

APPENDIX E
GEOTECHNICAL DATA



January 11, 1995

Mr. John Carter
Science Applications International Corp.
1710 Goodridge Drive, M/S T2-2-4
McLean, VA 22102

Subject: Geotechnical Analysis Services
Tooele Army Depot-South Area
Tooele, Utah

Delta Job No. 3503

Dear Mr. Carter:

This report summarizes our geotechnical analysis of the samples delivered to us by your representative Mr. Mike Miles. The samples were received in sealed plastic sample bottles. Some samples were limited in size. The natural moisture content may not reflect actual conditions due to the interval between the sample date and testing date.

GEOTECHNICAL ANALYSIS AND UNIFIED SOIL CLASSIFICATION

Sample No.: SB-19-003
Depth: 26 to 28 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	96.0
3/8 in.	81.0
No. 4	64.2
No. 8	56.0
No. 16	51.0
No. 30	47.6
No. 50	42.7
No. 100	36.9
No. 200	29.9

ATTERBERG LIMITS

Liquid Limit (LL)	22.8
Plastic Limit (PL)	15.9
Plasticity Index (PI)	7.1

NATURAL MOISTURE CONTENT

Percent Moisture	13.2
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UNIFIED SOIL CLASSIFICATION

Description:
Light Brown Sand and Clayey Gravel

Classification: SC-GC

The amount of sample available for testing was very small, therefore, the results of these tests may not be representative.

Sample No.: SB-19-003
 Depth: 33 to 35 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	100
No. 8	99.2
No. 16	97.5
No. 30	90.2
No. 50	82.1
No. 100	75.0
No. 200	55.8

ATTERBERG LIMITS

Liquid Limit (LL)	26.0
Plastic Limit (PL)	12.0
Plasticity Index (PI)	14.0

NATURAL MOISTURE CONTENT

Percent Moisture	9.8
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UNIFIED SOIL CLASSIFICATION

Description:
 Light Brown Sandy Clay

Classification: **CL**

The amount of sample available for testing was very small, therefore, the results of these tests may not be representative.

Sample No.: SB-19-004
 Depth: 29 to 31 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	92.8
No. 8	82.8
No. 16	81.4
No. 30	78.2
No. 50	70.2
No. 100	58.3
No. 200	45.8

ATTERBERG LIMITS

Liquid Limit (LL)	*
Plastic Limit (PL)	*
Plasticity Index (PI)	*

NATURAL MOISTURE CONTENT

Percent Moisture	7.5
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UNIFIED SOIL CLASSIFICATION

Description:
 Light Brown to Gray Silty Sand

Classification: **SM**

* Non-Plastic

The amount of sample available for testing was very small, therefore, the results of these tests may not be representative.

Sample No.: SB-19-05
Depth: 15.0 to 16.0 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	100
No. 8	98.4
No. 16	96.8
No. 30	96.1
No. 50	91.2
No. 100	76.2
No. 200	63.7

ATTERBERG LIMITS

Liquid Limit (LL)	26.0
Plastic Limit (PL)	12.0
Plasticity Index (PI)	14.0

NATURAL MOISTURE CONTENT

Percent Moisture	4.7
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UNIFIED SOIL CLASSIFICATION

Description:
Dark Brown Sandy Clay

Classification: CL

Sample No.: SB-19-005
Depth: 25.0 to 27.0 feet.

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	100
No. 8	99.3
No. 16	97.2
No. 30	87.5
No. 50	81.2
No. 100	75.7
No. 200	70.5

ATTERBERG LIMITS

Liquid Limit (LL)	*
Plastic Limit (PL)	*
Plasticity Index (PI)	*

NATURAL MOISTURE CONTENT

Percent Moisture	6.2
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UNIFIED SOIL CLASSIFICATION

Description:
Brown Fine Sandy Silt

Classification: ML

* Non-Plastic

Sample No.: SB-19-006
Depth: 25 to 27 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	100
No. 8	99.4
No. 16	98.5
No. 30	97.8
No. 50	97.4
No. 100	93.5
No. 200	88.1

ATTERBERG LIMITS

Liquid Limit (LL)	29.4
Plastic Limit (PL)	21.5
Plasticity Index (PI)	7.9

NATURAL MOISTURE CONTENT

Percent Moisture	5.7
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UNIFIED SOIL CLASSIFICATION

Description:
Light Brown Sandy Clay

Classification: CL

Sample No.: SB-19-007
Depth: 15 to 17 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	100
No. 8	99.2
No. 16	98.0
No. 30	97.5
No. 50	96.9
No. 100	95.4
No. 200	93.8

ATTERBERG LIMITS

Liquid Limit (LL)	40.0
Plastic Limit (PL)	21.6
Plasticity Index (PI)	18.4

NATURAL MOISTURE CONTENT

Percent Moisture	23.6
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UNIFIED SOIL CLASSIFICATION

Description:
Light Brown to Gray Sandy Clay

Classification: CL

Sample No.: MW-5-113-94
Depth: 39 to 40.5 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	100
No. 8	99.4
No. 16	99.0
No. 30	98.6
No. 50	97.7
No. 100	82.2
No. 200	62.8

* Non-Plastic

Sample No.: MW-5-113-94
Depth: 129 to 130.5 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	92.2
3/8 in.	60.6
No. 4	41.8
No. 8	35.3
No. 16	31.1
No. 30	25.8
No. 50	19.6
No. 100	11.4
No. 200	7.6

* Non-Plastic

ATTERBERG LIMITS

Liquid Limit (LL)	*
Plastic Limit (PL)	*
Plasticity Index (PI)	*

NATURAL MOISTURE CONTENT

Percent Moisture	10.6
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UNIFIED SOIL CLASSIFICATION

Description:
Light Brown Fine Sandy Silt

Classification: ML

ATTERBERG LIMITS

Liquid Limit (LL)	*
Plastic Limit (PL)	*
Plasticity Index (PI)	*

NATURAL MOISTURE CONTENT

Percent Moisture	10.0
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UNIFIED SOIL CLASSIFICATION

Description:
Gray to Brown, Clean to Silty, Sandy Gravel

Classification: GW-GM

Sample No.: MW-5-114-94
Depth: 79 to 80.5 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	86.1
3/8 in.	65.7
No. 4	48.5
No. 8	42.8
No. 16	39.0
No. 30	38.0
No. 50	36.8
No. 100	35.8
No. 200	34.3

ATTERBERG LIMITS

Liquid Limit (LL)	29.5
Plastic Limit (PL)	15.5
Plasticity Index (PI)	13.8

NATURAL MOISTURE CONTENT

Percent Moisture	14.2
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UNIFIED SOIL CLASSIFICATION

Description:
Light Brown Clayey, Sandy, Gravel

Classification: **GW-GC**

Sample No.: MW-5-115-94
Depth: 119 to 120 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	100
No. 8	99.0
No. 16	96.8
No. 30	95.9
No. 50	94.4
No. 100	93.2
No. 200	90.1

ATTERBERG LIMITS

Liquid Limit (LL)	39.2
Plastic Limit (PL)	16.2
Plasticity Index (PI)	23.0

NATURAL MOISTURE CONTENT

Percent Moisture	18.3
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UNIFIED SOIL CLASSIFICATION

Description:
Light Brown Sandy Clay

Classification: **CL**

Sample No.: MW-5-115-94
Depth: 129 to 130 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	68.6
3/4 in.	42.7
3/8 in.	35.4
No. 4	26.0
No. 8	24.9
No. 16	22.5
No. 30	20.9
No. 50	19.1
No. 100	18.4
No. 200	17.3

ATTERBERG LIMITS

Liquid Limit (LL)	24.2
Plastic Limit (PL)	17.9
Plasticity Index (PI)	6.3

NATURAL MOISTURE CONTENT

Percent Moisture	2.1
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UNIFIED SOIL CLASSIFICATION

Description:
Gray Brown Clayey Sandy Gravel

Classification: GC

Sample No.: MW-5-116-94
Depth: 49 to 50.5 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	100
No. 8	98.9
No. 16	97.7
No. 30	96.6
No. 50	96.0
No. 100	94.5
No. 200	93.8

ATTERBERG LIMITS

Liquid Limit (LL)	30.0
Plastic Limit (PL)	22.5
Plasticity Index (PI)	7.5

NATURAL MOISTURE CONTENT

Percent Moisture	17.2
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UNIFIED SOIL CLASSIFICATION

Description:
Light Brown Sandy Clay

Classification: CL

Sample No.: MW-5-116-94
Depth: 149 to 150.5 feet

GRADATION ANALYSIS

Sieve Size	Percent Passing
3.0 in.	100
1.5 in.	100
3/4 in.	100
3/8 in.	100
No. 4	94.8
No. 8	92.6
No. 16	90.6
No. 30	88.1
No. 50	86.4
No. 100	83.4
No. 200	73.3

ATTERBERG LIMITS

Liquid Limit (LL)	42.7
Plastic Limit (PL)	19.1
Plasticity Index (PI)	23.6

NATURAL MOISTURE CONTENT

Percent Moisture	19.3
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UNIFIED SOIL CLASSIFICATION

Description:
Fine Sandy Clay

Classification: **CL**

All soil tests were performed according to the following ASTM Standards:

Sieve Grain Size:	ASTM Method D-421, D-422, and D-2217
Moisture Content:	ASTM Method D-2216-80
Atterberg Limits:	ASTM Method D-4318

The soil was then classified using the Unified Soil Classification System.

We appreciate the opportunity to assist you in this project. If you have any questions please call our office at (801) 487-7754.

Very truly yours,

DELTA GEOTECHNICAL CONSULTANTS, INC.

Warren D. Clyde

WARREN D. CLYDE

Inspection Services Manager

WDC/