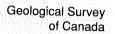


Ressources Naturelles Canada





Commission géologique du Canada

## AGGREGATE TESTING OF MARINE SAND AND GRAVEL SAMPLES FROM OFFSHORE CAPE BRETON ISLAND

Submitted by:
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Submitted to:
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Bedford Institute of Oceanography
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NAO-1268

February, 1995

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GEOLOGICAL SURVEY
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OTTAWA

February 6, 1995

NAO-1268

Atlantic Geoscience Centre Bedford Institute of Oceanography P.O. Box 1006 Dartmouth, Nova Scotia B2Y 4A2

Attention:

Mr. Gordon B. J. Fader

Dear Mr. Fader,

RE:

AGGREGATE TESTING OF MARINE SAND AND GRAVEL SAMPLES FROM OFFSHORE CAPE BRETON ISLAND SSC FILE NO. HAL94-00782-(110) CONTRACT NO. 23420-4M195/01-HAL

On November 8, 1994 Maritime Testing (1985) Limited picked up fifteen marine sand and gravel samples at the Atlantic Geoscience Centre (AGC), Dartmouth, NS. These samples were obtained by the AGC from offshore Cape Breton and were to be evaluated for possible use as Portland Cement and Asphaltic Cement Aggregates. Fifteen Canadian Standards Association (CSA) tests and one British Standards (BS) test were to be conducted on these samples.

Because of the small mass and the gradation of these samples, some changes were made in the testing regime. Tests were scheduled in a specific order and material reused where possible in order to obtain the maximum amount of information from a limited amount of sample material. The minimum mass of test sample suggested by CSA in some of the tests was not obtainable. However, where our experience indicated testing a smaller sample could yield an accurate result, we carried out the test. In instances where a small sample size could give erroneous results we deleted the test and reported it as having insufficient sample to conduct that test.

The CSA test procedures were designed for relatively clean (less than  $4\% < 80 \ \mu m$ ) concrete sand aggregate and concrete stone aggregate. The test samples from offshore Cape Breton consist of a mixture of gravel, sand, and silt. This made certain CSA tests inappropriate for these samples.



The soft, rounded sandstone would not make a good concrete aggregate because of its low strength, low density and high absorption rate.

The samples tested contain a relatively high amount of minus  $80~\mu m$  diameter particles. This excess of fine material would decrease the strength of the concrete. The excess fines would have to be removed through a screening or washing procedure. This screening procedure would also have to separate the material into coarse and fine aggregate to meet CSA gradation specifications.

The presence of salt in the test samples would have to be addressed. Marine samples which contain chlorides can have detrimental effects on concrete. Chlorides can cause efflorescence, increase drying shrinkage, and alter time of set. It is not recommended to use aggregates with chlorides present in the production of steel reinforced concrete. The chlorides can increase the risk of corrosion of the steel reinforcement. The amount of salt present in this aggregate could be reduced by washing the material at the time of screening and processing.

### SUITABILITY OF MATERIAL FOR USE AS ASPHALTIC CONCRETE AGGREGATE

The aggregate test results are compared to Nova Scotia Department of Transportation and Public Works Canada Specifications on the attached Table 2.

This table compares ranges of results with the predominantly granite samples in one group and predominantly sandstone samples in the other group.

If these were terrestrial samples we would recommend against the use of the sandstone samples due to high percentage lumps, high soundness losses, high absorptions, and poor petrographic values. The granite samples could have some potential, however there are a wide range of easily accessible terrestrial granite deposits available in Nova Scotia.



CSA test A23.2-6A, Relative density and absorption of fine aggregate and CSA test A23.2-11A, Surface moisture of fine aggregate could not be conducted because of the difficulty in determining the surface saturated dry state of the samples. These tests were developed for relatively clean sands, not for mixtures of gravel, sand, and silt. The test samples were received in a saturated condition and the moisture content was obtained for all samples and reported. The CSA test A23.2-12A, Relative density and absorption of coarse aggregate was conducted on all samples with sufficient mass.

CSA test A23.2-16A, Los Angeles Abrasion (LAR) of small size coarse aggregates and CSA test 23.2-17A, LAR of large size coarse aggregate require relatively large masses of aggregate to conduct testing. Substituting smaller amounts of aggregate could yield erroneous test results. Sample #16 was the only sample which had the required mass to run this test.

CSA test A23.2-4A, Low density granular material was modified as follows: Sucrose was used to create a liquid with a specific gravity of approximately 1.5 instead of a zinc chloride to create a liquid with a specific gravity of 2.0. This was because of the difficulty in acquiring zinc chloride.

CSA test A23.2-18A, Clay size particles in aggregate was conducted on all the samples. The test results have been reported in conjunction with CSA A23.2-2A, Sieve analysis of fine and coarse aggregate. As can be seen on the report forms there is an anomaly in regards to the percent of particles smaller than the 80  $\mu$ m diameter size. This is due to the presence of salt in the test samples which gave an artificially high hydrometer reading for these particles. This results in test results that show a slightly higher percent of minus 80  $\mu$ m diameter size particles than actually exist in the test samples.

### SUITABILITY OF MATERIAL FOR USE AS PORTLAND CEMENT AGGREGATE

Attached is a table from CSA Standard A23.1-94, A23.2-94, Limits for Deleterious Substances and Physical Properties. (Table 1) This table lists properties for both coarse and fine concrete aggregate.

The samples from Offshore Cape Breton are either predominantly granite material or predominantly sandstone material.

The granite is rounded but durable. The rounded, smooth surface of the granite may cause a decrease in the bond strength between the aggregate and the paste in the hardened concrete. But a concrete mix using rounded aggregate usually requires less water to obtain a workable mix. This can allow for the use of a lower water to cement ratio.



We trust the above is self explanatory, however, if you have any further questions please feel free to contact this office at your convenience.

Sincerely,

MARITIME TESTING (1985) LIMITED

Kevin Bearnes, C.E.T. Laboratory Supervisor

Table 1
Limits for Deleterious Substances\* and Physical Properties

|   | Maximum pe        | ercentage by mass of                           | total sample                    |
|---|-------------------|--|---------------------------------|
|   |                   | Coarse aggregate                               |                                 |
| Property  | Fine<br>aggregate | Exposure<br>classifications†<br>F-1, C-1, C-2, | Other<br>exposure<br>conditions |
| Standard Requirements Clay lumps (see Note 1)                       | 1.0               | 0.25   | 0.5                             |
| Low-density granular materials (see Note 2)                         | 0.5               | 0.5  | 1.0                             |
| Material finer than 80 μm   | 3.0§              | 1.0‡   | 1.0‡                            |
| MgSO₄ soundness loss (see Note 3)                                   | 16                | 12   | 18                              |
| Abrasion loss**   | N/A               | 50   | 50                              |
| Alternative Requirements (see Note 3) Micro-Deval test (see Note 4) | )                 |  |                                 |
| , ,   | 20                | <del></del>                                    |                                 |
| Unconfined freeze-thaw test (see Note 5)                            | _                 | 6  | 10                              |

<sup>\*</sup>Limits for deleterious substances not listed in the Table, such as shalestone, siltstone, sandstone, or argillaceous limestone, shall be specified by the Owner to encompass deleterious materials known to be present in a particular region. In the absence of such information aggregate shall be accepted or rejected in accordance with Clause 5.9.

#### Notes:

- (1) Clay lumps are defined as fine-grained, consolidated, sedimentary materials of a hydrous aluminosilicate nature.
- (2) A liquid with a relative density of 2.0 is generally used to separate particles classified as coal or lignite. Liquids with relative densities higher or lower than 2.0 may be required to identify other deleterious low-density materials.
- (3) The MgSO₄ soundness loss requirements can be waived provided the material meets the Alternative Requirements detailed in Table 3.
- (4) CSA Test Method A23.2-23A. This test for fine aggregate is rapid, has excellent precision, and has a significant correlation with the more complex and variable MgSO<sub>4</sub> soundness test. For more information see "Micro-Deval Test for Evaluating the Quality of Fine Aggregate for Concrete and Asphalt", C.A. Rogers, M. Bailey, and B. Price, Transportation Research Board, Record No. 1301, pp. 68–76, 1991.

(Continued)

<sup>†</sup>See Table 7.

<sup>‡</sup>In the case of crushed aggregate, if material finer than the 80 µm sieve consists of the dust of fracture, essentially free from clay or shale, the maximum shall be 1.5%.

<sup>§</sup>This limit shall be 5% if the clay size material (finer than 2  $\mu$ m) does not exceed 1% of the total fine aggregate sample. The amount of material of clay size shall be determined by performing a hydrometer analysis as per ASTM Standard D422 on a sample washed through an 80  $\mu$ m sieve.

<sup>\*\*</sup>The abrasion loss shall not be greater than 35% when the aggregate is used in concrete paving or for other concrete surfaces subjected to significant wear. This does not refer to air-cooled iron blast-furnace slag coarse aggregate.

TABLE 2: Comparison of Test Results to Typical Asphalt Aggregate Specifications

| Test Method and Discription  | Test R                                    |                              | N S DOTC                               | PWC                              | Comments  |
|--|---|------------------------------|--|----------------------------------|---|
|  | Granite                                   | Sandstone                    | Spec                                   | AK Spec                          |   |
| A 23.2 - 2A<br>Sieve Analysis of Fine and<br>Coarse Aggregate          |   | mounts of and Clay           | Various                                | Various                          | Highly variable gradations                                  |
| A 23.2 - 3A<br>Clay Lumps in Natural<br>Aggregate                      | Low                                       | 0 - 90 %                     | "Free from<br>clay"                    |                                  | Too much clay in sandstone samples                          |
| A 23.2 - 4A<br>Low Density Material in<br>Aggregate                    | 0   | 0                            | "Free from<br>deleterious<br>Material" |                                  | O. K.   |
| A 23.3 - 5A<br>Amount of Material finer than<br>80 µm in Aggregate     | Vari                                      | able                         | Typically<br>8 % Max                   | Typically<br>8%                  | Samples variable,<br>many require washing                   |
| A 23.2 - 7A<br>Organic Impurities in sands<br>for Concrete             | Typica                                    | lly > 3                      | Not Appl                               | icable                           |   |
| A 23.2 - 9A<br>Magnesium Sulphate<br>Soundness                         | Typically<br>Less Than<br>2%              | Some<br>samples<br>18 - 27 % | Max<br>10 or 15 %                      | Max<br>12 or 16 %                | Sandstone samples failed Spec                               |
| A 23.2 - 10A<br>Density of Aggregate                                   |   |                              |  |                                  |   |
| A 23.2 - 12A<br>Relative Density and Absorption<br>of Coarse Aggregate | 1 - 1.6                                   | 2 - 4                        | Max<br>1.75 %                          |                                  | Granitic aggregates O.K.<br>Sandstone Failed                |
| A 23.2 - 13A<br>Flat and Elongated particles<br>in Coarse Aggregate    | Predom<br>rounde<br>subro                 | ed and                       | B S 812<br>Max 45 %                    | "Free from<br>flat<br>elongated" |   |
| A23.2 - 15A<br>Petrographic Examination<br>of Coarse Aggregate         | 223 323<br>121,119 198<br>121,136 261,241 |                              | 135 -200<br>Depending on<br>traffic    |                                  | Granitic Samples could be<br>be O.K.<br>Sandstones too soft |
| A 23.2 - 16A<br>Los Angeles Abrasion<br>Small Aggregate ( < 40 mm)     | 22  |                              | 35%<br>Maximum                         | 25%<br>Maximum                   |   |

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Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

B2Y 4A2

0

FILE:

NAO-1268

DATE:

**19 JANUARY 95** 

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94–131 J.L. HART P.O.#23420–4–M195/01–HAL

SOURCE:

STN #1

DEPTH:

N/A

| SAMPLE           | ΓΥΡΕ:      | DRE              | DGED SAI                              | MPLE              |       | ATE     | TESTED: | 16 JANUARY 95 |              |      |               |       |     |     |               |
|------------------|------------|------------------|---------------------------------------|-------------------|-------|---------|---------|---------------|--------------|------|---------------|-------|-----|-----|---------------|
| SIEVE            | %          |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
|                  | PASS       |                  |                                       | .002 m            |       |         | 0.080   | ) mm          |              |      |               | 5.0 r |     |     | l             |
| (MM)             |            | 100 <sub>f</sub> | CLAY                                  | , <u> </u>        | S     | ILT     |         |               | <u>S.</u>    | AND  | <del></del> 1 |       | GRA | VEL |               |
| 112              | 100.0      |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 80               | 100.0      | 90               |                                       |                   |       |         |         |               |              |      |               |       |     |     | ШІ            |
| 56               | 79.0       |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 40               | 48.0       | 80               |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 28               | 39.0       | 80               |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 20               | 37.0       | ا ا              |                                       |                   |       |         |         |               |              |      |               |       |     | :   |               |
| 14               | 32.0       | 70               |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 10               | 29.0       |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 5.0              | 23.0       | 60               |                                       |                   |       |         |         | <del> </del>  | <del> </del> |      |               |       |     |     | <del> /</del> |
| 2.5              | 21.0       |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 1.25             | 20.0       | 50               | · · · · · · · · · · · · · · · · · · · |                   |       |         |         |               |              |      |               |       |     |     | <u>∦</u> - ∣  |
| 0.63             | 18.0       |                  |                                       |                   |       |         |         |               |              |      |               |       |     | /   | T             |
| 0.315            | 15.0       | 40               |                                       |                   |       |         |         |               | ļ            |      |               |       |     |     | HI            |
| 0.160            | 7.0        |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 0.080            | 3.2        | 30               |                                       |                   |       | -       |         |               |              |      |               |       |     |     | $\sqcup I$    |
| 0.0359<br>0.0234 | 5.2        |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 0.0234           | 3.8<br>2.8 | 20               |                                       |                   |       |         |         |               |              |      |               | B     |     |     |               |
| 0.0137           | 2.6        | 20               |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 0.0097           | 1.8        |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 0.0089           | 1.0        | 10               |                                       |                   |       |         |         |               | 1            |      |               |       |     |     |               |
| 0.0034           | 0.5        |                  |                                       |                   |       |         |         |               |              |      |               |       |     |     |               |
| 0.0014           | 0.5        | 0.0              | 0002 0.0                              | ∟ <u>∎</u><br>001 | 0.004 | 0.01 0. | .02     | 0.1           | ).2 0        | .4 1 | 2             |       | 1   | 0 4 | 10            |
|                  |            |                  | V.0                                   | · • =             |       |         |         |               |              |      |               |       | -   | -   | 50            |
|                  | l          | l                |                                       |                   |       | PA      | RTICL   | E SIZ         | ZE (1        | mm)  |               |       |     |     | Ĭ             |

#### COMMENTS:

The irregularity in gradation below 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS — CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO DARTMOUTH, NOVA SCOTIA

B2Y 4A2

0

FILE:

NAO-1268

DATE: **19 JANUARY 95** 

**CLIENT PO:** 

ATTENTION:

MR. GORDON FADER

PROJECT:

94–131 J.L. HART P.O.#23420–4–M195/01–HAL

SOURCE:

STN #4

DEPTH:

N/A

| CAMBIE |       |     |          | ADI E   |          |                       | 4.0         | 16 JANUARY 95 |       |          |     |       |     |          |             |
|--------|-------|-----|----------|---------|----------|-----------------------|-------------|---------------|-------|----------|-----|-------|-----|----------|-------------|
|        |       | DKE | DGED SAM | VIPLE   | <u> </u> | DATE TESTED: 16 JANUA |             |               |       |          |     | 95    |     |          |             |
| SIEVE  | %     |     |          |         |          |                       |             |               |       |          |     |       |     |          |             |
|        | PASS  |     |          | .002 mi |          |                       | 0.08        | 0 mm          |       |          |     | 5.0 r |     |          |             |
| (MM)   |       | 100 | CLAY     |         |          | SILT                  |             |               | S.    | AND      |     |       | GRA | <u> </u> | $\pi$       |
| 112    | 100.0 |     |          |         | }        |                       |             |               |       |          |     |       |     |          | <b>'   </b> |
| 80     | 100.0 | 90  |          |         |          |                       |             |               | _     |          | ļi  |       |     |          | 44          |
| 56     | 100.0 |     |          |         |          |                       |             |               |       |          |     |       |     |          |             |
| 40     | 100.0 |     |          |         |          |                       |             |               |       | _        |     |       |     |          |             |
| 28     | 94.0  | 80  |          |         |          |                       |             |               |       | -        |     |       |     |          |             |
| 20     | 90.0  |     |          |         |          |                       |             |               |       | /        |     |       |     |          |             |
| 14     | 87.0  | 70  |          |         |          |                       | <del></del> |               |       |          |     |       |     |          |             |
| 10     | 86.0  |     |          | ·       |          |                       |             |               | /     |          |     |       |     |          |             |
| 5.0    | 85.0  | 60  |          |         | -        |                       |             |               | -     |          |     |       |     |          | +           |
| 2.5    | 84.0  |     |          |         |          |                       |             |               | /     |          |     |       |     |          | 1           |
| 1.25   | 82.0  | 50  |          |         |          |                       |             |               | 1/-   | <u> </u> |     |       |     |          | 4-4         |
| 0.63   | 78.0  |     |          |         |          |                       |             |               |       |          |     |       |     |          |             |
| 0.315  | 59.0  | 40  |          |         |          |                       |             |               |       | `        |     |       |     | *****    | Ш           |
| 0.160  | 18.0  | 40  |          |         |          |                       |             |               | /     |          |     |       |     |          |             |
| 0.080  | 14.1  |     |          |         |          |                       |             |               | 1     |          |     |       |     |          | 11          |
| 0.0371 | 16.6  | 30  |          |         |          |                       |             |               | 1     |          |     |       |     |          |             |
| 0.0238 | 12.4  |     |          |         |          |                       |             |               | /     |          |     |       |     |          |             |
| 0.0138 | 9.9   | 20  |          |         |          |                       |             |               |       |          |     |       |     |          |             |
| 0.0099 | 7.9   |     |          |         |          |                       |             |               |       |          |     |       |     |          |             |
| 0.0070 | 7.7   | 10  |          |         |          |                       | - <b>B</b>  | _             |       |          | -   |       |     |          |             |
| 0.0034 | 4.1   |     |          |         |          |                       |             |               |       |          |     |       |     |          |             |
| 0.0014 | 2.1   |     |          |         |          |                       |             |               |       | <u></u>  |     |       |     |          |             |
|        |       |     | 0.0      | 01 (    | 0.004    | 0.01 0.0              | 02          | 0.1           | 0.2 0 | .4       | 1 2 | 2     | 10  | )        | 40          |
|        |       |     |          |         |          | PARTICLE SIZE (mm)    |             |               |       |          |     | 50    |     |          |             |

#### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS — CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

B2Y 4A2

FILE:

NAO-1268

**19 JANUARY 95** DATE:

**CLIENT PO:** 

ATTENTION:

MR. GORDON FADER

PROJECT:

94–131 J.L. HART P.O.#23420–4–M195/01–HAL

SOURCE:

STN #5

DEPTH:

N/A

| SAMPLE | TYPE: | DRE   | DGED SAM | PLE    | DATE   | TESTED:  |             | 16 JANUARY 95 |     |       |     |            |          |
|--------|-------|-------|----------|--------|--------|----------|-------------|---------------|-----|-------|-----|------------|----------|
| SIEVE  | %     |       |          |        |        |          |             |               |     |       |     |            |          |
| SIZE   | PASS  |       |          | 002 mm |        | 0.080    | mm C        |               |     | 5.0 r |     |            |          |
| (MM)   |       | 100   | CLAY     |        | SILT   |          | <del></del> | SAND          |     |       | GRA | VEL        |          |
| 112    | 100.0 |       |          |        |        |          |             |               |     |       |     |            | 1/1      |
| 80     | 100.0 | 90    |          |        |        |          |             |               |     |       |     |            | И        |
| 56     | 100.0 |       |          |        |        |          |             |               |     |       |     |            |          |
| 40     | 89.0  |       |          |        |        |          |             |               |     |       |     | <b>M-8</b> |          |
| 28     | 83.0  | 80    |          |        |        |          |             |               |     |       |     | pa         |          |
| 20     | 83.0  |       |          |        |        |          |             |               |     |       |     | /          |          |
| 14     | 77.0  | 70    |          |        |        |          |             |               |     |       |     | <u> </u>   | П        |
| 10     | 69.0  |       |          |        |        |          |             |               |     |       |     |            |          |
| 5.0    | 55.0  | 60    |          |        |        |          |             |               |     |       |     |            | H        |
| 2.5    | 47.0  |       | u.pu.    |        |        |          |             |               |     |       |     |            |          |
| 1.25   | 44.0  | 50    |          |        |        |          |             |               |     | -/    |     |            | $\vdash$ |
| 0.63   | 41.0  |       | :        |        |        |          |             |               |     | _     |     |            |          |
| 0.315  | 35.0  | 40    |          |        |        |          |             |               |     |       |     |            | Н        |
| 0.160  | 17.0  |       |          |        |        |          |             |               |     |       |     |            |          |
| 0.080  | 11.4  | 30    |          |        |        |          |             |               |     |       |     |            | Ш        |
| 0.0360 | 12.4  | 30    |          |        |        |          |             | /             |     |       |     |            |          |
| 0.0231 | 10.8  |       |          |        |        |          | 1 /         | '             |     |       |     |            |          |
| 0.0135 | 8.5   | 1 1   |          |        |        |          |             |               |     |       |     |            | $\Box$   |
| 0.0097 | 6.5   | ( 1   |          |        |        | W        |             |               |     |       |     |            |          |
| 0.0069 | 5.3   | 10    |          | -      |        |          |             |               |     |       |     |            | Н        |
| 0.0034 | 3.1   |       |          |        |        |          |             |               |     |       |     |            |          |
| 0.0014 | 2.3   | 1 0 - |          |        |        | <u> </u> |             |               |     |       |     |            | $\Box$   |
|        |       | 0.0   | 0.002    | 0.004  | 0.01 0 | .02      | 0.1 0.3     | 2 0.4         | 1 2 | 2     | 10  | 0 4        | 10       |
|        |       |       |          |        | PA     | RTICL    | E SIZ       | SIZE (mm)     |     |       |     |            |          |

#### **COMMENTS:**

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

**B2Y 4A2** 

0

FILE:

NAO-1268

**19 JANUARY 95** DATE:

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #8

DEPTH:

N/A

|        |       | DRE              | DGED SAN           | MPLE               | D             | ATE     | rested: | 16 JANUARY 95 |          |     |          |       |     |                        |         |
|--------|-------|------------------|--------------------|--------------------|---------------|---------|---------|---------------|----------|-----|----------|-------|-----|------------------------|---------|
| SIEVE  | %     |                  |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
|        | PASS  |                  |                    | .002 mr            |               |         | 0.080   | mm            |          |     |          | 5.0 r |     | <del>* - 1 - 1 *</del> |         |
| (MM)   |       | 100 <sub>F</sub> | CLAY               |                    | $\frac{s}{1}$ | ILT     |         | Т             | S.       | AND | [        |       | GRA | VEL                    | $\Box$  |
| 112    | 100.0 |                  |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
| 80     | 100.0 | 90               |                    |                    |               | -       |         |               |          |     |          |       |     |                        | +       |
| 56     | 59.0  |                  |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
| 40     | 48.0  | 80 -             |                    |                    |               |         |         |               |          |     |          |       |     |                        | Ш       |
| 28     | 42.0  | 80               |                    |                    | į             |         |         |               |          |     |          |       |     |                        |         |
| 20     | 39.0  |                  |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
| 14     | 37.0  | 70               |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
| 10     | 35.0  |                  |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
| 5.0    | 33.0  | 60               |                    |                    |               |         |         |               |          |     |          |       |     |                        | $\prod$ |
| 2.5    | 31.0  |                  |                    |                    |               |         |         |               |          |     |          |       |     |                        | /       |
| 1.25   | 29.0  | 50               |                    |                    | -             |         |         |               | <u> </u> |     | <b> </b> |       |     | <del></del>            |         |
| 0.63   | 27.0  |                  |                    |                    |               |         |         |               |          |     |          |       |     |                        | 1       |
| 0.315  | 22.0  | 40               |                    |                    |               |         |         |               |          |     |          |       |     |                        | +       |
| 0.160  | 8.0   |                  |                    |                    |               |         |         | İ             |          |     |          |       |     |                        |         |
| 0.080  | 5.9   | 30               |                    |                    |               | 1 1     |         |               | ļ        |     |          | _     |     | <del>-,</del>          | 4-1     |
| 0.0367 | 6.8   |                  |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
| 0.0234 | 6.0   | 20               |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
| 0.0137 | 4.5   | 20               |                    |                    |               |         |         |               | 17       |     |          |       |     |                        |         |
| 0.0098 | 3.8   |                  |                    |                    |               |         |         |               | X        |     |          |       |     |                        |         |
| 0.0070 | 2.9   | 10               |                    |                    |               |         |         |               |          |     |          |       |     |                        |         |
| 0.0034 | 2.0   |                  |                    | _   <sub>_</sub> _ |               |         |         | <b>'</b>      |          |     |          |       |     |                        |         |
| 0.0014 | 1.1   | 0.0              | 002 0.0            | 001 0              | 0.004 0       | 0.01 0. | I<br>02 | 0.1           | 0.2 0    | .4  | 1 :      |       | 1   | 0                      | 40      |
|        |       |                  | <b>0.0</b>         | • -                | • • • •       |         |         |               |          |     |          |       |     |                        | 50      |
|        | I     | J                | PARTICLE SIZE (mm) |                    |               |         |         |               |          |     |          |       |     |                        |         |

#### COMMENTS:

The irregularity in gradation below the 80 um practice size is due to salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

B2Y 4A2

0

FILE:

NAO-1268

DATE:

**19 JANUARY 95** 

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #9

DEPTH:

N/A

16 IANIIADV OF

| SAMPLE :         | TYPE:      | DRE | DGED SAI | MPLE   | D.       | ATE   | TESTED: |                | 16    | JANU | ARY | 95    |     |          |   |
|------------------|------------|-----|----------|--------|----------|-------|---------|----------------|-------|------|-----|-------|-----|----------|---|
| SIEVE            | %          |     |          |        |          |       |         |                |       |      |     |       |     |          |   |
| ľ                | PASS       |     |          | .002 m |          |       | 0.080   | ) mm           |       |      |     | 5.0 r |     |          |   |
| (MM)             |            | 100 | CLAY     |        | s:       | ILT   |         | <del>-</del> T | S.    | AND  |     |       | GRA | .VEL     |   |
| 112              | 100.0      |     |          |        |          |       |         |                |       | :    |     |       |     |          | 1/1   |
| 80               | 100.0      | 90  |          |        |          |       |         |                |       |      |     |       |     |          | 141   |
| 56               | 100.0      |     |          |        |          |       |         |                |       |      |     |       |     |          | $\parallel \parallel \parallel \parallel \parallel$ |
| 40               | 82.0       | 80  |          |        |          |       |         |                |       |      |     |       |     |          |   |
| 28               | 79.0       | 00  |          |        |          |       |         |                |       |      |     |       |     |          |   |
| 20               | 72.0       |     |          |        |          |       |         |                |       |      |     |       |     | <b> </b> |   |
| 14               | 67.0       | 70  |          |        |          |       |         |                |       |      |     |       |     |          |   |
| 10               | 64.0       |     |          |        |          |       |         |                |       |      |     |       |     |          |   |
| 5.0              | 62.0       | 60  |          |        |          |       |         |                |       |      |     |       |     |          | +-  |
| 2.5              | 60.0       |     |          |        |          |       |         |                |       |      | ľ   |       |     |          |   |
| 1.25             | 58.0       | 50  |          |        |          |       |         | -              |       |      |     |       |     |          | +   |
| 0.63             | 52.0       |     |          |        |          |       |         |                |       |      |     |       |     |          |   |
| 0.315            | 39.0       | 40  |          |        |          |       |         |                |       |      |     |       |     |          |   |
| 0.160            | 11.0       |     |          |        |          |       |         |                | [     |      |     |       |     |          |   |
| 0.080            | 5.7        | 30  |          |        |          |       |         |                |       |      |     |       |     |          | 441   |
| 0.0378           | 8.2        |     |          |        |          |       |         |                | /     |      |     |       |     |          |   |
| 0.0242<br>0.0140 | 6.0<br>5.4 | 20  |          |        |          |       |         |                | /     |      |     |       |     |          | ÷   |
| 0.0140           | 4.0        | 20  |          |        |          |       |         |                | 1     |      |     |       |     |          |   |
| 0.0100           | 3.4        | 4.0 |          |        |          |       |         |                |       |      |     |       |     |          |   |
| 0.0070           | 1.9        | 10  |          |        |          |       |         |                |       |      |     |       |     |          | $\Box$  |
| 0.0034           | 1.5        |     |          |        |          |       |         |                |       | _    |     |       |     |          |   |
| 0.0014           | 1.5        | 0.0 | 0002 0.0 | 01 (   | D.004 0. | 01 0. | 02      | 0.1            | 0.2 0 | .4 7 | L 2 |       | 1   | 0        | 40  |
|                  |            |     | ***      |        | •        |       |         |                |       |      | _   |       | _   | -        | 50  |
|                  | L          | J   |          |        |          | PA    | RTICLI  | E SIZ          | ĽE (: | mm)  |     |       |     |          |   |

#### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

**B2Y 4A2** 

0

FILE:

NAO-1268

DATE: **19 JANUARY 95** 

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #12

DEPTH:

N/A

SAMPLE TYPE: DREDGED SAMPLE

DATE TESTED:

16 JANIJARY 95

| YPE:  | REDGED SAMPLE DATE TESTED: 16 JANUARY 95   |
|-------|--|
| %     |  |
| PASS  | 0.002 mm 0.080 mm 5.0 mm   |
|       | CLAY SILT SAND GRAVEL  |
| 100.0 |  |
|       |  |
| £     | `  |
| 1     |  |
| 1     |  |
| 1     |  |
| l .   |  |
| 1     |  |
| 1     |  |
| 1     |  |
| 1     |  |
| 4     |  |
| 1     | 0 -  |
| 1     |  |
|       |  |
|       |  |
|       |  |
|       |  |
|       |  |
| l .   |  |
| i .   |  |
| 1.8   | 0.0002 0.001 0.004 0.01 0.02 0.1 0.2 0.4 1 2 10 40   |
|       |  |
|       | PARTICLE SIZE (mm)   |
|       | % PASS 100.0 100.0 100.0 100.0 100.0 99.0 98.0 698.0 97.0 95.0 423.0 4.5 4.1 3.4 2.3 4.1 3.4 2.3 1.8 (6.5) |

#### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

**B2Y 4A2** 

0

FILE: DATE: NAO-1268

**19 JANUARY 95** 

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN # 13

DEPTH:

N/A

DEDGED SAMPLE

DATE TESTED:

16 IANIIIARV 1995

| SAMPLET |       | DRE              | DGED SAMI | PLE    | D/     | ATE T  | ESTED: | 16 JANUARY 1995 |      |      |     |       |   |              |        |
|---------|-------|------------------|-----------|--------|--------|--|--------|-----------------|------|------|-----|-------|---|--------------|--------|
| SIEVE   | %     |                  |           |        |        |  |        |                 |      |      |     |       |   |              |        |
| SIZE    | PASS  |                  |           | )02 mm |        |  | 0.080  | ) mm            |      |      |     | 5.0 n |   |              |        |
| (MM)    |       | 100 <sub>F</sub> | CLAY      |        | SI     | LT   |        |                 | SA   | AND  |     |       | GRA   | <u> </u>     |        |
| 112     | 100.0 |                  |           |        |        |  |        |                 |      |      |     |       |   |              | /      |
| 80      | 100.0 | 90               |           |        |        |  |        |                 |      |      |     |       |   |              | Ш      |
| 56      | 100.0 | 30               |           |        |        |  |        |                 |      | 3    |     |       |   |              |        |
| 40      | 84.0  |                  |           |        |        |  |        |                 |      |      |     |       |   |              |        |
| 28      | 76.0  | 80               |           |        |        |  |        |                 |      |      |     |       |   |              |        |
| 20      | 76.0  |                  |           |        |        |  | İ      |                 |      | ļ    |     | ,     |   |              |        |
| 14      | 62.0  | 70               |           |        |        |  |        |                 |      |      |     |       |   |              |        |
| 10      | 53.0  |                  |           |        |        |  |        |                 |      |      |     |       |   |              |        |
| 5.0     | 30.0  | 60               |           |        |        |  |        |                 |      |      |     |       |   | <del>/</del> | Н      |
| 2.5     | 19.0  |                  |           |        |        |  |        |                 |      |      |     |       |   | (            |        |
| 1.25    | 15.0  | 50               |           |        |        | <del>                                     </del> |        |                 |      |      |     |       | <del>-/</del>   |              | Н      |
| 0.63    | 13.0  |                  |           |        |        |  |        |                 |      |      |     |       |   |              |        |
| 0.315   | 11.0  | 40               |           |        |        | -  |        |                 |      |      |     |       | $-\!\!\!/-\!$ |              | Н      |
| 0.160   | 7.0   |                  |           |        |        |  |        |                 |      |      |     |       | /   |              |        |
| 0.080   | 4.5   | 30               |           |        |        |  |        |                 |      |      |     |       | /   |              | Ш      |
| 0.0364  | 4.5   | ~                |           |        |        |  |        |                 |      |      |     |       |   | ;<br>!       |        |
| 0.0233  | 3.9   |                  |           |        |        |  |        |                 |      |      |     |       |   |              |        |
| 0.0136  | 3.1   | 20               |           |        |        |  |        |                 |      |      | /   |       |   |              | П      |
| 0.0097  | 2.7   |                  |           |        |        |  |        |                 |      |      |     |       |   | ı            |        |
| 0.0069  | 2.1   | 10               |           |        |        |  |        |                 |      |      |     |       |   |              | $\Box$ |
| 0.0033  | 1.3   |                  |           |        |        |  |        |                 |      |      |     |       |   |              |        |
| 0.0014  | 0.7   | 0 1              | 2000      | 1 00   | ^4     |  |        | 01 0            | 0 0  | 4 1  | L 2 | l     | 1.  | 0 /          | 10     |
|         |       | 0.0              | 0.002     | 1 0.0  | 104 0. | 01 0.0   | JZ     | 0.1 0.          | .2 0 | .4 1 |     | د     | 1   | <b>U</b> 4   |        |
|         |       | ]                |           |        |        | PA   | RTICL  | E SIZ           | Œ (1 | mm)  |     |       |   |              | 50     |
| I .     |       |                  |           |        |        |  |        |                 | `    | ,    |     |       |   |              |        |

### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS — CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

B2Y 4A2

0

FILE:

NAO-1268

DATE:

**19 JANUARY 95** 

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94–131 J.L. HART P.O.#23420–4–M195/01–HAL

SOURCE:

STN #16

DEPTH:

N/A

DATE TESTED:

16 IANIIADV OF

|        |         | DRE    | DGED SAMP  | <u>LE</u> | DA          | <u>TE T</u>          | ESTED: |        | <u> 16</u> | JANU                                    | <u> 4RY</u> | <u>95                                    </u>                               | ····       |       |                    |
|--------|---------|--------|--|-----------|-------------|----------------------|--------|--------|------------|---|-------------|---|------------|-------|--------------------|
| SIEVE  | %       |        |  |           |             |                      |        |        |            |   |             |   |            |       | ľ                  |
|        | PASS    |        |  | 02 mm     |             |                      | 0.080  | mm     | ~ -        |   |             | 5.0 n   |            |       |                    |
| (MM)   |         | 100    | CLAY   |           | SI          | $\frac{\text{LT}}{}$ |        |        | SA         | AND                                     | — Т         |   | GRA        | AET _ | $\top$             |
| 112    | 100.0   |        |  |           |             |                      |        |        |            |   |             |   |            |       |                    |
| 80     | 100.0   | 90     |  |           |             |                      |        | _      |            |   |             |   |            |       | 44                 |
| 56     | 100.0   | ~      |  |           |             |                      |        |        |            |   |             |   | , <b>,</b> | ſ     |                    |
| 40     | 100.0   | 80     |  |           |             |                      |        |        |            |   |             |   | /          |       |                    |
| 28     | 100.0   |        |  |           |             |                      |        |        |            |   |             |   | _ /        |       |                    |
| 20     | 96.0    |        |  |           |             |                      |        |        |            |   |             |   | _ / ]      |       |                    |
| 14     | 92.0    | 1 1    |  |           |             |                      |        | 1      |            |   |             |   |            |       | $\prod$            |
| 10     | 87.0    | 1      |  |           |             |                      |        |        |            |   |             |   | /          |       |                    |
| 5.0    | 54.0    |        |  |           | <del></del> |                      |        |        |            |   |             |   | 1          |       | +-1                |
| 2.5    | 13.0    |        |  |           |             |                      |        |        |            |   |             |   | , I        |       |                    |
| 1.25   | 8.0     | , ~~   | <del>                                     </del> |           |             | $\longrightarrow$    |        | -      |            |   |             |   |            |       | +                  |
| 0.63   | 8.0     | 1 1    |  |           |             |                      |        |        |            |   |             | 1   |            |       |                    |
| 0.315  | 7.0     | 1 40 5 |  |           |             | $\rightarrow$        |        |        |            |   |             | /   | <u> </u>   |       | $\perp$            |
| 0.160  | 5.0     |        |  |           |             |                      |        |        |            |   |             | /1  |            |       |                    |
| 0.080  | 3.3     |        |  |           |             | $\perp$              |        |        |            |   |             | $-\!$ |            |       | $\perp \downarrow$ |
| 0.0367 | 1       |        |  |           |             |                      |        |        |            |   |             |   |            |       |                    |
| 0.0235 | 1       |        |  |           |             |                      |        |        |            |   |             |   |            |       |                    |
| 0.0137 | 1       |        |  |           |             |                      |        | -      |            |   |             | 1   |            |       | $\top$             |
| 0.0098 |         |        |  |           |             |                      |        |        |            |   |             | <u> </u>  |            |       |                    |
| 0.0069 | 3       | 1 1    |  |           |             | +                    |        | -      |            |   |             |   |            |       | +                  |
| 0.0034 |         | 1 1    |  |           | 1           | B00                  |        |        |            | _                                       | _           |   |            |       |                    |
| 0.0014 | 0.6     | 1 0 7  |  | <u></u>   |             |                      |        |        |            | لنـــــــــــــــــــــــــــــــــــــ |             | l   |            |       | 4                  |
|        |         | 0.0    | 0.001  | 0.00      | 0.0         | 0.0                  | )2     | 0.1 0. | .2 0.      | 4 1                                     | . 2         | •   | 10         | 3     | 40                 |
|        | <u></u> | _      |  |           |             | PAJ                  | RTICLE | E SIZ  | E (1       | nm)                                     |             |   |            |       | 50                 |

#### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS — CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

B2Y 4A2

0

FILE: DATE: NAO-1268 **19 JANUARY 95** 

**CLIENT PO:** 

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #17

DEPTH:

N/A

| SAMPLE 7 | TYPE: | DRE | DGED SA  | MPLE          | D       | ATE:     | TESTED: |         | 16 JAN       | <u>IUARY</u> | 95           |      |     |               |
|----------|-------|-----|----------|---------------|---------|----------|---------|---------|--------------|--------------|--------------|------|-----|---------------|
| SIEVE    | %     |     |          |               |         |          |         |         |              |              |              |      |     | l             |
| SIZE     | PASS  |     |          | .002 m        |         |          | 0.080   | ) mm    |              |              | 5.0 r        |      |     |               |
| (MM)     | ĺ     | 100 | CLAY     |               | S:      | LLT      |         |         | SAND         |              | -            | GRA' | VEL | <del></del>   |
| 112      | 100.0 |     |          |               |         |          |         |         |              |              |              |      |     |               |
| 80       | 100.0 | 90  |          |               |         |          |         |         |              |              |              |      |     | <del></del> ┃ |
| 56       | 100.0 |     |          |               |         |          |         |         |              |              |              |      |     |               |
| 40       | 100.0 | 00  |          |               |         |          |         |         |              |              |              |      |     |               |
| 28       | 100.0 | 80  |          |               |         |          |         |         |              |              |              |      |     |               |
| 20       | 100.0 |     |          |               |         |          |         |         |              |              |              |      |     |               |
| 14       | 100.0 | 70  |          |               |         |          |         |         |              |              |              |      |     | $\Box$        |
| 10       | 100.0 |     |          |               |         |          |         |         |              |              |              |      |     |               |
| 5.0      | 100.0 | 60  |          |               |         |          |         |         | <del> </del> |              | <del> </del> |      |     | ╁═╢           |
| 2.5      | 100.0 |     |          |               |         |          |         |         | <b> </b>     |              |              |      |     |               |
| 1.25     | 100.0 | 50  |          |               |         |          |         |         |              |              |              |      |     | +             |
| 0.63     | 100.0 |     |          |               |         |          |         |         |              |              |              |      |     |               |
| 0.315    | 98.0  | 40  |          |               |         |          |         | +       |              |              |              |      |     | +             |
| 0.160    | 29.0  |     |          |               |         |          |         | 1 /     |              |              |              |      |     | 1             |
| 0.080    | 3     | 30  |          |               |         |          |         | $\perp$ |              |              |              |      |     | <b>↓</b> ↓]   |
| 0.0392   | 3.6   |     |          |               |         |          |         | /       |              |              |              |      |     |               |
| 0.0248   | 3.6   |     |          |               |         |          |         |         |              |              |              |      |     |               |
| 0.0143   | 3.6   | 20  |          |               |         |          |         | 1/      |              |              |              |      |     |               |
| 0.0101   | 3.6   |     |          |               |         |          |         | V       |              |              |              |      |     |               |
| 0.0071   | 3.6   | 10  |          | <del>  </del> |         |          |         | 1       |              |              |              |      |     |               |
| 0.0034   | 3.1   |     |          |               |         |          | ···•    | 4       |              |              |              |      |     | -             |
| 0.0014   | 1.2   | 0   | 2000     |               |         | <u> </u> | ^0      |         | 1 1          | <u> </u>     | 2            |      |     |               |
|          |       | 0.0 | 0002 0.0 | 001           | 0.004 0 | .01 0.   | .02     | 0.1     | 0.2 0.4      | 1            | 2            | 10   | ,   | 40            |
|          |       | _   |          |               |         | PA       | RTICL   | E SIZ   | ZE (mm       | )            |              |      |     | 50            |

#### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS — CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

**B2Y 4A2** 0

FILE: DATE:

CLIENT PO:

NAO-1268

**19 JANUARY 95** 

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #20

DEPTH:

N/A

DATE TESTED

10 IANULADY OF

| SAMPLE -       | TYPE:    | DRE | DGED SAI | MPLE    | D,       | ATE          | <u> </u> |              | 16            | JANU  | <u>ARY</u> | 95    |     |                     |               |
|----------------|----------|-----|----------|---------|----------|--------------|----------|--------------|---------------|-------|------------|-------|-----|---------------------|---------------|
| SIEVE          | %        |     |          |         |          |              |          |              |               |       |            |       |     |                     |               |
| i .            | PASS     |     |          | .002 mr |          |              | 0.080    | ) mm         |               |       |            | 5.0 r |     |                     |               |
| (MM)           |          | 100 | CLAY     |         | s.       | LLT          |          | 1            | S.            | AND   |            |       | GRA | <u>∧₽₽</u>          | $T_{\lambda}$ |
| 112            | 100.0    |     |          |         |          |              |          |              |               |       |            |       |     |                     | I             |
| 80             | 100.0    | 90  |          |         |          |              |          |              |               |       |            |       |     | <del></del>         | 4             |
| 56             | 100.0    |     |          |         |          |              |          |              |               |       |            |       |     | <b>y</b> - <b>y</b> |               |
| 40             | 92.0     | 80  |          |         |          |              |          |              |               |       |            |       |     |                     | Ш             |
| 28             | 86.0     | 00  |          |         |          |              |          |              |               |       |            |       |     | . 🏓 .               | .             |
| 20             | 86.0     | 70  |          |         |          |              |          |              |               |       |            |       |     |                     |               |
| 14             | 78.0     | 70  |          |         |          |              |          |              |               |       |            |       |     | i                   |               |
| 10             | 69.0     |     |          |         |          |              |          |              |               |       |            |       |     |                     |               |
| 5.0            | 55.0     | 60  |          |         | <u> </u> |              |          |              |               |       |            |       | /   |                     | $\Box$        |
| 2.5            | 46.0     |     |          |         |          |              |          |              |               |       |            |       |     | ı                   |               |
| 1.25           | 39.0     | 50  |          |         | -        |              |          |              |               |       |            |       |     |                     | +             |
| 0.63           | 34.0     |     |          |         |          |              |          |              |               |       |            |       |     | ı                   |               |
| 0.315          | 21.0     | 40  |          |         |          | <del> </del> |          | <del> </del> | -             |       |            |       |     |                     |               |
| 0.160<br>0.080 | 13.0     |     |          |         |          |              |          |              |               |       |            |       |     | ı                   |               |
| 0.0370         | 8.7      | 30  |          |         |          |              |          |              | -             | -     |            |       |     |                     | +             |
| 0.0370         | 7.3      |     |          |         |          |              |          |              | /             | /     |            |       |     | ı                   |               |
| 0.0237         | 5.4      | 20  |          |         |          |              |          |              |               |       |            |       |     |                     | $\perp$       |
| 0.0098         | 5.1      |     |          |         |          |              |          |              |               |       |            |       |     | ı                   |               |
| 0.0069         | 4.6      | 10  |          |         |          |              |          |              |               |       |            |       |     |                     | Ш             |
| 0.0034         | 2.9      | 1   |          |         |          |              |          |              |               |       |            |       |     |                     |               |
| 0.0014         | 1.7      | 1   |          |         |          | Ī , I        |          |              |               | ,     |            |       |     |                     |               |
| 0.0011         | '''      | 0.0 | 0002 0.0 | 001 0   | .004 0.  | .01 0.       | 02       | 0.1          | 0.2 0         | .4 1  | . 2        | 2     | 1   | 0                   | 40            |
|                |          |     |          |         |          |              |          | E OT         | <b>7</b> 17 / |       |            |       |     |                     | 50            |
|                | <u> </u> | _   |          |         |          | PΑ           | RTICL    | F 21         | ZE (          | m m ) |            |       |     |                     |               |

#### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

B2Y 4A2

0

FILE:

NAO-1268

**19 JANUARY 95** DATE:

**CLIENT PO:** 

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #21

DEPTH:

N/A

DATE TESTED

16 IANILIADY 05

| SAMPLE |       | DRE | DGED SAN | MPLE     | D      | ATE.   | TESTED: |               | 16       | JANU         | ARY | 95    |           |          |             |
|--------|-------|-----|----------|----------|--------|--|---------|---------------|----------|--------------|-----|-------|-----------|----------|-------------|
| SIEVE  | %     |     |          |          |        |  |         |               |          |              |     |       |           |          |             |
| 4      | PASS  |     |          | .002 mr  |        | m  | 0.08    | ) m           |          | * ***        |     | 5.0 r | nm<br>GRA | t/ET     |             |
| (MM)   |       | 100 | CLAY     |          | S.     | ILT  |         | $\neg \vdash$ | <u> </u> | AND          | ļ   |       | AND       | V ET     | $\neg \neg$ |
| 112    | 100.0 |     |          |          |        |  |         |               |          |              |     |       |           | _ /      |             |
| 80     | 100.0 | 90  |          |          |        | ļ  |         | -             |          |              |     |       |           |          |             |
| 56     | 100.0 |     |          |          |        |  |         |               | İ        |              |     |       |           | <b>,</b> |             |
| 40     | 100.0 | 80  |          |          |        |  |         |               |          |              |     |       |           |          | 44          |
| 28     | 100.0 | 00  |          |          |        |  |         |               |          |              |     |       | اِ        | [        |             |
| 20     | 98.0  |     |          |          |        |  |         |               |          |              |     |       |           | 1        |             |
| 14     | 86.0  | 70  |          |          |        |  |         |               |          |              |     |       |           |          |             |
| 10     | 74.0  |     |          |          |        |  |         |               |          |              |     |       |           |          |             |
| 5.0    | 61.0  | 60  |          |          |        | <del> </del>                                     |         |               |          |              |     |       |           |          |             |
| 2.5    | 51.0  |     |          |          |        |  |         |               |          |              |     |       |           |          |             |
| 1.25   | 44.0  | 50  |          |          |        | <del>                                     </del> |         |               |          |              |     |       |           |          | +           |
| 0.63   | 38.0  |     |          |          |        |  |         |               |          |              |     |       |           |          |             |
| 0.315  | 24.0  | 40  |          | <u> </u> |        | -  |         |               |          |              |     |       |           |          | +           |
| 0.160  | 10.0  |     |          |          |        | ĺ  |         |               |          |              |     |       |           |          |             |
| 0.080  | 6     | 30  |          |          |        |  |         |               |          | <del>/</del> |     |       |           |          | 4-1         |
| 0.0366 | 7.2   |     |          |          |        |  |         |               |          | 1            |     |       |           |          |             |
| 0.0234 | 6.0   | 1   |          |          |        |  |         |               |          |              |     |       |           |          |             |
| 0.0135 | 5.4   | 20  |          |          |        |  |         |               |          |              |     |       |           |          |             |
| 0.0097 | 4.3   |     |          |          |        |  |         |               | Å        |              |     |       |           |          |             |
| 0.0068 | 3.9   | 10  |          |          |        |  |         |               |          |              |     |       |           |          |             |
| 0.0033 | 2.4   |     |          | _        |        |  |         |               |          |              |     |       |           |          |             |
| 0.0014 | 1.4   | 0 0 | 0000     |          | 004 0  | <u> </u>   | 02      | 0.1           | 0.2      | ).4          | 1 : | <br>2 | 1         | .0       | 40          |
|        |       | 0.0 | 0.002    | 101 0    | .004 0 | 0.01 0   | .02     | V.1           | 0.2      | 7.4          |     | ۷     | 1         | v        | 50          |
|        |       | ]   |          |          |        | PA   | RTICL   | ES            | SIZE (   | mm)          |     |       |           |          | 50          |

#### **COMMENTS:**

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS — CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

B2Y 4A2

0

FILE:

NAO-1268

DATE:

**19 JANUARY 95** 

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #24

DEPTH:

N/A

|                |              | DRE  | DGED SAN | 1PLE    | D             | ATE:         | TESTED: |          |          | 16        | JANU | <u>ARY</u> | 95    |     |        |          |
|----------------|--------------|------|----------|---------|---------------|--------------|---------|----------|----------|-----------|------|------------|-------|-----|--------|----------|
| SIEVE          | %            |      |          |         |               |              |         |          |          |           |      |            |       |     |        |          |
|                | PASS         |      |          | .002 m  |               |              | 0.080   | ) n      | nm       | ~         |      |            | 5.0 r |     | T TIPT |          |
| (MM)           |              | 100  | CLAY     |         | $\frac{s}{1}$ | ILT          |         | Т        |          | <u>S.</u> | AND  |            |       | GRA | .VEL   |          |
| 112            | 100.0        |      |          |         |               |              |         |          |          |           |      |            |       |     |        | <u> </u> |
| 80             | 100.0        | 90   |          |         |               |              |         | $\perp$  |          |           |      |            |       |     |        | _        |
| 56             | 100.0        |      |          |         |               |              |         |          |          |           |      |            |       |     |        |          |
| 40             | 100.0        | 80 - |          |         |               |              |         |          |          |           |      |            |       |     |        |          |
| 28             | 95.0         |      |          |         | 1             |              |         |          |          |           |      |            | į     |     |        |          |
| 20             | 95.0         | 70   |          |         | İ             |              |         |          |          |           |      |            |       |     |        |          |
| 14             | 94.0         | 70   |          |         |               |              |         |          |          |           |      |            |       |     |        |          |
| 10             | 93.0         |      |          |         |               |              |         |          |          | 1         |      |            | ľ     |     |        |          |
| 5.0            | 93.0         | 60   |          |         |               |              |         |          |          |           |      |            |       |     |        |          |
| 2.5            | 92.0         |      |          |         |               |              |         |          |          | ĺ         |      |            |       |     |        |          |
| 1.25           | 92.0         | 50   |          |         |               | <del> </del> |         | $\dashv$ |          |           |      |            |       |     |        |          |
| 0.63           | 91.0         |      |          |         |               |              |         |          | <b>\</b> |           |      |            |       |     |        |          |
| 0.315<br>0.160 | 88.0<br>16.0 | 40 = |          |         |               |              |         | $\dashv$ |          |           |      |            |       |     |        | +        |
| 0.180          | 5.4          |      |          |         |               |              |         |          | 1        |           |      |            |       |     |        |          |
| 0.0377         | 6.8          | 30   |          |         |               |              |         | $\dashv$ |          |           |      |            | -     |     |        | $\dashv$ |
| 0.0377         | 5.6          |      | ı        |         |               |              |         |          | }        |           |      |            |       |     |        |          |
| 0.0233         | 5.0          | 20   |          |         |               |              |         |          |          |           |      |            |       |     |        | _        |
| 0.0098         | 4.1          |      |          |         |               |              |         |          | <u> </u> |           |      |            |       |     |        |          |
| 0.0069         | 3.4          | 10   |          |         |               |              |         | Ц,       |          |           |      |            | ļ     |     | ļ      |          |
| 0.0034         | 1.8          | *    |          |         |               | 1 10         |         |          |          |           |      |            |       |     |        |          |
| 0.0014         | 1.8          |      |          | <b></b> |               |              |         |          |          |           |      |            |       |     |        |          |
|                |              | 0.0  | 002 0.0  | 01      | 0.004 (       | 0.01 0       | .02     | 0.       | 1 0.2    | 2 0       | .4   | 1          | 2     | 1   | .0     | 40       |
|                |              |      |          |         |               | PA           | RTICL   | E        | SIZ      | Ε(        | mm)  |            |       |     |        | 50       |
| 1              |              |      |          |         |               |              |         |          |          | '         | ,    |            |       |     |        |          |

#### **COMMENTS:**

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS — CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

**B2Y 4A2** 

0

FILE:

NAO-1268

DATE: **19 JANUARY 95** 

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART

P.O.#23420-4-M195/01-HAL

SOURCE:

STN #25

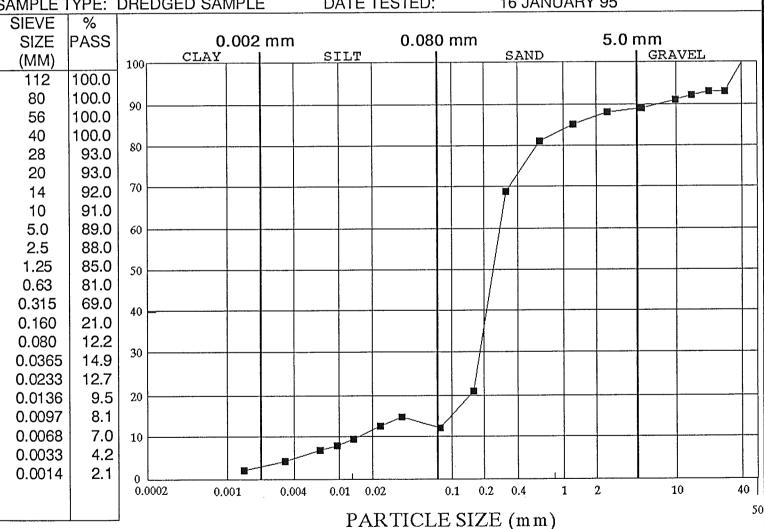
DEPTH:

N/A

SAMPLE TYPE: DREDGED SAMPLE

DATE TESTED:

16 JANUARY 95



#### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

B2Y 4A2

0

FILE: DATE: NAO-1268

**19 JANUARY 95** 

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #28

DEPTH:

| SAMPLE | YPE:       | DREDGE | D SAMPLE | <u> </u> | DATE      | TESTED: |            | 16 J     | ANUA | RY 95 |             |               |               |
|--------|------------|--------|----------|----------|-----------|---------|------------|----------|------|-------|-------------|---------------|---------------|
| SIEVE  | %          |        |          |          |           |         |            |          |      |       |             |               |               |
|        | PASS       |        | 0.002    | mm       | 0 T T III | 0.080   | ) mm       | SAI      | TD.  | 5.0   | mm<br>L GRA | <b>1757</b> . |               |
| (MM)   |            | 100    | CLAY     |          | SILT      | T       | 1          | SAI      | ND   |       | GRA         | Viii          | $\neg \neg  $ |
| 112    | 100.0      |        |          |          |           |         |            |          |      |       |             |               |               |
| 80     | 100.0      | 90     |          |          |           |         |            | -        |      |       |             |               |               |
| 56     | 100.0      |        |          |          | 1         |         |            | <b>9</b> |      |       |             |               |               |
| 40     | 100.0      | 80     |          |          |           |         |            |          |      |       | <u> </u>    |               | _ _           |
| 28     | 100.0      | 80     |          |          |           |         |            | /        |      |       |             |               |               |
| 20     | 100.0      | 70     |          |          |           |         |            |          |      |       |             |               |               |
| 14     | 100.0      | 70     |          |          |           |         |            | /        |      |       |             |               |               |
| 10     | 100.0      |        |          |          |           |         | /          | {        |      |       |             |               |               |
| 5.0    | 100.0      | 60     |          |          |           |         | 1 /        |          |      |       |             |               |               |
| 2.5    | 99.0       |        |          |          |           |         | #          |          |      |       |             |               |               |
| 1.25   | 99.0       | 50     |          |          |           |         | +/-        |          |      |       | 1           |               | 11            |
| 0.63   | 97.0       |        |          |          |           |         |            |          |      |       |             |               |               |
| 0.315  | 86.0       | 40     |          |          |           |         |            |          |      |       |             |               | +             |
| 0.160  | 54.0       |        |          |          |           |         | 1          |          |      |       |             |               |               |
| 0.080  | 24.4       | 30     |          |          |           |         | А          | -        |      |       | 1           | <u> </u>      |               |
| 0.0355 | 24.3       |        |          |          |           |         | <u>/</u> ] |          |      |       |             |               |               |
| 0.0227 | 21.9       |        |          |          |           |         | •          |          |      |       |             |               |               |
| 0.0133 | 17.0       | 20     |          |          |           |         |            |          |      |       |             |               |               |
| 0.0095 | 13.4       |        |          |          |           |         |            |          |      |       |             |               |               |
| 0.0068 | 10.0       | 10     |          |          |           |         |            |          |      |       |             |               |               |
| 0.0033 | 5.3<br>3.6 | 1 1    | <b>=</b> |          |           |         |            |          | .    |       |             |               |               |
| 0.0014 | 3.6        | 0.0002 | 0.001    | 0.004    | 0.01      | 0.02    | 0.1        | 0.2 0.4  | 1    | 2     | 1           | 10            | 40            |
|        |            | 0.0002 | 0.001    | 0.004    |           |         |            |          |      | _     | _           |               | 50            |
|        | <u> </u>   | j      |          |          | PA        | ARTICL  | E SIZ      | ĽE (m    | ım)  |       |             |               |               |

### COMMENTS:

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

GRAIN SIZE ANALYSIS - CSA CERTIFIED LAB

TO:

ATLANTIC GEOSCIENCE CENTRE/BIO

DARTMOUTH, NOVA SCOTIA

**B2Y 4A2** 

0

FILE:

NAO-1268

**19 JANUARY 95** DATE:

CLIENT PO:

ATTENTION:

MR. GORDON FADER

PROJECT:

94-131 J.L. HART P.O.#23420-4-M195/01-HAL

SOURCE:

STN #29

DEPTH:

N/A

| CAMBLET |          | שמח | DGED SAMPL         | F            | DATE    | rested: |           | 16       | JANU      | ARY | 95    |     |          |              |
|---------|----------|-----|--------------------|--------------|---------|---------|-----------|----------|-----------|-----|-------|-----|----------|--------------|
|         |          | חחב | DGED SAMEL         | <u> </u>     | DAIL    | LOILD.  |           | 10       | 07 (1 (0) | ,   |       |     |          |              |
| SIEVE   | %        |     | 0.000              | ) mm         |         | 0.080   | ) mm      |          |           |     | 5.0 r | nm  |          |              |
| 8       | PASS     |     | CLAY               | 2 mm         | SILT    | 0.000   | , ,,,,,,, | SA       | .ND       |     | J.U I |     | VEL      |              |
| (MM)    | 1000     | 100 | CIMI               |              |         |         |           |          |           |     |       |     |          | $\Lambda$    |
| 112     | 100.0    |     |                    |              |         |         |           |          |           | Į   |       |     |          | <b>F</b>     |
| 80      | 100.0    | 90  |                    | <del> </del> |         |         | _         |          |           |     |       | *** |          | <del> </del> |
| 56      | 100.0    |     |                    |              |         |         |           |          |           |     |       |     |          |              |
| 40      | 100.0    | 80  |                    | <u> </u>     |         |         |           |          |           |     |       |     | <b></b>  |              |
| 28      | 94.0     |     | 1                  |              |         |         |           |          |           |     |       |     |          |              |
| 20      | 61.0     | 70  |                    |              |         |         |           |          |           |     |       |     |          | _   _        |
| 14      | 56.0     | "[  |                    |              |         |         |           | -        |           |     |       |     |          |              |
| 10      | 50.0     |     |                    |              |         |         |           |          |           |     |       |     |          |              |
| 5.0     | 48.0     | 60  |                    | 1            |         |         |           |          |           |     |       |     |          |              |
| 2.5     | 47.0     |     |                    |              |         |         |           | ĺ        |           |     |       |     |          |              |
| 1.25    | 46.0     | 50  |                    | <del> </del> | -       |         |           |          |           |     |       |     | ¥        |              |
| 0.63    | 42.0     |     |                    |              |         |         |           |          |           |     |       |     |          |              |
| 0.315   | 27.0     | 40  |                    |              |         |         | -         |          |           |     |       |     |          |              |
| 0.160   | 10.0     |     |                    |              |         |         |           |          | /         |     |       |     |          |              |
| 0.080   | 5.3      | 30  |                    |              |         |         |           | A        |           |     |       |     | <u> </u> | _            |
| 0.0366  | 7.4      |     |                    |              |         |         |           | <b>)</b> |           |     |       |     |          |              |
| 0.0234  | 6.1      |     |                    |              |         |         |           |          |           |     |       |     |          |              |
| 0.0136  | 4.8      | 20  |                    |              |         |         |           | /        |           |     |       |     |          |              |
| 0.0097  | 3.8      |     |                    |              |         |         |           |          |           |     |       |     |          |              |
| 0.0069  | 3.2      |     |                    | 1            |         |         |           |          |           |     |       |     |          |              |
| 0.0034  | 1.6      |     |                    |              |         |         |           |          |           |     |       |     |          |              |
| 0.0018  | 1.1      | 0 0 |                    |              |         | ^^      |           |          | , .       |     | L     | l   | 1        | 40           |
|         |          | 0.0 | 0.001              | 0.004        | 0.01 0. | 02      | 0.1 0.    | 2 0.     | 4 .       | 1 2 | 2     |     | 10       |              |
|         | <u> </u> | ]   | PARTICLE SIZE (mm) |              |         |         |           |          |           |     |       |     |          |              |
|         |          |     | ran icle size (mm) |              |         |         |           |          |           |     |       |     |          |              |

#### **COMMENTS:**

The irregularity in gradation below the 80 um particle size is due to the salt present in the sample.

| Client Atantic Geoscience Center (B.I.O.) | <b>Job</b> # NAO-1268 |
|---|-----------------------|
| Sample #1                                 | Date                  |
| COARSE AGGI                               | REGATE                |
| M, Mass of Sample (g)                     | =                     |
| R, Mass After Clay Removed (g)            |                       |
| M - R = L = Clay Lumps<br>M%              | =                     |
| FINE AGGREGATE                            | 100g - 1.25mm         |
| M, Mass of Sample (g)                     | =                     |
| R, Mass After Clay Removed (g)            |                       |
| M - R = L = Clay Lumps<br>M%              |                       |
| COMMENTS: Insufficient Sample T           | o Conduct Test        |
|   |                       |

#### **CLAY LUMPS**

CSA A23.2 - 3A

| CDA AZ                            | 23.2 - 3A             |  |
|-----------------------------------|-----------------------|--|
| Client Atlantic Geoscience Center | <b>Job</b> # NAO-1268 |  |
| (B.I.O.)                          | <b>315-34</b> 31      |  |
| Sample #4                         | Date                  |  |
|                                   |                       |  |
| COARSE AG                         | GREGATE               |  |
| M, Mass of Sample (g)             | = 313.9               |  |
| R, Mass After Clay Removed (g)    | = 294.9               |  |
| M - R = L = Clay Lumps            | =                     |  |
| M%                                | 6.1%                  |  |

| FINE AGGREGATE                 | 100g - 1.2  | 5mm   |
|--------------------------------|-------------|-------|
| M, Mass of Sample (g)          | lend<br>U-0 | 126.1 |
| R, Mass After Clay Removed (g) | =           | 38.4  |
| M - R = L = Clay Lumps<br>M%   | =           | 69.5% |

| COMMENTS: |  |   |
|-----------|--|---|
|           |  |   |
|           |  |   |
|           |  | _ |

# CLAY LUMPS

CSA A23.2 - 3A

| <pre>lient Atlantic Geoscience Center (B.I.O.)</pre> |            |  |  |  |  |  |
|--|------------|--|--|--|--|--|
|  | Date Jan.2 | 26/95                                  |  |  |  |  |
| GREGATE  |            |  |  |  |  |  |
|  | 1656.9     | ······································ |  |  |  |  |
|  | 1632.4     |  |  |  |  |  |
| =  | 1.5%       |  |  |  |  |  |
|  | =          | GREGATE  = 1656.9  = 1632.4  =         |  |  |  |  |

| FINE AGGREGATE                 | 100g - 1.    | 25mm  |
|--------------------------------|--------------|-------|
| M, Mass of Sample (g)          |              | 129.6 |
| R, Mass After Clay Removed (g) |              | 109.7 |
| M - R = L = Clay Lumps         | =            |       |
| М%                             | <del> </del> | 15.4% |

| COMMENTS: |  |      |
|-----------|--|------|
|           |  | <br> |
|           |  |      |
|           |  |      |
|           |  | <br> |
|           |  |      |
|           |  |      |

#### **CLAY LUMPS**

|  | 23.2 - 3A   |        |           |
|--|---|--------|-----------|
| Client Atlantic Geoscience Center (B.I.O.) |   | Job #  | NAO-1268  |
| Sample #8                                  |   | Date   | Jan.26/95 |
| COARSE AG                                  | GREGATE   |        |           |
| M, Mass of Sample (g)                      | gamen and the second | 1277.6 |           |
| R, Mass After Clay Removed (g)             |   | 1274.4 | *1-1      |
| M - R = L = Clay Lumps<br>M%               | =   | 0.3%   |           |
|  | <del></del>   |        |           |

| FINE AGGREGATE                 | 100g - 1.2 | 25mm  |
|--------------------------------|------------|-------|
| M, Mass of Sample (g)          |            | 115.3 |
| R, Mass After Clay Removed (g) |            | 73.1  |
| M - R = L = Clay Lumps         |            |       |
| M%                             |            | 36.6% |

| COMMENTS: |  |
|-----------|--|
|           |  |
|           |  |
|           |  |
|           |  |
|           |  |
|           |  |



# CLAY LUMPS

| Job # NAO-1268  Date Jan.26/95  403.5  402.8 |
|--|
| 403.5  |
| 402.8  |
| 402.8  |
|  |
| 0.1%   |
|  |
|  |
| 99.9   |
| 81.9   |
| 18.0%  |
|  |
|  |
|  |

| Client Atlantic Geoscience Center (B.I.O.) |              | Job #  | NAO-1268  |
|--|--------------|--------|-----------|
| Sample # 12                                |              | Date   | Jan.26/95 |
| COARSE AGG                                 | REGATE       |        |           |
| M, Mass of Sample (g)                      | =            |        |           |
| R, Mass After Clay Removed (g)             | =            |        |           |
| M - R = L = Clay Lumps<br>M%               | =            |        |           |
| FINE AGGREGATE                             | 100g - 1.25  | <br>mm |           |
| M, Mass of Sample (g)                      | =            |        |           |
| R, Mass After Clay Removed (g)             |              |        |           |
| M - R = L = Clay Lumps<br>M%               | =            |        |           |
| COMMENTS: Insufficient Sample To (         | Conduct Toot |        |           |
| COMMENTS: Insufficient Sample To (         | Conduct lest |        |           |
|  |              |        |           |

#### **CLAY LUMPS**

|        |                                     | A23.2 - 3A |       |           |
|--------|-------------------------------------|------------|-------|-----------|
| Client | Atlantic Geoscience Center (B.I.O.) |            | Job # | NAO-1268  |
| Sample | <b>9</b> #13                        |            | Date  | Jan.26/95 |
|        | COARSE AC                           | GREGATE    |       |           |
| M, Ma  | ass of Sample (g)                   | = 19       | 36.3  |           |

| COARSE AGGREGATE               |   |        |  |  |  |
|--------------------------------|---|--------|--|--|--|
| M, Mass of Sample (g)          | = | 1936.3 |  |  |  |
| R, Mass After Clay Removed (g) | = | 1936.3 |  |  |  |
| M - R = L = Clay Lumps<br>M%   | = | 0 %    |  |  |  |

| FINE AGGREGATE                 | 100g - 1. | 25mm  |
|--------------------------------|-----------|-------|
| M, Mass of Sample (g)          | =         | 127.4 |
| R, Mass After Clay Removed (g) | =         | 126.5 |
| M - R = L = Clay Lumps<br>M%   | =         | 0.7%  |

| COMMENTS: |     |      |            |
|-----------|-----|------|------------|
|           |     |      |            |
|           | ··· | <br> | <br>······ |
|           |     |      |            |

| Client Atlantic Geoscience Center (B.I.O.) |           | Job # NAO-1268 |  |  |  |
|--|-----------|----------------|--|--|--|
| Sample #                                   |           | Date           |  |  |  |
| COARSE AGGREGATE                           |           |                |  |  |  |
| M, Mass of Sample (g)                      | =         | 904.7          |  |  |  |
| R, Mass After Clay Removed (g)             | =         | 903.3          |  |  |  |
| M - R = L = Clay Lumps                     | =         |                |  |  |  |
| M%   |           | 0.2%           |  |  |  |
| FINE AGGREGATE                             | 100g - 1. | .25mm          |  |  |  |
| M, Mass of Sample (g)                      | =         | 136.2          |  |  |  |
| R, Mass After Clay Removed (g)             |           |                |  |  |  |
|  | =         | 135.1          |  |  |  |
| M - R = L = Clay Lumps                     | =         | 135.1          |  |  |  |
| M - R = L = Clay Lumps<br>M%               |           | 0.8%           |  |  |  |
|  |           |                |  |  |  |
|  |           |                |  |  |  |

| Client  Atlantic Geoscience Center (B.I.O.) | Job #NAO-1268 |
|---|---------------|
| Sample #17                                  | Date          |
| COARSE AGGR                                 | REGATE        |
| M, Mass of Sample (g)                       | =             |
| R, Mass After Clay Removed (g)              | =             |
| M - R = L = Clay Lumps M%                   | =             |
|   |               |
| FINE AGGREGATE                              | 100g - 1.25mm |
| M, Mass of Sample (g)                       | =             |
| R, Mass After Clay Removed (g)              | =             |
| M - R = L = Clay Lumps<br>M%                | · <b>=</b>    |
| COMMENTS: Insufficient Sample To C          | onduct Test   |
|   |               |

| Client Atlantic Geoscience Center (B.I.O.)                 |          | Job # <u>NAO-1268</u> |
|--|----------|-----------------------|
| Sample #   |          | Date Jan. 26/95       |
| COARSE AG  | GREGATE  |                       |
| M, Mass of Sample (g)                                      | =        | 2047.9                |
| R, Mass After Clay Removed (g)                             | =        | 2045.8                |
| M - R = L = Clay Lumps<br>M%                               | =        | 0.1%                  |
| FINE AGGREGATE   | 100g - 1 | .25mm                 |
| M, Mass of Sample (g)                                      | =        | 110.7                 |
|  |          |                       |
| R, Mass After Clay Removed (g)                             | =        | 108.0                 |
| R, Mass After Clay Removed (g)  M - R = L = Clay Lumps  M% | =        | 2.4%                  |
| M - R = L = Clay Lumps                                     |          |                       |
| M - R = L = Clay Lumps                                     |          |                       |
| M - R = L = Clay Lumps<br>M%                               |          |                       |

# **CLAY LUMPS**

|                                   | 3.2 - 3A |       |           |
|-----------------------------------|----------|-------|-----------|
| Client Atlantic Geoscience Center |          | Job # | NAO-1268  |
| (B.I.O.)                          |          |       |           |
| Sample #21                        |          | Date  | Jan.26/95 |
|                                   |          |       |           |
| COARSE AG                         | GREGATE  |       |           |
| M, Mass of Sample (g)             | =        | 994.8 |           |
| R, Mass After Clay Removed (g)    | =        | 994.8 |           |
| M - R = L = Clay Lumps            | =        |       |           |
| M%                                |          | 0 %   |           |

| FINE AGGREGATE                 | 100g - 1 | 1.25mm |  |
|--------------------------------|----------|--------|--|
| M, Mass of Sample (g)          | =        | 114.4  |  |
| R, Mass After Clay Removed (g) | =        | 112.9  |  |
| M - R = L = Clay Lumps         | =        |        |  |
| M%                             |          | 1.3%   |  |

| COMMENTS: | <br> |  |  |  |
|-----------|------|--|--|--|
|           |      |  |  |  |
|           |      |  |  |  |

| Client Atlantic Geoscience Center (B.I.O.)    |              | Job # | NAO-1268   |  |  |
|---|--------------|-------|--|--|--|
| Sample #24                                    |              | Date  | Jan.26/95  |  |  |
| COARSE AGGRE                                  | GATE         |       |  |  |  |
| M, Mass of Sample (g)                         | =            |       |  |  |  |
| R, Mass After Clay Removed (g)                | =            |       |  |  |  |
| M - R = L = Clay Lumps<br>M%                  | =            |       |  |  |  |
| FINE AGGREGATE 1                              | 00g - 1.25mm |       |  |  |  |
| M, Mass of Sample (g)                         |              |       |  |  |  |
| R, Mass After Clay Removed (g)                | =            |       |  |  |  |
| M - R = L = Clay Lumps<br>M%                  | =            |       |  |  |  |
| COMMENTS: Insufficient Sample To Conduct Test |              |       |  |  |  |
|   |              |       | and the state of t |  |  |

### CLAY LUMPS CSA A23.2 - 3A

| REGATE       | Date Jan. 26/95 |
|--------------|-----------------|
| REGATE       |                 |
|              |                 |
| guag<br>Bara | 469.4           |
| =            | 460.1           |
| =            | 2.0 %           |
| 100g - 1     | .25mm           |
| 3-si         | 100.6           |
| =            | 56.2            |
| =            | 44.1%           |
|              |                 |
|              | 100g - 1        |

#### CLAY LUMPS CSA A23,2 - 3A

| CSA F  |                    |   |
|--|--------------------|---|
| ient Atlantic Geoscience Center (B.I.O.)   |                    | Job # _NAO-1268                         |
| mple #28   |                    | Date Jan.26/9                           |
| COARSE AG  | GREGATE            | 71 - 17 - 17 - 17 - 17 - 17 - 17 - 17 - |
| I, Mass of Sample (g)  | =                  |   |
| , Mass After Clay Removed (g)  |                    |   |
| <u>f - R</u> = L = Clay Lumps<br>M%  | =                  |   |
|  |                    |   |
| FINE AGGREGATE   | 100g - 1.25mm      |   |
|  | 100g - 1.25mm<br>= | 106.6                                   |
| l, Mass of Sample (g)  |                    | 106.6                                   |
| FINE AGGREGATE  I, Mass of Sample (g) I, Mass After Clay Removed (g) I - R = L = Clay Lumps M% | =                  |   |

# CLAY LUMPS

CSA A23.2 - 3A

| Client Atlantic Geoscience Center | <b>Job</b> # <u>NAO-1268</u> |   |
|-----------------------------------|------------------------------|---|
| (B.I.O.)  Sample #                | <b>Date</b> Jan.26/99        | 5 |
| COARSE AGO                        | GREGATE                      |   |
| M, Mass of Sample (g)             | = 3737.4                     |   |
| R, Mass After Clay Removed (g)    | = 3733.0                     |   |
| M - R = L = Clay Lumps<br>M%      | =<br>0.1%                    |   |
|                                   |                              |   |
|                                   |                              |   |
| FINE AGGREGATE                    | 100g - 1.25mm                |   |
| M, Mass of Sample (g)             | =                            |   |
| R, Mass After Clay Removed (g)    | =                            |   |
| M - R = L = Clay Lumps<br>M%      | =                            |   |
|                                   |                              |   |
| COMMENTS: Insufficient Fine Aggr  | egate To Conduct Test        |   |
|                                   |                              |   |
|                                   |                              |   |

# LOW DENSITY MATERIAL CSA A23.2 - 4A (MODIFIED)

| Client AGC/BIO   |      | <b>Job</b> #NAO-1 | 268      |
|--|------|-------------------|----------|
| Sample # Station #1  |      | Date January      | 31, 1995 |
| COARSE AGGRE   | GATE | E                 |          |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                         | _    | 655.8             | _        |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                | =    | 0.0               | -        |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles | =    |                   | -        |
| M <sub>2</sub>   | -    | 0%                | -        |
|  |      |                   |          |
|  |      |                   |          |
| FINE AGGREGA   | ATE  |                   | ]        |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                         | =    | 110.3             | _        |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                | = _  | 0.0               | _        |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles | =    |                   |          |
| $M_2$  | -    | 0%                | -        |
|  |      |                   |          |
|  |      |                   |          |
| COMMENTS:  |      |                   |          |
|  |      |                   |          |
|  |      |                   |          |

### LOW DENSITY MATERIAL

| Client AGC/BIO   |            |          | Job #      | NAO-126 | 8                |
|--|------------|----------|------------|---------|------------------|
| Sample # Station #4  |            |          | Date _     | January | 31 <b>,</b> 1995 |
| COARSE AGGREGATE   |            |          |            |         |                  |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           |            | * *      |            |         |                  |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =          | **       |            |         |                  |
| $\underline{\underline{M}}_1 = L = \%$ Low Density Particles         |            |          | ,          | ·       |                  |
| M <sub>2</sub>   |            | **       |            |         |                  |
|  |            |          |            |         |                  |
|  |            |          |            |         |                  |
| FINE AGGREGA   | ATE        |          |            |         |                  |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | <b>***</b> |          | 93.3       |         |                  |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =          |          | 0.0        |         |                  |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | =          |          |            |         |                  |
| $M_2$  |            | <b>6</b> | 0%         |         |                  |
|  |            |          |            |         |                  |
|  |            |          |            |         |                  |
| COMMENTS: **Insufficient Coarse Agg                                  | rega       | te to co | nduct test | •       |                  |
|  |            |          |            |         |                  |
|  |            |          |            |         |                  |

### **LOW DENSITY MATERIAL**

| Client Atlantic Geoscience Centre/ B. I.O.                           |     |        | Job #  | NAO-126 | 8   |              |
|--|-----|--------|--------|---------|-----|--------------|
| Sample #5  |     |        | Date _ | January | 31, | <u>1</u> 995 |
| COARSE AGGRE   | GAT | E      |        |         |     |              |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | =   | 1581.2 |        |         |     |              |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =   | 0.0    |        |         |     |              |
| $\underline{\underline{M}}_1 = L = \%$ Low Density Particles         | =   |        |        |         |     |              |
| M <sub>2</sub>   |     | 0%     |        |         |     |              |
|  |     |        |        |         |     |              |
|  |     |        |        |         |     |              |
| FINE AGGREGA   | ATE |        |        |         |     |              |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | =   | 144.2  |        |         |     |              |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =   | 0.0    |        |         |     |              |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | =   |        |        |         |     |              |
| $M_2$  | -   | 0%     |        |         |     |              |
|  |     |        |        |         |     |              |
|  |     |        |        |         |     |              |
| COMMENTS:  |     |        |        |         |     |              |
|  |     |        |        |         |     |              |
|  |     |        |        |         |     |              |

### LOW DENSITY MATERIAL

| •     | Job #   | NAO-1268    | 3  |
|-------|---------|-------------|--|
|       | Date _  | January 3   | 1 <b>,</b> 199   |
| EGATE |         |             |  |
|       | 1268.1  |             |  |
| =     | 0.0     |             |  |
| =     | ,       |             |  |
|       | 0%      |             |  |
|       |         |             |  |
| ATE   |         |             |  |
|       | 107.0   | <del></del> |  |
| -     | 0.0     |             |  |
| =     |         |             |  |
|       | 0%      |             |  |
|       |         |             |  |
|       |         |             |  |
|       | •       |             |  |
|       |         |             |  |
|       |         | ***         |  |
|       | EGATE = | Date        | Date January 3  EGATE  = 1268.1  = 0.0  = 0%  ATE  = 107.0  = 0.0  = 0.0 |

### **LOW DENSITY MATERIAL**

| Client Atlantic Geoscience Centre/B.I.O.                     |      | <b>Job</b> #NAO-12 | 68  | <del></del>  |
|--|------|--------------------|-----|--------------|
| Sample #9  |      | Date January       | 30, | <u>1</u> 995 |
| COARSE AGGRE   | GATI | E                  |     | -            |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                   | ==   | 1382.4             |     |              |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)          | = .  | 0.0                |     |              |
| $\underline{\underline{M}}_1 = L = \%$ Low Density Particles | =    |                    |     |              |
| M <sub>2</sub>   |      | 0%                 |     |              |
|  |      | ·                  |     |              |
| FINE AGGREGA   | ATE  |                    |     |              |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                   | =    | 199.5              |     |              |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)          | = .  | 0.0                |     |              |
| $\underline{\underline{M}}_1 = L = \%$ Low Density Particles | =    |                    |     |              |
| $M_2$  | -    | 0%                 |     |              |
|  |      |                    |     |              |
| COMMENTS:  |      |                    |     |              |
|  |      |                    |     |              |
|  |      |                    |     |              |



# LOW DENSITY MATERIAL CSA A23.2 - 4A (MODIFIED)

| Client AGC/BIO  |             | <b>Job</b> #NAO-1268                    |  |  |
|---|-------------|---|--|--|
| Sample # Station #12  |             | Date January 31, 1995                   |  |  |
| COARSE AGGRE  | GAT         | E                                       |  |  |
| M <sub>2</sub> , Dry Mass of Aggregate (g)  | =           | **                                      |  |  |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                               |             | **                                      |  |  |
| $ \underline{M}_1 = L = \% $ Low Density Particles $ \underline{M}_2 $            | =           | **                                      |  |  |
|   |             |   |  |  |
| FINE AGGREGA  | ATE         |   |  |  |
| M <sub>2</sub> , Dry Mass of Aggregate (g)  | ==          | 117.7                                   |  |  |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                               | =           | 0.0                                     |  |  |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles $\mathbf{M}_2$ | anna<br>man | 0%                                      |  |  |
| COMMENTS: **Insufficient Coarse Aggregate to conduct test.                        |             |   |  |  |
|   |             | *************************************** |  |  |

# LOW DENSITY MATERIAL

| Client Atlantic Geoscience Centre/B.I.O.                             |     | Job #    | IAO-1268       |
|--|-----|----------|----------------|
| Sample #   |     | Date Jar | nuary 31, 1995 |
| COARSE AGGRE   | GAT | E        |                |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           |     | 1930.5   |                |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | = ' | 0.0      |                |
| $\underline{\underline{M}}_1 = L = \%$ Low Density Particles         | =   | :        |                |
| M <sub>2</sub>   |     | 0%       |                |
|  |     |          |                |
|  |     |          |                |
| FINE AGGREGA   | ATE |          |                |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | =   | 212.4    |                |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =   | 0.0      |                |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | =   |          |                |
| $M_2$  | -   | 0%       |                |
|  |     |          |                |
|  |     |          |                |
| COMMENTS:  |     |          |                |
|  |     |          |                |
| ·  |     |          |                |

### **LOW DENSITY MATERIAL**

| Client Atlantic Geoscience Centre/B.I.O.                             |                | <b>Job</b> # NAO-1268 |
|--|----------------|-----------------------|
| Sample #16   |                | Date January 31, 199  |
| COARSE AGGRE   | GATE           |                       |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | Paras<br>Caras | 895.5                 |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =              | 0.0                   |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | -              |                       |
| $M_2$  |                | 0%                    |
|  |                |                       |
|  |                |                       |
| FINE AGGREGA   | ATE            |                       |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | Çum,           | 227.6                 |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =              | 0.0                   |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles   | =              |                       |
| $M_2$  |                | 0%                    |
|  |                |                       |
|  |                |                       |
| COMMENTS:  |                |                       |
|  |                |                       |
|  |                |                       |

### LOW DENSITY MATERIAL

| Client AGC/BIO  |             | <b>Job</b> #NAO-1268  |
|---|-------------|-----------------------|
| Sample # _ Station #17  |             | Date January 31, 1995 |
| COARSE AGGRE  | GAT         | E                     |
| M <sub>2</sub> , Dry Mass of Aggregate (g)  | =           | **                    |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                                     | -           | **                    |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles                    | =           |                       |
| M <sub>2</sub>  |             | **                    |
|   |             |                       |
|   |             |                       |
| FINE AGGREGA  | ATE         |                       |
| M <sub>2</sub> , Dry Mass of Aggregate (g)  | =           |                       |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                                     | =           |                       |
| $ \underline{\mathbf{M}}_{1} = \mathbf{L} = \% $ Low Density Particles $\mathbf{M}_{2}$ | =           |                       |
| 2   |             |                       |
|   |             |                       |
| COMMENTS: **Insufficient material   | to co       | onduct either test.   |
|   | <del></del> |                       |
|   |             |                       |

# LOW DENSITY MATERIAL CSA A23.2 - 4A MODIFIED

| ClientAtlantic Geoscience Centre/B.I.O                             | •   | <b>Job</b> #NAO-1268 | 3        |
|--|-----|----------------------|----------|
| Sample #   |     | Date January 3       | 31, 1995 |
| COARSE AGGRE   | GAT | E                    |          |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                         |     | 2053.4               |          |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                | =   | 0.0                  |          |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles |     | :                    |          |
| $M_2$  |     | 0%                   |          |
|  |     |                      |          |
|  |     |                      |          |
| FINE AGGREGA   | ATE |                      |          |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                         | =   | 180.6                |          |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                | =   | 0.0                  |          |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles | =   |                      |          |
| $M_2$  |     | 0%                   |          |
|  |     |                      |          |
|  |     |                      |          |
| COMMENTS:  |     |                      |          |
|  |     |                      |          |
|  |     |                      |          |

# **LOW DENSITY MATERIAL**

| Client Atlantic Geoscience Centre/B.I.O.                             |     | Job #  | NAO-12  | 68  |               |
|--|-----|--------|---------|-----|---------------|
| Sample #21   |     | Date _ | January | 31, | <u> 19</u> 95 |
| COARSE AGGRE   | GAT | E      |         |     |               |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | =   | 941.2  |         |     |               |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | = . | 0.0    |         |     |               |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | =   |        |         | -   |               |
| $M_{2}$  | •   | 0%     |         | _   |               |
|  |     |        |         |     |               |
|  |     |        |         |     |               |
| FINE AGGREGA   | ATE |        |         |     |               |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | =   | 241.1  |         | ı   |               |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =   | 0.0    |         | •   |               |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles   | =   |        |         | •   |               |
| $M_2$  | -   | 0%     |         |     |               |
|  |     |        |         |     |               |
|  |     |        |         |     |               |
| COMMENTS:  |     |        |         |     |               |
|  |     |        |         |     | <del></del>   |
|  |     |        |         |     |               |



# LOW DENSITY MATERIAL

CSA A23.2 - 4A Modified

| Client Atlantic Geoscience Centre/B.I.O.  | •     | Job #             | NAO-12   | 68       |
|---|-------|-------------------|----------|----------|
| Sample #  |       | Date _            | January  | 31, 1995 |
| COARSE AGGRE  | GATE  |                   |          |          |
| M <sub>2</sub> , Dry Mass of Aggregate (g)  | Provi |                   |          |          |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                               | =     |                   |          |          |
| $ \underline{M}_1 = L = \% $ Low Density Particles $ \underline{M}_2 $            | =     |                   |          |          |
|   | -     |                   |          |          |
|   |       |                   |          |          |
| FINE AGGREGA  | ATE   |                   |          |          |
| M <sub>2</sub> , Dry Mass of Aggregate (g)  | =     |                   | <u> </u> |          |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                               | =     |                   |          |          |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles $\mathbf{M}_2$ | =     |                   |          |          |
|   |       |                   |          |          |
|   |       |                   |          |          |
| COMMENTS: Insufficient material reta  | ained | on the required s | sieves.  |          |
|   |       |                   |          |          |
|   |       |                   |          |          |

# LOW DENSITY MATERIAL

| Client Atlantic Geoscience Centre/B.I.0                              | •    | <b>Job</b> #NAO-12 | 68       |
|--|------|--------------------|----------|
| Sample #   |      | DateJanuary        | 31, 1995 |
| COARSE AGGRE   | EGA7 | TE                 |          |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           |      | 455.1              |          |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =    | 0.0                |          |
| $\underline{\underline{M}}_1 = L = \%$ Low Density Particles         | =    |                    |          |
| $M_2$  |      | 0%                 |          |
|  |      |                    |          |
|  |      |                    |          |
| FINE AGGREGA   | ATE  |                    |          |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           |      | 152.4              |          |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =    | 0.0                |          |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | =    |                    |          |
| $M_2$  |      | 0%                 |          |
|  |      |                    |          |
|  |      |                    |          |
| COMMENTS:  |      |                    |          |
|  |      |                    |          |
|  |      |                    |          |



# LOW DENSITY MATERIAL CSA A23.2 - 4A (MODIFIED)

| Client AGC/BIO   |              | Job #               | NAO-1268   |
|--|--------------|---------------------|--|
| Sample #Station #28  |              | Date _              | January 31, 1995   |
| COARSE AGGRE   | GAT          | E                   |  |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           |              | **                  | Marine ( Commission of the Com |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =            | *.*:                |  |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | =            |                     |  |
| $M_2$  |              | **:                 | ·  |
|  |              |                     |  |
|  |              |                     |  |
| FINE AGGREGA   | ATE          |                     |  |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | =            | 85.4                |  |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | =            | 0.0                 |  |
| $\underline{\mathbf{M}}_1 = \mathbf{L} = \%$ Low Density Particles   | =            |                     |  |
| M <sub>2</sub>   |              | 0%                  |  |
|  |              |                     |  |
| COMMENTS: **Insufficient Coarse Ag                                   | greg         | ate to conduct test | •  |
|  | <del>"</del> |                     |  |

# LOW DENSITY MATERIAL

| Client Atlantic Geoscience Centre/B.I.                               | ο.   | <b>Job</b> #NAO-126 | 8                |
|--|------|---------------------|------------------|
| Sample #   |      | Date January        | 31 <b>,</b> 1995 |
| COARSE AGGRE   | GATE |                     |                  |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | =    | 3713.6              |                  |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | = -  | 0.0                 |                  |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | =    |                     |                  |
| M <sub>2</sub>   | _    | 0%                  |                  |
|  |      |                     |                  |
|  |      |                     |                  |
| FINE AGGREGA   | ATE  |                     |                  |
| M <sub>2</sub> , Dry Mass of Aggregate (g)                           | =    | 231.7               |                  |
| M <sub>1</sub> , Dry Mass of Decanted Aggregate (g)                  | = -  | 0.0                 |                  |
| $\underline{\mathbf{M}}_{1} = \mathbf{L} = \%$ Low Density Particles | =    |                     |                  |
| M <sub>2</sub>   | _    | 0%                  |                  |
|  |      |                     |                  |
|  |      |                     | , v              |
| COMMENTS:  |      |                     |                  |
|  |      |                     |                  |
|  |      |                     |                  |

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# ORGANIC IMPURITIES IN FINE AGGREGATE CSA A23.2 - 7A

CLIENT:

AGC/BIO

PROJECT:

**NAO-1268** 

CONTACT:

Gordon Fader

DATE TESTED:

February 2, 1995

| SAMPLE # | COLOUR        |
|----------|---------------|
| 1        | 2             |
| 4        | 4             |
| 5        | between 4 & 5 |
| 8        | between 3 & 4 |
| 9        | 3             |
| 12       | between 2 & 3 |
| 13       | 3             |
| 16       | 2             |
| 17       | 1             |
| 20       | 4             |
| 21       | between 4 & 5 |
| 24       | 2             |
| 25       | 4             |
| 28       | 4             |
| 29       | 4             |

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #1     | Aggregate: Gravel         |
|----------------------|---------------------------|
| Date Sampled: -      | Sampled By: Client        |
| Date Received: -     | Date Tested: Jan.23-31/95 |
| Test Solution: MgS04 | Number of Cycles: 5       |

| Coarse Aggregate       |        | Fine Aggregate             |                    |          |  |
|------------------------|--------|----------------------------|--------------------|----------|--|
| Sieve Si<br>Passing/Re |        | Weighted<br>Average % Loss | Sieve<br>Passing/F |          | Weighted<br>Average % Loss   |
| 80 mm                  | 56 mm  |                            |                    |          |  |
| 56 mm                  | 40 mm  |                            | 10 mm              | 5 mm     |  |
| 40 mm                  | 28 mm  |                            | 5 mm               | 2.5 mm   |  |
| 28 mm                  | 20 mm  |                            | 2.5 mm             | 1.25 mm  |  |
| 20 mm                  | 14 mm  |                            | 1.25 mm            | 0.630 mm | - Constitution of the Cons |
| 14 mm                  | 10 mm  |                            | 0.630 mm           | 0.315 mm |  |
| 10 mm                  | 5 mm   | 0.8                        |                    |          |  |
| Loss Sub               | total: |                            | Loss Su            | ıbtotal: |  |
|                        |        | Total Loss:                | %                  |          | 1  |

| Comments:     |           |  |
|---------------|-----------|--|
|               |           |  |
| )<br>         | Divis No. |  |
| Certified by: | Plate No. |  |

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #4     | Aggregate: Sand           |
|----------------------|---------------------------|
| Date Sampled:        | Sampled By: Client        |
| Date Received:       | Date Tested: Jan.23-31/95 |
| Test Solution: MgS04 | Number of Cycles: 5       |

|                               | Coarse Aggregate           | Fine Agg                       | regate                     |
|-------------------------------|----------------------------|--------------------------------|----------------------------|
| Sieve Size<br>Passing/Retaine | Weighted ed Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss |
| 80 mm 56 n                    | nm                         |                                |                            |
| 56 mm 40 n                    | nm                         | 10 mm 5 mm                     |                            |
| 40 mm 28 n                    | nm                         | 5 mm 2.5 mm                    |                            |
| 28 mm 20 n                    | ım                         | 2.5 mm 1.25 mm                 |                            |
| 20 mm 14 n                    | nm                         | 1.25 mm 0.630 mm               | 8.02                       |
| 14 mm 10 n                    | nm                         | 0.630 mm 0.315 mm              | 18.64                      |
| 10 mm 5 mi                    | n                          |                                |                            |
| Loss Subtotal:                |                            | Loss Subtotal:                 |                            |
|                               | Total Loss:                | %                              | 27                         |
| Comments:                     |                            | ,                              |                            |
| Certified by:                 | Í.                         | Plate No.                      |                            |

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #5     | Aggregate: Gravel         |  |
|----------------------|---------------------------|--|
| Date Sampled: -      | Sampled By: Client        |  |
| Date Received: -     | Date Tested: Jan.23-31/95 |  |
| Test Solution: MgS04 | Number of Cycles: 5       |  |

|                    | Coarse Aggregate |                            | Fine Aggregate                 |       | egate                      |
|--------------------|------------------|----------------------------|--------------------------------|-------|----------------------------|
| Sieve<br>Passing/F |                  | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained |       | Weighted<br>Average % Loss |
| 80 mm              | 56 mm            |                            |                                |       |                            |
| 56 mm              | 40 mm            |                            | 10 mm 5 mi                     | m     |                            |
| 40 mm              | 28 mm            |                            | 5 mm 2.5 r                     | nm    | 0.72                       |
| 28 mm              | 20 mm            |                            | 2.5 mm 1.25                    | mm    |                            |
| 20 mm              | 14 mm            |                            | 1.25 mm 0.63                   | 0 mm  |                            |
| 14 mm              | 10 mm            | 0.96                       | 0.630 mm 0.3                   | 15 mm |                            |
| 10 mm              | 5 mm             | 2.69                       |                                |       |                            |
| Loss Su            | ıbtotal:         |                            | Loss Subtota                   | l:    |                            |
|                    |                  | Total Loss:                | %                              |       | 5                          |
| Comments:          | /                |                            |                                |       |                            |
| Certified by:      | h                |                            | Plate No.                      |       |                            |

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

NAO-1268

| Test No.: STN #8 | Aggregate: Gravel   |  |
|------------------|---------------------|--|
| Date Sampled: -  | Sampled By: Client  |  |
| Date Received: - | Date Tested: -      |  |
| Test Solution: - | Number of Cycles: - |  |

| Coarse Aggregate               |                            | Fine Aggregate                 |   |  |
|--------------------------------|----------------------------|--------------------------------|---|--|
| Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss  |  |
| 80 mm 56 mm                    |                            |                                |   |  |
| 56 mm 40 mm                    |                            | 10 mm 5 mm                     |   |  |
| 40 mm 28 mm                    |                            | 5 mm 2.5 mm                    |   |  |
| 28 mm 20 mm                    |                            | 2.5 mm 1.25 mm                 | t the control of the |  |
| 20 mm 14 mm                    |                            | 1.25 mm 0.630 mm               |   |  |
| 14 mm 10 mm                    |                            | 0.630 mm 0.315 mm              |   |  |
| 10 mm 5 mm                     |                            |                                |   |  |
| Loss Subtotal:                 |                            | Loss Subtotal:                 | - to the state of |  |
|                                | Total Loss:                | %                              |   |  |

Comments: INSUFFICIENT MATERIAL FOR TEST

Certified by: Plate No.

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# AGGREGATE SOUNDNESS REPORT

CLIENT:

CSA A23.2 - 9A Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #9     | Aggregate: Sand           |  |
|----------------------|---------------------------|--|
| Date Sampled: -      | Sampled By: Client        |  |
| Date Received: -     | Date Tested: Jan.23-31/95 |  |
| Test Solution: MgS04 | Number of Cycles: 5       |  |

| Coarse A                       | Coarse Aggregate           |                                | regate                     |
|--------------------------------|----------------------------|--------------------------------|----------------------------|
| Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss |
| 80 mm 56 mm                    |                            |                                |                            |
| 56 mm 40 mm                    |                            | 10 mm 5 mm                     |                            |
| 40 mm 28 mm                    |                            | 5 mm 2.5 mm                    |                            |
| 28 mm 20 mm                    | ·                          | 2.5 mm 1.25 mm                 | 0.26                       |
| 20 mm 14 mm                    |                            | 1.25 mm 0.630 mm               | 0.52                       |
| 14 mm 10 mm                    |                            | 0.630 mm 0.315 mm              | 1.46                       |
| 10 mm 5 mm                     |                            | ·                              |                            |
| Loss Subtotal:                 |                            | Loss Subtotal:                 |                            |
|                                | Total Loss:                | %                              | 2                          |
| Comments:                      |                            |                                |                            |
| Certified by:                  |                            | Plate No.                      |                            |

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### AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

Atlantic Geoscience Centre/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

NAO-1268

| Test No.:STN #12 | Aggregate: Sand     |  |
|------------------|---------------------|--|
| Date Sampled: -  | Sampled By: Client  |  |
| Date Received: - | Date Tested: -      |  |
| Test Solution: - | Number of Cycles: - |  |

| Coarse Aggregate               |             | Fine Aggregate    |                            |  |
|--------------------------------|-------------|-------------------|----------------------------|--|
| Sieve Size<br>Passing/Retained | I           |                   | Weighted<br>Average % Loss |  |
| 80 mm 56 mm                    |             |                   |                            |  |
| 56 mm 40 mm                    |             | 10 mm 5 mm        |                            |  |
| 40 mm 28 mm                    |             | 5 mm 2.5 mm       |                            |  |
| 28 mm 20 mm                    |             | 2.5 mm 1.25 mm    |                            |  |
| 20 mm 14 mm                    |             | 1.25 mm 0.630 mm  |                            |  |
| 14 mm 10 mm                    |             | 0.630 mm 0.315 mm |                            |  |
| 10 mm 5 mm                     |             |                   |                            |  |
| Loss Subtotal:                 |             | Loss Subtotal:    |                            |  |
|                                | Total Loss: | %                 |                            |  |

Comments: Insufficient Sample to Conduct Test.

|               | K  |   |  |      |
|---------------|----|---|--|------|
| Certified by: | N. | 7 |  |      |
| continua by.  |    |   |  | <br> |

Plate No.

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #13    | Aggregate: Gravel         |  |
|----------------------|---------------------------|--|
| Date Sampled: -      | Sampled By: Client        |  |
| Date Received: -     | Date Tested: Jan.23-31/95 |  |
| Test Solution: MgS04 | Number of Cycles: 5       |  |

|                   | Coarse A | aggregate                  | Fine Aggregate                 |                            |  |
|-------------------|----------|----------------------------|--------------------------------|----------------------------|--|
| Sieve<br>Passing/ |          | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss |  |
| 80 mm             | 56 mm    |                            |                                |                            |  |
| 56 mm             | 40 mm    |                            | 10 mm 5 mm                     |                            |  |
| 40 mm             | 28 mm    |                            | 5 mm 2.5 mm                    | 0.18                       |  |
| 28 mm             | 20 mm    |                            | 2.5 mm 1.25 mm                 |                            |  |
| 20 mm             | 14 mm    |                            | 1.25 mm 0.630 mm               |                            |  |
| 14 mm             | 10 mm    | 0.02                       | 0.630 mm 0.315 mm              |                            |  |
| 10 mm             | 5 mm     | 0.11                       |                                |                            |  |
| Loss St           | ubtotal: |                            | Loss Subtotal:                 |                            |  |
| •                 |          | Total Loss:                | %                              | 0.3                        |  |
| Comments:         | ,        |                            |                                |                            |  |
| Certified by:     | m        |                            | Plate No.                      |                            |  |

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #16    | Aggregate: Gravel         |  |
|----------------------|---------------------------|--|
| Date Sampled: -      | Sampled By: Client        |  |
| Date Received: -     | Date Tested: Jan.23-31/95 |  |
| Test Solution: MgS04 | Number of Cycles: 5       |  |

| Coarse                         | Aggregate                  | Fine Agg                       | regate                     |
|--------------------------------|----------------------------|--------------------------------|----------------------------|
| Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss |
| 80 mm 56 mm                    |                            |                                |                            |
| 56 mm 40 mm                    |                            | 10 mm 5 mm                     |                            |
| 40 mm 28 mm                    |                            | 5 mm 2.5 mm                    | 0.15                       |
| 28 mm 20 mm                    |                            | 2.5 mm 1.25 mm                 |                            |
| 20 mm 14 mm                    | 0.01                       | 1.25 mm 0.630 mm               |                            |
| 14 mm 10 mm                    | 0                          | 0.630 mm 0.315 mm              |                            |
| 10 mm 5 mm                     | 0.04                       |                                |                            |
| Loss Subtotal:                 |                            | Loss Subtotal:                 |                            |
|                                | Total Loss:                | %                              | 0.2                        |
| Comments:                      |                            |                                |                            |
| Certified by:                  |                            | Plate No.                      |                            |

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

### AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Centre/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

NAO-1268

| Test No.: STN #17 | Aggregate: Sand     |  |
|-------------------|---------------------|--|
| Date Sampled: -   | Sampled By: Client  |  |
| Date Received: -  | Date Tested: -      |  |
| Test Solution: -  | Number of Cycles: - |  |

| Coarse Aggregate               |                            | Fine Aggregate                 |                            |
|--------------------------------|----------------------------|--------------------------------|----------------------------|
| Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss |
| 80 mm 56 mm                    |                            |                                |                            |
| 56 mm 40 mm                    |                            | 10 mm 5 mm                     |                            |
| 40 mm 28 mm                    |                            | 5 mm 2.5 mm                    |                            |
| 28 mm 20 mm                    |                            | 2.5 mm 1.25 mm                 |                            |
| 20 mm 14 mm                    |                            | 1.25 mm 0.630 mm               |                            |
| 14 mm 10 mm                    |                            | 0.630 mm 0.315 mm              |                            |
| 10 mm 5 mm                     |                            |                                |                            |
| Loss Subtotal:                 |                            | Loss Subtotal:                 |                            |
|                                | Total Loss:                | %                              |                            |

Comments: Insufficient Sample to Conduct Test.

Certified by: Plate No.

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #20    | Aggregate: Gravel         |                                       |
|----------------------|---------------------------|---------------------------------------|
| Date Sampled: -      | Sampled By: Client        |                                       |
| Date Received: -     | Date Tested: Jan.23-31/95 | · · · · · · · · · · · · · · · · · · · |
| Test Solution: MgS04 | Number of Cycles: 5       |                                       |

|                   | Coarse A | Aggregate                  |           | Fine Agg            | regate                     |
|-------------------|----------|----------------------------|-----------|---------------------|----------------------------|
| Sieve<br>Passing/ |          | Weighted<br>Average % Loss | 1         | e Size<br>'Retained | Weighted<br>Average % Loss |
| 80 mm             | 56 mm    |                            |           |                     |                            |
| 56 mm             | 40 mm    |                            | 10 mm     | 5 mm                |                            |
| 40 mm             | 28 mm    |                            | 5 mm      | 2.5 mm              | 0.14                       |
| 28 mm             | 20 mm    |                            | 2.5 mm    | 1.25 mm             |                            |
| 20 mm             | 14 mm    |                            | 1.25 mm   | 0.630 mm            |                            |
| 14 mm             | 10 mm    | 0                          | 0.630 mm  | 0.315 mm            |                            |
| 10 mm             | 5 mm     | 0.13                       |           |                     |                            |
| Loss Sı           | ubtotal: |                            | Loss S    | ubtotal:            |                            |
|                   |          | Total Loss:                | %         |                     | 0.2                        |
| Comments:         |          |                            |           |                     |                            |
| Certified by:     | h        |                            | Plate No. |                     |                            |

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

NAO-1268

| Test No.: STN #21    | Aggregate: Sand           |  |
|----------------------|---------------------------|--|
| Date Sampled: -      | Sampled By: Client        |  |
| Date Received: -     | Date Tested: Jan.23-31/95 |  |
| Test Solution: MgS04 | Number of Cycles: 5       |  |

| Coars                          | e Aggregate                | Fine Aggi                      | regate                     |
|--------------------------------|----------------------------|--------------------------------|----------------------------|
| Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss |
| 80 mm 56 mm                    |                            |                                |                            |
| 56 mm 40 mm                    |                            | 10 mm 5 mm                     |                            |
| 40 mm 28 mm                    |                            | 5 mm 2.5 mm                    | 0.30                       |
| 28 mm 20 mm                    |                            | 2.5 mm 1.25 mm                 |                            |
| 20 mm 14 mm                    |                            | 1.25 mm 0.630 mm               |                            |
| 14 mm 10 mm                    | 0                          | 0.630 mm 0.315 mm              |                            |
| 10 mm 5 mm                     | 0.22                       |                                |                            |
| Loss Subtotal:                 |                            | Loss Subtotal:                 |                            |
|                                | Total Loss:                | %                              | 1                          |

Comments:

| 3             |           |
|---------------|-----------|
| Certified by: | Plate No. |

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### AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Centre/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

NAO-1268

| Test No.: STN #24 | Aggregate: Sand     |  |
|-------------------|---------------------|--|
| Date Sampled: -   | Sampled By: Client  |  |
| Date Received: -  | Date Tested: -      |  |
| Test Solution: -  | Number of Cycles: - |  |

| Coarse Aggregate               |                            | Fine Aggregate                 |                            |
|--------------------------------|----------------------------|--------------------------------|----------------------------|
| Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss |
| 80 mm 56 mm                    |                            |                                |                            |
| 56 mm 40 mm                    |                            | 10 mm 5 mm                     |                            |
| 40 mm 28 mm                    | 44                         | 5 mm 2.5 mm                    |                            |
| 28 mm 20 mm                    |                            | 2.5 mm 1.25 mm                 |                            |
| 20 mm 14 mm                    |                            | 1.25 mm 0.630 mm               |                            |
| 14 mm 10 mm                    |                            | 0.630 mm 0.315 mm              |                            |
| 10 mm 5 mm                     |                            |                                |                            |
| Loss Subtotal:                 |                            | Loss Subtotal:                 |                            |
|                                | Total Loss:                | %                              |                            |

Comments: Insufficient Sample to Conduct Test.

Certified by:

Plate No.

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #25    | Aggregate: Sand           |  |
|----------------------|---------------------------|--|
| Date Sampled: -      | Sampled By: Client        |  |
| Date Received: -     | Date Tested: Jan.23-31/95 |  |
| Test Solution: MgS04 | Number of Cycles: 5       |  |

| Coarse Aggregate               |                            | Fine Aggregate                 |  |
|--------------------------------|----------------------------|--------------------------------|--|
| Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss   |
| 80 mm 56 mm                    |                            |                                |  |
| 56 mm 40 mm                    |                            | 10 mm 5 mm                     |  |
| 40 mm 28 mm                    |                            | 5 mm 2.5 mm                    |  |
| 28 mm 20 mm                    |                            | 2.5 mm 1.25 mm                 |  |
| 20 mm 14 mm                    |                            | 1.25 mm 0.630 mm               |  |
| 14 mm 10 mm                    |                            | 0.630 mm 0.315 mm              | 17.5   |
| 10 mm 5 mm                     |                            |                                |  |
| Loss Subtotal:                 |                            | Loss Subtotal:                 |  |
|                                | Total Loss:                | %                              | 18   |
| Comments:                      |                            |                                |  |
| Certified by:                  |                            | Plate No.                      | V. Control of the Con |
| 1//                            |                            |                                |  |

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #28    | Aggregate: Sand              |  |
|----------------------|------------------------------|--|
| Date Sampled: -      | Sampled By: Client           |  |
| Date Received: -     | Date Tested: Jan.24-Feb.2/95 |  |
| Test Solution: MgS04 | Number of Cycles: 5          |  |

| Coarse Aggregate               |                            | Fine Aggregate                 |                            |
|--------------------------------|----------------------------|--------------------------------|----------------------------|
| Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained | Weighted<br>Average % Loss |
| 80 mm 56 mn                    |                            |                                |                            |
| 56 mm 40 mn                    |                            | 10 mm 5 mm                     |                            |
| 40 mm 28 mn                    |                            | 5 mm 2.5 mm                    |                            |
| 28 mm 20 mn                    |                            | 2.5 mm 1.25 mm                 |                            |
| 20 mm 14 mn                    |                            | 1.25 mm 0.630 mm               |                            |
| 14 mm 10 mn                    |                            | 0.630 mm 0.315 mm              | 2.3                        |
| 10 mm 5 mm                     |                            |                                |                            |
| Loss Subtotal:                 |                            | Loss Subtotal:                 |                            |
|                                | Total Loss:                | %                              | 2                          |
| Comments:                      |                            |                                |                            |
| Certified by:                  |                            | Plate No.                      |                            |

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# AGGREGATE SOUNDNESS REPORT

CSA A23.2 - 9A

CLIENT:

Atlantic Geoscience Center/

B.I.O.

DATE:

February 3, 1995

CONTACT:

Gordon Fader

PROJECT NO:

| Test No.: STN #29    | Aggregate: Sand           |  |
|----------------------|---------------------------|--|
| Date Sampled: -      | Sampled By: Client        |  |
| Date Received: -     | Date Tested: Jan.23-31/95 |  |
| Test Solution: MgS04 | Number of Cycles: 5       |  |

| Coarse Aggregate   |               | Fine Aggregate             |                                |           |                            |  |
|--------------------|---------------|----------------------------|--------------------------------|-----------|----------------------------|--|
| Sieve<br>Passing/l |               | Weighted<br>Average % Loss | Sieve Size<br>Passing/Retained |           | Weighted<br>Average % Loss |  |
| 80 mm              | 56 mm         |                            |                                |           |                            |  |
| 56 mm              | 40 mm         |                            | 10 mm                          | 5 mm      |                            |  |
| 40 mm              | 28 mm         |                            | 5 mm                           | 2.5 mm    |                            |  |
| 28 mm              | 20 mm         |                            | 2.5 mm                         | 1.25 mm   |                            |  |
| 20 mm              | 14 mm         |                            | 1.25 mm                        | 0.630 mm  |                            |  |
| 14 mm              | 10 mm         |                            | 0.630 mm                       | 0.315 mm  | 4.5                        |  |
| 10 mm              | 5 mm          |                            |                                |           |                            |  |
| Loss St            | ubtotal:      |                            | Loss S                         | ubtotal:  |                            |  |
|                    |               | Total Loss:                | %                              |           | 5                          |  |
| Comments:          |               |                            |                                |           |                            |  |
| Certified by:      | Certified by: |                            |                                | Plate No. |                            |  |

TO Atlantic Ceoscience Centre/B.I.O.

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

SAMPLE DATE: DATE RECEIVED:

STATION

SAMPLE TYPE -

DATE TESTED:

January 13, 1995

### RODDED UNIT WEIGHT

|               | TRIAL 1            | TRIAL 2   | TRIAL 3 |
|---------------|--------------------|---|---------|
| SAMPLE + TARE |                    |   |         |
| TARE          |                    |   |         |
| SAMPLE        |                    | **  |         |
| DENSITY       |                    |   |         |
|               | AVERAGE<br>DENSITY | Insufficient Material for density of aggregate. |         |

CSA A23.2 - 10A

TO Atlantic Geoscience Centre/B.I.O.

FILE:

NAO-1268

Dartmouth, Nova Scotia

B2Y 4A2

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

SAMPLE DATE: DATE RECEIVED:

STATION

SAMPLE TYPE

Sand

DATE TESTED:

January 13, 1995

UNIT #20

RODDED UNIT WEIGHT

Factor = 141.0

|               | TRIAL 1            | TRIAL 2    | TRIAL 3 |
|---------------|--------------------|------------|---------|
| SAMPLE + TARE | 13780              | 13818      | 13922   |
| TARE          | 4288               | 4288       | 4288    |
| SAMPLE        | 9492               | 9530       | 9634    |
| DENSITY       | 1338               | 1344       | 1358    |
|               | AVERAGE<br>DENSITY | 1347 kg/m³ |         |

CSA A23.2 - 10A

FILE:

NAO-1268

Dartmouth, Nova Scotia

B2Y 4A2

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

SAMPLE DATE: DATE RECEIVED:

**STATION** SAMPLE TYPE

Gravel

DATE TESTED:

January 12, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

|               | TRIAL 1            | TRIAL 2    | TRIAL 3 |
|---------------|--------------------|------------|---------|
| SAMPLE + TARE | 7396               | 7434       | 7478    |
| TARE          | 2704               | 2704       | 2704    |
| SAMPLE        | 4692               | 4730       | 4774    |
| DENSITY       | 1642               | 1656       | 1671    |
|               | AVERAGE<br>DENSITY | 1656 kg/m³ |         |

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

SAMPLE DATE:

DATE RECEIVED:

STATION #8 SAMPLE TYPE

DATE TESTED:

January 12, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

|               | TRIAL 1            | TRIAL 2    | TRIAL 3 |
|---------------|--------------------|------------|---------|
| SAMPLE + TARE | 7940               | 7907       |         |
| TARE          | 2704               | 2704       |         |
| SAMPLE        | 5236               | 5203       |         |
| DENSITY       | 1833               | 1821       |         |
|               | AVERAGE<br>DENSITY | 1827 kg/m³ |         |

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

SAMPLE DATE: DATE RECEIVED:

STATION

#9

SAMPLE TYPE Sand

DATE TESTED:

January 13, 1995

UNIT #20

#### RODDED UNIT WEIGHT

FACTOR = 141.0

|               | TRIAL 1            | TRIAL 2      | TRIAL 3 |
|---------------|--------------------|--------------|---------|
| SAMPLE + TARE | 16413              | 16584        | 16600   |
| TARE          | 4288               | 4288         | 4288    |
| SAMPLE        | 12125              | 12296        | 12312   |
| DENSITY       | 1710               | 1734         | 1736    |
|               | AVERAGE<br>DENSITY | 1727 kg/m³ . |         |

FILE:

NAO-1268

Dartmouth, Nova Scotia

B2Y 4A2

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

Sand

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

STATION

SAMPLE TYPE

#12

SAMPLE DATE:

DATE RECEIVED:

DATE TESTED:

January 12, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

|               | TRIAL 1            | TRIAL 2    | TRIAL 3 |
|---------------|--------------------|------------|---------|
| SAMPLE + TARE | 6915               | 6947       | 6955    |
| TARE          | 2704               | 2704       | 2704    |
| SAMPLE        | 4211               | 4243       | 4251    |
| DENSITY       | 1474               | 1485       | 1488    |
|               | AVERAGE<br>DENSITY | 1482 kg/m³ |         |

FILE:

NAO-1268

Dartmouth, Nova Scotia

#13

B2Y 4A2

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

SAMPLE TYPE

94-131 J.L. Hart

SOURCE STATION

Offshore Cape Breton

SAMPLE DATE:

Grave1

DATE RECEIVED: DATE TESTED:

January 12, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

|               | TRIAL 1            | TRIAL 2                | TRIAL 3 |
|---------------|--------------------|------------------------|---------|
| SAMPLE + TARE | 8104               | 8168                   | 8171    |
| TARE          | 2704               | 2704                   | 2704    |
| SAMPLE        | 5400               | 5464                   | 5467    |
| DENSITY       | 1890               | 1912                   | 1913    |
|               | AVERAGE<br>DENSITY | 1905 kg/m <sup>3</sup> |         |

FILE:

NAO-1268

Dartmouth, Nova Scotia

B2Y 4A2

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT: 94-131 J.L. Hart

SOURCE

Offshore Cape Breton

SAMPLE DATE:

STATION

#16

DATE RECEIVED:

SAMPLE TYPE

**Gravel** 

DATE TESTED:

January 13, 1995

UNIT #20

#### RODDED UNIT WEIGHT

FACTOR = 141.0

|               | TRIAL 1            | TRIAL 2                | TRIAL 3 |
|---------------|--------------------|------------------------|---------|
| SAMPLE + TARE | 16201              | 16312                  | 16355   |
| TARE          | 4288               | 4288                   | 4288    |
| SAMPLE        | 11913              | 12024                  | 12067   |
| DENSITY       | 1680               | 1695                   | 1701    |
|               | AVERAGE<br>DENSITY | 1692 kg/m <sup>3</sup> | 1       |

FILE:

NAO-1268

Dartmouth, Nova Scotia

B2Y 4A2

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT: 94-131 J.L. Hart

SOURCE

Offshore Cape Breton

Sand

SAMPLE DATE:

STATION

#17

SAMPLE TYPE

DATE RECEIVED: DATE TESTED:

January 13, 1995

RODDED UNIT WEIGHT

|               | TRIAL 1            | TRIAL 2  | TRIAL 3 |
|---------------|--------------------|--|---------|
| SAMPLE + TARE |                    |  |         |
| TARE          |                    |  |         |
| SAMPLE        |                    |  |         |
| DENSITY       |                    |  |         |
|               | AVERAGE<br>DENSITY | Insufficient Material for density of aggregate test. |         |

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

STATION

#20 SAMPLE TYPE

Grave1

SAMPLE DATE:

DATE RECEIVED:

DATE TESTED:

January 12, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

|               | TRIAL 1            | TRIAL 2    | TRIAL 3 |
|---------------|--------------------|------------|---------|
| SAMPLE + TARE | 8015               | 8101       | 8098    |
| TARE          | 2704               | 2704       | 2704    |
| SAMPLE        | 5311               | 5397       | 5394    |
| DENSITY       | 1859               | 1889       | 1888    |
|               | AVERAGE<br>DENSITY | 1879 kg/m³ |         |

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

Sand

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

**STATION** 

SAMPLE TYPE

#21

SAMPLE DATE:

DATE RECEIVED:

DATE TESTED:

January 13, 1995

IINIT X

#### RODDED UNIT WEIGHT

FACTOR = 350.0

| UNII A        | TRIAL 1            | TRIAL 2    | TRIAL 3 |
|---------------|--------------------|------------|---------|
| SAMPLE + TARE | 8175               | 8136       | 8129    |
| TARE          | 2704               | 2704       | 2704    |
| SAMPLE        | 5471               | 5432       | 5425    |
| DENSITY       | 1915               | 1901       | 1899    |
|               | AVERAGE<br>DENSITY | 1905 kg/m³ |         |

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

STATION

#24

SAMPLE TYPE

Fine Sand

SAMPLE DATE:

DATE RECEIVED:

DATE TESTED:

January 13, 1995

### RODDED UNIT WEIGHT

|               | TRIAL 1            | TRIAL 2  | TRIAL 3 |
|---------------|--------------------|--|---------|
| SAMPLE + TARE |                    |  |         |
| TARE          |                    |  |         |
| SAMPLE        |                    |  |         |
| DENSITY       |                    |  |         |
|               | AVERAGE<br>DENSITY | Insufficient material for density of aggregate test. |         |

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

STATION

SAMPLE TYPE Fine Sand

DATE RECEIVED:

DATE TESTED:

SAMPLE DATE:

January 13, 1995

UNIT X

#### RODDED UNIT WEIGHT

FACTOR = 350.0

|               | TRIAL 1            | TRIAL 2    | TRIAL 3 |
|---------------|--------------------|------------|---------|
| SAMPLE + TARE | 7126               | 7149       | 7161    |
| TARE          | 2704               | 2704       | 2704    |
| SAMPLE        | 4422               | 4445       | 4457    |
| DENSITY       | 1548               | 1556       | 1560    |
|               | AVERAGE<br>DENSITY | 1555 kg/m³ | !       |

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT:

94-131 J.L. Hart

SOURCE

Offshore Cape Breton

SAMPLE DATE: DATE RECEIVED:

STATION

#28

. Sand

DATE TESTED:

January 12, 1995

UNIT # 20

SAMPLE TYPE

#### RODDED UNIT WEIGHT

FACTOR = 141.0

| 7             | , |           | 11101010 11110 |  |
|---------------|---|-----------|----------------|--|
|               | TRIAL 1                                 | TRIAL 2   | TRIAL 3        |  |
| SAMPLE + TARE | 14123                                   | 14133     | 14105          |  |
| TARE          | 4288                                    | 4288      | 4288           |  |
| SAMPLE        | 9835                                    | 9845      | 9817           |  |
| DENSITY       | 1387                                    | 1388      | 1384           |  |
|               | AVERAGE<br>DENSITY                      | 1386 kg/r | n <sup>3</sup> |  |

Dartmouth, Nova Scotia

B2Y 4A2

FILE:

NAO-1268

DATE:

January 26, 1995

CLIENT P.O. 23420-4-M195/01-HAL

ATTN:

Gordon Fader

PROJECT: 94-131 J.L. Hart

SAMPLE TYPE Sand

SOURCE STATION

#29

Offshore Cape Breton

SAMPLE DATE:

DATE RECEIVED:

DATE TESTED:

January 13, 1995

UNIT X

RODDED UNIT WEIGHT

FACTOR = 350.0

|               | TRIAL 1            | TRIAL 2                | TRIAL 3 |
|---------------|--------------------|------------------------|---------|
| SAMPLE + TARE | 8009               | 7965                   | 7987    |
| TARE          | 2704               | 2704                   | 2704    |
| SAMPLE        | 5305               | 5261                   | 5283    |
| DENSITY       | 1857               | 1841                   | 1849    |
|               | AVERAGE<br>DENSITY | 1849 kg/m <sup>3</sup> |         |

MARITIME TESTING (1985) LIMITED
Suite 116, 900 Windmill Road
Dartmouth, N.S. B3B 1P7 468-6486

COARSE SPECIFIC GRAVITY AND ABSORPTION CSA A23.2 - 12A

CLIENT:

AGC/BIO

PROJECT:

**NAO-1268** 

CONTACT:

Gordon Fader

DATE TESTED:

January 26, 1995

| SAMPLE # | BULK SPECIFIC GRAVITY | APPARENT SPECIFIC GRAVITY | ABSORPTION % |
|----------|-----------------------|---------------------------|--------------|
| 1        | 2.43                  | 2.60                      | 2.7          |
| 4        | 2.38                  | 2.62                      | 3.9          |
| 5        | 2.47                  | 2.63                      | 2.5          |
| 8        | 2.45                  | 2.65                      | 3.1          |
| 9        | 2.47                  | 2.64                      | 2.6          |
| 12       | *                     | *                         | *            |
| 13       | 2.57                  | 2.64                      | 1.0          |
| 16       | 2.60                  | 2.63                      | 0.9          |
| 17       | *                     | *                         | *            |
| 20       | 2.54                  | 2.65                      | 1.6          |
| 21       | 2.59                  | 2.66                      | 0.9          |
| 24       | *                     | *                         | *            |
| 25       | 2.54                  | 2.69                      | 2.2          |
| 28       | *                     | *                         | *            |
| 29       | 2.41                  | 2.64                      | 3.6          |

<sup>\*</sup>Insufficient sample to conduct test

#### **FLAT & ELONGATED PARTICLES**

| Client Atla     | ntic | Geosci   | enc  | e Center B     | .I.O.    |              |     | Job         | ) # <u>.</u> | NAO-1268    |
|-----------------|------|----------|------|----------------|----------|--------------|-----|-------------|--------------|-------------|
| Sample #        | 1    |          | _    |                |          |              |     | Dat         | te _         | Jan.26/95   |
| Particl<br>Size | е    | Fla<br>% |      | Elonga<br>%    | ated     | F & E<br>%   |     | Sphere<br>% | ).           | Blocky<br>% |
|                 |      |          |      |                |          |              |     |             |              |             |
|                 |      |          |      |                |          |              |     |             |              |             |
|                 |      |          |      |                |          |              |     |             |              |             |
| Particle        | And  | gular    | Ç,   | AN<br>bangular | GULAR    | ITY<br>unded |     | Rounded     | 14/          | ell-Rounded |
| Size            |      | %        | J.   | %              |          | 6            |     | %           | AA6          | %           |
|                 |      |          |      |                |          |              |     |             |              |             |
|                 |      |          |      |                |          |              |     |             |              | ****        |
|                 |      |          |      |                |          |              |     |             |              |             |
| COMMEN          | TC.  | -        |      |                |          |              |     |             |              |             |
| COMMEN          | 13.  | ıns      | uII1 | icient Samp    | ole To C | onduct '     | Tes | t           |              |             |
|                 |      |          |      |                |          |              |     |             |              |             |

#### **FLAT & ELONGATED PARTICLES**

| Size % % % % %   %                                     |            |
|--|------------|
| Size % % % % %   %                                     | 6/95       |
| Particle Angular Subangular Subrounded Rounded Well-Ro | locky<br>% |
| Particle Angular Subangular Subrounded Rounded Well-Ro |            |
| Particle Angular Subangular Subrounded Rounded Well-Ro |            |
| Particle Angular Subangular Subrounded Rounded Well-Ro |            |
|  |            |
| Size % % % % 9   | ounde<br>% |
|  |            |
|  |            |
|  |            |

#### **FLAT & ELONGATED PARTICLES**

| Client Atla      | ntic G    | Geosci       | <u>ence Center l</u>  | 3.I.O.   |                    | Job          | ) # <u>NAO-1268</u> |
|------------------|-----------|--------------|-----------------------|----------|--------------------|--------------|---------------------|
| ample # _        | 8         |              | -                     |          |                    | Da           | <b>te</b> Jan.26/95 |
| Particle<br>Size | e         | Flat         | Elong %               |          | F & E              | Sphere<br>%  | e. Blocky           |
|                  |           |              |                       |          |                    |              |                     |
|                  |           | <del> </del> |                       |          |                    |              |                     |
|                  |           |              |                       |          | <u> </u>           |              |                     |
| Particle<br>Size | Angı<br>% |              | Al<br>Subangular<br>% | 1        | ITY<br>ounded<br>% | Rounded<br>% | Well-Rounded        |
|                  |           |              |                       |          |                    |              |                     |
|                  |           |              |                       |          |                    |              |                     |
|                  |           |              |                       |          |                    |              |                     |
| COMMEN           | TS:       | Insu         | fficient Samp         | ole To C | onduct 5           | lest         |                     |
|                  |           |              |                       |          |                    |              |                     |

#### **FLAT & ELONGATED PARTICLES**

| Client At1       | antic       | Geosc      | ien         | ce Centre E          | B.I.O. |                   |   | Job          | )#.         | NAO-1268         |
|------------------|-------------|------------|-------------|----------------------|--------|-------------------|---|--------------|-------------|------------------|
| Sample #         | 5           | · · ·      | <del></del> |                      |        |                   |   | Dat          | te <u>J</u> | an.26/95         |
| Particl<br>Size  | e           | Fla<br>%   |             | Elonga<br>%          | ited   | F & E<br>%        |   | Sphere<br>%  | ).          | Blocky<br>%      |
| + 10 1           | nm          | 20.        | 5           | Ø                    |        | ý                 |   | 3.7          |             | 75.8             |
|                  |             |            |             |                      |        |                   |   |              |             |                  |
|                  | <del></del> |            |             |                      |        |                   |   | ·            |             |                  |
| Particle<br>Size |             | gular<br>% | Sı          | AN<br>Jbangular<br>% | 1      | ITY<br>unded<br>% | R | lounded<br>% | W           | ell-Rounded<br>% |
| + 10 mm          |             | 12.1       |             | 40.0                 | 36     |                   |   | 7.8          |             | 3.7              |
|                  |             |            |             |                      |        |                   |   |              |             |                  |
| COMMEN           | TS:         |            |             |                      | ı      |                   |   |              |             |                  |

### **FLAT & ELONGATED PARTICLES**

CSA A23.2 - 13A MODIFIED

| Client | Atlantic Geoscienc | e Center B.I.O. | Job #  | NAO-1268  |
|--------|--------------------|-----------------|--------|-----------|
| Sample | <b>2</b> #13       |                 | Date _ | Jan.26/95 |

| Particle<br>Size | Flat<br>% | Elongated<br>% | F&E<br>% | Sphere.<br>% | Blocky<br>% |
|------------------|-----------|----------------|----------|--------------|-------------|
| + 14 mm          | 31.0      | Ø              | Ø        | Ø            | 69.0        |
| + 10 mm          | 32.9      | Ø              | Ø        | 2.3          | 64.8        |
|                  |           |                |          |              |             |

| Particle<br>Size | Angular<br>% | Subangular<br>% | Subrounded<br>% | Rounded<br>% | Well-Rounded<br>% |
|------------------|--------------|-----------------|-----------------|--------------|-------------------|
| + 14 mm          | 10.6         | 43.5            | 28.2            | 17.7         | Ø                 |
| + 10 mm          | 6.1          | 34.7            | 40.6            | 16.2         | 2.3               |
|                  |              |                 |                 |              |                   |

| COMMENTS: |      |      |      |
|-----------|------|------|------|
|           |      |      |      |
|           | <br> |      | <br> |
|           | <br> | <br> |      |

#### **FLAT & ELONGATED PARTICLES**

CSA A23.2 - 13A MODIFIED

| Client Atlantic  | : Geoscieno | ce Center B.I.O. |            | Job #        | NAO-1268    |
|------------------|-------------|------------------|------------|--------------|-------------|
| Sample #         |             |                  |            | Date "       | an.26/95    |
| Particle<br>Size | Flat<br>%   | Elongated<br>%   | F & E<br>% | Sphere.<br>% | Blocky<br>% |

| Size    | %    | % | %   | <u> </u> | %    |
|---------|------|---|-----|----------|------|
| + 10 mm | 41.7 | Ø | 5.6 | Ø        | 52.7 |
|         |      |   |     |          |      |
|         |      |   |     |          |      |

| Particle<br>Size | Angular<br>% | Subangular<br>% | Subrounded<br>% | Rounded<br>% | Well-Rounded<br>% |
|------------------|--------------|-----------------|-----------------|--------------|-------------------|
| + 10 mm          | 1.0          | 31.2            | 41.3            | 26.5         | Ø                 |
|                  |              |                 |                 |              |                   |

| COMMENTS: |      |      |  |
|-----------|------|------|--|
|           |      |      |  |
|           | <br> |      |  |
|           | <br> | <br> |  |

#### **FLAT & ELONGATED PARTICLES**

CSA A23.2 - 13A MODIFIED

| Client Atlant    | ic Geoscienc | Job #          | NAO-1268 |              |             |
|------------------|--------------|----------------|----------|--------------|-------------|
| Sample #         | 20           |                |          | Date _       | Jan.26/95   |
| Particle<br>Size | Flat         | Elongated<br>% | F&E      | Sphere.<br>% | Blocky<br>% |

| Particle<br>Size | Flat<br>% | Elongated<br>% | F&E<br>% | Sphere.<br>% | Blocky<br>% |
|------------------|-----------|----------------|----------|--------------|-------------|
| + 14 mm          | 4.4       | Ø              | Ø        | Ø            | 95.6        |
| + 10 mm          | 2.4       | 2.8            | Ø        | 4.9          | 89.9        |
|                  |           |                |          |              |             |

| Particle<br>Size | Angular<br>% | Subangular<br>% | Subrounded<br>% | Rounded<br>% | Well-Rounded<br>% |
|------------------|--------------|-----------------|-----------------|--------------|-------------------|
| + 14 mm          | Ø            | Ø               | Ø               | 83.2         | 16.8              |
| + 10 mm          | 1.5          | 2.2             | 3.6             | 82.0         | 10.7              |
|                  |              |                 |                 |              |                   |

| COMMENTS: |  | <br> |  |
|-----------|--|------|--|
|           |  |      |  |
|           |  |      |  |

#### **FLAT & ELONGATED PARTICLES**

CSA A23.2 - 13A MODIFIED

| Client Atlantic Geoscience Center B.I.O. | Job # <sub>NAO-1268</sub> |
|--|---------------------------|
|  |                           |
| Sample # 21                              | Date Jan.26/95            |

| Particle<br>Size | Flat<br>% | Elongated<br>% | F&E<br>% | Sphere.<br>% | Blocky<br>% |
|------------------|-----------|----------------|----------|--------------|-------------|
| + 14 mm          | 1.8       | 0              | Ø        | 1.7          | 96.5        |
| + 10 mm          | 1.7       | 7.1            | ø        | 4.9          | 86.3        |
|                  |           |                |          |              |             |

| Particle<br>Size | Angular<br>% | Subangular<br>% | Subrounded<br>% | Rounded<br>% | Well-Rounded<br>% |
|------------------|--------------|-----------------|-----------------|--------------|-------------------|
| + 14 mm          | Ø            | Ø               | Ø               | 95           | 5                 |
| + 10 mm          | Ø            | Ø               | Ø               | 95           | 5                 |
|                  |              |                 |                 |              |                   |

| COMMENTS: |  | <br> |
|-----------|--|------|
|           |  |      |
|           |  | <br> |
|           |  |      |

#### **FLAT & ELONGATED PARTICLES**

|                  |            | CSA A23.2 - 13A | MODIFIED   |              |             |
|------------------|------------|-----------------|------------|--------------|-------------|
| Client Atlantic  | Geoscience | e Center B.I.O. |            | Job #        | NAO-1268    |
| Sample #29       |            |                 |            | Date _J      | an.26/95    |
| Particle<br>Size | Flat<br>%  | Elongated<br>%  | F & E<br>% | Sphere.<br>% | Blocky<br>% |

| %   | <u></u> | %            | % | <u></u> % |
|-----|---------|--------------|---|-----------|
| 5.2 | Ø       | Ø            | Ø | 94.8      |
|     |         |              |   |           |
|     |         |              |   |           |
|     |         | % %<br>5.2 Ø |   |           |

| Particle<br>Size | Angular<br>% | Subangular<br>% | Subrounded<br>% | Rounded<br>% | Well-Rounded<br>% |
|------------------|--------------|-----------------|-----------------|--------------|-------------------|
| + 20 mm          | Ø            | 10.9            | 24.7            | 61.1         | 3.3               |
|                  |              |                 |                 |              |                   |

| COMMENTS: |      |      |  |
|-----------|------|------|--|
|           |      |      |  |
|           |      |      |  |
|           | <br> | <br> |  |

## COARSE AGGREGATE PETROGRAPHIC ANALYSIS

PER:



| CLIENT:     | Atlantic Geoscience Centre/BIO PRO | JECT       | NAO-126                               | 8        |
|-------------|------------------------------------|------------|---------------------------------------|----------|
| CONTACT:    | Gordon Fader DATE                  | <b>:</b> : | January 31, 1995                      |          |
| PIT NAME:   | Station: #1 DATE                   | TESTED     | January                               | 31, 1995 |
| DATE SAM    | PLED: _ ANAL                       | YST:       | K. Bear                               |          |
|             |                                    |            |                                       |          |
|             | TYPE                               |            | WEIGHT                                | 7 %      |
| FACTOR (1)  | QUARTZITE                          |            |                                       |          |
|             | QUARTZ                             |            |                                       | 1.3      |
|             | GREYWACKE                          |            |                                       |          |
|             | SANDSTONE                          |            |                                       | 3.9      |
|             | GRANITE                            |            |                                       | 46.0     |
|             | CARBONATES                         |            |                                       |          |
|             | VOLCANICS                          |            |                                       |          |
|             | BASALT                             |            |                                       |          |
|             |                                    |            |                                       |          |
|             | SUBTOTAL                           |            |                                       | 51.2     |
| FACTOR (3)  | SANDSTONE                          |            |                                       | 47.8     |
|             | VOLCANICS                          |            | Radi                                  | -        |
|             | GRANITE (BRITTLE OR WEATHERED)     |            |                                       | 1.0      |
|             | SLATE                              |            |                                       | 1.0      |
|             | OUTTOTAL                           |            |                                       | 48.8     |
| FACTOR (6)  | SUBTOTAL                           |            |                                       | 40.0     |
| FACTOR (0)  | SANDSTONE VOLCANICS                |            |                                       |          |
|             | SLATE                              |            | · · · · · · · · · · · · · · · · · · · |          |
|             | SHALE                              |            |                                       |          |
|             | SCHIST                             |            |                                       |          |
|             |                                    |            |                                       |          |
|             | SUBTOTAL                           |            |                                       |          |
| FACTOR (10) | SLATE                              |            |                                       |          |
|             | SHALE                              |            |                                       |          |
|             | OCHRE                              |            |                                       |          |
|             |                                    |            |                                       |          |
|             | SUBTOTAL                           |            |                                       | <u></u>  |
| COMMENTS:   | Crushed by FACTOR 1 X              | 51.2       | = 5                                   | 51.2     |
|             | FACTOR 3 X                         | 48.8       | <del></del>                           | 16.4     |
|             | antly hard rounded granite and     | -70 • 0    | =                                     | 1        |
| soit rou    | and brown bandscone.               |            |                                       |          |
|             | FACTOR 10 X                        |            | =                                     |          |
|             |                                    |            |                                       |          |

"P.N." TOTAL

198



| CLIENT:       | Atlantic Geoscience Centre/BIO | PROJECT     | NAO-1268         |
|---------------|--------------------------------|-------------|------------------|
| CONTACT:      | Gordon Fader                   | DATE:       | January 31, 1995 |
| PIT NAME:     | Station: #4                    | DATE TESTED | January 31, 1995 |
| DATE SAMPLED: |                                | ANALYST:    | K. Bearnes       |
|               |                                |             |                  |

|             | TYPE                           | WEIGHT   | %    |
|-------------|--------------------------------|----------|------|
| FACTOR (1)  | QUARTZITE                      |          | 7.8  |
|             | QUARTZ                         |          |      |
|             | GREYWACKE                      |          |      |
|             | SANDSTONE                      |          | 15.2 |
|             | GRANITE                        |          |      |
|             | CARBONATES                     |          |      |
|             | VOLCANICS                      |          |      |
|             | BASALT                         |          |      |
|             |                                | SUBTOTAL | 23.0 |
| FACTOR (3)  | SANDSTONE                      |          | 56.1 |
|             | VOLCANICS                      |          |      |
|             | GRANITE (BRITTLE OR WEATHERED) |          |      |
|             | SLATE                          |          | 6.4  |
|             |                                |          |      |
|             |                                | SUBTOTAL | 62.6 |
| FACTOR (6)  | SANDSTONE                      |          | 8.1  |
|             | VOLCANICS                      |          |      |
|             | SLATE                          |          |      |
|             | SHALE                          |          |      |
|             | SCHIST                         |          |      |
|             |                                | SUBTOTAL | 8.1  |
| FACTOR (10) |                                |          |      |
|             | SHALE                          |          |      |
|             | OCHRE                          |          |      |
|             | Sandstone                      |          | 6.4  |
|             |                                | UBTOTAL  | 6.4  |

|  |         |     | 23.0 | _ = _ | 23.0  |
|--|---------|-----|------|-------|-------|
| Predominantly soft brown and grey sandstone. FAC | CTOR 3  | x _ | 62.6 | _ = _ | 187.8 |
| FAC  | CTOR 6  | x _ | 8.1  | = _   | 48.6  |
| FAC  | CTOR 10 | x _ | 6.4  | = =   | 64.0  |

| $\Box$ | ځ |
|--------|---|
|        |   |

| I    |              |     |  |
|------|--------------|-----|--|
| PER: | *P.N." TOTAL | 323 |  |

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

| CLIENT:     | Atlantic Geoscience Centre/ B.I.O.   | PROJECT:     | NAO-1268          |  |
|-------------|--|--------------|-------------------|--|
| Contact:    | Gordon Fader   | DATE:        | January 26, 1995  |  |
| PIT NAME:   | Station #5   | DATE TESTED: | January 24 , 1995 |  |
| DATE SAM    |  | ANALYST:     | K. Bearnes        |  |
| <u> </u>    | TYPE   |              | WEIGHT %          |  |
| FACTOR (1)  | QUARTZITE  |              | 5.8               |  |
|             | QUARTZ   |              | 2.7               |  |
|             | GREYWACKE  |              |                   |  |
|             | SANDSTONE  |              | 9.5               |  |
|             | GRANITE  |              | 29.5              |  |
|             | CARBONATES   |              |                   |  |
|             | VOLCANICS  |              |                   |  |
|             | BASALT   |              |                   |  |
|             |  |              |                   |  |
| .*          |  | SUBTOTAL     | <u>- 47.5</u>     |  |
| FACTOR (3)  | SANDSTONE  |              | 35.4              |  |
|             | VOLCANICS  |              |                   |  |
|             | GRANITE (BRITTLE OR WEATHERED)   |              |                   |  |
|             | SLATE  |              | 11.1              |  |
|             | Siltstone  |              |                   |  |
|             | C-1 to the control of | SUBTOTAL     | 46.5              |  |
| FACTOR (6)  | Siltstone  |              | 6.0               |  |
|             | VOLCANICS  |              |                   |  |
|             | SLATE  |              |                   |  |
|             |  | SUBTOTAL     | 6.0               |  |
| FACTOR (10) | SLATE  | SOBIOTAL     | 0.0               |  |
| PACION (10) | SHALE  |              |                   |  |
|             | STALE  |              |                   |  |
|             |  | SUBTOTAL     |                   |  |
|             |  |              |                   |  |
| COMMENTS:   | Crushed by FACT  | OR 1 X 47.5  | <del>=</del> 47.5 |  |
| Hard, row   | nded, red/brown granite, soft, brown, FACT   | OR 3 X 46.5  | = 139.5           |  |
|             |  | OR 6 X 6.0   | = 36.0            |  |
|             | FACT   | OR 10 X      | <b>=</b>          |  |
|             | 83   |              |                   |  |
| PER:        | -P.N.  | * TOTAL 223  |                   |  |
|             |  |              |                   |  |

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| Contact: Gord                           |           | Atlantic Geoscience Centre/B   | .I.O. PROJECT:   | PROJECT: |        | NAO-1268         |  |  |
|---|-----------|--------------------------------|------------------|----------|--------|------------------|--|--|
|   |           | Gordon Fader                   |                  | DATE:    |        | January 26, 1995 |  |  |
|   |           | Station #8                     | DATE TES         | TED:     |        | ry 25, 1995      |  |  |
|   |           | Station "0                     | ANALYST:         |          |        |                  |  |  |
|   |           |                                | ANALTSI.         |          | K. Be  | arnes            |  |  |
|   | TYPE      |                                |                  | <u> </u> | WEIGHT | %                |  |  |
| FACTOR (1)                              | QUARTZ    | TF                             |                  |          |        | 5.9              |  |  |
| ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | QUARTZ    |                                |                  |          |        | 1.9              |  |  |
|   | GREYW     |                                |                  |          |        |                  |  |  |
|   | SANDST    |                                |                  |          |        | 15.2             |  |  |
|   | GRANITI   |                                |                  |          |        | 10.9             |  |  |
|   | CARBO     | NATES                          |                  |          |        |                  |  |  |
|   | VOLCAN    | IICS                           |                  | <u>'</u> |        |                  |  |  |
|   | BASALT    |                                |                  |          |        |                  |  |  |
|   |           |                                |                  |          |        |                  |  |  |
|   |           |                                | SUBTOTAL         |          |        | _ 33.9           |  |  |
| FACTOR (3)                              | Sands     | tone                           |                  |          |        | 63.6             |  |  |
|   | _VOLCAN   | NICS                           |                  |          |        |                  |  |  |
|   | GRANIT    | E (BRITTLE OR WEATHERED)       |                  |          |        |                  |  |  |
|   | SLATE     |                                |                  |          |        |                  |  |  |
|   |           |                                |                  |          |        |                  |  |  |
|   |           |                                | SUBTOTAL         |          |        | 63.6             |  |  |
| FACTOR (6)                              | Mudst     | one                            |                  |          |        | 2.5              |  |  |
|   | VOLCAN    | NICS                           |                  |          |        |                  |  |  |
|   | SLATE     |                                |                  |          |        |                  |  |  |
|   |           |                                |                  |          |        |                  |  |  |
|   |           |                                | SUBTOTAL         | <u> </u> |        | 2.5              |  |  |
| FACTOR (10)                             | SLATE     |                                |                  |          |        |                  |  |  |
|   | SHALE     |                                |                  |          |        |                  |  |  |
|   |           |                                | SUBTOTAL         |          |        |                  |  |  |
|   |           |                                |                  |          |        |                  |  |  |
| COMMENTS:                               | Crushed b | у                              | FACTOR 1 X 33.   | 9        | _ =    | 33.9             |  |  |
| Predomin                                | antly s   | oft, brown, rounded sandstone. | FACTOR 3 X 63.   | 9        |        | 191.7            |  |  |
|   | -         |                                | FACTOR 6 X 2.    | 5        | _ =    | 15.0             |  |  |
|   |           |                                | FACTOR 10 X      |          |        |                  |  |  |
|   |           | 90                             | <u> </u>         |          |        |                  |  |  |
| PER:                                    |           |                                | *P.N.* TOTAL 241 |          |        |                  |  |  |

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| CLIENT:     | Atlantic Geoscience Centre/B.I.O.              | PROJECT:     | NAO-126                                | 58                 |
|-------------|--|--------------|--|--------------------|
| Contact:    | Gordon Fader                                   | DATE:        | January                                | , 26 <b>,</b> 1995 |
| PIT NAME:   | Station #13                                    | DATE TESTED: | January                                | 24, 1995           |
| DATE SAMI   |  | ANALYST:     | K. Bear                                |                    |
| DAIL OAM    | Eule 6/1                                       |              | Tre Bott.                              |                    |
|             |  |              |  | 1                  |
|             | TYPE   |              | WEIGHT                                 | 10.0               |
| FACTOR (1)  | QUARTZITE                                      |              |  | 7.9                |
|             | QUARTZ   |              |  | 7.9                |
|             | GREYWACKE                                      |              |  | 4.0                |
|             | SANDSTONE                                      |              |  | 67.6               |
|             | GRANITE  |              |  | 07.0               |
|             | CARBONATES                                     |              |  |                    |
|             | VOLCANICS BASALT                               |              |  |                    |
|             | DOOLI  |              | •                                      |                    |
|             |  | SUBTOTAL     |  | 89.5               |
| FACTOR (3)  | SANDSTONE                                      |              |  | 10.0               |
|             | VOLCANICS                                      |              |  |                    |
|             | GRANITE (BRITTLE OR WEATHERED)                 | ·            |  |                    |
|             | SLATE  |              |  | 0.5                |
|             |  |              | ······································ | -                  |
|             |  | SUBTOTAL     |  | 10.5               |
| FACTOR (6)  | SANDSTONE                                      |              |  |                    |
|             | VOLCANICS                                      |              |  |                    |
|             | SLATE  |              |  |                    |
|             |  |              |  |                    |
|             | <u> </u>                                       | SUBTOTAL     |  |                    |
| FACTOR (10) | SLATE  |              |  |                    |
|             | SHALE  |              |  |                    |
|             |  | OUDTOTAL     |  |                    |
|             |  | SUBTOTAL     |  |                    |
| COMMENTS:   | Crushed by FACTOR                              | 1 X 89.5     | =                                      | 89.5               |
| D 1 4       | antly hard, rounded, red/brown granite, FACTOR | 3 X 10.5     | =                                      | 31.5               |
| milky qua   | artz and grey quartzite. FACTOR                |              | =                                      |                    |
| · J 1 1 - 1 | FACTOR   | 10 X         | =                                      |                    |
|             | 91   |              |  |                    |
| PER:        | *P.N.* TO                                      | OTAL 121     | ,                                      |                    |
| , had to    |  |              |  |                    |

Sulte 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

| CLIENT: Atlantic Geoscience Centre/ B.I.O.                                       |           | B.I.O. PROJ                | ECT:         | NAO-1268 |   |                   |
|--|-----------|----------------------------|--------------|----------|---|-------------------|
| Contact:   |           | _                          |              | DATE:    |   | 26, 1995          |
| PIT NAME:  |           | Station #16                | DATE TEST    |          | January 2                               |                   |
|  | u ED.     | Station #10                | ANAL         | YST:     | K. Bearne                               |                   |
| DATE SAMP  | LED:      |                            |              |          | K. Bearing                              | = 5               |
|  |           |                            |              |          |   | 1                 |
|  | TYPE      |                            |              |          | WEIGHT                                  | %                 |
| FACTOR (1)   | QUARTZ    | ITE                        |              |          |   | 6.7               |
|  | QUARTZ    |                            |              |          |   | 6.2               |
|  | GREYW     | ACKE                       |              |          |   | <u> </u>          |
|  | SANDST    | ONE                        |              |          |   |                   |
|  | GRANITI   |                            |              |          |   | 70.0              |
|  | CARBON    | NATES                      |              |          |   |                   |
|  | VOLCAN    | IICS                       |              | ,        |   |                   |
|  | BASALT    |                            |              |          |   | -                 |
|  |           |                            |              |          |   |                   |
|  | •         |                            | SUBTOTAL     |          |   | <sub>-</sub> 82.9 |
| FACTOR (3)   | SANDST    | ONE                        |              |          |   | 16.5              |
|  | VOLCAN    | IICS                       |              |          |   |                   |
|  | GRANIT    | E (BRITTLE OR WEATHERED)   |              |          |   |                   |
|  | SLATE     |                            |              |          |   |                   |
|  |           |                            |              |          |   |                   |
|  |           |                            | SUBTOTAL     |          |   | 16.5              |
| FACTOR (6)   | SANDST    | ONE                        |              |          |   | 0.6               |
|  | _VOLCAN   | IICS                       |              |          |   |                   |
|  | SLATE     |                            |              |          |   |                   |
|  |           |                            |              |          |   | 0 (               |
|  |           |                            | SUBTOTAL     |          |   | 0.6               |
| FACTOR (10)  | _\$LATE   |                            |              |          |   |                   |
|  | SHALE     |                            |              |          |   |                   |
|  |           |                            |              |          |   |                   |
|  |           |                            | SUBTOTAL     |          |   |                   |
| COLUMNICATIO   | Couchad b |                            | FACTOR 1 X   | 82.9     | =                                       | 82.9              |
| COMMENTS:  |           |                            | FACTOR 3 X   | 16.5     | ======================================= | 49.5              |
| Predominantly hard, rounded red/brown granite and soft, rounded brown sandstone. |           | -                          |              |          |   |                   |
| granite a  | na sort   | , rounded brown sandstone. | FACTOR 6 X   | 0.6      |   | 3.6               |
|  |           |                            | FACTOR 10 X  |          | =                                       |                   |
|  |           |                            | 92           |          |   |                   |
| PER:   |           |                            | "P.N." TOTAL | 136      |   |                   |

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| CLIENT:   | Atlantic Geoscience Centre/B.I.O. | PROJECT:      | NAO-1268                                |  |
|---|-----------------------------------|---------------|---|--|
| Contact:  | Gordon Fader                      | DATE:         | January 26 <b>,</b> 1995                |  |
| PIT NAME:   | Station #20                       | DATE TESTED:  | January 25, 1995                        |  |
| DATE SAME   |                                   | –<br>ANALYST: | K. Bearnes                              |  |
|   |                                   | <del></del>   | *************************************** |  |
|   |                                   |               |   |  |
|   | TYPE                              |               | WEIGHT % 8.4                            |  |
| FACTOR (1)  | QUARTZITE                         |               | 19.0                                    |  |
|   | QUARTZ                            |               | 19.0                                    |  |
|   | GREYWACKE                         |               |   |  |
|   | SANDSTONE                         |               | 62.9                                    |  |
|   | GRANITE                           |               |   |  |
|   | CARBONATES                        | ,             |   |  |
|   | VOLCANICS  BASALT                 |               | ·                                       |  |
|   | DAOALI                            |               |   |  |
|   |                                   | SUBTOTAL      | _ 90.3                                  |  |
| FACTOR (3)  | SANDSTONE / MUDSTONE              |               | 9.7                                     |  |
|   | VOLCANICS                         |               |   |  |
|   | GRANITE (BRITTLE OR WEATHERED)    |               |   |  |
|   | SLATE                             |               |   |  |
|   |                                   |               |   |  |
|   |                                   | SUBTOTAL      | 9.7                                     |  |
| FACTOR (6)  | SANDSTONE                         |               |   |  |
|   | VOLCANICS                         |               |   |  |
|   | SLATE                             |               |   |  |
|   |                                   |               |   |  |
|   |                                   | SUBTOTAL      |   |  |
| FACTOR (10)   | ŞLATE                             |               |   |  |
|   | SHALE                             |               |   |  |
|   |                                   |               |   |  |
|   |                                   | SUBTOTAL      |   |  |
| COMMENTS:   | Crushed by FACT                   | TOR 1 X 90.3  | = 90.3                                  |  |
| Predominantly hard, rounded, red/brown granite and milky quartz with soft, brown sandstone FACTOR 6 |                                   | TOR 3 X 9.7   | = 29.1                                  |  |
|   |                                   |               | =                                       |  |
| and silts   | tone.                             | TOR 10 X      | *                                       |  |
|   | ~;<br>Ee                          |               |   |  |
|   |                                   | * TOTAL 110   |   |  |
| PER:  | -P.N                              | *TOTAL 119    |   |  |

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| CLIENT:       |                     | Atlantic Geoscience Centre/B.I | .o. PROJECT:     | ,                                     | NAO-12     | 268         |              |
|---------------|---------------------|--------------------------------|------------------|---------------------------------------|------------|-------------|--------------|
| Contact:      |                     | Gordon Fader                   | DATE:            |                                       | Janua      | ry 26, 199  | )5           |
| PIT NAME:     | 4                   | Station #21                    | DATE TEST        | ED:                                   | Janua:     | ry 24 , 199 | )5           |
| DATE SAMPLED: |                     | -                              | ANALYST:         |                                       | K. Bearnes |             |              |
|               |                     |                                |                  |                                       |            |             | -            |
|               | TYPE                |                                |                  | ,                                     | WEIGHT     | %           |              |
| FACTOR (1)    | QUARTZIT            | E                              |                  |                                       |            | 15.0        | <u> </u>     |
| ,,            | QUARTZ              |                                |                  |                                       |            | 16.8        | 3            |
|               | GREYWAC             | CKE                            |                  |                                       |            |             |              |
|               | SANDSTO             |                                |                  |                                       |            | 9.2         | 2            |
|               | GRANITE             |                                |                  |                                       |            | 48.3        | 3            |
| •             | CARBONA             | TES                            |                  | · · · · · · · · · · · · · · · · · · · |            |             | _            |
|               | VOLCANIC            |                                |                  | ,                                     |            |             | _            |
|               | BAŞALT              |                                |                  |                                       |            |             |              |
|               |                     |                                |                  |                                       |            |             | _            |
|               |                     | 3                              | SUBTOTAL         |                                       |            | _ 89.1      | <u>3</u>     |
| FACTOR (3)    | SANDSTO             | NE/Mudstone                    |                  |                                       |            | 9.1         | <u>3</u>     |
|               | VOLCANIC            | OS                             |                  |                                       |            |             | 4            |
|               | GRANITE             | (BRITTLE OR WEATHERED)         |                  | •                                     |            |             |              |
|               | SLATE               |                                |                  |                                       |            | 1.          | 4            |
|               |                     |                                |                  | ·····                                 |            |             |              |
|               |                     |                                | SUBTOTAL         |                                       |            | 10.         | <del>7</del> |
| FACTOR (6)    | SANDSTO             | NE                             |                  |                                       |            |             |              |
|               | VOLCANIC            | os                             |                  |                                       |            |             | _            |
|               | SLATE               |                                |                  |                                       |            |             |              |
|               |                     |                                |                  |                                       |            |             |              |
|               |                     |                                | SUBTOTAL         | · · · · · ·                           |            |             |              |
| FACTOR (10)   | SLATE               |                                |                  |                                       |            |             |              |
|               | SHALE               |                                |                  | · · · · · · · · · · · · · · · · · · · |            |             |              |
|               | <u> </u>            |                                |                  |                                       |            |             |              |
|               |                     |                                | SUBTOTAL         |                                       |            | 1           |              |
| COMMENTS:     | Crushed by          | 1                              | FACTOR 1 X 89.   | 3                                     | =          | 89.3        |              |
|               |                     | nantly red/brown, rounded,     | FACTOR 3 X 10.   |                                       |            | 32.1        |              |
| hard gra      | predomi<br>nite, mi | mancry red/brown, rounded,     | FACTOR 6 X       | <u>/</u>                              | _ <u></u>  | <u> </u>    |              |
| 0-~           | ,                   |                                | FACTOR 10 X      |                                       |            |             |              |
|               |                     | 54                             | TACION IU A      |                                       |            |             |              |
|               |                     |                                |                  |                                       |            |             |              |
| PER:          |                     |                                | *P.N.* TOTAL 121 |                                       |            |             |              |

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| CLIENT:                                     | <u>Atlantic Geoscience Centre/</u> | B.I.O. PROJECT:  | NAO-126    | 3        |  |
|---|------------------------------------|------------------|------------|----------|--|
| Contact:                                    | Gordon Fader                       | DATE:            | January    | 26, 1995 |  |
| PIT NAME:                                   | Station #29                        | DATE TESTED      | : January  | 25, 1995 |  |
| DATE SAMPLED:                               |                                    | ANALYST:         | K. Bearnes |          |  |
|   | TYPE                               |                  | WEIGHT     | \ %      |  |
| FACTOR (1)                                  | QUARTZITE                          |                  |            | 13.3     |  |
|   | QUARTZ                             |                  |            | 3.3      |  |
|   | GREYWACKE                          |                  |            |          |  |
|   | SANDSTONE                          |                  |            | 2.2      |  |
|   | GRANITE                            |                  |            | 9.2      |  |
|   | CARBONATES                         |                  |            |          |  |
|   | VOLCANICS                          |                  |            |          |  |
|   | BASALT                             |                  |            |          |  |
|   |                                    |                  |            |          |  |
|   |                                    | SUBTOTAL         |            | _ 28.0   |  |
| FACTOR (3)                                  | SANDSTONE                          |                  |            | 66.4     |  |
|   | VOLCANICS                          |                  |            |          |  |
|   | GRANITE (BRITTLE OR WEATHERED)     |                  |            |          |  |
|   | SLATE                              |                  |            |          |  |
|   |                                    | OUDTOTAL         |            | 66.4     |  |
| FACTOR (6)                                  | SANDSTONE/Mudstone                 | SUBTOTAL         |            | 5.6      |  |
| FACTOR (6)                                  | VOLCANICS                          |                  |            | 3.0      |  |
|   | SLATE                              |                  |            |          |  |
|   | OLATE                              |                  |            |          |  |
|   |                                    | SUBTOTAL         |            | 5.6      |  |
| FACTOR (10)                                 | SLATE                              |                  |            |          |  |
|   | SHALE                              |                  |            |          |  |
|   |                                    |                  |            |          |  |
|   |                                    | SUBTOTAL         |            |          |  |
| 0014457550                                  | Ourholdhu                          | FACTOR 1 X 28.0  |            | 0 0      |  |
| COMMENTS: Crushed by                        |                                    |                  |            | 28.0     |  |
| Predominantly rounded, soft brown sandstone |                                    | FACTOR 3 X 66.4  |            | 9.2      |  |
| and siltstone.                              |                                    | FACTOR 6 X 5.6   | 3          | 3.6      |  |
|   | E                                  | FACTOR 10 X      | =          |          |  |
|   |                                    |                  |            |          |  |
| PER   |                                    | *P.N.* TOTAL 261 |            |          |  |
|   |                                    |                  |            |          |  |



### LOS ANGELES ABRASION METRIC TEST REPORT

Atlantic Geoscience Centre/Bio TO

Dartmouth, Nova Scotia

B2Y 4A2

Attention: Gordon Fader

PROJECT NO.

NAO-1268

DATE CLIENT P.O. January 26, 1995 23420-4-M195/01-HAL

CC

| <b>PROJECT</b> 94-131 J.L. Hart            |                       |  |             |             |      |
|--|-----------------------|--|-------------|-------------|------|
| SOURCE Station #16                         | TYPE OF SAMPLE 0.50"  | Gravel   | SAMPLED BY  | Client      |      |
| DATE SAMPLED -                             | DATE RECEIVED         | _  | DATE TESTED | January 26, | 1995 |
|  |                       |  |             |             |      |
| MATERIAL                                   | . GRADING:            | D  |             |             |      |
| ACTUAL SIEVE SIZES                         |                       | AM   | OUNT        |             |      |
| 5mm + 2.5mm                                |                       |  |             | 5003.0      | g    |
| +  |                       |  |             |             | g    |
| _ +  |                       |  |             |             | g    |
| +  |                       |  |             |             | g    |
|  | TOTAL SAMPLE          |  |             | 5003.0      | g    |
| NO. OF REVOLUTIONS 500                     |                       |  |             |             |      |
| NO. OF SPHERES 6                           | TOTAL SAMPLE          | out the same of th |             | 5003.0      |      |
| WT. OF SPHERES g                           | + 1.8 MATERIAL AFTER  |  |             | 3904.4      | g    |
|  | - 1.8 MATERIAL AFTER  |  |             | 1098.6      | g    |
| LOS ANGELES ABRASION= LOSS<br>TOTAL SAMPLE | 1098.6 x 100 = 5003.0 | 22   | %           |             |      |
|  |                       |  |             |             |      |

COMMENTS:

CSA A23.2 - 16A

96

**TECHNICIAN** D.Garden/B. Mercer REPORT CERTIFIED

Suite 116, 900 Windmill Road Dartmouth, N.S. B3B 1P7 468-6486

#### SHELL CONTENT TEST RESULTS

CLIENT:

AGC/BIO

PROJECT:

NAO-1268

CONTACT: 23420-4-M195/01-HAL

DATE TESTED:

**JANUARY 16, 1995** 

ANALYST: BM/KB

BS882:

1992

| SAMPLE # | SHELL CONTENT<br>COARSER THAN 10 mm |     | SHELL CONTENT<br>FINER THAN 10 mm |              |
|----------|-------------------------------------|-----|-----------------------------------|--------------|
|          | %                                   | *** | %                                 | ***          |
| 1        | 0                                   | 0   | 0.1                               | 0            |
| 4*       |                                     | -   |                                   | -            |
| 5        | 0.4                                 | 0   | 0.3                               | 0            |
| 8        | 0                                   | 0   | 0.7                               | 1            |
| 9        | 0.2                                 | 0   | 1.0                               | 1            |
| 12*      | -                                   | -   | -                                 | <del>-</del> |
| 13       | 0.2                                 | 0   | 0.3                               | 0            |
| 16       | 0                                   | 0   | 0                                 | 0            |
| 17*      | -                                   | -   | -                                 | -            |
| 20       | 0                                   | 0   | 0.1                               | 0            |
| 21       | 0                                   | 0   | 0                                 | 0            |
| 24*      | mat .                               |     | -                                 | -            |
| 25       | 0                                   | 0   | 1.0                               | 1            |
| 28*      | -                                   | -   | -                                 | -            |
| 29       | 0.3                                 | 0   | 2.3                               | 2            |

<sup>\*</sup>Insufficient material to conduct test

<sup>\*\*\*</sup>Rounded to nearest whole number

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#### AS RECEIVED MOISTURE CONTENT

CLIENT:

AGC/BIO

PROJECT:

NAO-1268

CONTACT:

Gordon Fader

DATE TESTED:

January 6, 1995

| SAMPLE # | MOISTURE CONTENT % |
|----------|--------------------|
| STN #1   | 14.4               |
| STN #4   | 41.4               |
| STN #5   | 31.7               |
| STN #8   | 24.4               |
| STN #9   | 24.0               |
| STN #12  | 26.6               |
| STN #13  | 14.8               |
| STN #17  | 32.6               |
| STN #16  | 13.1               |
| STN #20  | 18.3               |
| STN #21  | 15.2               |
| STN #24  | 34.3               |
| STN #25  | 25.6               |
| STN #28  | 43.2               |
| STN #29  | 16.9               |

As received moisture; all samples arrived in a saturated condition.

c:\wpdoc\forms\armc.kb