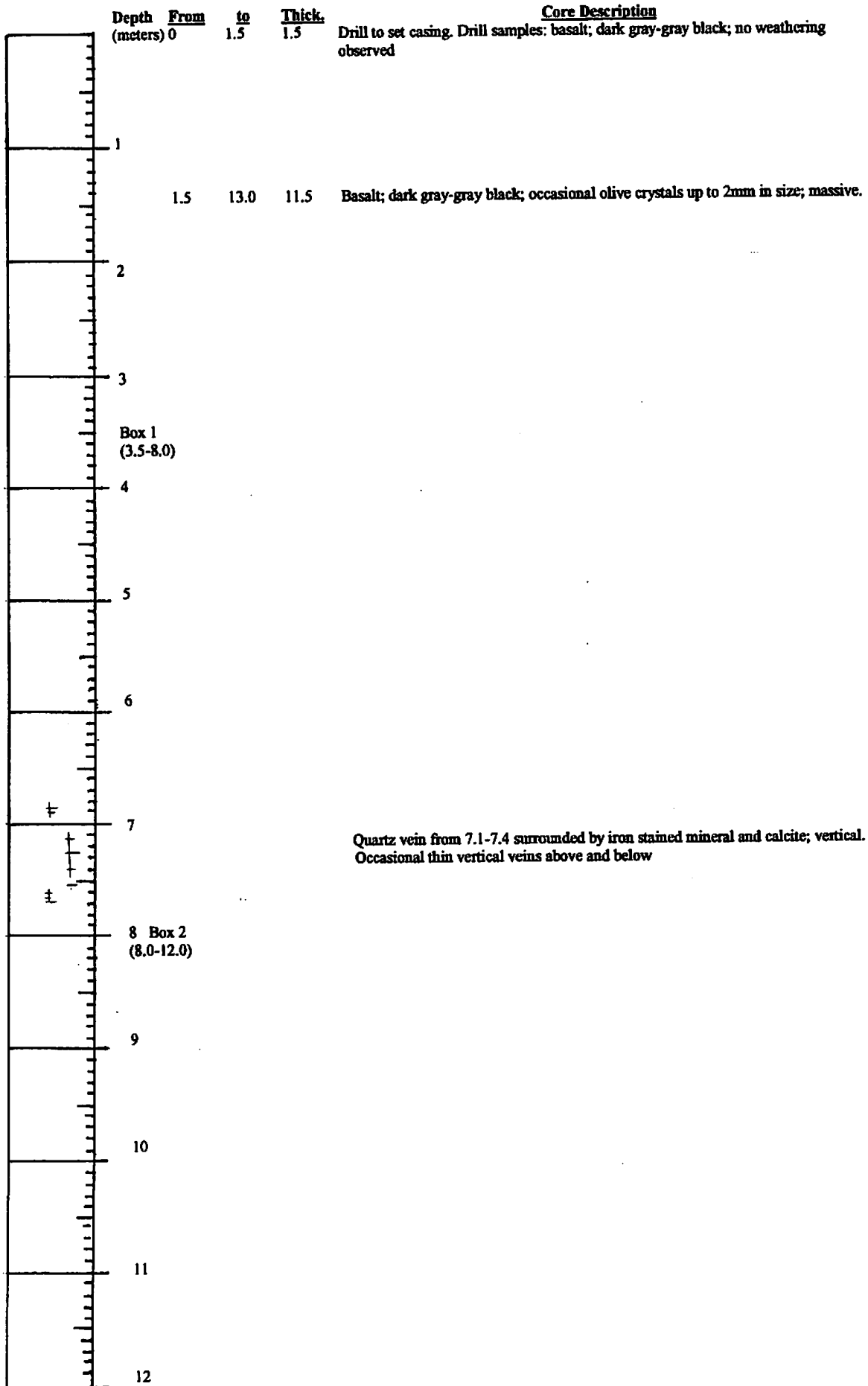


CORE DESCRIPTION

Hole No.: NS-02-01
 Description By: J. Lizak

Prospect: Denton
 Drilled By: Logan Drilling

Page: 1 of 6
 Date: 4-30-02 to 5-2-02

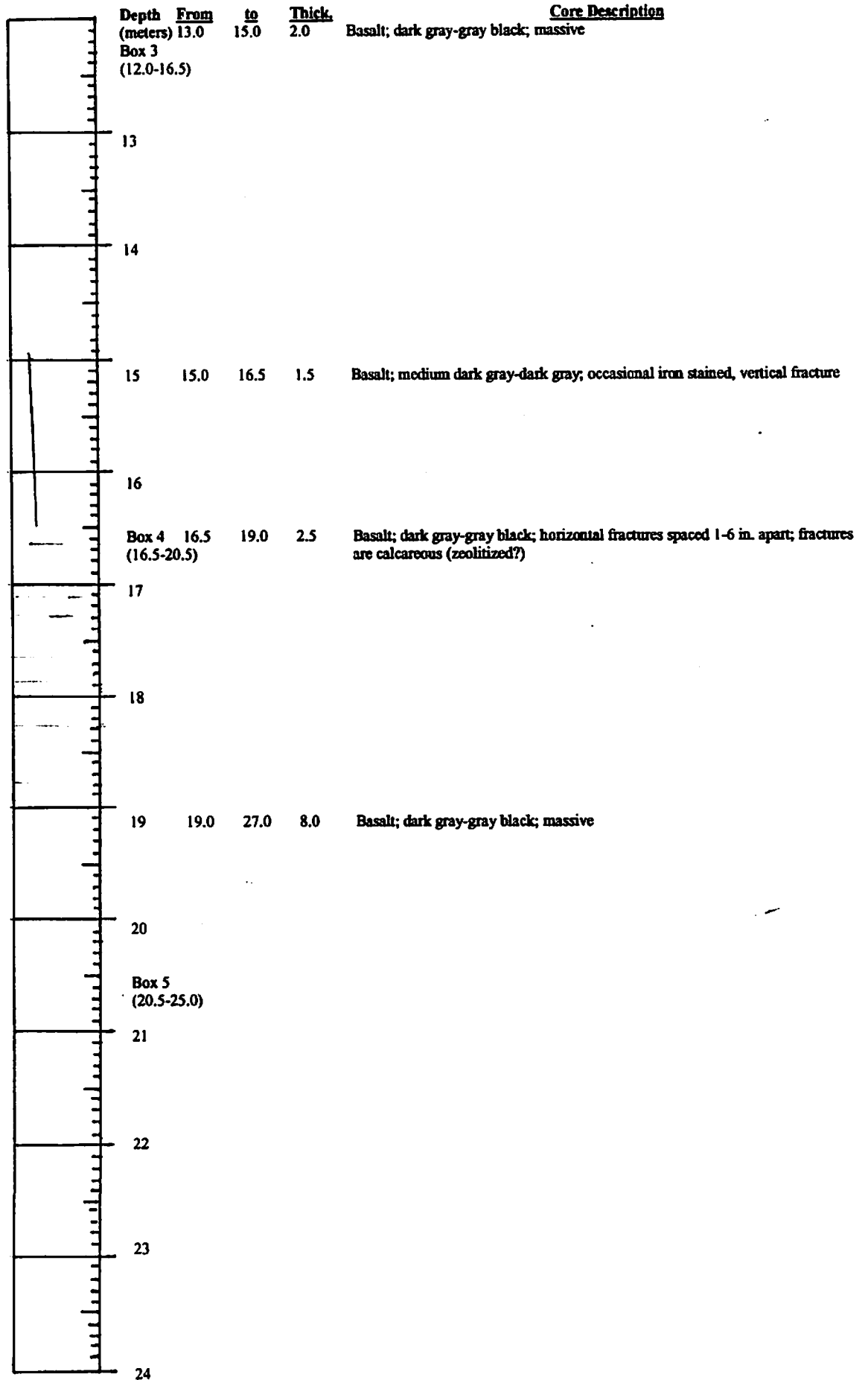


CORE DESCRIPTION

Hole No.: NS-02-01
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 2 of 6
Date: 4-30-02 to 5-2-02

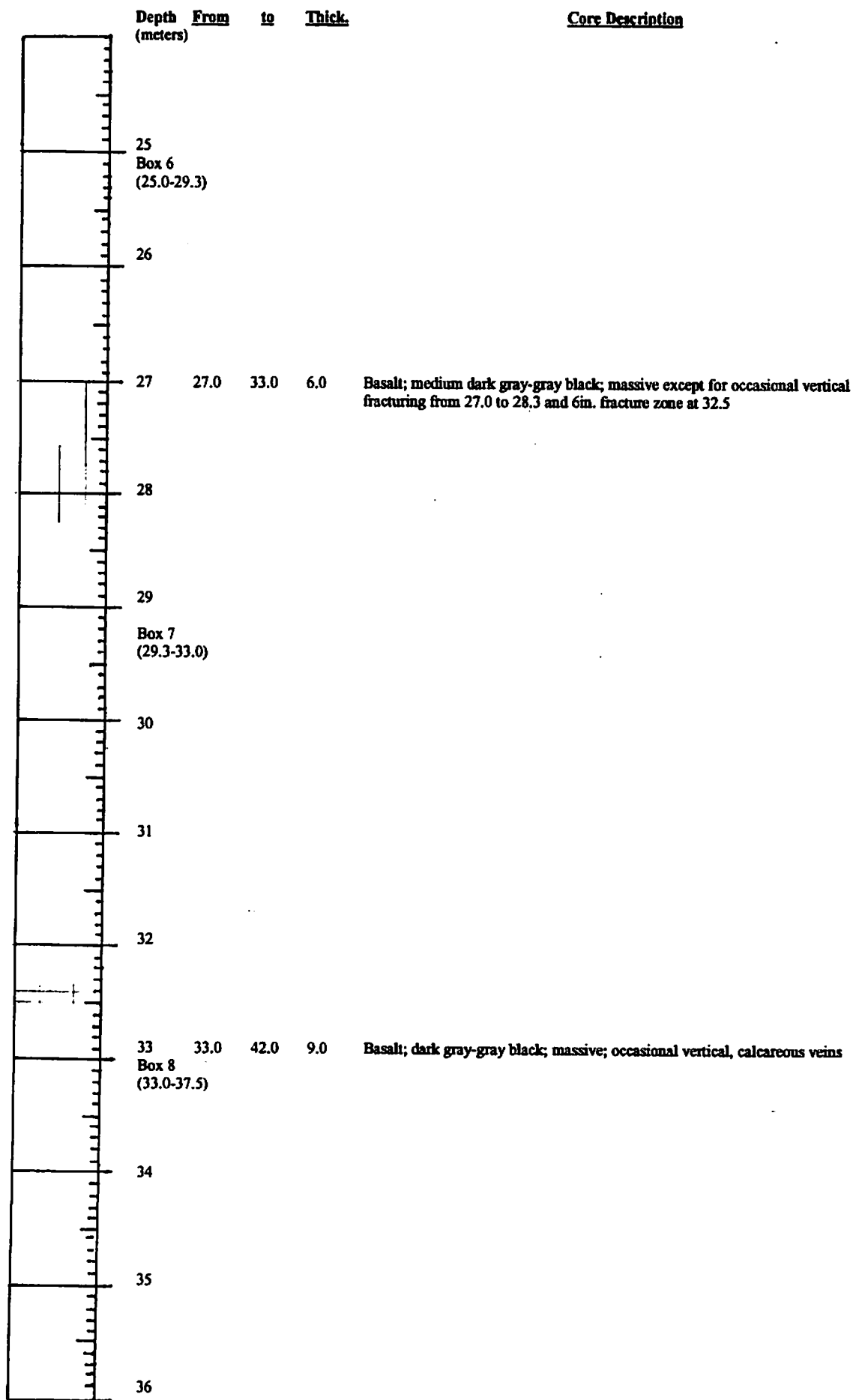


CORE DESCRIPTION

Hole No.: NS-02-01
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 3 of 6
Date: 4-30-02 to 5-2-02



CORE DESCRIPTION

Hole No.: NS-02-01
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 4 of 6
Date: 4-30-02 to 5-2-02

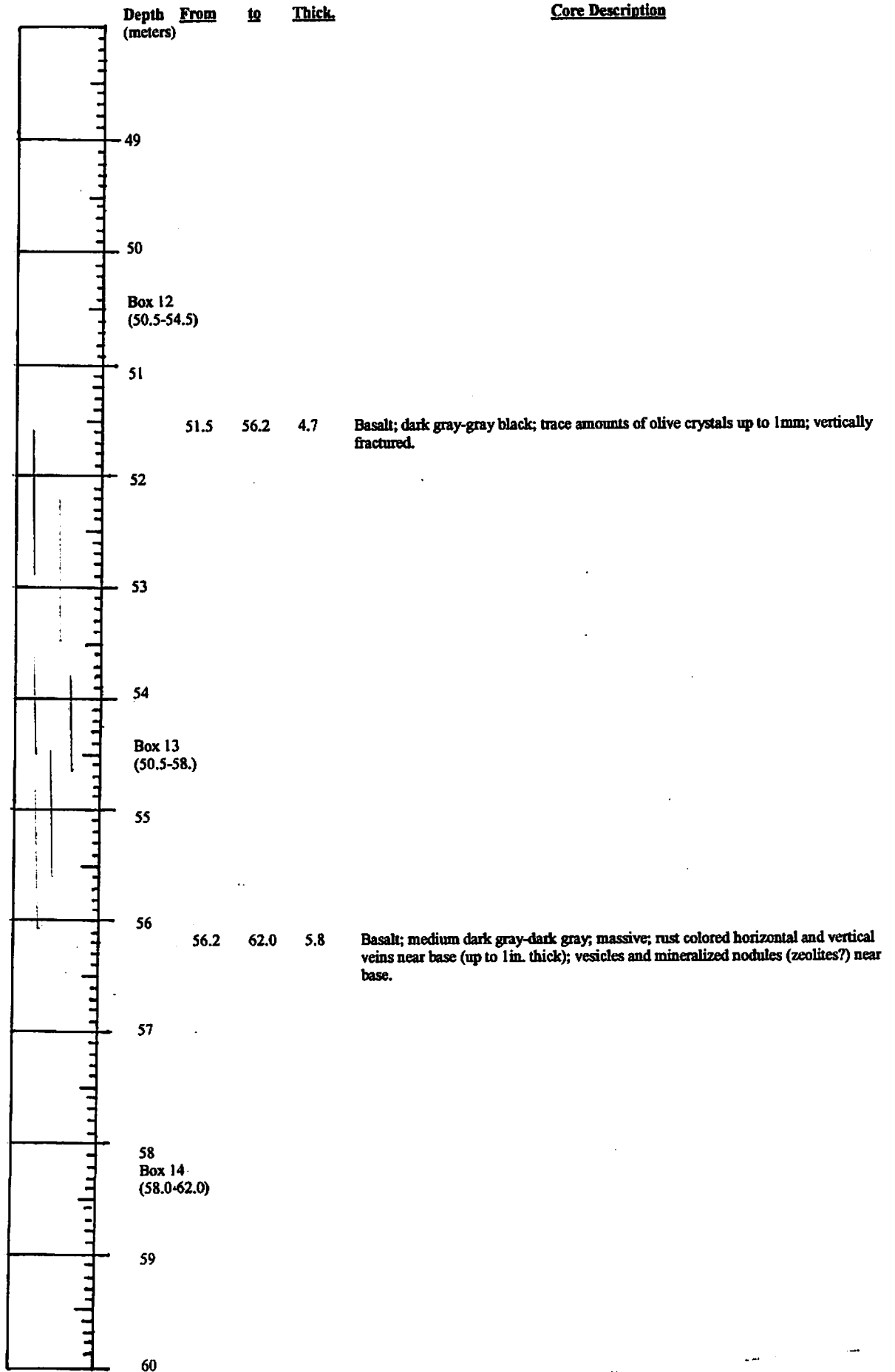
Depth (meters)	From	to	Thick.	Core Description
37				
37.5-42.0				Box 9
38				
39				
40				
41				
42.0-46.3	42.0	51.5	9.5	Basalt; medium dark gray-dark gray; massive Box 10
43				
44				
45				
46.3-50.5				Box 11
47				
48				

CORE DESCRIPTION

Hole No.: NS-02-01
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 5 of 6
Date: 4-30-02 to 5-2-02



DRILL HOLE COMPLETION REPORT
LIZAK GEOSCIENCE & ENGINEERING, INC.

Northeast Office-1805 Evans St.
Northampton, PA 18067
Phone 610-262-9120 * Fax 610-262-4212

Hole No: NS-02-02 Property/Project: Denton
Location: ≈ 1500 Ft N. along road Gr. Elevation: 234.6ft.
Location Surveyed: (Yes) (No) Surveyor's Name: Scotic Surveys
County: Digby State/Province N.S. Country: Canada
Surface Owner: Johnson Option No.: _____
Spud Date: 5-3-02 Completion Date: 5-4-02
Hole Size: Surface NW Interval 0 - 2.0 Ft.
Main Hole _____ Interval 2.0 Ft. - 74.5 m
Total Depth: 74.5 m Air to: _____ Water/Mud to: 0 - T.O.
Cored: (Yes) (No): If yes, intervals 2.0 Ft. - 74.5 m
Core Barrel Type: NQ I.D. _____ O.D. _____ Length 4.0 m
Lost Circulation at: 74.5 m Regained: (Yes) (No) _____
Static Water Level: Initial _____ Final _____
Noticeable Water Invasion: (Yes) (No); Intervals _____
Casing: Depth 2.0 Ft Diameter NW Recovered: (Yes) (No)
Contractor's name and address: Logan Drilling - P.O. Box 189
Stewicke, NS, Canada B0N 2J0
Hole Plugged: (Yes) (No) Name/address if company differs from contractor _____

Samples and core descriptions by: John Lizak
Report prepared by: S. Lizak Date: 5-4-02

Comments:

5-3-02 On site 7:00 AM. Cored to 44 m.
5-4-02 On site 7:00 AM cored to T.O.

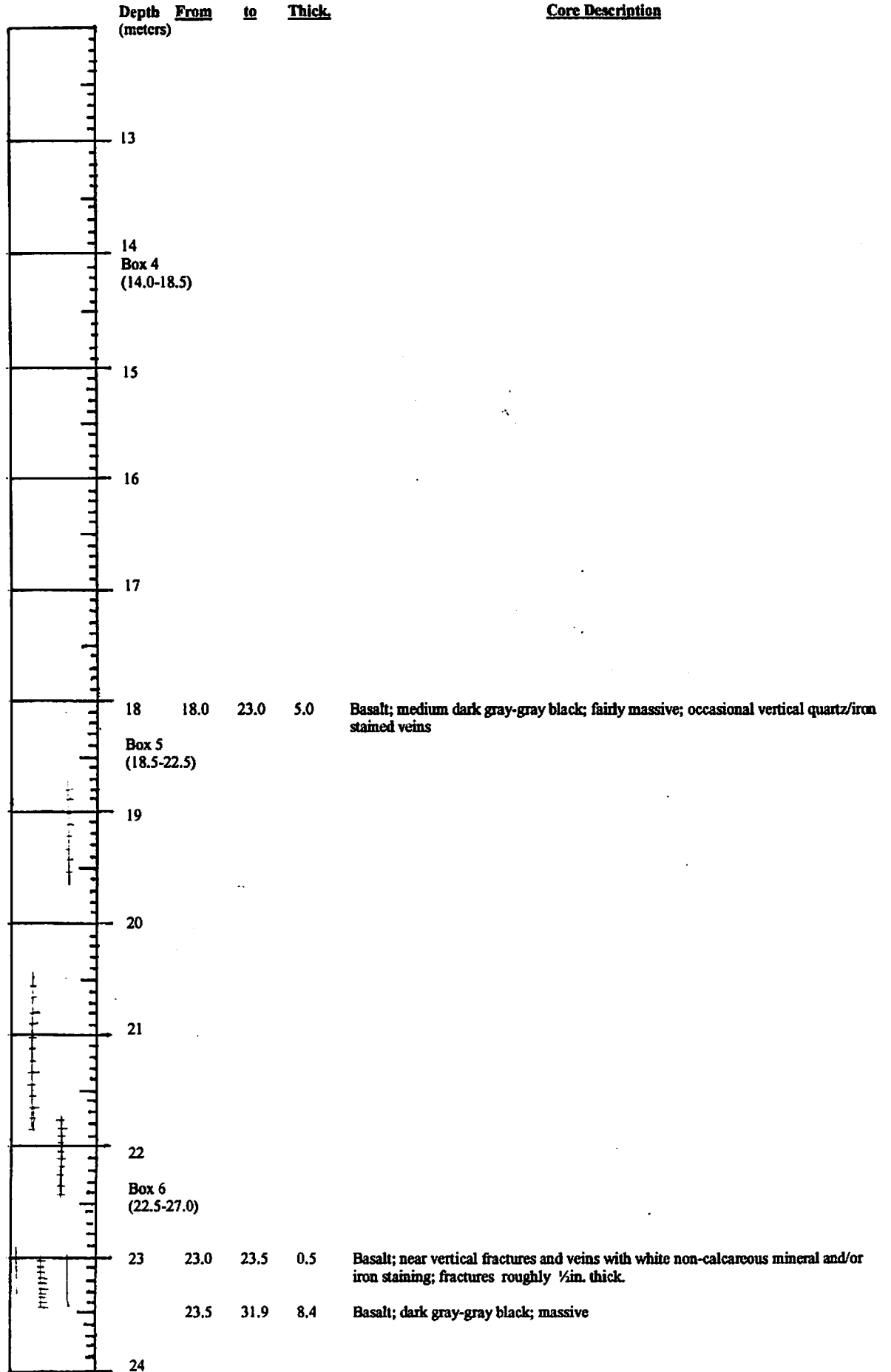
Location Sketch

CORE DESCRIPTION

Hole No.: NS-02-02
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 2 of 7
Date: 5-3-02 to 5-4-02

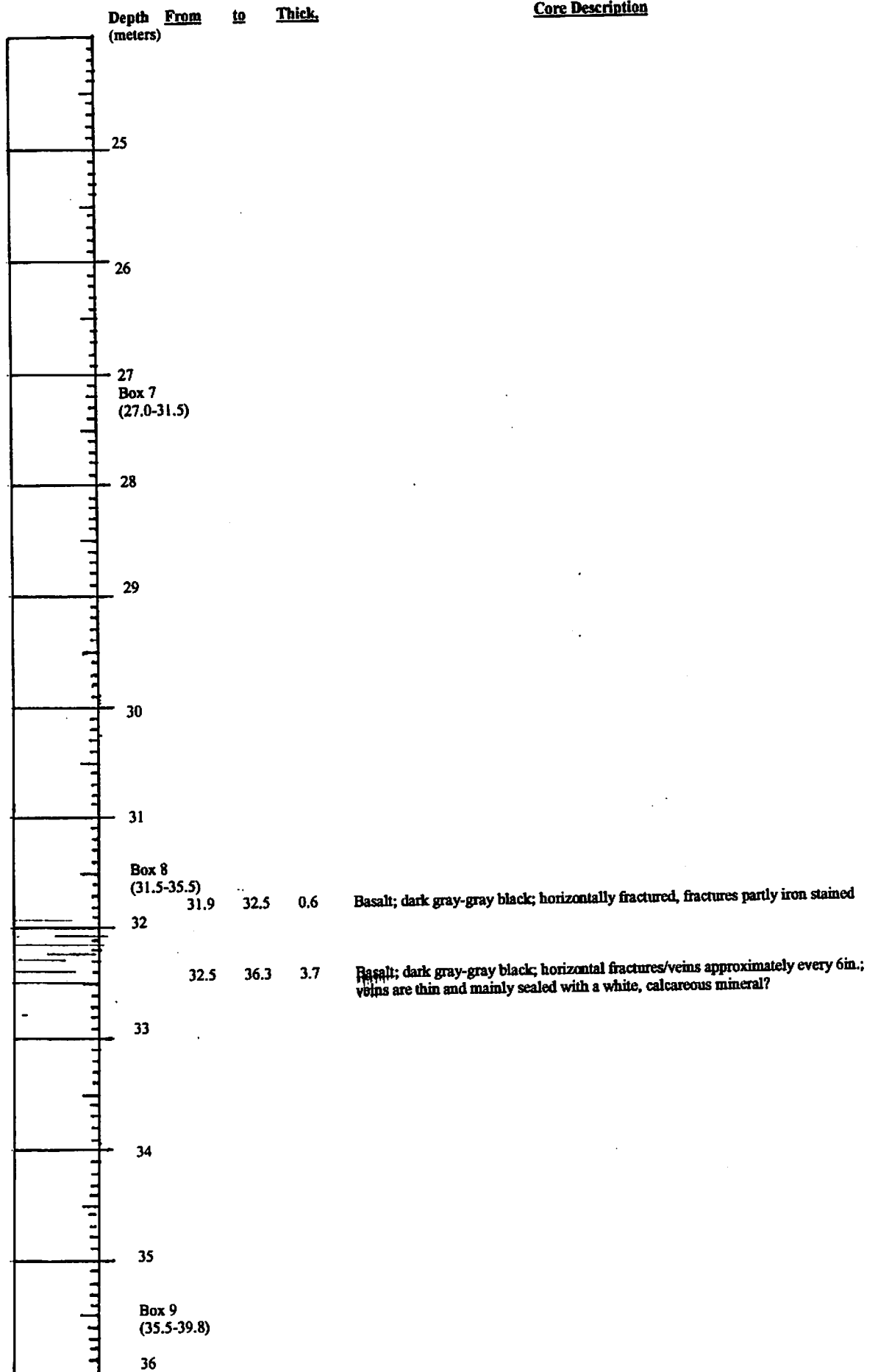


CORE DESCRIPTION

Hole No.: NS-02-02
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 3 of 7
Date: 5-3-02 to 5-4-02

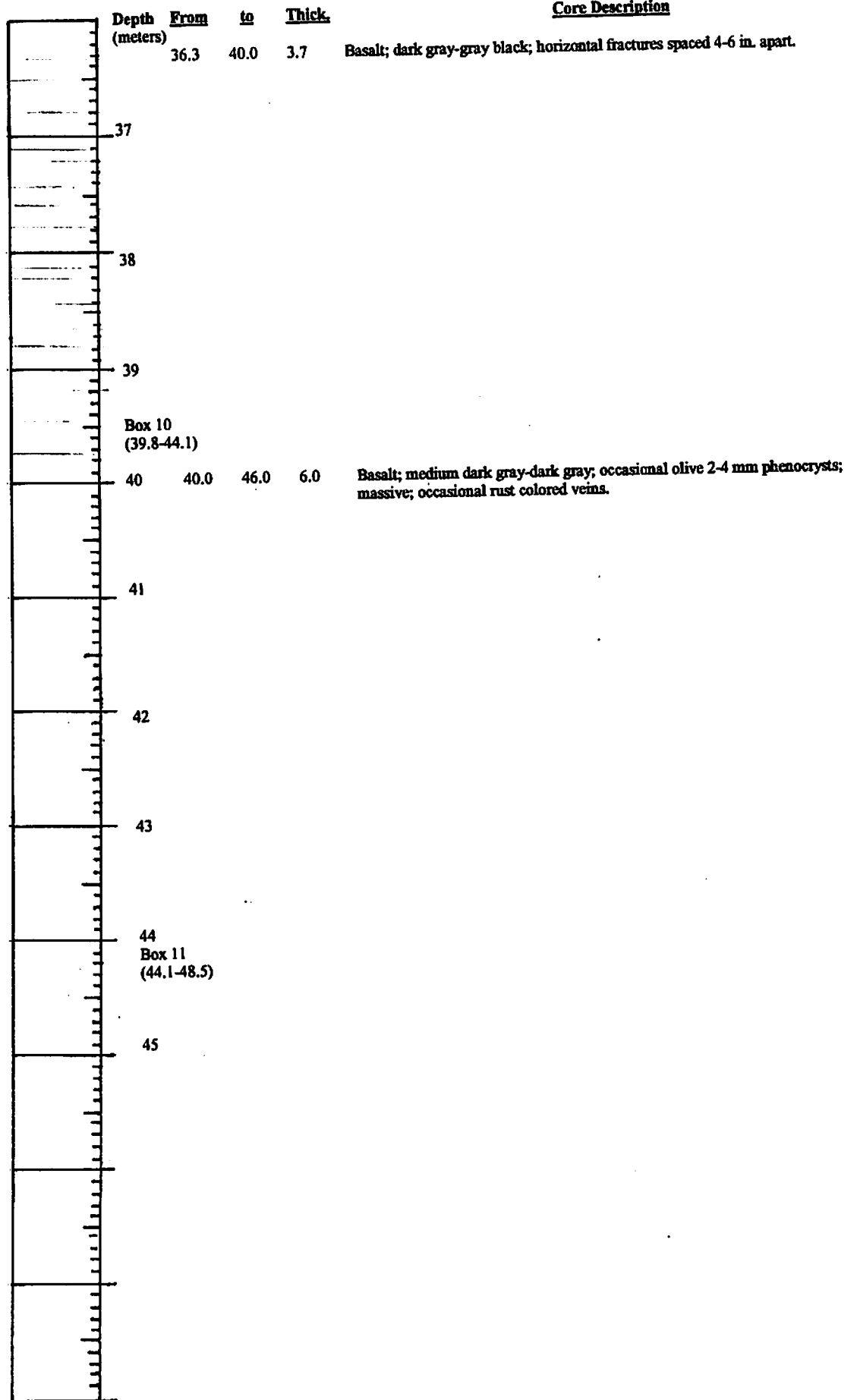


CORE DESCRIPTION

Hole No.: NS-02-02
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 4 of 7
Date: 5-3-02 to 5-4-02

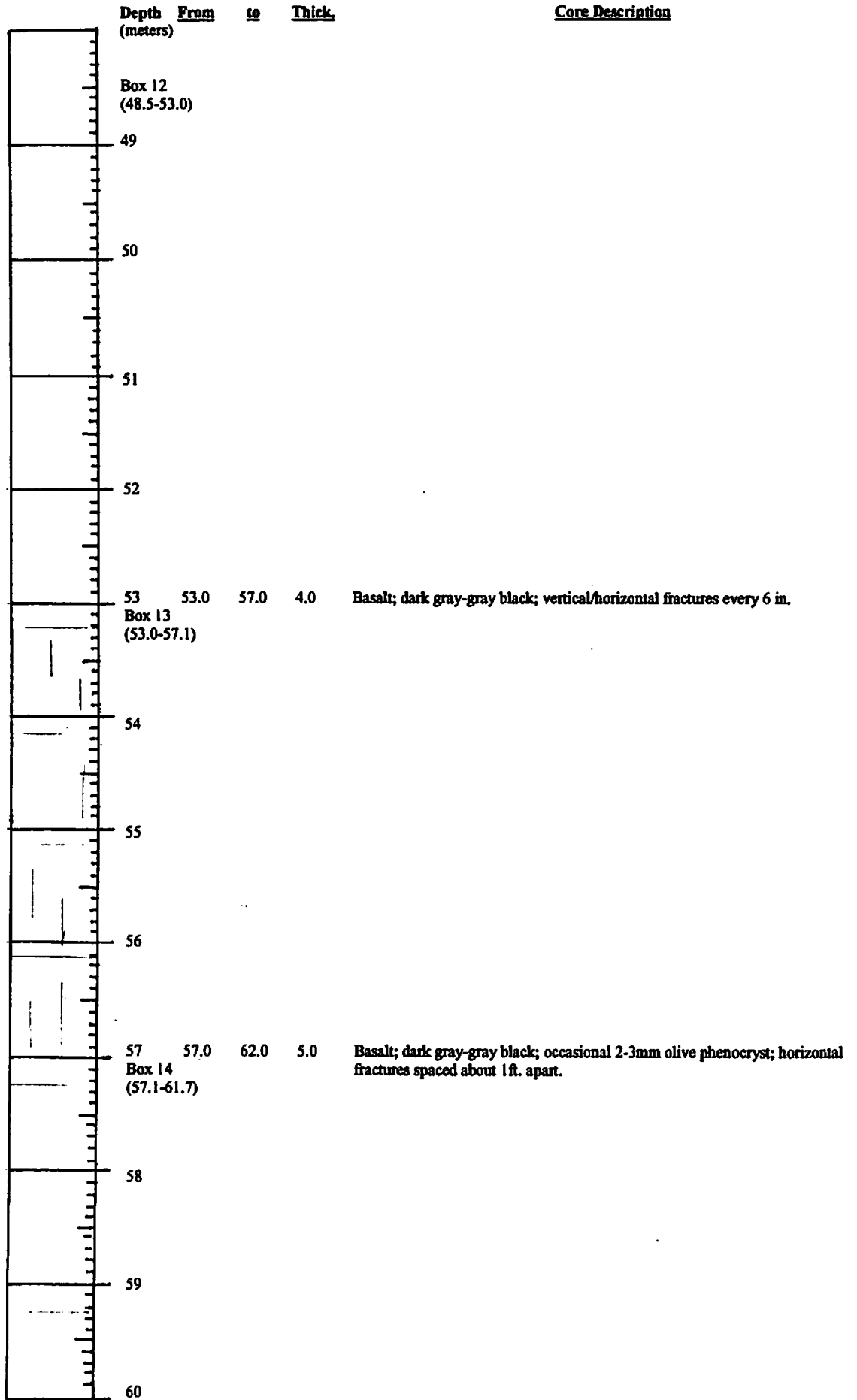


CORE DESCRIPTION

Hole No.: NS-02-02
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 5 of 7
Date: 5-3-02 to 5-4-02



CORE DESCRIPTION

Hole No.: NS-02-02
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 6 of 7
Date: 5-3-02 to 5-4-02

Depth (meters)	From	to	Thick.	Core Description
61				
Box 15 (61.6-66.0)				
62	62.0	65.4	3.4	Basalt; medium dark gray-gray black; vertically fractured; some fractures are rust colored; major fracture at 65.2.
63				
64				
65				
	65.4	72.0	6.6	Basalt; medium dark gray-dark gray; "clangy"; with thin (< 1/8in) iron-stained veins and fractures; fractures are horizontal and vertical.
66				
Box 16 (66.0-70.0)				
67				
68				
69				
70				
Box 17 (70.0-74.5)				
71				
72				

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LIZAK GEOSCIENCE & ENGINEERING, INC.

Northeast Office-1805 Evans St.
Northampton, PA 18067
Phone 610-262-9120 * Fax 610-262-4212

Hole No: NS-02-03 Property/Project: Denton

Location: ≈ 2200 ft N of PL, along road Gr. Elevation: 118.2 ft.

Location Surveyed: (Yes) (No) Surveyor's Name: Scotic Surveys

County: Digby State/Province N.S. Country: Canada

Surface Owner: Johnson Option No.: _____

Spud Date: 5-4-02 Completion Date: 5-7-02

Hole Size: Surface _____ Interval 0-2.0 ft

Main Hole _____ Interval 2.0 ft. - 35.0 m

Total Depth: 35.0 m Air to: _____ Water/Mud to: 0-T.D

Cored: (Yes) (No): If yes, intervals 2.0 ft. - 35.0 m

Core Barrel Type: NQ I.D. _____ O.D. _____ Length 4.0 m

Lost Circulation at: - Regained: (Yes) (No) _____

Static Water Level: Initial - Final -

Noticeable Water Invasion: (Yes) (No); Intervals _____

Casing: Depth 2.0 ft Diameter NW Recovered: (Yes) (No)

Contractor's name and address: Logan Drilling - P.O Box 133
Stewiacke, NS, Canada BON 250

Hole Plugged: (Yes) (No) Name/address if company differs from contractor _____

Samples and core descriptions by: John Lizak

Report prepared by: J. Lizak Date: 5-7-02

Comments:

5-4-02 Move on site late PM
5-5-02 Drilled to 26 m
5-6-02 OFF
5-7-02 Drilled to TD. Moved onto site 4.

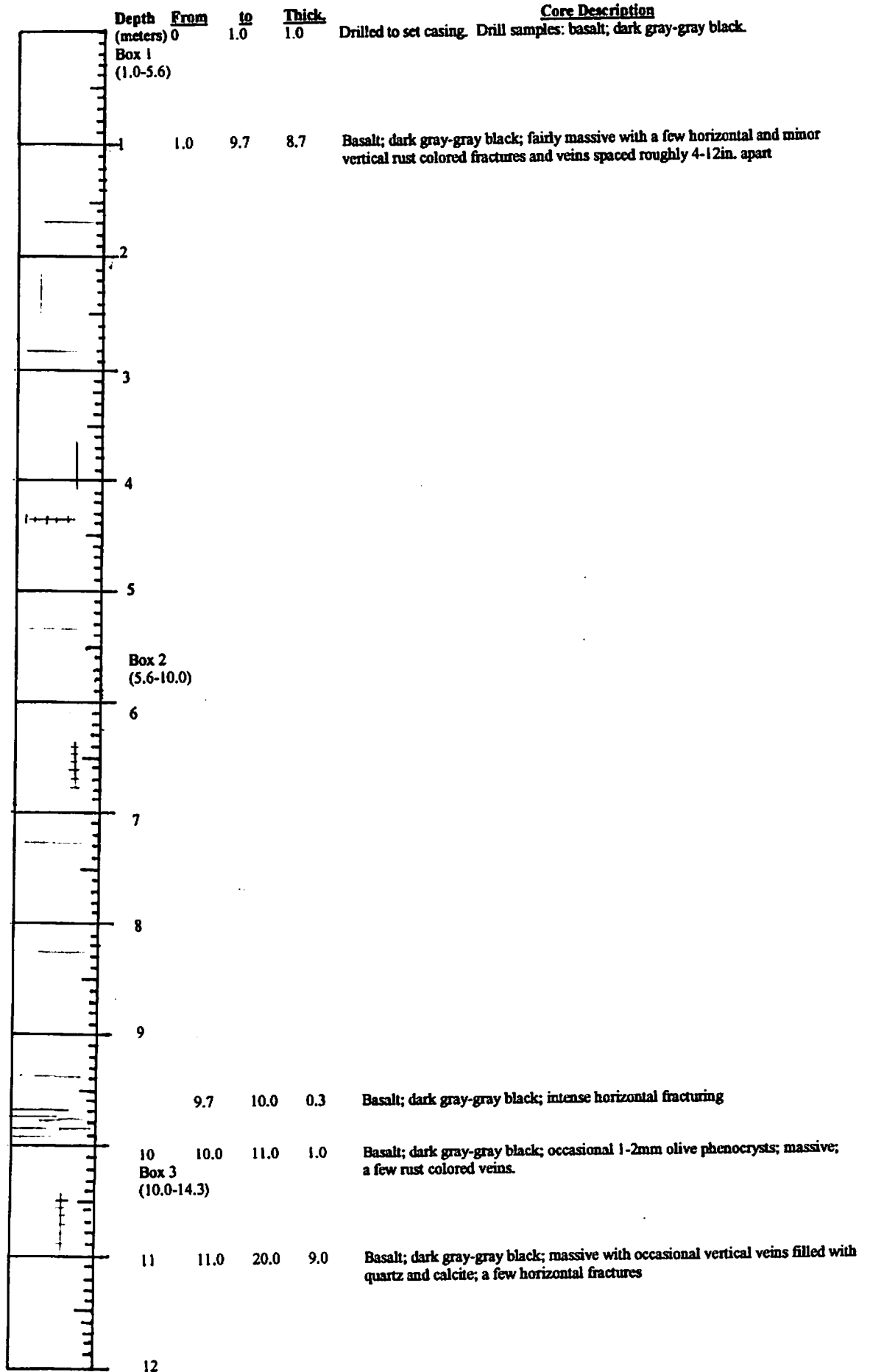
Location Sketch

CORE DESCRIPTION

Hole No.: NS-02-03
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 1 of 3
Date: 5-4-02 to 5-7-02

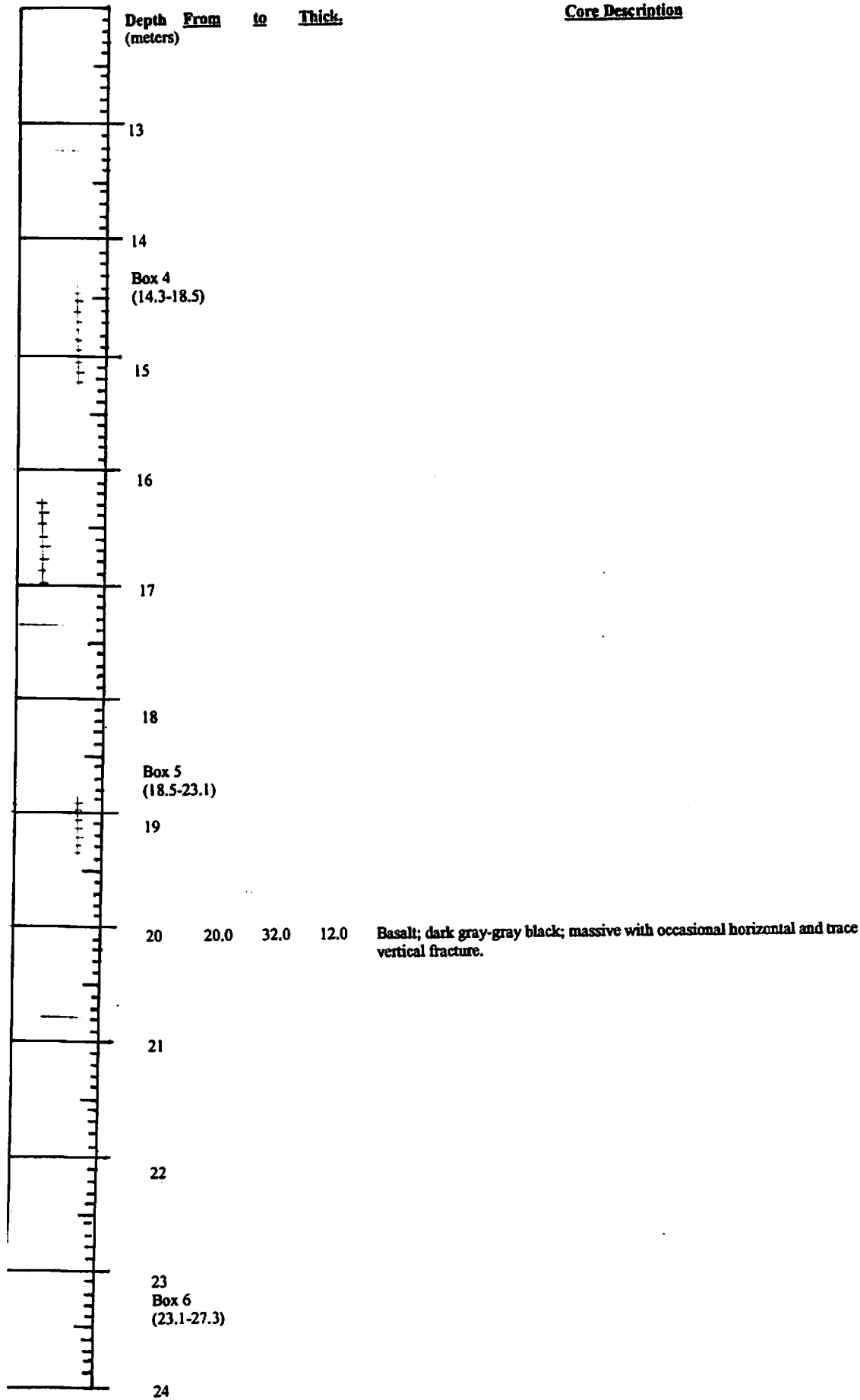


CORE DESCRIPTION

Hole No.: NS-02-03
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 2 of 3
Date: 5-4-02 to 5-7-02

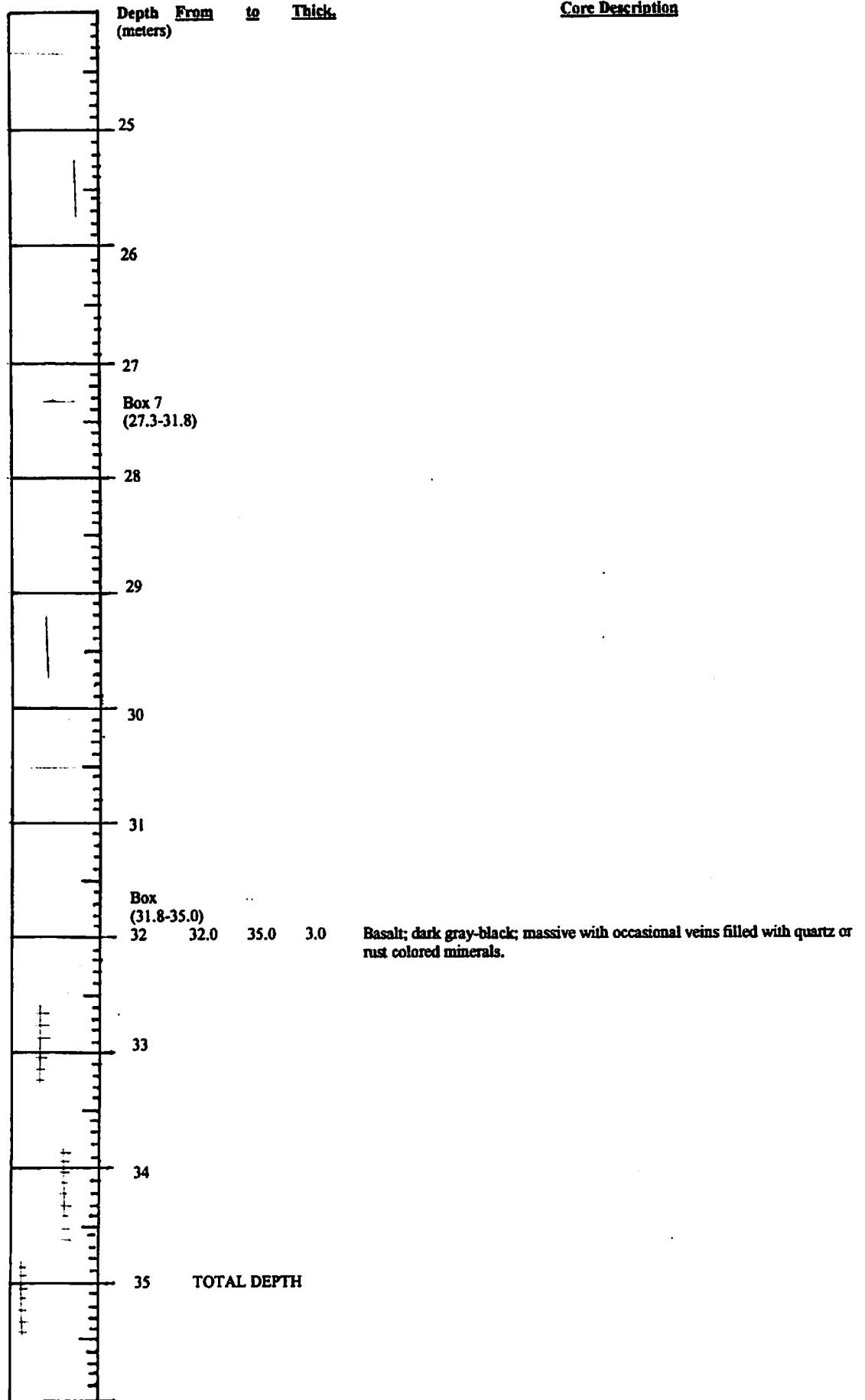


CORE DESCRIPTION

Hole No.: NS-02-03
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 3 of 3
Date: 5-4-02 to 5-7-02



DRILL HOLE COMPLETION REPORT
LIZAK GEOSCIENCE & ENGINEERING, INC.

Northeast Office-1805 Evans St.
Northampton, PA 18067
Phone 610-262-9120 * Fax 610-262-4212

Hole No: NS-02-04 Property/Project: Denton

Location: Near end of road, shore Gr. Elevation: 40.7 Ft.

Location Surveyed: (Yes) (No) Surveyor's Name: Scotia Surveys

County: Digby State/Province NS Country: Country

Surface Owner: Johnson Option No.: _____

Spud Date: 5-7-02 Completion Date: 5-8-02

Hole Size: Surface NW Interval 0-6.0 Ft.

Main Hole _____ Interval 6.0 Ft. - 20.0 m

Total Depth: 20 m Air to: _____ Water/Mud to: T.D.

Cored: (Yes) (No) If yes, intervals 2.0 m - 20.0 m

Core Barrel Type: NQ I.D. _____ O.D. _____ Length 4.0 m

Lost Circulation at: - Regained: (Yes) (No) _____

Static Water Level: Initial - Final -

Noticeable Water Invasion: (Yes) (No) Intervals _____

Casing: Depth 6.0 Ft. Diameter _____ Recovered: (Yes) (No)

Contractor's name and address: Logan Drilling - P.O. Box 188
Stewiacke, NS, Canada B0N 2J0

Hole Plugged: (Yes) (No) Name/address if company differs from contractor _____

Samples and core descriptions by: John Lizak

Report prepared by: J. Lizak Date: 5-8-02

Comments:

5-7-02 Moved on site PM.
5-8-02 Drilled to TD.

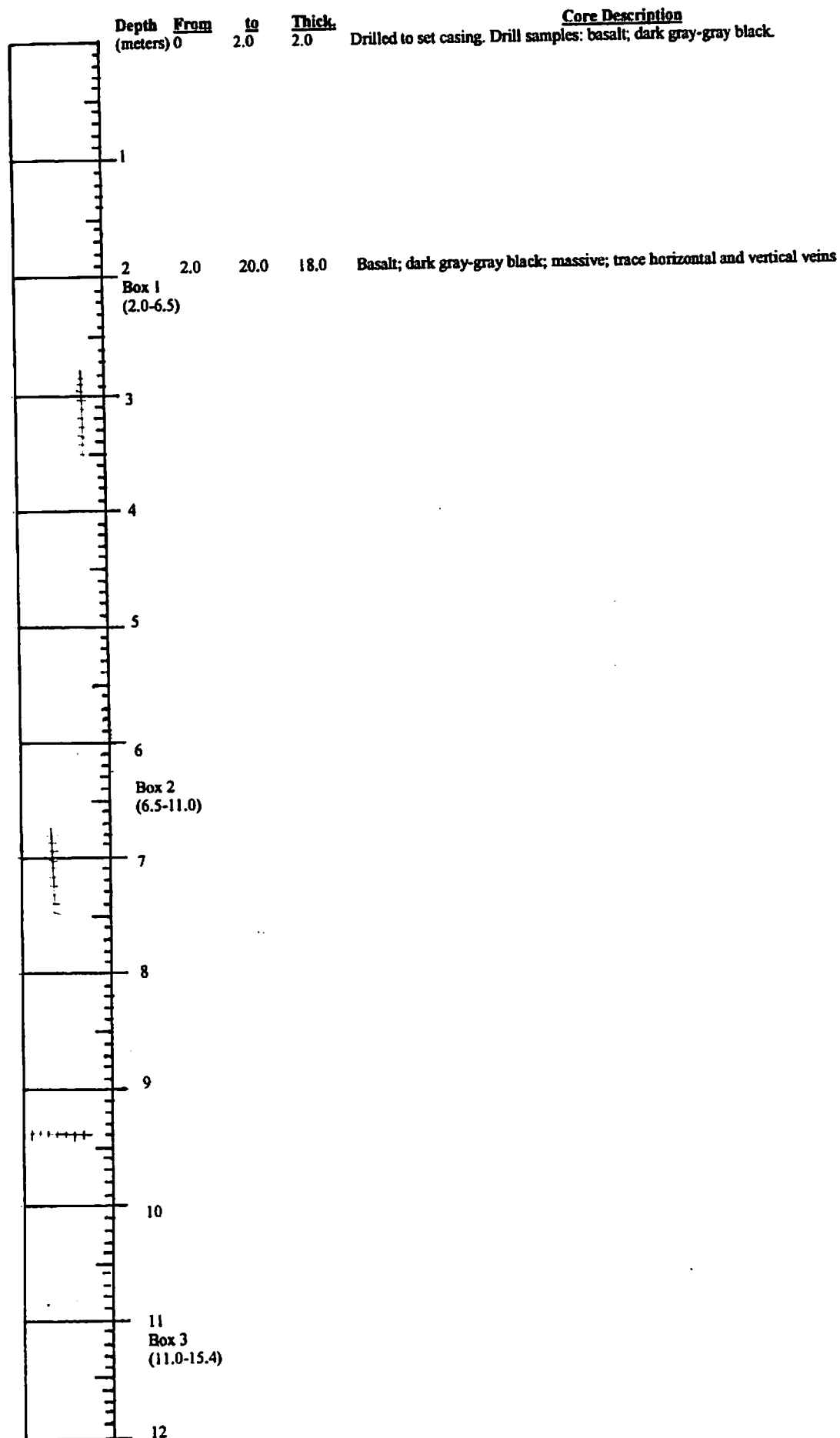
Location Sketch

CORE DESCRIPTION

Hole No.: NS-02-04
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 1 of 2
Date: 5-7-02 to 5-8-02

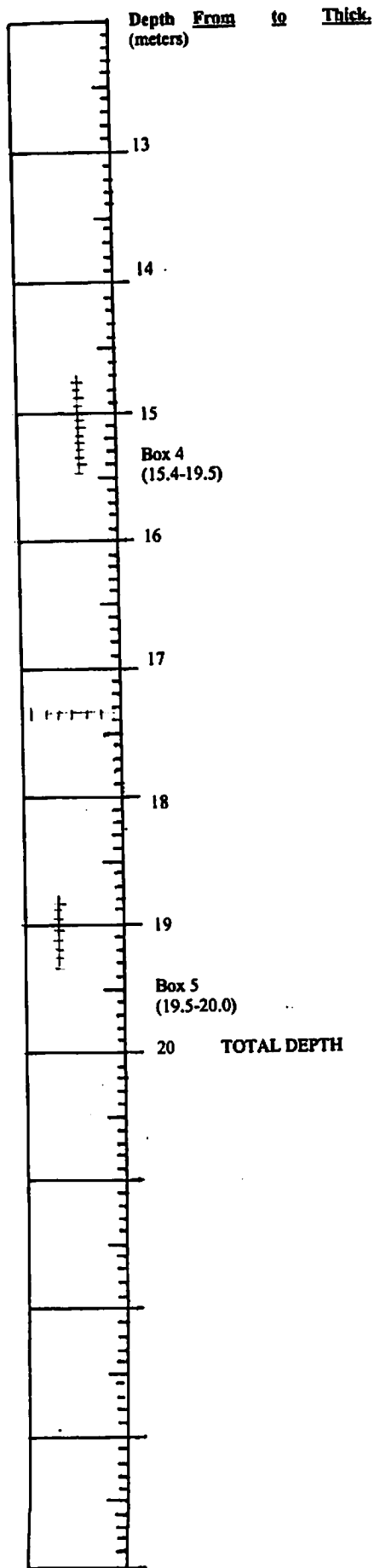


CORE DESCRIPTION

Hole No.: NS-02-04
Description By: J. Lizak

Prospect: Denton
Drilled By: Logan Drilling

Page: 2 of 2
Date: 5-7-02 to 5-8-02



Core Description