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UNITED INDUSTRIAL SERVICES LTD. (UISL)

ASSESSMENT REPORT ON SILICA SAND PERMIT 9393080332

by

John D. Godfrey, P.Geol., PhD

J.D. Sons & Associates Management Ltd.

and

Murray E. Robinson, CMA

United Industrial Services Ltd.

October 31, 1999 **Calgary, Alberta**

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UNITED INDUSTRIAL SERVICES LTD. (UISL)

ASSESSMENT REPORT ON SILICA SAND PERMIT 9393080332

Introduction

United Industrial Services Ltd. (formerly known as "Ultrasonic Industrial Sciences Ltd."), the permit holder, wishes to submit the following assessment report in order to comply with requirements by Alberta Energy regarding an area of 1249.56 hectares contained within Metallic and Industrial Minerals Permit # 9393080332.

Compilation of this report is a joint undertaking by John D. Godfrey, P.Geol., primarily responsible for the geological content and Murray E. Robinson, CMA who is directly responsible for the financial operations of UISL.

Background Summary

Prior to any field exploration program being undertaken by UISL, an evaluation of existing reports and recent fieldwork by the previous management of Ultrasonic Industrial Sciences Ltd. was compiled and summarised by John D. Godfrey (1997a). This summary became the basis for the initial programs developed by the new management of United Industrial Services Ltd.

During the past two years, United Industrial Services Ltd. (UISL) has been fully and actively engaged in the detailed exploration of a silica sand deposit located some 10 km north of the town of Peace River, Alberta, accessible from the town by road (Figure 1). The permit area (Figure 2) straddles the Peace River, however, the recent geological exploration effort by UISL has been initially concentrated on the east side of the river valley with a view to bringing this part of the deposit into production first.

This silica sand deposit of Lower Cretaceous age was first described in detail by geologist M.B.B. Crockford, Research Council of Alberta (1949). The reader is referred to this manuscript for a detailed description of the

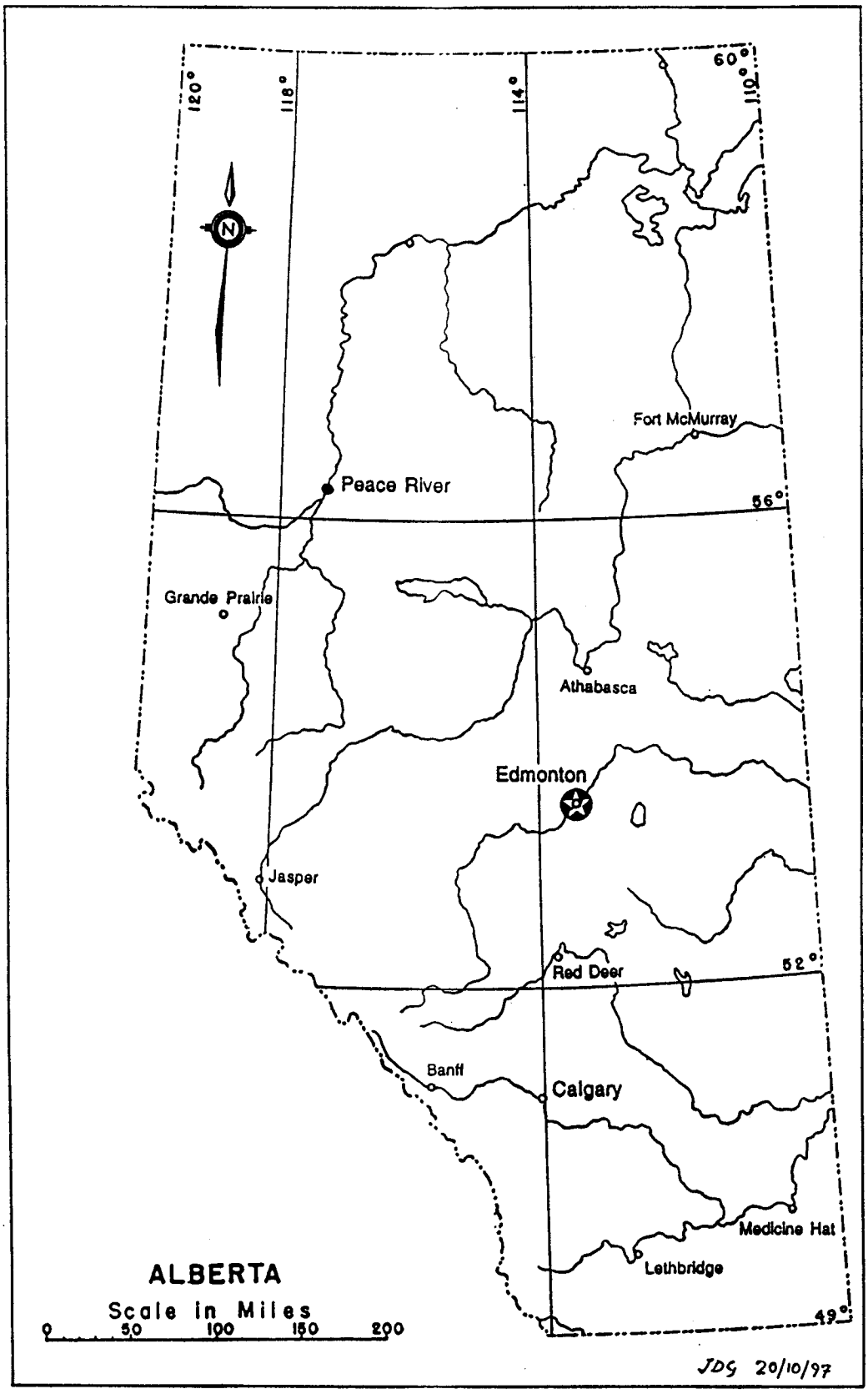
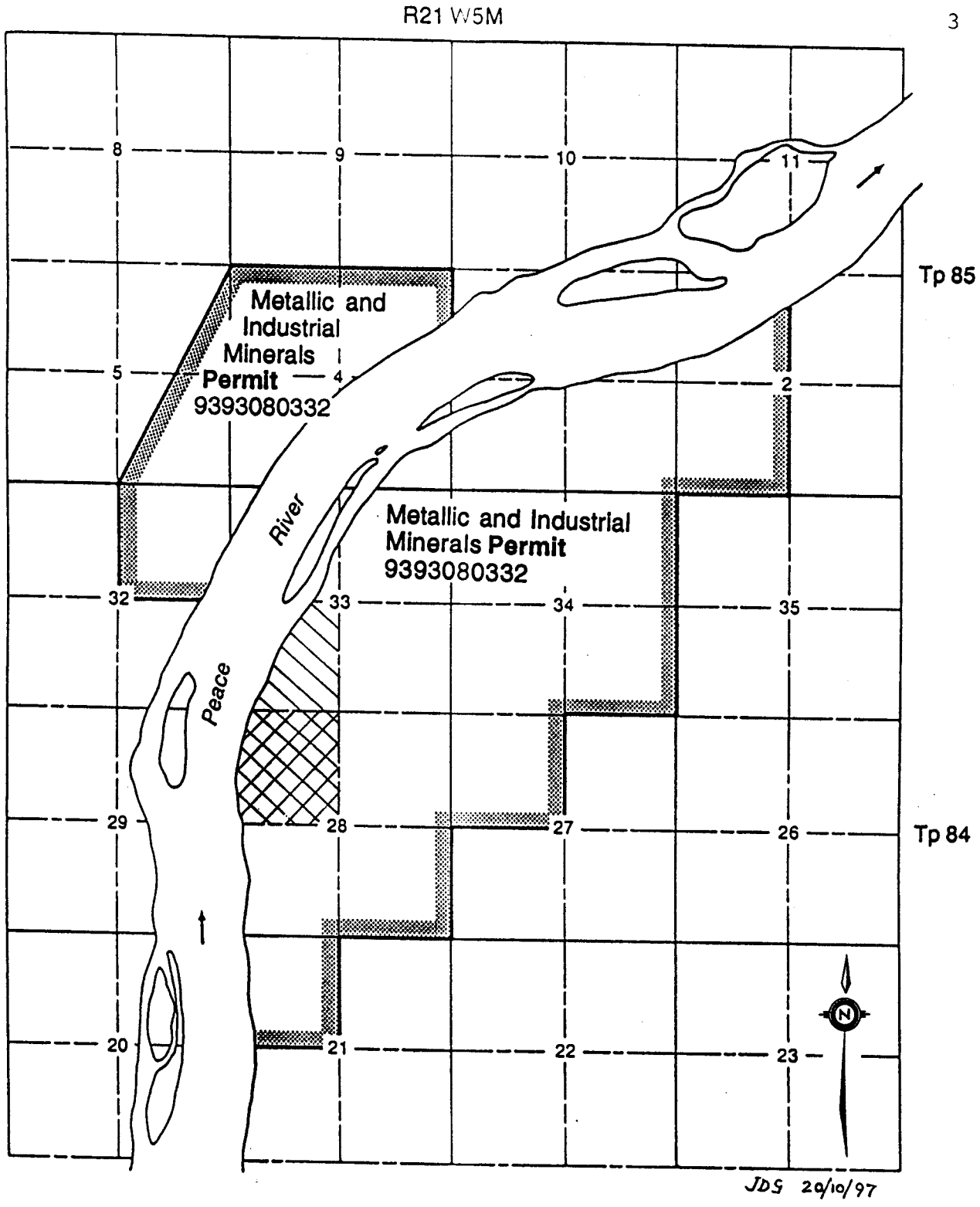


Figure 1. Location of Silica Sand Property, Peace River region, Alberta, Canada United Industrial Services Ltd.



Scale

0 .5 1 mile

0 .5 1 km

Metallic and Industrial Minerals **Permit** 9393080332

Metallic and Industrial Minerals **Lease** 9496110001 (mining)

Mineral Surface Lease (MSL) MSL 941817 (access & plant)

Figure 2. Silica Sand permit and leases, United Industrial Services Ltd.

regional geology and several measured sections including the silica sand bed that occur within the immediate general area.

More recent work by Dale A. Leckie (1990) of the Geological Survey of Canada and associated workers provides more detail, particularly regarding the sedimentological environment of deposition of the Paddy Member (includes the silica sand) and adjacent lithologies. By this time, the sand had become of increasing interest to the petroleum exploration industry where it lies beneath an appropriately thicker cover of younger strata.

Exploration of the Paddy Member silica sand by UISL has drawn on these, other published studies, and other publicly available documents, wherever suitable.

During the past 45 years or so, exploration of the silica sand has been successively undertaken by several mineral permit holders in the general area of the permit held by UISL. Their work and the reliability of the exploration data were evaluated and selectively compiled by Hamilton, Alberta Research Council, (1989). At that time, in conjunction with Hardy/BBT, Hamilton also supervised a series of five drill holes that explored the continuity of the Paddy Member sand subcrop along a strike length of about 2.5 miles on the east side of the Peace River valley. The compilation of earlier drill data and additional exploration drilling by Hamilton have formed the basis for the initial exploration programs by UISL.

Following are outlines of the exploration work programs conducted by UISL, described on a year-by-year basis (1996-99), with a financial statement of expenses associated with each phase of the work programs. Costs of laboratory analytical work do not form a part of the assessment claim and therefore correspondingly do not form a part of the technical documentation presented here. A map of the UISL property showing access road and trails, the processing plant, the locations and identification numbers of channel samples, drill hole sample sites and test pits is enclosed in Appendix 1.

1. UISL FIELDWORK PROGRAMS

UISL FIELDWORK PROGRAM FOR 1996

1. PROGRAMS UNDERTAKEN

Phase I Fieldwork Program

1. I. 1 Program Description:

A major operation of stripping overburden was undertaken in order to explore the lateral continuity, thickness and textural character of the Paddy Member silica sand by extending the natural outcrop already visible towards the southern boundary of the permit area. The success of this stripping program was very limited as the expected lateral continuity of the silica sand bed was not realised. Later exploration by test pits and drill sampling data show that an erosional valley has removed much of the silica sand at this location. Although not successful in leading directly towards a production operation, the overall exploration program of the silica sand deposit has benefited in helping to define a 3-D model of the deposit in the local area.

Access to the stripping site required flagging of the right-of-way followed by the construction of trails primarily with the use of a bulldozer. Stripping of overburden was accomplished by bulldozer.

UISL FIELDWORK PROGRAM IN 1997

2. PROGRAMS UNDERTAKEN

Phase I Fieldwork Program

2. I. 1 Program Description:

A general geological examination of the surface features of the property, including natural outcrops and exposures created by inactive gravel pit operations and a series of test pits and trenches, was followed by vertical channel sampling of one natural outcrop of the Paddy Member sandstone on the upper bank of the Peace River valley.

UISL decided to focus the immediate exploration effort in the southern extremity of the East Block (east of the Peace River) within the permit area, with a view to outlining reserves for an evaluation leading to a production situation. Over the succeeding years, exploration has continued to focus on this region, gradually extending the area of detailed sampling and exploration generally progressing from south to north.

A two-man crew cut a continuous vertical channel sample across the silica sand beds at 2-foot lengths, occasionally using lateral stratigraphic offsets to improve ease of access (JG/KM-97-CH01). The sandstone is sufficiently friable that the exposed surface can be cleaned off by shaving it with a hand axe and the channel sample cut by axe, sand caught in a plastic pail, bagged, tied and labeled. The geological log of the channel section was measured with the aid of a tape measure. Geological observations included primary sedimentary structures, sand textures, orientation of bedding, joints, and groundwater features. Some of the photographs recording various geological features are reproduced in a report by Godfrey (1997b).

This sampling methodology was used throughout in the course of vertical channel sampling of surface exposures in later years. The 2-foot channel sample lengths (for both outcrop channel sampling and for drill hole sampling) were standardized throughout the exploration programs for 1997

and 1998. The field program for 1999 employed the same methodology but after the experience of the first two years, and in order to harmonize with the metric system being used in other aspects of property development, continuous sampling switched from 2-foot to one metre length samples.

2. I. 2 Samples Collected:

Channel Sample: JG/KM-97-CH01-1/12 12 samples

Bulk Sample: KM-97-B02-1 1 sample

Phase II Fieldwork Program

2. II. 1 Program Description:

An extensive field exploration program was conducted following the fieldwork guidelines set out above that included: tape-measured sections and channel sampling of natural outcrops (2), test pits and trenches (Map in pocket). Working on the steep cliff face of the Paddy Member in the Peace River valley wall required the expertise of an experienced mountain climber (Ryan Wyngaarden) for safety reasons.

Drill sampling utilized a reverse air circulation rig for sampling of 7 boreholes; the operation included a 2-man drill crew plus a geologist logging the borehole and catching/labeling samples. Two geologists, John D. Godfrey and John M. Bodard, worked on different phases of the exploration program on the property. A summary of the exploration geology program, including geological logs, is reported in Bodard (1997) (Appendix 2). Particle size analyses were conducted on all of the silica sand samples and several of the mixed zone materials.

2. II. 2 Samples Collected:

Four channel sampled sections of natural outcrops accounted for a total of 49.3 m of section and drill sampling at 7 drill hole sites accounted for another 224.7 m for a grand total of 274.0 m for the 1997 field season.

Notations for various categories of field samples are:

CH = Channel sampled continuous section in silica sand

CHTP = Channel sampled continuous section in test pit

DH = Drill hole sampled continuous section in silica sand

B = Bulk sample taken perpendicularly across silica sand section

Tabulation of sample sites:	Number of Samples
JG/JB-97-DH03-1/12	12
JG/JB-97-DH04-1/22	22
JG-97-DH05-1/4	4
JG-97-DH06-1/19	19
JG-97-DH07-1/31	31
JG-97-DH08-1/31	26
JG/JB-97-DH09-1/21	19
JG/JB-97-CH10-1/16	17
JG/JB-97-CH12-1/9	9
JG/JB-97-CH13-1/13	13
Total	**172**

Phase III Laboratory Program

2. III. 1 Program Description

Laboratory procedures included particle size distribution analyses conducted by EBA Consulting Engineers, Calgary, (172) and AGRA Earth & Environmental Limited, Edmonton, (11).

A particle shape and roundness evaluation and a diagenetic study of the Paddy Member sandstone, using petrographic and binocular microscopes, was conducted by John D. Godfrey.

2. III. 2 Sieve Analyses

All of the sand samples were oven dried, split, sieved according to the ASTM guidelines, bagged and labeled.

AGRA sieved 11 samples, using the following US Standard Series openings:

8/10/16/20/30/40/50/100/200/-200 (pan)

EBA sieved 172 samples using the following US Standard Series openings:

12/20/40/50/70/80/100/200/-200 (pan)

2. III. 3 Auxiliary Services

Technical assistant, Tolan Freisen, supervised drying of the sand samples whilst in temporary storage at the Ramsay Ranch, Okotoks. Examination of the samples was made by Ken Murdock, P.Eng. and John Godfrey, P.Geol.

The samples were transferred from the Ramsay Ranch to the EBA laboratory for size analyses and thence to a permanent mini storage facility in Calgary.

Phase IV Data Compilation

2. IV. 1 Field Data

Channel sampling and drill-hole data have allowed a more precise definition of the shape and size of the silica sand body. Geologs of the 1997 channel and drill hole sections are presented in Appendix 2. An isopach map (contours of the silica sand body) was constructed based on 1997 sample data points plus selected reliable data points from earlier exploration programs.

The isopach map is a useful guide for modeling of the silica sand body, it also illustrates the continuity of the silica sand, defines the area of upgraded reserves to pre-production development ore and has provided the initial basis for mine planning and production scheduling.

Siting of the permanent processing plant facilities and storage areas (now completed) was determined from the isopach compilation, taking advantage of a local area of thinned Paddy Member silica sands.

The initial pilot-scale open-pit operations to feed the processing plant are being taken from the area south of the plant site. Eventual exhaustion of these reserves will require moving the excavation operation to the east and north sides of the plant site.

2. IV. 2 Laboratory Analytical Data

Industrial applications of silica sand products depend to a large extent on its textural characteristics. Therefore, particle size analyses have been conducted on every silica sand sample taken in vertical continuous channel and drill-hole sample sections and in bulk samples.

The individual particle size analyses have been compiled and systematically reduced and averaged for the drill hole and channel sample sections, then averaged by weighting to estimate reserves for various pre-production mining areas south of the plant site.

UISL FIELDWORK PROGRAM FOR 1998

3. PROGRAMS UNDERTAKEN

Phase I Fieldwork Program

3. I. 1 Program Description

The field program objective was directed towards establishing a network of sample points for the purpose of testing the lateral continuity, quality and character of the Paddy Member sandstone. In the process, the volume of proven silica sand reserves was increased and the field data on overburden thickness and type was incorporated into the mine planning process.

Continuous vertical channel samples were cut by a 2-man crew on the outcrop of the Paddy Member sandstone exposed in the upper cliff face along the east bank of the Peace River (Map in Appendix 1 pocket for locations). Professional mountaineer, Matt Peters, provided assistance to ensure that safety standards were met at each step of this operation.

The field work was under the direction of John D. Godfrey, P.Geol. and professional geologist Stuart C. Fraser was assisted by James Foufas in the field during the channel sampling and drill hole sampling phases.

The drilling contractor was Simons Drilling, Edmonton, who supplied a 2-man crew to run the reverse circulation drill rig. Much of the drill sampling was conducted with dry air, occasionally water misting was employed, and one hole was abandoned (JG/SF-98-DH25) with rods stuck in a particularly thick overburden section of glacial gravel.

The general procedures used in the sampling program followed the guidelines described earlier. Location of sample points are shown in the map in the attached pocket. The samples were transported to the laboratory of EBA Engineering, Calgary for particle size analysis of all of the Paddy Member samples and selected representation from the underlying Cadotte Sandstone member.

Several test pits were mapped and sampled in the usual way to extend the local coverage of geological data on the Paddy Member sandstone. Test pits, access trails, drill pad preparations, and all other surface work was completed by contractor Eric's Trenching, Peace River.

Geologs of all sampled and measured sections for 1998 are presented in Appendix 3. A description of the status of the geology on the UISL property is given by Godfrey (1998) and presented in Appendix 4.

Ground survey control of the above field activity, and other on-site work, was maintained by Northpoint Land Surveying Ltd., Peace River.

MRDI, Calgary inspected the property and especially made note of the geology from the point-of-view of constraints and options for open-pit excavation planning. Geotechnical engineers from AGRA, Edmonton, also inspected the property with a particular interest in slope stability conditions.

A second aspect of the 1998 program was to obtain some geological knowledge of the Paddy Member silica sand throughout the east side permit area of the deposit at the reconnaissance level. The previous owner of the property had already commissioned a reconnaissance study, including a 5 drill hole program, conducted by Hardy/BBT and the Alberta Research Council (Hamilton, 1989). It was therefore unnecessary for UISL to undertake such a drill program. Samples were obtained from the earlier study for laboratory analysis.

3. I. 2. Samples Collected

The UISL program involved continuous vertical channel sampling of the Paddy Member sandstone was conducted in 7 Test Pits, 4 natural outcrop sections, 12 drill holes (one abandoned) and 1 representative bulk sample was taken across the Paddy sandstone in Test Pit 6.

Channel sampling of natural outcrops accounted for 21.8 m of section, channel sampling of test pits for 11.8 m and drill sampling another 230.7 m for a grand total of 264.3 m for the field season of 1998.

Geologs for these sections are given in Appendix 3.

Sample sites:	**Number of Samples**
JG/SF-98-CH11A-1/	0
JG/SF-98-CHTP14-1/	0
JG/SF-98-CHTP15-1/	0
JG/SF-98-CHTP16-4/16	13
JG/SF-98-CHTP17-1/	2
SF/KM-98-B18	1
JG/SF-98-CH19-1/4	4
JG/SF-98-CH20-1/	0
JG/SF-98-CH21-1/	0
JG/SF-98-DH22-4/16	13
JG/SF-98-DH23-1/17	17
JG/SF-98-DH24-1/22	22
JG/SF-98-DH25- abandoned	0
JG/SF-98-DH26-9/20	12
JG/SF-98-DH27-2/23	21
JG/SF-98-DH28-1/22	22
JG/SF-98-DH29-1/23	23
JG/SF-98-DH30-1/19	19
JG/SF-98-DH31-2/19	18
JG/SF-98-DH32- 1/14	14
JG/SF-98-DH33-1/21	21
Total	**225**

Samples collected from the Hardy/BBT - Alberta Research Council study included:

Sample sites:	Number of Samples
E89-1-1/7	7
E89-2-1/22	22
E89-3-1/16	16
E89-4-1/5	5
E89-5-1/15	14*
Total	**64**

*Sample # 6 is missing

Phase II Laboratory Program

3. II. I Program Description

The UISL field program produced 225 drill and channel outcrop samples, submitted to EBA Engineering, Calgary for particle size analysis, were dried and sieved according to the ASTM guidelines.

Another series of 64 samples were sieved from the 1989 study by Hardy/BBT - Alberta Research Council.

3. II. 2 Sieve Analyses

EBA Engineering, Calgary were responsible for the entire particle size analyses of 289 samples. The bagged, labeled size fraction separates were placed in long-term storage in the company mini storage facility in Calgary. The size analysis used the following US Standard Series openings:

12/20/40/50/70/80/100/200/-200 (pan)

Phase III Data Compilation

3. III. 1 Field Data

The sample point field data have been incorporated into the overall geological data base and have extended the regional network of points used for geological cross-section construction, refinement of Paddy Member isopach mapping, proven reserves calculations, etc.

3. III. 2 Laboratory Analytical Data

Individual particle size analyses of samples have been tabulated and reduced to produce weighted averages for each sample point and then summarised for calculations of ore reserves.

UISL FIELDWORK PROGRAM FOR 1999

4. PROGRAMS UNDERTAKEN

Phase I Fieldwork Program

4. I. 1 Program Description

A field program of expanding the network of sample data points was essential for the orderly development and extension of the proven reserves and for open-pit planning in advance of production planning. A pattern of drill-hole sampling was completed to improve and refine the 3-D model of the Paddy Member sandstone body, outline reserves initially to the south of the plant site and then shifted to the east and north sides of the plant to develop data in readiness for future production and to meet information requirements for the 5-year plan. Drill hole geologs are in Appendix 5 and other details of the program are summarised by Fraser (Appendix 6).

A series of 16 drill holes by contractor Schmidt Drilling, Ponoka, Alberta in the 1999 field sampling program included 4 to the south of the plant site and another 12 in an approximate grid pattern to the east and north.

Recent drill sampling to the south has better defined the previously indicated erosional channel that has locally removed part of the upper section of the Paddy Member sandstone, Figure 4, Fraser (1999, Appendix 6). This detail provides important input for the open-pit mine planning. UISL achieved pilot-scale production during the current year.

To the north of the plant site the western boundary of the mineable Paddy Member sandstone is defined by a combination of glacial melt water erosion, later in-filled by glacial deposits, and by subsequent slump activity that transported bedrock blocks westwards towards the Peace River valley.

For the first time, the groundwater table became evident in drilling DH 38 and several piezometric observation wells were subsequently installed to provide monitoring of the water level. This groundwater may turn out to be a perched water table.

4. I. 2 Samples Collected

The Paddy Member, including the related Upper and Lower Mixed Zones, were subjected to continuous sample collecting, individual samples being one metre long. Drilling was conducted in a dry state wherever possible to improve the quality of the geological data. However, misting with water was used at the discretion of the driller. One hole was abandoned (JG/SF-99-DH45) due to the drill rods sticking in a thick section of glacial gravel. Following is a list of drill holes and samples collected at each drill site.

Drill Sample Sites	No. Samples Collected
JG/SF-99-DH34-18/25	8
JG/SF-99-DH35-12/26	15
JG/SF-99-DH36-17/22	6
JG/SF-99-DH37-12/17	6
JG/SF-99-DH38-19/35	17
JG/SF-99-DH39-19/35	17
JG/SF-99-DH40-14/32	19
JG/SF-99-DH41-10/27	18
JG/SF-99-DH42-17/19	3
JG/SF-99-DH43-11/24	14
JG/SF-99-DH44-14/28	15
JG/SF-99-DH45 abandoned	0
JG/SF-99-DH46-18/20	3
JG/SF-99-DH47-37-52	18
JG/SF-99-DH48-12/29	18
JG/SF-99-DH49-25/43	19
Total	**210**

Phase II Laboratory Program

4. II. 1 Program Description

J.R. Paine & Associates Ltd., Peace River, Alberta were awarded the contract for particle size analysis for the drill samples generated from the exploration drill sampling program. All laboratory procedures followed the regulations as prescribed by ASTM.

Spot checks of the geological character of the Paddy Member silica sand were made under the binocular microscope.

4. II. 2 Sieve Analyses

The particle size analysis of 210 samples by J.R. Paine & Associates Ltd. used the following US Standard Series openings:

12/20/40/50/70/80/100/200/-200 (pan)

Phase III Data Compilation

4. III. 1 Field Data

A suitable network of sample data points is now in place for the area south of the plant site. Isopach plots for the Paddy Member sandstone (Map in Appendix 1 pocket) using measured sections and analytical sample data, will allow calculation of the proven reserves and for open-pit mine planning. There are enough data points adjacent to the east and north of the plant site to tentatively extend the isopach map coverage northwards.

4. III. 2 Laboratory Analytical data

The particle size analyses provide the key to evaluating the textural character of the sand and its potential industrial applications.

SAMPLES SELECTED FOR STORAGE

In compliance with the Mines and Minerals Act, Alberta Regulation 66/93, Part 4 General, Item 23, UISL has selected cuttings from 2 drill holes and 1 channel sample, representing 3 full sections of Paddy Member silica sand, sampled during the 1997 - 1999 period.

The Paddy Member sandstone is very friable and the approximately 500 gm representative samples are split from the original materials, bagged and labeled. The samples submitted are from the following three sections:

Year	Location	Sample Sequence	Sample Type
1997	DH07	1 to 31 incl.	Drill Hole
1998	CH16	4 to 16 incl.	Channel (test pit)
1999	DH35	12 to 26 incl.	Drill Hole

The 1997 and 1998 samples represent 2 foot-long sections of the continuous sampled interval, whereas the 1999 samples represent 1 metre long sample sections.

The samples are to be delivered by UISL to the appropriate mineral exploration sample storage section of the Alberta Geological Survey, Edmonton, Alberta.

2. COST COMPONENTS OF ALL FIELDWORK

The following exploration cost claim is connected to geological exploration fieldwork and especially to the sampling phase of the Paddy Member sandstone and related services and activities.

Sampling of the Paddy Member silica sand included: channel sampling of natural outcrops, test pits and trenches, bulk samples and drill hole sampling by reverse circulation technology. The related services have primarily included: stripping of overburden, excavation of test pits and trenches, construction of access roads and trails, preparation of drill pads, use of a drill rig and ground survey of these exploration activities.

Not included in the exploration expenditures are costs related to laboratory analyses and studies.

A year-by-year summary of exploration costs for various categories covering the years 1996, 1997, 1998 and 1999 follows, and immediately below is an overview of those reported costs:

1996	$88,260.00
1997	$50,809.32
1998	$77,533.36
1999	$61,121.28
Grand total	**$277,723.96**

John D. Godfrey, P.Geol., PhD

[redacted]

Murray E. Robinson, CMA

UNITED INDUSTRIAL SERVICES LTD. DEFRCOSTASM9912.xls

ASSESSMENT REPORT ON SILICA SAND PERMIT 9393080332

October 25, 1999

Z.C. = ZERO CLAIMED: N.A. = NOT APPLICABLE

2. COST COMPONENTS OF ALL FIELDWORK

UISL FIELDWORK PROGRAM FOR 1996	AMOUNT	DATE
Phase I Fieldwork		
1. I. 1 Personnel - Staff, consultants, technicians	Z.C.	
1. I. 2 Transportation, room and board, sundry supplies	Z.C.	
1. I. 3 Local Services, contractors		
Eric's Trenching - Stripping costs	$88,260.00	Nov. /96
Phase II Laboratory	N.A.	
1. II. 1 Personnel - Staff, consultants, technicians		
1. II. 2 Transportation, room and board, sundry supplies		
1. II. 3 Local Services, contractors		
Phase III Data Compilation	N.A.	
1. III. 1 Personnel - Staff, consultants, technicians		
1. III. 2 Transportation, room and board, sundry supplies		
1. III. 3 Local Services, contractors		
TOTAL COST OF 1996 FIELDWORK	$88,260.00	

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2. COST COMPONENTS OF ALL FIELDWORK

UISL FIELDWORK PROGRAM FOR 1997	AMOUNT	DATE
Phase I Fieldwork		
2. I. 1 Personnel - Staff, consultants, technicians		
John Godfrey, P.Geol. Consultant	[redacted]	Aug.21/97
2. I. 2 Transportation, room and board, sundry supplies		
Sundry vendors - supplies	$706.32	
Accent Aviation	$2,743.55	Sept./97
2. I. 3 Local Services, contractors		
Northpoint Land Surveying - Topographic map	$9,922.00	Sept. 30/97
Northpoint Land Surveying - Locate test pits	$850.00	Dec. /97
Eric's Trenching - Track hoe & Crawler	$10,071.00	Jan.6/97
Phase II Fieldwork		
2. II. 1 Personnel - Staff, consultants, technicians		
Ryan Wyngaarden, climbing specialist	[redacted]	Sept./97
Achiever Energy - geological field work (Bodard)	$1,200.00	Nov. /97
John Godfrey, P.Geol. Consultant	[redacted]	Sept./97
2. II. 2 Transportation, room and board, sundry supplies		
2. II. 3 Local Services, contractors		
Simmons Drilling - Drilling test holes	$11,130.40	Sept. /97
Eric's Trenching - Dig Test Pits	$8,455.00	Aug & Sept/97
Phase III Laboratory		
2. III. 1 Personnel - Staff, consultants, technicians	N.A.	
2. III. 2 Transportation, room and board, sundry supplies	N.A.	
2. III. 3 Local Services, contractors		
Southside RV Storage - store samples	$1,522.00	Yearly
Phase IV Data Compilation		
2. IV. 1 Personnel - Staff, consultants, technicians		
John Godfrey, P.Geol. Consultant	[redacted]	Sept./Oct./97
2. IV. 3 Local Services, contractors	N.A.	
TOTAL COST OF 1997 FIELDWORK	$50,809.32	

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Z.C. = ZERO CLAIMED: N.A. = NOT APPLICABLE

2. COST COMPONENTS OF ALL FIELDWORK

UISL FIELDWORK PROGRAM FOR 1998	AMOUNT	DATE
Phase I Fieldwork		
3. I. 1 Personnel - Staff, consultants, technicians		
John Godfrey, P.Geol. Consultant	[redacted]	Jul-98
Stuart Fraser, P. Geol.		June& July/98
James Foufas		Jul-98
Matt Peter - Climber		Jul-98
3. I. 2 Transportation, room and board, sundry supplies		
Stuart Fraser, P. Geol. - Auto, Hotel, Meals	[redacted]	June & July/98
Stuart Fraser, P. Geol. - Auto, Hotel, Meals		Aug. & Sept/98
3. I. 3 Local Services, contractors		
Northpoint Land Surveying - Locate test pits	$779.00	Jun-98
Eric's Trenching - Excavate samples, trails, drill pads	$8,550.00	May-98
Simmons Drilling - Drilling test holes	$18,248.69	Jul-98
Eric's Trenching - Dig Test Pits	$1,578.00	Aug./98
Phase II Laboratory		
3. II. 1 Personnel - Staff, consultants, technicians		
John Godfrey, P.Geol. Consultant	[redacted]	Aug./98
3. II. 2 Transportation, room and board, sundry supplies	N.A.	
3. II. 3 Local Services, contractors		
Southside RV Storage - store samples	$1,428.00	Yearly
Phase III Data Compilation		
3. III. 1 Personnel - Staff, consultants, technicians		
Stuart Fraser, P. Geol.	[redacted]	Aug. & Sept./98
John Godfrey, P.Geol. Consultant		July & Sept./98
3. III. 2 Transportation, room and board, sundry supplies		
3. III. 3 Local Services, contractors	N.A.	
TOTAL COST OF 1998 FIELDWORK	$77,533.36	

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2. COST COMPONENTS OF ALL FIELDWORK

UISL FIELDWORK PROGRAM FOR 1999	AMOUNT	DATE
Phase I Fieldwork		
4. I. 1 Personnel - Staff, consultants, technicians		
Stuart Fraser, P. Geol.	[redacted]	Aug. & Sept./99
John Lewis - field assistant		Aug. & Sept./99
John Godfrey, P.Geol. Consultant		Aug./99
4. I. 2 Transportation, room and board, sundry supplies		
Travellers Motor Hotel - Stuart Fraser	[redacted]	Aug. & Sept./99
John Godfrey, P. Geol. - Travel, Hotel, Meals		Aug. & Sept./99
4. I. 3 Local Services, contractors		
Schmidt Drilling - Drilling holes	$34,040.00	Sept. 3/99
Eric's Trenching - Build pads for drilling, trails	$7,051.00	Sept. 3/99
Phase II Laboratory		
4. II. 1 Personnel - Staff, consultants, technicians		
John Godfrey, P.Geol. Consultant	[redacted]	Sept./99
4. II. 2 Transportation, room and board, sundry supplies	N.A.	
4. II. 3 Local Services, contractors	N.A.	
Phase III Data Compilation		
4. III. 1 Personnel - Staff, consultants, technicians		
Stuart Fraser, P. Geol.	[redacted]	Sept./99
John Godfrey, P.Geol. Consultant		Sept./99
4. III. 2 Transportation, room and board, sundry supplies	N.A.	
4. III. 3 Local Services, contractors	N.A.	
TOTAL COST OF 1999 FIELDWORK	$61,121.28	

DECLARATION OF PROFESSIONAL QUALIFICATIONS AND VERACITY OF STATED EXPLORATION EXPENSES

I, JOHN DERRICK GODFREY, of the Municipality of Edmonton, Alberta, Canada do certify that:

(1) I am a professional geologist, residing at: [redacted] Edmonton, Alberta, Canada T5R 0G4.

(2) I am a graduate of the University of Nottingham (1950) into a Bachelor of Science (B.Sc.) degree in the combined subjects of Geology and Physics; and a graduate of the University of Chicago with a Master of Science (M.S.) degree in Geology (1955) and a Doctor of Philosophy (Ph.D.) degree in Geology (1962).

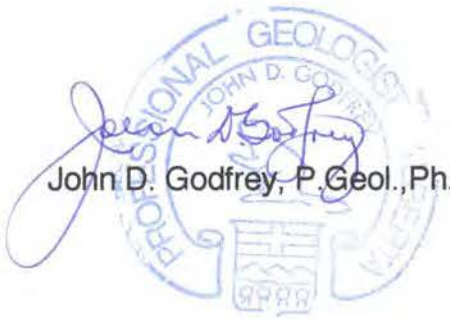
(3) I have practiced my profession continuously since graduation whilst being employed by such agencies as The University of Chicago, The University of Alberta, the Alberta Research Council, and the Canadian International Development Agency (CIDA). I have also undertaken numerous short-term projects as an independent consultant geologist during the past forty-nine (49) years, primarily through the office of J.D. Sons & Associates Management Ltd.

(4) I am an active member in good standing of the Association of Professional Engineers, Geologists, and Geophysicists of Alberta, Edmonton.

(5) This report summarizes both personal examinations during extensive visits to the property (1980; August and September, 1997; April and June 1998; February, April, June, and August 1999) and the reports of investigations by other professional geologists and engineers.

(6) I am presently acting as geological advisor to the board of directors of United Industrial Services Ltd. As of November, 1998, I own 10,000 shares of United Industrial Services Ltd. ("UISL") and have options to purchase 300,000 shares of UISL. My spouse, Doreen Godfrey, owns 120,000 shares and 15,125 special warrants execisable into 7,562 common shares of UISL.

(7) I am familiar with all aspects of the field operations, having planned, supervised and participated in each of them from August, 1997 onwards. Therefore, with the assistance of the accounting system in place at the head office of United Industrial Services Ltd., I am able to verify that the expeditures listed in this document represent a correct and accurate statement of the costs entailed in the various phases of the exploration operations to this date.



John D. Godfrey, P.Geol., Ph.D.

Dated at the City of Edmonton
in the Province of Alberta
this 5th day of November, 1999

REFERENCES

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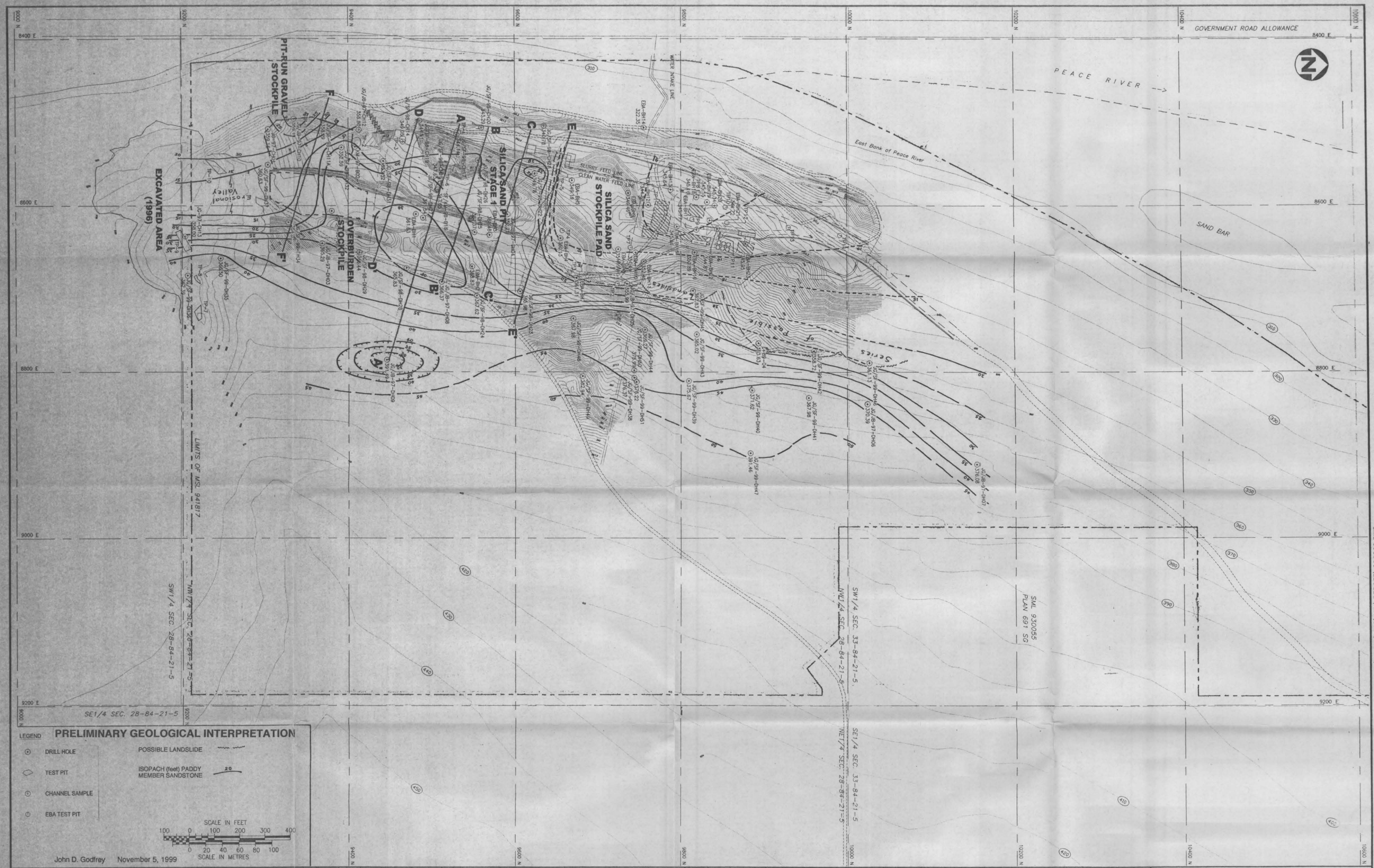
APPENDIX 1

Property map with geological sample sites, cross-section location

Isopach map of Paddy Member sandstone



PRELIMINARY GEOLOGICAL INTERPRETATION

LEGEND

- DRILL HOLE
- TEST PIT
- CHANNEL SAMPLE
- EBA TEST PIT
- POSSIBLE LANDSLIDE
- ISOPACH (feet) PADDY MEMBER SANDSTONE

SCALE IN FEET: 100 0 100 200 300 400

SCALE IN METRES: 0 20 40 60 80 100

John D. Godfrey November 5, 1999

REV.	REVISION DESCRIPTION	DATE	DRAWN BY	DESIGNED BY	DWG. CHECK	DESIGN CHECK	LEAD ENG./ DEPT. MGR.	P. ENG./ PROJ. MGR.
E	TEST HOLE LOCATIONS Sept.02,1999	99/09/8	Bb					RVP
D	REVISED PLANT LAYOUT — DRY, SCALE AND ADDITIONAL TOPO.	99/08/05	Bb					RVP
C	UPDATE SAMPLE LOCATIONS	98/07/23	Bb	THAH			THAH	RVP
B	SURVEYED LOCATIONS	98/07/05	Bb	THAH			THAH	RVP
A	ISSUED FOR REVIEW	98/06/26	Bb	THAH			THAH	RVP

NO.	DWG. NO.	REFERENCE DRAWINGS
8		
7		
6		
5		
4		
3		
2		
1		

P. ENG./ PROJ. MGR.	RVP	98/06/26
LEAD ENG./ DEPT. MGR.		
DESIGN CHECK		
DWG. CHECK		
DESIGNED BY		
DRAWN BY	Bb	98/06/26

ENGINEERING REVIEW

CLIENT APPROVAL BY DATE

UNITED INDUSTRIAL SERVICES LTD.
PEACE RIVER , ALBERTA

PROJECT NO. L329A | SCALE 1:2000 | SIMONS H.A. SIMONS LTD. MINING GROUP CALGARY , CANADA

DRAWING NO. L329-20-0-009 | REV. E

MRDI Canada

PEACE RIVER SILICA SANDS

GENERAL SITE PLAN

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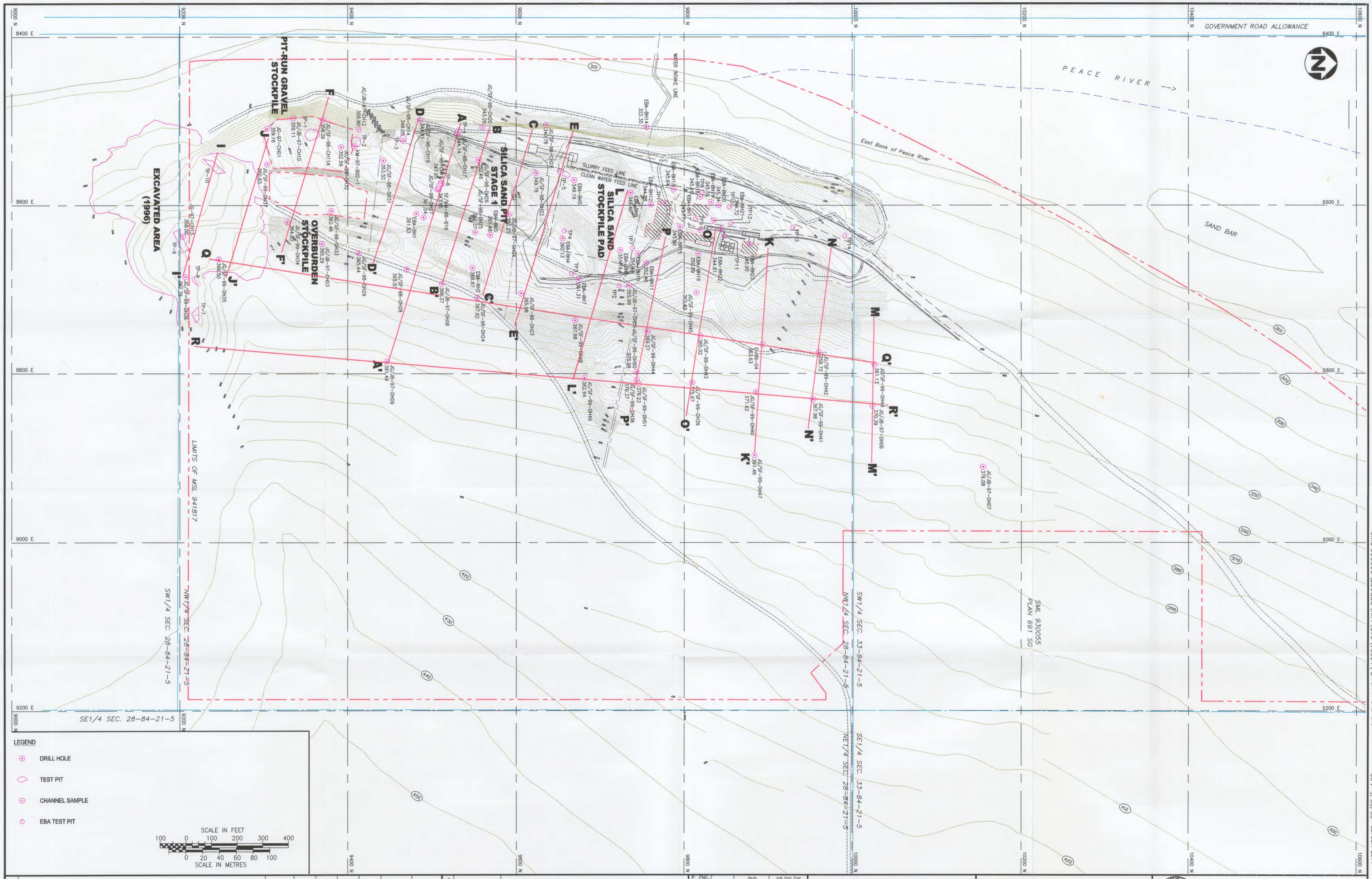
LAST UPDATE: 99/09/9, 4:29pm



LEGEND

- DRILL HOLE
- TEST PIT
- CHANNEL SAMPLE
- EBA TEST PIT

SCALE IN FEET
100 0 100 200 300 400
SCALE IN METRES
0 20 40 60 80 100

REV.	REVISION DESCRIPTION	DATE	DRAWN BY	DESIGNED BY	DWG. CHECK	DESIGN CHECK	LEAD ENG./ DEPT. MGR.	P. ENG./ PROJ. MGR.
F	SECTION LOCATIONS	99/10/28	Bb					RVP
E	TEST HOLE LOCATIONS Sept.02,1999	99/9/8	Bb					RVP
D	REVISED PLANT LAYOUT – DRY, SCALE AND ADDDITIONAL TOPO.	99/08/05	Bb					RVP
C	UPDATE SAMPLE LOCATIONS	98/07/23	Bb	THAH			THAH	RVP
B	SURVEYED LOCATIONS	98/07/05	Bb	THAH			THAH	RVP
A	ISSUED FOR REVIEW	98/06/26	Bb	THAH			THAH	RVP

NO.	DWG. NO.	REFERENCE DRAWINGS
8		
7		
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4		
3		
2		
1		

P. ENG./ PROJ. MGR.	RVP	98/06/26
LEAD ENG./ DEPT. MGR.		
DESIGN CHECK		
DWG. CHECK		
DESIGNED BY		
DRAWN BY	Bb	98/06/26

ENGINEERING REVIEW

CLIENT APPROVAL
BY DATE

UNITED INDUSTRIAL SERVICES LTD.
PEACE RIVER , ALBERTA

MRDI Canada

PEACE RIVER SILICA SANDS

GENERAL SITE PLAN

PROJECT NO. L329A | SCALE 1:2000 | SIMONS H.A. SIMONS LTD. MINING GROUP CALGARY , CANADA

DRAWING NO. L329-20-0-009 | REV. F

CAD FILE NAME: Q:\L329A\CAD\MIN\REPORT\200009.DWG

LAST UPDATE: 99/08/5 4:20pm

APPENDIX 2

1997 Bodard geology report on fieldwork

Ultrasonic Industrial Sciences Ltd.

Peace River Silica Sand Sampling Program

23-27 September 1997

Descriptive Notes & Observations

by

John M Bodard, Ph.D. Geol.

30 September 1997

INTRODUCTION

Ultrasonic Industrial Sciences Ltd. (UIS) has undertaken a series of evaluation programs to determine the distribution and quality of silica sand 9 km north of Peace River, Alberta, on permit holdings of approximately 3,240 acres.

Work on part of the Peace River Permit area (Figure 1) during the five day period between 23 and 27/9/97 comprised:

- 7 rotary drillholes
- 2 cliff-face channel digs
- 1 trench excavation
- re-examination of all existing exposures

The purpose of this latest work was to confirm silica sand quality and reserves for mining and processing silica ore and natural sand proppant used in oil reservoir stimulation.

This note provides a detailed account of the writer's observations made while assisting with the sampling program.

GEOLOGICAL FRAMEWORK

The silica sand deposit at Peace River is part of the Paddy Member of the Peace River Formation, which is of Lower Cretaceous - Albian age. It is one of at least eight known silica sand deposits in western Canada.

Regionally the Peace River Fm consists, from the base up, of the Harmon, Cadotte, and Paddy Members. These units represent, in order, marine shale, lower shoreface sand, and coastal plain mixed clastics deposition. The Peace River Fm is overlain by the marine shales of the Shaftsbury Formation.

The Paddy Mbr is restricted to the northwest plains of Alberta (namely the region of the Peace River Arch), but it is laterally correlatable to the regionally extensive Viking Formation, which also is a major oil and gas reservoir in western Canada. The erosional surface forming the base of the Paddy Mbr has been variably downcut into the underlying Cadotte Mbr. This surface forms a major sequence boundary which separates depositional packages attributed to different sealevel events.

Paddy Mbr deposits represent the return of varied often sand-rich (high energy) coastal plain environments to the Peace River area. These eolian, fluvial, estuarine, shoreline and proximal shallow marine facies filled sub-aerial and sub-aqueous topographic lows before giving way to the widespread marine flooding event represented by the Shaftsbury Fm.

Within the UIS permit area, and for many kilometres beyond, well-indurated argillaceous siltstone and fine sandstone of the Cadotte Mbr form the prominent cliff banks of the Peace River itself. Sands of the more recessive Paddy Mbr locally cap the cliff-forming succession above the eroded upper boundary of the Cadotte Mbr. Dark grey mudstones of the Shaftsbury Fm, bolder gravels of glacial origin and soils complete the succession above the Paddy sands.

While the Paddy Mbr varies regionally in character between siltstone and sandstone, and can be complexly interbedded, in the UIS permit area it is sand dominant, with the sands being monomictic quartz arenites that are highly mature in all aspects. This character is consistent with prolonged erosional reworking and long transportation from already mature, sources including the Cadotte Mbr., coupled with local enrichment through winnowing and cyclic processes (e.g. wind, tide). It is a corollary with the properties of high quality petroleum reservoirs and groundwater aquifers.

SAMPLING METHODOLOGY

Samples of silica sand from the Paddy Mbr were collected as follows:

- borehole cuttings
- trenches & pits
- outcrop channelling

Sampling was designed to deliver representative bulk material of two foot intervals continuous throughout the zone of interest.

Boreholes were drilled with a dual barrel drill string. An air/water mist was "reverse circulated" through the outer annulus and returned via the inner annulus of the barrel. Due to the soft nature of the formations drilled, an open-centred auger-toothed bit was used interchangeably with a tricone rock bit. In some cases, air-only was circulated to deliver dry samples. Cuttings were circulated through a cyclone and caught by a large plastic bag or 5 gallon plastic bucket as they exited the cyclone.

Air/water drilled samples were retained in buckets and set aside to settle. After several hours the excess water was decanted and the contents bagged or sealed and labelled. Bagged dry cuttings were labelled and sealed, and all samples were sealed in plastic buckets. Samples were transported off-site for later visual inspection (see appended notes by K. Murdock) and laboratory tests.

Despite the shallow depths drilled (<150 ft) the drilling process may have had a significant impact on the nature of cuttings sampled. Air-only carried (dry) returns appeared to be dominantly very fine-grained, whereas a coarser fraction was evident with the air/water mist system. When air-only was used to circulate cuttings the drill string tended to become stuck. This was attributed to sloughing of the formation around the string, and may relate to inefficient "cleaning" of the hole (with the coarser fraction of the formation preferentially left behind). To a lesser extent the same problem was encountered with air/water mist suggesting that wet returns may also be somewhat fine grainsize biased. In addition, drilling proceeded in fixed steps to ensure samples represented two foot intervals of the formation. This start/stop cyclic agitation and settling action may have further size-segregated cuttings.

OBSERVATIONS

Observations reported here are made prior to laboratory reports on the material sampled. The writer conducted three channel excavations (CH10, CH12, CH13) and witnessed four drillholes (DH03, DH04, DH05, DH09).

The Paddy Mbr ranges between light buff to tan in colour and variably exhibits a yellow brown to strong purplish hue. Individual grains are typically well-rounded and spherical, and often translucent such that they have a "smoky" grey appearance. Framework grain mineralogy is almost exclusively quartz, with trace opaques. In contrast, Cadotte Mbr sands are "salt and pepper" in appearance like most Cretaceous sands in western Canada.

In outcrop the Paddy sands are friable to moderately indurated, whereas freshly excavated subsurface samples are more competent. Bedding planes show no persistent dip direction, or dip, where representative measurements were made, indicating that the structure of the area is flat-lying. For the most part bioturbation is absent in the sands, which are typically massive to planar cross-bedded in its lower parts, and homogeneous to finely parallel bedded elsewhere. Carbonaceous stringers, interpreted to be buried remnant soil horizons (paleosols), are evident in outcrop. A carbonaceous siltstone unit in the upper third of the Paddy Mbr succession separates lower and upper sands in at least part of the UIS property.

Based on the above observations, the Paddy Mbr in the area studied can be divided into three sand units (Figure 2):

1) **cross-bedded (basal) unit** comprising the buff-coloured lower third of the Paddy Mbr.
2) **planar bedded unit** comprising the buff- to purple coloured middle and upper part of the Paddy Mbr below the carbonaceous unit.
3) **homogeneous bedded (upper) unit** comprising yellow to tan sands above the carbonaceous unit.

The above scheme is simplified and provisional, as time and the available data did not permit a detailed facies analysis and stratigraphic evaluation.

Cross-bedded (basal) Unit

The cross-bedded unit (Figure 3) is primarily evident in cliff-face outcrop along the western edge of the area studied, and contains the coarsest grainsize distribution of the Paddy Mbr. The unit exhibits planar cross-stratified sets and co-sets interbedded with homogenous sand sets. Cross-beds show up to 30° angles, and bioturbation was not observed. The base of the unit is marked by thin carbonaceous bands, and carbonaceous lenses and stringers occur sporadically throughout. The unit is interpreted to be angle of repose eolian dune sands with remnant paleosol horizons. Although the unit was best observed in outcrop at the western edge of the property, it may be more extensive below the regional parallel-bedded unit.

Parallel-bedded Unit

The parallel-bedded unit (Figure 4) overlies the cross-bedded unit above an abrupt but indistinct boundary (Figure 5), and is observed in trench excavations across the property. The unit is comprised of finely parallel bedded and laminated to homogeneous sands with occasional fine cross-lamination and bedding. Sands vary in colour between light buff to tan or purple (on fresh exposures).

The parallel-bedded unit is typically very fine- to medium- grained, and bioturbation was not observed except for one possible occurrence at the sample 5 level in outcrop channel 12. Thin carbonaceous bands and lenses are sometimes present. The unit also exhibits a white ?clay banded interval (Figure 6) and possible stratigraphic marker. Where the unit is capped by carbonaceous mudstone, soft sediment deformation features are present.

The parallel-bedded unit is interpreted to comprise interdune fill and sheet sands with preserved paleosols. The overlying carbonaceous unit has much intermixed sands, and is believed to represent local lacustrine conditions contaminated by eolian drift sands.

Homogeneous Bedded (upper) Unit

The homogenous upper unit is established above the carbonaceous mudstone unit in a trench excavation (CH13) at the south edge of the property (Figure 7). This unit is noticeably tan to yellowish brown in colour, whereas the other sand units are light buff with a sometimes strong purple hue. The unit may be present above the parallel bedded unit elsewhere on the property. For example, tan (and brown) sands were sampled above a dark carbonaceous zone in DH05 and DH06. In the latter drillhole, however, the lower parts of the silica sand package appeared highly condensed.

The homogeneous upper unit appears to be dominantly fine-grained with some coarser fractions. Its origin and relationship with the Paddy Mbr is not certain. Its silica sand quality requires verification (samples 1 to 3 CH13).

Silica Sand Thickness & Extent

Eolian sand bodies in coastal environments (as suggested here) have geometries tied to shoreline morphology, and thus can be of limited extent. They tend not to be preserved in the rock record due to their transitional nature .

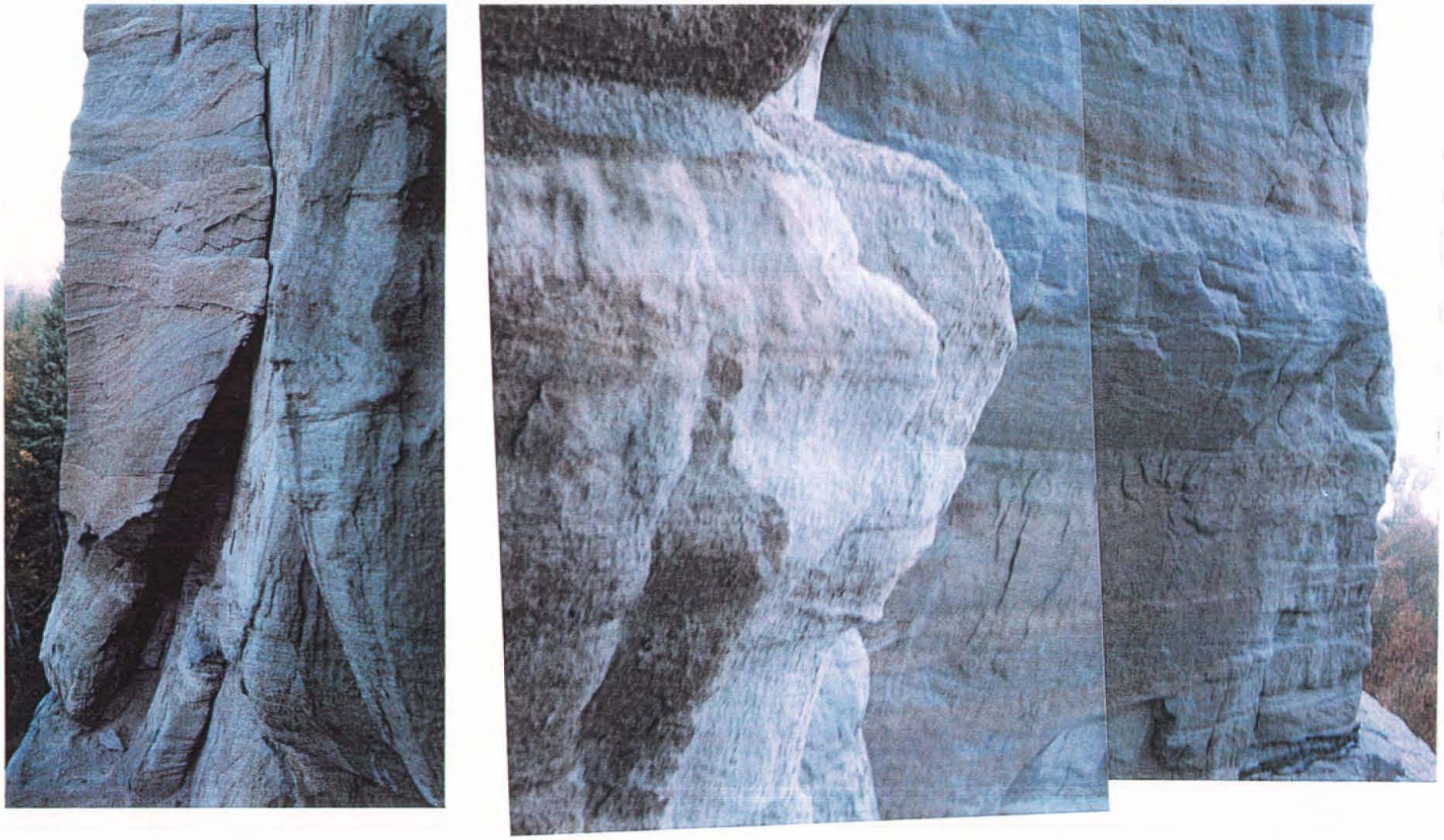
In the UIS permit area the sands of the Paddy Mbr are up to 10 m (≈30 ft) thick, with significant lateral variation. Factors controlling thickness such as the topography of the depositional platform, deposition itself, and post depositional erosion., are involved. In DH05, for example, a possible local high in the Cadotte surface may explain the apparent sharp reduction in Paddy sand thickness. However, outcrop at the south edge of the property (80 m west of CH13) shows that sand thickness is also locally controlled by the depositional surface, with mudstone filling an abrupt depression. This may explain the variation in depth to top of sand between adjacent pits a short distance north of the outcrop location. It may be an important determinant of mineable reserves.

ADDITIONAL REMARKS

UIS has demonstrated that the sands of the Paddy Mbr in their Peace River permit area are a suitable proppant media in reservoir stimulation (K Murdock, per comm. 1997). In fact, the sands are distinctive for their dominant silica mineralogy, and similarly mature grain roundness, sphericity, and sorting character. The UIS work has established that as much as 20 % (by weight) of the Paddy Mbr may be of 20/40 mesh grain-size, the most common sand proppant. Grainsize distributions and ultimate ore grades may vary according to the facies associations discussed above. The 20/40 mesh size corresponds to medium and coarse grainsize classifications (0.5-1.0 mm dia), which typifies the cross-bedded unit. Coarser 12/20 mesh sands, classified as very coarse sands (1-2 mm dia), also used in reservoir stimulation, may be limited to the cross-bedded unit. Similarly, proppant sand yields from the finer-grained parallel-bedded unit may be lower, but for other applications the purity of silica ore may be enriched. The colour distinction of the upper sand unit may suggest greater or different impurities.

Drilling programs (this and other work) were designed for sampling purposes, and did not produce reliable stratigraphic detail of the Paddy sands. Silica sand tops may be suspect, as wireline logs were not run and intact core was not taken. However, a drill break exists at the sequence boundary between the Paddy and Cadotte mbrs, with the latter being significantly more resistant. The Shaftsbury Fm is distinctive from the Paddy sands, but may be confused with argillaceous parts of the Paddy Mbr itself.

Facies variation in the sands of the Paddy Mbr may prove to be an influence on the properties of silica sand for mining and processing operations. This should be established through laboratory tests on the samples taken during the present program, and integration of these data with previous laboratory work. Should facies parameters be shown to be important, the preliminary scheme suggested above may be of some assistance in understanding and high-grading the silica sands of the Paddy Mbr in the UIS permit area.



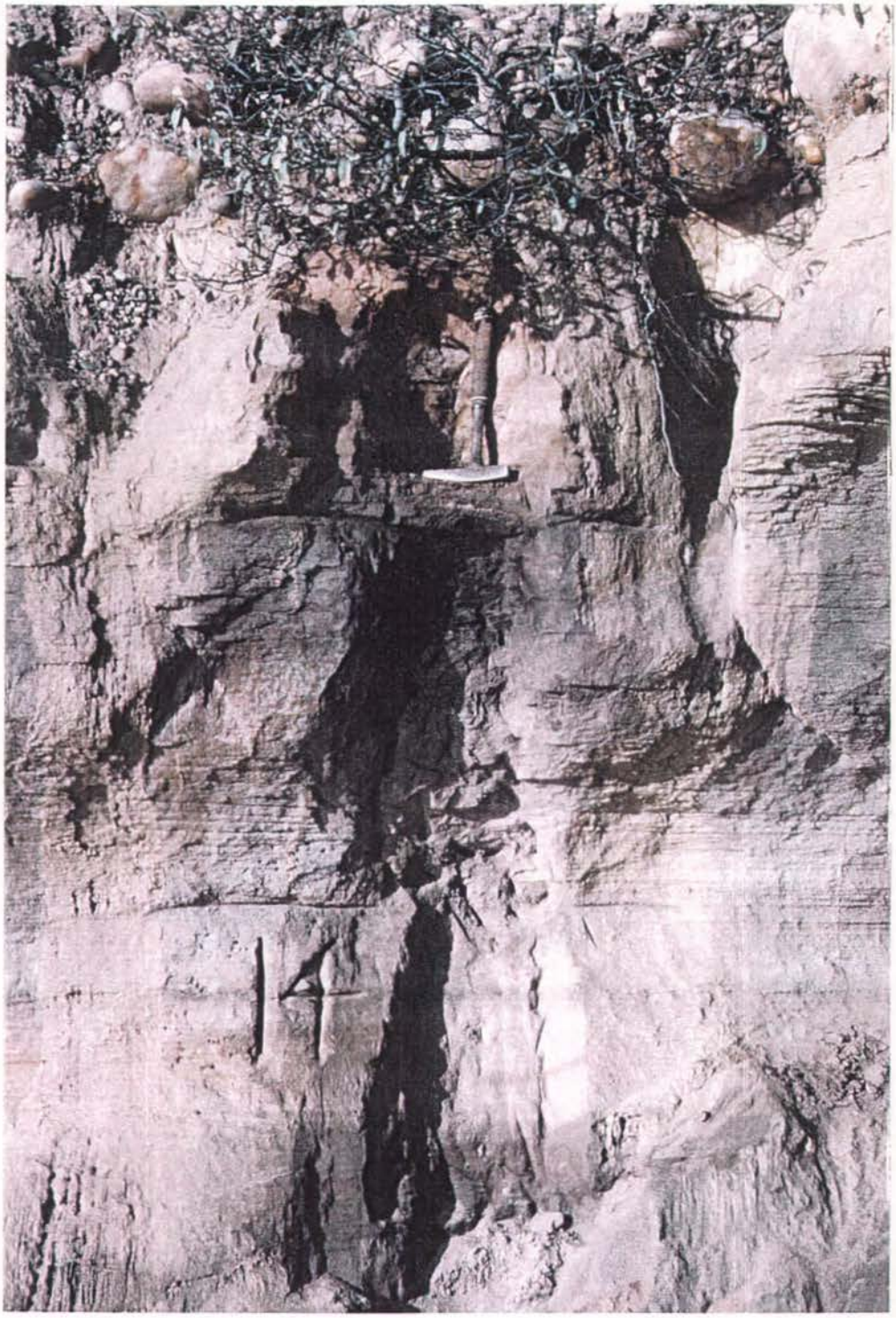
Channel 10 - Photo spread of rock face showing alternating planar cross-bedded and homogeneous bedded (lower) section of Paddy Mbr silica sand. Note black carbonaceous paleosol at base of unit in bottom right coner of photo. Samples 1 to 4 (see channel sampling log) represent section shown.

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

Cross-bedded Unit

23 to 27 Sept '97 Program

JMB	Figure 3	30/9/97



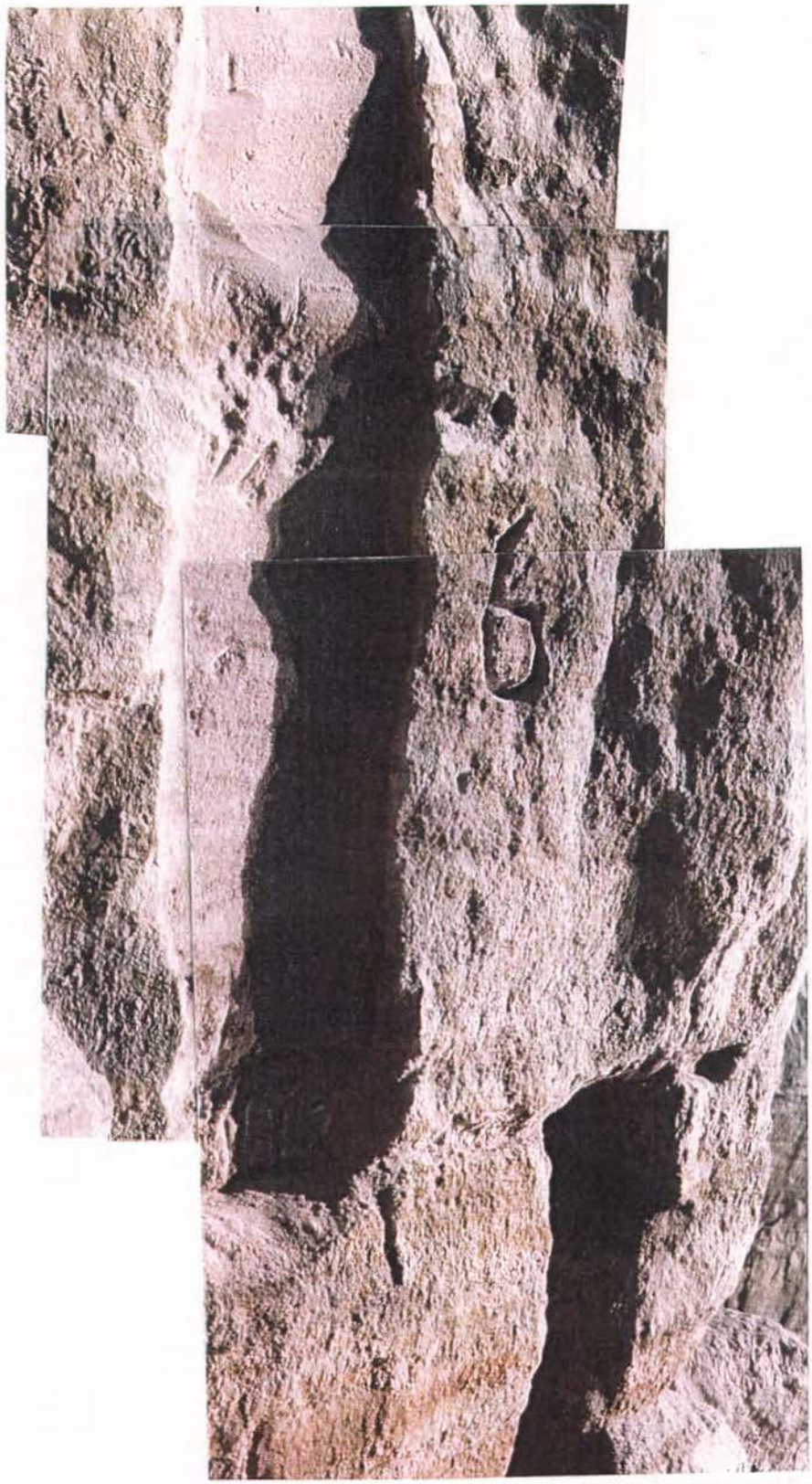
Channel 10 - Photo of rock face showing alternating planar bedded to laminated and homogeneous bedded section of silica sand. Gravel scree caps the section. Note dark coloration below sample 14 at bottom of photo appears to be an "organic stain". Samples 14 to 16 (see channel sampling log) represent the section shown.

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

Planar Bedded Unit

23 to 27 Sept '97 Program

JMB	**Figure 4**	30/9/97



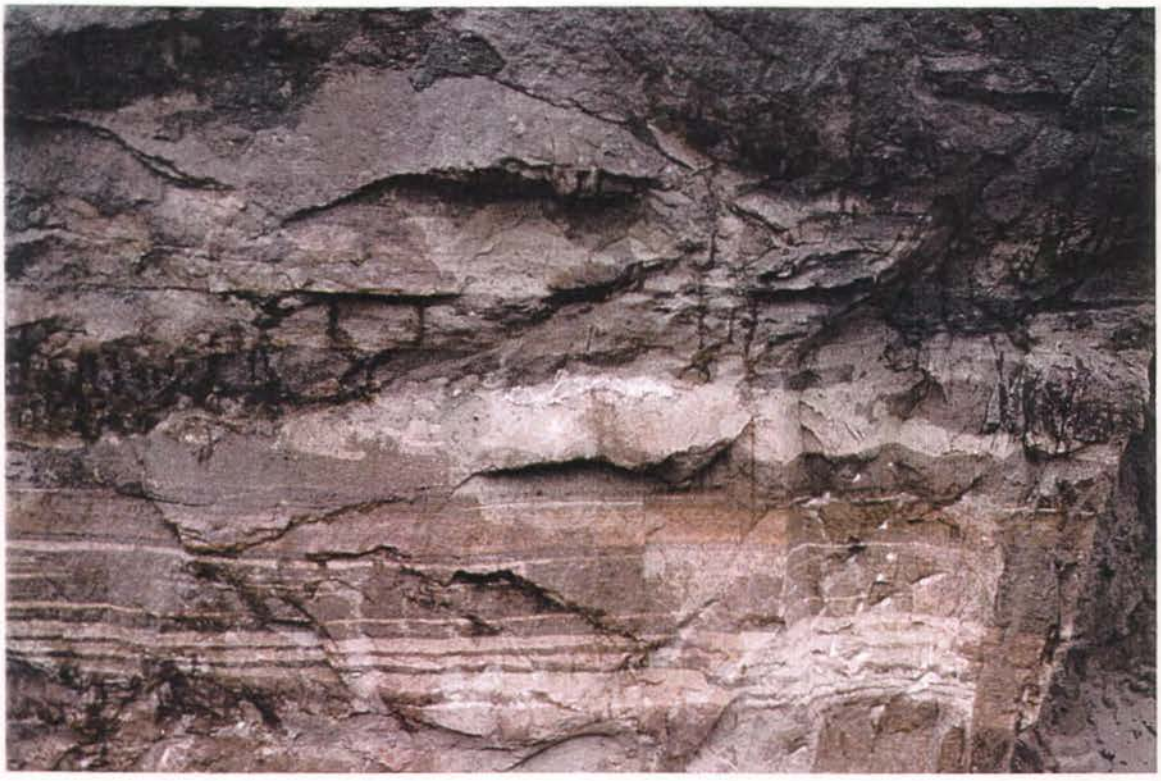
Channel 10 - Photo spread of rock face showing boundary between planar bedded and cross-bedded section of silica sand. The boundary is within the sample 6 interval just below "6" etched in the rock face, and separates the coarser-textured rock below from smoother-textured rock above. Samples 5, 6, & 7 are represented by the section shown.

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

Boundary Between Planar- & Cross-bedded Units

23 to 27 Sept '97 Program

JMB	**Figure 5**	30/9/97



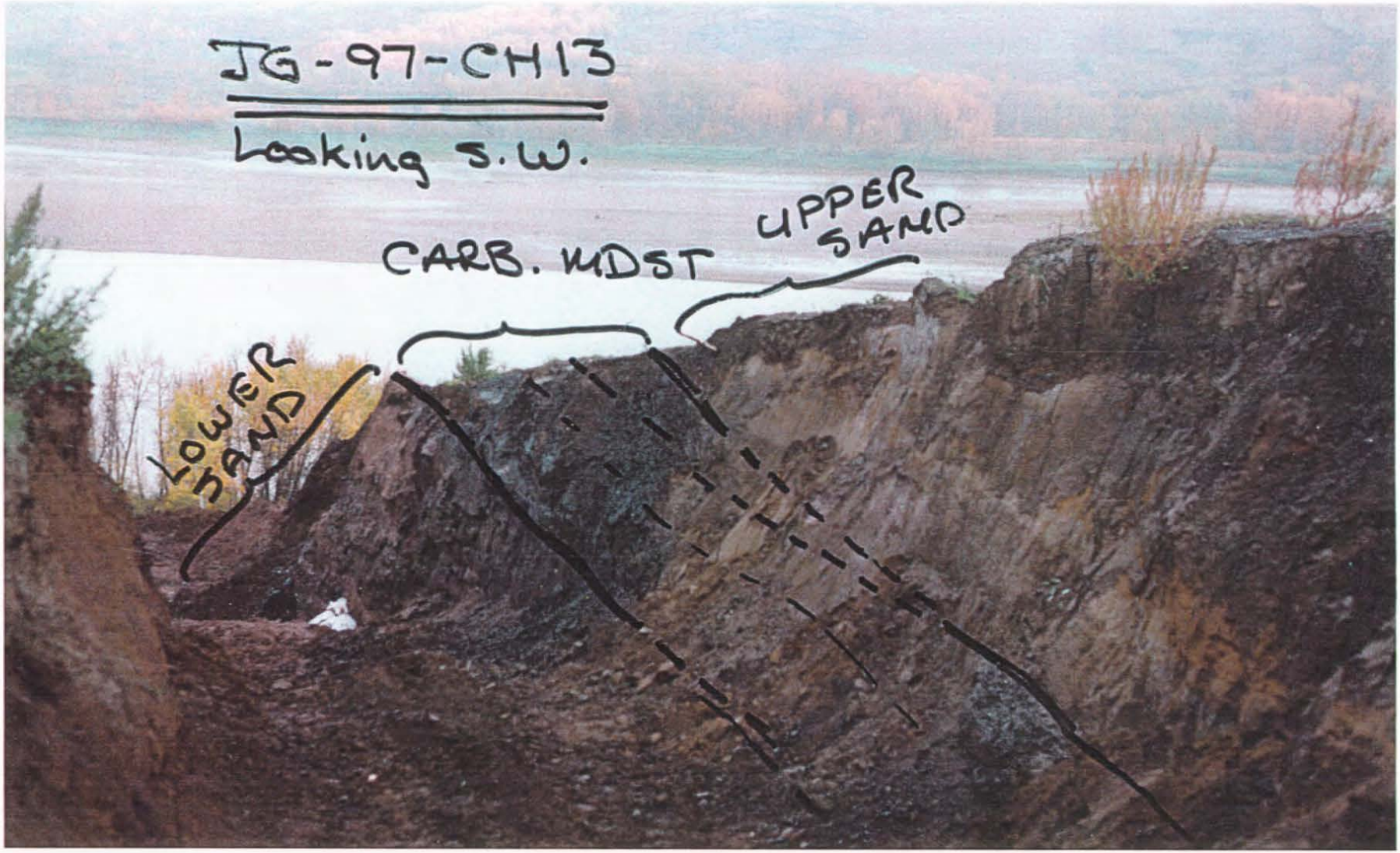
White banded zone in CH10 rock face (upper photo) and CH13 rock face (lower photo). The white bands are possibly clay deposits, and mark a more competent and ?finer part of the parallel-bedded unit. In CH10 the bands are represented by samples 10 $ 11, about 6 ft above the cross-bedded unit. In CH13 the bands are at the base of the section (sample 12), suggesting that cross-bedded sands may be unexposed below.

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

White Banded Marker

23 to 27 Sept '97 Program

JMB	**Figure 6**	30/9/97

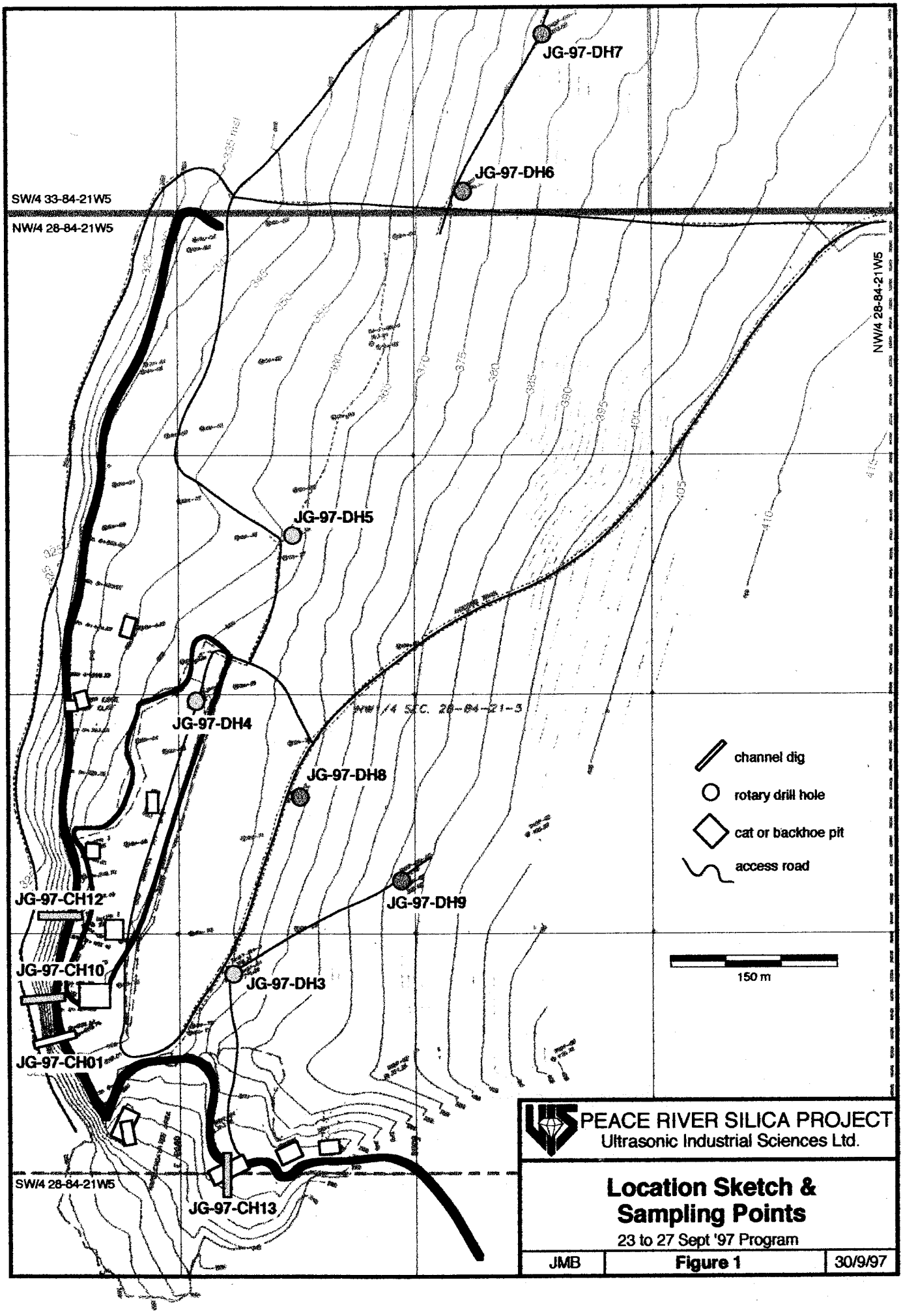


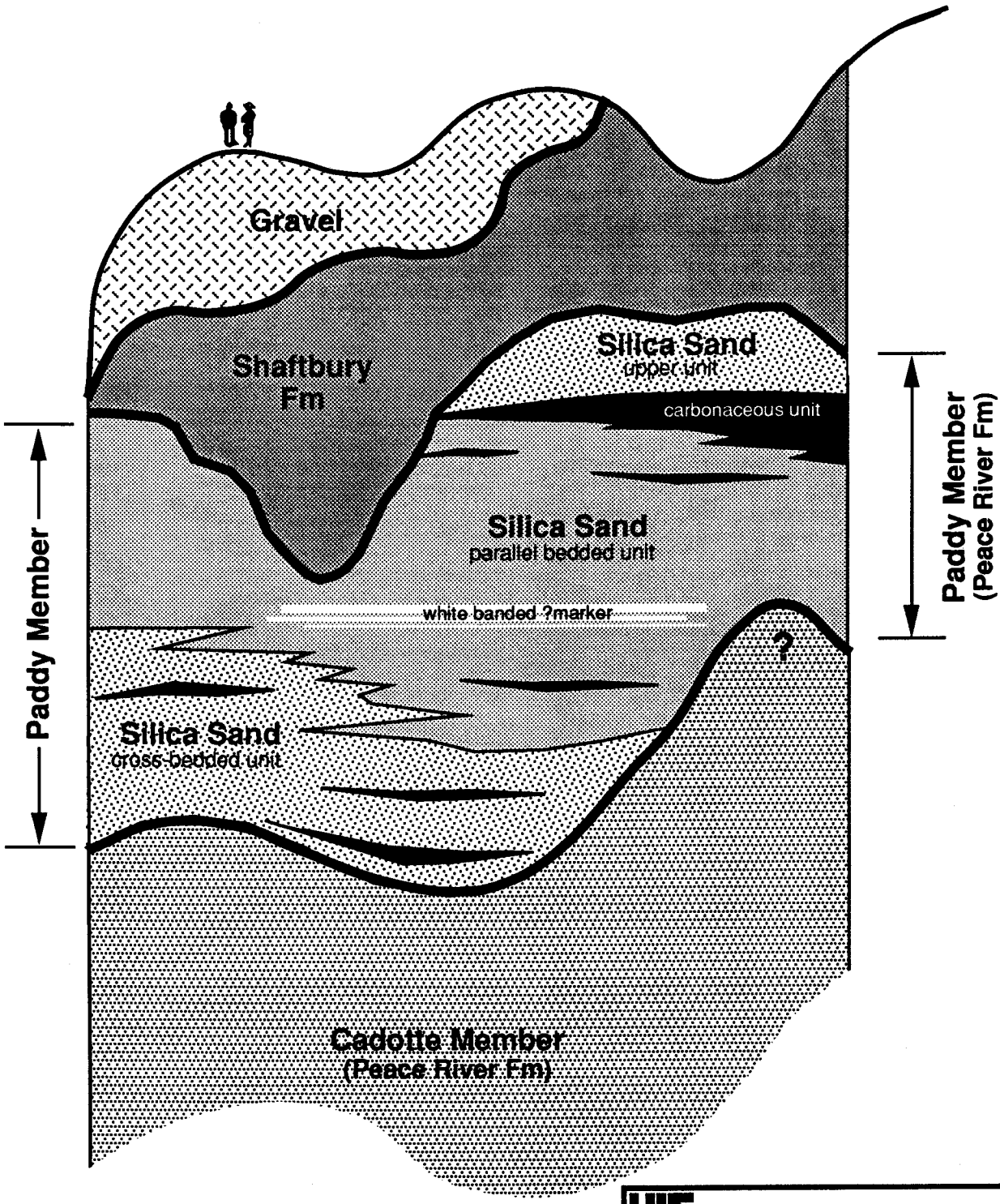
Channel 13 - Photo shows CH13 from the top, looking southwest and down at the trench. The dark grey carbonaceous unit is positioned as marked, above the parallel bedded unit (lower sand), which has a distinctive purple hue. The upper unit overlies the carbonaceous unit and is a tan to reddish brown color. In the trench scree from the upper unit covers part of the carbonaceous unit, which shows recessive character above the underlying sands. Sand stringers and banding is abundant in the carbonacous unit. It is not clear whether the carbonaceous unit is basal Shaftsbury Fm (with the "upper sand" being part of the basal package), or as suggested here, a unit within the Paddy Mbr. of the Peace River Fm.

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

CH13 Section
23 to 27 Sept '97 Program

JMB	**Figure 7**	30/9/97

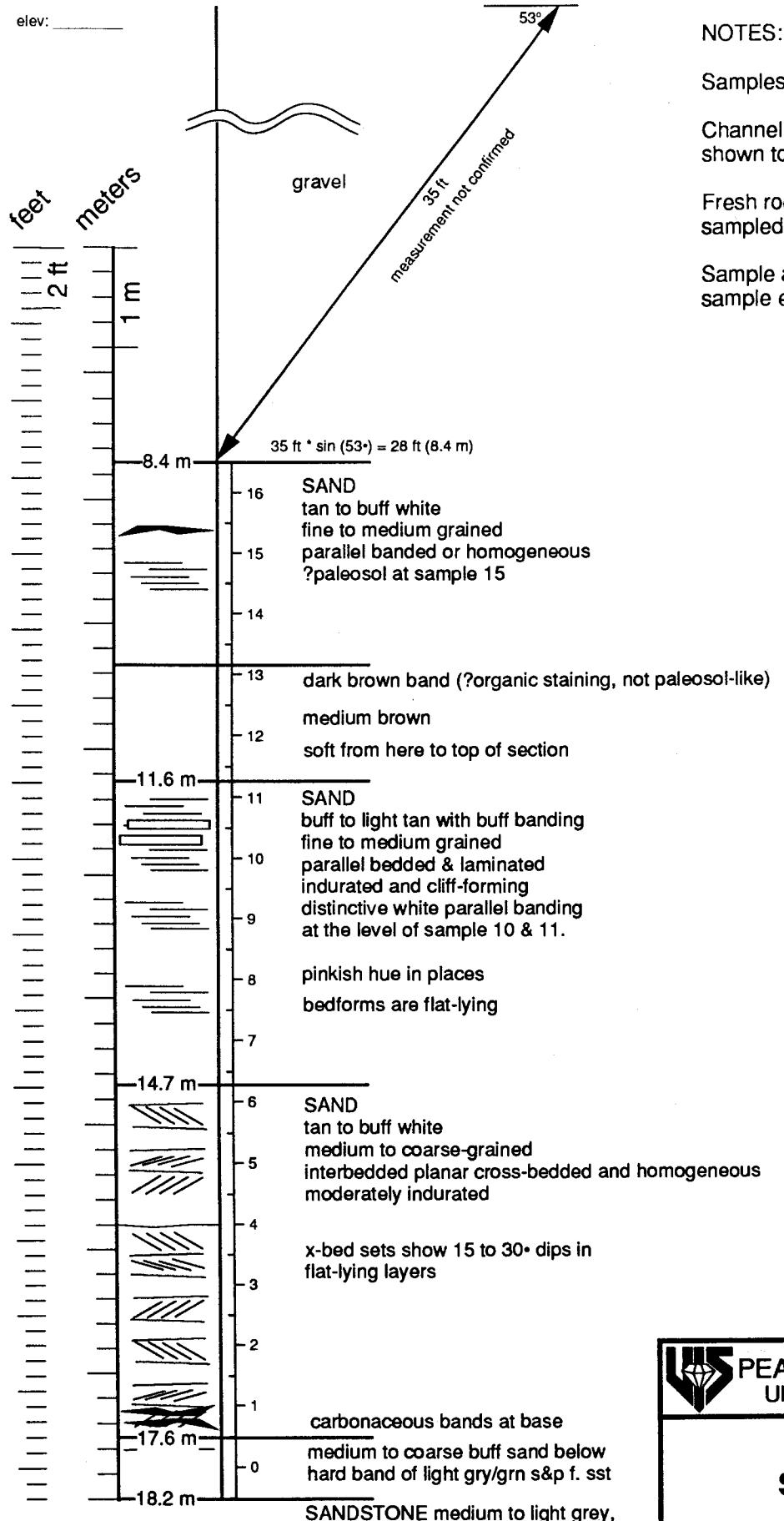

JG-97-DH7
JG-97-DH6
SW/4 33-84-21W5
NW/4 28-84-21W5
NW/4 28-84-21W5
JG-97-DH5
JG-97-DH4
JG-97-DH8
JG-97-DH9
JG-97-CH12
JG-97-CH10
JG-97-DH3
JG-97-CH01
SW/4 28-84-21W5
JG-97-CH13
channel dig
rotary drill hole
cat or backhoe pit
access road
150 m
PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.
Location Sketch & Sampling Points
23 to 27 Sept '97 Program
JMB
Figure 1
30/9/97



PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

Schematic Stratigraphy
23 to 27 Sept '97 Program

JMB	**Figure 2**	30/9/97



NOTES:

Samples collected from base upwards.

Channel samples taken every 2 ft as shown to provide a continuous section.

Fresh rock face below surface layer sampled.

Sample at base of sequence taken after sample established numbering

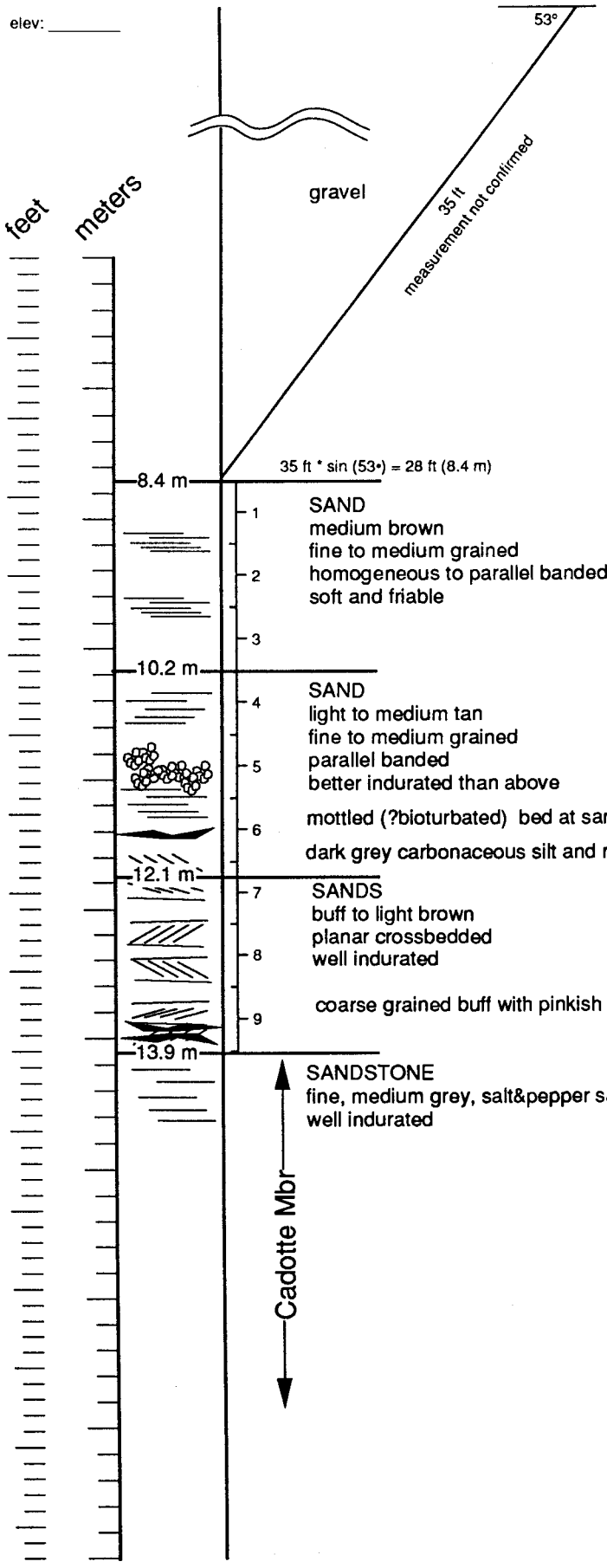
Channel 10

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

JG-97-CH10
Sampling Record

23 to 27 Sept '97 Program

JMB	**Figure 8**	30/9/97



NOTES:

samples collected from top downwards.

channel samples taken every 2 ft to provide a continuous section.

approximately 20 ft of sand section

Channel 12

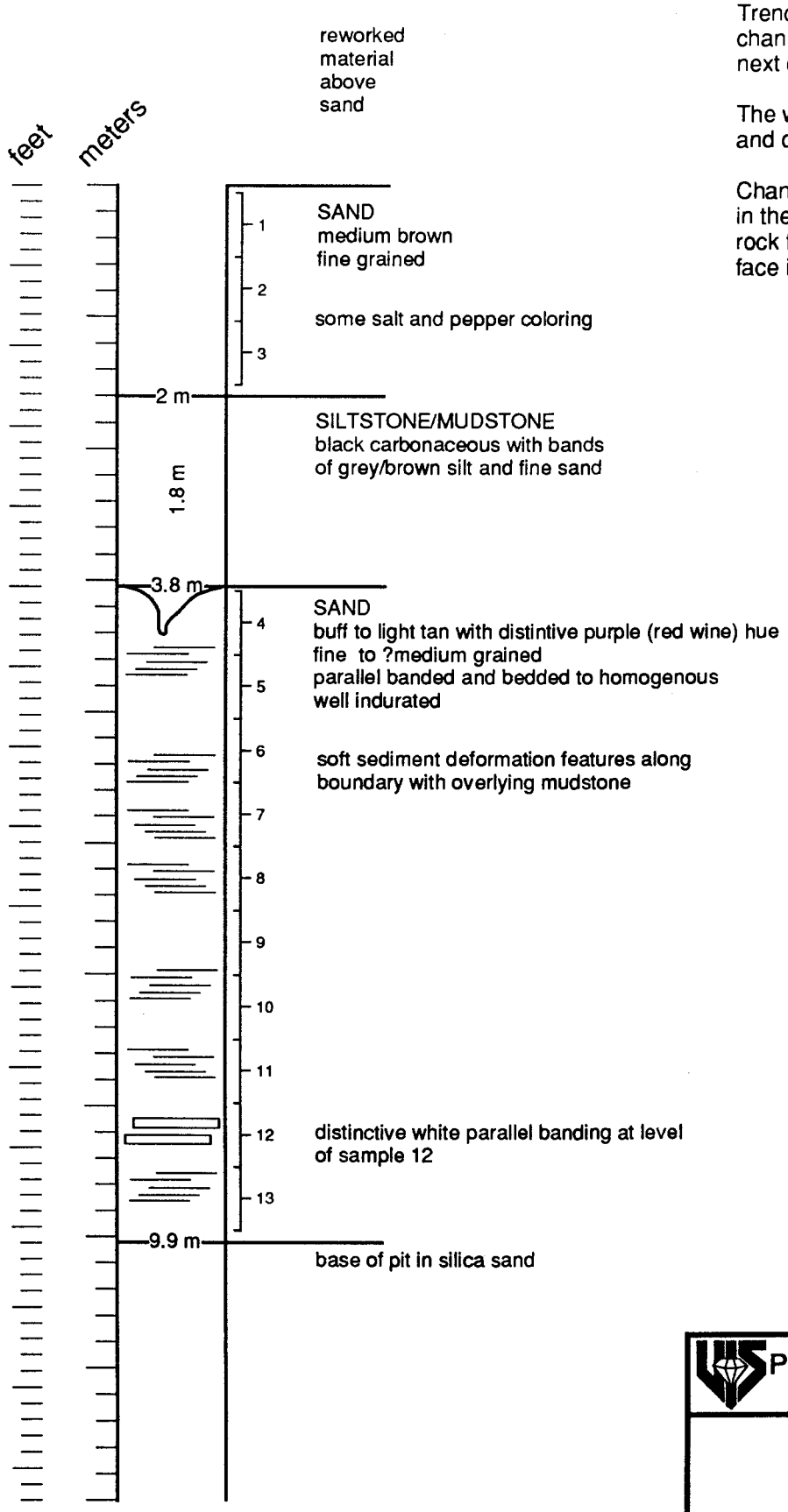
PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

JG-97-CH12 Sampling Record

23 to 27 Sept '97 Program

JMB	**Figure 9**	30/9/97

elev: _____



NOTES:

Trench excavated by cat on 26/9/97 and channel sampling was conducted the next day on 27th Sept.

The weather on the 27th was cool, windy and overcast with rain.

Channel samples were taken every 2 ft in the sand section from the top of the rock face to the base of the pit. The rock face itself is vertical.

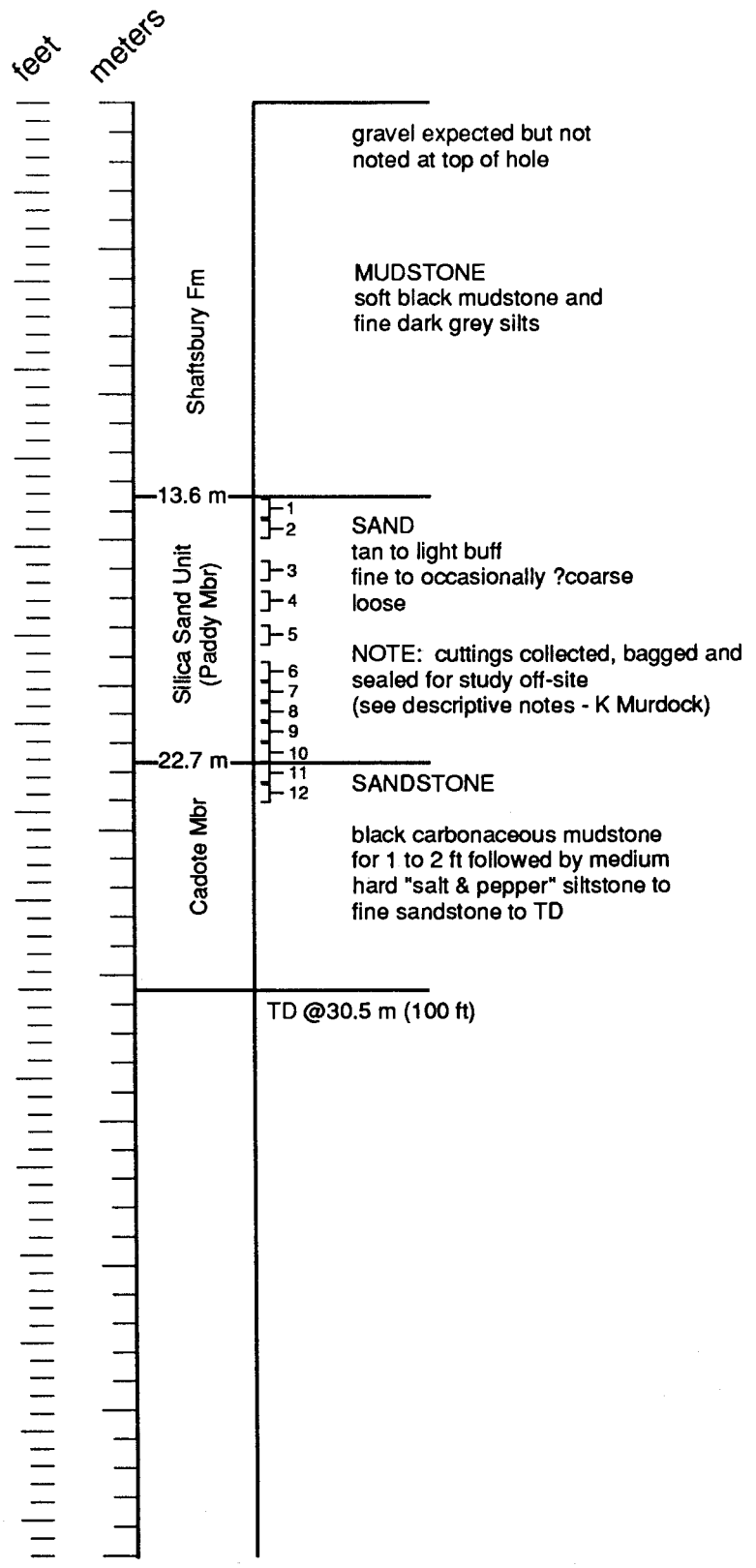
Channel 13

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

JG-97-CH13
Sampling Record

23 to 27 Sept '97 Program

JMB	**Figure 10**	30/9/97



NOTES:

Rotary Drill Hole, spudded 25/9/97

Reverse circulation Air/Water mist to mid silica sand, then drilled without water to TD.

Pipe stuck in hole due to dry sand cavings in unconsolidated sand section.

Started with rock bit (tri-cone) which plugged. Changed to open center auger bit to complete hole.

Drill Hole 03

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

JG-97-DH03
Cuttings & Sampling Record

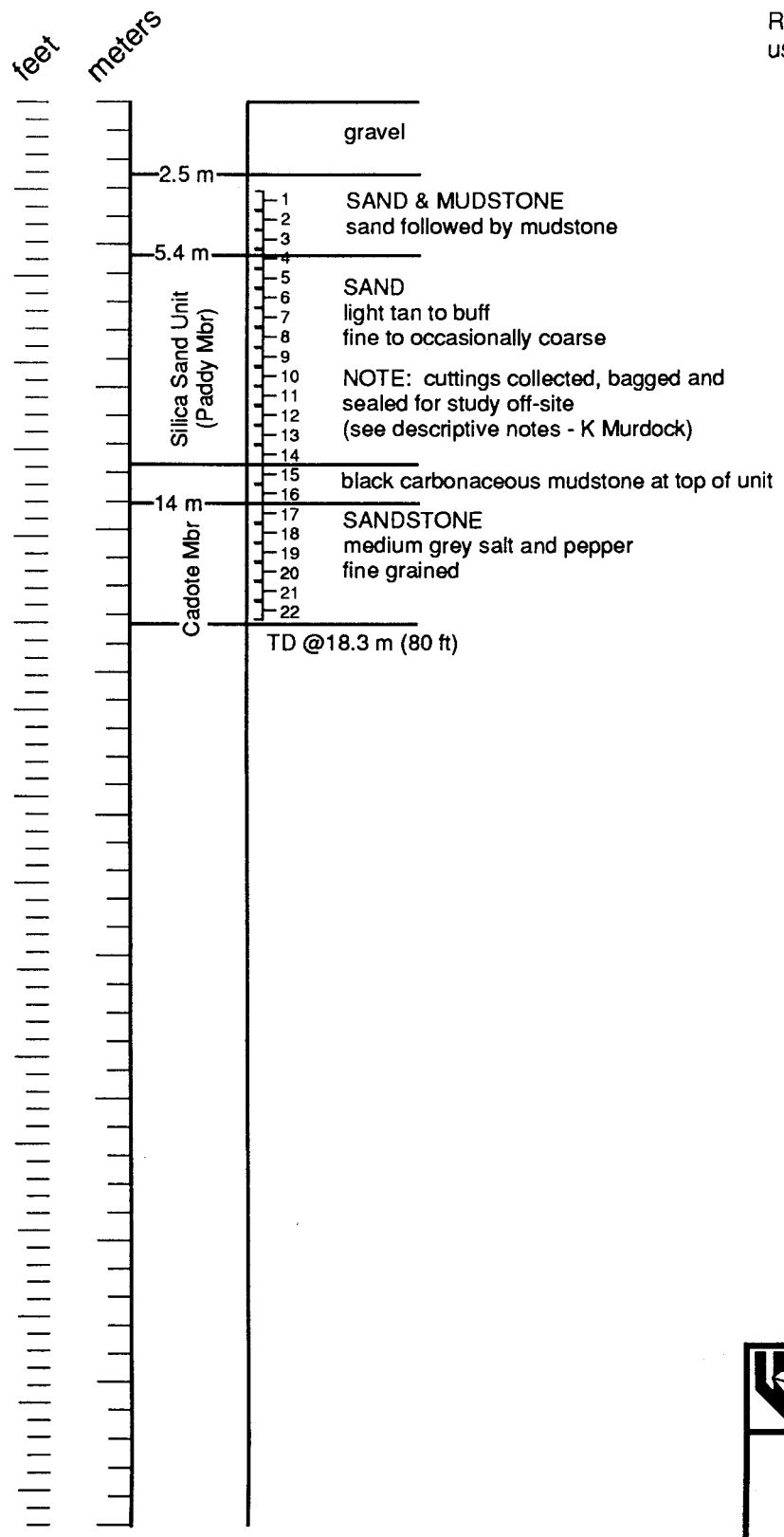
23 to 27 Sept '97 Program

JMB	**Figure 11**	30/9/97

NOTES:

Rotary Drill Hole, spudded 24/9/97.

Reverse circulation Air/Water mist to TD using open center auger bit.



Drillhole 04

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

JG-97-DH04
Cuttings & Sampling Record

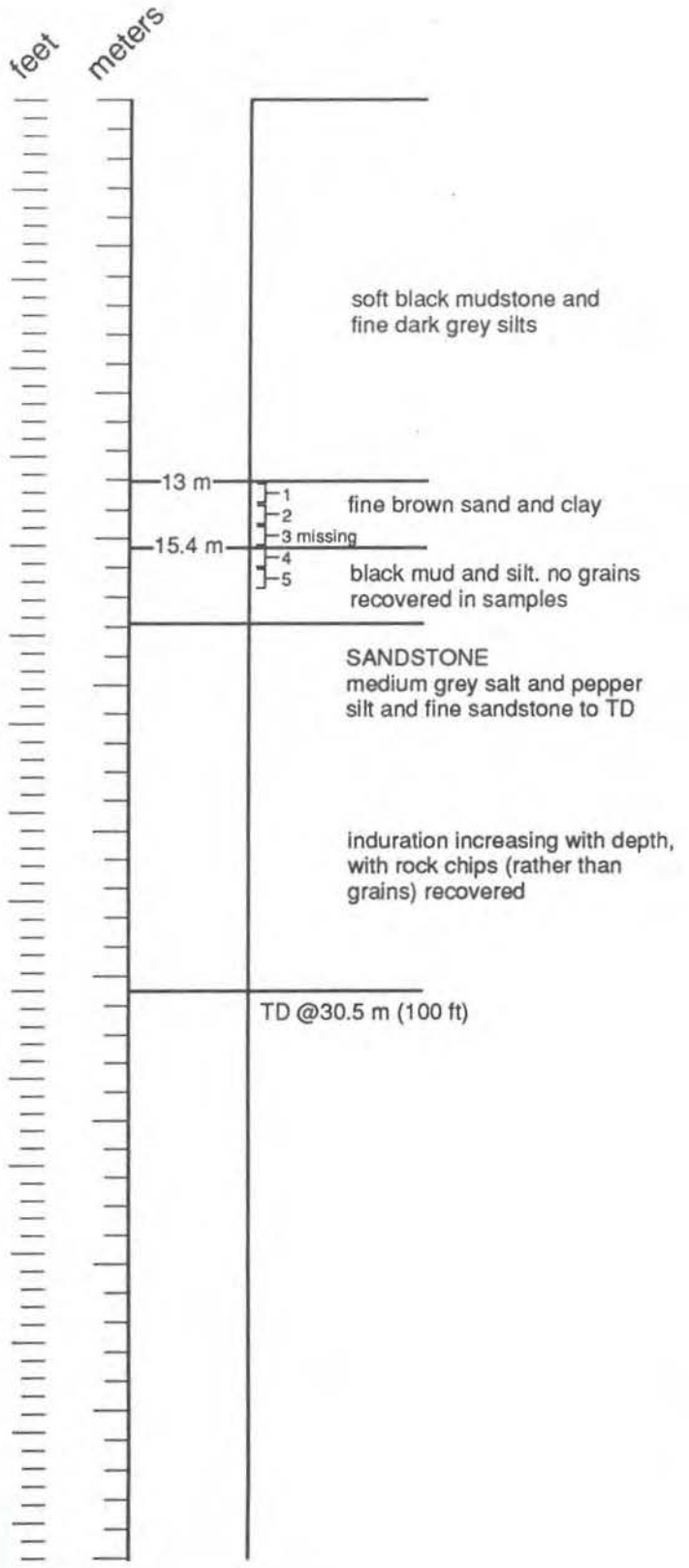
23 to 27 Sept '97 Program

JMB	Figure 12	30/9/97

NOTES:

Rotary Drill Hole, spudded 24/9/97

Reverse circulation Air/Water mist.



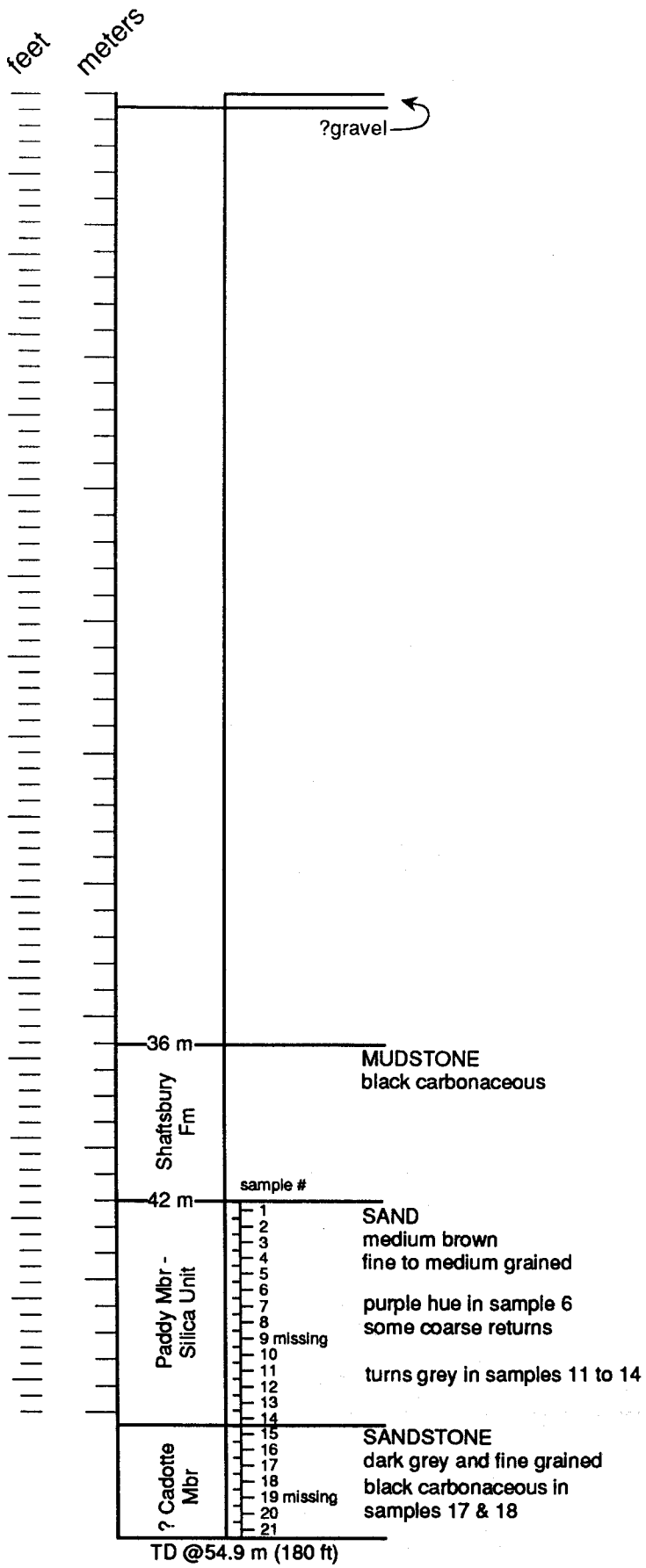
NOTE: cuttings collected, bagged and sealed for study off-site (see descriptive notes - K Murdock)

Drillhole 05

PEACE RIVER SILICA PROJE
Ultrasonic Industrial Sciences Ltd.

JG-97-DH05
Cuttings & Sampling Recor
23 to 27 Sept '97 Program

JMB	**Figure 13**	30/



NOTES:

Rotary Drill Hole, spudded 27/9/97

Reverse circulation Air/Water mist.

NOTE: cuttings collected, bagged and sealed for study off-site
(see descriptive notes - K Murdock)

Drillhole 09

PEACE RIVER SILICA PROJECT
Ultrasonic Industrial Sciences Ltd.

JG-97-DH09
Cuttings & Sampling Record

23 to 27 Sept '97 Program

KJM	**Figure 14**	30/9/97

UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-DH03-01	FINE SILICA SAND	BROWN/ PURPLE	100g	ZIP LOCK	WET WAS DRY WET W/BAG WATER
97-DH03-02	"	"	200g	"	" /DRY AIR DRILL RUN DRY
97-DH03-03	MISSING				
97-DH03-04	"	"	700g	"	DRY
97-DH03-05	"	LIGHTER BROWN	200g	"	APEARS LIGHTER & FINER THAN PREVIOUS SAMPLES
97-DH03-06	SILICA SAND	DARK BROWN	400g	"	FIRST CATCH FROM THIS DEPTH
97-DH03-06	"	BROWN	3kg	2 ZIP LOCK BAGS	18.5m - 19.5m AIR DRILL RUN DRY
97-DH03-07	"	BROWN	3kg	"	19.5 - 20.5m "
97-DH03-08	"	"	2kg	1 "	20.5 - 21.5m "
97-DH03-09	"	"	3kg	2 "	21.5 - 22.5m "
97-DH03-10	"	"	4kg	2 "	22.5 - 23.5m "
97-DH03-11	SAND STONE	LIGHT GREY	2kg.	2 "	23.5 - 24.5m " TEXTURE LIKE POWDER
97-DH03-12	S.STONE/ CLAY	ONE LT GREY TWO BLACK	4kg.	3 "	24.5 - 25.5m GREY AND FINE TEXTURE BLACK CONCRETE

PLASTIC
21" x 36" 4m
8 x 18" 2m

UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-OH04-01	SILICA SAND	BROWN	15 kg	21x36 4m	APPEARS DRY DRILLED
97-OH04-02	SAND/ BLACK CLAY	BROWN/ BLACK	15 kg	"	"
97-OH04-03	BLACK CLAY	BLACK	7kg	"	WET DRILLED
97-OH04-04	DARK BROWN SAND	BROWN	15 kg	"	DRY DRILLED ?
97-OH04-05	SAND	"	7kg	"	~~APPEARS~~ LIGHTER THAN OH04-04
97-OH04-06	FLUID	"	1kg	8x18" 2m	FLUID FROM PAIL USED TO COLLECT OH04-06
97-OH04-06	SAND/ S. STONE	LIGHT BROWN	7 kg	21x36" 4m	BLEND OF SAND & GROUND SAND STONE
97-OH04-07	SAND STONE	LIGHT GREY	7 kg	"	FINE POWDER TEXTURE
97-OH04-08	SAND	BROWN/ GREY	7kg	"	SAND TEXTURE BUT COLOR SUGGEST BLEND OF SAND STONE
97-OH04-09	SAND	"	"	"	"
97-OH04-10	SAND/ ~~SAND STONE~~	GREY	"	"	~~SOME~~ SAND TEXTURE WET DRILL/PREPUMPED ~~POWDER TEXTURE~~
97-OH04-11	SAND	BROWN/ GREY	"	"	SAND TEXTURE MOISTURE IN BAG
97-OH04-12	"	GREY	6 kg	"	" LOOKS LIKE SLURRY MOISTURE IN BAG
97-OH04-13	"	LIGHT BROWN	7kg	"	SAND TEXTURE LESS MOISTURE IN BAG

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UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-OH04-14	SAND/ CLAY	BROWN/ BLACK	7kg	21x36" 4mm	SAND CONTAMINATED BY CLAY
97-OH04-15	"	BLACK	6kg	"	"
97-OH04-16	SAND/ CLAY	BLACK	7kg	"	MOISTURE IN BAG SAND TEXTURE
97-OH04-17	SAND/ CLAY	"	"	"	"
97-OH04-18	SAND STONE CLAY	BLACK/ GREY	6kg	"	FINE TEXTURE MOISTURE IN BAG
97-OH04-19	SAND STONE	GREY	6kg	"	" BAG TORNED TO RAIL
97-OH04-20	" SAND	GREY/ BLACK	7kg	"	GREY STREAKED WITH BLACK. TEXTURE APPEARS TO BE FINER
97-OH04-21	" SAND	GREY	6kg	"	FINE TEXTURE W/SOME SAND
97-OH04-22	SAND STONE/ SAND?	GREY W/BROWN	6kg	"	COARSER TEXTURE
97-OH05-01	SAND/ CLAY	BROWN/ BLACK	10kg	"	MOISTURE/WET DRILLED SAND TEXTURE W/BLACK WET DRILLED
97-OH05-02	SAND/ CLAY	BROWN/ BLACK	7kg	"	" WET DRILLED TEXTURE FINER THAN 01
97-OH05-03	MISSING				
97-OH05-04	SILT	BLACK	6kg	"	TEXTURE LIKE MUD NO GRAINS WET DRILLED
97-OH05-05	SAND/ CLAY	BROWN/ BLACK	6kg	"	BROWN W/SOME CLAY SAND WET DRILLED

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UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97 OH06-01	SAND STONE	SALT/ PEPPER GREY/BLACK	1kg	21 x 36" Amon	DRY DRILLED FINE TEXTURE
97-OH06-02	S. STONE/ SILICA SAND ?	S/P WITH RED BROWN	2kg	"	DRILLED DRY FINE TEXTURE W/SOME COARSE -
97-OH06-03	S. STONE/ SAND ?	COPPER BROWN (RED)	4 kg	"	DRY DRILLED FINE TEXTURE SOME GRAINS
97-OH06-04	"	"	7kg	"	"
97-OH06-05	SAND STONE/ SAND ?	LIGHT GREY/ BROWN	7kg	"	DRY DRILLED FINE POWDER NO LG ~~HARD STONE~~ GRAINS
97-OH06-06	"	"	"	"	"
97-OH06-07	"	"	"	"	" COLOR LIGHTER THAN 06
97-OH06-08	SAND STONE	LIGHT GREY → WHITE	6 kg	"	" FINER TEXTURE
97-OH06-09	"	"	"	"	"
97-OH06-10	SAND	COPPER BROWN DARK	"	"	WET DRILLED ? COARSE TEXTURE → GRAINS
97-OH06-11	"	"	"	"	"
97-OH06-12	"	"	"	"	" MOISTURE IN BAG
97-OH06-13	"	"	"	"	"
97-OH06-14	SAND/ CLAY	BROWN/ BLACK	7kg	"	SAND COLOR CHANGE BLACK MORE THAN COPPER

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UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container ~~2nd~~	Comments
97-DH06-15	SAND	DARK BROWN	6kg	21x36" 4mm	WET DRILLED FINE GRAINED TEXTURE
97-DH06-16	"	LIGHT TO DARK BROWN	7kg	"	"
97-DH06-17	"	LIGHT BROWN	6kg	"	"
97-DH07-01	SAND STONE	GREY SALT/ PEPPER	2kg	5 gal PAIL	FINE TEXTURE WET DRILLED NO INVASIVE GROUND
97-DH07-02	"	" YELLOW/ BROWN	"	"	" SOME SILT CONTAMINATION
97-DH07-03	SAND	DARK BROWN W/PURPLE	"	"	+ FINE SAND WET DRILLED LIGHT BROWN WATER
97-DH07-04	"	" COPPER H2O	"	"	" WATER HAS COPPER COLOR FROM D. BROWN/PURPLE
97-DH07-05	"	"	"	"	"
97-DH07-06	"	"	"	"	"
97-DH07-07	"	"	"	"	"
97-DH07-08	"	DARK BROWN BROWN H2O	"	"	SAND FINE GRAINED WATER HAS DARK BROWN TO BLACK COLOR
97-DH07-09	"	BROWN SAND COPPER H2O	3kg	8x18" 2mm	FINE SAND COPPER WATER STAINS IN BAG
97-DH07-10	"	LIGHT BROWN COPPER H2O	2kg	5 gal PAIL	SAND LT BROWN TO LIGHT PURPLE W/ COPPER CONTAMINATION WET DRILLED

UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-DH07-11	SAND/ SAND STONE	COPPER COLOR W/ GRIT & PEAR	2 kg	5 gal PAIL	COPPER COLORED WATER/WET DRILLED SAT/NEAR SAND/SO MEDIUM FINE TEXTURE
97-DH07-12	SAND	GREY	"	"	FINE TO COARSE SAND WET DRILLED, SLURRY GREY/BROWN COLOR DEBRIS OVER
97-DH07-13	"	~~DARK~~ BROWN	5 kg	21 x 36" 4mm	COARSE TEXTURE WET DRILLED LIGHT BROWN SLURRY
97-DH07-14	"	DARK BROWN W/ PEARL	2 kg	5 gal PAIL	FINE TO COARSE TEXTURE, WET DRILLED FLUID BROWN COLOR
97-DH07-15	"	"	5 kg	21 x 36" 4 mm	FINE TO COARSE TEXT. WET DRILLED
97-DH07-16	"	"	"	"	"
97-DH07-17	"	"	"	"	"
97-DH07-18	"	"	"	"	" SAND FINER
97-DH07-19	"	"	"	"	" COLOR BECOMING MORE DARK BROWN
97-DH07-20	"	" H_2O CHOC BROWN	3 kg	5 gal PAIL	" H_2O CHOC BROWN
97-DH07-21	"	"	"	"	" "
97-DH07-22	"	"	"	"	SAND HAS LIGHTER COLORING AND IS SLIGHTLY COARSER
97-DH07-23	"	"	"	"	" SAND IS VERY COARSE
97-DH07-24	"	"	"	"	" SAND IS SLIGHTLY FINER CHOC BROWN COLOR MORE PREDOMINENT

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UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-DH07-25	SAND? SAND STONE	DARK BROWN W/ARRE	3 kg	5 gal PAIL	FINE TEXTURE COOL BROWN COLOR TO SLURRY. WET DRILLED
97-DH07-26	SAND? SAND STONE	"	"	"	" SOME SALT/REAR COLORING
97-DH07-27	"	LIGHT BROWN TO GREY	"	"	" "
97-DH07-28	SAND STONE	"	"	"	" " NO SAND GRAINS
97-DH07-29	"	DARK GREY	"	"	" "
97-DH07-30	"	"	"	"	" LOTS OF SLURRY
97-DH07-31	"	"	"	"	" "
97-DH08-06	SAND	BROWN W/GREEN	1 kg	8x18" 2mm	FINE TO COARSE TEXTURE DRY DRILLED?
97-DH08-07	COAL?	BLACK	2 kg	"	SLURRY - LARGE ORGANIC PARTICLES WET DRILLED
97-DH08-08	SAND	BROWN W/BLACK	4 kg	21x36" 4mm	COARSE GRAINED SAND WET DRILLED, CONTAMINATED WITH COAL?
97-DH08-09	"	"	3 kg	5 gal PAIL	COARSE GRAINED SAND " BLACK COAL CONTAMINATION - BLACK SHALE
97-DH08-10	" SAND STONE?	"	"	"	FINE"
97-DH08-11	" SAND STONE?	"	2 kg	21x36" 4mm	FINE TEXTURE WET DRILLED COAL CONTAMINATION

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UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-DH08-12	SAND STONE	SALT/ ASH WHITE	10 kg	5 Tal Ant	SALT/ASH COLORED FINE GRAINED S/S BLACK MINOR CONTAMINANT → SLURRY
97-DH08-13	COAL	BLACK	3 kg	4	COARSE ORGANIC PARTICLES WET DRILLED
97-DH08-14	SAND STONE SAND?	CHOC BROWN	"	"	FINE TEXTURE → SOME CRYSTAL STRUCTURE CHOC BROWN → SAND? ORG CONTAM
97-DH08-15	SAND	MILK CHOC BROWN	"	"	FINE TEXTURE SAND LIGHT BROWN ORG? CONTAMINANT SLURRY
97-DH08-16	"	"	"	"	"
97-DH08-17	"	"	"	"	"
97-DH08-18	"	"	"	"	COARSER TEXTURE "
97-DH08-19	"	"	"	"	" "
97-DH08-20	"	"	"	"	"
97-DH08-21	"	"	"	"	"
97-DH08-22	"	"	10kg	"	FINE TEXTURE "
97-DH08-23	"	" DARKER BROWN	3 kg	"	COARSE TEXTURE CHOC BROWN CONTAMINANT IN SLURRY
97-DH08-24	"	GREY	6 kg	"	FINE TEXTURE ~~SAND STONE~~ GREY SLURRY
97-DH08-25	"	"	"	"	"

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UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-DH08-26	SAND	GREY	6kg	5gal PAIL	FINE TEXTURE SAND WET DRILLED W/GREY SLURRY
97-DH08-27	SAND STONE	" DARK GREY	"	"	+. FINE POWDER " "
97-DH08-28	"	"	"	"	+. FINE TEXTURE SALT/PEPPER COLORING
97-DH08-29	"	"	"	"	"
97-DH08-30	"	"	"	"	"
97-DH08-31	"	"	"	"	"
97-DH09-01	SAND	BROWN	12kg	"	FINE TEXTURE WET DRILLED CHOC BROWN SLUDGE ON SURFACE OF PAIL
97-DH09-02	"	"	8kg	"	" LIGHT BROWN SLUDGE
97-DH09-03	"	"	4kg	"	COARSE TEXTURE "
97-DH09-04	"	"	"	"	" "
97-DH09-05	"	"	8kg	"	" CHOC BROWN SLUDGE
97-DH09-06	"	" W/GRAVEL	"	"	" "
97-DH07	"	"	5kg	"	" "

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UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-DH09-08	SAND	BROWN	4 kg	45gal DRUM	COARSE TEXTURE WET DRILLED CHOCOLATE BROWN SLUDGE ON SURFACE OF DRUM
97-DH09-09	MISSING				
97-DH09-10	SAND	"	20kg	"	FINE SAND " "
97-DH09-11	SAND/ SANDSTONE	GREY	12kg	"	FINE TO V FINE TEXTURE SOME CARBONATES SALT/PEPPER COLOR WET DRILLED
97-DH09-12	SAND STONE	"	"	"	LOTS OF FINE SLUDGE ON SURFACE "
97-DH09-13	"	"	"	"	" "
97-DH09-14	" W/SAND?	" DARK GREY	"	"	SOME CRYSTALS IN CORE FRACTION LOTS OF SLUDGE DARK GREY SLUDGE
97-DH09-15	"	"	"	"	"
97-DH09-16	SAND STONE	"	"	"	CRYSTALS ARE FINER MORE SALT/PEPPER "
97-DH09-17	"	BLACK/ GREY	"	"	SOME ORGANICS "
97-DH09-18	"	GREY	8kg	"	LOTS OF SLUDGE LIGHTER GREY FINE TEXT SEDIMENT
97-DH09-19	MISSING				
97-DH09-20	"	"	4kg	"	NO SLUDGE IN DRUM → PORED OUT - SALT/PEPPER FINE TEXTURE
97-DH09-21	"	"	6kg	"	LOTS OF SLUDGE "

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UIS 1997 Sampling Program - September 22nd to 26th

Sample Identification	Material	Color	Size	Container	Comments
97-CH10-00	SAND	WHITE BROWN	3kg	8x16" 2mm	SOME BLACK PARTICLES VERY COARSE
97-CH10-01	"	"	"	"	FINE TEXTURED SAND
97-CH10-02	"	"	2kg	"	"
97-CH10-03	"	"	3kg	"	"
97-CH10-04	"	LIGHT "	8kg	" x2	"
97-CH10-05	"	LIGHT BROWN	"	" x2	"
97-CH10-06	"	"	6kg	" x2	"
97-CH10-07	"	"	5kg	"	"
97-CH10-08	"	"	8kg	" x2	"
97-CH10-09	"	"	"	" x2	"
97-CH10-10	"	"	"	" x2	"
97-CH10-11	"	DARK BROWN/ GREY	"	" x2	"
97-CH10-12	"	DARK GREY	9kg	" x3	"
97CH10-13	"	DARK BROWN/ GREY	8k	" x2	"
97CH10-14	"	"	"	" x2	"
97CH10-15	"	DARK GREY	"	" x2	"

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97-CH12-01	SAND	DARK BROWN	10kg	21x36" 4mm	FINE SAND
97-CH12-02	"	"	"	"	"
97-CH12-03	"	LIGHTER BROWN	9kg	"	"
97-CH12-04	"	BROWN/ GREY	7kg	8x18" 2mm x2	"
97-CH12-05	"	LIGHT BROWN	"	" x2	"
97-CH12-06	"	LIGHT BROWN -GREY	8kg	" x2	"
97-CH12-07	"	LIGHT BROWN	"	" x2	FINE/COARSE SAND
97-CH12-08	"	"	10kg	21x36" 4mm	"
97-CH12-09	"	LIGHT GREY	8kg	8x18" 2mm x2	"

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97-CH13-01	SAND	LIGHT GREY	9hz	21436" 4mm	FINE TEXTURED SAND
97-CH13-02	"	"	"	"	"
97-CH13-03	"	LIGHT BROWN	"	"	"
97-CH13-04	"	DARK ARGE BROWN BLACK	"	"	"
97-CH13-05	"	ARGE	"	"	"
97-CH13-06	"	"	6hz	"	"
97-CH13-07	"	ARGE W/COPPER	7hz	"	"
97-CH13-08	"	ARGE	"	"	"
97-CH13-09	"	DARK ARGE	"	"	"
97-CH13-10	"	" W/COPPER	"	"	"
97-CH13-11	"	"	"	"	"
97-CH13-12	"	LIGHT ARGE	"	"	" SOME PEACES OF LARGE LAMINATION
97-CH13-13	"	"	"	"	" "

13/B

APPENDIX 3

1998 Geological log of channel and drill-hole sample sections

Peace River Project drill hole and channel sample survey data
September 1998

Sample type	Map ref.	Northing	Easting	Elevation	Descriptions	Sample #'s
JG/KM-97-CH01	97-CH01	9303.99	8508.62	359.16		
KM-97-B02	97-B02	9406	8527			
JG/JB-97-DH03	97-DH03	9369.03	8645.39	365.29	log by Bodard (1997 report)	samples 01-12
JG/JB-97-DH04	97-DH04	9590.83	8610.32	352.21	log by Bodard (1997 report)	samples 01-22
JG-97-DH05	97-DH05	9734.38	8694.83	355.99	log by Bodard (1997 report)	samples 01-04
JG-97-DH06	97-DH06	10024.183	8838.31	370.39	sections from Godfrey (1997 report)	samples 01-19
JG-97-DH07	97-DH07	10154.92	8910.26	376.08	sections from Godfrey (1997 report)	hole too short
JG-97-DH08	97-DH08	9511.42	8692.58	366.37	sections from Godfrey (1997 report)	samples 01-29
JG/JB-97-DH09	97-DH09	9445.80	8785.64	391.49	log by J. Bodard (1997 report)	samples 01-16
JG/JB-97-CH10	97-CH10	9334.86	8496.54	359.11	log by J. Bodard (1997 report)	samples 01-16
JG/SF-98-CH11A	98-CH11A	9370.07	8498.36	358.2904	picket at top of ridge (survey control)	
					17' of glacial gravels; 10.8' Paddy with coal	
					16' of clean Paddy Mbr	JG/SF-98-CH -01-08
					4' of Cadotte mixed zone	09, 10
JG/JB-97-CH12	97-CH12	9412.72	8509.61	356.80	Shaftesbury shale outcropping in area; log by J. Bodard (1997 report)	JG-97-CH- 01-09
JG/JB-97-CH13	97-CH13	9203.6	8636.9	358.0	test pit	
JG/SF-98-CHTP14	98-CHTP14	9465.51	8523.46	349.05	Test pit 3	
					0-6.4' glacial gravel overburden	
					6.4-6.6' white, fn gr. ss	
					6.6-8.5' coal seam	
					8.5-10.8' grey to greyish brown ss with coal lenses	SF-98-CH14-01
					10.8-13.1' grey to greyish br Paddy Mbr with dk br ss with diss coal 12.6-13.1'	02
					13.1-14.5' clean Paddy Mbr, typical buff brown, med to cs grained.	98-CH14-03
JG/SF-98-CHTP15	98-CHTP15	9654	8561	348.5	0-4.2' overburden consisting of glacial gravels.	98-CH15-01
					4.2-5.2' fine grained, white Paddy Mbr ss.	
					5.2-7.5' coal seam	
					7.5-13.0' Dk br, med to cs. gr. Paddy mbr ss. with probable diss. coal.	
					13.0-14.1' coal seam	

Sample type	Map Ref.	Northing	Easting	Elevation	Descriptions	Sample #'s
JG/SF-98-CHTP15 cont'd					14.1-21.4' Paddy mbr with shale lenses from 14.9-15.1' and 18.5-19.1'	
					21.4-25.4' Cadotte ss; did not observe mixed zone.	
					25.4' base of pit.	
JG/SF-98-CHTP16	98-CHTP16	9510.9	8573.5	347.65	Test pit 6	
					5.5' glacial gravel overburden	
					0 measured at top of bedrock	
					0-2.5' med-cs gr ss with 0.3' thick coal seam at 0.5'	
					2.5-4.9' coal seam	
					4.9-6.0' dk reddish br ss	
					6.0-8.0' lighter brown, fine grained Paddy Mbr ss	JG/SF-98-CH 16-04
					8.0-10' becomes more pale br. in color	98-CH 16-05
					10-25' Paddy Mbr cont'd and locally with planar cross-bedding present 16.6-24.4'	06-12
					2cm clay rich section at 16.4'	
					10 cm clay mottled zone with 1-2mm flecks of coal	
					25.0-30.5 mixed zone with 0.1-0.3' thick shale lenses	13-15
					30.5-32' mainly Cadotte ss with a 2.5-3.0 cm thick shale lens at 31.0'.	98-CH16-16
JG/SF-98-CHTP-17	98-CHTP-17	9529.75	8515.40	344.14	Test pit 4	
					0-2.9' overburden; 1.3' topsoil, 1.6' glacial gravel.	
					2.9-5.9' Paddy mbr ss with crossbeds varying from 14 degress SW to 25 deg. NW. section includes a 3-4 mm thick discontinous lens of coal from 4.95-5.0'.	JG/SF-98-CH17-01
					5.9-12.1' mixed zone within Cadotte ss contains variably med to cs grained silica lenses and lesser shale lenses.	98-CH17-02-05
SF/KM-98-B18	98-B18	9507.58	8580.81	347.65	excavated from test pit 6	
SF/JF-98-CH19	98-CH19	9485.91	8498.41	344.91	picket at top of channel sample;	
					0-2.2' overburden consisting of 1.2' topsoil and 1.0' of glacial gravel .	
					2.2-3.9' med to cs gr. Paddy Mbr ss.	JG/SF-98-CH19-01
					3.9-10.2' mixed zone within Cadotte ss; shale lenses	98-CH19-02-04

Sample type	Map Ref.	Northing	Easting	Elevation	Descriptions	Sample #'s
					at 5.0' and 5.8'.	
					10.2' and below Cadotte ss.	
JG/SF-98-CH20	98-CH20	9559.89	8506.78	343.29	picket at top of channel sample	no samples
					7.7'/2.3m glacial gravel and topsoil	
					overlying Cadotte ss.	
JG/SF-98-CH21	98-CH21	9635.21	8504.62	340.78	picket at top of channel sample	no samples
					12' of glacial gravels overlying Cadotte ss	
JG/SF-98-DH22*	98-DH22	9623.77	8561.8	349.78	0-6' glacial gravels	
					6-10' intercalated Paddy Mbr ss and coal	JG/SF-98-DH22-04,05
					10-14' fine grained Paddy Mbr	06,07
					14-20' med to cs grained Paddu Mbr ss	08-10
					20-22' fine to med grained Paddy Mbr with	11
					thin coal lens from 21.8-22'	
					22-26' fine to med grained Paddy Mbr.	12, 13
					26-28' med to cs grained Paddy Mbr	14
					28-34' mixed zone within Cadotte	15 - 17
					34-38' Cadotte ss	98-DH22-18
					38' EOH	
JG/SF-98-DH23	98-DH23	9605.67	8704.06	365.98	0-14' predominantly clay, silt	
					14-44' glacial sand	
					44-80.4' Paddy Mbr ss.	
					46-54' no material collected, no return circulation	
					54-56.0' brownish black to bk, Paddy Mbr. with coal	JG/SF-98-DH23-01
					56.4-58.4 br to br-bk, fn gr Paddy Mbr.	02
					58.4-60.4 med br, fn gr Paddy Mbr with coal 60.0-60.4'	03
					60.4-62.4' med gr Paddy Mbr; 61.5-62.4 coal rich	04
					62.4-64.4' predominantly coal to ~64.7'	05
					64.4-66.4' Paddy Mbr becomes more cs grained;	06
					reddish brown in color	
					66.4-68.4' minor coal lenses within Paddy Mbr.	07
					68.4-70.4' black liquid appears to contain coal;	08
					possible contamination	
					70.4-72.4 fluid still dark brownish-black	09
					72.4-74.4' med brown solution, med to cs grained	10
					74.4-76.4' light br solution, clean Paddy Mbr.	98-DH23-11

The location 56.4 feet was determined by use of the geograph which was attached to the drilling assembly. Confusion resulted because rods were imperial, geograph was measured in meters and measurements were required in feet. All later holes were measured by marking a two foot chauk measurement directly onto rods by the driller.

Sample type	Map Ref.	Northing	Easting	Elevation	Descriptions	Sample #'s
JG/SF-98-DH23 cont'd					76.4-78.4' med to cs grained Paddy Mbr with minor shale lenses.	98-DH2312
					78.4-80.4' poor yield;clay rich section and locally cs gr	13
					80.4-82.4' shale lenses intercalated with Paddy Mbr darker solution suggests presence of Cadotte ss	14
					82.4-92.4' Cadotte ss	98-DH23-15-17
					92' EOH	
JG/SF-98-DH24	98-DH24	9553.70	8709.08	367.62	0-46' glacial sand deposits	
					38-46' limonite stained	
					46-48' grey fn gr Paddy Mbr	JG/SF-98-DH24-01
					48-52' med gr ss	02, 03
					52-54' typical buff color associated with Paddy Mbr.	04
					54-56' Paddy Mbr with intercalated coal lenses	05
					56-58' coal seam to 59.3'	06
					58-60' minor coal lenses to 59.3'	07
					60.3-84' clean paddy Mbr. ss	08 - 19
					84-86' mixed zone, med to cs gr silica sections	20
					86-98' Cadotte ss.	98-DH24-21, 22
					last sample to be sieved 88-90'	
					98' EOH	
JG/SF-98-DH25	98-DH25	9550.95	8631.75	361.37	hole aborted short of Paddy Mbr; 0-14' sand	no samples
					14-42' glacial gravels	collected
	98-DH26	9555.64	8546.01	352.46	0-11' glacial gravels	
					11 - 12' sand limonite stained	
					12- 13' fine grained white sand	
					13-16' coal seam	
					16-18' intermixed Paddy and coal lenses	JG/SF-98-DH26-09
					18-18.3' coal seam; 18-20' fine grained Paddy ss	10
					18.3-36' clean Paddy member ss	
					20-22' fine to med grained Paddy Mbr	11
					22-26' fine grained Paddy Mbr	12, 13
					26-30' med to cs grained Paddy Mbr	14, 15
					30.6- 32' dark br Paddy Mbr with clay lenses	16
					32-33.4' white, med to cs grained Paddy Mbr ss	98-DH26-17
					33.4-34' fine grained Paddy ss intercalated with shale	

Sample type	Map Ref.	Northing	Easting	Elevation	Descriptions	Sample #'s
JG/SF-98-DH26 cont'd					34-36' med to cs grained Paddy Mbr	JG/SF-98-DH26-18
					36-39' mixed zone within Cadotte ss	19
					39-40' Cadotte ss	98-DH26-20
					40' EOH	
	98-DH27	9489.6	8614.3	361.54	0-34' glacial gravels	
					34-70' Paddy Mbr ss including coal from 35-38'	JG/SF-98-DH27-02-19
					70-78' Cadotte ss	**98-DH27-20-23**
					78' EOH	
JG/SF-98-DH28	98-DH28	9469.50	8675.68	365.83	Overburden to 41'	
					0-2' clay and topsoil	
					2-18' med grained sand	
					18-20' sand, silt (Lacustrine sediment)	
					20-38' glacial sand	
					38-40' fine grained sand	
					40-41' Shaftesbury shale	
					41-50' predominantly coal; 41' start of Paddy Mbr	1st sample 42-44'
						JG/SF-98-DH28-01-04
					50-52' fine grained dark ss	98-DH28-05
					56-58' dk br ss intermixed with coal	98-DH28-06-08
					58-60' med gr. Paddy Mbr; 58' start of clean ss.	98-DH28-09
					60-68' fn-med grained	98-DH28-10-13
					68-76' med-cs gr ss	98-DH28-14-17
					76-80' mixed zone	98-DH28-18,19
					80-88' Cadotte ss	98-DH28-20-22
JG/SF-98-DH29	98-DH29	9412.91	8656.40	365.44	0-39" overburden	
					0-22' mainly clay, lesser sand component	
					22-24' Glacial gravel, lesser sand.	
					24-36' fine grained sand	
					36-39' Shaftesbury shale	
					39-46' coal (7' thickness)	1st sample 40-42'
					increasing thickness to east (?)	JG/SF-98-DH29-01-03
					46-70.6' Paddy Mbr ss	98-DH29-04-16
					70.6-75.0' mixed zone	98-DH29-17, 18
					Predominantly Cadotte with some med to cs grained	

Sample type	Map Ref.	Northing	Easting	Elevation	Descriptions	Sample #'s
					silica sections, with minor shale lenses at 72.2 and 74.6'	
					75-90' Cadotte ss.	JG/SF-98-DH29-19-23
					90' EOH	
JG/SF-98-DH30	98-DH30	9429.5	8596.5	361.69	0-8' mainly silt, clay	
					8-20' mainly sand	
					20-30' glacial gravel	
					30-35' sand, lesser gravel	
					34-36 35' start of Paddy Mbr ss	JG/SF-98-DH30-01
					36-38' 37-38' coal seam	02
					38-43' mainly coal; drilling wet here and as a result exact positions of coal are unclear.	03, 04,05
					43-61' clean Paddy Mbr	06-13
					61-67' mixed zone with med to cs grained silica sections within Cadotte ss	14-16
					67-74' Cadotte ss	98-DH30-17-20
					74' EOH	
JG/SF-98-DH31	98-DH31	9442.1	8530.8	352.59	4-6' 0-4.4' glacial gravels;	
					4.4 - 28.3' Paddy Mbr ss	JG/SF-98-DH31-01
					5-7' coal seam	02
					7.0-11.0' intermixed Paddy and coal lenses	03
					11.0-15.0' coal seam	04
JG/SF-98-DH31 cont'd					15-28.3' clean Paddy Mbr. ss	07-12
					28.3-28.4 shale lens	13
					28.4-34.0' mixed zone with med to cs grained silica sections within Cadotte ss.	98-DH31-14, 15
					34-42' Cadotte ss; 42' EOH	JG/SF-98-DH31-16-19
JG/SF-98-DH32	**98-DH32**	9391.9	**8546.8**	353.52	0-5.7' glacial gravels	
					5.7-10.4' Shaftesbury shale	
					10.4-32' Paddy Member ss [1st sample 10-12']	JG/SF-98-DH32-01-10
					32-36' mixed zone (Cadotte ss)	**12-13**
					36-38' Cadotte ss	**98-DH32-14**
					38' EOH	

Sample type	Map Ref.	Northing	Easting	Elevation	Descriptions	Sample #'s
JG/SF-98-DH33	**98-DH33**	9380.28	8606.29	362.46	0-18' silt, fine grained sand	
					18-20' sand	
					20-22' glacial gravels	
					22-26' fine grained sand and gravel	
					26.0-26.8' fine grained sand (start of Paddy Mbr)	JG/SF-98-DH33-01
					26.8-28' coal	
					28.0-30.3' fine grained sand	02
					30.3-34.0' coal	03,04
					34.0-38.0' dark brown Paddy Mbr possibly with coal	05,06
					38-60' clean Paddy Mbr.	**07 to 17**
					60-64' mixed zone; med to cs gr silica sections in Cadotte ss.	**18, 19**
					64-78' Cadotte ss	**98-DH33-20-26**
					78' EOH	
Northpoint survey data -spot survey locations						
ss	East of TP-6	9505.60	8588.60	351.54	glacial gravel in contact with Shaftesbury shale	
SF-1	Test pit 6	9512.56	8580.65	348.33	possible erosional interface and contact with coal seam at north face of B18 /Tp-6 pit	
SF-2	Test pit 6	9507.58	8580.81	347.65	contact of glacial gravel and Shaftesbury shale	
SF-3	Test pit 6	9507.69	8566.31	350.77	western most position of glacial gravel/Shaftesbury shale contact	
SF-4	Test pit 6	9495.41	8575.83	351.41	southern edge of Shaftesbury shale and contact with glacial gravels	
SF-5	Test pit 2	9405.77	8528.13	351.91	glacial gravel and Shaftesbury shale contact	
SF-6	Test pit 2	9406.70	8519.43	351.83	southwest edge of pit; glacial gravel and Shaftesbury shale contact	
SF-7	Test pit 2	9412.92	8519.21	351.08	northwestern edge of pit and contacts as above	
SF-8	Test pit 2	9414.24	8528.48	351.29	northeastern edge of test pit and contacts as above	
SF-9	Test pit 1	9351.25	8521.60	353.16	southeast edge of pit, contact between glacial gravels and Shaftesbury shale	
SF-10	Test pit 1	9350.24	8512.91	353.23	southwest edge of pit, contact as above	
SF-11	Test pit 1	9362.44	8510.44	353.31	northwest edge of pit, contact between glacial gravels and Shaftesbury shale	
SF-12	Test pit 1	9365.66	8516.00	352.97	northeast edge of pit, contact as above	

APPENDIX 4

1998 Godfrey geology summary memorandum on fieldwork

MEMORANDUM #121A **AUGUST 16, 1998**

Subject: General Geology of the UIS Paddy Member Sandstone, Peace River Silica Sand Deposit, Alberta; a Current Synthesis, East Side Permit Area

Fieldwork during the UIS 1997 season and confirmed during the 1998 season shows that the Paddy Member sandstone in the area south of the plant site can generally be subdivided into three distinct zones. These three zones are not always present in a given geological section. Definition of each of these three zones, their spatial continuity and total lateral extents will have practical benefits for the open-pit mine planning and a direct impact and significant implications for the economics of the silica sand operation:

Upper Mixed Coal Zone
Middle "Clean" Silica Sand Zone
Lower Mixed Zone

Upper Mixed Coal Zone: characterized by a concentration of coal seams which are interbedded with silica sands. Test Pit-6, site of both bulk sample SF-98-B18 and channel sample JG/SF-98-CHTP16 shows three coal seams exposed over a horizontal distance of about 200 feet, ranging in thickness from top to bottom of 14, 7 and 31 inches, as measured at the easterly point "B", see Figure 1.

This Upper Coal Zone is very extensive, having been encountered in virtually all UIS development drill holes throughout the area south of the UIS plant site.

The Upper Coal Zone is notably absent in two restricted areas south of the UIS plant site:

1. Towards the extreme south end of the area explored by drilling at 97-DH03 and 98-DH32, i.e. approaching the geologically anomalous region of unusually thick sections of Shaftesbury Formation shale (and associated with thinning of the Paddy Member) identified thus far to extend from TH-72 westwards to TP-1 and crop out in the east bank as shown in cross section G - G'. The absence of the Upper Coal Zone in 97-DH03 and 98-DH32, general thinning of the Paddy Member and the adjacent unusual thickness of the overlying Shaftesbury Formation to the south are probably geologically linked. Perhaps these features are related to a tidal-surge channel eroded into the top of the Paddy Member sandstone, resulting in removal of the upper portion of the Paddy section and

development of a trough or embayment for deposition of Shaftesbury Formation shales in the course of subsequent subsidence.

2. In the extreme western section of the area of open-pit excavation glacial erosion has removed the bedrock cover and some or all of the Paddy Member silica sand, thereby terminating continuity of the Upper Coal Zone to the west. Coal seams are generally not observed within the Paddy Member exposed along the Peace River east bank cliffs, except at 98-CH11A, as a consequence of this glacial erosion. Here, glacial deposits rest directly on either the Middle Clean Silica Sand Zone, the Lower Mixed Zone or on the underlying Cadotte Member sandstone.

South of the UIS plant site the lower part of the Paddy Member silica sand section tends to be of medium - coarse grain size, the middle section is coarsest and the upper zone is of medium to finer grain size. This grain size distribution suggests deltaic build out into open water during the lower and middle zone periods, followed by quieter coastal waters sheltered behind the deltaic sedimentation front farther out to sea. Establishment of a substantial vegetation cover on the emerging low-lying coast is evidenced by the presence of several coal seams in the Upper Coal Zone. Trapping of a coarser pebbly sand lag sediment in the roots of this vegetation is evident in the bimodal character (two particle size maxima) of the Paddy Member sand with the coarse mean in the plus 12 mesh range (see 97-DH05-1 and 97-DH08-13).

Local erosion can develop channels in shallow water or partly exposed sands, creating an uneven relief for the vegetational cover. Test Pit-6 at the east end shows the upper coal seam to occupy a channel cutting across about 1 foot of the underlying silica sand bed. This channel slopes eastward.

Paleosol (ancient, buried soil profile) formation can be expected in a sediment surface occasionally exposed to the atmosphere and as a seat to coal seams. Thick concentrations of limonite at several drill hole locations within the Upper Coal Zone are interpreted as such. Paleosol development has been noted at the top of the Upper Coal Zone, e.g. 97-DH07, 98-DH24, 98-DH26, and within the Upper Coal Zone e.g. at 97-DH08.

Rare, silica-cemented nodules of silica sand have been noted within the Upper Coal Zone. These tabular-shaped nodules measure up to 1 metre long by 0.25 metres thick, lie flat in

the bedding of the silica sand and have a smoothly rounded, somewhat knobby exterior surface. They should not represent a problem in the course of open-pit stripping.

Information on the area north of the UIS plant site is largely based on the only reliable fieldwork by Hardy/BBT/ARC reported by Hamilton, July, 1989. This information consists of four widely spaced drill holes extending for 1.5 miles north of the UIS plant site. These four drill holes show a continuous coal seam at the base of the Paddy Member silica sand, a geological situation largely absent at the south end of the property. There is no indication of the Upper Coal Zone extending north of the UIS plant site based on 1989 exploration work.

Middle Clean Silica Sand Zone: This zone of the Paddy Member is characterized by variably planar (parallel, straight sided) to cross-bedded sands, typically of medium to coarse grain size, rare thin silty clay layers, little or no coal seams, and uncommon light iron oxide stains deposited by groundwater. Microscope study shows these rich, mature quartz sands to have a locked grain texture resulting from pressure solution at grain-to-grain contact points. A consequence of this locked grain texture is that natural exposures and artificial slopes in the Paddy Member Silica Sand are able to stand at steep angles (in excess of 45°) for a considerable time, i.e. many years.

Although these Paddy Member silica sand deposits are of Late Lower Cretaceous age (about 100 million years old) they have remained largely free of cementation and are friable, crumbling to the touch of the hand. The quartz grains are typically of multicycle origin (two cycles are clearly evident), and show rounded first cycle overgrowths. Rarely, the euhedral (well-shaped hexagonal) form of the second cycle overgrowth is preserved despite the subsequent partial rounding.

Heavy minerals and trace minerals (including magnetic minerals) are of minor concentration, probably representing a cumulative total of less than 1% by weight.

The coarse-grained quartz sand particles in this part of the section are typically well rounded and form the prime target for the production of frac sand.

Lower Mixed Zone: Although of common occurrence, this zone is not always present in the geological sections either channel sampled or drilled sampled and we still need to

determine the pattern of its distribution, its geometry and its significance in the overall picture of the Paddy Member.

The Lower Mixed Zone is well displayed over a thickness of 6.2 feet in Test Pit-4 (situated between the Middle Clean Silica Sands and Cadotte Member Sandstone) where medium- to coarse-grained, clean silica sands are interbedded with typical fine-grained Cadotte sandstone or silty clay layers. Channel sample 98-CHTP17 was taken from Test Pit-4. The layers of the Mixed Zone are generally from 4 to 6 inches thick, but they are seen to have a generally lenticular shape over the width of the test pit. Subaqueous dune bedding and wave forms with amplitudes of 3 to 4 inches and wave lengths of 12 inches or more are seen in one coarse-grained silica sand layer overlain by 1 inch of silty clay. The paleocurrent direction was from the northwest.

The Lower Mixed Zone is apparently absent in 97-CH01, where fieldwork involving detailed systematic channel sampling started in 1997. Here, clean Paddy silica sand rests directly and conformably on the fine grained, "salt and pepper" textured Cadotte Sandstone. However, elsewhere the Lower Mixed Zone is commonly encountered in most of the sections sampled within the development area south of the UIS plant site.

Geological Interpretation: The key to interpretation and modeling of this silica sand deposit is understanding the environment of deposition which should then guide the exploration and development of the deposit with an increased degree of confidence.

The Cadotte Member, a fine-grained, characteristically "salt and pepper" soft Cretaceous sandstone that is typically planar bedded and is interpreted to be a shallow, open-water deposit of marine origin. At this time in the geological history of the region there is no depositional evidence of a nearby source of continental clastic (solid particles) sediment.

The influx of a contrasting continental sediment from a nearby source into this marine environment heralds a change and a new phase in the pattern of sedimentation, perhaps a delta is building out and encroaching into the open sea. This is the beginning of deposition of the Paddy Member silica sands in the region.

Depending on the precise site within the area affected by deposition of deltaic sediment and also in particular the position of the site relative to the longshore drift current (i.e. whether the site is up-current or down-current from the delta deposits) the Paddy sands may either

intermix with the longshore drift sediment (i.e. up-current from delta) or be protected from mixing with them on the lee side (i.e. down-current).

Hence, the geological section at 97-CH01, where clean Paddy Silica Sands rest directly on the Cadotte Sandstone, appears to have been a site protected from mixing with the open water Cadotte sediment. However, in much of the rest of the southern portion of the UIS deposit the Paddy silica sands were in an environment that mixed with the later fine-grained sands of the Cadotte Member. The latter sequence of mixed sediments consisting of two, interbedded, diverse sources of sediment, has been called the Lower Mixed Zone.

Gradually, with continued sedimentation, the deltaic source of sediment became dominant and the Cadotte marine sediment diminished, and hence the Middle Clean Silica Sand Zone sediment was deposited, represented by the coarser grain size of the nearby continental clastic source. The well-rounded, quartz-rich quality of this clastic sediment indicates a mature sand that was probably exposed to vigorous wave action, was possibly a locally reworked sediment, and extensive current bedding sedimentary structures show the strong influence of fluvial or offshore current activity.

Uncommon thin layers of silty clay within the Middle Clean Silica Sand suggests temporary, quiet water conditions. Perhaps the site was in a lagoonal environment protected by a shifting offshore sandbar.

Advance and shift of a sandbar farther offshore could have left a more sheltered, lower-energy coastal environment behind, allowing deposition of finer-grained sand in quiet waters. Infilling of a lagoon with fine-grained sediment, closer proximity to the coastline, and exposure to the atmosphere provides the opportunity for establishment of mangrove swamp type vegetation, perhaps a weathered soil profile, both of which show up later in the geological section as coal seams and limonite-rich zones.

Repeated oscillation of the sea water levels could generate several cycles of alternating vegetation growth and sandy sediments, with the production of the three prominent coal seams present in the Upper Mixed Coal Zone of the Paddy Member.

Buildup of wind-blown onshore tidal waters and their return to the sea develops erosional channels referred to as tidal-surge channels. These downslope surges can erode channels

through the sandy deposits, including sandbars, to create the lateral discontinuities now seen in the Paddy Member.

A return to deeper water marine conditions followed the Paddy Member time and clay shales of the Shaftesbury Formation became the dominant sediment type.

Rocky Mountain uplift towards the end of the Cretaceous Period and extending into the Tertiary Period caused withdrawal of the shallow Cretaceous seas and created continental conditions which have lasted until the present time.

Pleistocene Glaciation

Cooling during the Pleistocene Period (last 2 million years) brought conditions that led to widespread glaciation in many parts of the polar latitudes, including North America, where the Peace River region was overrun by the Laurentide continental ice sheet. Extensive erosion by both the ice, its subsequent meltwaters and runoff from the Rocky Mountains has developed many of the major erosional features of the present landscape including the valley occupied by the Peace River. Most importantly for this project, glacial erosion has been responsible for the removal of part of the Paddy Member Silica Sands deposit. A glacial valley, now filled by glacial sediment, cuts into and in part through, the Paddy Member Silica Sands immediately east of the river east bank in the vicinity of 98-CH20, 98-CH19 and TP-4.

Precise delineation of the position and geometry of this glacial valley and its effect on the Paddy Member within the permit area is important from the point-of-view of silica sands reserve estimates (in situ and recoverable) and the open-pit mine planning.

A natural extension of the above discussion would be a series of isopach and other geological maps of the development area which are currently in preparation to document and illustrate many of the features described above.

John D. Godfrey August 16, 1998

APPENDIX 5

1999 Geological log of channel and drill-hole sample sections

Geologs from 1999 Peace River R. C. drill project
September 10/99

Hole #	map ref.	Northing	Easting	Elevation	Description	Sample #'s
JG/SF-99-DH34	**99-DH34**	9328.02	8619.97	364.83	0-18m Shaftesbury Fm shale 18-22.5 Paddy Member sandstone 22.5-24.0 Cadotte sandstone 24m EOH	JG/SF-99-DH34-18/23
JG/SF-99-DH35	**99-DH35**	9246.16	8663.68	366.50	0-6.0m Shaftesbury Fm shale 2.6-2.7m sand inlier 4.9-5.0m light brown (oxidized) clay rich section 6.0-9.8m micaceous sand (glacial ?) 9.8-11.2m Shaftesbury shale 11.2-25.25m Paddy Member sandstone 11.25-11.75 coal interbedded with ss 11.75-17.0m dk br Paddy Mbr ss 17-24.2m clean Paddy Mbr ss 24.2-25.25m Lower Mix Zone 25.25-27m Cadotte sandstone 27m EOH	JG/SF-99-DH35-11/26
JG/SF-99-DH36	**99-DH36**	9206.52	8684.78	362.39	0-16m Shaftesbury Fm shale (contains slide debris) 13m gravel noted in sample 16.0-21.8m Paddy Member sandstone 16.0-16.6m coal 19.4-20.0m resembles Lower Mix Zone 20.0-20.8m clean Paddy Mbr 20.8-21.0m Shaftesbury shale slide material 21.8-23.0m Cadotte sandstone 23.0m EOH	JG/SF-99-DH36-16/23
JG/SF-99-DH37	**99-DH37**	9303.70	8551.19	360.63	0-8.7m Glacial drift 0-2.0m glacial-lacustrine silt 2.0-3.0m glacial sand	

					3.0-8.7m sand and gravel 8.7-12.0m Shaftesbury Fm shale (seen as dark grey, clay rich chips) 12.0-16.3m Paddy Member ss 16.3-16.8m Cadotte sandstone 16.8m EOH	JG/SF-99-DH37-12/16
JG/SF-99-DH38	**99-DH38**	9743.14	8807.19	376.37	0-18.7m Shaftesbury Fm shale 4.0-9.0m oxidized, brown in color 9.0-10.0m no return, no sample 10.0-10.5m wet clay, assumed perched water table 11.0m dry clay continuing to 18.7m 18.7-34.0m Paddy Member sandstone 18.7-20.5m grey brown to greenish brown sand 20.5-23.3m clean Paddy mbr.with 1.1m inlier of silty section 22.0-23.1m 29.2-32m coal 34.0-35.0 Cadotte sandstone 35.0m EOH **Peizometer installed at 6.0m depth where hole sloughed; height of peizometer, measured 0.7m above hole collar**	JG/SF-99-DH38-20/34
JG/SF-99-DH39	**99-DH39**	9809.65	8810.74	375.67	0-18.6m Shaftesbury Fm. shale 18.6-34.0 Paddy Member sandstone 26.5-27.3 in part oxidized, yellowish-brown in color 29.2-32.6 coal 32.6-34.0m Lower Mix zone 34.0-35.0m Cadotte (just where contact lies is unclear as drilling went wet from 33.5-35.0m. 35.0m EOH	JG/SF-99-DH39-20/34
JG/SF-99-DH40	**99-DH40**	9885.77	8821.96	371.62	0-13.3m Shaftesbury Fm shale (moist to 5.0m) 13.3-29.1m Paddy Member sandstone 23.9-25.4m coal 25.4-27.0m brown to pinkish brown med-cs gr sandstone 27.0-29.1 cs gr, oxidized 29.1-32.0m Cadotte sandstone	JG/SF-99-DH40-14/32

					32.0m EOH.	
JG/SF-99-DH41	**99-DH41**	9953.61	8830.70	367.98	0-9.0m Shaftesbury Fm shale (moist to 5.0m) 9.0-25.0m Paddy Member sandstone 18.9-20.0m coal 20-24.0m brown to pinkish brown, med-cs grained 25.0-26.0m Cadotte sandstone 26.0m EOH	JG/SF-99-DH41-10/25 JG/SF-99-DH41-26
JG/SF-99-DH42	**99-DH42**	9959.93	8774.86	358.72	0-10.0m Shaftesbury Fm shale (moist to 5.0m) oxidized section, light brown in color, 5.6-5.7m 10.0-16.2 Glacial Drift 10.0-14.0m light to med brown silt, probable glacial drift 14.0-15.5m sand and gravel (glacial drift) Problems penetrating sand and gravel, case to 16.5m 16.2-18.0m Paddy Member (?) 16.2-16.6m coal 16.6-17.6 Paddy member (?) 17.6-17.75 coal 17.75-18.0m Lower Mix Zone 18.0-19.0m Cadotte sandstone 19.0m EOH	JG/SF-99-DH42-17 -18 -19
JG/SF-99-DH43	**99-DH43**	9819.38	8755.36	365.02	0-9.5m Shaftesbury Fm shale 9.5-11.3 Glacial drift 9.5-11.0 sand and gravel 11.0-11.3 glacial sand 11.3-24.0m Paddy Member sandstone 19.5-21.0m coal 24.0-25.0m Cadotte sandstone 25.0m EOH	JG/SF-99-DH43-12/25
JG/SF-99-DH44	**99-DH44**	9756.21	8749.97	369.27	0-5.2m Shaftesbury Fm shale 5.2-13.7m Glacial drift 5.2-7.5m glacial sand 7.5-8.5m sand and gravel 8.5-13.7m glacial sand	

					13.7-28.0m Paddy Member sandstone 13.5-14.0m moist sand in hole 23.6-23.7 coal 25.9-26.0 coal 28.0-28.1m Cadotte sanstone. 28.1m EOH; stopped hole due to tightening of rods in Cadotte sandstone.	JG/SF-99-DH44-14/28
JG/SF-99-DH45	**99-DH45**	9814.83	8703.10	362.83	0-8.5m Shaftesbury Fm shale 0-5.5m moist clay 5.5-8.5m generally dry clay 8.5-17.3m Glacial drift 8.5-9.0m sand 9.0-13.1m gravel 13.1-13.9m predominantly glacial sand with lesser gravel 13.9-17.3m sand and gravel; significant moisture at 17.0m 17.3m EOH; abandon hole in gravel.	no samples taken
JG/SF-99-DH46	**99-DH46**	10026.59	8789.29	361.13	0-13.0m Shaftesbury Fm shale 13.0-17.0m Glacial sand/silt 17.0-19.1m Paddy Member sandstone; med br, med-cs gr. 19.1-20.0m Cadotte sandstone 20.0m EOH	JG/SF-99-DH46-18/20
JG/SF-99-DH47	**99-DH47**	9883.63	8896.76	391.46	0-34.1m Shaftesbury Fm shale 11.0m driller noted water here 23.1m minor sand lens 28.0m very moist clay 34.1-51.0m Paddy Member sandstone 43.1 minor coal 46.9-48.7m coal 50-51.0 Lower Mix Zone 51.0-52.0m Cadotte sandstone 52.0m EOH **Peizometer installed to 170 ft depth, 17 lengths 2" PVC pipe** **Height measured above drill hole collar 1.3m.**	JG/SF-99-DH47-35/52

JG/SF-99-DH48	**99-DH48**	9670.06	8736.65	367.98	0-8.2m Glacial sand 8.2-11.0m Shaftesbury Fm shale 11.0-27.1m Paddy Member sandstone 19.8-22.1 coal 26.0-27.1m Lower Mix Zone 27.1-28.9m Cadotte sandstone 28.9m EOH	JG/SF-99-DH48-12/28.9
JG/SF-99-DH49	**99-DH49**	9681.16	8805.21	382.94	0-24.8 Shaftesbury Fm shale 0.5-2.0m very moist with abundant clay balls 5.0-5.2m fine grained silt (possible glacial contmination) 8.0-11.0m slightly moist 18.0-19.0m very moist 24.8-42.0m Paddy Member sandstone 34.2-36.0m coal 36.0-38.0m dk br Paddy Mbr. 41-42.0m Lower Mix Zone 42.0-43.0m Cadotte sandstone 43.0m EOH **Peizometer installed to 130 feet, 13 lengths of 10' 2" PVC pipe. Top of peizometer 0.3m above drill hole collar.**	JG/SF-99-DH49-26/42
JG/SF-99-DH50	**99-DH50**	9742.97	8798.23	375.99	0-10.5m Shaftesbury Fm shale 10.5m EOH hole sloughed in at 3m, unable to install peizometer	
JG/SF-99-DH51	**99-DH51**	9745.90	8812.00	376.22	0-4.0m Shaftesbury Fm shale 4.0m EOH; hole dry after 24 hours.	
Additional survey points						
Slide SF50		9241.05	8627.58	364.29	northern point of block slide, west of drill hole 99-DH35	
Slide SF51		9198.40	8620.55	355.37	southern point of block slide	

APPENDIX 6

1999 Fraser geology report on fieldwork (extract)

Report on 1999 reverse circulation drill program at the Peace River silica sand deposit, Peace River, Alberta

Owner:
United Industrial Services Limited,
#280-295 Midpark Way, S. E.
Calgary, Alberta
T2X 2A8

Submitted by:
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October 4, 1999.

Fraser Copy

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Appendix B Sieve analyses from J. R. Paine & Associates, Peace River

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Appendix D Suppliers for sampling equipment for drill project

Summary

In August of 1999 a 10 day reverse circulation drilling program was carried out on the Peace River silica sand deposit. The objective of the program was to substantiate silica sand reserves and clarify geological concerns. The geological concerns were based on possible east/west trending tidal channels which were thought to have incised portions of the Paddy member sandstone, host rock to silica sand.

Drill results clearly indicate that the Paddy member sandstone is generally very consistent, with erosion principally due to Quaternary glacial scouring which is itself often overlain by local slumping and/or landslide effects from Lower Cretaceous aged Shaftesbury Formation shale. Drilling indicates that coal beds appear to be dipping north through the Paddy member which has potential thicknesses of silica sand up to 14 meters. As expected the area drilled southeast of the open pit revealed silica sand up to12 meters in thickness with minimal coal contaminants. This area is highly recommended for additional drilling and development.

Drilling also located water within perched water tables within Shaftesbury Formation shale. Three piezometers were installed to measure water within the local stratigraphy.

Introduction

In August of 1999 a reverse circulation drilling program was carried out over a period of 10 days at the Peace River silica sand deposit, Peace River Alberta. This drill project, the third exploration drilling program carried out by United Industrial Services, Calgary, was intended to outline reserve potential and update geology within the deposit. Two areas were tested. These included; 1) an area directly east of the producing, pilot plant site (**Plate 1**) and an area southeast of the current open pit operations (**Plate 2**).

A reverse circulation drill was used for the project, ably provided by Schmidt Drilling of Ponoka, Alberta. After initial mechanical problems, a total of 16 drill holes were drilled to test the lower Cretaceous Paddy member sandstone and in addition two short holes were drilled for piezometer installation.

All samples were collected at one meter intervals and silica sand samples were analyzed at J. R. Paine and Associates Limited in Peace River.

Location and property

The Peace River silica sand deposit lies approximately 7 km downstream from the town of Peace River, along the east side of the Peace River within northwestern Alberta, approximately 500 km from the city of Edmonton (**Figure 1**). Gravel roads provide access to the property from Highway 2 and secondary paved road 688. **Figure 2** illustrates the United Industrial Services Limited (UISL) permit and excavation area (MSL 941817).

Previous Fieldwork

Several drill programs have been carried out on the Peace River silica sand deposit (Godfrey, 1997). An early drill program (1979-1980) consisting of 99 test holes was carried out without regard to geology and consequently holes reported by Lichtenbelt, (1982) are considered by the author to be of dubious value. Later Hamilton, (1989) of the Alberta Geological Survey reported results from 5 holes drilled on the east side of the Peace River within the silica sand deposit. Hamilton (1989) reported Upper Cretaceous Shaftesbury Formation shale overlying a sand and gravel section (in drill hole E89-04) and assumed the latter to be a lag deposit of Cretaceous age.

Prior to the 1999 drill program, two additional exploration drill programs were run by United Industrial Services in 1997 (Godfrey, 1997; Bodard, 1997) and 1998. The author was involved in the 1998 drill program, logging drill chips, drill hole and channel sample collection and microscopic assessment of silica sand.

Local Geology and stratigraphy

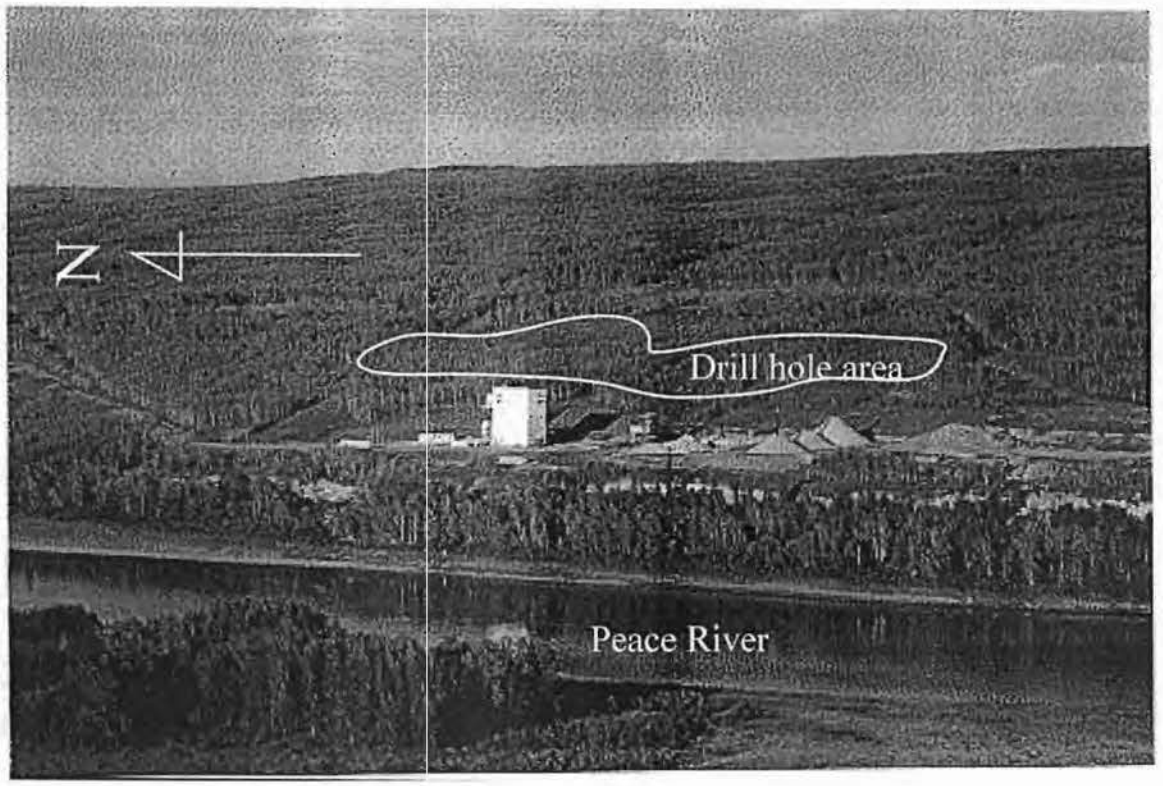


Plate 1 Photograph taken of the Peace River silica sand plant site, located just east of the Peace River and ~ 7 km downstream from the town of Peace River, Alberta. Cliffs in foreground expose the Paddy member silica sand. Drilling in 1999, concentrated to the east of the plant site is illustrated above.

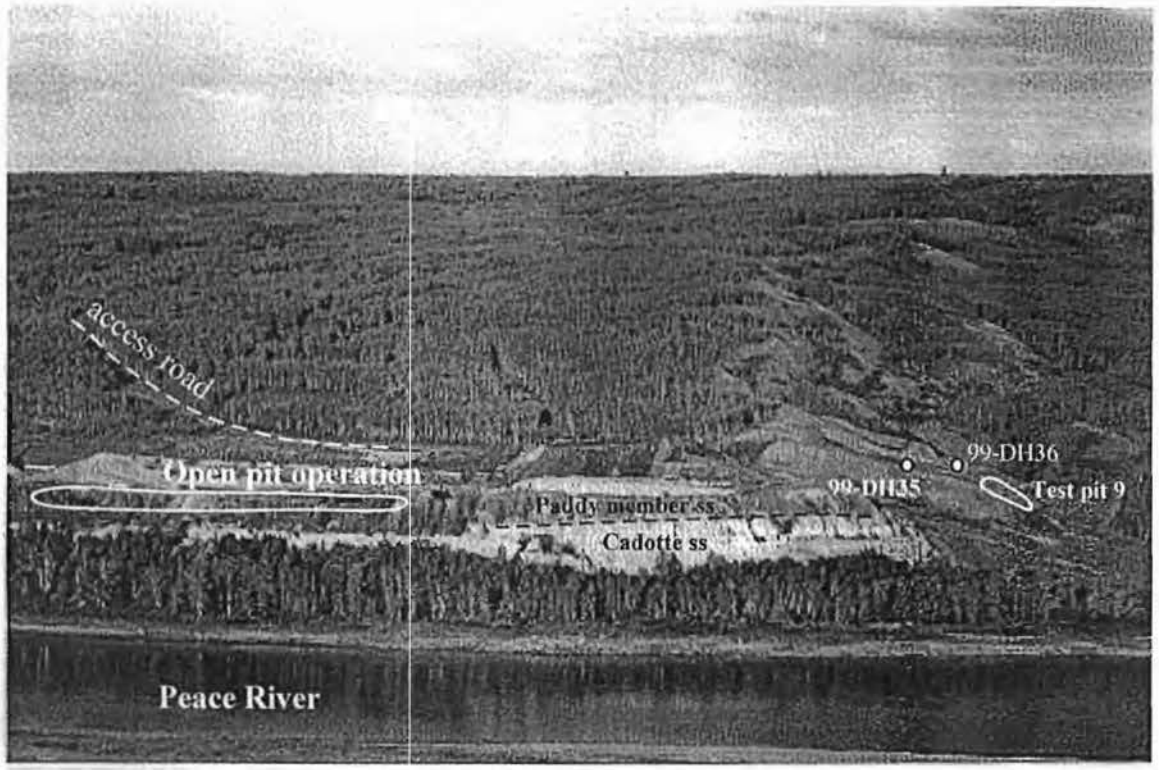


Plate 2 Photograph of southern part of United Industrial Services open pit , silica sand operation and two of four drill holes drilled southeast of the open pit. In foreground is exposure of the Paddy member silica sand overlying Cadotte sandstone.

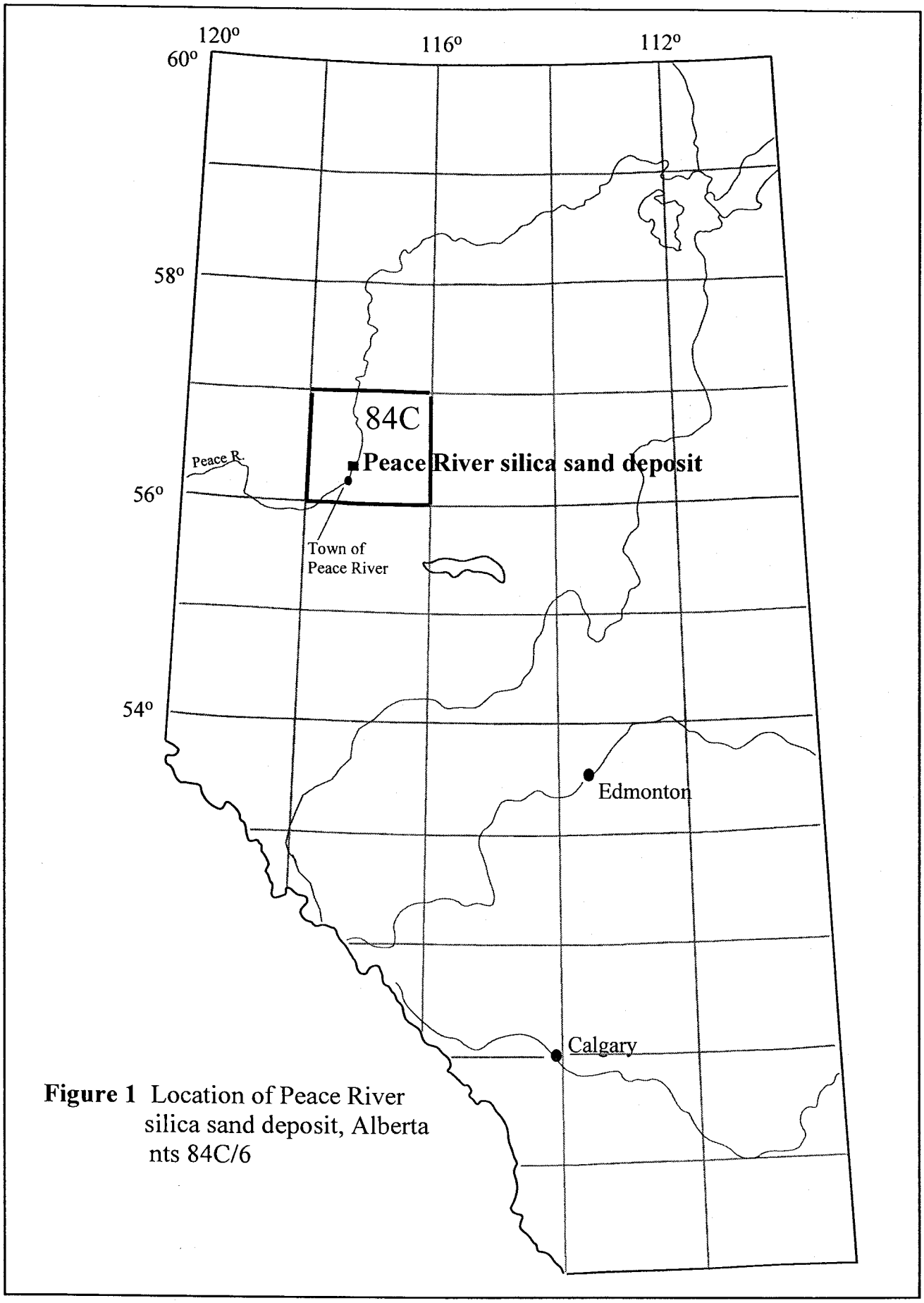
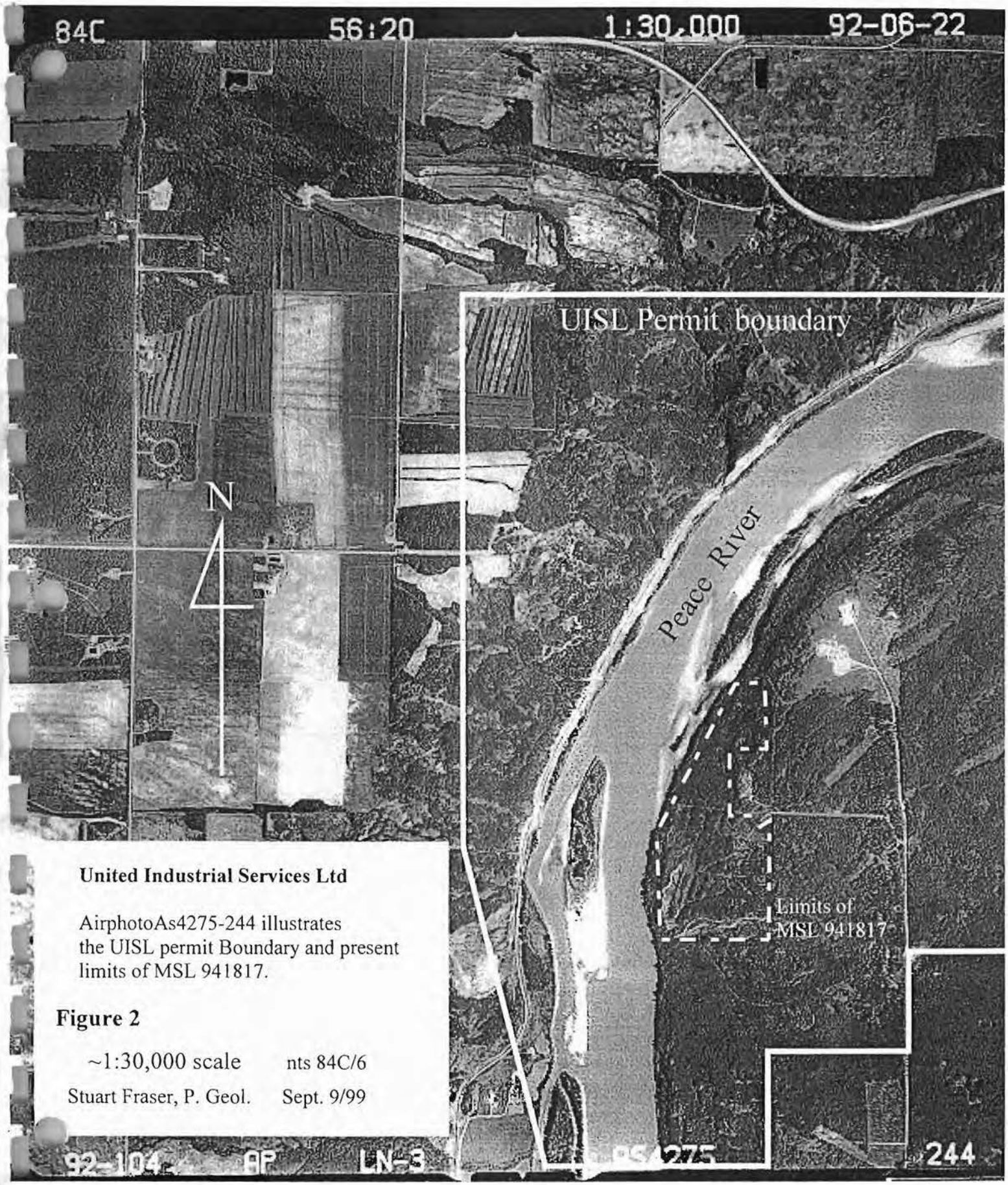


Figure 1 Location of Peace River silica sand deposit, Alberta nts 84C/6



United Industrial Services Ltd

AirphotoAs4275-244 illustrates the UISL permit Boundary and present limits of MSL 941817.

Figure 2

~1:30,000 scale nts 84C/6

Stuart Fraser, P. Geol. Sept. 9/99

Geologically the area along the Peace River hosting the silica sand deposit consists of Lower to Upper Cretaceous sedimentary rocks and three formations of significance. These include the Upper Cretaceous Dunvegan Formation which include interbedded sandstones and shales. Crockford (1949) reports that these shales cap the higher parts of the adjacent hills. The Shaftesbury and Peace River Formations which have been noted in drilling as well as outcrop are stratigraphically listed in Table 1 below. Crockford (1949) reports that this formation is approximately 180 meters thick and consists of dark gray marine shale. This formation is well known for its capacity for slumping (Cruden et al, 1990). Recent slumping of Shaftesbury shale at the Peace River silica sand site is seen in **Plate 3**. Crockford (1949) notes that bright yellow, ocherous material (possible bentonite layers ?) is usually present in the shale.

The Peace River Formation consists of three members two of which are sandstone, followed by a marine shale, the Harmon member. Crockford (1949) reports a total thickness of 91 meters, with the Paddy member having up to 30 meters thickness. Along the Peace River, the Paddy member consists essentially of an unconsolidated sandstone which is exposed in steep cliffs, overlying Cadotte sandstone (**Plate 2**). The Cadotte member is seen as a micaceous sandstone with a distinctive salt and pepper texture and due to its competent nature, forms prominent cliffs along both sides of the Peace River.

At the Peace River silica sand deposit along the east side of the Peace River, the Paddy member sandstone unconformably overlies Cadotte sandstone. The base of the Paddy member (referred to as the Lower Mixed Zone of 2-3meters thickness) consists of black argillaceous silty layers varying from 3-10cm in thickness and with local micaceous partings. Overlying the Lower Mixed Zone is a fine to medium grained unconsolidated sandstone varying from 5-10 meters thickness. The thickness of the Paddy member has been affected by glacial scouring, with resultant sand and sand and gravel infil. In the vicinity of the open pit, sub-bituminous coal is exposed at the top of the Paddy member. In 1998 drill logs, the coal bearing section at the top of the Paddy member was referred to as an Upper Mixed Zone.

Field mapping in 1998 also revealed the presence of Shaftesbury Formation shale along the east side of the open pit.

1999 Fieldwork

Initial fieldwork in early August consisted of surveying suitable drill site areas and cat work to provide base for sites. A total of 16 drill holes were targeted to intersect the Paddy member sandstone during August of 1999. **Figure 3** outlines drill sections in plan view east of the plant site at 1:2000 scale. **Figure 4** illustrates in plan view drill hole locations and references sections southeast of the open pit workings at 1:1000 scale.

In addition to outlining reserves, two drill holes (99-DH50 and 51) were drilled for piezometer installation. These holes are located adjacent to drill hole 99-DH38 which is shown in Section PP'.

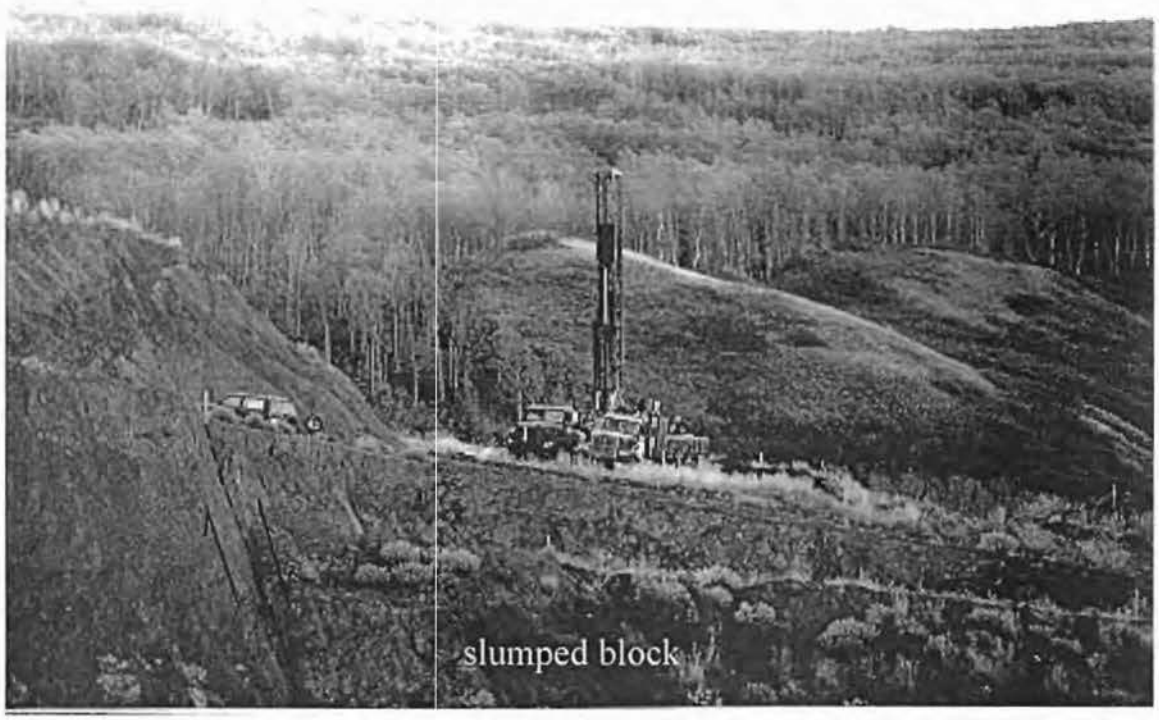
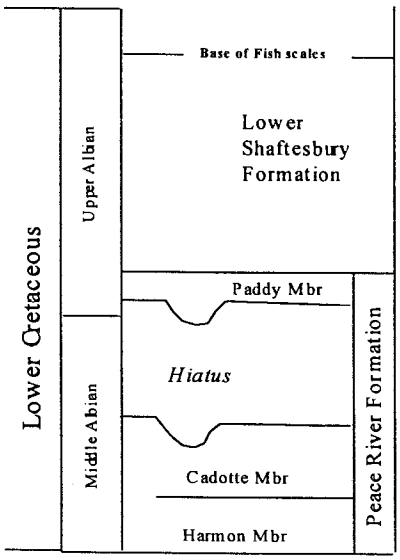


Plate 3 Schmidt Drilling reverse circulation drill set up over drill hole 99-DH36. In foreground is slumped block within Shaftesbury Formation shale.

Table 1 Lower Cretaceous stratigraphy for the Peace River area



(After Leckie, 1988)

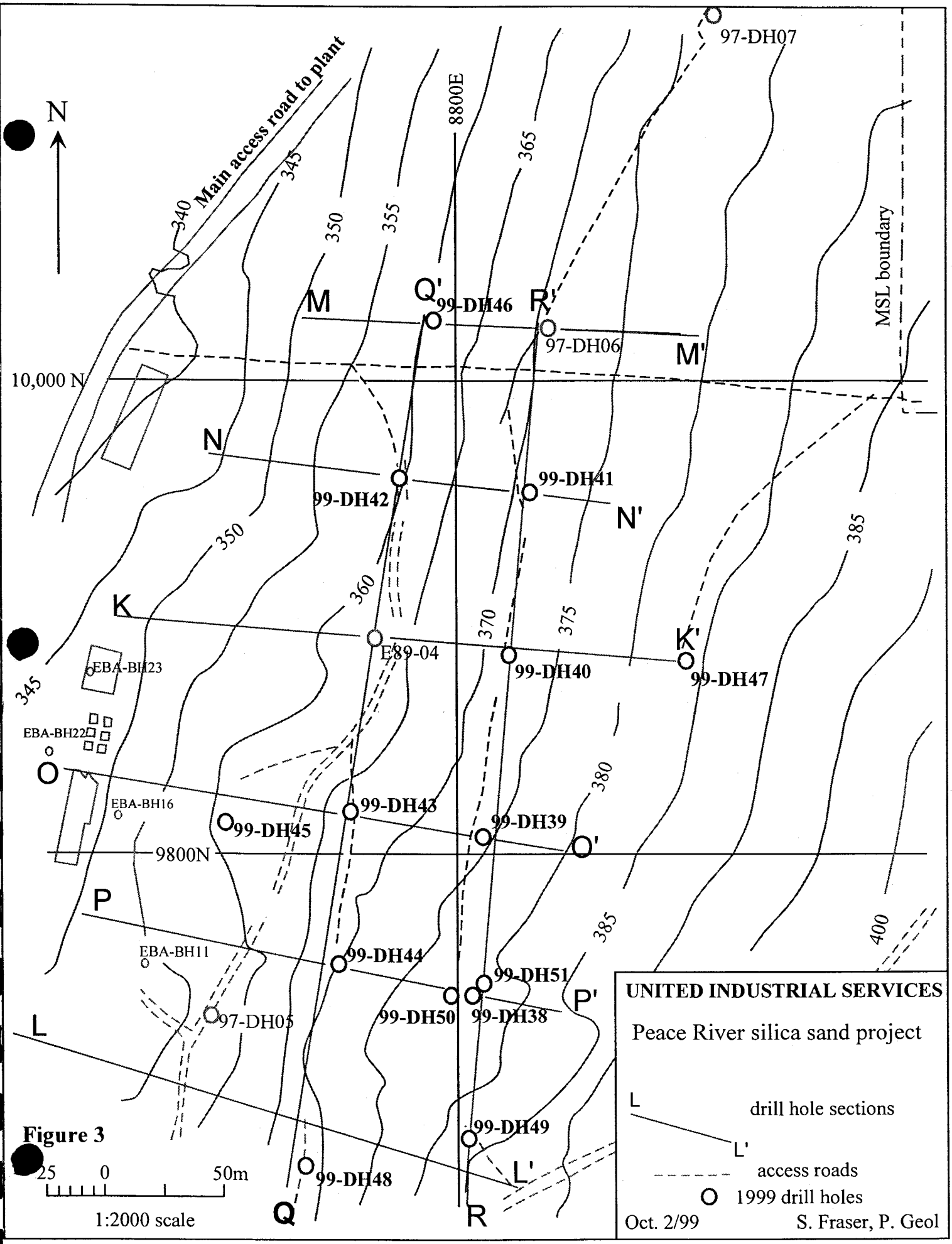
Geotechnical drilling and piezometer installation

Due to the presence of water detected within several drill holes (notably 99-DH38) east of the plant site, three piezometers were installed. The intention was to place three piezometers to the base of the Paddy member sandstone to monitor water there and in addition to place two shallow piezometers to a depth of 6-10 meters to monitor probable perched water tables within the Shaftesbury Formation shale. Geological drill logs in Appendix A note moisture detected during drilling.

Two piezometers were installed to the base of the Paddy member within drill holes 99-DH47 and 49. Two shallow holes drilled adjacent drill hole 99-DH38, holes 99-DH50 and 51 were drilled to depths of 10.5m and 4.0m respectively. An attempt was made to install a piezometer in hole 99-DH50, but the hole sloughed and PVC pipes would not penetrate 3.0m depth. Hole 99-DH38 also sloughed, but a piezometer was placed at a depth of 6.0m and water was noted here.

Sample preparation and analyses

Sieve analyses are reported in appendix B, but no microscopic study of silica sand samples was attempted during or after the fieldwork. Sieve analyses have been prepared by J. R. Paine and Associates in Peace River. During sieve analyses, certain samples indicate significant moisture loss in drying. These samples reflect presence of coal and loss during drying (pers. comm., Trent McLaughlin).


N
Main access road to plant
8800E
97-DH07
MSL boundary
M
Q'
99-DH46
R'
97-DH06
M'
10,000 N
N
99-DH42
99-DH41
N'
K
E89-04
99-DH40
K'
99-DH47
EBA-BH23
EBA-BH22
O
EBA-BH16
99-DH43
99-DH45
99-DH39
O'
9800N
P
EBA-BH11
99-DH44
99-DH51
P'
97-DH05
99-DH50
99-DH38
L
99-DH49
L'
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365
370
375
380
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25 0 50m
1:2000 scale
UNITED INDUSTRIAL SERVICES
Peace River silica sand project
drill hole sections
access roads
1999 drill holes
Oct. 2/99
S. Fraser, P. Geol

Figure 3

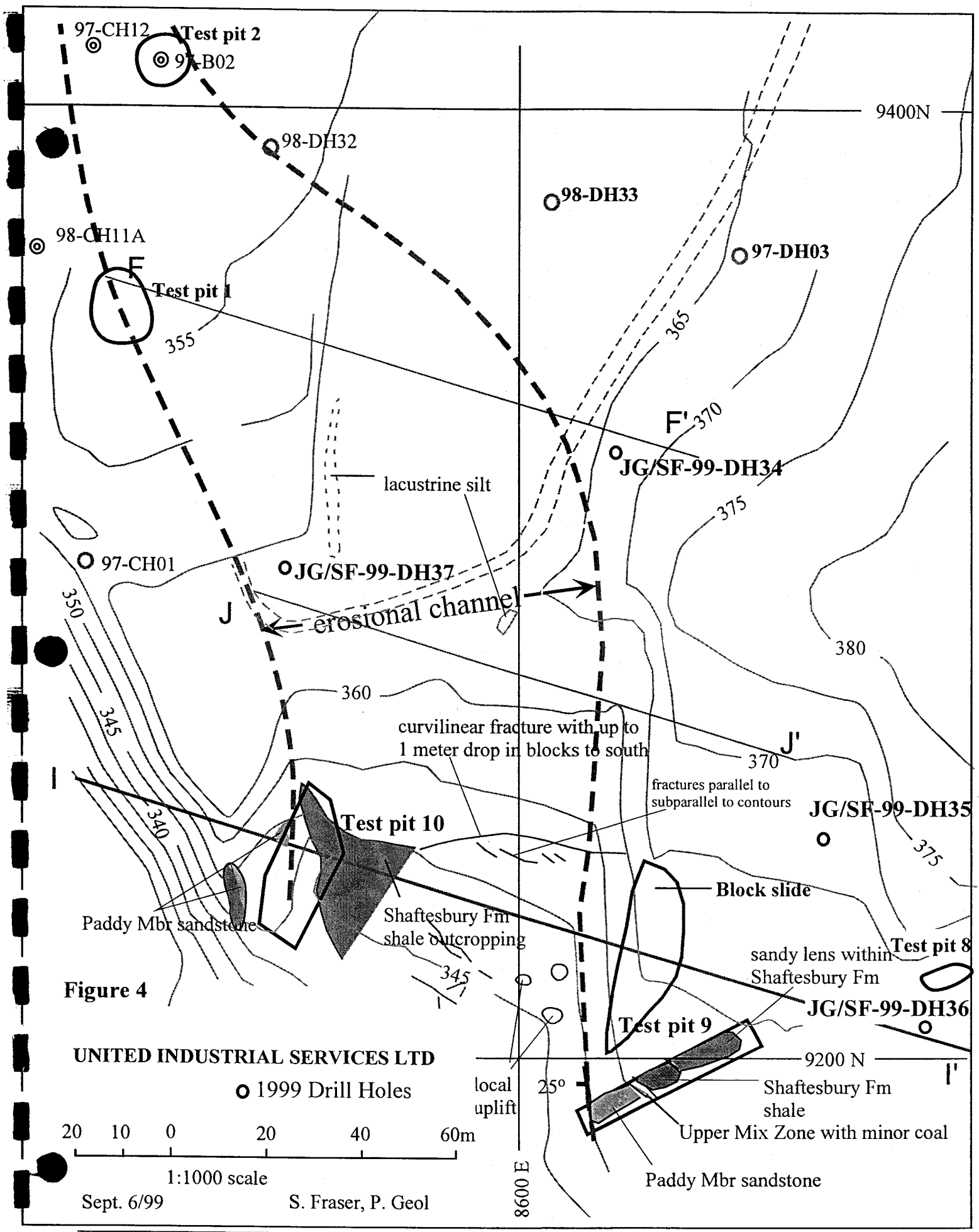

Figure 4

UNITED INDUSTRIAL SERVICES LTD

Drill Results

A total of 16 drill holes were completed in August of 1999. Only one hole (99-DH45) failed to reach the targeted depth, due to an unusual thickness of sand and gravel and consequently was abandoned at a depth of 17.3m in sand and gravel, short of its target. Two holes (99-DH34 and 99-DH42) were drilled using casing, where overburden caused tightening of rods during drilling

Geological logs for 1999 drill holes are listed in Appendix A. Sections MM', NN', OO', PP', KK' and LL' illustrate drill hole geology in the area east of the plant site. Sections FF', II' and JJ' illustrate drill hole geology south and southeast of the open pit. In addition north-south longitudinal sections QQ' and RR' show the generally consistent contact relationship with Paddy and Cadotte sandstone members. Also noteworthy within the longitudinal section RR' is the fact that the coal seam/bed is pervasive within Paddy member sandstone and that the coal (bed/or beds) appears to be found in that unit from its base to its contact with the overlying Shaftesbury Formation shale.

Drilling south of the open pit was intended to help define possible erosional channels believed to occur within Paddy member sandstone in the vicinity of Test pits 1 and 2. Drill hole 99-DH37 helped in interpreting the erosional channel, which is consistent with mapping carried out by the author in October of 1998. Drill sections FF' and JJ' as well as **Plate 4** further characterize the nature of the erosional channel. Shaftesbury Formation shale appears to have been deposited in a north to northwesterly direction, probably as erosional fill to a paleostream which incised Paddy member sandstone in Upper Albian time.

Southeast of the open pit, drill hole 99-DH35 intersected a 12.4 meter thick sequence of silica sand with a thin seam of coal noted stratigraphically above. This result is consistent with geological units mapped in Test pit 9, and indicates a significant resource potential, with little coal as a contaminant.

Conclusions

Longitudinal sections RR' and QQ' best illustrate the stratigraphic relationships between Quaternary glacial deposition, Shaftesbury Formation shale and the Peace River Formation Paddy and Cadotte member sandstones. Whereas Hamilton (1989) interpreted sand and gravel as a lag deposit within Shaftesbury shale in drill hole E89-04, the sand and gravel are probably Quaternary glacial drift. Similar stratigraphy was noted in drill hole 99-DH42. South of E89-04 glacial deposition thickens as seen in drill hole 99-DH45. Consequently the presence of the overlying Shaftesbury shale in drill hole E89-04 indicates that landslide activity at this site was active in the past, and will continue to be active. Recent slumping activity has already been noted between test pits 9 and 10 in the southern portion of the excavation permit.

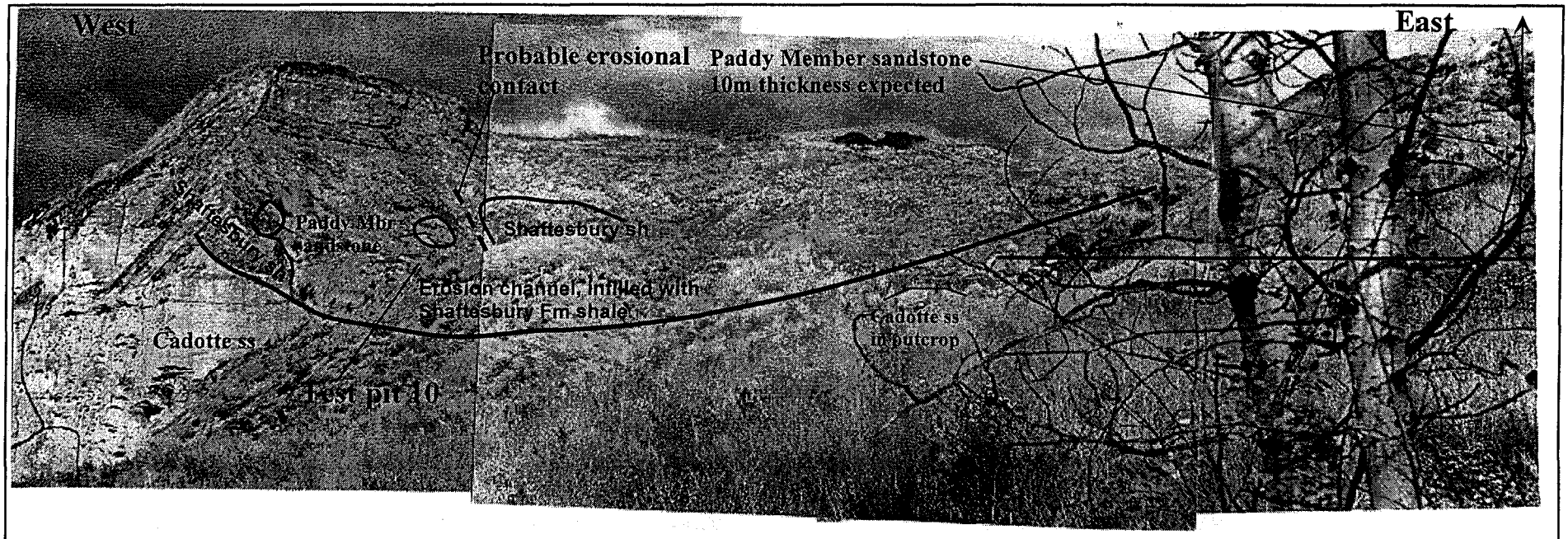

Plate 4 View from south of testpits 9 and 10 looking north. Contact of Shaftesbury Fm shale and Cadotte sandstone is seen on the left side of the photo(west). To the east Cadotte sandstone outcrops west of test pit 9 in the valley floor where illustrated. Based on the contact relationships an erosional channel is outlined above. Based on outcrop present in Test pit 10, an easterly dip of ~60° is interpreted for the erosional contact along the west side of the erosional channel. This dip is consistent with abrupt infilling of Shaftesbury shale in Test pits 1 and 2, further north.

The presence of coal noted in the 1999 drill holes (as illustrated in the longitudinal sections RR' and QQ') indicates that coal is pervasive through the Paddy member and that it also appears to dip north through the sequence. The Lower Mixed Zone exposed over 1 to 1.5 meters in the open pit, is generally visible and continues to show coarse grained silica sand as well as argillaceous sections. The relatively thin Paddy member section seen in E89-04 and in 99-DH42 reflects glacial erosion and is not a function of a surge channel. Drill cross sections NN', OO', and PP' confirm this.

The thickness of Shaftesbury shale noted in drill hole 99-DH34 is somewhat problematic, but consistent with drill hole 97-DH03. The buildup of Shaftesbury shale is probably related to earlier slumping.

Recommendations

Based on significant thicknesses of silica sand intersected in the 1999 drilling program, additional drilling is warranted south of the 1999 drill holes. Figure 5 (in pocket) as well as the longitudinal section RR' illustrate proposed drill holes to expand silica sand reserves and geological control. The impressive thickness of Paddy member sandstone intersected in drill hole 99-DH35 suggests that further exploration in the very southern section of the property (Figure 2) and expansion of the MSL boundary south, is warranted. In the light of the northerly dip in the coal bed/beds, it may be useful to test Paddy member sandstone further south and east, where it may be less problematic.

Variance in topographic contours from surveyed positions of drill hole collars (specifically noted in drill hole 99-DH47) suggests that contour elevations may be locally inaccurate. A GPS and base station unit could be rented to check this, but generally topographic profiles appear consistent with surveyed results.

Drill hole cross sections have been included in this report. It would be useful to display on cross sections individual sieve analyses for each meter interval with sum to 40 or appropriate sieve fraction. Such data may help in determining trends toward coarser grained, silica sand.

To the best knowledge of the author, 1999 completed drill holes are open and should be backfilled. In addition drill hole 97-DH06 is also open and possibly 97-DH07 as well. These holes should also be backfilled. As the 1999 drill holes are still open (?), installation of additional piezometers is warranted as well as possible slope monitors to check water conditions as well as ground movement. A slope monitor placed in drill hole 99-DH35 (+12 meter Paddy member thickness below coal) may be particularly important to monitor ground conditions in this potentially rich area, which is overlain by Shaftesbury shale.

Drill and related Costs

Schmidt Drilling completion of 18 drill holes, overall costs	36,423
Eric's trenching,(Peace River) 41.5 cat hours @$130/hr	5,395
local laborer, 92 hours @$18.00/hr	1,656
Geological consultant 19.5 days @$300/day; 20.5 days @250 (w/ GST)	11,743
expenses (includes sample bags, misc. supplies, as well as mileage charges)	2,178
accommodation and meals (Travelers Motel, Peace River)	est.$1200
J. R. Paine & Associates sieve analyses 200 samples @$75/sample	15,000
piezometer equipment and supplies (Rice Environmental technologies, Edmonton)	1,968
Total cost	**$75,562**

Statement of Qualification and Consent

I, Stuart Campbell Fraser of [redacted] Edmonton, Alberta, Canada, T5M 1P6, phone [redacted], fax 403-488-6076 do hereby certify that:

I am a registered professional geologist with the Association of Professional Engineers, Geologists and Geophysicists of Alberta, member number M47638.

I am a graduate of Dalhousie University, Halifax, Nova Scotia with a B.Sc. in geology, 1973, and a M. Sc. in geology from University of Alberta, Edmonton, Alberta, January of 1996.

I have been practicing my profession as a geologist since 1973, excluding the period taken to complete a Master's Program at the University of Alberta. I am a member of the Canadian Institute of Mining and Metallurgy.

I am the author of the Peace River silica sand report, having supervised field activities as well as constructing geological sections for this project. This report is based on personal observations at Peace River during May through October, 1998 and more recently during the reverse circulation drill program August 24th through September 2nd.

I am an independent consulting geologist and have no direct or indirect interest in any of the Peace River permit areas nor in United Industrial Services Limited, nor do I expect to receive any.

Dated at Edmonton, this 4th day of October, 1999.

[redacted]

Stuart C. Fraser

References

Bodard, J. M., 1997, Peace River Silica Sand Sampling Program; Descriptive notes and observations. UISL internal report with figures and appendices.

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Pocket A

Figure 5 planview of drill holes 1:2000 scale

section FF'

Section II'

Section JJ'

East Bank of Pea

10000 N

9800 N

9600 N

9400 N

WATER INTAKE LINE

310

SILICA SAND STOCKPILE PAD

SILICA SAND PIT STAGE 1

OVERBURDEN STOCKPILE

PIT-RUN GRAVEL STOCKPILE

CLEAN WATER FEED

DIRTY WATER FEED

TP14 TP13 TP12 TP11 TP10 TP9 TP8 TP7 TP6 TP5 TP4 TP3 TP2 TP1 TP-10 TP-9 TP-8 TP-7 TP-6 TP-5 TP-4 TP-3 TP-2 TP-1

EBA-BH25 345.95
EBA-BH21 344.72
EBA-BH20 345.34
EBA-BH19 345.55
EBA-BH18 345.16
EBA-BH17 345.77
EBA-BH16 350.89
EBA-BH15 345.86
EBA-BH13 345.64
EBA-BH12 344.88
EBA-BH14 322.35
EBA-BH11 352.40
EBA-BH10 351.48
EBA-BH9 349.46
EBA-BH8 351.93
EBA-BH7 361.31
EBA-BH5 349.19
EBA-BH4 360.13
EBA-BH3 365.48
EBA-BH2 368.87
EBA-BH1 361.53
KM-97-B02
KM-97-B18

JG/SF-99-DH34 364.83
JG/SF-99-DH46 361.13
JG/JB-97-DH06 370.39
JG/SF-99-DH42 358.72
JG/SF-99-DH41 367.98
JG/SF-99-04 355.63
JG/SF-99-DH40 371.62
JG/SF-99-DH45 362.83
JG/SF-99-DH43 365.02
JG/SF-99-DH39 375.67
JG/SF-99-DH44 369.27
JG/SF-99-DH50 375.99
JG/SF-99-DH51 376.22
JG/SF-99-DH38 376.37
JG/JB-97-DH05 355.99
JG/SF-99-DH48 382.94
JG/SF-98-DH28 365.83
JG/JB-97-DH09 391.49
JG/SF-98-DH25 365.88
JG/JB-97-DH04
JG/SF-98-DH24 367.62
JG/JB-97-DH08 366.37
JG/SF-98-DH29 365.44
JG/JB-97-DH03 365.29
JG/SF-99-DH34 364.83
JG/SF-99-DH35 366.50
JG/SF-98-DH31 353.52
JG/SF-98-DH32 352.59
JG/SF-98-DH26
JG/SF-98-DH27
JG/SF-98-DH22 349.78
JG/SF-98-CH21 340.78
JG/SF-98-CH20 343.29
JG/SF-98-CH19 344.15
JG/SF-98-CH16 347.65
JG/SF-98-CH14 349.05
JG/SF-98-CH11A 358.29
JG/JB-97-CH12 356.80
JG/JB-97-CH10 359.11
JG-97-CH01 359.16
JG-97-CH13
JG/SF-99-DH37 360.63

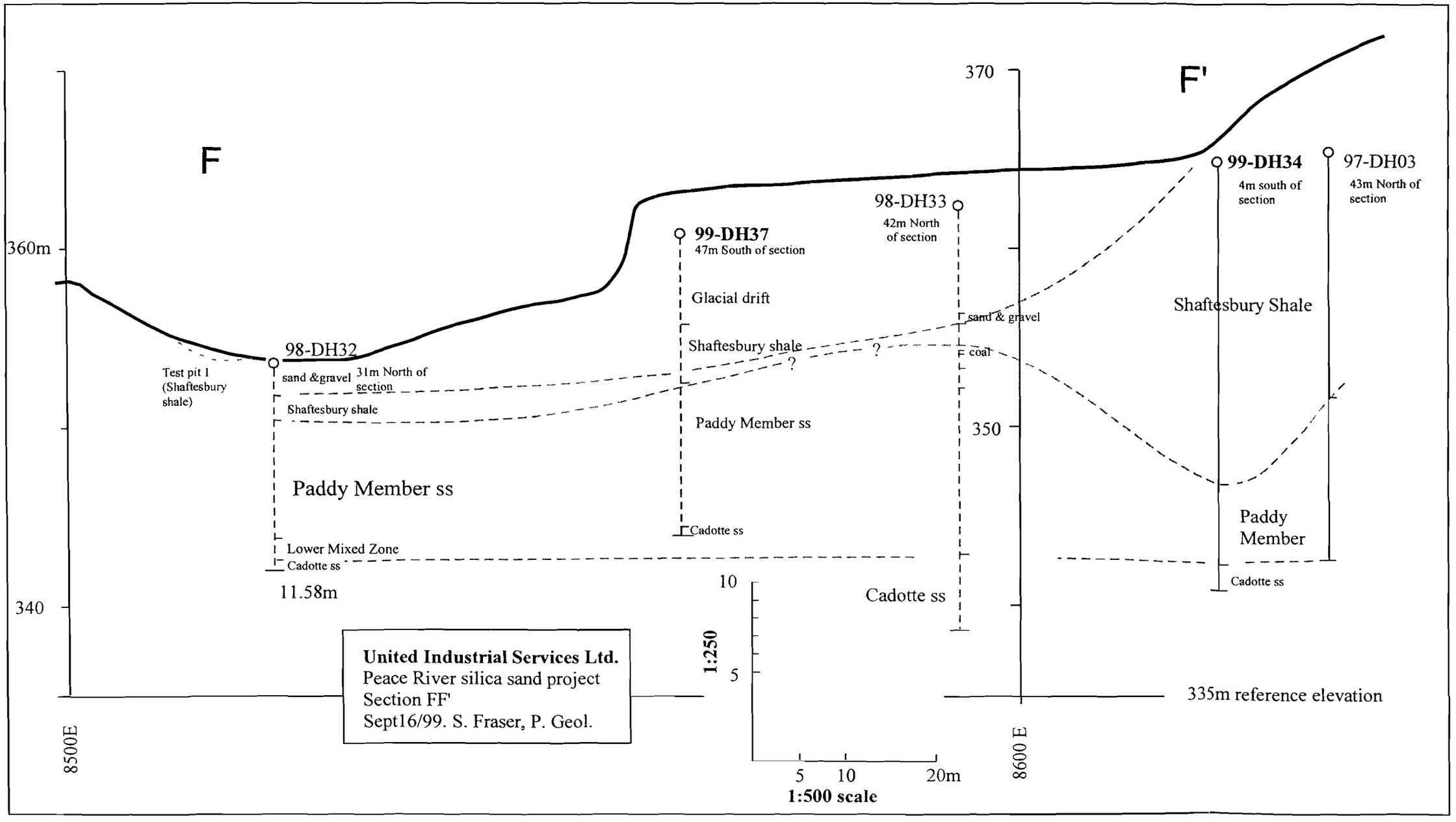
A A' B B' C C' D D' E E' F F' J J' K K' L L' M N N' P P' Q Q' R R'

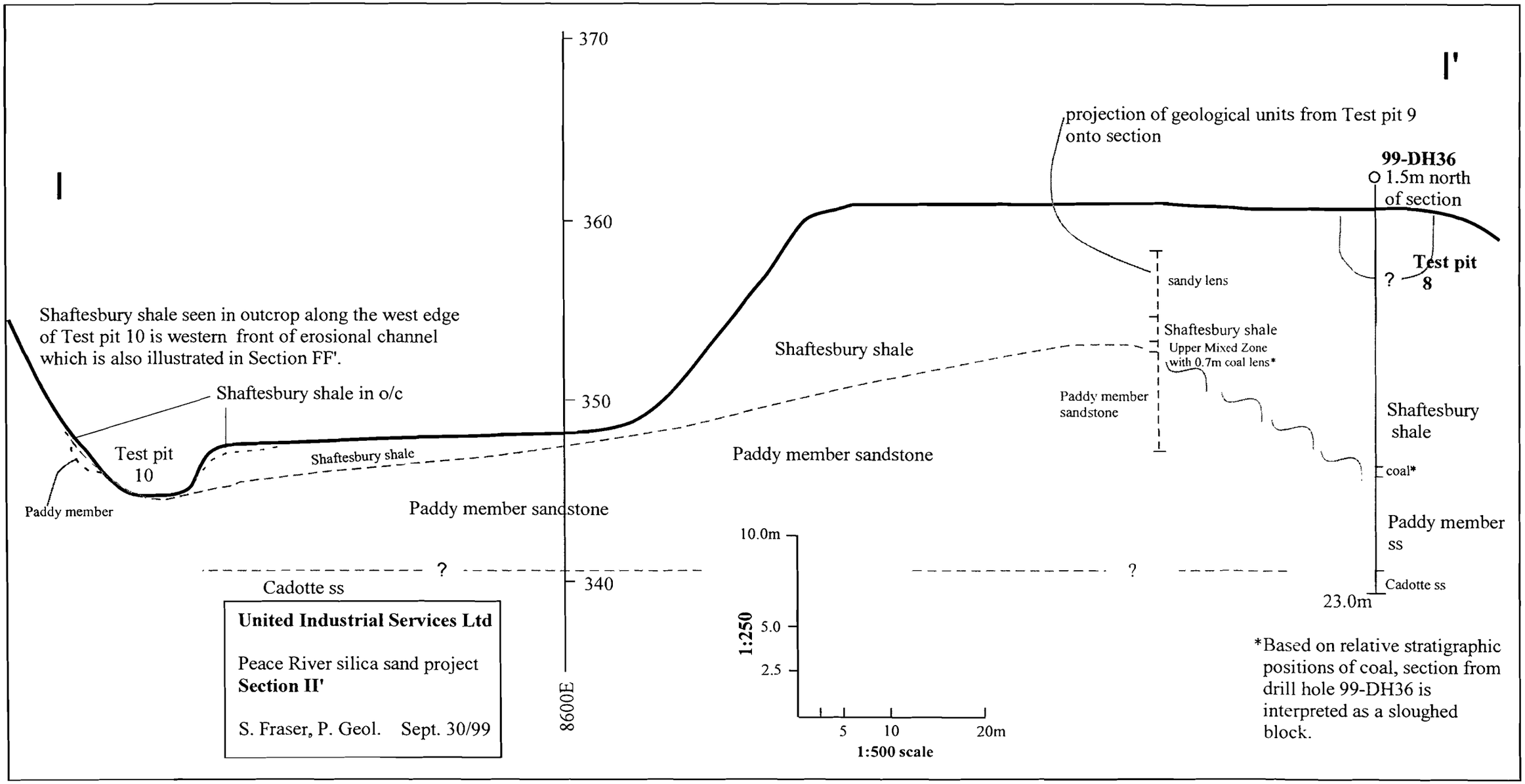
1:2000 scale

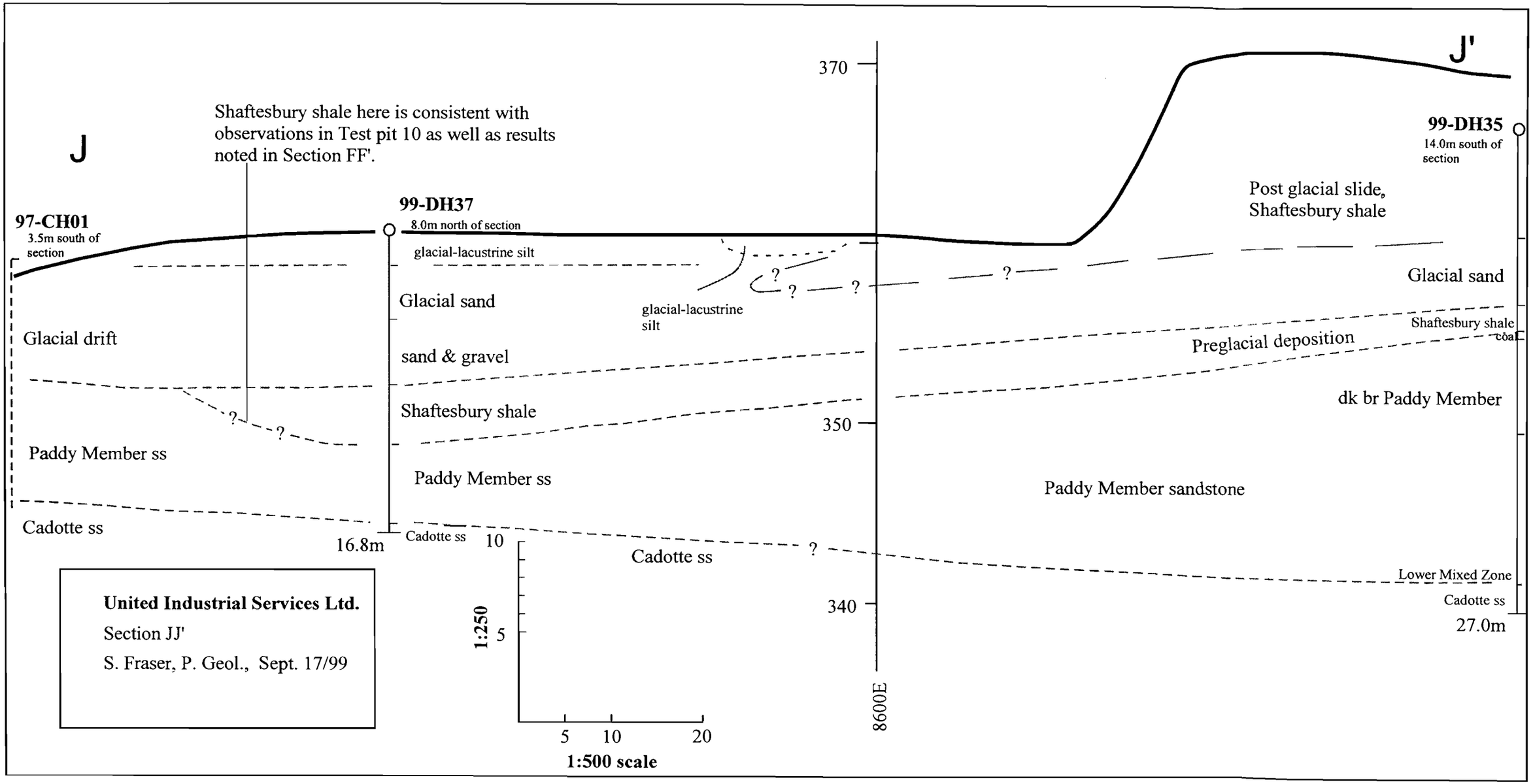
LIMITS O

8600 E

8800 E

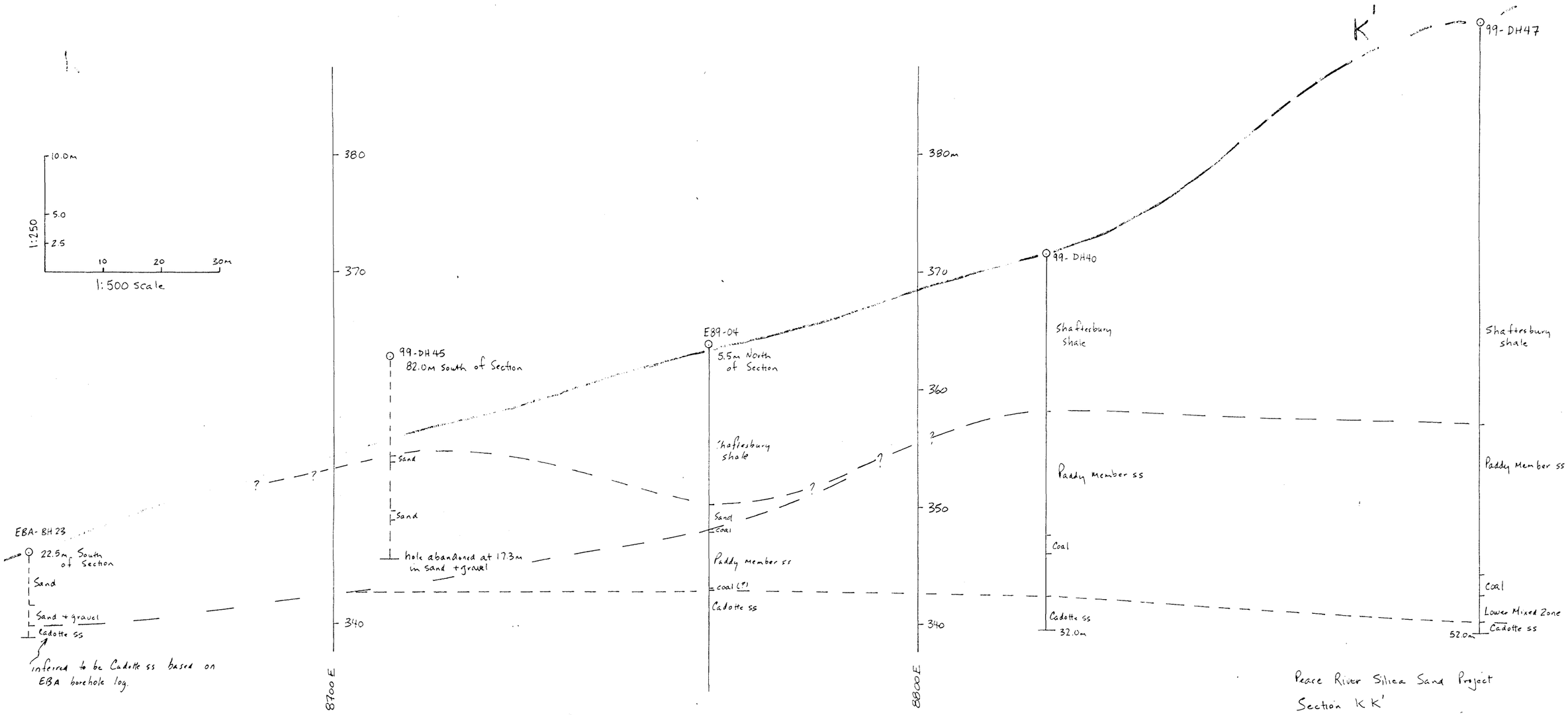

F
F'
370
360m
350
340
98-DH32
Test pit 1
(Shaftesbury
shale)
sand &gravel
31m North of
section
Shaftesbury shale
Paddy Member ss
Lower Mixed Zone
Cadotte ss
11.58m
99-DH37
47m South of section
Glacial drift
Shaftesbury shale
Paddy Member ss
Cadotte ss
98-DH33
42m North
of section
sand & gravel
coal
Cadotte ss
99-DH34
4m south of
section
97-DH03
43m North of
section
Shaftesbury Shale
Paddy
Member
Cadotte ss
United Industrial Services Ltd.
Peace River silica sand project
Section FF'
Sept16/99. S. Fraser, P. Geol.
1:250
10
5
5
10
20m
1:500 scale
335m reference elevation
8500E
8600 E


I
I'
370
360
350
340
8600E
projection of geological units from Test pit 9
onto section
99-DH36
1.5m north
of section
Test pit
8
?
sandy lens
Shaftesbury shale
Upper Mixed Zone
with 0.7m coal lens*
Paddy member
sandstone
Shaftesbury
shale
coal*
Paddy member
ss
Cadotte ss
23.0m
Shaftesbury shale seen in outcrop along the west edge
of Test pit 10 is western front of erosional channel
which is also illustrated in Section FF'.
Shaftesbury shale in o/c
Test pit
10
Paddy member
Shaftesbury shale
Shaftesbury shale
Paddy member sandstone
Paddy member sandstone
?
?
Cadotte ss
10.0m
5.0
2.5
1:250
5
10
20m
1:500 scale
United Industrial Services Ltd
Peace River silica sand project
Section II'
S. Fraser, P. Geol. Sept. 30/99
*Based on relative stratigraphic positions of coal, section from drill hole 99-DH36 is interpreted as a sloughed block.

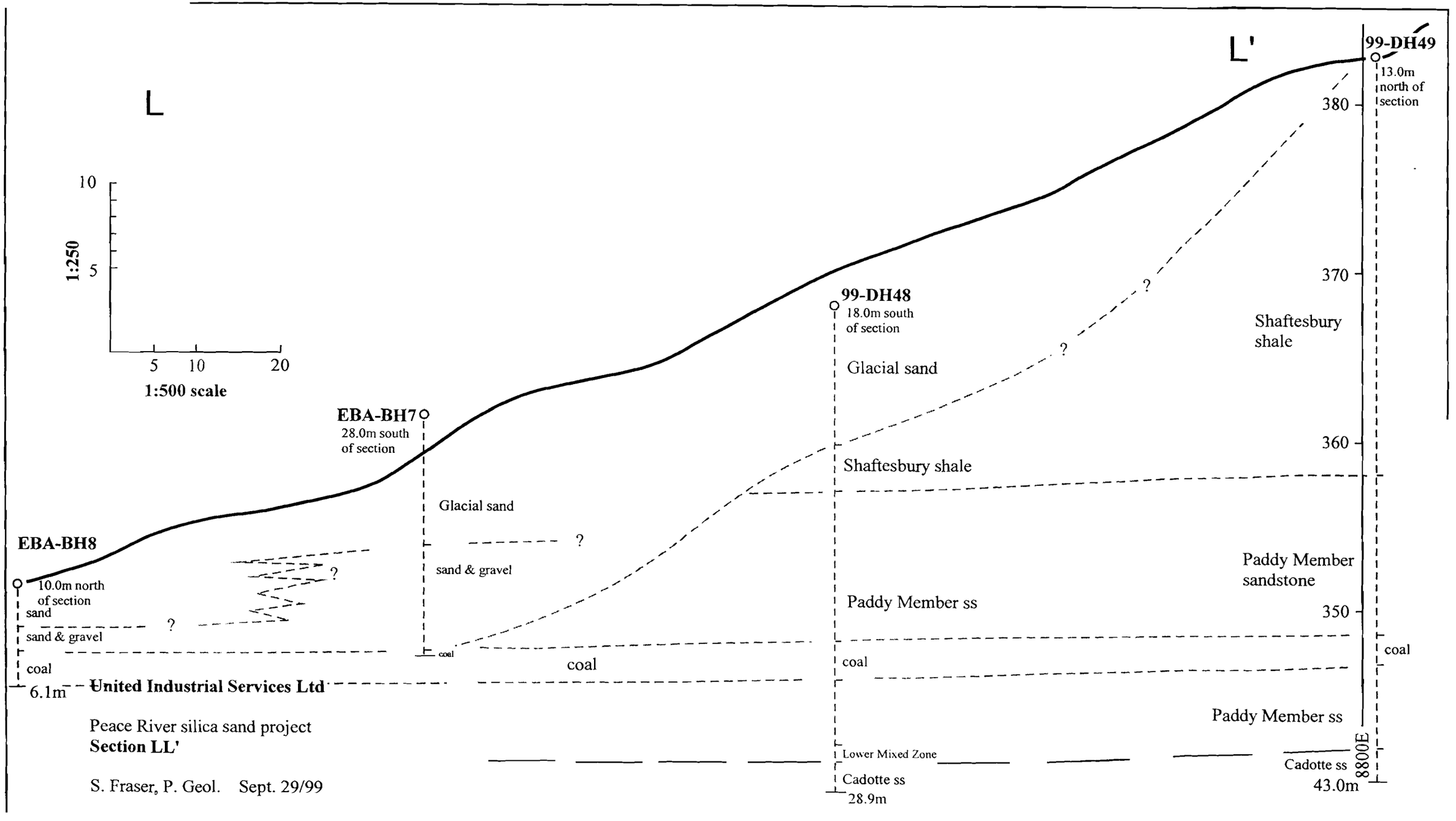

J
J'
Shaftesbury shale here is consistent with observations in Test pit 10 as well as results noted in Section FF'.
97-CH01
3.5m south of section
99-DH37
8.0m north of section
99-DH35
14.0m south of section
Post glacial slide, Shaftesbury shale
glacial-lacustrine silt
Glacial sand
glacial-lacustrine silt
Glacial sand
Glacial drift
sand & gravel
Shaftesbury shale
Shaftesbury shale
coal
Preglacial deposition
dk br Paddy Member
Paddy Member ss
Paddy Member ss
Paddy Member sandstone
Cadotte ss
16.8m
Cadotte ss
Cadotte ss
Lower Mixed Zone
Cadotte ss
27.0m
370
350
340
8600E
United Industrial Services Ltd.
Section JJ'
S. Fraser, P. Geol., Sept. 17/99
1:250
10
5
5
10
20
1:500 scale

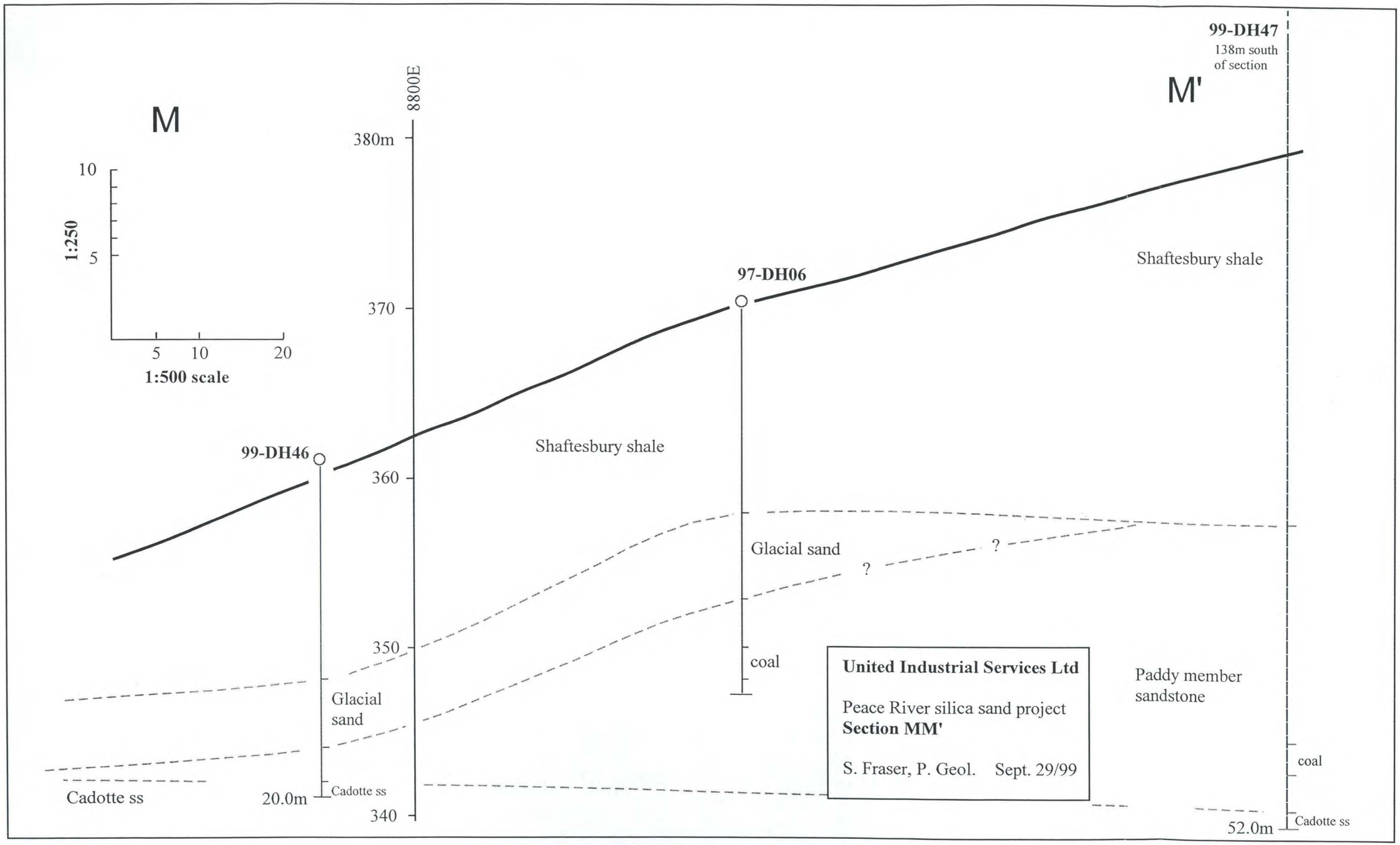
Pocket B

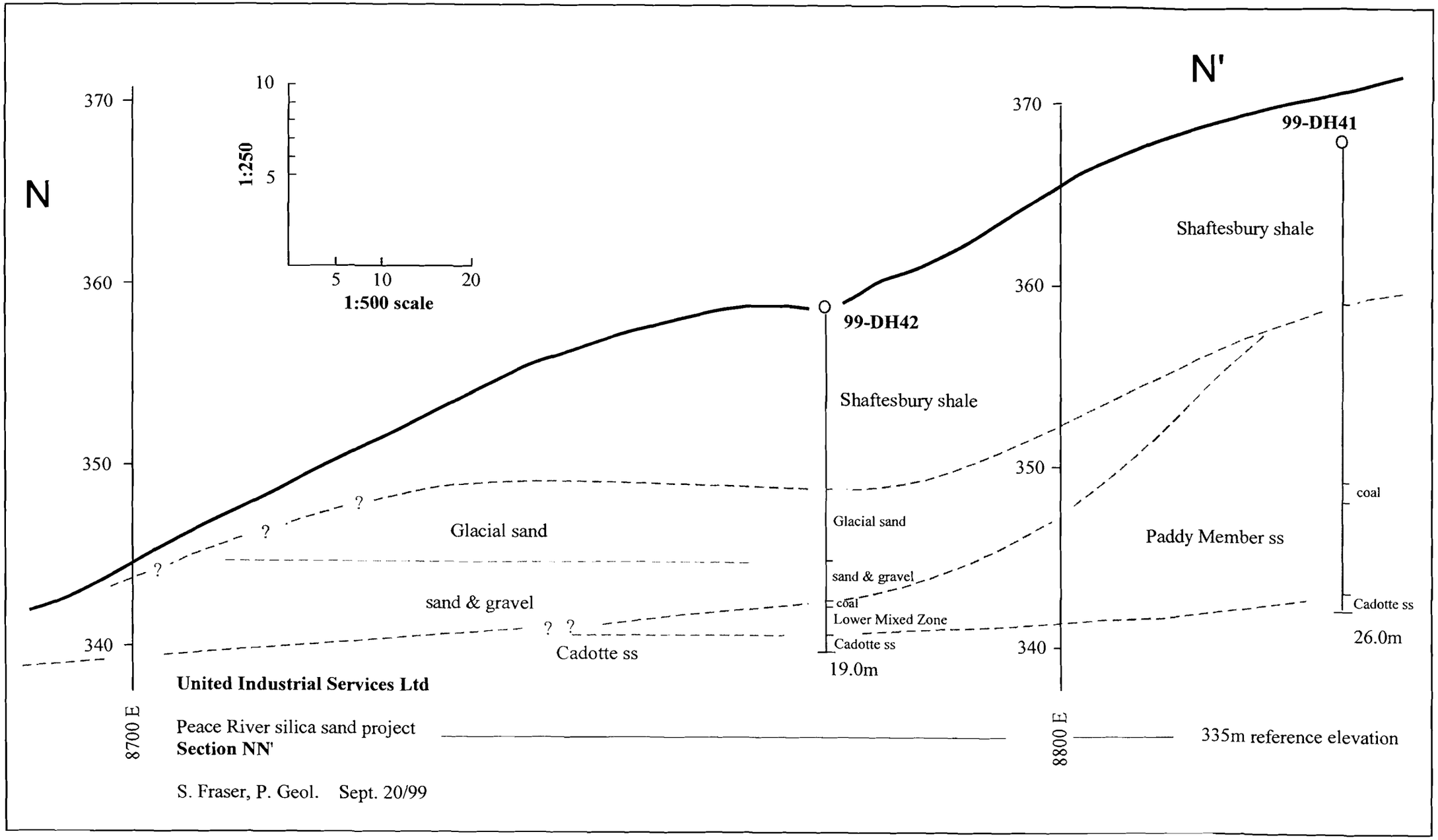
Sections KK',LL',MM',NN',OO',PP'



Peace River Silica Sand Project
Section K K'
Sept 30/99 S. Fraser, P. Geol.


L
L'
10
5
1:250
5 10 20
1:500 scale
99-DH49
13.0m north of section
380
370
360
350
99-DH48
18.0m south of section
Glacial sand
Shaftesbury shale
EBA-BH7
28.0m south of section
Glacial sand
Shaftesbury shale
EBA-BH8
10.0m north of section
sand
sand & gravel
sand & gravel
Paddy Member sandstone
Paddy Member ss
coal
coal
coal
coal
6.1m
United Industrial Services Ltd
Peace River silica sand project
Section LL'
S. Fraser, P. Geol. Sept. 29/99
Paddy Member ss
Lower Mixed Zone
Cadotte ss
28.9m
Cadotte ss
43.0m
8800E

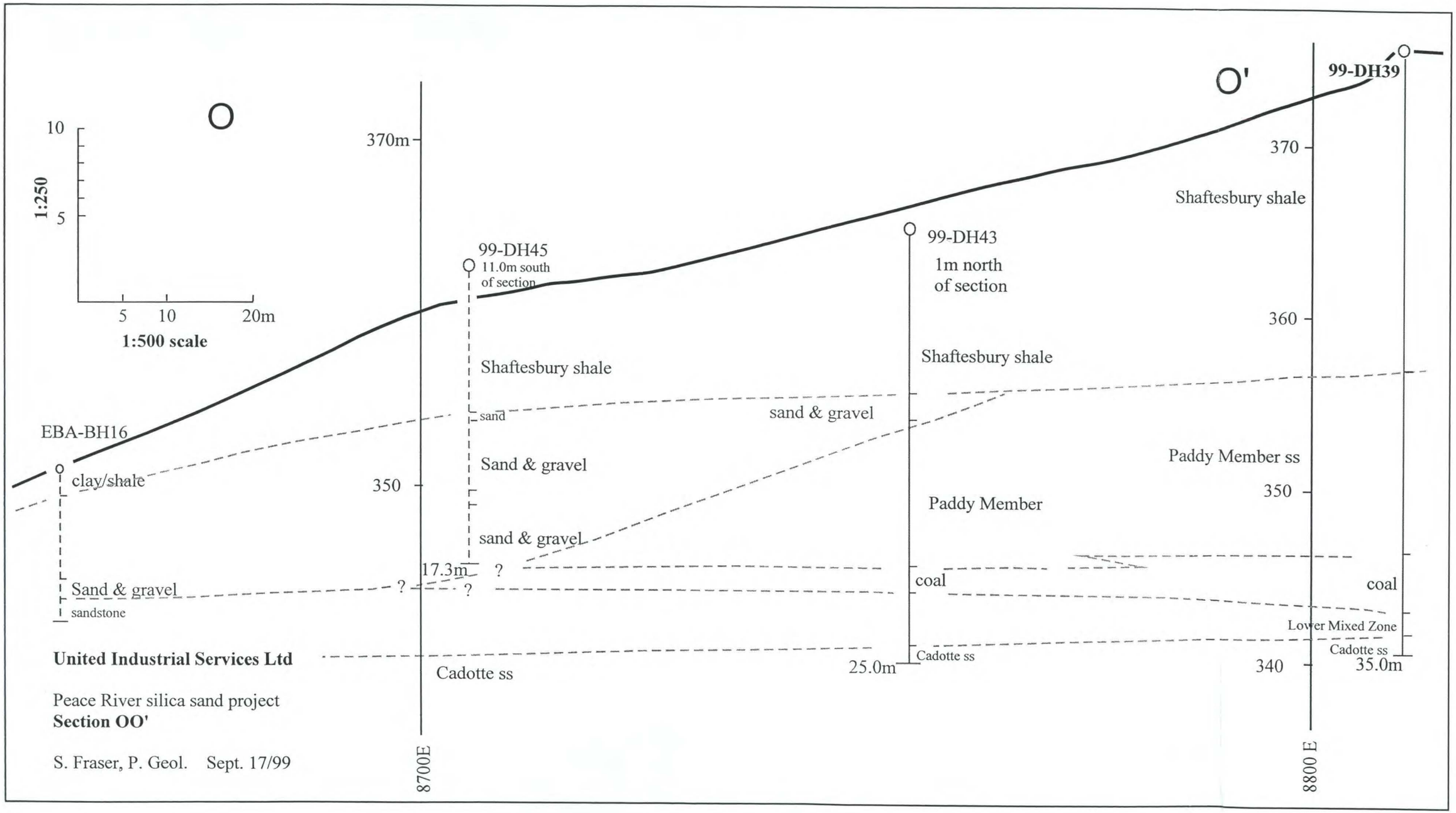

M
M'
8800E
380m
370
360
350
340
10
5
1:250
5
10
20
1:500 scale
99-DH46
97-DH06
99-DH47
138m south
of section
Shaftesbury shale
Shaftesbury shale
Glacial sand
Glacial
sand
coal
Cadotte ss
20.0m
Cadotte ss
Paddy member
sandstone
coal
52.0m
Cadotte ss
United Industrial Services Ltd
Peace River silica sand project
Section MM'
S. Fraser, P. Geol. Sept. 29/99

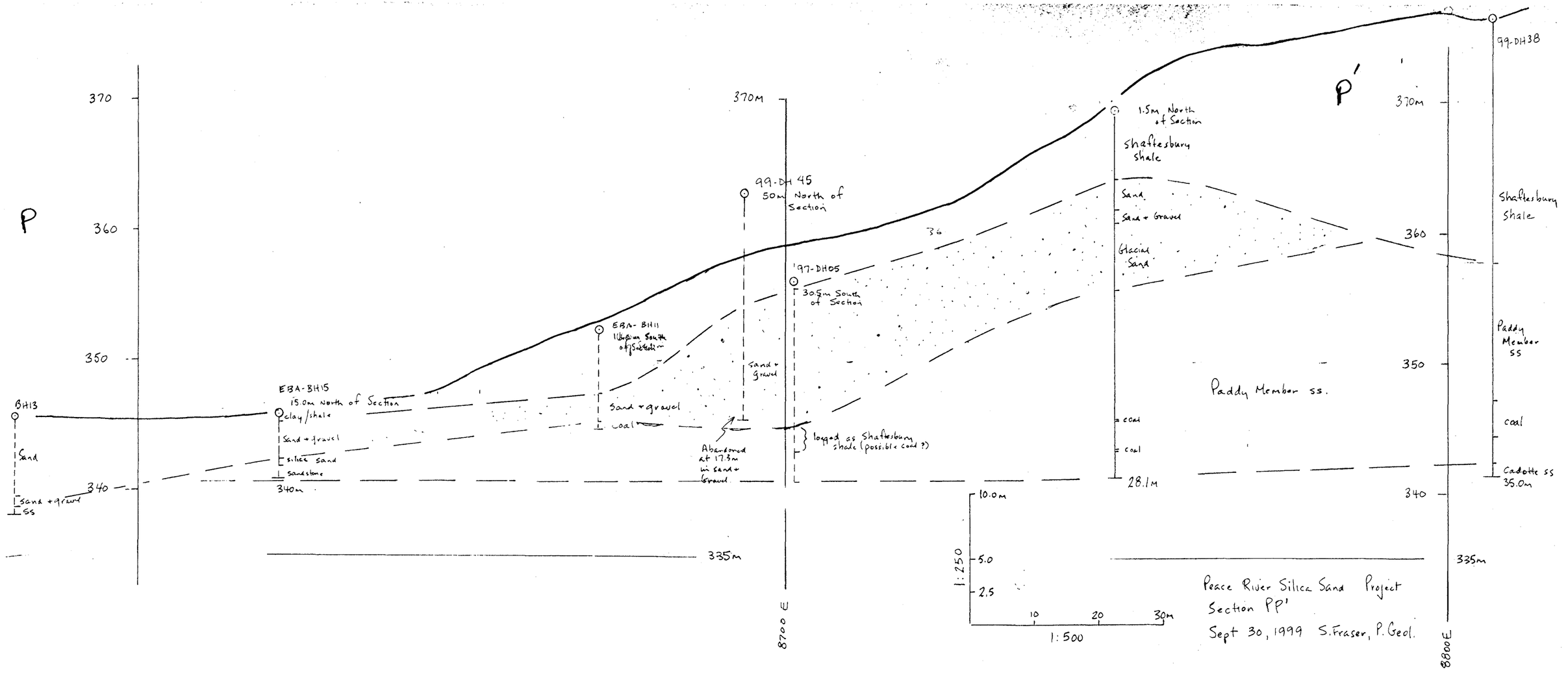


United Industrial Services Ltd

Peace River silica sand project
Section NN'

S. Fraser, P. Geol. Sept. 20/99

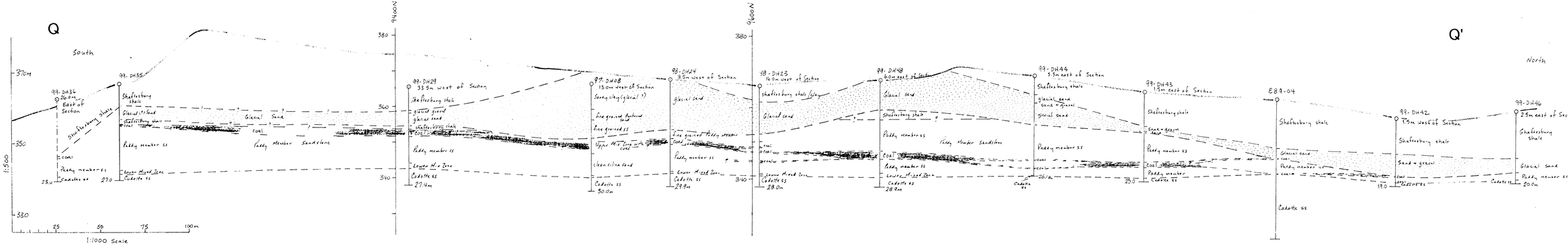

O
O'
10
5
1:250
5
10
20m
1:500 scale
370m
350
8700E
8800 E
EBA-BH16
clay/shale
Sand & gravel
sandstone
99-DH45
11.0m south
of section
Shaftesbury shale
sand
Sand & gravel
sand & gravel
17.3m
?
?
?
Cadotte ss
99-DH43
1m north
of section
Shaftesbury shale
sand & gravel
Paddy Member
coal
Cadotte ss
25.0m
99-DH39
370
360
350
340
Shaftesbury shale
Paddy Member ss
coal
Lower Mixed Zone
Cadotte ss
35.0m
United Industrial Services Ltd
Peace River silica sand project
Section OO'
S. Fraser, P. Geol. Sept. 17/99


P
P'
370
360
350
340
370m
360
350
340
335m
BH13
Sand
Sand + gravel
SS
EBA-BH15
15.0m North of Section
clay/shale
Sand + gravel
silica sand
sandstone
340m
EBA-BH11
Sand + gravel
coal
99-DH45
50m North of Section
Abandoned at 17.3m in sand + gravel
Sand + gravel
97-DH05
30.5m South of Section
logged as Shaftesbury shale (possible coal ?)
1.5m North of Section
Shaftesbury shale
Sand
Sand + Gravel
Glacial Sand
Paddy Member ss.
coal
coal
28.1m
99-DH38
Shaftesbury Shale
Paddy Member ss
coal
Cadotte ss
35.0m
8700 E
8800E
1:250
10.0m
5.0
2.5
1:500
10
20
30m
Peace River Silica Sand Project
Section PP'
Sept 30, 1999 S. Fraser, P. Geol.

Pocket C

Longitudinal Sections HH',QQ',RR'

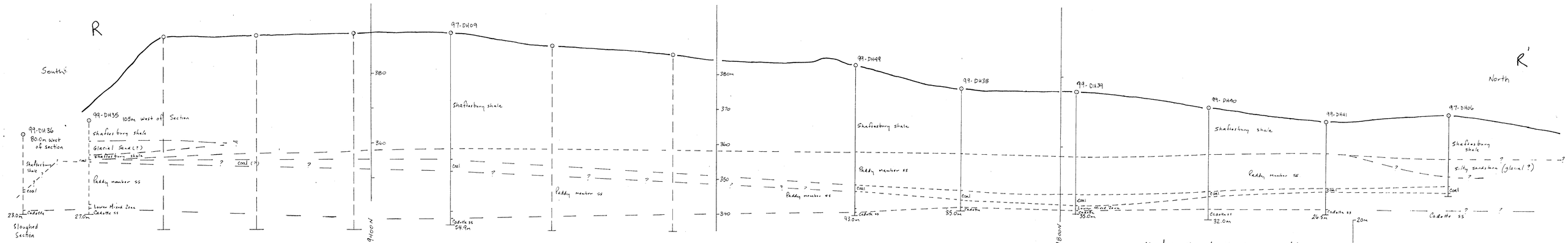

South
H
97-CH01
97-CH10
98-CH11A
98-CH11A
97-CH12
98-DH31
12m east of Section
360m
Test pit 3
360m
98-DH 26
98-DH22
0.5m West of Section
EBA BH5
3m West of Section
North
H'
360
350
340
350
Paddy Mbr SS
Cadotte
Mixed Zone ?
Cadotte
Gravel
Glacial Gravels
0.1m coal lens
SS intermixed with coal
Coal
Paddy member
Mixed Zone
Cadotte
Coal
Paddy Member
Cadotte SS
gravel
coal
coal
Mixed Zone
Cadotte SS
gravel
Coal
SS intermixed with coal
Coal
Mixed Zone
Includes sections of black shale and micaceous SS.
gravel
Sand
Coal
Glacial Gravels
Coal
Paddy Mbr SS
Mixed Zone
gravel
coal + sandstone
coal lens
Mixed Zone
Gravel
Sand
silica sand
SS + coal
silica sand
330m reference elev.
9400 N
Section AA'
9600 N
10.0
5.0
2.5
1:250
10
20
40m
1:500 scale
Peace River silica sand Project
Sept '98
S. Fraser, P. Geol.



United Industrial Services

Peace River Silica Sand Project

October 1, 1999 S. Fraser, P. Geol.

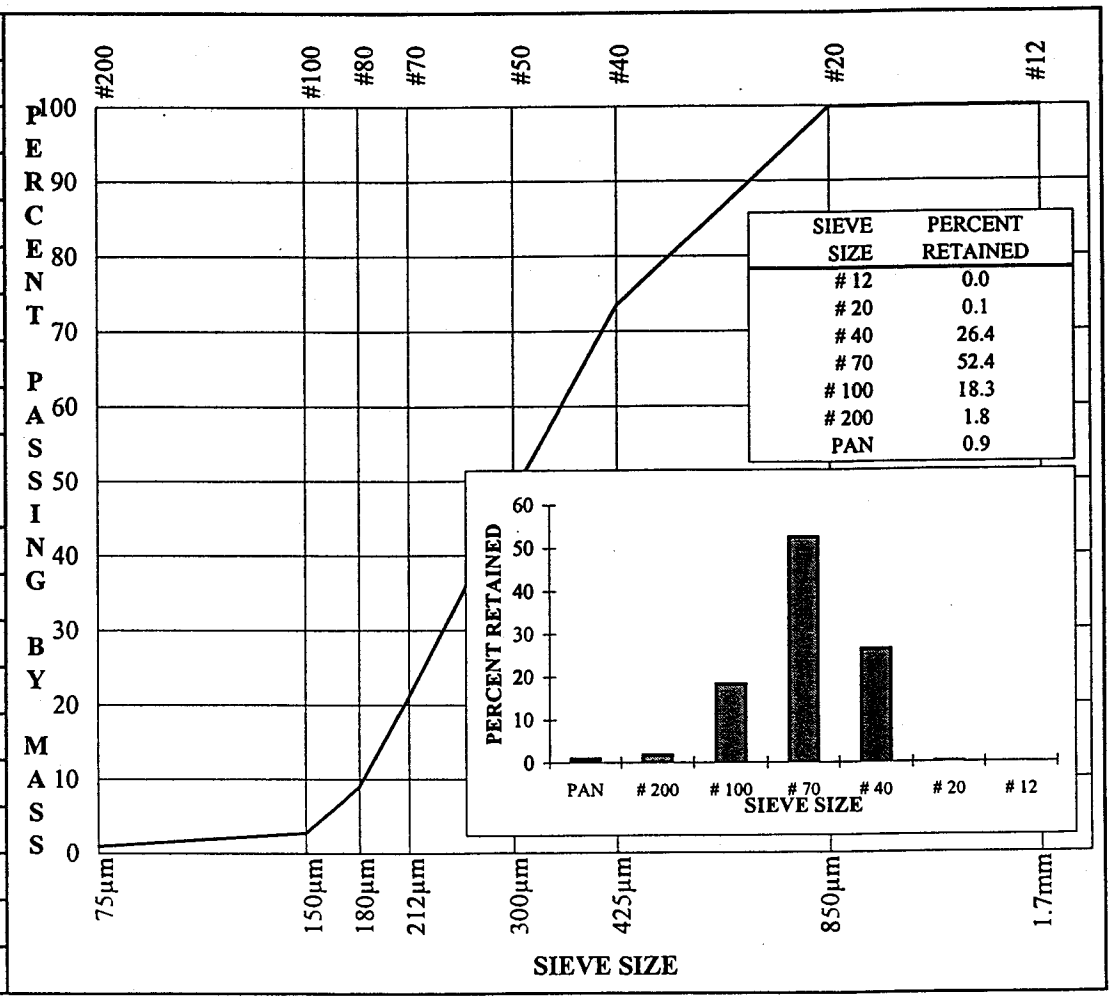

R
South
R'
North
99-DH36
80.0m west of section
99-DH35
105m west of Section
97-DH09
99-DH39
97-DH38
99-DH39
99-DH40
99-DH41
97-DH06
Shaftesbury shale
Glacial Sand (?)
Paddy member ss
Lower Mbrd Zone
Cadotte ss
coal
coal (?)
Cadotte ss
Silty sandstone (glacial?)
380
370
360
350
340
23.0m
27.0m
43.0m
35.0m
33.0m
32.0m
26.5m
9400N
9800N
Sloughed Section
United Industrial Services Ltd
Peace River Silica Sand Project
Section RR' looking west
Sept 30/99 S. Fraser P.Geol.
1:500
1:1000
20m
10
5
20
40
60
80m

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-4-01

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	286.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.9
# 40	73.5
# 50	48.3
# 70	21.1
# 80	9.0
# 100	2.8
# 200	0.9



REMARKS: UNWASHED

REVIEWED BY: [redacted] P.Eng.

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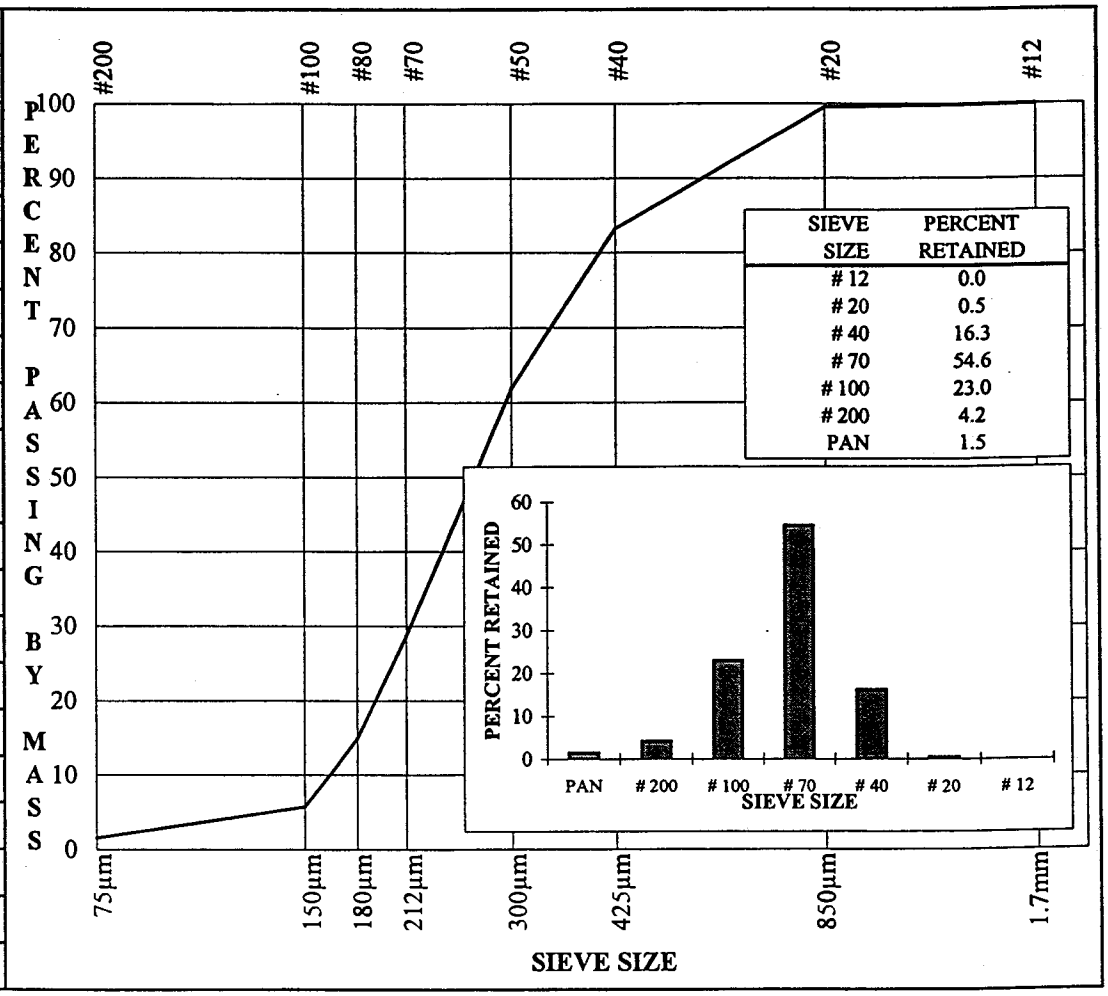
GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-4-02

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	322.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.5
# 40	83.3
# 50	61.9
# 70	28.7
# 80	14.9
# 100	5.7
# 200	1.5



REMARKS: UNWASHED

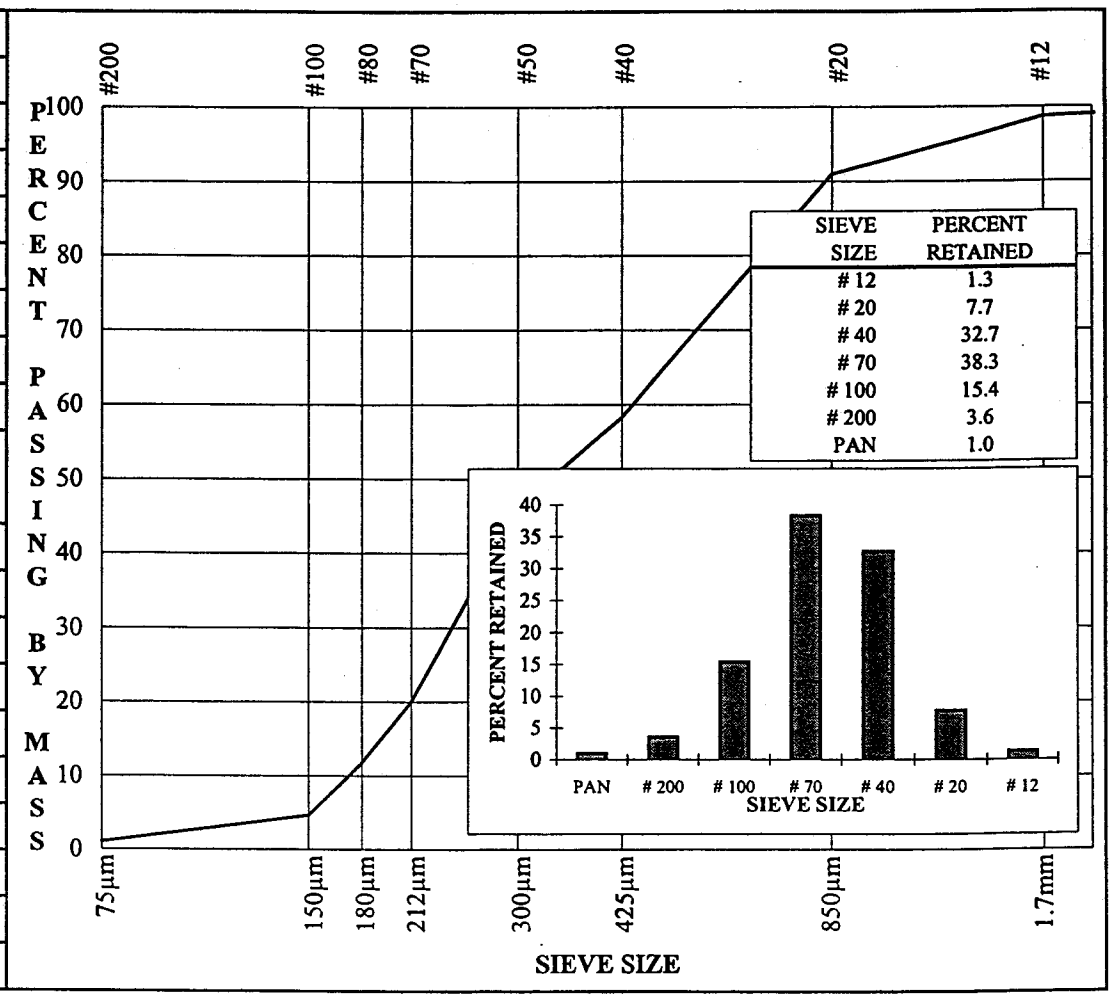
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-4 #3

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	294.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.7
# 20	91.0
# 40	58.3
# 50	46.2
# 70	20.0
# 80	11.8
# 100	4.6
# 200	1.0



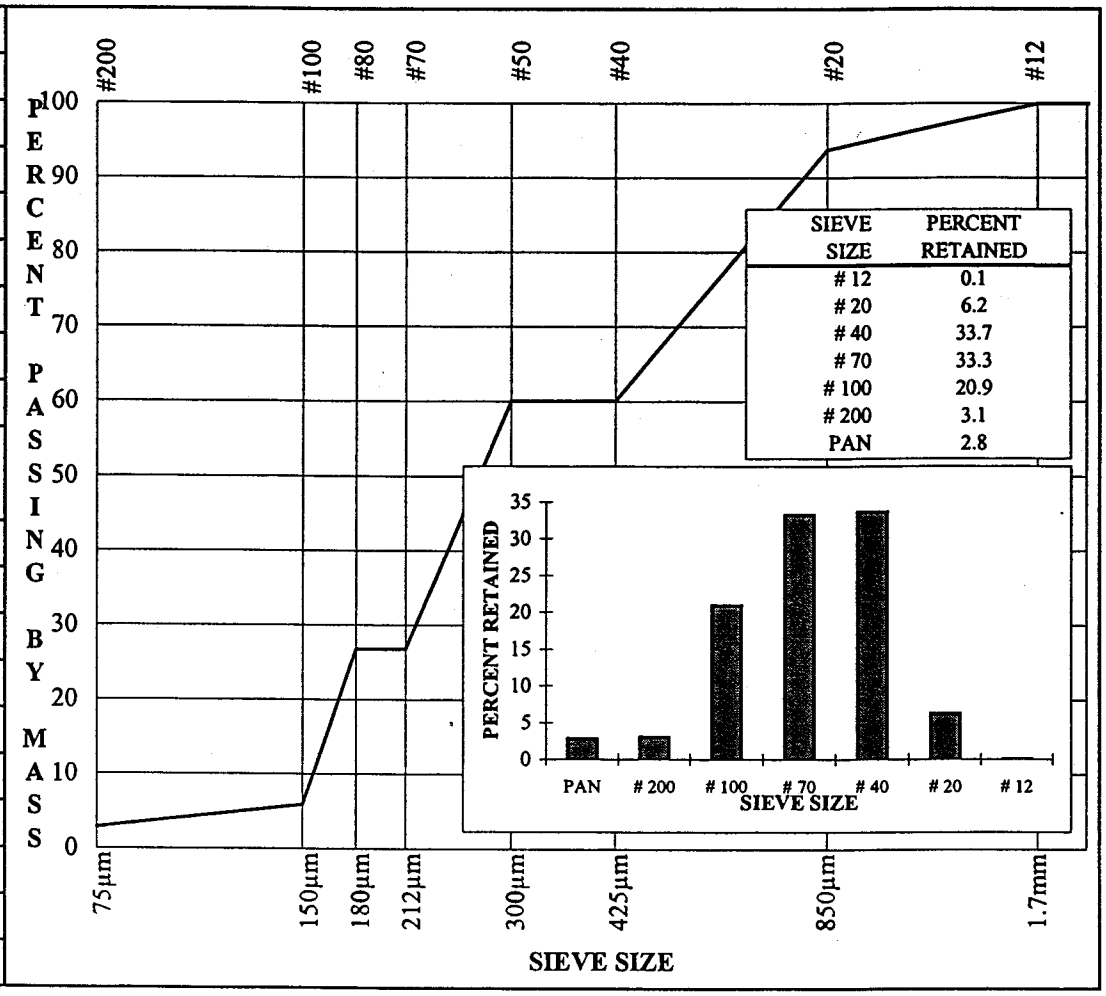
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-04-03

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	1000.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	93.7
# 40	60.1
# 50	60.1
# 70	26.8
# 80	26.8
# 100	5.9
# 200	2.8



REMARKS: WASHED & SIEVED IN 2 PARTS

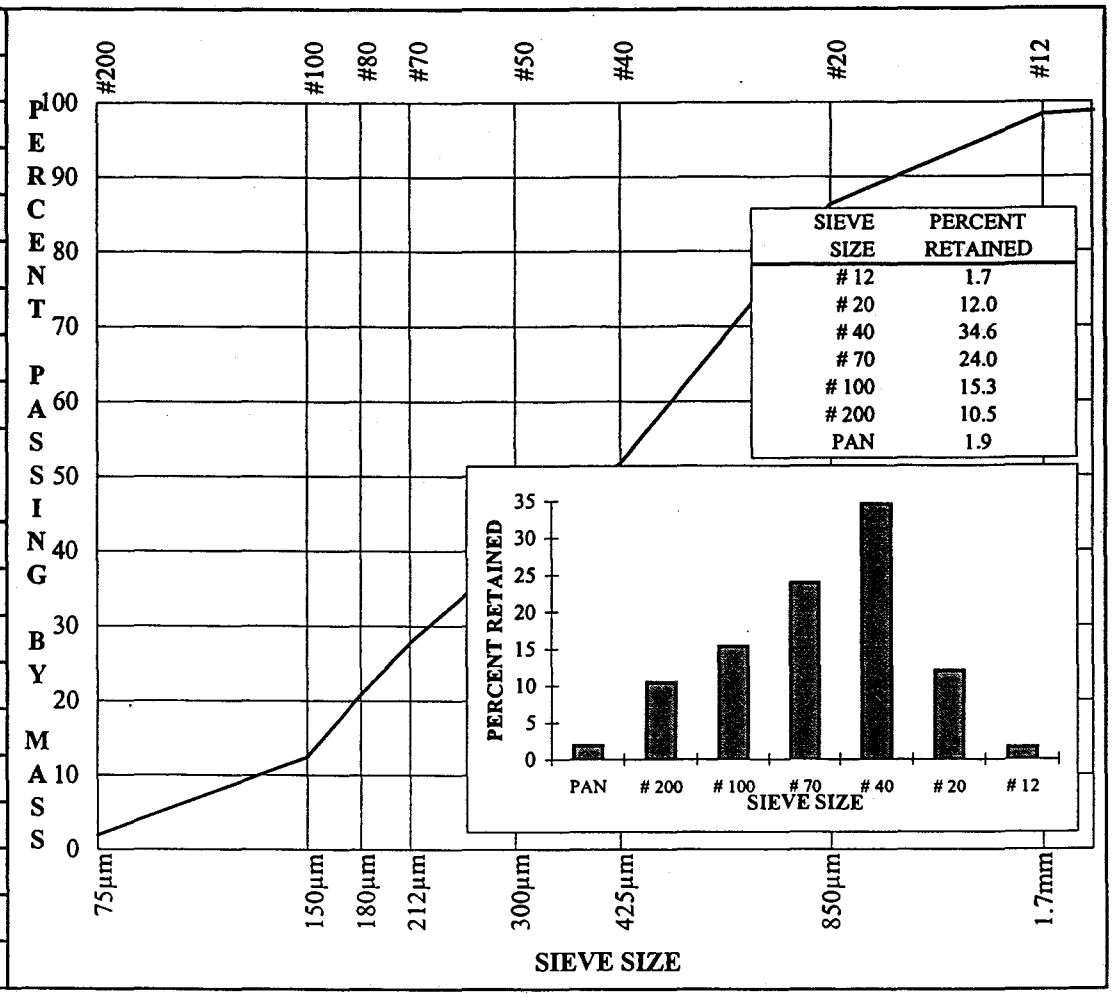
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-4-04

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	343.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.3
# 20	86.3
# 40	51.7
# 50	39.9
# 70	27.7
# 80	20.9
# 100	12.4
# 200	1.9



REMARKS: UNWASHED

REVIEWED BY: [redacted] P.Eng.

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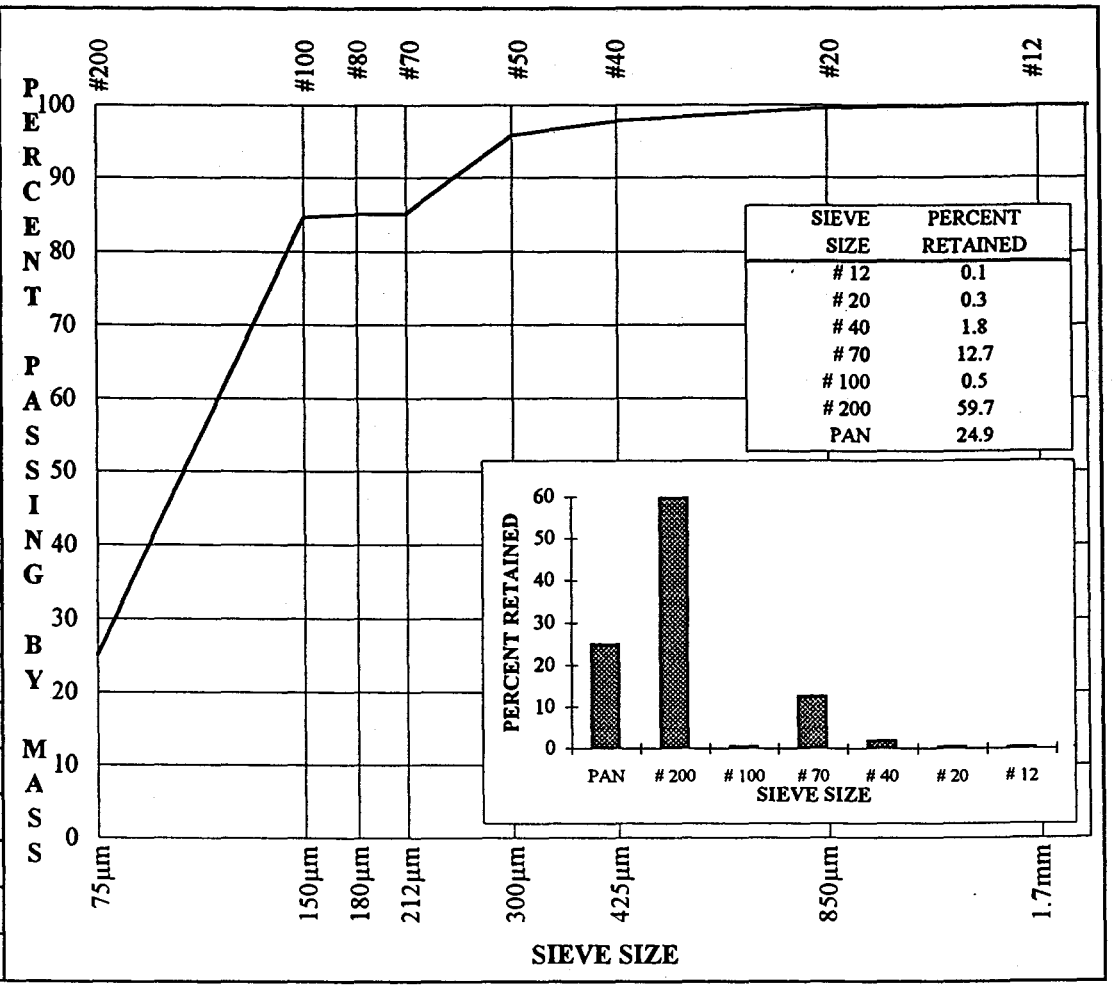
GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-04-05

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	326.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.6
# 40	97.8
# 50	95.7
# 70	85.1
# 80	85.1
# 100	84.7
# 200	24.9



REMARKS: UNWASHED

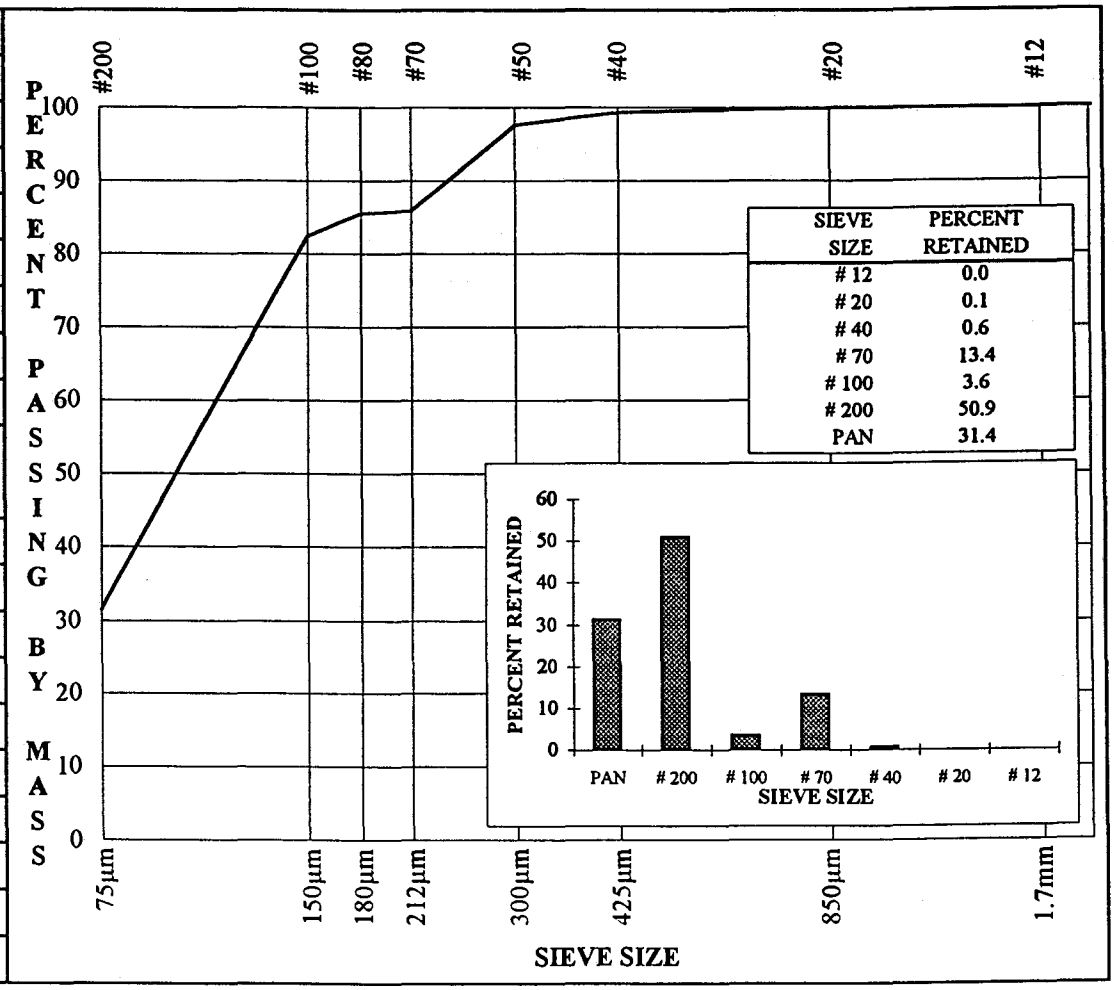
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-01

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	280.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	99.9
# 40	99.3
# 50	97.5
# 70	85.9
# 80	85.4
# 100	82.3
# 200	31.4



REMARKS: UNWASHED

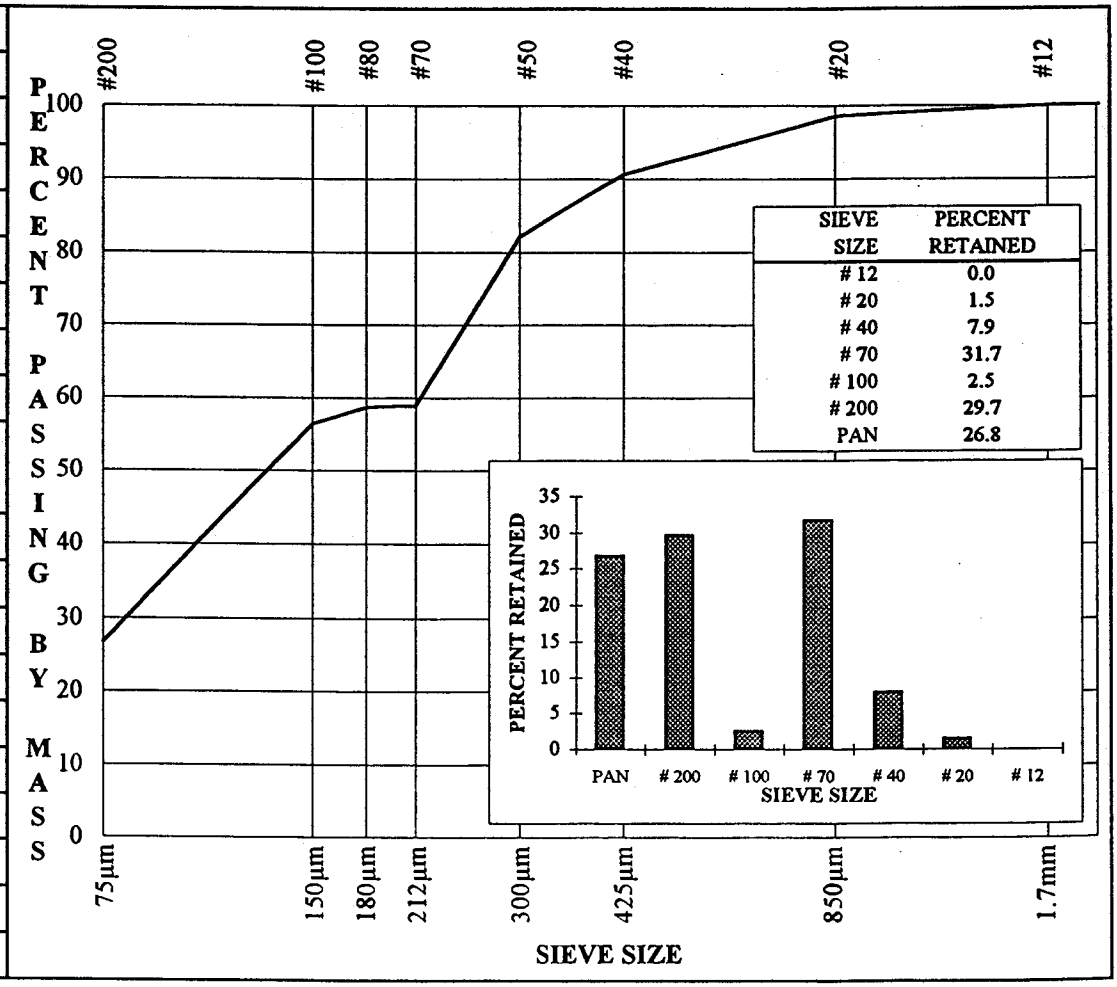
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-02

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	278.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	98.5
# 40	90.6
# 50	82.1
# 70	58.9
# 80	58.7
# 100	56.4
# 200	26.8



REMARKS: UNWASHED

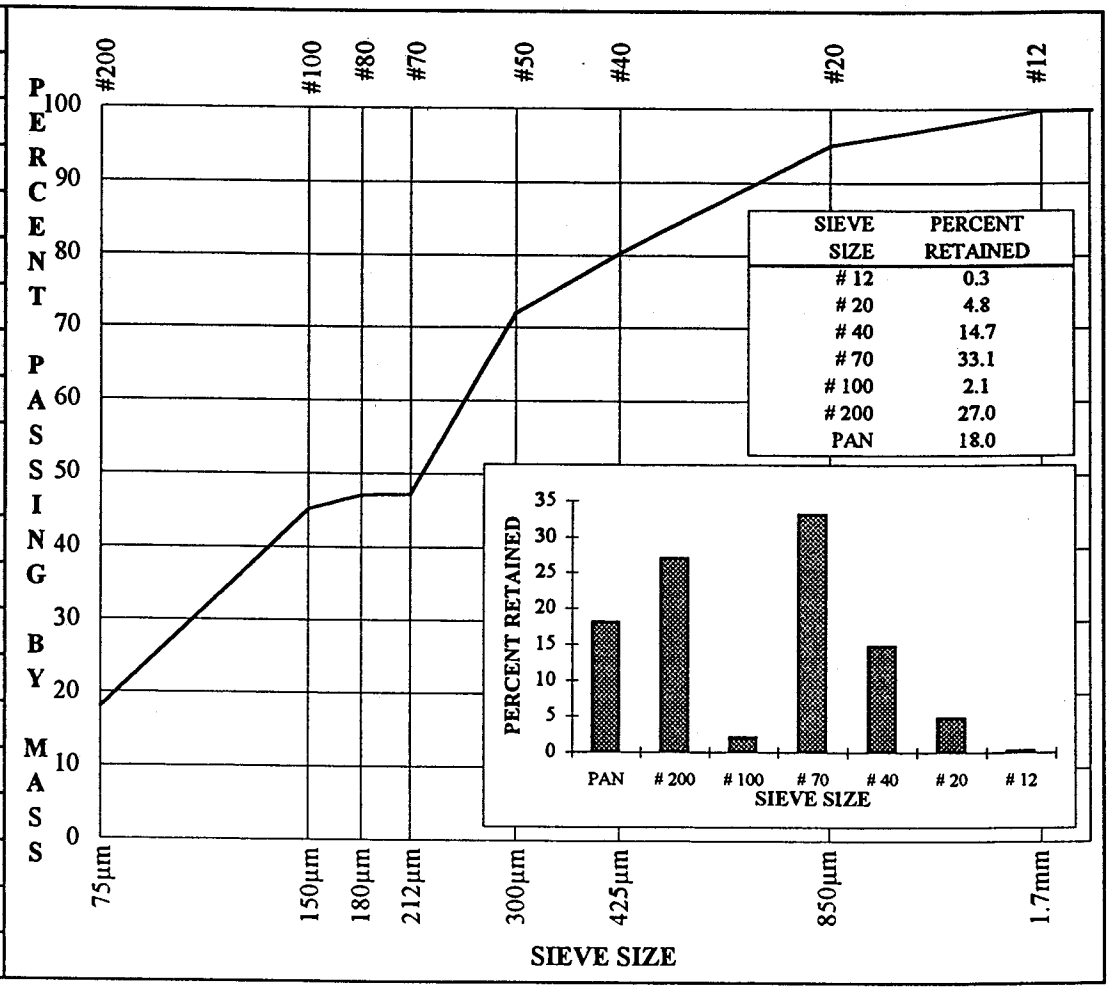
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-03

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	335.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.7
# 20	95.0
# 40	80.3
# 50	72.0
# 70	47.2
# 80	47.0
# 100	45.1
# 200	18.0



REMARKS: UNWASHED

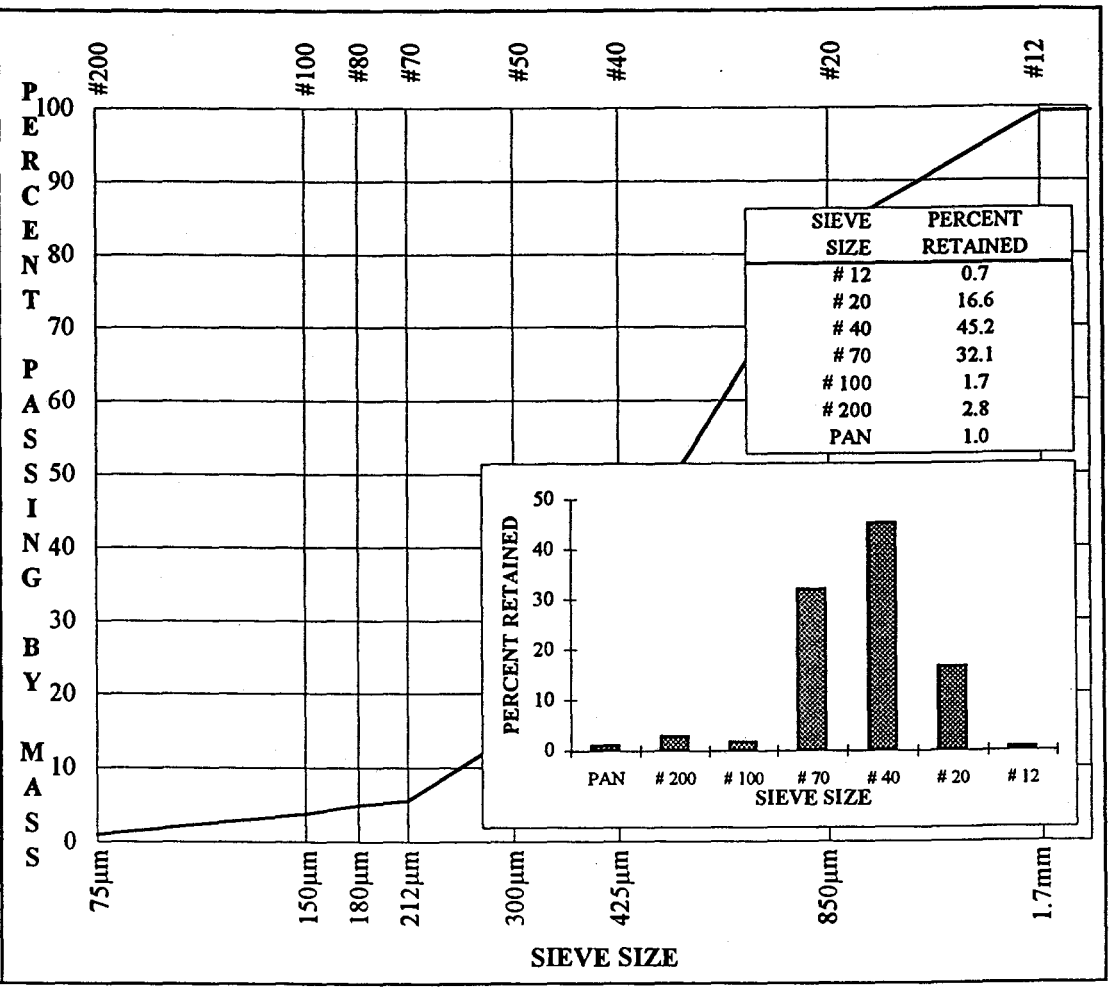
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-04

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	328.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.3
# 20	82.8
# 40	37.6
# 50	14.5
# 70	5.5
# 80	4.9
# 100	3.8
# 200	1.0



REMARKS: UNWASHED

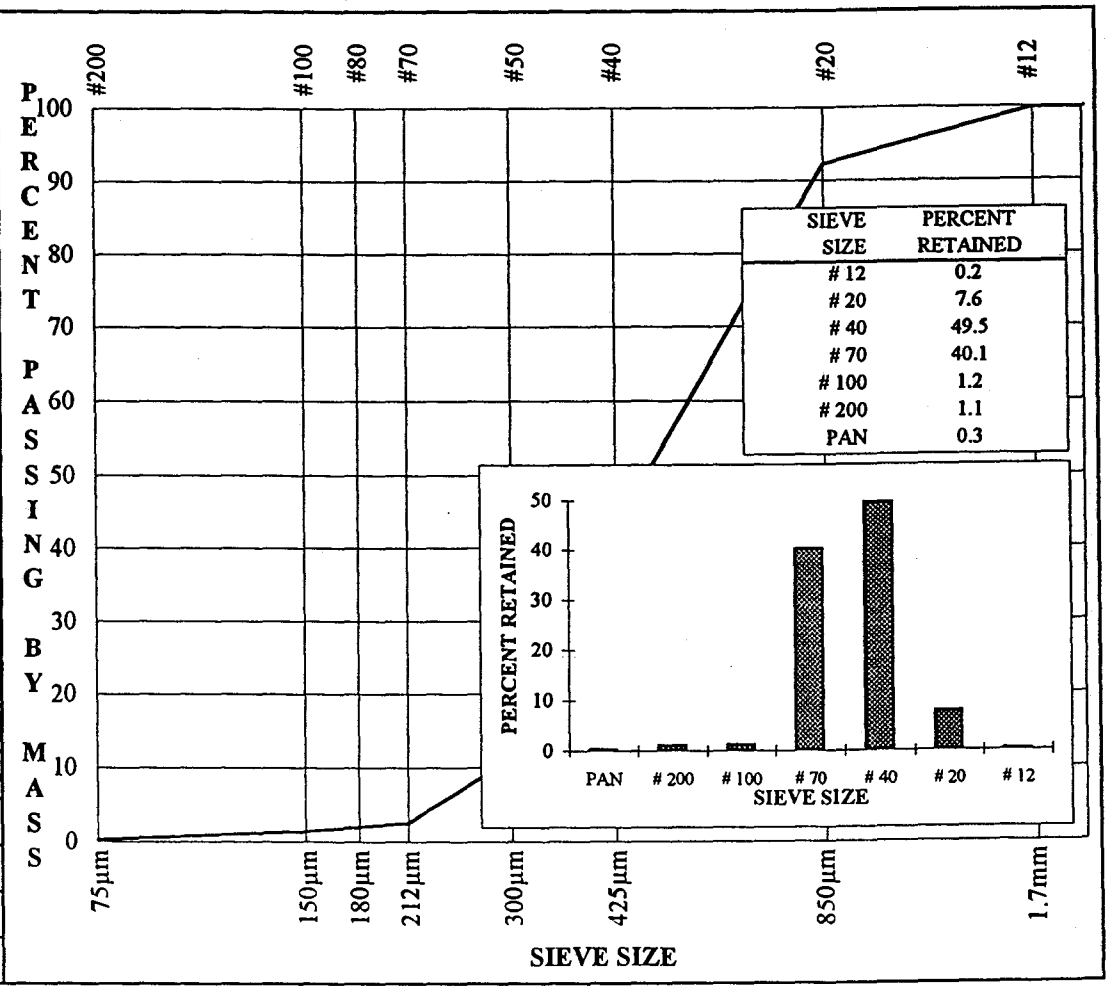
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-05

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	343.9
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	92.2
# 40	42.7
# 50	11.4
# 70	2.6
# 80	2.0
# 100	1.4
# 200	0.3



REMARKS: UNWASHED

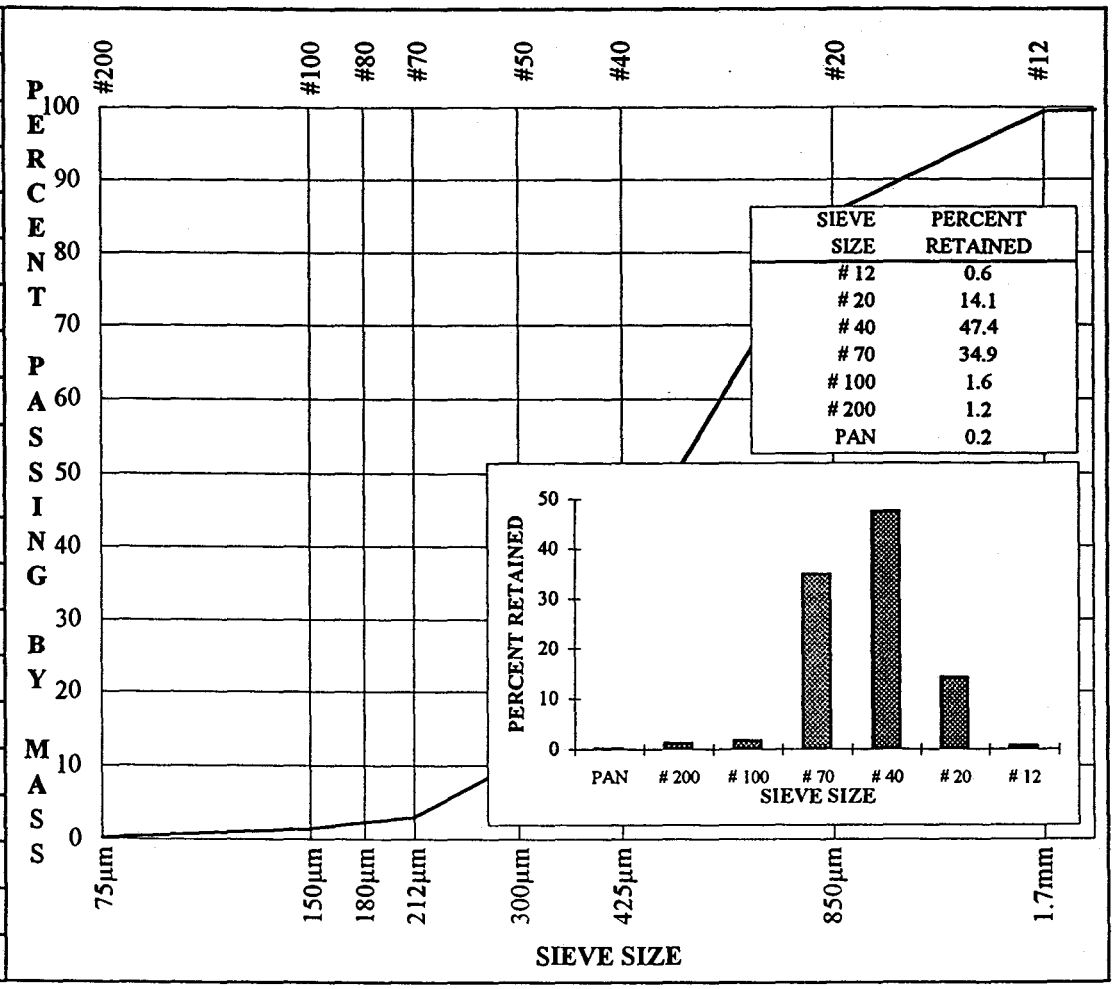
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-07

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	341.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.4
# 20	85.3
# 40	37.9
# 50	10.7
# 70	3.0
# 80	2.3
# 100	1.4
# 200	0.2



REMARKS: UNWASHED

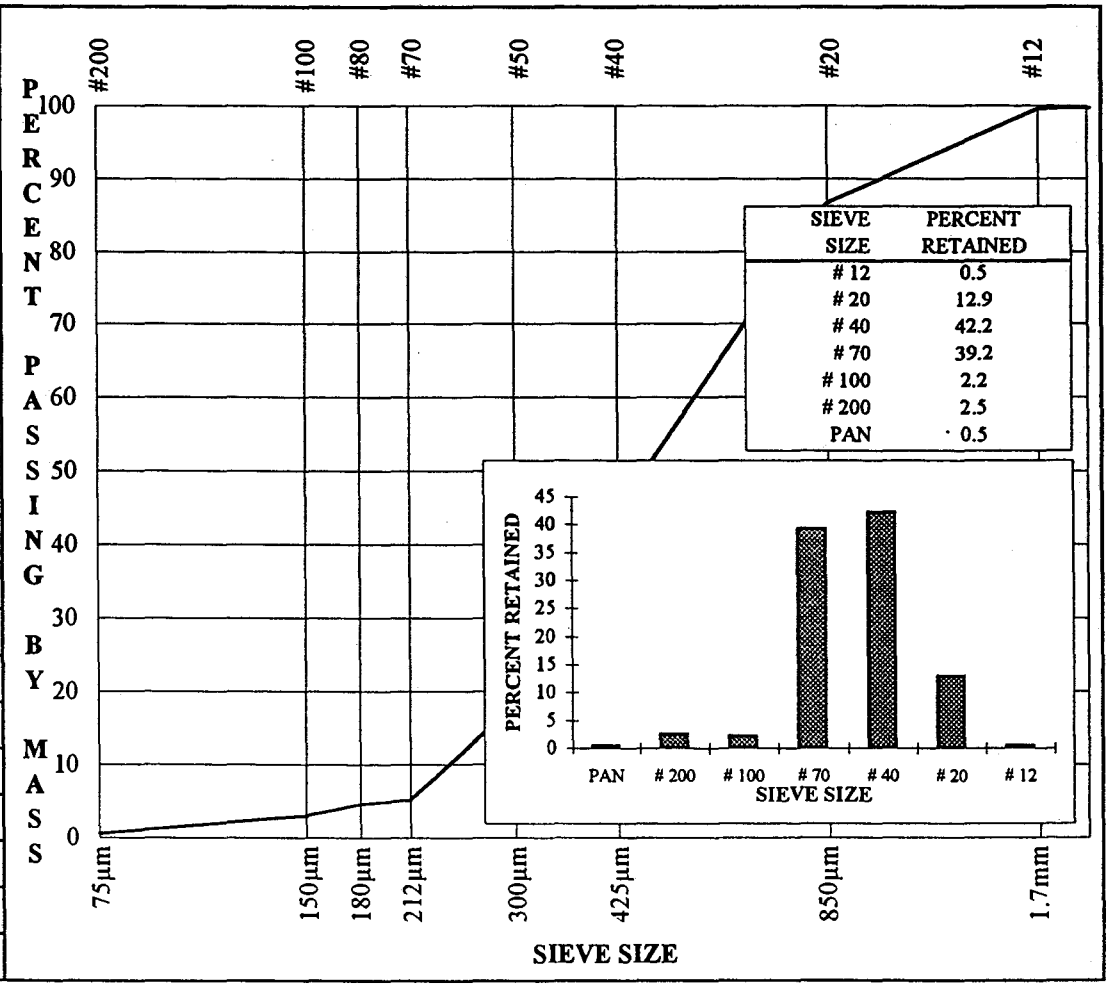
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-08

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	360.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.5
# 20	86.6
# 40	44.4
# 50	18.3
# 70	5.2
# 80	4.5
# 100	3.0
# 200	0.5



REMARKS: UNWASHED

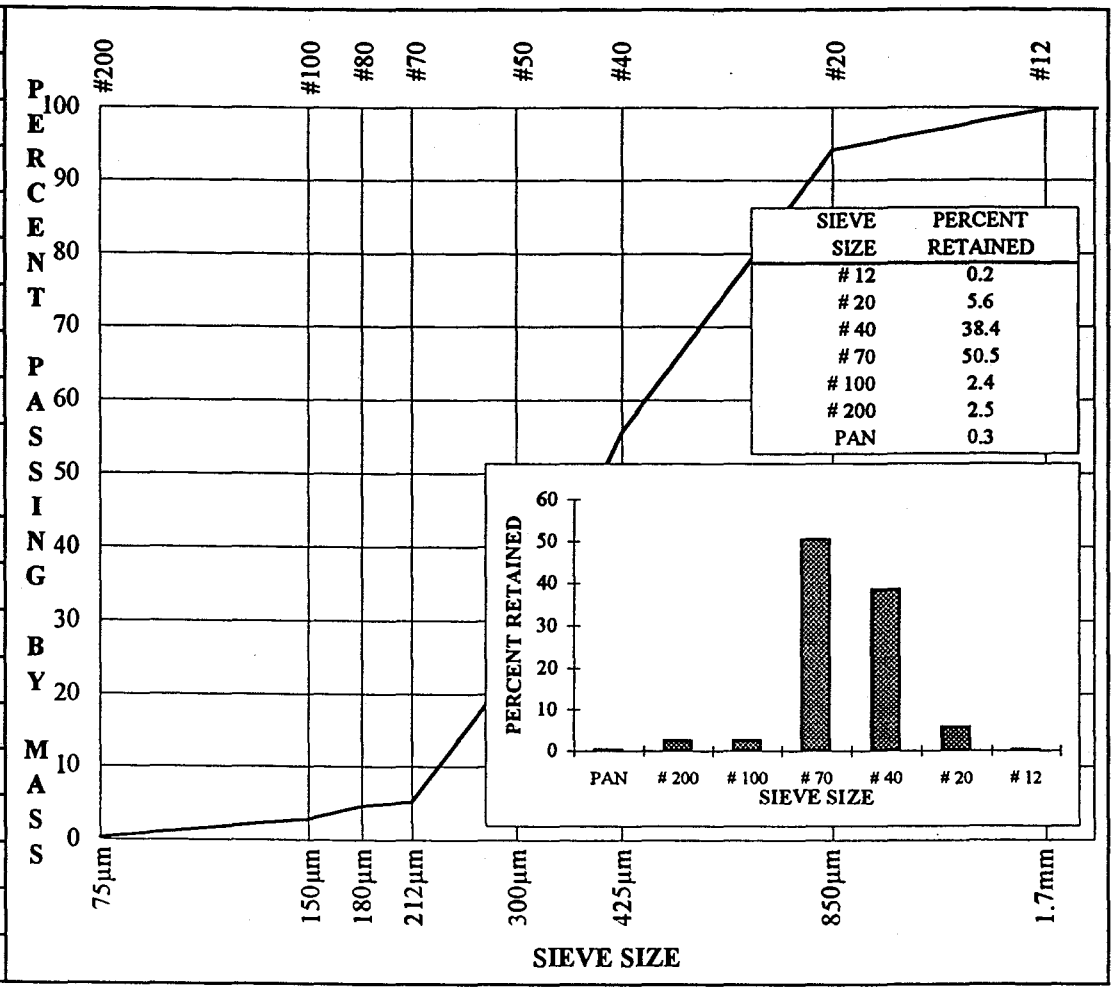
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-09

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	310.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	94.1
# 40	55.7
# 50	24.1
# 70	5.2
# 80	4.5
# 100	2.8
# 200	0.3



REMARKS: UNWASHED

REVIEWED BY: [redacted] P.Eng.

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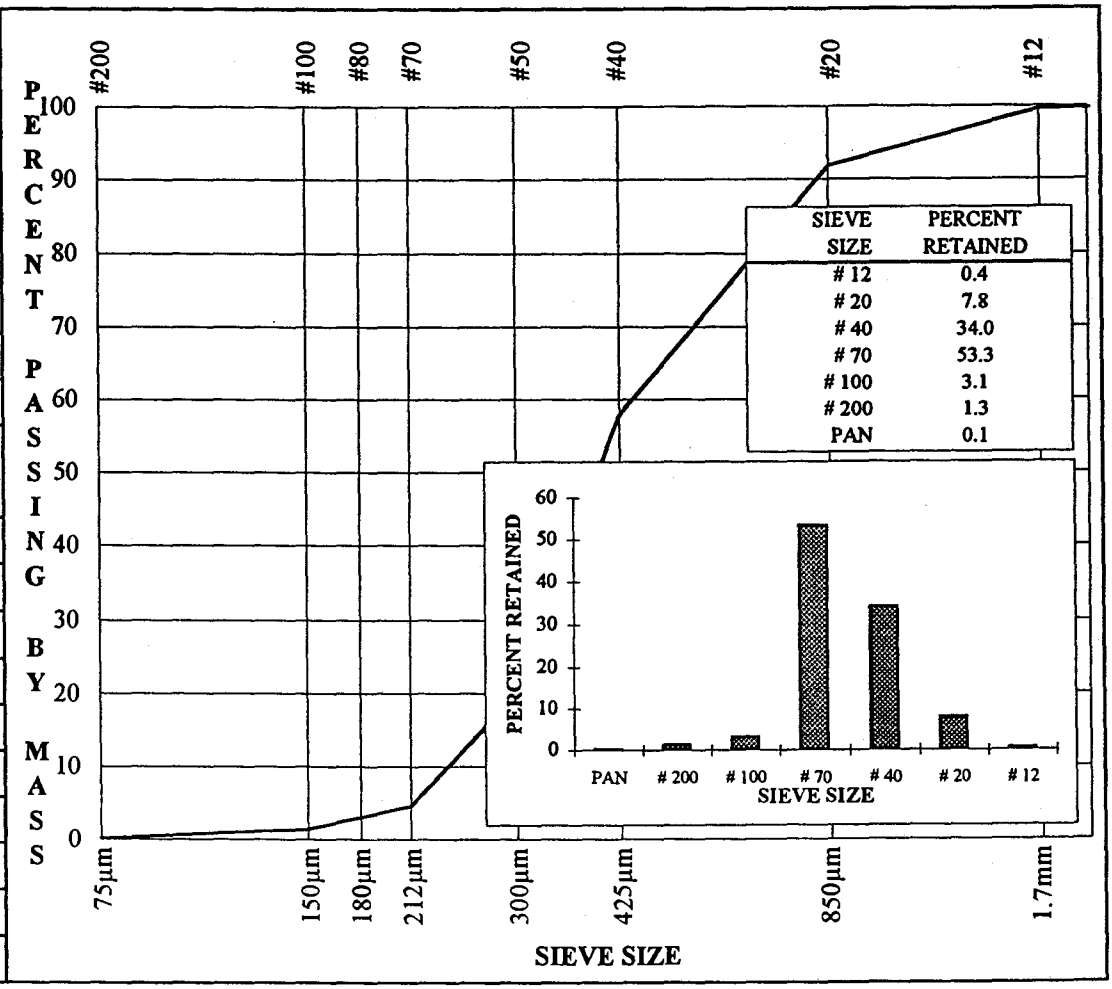
EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-10

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	320.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	91.8
# 40	57.8
# 50	20.1
# 70	4.5
# 80	3.0
# 100	1.4
# 200	0.1



REMARKS: UNWASHED

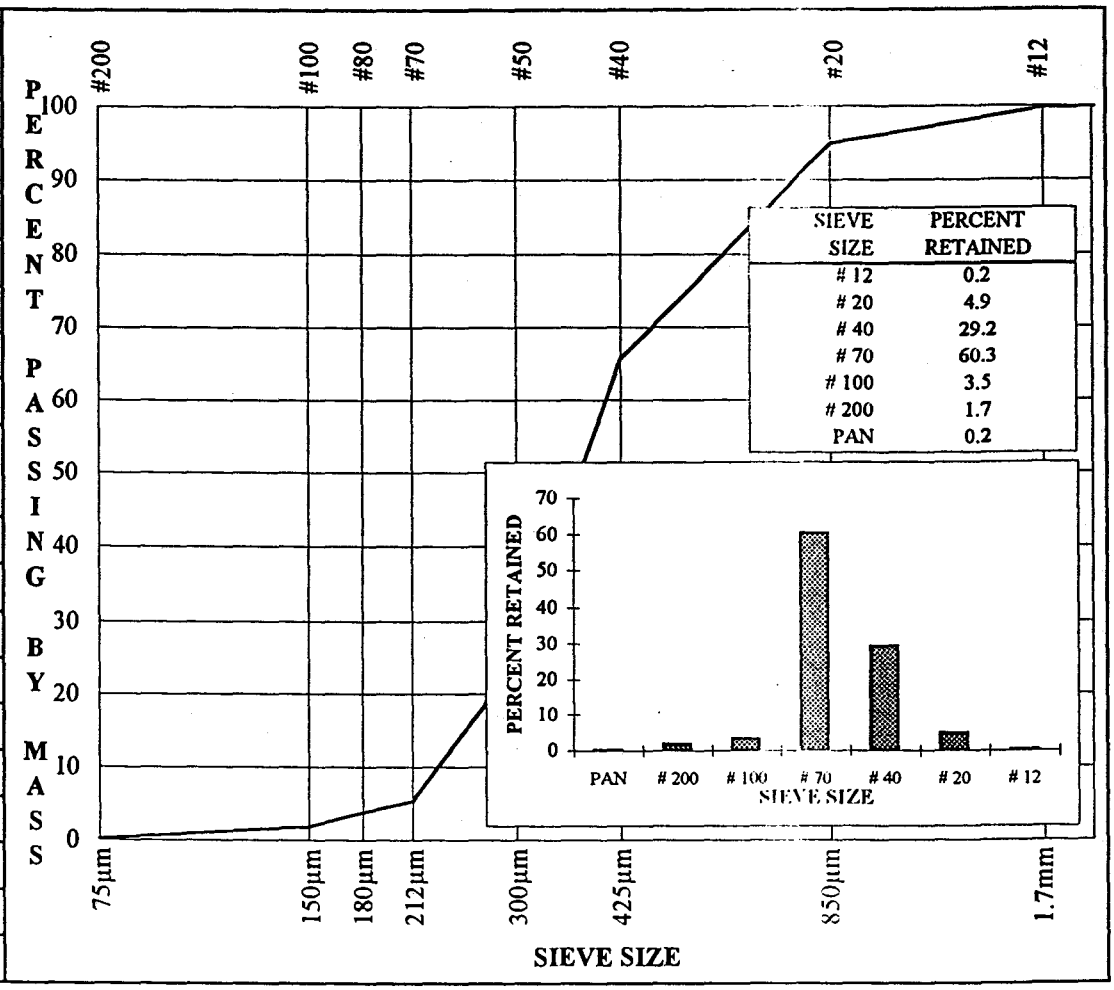
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-11

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	265.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	94.9
# 40	65.6
# 50	24.3
# 70	5.4
# 80	3.8
# 100	1.9
# 200	0.2



REMARKS: UNWASHED

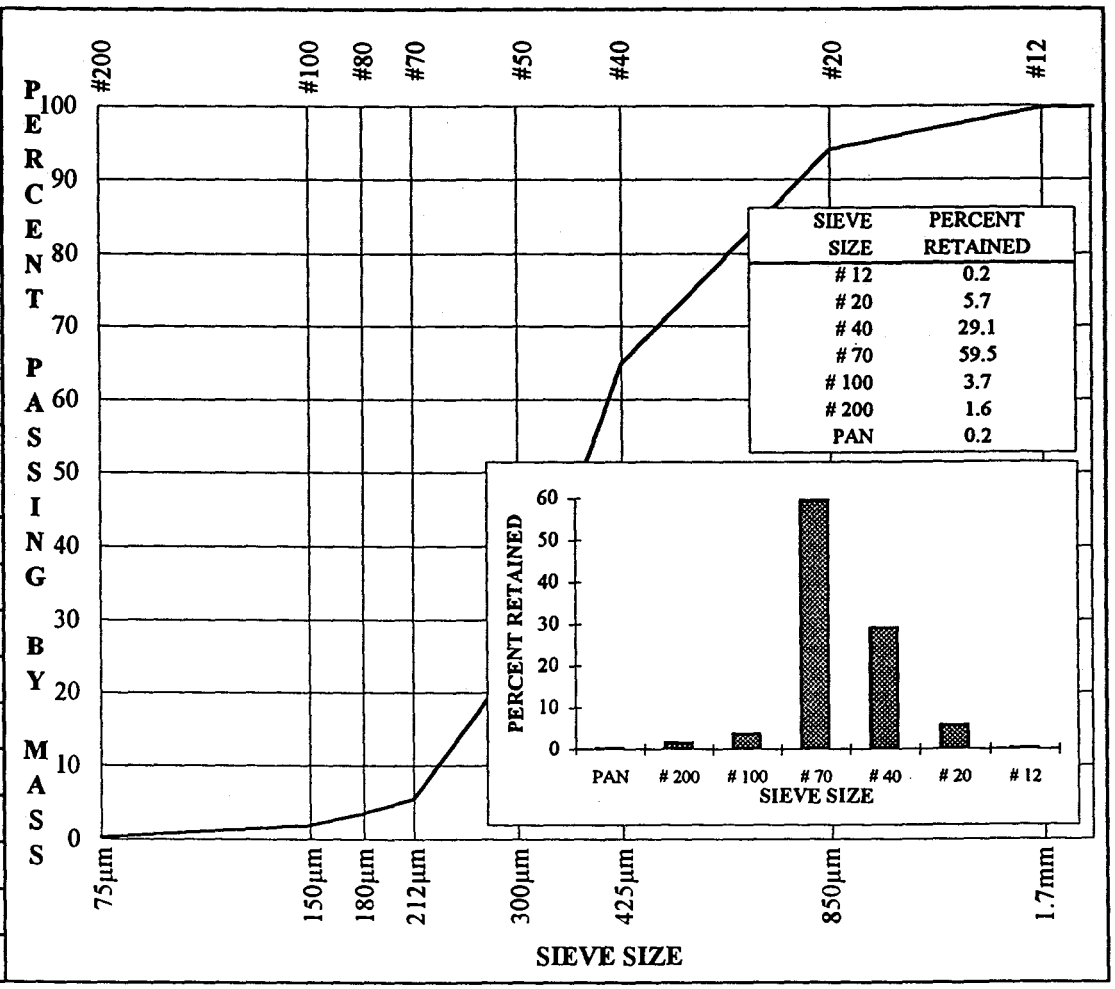
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-12

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	305.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	94.0
# 40	64.9
# 50	24.7
# 70	5.5
# 80	3.5
# 100	1.8
# 200	0.2



REMARKS: UNWASHED

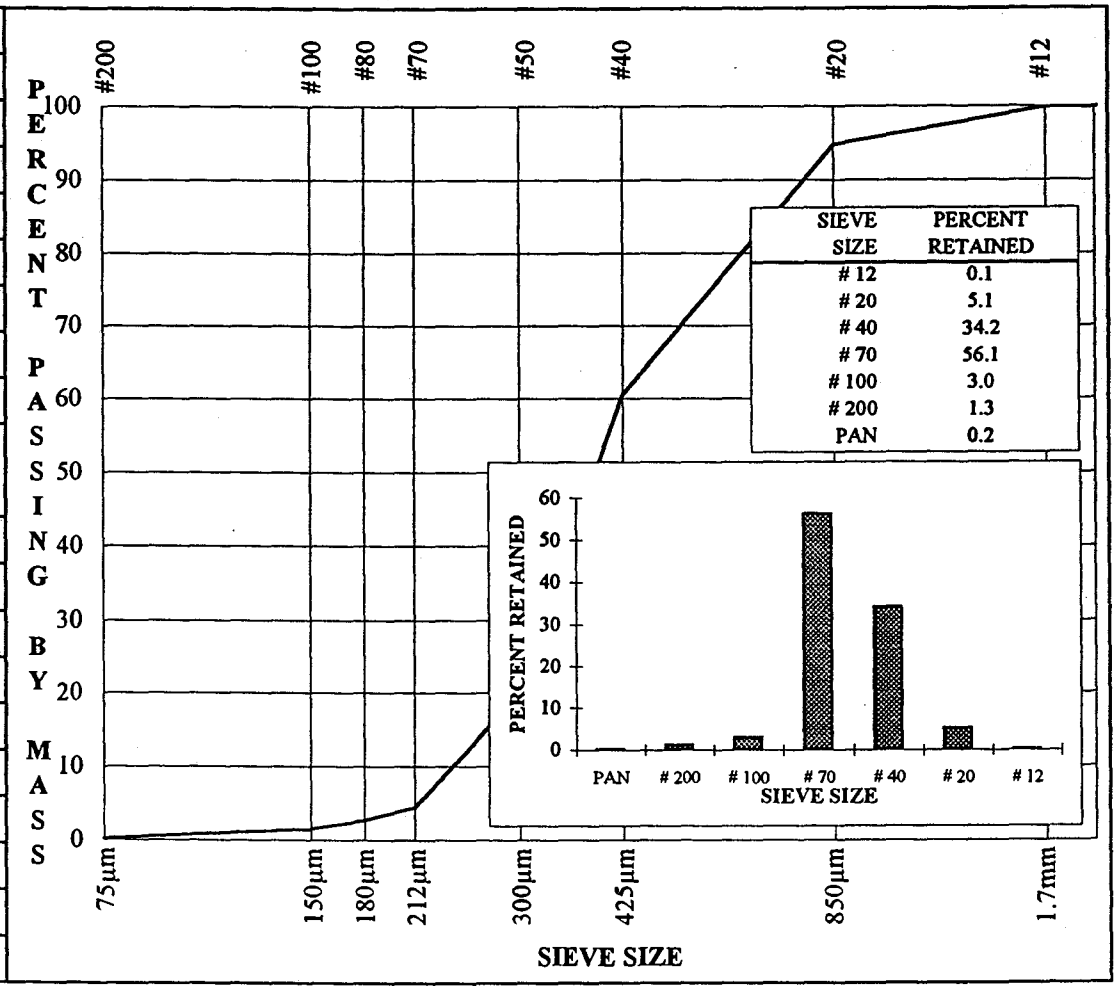
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-13

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	363.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	94.8
# 40	60.5
# 50	20.1
# 70	4.4
# 80	2.8
# 100	1.5
# 200	0.2



REMARKS: UNWASHED

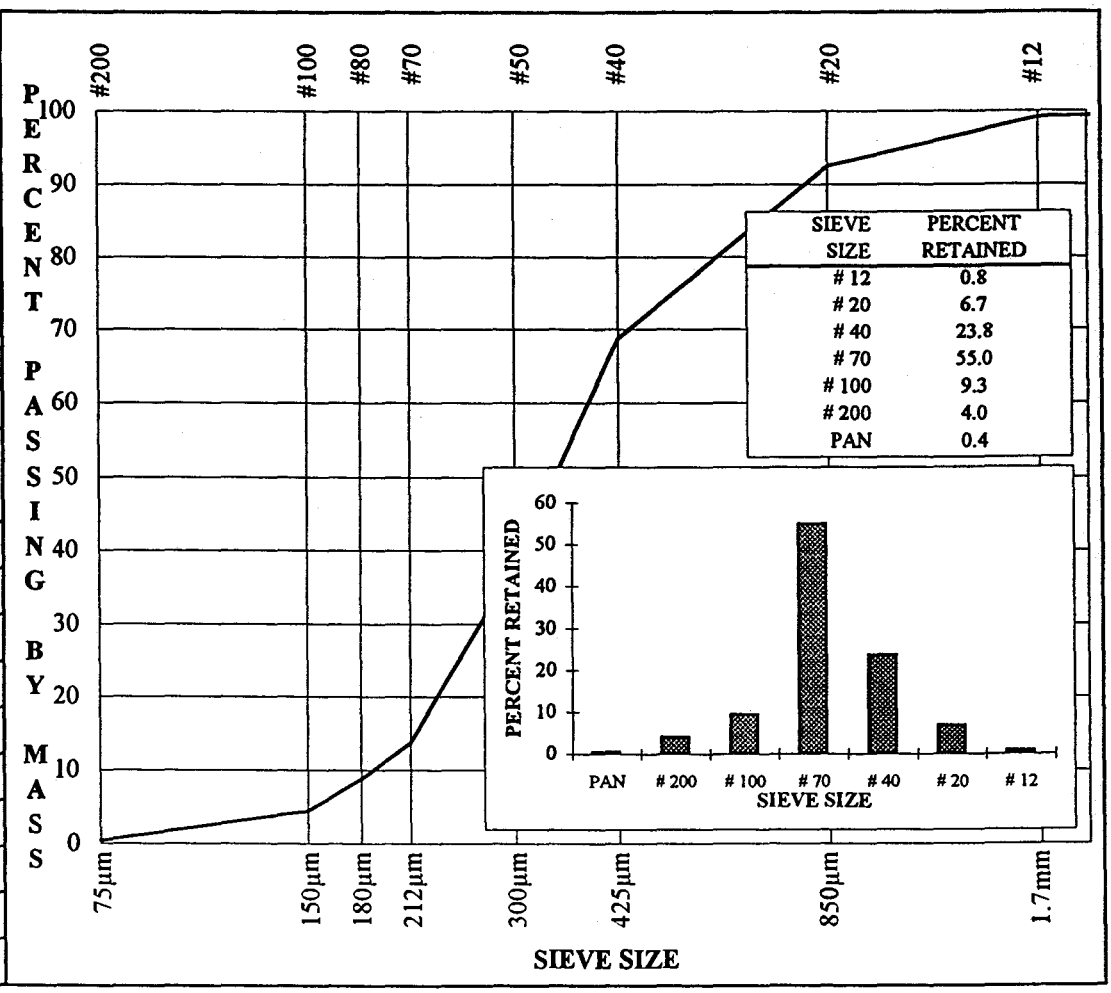
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-14

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	309.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.2
# 20	92.5
# 40	68.7
# 50	38.0
# 70	13.7
# 80	8.8
# 100	4.4
# 200	0.4



REMARKS: UNWASHED

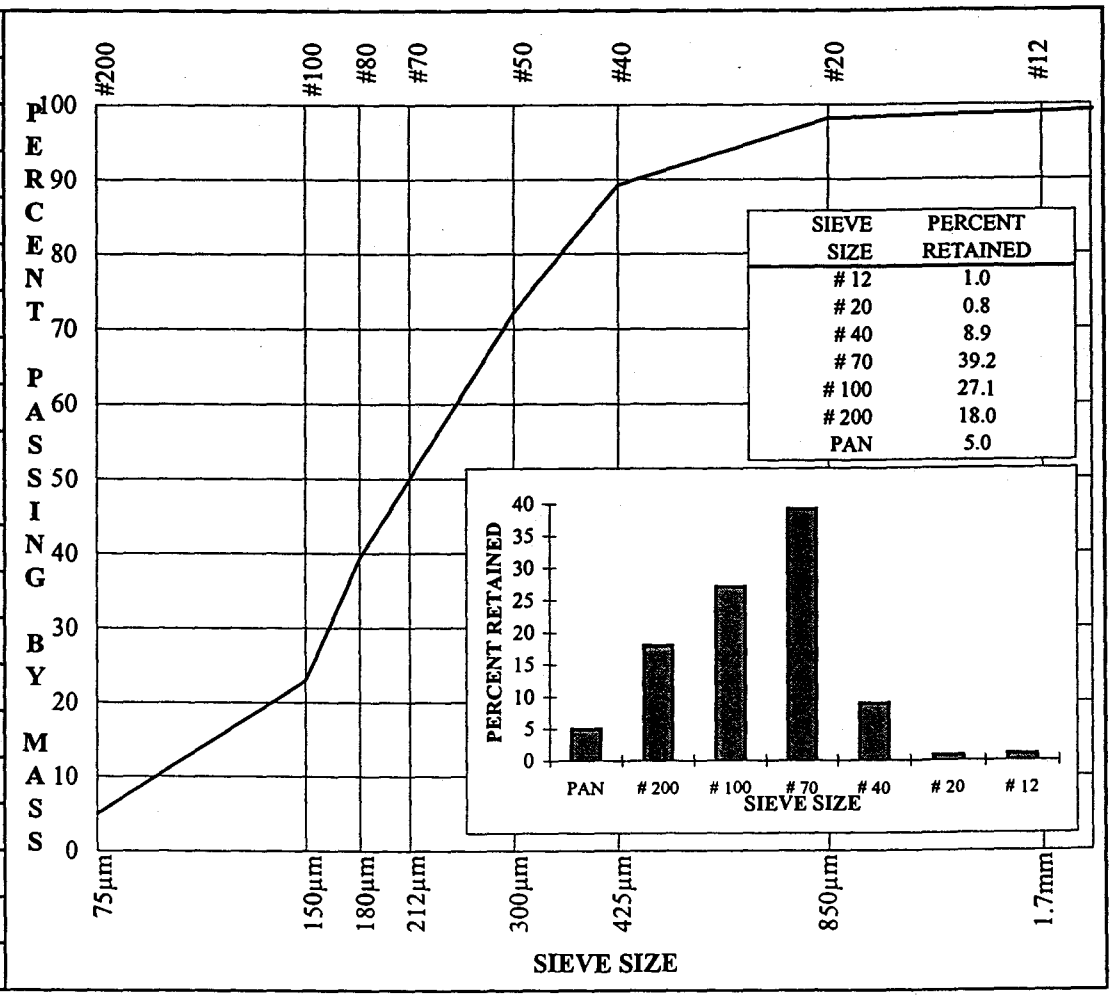
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-5 #15

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	340.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.0
# 20	98.2
# 40	89.2
# 50	72.2
# 70	50.0
# 80	39.4
# 100	22.9
# 200	5.0



REMARKS: UNWASHED

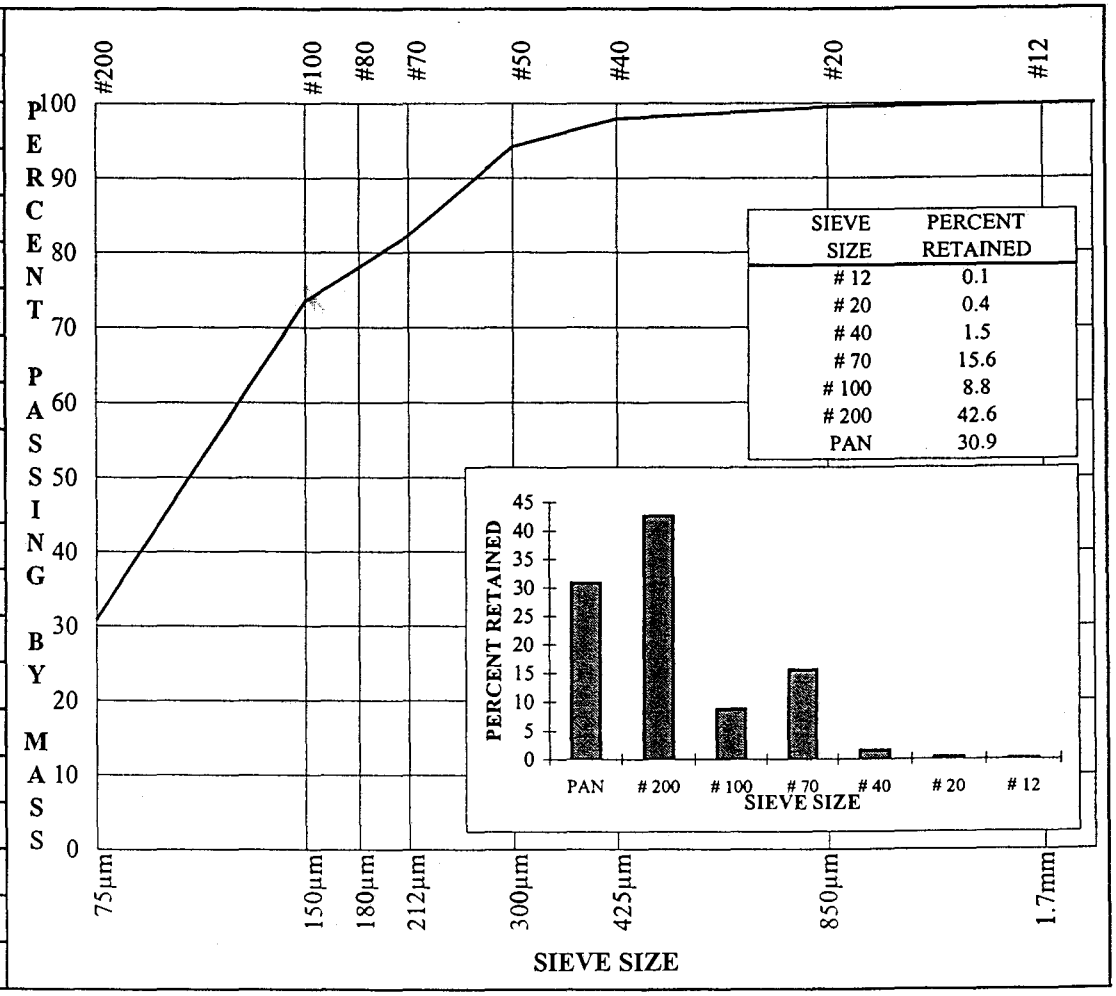
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #1

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	271.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.5
# 40	97.9
# 50	94.2
# 70	82.3
# 80	78.0
# 100	73.5
# 200	30.9



REMARKS: UNWASHED

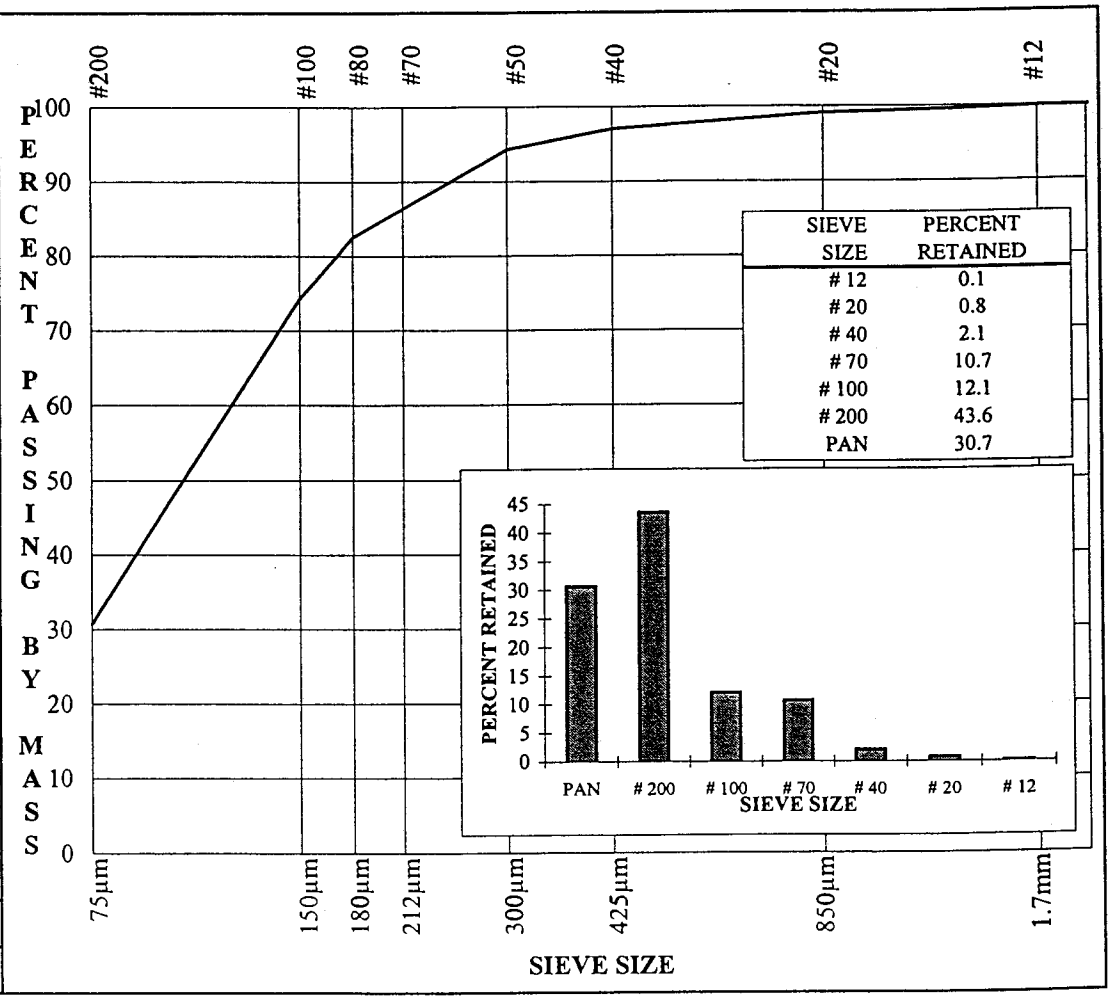
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #2

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	276.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.1
# 40	97.0
# 50	94.3
# 70	86.4
# 80	82.5
# 100	74.3
# 200	30.7



REMARKS: UNWASHED

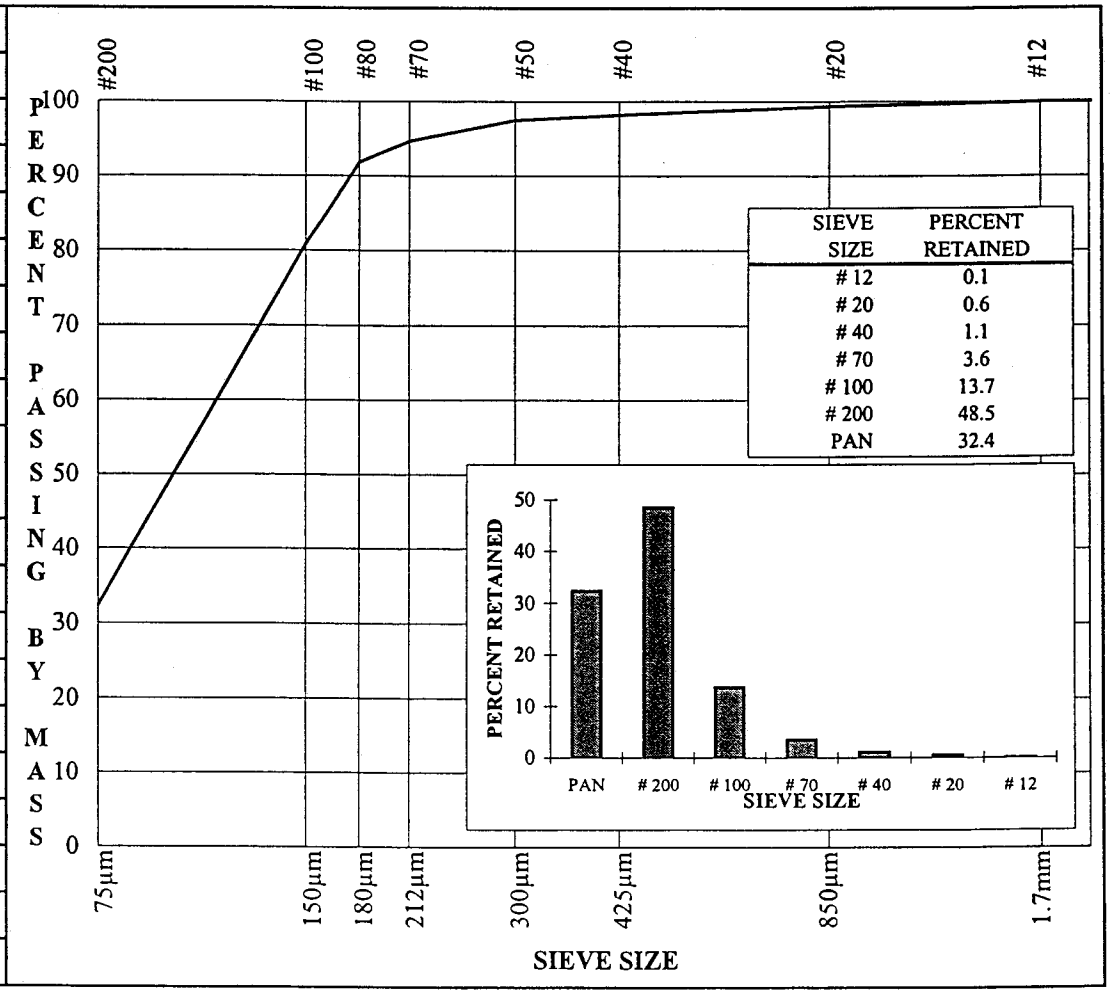
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #3

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	340.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.4
# 40	98.2
# 50	97.5
# 70	94.7
# 80	91.8
# 100	80.9
# 200	32.4



REMARKS: UNWASHED

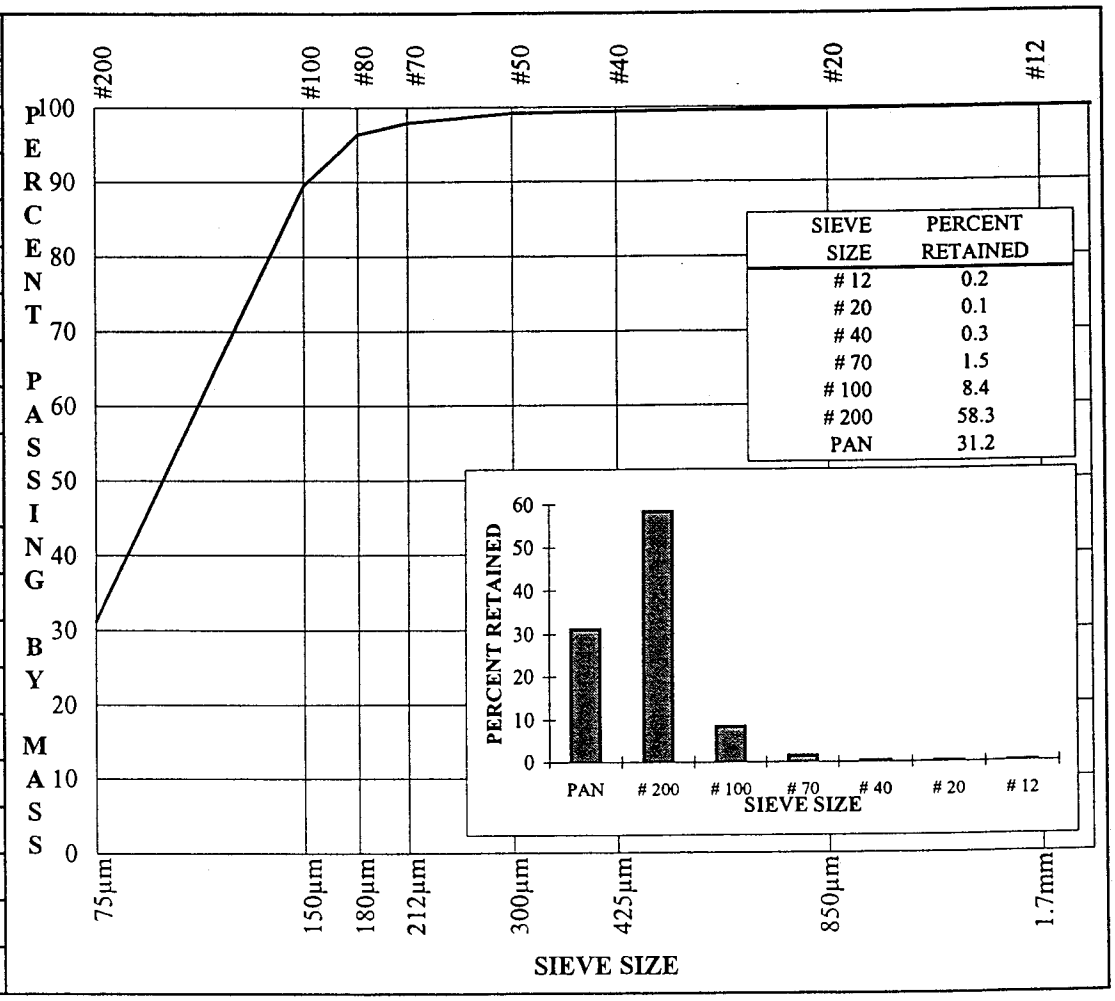
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #4

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	300.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	99.7
# 40	99.4
# 50	99.2
# 70	97.9
# 80	96.3
# 100	89.5
# 200	31.2



REMARKS: UNWASHED

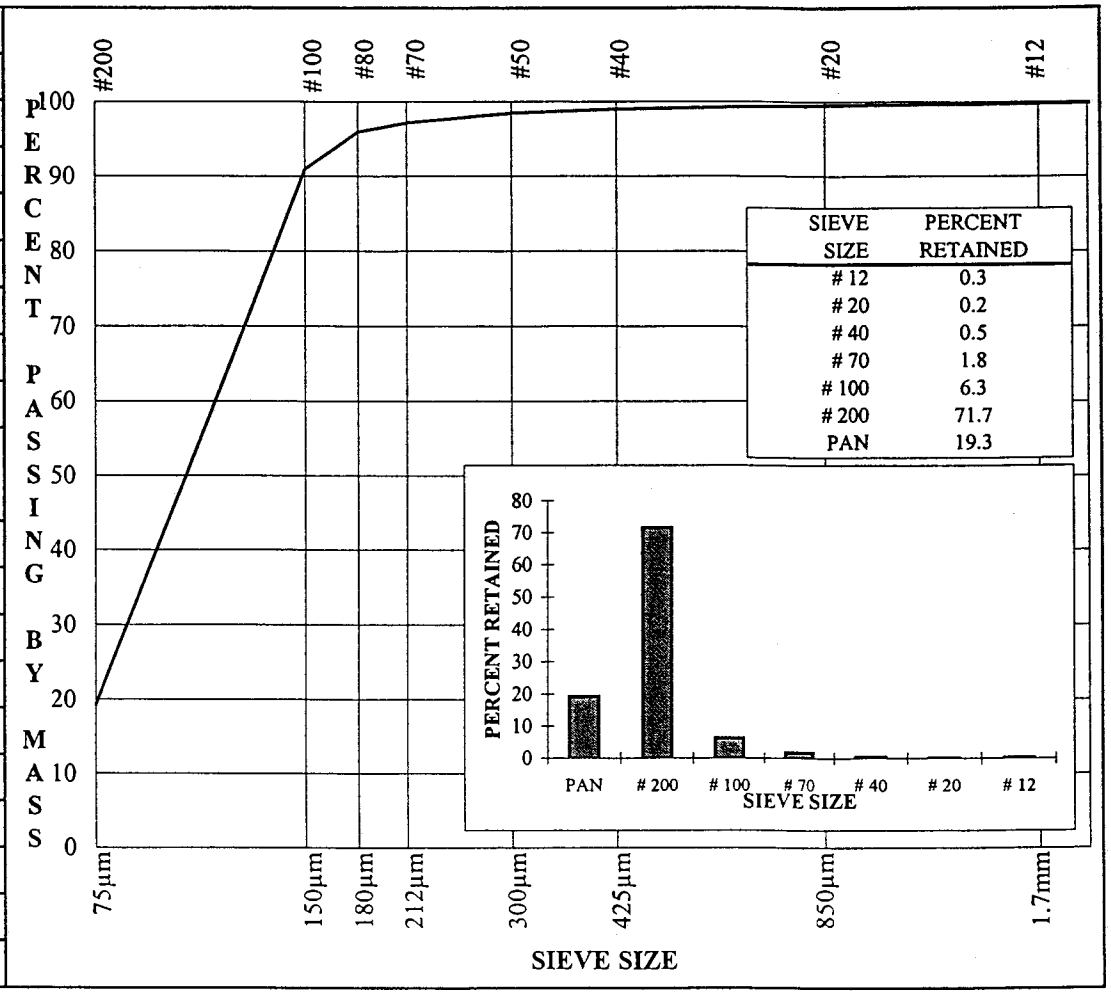
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #5

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	369.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.7
# 20	99.5
# 40	99.0
# 50	98.5
# 70	97.2
# 80	96.0
# 100	90.9
# 200	19.3



REMARKS: UNWASHED

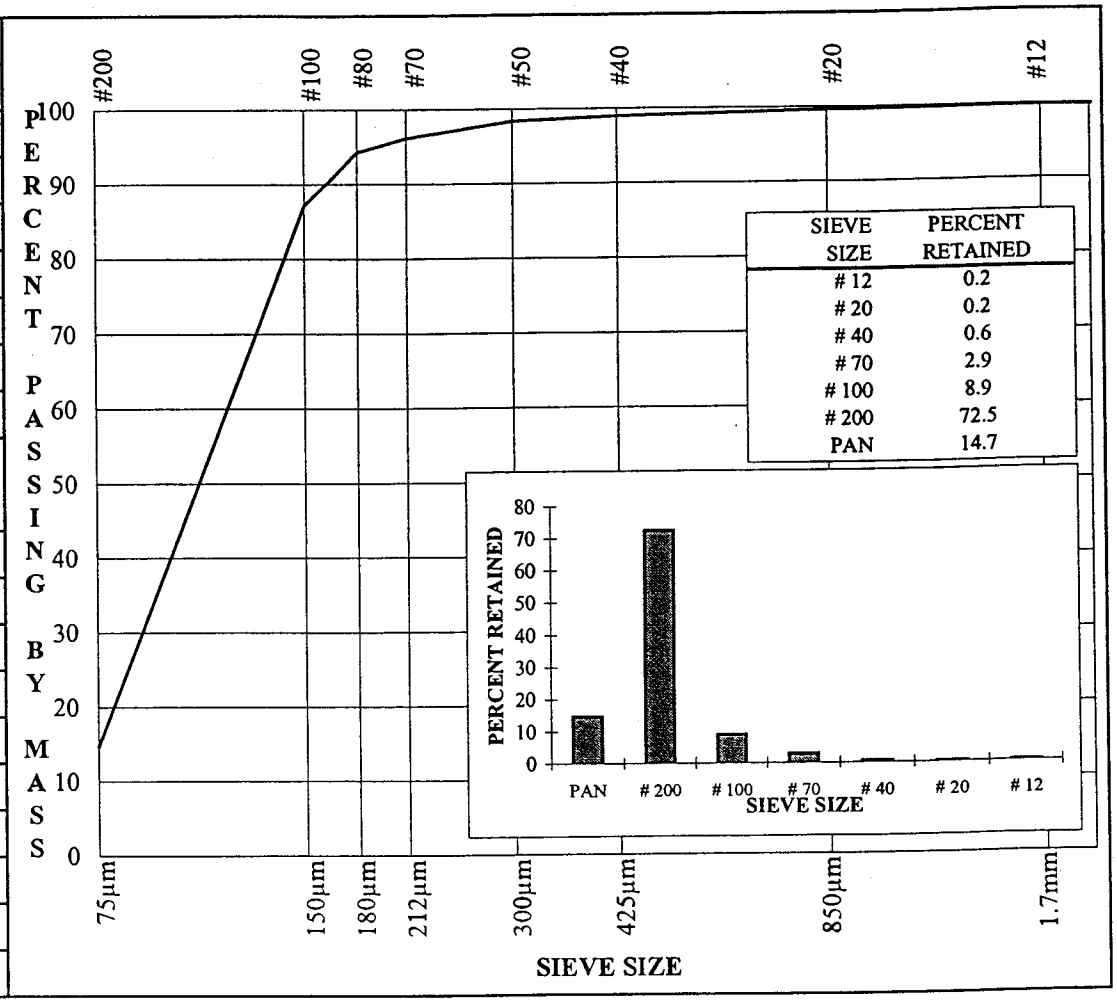
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #6

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	292.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	99.6
# 40	99.0
# 50	98.4
# 70	96.1
# 80	94.3
# 100	87.2
# 200	14.7



REMARKS: UNWASHED

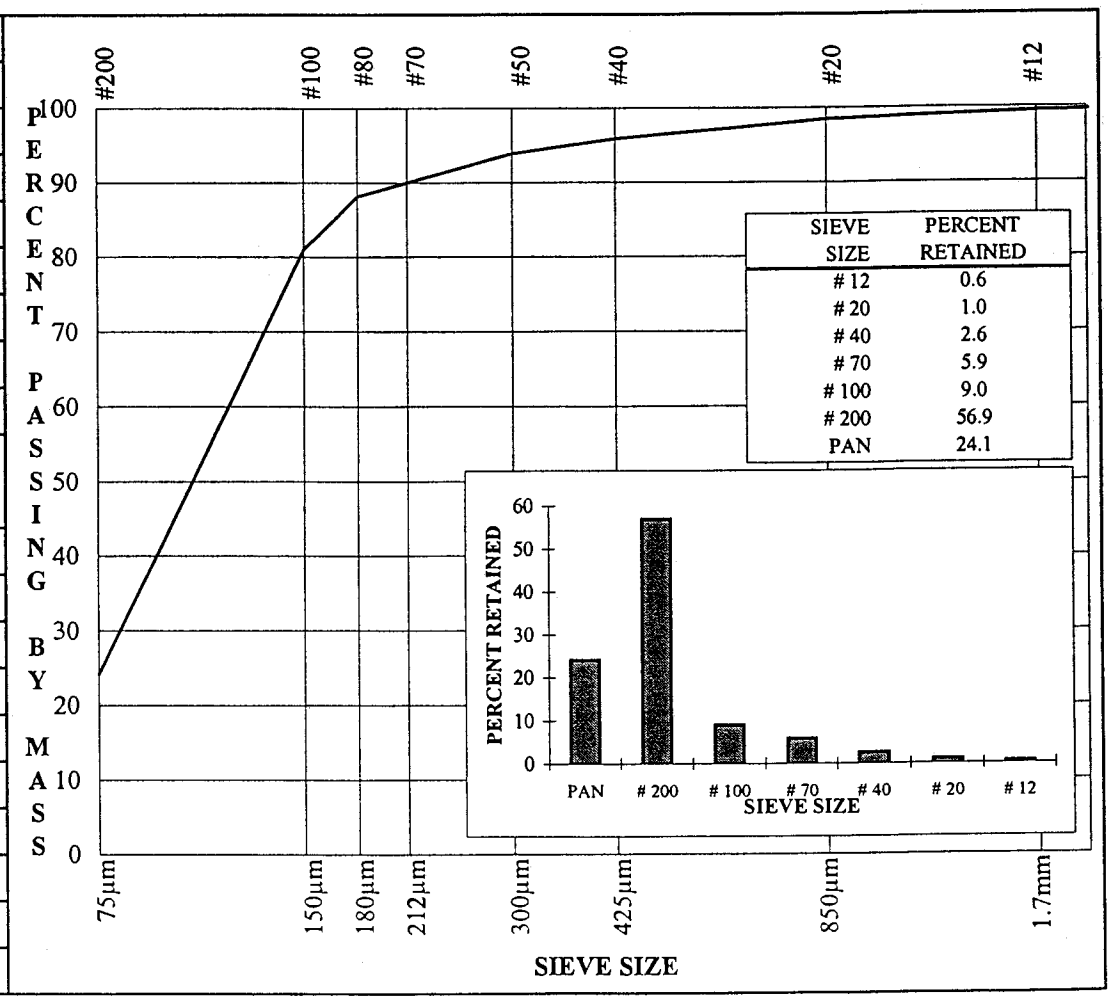
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #7

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	286.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.4
# 20	98.4
# 40	95.8
# 50	93.9
# 70	90.0
# 80	88.1
# 100	81.0
# 200	24.1



REMARKS: UNWASHED

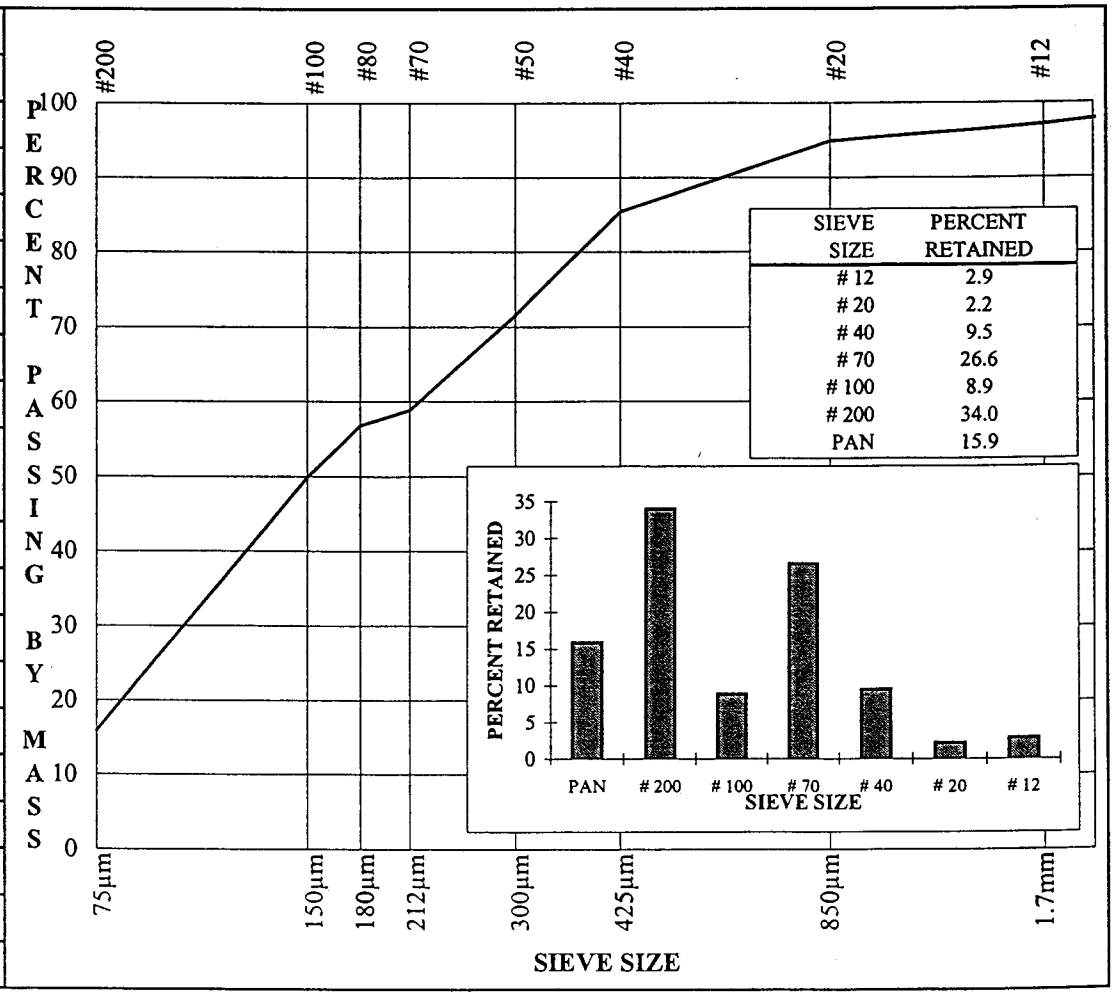
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #8

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	345.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	97.1
# 20	94.9
# 40	85.4
# 50	71.6
# 70	58.8
# 80	56.8
# 100	49.9
# 200	15.9



REMARKS: UNWASHED

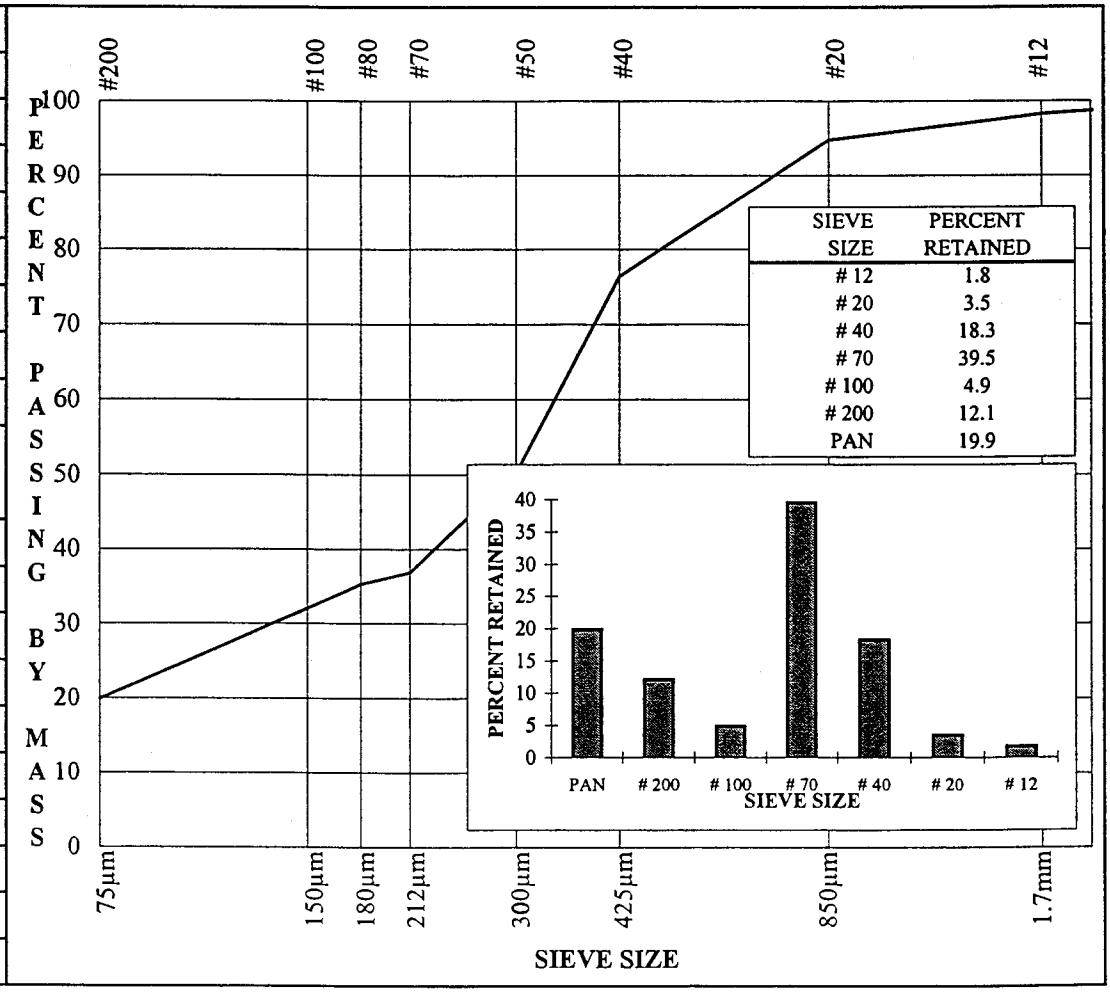
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #9

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	259.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.2
# 20	94.7
# 40	76.4
# 50	50.2
# 70	36.9
# 80	35.3
# 100	32.0
# 200	19.9



REMARKS: UNWASHED

REVIEWED BY: [redacted] P.Eng.

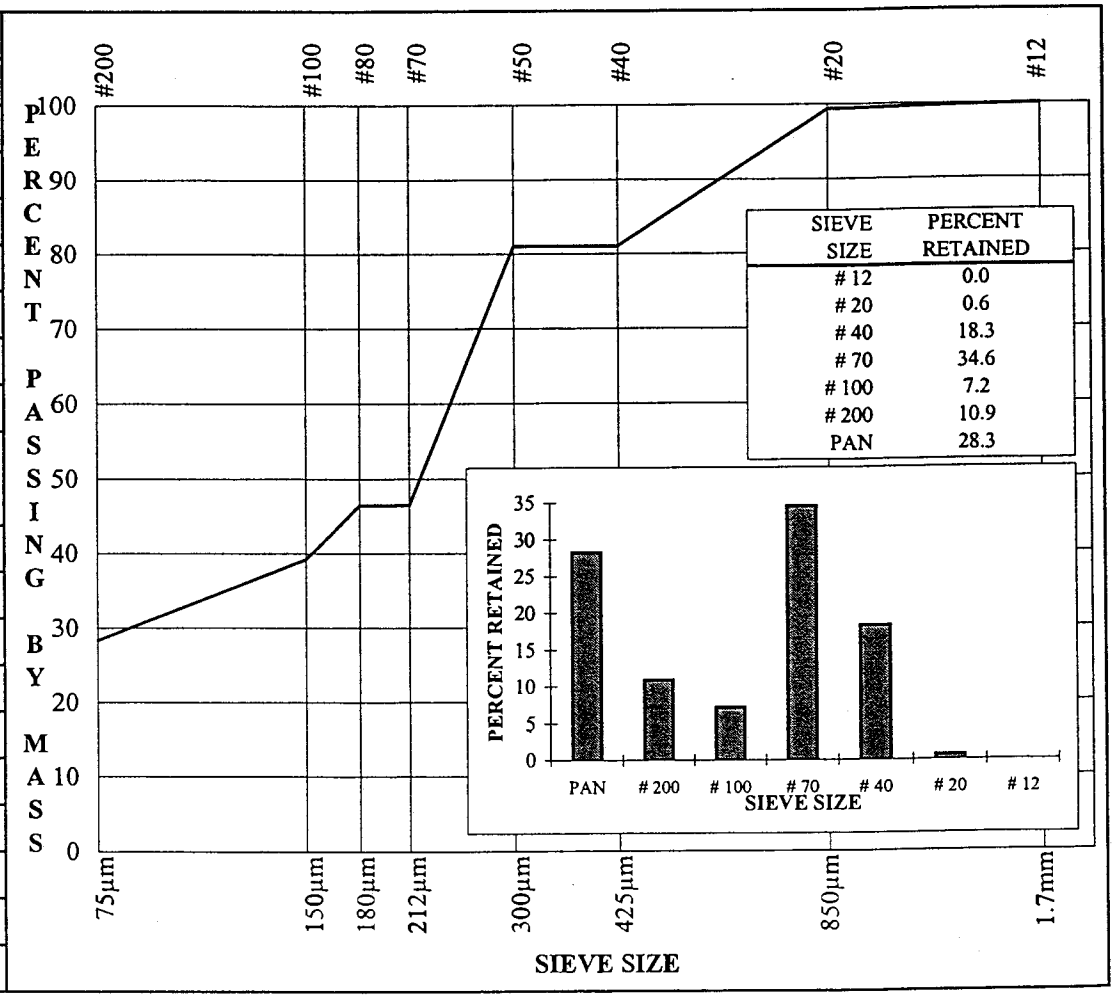
eba

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-03-09

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	1000.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.4
# 40	81.0
# 50	81.0
# 70	46.5
# 80	46.5
# 100	39.2
# 200	28.3



REMARKS: WASHED & SIEVED IN 2 PARTS

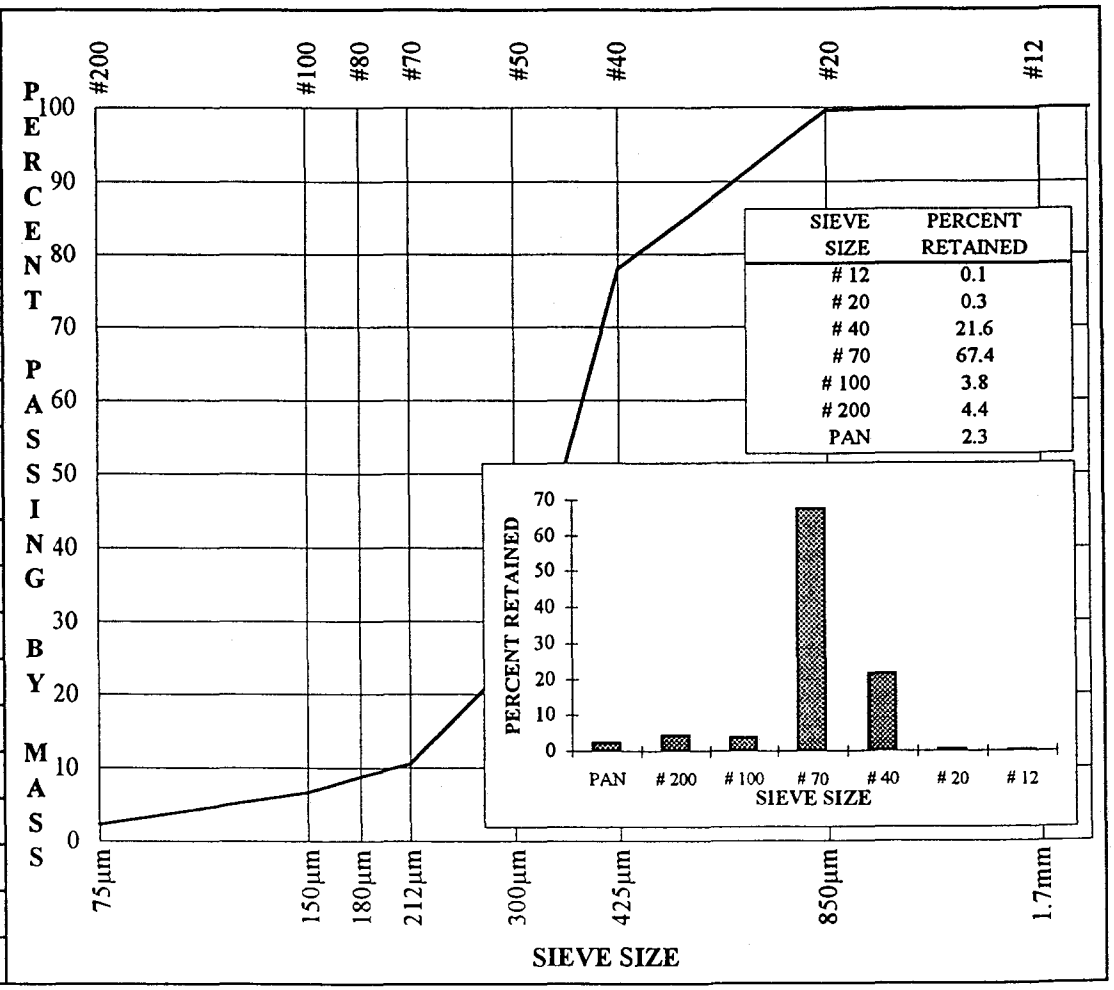
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-03-10

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	319.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.6
# 40	78.0
# 50	24.9
# 70	10.5
# 80	8.8
# 100	6.7
# 200	2.3



REMARKS: UNWASHED

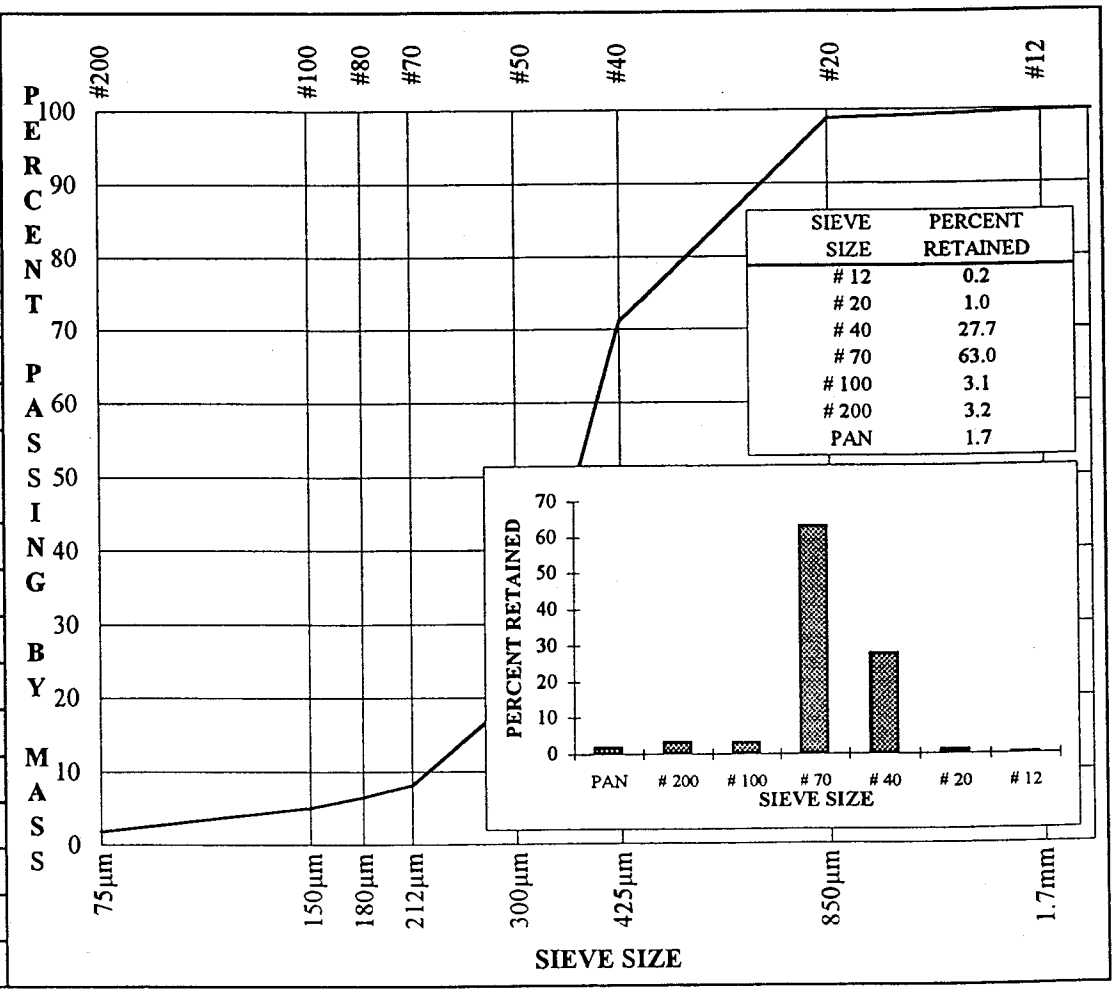
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-03-11

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	373.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	98.8
# 40	71.1
# 50	20.1
# 70	8.1
# 80	6.5
# 100	5.0
# 200	1.7



REMARKS: UNWASHED

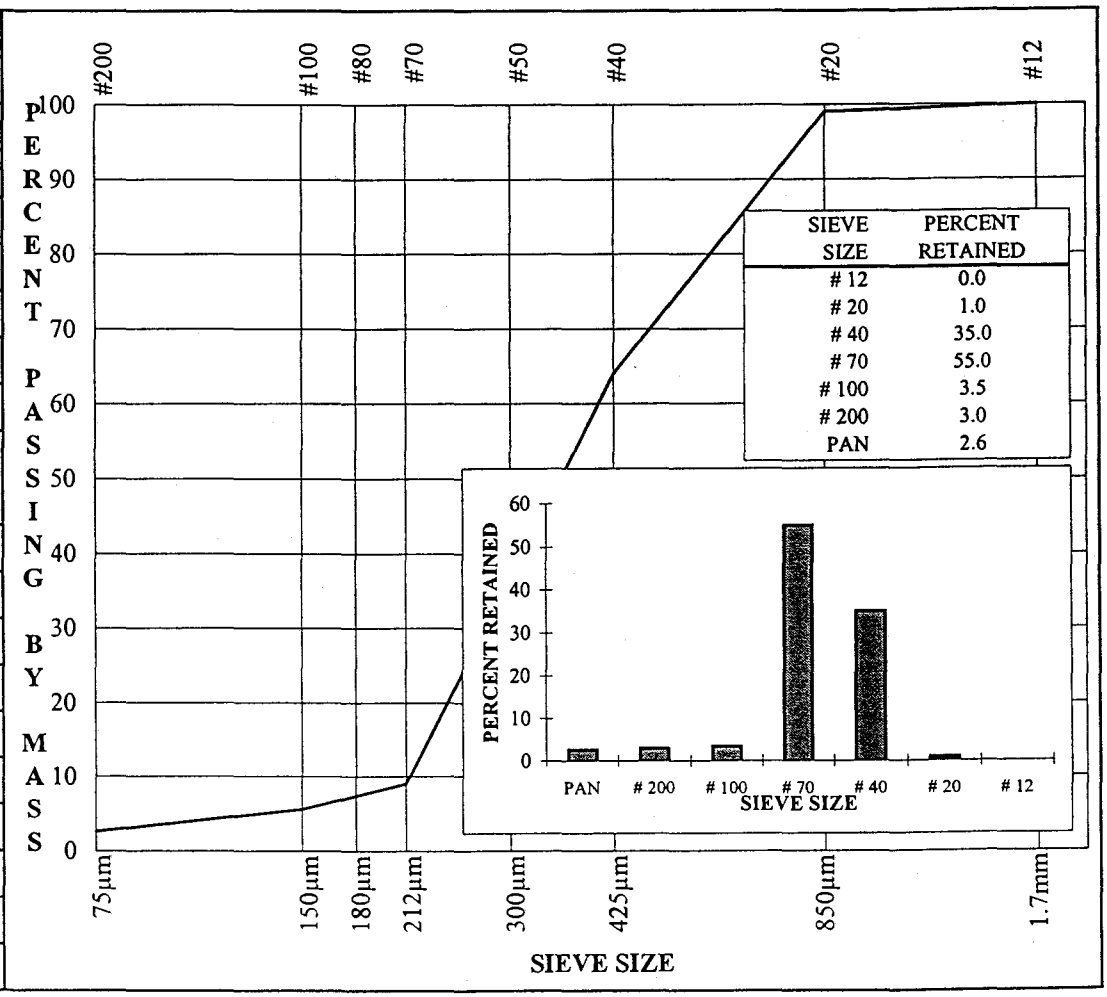
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-03-11

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	1000.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.0
# 40	64.0
# 50	
# 70	9.0
# 80	
# 100	5.6
# 200	2.6



REMARKS: WASHED & SIEVED IN 2 PARTS

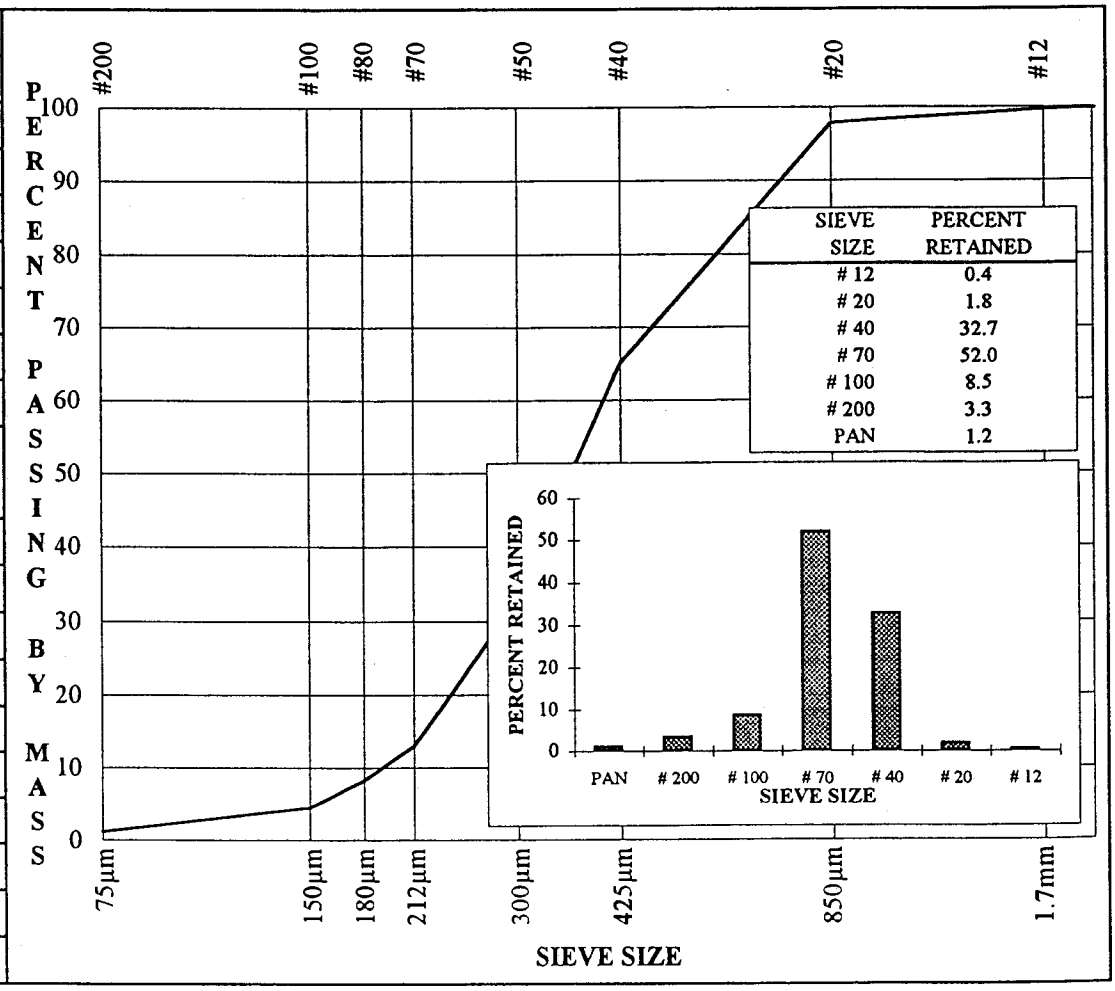
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-03-13

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	330.1
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	97.8
# 40	65.1
# 50	33.1
# 70	13.0
# 80	8.3
# 100	4.5
# 200	1.2



REMARKS: UNWASHED

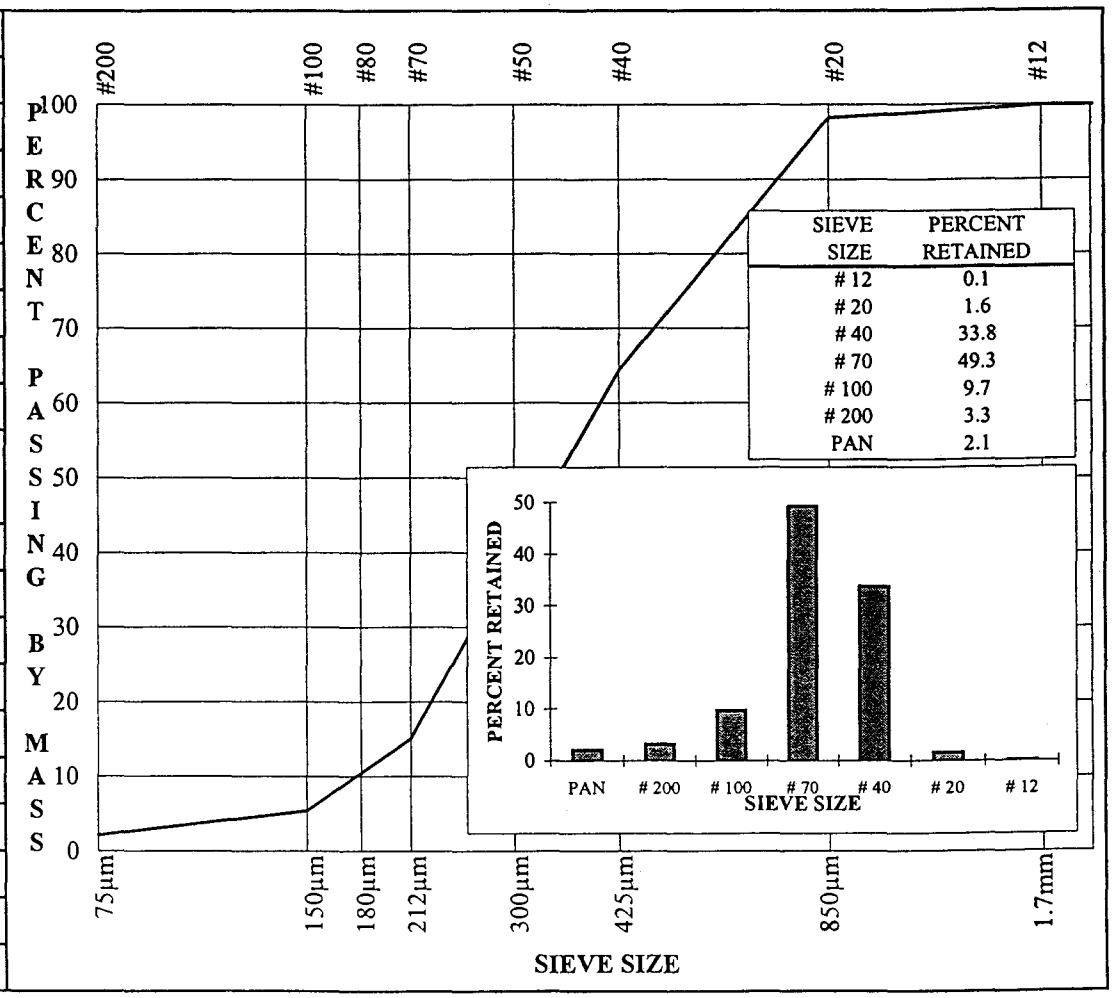
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-03-13

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	1000.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	98.2
# 40	64.4
# 50	
# 70	15.1
# 80	
# 100	5.4
# 200	2.1



REMARKS: WASHED & SIEVED IN 2 PARTS

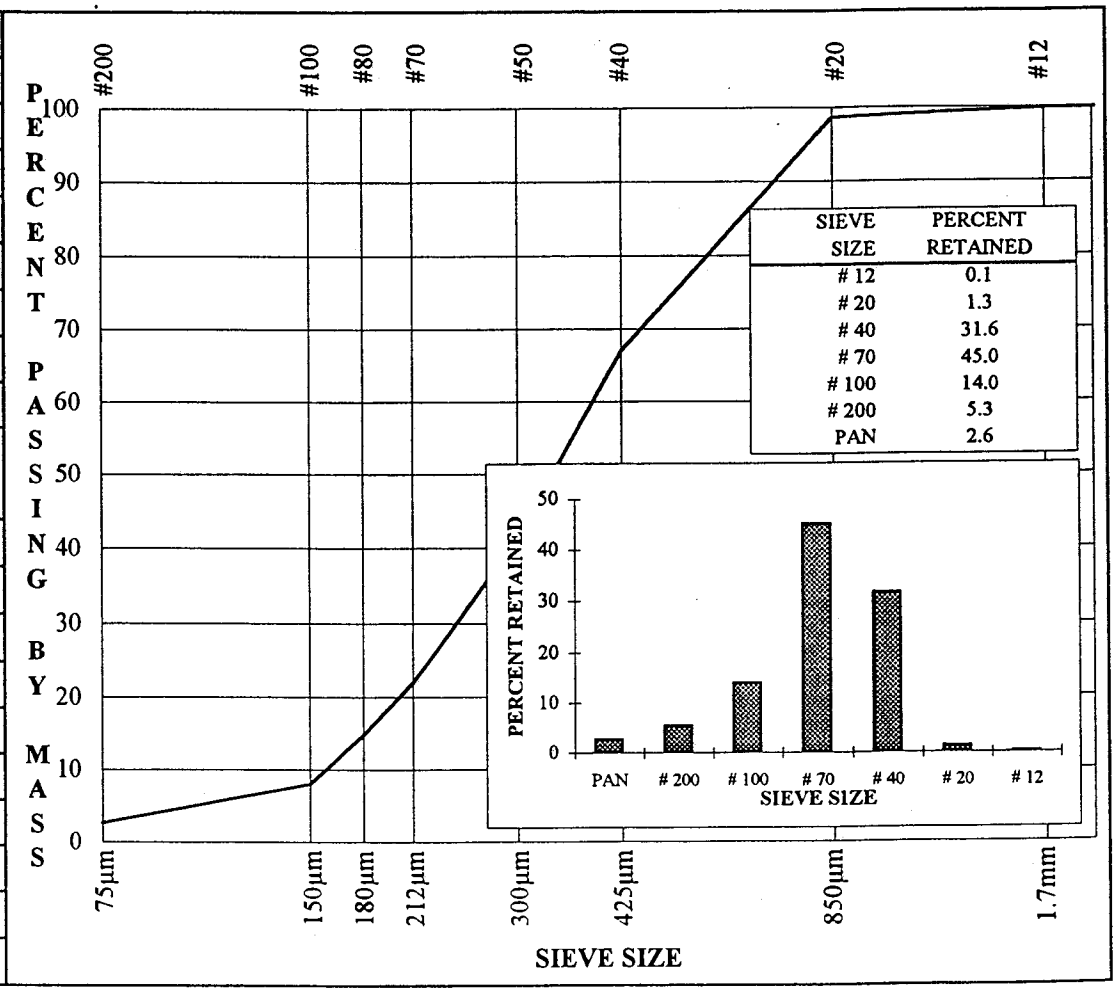
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-03-14

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	140.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	98.6
# 40	67.0
# 50	41.0
# 70	22.0
# 80	14.7
# 100	8.0
# 200	2.6



REMARKS: UNWASHED, ENTIRE SAMPLE USED.

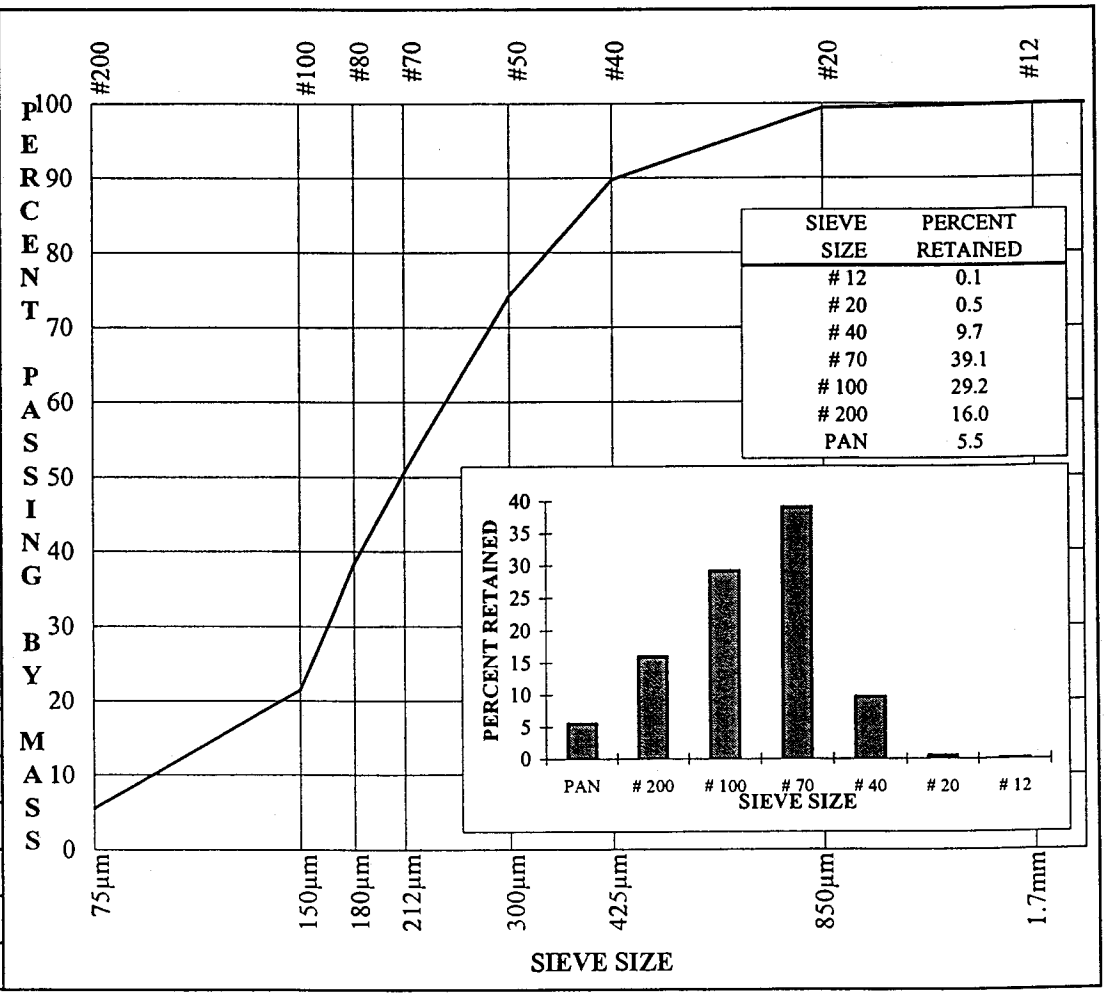
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #15

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	298.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.4
# 40	89.7
# 50	74.3
# 70	50.7
# 80	38.4
# 100	21.5
# 200	5.5



REMARKS: UNWASHED

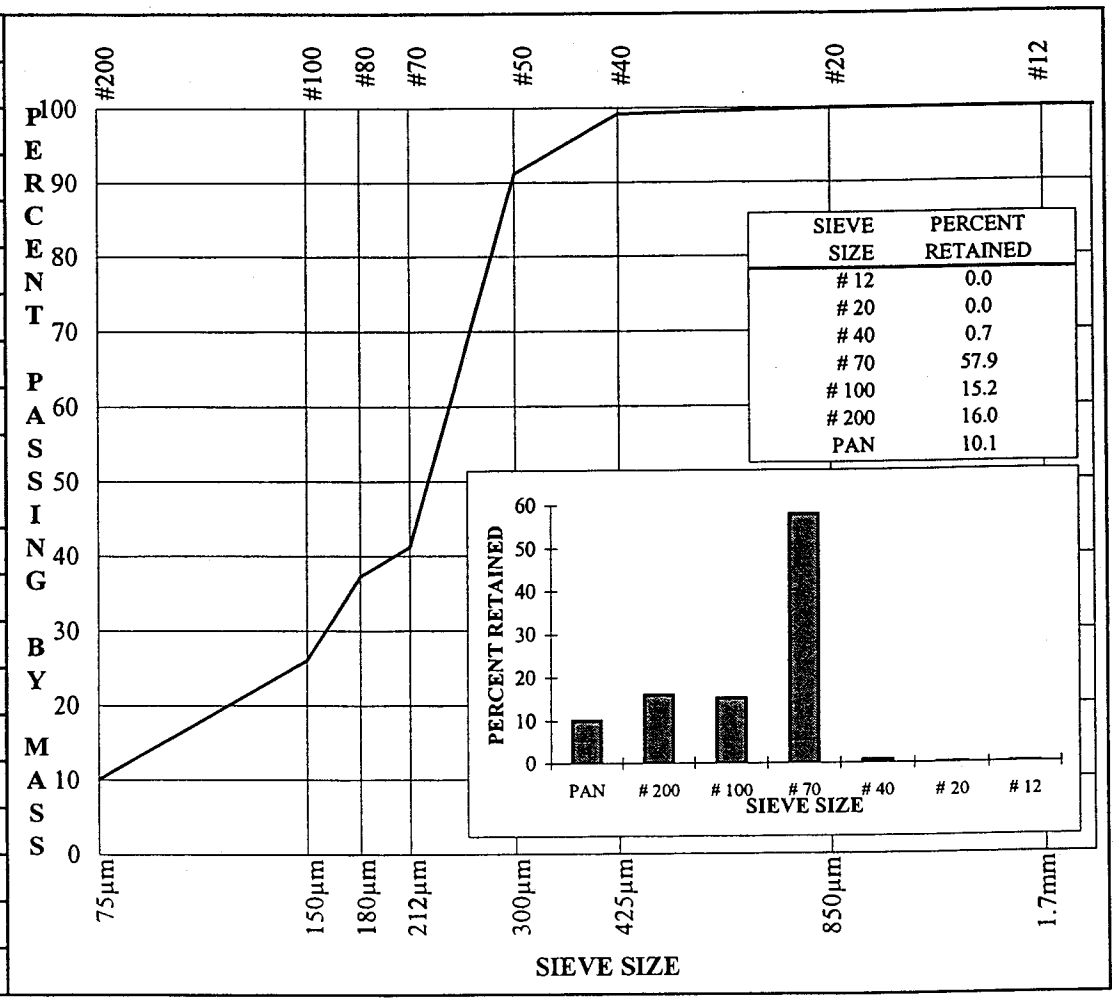
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #16

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	255.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	99.9
# 40	99.2
# 50	91.2
# 70	41.3
# 80	37.3
# 100	26.1
# 200	10.1



REMARKS: UNWASHED

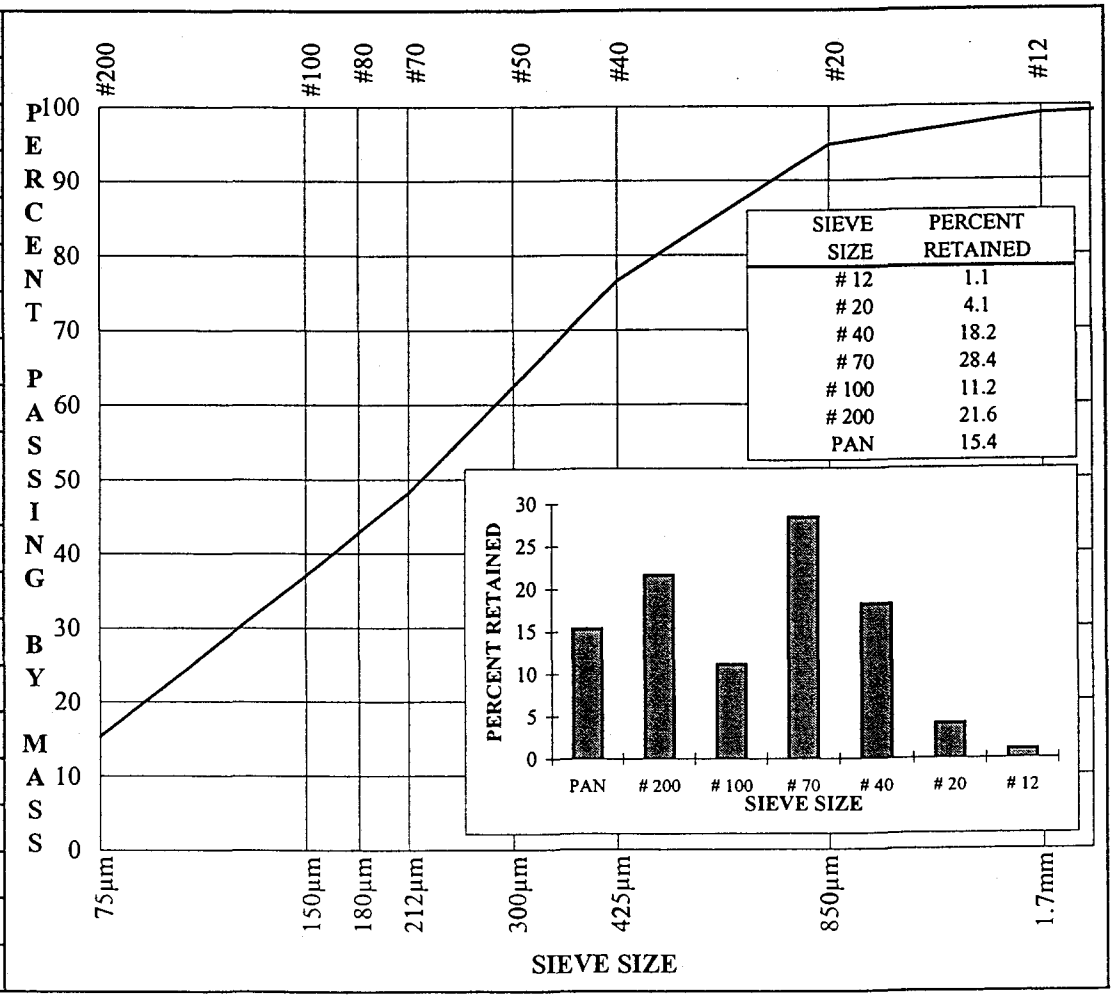
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-2-01

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	328.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.9
# 20	94.8
# 40	76.6
# 50	62.5
# 70	48.2
# 80	42.8
# 100	37.0
# 200	15.4



REMARKS: UNWASHED

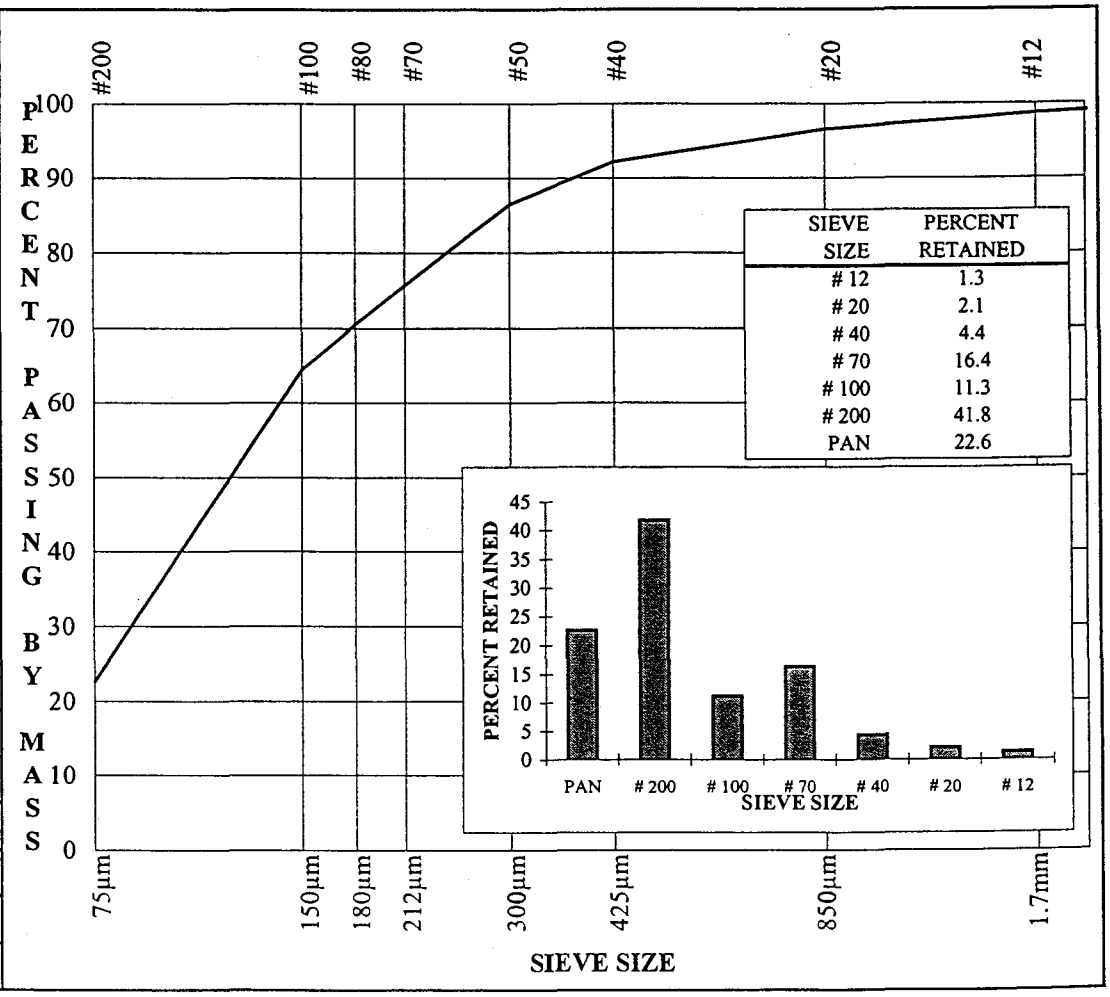
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-2 #2

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	309.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.7
# 20	96.5
# 40	92.1
# 50	86.5
# 70	75.7
# 80	70.5
# 100	64.5
# 200	22.6



REMARKS: UNWASHED

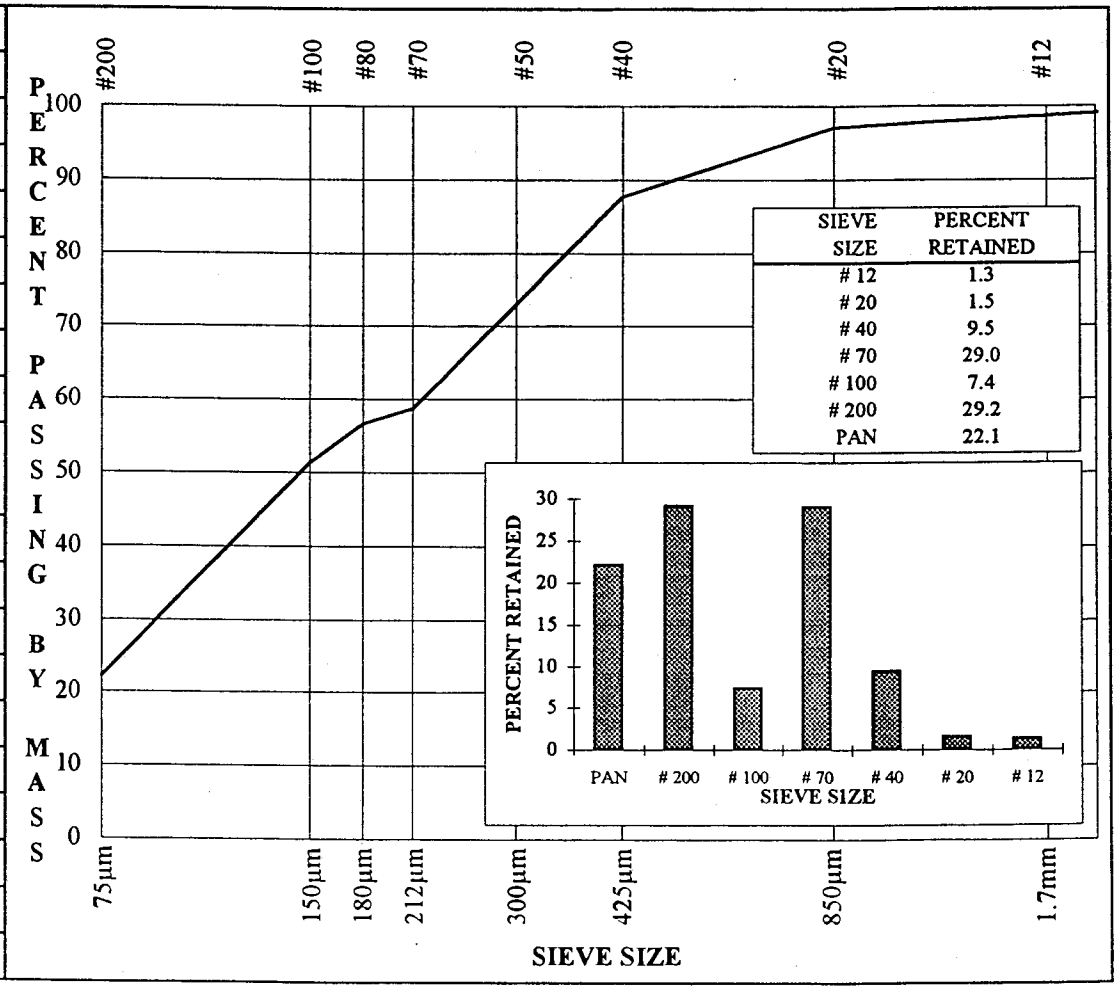
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-03

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	305.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.7
# 20	97.1
# 40	87.7
# 50	73.0
# 70	58.7
# 80	56.6
# 100	51.3
# 200	22.1



REMARKS: UNWASHED

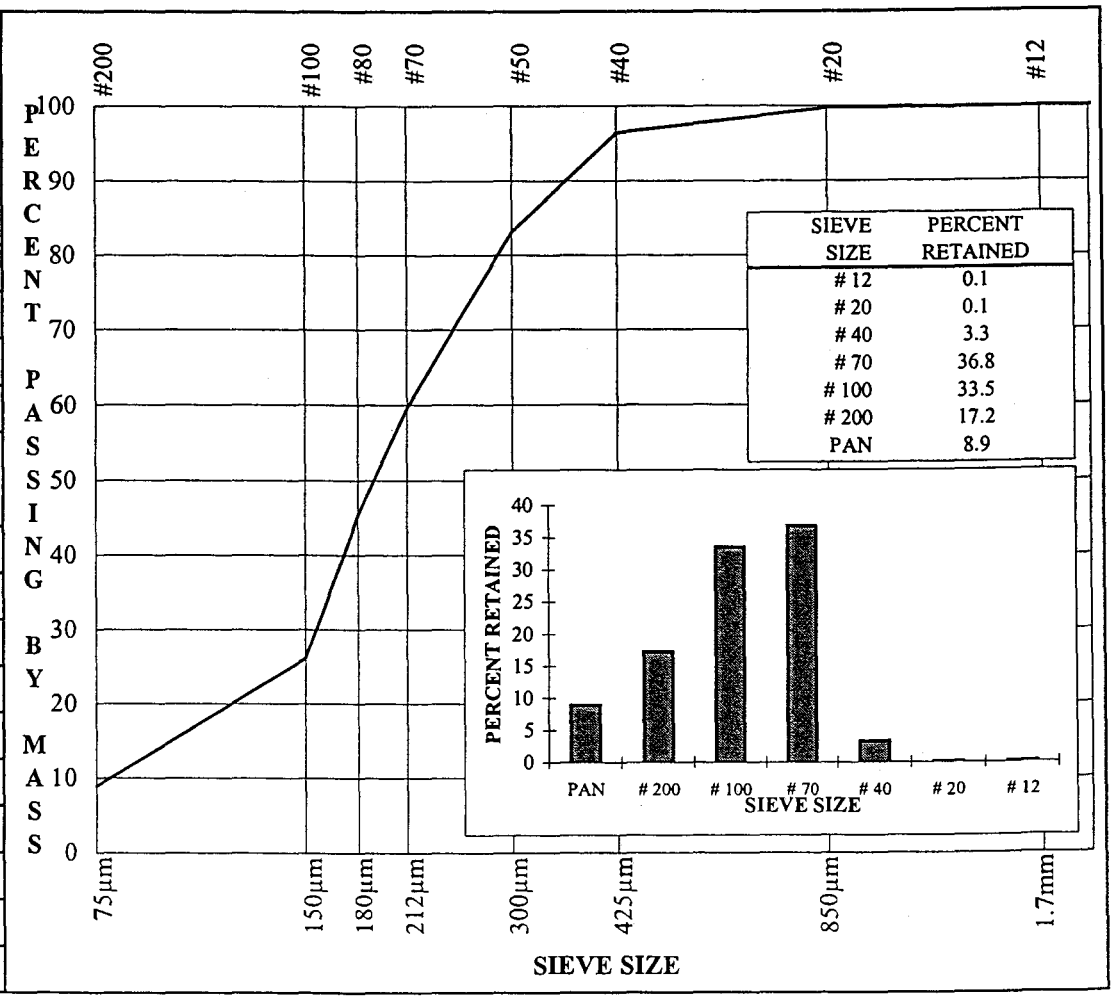
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-2-04

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	367.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.7
# 40	96.4
# 50	83.1
# 70	59.6
# 80	45.3
# 100	26.1
# 200	8.9



REMARKS: UNWASHED

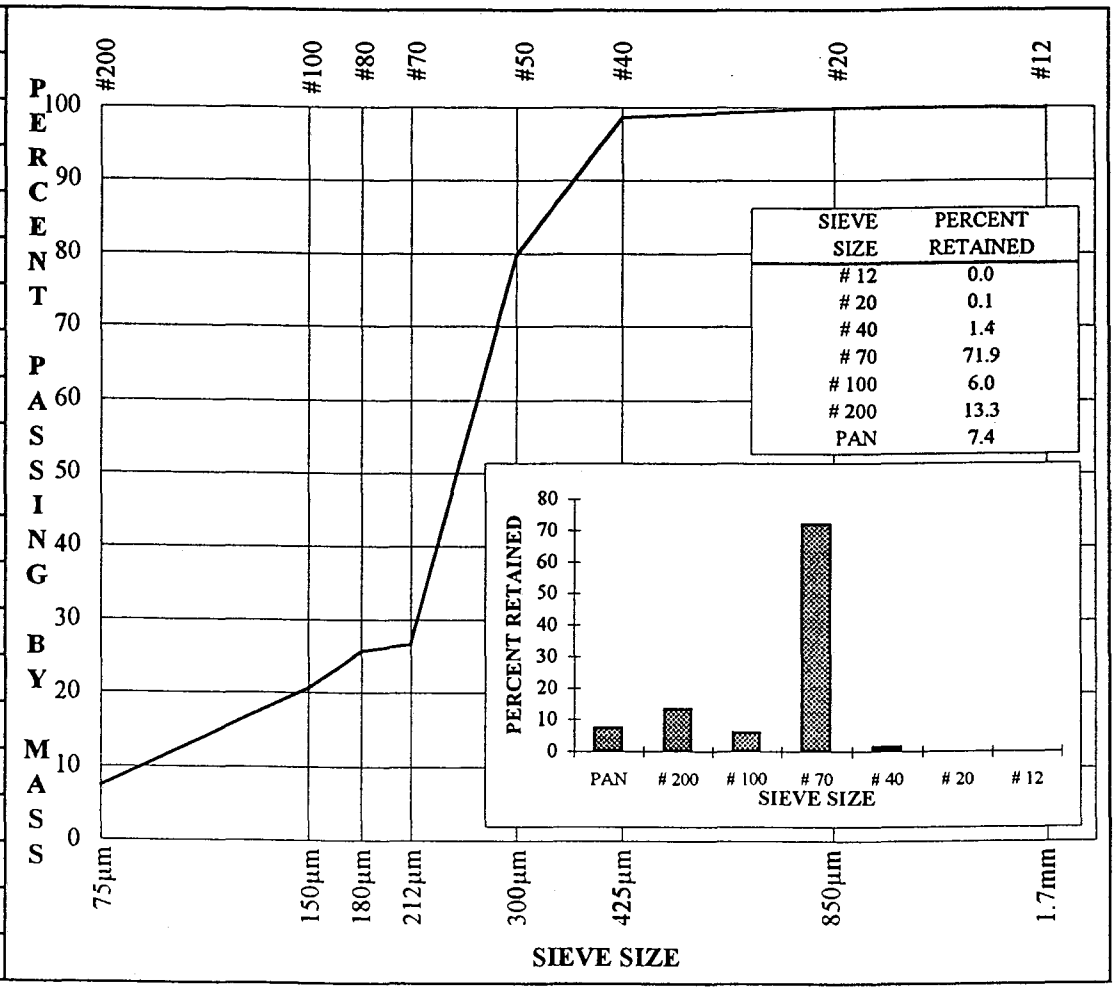
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-02-05

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	314.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.9
# 40	98.6
# 50	79.7
# 70	26.7
# 80	25.6
# 100	20.7
# 200	7.4



REMARKS: UNWASHED

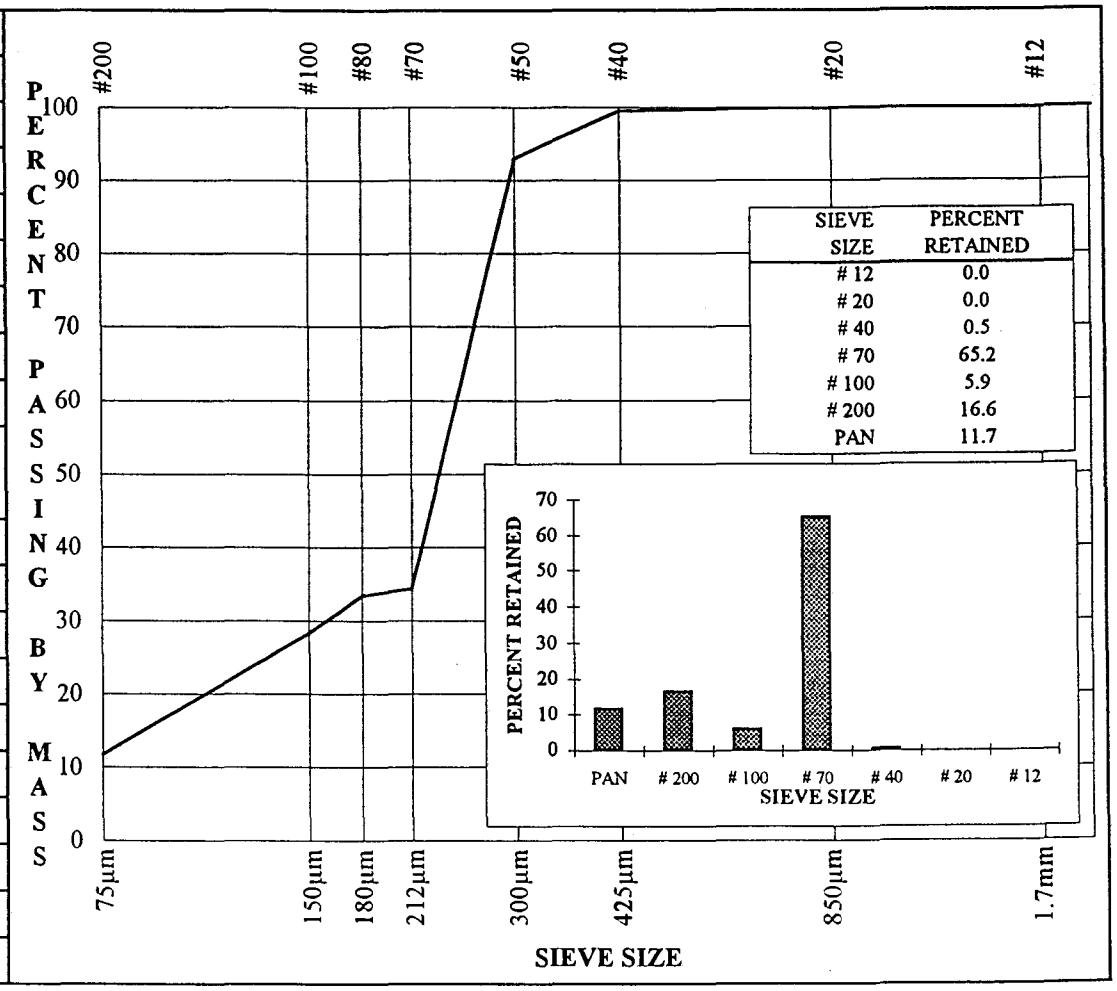
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-02-06

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	346.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	99.9
# 40	99.5
# 50	92.8
# 70	34.2
# 80	33.3
# 100	28.3
# 200	11.7



REMARKS: UNWASHED

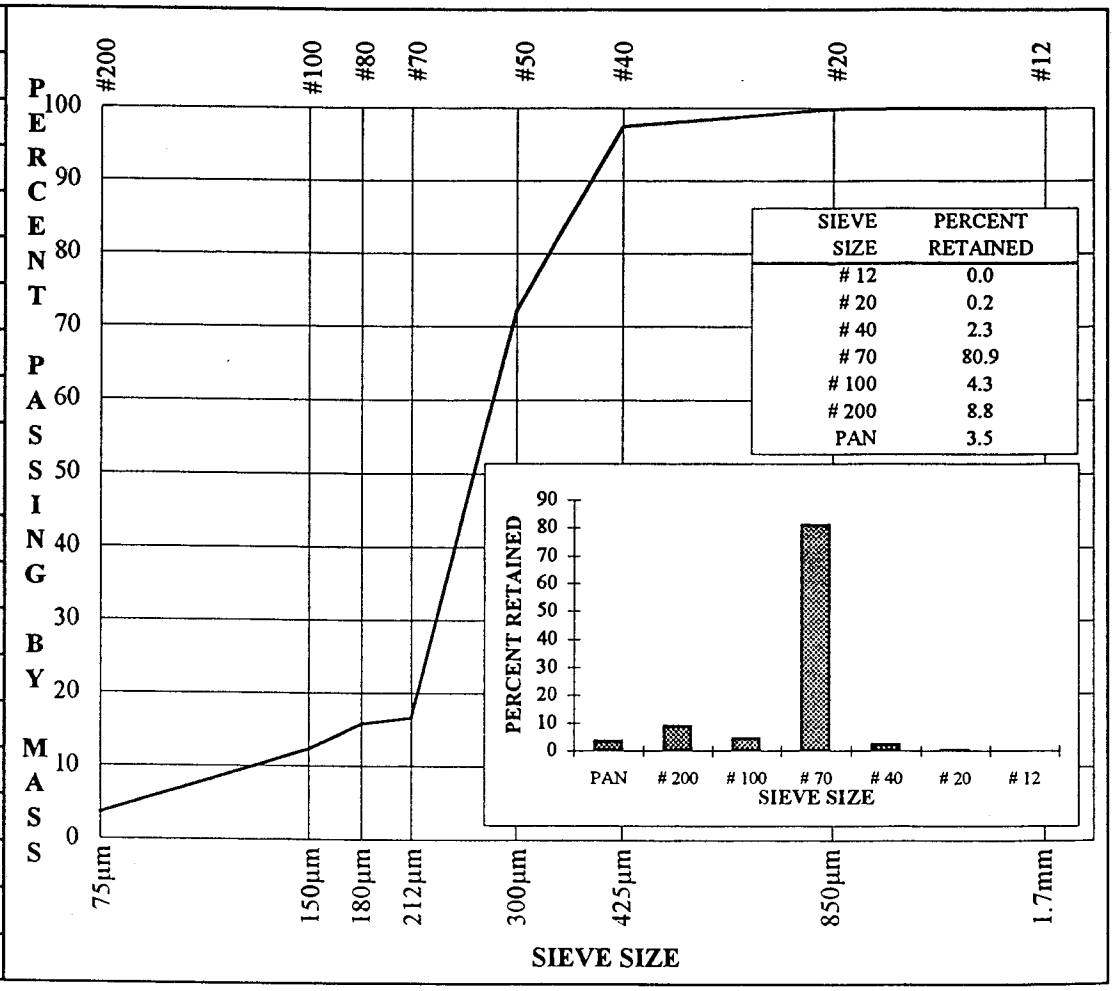
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-02-07

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	330.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.8
# 40	97.5
# 50	72.2
# 70	16.6
# 80	15.7
# 100	12.3
# 200	3.5



REMARKS: UNWASHED

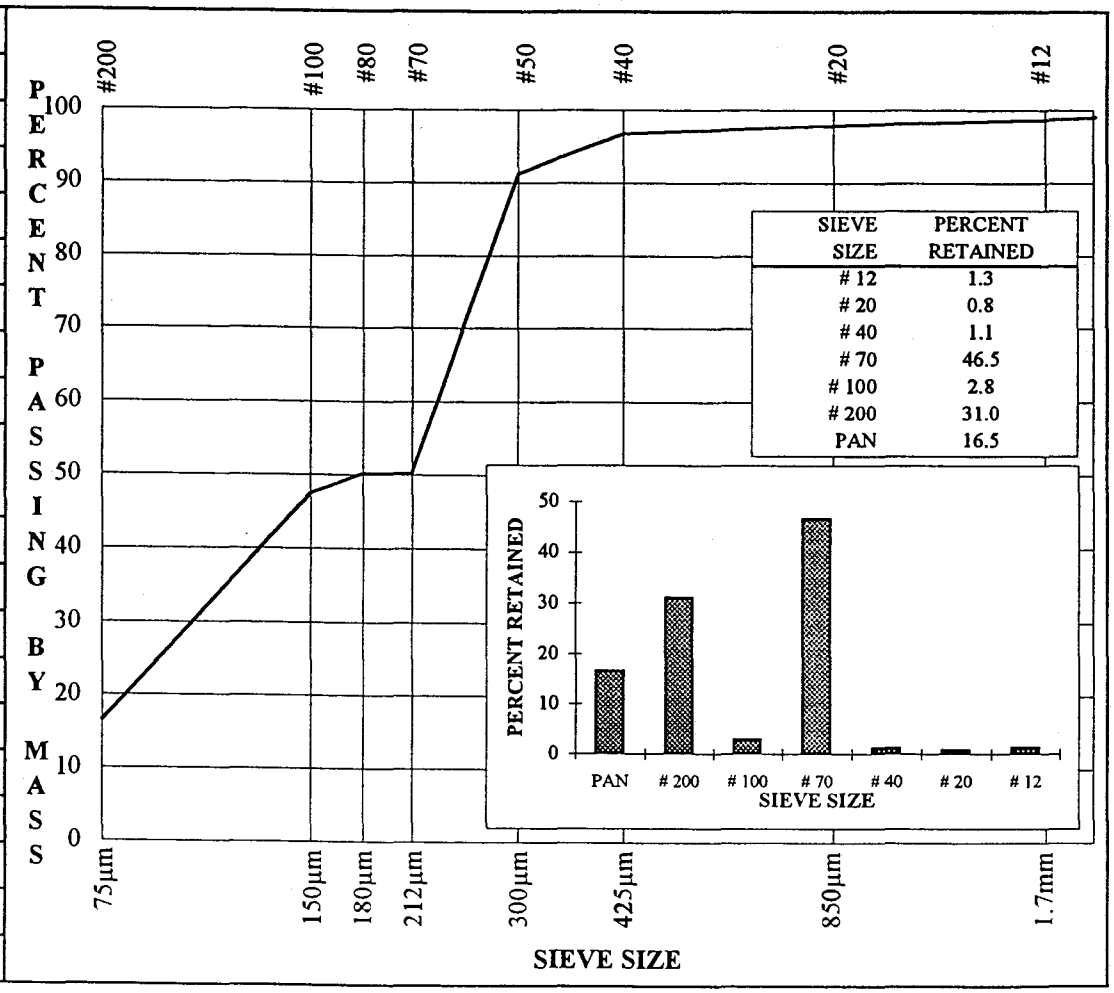
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-02-08

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	354.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.7
# 20	97.9
# 40	96.8
# 50	91.3
# 70	50.2
# 80	50.2
# 100	47.5
# 200	16.5



REMARKS: UNWASHED

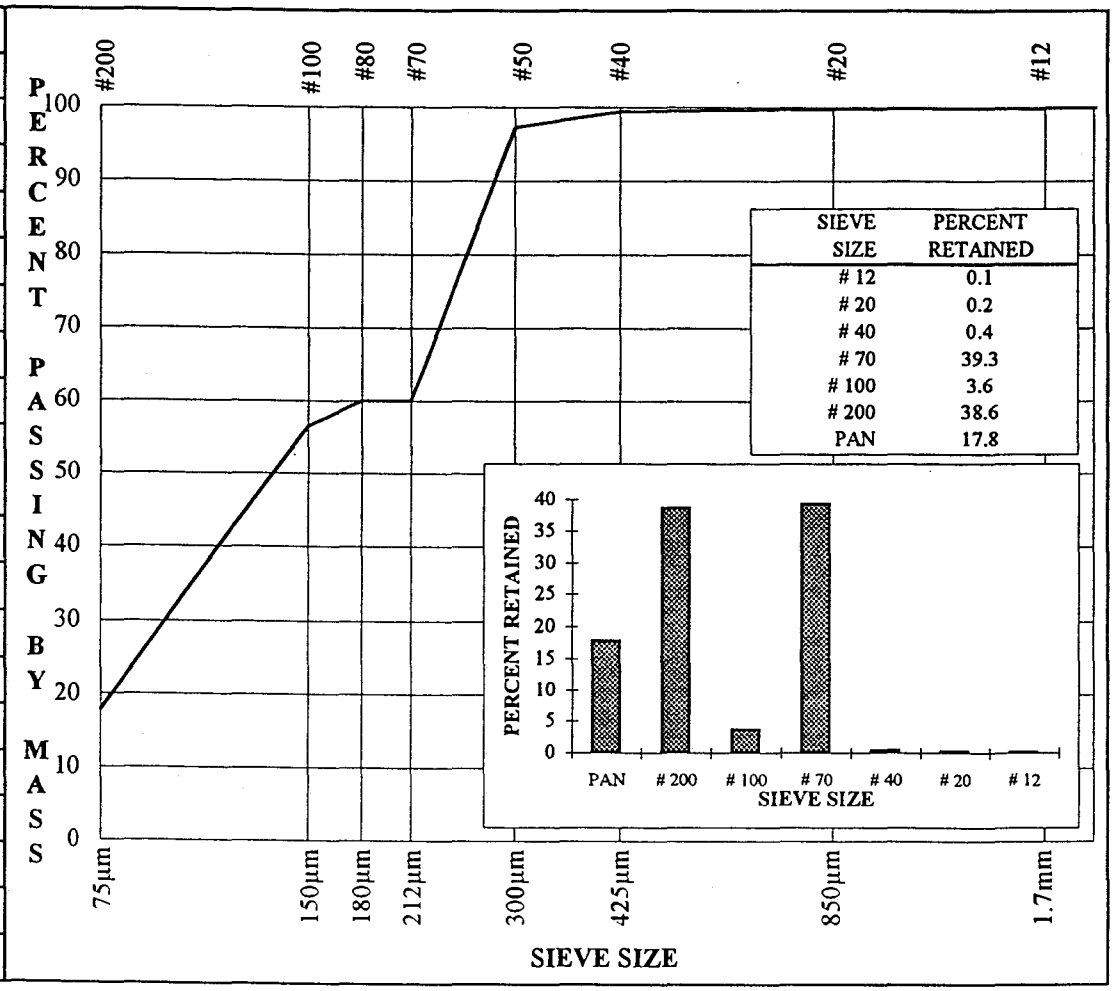
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-09

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	255.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.8
# 40	99.4
# 50	97.2
# 70	60.1
# 80	60.0
# 100	56.5
# 200	17.8



REMARKS: UNWASHED

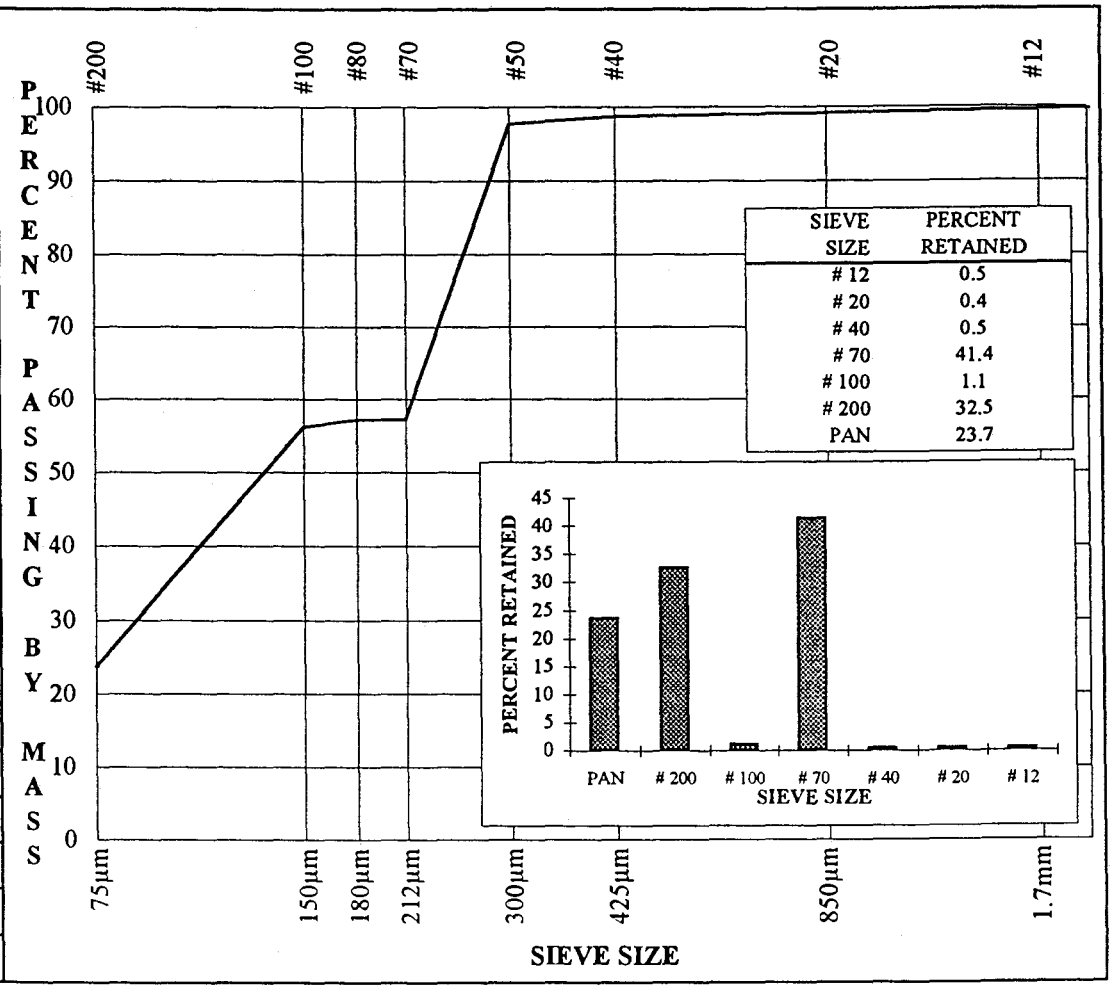
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-10

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	326.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.5
# 20	99.1
# 40	98.7
# 50	97.6
# 70	57.3
# 80	57.2
# 100	56.2
# 200	23.7



REMARKS: UNWASHED

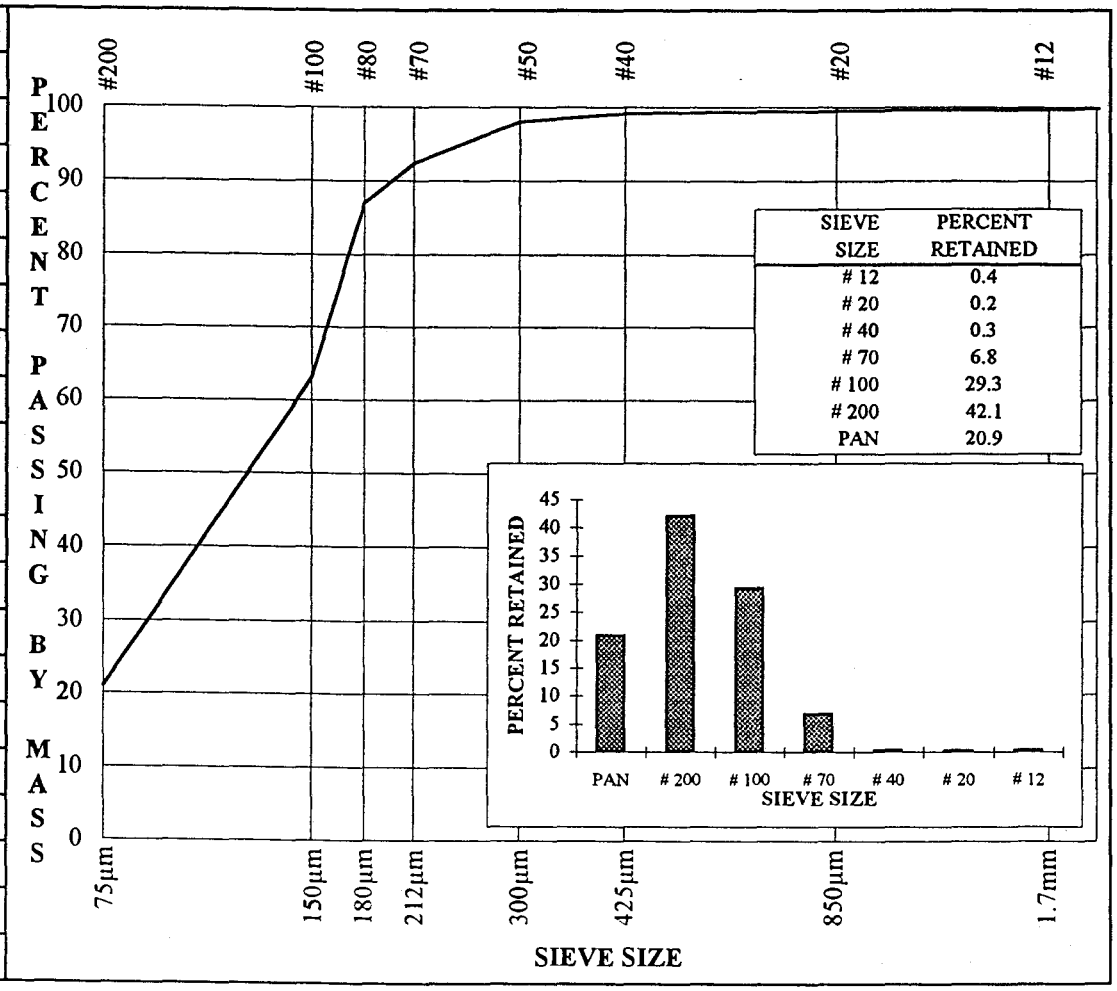
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-11

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	299.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	99.4
# 40	99.1
# 50	98.0
# 70	92.3
# 80	86.9
# 100	63.0
# 200	20.9



REMARKS: UNWASHED

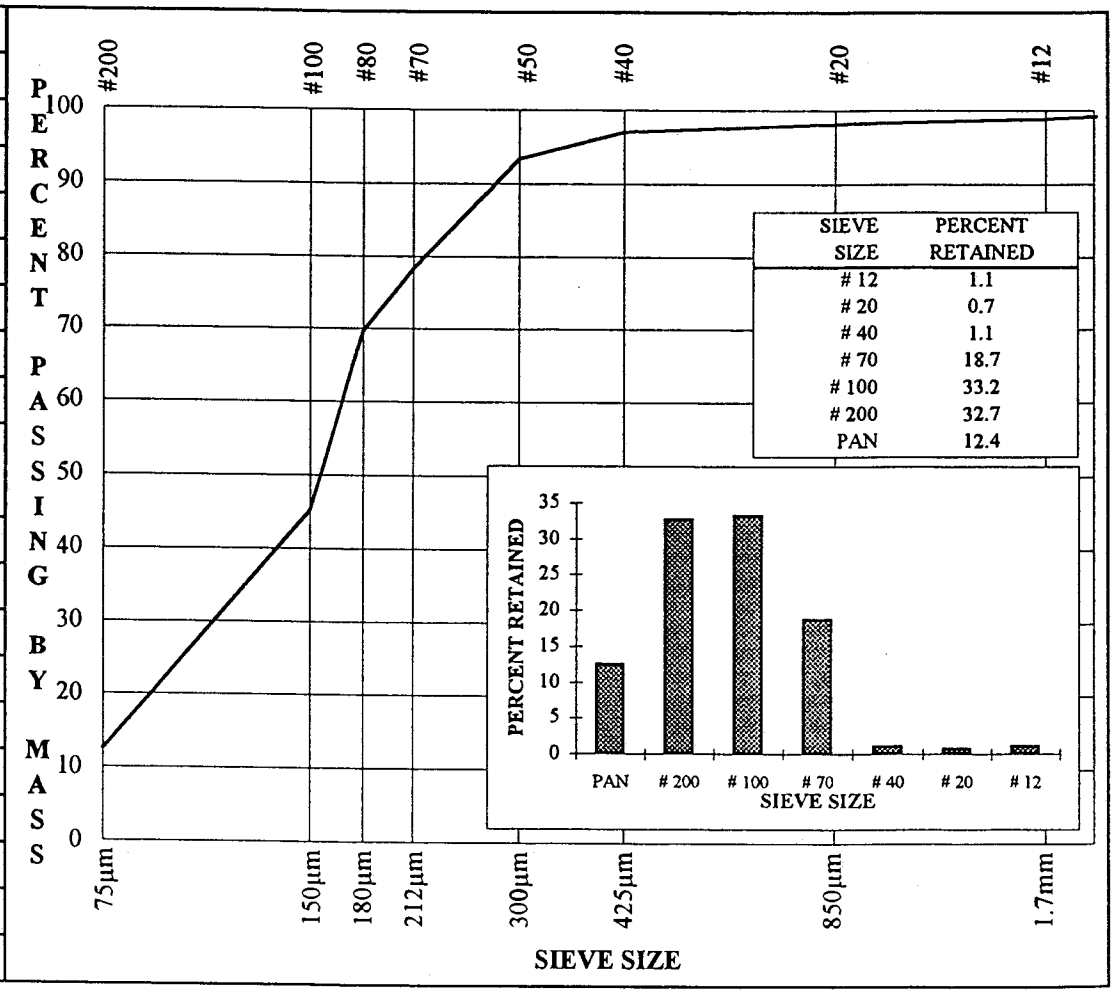
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-12

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	378.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.9
# 20	98.2
# 40	97.0
# 50	93.3
# 70	78.3
# 80	69.7
# 100	45.1
# 200	12.4



REMARKS: UNWASHED

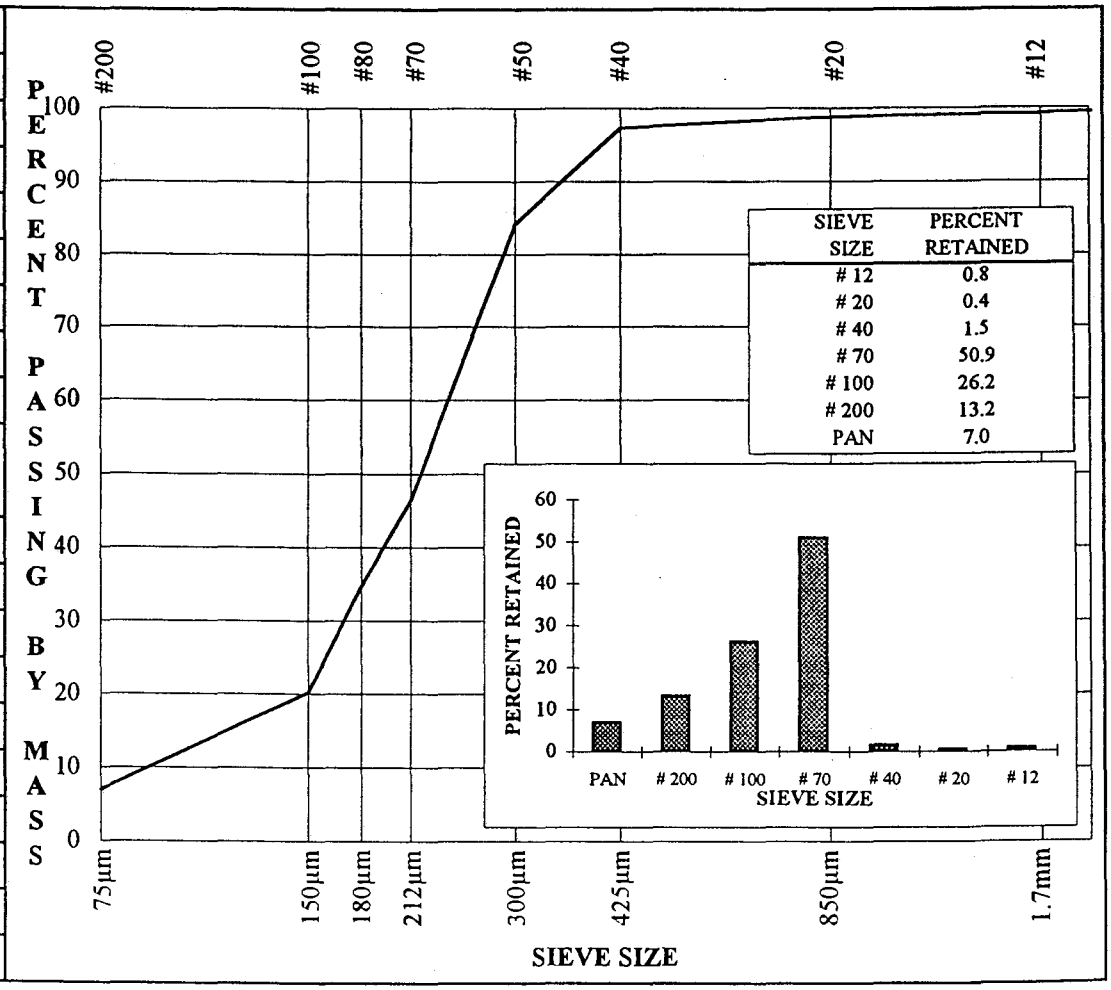
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-13

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	320.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.2
# 20	98.8
# 40	97.3
# 50	84.1
# 70	46.3
# 80	34.7
# 100	20.2
# 200	7.0



REMARKS: UNWASHED

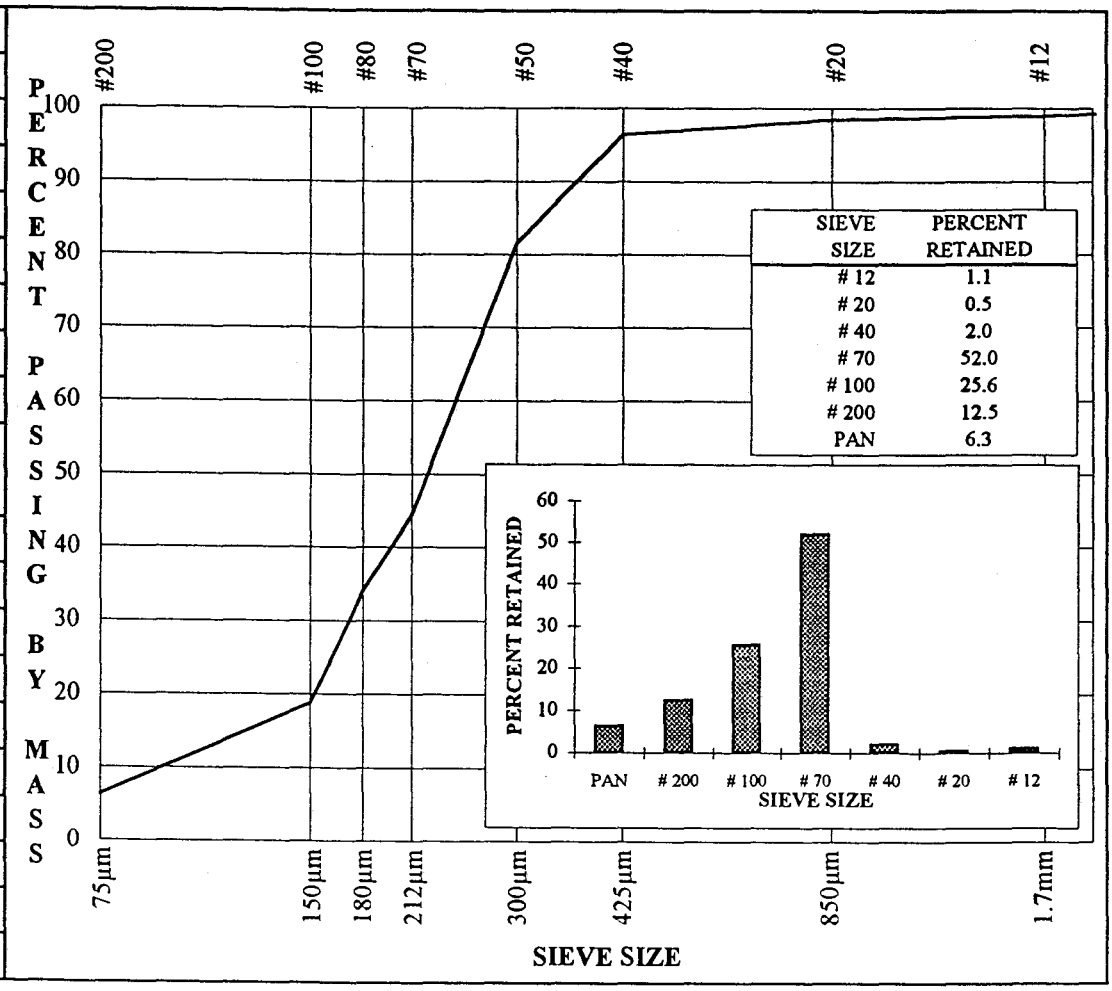
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-14

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	373.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.9
# 20	98.4
# 40	96.4
# 50	81.5
# 70	44.4
# 80	33.9
# 100	18.8
# 200	6.3



REMARKS: UNWASHED

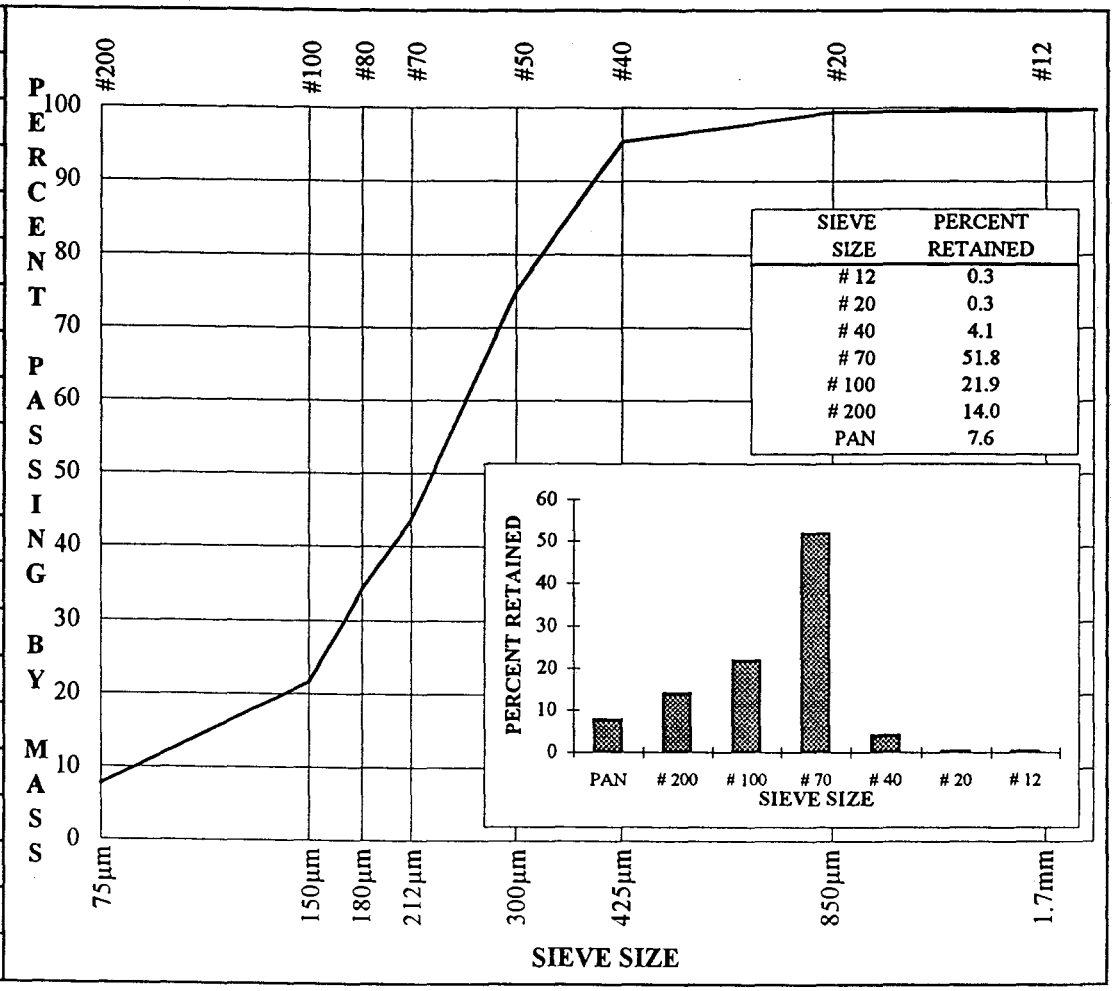
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-15

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	296.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.7
# 20	99.4
# 40	95.3
# 50	74.9
# 70	43.5
# 80	34.1
# 100	21.7
# 200	7.6



REMARKS: UNWASHED

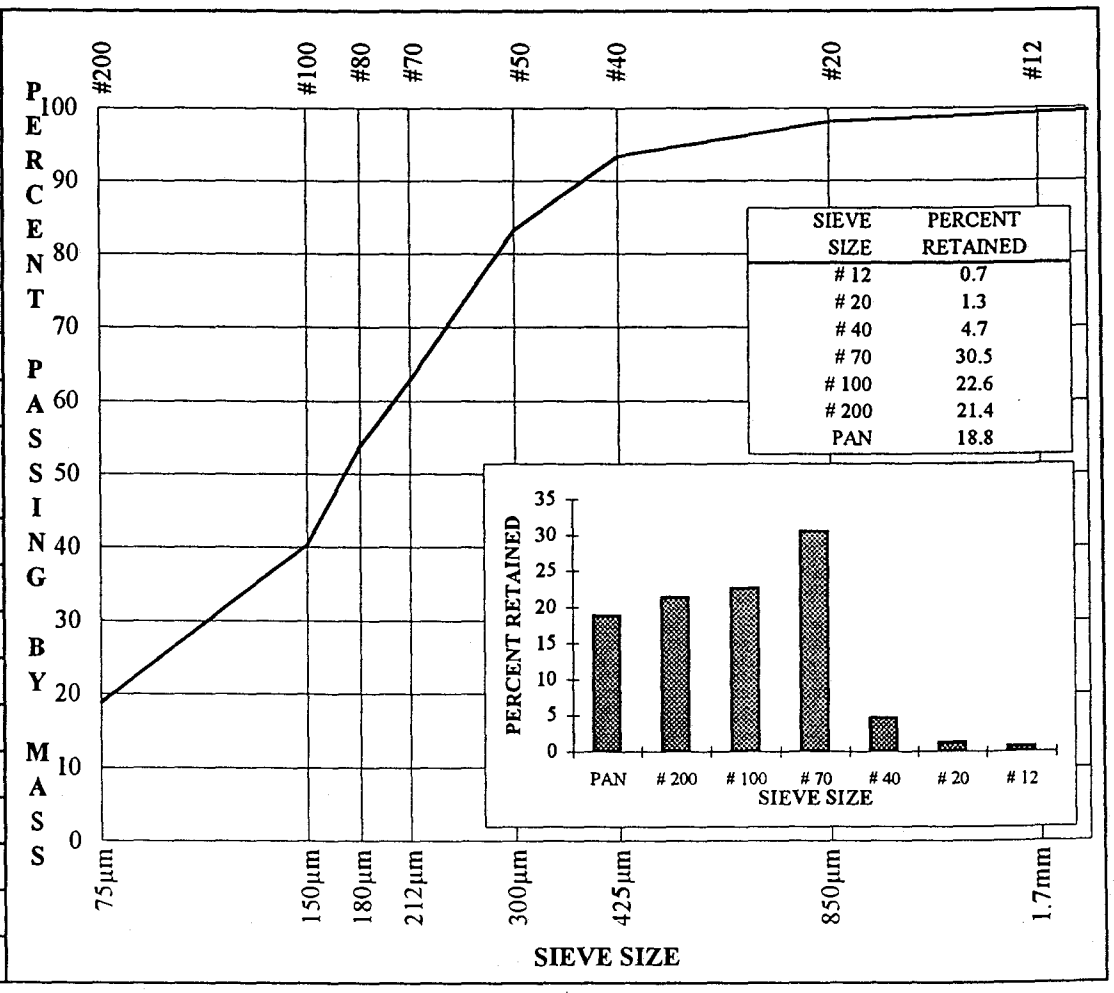
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-16

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	263.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.3
# 20	98.0
# 40	93.3
# 50	83.2
# 70	62.8
# 80	53.8
# 100	40.2
# 200	18.8



REMARKS: UNWASHED

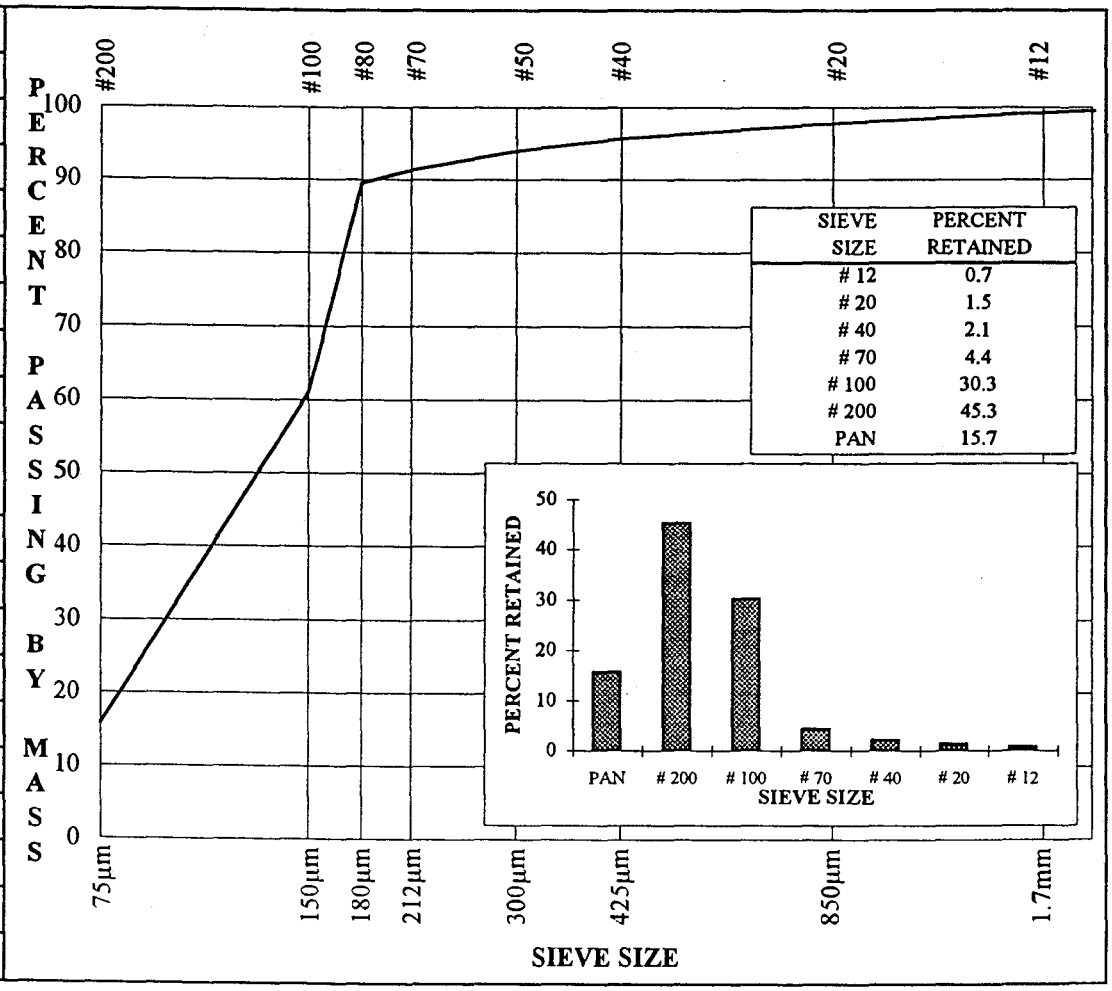
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-17

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	265.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.3
# 20	97.8
# 40	95.7
# 50	93.9
# 70	91.3
# 80	89.5
# 100	61.0
# 200	15.7



REMARKS: UNWASHED

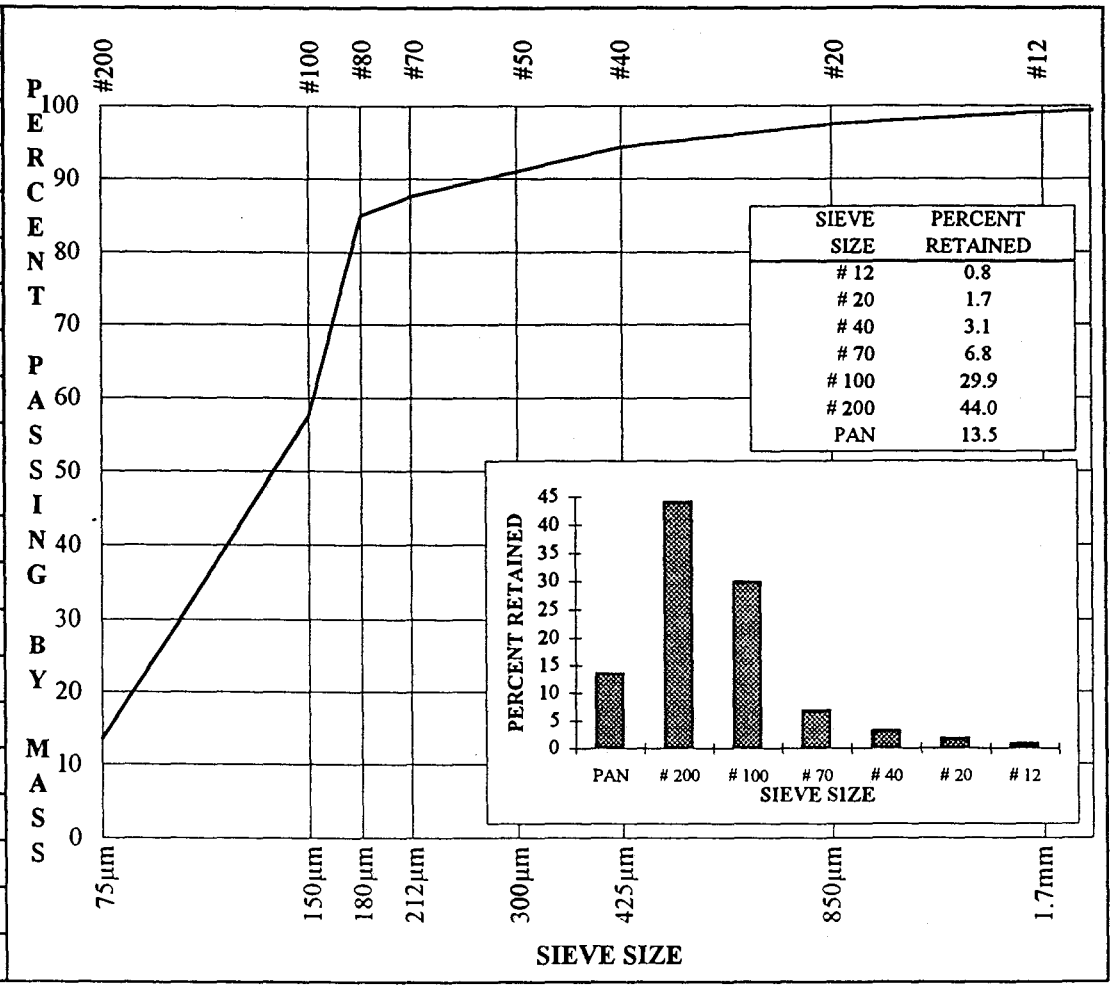
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-18

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	321.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.2
# 20	97.4
# 40	94.3
# 50	90.9
# 70	87.5
# 80	84.9
# 100	57.5
# 200	13.5



REMARKS: UNWASHED

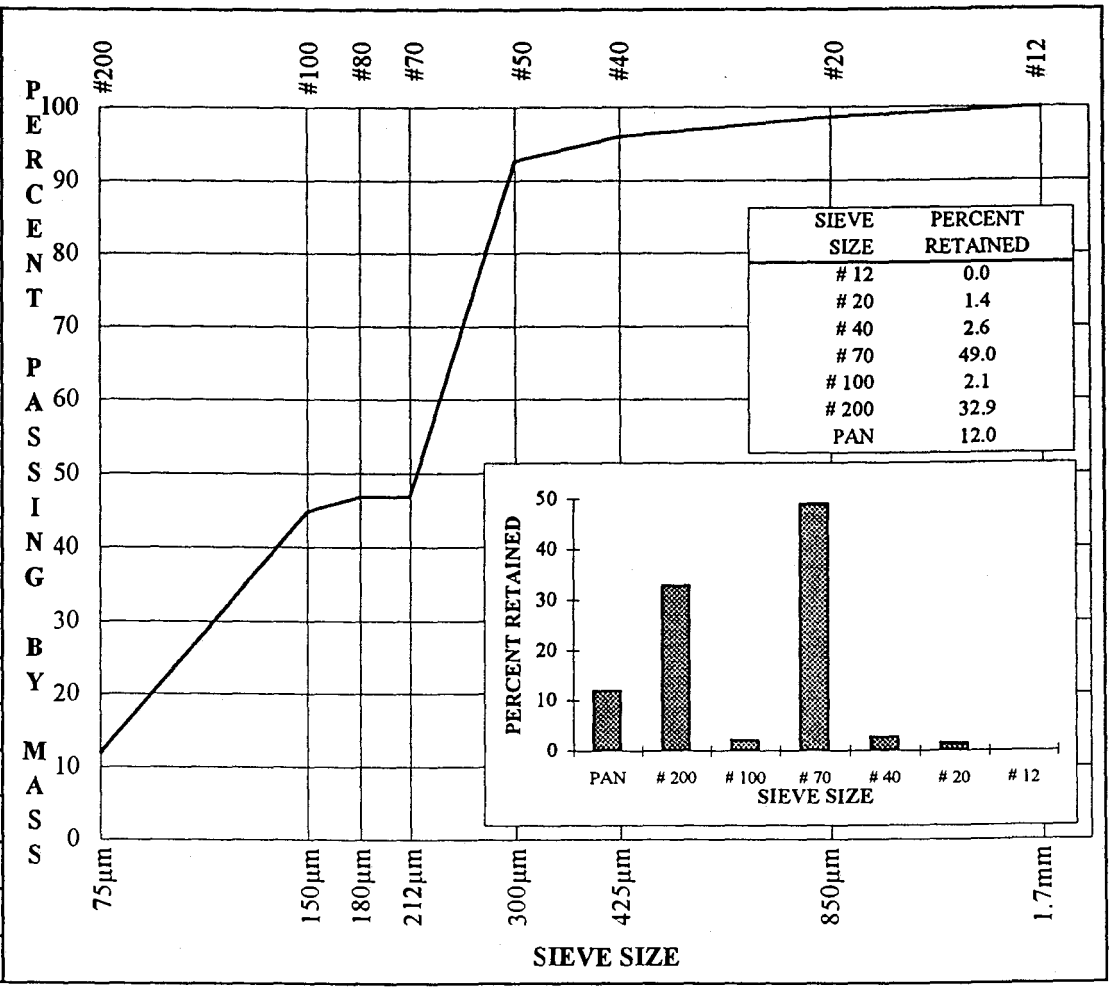
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-19

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	272.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	98.6
# 40	95.9
# 50	92.7
# 70	46.9
# 80	46.8
# 100	44.8
# 200	12.0



REMARKS: UNWASHED

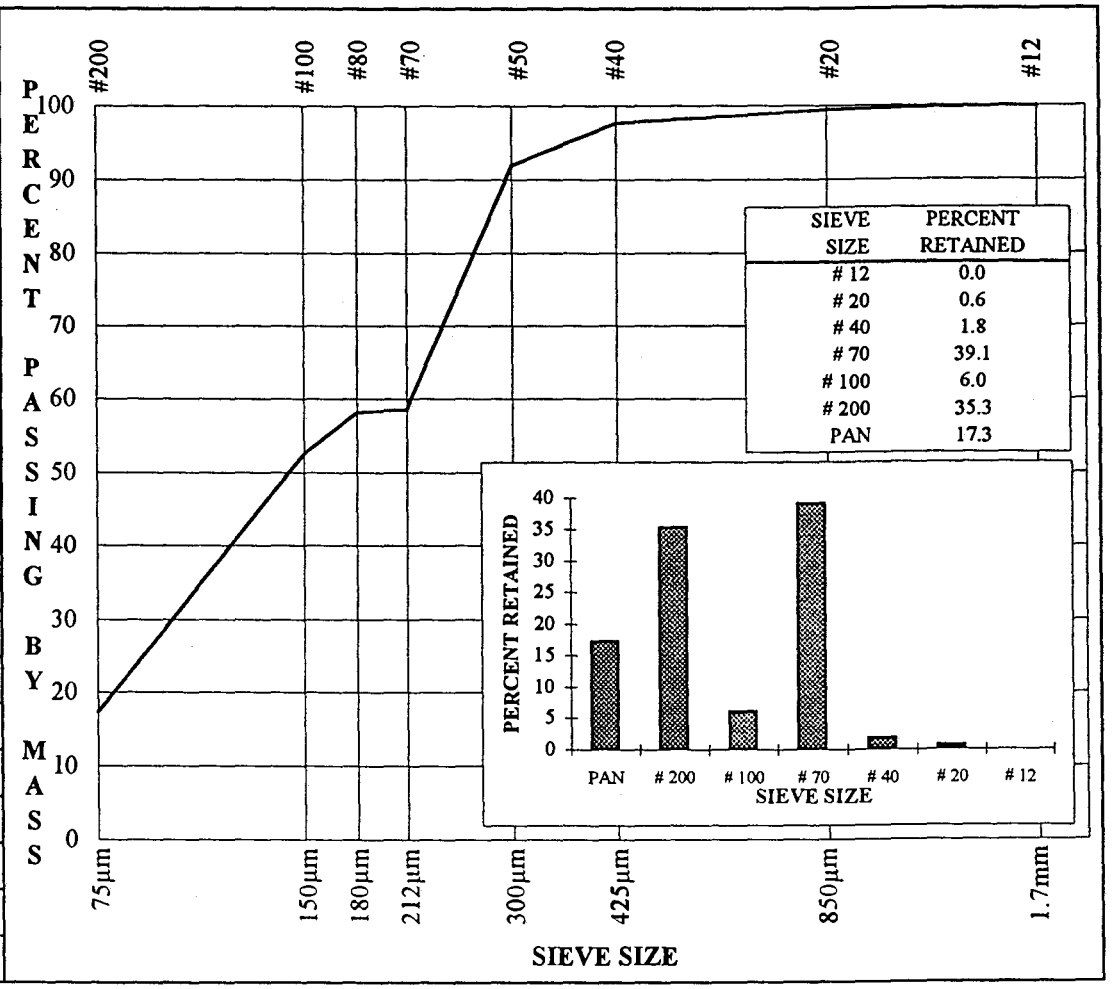
REVIEWED BY: _____ P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-20

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	268.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.4
# 40	97.6
# 50	91.9
# 70	58.6
# 80	58.2
# 100	52.6
# 200	17.3



REMARKS: UNWASHED

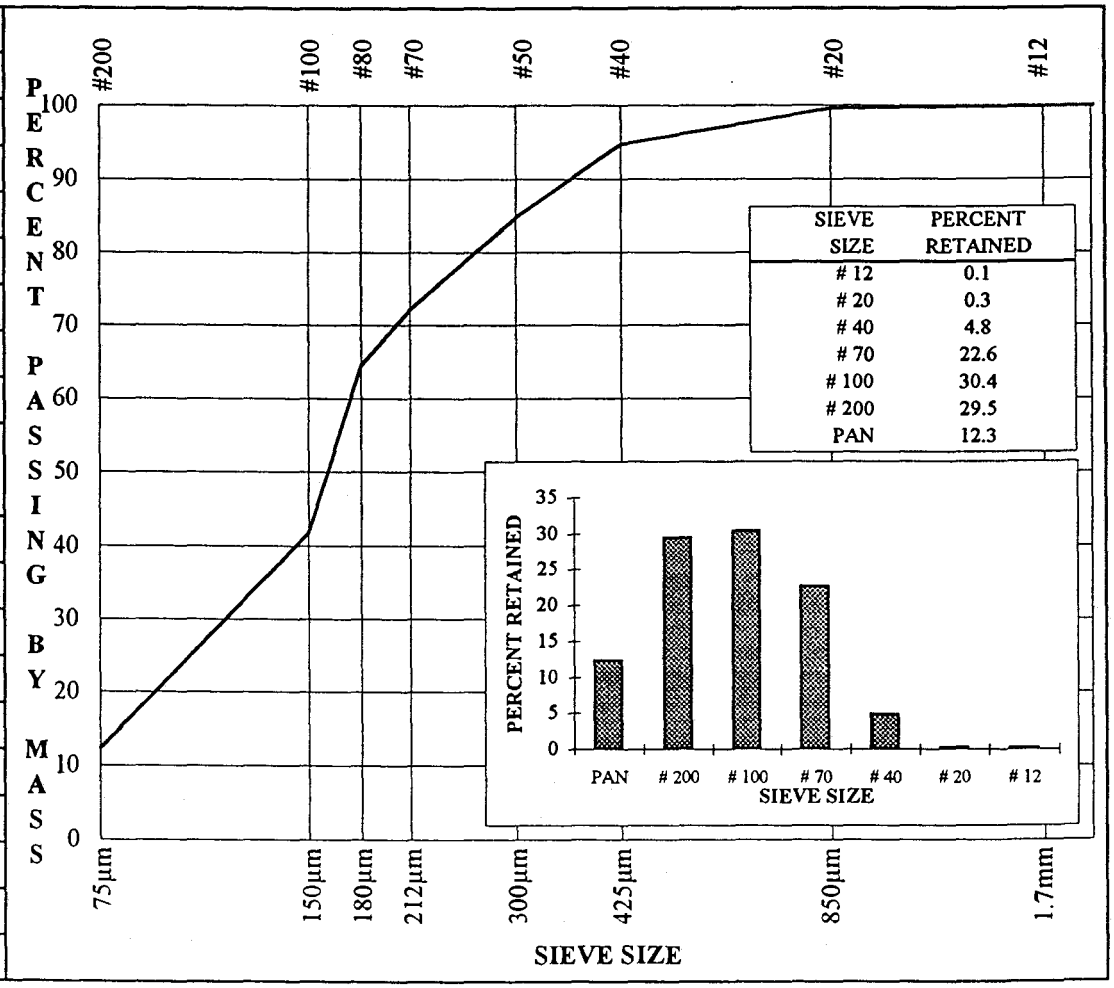
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-21

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	295.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.6
# 40	94.8
# 50	84.7
# 70	72.1
# 80	64.5
# 100	41.7
# 200	12.3



REMARKS: UNWASHED

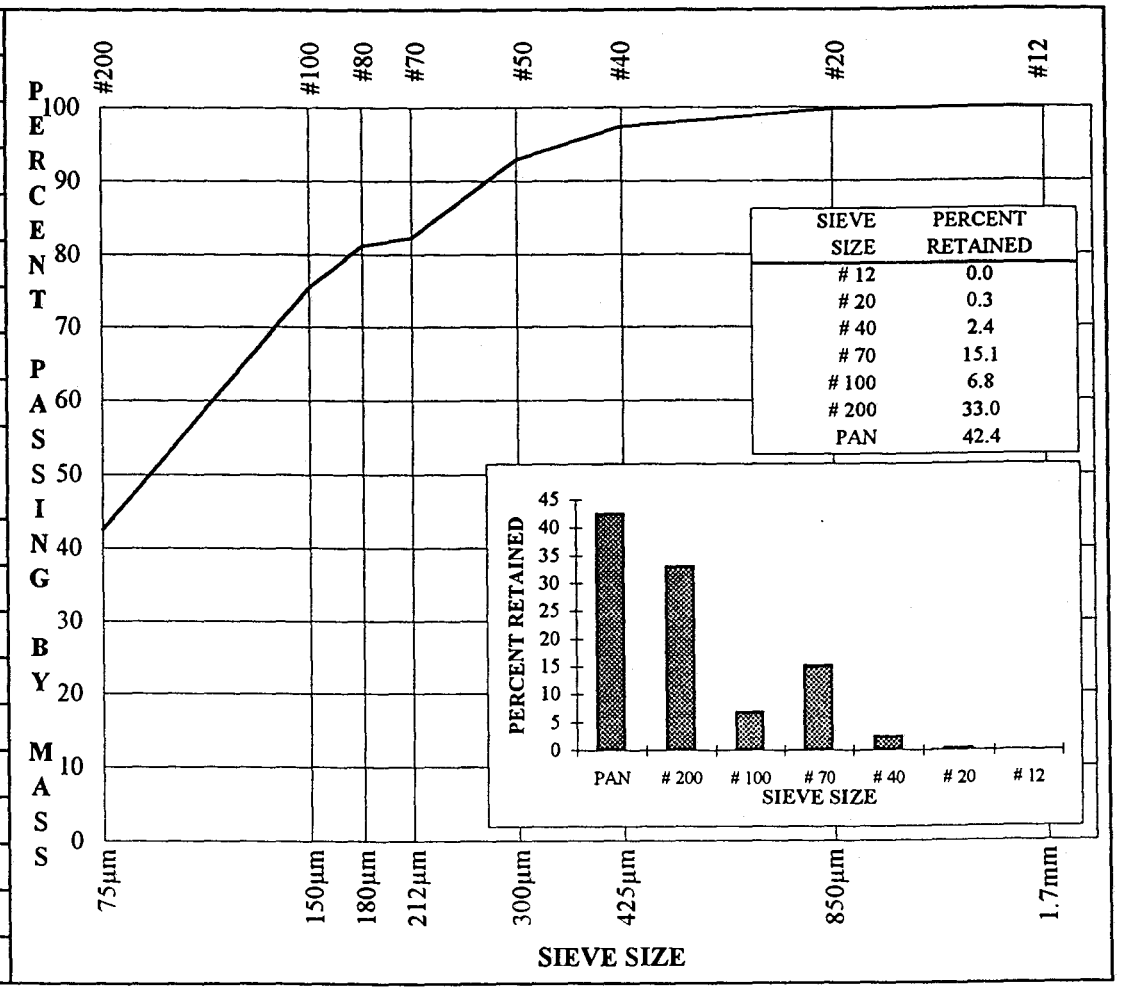
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-22

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	329.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.7
# 40	97.3
# 50	92.9
# 70	82.2
# 80	81.1
# 100	75.4
# 200	42.4



REMARKS: UNWASHED

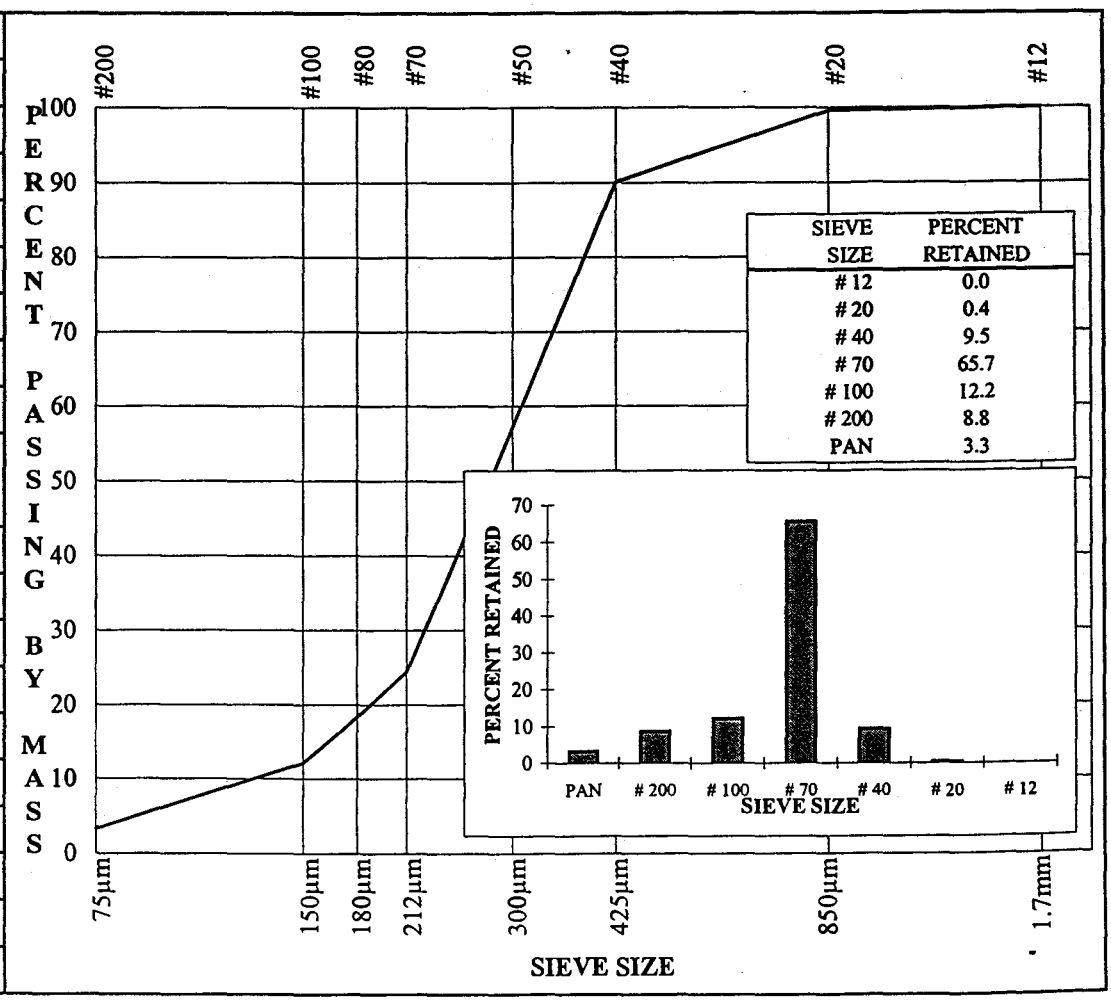
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-01

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	352.1
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.6
# 40	90.1
# 50	57.2
# 70	24.4
# 80	18.4
# 100	12.1
# 200	3.3



REMARKS: UNWASHED

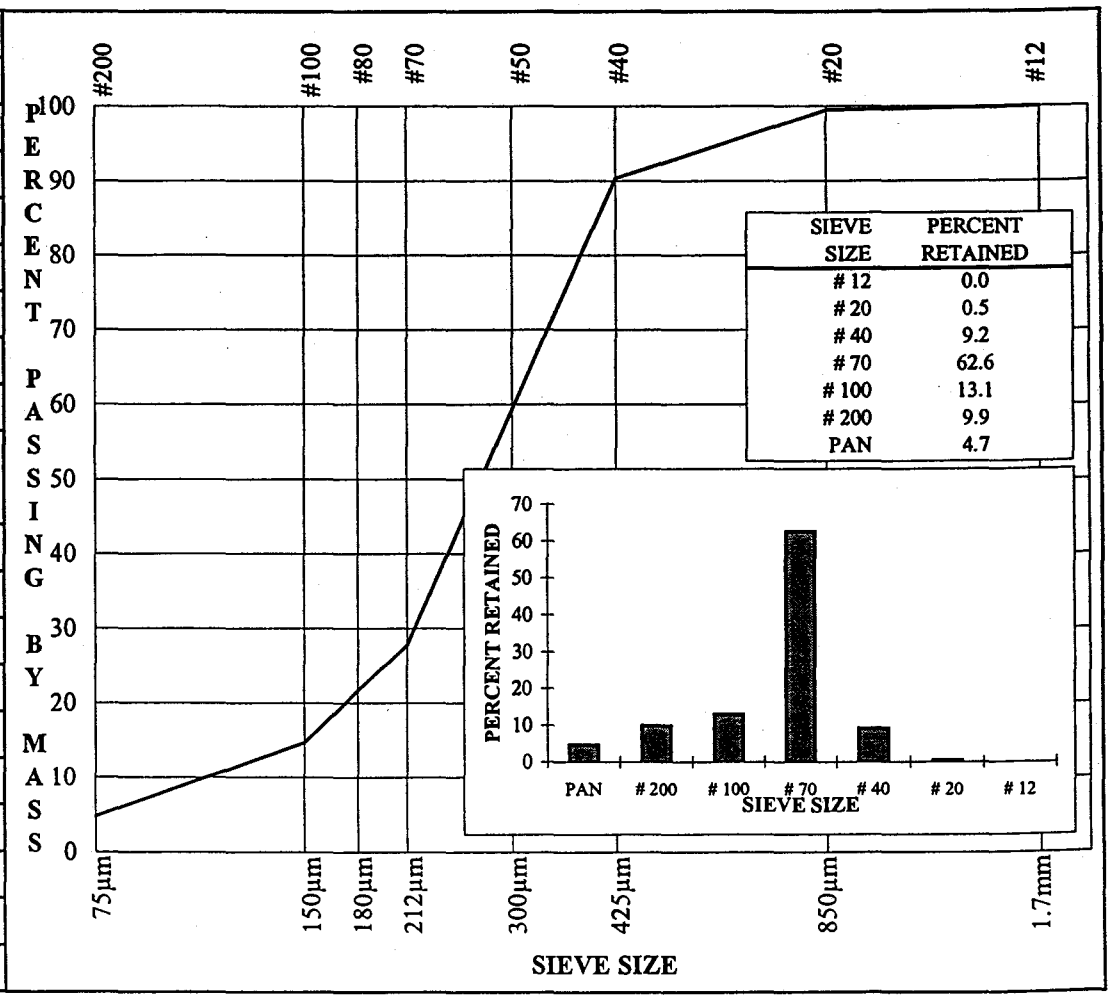
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-02

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	295.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.5
# 40	90.3
# 50	59.4
# 70	27.7
# 80	21.7
# 100	14.7
# 200	4.7



REMARKS: UNWASHED

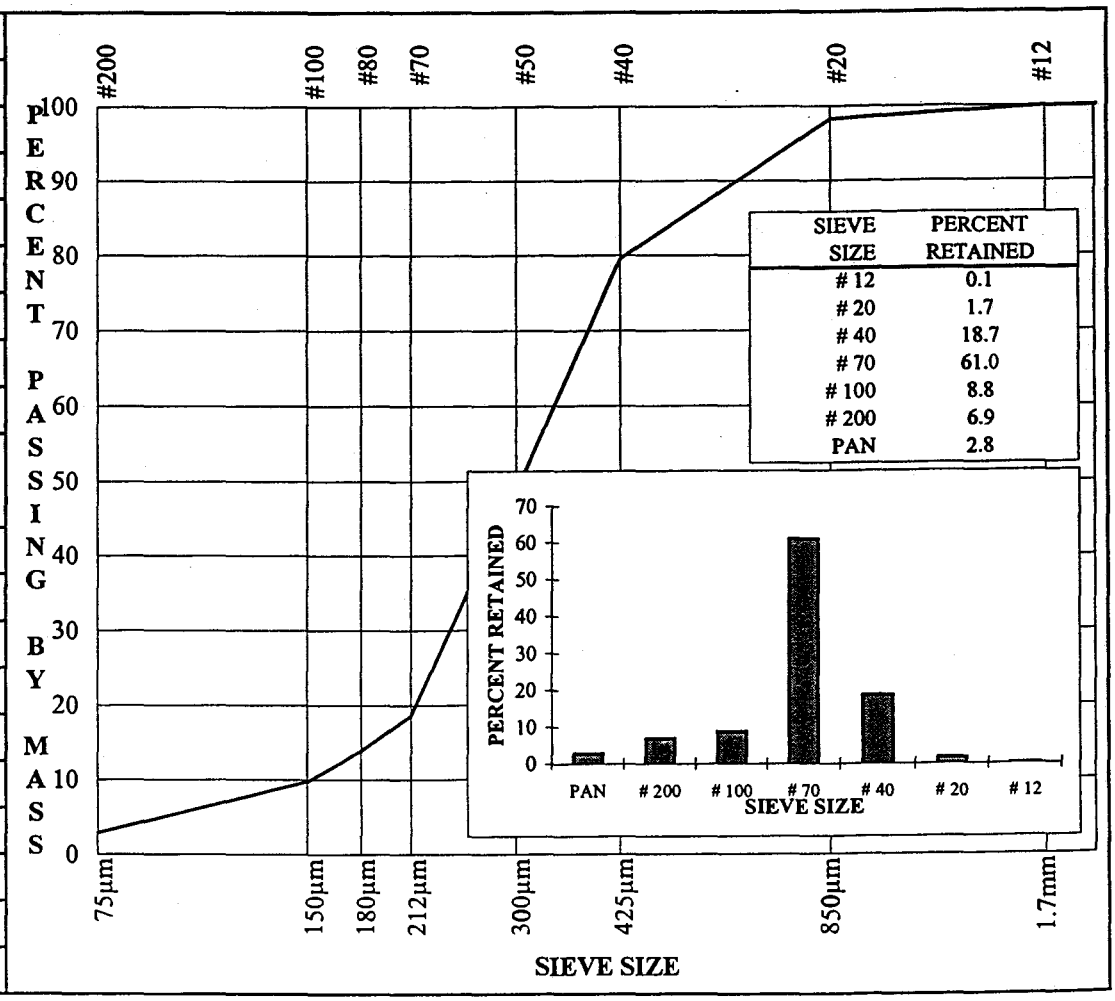
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-03

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	366.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	98.3
# 40	79.6
# 50	48.7
# 70	18.6
# 80	13.9
# 100	9.8
# 200	2.8



REMARKS: UNWASHED

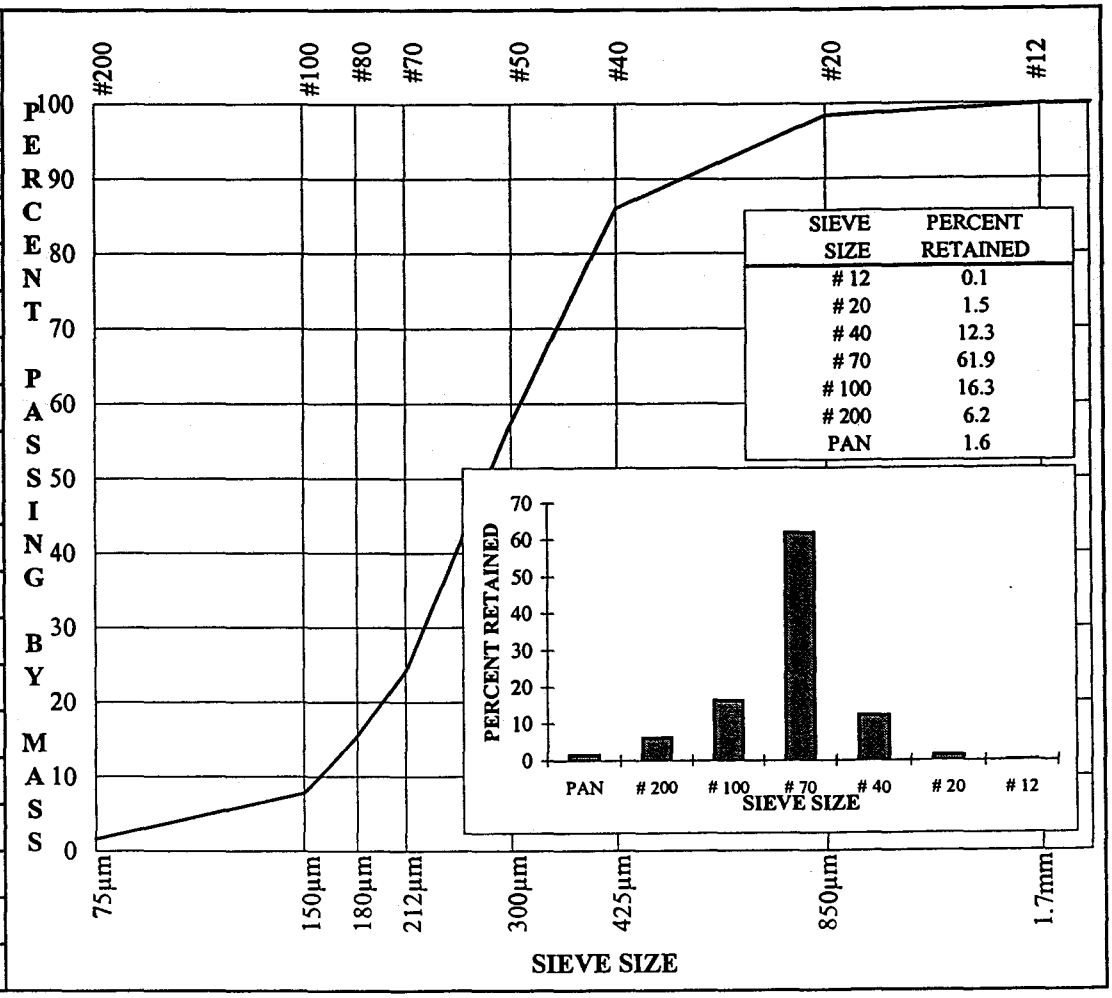
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-04

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	334.1
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	98.4
# 40	86.1
# 50	57.6
# 70	24.1
# 80	15.5
# 100	7.8
# 200	1.6



REMARKS: UNWASHED

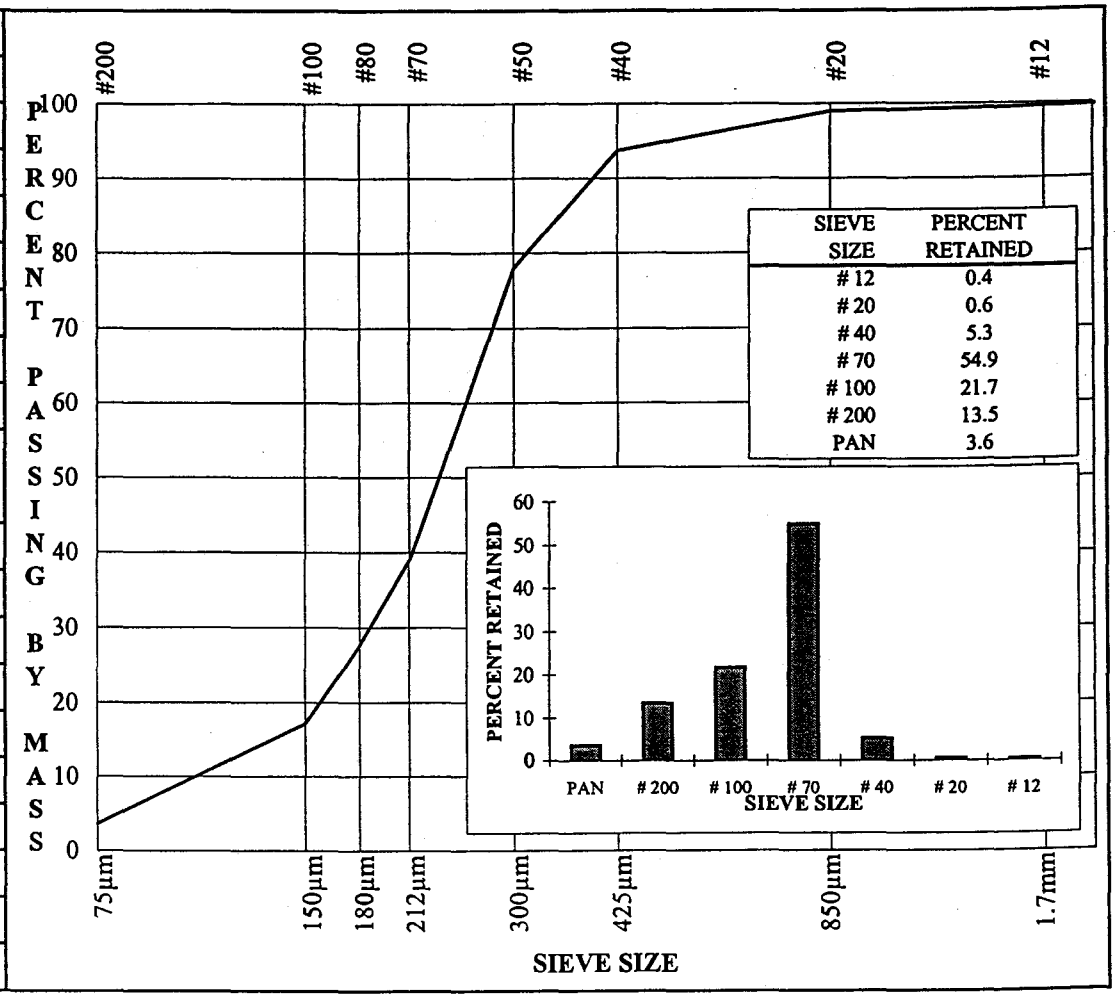
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-05

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	290.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	99.0
# 40	93.7
# 50	78.0
# 70	38.8
# 80	27.6
# 100	17.1
# 200	3.6



REMARKS: UNWASHED

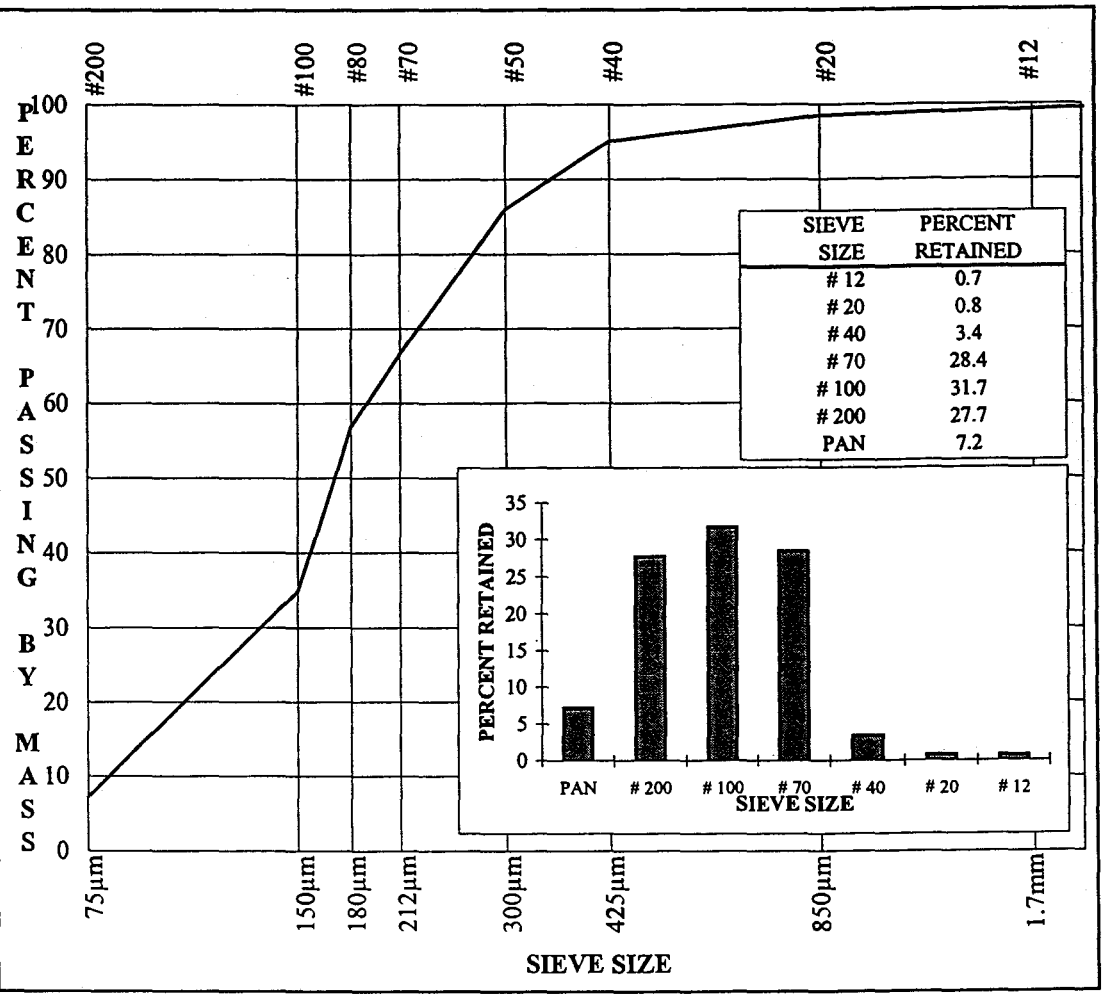
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-06

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	297.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.3
# 20	98.5
# 40	95.1
# 50	86.1
# 70	66.7
# 80	56.9
# 100	34.9
# 200	7.2



REMARKS: UNWASHED

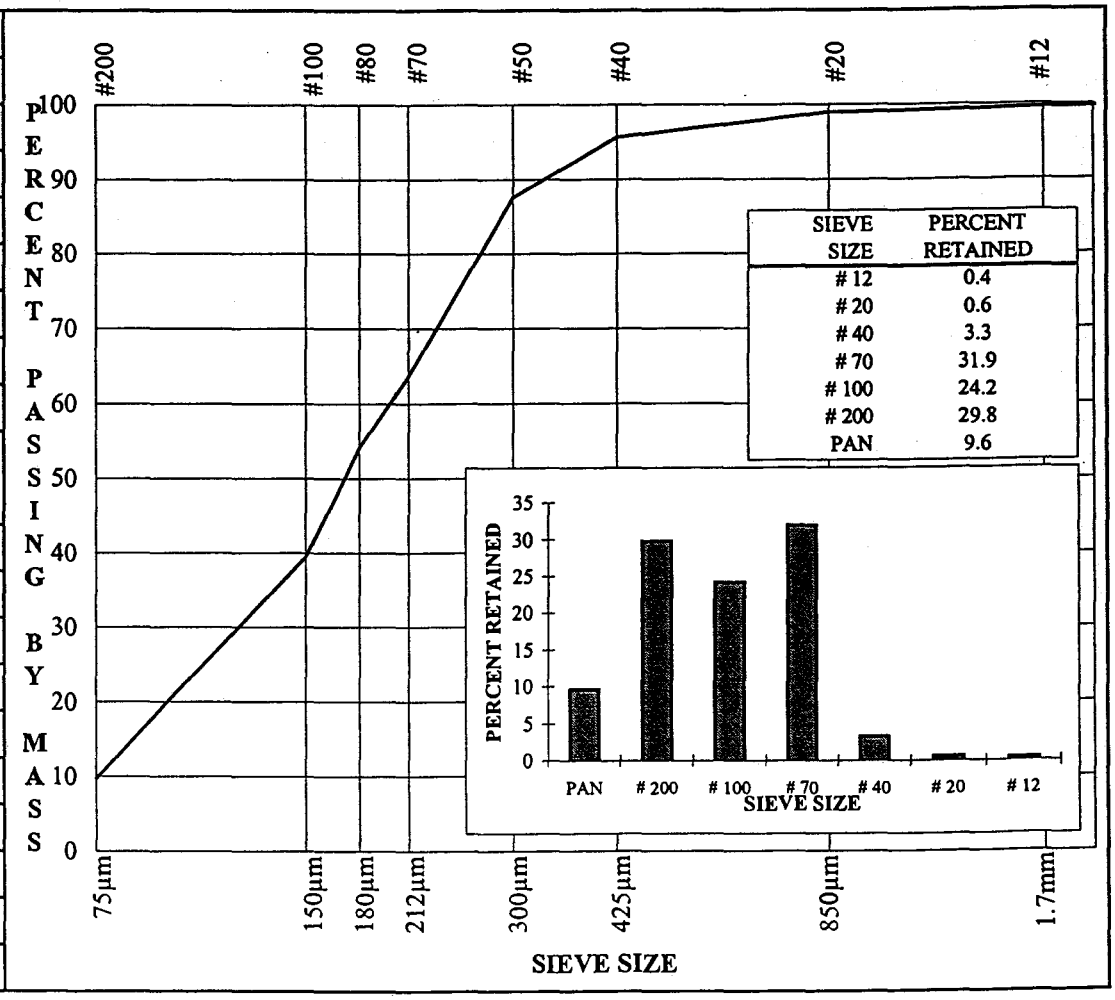
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-07

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	350.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	98.9
# 40	95.6
# 50	87.6
# 70	63.7
# 80	54.1
# 100	39.5
# 200	9.6



REMARKS: UNWASHED

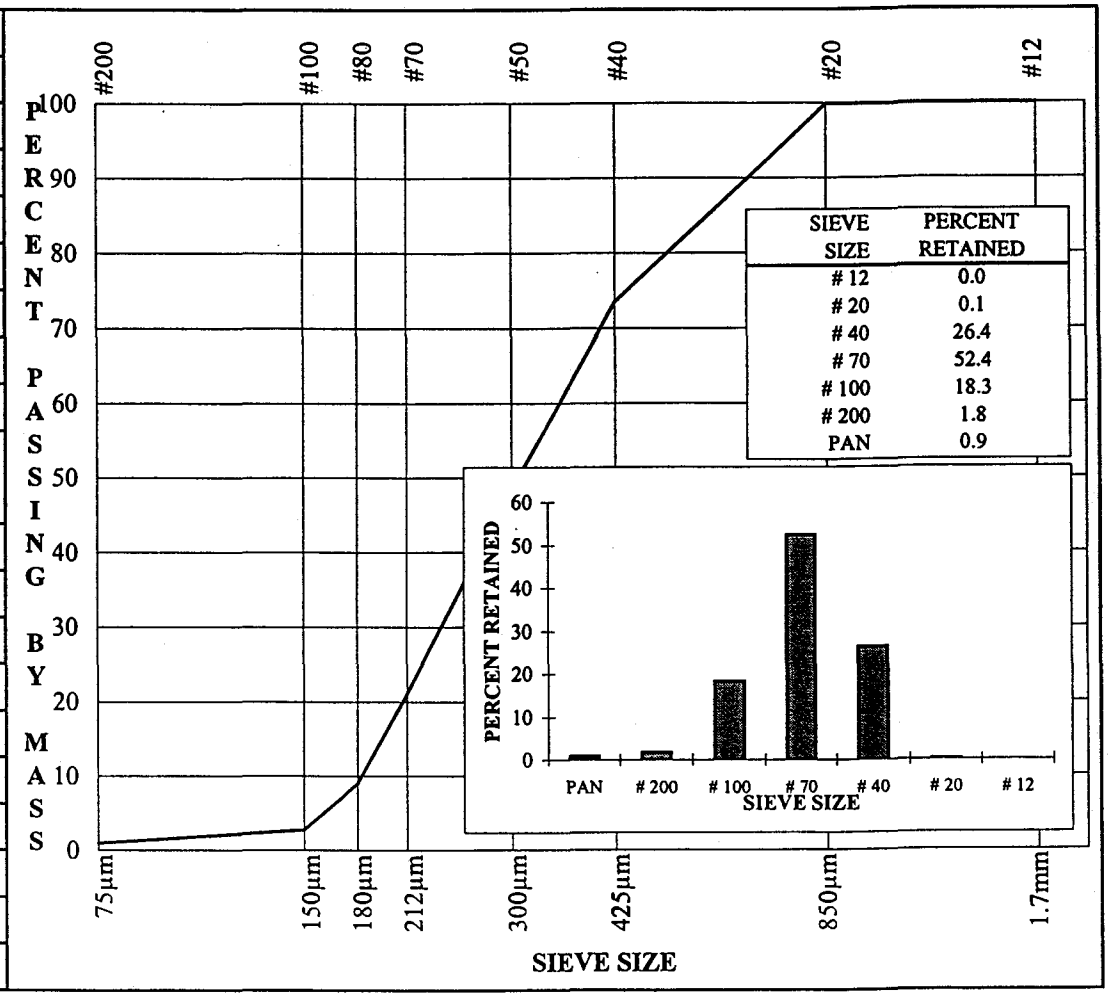
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-4-01

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	286.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.9
# 40	73.5
# 50	48.3
# 70	21.1
# 80	9.0
# 100	2.8
# 200	0.9



REMARKS: UNWASHED

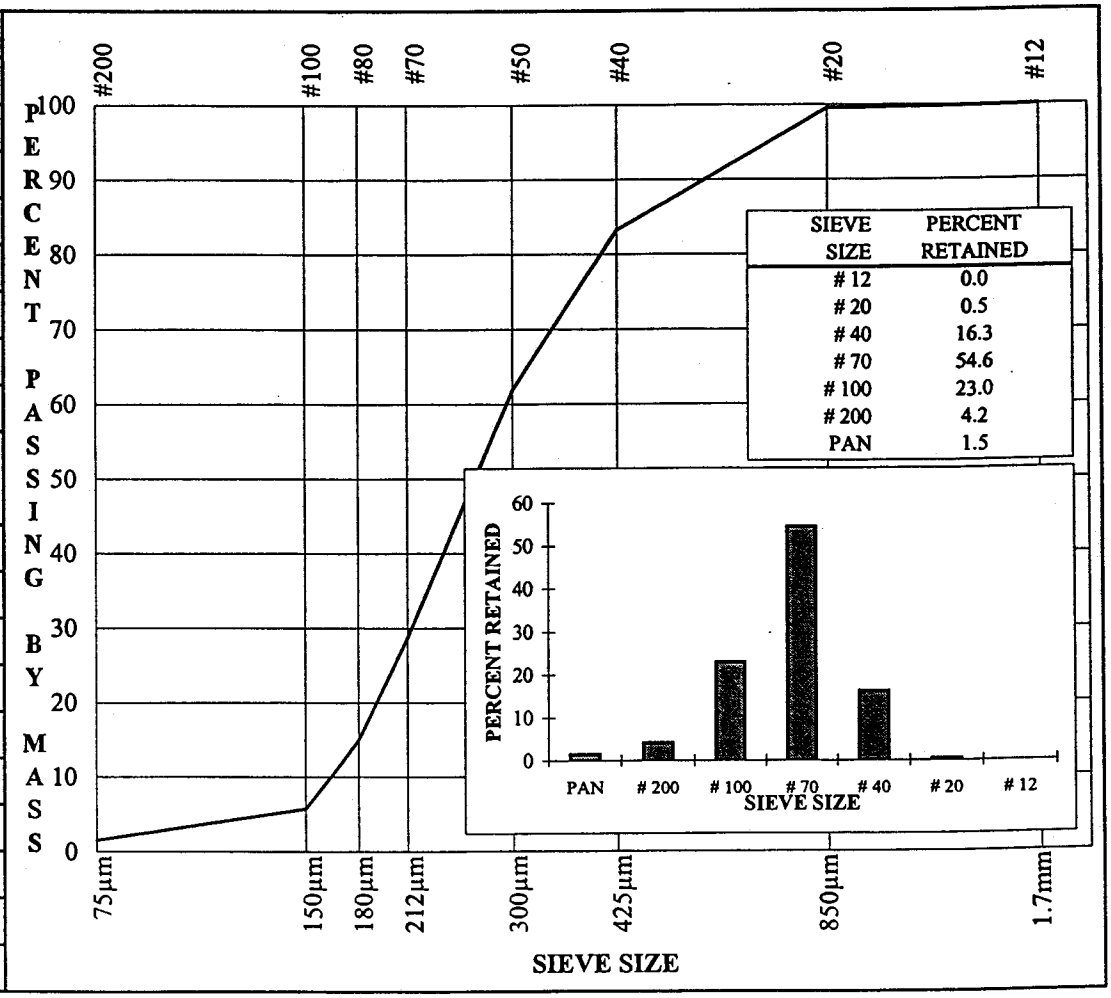
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-4-02

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	322.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.5
# 40	83.3
# 50	61.9
# 70	28.7
# 80	14.9
# 100	5.7
# 200	1.5



REMARKS: UNWASHED

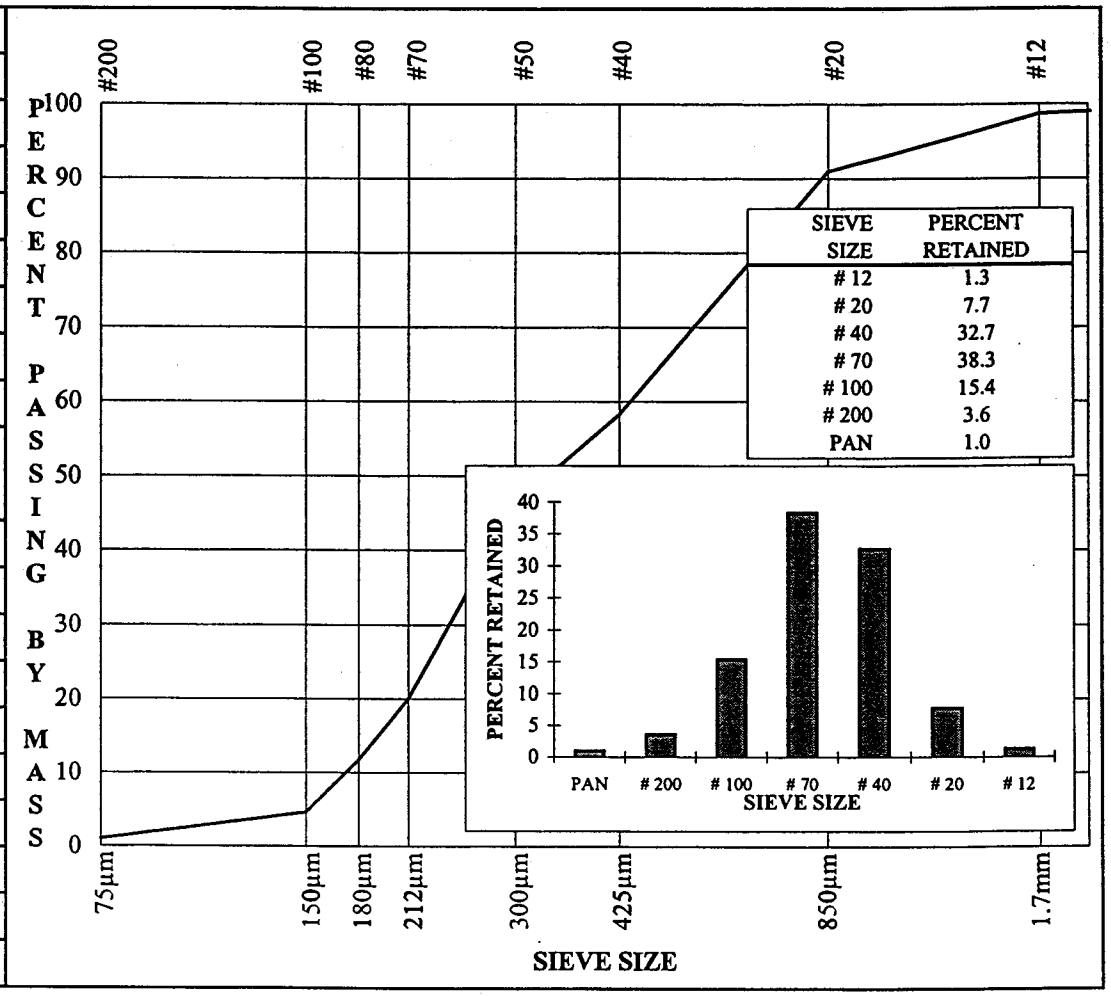
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-4 #3

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	294.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.7
# 20	91.0
# 40	58.3
# 50	46.2
# 70	20.0
# 80	11.8
# 100	4.6
# 200	1.0



REVIEWED BY: [redacted] P.Eng.

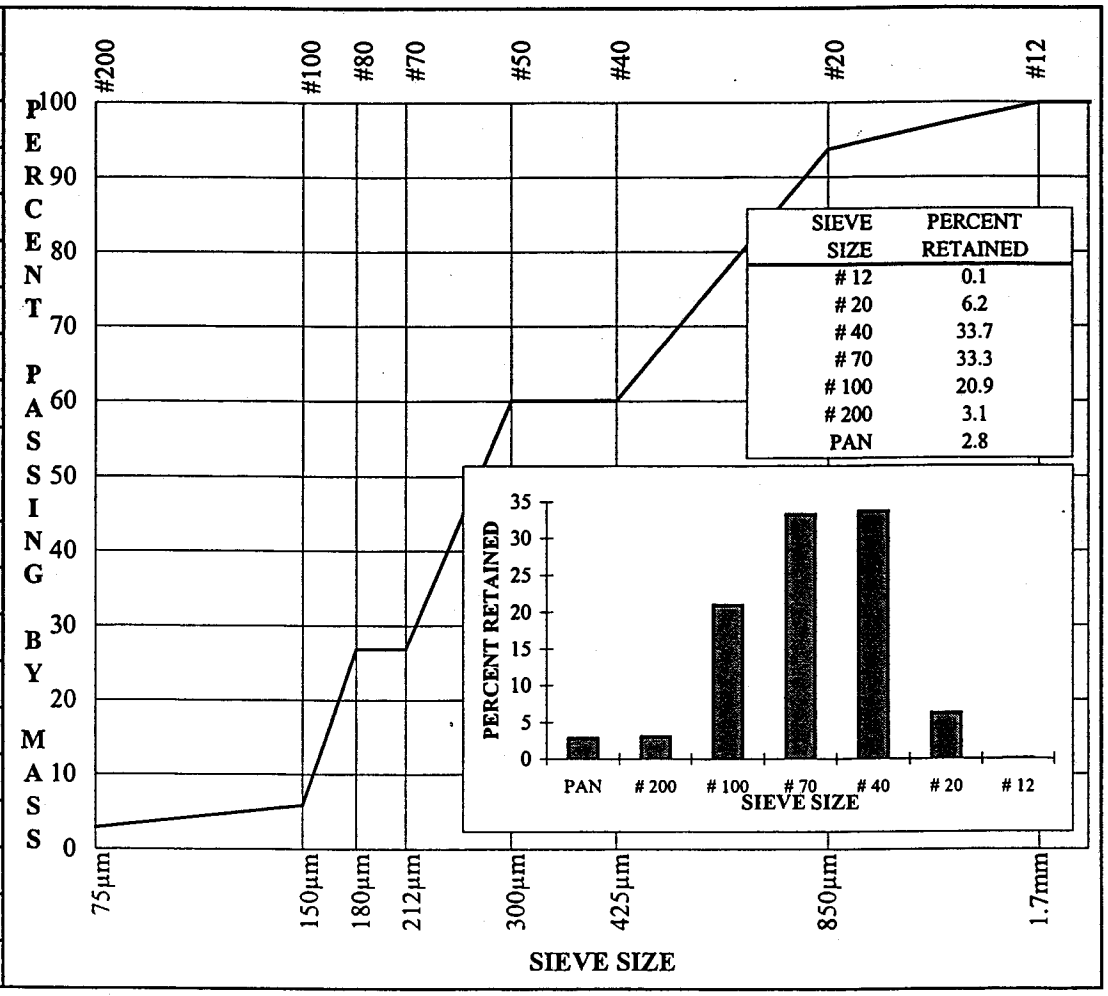
eba

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-04-03

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	1000.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	93.7
# 40	60.1
# 50	60.1
# 70	26.8
# 80	26.8
# 100	5.9
# 200	2.8



REMARKS: WASHED & SIEVED IN 2 PARTS

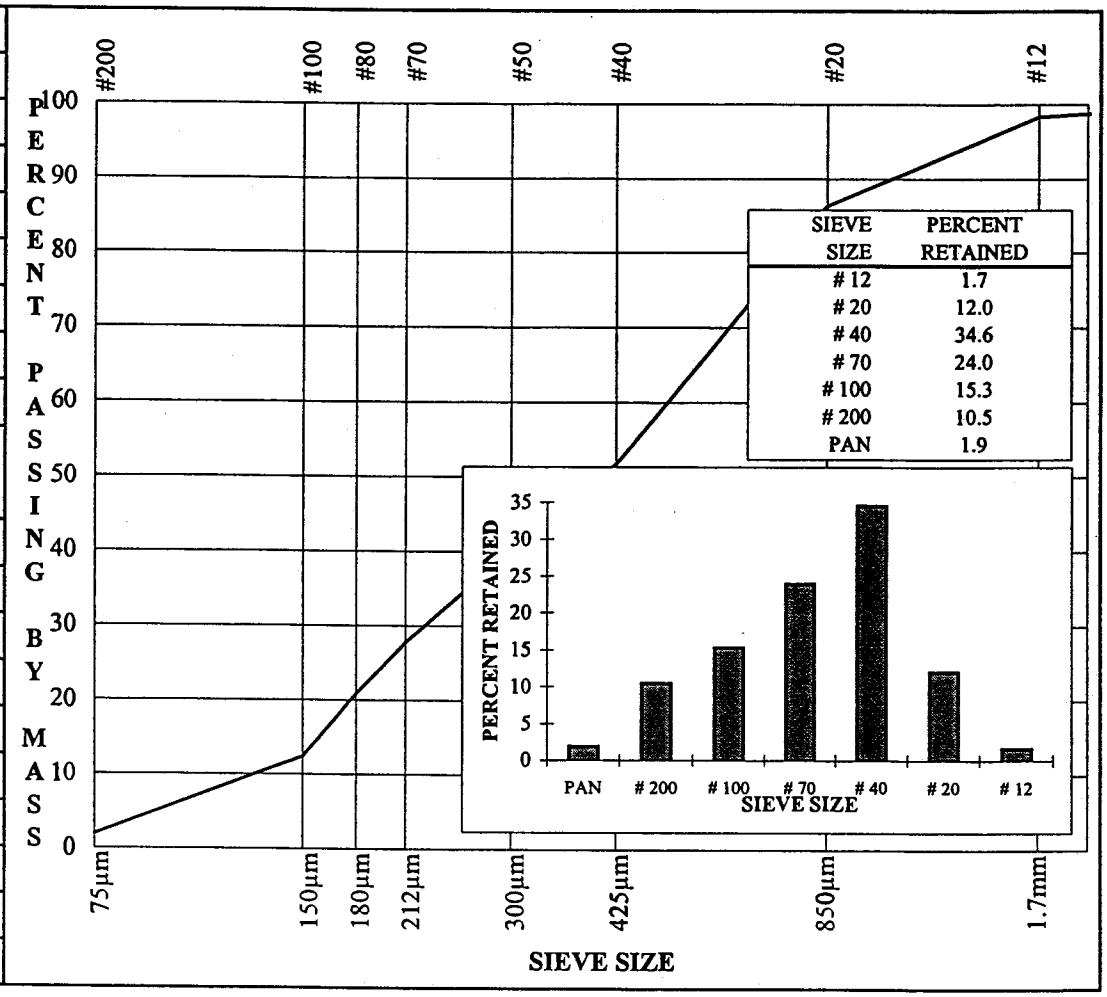
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-4-04

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	343.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.3
# 20	86.3
# 40	51.7
# 50	39.9
# 70	27.7
# 80	20.9
# 100	12.4
# 200	1.9



REMARKS: UNWASHED

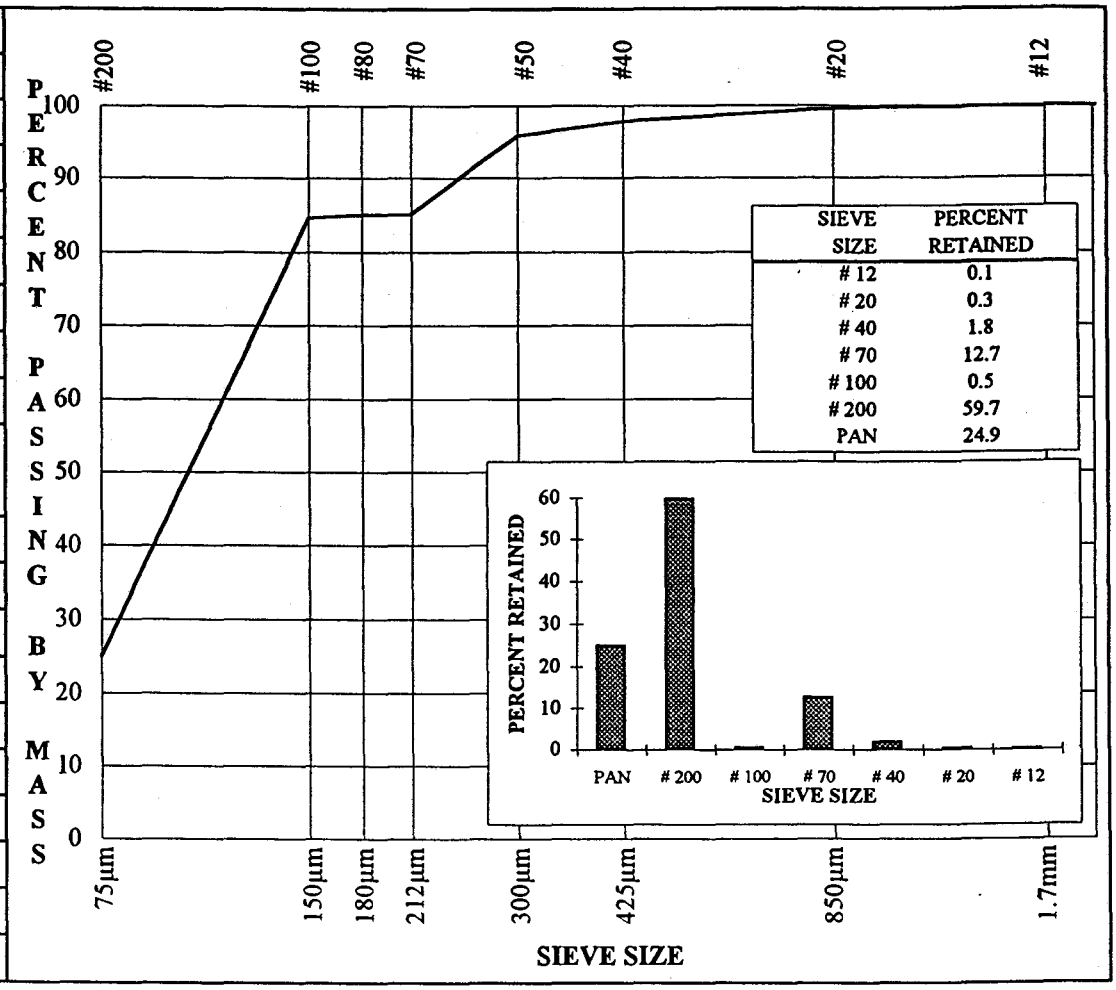
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-04-05

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	326.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.6
# 40	97.8
# 50	95.7
# 70	85.1
# 80	85.1
# 100	84.7
# 200	24.9



REMARKS: UNWASHED

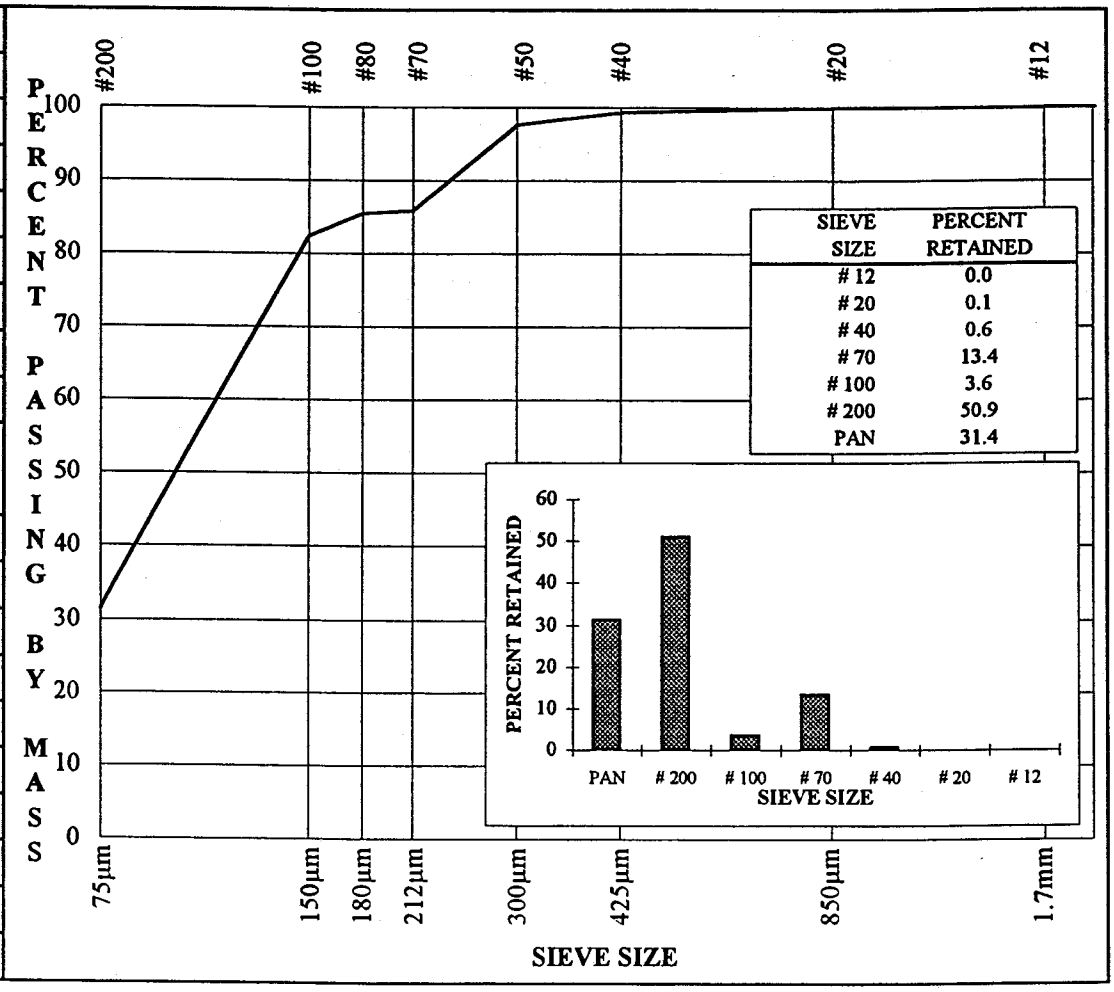
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-01

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	280.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	99.9
# 40	99.3
# 50	97.5
# 70	85.9
# 80	85.4
# 100	82.3
# 200	31.4



REMARKS: UNWASHED

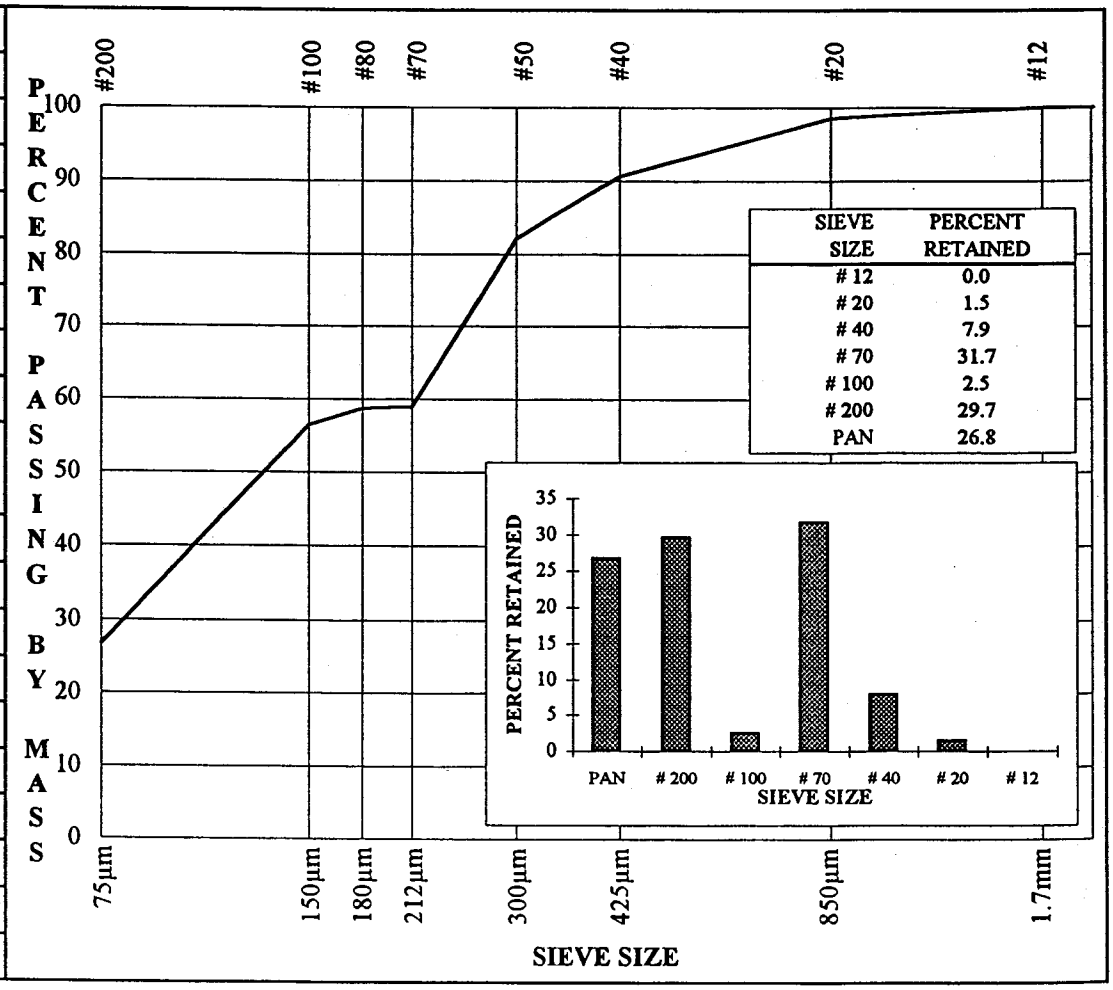
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-02

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	278.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	98.5
# 40	90.6
# 50	82.1
# 70	58.9
# 80	58.7
# 100	56.4
# 200	26.8



REMARKS: UNWASHED

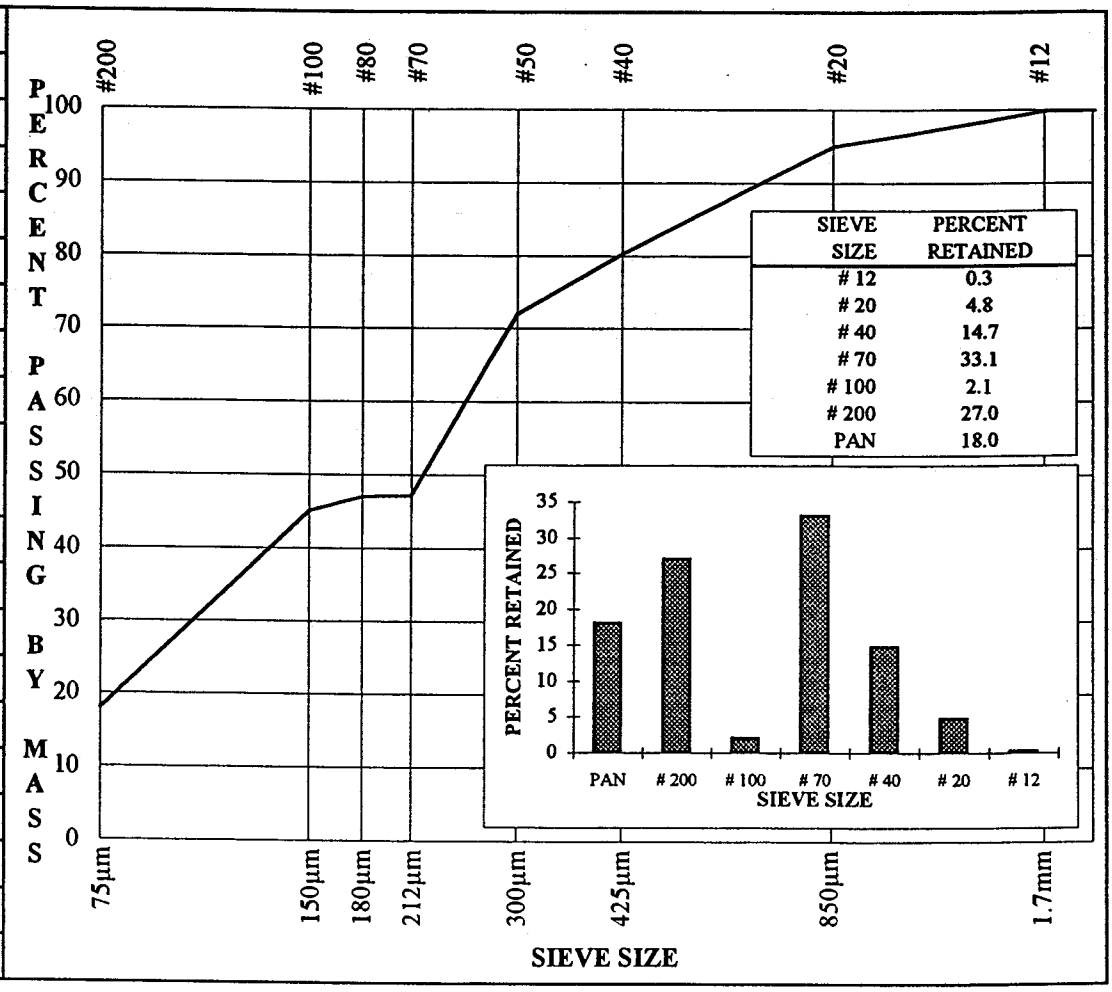
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-03

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	335.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.7
# 20	95.0
# 40	80.3
# 50	72.0
# 70	47.2
# 80	47.0
# 100	45.1
# 200	18.0



REMARKS: UNWASHED

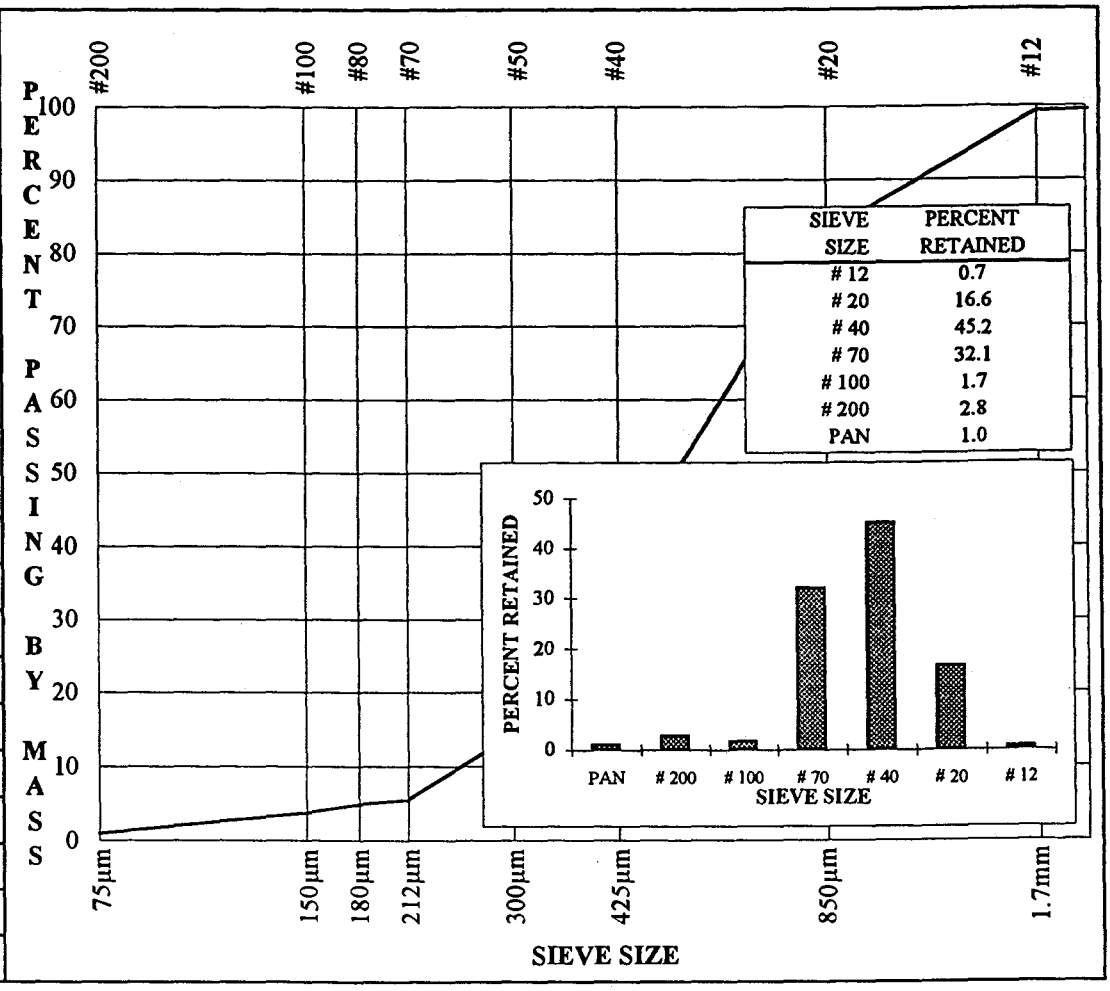
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-04

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	328.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.3
# 20	82.8
# 40	37.6
# 50	14.5
# 70	5.5
# 80	4.9
# 100	3.8
# 200	1.0



REMARKS: UNWASHED

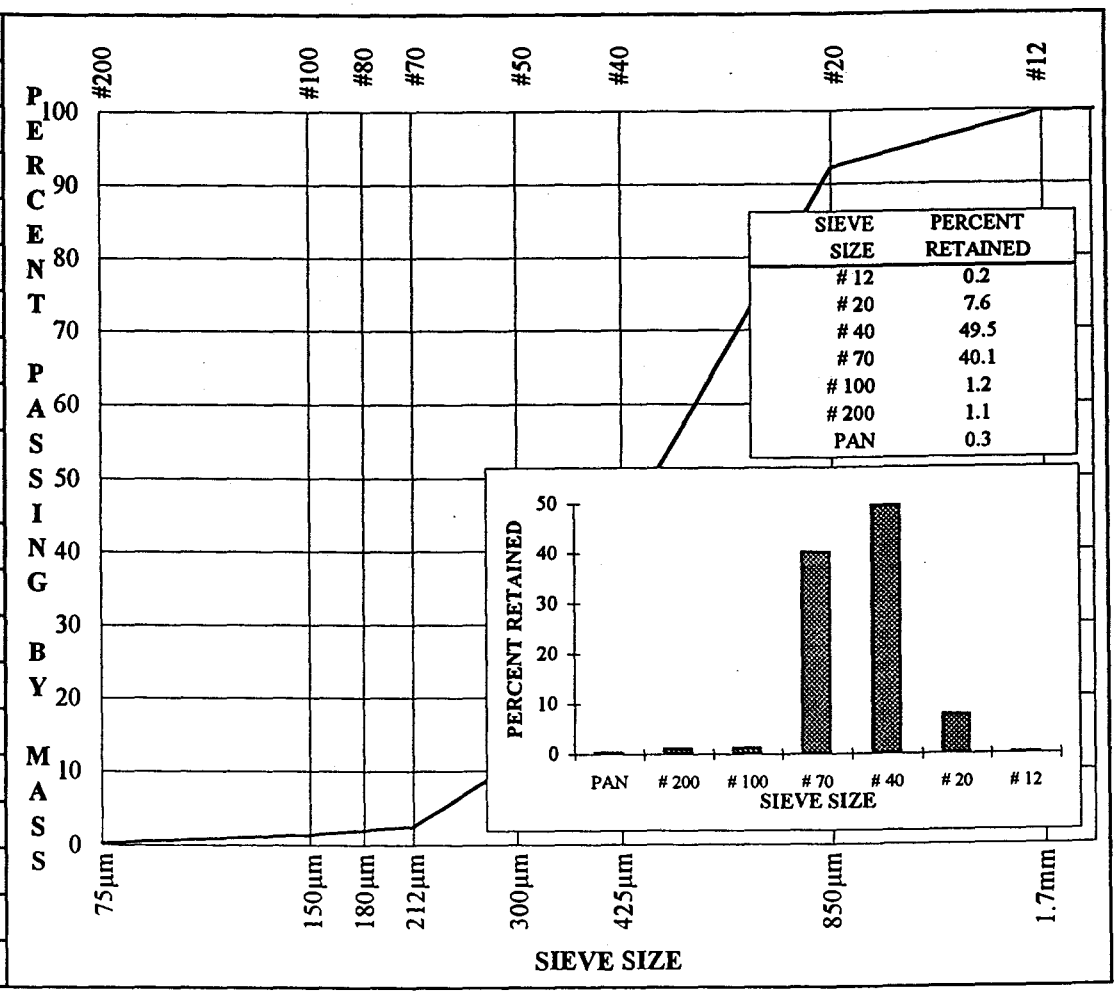
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-05

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	343.9
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	92.2
# 40	42.7
# 50	11.4
# 70	2.6
# 80	2.0
# 100	1.4
# 200	0.3



REMARKS: UNWASHED

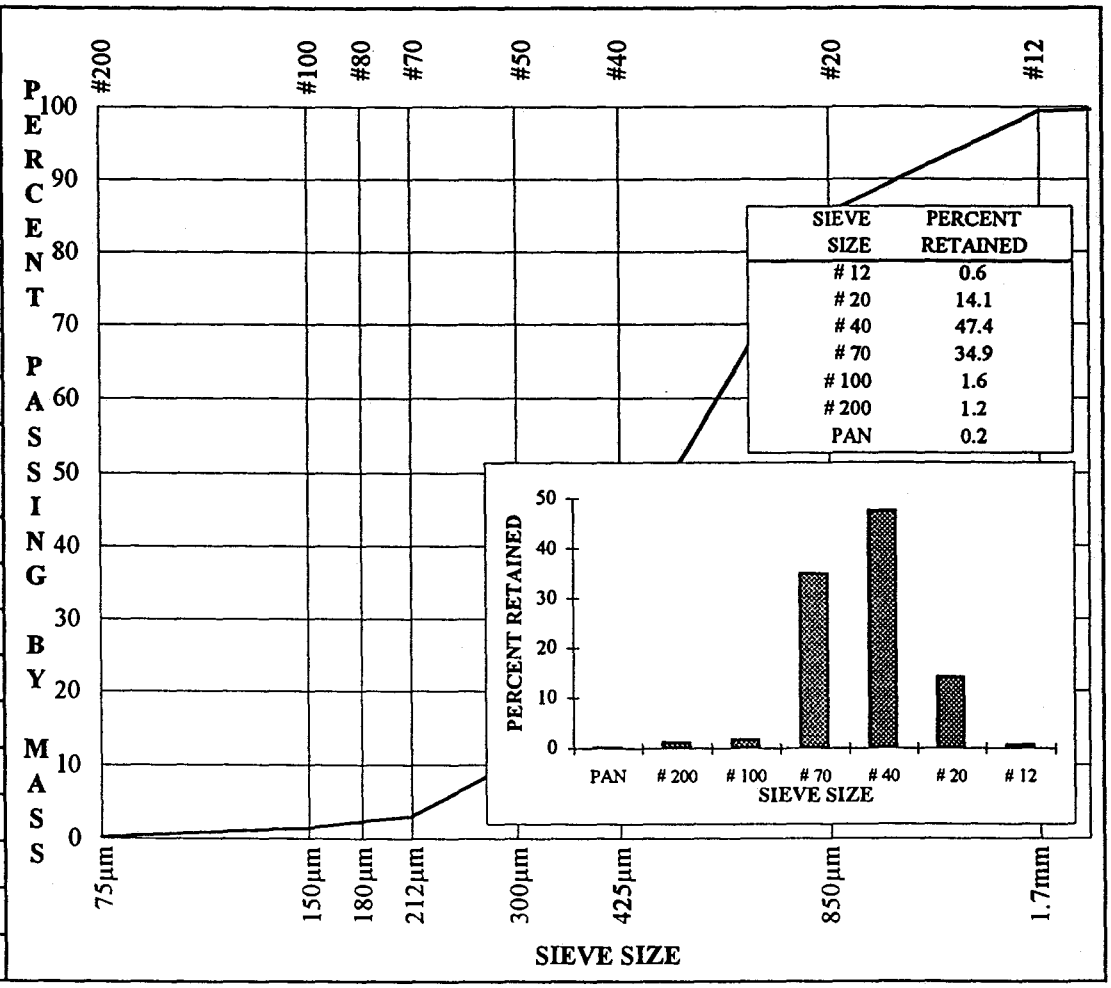
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-07

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	341.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.4
# 20	85.3
# 40	37.9
# 50	10.7
# 70	3.0
# 80	2.3
# 100	1.4
# 200	0.2



REMARKS: UNWASHED

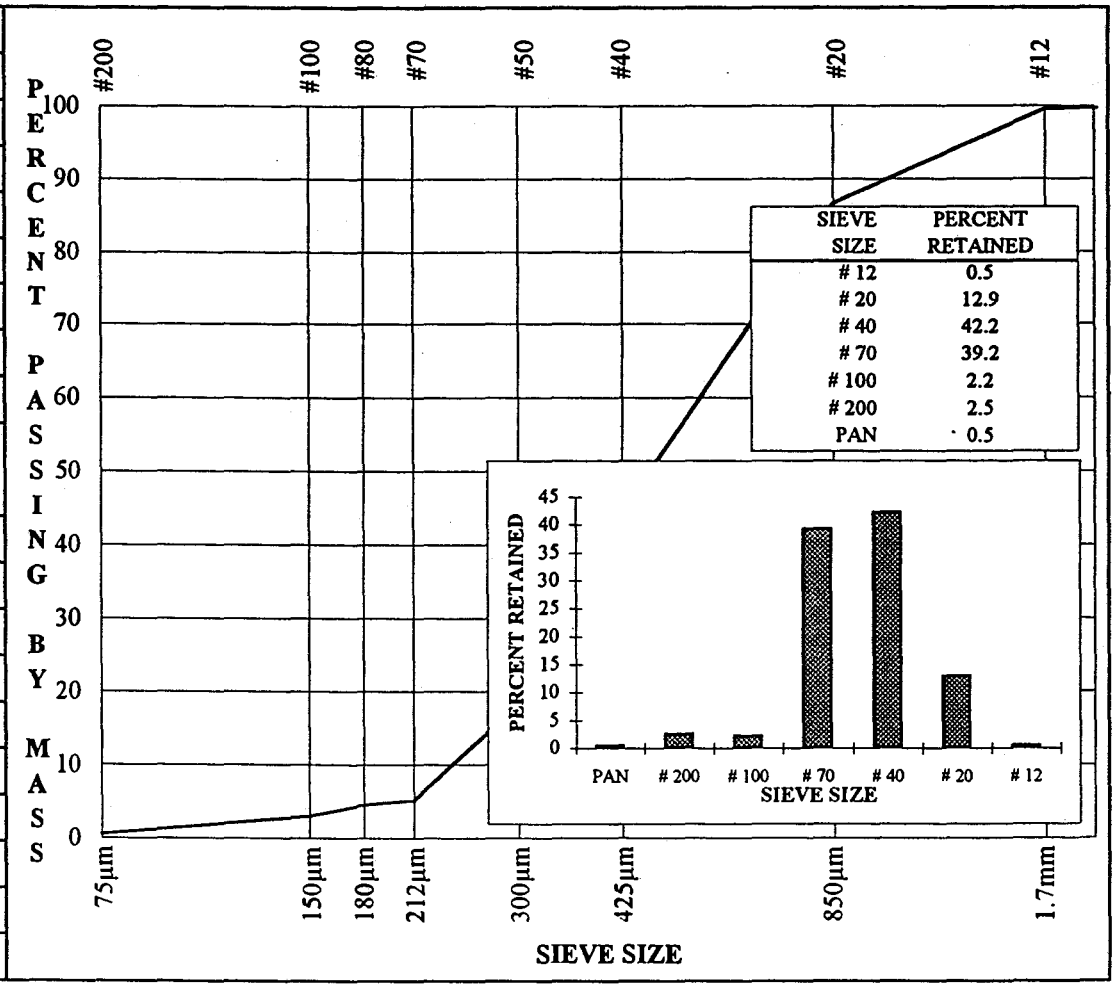
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-08

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	360.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.5
# 20	86.6
# 40	44.4
# 50	18.3
# 70	5.2
# 80	4.5
# 100	3.0
# 200	0.5



REMARKS: UNWASHED

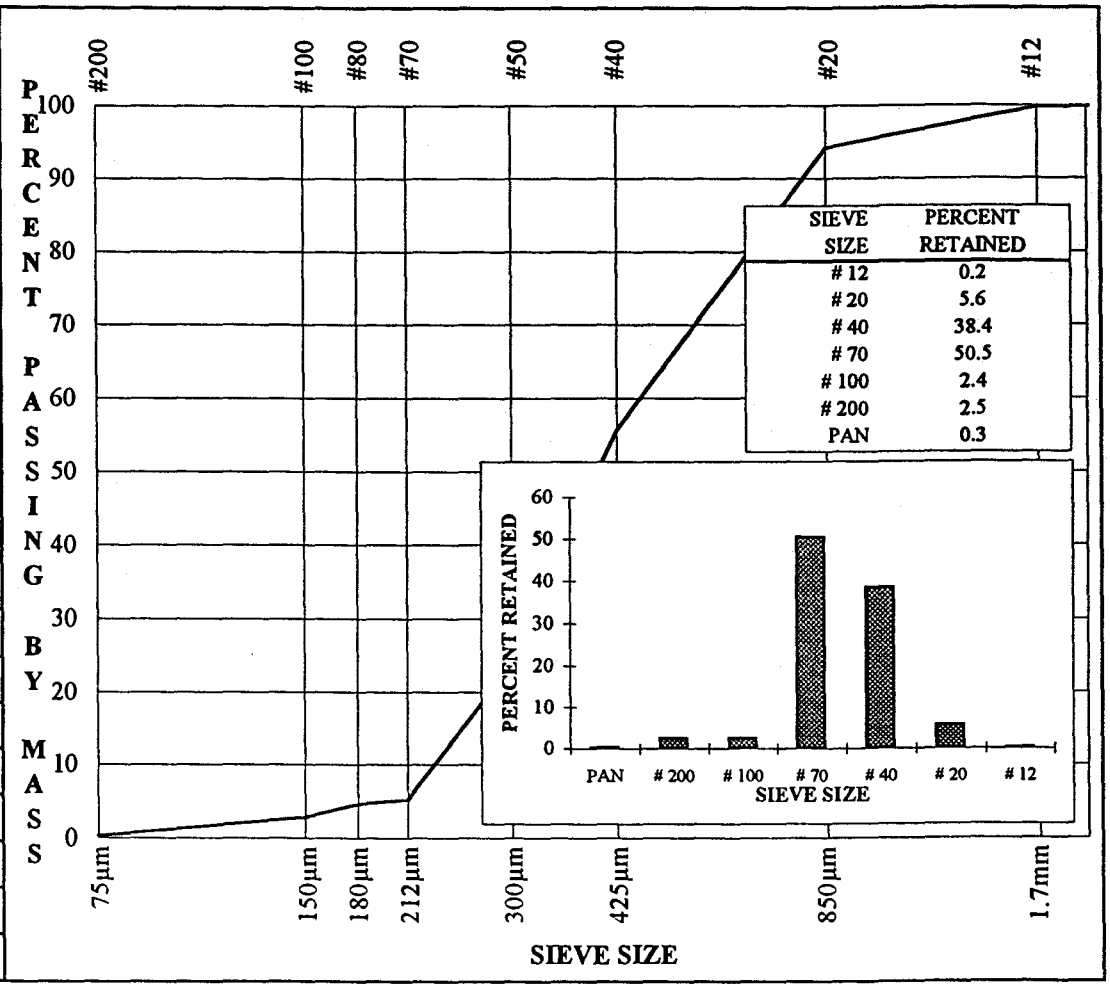
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-09

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	310.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	94.1
# 40	55.7
# 50	24.1
# 70	5.2
# 80	4.5
# 100	2.8
# 200	0.3



REMARKS: UNWASHED

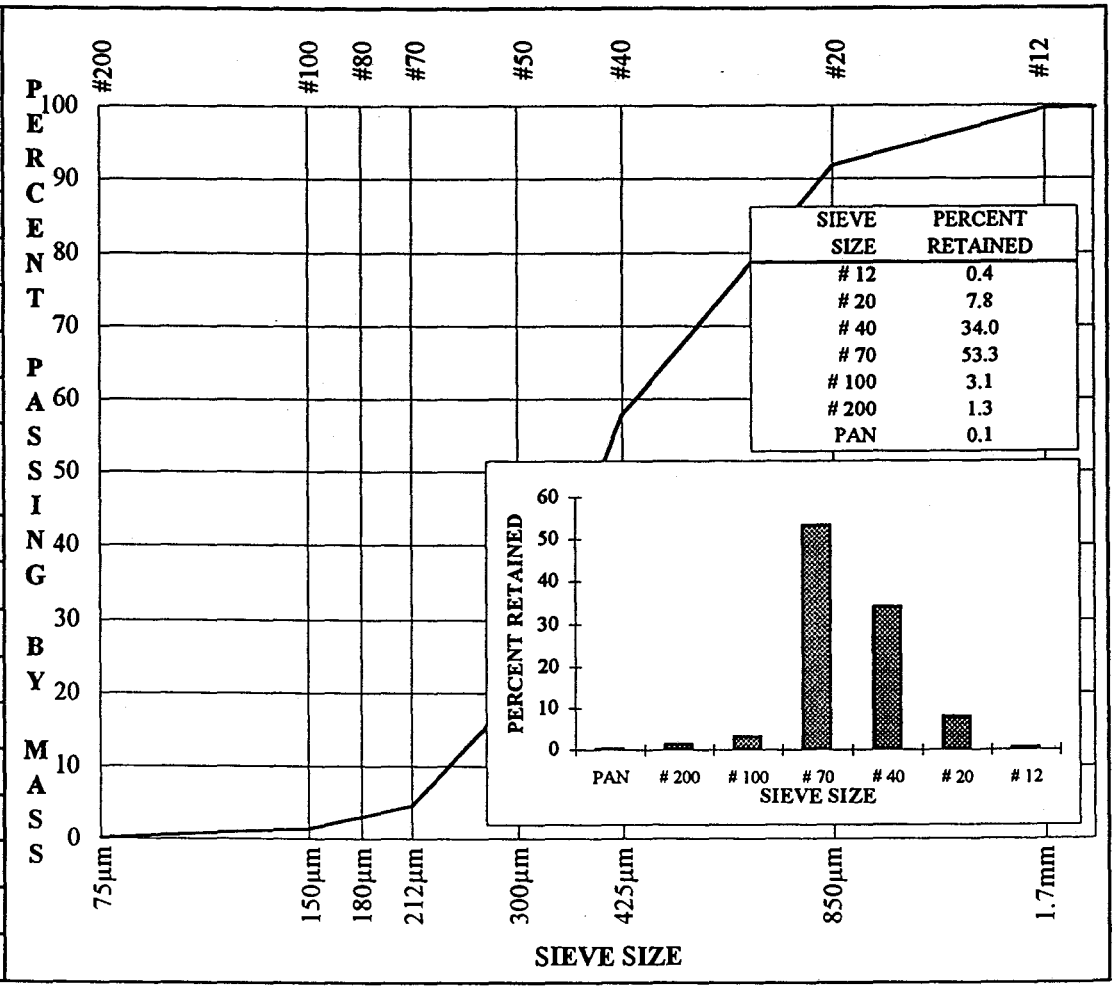
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-10

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	320.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	91.8
# 40	57.8
# 50	20.1
# 70	4.5
# 80	3.0
# 100	1.4
# 200	0.1



REMARKS: UNWASHED

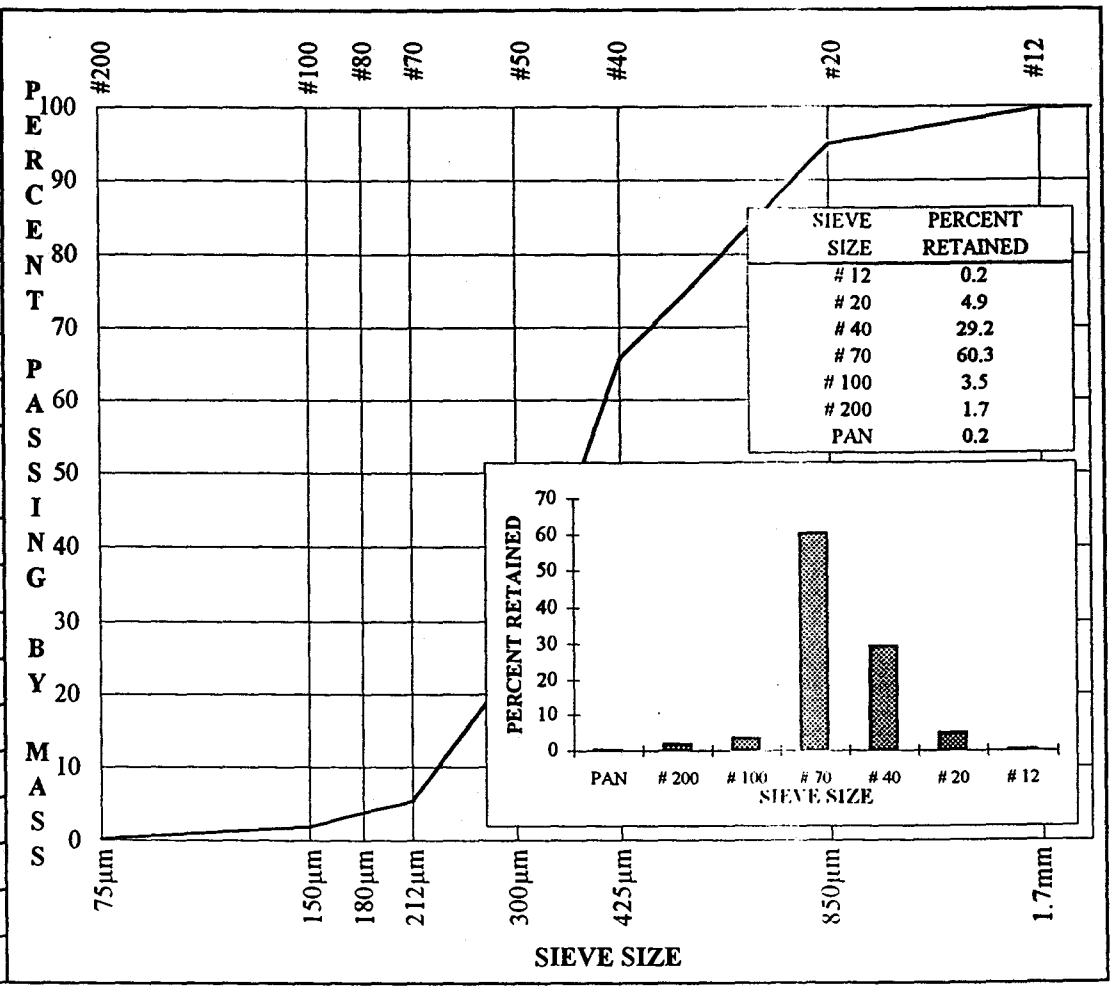
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-11

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	265.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	94.9
# 40	65.6
# 50	24.3
# 70	5.4
# 80	3.8
# 100	1.9
# 200	0.2



REMARKS: UNWASHED

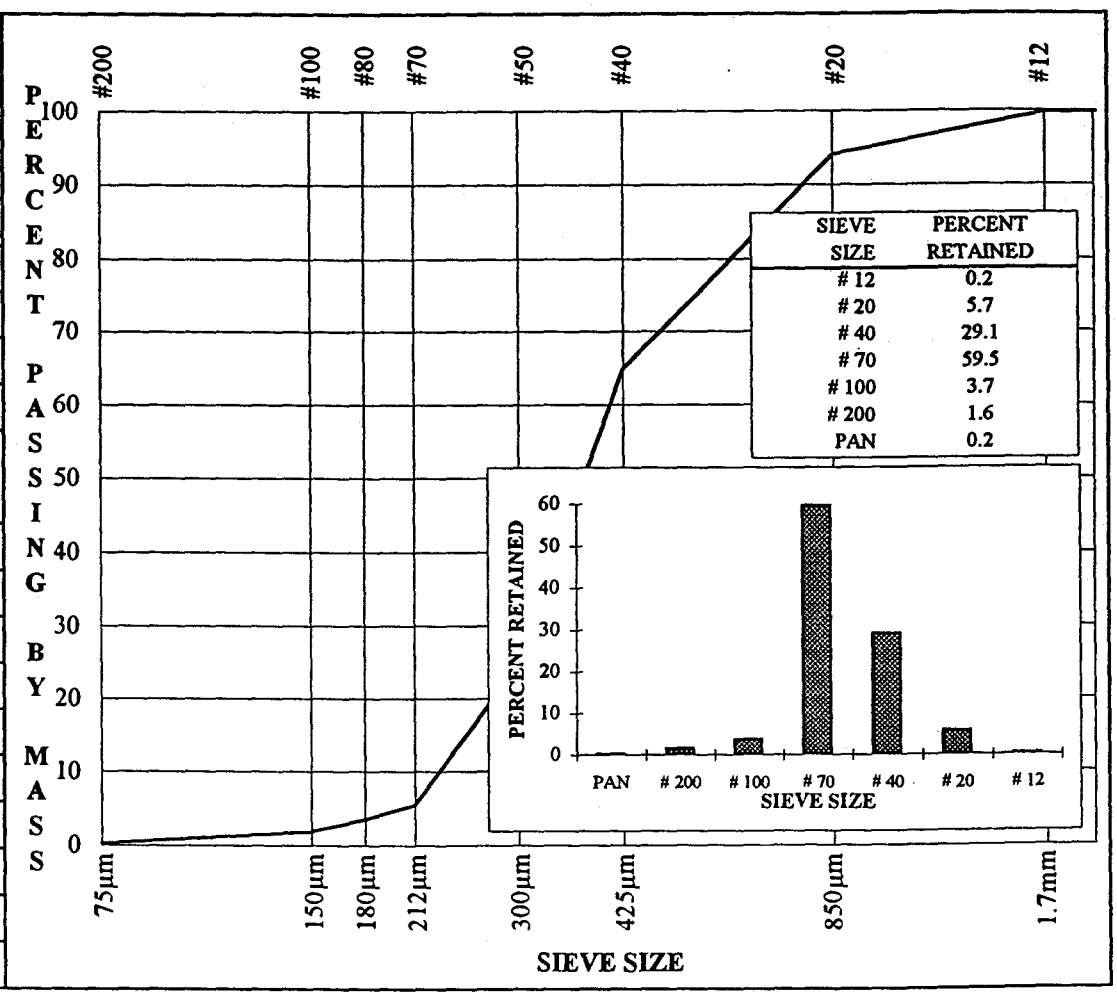
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-12

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	305.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	94.0
# 40	64.9
# 50	24.7
# 70	5.5
# 80	3.5
# 100	1.8
# 200	0.2



REMARKS: UNWASHED

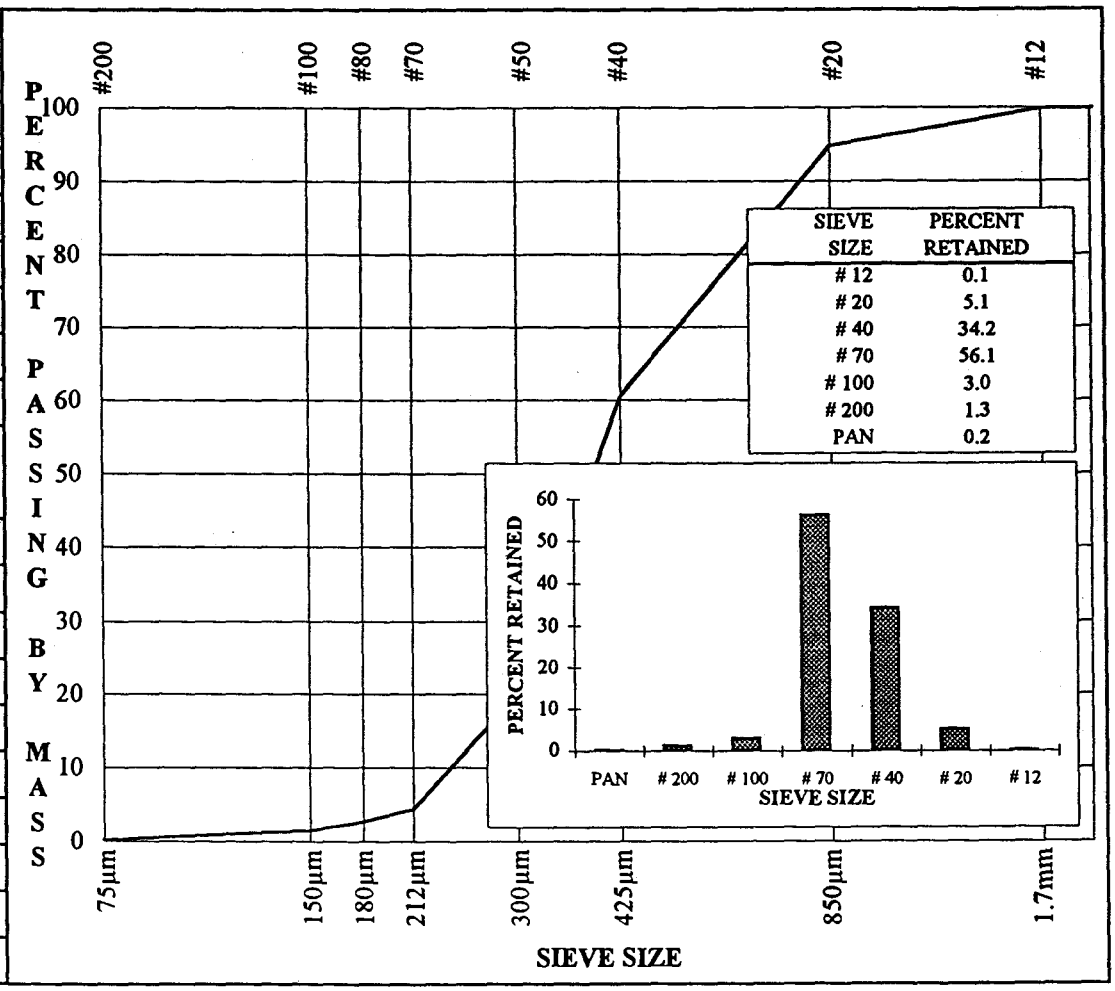
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-13

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	363.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	94.8
# 40	60.5
# 50	20.1
# 70	4.4
# 80	2.8
# 100	1.5
# 200	0.2



REMARKS: UNWASHED

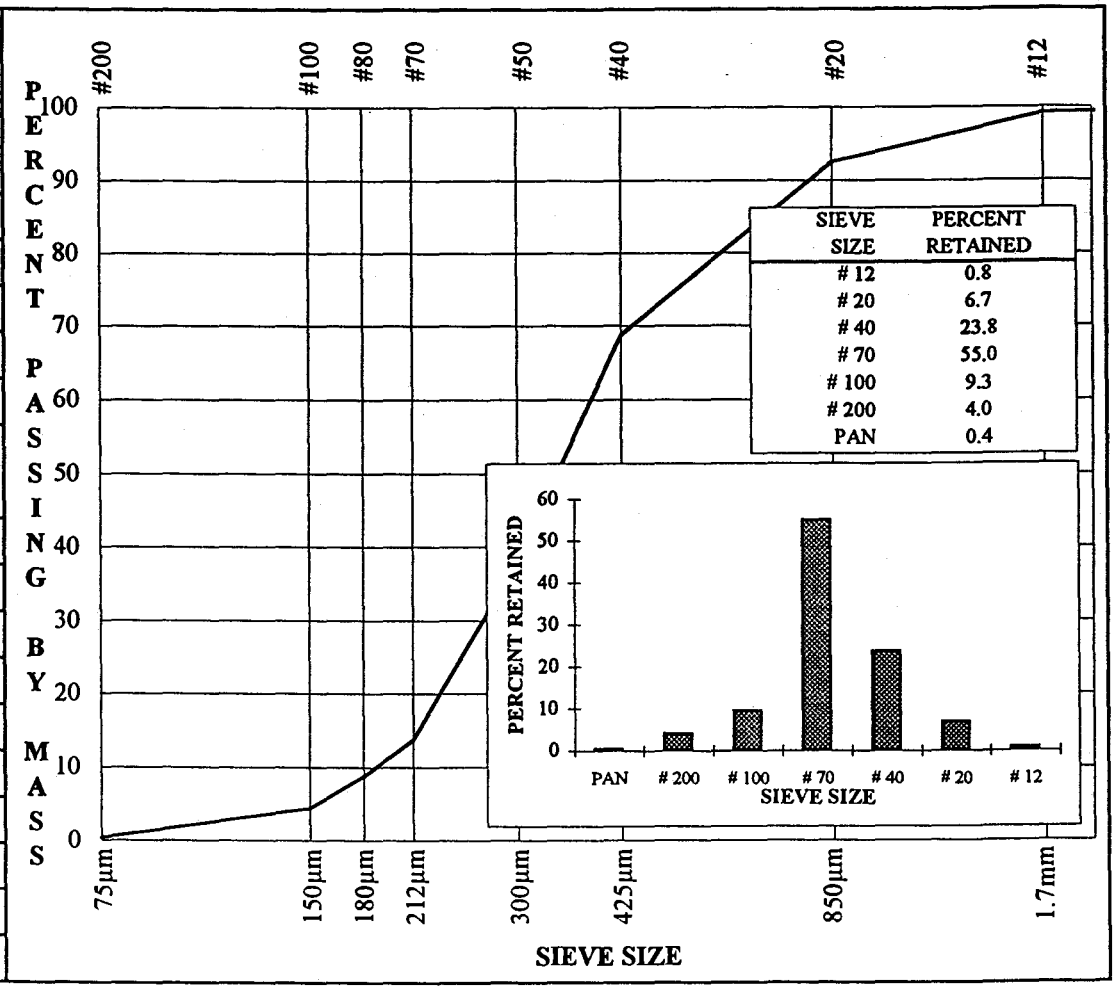
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-05-14

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	309.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.2
# 20	92.5
# 40	68.7
# 50	38.0
# 70	13.7
# 80	8.8
# 100	4.4
# 200	0.4



REMARKS: UNWASHED

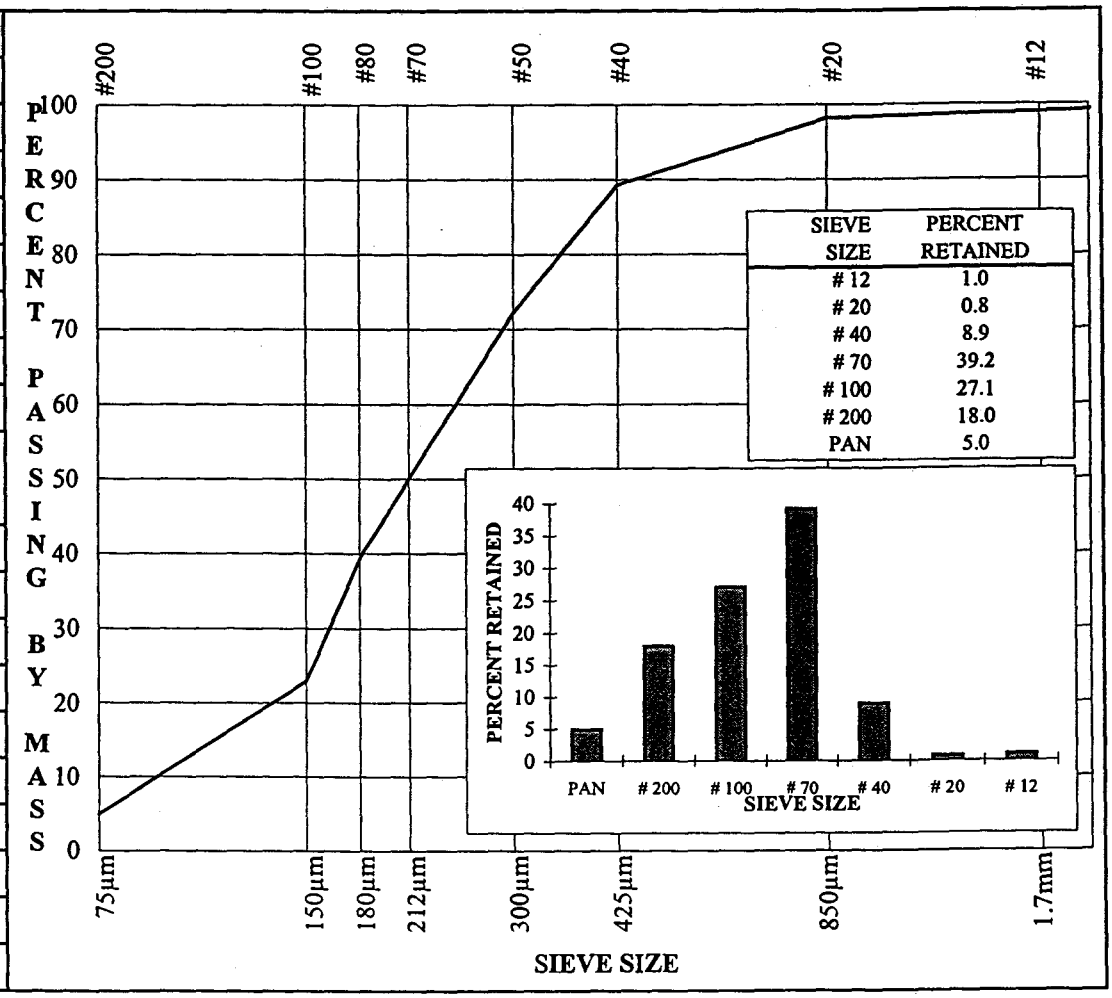
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-5 #15

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	340.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.0
# 20	98.2
# 40	89.2
# 50	72.2
# 70	50.0
# 80	39.4
# 100	22.9
# 200	5.0



REMARKS: UNWASHED

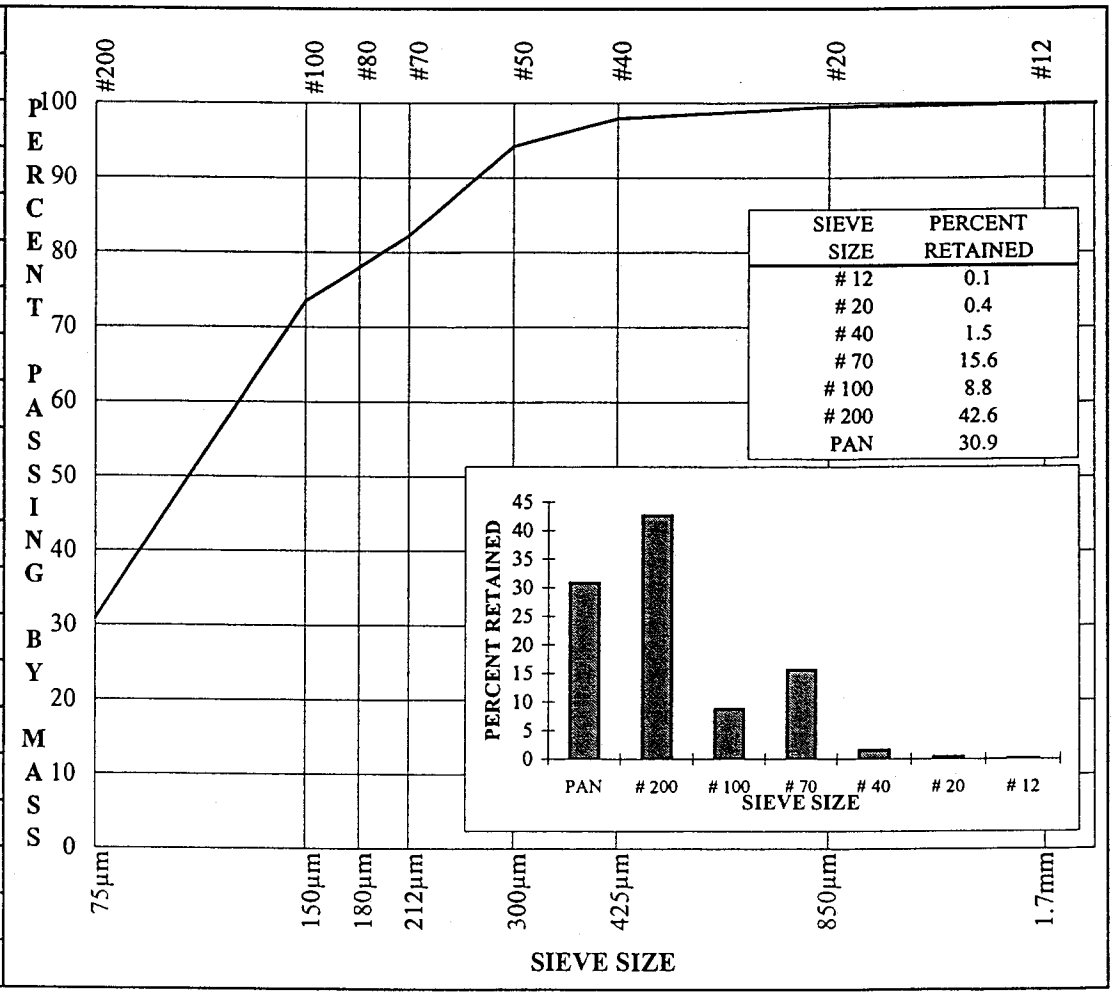
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #1

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	271.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.5
# 40	97.9
# 50	94.2
# 70	82.3
# 80	78.0
# 100	73.5
# 200	30.9



REMARKS: UNWASHED

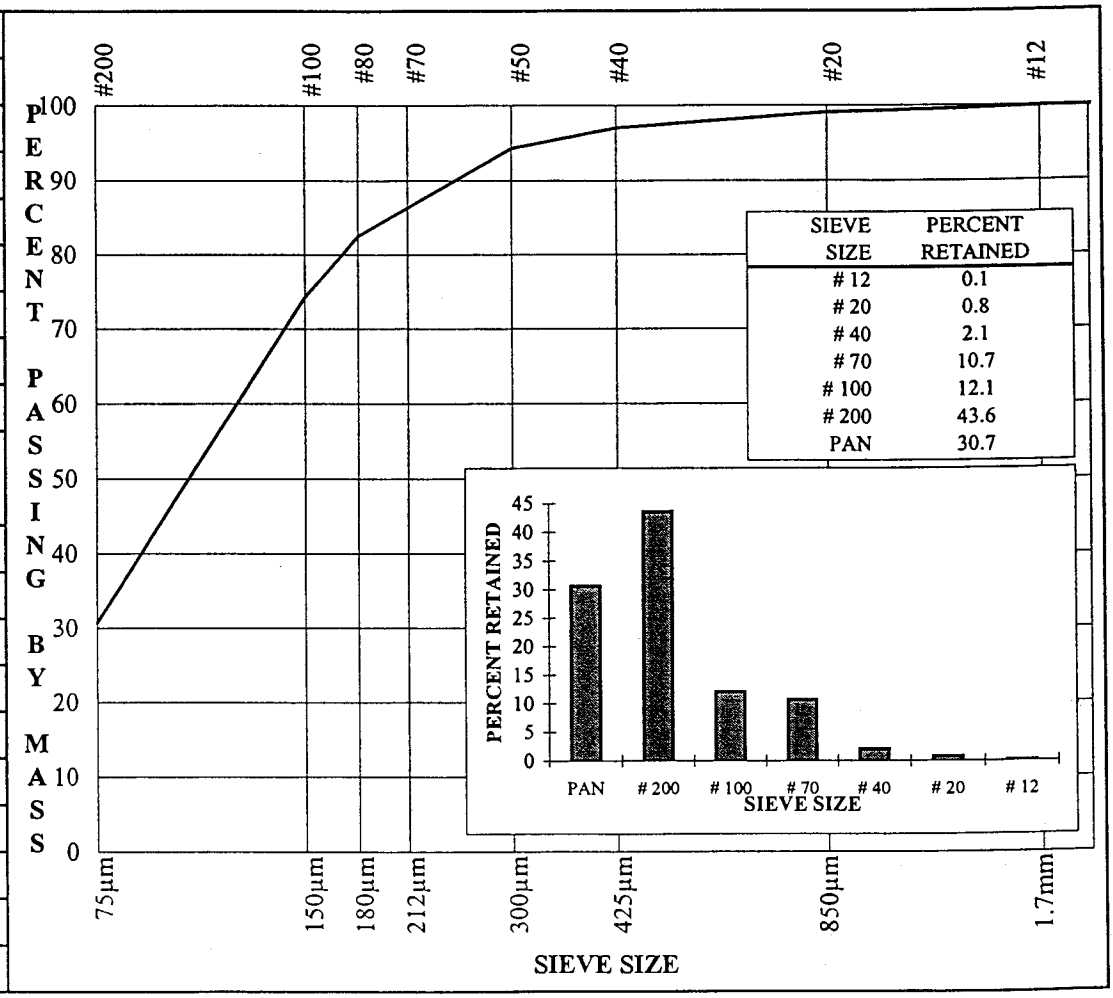
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #2

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	276.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.1
# 40	97.0
# 50	94.3
# 70	86.4
# 80	82.5
# 100	74.3
# 200	30.7



REMARKS: UNWASHED

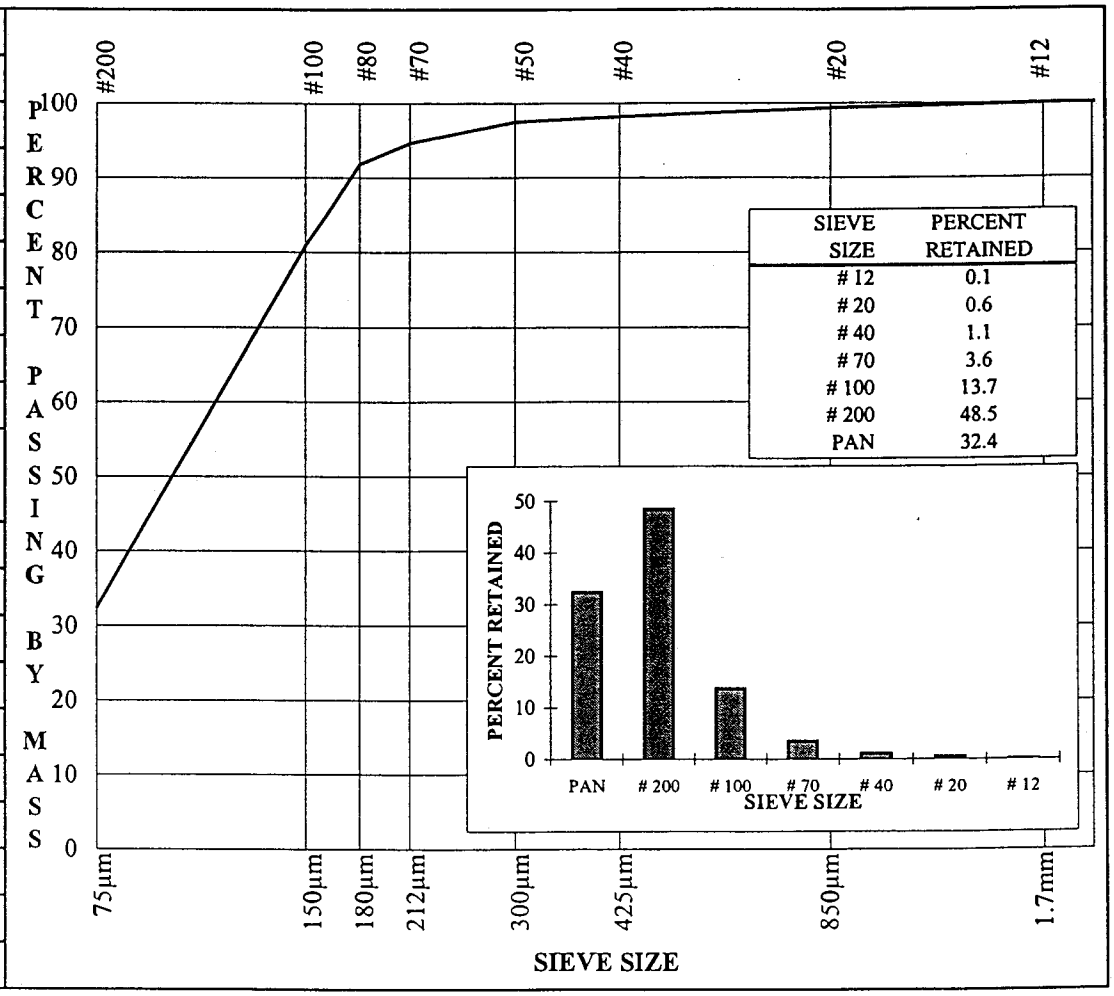
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #3

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	340.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.4
# 40	98.2
# 50	97.5
# 70	94.7
# 80	91.8
# 100	80.9
# 200	32.4



REMARKS: UNWASHED

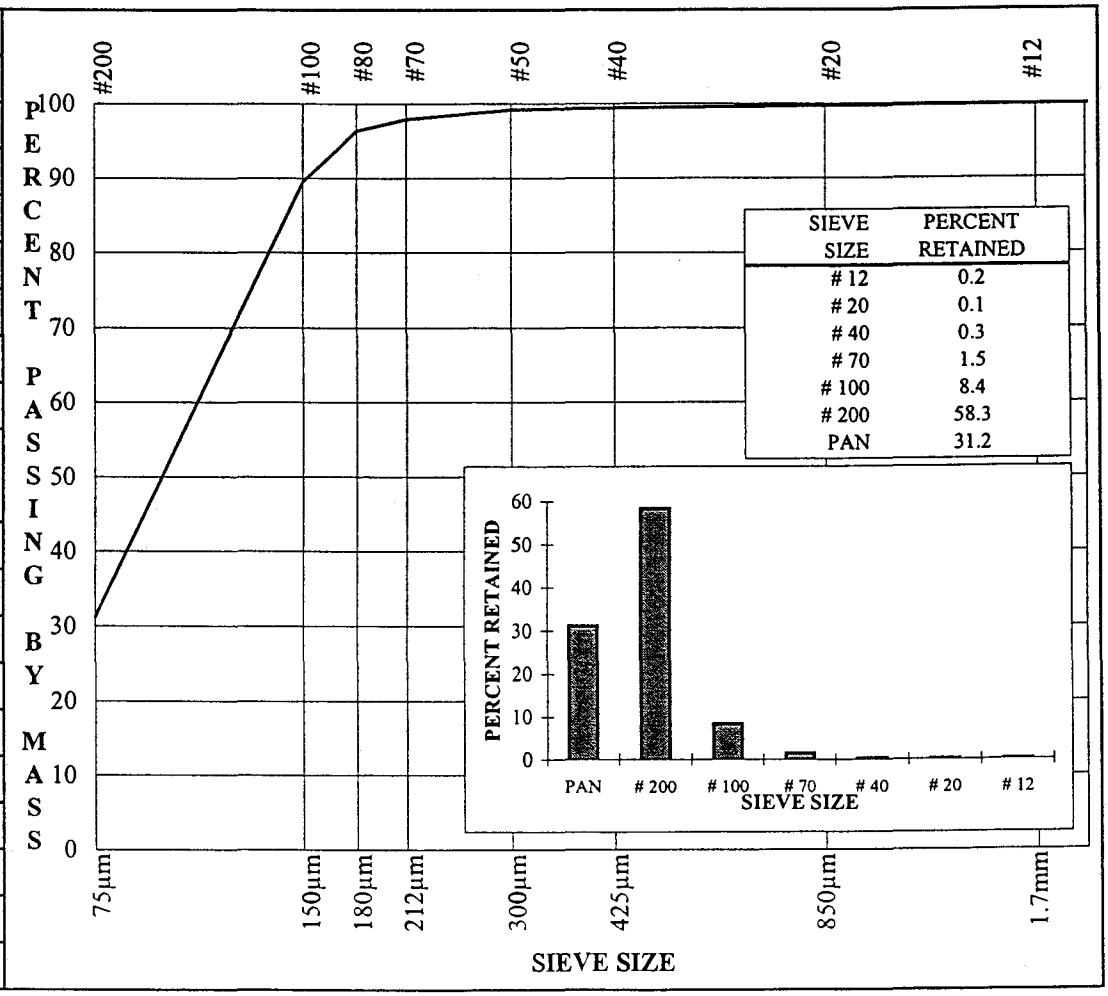
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #4

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	300.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	99.7
# 40	99.4
# 50	99.2
# 70	97.9
# 80	96.3
# 100	89.5
# 200	31.2



REMARKS: UNWASHED

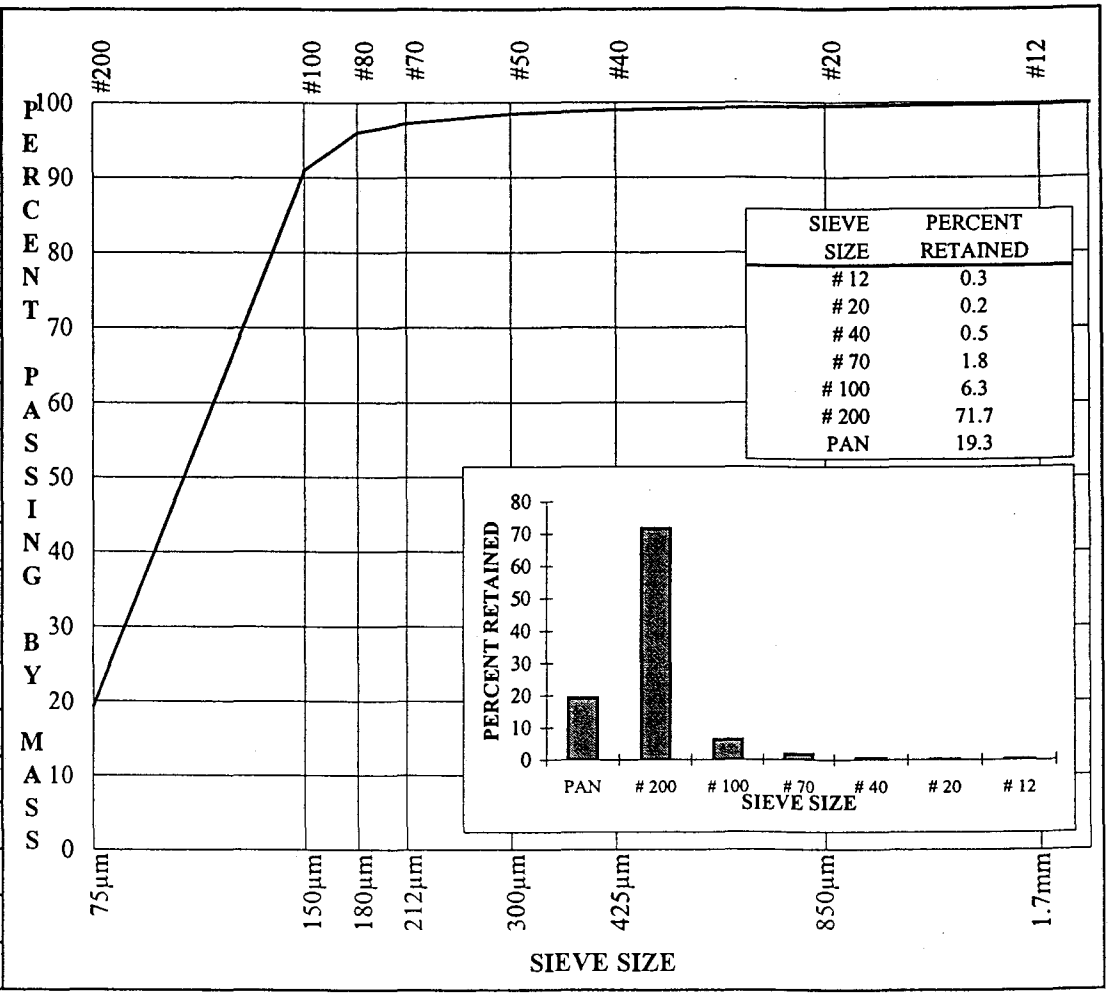
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-3 #5

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	369.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.7
# 20	99.5
# 40	99.0
# 50	98.5
# 70	97.2
# 80	96.0
# 100	90.9
# 200	19.3



REMARKS: UNWASHED

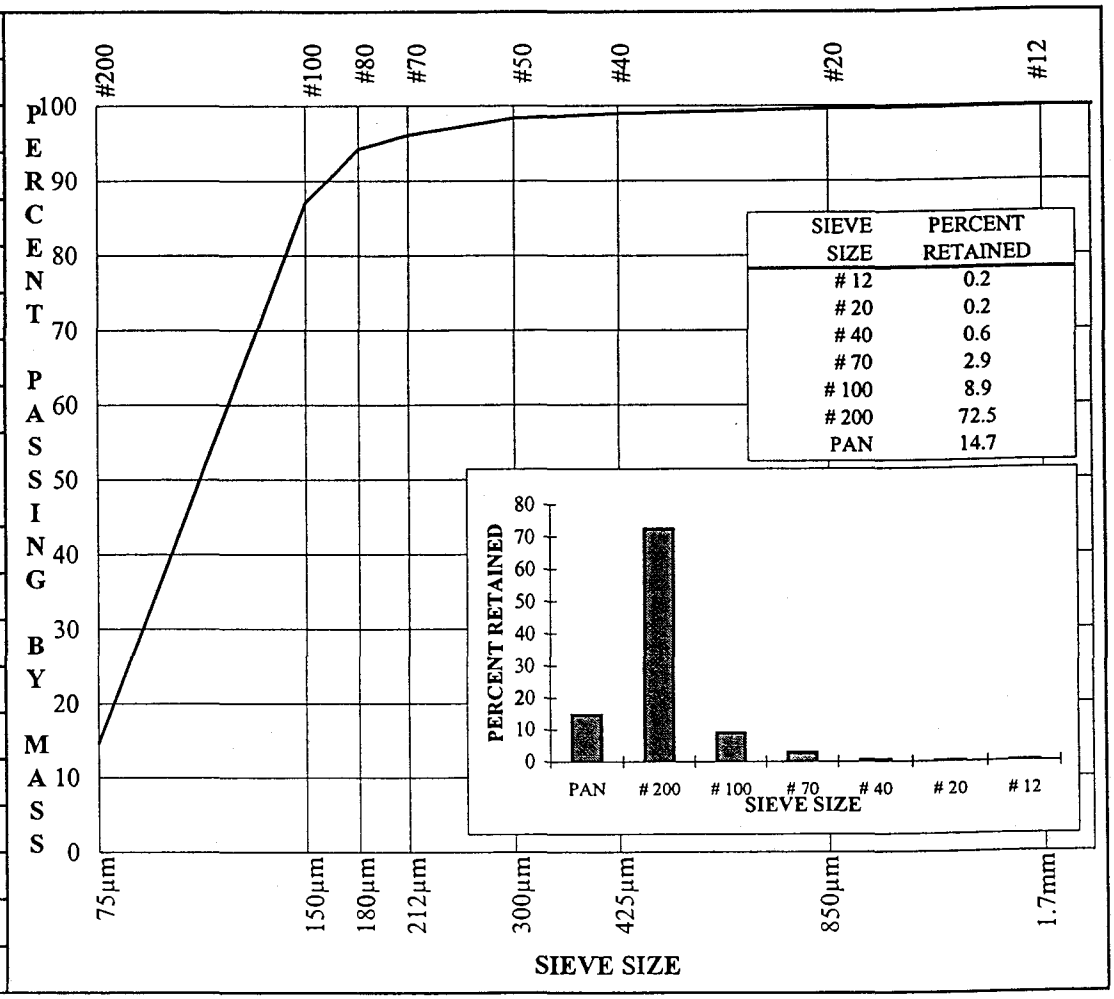
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #6

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	292.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	99.6
# 40	99.0
# 50	98.4
# 70	96.1
# 80	94.3
# 100	87.2
# 200	14.7



REMARKS: UNWASHED

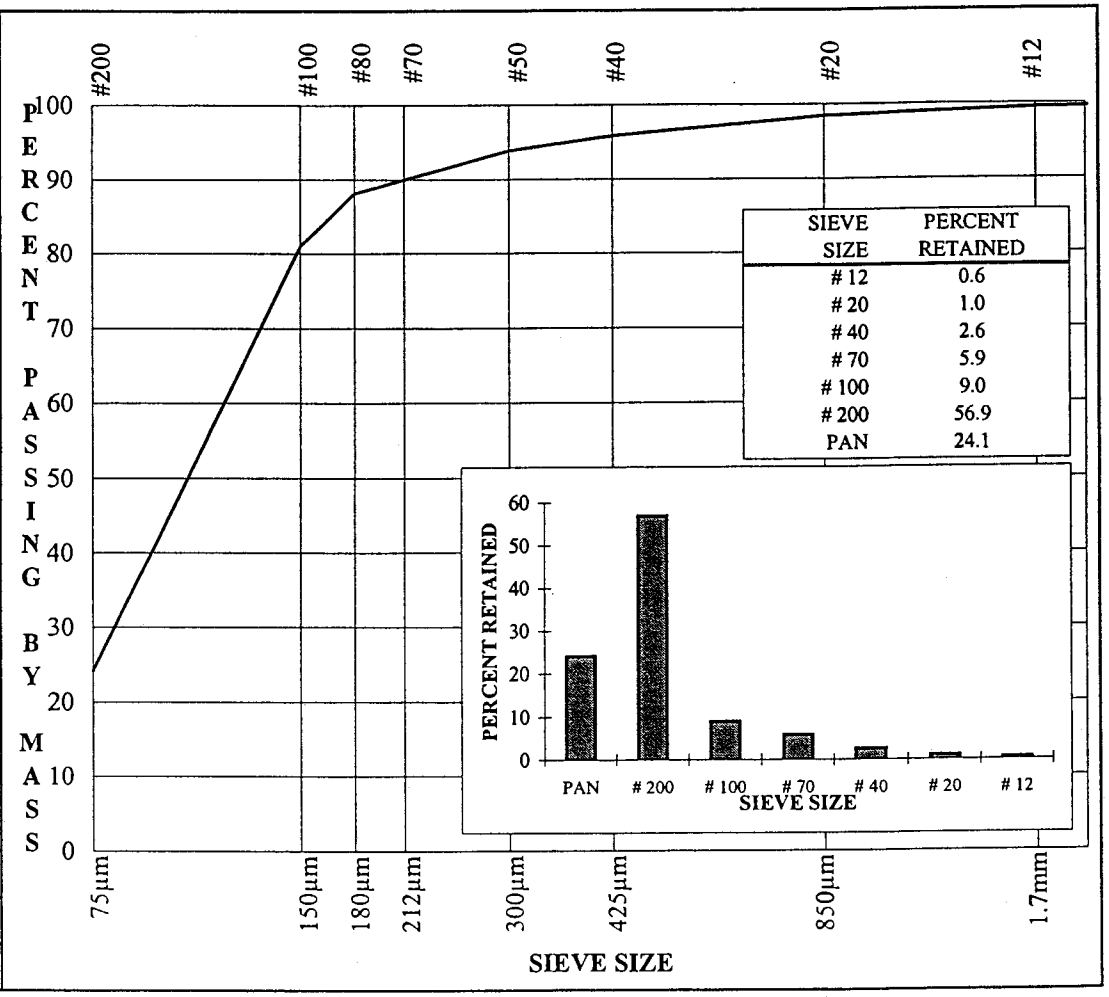
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #7

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	286.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.4
# 20	98.4
# 40	95.8
# 50	93.9
# 70	90.0
# 80	88.1
# 100	81.0
# 200	24.1



REMARKS: UNWASHED

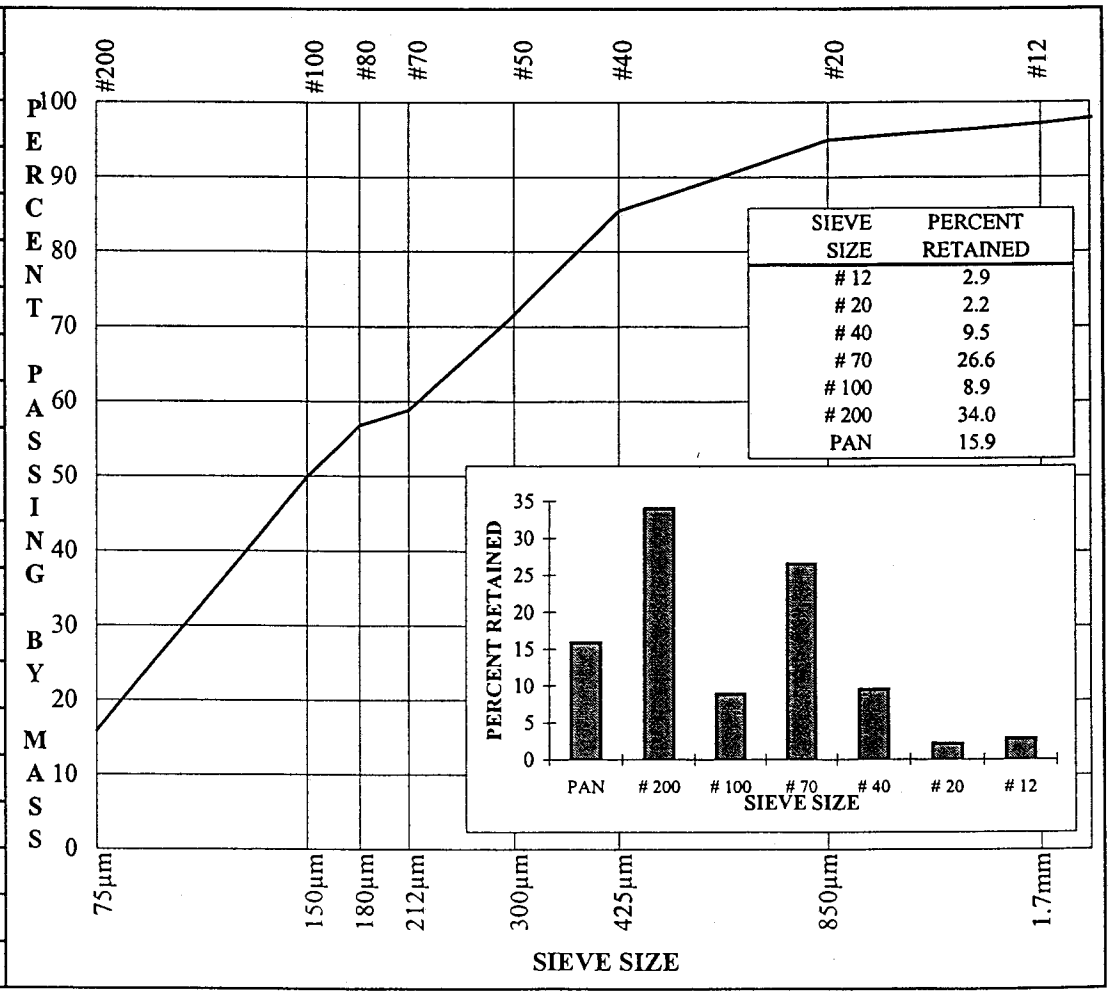
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #8

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	345.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	97.1
# 20	94.9
# 40	85.4
# 50	71.6
# 70	58.8
# 80	56.8
# 100	49.9
# 200	15.9



REMARKS: UNWASHED

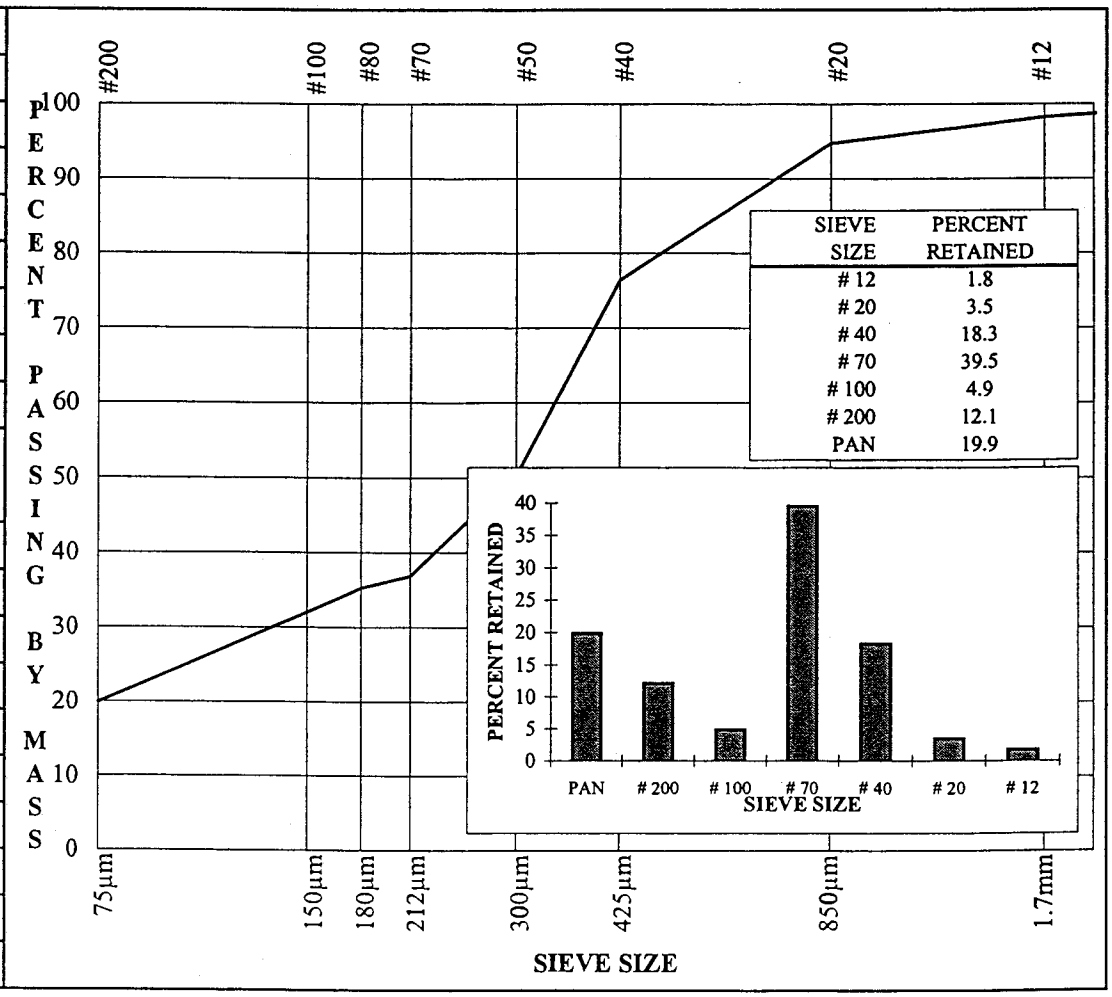
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #9

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	259.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.2
# 20	94.7
# 40	76.4
# 50	50.2
# 70	36.9
# 80	35.3
# 100	32.0
# 200	19.9



REMARKS: UNWASHED

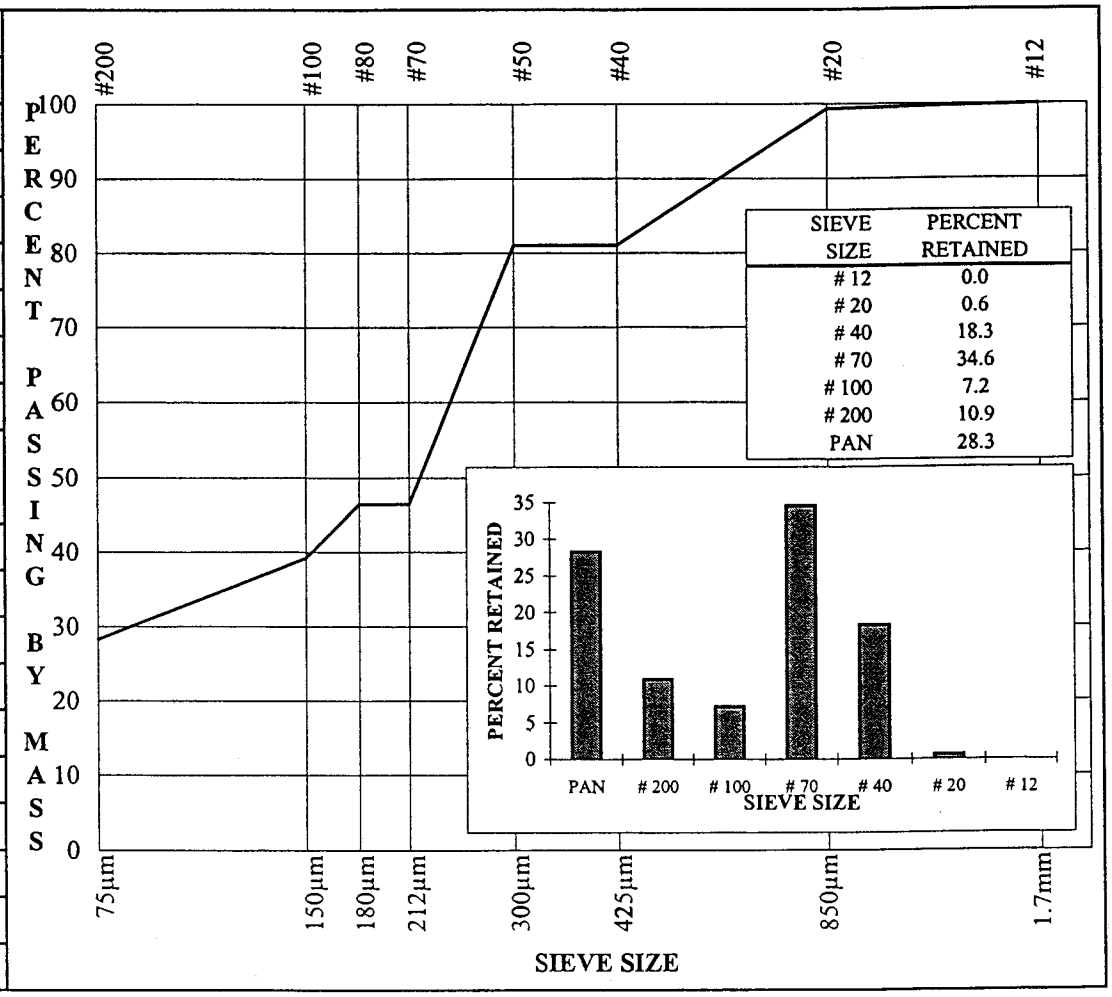
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-03-09

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	1000.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.4
# 40	81.0
# 50	81.0
# 70	46.5
# 80	46.5
# 100	39.2
# 200	28.3



REMARKS: WASHED & SIEVED IN 2 PARTS

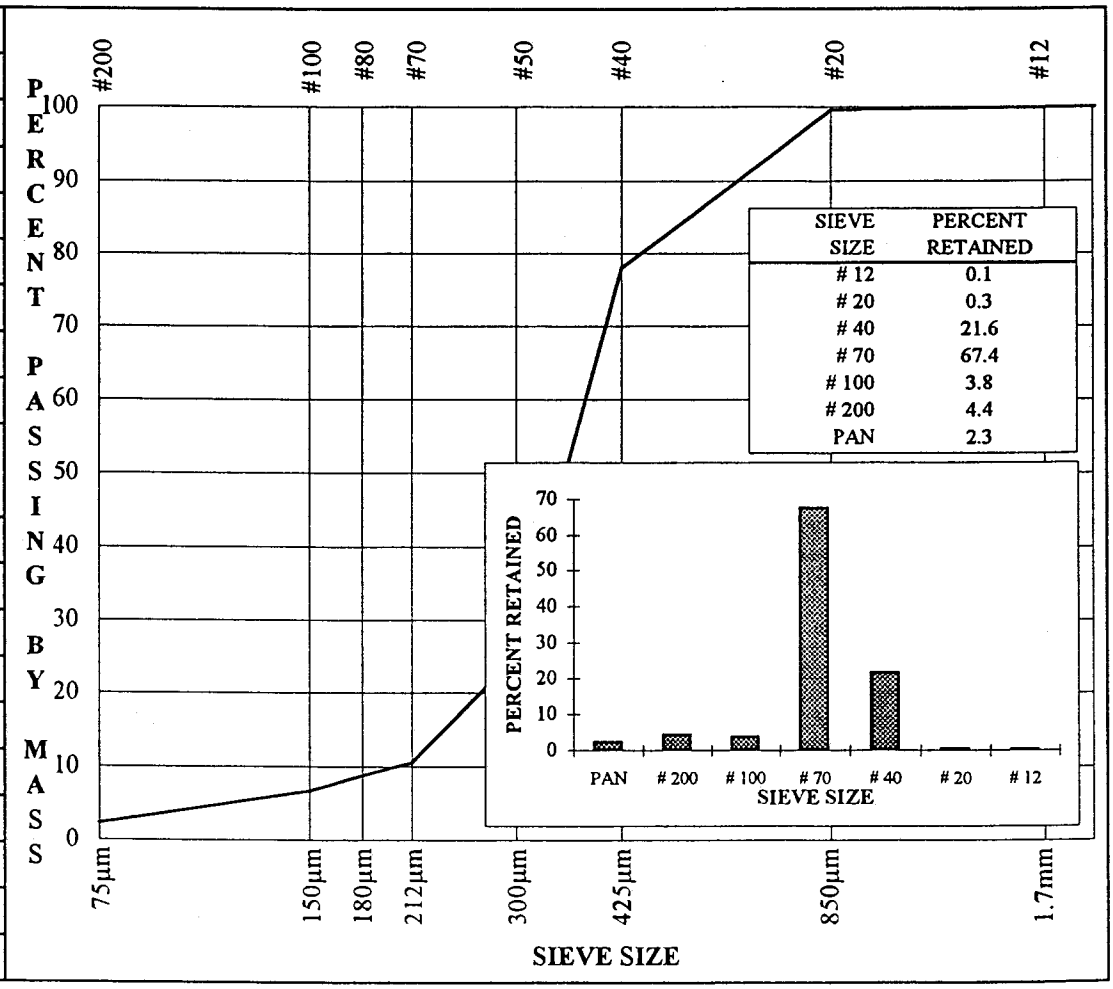
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-03-10

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	319.6
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.6
# 40	78.0
# 50	24.9
# 70	10.5
# 80	8.8
# 100	6.7
# 200	2.3



REMARKS: UNWASHED

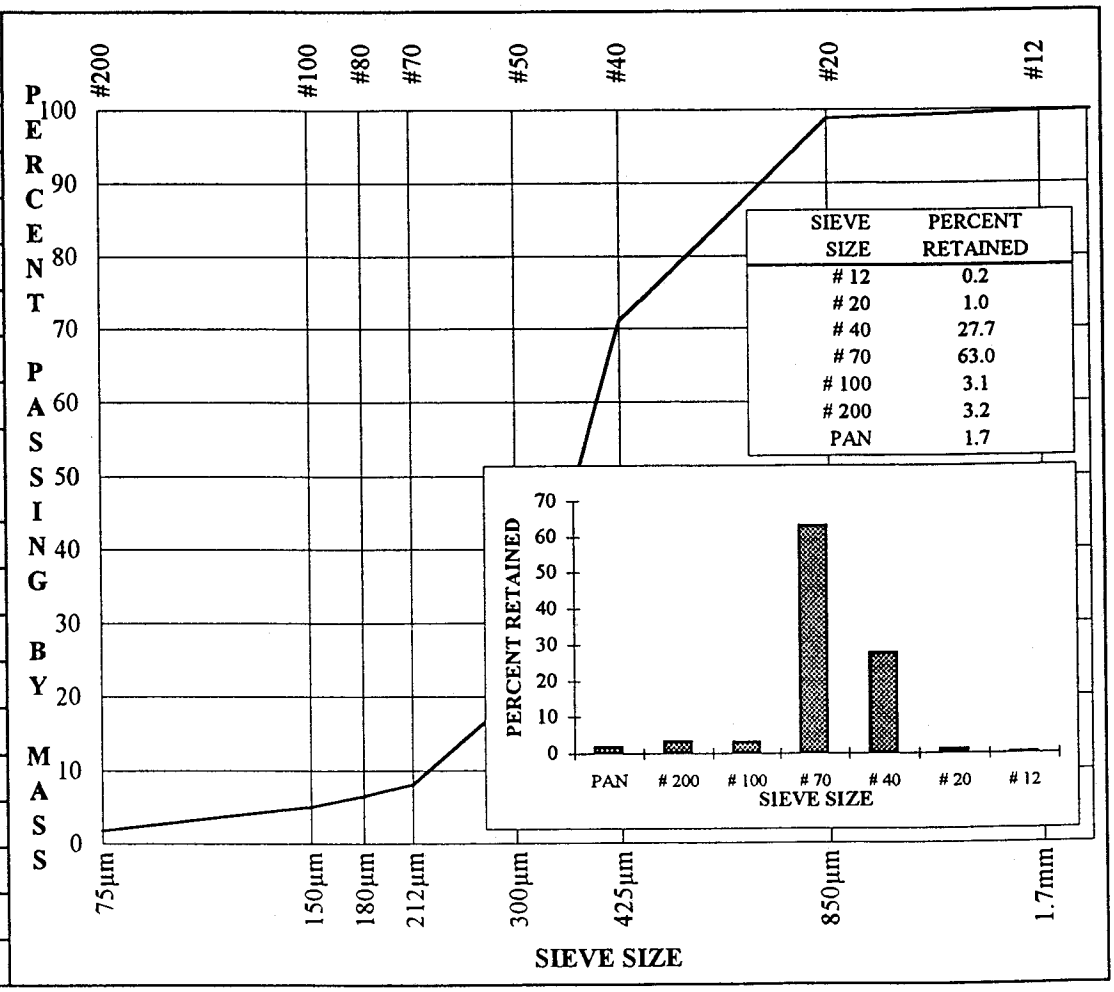
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-03-11

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	373.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.8
# 20	98.8
# 40	71.1
# 50	20.1
# 70	8.1
# 80	6.5
# 100	5.0
# 200	1.7



REMARKS: UNWASHED

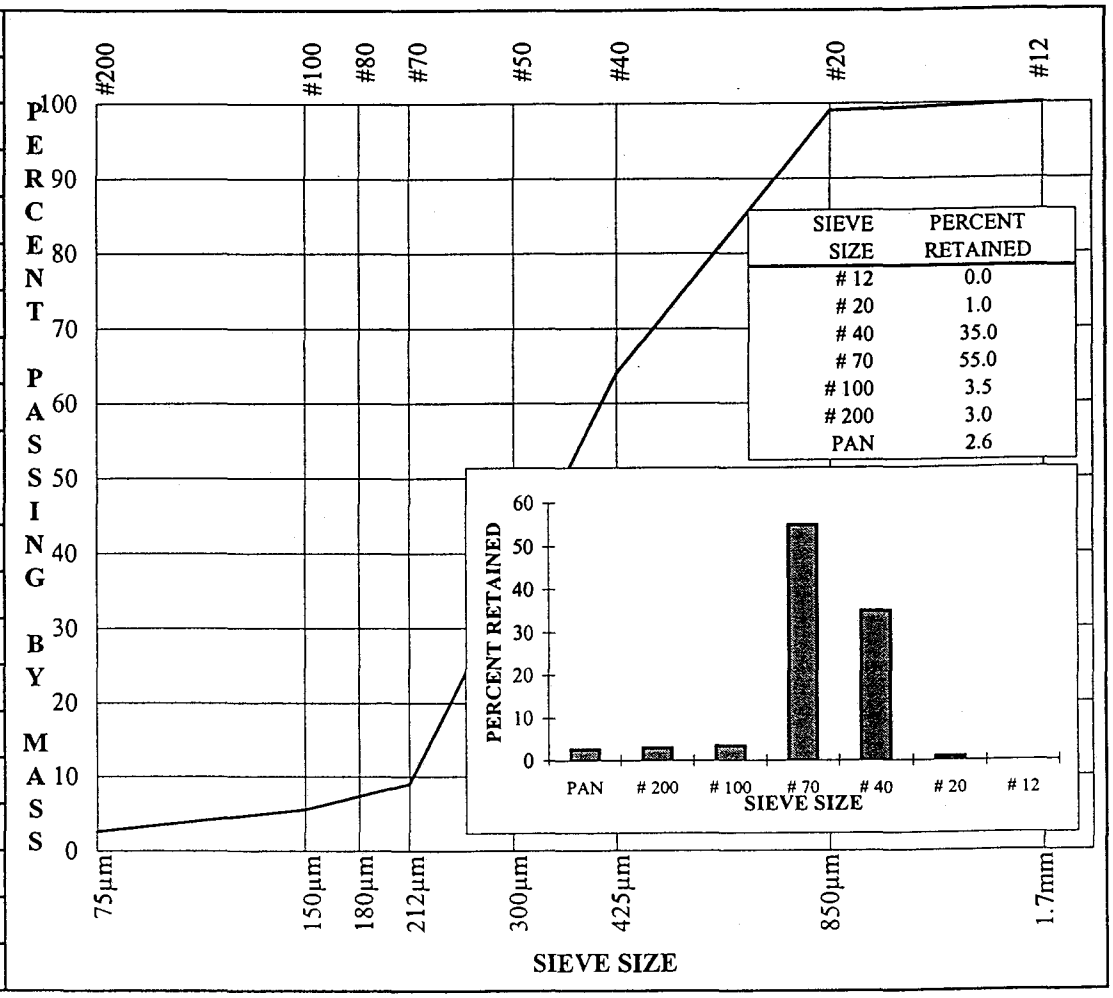
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-03-11

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	1000.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.0
# 40	64.0
# 50	
# 70	9.0
# 80	
# 100	5.6
# 200	2.6



REMARKS: WASHED & SIEVED IN 2 PARTS

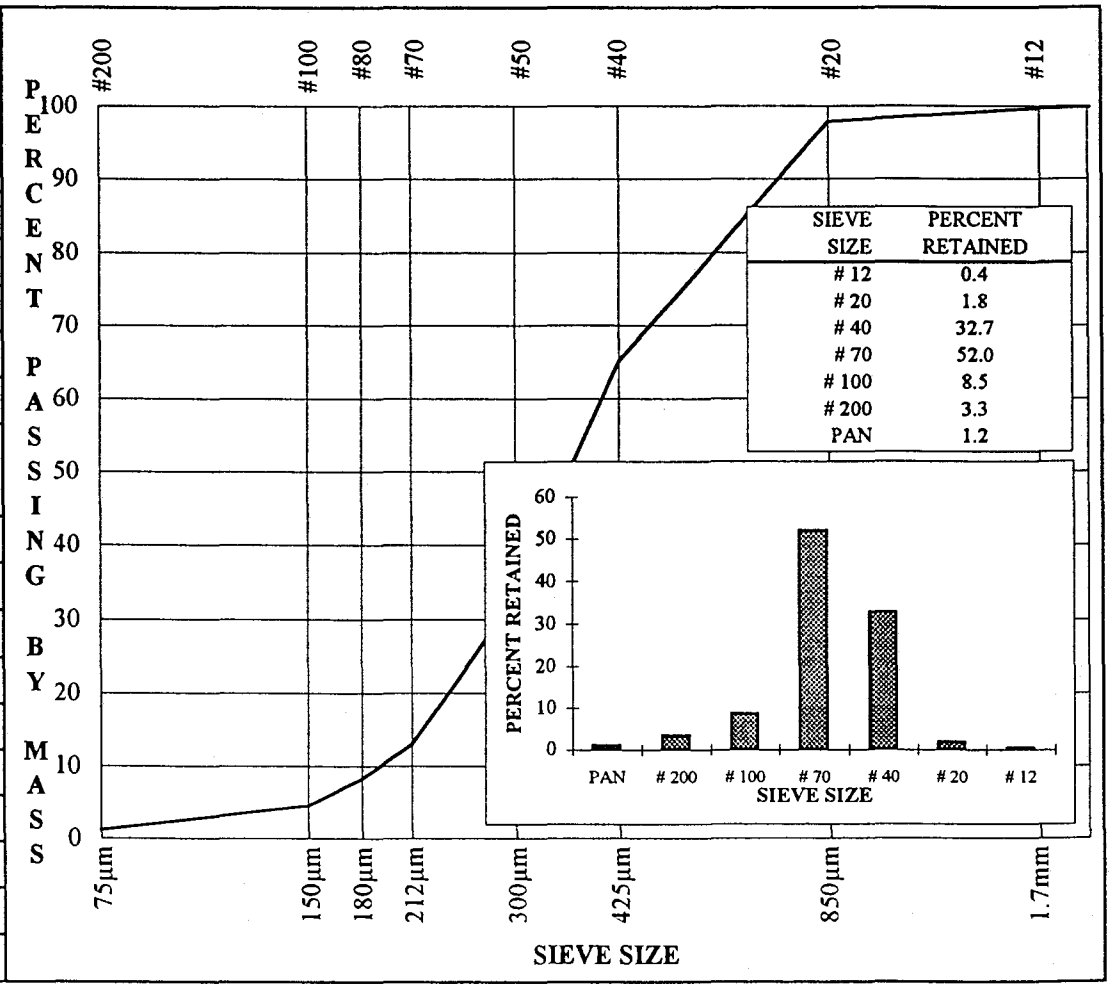
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-03-13

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	330.1
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	97.8
# 40	65.1
# 50	33.1
# 70	13.0
# 80	8.3
# 100	4.5
# 200	1.2



REMARKS: UNWASHED

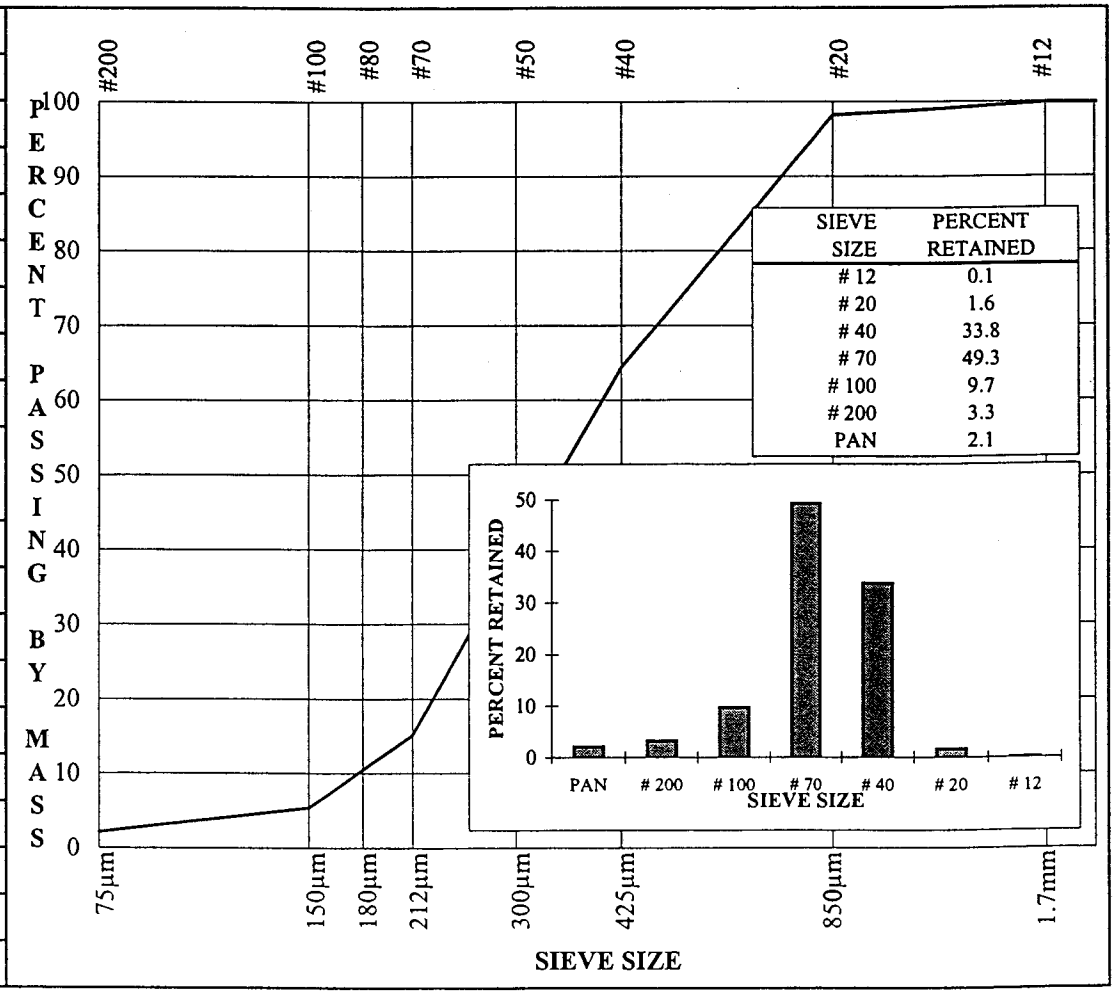
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-03-13

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	1000.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	98.2
# 40	64.4
# 50	
# 70	15.1
# 80	
# 100	5.4
# 200	2.1



REMARKS: WASHED & SIEVED IN 2 PARTS

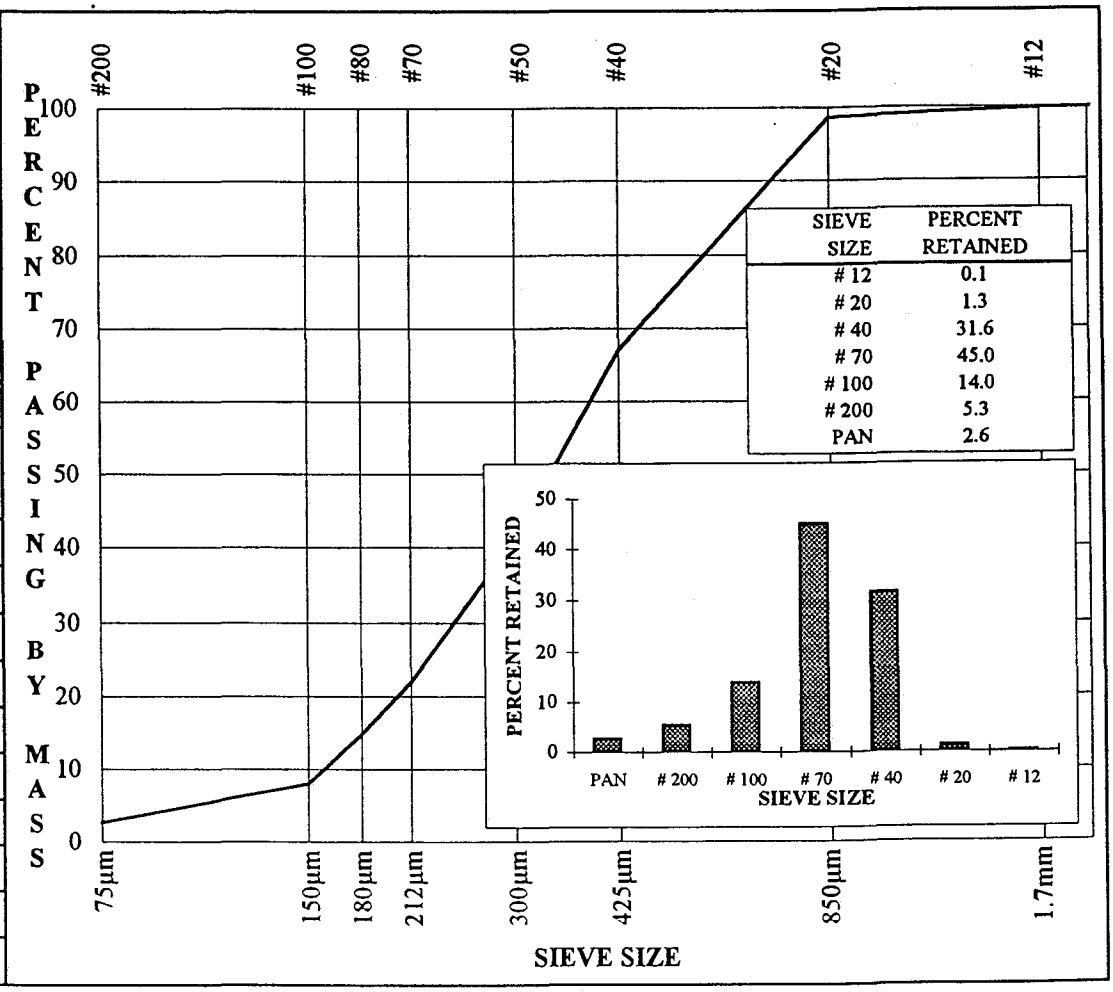
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-03-14

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	140.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	98.6
# 40	67.0
# 50	41.0
# 70	22.0
# 80	14.7
# 100	8.0
# 200	2.6



REMARKS: UNWASHED, ENTIRE SAMPLE USED.

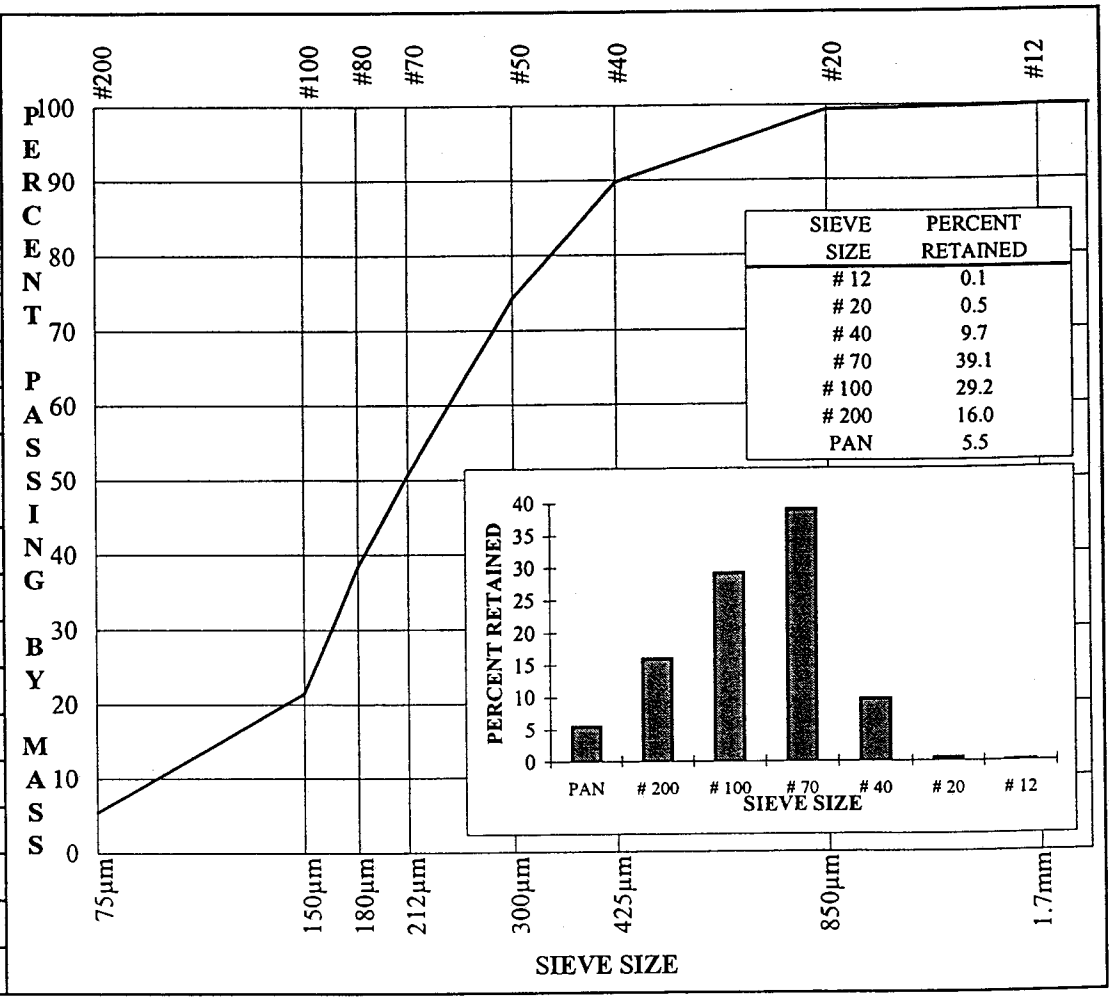
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #15

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	298.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.4
# 40	89.7
# 50	74.3
# 70	50.7
# 80	38.4
# 100	21.5
# 200	5.5



REMARKS: UNWASHED

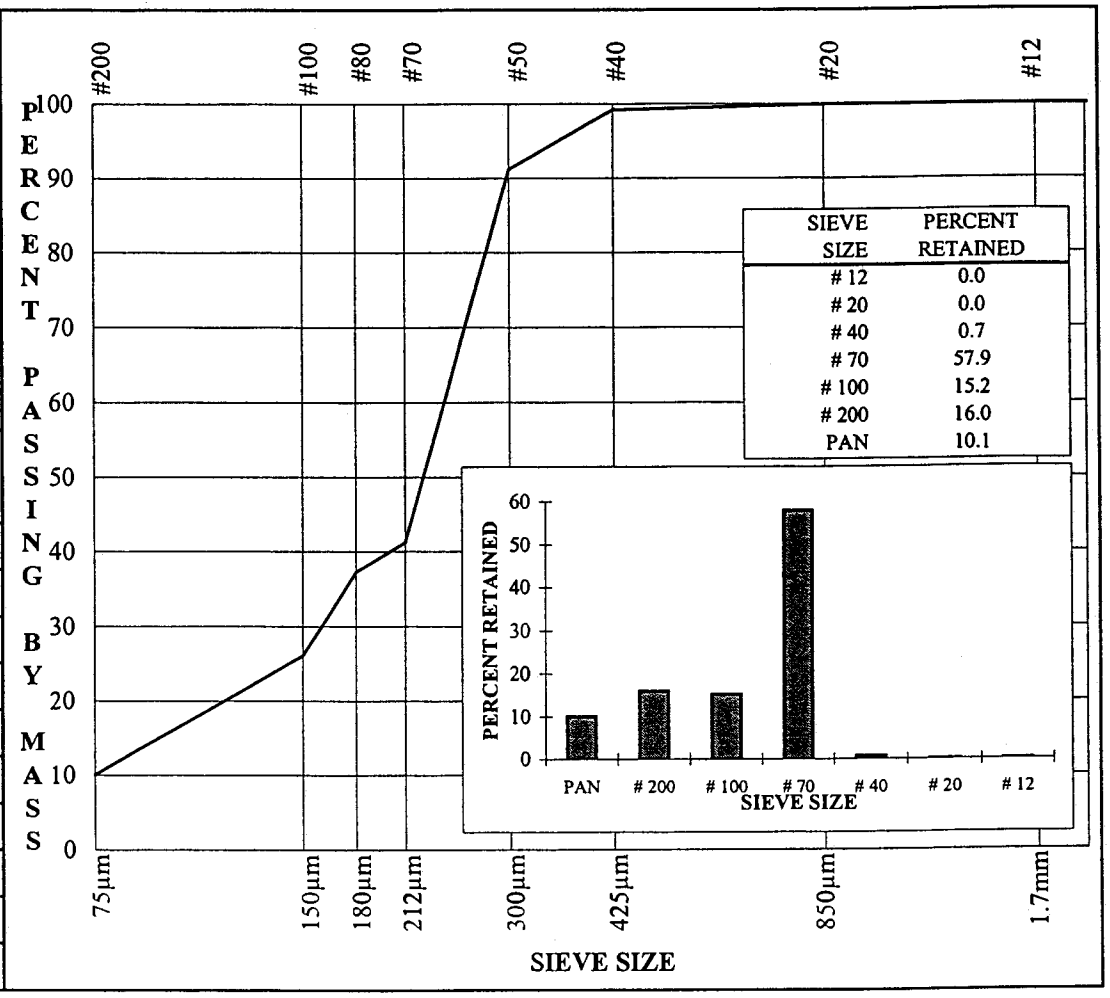
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 05, 1998
SAMPLE NO.: E89-3 #16

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	255.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	99.9
# 40	99.2
# 50	91.2
# 70	41.3
# 80	37.3
# 100	26.1
# 200	10.1



REMARKS: UNWASHED

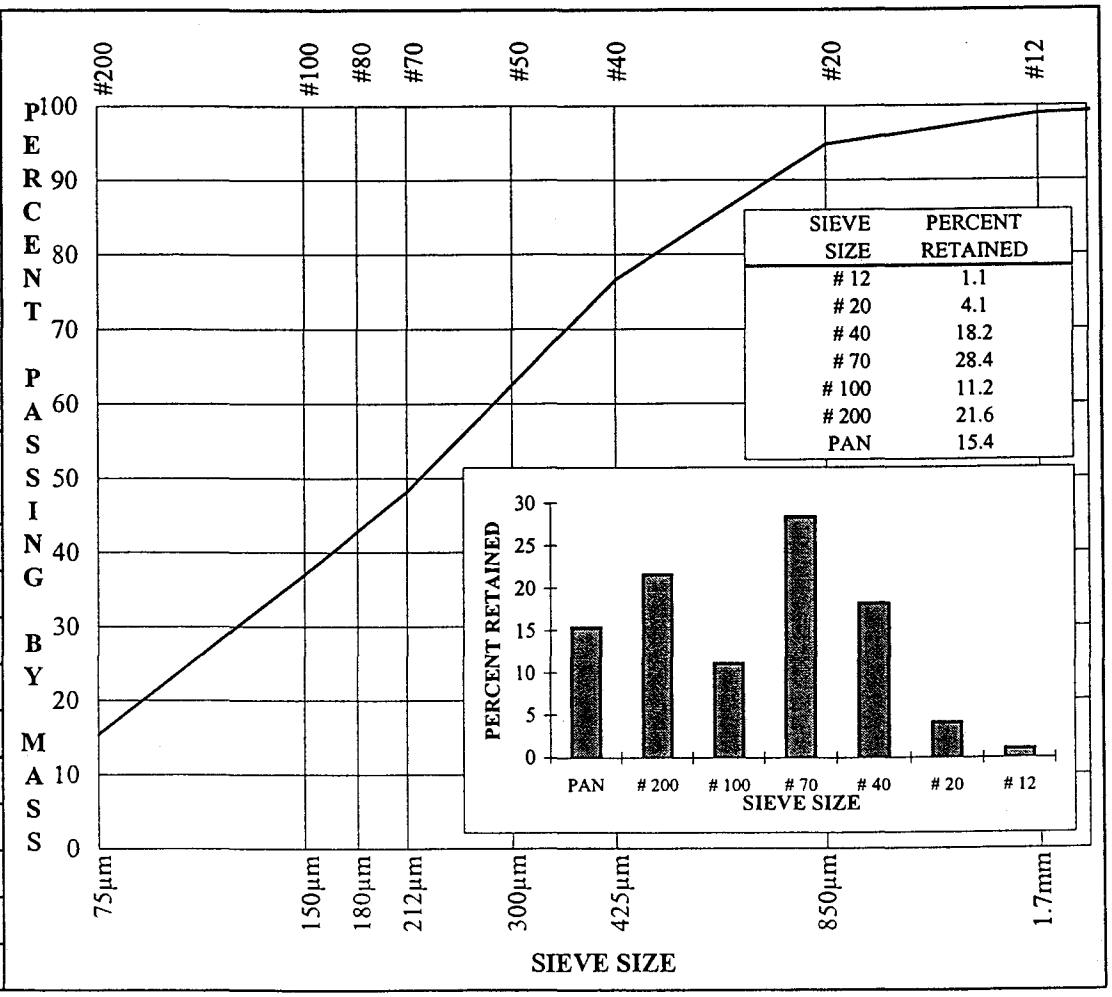
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-2-01

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	328.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.9
# 20	94.8
# 40	76.6
# 50	62.5
# 70	48.2
# 80	42.8
# 100	37.0
# 200	15.4



REMARKS: UNWASHED

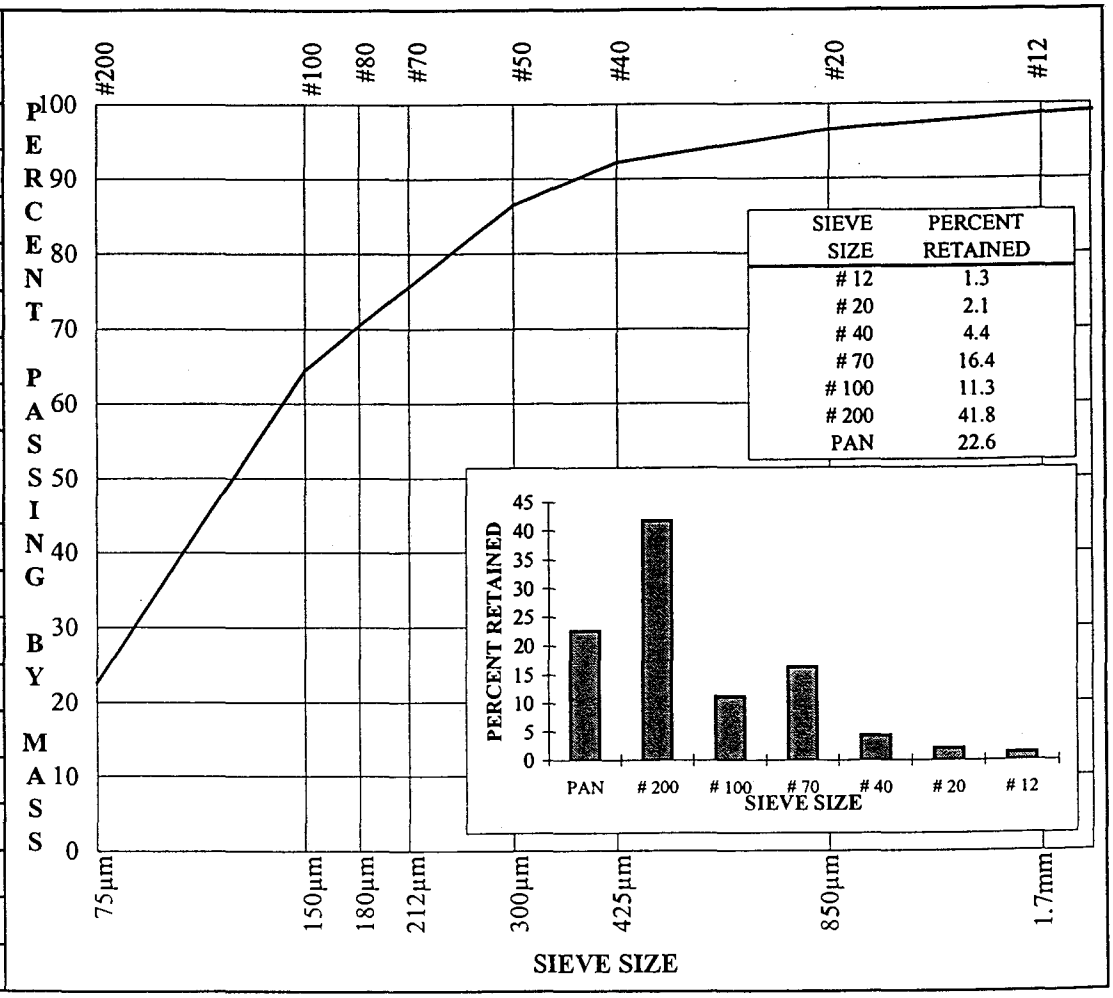
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 04, 1998
SAMPLE NO.: E89-2 #2

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	309.2
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.7
# 20	96.5
# 40	92.1
# 50	86.5
# 70	75.7
# 80	70.5
# 100	64.5
# 200	22.6



REMARKS: UNWASHED

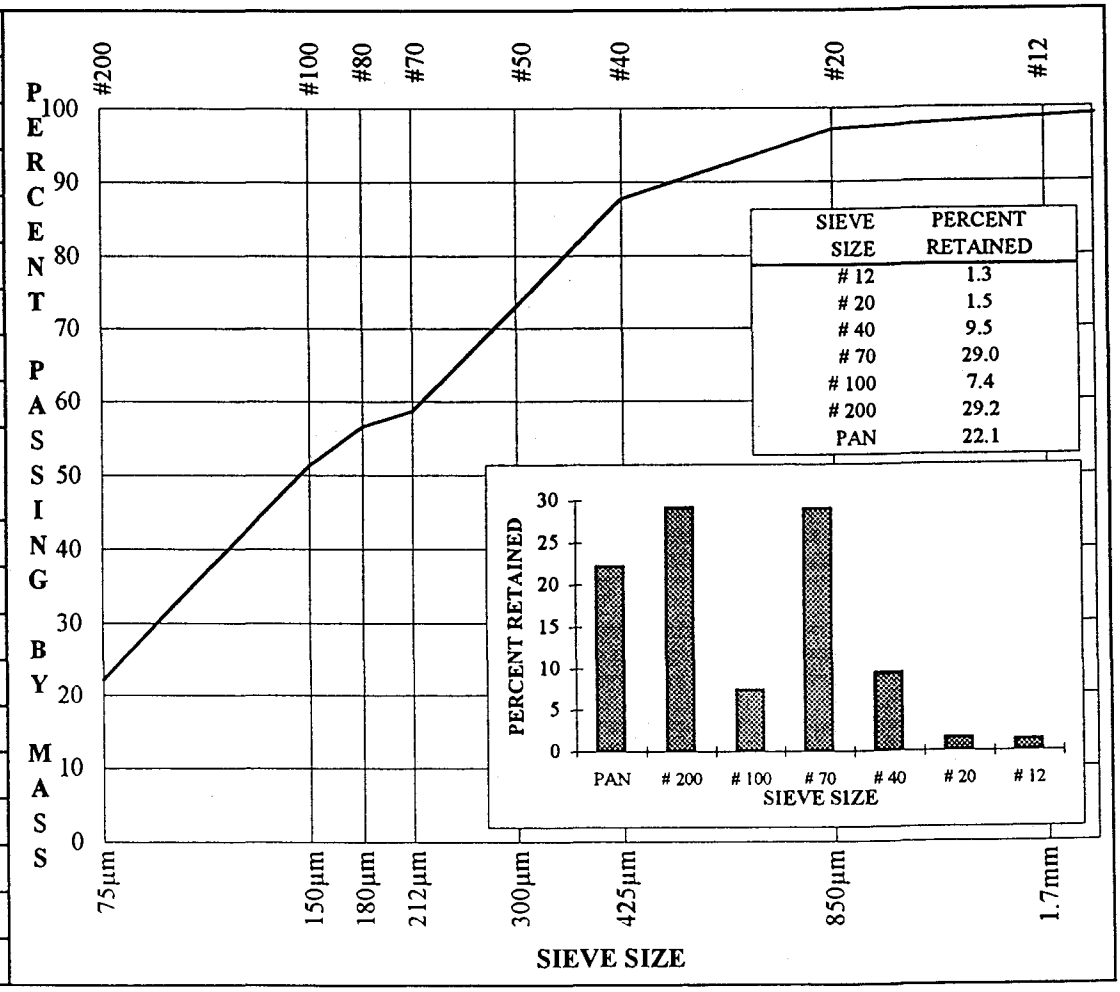
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-03

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	305.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.7
# 20	97.1
# 40	87.7
# 50	73.0
# 70	58.7
# 80	56.6
# 100	51.3
# 200	22.1



REMARKS: UNWASHED

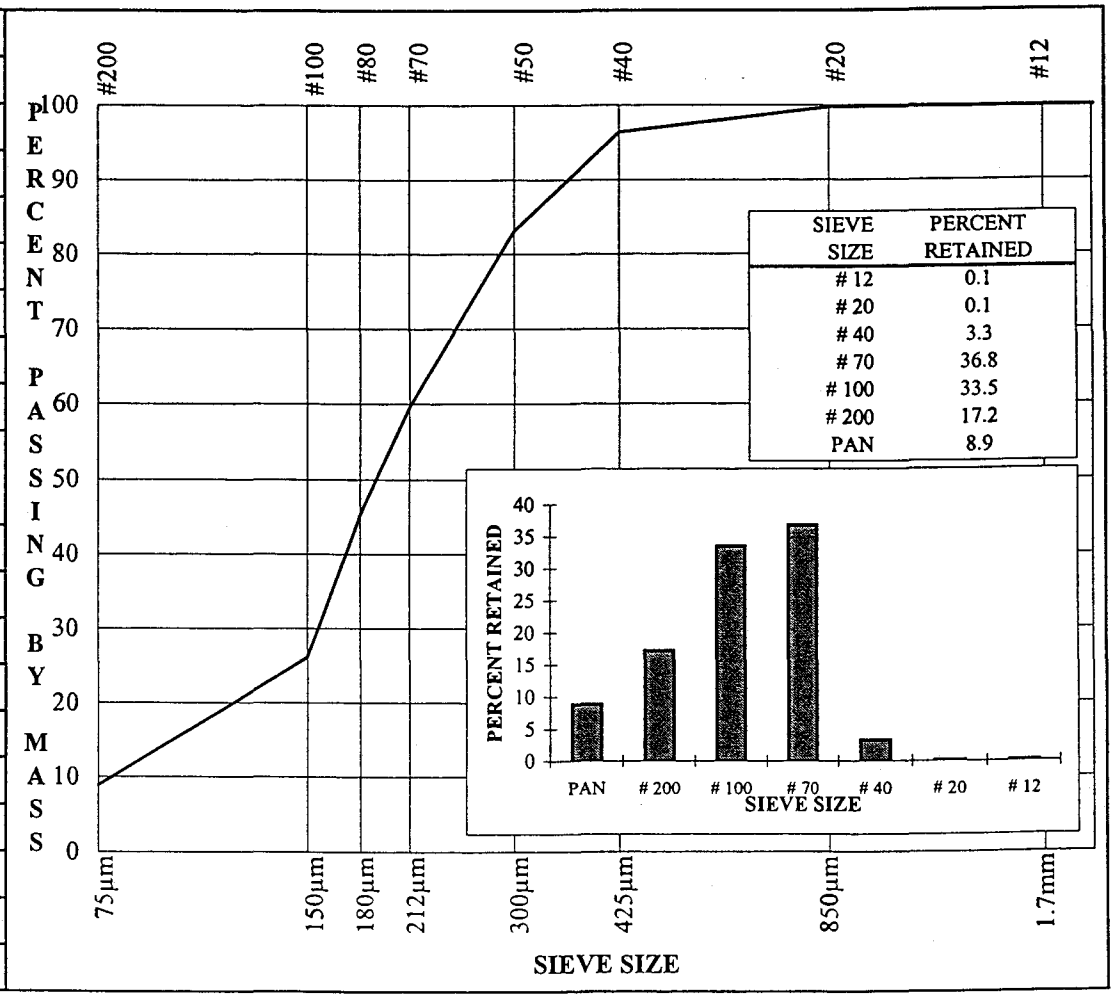
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-2-04

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	367.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.7
# 40	96.4
# 50	83.1
# 70	59.6
# 80	45.3
# 100	26.1
# 200	8.9



REMARKS: UNWASHED

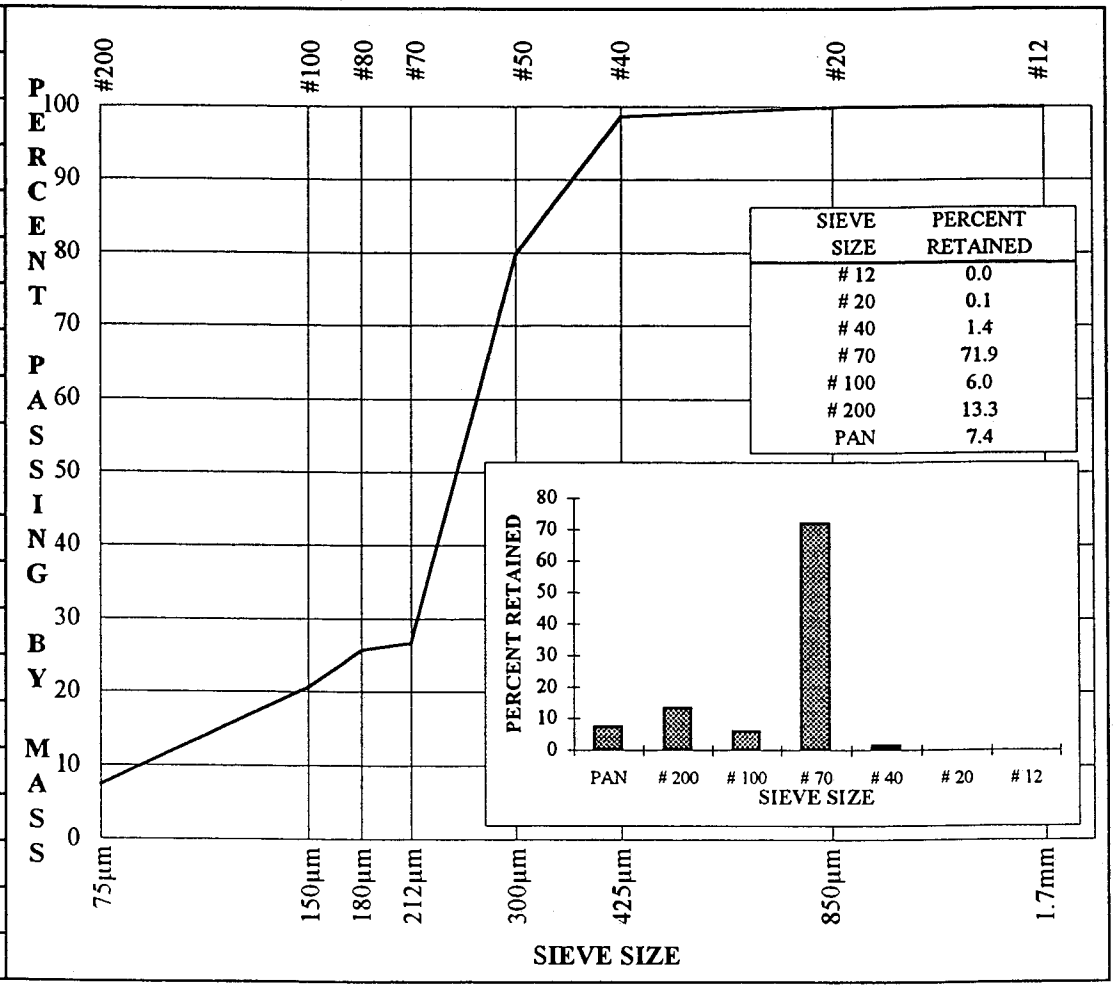
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-02-05

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	314.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.9
# 40	98.6
# 50	79.7
# 70	26.7
# 80	25.6
# 100	20.7
# 200	7.4



REMARKS: UNWASHED

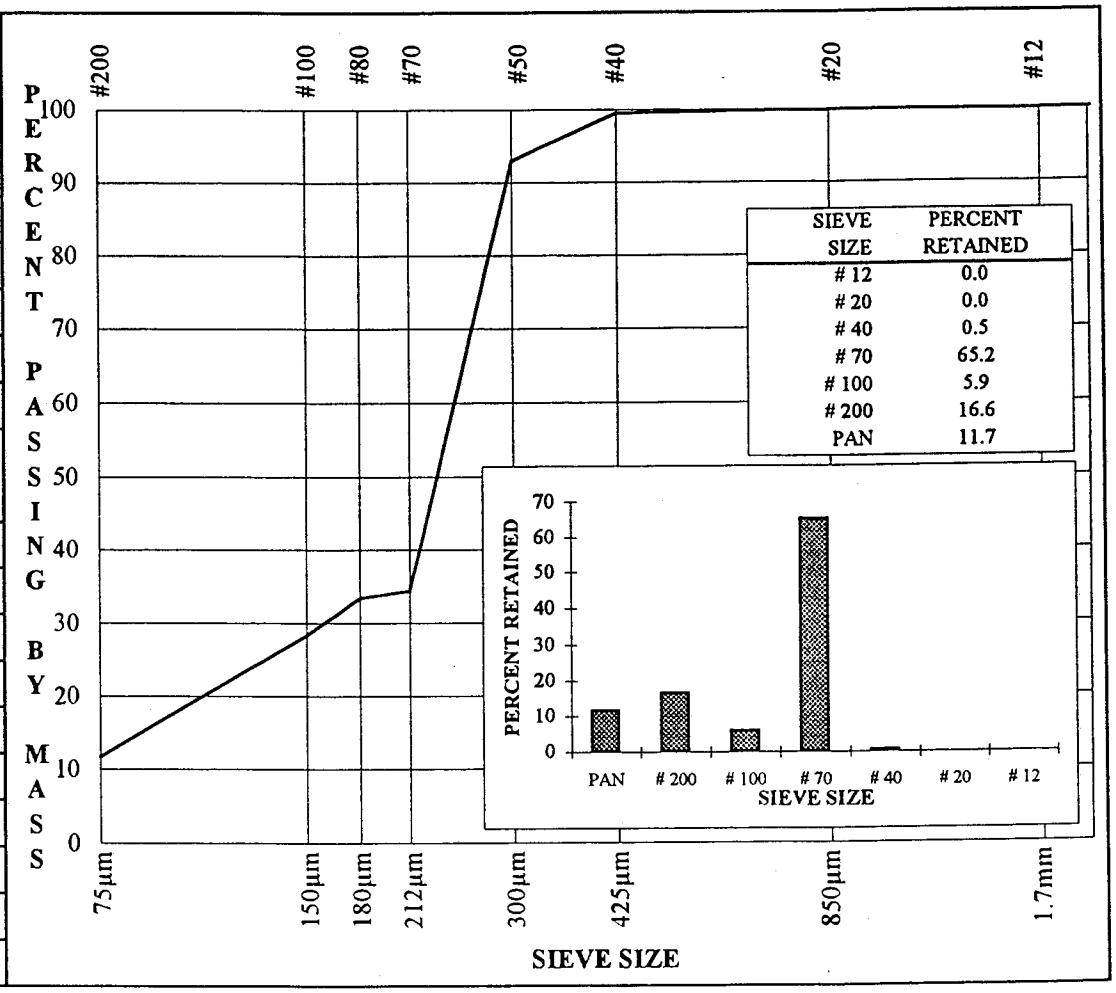
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-02-06

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	346.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	100.0
# 20	99.9
# 40	99.5
# 50	92.8
# 70	34.2
# 80	33.3
# 100	28.3
# 200	11.7



REMARKS: UNWASHED

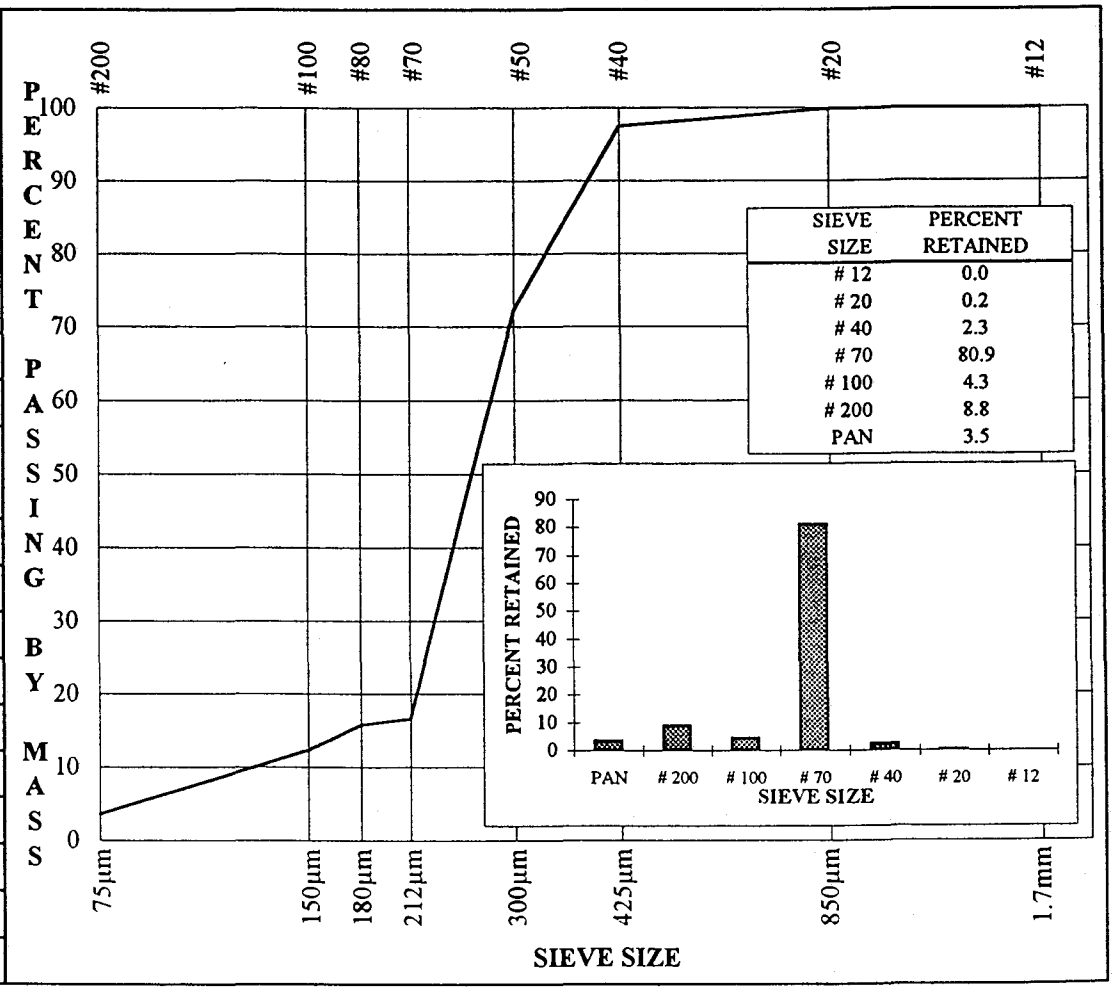
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-02-07

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	330.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.8
# 40	97.5
# 50	72.2
# 70	16.6
# 80	15.7
# 100	12.3
# 200	3.5



REMARKS: UNWASHED

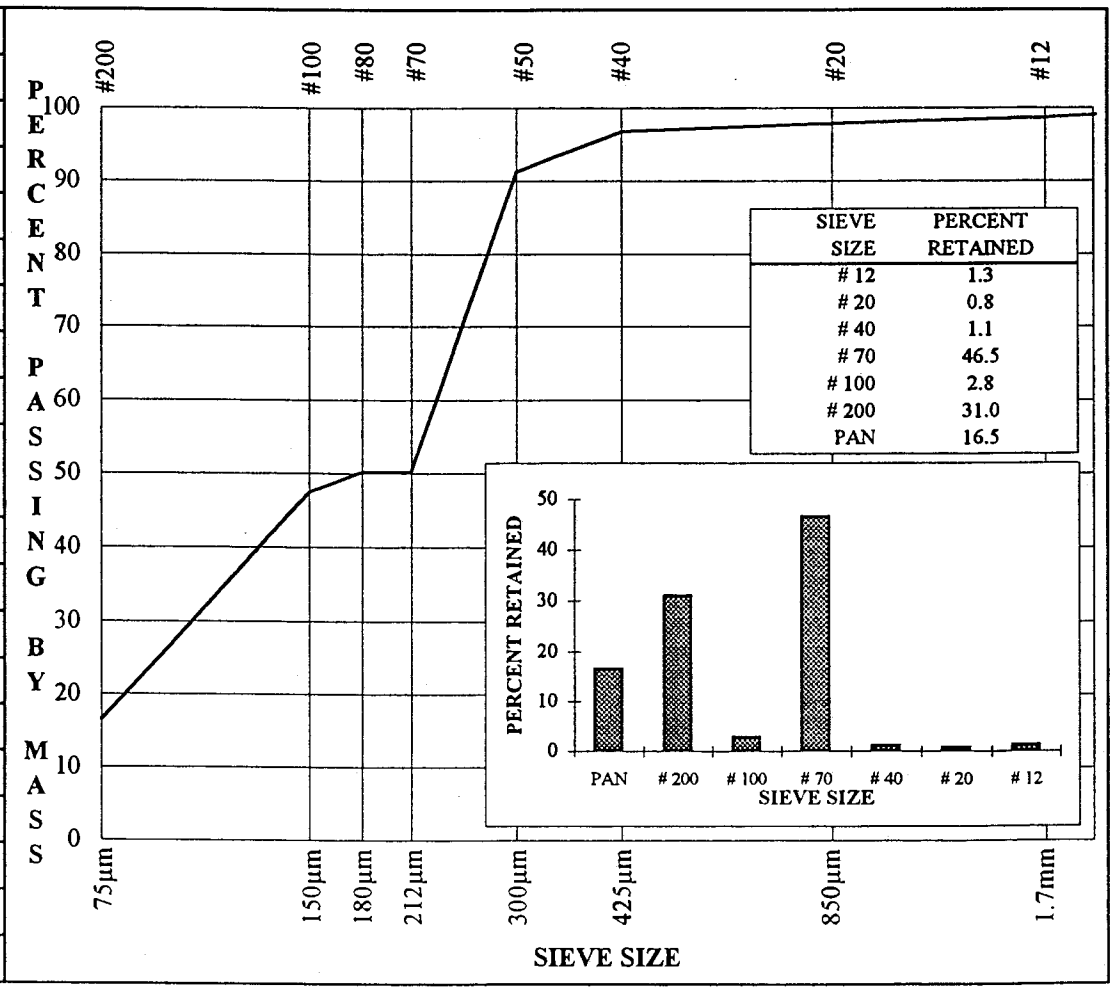
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 09, 1998
SAMPLE NO.: E89-02-08

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	354.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.7
# 20	97.9
# 40	96.8
# 50	91.3
# 70	50.2
# 80	50.2
# 100	47.5
# 200	16.5



REMARKS: UNWASHED

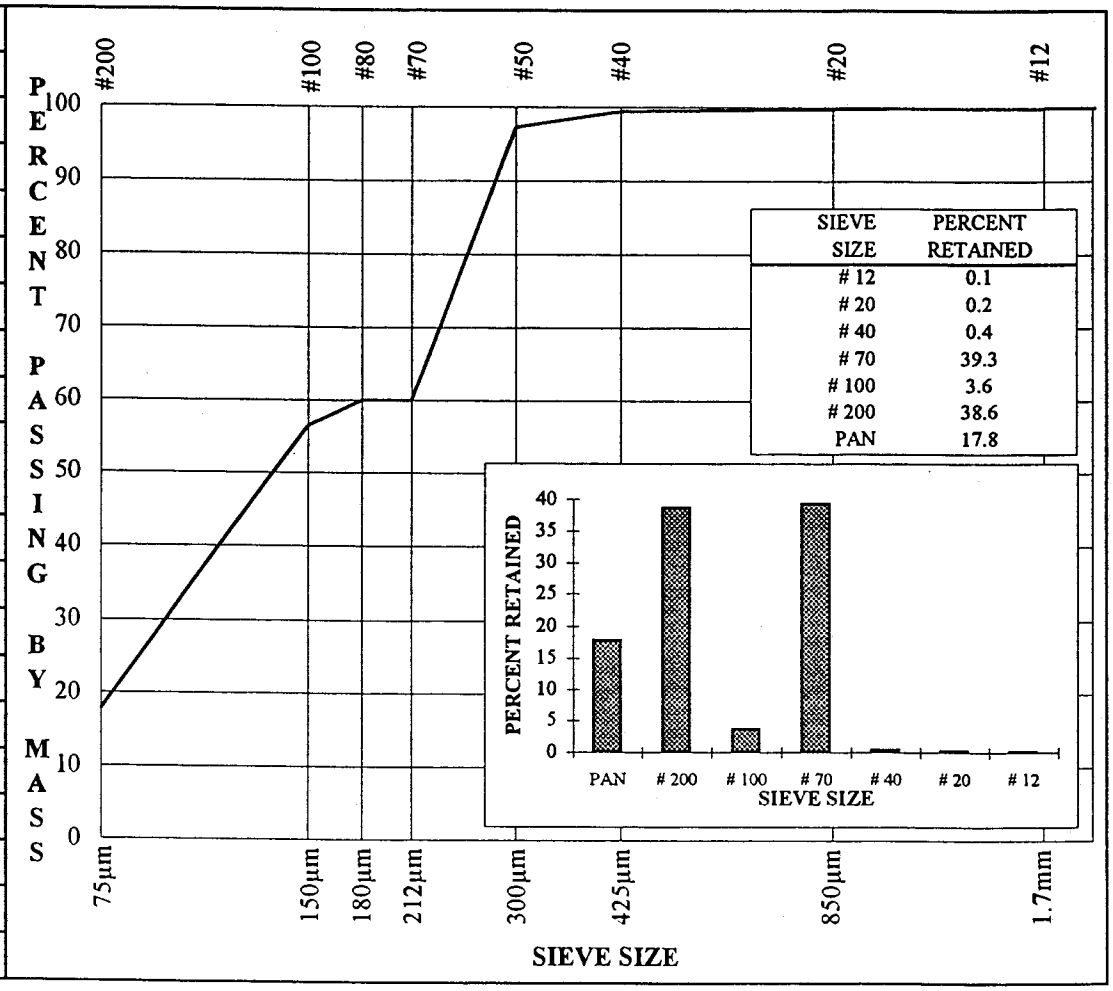
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-09

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	255.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.8
# 40	99.4
# 50	97.2
# 70	60.1
# 80	60.0
# 100	56.5
# 200	17.8



REMARKS: UNWASHED

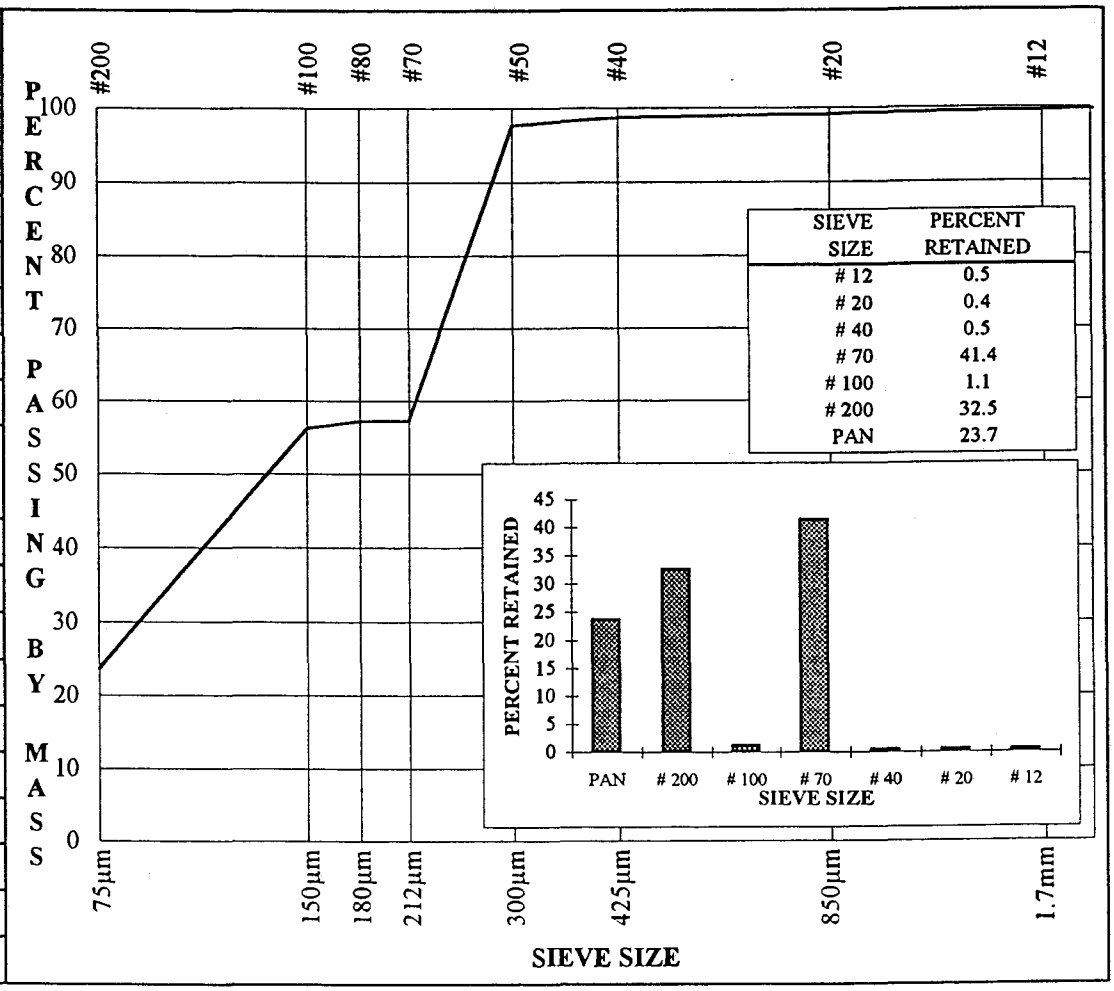
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-10

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	326.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.5
# 20	99.1
# 40	98.7
# 50	97.6
# 70	57.3
# 80	57.2
# 100	56.2
# 200	23.7



REMARKS: UNWASHED

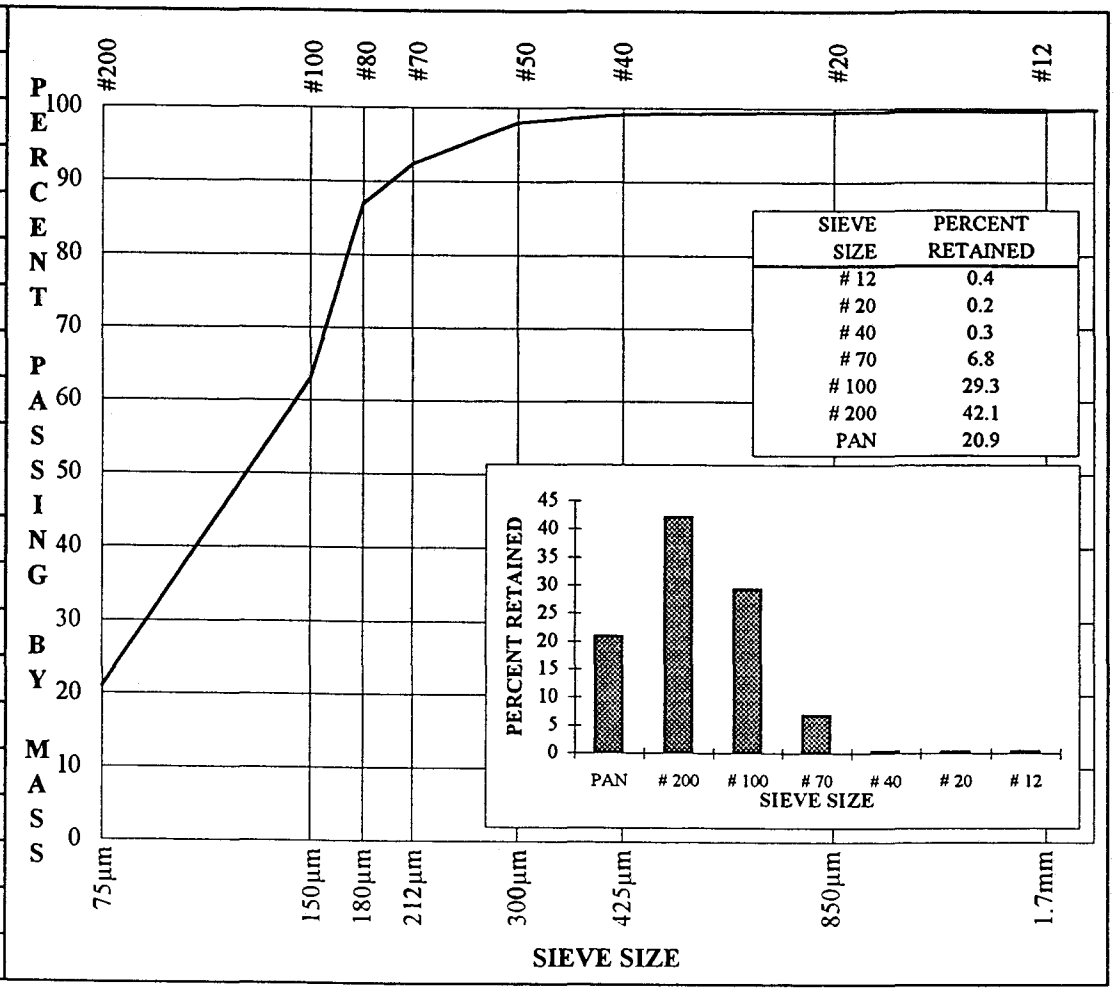
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-11

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	299.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	99.4
# 40	99.1
# 50	98.0
# 70	92.3
# 80	86.9
# 100	63.0
# 200	20.9



REMARKS: UNWASHED

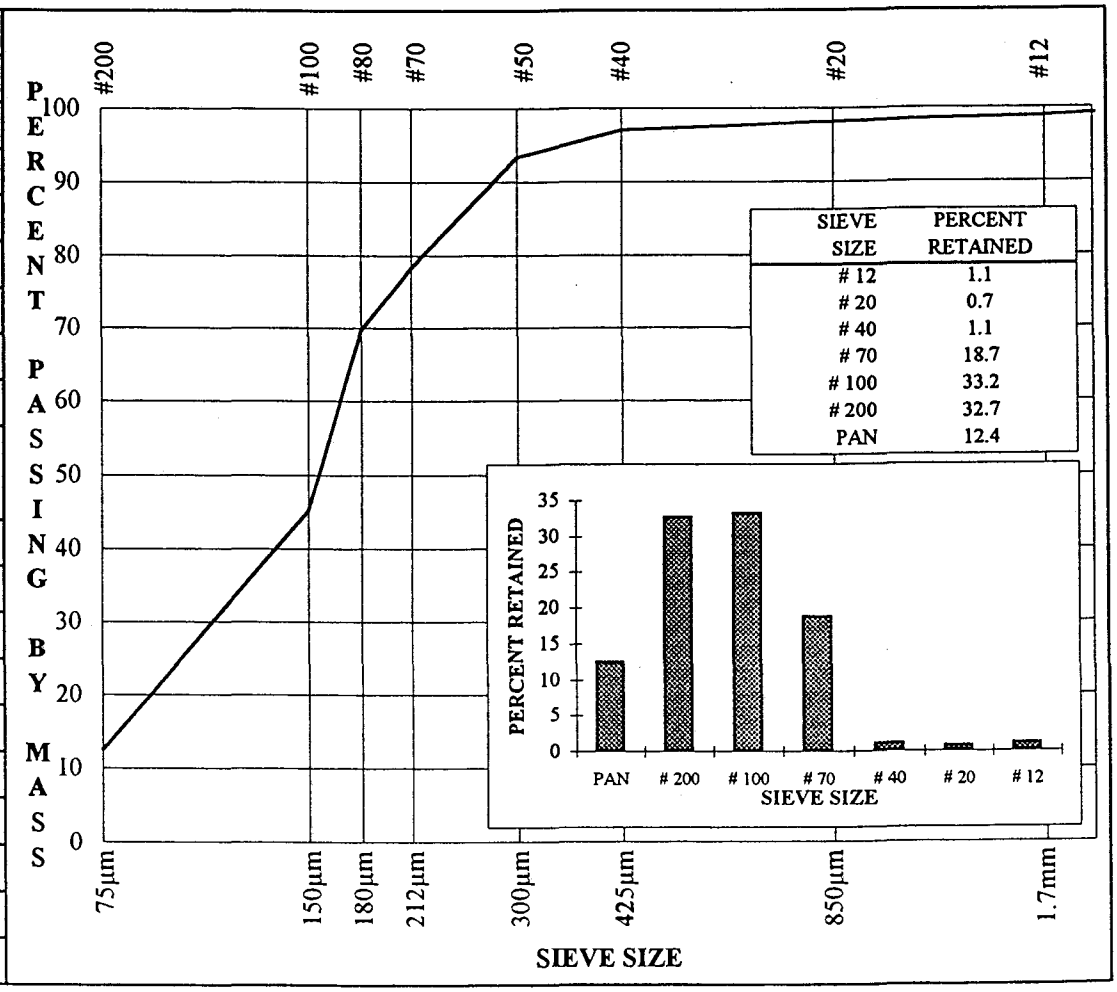
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-12

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	378.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.9
# 20	98.2
# 40	97.0
# 50	93.3
# 70	78.3
# 80	69.7
# 100	45.1
# 200	12.4



REMARKS: UNWASHED

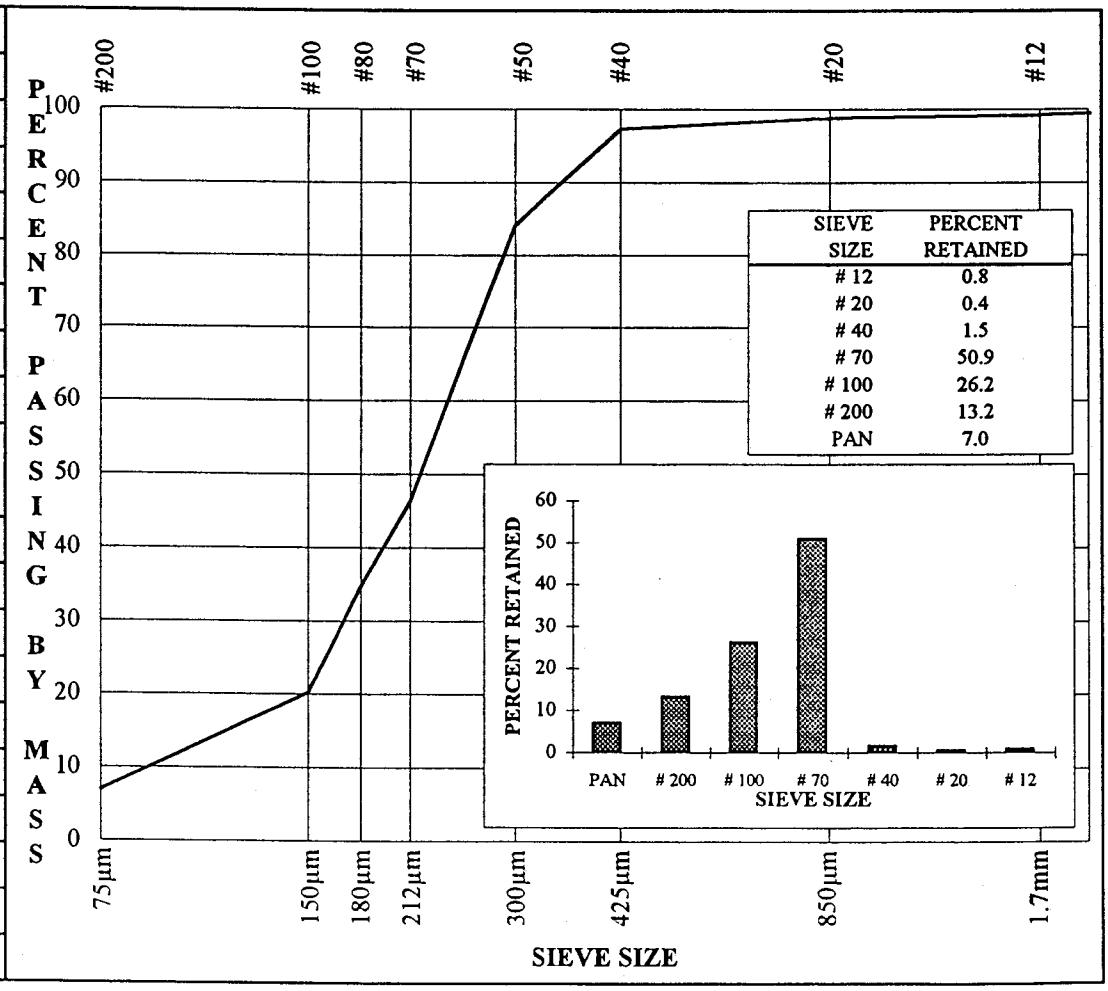
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-13

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	320.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.2
# 20	98.8
# 40	97.3
# 50	84.1
# 70	46.3
# 80	34.7
# 100	20.2
# 200	7.0



REMARKS: UNWASHED

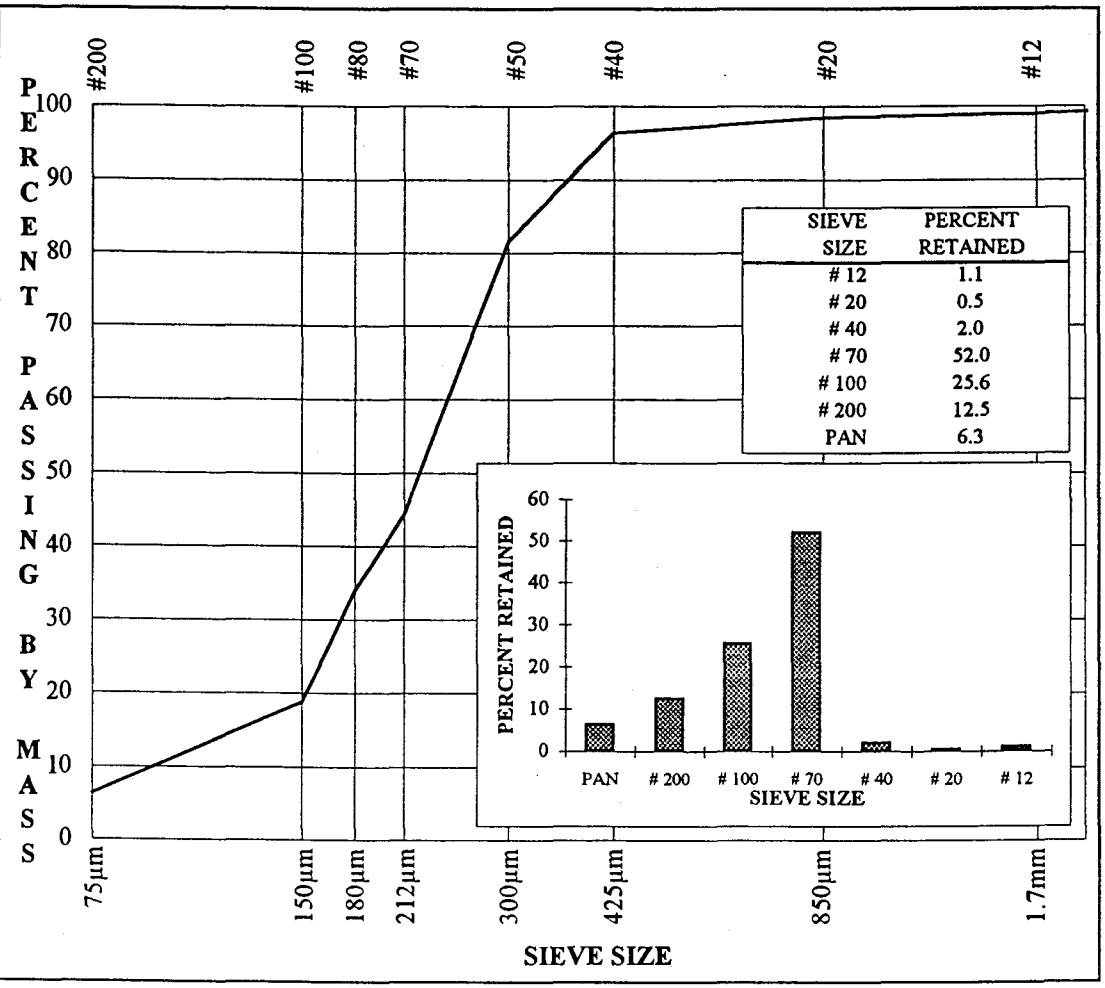
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-14

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	373.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	98.9
# 20	98.4
# 40	96.4
# 50	81.5
# 70	44.4
# 80	33.9
# 100	18.8
# 200	6.3



REMARKS: UNWASHED

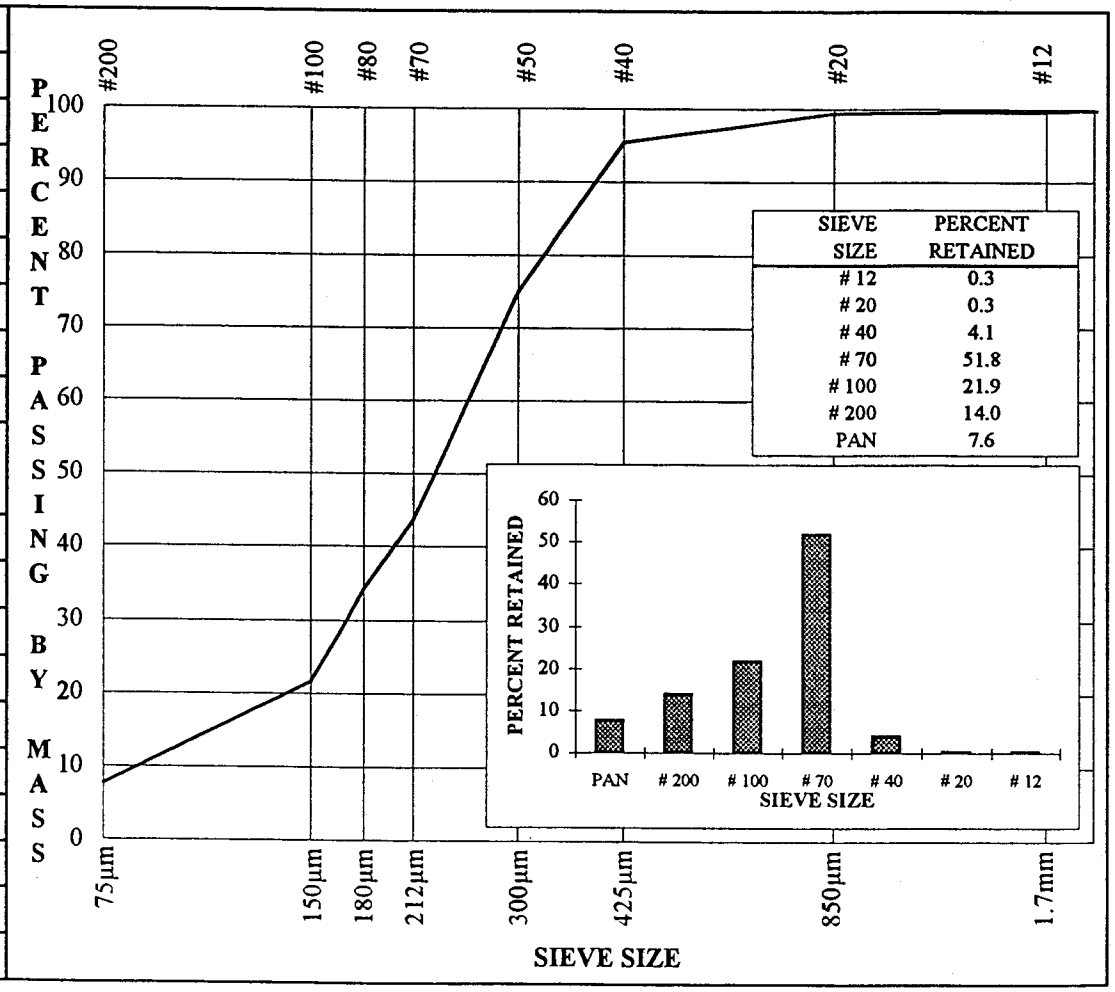
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-15

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	296.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.7
# 20	99.4
# 40	95.3
# 50	74.9
# 70	43.5
# 80	34.1
# 100	21.7
# 200	7.6



REMARKS: UNWASHED

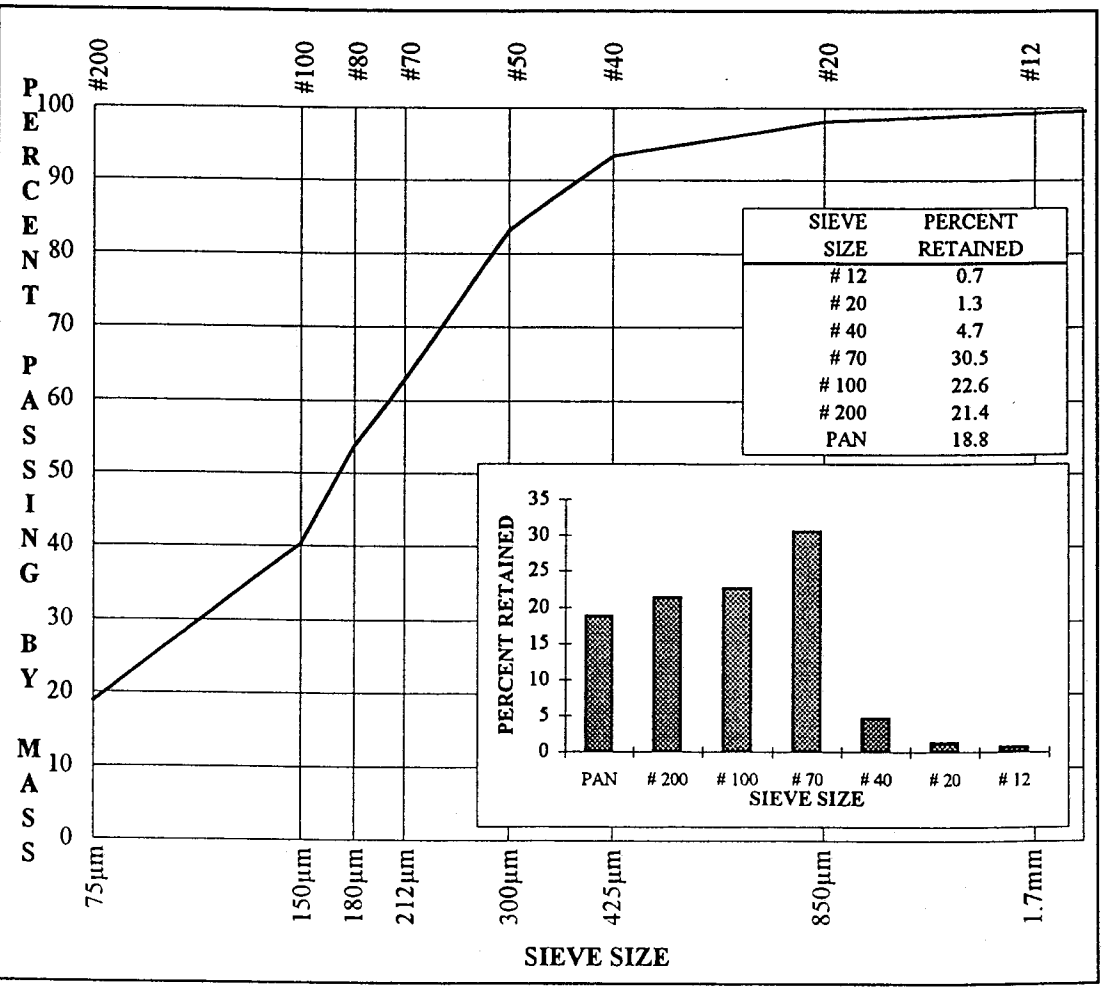
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 06, 1998
SAMPLE NO.: E89-02-16

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	263.7
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.3
# 20	98.0
# 40	93.3
# 50	83.2
# 70	62.8
# 80	53.8
# 100	40.2
# 200	18.8



REMARKS: UNWASHED

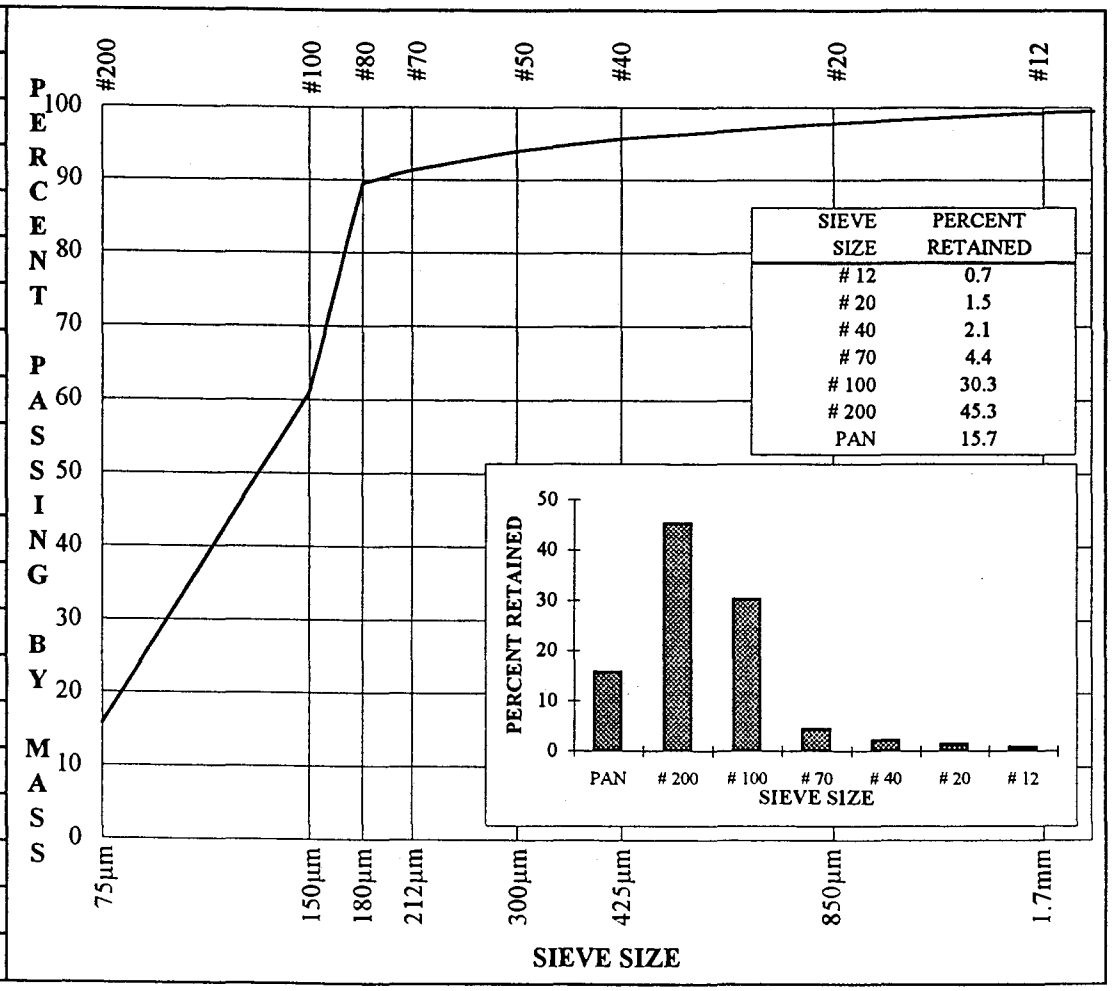
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-17

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	265.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.3
# 20	97.8
# 40	95.7
# 50	93.9
# 70	91.3
# 80	89.5
# 100	61.0
# 200	15.7



REMARKS: UNWASHED

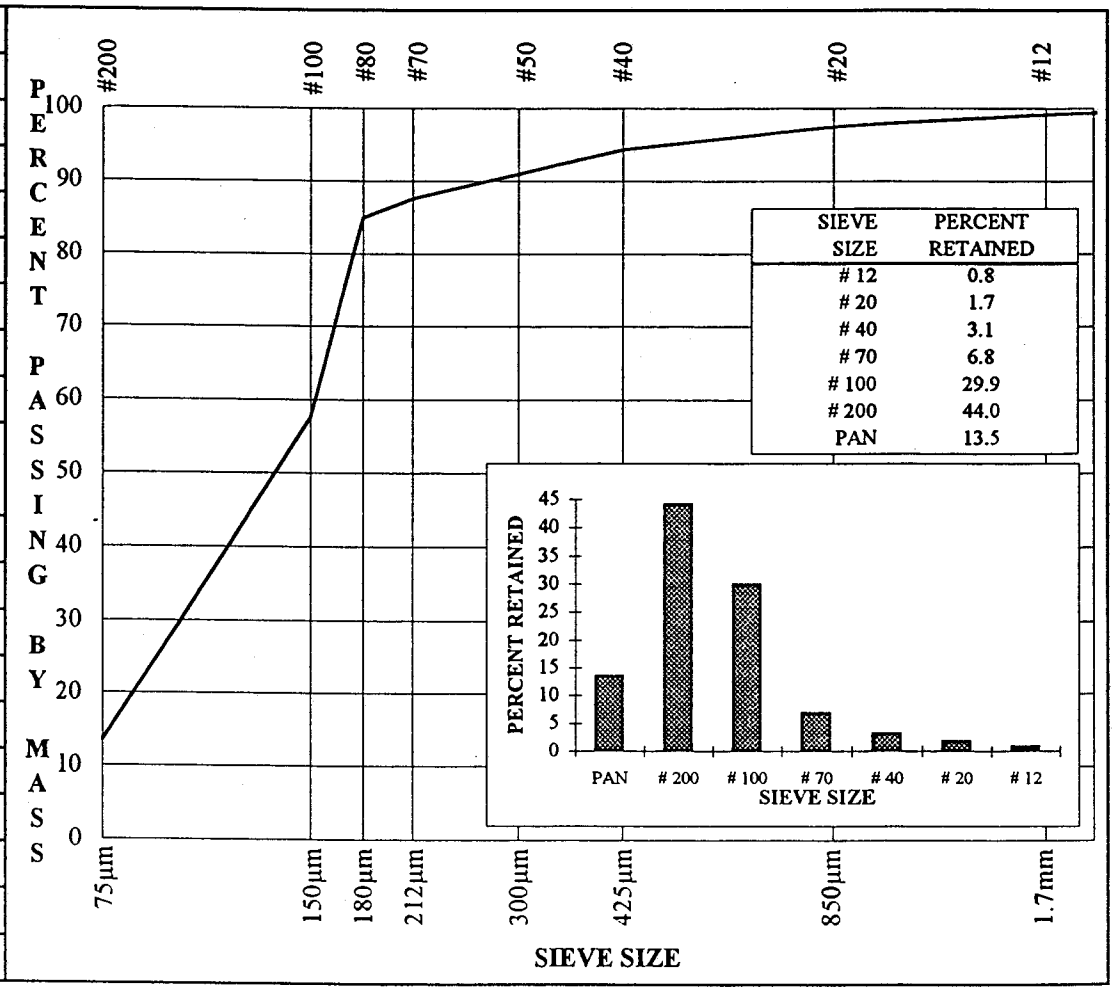
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-18

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	321.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.2
# 20	97.4
# 40	94.3
# 50	90.9
# 70	87.5
# 80	84.9
# 100	57.5
# 200	13.5



REMARKS: UNWASHED

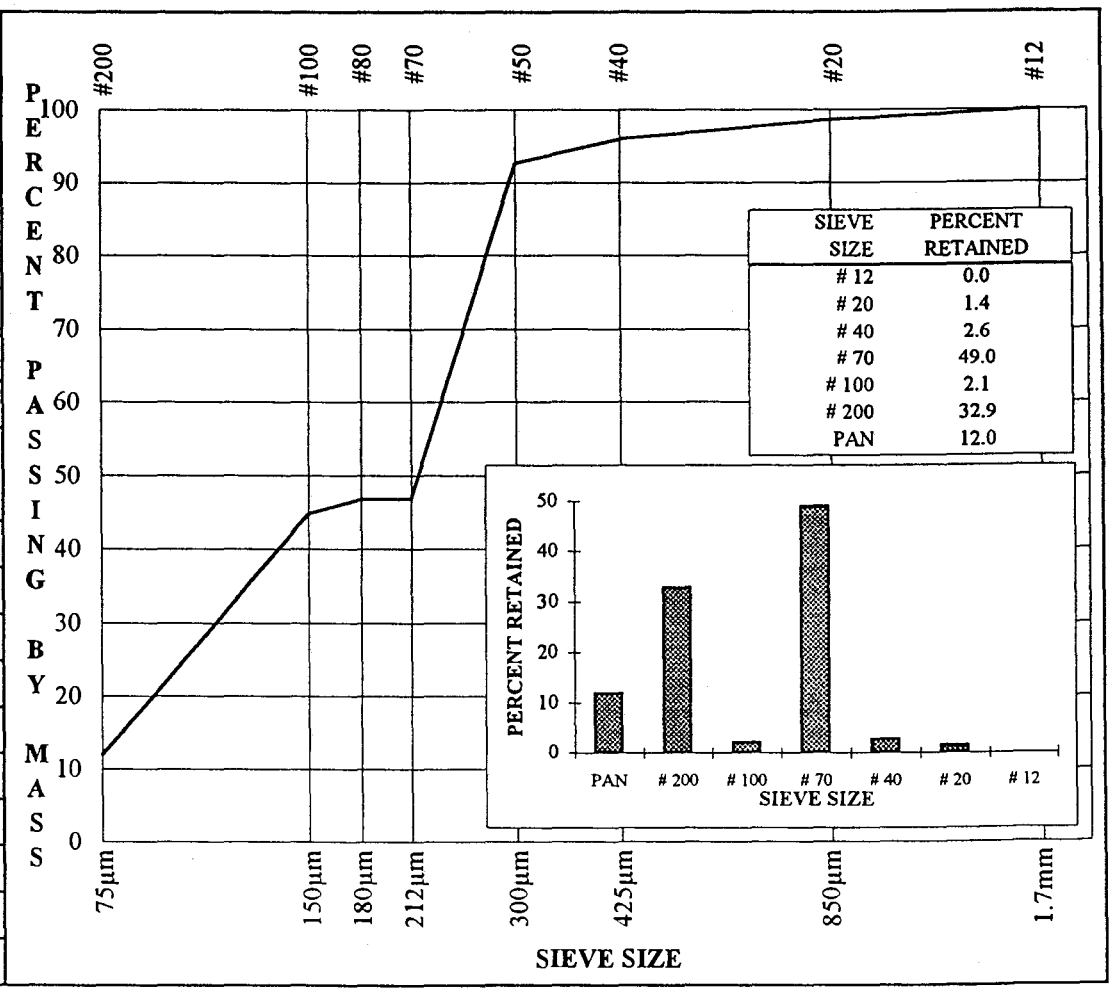
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-19

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	272.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	98.6
# 40	95.9
# 50	92.7
# 70	46.9
# 80	46.8
# 100	44.8
# 200	12.0



REMARKS: UNWASHED

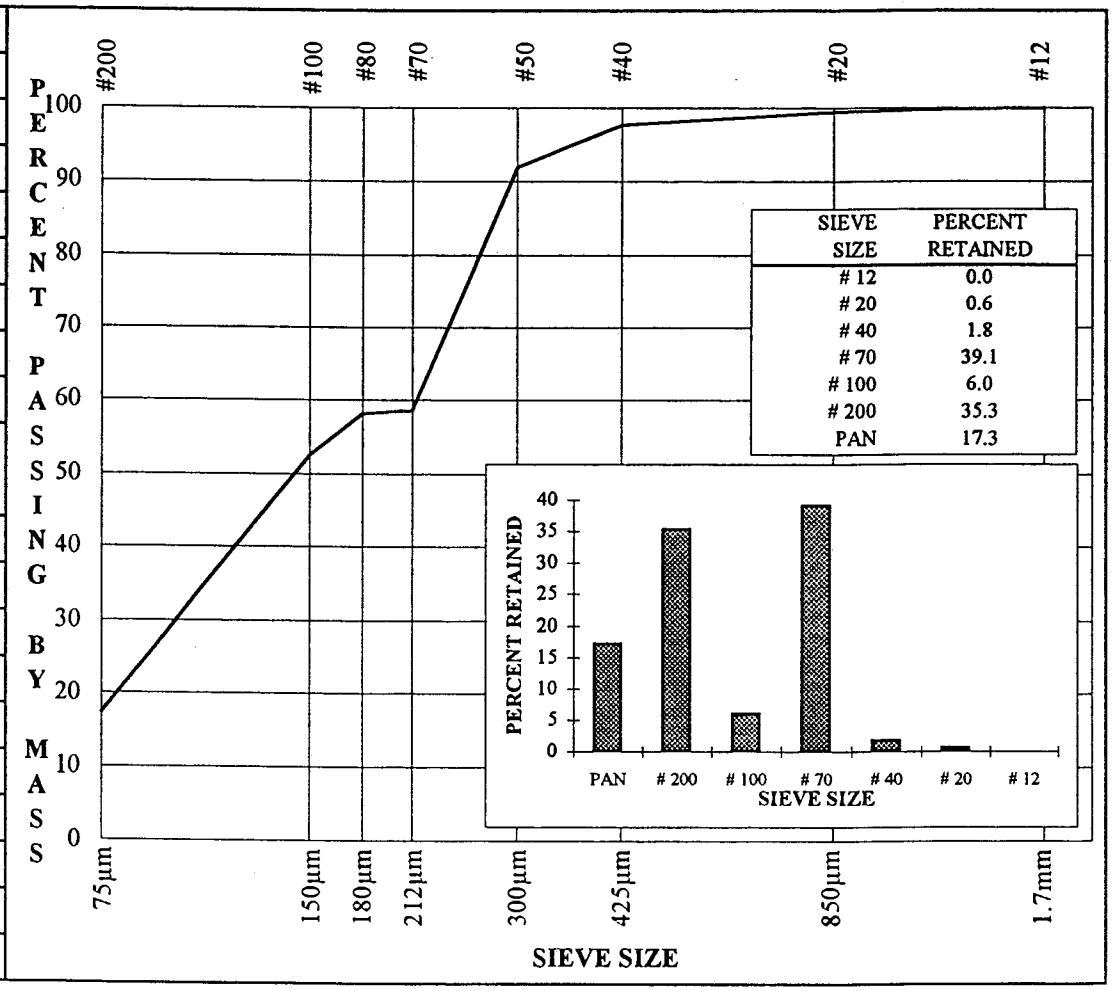
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-20

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	268.0
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.4
# 40	97.6
# 50	91.9
# 70	58.6
# 80	58.2
# 100	52.6
# 200	17.3



REMARKS: UNWASHED

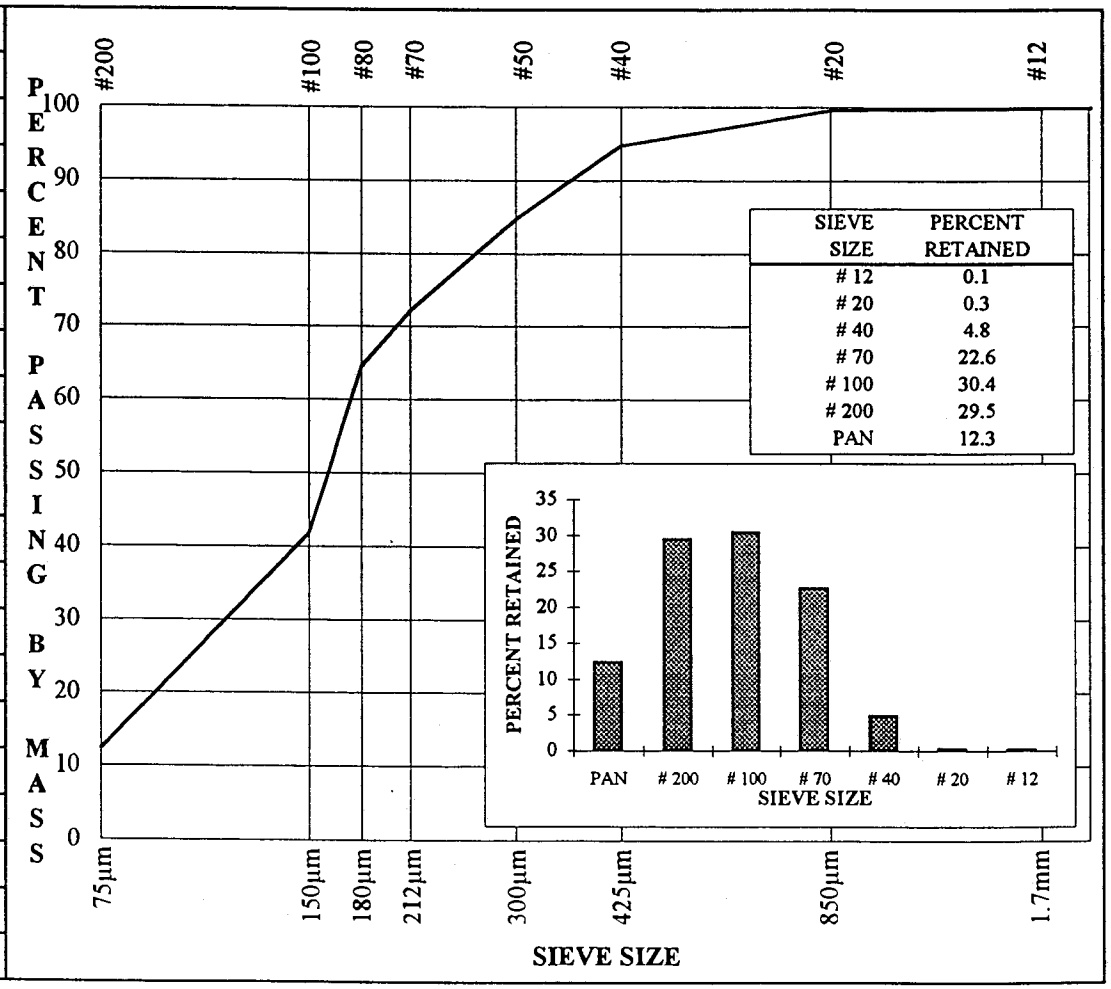
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-21

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	295.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	99.6
# 40	94.8
# 50	84.7
# 70	72.1
# 80	64.5
# 100	41.7
# 200	12.3



REMARKS: UNWASHED

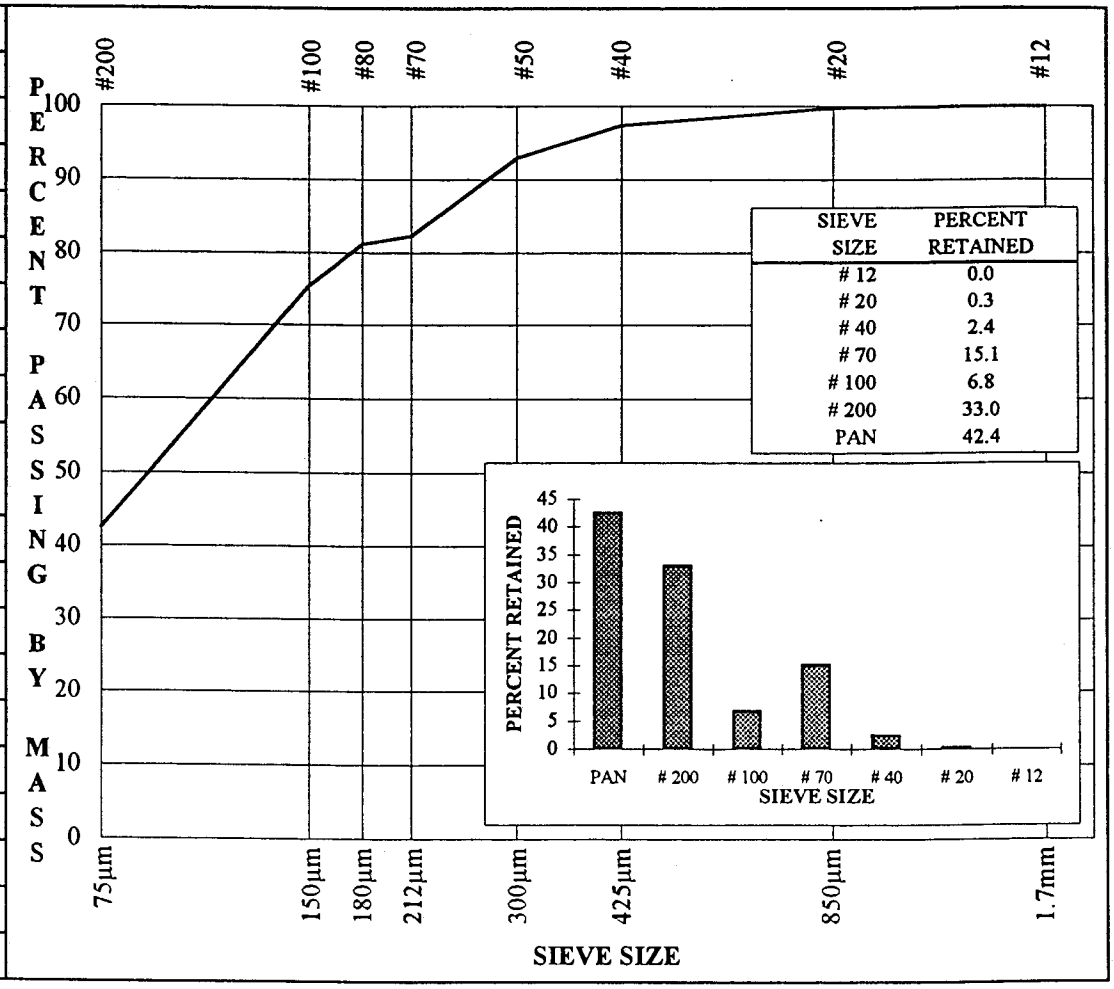
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 10, 1998
SAMPLE NO.: E89-02-22

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	329.4
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.7
# 40	97.3
# 50	92.9
# 70	82.2
# 80	81.1
# 100	75.4
# 200	42.4



REMARKS: UNWASHED

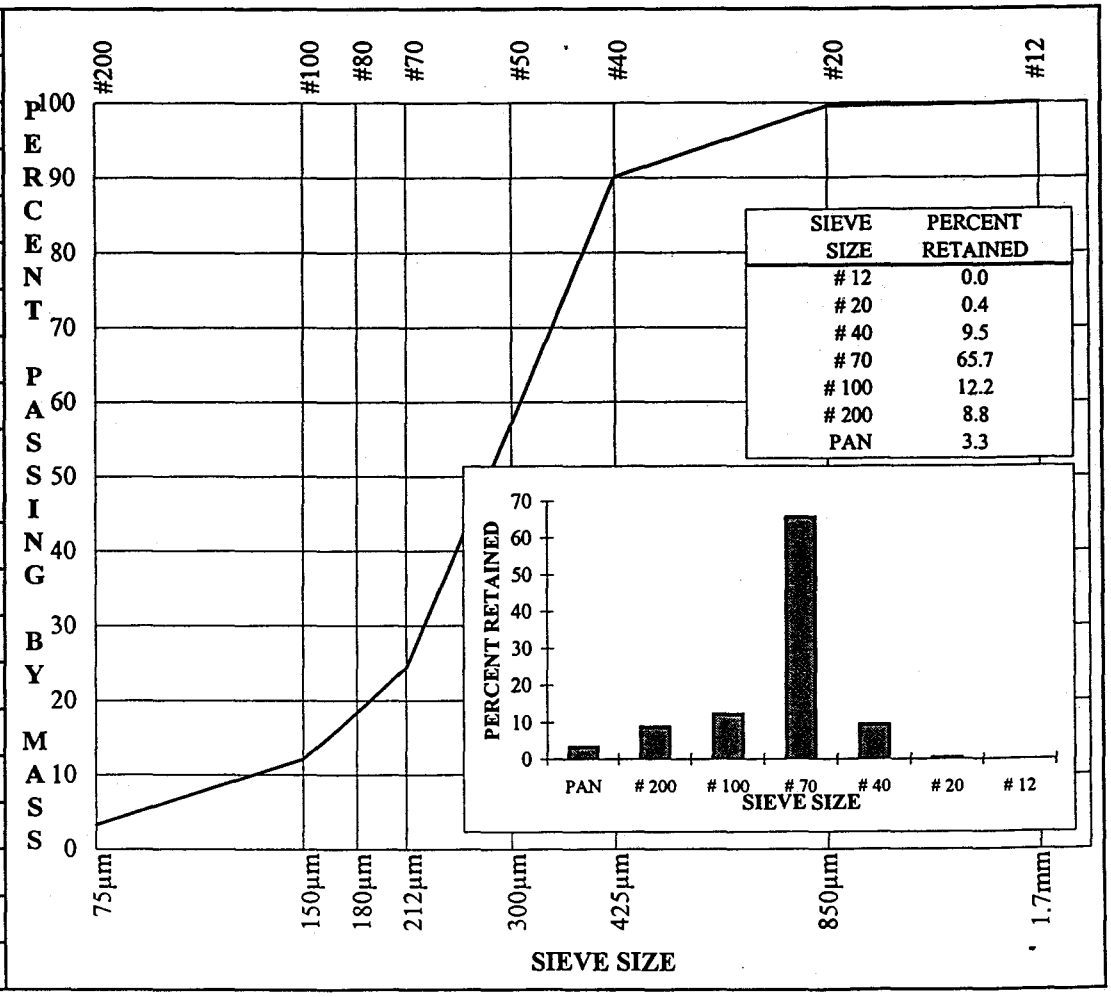
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-01

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	352.1
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.6
# 40	90.1
# 50	57.2
# 70	24.4
# 80	18.4
# 100	12.1
# 200	3.3



REMARKS: UNWASHED

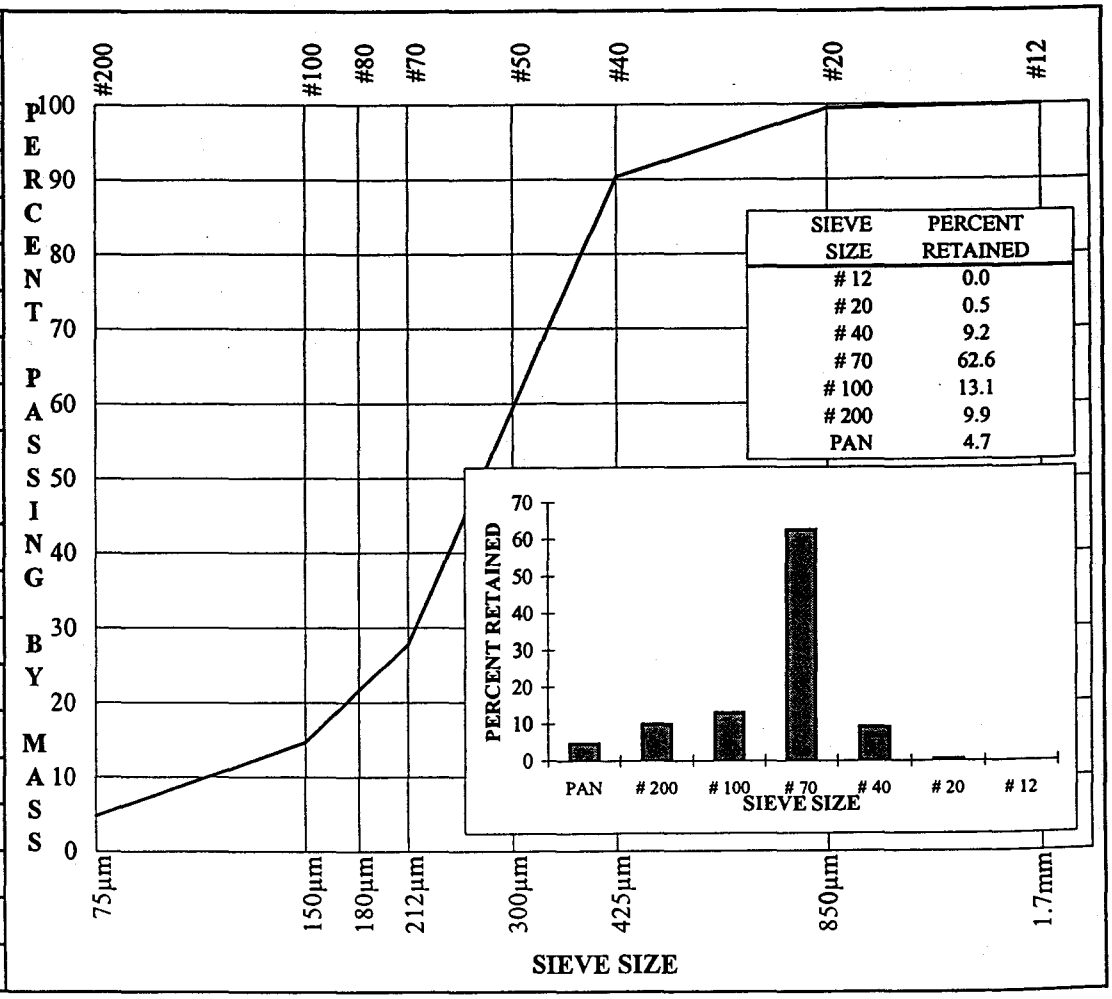
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-02

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	295.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
# 12	100
# 20	99.5
# 40	90.3
# 50	59.4
# 70	27.7
# 80	21.7
# 100	14.7
# 200	4.7



REMARKS: UNWASHED

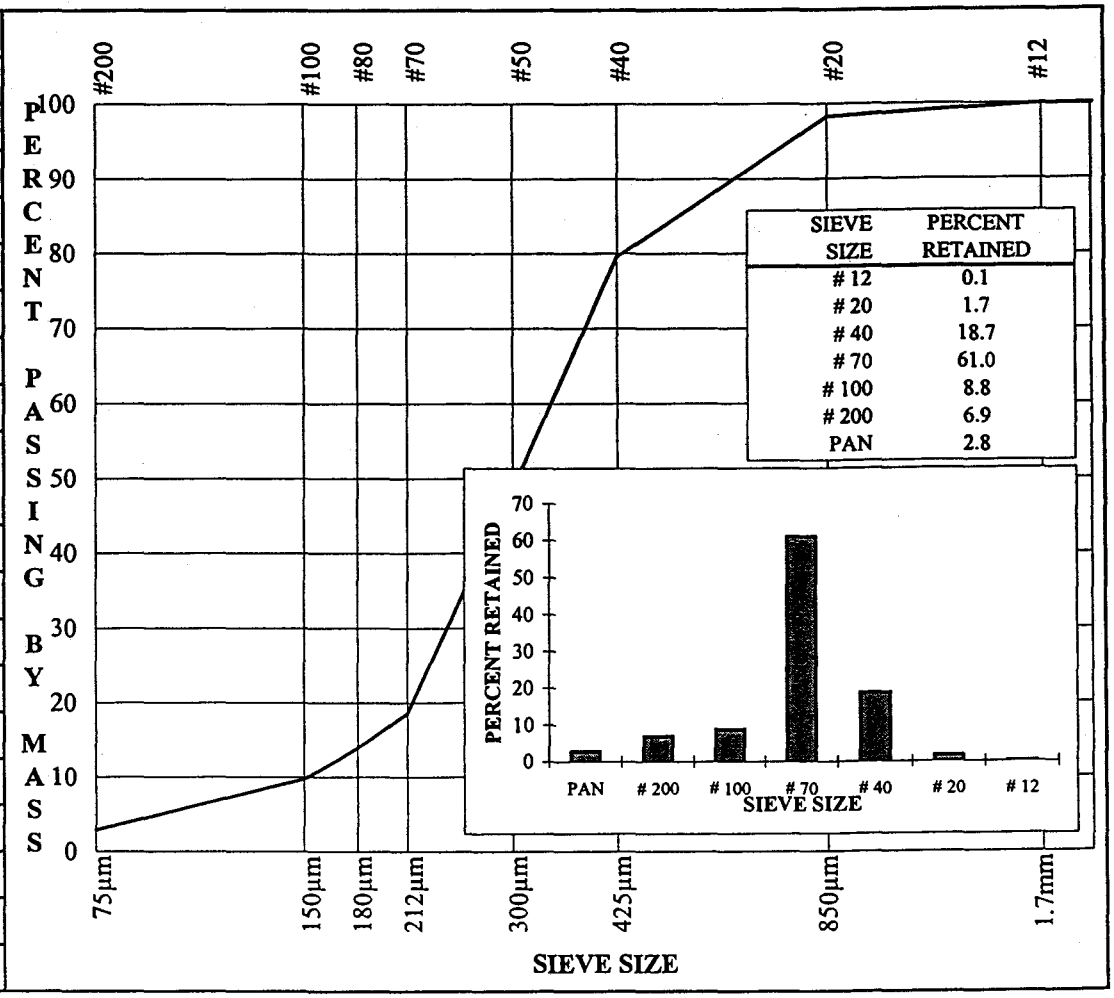
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-03

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	366.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	98.3
# 40	79.6
# 50	48.7
# 70	18.6
# 80	13.9
# 100	9.8
# 200	2.8



REMARKS: UNWASHED

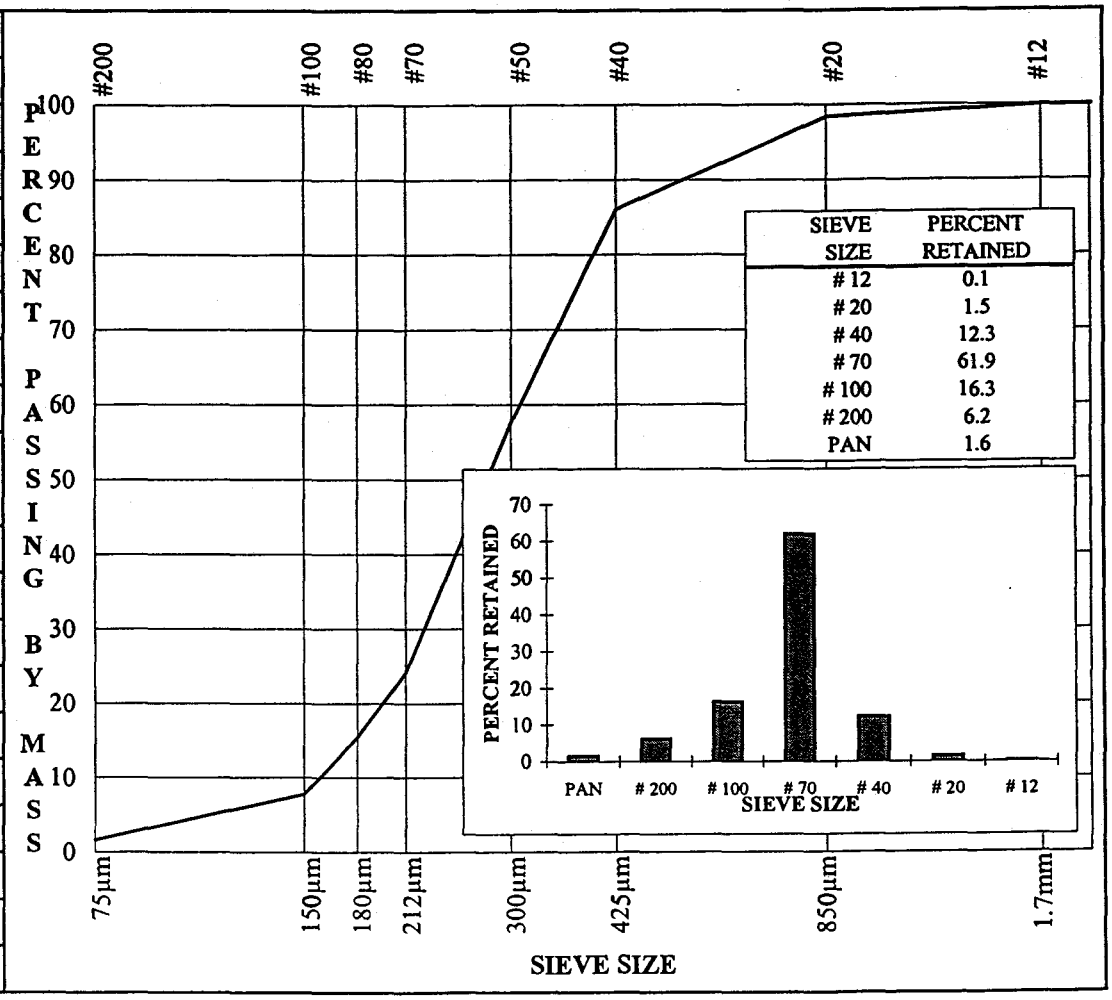
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-04

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	334.1
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.9
# 20	98.4
# 40	86.1
# 50	57.6
# 70	24.1
# 80	15.5
# 100	7.8
# 200	1.6



REMARKS: UNWASHED

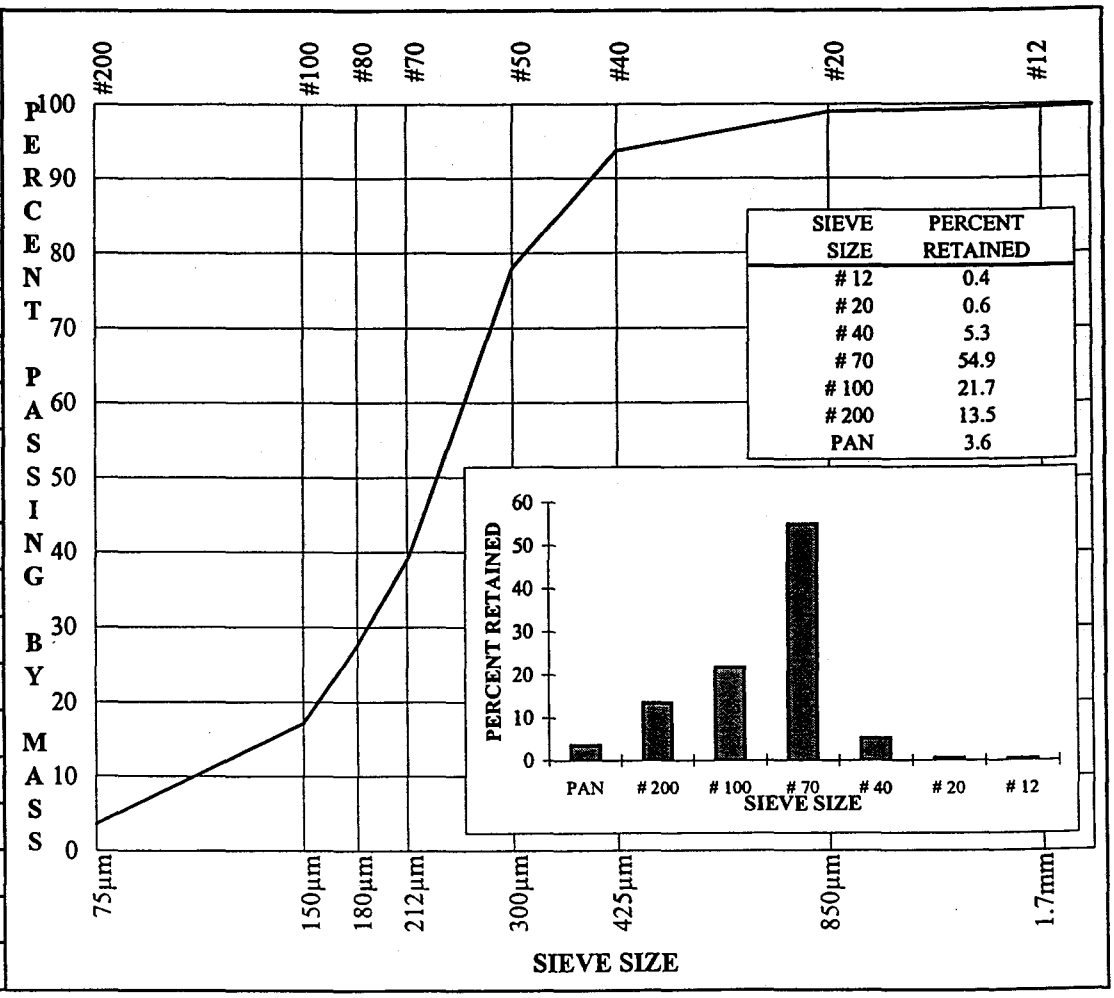
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-05

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	290.8
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	99.0
# 40	93.7
# 50	78.0
# 70	38.8
# 80	27.6
# 100	17.1
# 200	3.6



REMARKS: UNWASHED

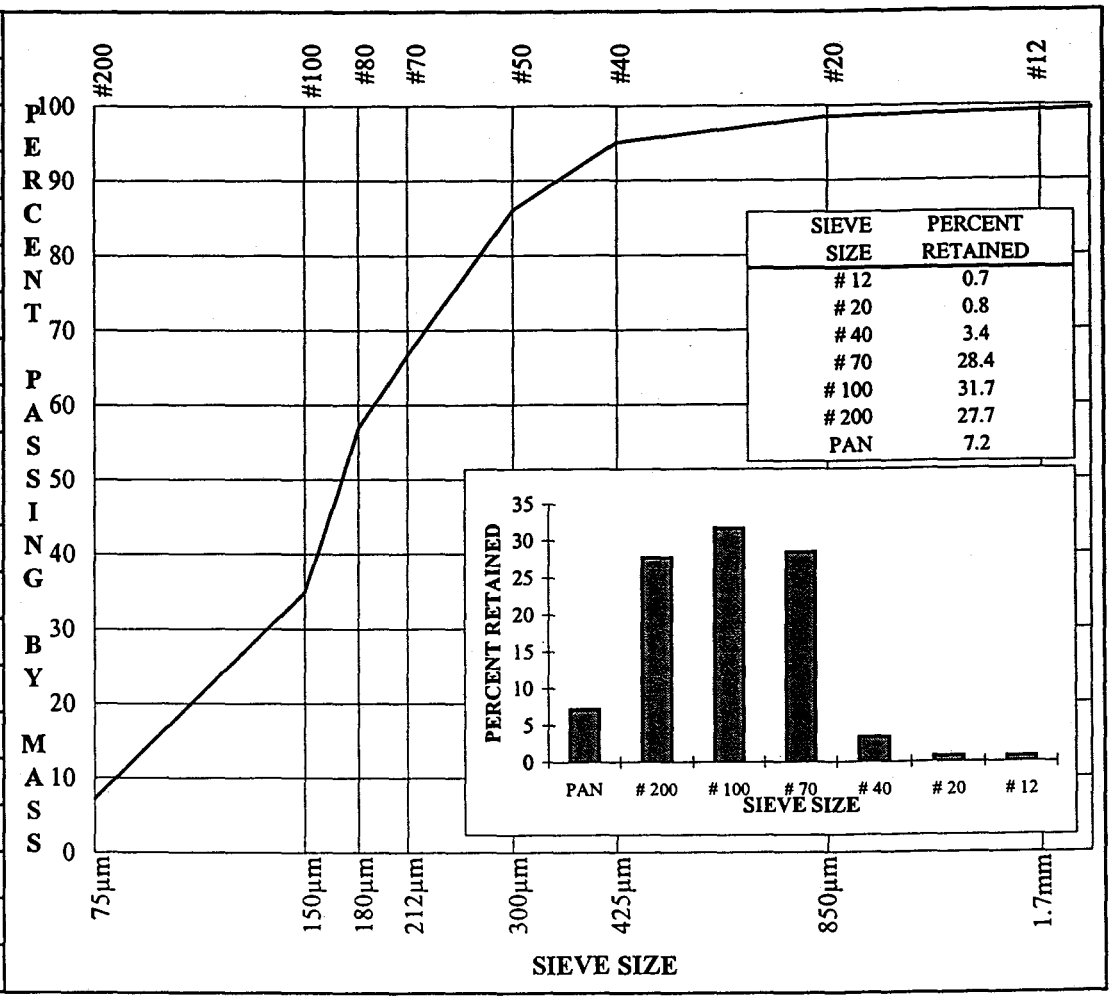
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-06

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	297.5
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.3
# 20	98.5
# 40	95.1
# 50	86.1
# 70	66.7
# 80	56.9
# 100	34.9
# 200	7.2



REMARKS: UNWASHED

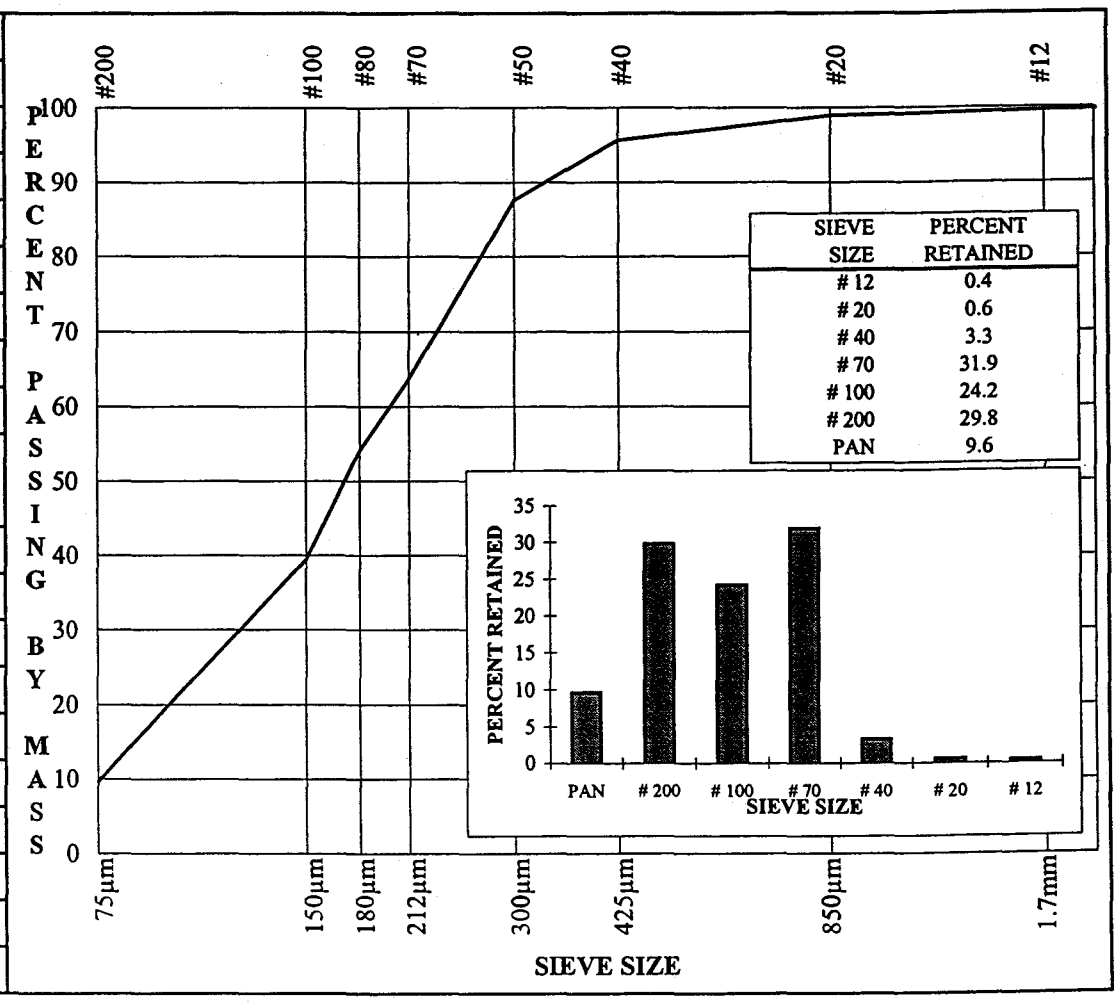
REVIEWED BY: [redacted] P.Eng.

EBA Engineering Consultants Ltd.

GRADATION ANALYSIS REPORT

PROJECT: **1997 UIS SAMPLING PROGRAM**
CLIENT: ULTRASONIC INDUSTRIAL SCIENCES LTD.
PROJECT NO.: 0304-30661
TEST DATE: Feb 01, 1998
SAMPLE NO.: E89-1-07

MOISTURE CONTENT:	
Bulk:	N/A
Top:	N/A
TOTAL MASS (g):	
Sieve:	350.3
Bulk:	N/A
Top:	N/A
SIEVE SIZES	PERCENT PASSING
	100
# 12	99.6
# 20	98.9
# 40	95.6
# 50	87.6
# 70	63.7
# 80	54.1
# 100	39.5
# 200	9.6



REMARKS: UNWASHED

REVIEWED BY: [redacted] P.Eng.