AGGREGATE SURVEY
TALTSON HYDRO FACILITY, NT

Project No. 0701-01-15333

December, 2001

AGGREGATE SURVEY
TALTSON HYDRO FACILITY, NT

Submitted To:

NORTHWEST TERRITORIES POWER CORPORATION
HAY RIVER, NT

Prepared by:

EBA ENGINEERING CONSULTANTS LTD.
YELLOWKNIFE, NT

Project No. 0701-01-15333

December, 2001

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

This report presents the results of an aggregate survey conducted by EBA Engineering Consultants (EBA) at the Taltson Hydro Facility during September 25 and 26, 2001. The objective of the investigation was to assess the existing borrow pits with respect to the types, quality and quantities of gravel and other materials in existing borrow pits at the site.

The survey was carried out on the basis of an EBA proposal letter dated July 24, 2001.

Authorization to proceed with the project was given by Northwest Territories Power Corporation (NTPC) through Service Agreement SA 106557.

1.2 Site Description

The Taltson Hydro Facility is situated on the Taltson River almost due north from Fort Smith and about midway between Fort Smith and the south shore of Great Slave Lake as indicated on Figure 1. The coordinates of the airstrip are 111° 22' west and 060° 24' north. The facility consists of an earth filled dam, penstock and power station plus some concrete spillway dams across alternate exit points for the head pond. The facility also includes an airstrip, bunkhouse and gravel surfaced connecting roads as indicated on the airphoto on Figure 2. The facility is serviced by charter flight from Fort Smith.

The primary area of investigation is located at the airstrip which was constructed on an elongated hill of granular outwash material, perhaps a modified kame or esker segment deposit. At least nine borrow pits have been developed in areas adjacent the airstrip. Two additional granular aggregate pits are present in the area as well as an area of silt. The borrow areas in relation to the airstrip are shown on Figure 3 attached.

The area is covered with open soft and hardwood forest, mostly jack pine and birch. The woodland is divided by numerous small streams and bogs. The ground surface is rolling to knobby with numerous outcropping of bedrock and bedrock controlled hills.

1.3 Scope of Work

EBA's scope of work was outlined in a proposal sent to NTPC on July 24, 2001.

- Visit the site and identify the existing borrow pits, morphology and hydrology of the area;
- Estimate the volumes of extractable, useable material;
- Collect representative samples for their evaluation as construction material;
- Conduct laboratory testing to establish their geotechnical characteristics with respect to end use;
- And prepare a summary report of the findings.

2.0 SITE INVESTIGATION

Mr. Ken Peck, P.Eng. (NS, NB, NFLD) of EBA conducted the site investigation on September 25 and 26, 2001. NTPC personnel initially drove Mr. Peck to the various borrow pits and explained and characteristics of each and provided the names of pits if any were available. Following the initial tour, each pit was reconnoitered to establish the length, width and face height and to observe the types of material present and the nature of any material changes in the pit. Visual estimates of the composition of each pit were made in the field. These estimates are provided in the charts in Figure 3 as percentages of boulder, cobbles, gravel, sand and fines (silt + clay).

A representative bulk sample was obtained from the exposed faces in each borrow area as well as smaller bagged samples of particular areas of interest. At Lake and Middle Pits, which were isolated deposits along the spillway road, the area behind the borrow face was also reconnoitered with occasional shallow hand auger samples taken to help identify the deposit limits. The borrow pits around the airstrip are all parts of the same large deposit, the extent of which was quite evident in stereo aerial photographs (see Figure 2).

Photographs were taken of the general features at each borrow source including any soil stratigraphy observed. Selected photos are provided in Appendix C.

3.0 LABORATORY TESTING

Samples were collected of the minus 75 mm fraction of the aggregate in the pits. These samples were returned to EBA's lab in Yellowknife for grain size analysis. A total of 14 samples were subjected to grain size analysis. Two of the fine grained samples were tested by hydrometer method while the granular aggregate was tested by mechanical analysis. Atterberg limits tests were also carried out on the fine grained soil samples. The individual laboratory analysis results are included in Appendix B and summarized on Table 1 and on the charts in Figure 3.

Table 1: Lab Test Result Summary

Pit Name	*% Gravel*	*% Sand*	*% Silt + Clay*			
Pit A	14	85	1			
Pit B	17	82	1			
Pit C	5	92	3			
Pit C – fine zone	5	36	59			
Pit D	16	83	1			
Pit V	69	28	3			
Pit W	71	28	1			
Sample X	60	39	1			
Pit Y	64	36	<1			
Gertrude Pit	66	32	2			
Middle Pit	59	40	1			
Lake Pit	40	47	13			
			% Silt	*%Clay*	*PL*	*LL*
South Clay Pit	0	18	63	19	12	16
North Clay Pit	0	4	53	43	19	31

PL: Plastic Limit; LL: Liquid Limit

4.0 SUBSURFACE SOIL CONDITIONS

Two types of borrow were identified at the site. An area of fine grained silt or silt and clay was exposed in the cut banks of the site access road to the power station. The coarser granular aggregate deposits are situated at the airstrip and in two individual deposits east of the airstrip.

The five pits identified surrounding the airstrip as well as Pits A, B, C and D all originate from the same aggregate source on which the airstrip was constructed. This pile of glacial outwash material extends for more than 1.5 km with perhaps a 1 km width in places based on airphoto interpretation. The deposit extends west across the Trudel River where it is visible in the river banks. Middle and Lake pits may have been a part of this main mass of aggregate but are now separated from the airstrip by an intervening stream and are separate from each other as well.

For ease of discussion, the borrow areas are readily grouped into four areas, namely;

- adjacent the airstrip including pits Y and Z at the east end, a surficial sample at X from towards the west end, Gertrude Pit located southwest of the airstrip and Pits V and W situated north and west of the airstrip;
- Pits A, B and C and D situated north of the airstrip along the spillway access road;
- Middle Pit and Lake Pit situated to the north of the spillway access road, approximately half a kilometer beyond the eastern limit of the airstrip borrow area, and;
- the so called "clay pits" situated north and south of the brook that divides them and located approximately half way from the airstrip to the power plant.

The locations of the pits and summaries of the pit gradation are presented in Figure 3. Photographs of many of the pits are provided in Appendix C.

Airstrip Pits

The five pits in this series include Pits V, W, Y, Z and the Gertrude Pit. These pits are located around the periphery of the airstrip at the shoulder of the glacial deposit. Some mechanical sorting has taken place in Pits Y and Z based on the presence of piles of cobbles. A grizzly screen is situated in Pit W.

Based on the results of testing, the gradation of the minus 75 mm material from these borrow pits consists of 60 to 71 % gravel, 28 to 39 % sand and from less than 1 to 3 % fines. Visual estimates in the field include from 10 to 15 % cobble sizes and 5 to 10 % boulder sizes.

The aggregate pieces are rounded to sub-rounded and consisted generally of hard fine grained rock, mostly brown to gray in color

North of Airstrip, Adjacent Spillway Road

The four pits in this series include Pits A, B, C and D. They differ from the pits described above primarily in that they are composed of finer grained aggregate. The bedding visible in Pit D (see Photo 11) indicates that these pits are on the north flank of the original deposit, beyond the distance where the coarser material is likely to have been deposited.

There are no stockpiles of sorted material visible in these pits. It appears that material has been borrowed as required without processing. There are areas that offer different gradations of material which are preferred for certain uses. Pit D, for instance, is a source for fine aggregate for mixing concrete. Pit C has a zone of finer grained soil consisting of 5% gravel sizes, 36 % sand and 59 % fines.

Based on the results of testing, the overall gradation of the minus 75 mm fraction of the aggregate material from these borrow pits consists of 5 to 17 % gravel, 82 to 92 % sand and from 1 to 3 % fines, excluding the finer gravel zone at Pit C. Visual estimates in the field include 2 % or less boulder sizes and 5 % or less cobble sizes.

Again, the aggregate pieces are rounded to sub-rounded and consisted generally of hard fine grained rock, mostly brown to gray in color

East of Airstrip

The 2 pits identified east of the airstrip include Lake Pit and Middle Pit. They were no doubt opened due to their proximity to the eastern end of the spillway road. Based on topography, both deposits are independent and extend for a few hundred metres north of their present pit faces.

The base of Middle Pit has a zone of generally coarse gravel sizes which has been exploited as a source for coarse aggregate for concrete (see Photo 4).

Based on the results of testing, the gradation of the minus 75 mm fraction of the aggregate material from these two borrow pits consists of 40 to 59 % gravel, 40 to 47 % sand and from 1 to 13 % fines. Visual estimates in the field include about 5 % boulder sizes and 10 % cobble sizes. These deposits compare more closely to those at the airstrip than the more sandy flank deposits.

The aggregate at these two pits is also rounded to sub-rounded and consisted generally of hard fine grained rock, mostly brown to gray in color

Clay Pits

An area of fine grained silt or silt and clay was present on either side of a brook passing under the access road about 1 km north of the airstrip. This deposit is exposed in the bank beside access road to the power station. The banks are up to 4 m high and the deposits extend below grade.

Horizontal stratification is clearly visible in the upper pit faces. This material is similar to the deposit of silt observed within Pit C. The results of gradation testing on one sample from each of the south and north extensions of the clay exposures indicate compositions of 0 % gravel, 4 to 18 % sand, 53 to 63 % silt and 19 to 43 % clay. The results of Atterberg tests indicate a Liquid Limit of from 19 to 31 % and a Plastic Limit of from 12 to 16 % for this fine grained soil. The clay has a low to medium plasticity based on these results.

5.0 VOLUME ESTIMATES

EBA's field investigation indicated an abundance of coarse aggregate at the airstrip deposit. By tracing a line around the base of the deposit as identified on aerial photographs (A20242 – 113 to 115) the deposit covers approximately 1.6 square kilometers in area east of the Trudel River. The base of the deposit corresponds with the 250 m contour line around the north side of the air strip. The airstrip itself lies above the 270 m contour. By calculating the area of the contours indicated on the contour map (NTS 75 D/6, 1:50,000 scale for Methleka Lake) and interpolating for height, a volume estimate of 19 million cubic metres of aggregate material can be arrived at, assuming a flat bottom to the deposit. This estimate in no way accounts for the quality of the aggregate or possible presence of a bedrock knoll at depth. Nor does it account for how much of the material must be left in place to preserve the existing airstrip. It does illustrate that there is alot of material at this site that can be exploited.

Considerably less volume is available at the Lake and Middle pits but rough approximations indicate that 100,000 m^3 and 50,000 m^3 of granular fill could be available at these sites respectively.

At the clay pits, an estimate of 30,000 m^3 of silt and clay may be present. This could be increased if the deposit can be confirmed to extend beyond 20 m from the road but some of this volume would be unusable as a result of contamination, stripping and excessive moisture conditions.

6.0 LIMITATIONS

This report presents the findings in 31 test pits at discrete locations. Volume estimates are considered to be in the order of ±50 percent, due to the limited number of test pits at each location. Additional test pits and/or boreholes would be required to delineate gravel boundaries and refine quantity estimates.

This report has been prepared for the exclusive use of the Northwest Territories Power Corporation, and their agents, for specific application to the development described in Section 1 of this report. It has been prepared in accordance with generally accepted soil engineering practices. No other warranty is made, either expressed or implied.

Reference should be made to the General Conditions attached in Appendix A of this report for further limitations.

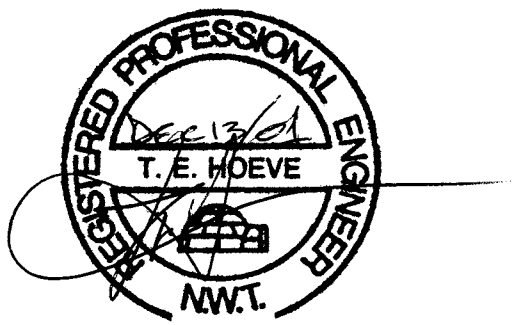
7.0 CLOSURE

We trust that this report meets your present requirements. Please contact either of the undersigned should there be any questions.

Respectfully submitted,
EBA ENGINEERING CONSULTANTS LTD.

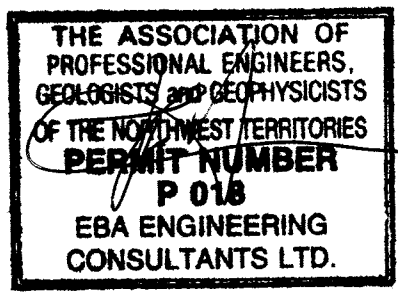
Prepared by:

Reviewed by:



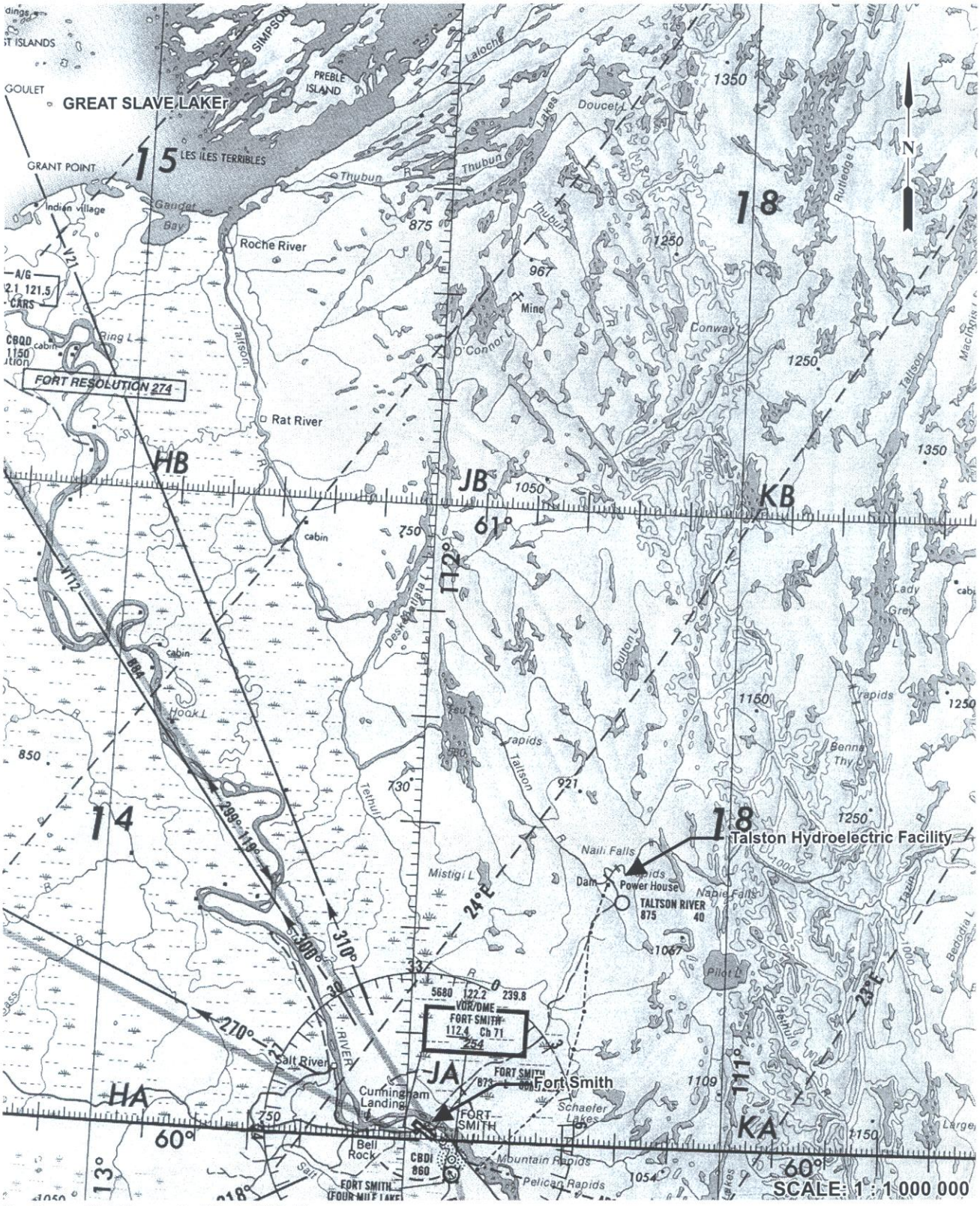
K. W. Peck, P. Eng, (NB, NF, NS)
Senior Geotechnical Engineer

T.E. (Ed) Hoeve P. Eng.
Chief Engineer, NWT/Nunavut



FIGURES

Figure 1: Site Location Map
Figure 2: Site Airphoto
Figure 3: Site Plan



Map Source: World Aeronautical Chart - WAC-13

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Figure 1
Site Location Map

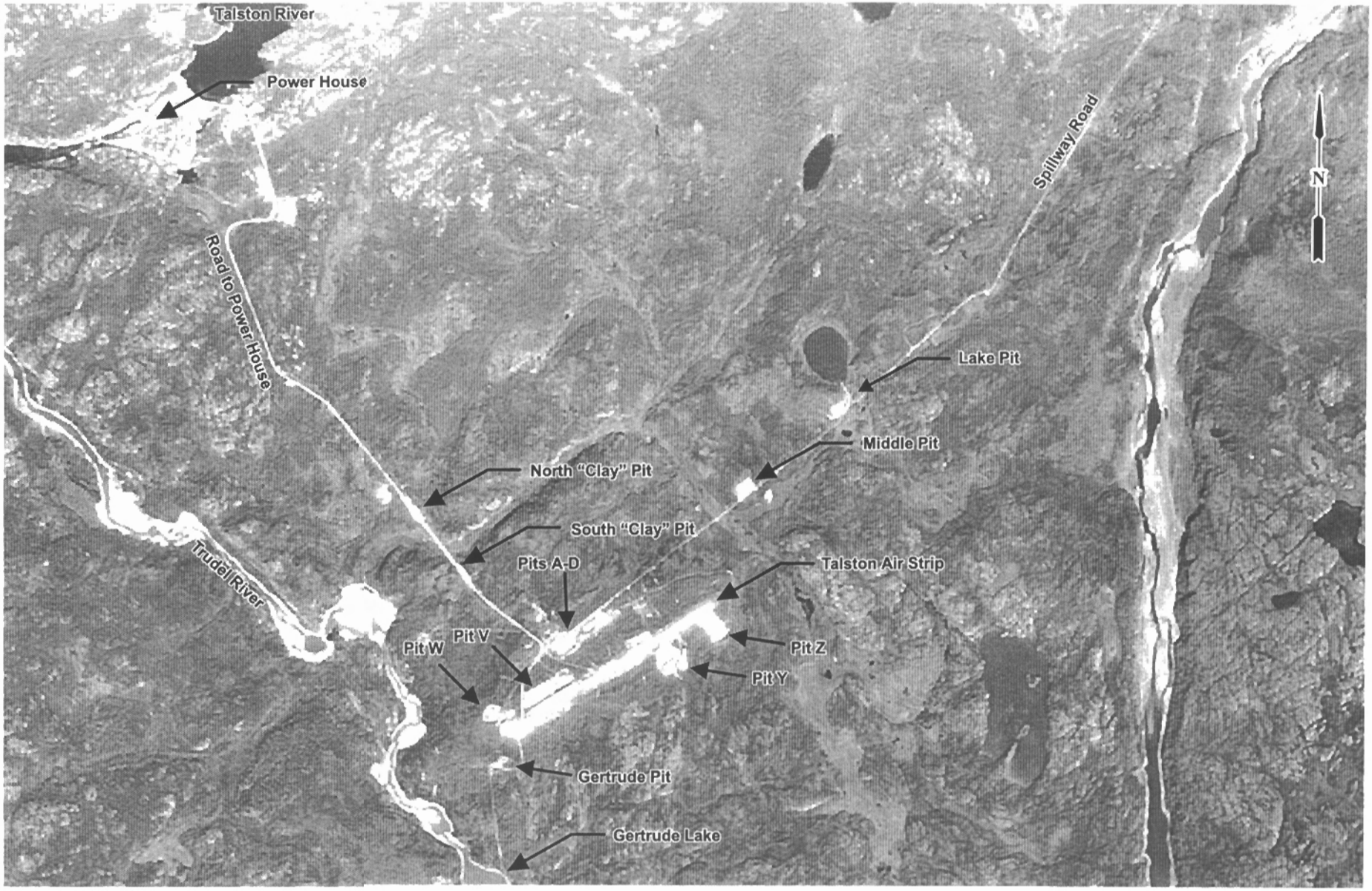

Figure 2
Site Airphoto

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eba

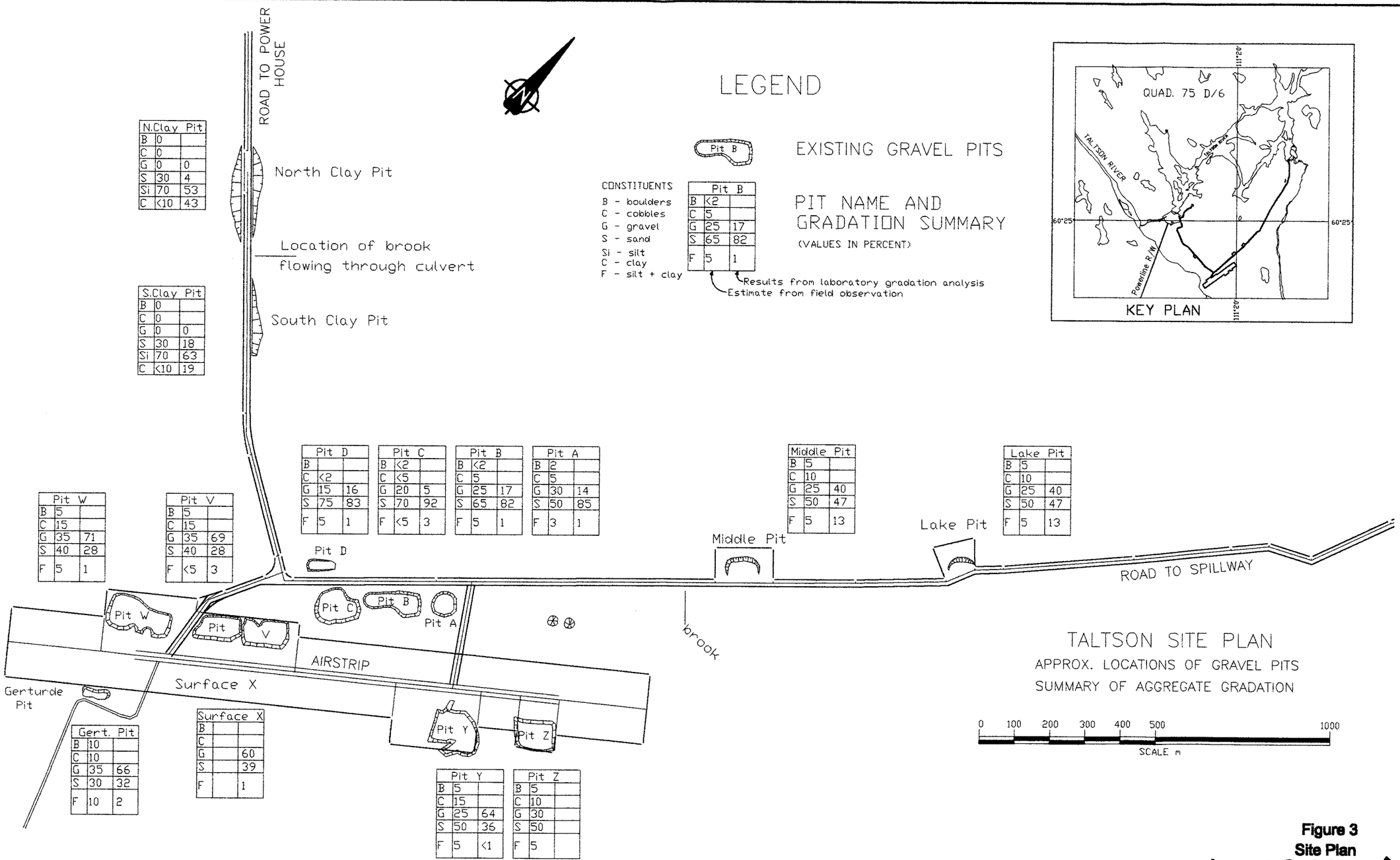

Figure 3
Site Plan
Aggregate Gradations

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APPENDIX A
GENERAL CONDITIONS AND LIMITATIONS

This report incorporates and is subject to these "General Conditions".

A.1 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

A.2 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

A.3 LOGS OF TEST HOLES

The test hole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

A.4 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

A.5 SURFACE WATER AND GROUNDWATER CONDITIONS

Surface and groundwater conditions mentioned in this report are those observed at the times recorded in the report. These conditions vary with geological detail between observation sites; annual, seasonal and special meteorologic conditions; and with development activity. Interpretation of water conditions from observations and records is judgmental and constitutes an evaluation of circumstances as influenced by geology, meteorology and development activity. Deviations from these observations may occur during the course of development activities.

A.6 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

A.7 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

A.8 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

A.9 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

A.10 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

A.11 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

A.12 SAMPLES

EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the client's expense upon written request, otherwise samples will be discarded.

A.13 STANDARD OF CARE

Services performed by EBA for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions in the jurisdiction in which the services are provided. Engineering judgement has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

A.14 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

A.15 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EBA shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EBA shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

The Client recognizes and agrees that electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

APPENDIX B
LABORATORY DATA

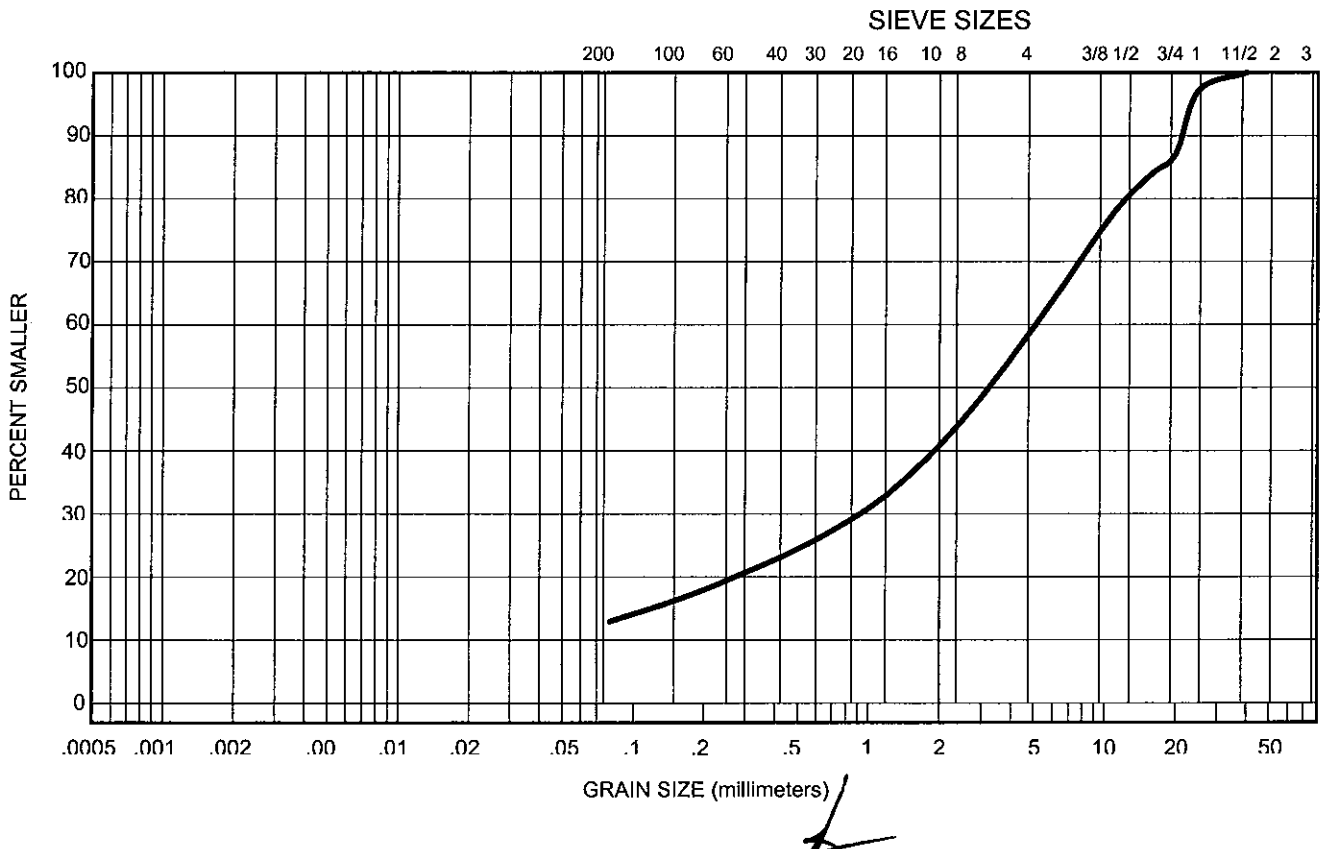
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 20, 2001
Test Pit Number: Lake Pit bulk sample
Depth, m surface
Lab Number: 2722-1
Soil Description: SAND & GRAVEL, some silt
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	100
25	97
20	87
16	84
12.5	80
10	76
5	60
2.5	45
1.25	34
0.63	26
0.315	21
0.16	17
0.08	13

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

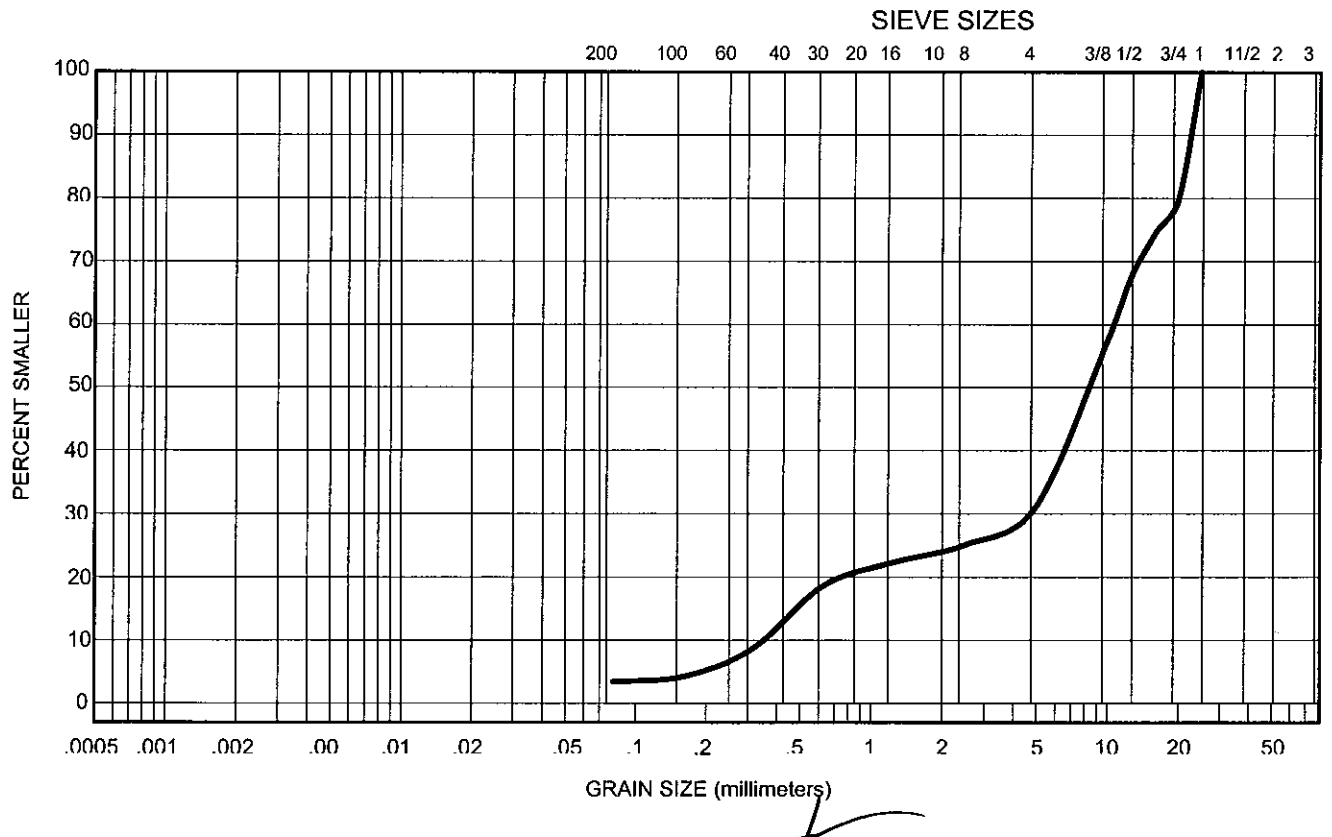
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 20, 2001
Test Pit Number: Pit Va - bulk
Depth, m surface
Lab Number: 2722-2
Soil Description: Sandy GRAVEL, trace silt
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	
25	100
20	80
16	75
12.5	67
10	57
5	31
2.5	25
1.25	22
0.63	19
0.315	9
0.16	4
0.08	3

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

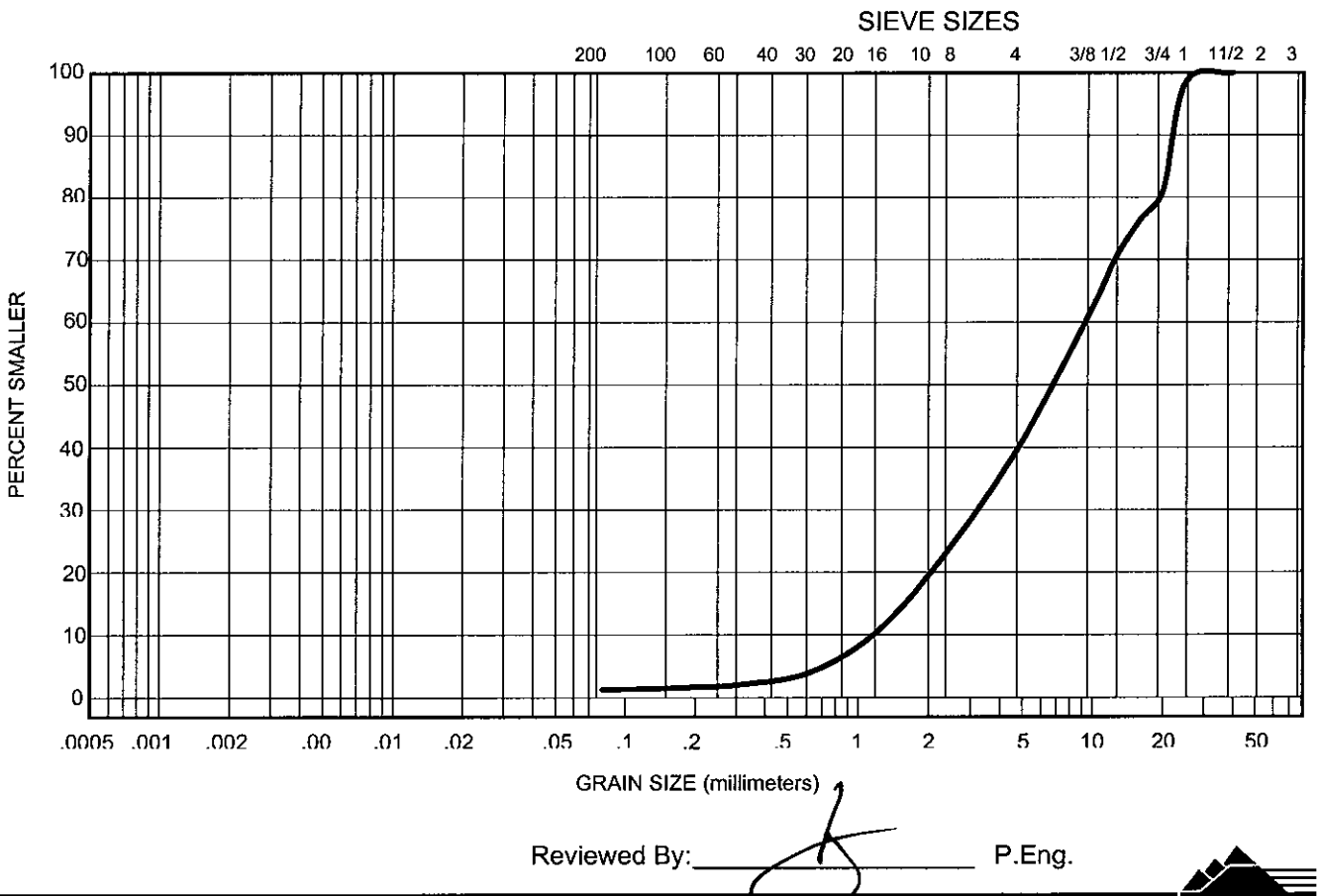
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 6, 2001
Test Pit Number: Middle Pit - bulk
Depth, m surface
Lab Number: 2722-3
Soil Description: GRAVEL & SAND, trace silt
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	100
25	99
20	81
16	76
12.5	70
10	62
5	41
2.5	24
1.25	11
0.63	4
0.315	2
0.16	2
0.08	1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

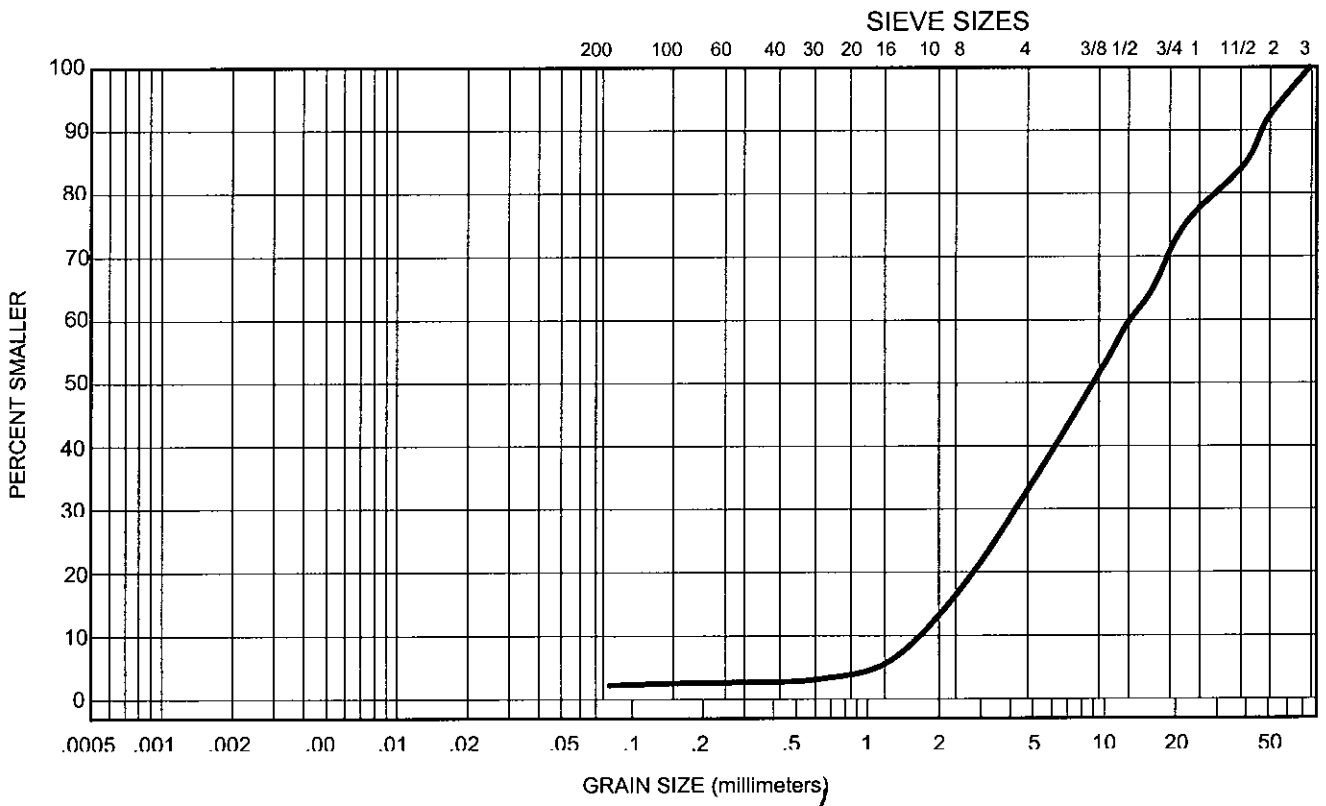
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 6, 2001
Test Pit Number: Gertrude Pit
Depth, m surface
Lab Number: 2722-4
Soil Description: Sandy GRAVEL, trace silt
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	85
25	77
20	72
16	65
12.5	59
10	53
5	34
2.5	18
1.25	6
0.63	3
0.315	3
0.16	3
0.08	2

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

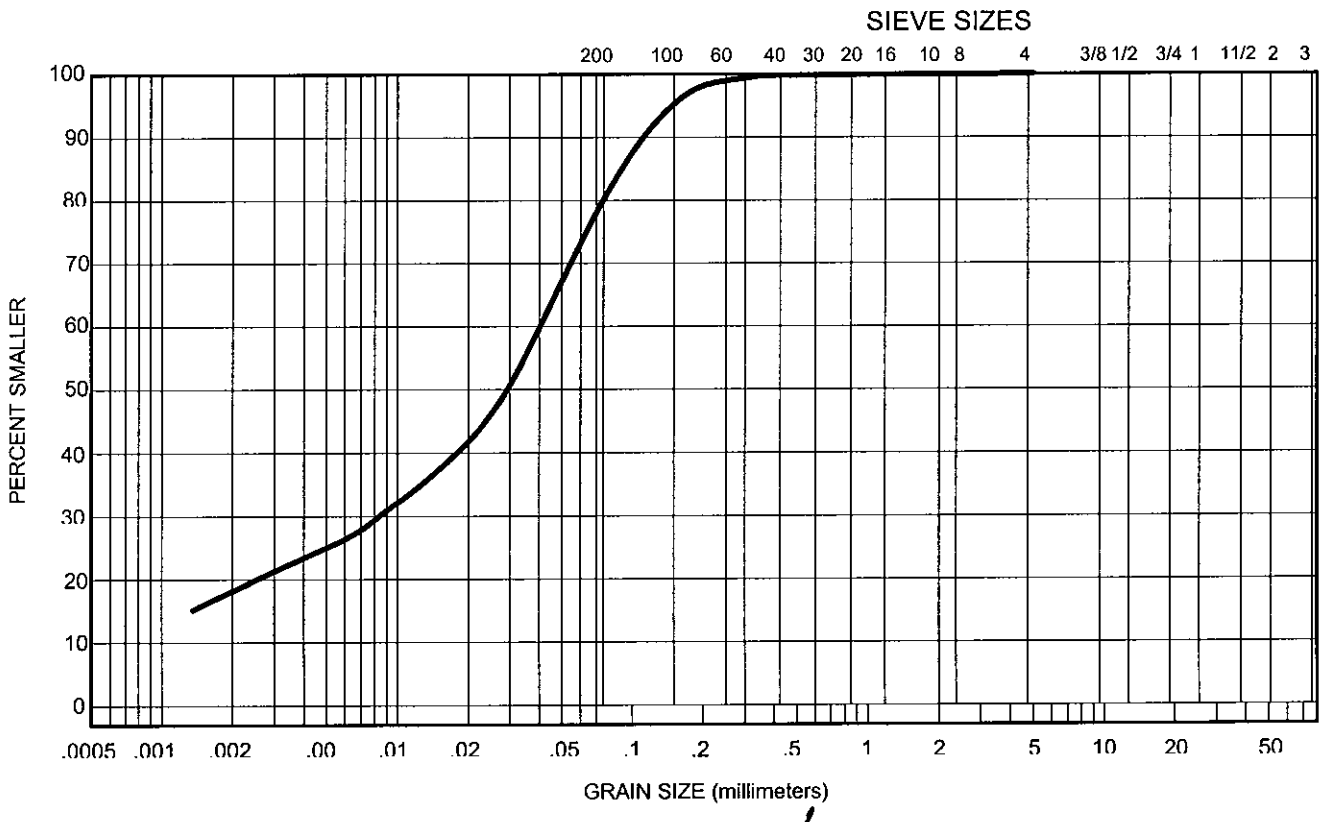
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 24, 2001
Sample Id South Clay Pit (Sc)
Depth, m from face
Lab Number: 2722-5
Soil Description: SILT, some sand and clay
Natural Moisture Content:
Remarks: LL - 19%, PL - 12%, PI - 7%

SIEVE	PERCENTAGE PASSING
40	
25	
20	
16	
12.5	
10	
5	100
2.5	100
1.25	100
0.63	100
0.315	99
0.16	96
0.08	82

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

eba

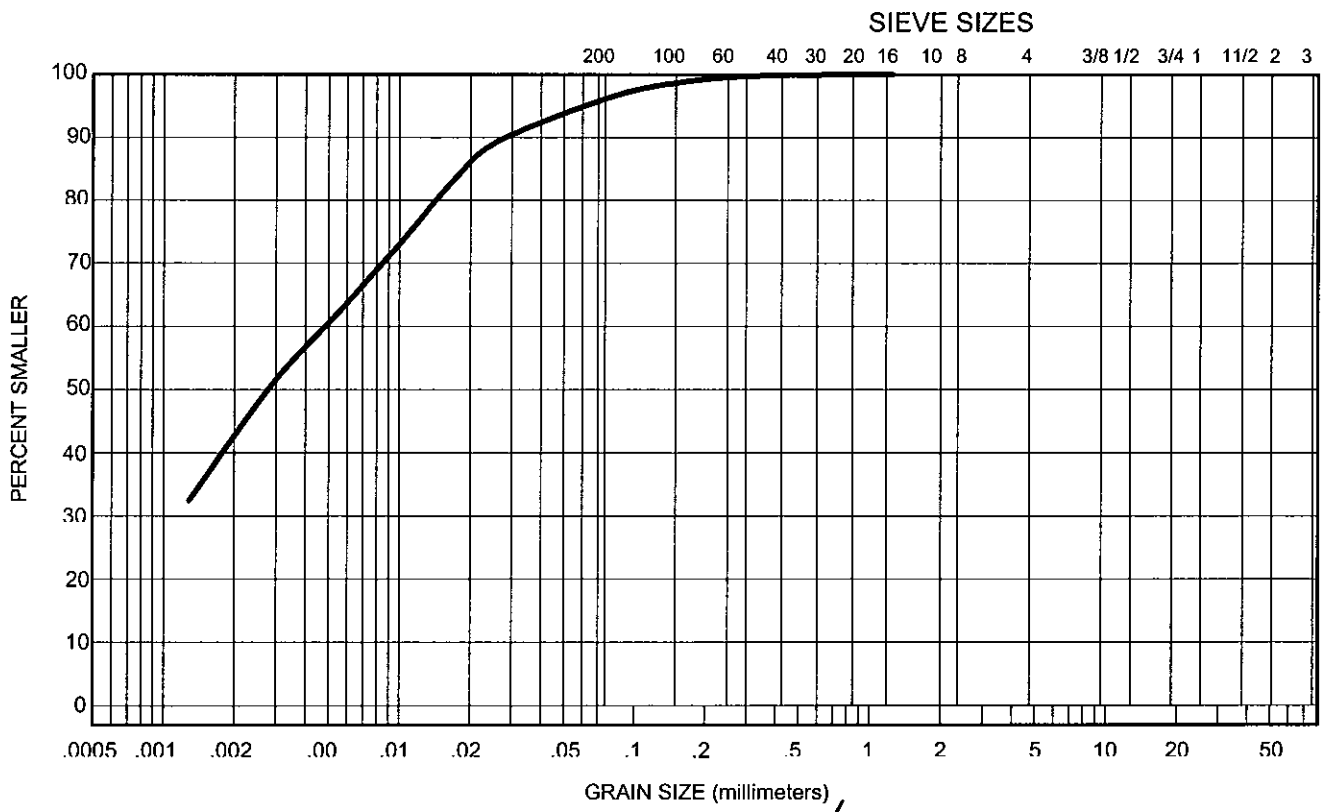
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 24, 2001
Sample ID: North Clay Pit (Nc)
Depth, m: from face
Lab Number: 2722-6
Soil Description: SILT & CLAY, trace of sand
Natural Moisture Content:
Remarks: LL - 31%, PL - 16%, PI - 15%

SIEVE	PERCENTAGE PASSING
40	
25	
20	
16	
12.5	
10	
5	
2.5	
1.25	
0.63	
0.315	100
0.16	99
0.08	96

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

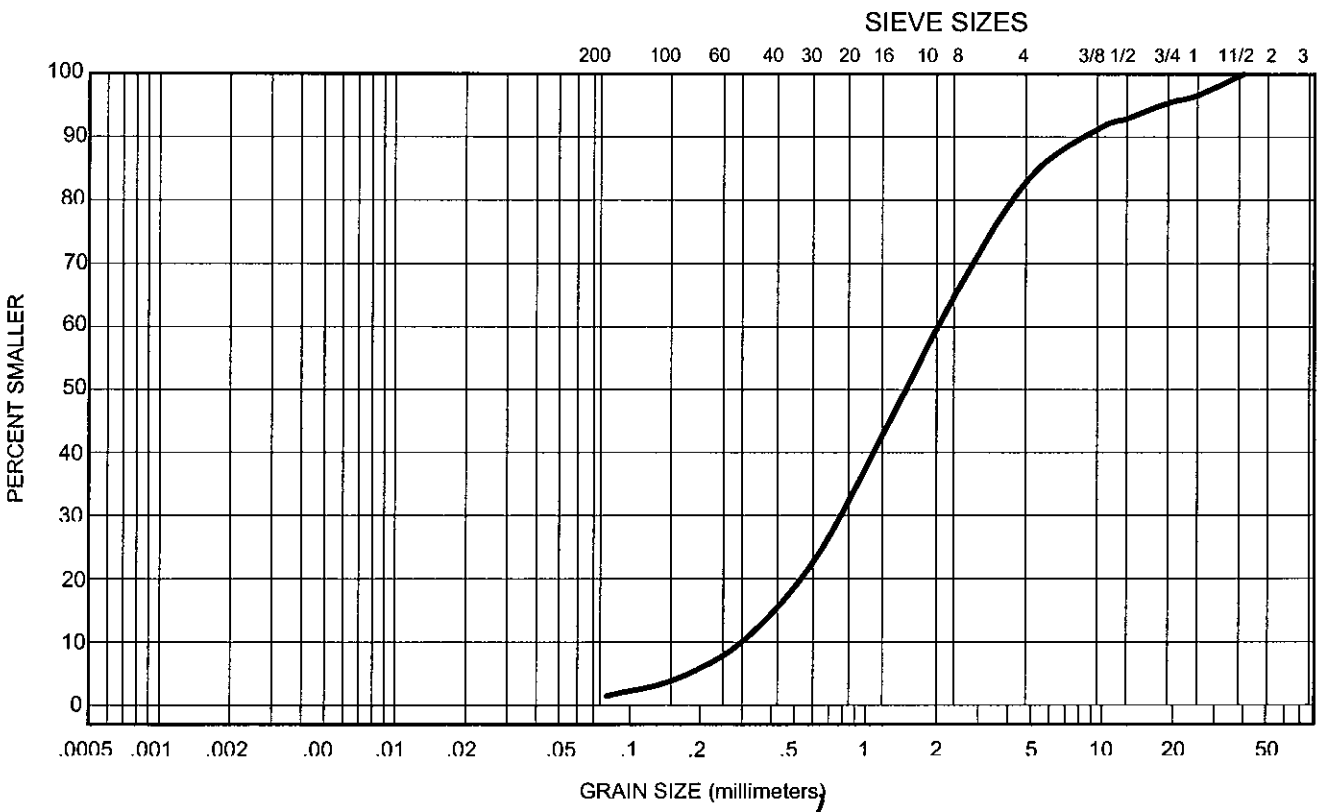
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 6, 2001
Test Pit Number: Pit Da
Depth, m surface
Lab Number: 2722-7
Soil Description: Gravely SAND, trace silt
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	100
25	97
20	96
16	94
12.5	93
10	92
5	84
2.5	66
1.25	44
0.63	24
0.315	11
0.16	4
0.08	1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

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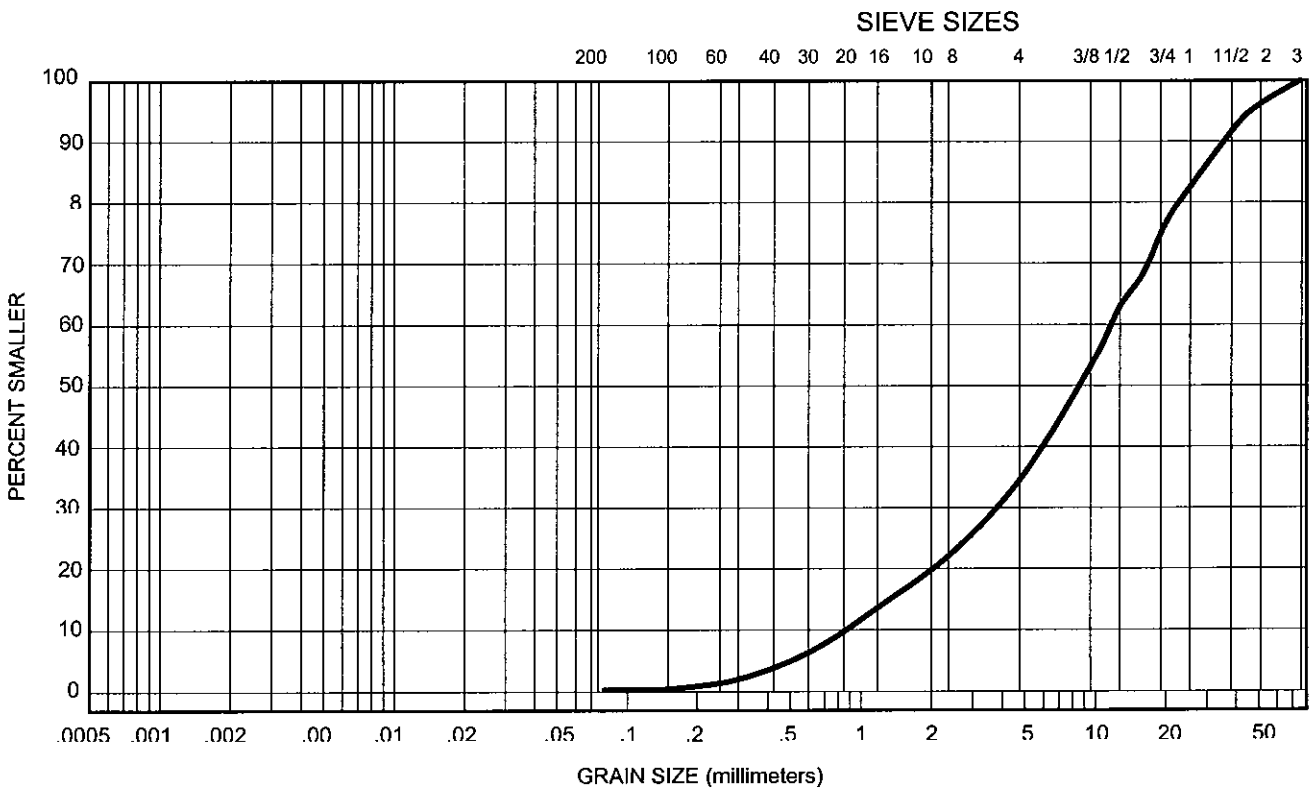
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 6, 2001
Test Pit Number: Pit Ya
Depth, m surface
Lab Number: 2722-8
Soil Description: GRAVEL & SAND, trace silt
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	93
25	82
20	77
16	68
12.5	62
10	55
5	36
2.5	23
1.25	14
0.63	7
0.315	2
0.16	1
0.08	0

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

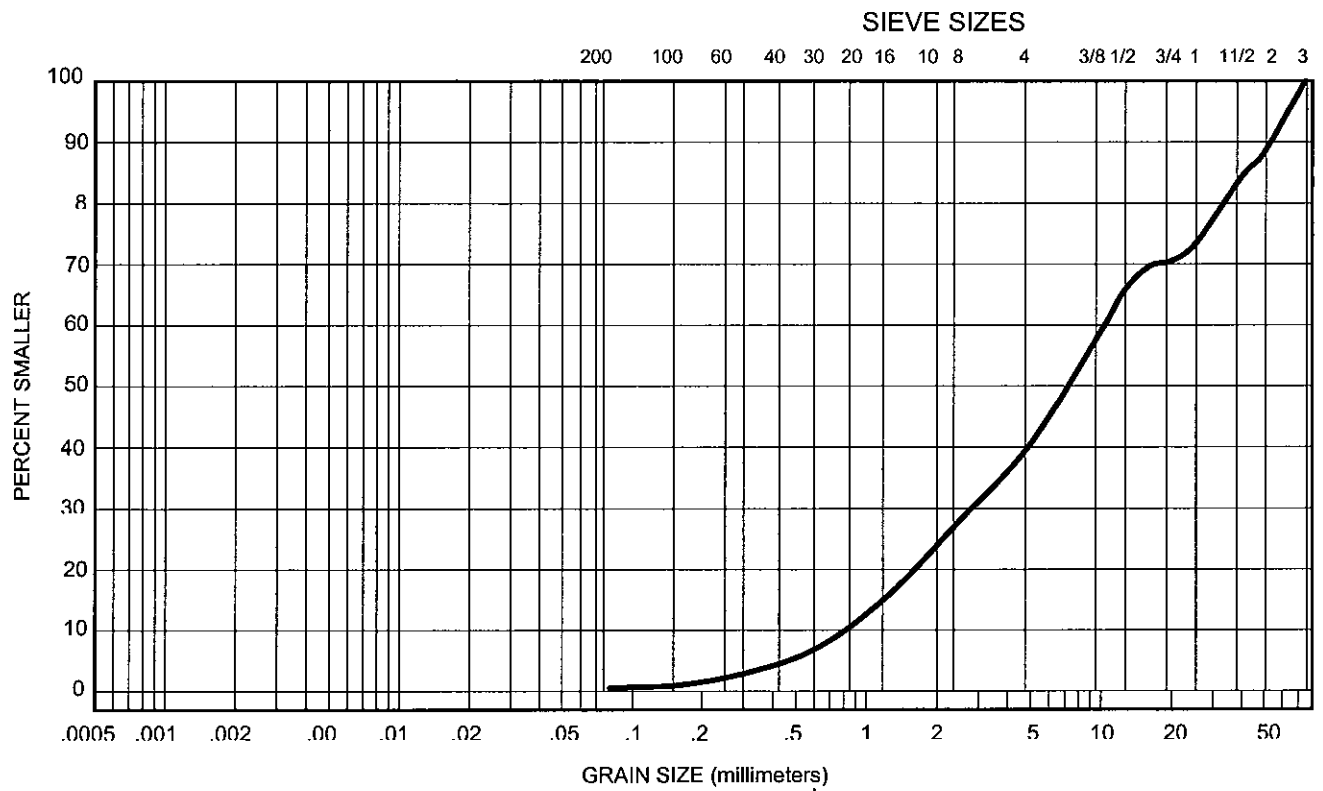
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 6, 2001
Test Pit Number: Pit Xa
Depth, m surface
Lab Number: 2722-9
Soil Description: GRAVEL & SAND, trace silt
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	84
25	73
20	71
16	70
12.5	65
10	59
5	40
2.5	28
1.25	16
0.63	7
0.315	3
0.16	1
0.08	1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

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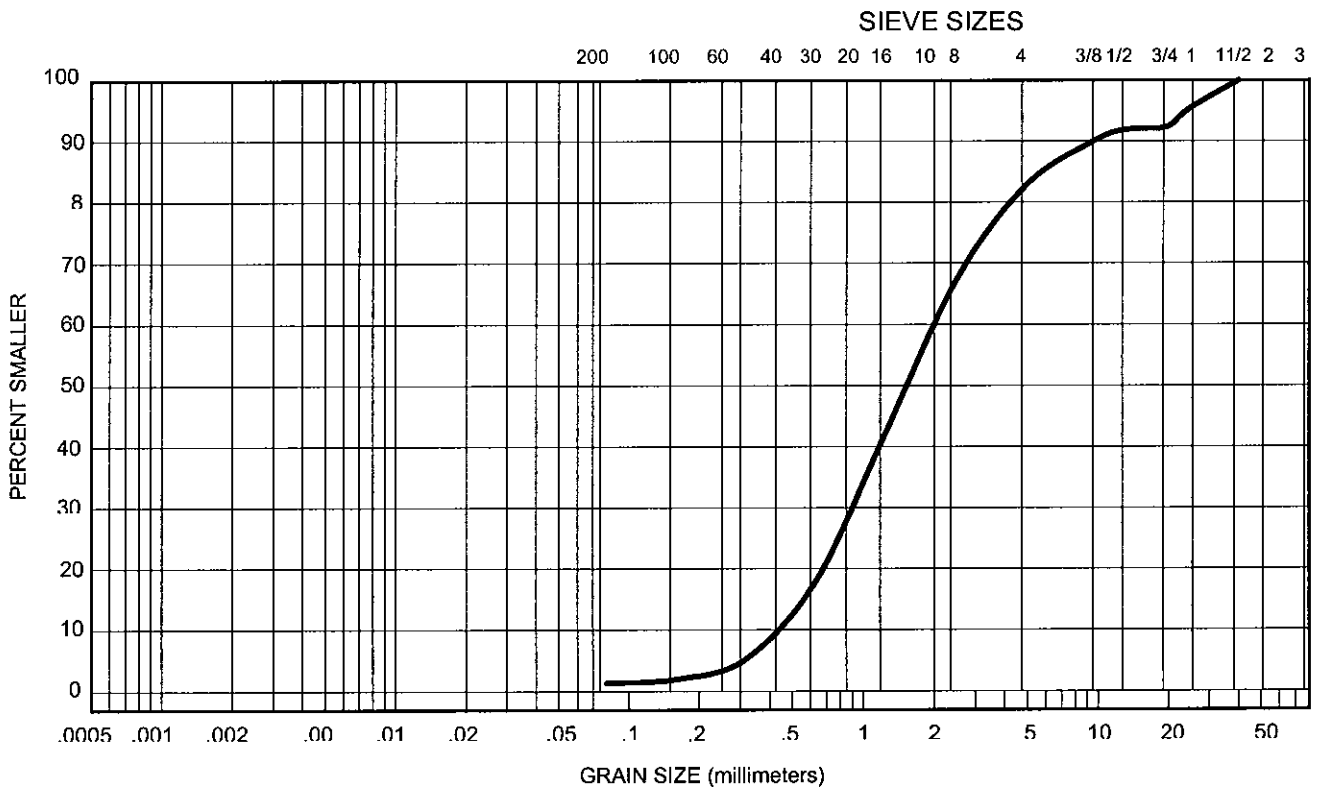
GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 6, 2001
Test Pit Number: Pit Ba
Depth, m surface
Lab Number: 2722-10
Soil Description: Gravely SAND, trace fines
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	100
25	96
20	92
16	92
12.5	92
10	90
5	83
2.5	67
1.25	42
0.63	18
0.315	5
0.16	2
0.08	1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

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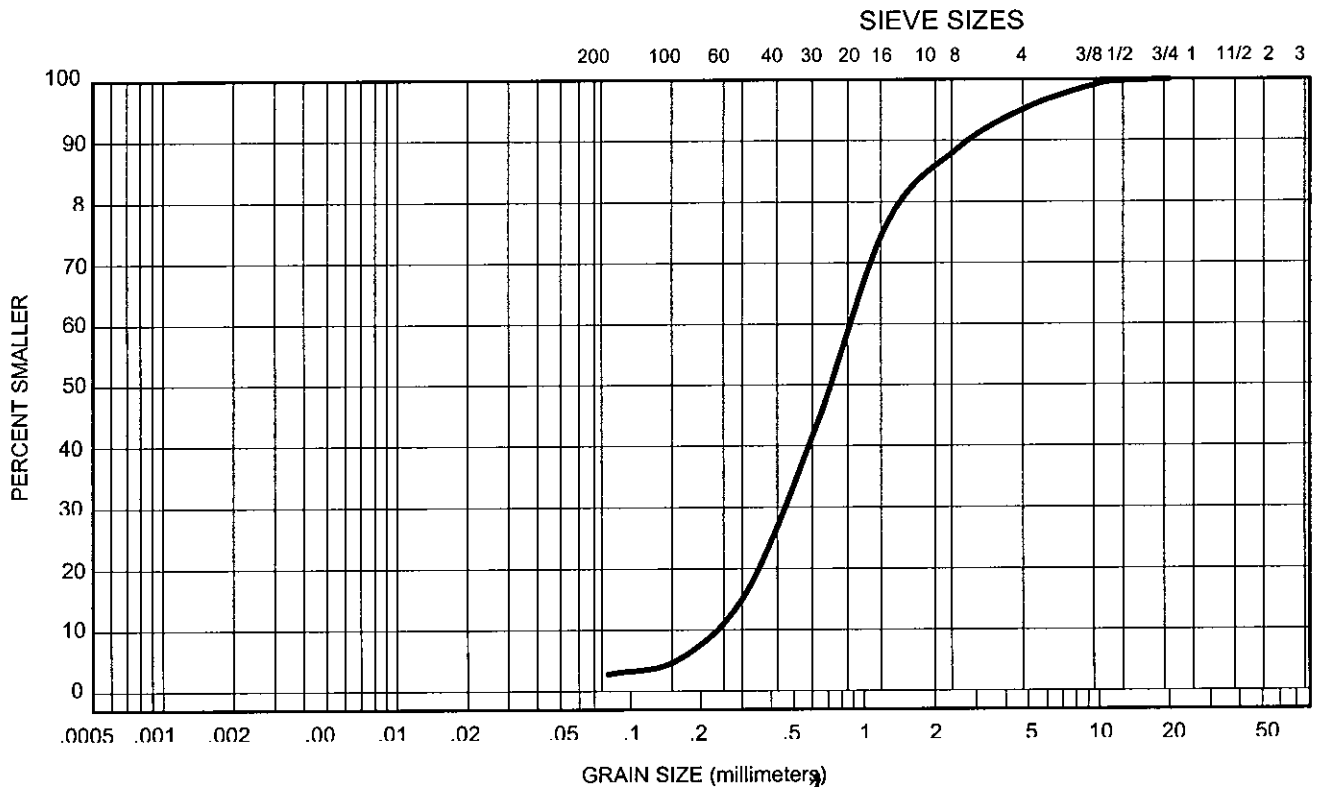
GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 6, 2001
Test Pit Number: Pit Ca
Depth, m surface
Lab Number: 2722-11
Soil Description: SAND, trace gravel and fines
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	
25	
20	100
16	100
12.5	100
10	99
5	95
2.5	89
1.25	76
0.63	44
0.315	16
0.16	5
0.08	3

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey

Project Number: 0701-01-15333

Client: NTPC

Attention: Greg Haist, P.Eng.

Date Tested: October 6, 2001

Test Pit Number: Pit Aa

Depth, m surface

Lab Number: 2722-12

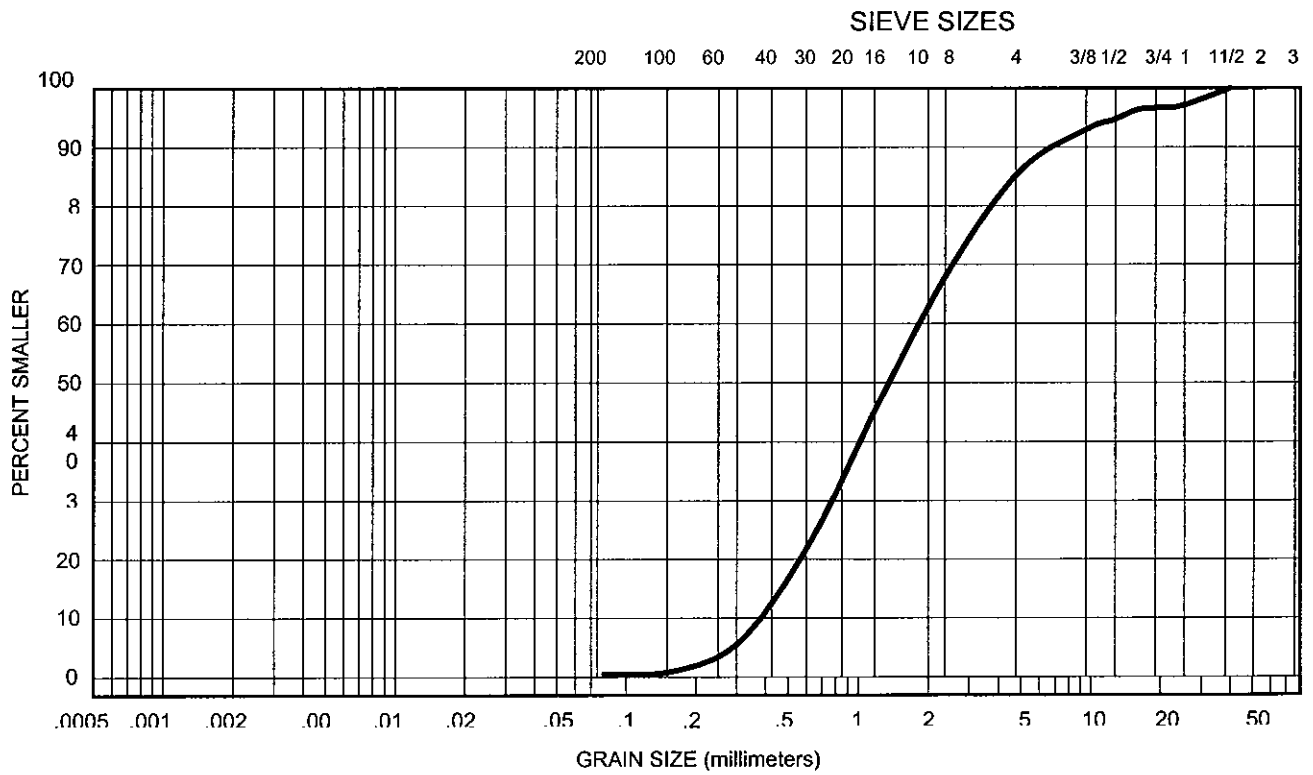
Soil Description: SAND, some gravel, trace fines

Natural Moisture Content:

Remarks:

SIEVE	PERCENTAGE PASSING
40	100
25	97
20	97
16	96
12.5	95
10	93
5	86
2.5	69
1.25	47
0.63	23
0.315	6
0.16	1
0.08	1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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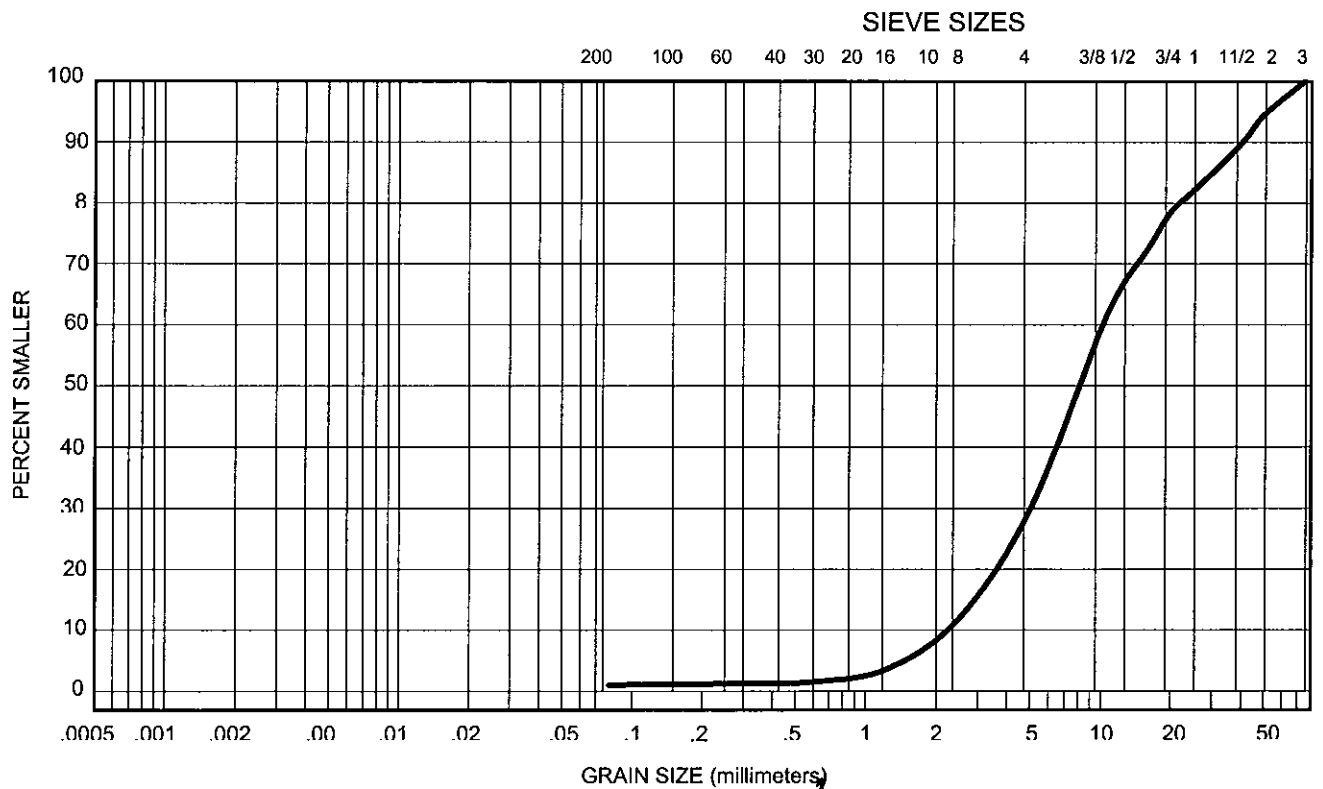
GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 6, 2001
Test Pit Number: Pit Wa
Depth, m surface
Lab Number: 2722-13
Soil Description: Sandy GRAVEL, trace silt
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	90
25	82
20	79
16	73
12.5	67
10	59
5	29
2.5	12
1.25	4
0.63	2
0.315	1
0.16	1
0.08	1

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

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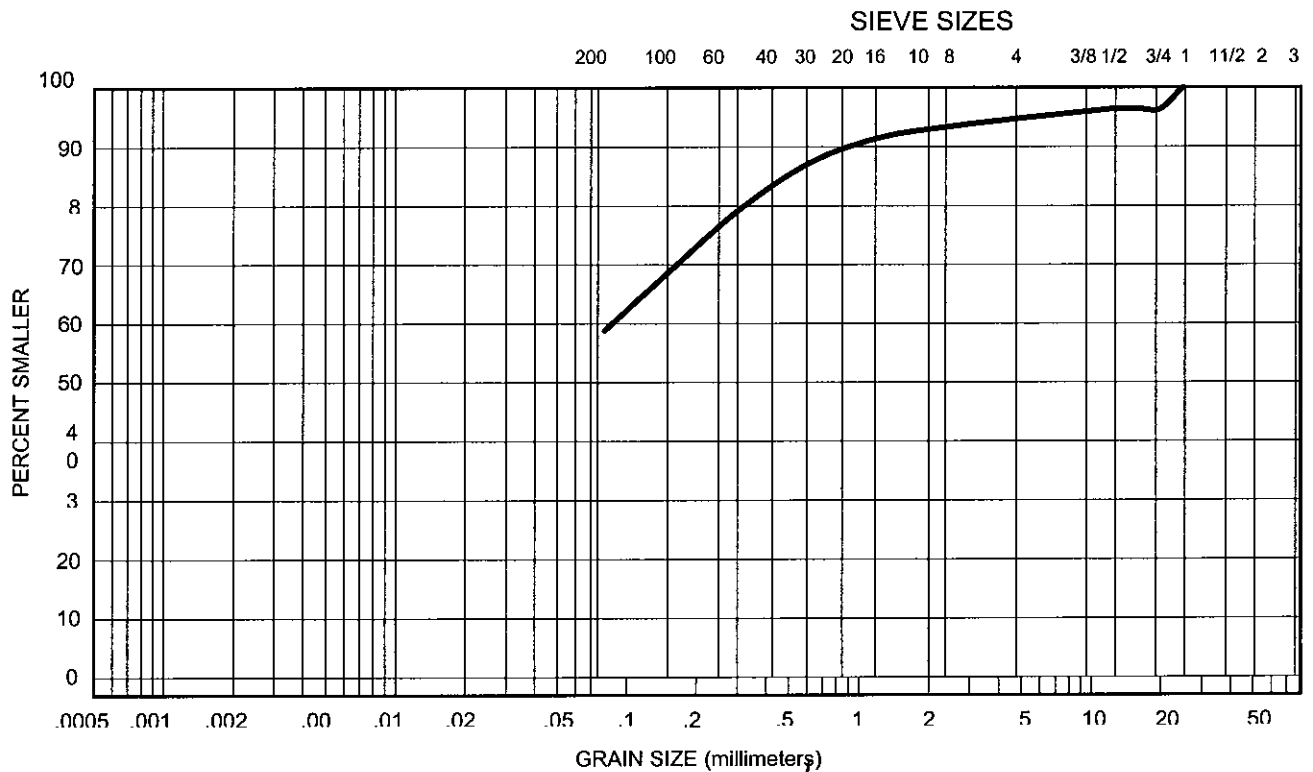
GRAIN SIZE DISTRIBUTION

Project: Talston Aggregate Survey
Project Number: 0701-01-15333
Client: NTPC
Attention: Greg Haist, P.Eng.
Date Tested: October 26, 2001
Test Pit Number: Pit Cb
Depth, m surface
Lab Number: 2722-14
Soil Description: SILT & SAND, some clay, trace gravel
Natural Moisture Content:
Remarks:

SIEVE	PERCENTAGE PASSING
40	
25	100
20	96
16	96
12.5	96
10	96
5	95
2.5	93
1.25	92
0.63	87
0.315	80
0.16	70
0.08	59

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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APPENDIX C
SITE PHOTOGRAPHS

Photo 1

Aerial view of airstrip looking NW. Pits Y & Z in foreground. Pits V & W opposite at far end runway.

Photo 2

Grizzly screen set up in Pit W.

Photo 3

Central portion of Lake Pit along north side of Spillway road. Pit is partly overgrown.

Photo 4

View of east portion of Middle Pit along north side of Spillway road. Coarse concrete aggregate is obtained from floor of pit at left hand side.

Photo 5

Pit Z looking north from southern edge of pit. Airstrip is behind trees.

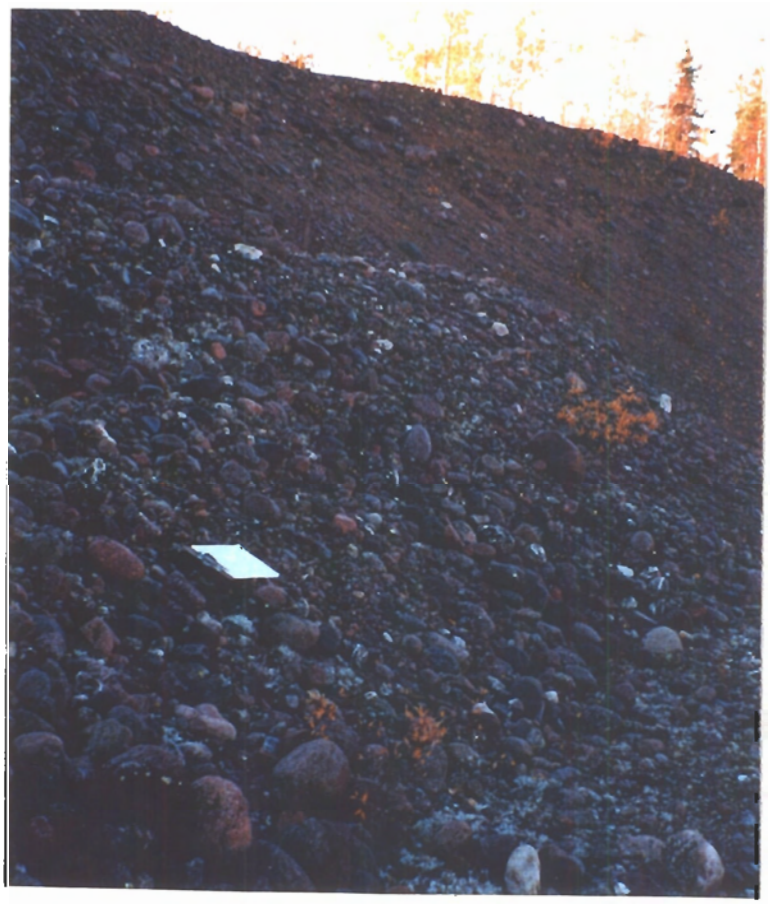
Photo 6

Close up of aggregate in Pit Z – some cobbles, mostly sand and gravel.

Photo 7

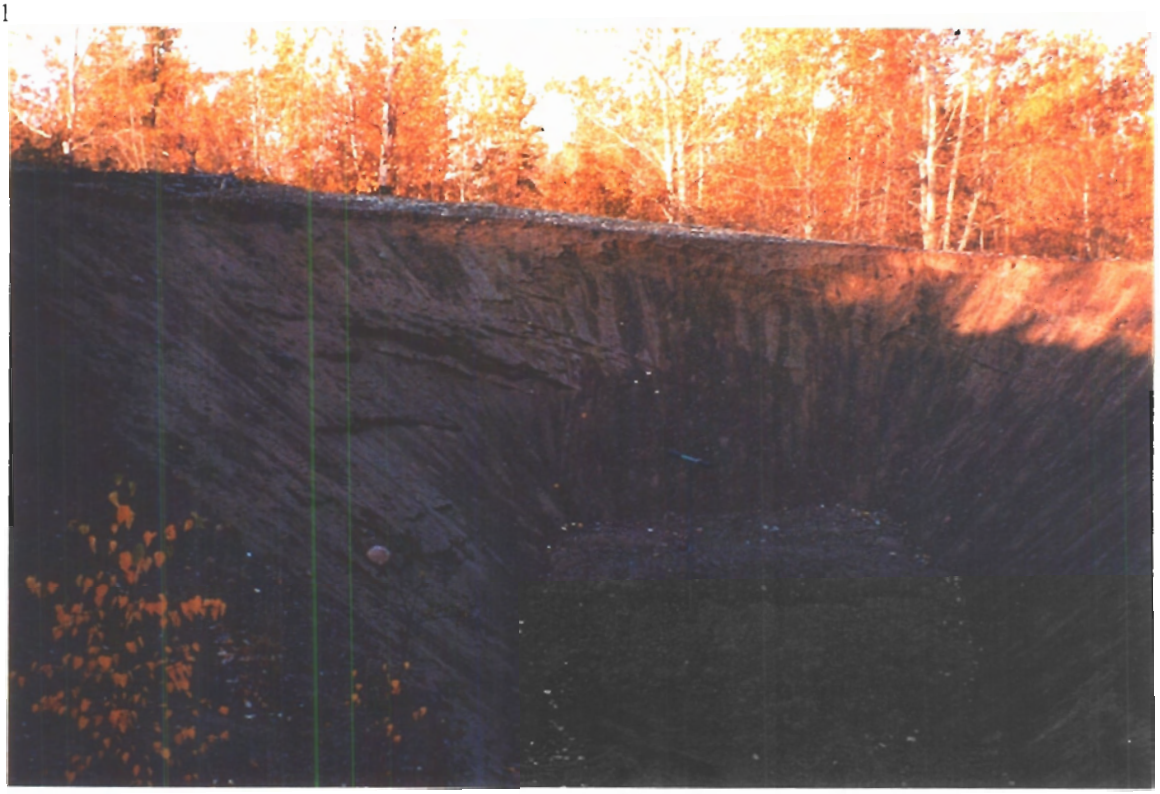
South edge of Pit Y looking south west along cobble ridge.

Photo 8



Intermediate ridge of coarse aggregate within Pit Y.

Photo 11



Pit D, looking west. This is the fine aggregate source. Note bedding sloping down to the north.

Photo 12

South Clay Pit looking at east bank showing horizontal bedding at top of face.

Photo 9 - Pit W looking east along south bank.

Photo 10 - Pit V looking north from airstrip.