GREEN RIVER, UTAH CONTAMINATED MATERIAL MOISTURE CONTENT, DENSITY AND COMPACTION DATA

November 1989

MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON KNUDSEN COMPANY

9001040097 891215
PDR WASTE
WM-68 PDC

GREEN RIVER, UTAH CONTAMINATED MATERIAL MOISTURE CONTENT, DENSITY AND COMPACTION DATA

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MORRISON-KNUDSEN ENGINEERS, INC.
A MORRISON KNUDSEN COMPANY

FORWARD

The enclosed information consists of copies of original data sheets recorded by MK-F to document moisture content, density and compaction test data of contaminated materials placed in the disposal cell at Green River, Utah.

DENSITY/MOISTURE CONTENT DATA PAIRS

10" 10" LIFT
CONTAMINATED MATERIAL
4 PASSES OF VIBRATORY ROLLER

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

ORIGINAL

MKE DOC. 5057-GRN-R-02-01420-00

QA REVIEWED FOR QUALITY REQUIREMENTS BY SJM 4/6/89
QA ENTRY NO. 695

CONTRACT 3050
GREEN RIVER, UTAH

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050-GREEN RIVER Date 4/5/89 Test Number CM-S-001

Location of Test SOUTH QUADRANT OF CELL AT EL 4105 (VICINITY PROPERTY MATERIAL)

Unit Weight of Sand (lbs./cu.ft.) 82.9 Type of Material SILTY SAND

Test Specification 02200 REV C Curve Number CM-4-017

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.77
Weight of sand used (lbs.)	8.23
Gross volume (cu. ft.)	.0993
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0633
Wet weight of material from hole (lbs.)	7.55
Wet density (lbs. cu. ft.)	119.3
Dry density (lbs./cu. ft.)	109.9

RECEIVED - MKE
APR 13 1989
UMTRA-S.F.

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		732.6
Dry weight, soil | dish (gm.)		688.3
Weight of water (gm.)		44.3
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		513.6
Water content, % of dry weight		8.6

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	117.7
Wet weight of sample (lbs.)		Optimum moisture	11.7

-3.1% BELOW OPTIMUM MOISTURE

PERCENTAGE DENSITY OF SAMPLE 93.4%

Comments: SPECS: GR-001 & GR-002
A 4-POINT WAS CONDUCTED ON THIS SAMPLE / NO CM-4-017

Test By [signature]

Checked By Steve Dike

2ND 10" LIFT
CONTAMINATED MATERIAL
4 PASSES OF VIBRATORY ROLLER

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

ORIGINAL

CONTRACT # 3050
GREEN RIVER, UTAH

INFORMATION ONLY

QA REVIEWED FOR QUALITY REQUIREMENTS
BY Sam 4/6/89
QA ENTRY NO. 696

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/5/89 Test Number CM-S-002

Location of Test SOUTH QUADRANT OF CELL AT REV 4105 (VICINITY PROPERTY MATERIAL)

Unit Weight of Sand (lbs./cu.ft.) 82.9 Type of Material SILTY SAND

Test Specification 07200 REV C Curve Number CM-4-07

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.44
Weight of sand used (lbs.)	8.56
Gross volume (cu. ft.)	.1033
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0673
Wet weight of material from hole (lbs.)	7.68
Wet density (lbs. cu. ft.)	114.1
Dry density (lbs./cu. ft.)	105.8

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number		MECO	/ OVEN
Wet weight, soil | dish (gm.)		774.8	781.4
Dry weight, soil | dish (gm.)		731.6	735.9
Weight of water (gm.)		43.2	45.5
Weight of dish (gm.)		174.7	174.7
Dry weight of sample (gm.)		556.9	561.2
Water content, % of dry weight		7.8	8.1

OK

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	117.7
Wet weight of sample (lbs.)		Optimum moisture	11.7

- 3.9% OF OPTIMUM MOISTURE

PERCENTAGE DENSITY OF SAMPLE 89.9 %

Comments: SCALES: 68-001 & 68-002

Test By [signature]

Checked By Steve Dike

ORIGINAL

MK-FERGUSON COMPANY
A MORRISON-KNUDSEN COMPANY

3050

GREEN RIVER, UTAH

CONTAMINATED MATERIAL
4 PASSES OF VIBRATORY ROLLER

INFORMATION ONLY

QA REVIEWED FOR QUALITY REQUIREMENTS
BY Sim 4/6/89
QA ENTRY NO. 697

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/5/89 Test Number CM-S-003

Location of Test SOUTH QUADRANT OF CELL AT ELEV 4106 (VICINITY PROPERTY MATERIAL)

Unit Weight of Sand (lbs./cu.ft.) 82.9 Type of Material BROWN SILTY SAND

Test Specification 02200 REV C Curve Number CM-4-017

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	4.48
Weight of sand used (lbs.)	7.52
Gross volume (cu. ft.)	.0907
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0547
Wet weight of material from hole (lbs.)	6.34
Wet density (lbs. cu. ft.)	115.9
Dry density (lbs./cu. ft.)	107.5

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		774.8
Dry weight, soil | dish (gm.)		731.6
Weight of water (gm.)		43.2
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		556.9
Water content, % of dry weight		7.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	119.3
Wet weight of sample (lbs.)		Optimum moisture	12.0

-4.2% BELOW OPTIMUM MOISTURE

PERCENTAGE DENSITY OF SAMPLE 90.1%

Comments: SCALE USED: 6B-001 & 6B-002
4 POINT PROCTOR WAS CONDUCTED
ON THIS SAMPLE / NO CM-4-016

Test By [signature]

Checked By Steve Dike

4" 10" LIFT
CONTAMINATED CATL
4 PASSES OF VIBRATORY ROLLER

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH

INFORMATIC
ONLY

QA REVIEWED FOR QUALITY REQUIREMENTS
BY SDM 4/6/89
QA ENTRY NO. 698

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/5/89 Test Number CM-S-004

Location of Test SOUTH QUADRANT OF CELL AT ELEV 4106 (VICINITY PROPERTY MATERIAL)

Unit Weight of Sand (lbs./cu.ft.) 82.9 Type of Material SILTY SAND

Test Specification 02200 REV C Curve Number CM-4-017

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.62
Weight of sand used (lbs.)	8.38
Gross volume (cu. ft.)	.1011
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0651
Wet weight of material from hole (lbs.)	7.10
Wet density (lbs. cu. ft.)	109.1
Dry density (lbs./cu. ft.)	101.8

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		781.4
Dry weight, soil | dish (gm.)		740.6
Weight of water (gm.)		40.8
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		565.9
Water content, % of dry weight		7.2

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	119.3
Wet weight of sample (lbs.)		Optimum moisture	12.0

- 4.8% OF OPTIMUM MOISTURE

PERCENTAGE DENSITY OF SAMPLE 85.3%

Comments: SCALES GR-001 & GR-002

Test By Steven Martz

Checked By Steve Dike

ORIGINAL
MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY
CONTRACT # 3050
GREEN RIVER, UTAH

4TH LIFT
CONTAMINATED MATERIAL
4 PASSES OF VIBRATORY ROLLER
4 PASSES OF TAMPING FOOT

INFORMATION ONLY

QA REVIEWED FOR QUALITY REQUIREMENTS BY SDM 4/6/89
QA ENTRY NO. 699

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/5/89 Test Number CM-S-005 SDM 4/6/89

Location of Test SOUTH QUADRANT OF CELL C ELEV 4106 (VICINITY PROPERTY MATERIAL

Unit Weight of Sand (lbs./cu.ft.) 82.9 Type of Material SILTY SAND

Test Specification 02200 REV C Curve Number CM-4-017

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.16
Weight of sand used (lbs.)	8.84
Gross volume (cu. ft.)	.1066
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0706
Wet weight of material from hole (lbs.)	8.49
Wet density (lbs. cu. ft.)	120.3
Dry density (lbs./cu. ft.)	112.7

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		741.8
Dry weight, soil | dish (gm.)		706.2
Weight of water (gm.)		35.6
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		531.5
Water content, % of dry weight		6.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	119.3
Wet weight of sample (lbs.)		Optimum moisture	12.0

-5.3% OF OPTIMUM MOISTURE

PERCENTAGE DENSITY OF SAMPLE 94.5%

Comments: SCALE USED: GB-001 & GB-002 Test By Steven Montz

AFTER THIS 1ST 1000 YARDS, 4 PASSES Checked By Steve Dike

EACH WERE CONDUCTED ON THE CONTAMINATED MATERIAL OF THE SHEEPS FOOT ROLLER & VIBRATORY ROLLER.

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH

QA REVIEWED FOR QUALITY REQUIREMENTS
BY SDM 4/7/89
QA ENTRY NO. 711

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 GREEN RIVER Date 4/6/89 Test Number CM-S-006

Location of Test N59,630 E59,015 @ EL 4106 (J.P. MATERIAL)

Unit Weight of Sand (lbs./cu.ft.) 82.1 Type of Material GRAVELY SAND

Test Specification 02200 Rel 2 Curve Number CM-4-018

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.37
Weight of sand used (lbs.)	8.63
Gross volume (cu. ft.)	.1051
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0691
Wet weight of material from hole (lbs.)	8.70
Wet density (lbs. cu. ft.)	125.9
Dry density (lbs./cu. ft.)	114.7

WATER CONTENT

NOTE: A FOUR POINT PROCTOR WAS CONDUCTED AFTER THE ONE-POINT COULD NOT BE MATCHED.

	Maximum Density Point		Field Density Test
Moisture pan number	MECCONNAHE	OVEN	MECCONNAHE
Wet weight, soil | dish (gm.)	768.6	756.2	825.3
Dry weight, soil | dish (gm.)	713.3	700.8	767.0
Weight of water (gm.)	55.3	55.4	58.3
Weight of dish (gm.)	174.7	174.7	174.7
Dry weight of sample (gm.)	538.6	526.1	592.3
Water content, % of dry weight	10.3	10.5	9.8

OK

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0247E3	Wet density (lbs./cu.ft.)	134.1
Weight of mold and soil (lbs.)	24.90	Dry density (lbs./cu. ft.)	121.6
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	121.7
Wet weight of sample (lbs.)	10.02	Optimum moisture	10.8

-1.0% OF OPTIMUM MOISTURE
THE AREA WAS RETESTED FOR MOISTURE & PASSED.

PERCENTAGE DENSITY OF SAMPLE 94.2 %

Comments: SCALES USED: GP-01 & GT-002
4 PASSES OF VIBRATORY ROLLER
& 4 PASSES W/ TAMPING FOOT.

Test By Steven Watts

Checked By Steve Dike

SEE MOISTURE TEST NO. CM-M-007 & CM-M-007-R1

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH

QA REVIEWED FOR QUALITY REQUIREMENTS
BY Sam 4/7/89
QA ENTRY NO. 712

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050-GREEN RIVER Date 4/6/89 Test Number CM-S-007

Location of Test N59,390 E59,110 GREEN 4106 (U.P. MATERIAL)

Unit Weight of Sand (lbs./cu.ft.) 82.1 Type of Material GRAVELLY SAND

Test Specification N/A Curve Number CM-4-018

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	4.01
Weight of sand used (lbs.)	7.99
Gross volume (cu. ft.)	.0973
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0613
Wet weight of material from hole (lbs.)	7.92
Wet density (lbs. cu. ft.)	129.2
Dry density (lbs./cu. ft.)	117.9

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		822.7
Dry weight, soil | dish (gm.)		766.2
Weight of water (gm.)		56.5
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		591.5
Water content, % of dry weight		9.6

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	121.7
Wet weight of sample (lbs.)		Optimum moisture	10.8

-1.2% BELOW OPTIMUM MOISTURE
* THE AREA WAS RETESTED FOR MOISTURE & PASSED.

PERCENTAGE DENSITY OF SAMPLE 96.9%

Test By Steven Martin

Checked By Steve Dike

Comments: SCALES USED: 68-001 & 68-002

4 PASSES OF VIBRATORY ROLLER &

4 PASSES OF TAMPING FOOT ROLLER.

SEE MOISTURE TEST NO. CM-M-005 & CM-M-005-R1

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH

CONTAMINATED MATERIAL
4 PASSES OF VIBRATORY ROLLER &
4 PASSES OF A TAMPING FOOT
1ST 10" LIFT TODAY
3' ABOVE TYPE "A" MATERIAL.

FIELD DENSITY TEST - SAND CONE METHOD

INFORMATION ONLY

QA REVIEWED FOR QUALITY REQUIREMENTS
BY SDM 4/7/89
QA ENTRY NO. 713

Job 3050 - GREEN RIVER Date 4/6/89 Test Number CM-S-008

Location of Test SOUTH QUADRANT OF CELL @ ELEV 4107 (WINDBLOWN MAT'L) SDM 4/11/89

Unit Weight of Sand (lbs./cu.ft.) 82.2 Type of Material SILTY SAND W/GRAVEL

Test Specification 02200 REV 2 Curve Number CM-4-010

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.11
Weight of sand used (lbs.)	8.89
Gross volume (cu. ft.)	.1082
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0722
Wet weight of material from hole (lbs.)	9.13
Wet density (lbs. cu. ft.)	126.5
Dry density (lbs./cu. ft.)	119.7

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	OVEN	OVEN
Wet weight, soil | dish (gm.)	810.6	754.7
Dry weight, soil | dish (gm.)	757.6	723.5
Weight of water (gm.)	53.0	31.2
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	582.9	548.8
Water content, % of dry weight	9.1	5.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747 FT3	Wet density (lbs./cu.ft.)	135.6
Weight of mold and soil (lbs.)	25.01	Dry density (lbs./cu. ft.)	124.3
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)	10.13	Optimum moisture	10.7

- 5.0% BELOW OPTIMUM MOISTURE

PERCENTAGE DENSITY OF SAMPLE 96.4%

Comments: SCALES USED: GR-001 & GR-002

Test By Steven Martz

Checked By Steve Dike

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH

QA REVIEWED FOR QUALITY REQUIREMENTS
BY SDM 4/10/89
QA ENTRY NO. 728

FIELD DENSITY TEST - SAND CONE METHOD
INFORMATION ONLY

Job 3050 - GREEN RIVER Date 4/7/89 Test Number CM-5-009 (4th LIFT)

Location of Test N 59,665 E 58,975 CELEV 4107 (WINDBLOWN MAT'L)

Unit Weight of Sand (lbs./cu.ft.) 82.1 Type of Material SILTY SAND W/GRAVEL

Test Specification N/A Curve Number CM-4-007

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.41
Weight of sand used (lbs.)	8.59
Gross volume (cu. ft.)	.1046
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0686
Wet weight of material from hole (lbs.)	8.76
Wet density (lbs. cu. ft.)	127.7
Dry density (lbs./cu. ft.)	118.6

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number	MICRO	MICRO / OVEN	
Wet weight, soil | dish (gm.)	722.0	742.2	748.0
Dry weight, soil | dish (gm.)	664.0	701.4	706.7
Weight of water (gm.)	58.0	40.8	41.3
Weight of dish (gm.)	174.7	174.7	174.7
Dry weight of sample (gm.)	489.3	526.7	532.0
Water content, % of dry weight	11.9	7.7	7.8

ok

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747 FT3	Wet density (lbs./cu.ft.)	138.6
Weight of mold and soil (lbs.)	25.23	Dry density (lbs./cu. ft.)	123.9
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	125.7
Wet weight of sample (lbs.)	10.35	Optimum moisture	10.9

-3.2% OF OPTIMUM MOISTURE

PERCENTAGE DENSITY OF SAMPLE 94.4%

Comments: SCALES: GB-001 & GB-002
4 PASSES OF VIBRATORY ROLLER &
4 PASSES OF TAMPING FOOT ROLLER

Test By [signature]

Checked By Steve Dike

2ND 10" LOOSE LIFT
4 PASSES OF VIBRATORY ROLLER

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY
FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/25/89 Test Number CM-S-010

Location of Test TAILINGS TEST STRIP - 2ND 10" LOOSE LIFT - CENTER OF CELL @ ELEV 4429

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY - YELLOW SILTY SAND TAILINGS

Test Specification 02200 Sec Curve Number CM-4-028

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.30
Weight of sand used (lbs.)	10.70
Gross volume (cu. ft.)	.1154
Tare volume (cu. ft.)	.0355 (65-01)
Net volume (cu. ft.)	.0799
Wet weight of material from hole (lbs.)	8.22 - .38 = 7.84
Wet density (lbs. cu. ft.)	98.1
Dry density (lbs./cu. ft.)	94.5

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	776.5	703.8
Dry weight, soil | dish (gm.)	699.8	684.4
Weight of water (gm.)	76.7	19.4
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	525.1	509.7
Water content, % of dry weight	14.6	3.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	112.8
Weight of mold and soil (lbs.)	13.21	Dry density (lbs./cu. ft.)	98.4
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	99.6
Wet weight of sample (lbs.)	3.79	Optimum moisture	15.8

-12.0% OF OPT. MOISTURE

(A.S.T.M D698)
PERCENTAGE DENSITY OF SAMPLE 94.9%

Comments: SCALE NO GB-001 & GB-002
THE 4 POINT CURVE CHOSEN WAS CONDUCTED ON NO. CM-S-012

Test By [signature]

Checked By [signature]

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

2ND 10" LOOSE LIFT
4 PASSES OF VIBRATORY ROLLER

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/25/89 Test Number CM-5-011

Location of Test TAILINGS TEST STRIP - 2ND 10" LIFT - CENTER OF CELL C ELEV 4129

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY-YELLOW SILTY SAND TAILINGS

Test Specification 02200 REV C Curve Number CM-4-028

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.20
Weight of sand used (lbs.)	10.80
Gross volume (cu. ft.)	.1165
Tare volume (cu. ft.)	.0360 (GB-02)
Net volume (cu. ft.)	.0805
Wet weight of material from hole (lbs.)	8.43 - .38 = 8.05
Wet density (lbs. cu. ft.)	100.0
Dry density (lbs./cu. ft.)	96.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	MICROWAVE
Wet weight, soil | dish (gm.)		778.6
Dry weight, soil | dish (gm.)		756.0
Weight of water (gm.)		22.6
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		581.3
Water content, % of dry weight		3.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	99.6
Wet weight of sample (lbs.)		Optimum moisture	15.8

-11.9% of OPT. MOISTURE

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 96.6%

Comments: SCALE NO. 68-001 & 68-002.

Test By [signature]

Checked By [signature]

3ND 10" LOOSE LIFT
4 PASSES OF VIBRATORY ROLLER

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050-GREEN RIVER Date 4/25/89 Test Number CM-5-012

Location of Test TAILINGS TEST STRIP - 3ND 10" LIFT - CENTER OF CELL C ELEV 4136 ~~4124~~ SDM 4.

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY - YELLOW SILTY SAND TAILINGS

Test Specification 02200 REV C Curve Number CM-4-028

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.20
Weight of sand used (lbs.)	10.80
Gross volume (cu. ft.)	.1165
Tare volume (cu. ft.)	.0360 (63-02)
Net volume (cu. ft.)	.0805
Wet weight of material from hole (lbs.)	8.56-.38 = 8.18
Wet density (lbs. cu. ft.)	101.6
Dry density (lbs./cu. ft.)	~~99.8~~ 98.1 SDM 4/26/89

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		767.1
Dry weight, soil | dish (gm.)		746.7
Weight of water (gm.)		20.4
Weight of dish (gm.)	N/A	174.7
Dry weight of sample (gm.)		572.0
Water content, % of dry weight		~~1.8~~ 3.6 SDM 4/26/89

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	N/A
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	99.6
Wet weight of sample (lbs.)		Optimum moisture	15.8

-12.2% OF OPT. MOISTURE

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 98.5%

Comments: A FOUR POINT PROCTOR WAS CONDUCTED ON THIS SAMPLE WHICH MATCHED THE ONE POINT CONDUCTED ON NO. CM-5-010. THE FOUR POINT WAS THEN ASSIGNED.

Test By [signature]

Checked By Steve Dike

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

3ND 10" LOOSE LIFT
4 PASSES OF VIBRATORY ROLLER

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/25/89 Test Number CM-5-013

Location of Test TAILINGS TEST STRIP - 3ND 10" LIFT - CENTER OF CELL @ ELEV 4130

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY - YELLOW SILTY SAND TAILINGS

Test Specification 02200 REV C Curve Number CM-4-028

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.68
Weight of sand used (lbs.)	10.32
Gross volume (cu. ft.)	.1113
Tare volume (cu. ft.)	.0360 (105-02)
Net volume (cu. ft.)	.0753
Wet weight of material from hole (lbs.)	8.01 - .38 = 7.63
Wet density (lbs. cu. ft.)	101.3
Dry density (lbs./cu. ft.)	92.7

WATER CONTENT

	Maximum Density Point	Field Density Test	
Moisture pan number		MICROWAVE	OVEN
Wet weight, soil | dish (gm.)		750.8	748.2
Dry weight, soil | dish (gm.)		730.5	727.1
Weight of water (gm.)		20.3	21.1
Weight of dish (gm.)	N/A	174.7	174.7
Dry weight of sample (gm.)		555.8	552.4
Water content, % of dry weight		3.7	3.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	N/A
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	99.6
Wet weight of sample (lbs.)		Optimum moisture	15.8

-12.1% OF OPT. MOISTURE

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 98.1%

Comments: SPACE NO. 68-001 & 68-002

Test By Stan Mock

Checked By Steve Dike

4th 10" LOOSE LIFT

4 PASSES WITH A VIBRATORY ROLLER

#1

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050-GREEN RIVER Date 4/25/89 Test Number CM-5-04

Location of Test 4th 10" LOOSE LIFT - THELENS TEST STRIP - CENTER OF CELL @ ELEV 4130

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY YELLOW SILTY SAND - THELENS

Test Specification 02200 REV C Curve Number CM-4-028

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.21
Weight of sand used (lbs.)	10.79
Gross volume (cu. ft.)	.1164
Tare volume (cu. ft.)	.10360 (68-2)
Net volume (cu. ft.)	.10804
Wet weight of material from hole (lbs.)	8.48 - .38 = 8.10
Wet density (lbs. cu. ft.)	100.7
Dry density (lbs./cu. ft.)	97.6

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	OVEN
Wet weight, soil | dish (gm.)		740.5
Dry weight, soil | dish (gm.)		722.9
Weight of water (gm.)		17.6
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		548.2
Water content, % of dry weight		3.2

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	102.3
Wet weight of sample (lbs.)		Optimum moisture	15.2

-12.0% OF OPT. MOISTURE

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 95.4%

Comments: SCALE NO. 68-001 & 68-002

Test By [signature]

Checked By Steve Dike

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

4th 10" LOOSE LIFT
4 PASSES WITH A VIBRATORY ROLLER

#2

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050-GREEN RIVER Date 4/25/89 Test Number CM-S-015

Location of Test 4th 10" LOOSE LIFT - TAILINGS TEST STRIP - CENTER OF CELL @ EL 4130

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY YELLOW SEDY SAND TAILINGS

Test Specification 02200 REV C Curve Number CM-4-078

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.30
Weight of sand used (lbs.)	10.70
Gross volume (cu. ft.)	.1154
Tare volume (cu. ft.)	.0355 (GB-01)
Net volume (cu. ft.)	.0799
Wet weight of material from hole (lbs.)	8.54 - .38 = 8.16
Wet density (lbs. cu. ft.)	102.1
Dry density (lbs./cu. ft.)	98.6

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	OVEN
Wet weight, soil | dish (gm.)		732.0
Dry weight, soil | dish (gm.)		713.2
Weight of water (gm.)		18.8
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		538.5
Water content, % of dry weight		3.5

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	102.3
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	15.2
Wet weight of sample (lbs.)		Optimum moisture	

-11.7% OF OPT. MOISTURE

(A.S.T.M D698)
PERCENTAGE DENSITY OF SAMPLE 96.4%

Comments: SCALE NO. GB-001 & GB-002

Test By [signature]

Checked By [signature]

#3

4th 10" LOOSE LIFT

4 PASSES OF A VIBRATORY ROLLER

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050-GREEN RIVER Date 4/25/89 Test Number CM-5-016

Location of Test 4th 10" LOOSE LIFT - TAILINGS TEST STRIP - CENTER OF CELL @ EL 4130

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY-YELLOW SILTY SAND TAILINGS

Test Specification 02200 Rev Curve Number CM-4-028

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.19
Weight of sand used (lbs.)	10.81
Gross volume (cu. ft.)	.1166
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.10806
Wet weight of material from hole (lbs.)	8.49 - .38 = 8.11
Wet density (lbs. cu. ft.)	100.6
Dry density (lbs./cu. ft.)	97.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		OVEN
Wet weight, soil | dish (gm.)		730.7
Dry weight, soil | dish (gm.)		711.1
Weight of water (gm.)	N/A	19.6
Weight of dish (gm.)		174.8
Dry weight of sample (gm.)		536.3
Water content, % of dry weight		3.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	N/A
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	102.3
Wet weight of sample (lbs.)		Optimum moisture	15.2

-11.5% OF OPTIMUM MOISTURE

(A.S.T.M. D-698)
PERCENTAGE DENSITY OF SAMPLE 94.8%

Comments: Scales used: GR-001 + GR-002

Test By Steven Mark

Checked By Steve Dibe

4th 10" LOOSE LIFT

4 PASSES OF A VIBRATORY ROLLER

#4

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050-GREEN RIVER Date 4/25/89 Test Number CM-S-017

Location of Test 4th LOOSE LIFT - THILINGS TEST STRIP - CENTER OF CELL @ EL 4130

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY YELLOW SILTY SAND THILINGS

Test Specification 02200 Rev C Curve Number CM-4-028

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.40
Weight of sand used (lbs.)	10.60
Gross volume (cu. ft.)	.1143
Tare volume (cu. ft.)	.0355 (GR-01)
Net volume (cu. ft.)	.0788
Wet weight of material from hole (lbs.)	8.61 - .38 = 8.23
Wet density (lbs. cu. ft.)	104.4
Dry density (lbs./cu. ft.)	100.7

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		OOEN
Wet weight, soil | dish (gm.)		744.6
Dry weight, soil | dish (gm.)		724.1
Weight of water (gm.)	N/A	20.5
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		549.4
Water content, % of dry weight		3.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	N/A
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	102.3
Wet weight of sample (lbs.)		Optimum moisture	15.2

-11.5% OF OPTIMUM MOISTURE

(A.S.T.M. D-698)
PERCENTAGE DENSITY OF SAMPLE 98.4%

Comments: SCALE NO: GR-001 & GR-002

Test By [signature]

Checked By Steve Dike

#5

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

4th 10" LOOSE LIFT
4 PASSES WITH VIBRATORY ROLLER

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/25/89 Test Number CM-5-018

Location of Test 4th 10" LOOSE LIFT - TAILINGS TEST STRIP - CENTER OF CELL C. ELEV 413

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material GREY YELLOW SILTY SAND TAILINGS

Test Specification 02200 REV C Curve Number CM-4-028

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.40
Weight of sand used (lbs.)	10.60
Gross volume (cu. ft.)	.1143
Tare volume (cu. ft.)	.0360 (GB-02)
Net volume (cu. ft.)	.0783
Wet weight of material from hole (lbs.)	8.45 - .38 = 8.07
Wet density (lbs. cu. ft.)	103.1
Dry density (lbs./cu. ft.)	99.7

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		OVEN
Wet weight, soil | dish (gm.)		711.1
Dry weight, soil | dish (gm.)		693.7
Weight of water (gm.)		17.4
Weight of dish (gm.)	N/A	174.7
Dry weight of sample (gm.)		519.0
Water content, % of dry weight		3.4

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	N/A
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	102.3
Wet weight of sample (lbs.)		Optimum moisture	15.2

-11.8% OF OPTIMUM MOISTURE

(A.S.T.M. D-698)
PERCENTAGE DENSITY OF SAMPLE 97.5%

Comments: SCALE NO: GB-001 & GB-002

Test By Steven Martz

Checked By Steve Dike

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

#2

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050-Green River Date 4-7-89 Test Number MK-E-001

Location of Test N59470 + E58890 @ Elev. 4108 - Windblown contaminate

Unit Weight of Sand (lbs./cu.ft.) 82.2 Type of Material Silty sand

Test Specification N/A Curve Number CM-4-019

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	2.95
Weight of sand used (lbs.)	9.05
Gross volume (cu. ft.)	.1101
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0741
Wet weight of material from hole (lbs.)	8.51
Wet density (lbs. cu. ft.)	114.8
Dry density (lbs./cu. ft.)	108.7 ✓

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number	Micro	Micro	Oven
Wet weight, soil | dish (gm.)	750.0	745.1	745.4
Dry weight, soil | dish (gm.)	694.1	715.0	715.4
Weight of water (gm.)	55.9	30.1	30.0
Weight of dish (gm.)	174.7	174.7	174.7
Dry weight of sample (gm.)	519.4	540.3	540.7
Water content, % of dry weight	10.8	5.6	5.5 ✓

← ok →

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	121.4
Weight of mold and soil (lbs.)	13.50	Dry density (lbs./cu. ft.)	109.6
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	111.2
Wet weight of sample (lbs.)	4.08	Optimum moisture	13.2

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 97.8 ✓ -7.6 % ✓ of opt. moisture

Comments: Scales used: GR-001 + GR-002

Test By Steve Dike

Checked By Steven Marks

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-10-89 Test Number MK-E-002

Location of Test N59345 + E58972 @ Elev. 4109 - Contaminated material WIND BLOWN

Unit Weight of Sand (lbs./cu.ft.) 81.8 lbs/ft³ Type of Material Silty Sand w/gravel

Test Specification 90% of D 698 -3.0% of OPT. Curve Number CM-4-010

FIELD DENSITY

Scale #GR-001

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.19
Weight of sand used (lbs.)	8.81
Gross volume (cu. ft.)	.1077
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0717
Wet weight of material from hole (lbs.)	8.96 - .38 = 8.58
Wet density (lbs. cu. ft.)	119.7
Dry density (lbs./cu. ft.)	113.4

WATER CONTENT

Scale #GR-002

	Maximun Density Point *	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	721.2	SW 4-10-89 ~~720.0~~ 733.6
Dry weight, soil | dish (gm.)	677.8	703.9
Weight of water (gm.)	43.4	29.7
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	503.1	529.2
Water content, % of dry weight	8.6	5.6

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	SW 4-10-89 .03636	Wet density (lbs./cu.ft.)	130.4
Weight of mold and soil (lbs.)	13.80	Dry density (lbs./cu. ft.)	120.1
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)	4.38	Optimum moisture	10.7

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 91.3% @ -5.1% of OPT. Pass/Fail

Comments: * See one point proctor test # CM-006.

Test By Steve Wilke

Checked By Steven Wilke

INFORMATION ONLY

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-10-89 Test Number MK-E-003 (WINDBLOWN)

Location of Test N 59528 + E 59230 @ Elev. 4108 - Contaminated materials

Unit Weight of Sand (lbs./cu.ft.) 81.8 lbs/ft³ Type of Material Silty Sand

Test Specification N/A Curve Number CM-A-020

FIELD DENSITY

Scale #GR-001

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.02
Weight of sand used (lbs.)	8.98
Gross volume (cu. ft.)	.1098
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0738
Wet weight of material from hole (lbs.)	8.63 - .38 = 8.25
Wet density (lbs. cu. ft.)	111.8
Dry density (lbs./cu. ft.)	105.2

WATER CONTENT

Scale #GR-002

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	MICRO
Wet weight, soil | dish (gm.)		701.1
Dry weight, soil | dish (gm.)		669.7
Weight of water (gm.)		31.4
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		495.0
Water content, % of dry weight		6.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)	N/A	Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	116.5
Wet weight of sample (lbs.)		Optimum moisture	11.9

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 90.3 @ -5.6% of OPTIMUM MOISTURE (Pass)/Fail

Comments: A four point proctor (CM-A-020) was performed on the material from which this sample was obtained. Therefore, no one point proctor is necessary.

Test By Steve Wilke

Checked By Steve Dibel

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-11-89 Test Number MK-E-004

Location of Test N 59520 E 58962 @ Elev. 4109

Unit Weight of Sand (lbs./cu.ft.) 81.5 lbs/ft³ Type of Material Windblown contaminated Sandy Silt w/gravel

Test Specification 90% of D698 -3% of opt. Curve Number CM-4-90

FIELD DENSITY

Scale # GR-001

Original weight of sand and container (lbs.)	12.00 lbs
Final weight of sand and container (lbs.)	2.58
Weight of sand used (lbs.)	9.42
Gross volume (cu. ft.)	.1156
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0796
Wet weight of material from hole (lbs.)	9.81 - .38 = 9.43
Wet density (lbs. cu. ft.)	118.5
Dry density (lbs./cu. ft.)	112.2

WATER CONTENT

Scale # GR-002

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	720.0	735.4
Dry weight, soil | dish (gm.)	673.9	705.5
Weight of water (gm.)	46.1	29.9
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	499.2	530.8
Water content, % of dry weight	9.2	5.6

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	133.0
Weight of mold and soil (lbs.)	13.89	Dry density (lbs./cu. ft.)	121.8
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)	4.47	Optimum moisture	10.7

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 90.3 @ -5.1% of OPTIMUM MOISTURE (Pass)/Fail

Comments:

Test By Steve Wills

Checked By Steve Dike

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-11-89 Test Number MK-E-005

Location of Test N 59582 E 59165 @ Elev. 4109

Unit Weight of Sand (lbs./cu.ft.) 82.2 lbs/Ft³ Type of Material Windblown contaminated Silty Sand w/gravel

Test Specification 90% of D698 -3.0% of OPT. Curve Number CM-4-011

FIELD DENSITY

SW 4-11-89

Scale # ~~DU~~ GR-001

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.37
Weight of sand used (lbs.)	8.63
Gross volume (cu. ft.)	.1050
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0690
Wet weight of material from hole (lbs.)	8.79 - .38 = 8.41
Wet density (lbs. cu. ft.)	121.9
Dry density (lbs./cu. ft.)	114.1

WATER CONTENT

SW 4-11-89

Scale # ~~DU~~ GR-002

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	710.1	729.1
Dry weight, soil | dish (gm.)	660.2	693.8
Weight of water (gm.)	49.9	35.3
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	485.5	519.1
Water content, % of dry weight	10.3	6.8

MAXIMUM DENSITY POINT

SW 4-11-89

Scale # ~~DU~~ GR-001

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	137.8
Weight of mold and soil (lbs.)	14.05	Dry density (lbs./cu. ft.)	124.9
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	125.2
Wet weight of sample (lbs.)	4.63	Optimum moisture	10.2

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 91.1 @ -3.4% of OPTIMUM MOISTURE (Pass)/Fail

Comments: Scales used: GR-001 + GR002

Test By Steve Witts

Checked By Steve Dike

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-11-89 Test Number MK-E-006

Location of Test N 59535 E 59047 @ Elev 4109

Unit Weight of Sand (lbs./cu.ft.) 82.2 lbs/ft³ Type of Material Windblown contaminated Silty Sand w/gravel

Test Specification 90% of D698 -3% of opt. Curve Number CM-4-011

FIELD DENSITY

Scale # GR-001

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	2.74
Weight of sand used (lbs.)	9.26
Gross volume (cu. ft.)	.1127
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0767
Wet weight of material from hole (lbs.)	9.95 - .38 = 9.57
Wet density (lbs. cu. ft.)	124.8
Dry density (lbs./cu. ft.)	118.2

WATER CONTENT

Scale # GR-002

	Maximun Density Point	Field Density Test
Moisture pan number		Micro
Wet weight, soil | dish (gm.)		722.0
Dry weight, soil | dish (gm.)		693.0
Weight of water (gm.)		29.0
Weight of dish (gm.)	N/A	174.7
Dry weight of sample (gm.)		518.3
Water content, % of dry weight		5.6

MAXIMUM DENSITY POINT

Scale # GR-001

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)	N/A	Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	125.2
Wet weight of sample (lbs.)		Optimum moisture	10.2

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 94.4% @ -4.6% of OPTIMUM MOISTURE

Comments: Pass/Fail

Test By Steve Wilts

Checked By Steve Dal

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-12-87 Test Number MK-E-007

Location of Test N59535 + E58848 @ Elev. 4110

Unit Weight of Sand (lbs./cu.ft.) 81.8 lbs/ft³ Type of Material Windblown contaminated Sandy Silt w/gravel

Test Specification 90% of D698 -3.0% of OPT. Curve Number CM-4-021

FIELD DENSITY

Scale # GR-001

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	1.25
Weight of sand used (lbs.)	10.75
Gross volume (cu. ft.)	.1314
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0954
Wet weight of material from hole (lbs.)	12.37-.38 = 11.99
Wet density (lbs. cu. ft.)	125.7
Dry density (lbs./cu. ft.)	120.7

WATER CONTENT

Scale # GR-002

	Maximun Density Point	Field Density Test
Moisture pan number	~~732.7~~ Microwave (w 4-12-87)	Microwave
Wet weight, soil | dish (gm.)	732.7	772.6
Dry weight, soil | dish (gm.)	692.8	749.3
Weight of water (gm.)	40.7	23.3
Weight of dish (gm.)	174.7	574.6
Dry weight of sample (gm.)	517.3	174.7
Water content, % of dry weight	7.9	4.1

MAXIMUM DENSITY POINT

Scale # GR-001

Volume of cylinder mold (cu. ft.)	.0747	Wet density (lbs./cu.ft.)	141.2
Weight of mold and soil (lbs.)	25.43	Dry density (lbs./cu. ft.)	130.9
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	130.9
Wet weight of sample (lbs.)	10.55	Optimum moisture	7.9

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 92.2 @ -3.8% of OPTIMUM MOISTURE

Comments: Pass/Fail

SCALES: GR-001 & GR-002

Test By Steve Wilke

Checked By Steven Marks

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-12-89 Test Number MK-E-008

Location of Test N 59450 + E 59172 @ Elev. 4111

Unit Weight of Sand (lbs./cu.ft.) 81.8 lbs/ft³ Type of Material Windblown contaminated Silty Sand w/ gravel

Test Specification 90% of D698 -3.0% of opt. Curve Number CM-4-013

FIELD DENSITY

Scale #GR-001

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	2.93
Weight of sand used (lbs.)	9.07
Gross volume (cu. ft.)	.1109
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0749
Wet weight of material from hole (lbs.)	9.51
Wet density (lbs. cu. ft.)	127.0
Dry density (lbs./cu. ft.)	118.7

WATER CONTENT

Scale #GR-002

	Maximun Density Point	Field Density Test
Moisture pan number		Microwave
Wet weight, soil | dish (gm.)		734.4
Dry weight, soil | dish (gm.)		698.0
Weight of water (gm.)	N/A	36.4
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		523.3
Water content, % of dry weight		7.0

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)	N/A	Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	125.6
Wet weight of sample (lbs.)		Optimum moisture	10.0

A.S.T.M. D 698
PERCENTAGE DENSITY OF SAMPLE 94.5 -3.0% of opt. moisture

Comments: Pass/Fail

Test By Steve Dike

Checked By Steve Witte

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-13-89 Test Number MK-E-009

9 SDMM 4/13/89

Location of Test N 59432 E 58453 @ Elev. 4113

Unit Weight of Sand (lbs./cu.ft.) 82.0 lbs/ft³ Type of Material Windblown contaminated Sandy silt w/gravel

Test Specification 90% of D698 @ -3% of opt. Curve Number CM-4-010

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	2.00
Weight of sand used (lbs.)	10.00
Gross volume (cu. ft.)	.1220
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0860
Wet weight of material from hole (lbs.)	11.00-.38 = 10.62
Wet density (lbs. cu. ft.)	123.5
Dry density (lbs./cu. ft.)	117.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	752.2	736.2
Dry weight, soil | dish (gm.)	701.1	707.5
Weight of water (gm.)	51.1	28.7
Weight of dish (gm.)	174.7	SW 4-13-89 5°247.7
Dry weight of sample (gm.)	526.4	532.8
Water content, % of dry weight	9.7	5.4

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747	Wet density (lbs./cu.ft.)	134.8
Weight of mold and soil (lbs.)	24.95	Dry density (lbs./cu. ft.)	122.9
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)	10.07	Optimum moisture	10.7

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 94.4% @ -5.3% of OPT. (Pass)/Fail

Comments: Scales used: GR-001 + GR-002

Test By Steve Mills

Checked By Steve Dale

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River UMTRA Date 4-13-89 Test Number MK-E-010

Location of Test N 59292 E 59068 @ Elev. 4112

Unit Weight of Sand (lbs./cu.ft.) 81.9 lbs/ft³ Type of Material windblown contaminated sandy silt w/gravel

Test Specification 90% of D698 @ -3.0% of OPT. Curve Number CM-4-010

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	2.47
Weight of sand used (lbs.)	9.53
Gross volume (cu. ft.)	.1164
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0804
Wet weight of material from hole (lbs.)	9.69 - .38 = 9.31
Wet density (lbs. cu. ft.)	115.8
Dry density (lbs./cu. ft.)	110.6

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		Microwave
Wet weight, soil | dish (gm.)		752.5
Dry weight, soil | dish (gm.)		726.5
Weight of water (gm.)		26.0
Weight of dish (gm.)	N/A	124.7
Dry weight of sample (gm.)		557.8
Water content, % of dry weight		4.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)	N/A	Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)		Optimum moisture	10.7

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 89.0 @ -6.0% of opt. Pass (Fa-1)

Comments: Scales used: GR-001 + GR-002 Test By Steve Wells

Checked By Steve Dike

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - GREEN RIVER Date 4/14/89 Test Number MK-E-010-R1

Location of Test N 59,292 E 59,068 @ ELEV 4112

Unit Weight of Sand (lbs./cu.ft.) 80.4 lbs/FT3 Type of Material WINDBLOWN SILTY SAND w/GRAVEL

Test Specification N/A Curve Number CM-4-010

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	2.94
Weight of sand used (lbs.)	9.06
Gross volume (cu. ft.)	.1127
Tare volume (cu. ft.)	.0360
Net volume (cu. ft.)	.0767
Wet weight of material from hole (lbs.)	9.90 - .38 = 9.52
Wet density (lbs. cu. ft.)	124.1
Dry density (lbs./cu. ft.)	118.1

WATER CONTENT

	Maximun Density Point	Field Density Test
SCALE: 6R-001 & 6R-002		
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		763.3
Dry weight, soil | dish (gm.)		734.8
Weight of water (gm.)		28.5
Weight of dish (gm.)	N/A	174.7
Dry weight of sample (gm.)		560.1
Water content, % of dry weight		5.1

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)		Optimum moisture	10.7

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 95.1% — 5.6% OF OPTIMUM MOISTURE

Comments: N/A

RETEST OF TEST NO. MK-E-010.

Test By [signature]

Checked By [signature]

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - Green River Date 4-14-89 Test Number ~~SFA~~ SD 4-14-89 MK-E-011

Location of Test N59665 + E59080 @ Elev. 4113 - Windblown Contaminates

Unit Weight of Sand (lbs./cu.ft.) 80.4 Type of Material Silty sand w/ gravel

Test Specification N/A Curve Number CM-4-018

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.20
Weight of sand used (lbs.)	8.80
Gross volume (cu. ft.)	.1095
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0735
Wet weight of material from hole (lbs.)	9.64 - .38 = 9.26
Wet density (lbs. cu. ft.)	126.0
Dry density (lbs./cu. ft.)	117.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Micro	Micro
Wet weight, soil | dish (gm.)	708.8	766.2
Dry weight, soil | dish (gm.)	655.7	724.8
Weight of water (gm.)	53.1	41.4
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	481.0	550.1
Water content, % of dry weight	11.0	7.5

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747	Wet density (lbs./cu.ft.)	134.9
Weight of mold and soil (lbs.)	24.96	Dry density (lbs./cu. ft.)	121.5
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	121.7
Wet weight of sample (lbs.)	10.08	Optimum moisture	10.8

SPM 4/14/89 ~~PASS~~ FAIL NA

A.S.T.M D698
PERCENTAGE DENSITY OF SAMPLE 96.3 -3.3% of opt. moisture

Comments: Scales used: GR-001 + GR-002 Test By Steve Dike

One-point covers test no's CM-M-054 Checked By [signature]

thru CM-M-

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

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FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - Green River Date 4-14-89 Test Number MK-E-012

Location of Test N59452 + E59047 @ Elev. 4115 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 80.4 Type of Material Silty sand w/gravel

Test Specification N/A Curve Number CM-4-018

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	2.77
Weight of sand used (lbs.)	9.23
Gross volume (cu. ft.)	.1148
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0788
Wet weight of material from hole (lbs.)	9.96 - .38 = 9.58
Wet density (lbs. cu. ft.)	121.6
Dry density (lbs./cu. ft.)	115.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		
Wet weight, soil | dish (gm.)		761.6
Dry weight, soil | dish (gm.)		730.0
Weight of water (gm.)	N	31.6
Weight of dish (gm.)	A	174.7
Dry weight of sample (gm.)		555.3
Water content, % of dry weight		5.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	121.7
Wet weight of sample (lbs.)		Optimum moisture	10.8

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 94.5% -5.1% of opt. moisture

Comments: Scales used: GR-001 + GR-002

Test By Steve Dike

Checked By Steven Moore

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 - Green River Date 4-14-89 Test Number MK-E-01

Location of Test N59470 + E59239 @ Elev. 4115 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 80.6 Type of Material Silty Sand w/gravel

Test Specification N/A Curve Number CM-4-018

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.27
Weight of sand used (lbs.)	8.73
Gross volume (cu. ft.)	.1083
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0723
Wet weight of material from hole (lbs.)	9.36 - .38 = 8.98
Wet density (lbs. cu. ft.)	124.2
Dry density (lbs./cu. ft.)	116.8

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		
Wet weight, soil | dish (gm.)		765.1
Dry weight, soil | dish (gm.)		729.9
Weight of water (gm.)	N	35.2
Weight of dish (gm.)	A	174.7
Dry weight of sample (gm.)		555.2
Water content, % of dry weight		6.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	121.7
Wet weight of sample (lbs.)		Optimum moisture	10.8

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 96.0% -4.5% OF OPTIMUM MOISTURE

Comments: Scales used: GR001 + GR002

Test By Steve Dike

Checked By Steven Moots

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4-17-89 Test Number MK-E-014

Location of Test N59735 + E5905 @ Elev. 4116-Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 80.0 Type of Material Gravelly sand

Test Specification N/A Curve Number CM-4-018

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	1.24
Weight of sand used (lbs.)	10.76
Gross volume (cu. ft.)	.1345
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0985
Wet weight of material from hole (lbs.)	11.86
Wet density (lbs. cu. ft.)	120.4
Dry density (lbs./cu. ft.)	115.3

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	965.7	769.1
Dry weight, soil | dish (gm.)	887.7	744.3
Weight of water (gm.)	78.0	24.8
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	713.0	569.6
Water content, % of dry weight	10.9	4.4

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747	Wet density (lbs./cu.ft.)	134.3
Weight of mold and soil (lbs.)	24.91	Dry density (lbs./cu. ft.)	121.1
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	121.7
Wet weight of sample (lbs.)	10.03	Optimum moisture	10.8

-6.4 % of Optimum Moisture

(A.S.T.M. D 698)
PERCENTAGE DENSITY OF SAMPLE 94.7% N/A ~~Pass/Fail~~

Comments: N/A

Test By Steve Dahe

Checked By Steven Marks

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4-17-89 Test Number MK-E-015

Location of Test N 59452 + E 58806 @ Elev. 4117 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 81.4 Type of Material Silty sand - brown

Test Specification N/A Curve Number CM-4-022

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	2.65
Weight of sand used (lbs.)	9.35
Gross volume (cu. ft.)	.1149
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0789
Wet weight of material from hole (lbs.)	10.38 - .38 = 10.00
Wet density (lbs. cu. ft.)	126.7
Dry density (lbs./cu. ft.)	119.5

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		792.5
Dry weight, soil | dish (gm.)		757.5
Weight of water (gm.)		35.0
Weight of dish (gm.)		174.8
Dry weight of sample (gm.)		582.7
Water content, % of dry weight		6.0

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	123.4
Wet weight of sample (lbs.)		Optimum moisture	10.6

-4.6 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 97 (96.8%) ~~Pass/Fail~~ N/A

Comments: A 4 point proctor was induced late yesterday for this material.

Test By Steve Dike

Checked By Steven Marts

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4-18-86 Test Number MK-E-016

Location of Test N 59398 + E59172 @ Elev. 4117 - Windblown Contaminates

Unit Weight of Sand (lbs./cu.ft.) 81.4 Type of Material Silty sand - brown

Test Specification N/A Curve Number CM-4-022

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	1.72
Weight of sand used (lbs.)	10.28
Gross volume (cu. ft.)	.1263
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0903
Wet weight of material from hole (lbs.)	11.28
Wet density (lbs. cu. ft.)	124.9
Dry density (lbs./cu. ft.)	119.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		701.2
Dry weight, soil | dish (gm.)		676.0
Weight of water (gm.)		25.2
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		501.3
Water content, % of dry weight		5.0

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	123.4
Wet weight of sample (lbs.)		Optimum moisture	10.6

-5.6 % of Optimum Moisture

(A.S.T.M. D698) PERCENTAGE DENSITY OF SAMPLE 96.4 % ~~Pass/Fail~~ N/A

Comments: A 4-point proctor was conducted late yesterday which matches this material

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/18/89 Test Number MK-E-017

Location of Test N 59489 + E 59101 @ Elev. 4119 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 81.4 Type of Material Brown Silty SAND

Test Specification N/A Curve Number CM-4-022

FIELD DENSITY

Original weight of sand and container (lbs.)	12.00
Final weight of sand and container (lbs.)	3.05
Weight of sand used (lbs.)	8.95
Gross volume (cu. ft.)	4/19/89 SDM ~~.0~~ .1100
Tare volume (cu. ft.)	.0360 (GB-02)
Net volume (cu. ft.)	.0740
Wet weight of material from hole (lbs.)	9.50 - .38 = 9.12
Wet density (lbs. cu. ft.)	123.2
Dry density (lbs./cu. ft.)	115.6

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	MICROWAVE
Wet weight, soil | dish (gm.)		755.6
Dry weight, soil | dish (gm.)		719.5
Weight of water (gm.)		36.1
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		544.8
Water content, % of dry weight		6.6

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	123.4
Wet weight of sample (lbs.)		Optimum moisture	10.6

-4.0 % of Optimum Moisture

(D698) PERCENTAGE DENSITY OF SAMPLE 93.7% N/A → ~~Pass/Fail~~

Comments: N/A

Test By Steven Mott

Checked By Steve Dale

SCALE USED GB-001 & GB-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4-18-89 Test Number MK-E-018

Location of Test N59598 + E58962 @ Elev. 4120 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 90.1 Type of Material Silty sand - brown

Test Specification N/A Curve Number CM-4-023

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.08
Weight of sand used (lbs.)	9.92
Gross volume (cu. ft.)	.1101
Tare volume (cu. ft.)	.0355 (GR-01)
Net volume (cu. ft.)	.0746
Wet weight of material from hole (lbs.)	9.26 - .38 = 8.88
Wet density (lbs. cu. ft.)	119.0
Dry density (lbs./cu. ft.)	111.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		772.9
Dry weight, soil | dish (gm.)		734.0
Weight of water (gm.)		38.9
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		559.3
Water content, % of dry weight		7.0

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	114.8
Wet weight of sample (lbs.)		Optimum moisture	12.3

-5.3 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 96.9 ~~Pass/Fail~~ N/A

Comments: A 4-point proctor was ducted on this material today.

Test By Steve Dahe

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4-19-89 Test Number MK-E-019

Location of Test N 59388 - E 58416 @ 4120 (WIND BLOWN)

Unit Weight of Sand (lbs./cu.ft.) 91.7 Type of Material SILTY SAND & GRAVELLY

Test Specification N/A Curve Number CM-4-022

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	2.66
Weight of sand used (lbs.)	11.34
Gross volume (cu. ft.)	.1237
Tare volume (cu. ft.)	.0360 (GB-02)
Net volume (cu. ft.)	.0877
Wet weight of material from hole (lbs.)	11.34-.38 = 10.96
Wet density (lbs. cu. ft.)	125.0
Dry density (lbs./cu. ft.)	117.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	737.7	777.0
Dry weight, soil | dish (gm.)	682.0	738.4
Weight of water (gm.)	55.7	38.6
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	507.3	563.7
Water content, % of dry weight	11.0	6.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747 FT3	Wet density (lbs./cu.ft.)	135.5
Weight of mold and soil (lbs.)	25.00	Dry density (lbs./cu. ft.)	122.1
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	123.4
Wet weight of sample (lbs.)	10.12	Optimum moisture	10.6

-3.8 % of Optimum Moisture

(A.S.T.M D698)
PERCENTAGE DENSITY OF SAMPLE 94.8% ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steven Moats

Checked By Steven Moats

SCALE USED GB-001 & GB-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/19/89 Test Number MK-E-020

Location of Test N59,610 E59,108 @ EL 4119 - INTERBOUND

Unit Weight of Sand (lbs./cu.ft.) 91.4 Type of Material SELECT SAND

Test Specification N/A Curve Number CM-4-022

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.27
Weight of sand used (lbs.)	10.73
Gross volume (cu. ft.)	.1174
Tare volume (cu. ft.)	.0360 (.68-02)
Net volume (cu. ft.)	.0814
Wet weight of material from hole (lbs.)	10.56 - .38 = 10.18
Wet density (lbs. cu. ft.)	125.1
Dry density (lbs./cu. ft.)	118.1

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number		MICRO	OVEN
Wet weight, soil | dish (gm.)		749.4	753.4
Dry weight, soil | dish (gm.)		717.5	720.7
Weight of water (gm.)		31.9	32.7
Weight of dish (gm.)	N/A	174.7	174.7
Dry weight of sample (gm.)		542.8	546.0
Water content, % of dry weight		5.9	6.0

ok

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	123.4
Wet weight of sample (lbs.)		Optimum moisture	10.6

-4.7 % of Optimum Moisture

(A.S.T.M. D.698)
PERCENTAGE DENSITY OF SAMPLE 95.7 % SDM 4/19/89 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steven Marks

Checked By Steve Dikel

SCALE USED GB-001 & GB-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/20/89 Test Number MK-E-021

Location of Test N59,322 E59,103 @ EL 4121

Unit Weight of Sand (lbs./cu.ft.) 90.1 Type of Material "WINDBLOWN" SILTY SAND

Test Specification N/A Curve Number CM-4-022

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	2.75
Weight of sand used (lbs.)	11.25
Gross volume (cu. ft.)	.1249
Tare volume (cu. ft.)	.0360 (GB-02)
Net volume (cu. ft.)	.0889
Wet weight of material from hole (lbs.)	10.97 - .38 = 10.59
Wet density (lbs. cu. ft.)	119.1
Dry density (lbs./cu. ft.)	111.7

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		733.4
Dry weight, soil | dish (gm.)		698.7
Weight of water (gm.)		34.7
Weight of dish (gm.)	N/A	174.7
Dry weight of sample (gm.)		524.0
Water content, % of dry weight		6.6

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	N/A
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	123.4
Wet weight of sample (lbs.)		Optimum moisture	10.6

-4.0 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 90.5% ~~Pass/Fail~~ N/A

Comments: N/A

Test By [signature]

Checked By [signature]

SCALE USED GB-002 & GB-003

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/20/89 Test Number MK-E-022

Location of Test N 59,536 E 59,110 @ El 4422

Unit Weight of Sand (lbs./cu.ft.) 90.1 Type of Material Silty Sand w/Gravel

Test Specification N/A Curve Number CM-4-010

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.61
Weight of sand used (lbs.)	10.39
Gross volume (cu. ft.)	.1153
Tare volume (cu. ft.)	.0360 (GB-02)
Net volume (cu. ft.)	.0793
Wet weight of material from hole (lbs.)	10.56 - .38 = 10.18
Wet density (lbs. cu. ft.)	128.4
Dry density (lbs./cu. ft.)	119.3

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	744.1	713.9
Dry weight, soil | dish (gm.)	686.1	676.0
Weight of water (gm.)	58.0	37.9
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	511.4	501.3
Water content, % of dry weight	11.3	7.6

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747 ft3	Wet density (lbs./cu.ft.)	136.9
Weight of mold and soil (lbs.)	25.11	Dry density (lbs./cu. ft.)	123.0
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)	10.23	Optimum moisture	10.7

-3.1 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 96.1 % ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steven Moats

Checked By Steven Moats

SCALE USED GB-001 & GB-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/20/89 Test Number MK-E-023

Location of Test N59,475 E58,967 @ EL 4123

Unit Weight of Sand (lbs./cu.ft.) 90.1 Type of Material SILTY SAND W/GRAVEL

Test Specification N/A Curve Number CM-4-00

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.30
Weight of sand used (lbs.)	10.70
Gross volume (cu. ft.)	.1188
Tare volume (cu. ft.)	.0360 (GE-02)
Net volume (cu. ft.)	.0828
Wet weight of material from hole (lbs.)	10.38-.38 = 10.00
Wet density (lbs. cu. ft.)	120.8
Dry density (lbs./cu. ft.)	114.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		719.9
Dry weight, soil | dish (gm.)		690.2
Weight of water (gm.)	N/A	29.7
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		515.5
Water content, % of dry weight		5.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)	N/A	Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)		Optimum moisture	10.7

-4.9 % of Optimum Moisture

A.S.T.M D.698
PERCENTAGE DENSITY OF SAMPLE 91.9% ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steven Moats

Checked By Steven Moats

SCALE USED GR-001 & GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/21/89 Test Number MK-E-024

Location of Test N 59,616 E 59,030 @ ELEVATION 4124 - WIND BLOWN

Unit Weight of Sand (lbs./cu.ft.) 90.8 Type of Material SILTY SAND w/GRAVEL

Test Specification N/A Curve Number CM-4-018

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.94
Weight of sand used (lbs.)	10.06
Gross volume (cu. ft.)	.1108
Tare volume (cu. ft.)	.03600 (GR-02)
Net volume (cu. ft.)	.0748
Wet weight of material from hole (lbs.)	9.62 - .38 = 9.24
Wet density (lbs. cu. ft.)	123.5
Dry density (lbs./cu. ft.)	117.8

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	721.7	721.9
Dry weight, soil | dish (gm.)	666.1	696.6
Weight of water (gm.)	55.6	25.3
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	491.4	521.9
Water content, % of dry weight	11.3	4.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0742 ~~F3~~	Wet density (lbs./cu.ft.)	135.5
Weight of mold and soil (lbs.)	25.00	Dry density (lbs./cu. ft.)	121.7
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	121.7
Wet weight of sample (lbs.)	10.12	Optimum moisture	10.8

-6.0 % of Optimum Moisture

(A.S.T.M. D 698)
PERCENTAGE DENSITY OF SAMPLE 96.8% ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steven Mott

Checked By Steven Mott

SCALE USED GR-001 & GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/21/89 Test Number MK-E-025

Location of Test N 59,510 E 59,172 C ELEV 4125 - UNDERGROUND

Unit Weight of Sand (lbs./cu.ft.) 90.8 Type of Material SILTY SAND W/GRAVEL

Test Specification N/A Curve Number CM-4-018

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.90
Weight of sand used (lbs.)	9.10
Gross volume (cu. ft.)	.1002
Tare volume (cu. ft.)	.0355 (GR-01)
Net volume (cu. ft.)	.0647
Wet weight of material from hole (lbs.)	8.73 - .38 = 8.35
Wet density (lbs. cu. ft.)	129.1
Dry density (lbs./cu. ft.)	121.3

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MERSONNE
Wet weight, soil | dish (gm.)		716.9
Dry weight, soil | dish (gm.)		684.5
Weight of water (gm.)	N/A	32.4
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		509.8
Water content, % of dry weight		6.4

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	121.7
Wet weight of sample (lbs.)		Optimum moisture	10.8

-4.4 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 99.7% ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steven Mark

Checked By Steven Mark

SCALE USED GR-001 & GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/24/89 Test Number MK-E-026

Location of Test N59,352 E59,130 @ ELEV 4126 - WINDBLOWN CONTAMINATED SILTY SAND (BROWN)

Unit Weight of Sand (lbs./cu.ft.) 91.6 Type of Material CM-4-020

Test Specification N/A Curve Number CM-4-020

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.76
Weight of sand used (lbs.)	9.24
Gross volume (cu. ft.)	.1009
Tare volume (cu. ft.)	.0355 (GR-01)
Net volume (cu. ft.)	.0654
Wet weight of material from hole (lbs.)	8.30 - .38 = 7.92
Wet density (lbs. cu. ft.)	121.1
Dry density (lbs./cu. ft.)	114.5

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	743.1	774.4
Dry weight, soil | dish (gm.)	675.3	741.4
Weight of water (gm.)	67.8	33.0
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	500.6	566.7
Water content, % of dry weight	13.5	5.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747 FT3	Wet density (lbs./cu.ft.)	130.5
Weight of mold and soil (lbs.)	24.63	Dry density (lbs./cu. ft.)	115.0
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	116.5
Wet weight of sample (lbs.)	9.75	Optimum moisture	11.9

-6.1 % of Optimum Moisture

A.S.T.M. 0698
PERCENTAGE DENSITY OF SAMPLE 98.3% ~~Pass/Fail~~ N/A

Comments: THE ONE POINT INDICATES A FINER MATERIAL WHICH HAS BECOME EVIDENT WITH NEW MATERIAL BEING PLACED.

Test By Steven Marks

Checked By Steven Marks

SCALE USED GB-001 & GB-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4/24/89 Test Number MK-E-027

Location of Test N59,555 E58,961 @ ELEV 4127 "WINDBLOWN"

Unit Weight of Sand (lbs./cu.ft.) 92.1 Type of Material BROWN SILTY SAND

Test Specification N/A Curve Number CM-4-020

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.40
Weight of sand used (lbs.)	10.60
Gross volume (cu. ft.)	.1151
Tare volume (cu. ft.)	.0360 (63-02)
Net volume (cu. ft.)	.0791
Wet weight of material from hole (lbs.)	9.96 - .38 = 9.58
Wet density (lbs. cu. ft.)	121.1
Dry density (lbs./cu. ft.)	114.6

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		764.9
Dry weight, soil | dish (gm.)		732.9
Weight of water (gm.)		32.0
Weight of dish (gm.)	N/A	174.7
Dry weight of sample (gm.)		558.2
Water content, % of dry weight		5.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	116.5
Wet weight of sample (lbs.)		Optimum moisture	11.9

-6.2 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 98.4% ~~Pass~~/~~Fail~~ N/A

Comments: N/A

THE MATERIAL AS MK-E-026 SAND CONE.

Test By Steven Mast

Checked By Steven Mast

SCALE USED 63-002 & 63-001

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4-25-89 Test Number MK-E-028

Location of Test N59,413 E58,870 @ ELEV 4128 "WINDBLOWNS"

Unit Weight of Sand (lbs./cu.ft.) 92.8 Type of Material SILICA SAND / WITCHGRASS

Test Specification N/A Curve Number CM-4-004

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.60
Weight of sand used (lbs.)	10.40
Gross volume (cu. ft.)	.1121
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0761
Wet weight of material from hole (lbs.)	9.92 - .38 = 9.54
Wet density (lbs. cu. ft.)	125.4
Dry density (lbs./cu. ft.)	119.7

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	755.0	790.7
Dry weight, soil | dish (gm.)	703.9	762.7
Weight of water (gm.)	51.1	28.0
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	529.2	588.0
Water content, % of dry weight	9.7	4.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747 FT³	Wet density (lbs./cu.ft.)	136.3
Weight of mold and soil (lbs.)	25.06	Dry density (lbs./cu. ft.)	124.2
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	124.4
Wet weight of sample (lbs.)	10.18	Optimum moisture	10.8

-6.0 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 96.2 % ~~Pass/Fail~~ N/A

Comments: N/A

Test By [illegible]

Checked By Steve Dike

SCALE USED GR-002 & GR-001

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/Green River Date 4-25-89 Test Number MK-E-029

Location of Test N 59,588 E 59,092 @ ELEV 4128 WENDBLOWNS

Unit Weight of Sand (lbs./cu.ft.) 92.8 Type of Material SILTY SAND W/GRAVEL

Test Specification N/A Curve Number CM-4-010

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.99	
Weight of sand used (lbs.)	10.01	
Gross volume (cu. ft.)		.1079
Tare volume (cu. ft.)		.0360
Net volume (cu. ft.)		.0719
Wet weight of material from hole (lbs.)	8.90-.38 =	8.52
Wet density (lbs. cu. ft.)		118.5
Dry density (lbs./cu. ft.)		113.1

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number	MICROWAVE	MICROWAVE	OVEN
Wet weight, soil | dish (gm.)	733.3	758.2	737.1
Dry weight, soil | dish (gm.)	671.4	731.4	708.8
Weight of water (gm.)	61.9	26.8	28.3
Weight of dish (gm.)	174.8	174.7	174.7
Dry weight of sample (gm.)	496.6	556.7	534.1
Water content, % of dry weight	12.5	4.8	5.3

← ok →

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747	Wet density (lbs./cu.ft.)	136.1
Weight of mold and soil (lbs.)	25.05	Dry density (lbs./cu. ft.)	121.0
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)	10.17	Optimum moisture	10.7

-5.9 % of Optimum Moisture

A.S.T.M. D-698
PERCENTAGE DENSITY OF SAMPLE 91.1% ~~Pass/Fail~~ N/A

Comments: N/A

Test By Stan Mark

Checked By Steve Dee

SCALE USED GB-001 & GB-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 Green River Date 4-26-89 Test Number MK-E-030

Location of Test N59438 + E59128 @ Elev. 4129 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 92.5 Type of Material Silty Sand /w. gravel

Test Specification N/A Curve Number CM-4-020

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	1.96
Weight of sand used (lbs.)	12.04
Gross volume (cu. ft.)	.1302
Tare volume (cu. ft.)	.0360 (65-02)
Net volume (cu. ft.)	.0942
Wet weight of material from hole (lbs.)	11.59 - .38 = 11.21
Wet density (lbs. cu. ft.)	119.0
Dry density (lbs./cu. ft.)	113.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	MICROWAVE	microwave
Wet weight, soil | dish (gm.)	732.8	769.2
Dry weight, soil | dish (gm.)	671.6	739.1
Weight of water (gm.)	61.2	30.1
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	496.9	564.4
Water content, % of dry weight	12.3	5.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	129.8
Weight of mold and soil (lbs.)	13.78	Dry density (lbs./cu. ft.)	115.6
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	116.5
Wet weight of sample (lbs.)	4.36	Optimum moisture	11.9

-6.6% of opt. moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 97.0%

Comments: Scales: GR-001 + GR-002 one-point proctor (CM-1-022) was conducted for this material.

Test By Steve Dive

Checked By [illegible]

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 · Green River Date 4-26-89 Test Number MK-E-31

Location of Test N 59308 + E 58994 c Elev. 4129 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 92.5 Type of Material Silty Sand) SC/Sand

Test Specification N/A Curve Number CM-4-020

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.61
Weight of sand used (lbs.)	10.39
Gross volume (cu. ft.)	.1123
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0763
Wet weight of material from hole (lbs.)	8.91 - .38 8.53
Wet density (lbs. cu. ft.)	111.8
Dry density (lbs./cu. ft.)	105.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		Microwave
Wet weight, soil | dish (gm.)		771.5
Dry weight, soil | dish (gm.)		736.2
Weight of water (gm.)	N	35.3
Weight of dish (gm.)	A	174.7
Dry weight of sample (gm.)		561.5
Water content, % of dry weight		6.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	116.5
Wet weight of sample (lbs.)		Optimum moisture	11.9

-5.6% of opt. moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 90.3%

Comments: Scales used: GR-001 + GR-002

Test By Steve Dike

Checked By Allen Weeks

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050 · Green River Date 4-26-89 Test Number MK-E-032

Location of Test N59400 + E59077 @ Elev. 4130 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 93.0 Type of Material silty sand w/gravel

Test Specification N/A Curve Number CM-4-020

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	2.51	
Weight of sand used (lbs.)	11.49	
Gross volume (cu. ft.)		.1235
Tare volume (cu. ft.)		.0360
Net volume (cu. ft.)		.0875
Wet weight of material from hole (lbs.)	10.91 - .38 =	10.53
Wet density (lbs. cu. ft.)		120.3
Dry density (lbs./cu. ft.)		114.9

WATER CONTENT

	Maximun Density Point	Field Density Test Microwave
Moisture pan number	N/A	~~789.0~~ SD 4-26-89
Wet weight, soil | dish (gm.)		789.0
Dry weight, soil | dish (gm.)		761.2
Weight of water (gm.)		27.8
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		586.5
Water content, % of dry weight		4.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	116.5
Wet weight of sample (lbs.)		Optimum moisture	11.9

-7.2% of opt. moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 98.6

Comments: Scales used: GR-001 + GR-002

Test By Steve Dike

Checked By [illegible]

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 4-27-89 Test Number MKE-033

Location of Test N59393 + E58466 @ Elev. 4131 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 91.7 Type of Material SILTY SAND w/gravel

Test Specification N/A Curve Number CM-4-004

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.08
Weight of sand used (lbs.)	10.92
Gross volume (cu. ft.)	.1191
Tare volume (cu. ft.)	.0360 (68-02)
Net volume (cu. ft.)	.0831
Wet weight of material from hole (lbs.)	10.52 - .38 = 10.14
Wet density (lbs. cu. ft.)	122.0
Dry density (lbs./cu. ft.)	SD ~~111.9~~ 114.0 4-27-89

WATER CONTENT

	Maximun Density Point		Field Density Test
Moisture pan number	Micro	Oven	Microwave
Wet weight, soil | dish (gm.)	763.6	770.9	737.7
Dry weight, soil | dish (gm.)	706.6	716.0	700.9
Weight of water (gm.)	57.0	54.9	36.8
Weight of dish (gm.)	174.8	174.8	174.7
Dry weight of sample (gm.)	531.8	541.2	526.2
Water content, % of dry weight	10.7	10.1	7.0

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747	Wet density (lbs./cu.ft.)	137.1
Weight of mold and soil (lbs.)	25.12	Dry density (lbs./cu. ft.)	123.8
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	124.4
Wet weight of sample (lbs.)	10.24	Optimum moisture	10.8

-3.8 % of Optimum Moisture

A.S.T.M. D698 SD

PERCENTAGE DENSITY OF SAMPLE 4-27-89 ~~90.0~~ 91.6 ~~Pass/Fail~~ N/A

Comments: A one-point, #CM-1-024, was conducted on this material.

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 4-27-89 Test Number MK-E-034

Location of Test N 59562 + E 58922 @ Elev. 4129 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 91.5 Type of Material Silty sand w/ gravel

Test Specification N/A Curve Number CM-4-004

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.27
Weight of sand used (lbs.)	9.73
Gross volume (cu. ft.)	.1063
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0703
Wet weight of material from hole (lbs.)	9.10 - .38 = 8.72
Wet density (lbs. cu. ft.)	124.0
Dry density (lbs./cu. ft.)	115.21 SDM 4/27/89

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	MICROWAVE
Wet weight, soil | dish (gm.)		757.2
Dry weight, soil | dish (gm.)		715.6
Weight of water (gm.)		41.6
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		540.9
Water content, % of dry weight		7.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	124.4
Wet weight of sample (lbs.)		Optimum moisture	10.8

-3.1 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 92.6 SDM 4/27/89 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By Allen Moats

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 4-28-89 Test Number MK-E-035

Location of Test N59487 + E59200 @ Elev. 4131 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 93.0 Type of Material Silty sand w/ gravel

Test Specification N/A Curve Number CM-4-030

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.00
Weight of sand used (lbs.)	10.00
Gross volume (cu. ft.)	.1075
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0715
Wet weight of material from hole (lbs.)	9.40 - .38 = 9.02
Wet density (lbs. cu. ft.)	126.2
Dry density (lbs./cu. ft.)	119.4

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		721.5
Dry weight, soil | dish (gm.)		691.9
Weight of water (gm.)		29.6
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		517.2
Water content, % of dry weight		5.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	123.0
Wet weight of sample (lbs.)		Optimum moisture	10.9

-5.2 % of Optimum Moisture

(A.S.T.M.-D698)
PERCENTAGE DENSITY OF SAMPLE 97.1 ~~Pass/Fail~~ N/A

Comments: A four-point proctor (#CM-030) was conducted on this material late yesterday

Test By Steve Dale

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 4-28-89 Test Number MK-E-036

Location of Test N59566 + E59040 @ Elev. 4129 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 93.0 Type of Material Silty sand w/ gravel

Test Specification N/A Curve Number CM-4-030

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	2.89
Weight of sand used (lbs.)	11.11
Gross volume (cu. ft.)	.1195
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0835
Wet weight of material from hole (lbs.)	10.74 - .38 = 10.36
Wet density (lbs. cu. ft.)	124.1
Dry density (lbs./cu. ft.)	119.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		757.6
Dry weight, soil | dish (gm.)		734.5
Weight of water (gm.)		23.1
Weight of dish (gm.)		174.8
Dry weight of sample (gm.)		559.7
Water content, % of dry weight		4.1

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	123.0
Wet weight of sample (lbs.)		Optimum moisture	10.9

-6.8 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 96.9 Pass/Fail

Comments: NA

Test By Steve Dahe

Checked By Allen Watts

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 4-28-89 Test Number MK-E-037

Location of Test N 59522 + E 58907 @ Elev. 4131 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand, Silty

Test Specification N/A Curve Number CM-4-031

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.76
Weight of sand used (lbs.)	10.24
Gross volume (cu. ft.)	.1115
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0755
Wet weight of material from hole (lbs.)	8.75 - .38 = 8.37
Wet density (lbs. cu. ft.)	110.9
Dry density (lbs./cu. ft.)	105.5

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number	Micro	Micro	Oven
Wet weight, soil | dish (gm.)	775.6	734.9	748.1
Dry weight, soil | dish (gm.)	709.~~6~~5 SD 4-28-89	707.8	718.9
Weight of water (gm.)	66.1	27.1	29.2
Weight of dish (gm.)	174.7	174.7	174.7
Dry weight of sample (gm.)	534.8	533.1	544.2
Water content, % of dry weight	12.4	5.1	5.4

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	130.1
Weight of mold and soil (lbs.)	13.79	Dry density (lbs./cu. ft.)	115.7
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	116.1
Wet weight of sample (lbs.)	4.37	Optimum moisture	12.2

-7.1 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 90.9 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH

QA REVIEWED FOR QUALITY REQUIREMENTS
BY N/A
QA ENTRY NO. N/A

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-1-89 Test Number MK-E-038

Location of Test N59338 + E59055 @ Elev. 4133 (TAILINGS MIXTURE Windblown contaminates)

Unit Weight of Sand (lbs./cu.ft.) 92.7 Type of Material Silty sand

Test Specification N/A Curve Number CM-4-019

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.05
Weight of sand used (lbs.)	9.95
Gross volume (cu. ft.)	.1073
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0713
Wet weight of material from hole (lbs.)	8.24-.38 = 7.86
Wet density (lbs. cu. ft.)	110.2
Dry density (lbs./cu. ft.)	104.2

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number	Micro	Micro	Oven
Wet weight, soil | dish (gm.)	762.3	766.9	723.3
Dry weight, soil | dish (gm.)	678.5	734.2	692.9
Weight of water (gm.)	83.8	32.7	30.4
Weight of dish (gm.)	174.7	174.7	174.7
Dry weight of sample (gm.)	503.8	559.5	518.2
Water content, % of dry weight	16.6	5.8	5.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	124.7
Weight of mold and soil (lbs.)	13.61	Dry density (lbs./cu. ft.)	106.9
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	111.2
Wet weight of sample (lbs.)	4.19	Optimum moisture	13.2

-7.4 % of Optimum Moisture

(A.S.T.M. D 698) PERCENTAGE DENSITY OF SAMPLE 93.7% ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By Steven Weeks

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH

QA REVIEWED FOR QUALITY REQUIREMENTS
BY N/A
QA ENTRY NO. N/A

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-1-89 Test Number MK-E-039

Location of Test N59603 + E58995 @ Elev. 4132 (TAILINGS MIXTURE windblown contaminates)

Unit Weight of Sand (lbs./cu.ft.) 92.4 Type of Material Silty sand

Test Specification N/A Curve Number CM-4-019

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.33
Weight of sand used (lbs.)	10.67
Gross volume (cu. ft.)	.1155
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0795
Wet weight of material from hole (lbs.)	9.00-.38 = 8.62
Wet density (lbs. cu. ft.)	108.4
Dry density (lbs./cu. ft.)	~~105.0~~ 104.9 SDM 5/1/89

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		Microwave
Wet weight, soil | dish (gm.)		763.4
Dry weight, soil | dish (gm.)		744.7
Weight of water (gm.)	N	18.7
Weight of dish (gm.)	A	174.7
Dry weight of sample (gm.)		570.0
Water content, % of dry weight		3.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N	Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	A	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	111.2
Wet weight of sample (lbs.)		Optimum moisture	13.2

-9.9 % of Optimum Moisture

(A.S.T.M. D698) PERCENTAGE DENSITY OF SAMPLE 94.43 SDM 5/1/89 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dale

Checked By Steven Mark

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-2-89 Test Number MK-E-040 (TAILINGS MIXTURE)

Location of Test N59495 + E59009 @ Elev. 4134 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 92.3 Type of Material Silty sand w/gravel

Test Specification N/A Curve Number CM-4-006

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.72	
Weight of sand used (lbs.)	10.28	
Gross volume (cu. ft.)		.1114
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0754
Wet weight of material from hole (lbs.)	8.88-.38	8.50
Wet density (lbs. cu. ft.)		112.7
Dry density (lbs./cu. ft.)		106.9

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number	Microwave	Microwave	oven
Wet weight, soil | dish (gm.)	732.5	741.1	732.1
Dry weight, soil | dish (gm.)	672.1	712.1	703.1
Weight of water (gm.)	60.4	28.0	29.0
Weight of dish (gm.)	174.7	174.7	174.7
Dry weight of sample (gm.)	497.4	537.4	528.4
Water content, % of dry weight	12.1	5.4	5.5

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	132.4
Weight of mold and soil (lbs.)	13.87	Dry density (lbs./cu. ft.)	118.1
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	118.8
Wet weight of sample (lbs.)	4.45	Optimum moisture	13.1

-7.7 % of Optimum Moisture

(ASTM D698)
PERCENTAGE DENSITY OF SAMPLE 90.0 % ~~Pass/Fail~~ N/A

Comments: NA

Test By Steve Dike

Checked By Allan Moore

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-2-89 Test Number MK-E-041

Location of Test N59547 + E59187 @ Elev. 4135 (1ST LIFT OF Mill tailings)

Unit Weight of Sand (lbs./cu.ft.) 92.2 Type of Material Tailings - Silty sand

Test Specification N/A Curve Number CM-4-033

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.34
Weight of sand used (lbs.)	10.66
Gross volume (cu. ft.)	.1156
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0796
Wet weight of material from hole (lbs.)	8.76 - .38 = 8.38
Wet density (lbs. cu. ft.)	105.3
Dry density (lbs./cu. ft.)	102.3

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		Microwave
Wet weight, soil | dish (gm.)		769.7
Dry weight, soil | dish (gm.)		753.0
Weight of water (gm.)	N	16.7
Weight of dish (gm.)	A	174.8
Dry weight of sample (gm.)		578.2
Water content, % of dry weight		2.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	104.4
Wet weight of sample (lbs.)		Optimum moisture	13.5

-10.6 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 98.0 % ~~Pass/Fail~~

Comments: N/A + A FOUR-POINT PROCTOR WAS CONDUCTED FOR THIS MATERIAL.

Test By Steve Dike

Checked By Steve Monts

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-3-89 Test Number MK-E-042

Location of Test N 59674 + E 59040 @ Elev. 4135 (1st LIFT OF Mill tailings)

Unit Weight of Sand (lbs./cu.ft.) 92.0 Type of Material Sand - slightly silty

Test Specification N/A Curve Number CM-4-033

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.07
Weight of sand used (lbs.)	9.93
Gross volume (cu. ft.)	.1079
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0719
Wet weight of material from hole (lbs.)	7.84 - .38 = 7.46
Wet density (lbs. cu. ft.)	103.8
Dry density (lbs./cu. ft.)	99.4

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	735.7	721.0
Dry weight, soil | dish (gm.)	670.2	697.9
Weight of water (gm.)	65.5	23.1
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	495.5	523.2
Water content, % of dry weight	13.2	4.4

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	117.6
Weight of mold and soil (lbs.)	13.37	Dry density (lbs./cu. ft.)	103.9
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	104.4
Wet weight of sample (lbs.)	3.95	Optimum moisture	13.5

-9.1 % of Optimum Moisture

ASTM D698
PERCENTAGE DENSITY OF SAMPLE 95.2 ~~Pass/Fail~~ N/A

Comments: N/A

MATCHED A FOUR POINT PROCTOR CONDUCTED YESTERDAY.

SCALE USED GR-001 - GR-002

Test By Steve Dake

Checked By Allan Mish

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-3-89 Test Number MK-E-043

Location of Test N59484 + E59137 @ Elev. 4136 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 92.0 Type of Material Sand - slightly silty

Test Specification N/A Curve Number CM-4-033

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.22
Weight of sand used (lbs.)	10.78
Gross volume (cu. ft.)	.1172
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0812
Wet weight of material from hole (lbs.)	8.88 - .38 = 8.50
Wet density (lbs. cu. ft.)	104.7
Dry density (lbs./cu. ft.)	100.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		Microwave
Wet weight, soil | dish (gm.)		721.4
Dry weight, soil | dish (gm.)		697.0
Weight of water (gm.)	N	24.4
Weight of dish (gm.)	A	174.7
Dry weight of sample (gm.)		522.3
Water content, % of dry weight		4.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	104.4
Wet weight of sample (lbs.)		Optimum moisture	13.5

-8.8 % of Optimum Moisture

ASTM D698
PERCENTAGE DENSITY OF SAMPLE 95.8 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-3-89 Test Number MK-E-044

Location of Test N59422 + E59004 @ Elev. 4137 - Mill Tailings

Unit Weight of Sand (lbs./cu.ft.) 91.9 Type of Material Sand, slightly silty

Test Specification N/A Curve Number CM-4-034

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.35
Weight of sand used (lbs.)	9.65
Gross volume (cu. ft.)	.1050
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0690
Wet weight of material from hole (lbs.)	7.33 - .38 = 6.95
Wet density (lbs. cu. ft.)	100.7
Dry density (lbs./cu. ft.)	97.1

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		751.4
Dry weight, soil | dish (gm.)		730.9 ~~730~~ SDM 5/31/89
Weight of water (gm.)		20.5
Weight of dish (gm.)		174.8
Dry weight of sample (gm.)		556.1
Water content, % of dry weight		3.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	102.0
Wet weight of sample (lbs.)		Optimum moisture	14.5

-10.8 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 95.2 ~~Pass/Fail~~ N/A

Comments: A four-point proctor was conducted on this material.

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-4-89 Test Number MK-E-045

Location of Test N59468 + E58843 @ Elev. 4137 - Mill Tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.35
Weight of sand used (lbs.)	10.65
Gross volume (cu. ft.)	.1160
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0800
Wet weight of material from hole (lbs.)	8.37-.38 7.99
Wet density (lbs. cu. ft.)	99.9
Dry density (lbs./cu. ft.)	96.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	736.8	762.0
Dry weight, soil | dish (gm.)	663.4	740.1
Weight of water (gm.)	73.4	21.9
Weight of dish (gm.)	174.8	174.7
Dry weight of sample (gm.)	488.6	565.4
Water content, % of dry weight	15.0	3.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	116.1
Weight of mold and soil (lbs.)	13.32	Dry density (lbs./cu. ft.)	101.0
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)	3.90	Optimum moisture	15.0

-11.1 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 95.2 ~~Pass/Fail~~ N/A

Comments: The one-point did not match an existing proctor and a four point was conducted on this sample

Test By Steve Dike

Checked By Stan Marts

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-4-89 Test Number MK-E-046

Location of Test N59508 + E59078 @ Elev. 4138 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.30
Weight of sand used (lbs.)	10.70
Gross volume (cu. ft.)	.1166
Tare volume (cu. ft.)	.0360 ~~.0354~~ (GR-02)
Net volume (cu. ft.)	.0806
Wet weight of material from hole (lbs.)	8.48 - .38 = 8.10
Wet density (lbs. cu. ft.)	100.5
Dry density (lbs./cu. ft.)	97.8

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	MICROWAVE
Wet weight, soil | dish (gm.)	N/A	739.0
Dry weight, soil | dish (gm.)	N/A	722.2
Weight of water (gm.)	N/A	16.8
Weight of dish (gm.)	N/A	174.7
Dry weight of sample (gm.)	N/A	597.5
Water content, % of dry weight	N/A	2.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)	N/A	Dry density (lbs./cu. ft.)	N/A
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)	N/A	Optimum moisture	15.0

-12.2 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 96.8 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By Allan Mints

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-4-89 Test Number MK-E-047

Location of Test N59581 + E59028 @ Elev. 4138- Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.9 Type of Material Sand

Test Specification N/A Curve Number CM-4-038

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.57
Weight of sand used (lbs.)	10.43
Gross volume (cu. ft.)	.1135
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0775
Wet weight of material from hole (lbs.)	8.24-.38= 7.91
Wet density (lbs. cu. ft.)	102.1
Dry density (lbs./cu. ft.)	98.8

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		715.6
Dry weight, soil | dish (gm.)		698.5
Weight of water (gm.)		17.1
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		523.8
Water content, % of dry weight		3.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	102.3
Wet weight of sample (lbs.)		Optimum moisture	15.0

-11.7 % of Optimum Moisture

ASTM D-698
PERCENTAGE DENSITY OF SAMPLE 96.6 ~~Pass/Fail~~ N/A

Comments: A four-point proctor was conducted on this material.

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/5/89 Test Number MK-E-048

Location of Test N59437 + E59061 @ Elev. 4139 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand

Test Specification N/A Curve Number CM-4-029

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	4.02	
Weight of sand used (lbs.)	9.98	
Gross volume (cu. ft.)		.1087
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0727
Wet weight of material from hole (lbs.)	8.02 - .38	7.64
Wet density (lbs. cu. ft.)		105.1
Dry density (lbs./cu. ft.)		102.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	microwave
Wet weight, soil | dish (gm.)	728.3	741.7
Dry weight, soil | dish (gm.)	660.6	725.2
Weight of water (gm.)	67.7	16.5
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	485.9	550.5
Water content, % of dry weight	13.9	3.0

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	114.9
Weight of mold and soil (lbs.)	13.28	Dry density (lbs./cu. ft.)	100.9
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	102.3
Wet weight of sample (lbs.)	3.86	Optimum moisture	15.2

-12.2 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 99.7 ~~Pass/Fail~~ N/A

Comments: The one-point watched proctor No. CM-4-029.

Test By Steve Dike

Checked By Steven Mark

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/5/89 Test Number MK-E-049

Location of Test N59496 + E58928 @ Elev. 4139 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand

Test Specification N/A Curve Number CM-4-029

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	4.35	
Weight of sand used (lbs.)	9.65	
Gross volume (cu. ft.)		.1051
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0691
Wet weight of material from hole (lbs.)	7.63 - .38 =	7.25
Wet density (lbs. cu. ft.)		104.9
Dry density (lbs./cu. ft.)		99.6

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		739.8
Dry weight, soil | dish (gm.)		711.6
Weight of water (gm.)		28.2
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		536.9
Water content, % of dry weight		5.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	102.3
Wet weight of sample (lbs.)		Optimum moisture	15.2

-9.9 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 97.4 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By Steven Marks

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-5-89 Test Number MK-E-050

Location of Test N59411 + E59228 @ Elev. 4140 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.9 Type of Material Sand

Test Specification N/A Curve Number CM-4-039

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.08	
Weight of sand used (lbs.)	10.92	
Gross volume (cu. ft.)		.1188
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0828
Wet weight of material from hole (lbs.)	9.03 - .38	8.65
Wet density (lbs. cu. ft.)		104.5
Dry density (lbs./cu. ft.)		101.2

WATER CONTENT

	Maximum Density Point	Field Density Test	
Moisture pan number		MUCHO	BUCKY
Wet weight, soil | dish (gm.)		753.3	729.5
Dry weight, soil | dish (gm.)		735.0	708.7
Weight of water (gm.)	N	18.3	20.8
Weight of dish (gm.)	A	174.7	174.7
Dry weight of sample (gm.)		560.3	534.0
Water content, % of dry weight		3.3	3.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	104.2
Wet weight of sample (lbs.)		Optimum moisture	13.7

-10.4 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 97.1 ~~Pass/Fail~~ N/A

Comments: A four-point proctor (e. CM-4-039) was conducted on this material.

Test By Steve Dike

Checked By Steven Mist

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/8/89 Test Number MK-E-051

Location of Test N59302 + E59122 @ Elev. 4141 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 92.0 Type of Material Sand, slightly silty

Test Specification N/A Curve Number CM-4-033

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.25
Weight of sand used (lbs.)	9.75
Gross volume (cu. ft.)	.1060
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0700
Wet weight of material from hole (lbs.)	7.49 - .38 7.11
Wet density (lbs. cu. ft.)	5-8-89 SD ~~106~~ 101.6
Dry density (lbs./cu. ft.)	97.6

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Oven	Microwave
Wet weight, soil | dish (gm.)	757.7	772.2
Dry weight, soil | dish (gm.)	688.6	748.4
Weight of water (gm.)	69.1	23.8
Weight of dish (gm.)	174.8	174.7
Dry weight of sample (gm.)	513.8	573.7
Water content, % of dry weight	13.4	4.1

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	118.2
Weight of mold and soil (lbs.)	13.39	Dry density (lbs./cu. ft.)	104.2
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	104.4
Wet weight of sample (lbs.)	3.97	Optimum moisture	13.5

-9.4 % of Optimum Moisture

ASTM D698
PERCENTAGE DENSITY OF SAMPLE 93.5% ~~Pass/Fail~~ N/A

Comments: The one-point matched a [illegible]-point no. CM-4-033.

Test By Steve Dike

Checked By [signature]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-8-89 Test Number MK-E-052

Location of Test N 59529 + E 59006 @ Elev. 4141 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 92.0 Type of Material Sand, slightly silty

Test Specification N/A Curve Number CM-4-033

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.84
Weight of sand used (lbs.)	10.16
Gross volume (cu. ft.)	.1104
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0744
Wet weight of material from hole (lbs.)	7.98 - .38 = 7.60
Wet density (lbs. cu. ft.)	102.2
Dry density (lbs./cu. ft.)	98.8

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MICROWAVE
Wet weight, soil | dish (gm.)		782.2
Dry weight, soil | dish (gm.)		762.0
Weight of water (gm.)	N	20.2
Weight of dish (gm.)	A	174.8
Dry weight of sample (gm.)		587.2
Water content, % of dry weight		3.4

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	104.4
Wet weight of sample (lbs.)		Optimum moisture	13.5

-10.1 % of Optimum Moisture

A.S.T.M. 698
PERCENTAGE DENSITY OF SAMPLE 94.6 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By [signature]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-8-89 Test Number MKE-053

Location of Test N59562 + E59131 @ Elev. 4141 - Mill Tailings

Unit Weight of Sand (lbs./cu.ft.) 91.7 Type of Material Sand, slightly silty

Test Specification N/A Curve Number CM-4-033

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.75	
Weight of sand used (lbs.)	10.25	
Gross volume (cu. ft.)		.1115
Tare volume (cu. ft.)	GR-02	.0360
Net volume (cu. ft.)		.0755
Wet weight of material from hole (lbs.)	5.01 - .58	7.63
Wet density (lbs. cu. ft.)		100.7
Dry density (lbs./cu. ft.)		95.7

WATER CONTENT

	Maximum Density Point	Field Density Test	
Moisture pan number		Microwave	Oven
Wet weight, soil | dish (gm.)		754.4	757.7
Dry weight, soil | dish (gm.)		725.9	729.5
Weight of water (gm.)	N	28.5	28.2
Weight of dish (gm.)	A	174.8	174.8
Dry weight of sample (gm.)		551.1	554.7
Water content, % of dry weight		5.2	5.1

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	104.4
Wet weight of sample (lbs.)		Optimum moisture	13.5

-8.3 % of Optimum Moisture

PERCENTAGE DENSITY OF SAMPLE 91.7 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By Allan Mark

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/9/89 Test Number MK-E-054

Location of Test N59443 + E58918 @ Elev. 4141 - Mill Tailings

Unit Weight of Sand (lbs./cu.ft.) 91.9 Type of Material Sand, slightly silty

Test Specification N/A Curve Number CM-4-034

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.11	
Weight of sand used (lbs.)	10.89	
Gross volume (cu. ft.)		.1185
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0825
Wet weight of material from hole (lbs.)	8.83-.38	8.45
Wet density (lbs. cu. ft.)		102.4
Dry density (lbs./cu. ft.)		96.3

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	747.8	786.0
Dry weight, soil | dish (gm.)	674.3	750.0
Weight of water (gm.)	73.5	36.0
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	499.96 [illegible]	575.3
Water content, % of dry weight	14.7	6.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	118.5
Weight of mold and soil (lbs.)	13.40	Dry density (lbs./cu. ft.)	103.3
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	103.5
Wet weight of sample (lbs.)	3.98	Optimum moisture	13.8

-7.5 % of Optimum Moisture

(ASTM D698)
PERCENTAGE DENSITY OF SAMPLE 93.0 ~~Pass/Fail~~ N/A

Comments: The one-point matched a [illegible]-point (No. CM-4-034)

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

E: Today's elevations reflect grade changes obtained from site engineer

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/9/89 Test Number MK-E-055

Location of Test N59353 + E59230 @ Elev. 4142 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.9 Type of Material Sand, slightly silty

Test Specification N/A Curve Number CM-4-034

FIELD DENSITY

Original weight of sand and container (lbs.)	14.03	
Final weight of sand and container (lbs.)	3.66	
Weight of sand used (lbs.)	10.36	
Gross volume (cu. ft.)		.1127
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0767
Wet weight of material from hole (lbs.)	8.24 - .38 =	7.86
Wet density (lbs. cu. ft.)		102.5
Dry density (lbs./cu. ft.)		99.2

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		Microwave
Wet weight, soil | dish (gm.)		764.6
Dry weight, soil | dish (gm.)		746.0
Weight of water (gm.)	N/A	18.6
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		571.3
Water content, % of dry weight		3.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	103.5
Wet weight of sample (lbs.)		Optimum moisture	13.8

-10.5 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 95.8 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-9-89 Test Number MK-E-056

Location of Test N59407 + E59030 @ Elev. 4142 · Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.9 Type of Material Sand - slightly silty

Test Specification N/A Curve Number CM-4-034

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.62
Weight of sand used (lbs.)	10.38
Gross volume (cu. ft.)	.1129
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0769
Wet weight of material from hole (lbs.)	8.25 - .38 = 7.87
Wet density (lbs. cu. ft.)	102.3
Dry density (lbs./cu. ft.)	99.01 EEL 5-9-89

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		Micro
Wet weight, soil | dish (gm.)		763.1
Dry weight, soil | dish (gm.)		744.4
Weight of water (gm.)	N	18.7
Weight of dish (gm.)	A	174.5
Dry weight of sample (gm.)		569.9
Water content, % of dry weight		3.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	103.5
Wet weight of sample (lbs.)		Optimum moisture	13.8

-10.5 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 95.7 ~~Pass/Fail~~

Comments: N/A

Test By Steve Dike

Checked By Eugene Peterson

SCALE USED GR-001 + GR-002

INFORMATION ONLY

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/10/89 Test Number MK-E-057

Location of Test N59453 + E58992 @ Elev. 4143 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 92.1 Type of Material SAND

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.66	
Weight of sand used (lbs.)	10.34	
Gross volume (cu. ft.)	.1123	
Tare volume (cu. ft.)	(GR-E-2)	.0360
Net volume (cu. ft.)		.0763
Wet weight of material from hole (lbs.)	8.31 - .38 =	7.93
Wet density (lbs. cu. ft.)		103.9
Dry density (lbs./cu. ft.)		97.9

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	758.1	747.0 ~~747.0~~ EFL 5/10/89
Dry weight, soil | dish (gm.)	685.6	714.1
Weight of water (gm.)	72.5	32.9
Weight of dish (gm.)	174.7	174.6
Dry weight of sample (gm.)	510.9	539.5
Water content, % of dry weight	14.2	6.1

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	114.3
Weight of mold and soil (lbs.)	13.26	Dry density (lbs./cu. ft.)	100.1
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)	3.84	Optimum moisture	15.0

-8.9 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 96.9 ~~Pass/Fail~~ N/A

Comments: The one-point matched a on-point (no. CM-4-037)

Test By [signature]

Checked By Steve Dike

SCALE USED GR-EE1 + GR-EE2

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/10/89 Test Number MK-E-058

Location of Test N59277 + E59151 @ Elev. 4143 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 92.1 Type of Material Sand

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.81	
Weight of sand used (lbs.)	10.19	
Gross volume (cu. ft.)		.1106
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0746
Wet weight of material from hole (lbs.)	7.85 - .38	7.47
Wet density (lbs. cu. ft.)		100.1
Dry density (lbs./cu. ft.)		97.0

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number		microwave
Wet weight, soil | dish (gm.)		773.6
Dry weight, soil | dish (gm.)		754.9
Weight of water (gm.)	N	18.7
Weight of dish (gm.)	A	174.6
Dry weight of sample (gm.)		580.3
Water content, % of dry weight		3.2

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)		Optimum moisture	15.0

~11.8 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 96.0 ~~Pass/Fail~~

Comments: N/A

Test By Everett Lehman

Checked By Steve Dike

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/10/89 Test Number MK-E-059

Location of Test N59660 + E59061 @ Elev. 4143 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 92.1 Type of Material Sand

Test Specification N/A Curve Number CM-A-037

FIELD DENSITY

Original weight of sand and container (lbs.)	~~18.00~~ 14.00	
Final weight of sand and container (lbs.)	3.71	
Weight of sand used (lbs.)	10.29	
Gross volume (cu. ft.)		.1167
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0757
Wet weight of material from hole (lbs.)	8.00 - .38 = 7.62	
Wet density (lbs. cu. ft.)		100.7
Dry density (lbs./cu. ft.)		96.8

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number		Microwave
Wet weight, soil + dish (gm.)		763.4
Dry weight, soil + dish (gm.)	N	741.0
Weight of water (gm.)		22.4
Weight of dish (gm.)	A	174.7
Dry weight of sample (gm.)		566.3
Water content, % of dry weight		4.0

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)	A	Optimum moisture	15.0

-11.0 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 95.8 ~~Pass/Fail~~ N/A

Comments: N/A

Test By [signature]

Checked By Steve Dike

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/10/89 (SDM 5/11/89) Test Number MK-E-060

Location of Test N 59512 + E 58377 @ Elev 4144 - Mill Tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material SAND Silty TAN

Test Specification N/A Curve Number CM-4-040

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.72	
Weight of sand used (lbs.)	10.28	
Gross volume (cu. ft.)		.1120
Tare volume (cu. ft.)		.0360 (CR-02)
Net volume (cu. ft.)		.0760
Wet weight of material from hole (lbs.)	8.11 - .38	7.73
Wet density (lbs. cu. ft.)		101.7
Dry density (lbs./cu. ft.)		98.1

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	744.5	750.3
Dry weight, soil | dish (gm.)	677.5	729.8
Weight of water (gm.)	67.0	20.5
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	502.8	555.1
Water content, % of dry weight	13.3	3.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	116.1
Weight of mold and soil (lbs.)	13.32	Dry density (lbs./cu. ft.)	102.5
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	103.1
Wet weight of sample (lbs.)	3.90	Optimum moisture	14.8

-11.1 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 95.2 ~~Pass/Fail~~ N/A

Comments: A one-point was conducted which matched a four-point No. CM-4-040

Test By [signature]

Checked By Steve Dike

SCALE USED CR-001 CR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

SDM 5/11/89

Job 3050/GREEN RIVER Date 5-11-89 Test Number MK-E-061

SD 5-11-89

Location of Test ~~N59394 + E~~ N59394 + E59300 @ Elev. 4144 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand

Test Specification N/A Curve Number CM-4-040

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.72	
Weight of sand used (lbs.)	10.28	
Gross volume (cu. ft.)	.1120	
Tare volume (cu. ft.)	.0360	(GR-02)
Net volume (cu. ft.)	.0760	
Wet weight of material from hole (lbs.)	8.58 - .38	8.20
Wet density (lbs. cu. ft.)	107.9	
Dry density (lbs./cu. ft.)	101.9	

WATER CONTENT

	Maximum Density Point	Field Density Test	
		Micro	Oven
Moisture pan number			
Wet weight, soil | dish (gm.)		742.1	750.4
Dry weight, soil | dish (gm.)	N	710.7	718.6 ~~543.9~~ EH 5-12-89
Weight of water (gm.)		31.4	31.8
Weight of dish (gm.)		174.7	174.7
Dry weight of sample (gm.)	A	536.0	543.9
Water content, % of dry weight		5.9	5.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	~~101.3~~ 103.1 SDM 5/11/89
Wet weight of sample (lbs.)		Optimum moisture	14.8

(ASTM D698) 98.8% SDM 5/11/89 -8.9 % of Optimum Moisture

PERCENTAGE DENSITY OF SAMPLE ~~100.6~~ ~~Pass/Fail~~ N/A

Comments: N/A

Test By [signature]

Checked By Steve Dye

SCALE USED GR-001 GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-~~10~~ 11-89 SDM 5/11/89 Test Number MK-E-062

Location of Test N59468 + E59059 @ Elev. 4145 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand, silty

Test Specification N/A Curve Number CM-4-040

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	4.03	
Weight of sand used (lbs.)	9.97	
Gross volume (cu. ft.)		.1096
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0726
Wet weight of material from hole (lbs.)	8.27 - .38	7.89
Wet density (lbs. cu. ft.)		108.7
Dry density (lbs./cu. ft.)		103.1

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number	N/A	Micro
Wet weight, soil | dish (gm.)		767.8
Dry weight, soil | dish (gm.)		737.5
Weight of water (gm.)		30.3
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		562.8
Water content, % of dry weight		5.4

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	103.1
Wet weight of sample (lbs.)		Optimum moisture	14.8

-9.4 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 100 ~~Pass/Fail~~ N/A

Comments: N/A

Test By Steve Dike

Checked By [illegible signature]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-12-89 Test Number MK-E-063

Location of Test N58920 + E58900 @ Elev. 4145 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.9 Type of Material Sand

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	3.05	
Weight of sand used (lbs.)	10.95	
Gross volume (cu. ft.)		.1192
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0832
Wet weight of material from hole (lbs.)	8.75 - .38 =	8.37
Wet density (lbs. cu. ft.)		100.6
Dry density (lbs./cu. ft.)		98.7

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	788.5	749.1
Dry weight, soil | dish (gm.)	681.59 EAL 5-12-89	738.6
Weight of water (gm.)	106	10.5
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	507.2	563.9
Water content, % of dry weight	15.1	1.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	116.4
Weight of mold and soil (lbs.)	13.33	Dry density (lbs./cu. ft.)	101.1
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)	3.91	Optimum moisture	15.0

-13.1 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 97.7 ~~Pass/Fail~~

Comments: The one-point matched four-point no. CM-4-037

Test By [signature]

Checked By Steve Dike

SCALE USED GR-002 GR-001

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/12/89 Test Number MK-E-044

Location of Test N 59217 + E 59150 @ ELEV. 4146 - MKI TAILINGS

Unit Weight of Sand (lbs./cu.ft.) 91.9 Type of Material SAND LT. GREY

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	4.19	
Weight of sand used (lbs.)	9.81	
Gross volume (cu. ft.)		.1067
Tare volume (cu. ft.)	(CR-02)	.0360
Net volume (cu. ft.)		.0707
Wet weight of material from hole (lbs.)	7.74 - .38 =	7.36
Wet density (lbs. cu. ft.)		104.1
Dry density (lbs./cu. ft.)		98.1

WATER CONTENT

	Maximum Density Point	Field Density Test	
Moisture pan number		MICRO	OVEN
Wet weight, soil + dish (gm.)		742.5	749.2
Dry weight, soil + dish (gm.)	N	709.8	713.2
Weight of water (gm.)		32.7	36
Weight of dish (gm.)		174.7	174.7
Dry weight of sample (gm.)	A	535.1	538.5
Water content, % of dry weight		6.1	6.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	SD 5-12-89 116.4
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	101.1
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)		Optimum moisture	15.0

-8.9 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 97.1 ~~Pass/Fail~~

Comments: N/A

Test By Eugene Johnson

Checked By Steve Dike

SCALE USED CR-001 CR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-12-89 Test Number MK-E-065

Location of Test N 59504 + E 58982 @ Elev. 4147 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.7 Type of Material Sand

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.60
Weight of sand used (lbs.)	10.40
Gross volume (cu. ft.)	.1134
Tare volume (cu. ft.)	.0360 GR-02
Net volume (cu. ft.)	.0774
Wet weight of material from hole (lbs.)	8.33-.38= 7.95
Wet density (lbs. cu. ft.)	102.7
Dry density (lbs./cu. ft.)	97.5

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Microwave
Wet weight, soil | dish (gm.)		745.4
Dry weight, soil | dish (gm.)		716.9
Weight of water (gm.)		28.5
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		542.2
Water content, % of dry weight		5.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)		Optimum moisture	15.0

-9.7 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 96.5 ~~Pass/Fail~~

Comments: N/A

Test By Steve Dike

Checked By Steven Mart

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/15/89 Test Number MK-E-066

Location of Test N59436 + E59198 c Elev. 4148 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand, silty

Test Specification N/A Curve Number CM-4-036

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.71
Weight of sand used (lbs.)	10.29
Gross volume (cu. ft.)	SD 5-15-89 ~~.1131~~ .1121
Tare volume (cu. ft.)	.0360 (89-02)
Net volume (cu. ft.)	SD 5-15-89 ~~.0771~~ .0761
Wet weight of material from hole (lbs.)	8.17 - .38 7.79
Wet density (lbs. cu. ft.)	SD 5-15-89 ~~101.0~~ 102.4
Dry density (lbs./cu. ft.)	SD 5-15-89 ~~97.0~~ 98.4

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	Microwave
Wet weight, soil | dish (gm.)	761.0	787.3
Dry weight, soil | dish (gm.)	689.4	763.4
Weight of water (gm.)	71.6	23.9
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	514.7	588.7
Water content, % of dry weight	13.9	4.1

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	120.5
Weight of mold and soil (lbs.)	13.47	Dry density (lbs./cu. ft.)	105.8
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	107.6
Wet weight of sample (lbs.)	4.05	Optimum moisture	13.1

-9.0 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE SD 5-15-89 ~~90.1~~ 91.4 ~~Pass/Fail~~

Comments: The one-point matched a four point (CM-4-036)

Test By [signature]

Checked By Steve Dtle

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/15/89 Test Number MK-E-067

Location of Test N59368 + E59089 @ Elev. 4149 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.8 Type of Material Sand, silty

Test Specification N/A Curve Number CM-4-036

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.86
Weight of sand used (lbs.)	10.14
Gross volume (cu. ft.)	.1105
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0745
Wet weight of material from hole (lbs.)	8.31 - .38 = 7.93
Wet density (lbs. cu. ft.)	106.4
Dry density (lbs./cu. ft.)	101.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		MERONINE
Wet weight, soil | dish (gm.)		759.6
Dry weight, soil | dish (gm.)		730.0
Weight of water (gm.)	N	29.6
Weight of dish (gm.)	A	174.7
Dry weight of sample (gm.)		555.3
Water content, % of dry weight		5.3

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	107.6
Wet weight of sample (lbs.)		Optimum moisture	13.1

-7.8 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 93.9 ~~Pass/Fail~~

Comments: N/A

Test By [signature]

Checked By Steve Dike

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-15-89 Test Number MK-E-068

Location of Test N59458 + E58442 @ Elev. 4150 Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 92.0 Type of Material Sand - Dark brown

Test Specification N/A Curve Number CM-4-042

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	4.70	
Weight of sand used (lbs.)	9.30	
Gross volume (cu. ft.)		.1011
Tare volume (cu. ft.)	(GR-02)	.0360
Net volume (cu. ft.)		.0651
Wet weight of material from hole (lbs.)	7.63 - .38 =	7.25
Wet density (lbs. cu. ft.)		111.4
Dry density (lbs./cu. ft.)		104.4

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number	Micro	Micro
Wet weight, soil | dish (gm.)	746.1	745.8
Dry weight, soil | dish (gm.)	684.9	710.0
Weight of water (gm.)	61.2	35.8
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	510.2	535.3
Water content, % of dry weight	12.0	6.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	122.0
Weight of mold and soil (lbs.)	13.52	Dry density (lbs./cu. ft.)	108.9
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	110.0
Wet weight of sample (lbs.)	4.10	Optimum moisture	13.3

-6.6 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 95.0 ~~Pass/Fail~~

Comments: The one-point did not match curve, therefore a four-point was conducted.

Test By [signature]

Checked By Steve Dike

SCALE USED GR-001 GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-16-89 Test Number MK-E-069

Location of Test N59384 + E59149 @ Elev. 4152 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.7 Type of Material Sand, silty lt. brown

Test Specification N/A Curve Number CM-4-034

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.70
Weight of sand used (lbs.)	9.30
Gross volume (cu. ft.)	.1014
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0654
Wet weight of material from hole (lbs.)	7.43 - .38 = 7.05
Wet density (lbs. cu. ft.)	107.8
Dry density (lbs./cu. ft.)	102.9

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Microwave	microwave
Wet weight, soil | dish (gm.)	776.2	774.2
Dry weight, soil | dish (gm.)	706.0	746.6
Weight of water (gm.)	70.2	27.6
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	531.3	571.9
Water content, % of dry weight	13.2	4.8

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	117.0
Weight of mold and soil (lbs.)	13.35	Dry density (lbs./cu. ft.)	103.4
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	103.5
Wet weight of sample (lbs.)	3.93	Optimum moisture	13.8

-9.0 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 99.4 ~~Pass/Fail~~

Comments: The one-point matched a four-point, no. CM-4-034

Test By [signature]

Checked By Steve Dike

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/16/89 Test Number MKE-070

Location of Test N59494 + E 59041 @ ELEV. SD 5-16-89 4 5154 - MILL TAILINGS

Unit Weight of Sand (lbs./cu.ft.) 91.7 Type of Material SAND Silty Lt Bk.

Test Specification N/A Curve Number CM-4-034

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.91
Weight of sand used (lbs.)	10.09
Gross volume (cu. ft.)	.1100
Tare volume (cu. ft.)	.0360 (BR-02)
Net volume (cu. ft.)	.0740
Wet weight of material from hole (lbs.)	8.01-.38 = 7.63
Wet density (lbs. cu. ft.)	103.1
Dry density (lbs./cu. ft.)	SD 5-16-89 ~~100.5~~ 99.5

WATER CONTENT

	Maximun Density Point	Field Density Test	
Moisture pan number		MICRO	OLSEN
Wet weight, soil | dish (gm.)		740.8	750.3
Dry weight, soil | dish (gm.)		720.9	728.5
Weight of water (gm.)	N	19.9	21.8
Weight of dish (gm.)	A	174.7	174.7
Dry weight of sample (gm.)		546.2	553.8
Water content, % of dry weight		3.6	3.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	103.5
Wet weight of sample (lbs.)		Optimum moisture	13.8

-10.2 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 96.1 ~~Pass/Fail~~

Comments: N/A

Test By [signature]

Checked By Steve Dike

SCALE USED BR-001 BR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-16-89 Test Number MK-E-071

Location of Test N59444 + E59097 @ Elev. 4157 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.6 Type of Material Sand, silty, lt. brown

Test Specification N/A Curve Number CM-4-034

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	5-16-89 SD 32.81
Weight of sand used (lbs.)	10.19
Gross volume (cu. ft.)	.1112
Tare volume (cu. ft.)	.0360 GR-02
Net volume (cu. ft.)	.0752
Wet weight of material from hole (lbs.)	8.02 - .38 = 7.64
Wet density (lbs. cu. ft.)	101.6
Dry density (lbs./cu. ft.)	96.8

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number		Micro
Wet weight, soil | dish (gm.)		768.5
Dry weight, soil | dish (gm.)		740.0
Weight of water (gm.)	N	28.5
Weight of dish (gm.)	A	174.8
Dry weight of sample (gm.)		565.2
Water content, % of dry weight		5.0

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	N
Weight of mold and soil (lbs.)	N	Dry density (lbs./cu. ft.)	A
Weight of mold (lbs.)	A	Maximum density (lbs./cu.ft.)	103.5
Wet weight of sample (lbs.)		Optimum moisture	13.8

-8.8 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 93.5 ~~Pass/Fail~~

Comments: N/A

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/17/89 Test Number MK-E-072

Location of Test N 59348 + E 59172 @ Elev. 4160 - Mill tailings / subgrade soils

Unit Weight of Sand (lbs./cu.ft.) 91.2 Type of Material SAND DK BROWN

Test Specification N/A Curve Number CU-4-043

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.69
Weight of sand used (lbs.)	10.31
Gross volume (cu. ft.)	.1130
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0770
Wet weight of material from hole (lbs.)	9.17-.38 8.79
Wet density (lbs. cu. ft.)	114.2
Dry density (lbs./cu. ft.)	109.9

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	770.8	774.1
Dry weight, soil | dish (gm.)	704.8	751.6
Weight of water (gm.)	66.0	22.5
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	530.1	576.9
Water content, % of dry weight	12.5	3.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	130.1
Weight of mold and soil (lbs.)	13.79	Dry density (lbs./cu. ft.)	115.6
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	115.6
Wet weight of sample (lbs.)	4.37	Optimum moisture	12.7

-8.8 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 95.1 ~~Pass/Fail~~

Comments: ONE POINT DID NOT MATCH CURVE. THEREFORE A (4) POINT WAS CONDUCTED

Test By [signature]

Checked By [signature]

SCALE USED GR-001 GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/17/89 Test Number MK-E-073

Location of Test N59504 + E59112 @ Elev. 4162 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.5 Type of Material Stand Lt Grey

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.08
Weight of sand used (lbs.)	9.92
Gross volume (cu. ft.)	.1084
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0724
Wet weight of material from hole (lbs.)	7.74 - .38 = 7.36
Wet density (lbs. cu. ft.)	101.7
Dry density (lbs./cu. ft.)	97.9

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	microwave	microwave
Wet weight, soil | dish (gm.)	769.2	756.7
Dry weight, soil | dish (gm.)	695.2	734.9
Weight of water (gm.)	74.0	21.8
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	520.5	560.2
Water content, % of dry weight	14.2	3.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	114.9
Weight of mold and soil (lbs.)	13.28	Dry density (lbs./cu. ft.)	100.6
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)	3.86	Optimum moisture	15.0

-11.1 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 96.9 ~~Pass/Fail~~ N/A

Comments: N/A

Test By [signature]

Checked By [signature]

SCALE USED GR-001 - GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/17/99 Test Number MK-E-074

Location of Test N 59425 E 59094 @ ELE. 4164 - MILL TAILINGS

Unit Weight of Sand (lbs./cu.ft.) 91.5 Type of Material SAND LT BRSY

Test Specification N/A Curve Number CM-4-037

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.16
Weight of sand used (lbs.)	9.84
Gross volume (cu. ft.)	.1075
Tare volume (cu. ft.)	.0360 (BR-02)
Net volume (cu. ft.)	.0715
Wet weight of material from hole (lbs.)	7.47-.38 = 7.09
Wet density (lbs. cu. ft.)	99.2
Dry density (lbs./cu. ft.)	95.2

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number		microwave
Wet weight, soil | dish (gm.)		740.8
Dry weight, soil | dish (gm.)		718.0
Weight of water (gm.)		22.8
Weight of dish (gm.)	N/A	174.7
Dry weight of sample (gm.)		543.3
Water content, % of dry weight		4.2

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)		Wet density (lbs./cu.ft.)	
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	N/A
Weight of mold (lbs.)	N/A	Maximum density (lbs./cu.ft.)	101.0
Wet weight of sample (lbs.)		Optimum moisture	15.0

-10.8 % of Optimum Moisture

A.S.T.M. D698
PERCENTAGE DENSITY OF SAMPLE 94.3 ~~Pass/Fail~~

Comments: N/A

Test By [signature]

Checked By [signature]

SCALE USED GR-001 GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/18/89 Test Number MK-E-075

Location of Test N59450 + E59067 @ Elev. 4168 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.5 Type of Material SAND THU

Test Specification N/A Curve Number CM-4-040

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	4.26
Weight of sand used (lbs.)	9.74
Gross volume (cu. ft.)	.1064
Tare volume (cu. ft.)	.0360 (CR-02)
Net volume (cu. ft.)	.0704
Wet weight of material from hole (lbs.)	7.74 - .38 = 7.36
Wet density (lbs. cu. ft.)	104.5
Dry density (lbs./cu. ft.)	98.7

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	MICROWAVE	MICROWAVE
Wet weight, soil | dish (gm.)	757.0	746.3
Dry weight, soil | dish (gm.)	682.3	714.7
Weight of water (gm.)	74.7	31.6
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	507.6	540.0
Water content, % of dry weight	14.7	5.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	118.2
Weight of mold and soil (lbs.)	13.39	Dry density (lbs./cu. ft.)	103.1
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	103.1
Wet weight of sample (lbs.)	3.97	Optimum moisture	14.8

-8.9 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 95.7 ~~Pass/Fail~~

Comments: ONE POINT CORRELATED WITH BOVE 4 POINT CURVE NO. CM-4-040

Test By [signature]

Checked By Steve Dike

SCALE USED CR-001 CR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/18/89 Test Number MK-E-076

Location of Test N59413 + E59114 @ Elev. 4174 - Mill tailings

Unit Weight of Sand (lbs./cu.ft.) 91.5 Type of Material SAND TAN

Test Specification N/A Curve Number Cu - 4 - 040

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.98
Weight of sand used (lbs.)	10.02
Gross volume (cu. ft.)	.1095
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0735
Wet weight of material from hole (lbs.)	8.01 - .38 = 7.63
Wet density (lbs. cu. ft.)	103.8
Dry density (lbs./cu. ft.)	98.7

WATER CONTENT

	Maximum Density Point	Field Density Test
Moisture pan number	N/A	microwave
Wet weight, soil | dish (gm.)		751.8
Dry weight, soil | dish (gm.)		723.5
Weight of water (gm.)		28.3
Weight of dish (gm.)		174.7
Dry weight of sample (gm.)		548.8
Water content, % of dry weight		5.2

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A	Wet density (lbs./cu.ft.)	N/A
Weight of mold and soil (lbs.)		Dry density (lbs./cu. ft.)	
Weight of mold (lbs.)		Maximum density (lbs./cu.ft.)	103.1
Wet weight of sample (lbs.)		Optimum moisture	14.8

-9.6 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 95.7 ~~Pass/Fail~~

Comments: N/A

Test By Eugene Hohman

Checked By Steve Dike

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
& MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-19-89 Test Number MK-E-077

Location of Test N59478 + E59047 @ Elev. 4174 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 91.5 Type of Material Sandy gravelly clay

Test Specification N/A Curve Number CM-4-014

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00	
Final weight of sand and container (lbs.)	2.68	
Weight of sand used (lbs.)	11.32	
Gross volume (cu. ft.)	.1237	
Tare volume (cu. ft.)	.0360	GR-02
Net volume (cu. ft.)	.0877	
Wet weight of material from hole (lbs.)	10.38 - .38 = 10.00	
Wet density (lbs. cu. ft.)	114.0	
Dry density (lbs./cu. ft.)	108.7	

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Micro	Micro
Wet weight, soil | dish (gm.)	733.1	763.8
Dry weight, soil | dish (gm.)	668.7	736.5
Weight of water (gm.)	64.4	27.3
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	494.0	561.8
Water content, % of dry weight	13.0	4.9

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0336	Wet density (lbs./cu.ft.)	127.1
Weight of mold and soil (lbs.)	13.69	Dry density (lbs./cu. ft.)	112.5
Weight of mold (lbs.)	9.42	Maximum density (lbs./cu.ft.)	112.8
Wet weight of sample (lbs.)	4.27	Optimum moisture	12.5

-7.6 % of Optimum Moisture

(A.S.T.M. D698)
PERCENTAGE DENSITY OF SAMPLE 96.4 ~~Pass/Fail~~

Comments: The one point matched a four point no. CM-4-014

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5/22/89 Test Number MK-E-078

Location of Test N59442 + E59082 @ Elev. 4174 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 91.6 Type of Material Silty Sand with Gravel

Test Specification N/A Curve Number CM-4-010

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.78
Weight of sand used (lbs.)	10.22
Gross volume (cu. ft.)	.1116
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0756
Wet weight of material from hole (lbs.)	9.61 - .38 = 9.23
Wet density (lbs. cu. ft.)	122.1
Dry density (lbs./cu. ft.)	115.1

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	Micro	micro
Wet weight, soil | dish (gm.)	764.8	768.3
Dry weight, soil | dish (gm.)	700.0	734.2
Weight of water (gm.)	64.8	34.1
Weight of dish (gm.)	174.7	174.7
Dry weight of sample (gm.)	525.3	559.5
Water content, % of dry weight	12.3	6.1

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	.0747	Wet density (lbs./cu.ft.)	137.2
Weight of mold and soil (lbs.)	25.13	Dry density (lbs./cu. ft.)	122.2
Weight of mold (lbs.)	14.88	Maximum density (lbs./cu.ft.)	124.2
Wet weight of sample (lbs.)	10.25	Optimum moisture	10.7

-4.6 % of Optimum Moisture

ASTM D698
PERCENTAGE DENSITY OF SAMPLE 92.7 ~~Pass/Fail~~

Comments: The one-point matched a four-point no. CM-4-010

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

INFORMATION ONLY

FIELD DENSITY TEST - SAND CONE METHOD

Job 3050/GREEN RIVER Date 5-25-89 Test Number MK-E-079

Location of Test N59380 + E59128 @ Elev. 4165 - Windblown contaminates

Unit Weight of Sand (lbs./cu.ft.) 91.7 Type of Material Silty sand w/gravel

Test Specification N/A Curve Number CM-4-010

FIELD DENSITY

Original weight of sand and container (lbs.)	14.00
Final weight of sand and container (lbs.)	3.26
Weight of sand used (lbs.)	10.74
Gross volume (cu. ft.)	.1171
Tare volume (cu. ft.)	.0360 (GR-02)
Net volume (cu. ft.)	.0811
Wet weight of material from hole (lbs.)	10.66-.38 = 10.28
Wet density (lbs. cu. ft.)	126.8
Dry density (lbs./cu. ft.)	120.0

WATER CONTENT

	Maximun Density Point	Field Density Test
Moisture pan number	N/A	Micro
Wet weight, soil | dish (gm.)		779.0
Dry weight, soil | dish (gm.)		746.5
Weight of water (gm.)		32.5
Weight of dish (gm.)		174.8
Dry weight of sample (gm.)		571.8
Water content, % of dry weight		5.7

MAXIMUM DENSITY POINT

Volume of cylinder mold (cu. ft.)	N/A
Weight of mold and soil (lbs.)	
Weight of mold (lbs.)	
Wet weight of sample (lbs.)	

Wet density (lbs./cu.ft.)	N/A
Dry density (lbs./cu. ft.)	
Maximum density (lbs./cu.ft.)	124.2
Optimum moisture	10.7

-5.0 % of Optimum Moisture

PERCENTAGE DENSITY OF SAMPLE 96.6 ~~Pass/Fail~~

Comments: This test should cover last the contaminated materials.

Test By Steve Dike

Checked By [illegible]

SCALE USED GR-001 + GR-002

COMPACTION TEST DATA

MKC-FERGUSON MAXIMUM DENSITY DETERMINATION

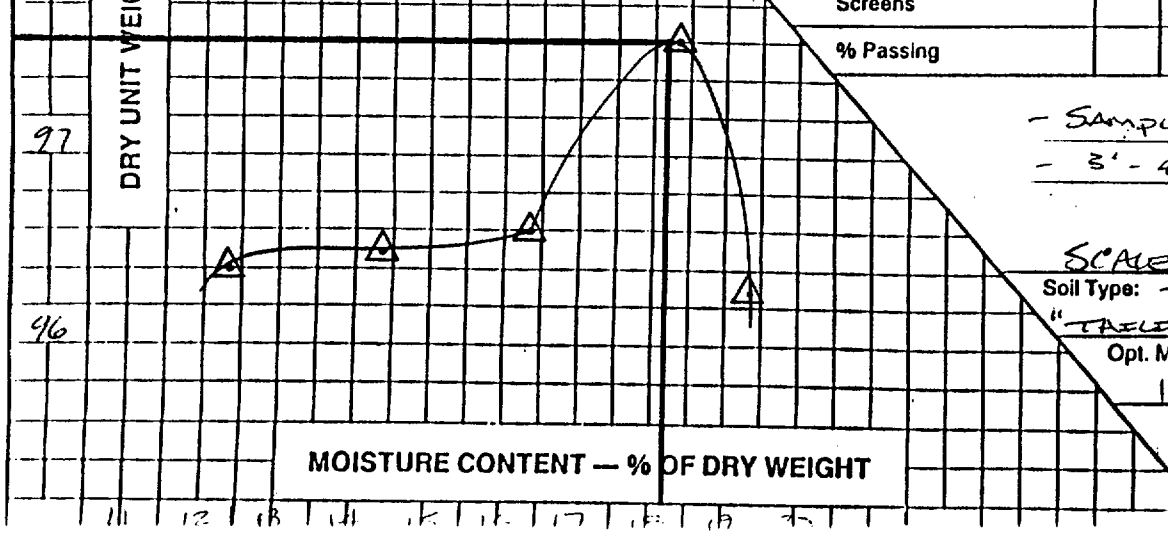
MKC-FERGUSON ISON KNUDSEN COMPANY

QA ENTRY NO. 57

(STANDARD) D698 METHOD "A"

Blows Per Layer 25	COMPACTION SAMPLE NO.	+250 ML	+300 ML	+350 ML	+400 ML	+450 ML
No. Layers 3	Weight of Wet Soil & Mold	13.06	13.13	13.20	13.30	13.28
Tamper Wt. 5.5#	Weight of Mold	9.42	9.42	9.42	9.42	9.42
Drop Ht. 12"	Weight of Wet Soil	3.64	3.71	3.78	3.88	3.86
Mold Dia. 4"	Wet Unit Weight	108.3	110.4	112.5	115.5	114.9
Volume of Sample .0336	MOISTURE SAMPLE NO.	Oven	Oven	Oven	Oven	Oven
	Weight of Wet Soil & Tare	469	464.1	482.4	486.3	488.9
	Weight of Dry Soil & Tare	429.5	427.7	439.1	438.0	438.1
	Weight of Water	31.4	36.4	43.3	48.3	50.8
	Weight of Tare	174.7	174.7	174.7	174.7	174.7
	Weight of Dry Soil	254.8	253.0	264.4	263.3	263.4
	MOISTURE CONTENT	12.3	14.4	16.4	18.3	19.3
	Ave. Moisture Content					
	DRY UNIT WEIGHT	96.4	96.5	96.6	97.6	96.3

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

- SAMPLE FROM MIDDLE OF TAILINGS PILE
- 3' - 4' DEEP.

SCALES USED: 6B-001 & 6B-002

Soil Type: TAN - BROWN "TAILINGS"

Test No.: CM-4-001 11/3/88 SDM 11/3/88

Opt. Moisture	Max. Dry Unit Weight	Date:
18.2	97.6	11/3/88

Tested By: Steven Mack

Reviewed By: Steven Mack Steve Dike

Project: UMTRA - 3050 - GREEN RIVER

1-24-99

MK-FERGUSON MAXIMUM DENSITY DETERMINATION

MORRISON KNUDSEN COMPANY

(MODIFIED) D1557 ML "A"

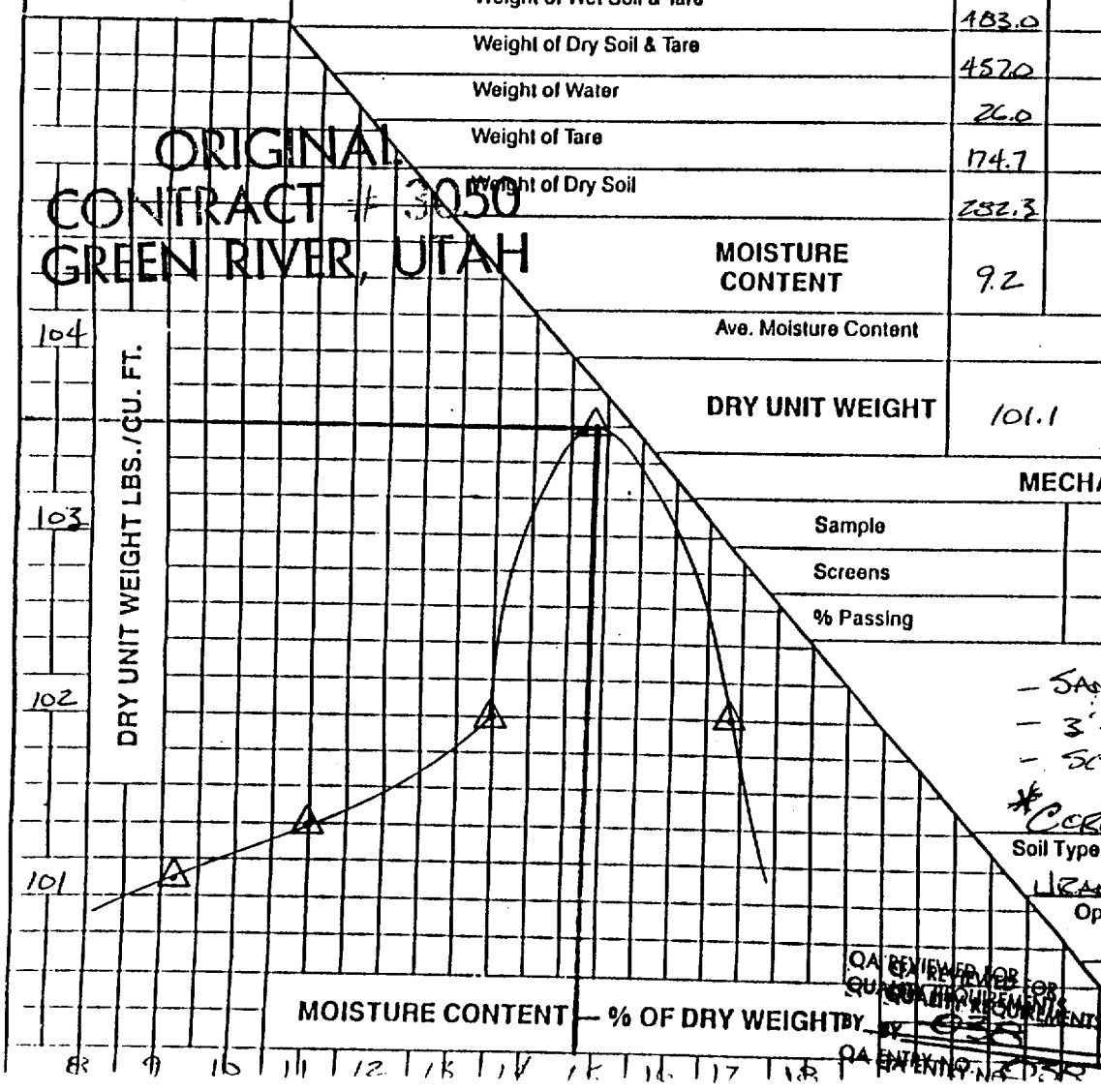
Blows Per Layer	25
No. Layers	5
Tamper Wt.	10#
Drop Ht.	18"
Mold Dia.	4"
Volume of Sample	.0336

QA REVIEWED FOR QUALITY REQUIREMENTS BY SDM 11/4/88 QA ENTRY NO. 038

COMPACTION SAMPLE NO.	+00ML	+50ML	+100ML	+150ML	+200ML
Weight of Wet Soil & Mold	13.13	13.20	13.31	13.42	13.43
Weight of Mold	9.42	9.42	9.42	9.42	9.42
Weight of Wet Soil	3.71	3.78	3.89	4.00	4.01
Wet Unit Weight	110.4	112.5	115.8	119.0	119.3

MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven	#5	Oven
Weight of Wet Soil & Tare	483.0		491.5		487.2		495.9		498.2	
Weight of Dry Soil & Tare	457.0		460.1		450.1		454.2		451.4	
Weight of Water	26.0		31.4		37.1		41.7		46.8	
Weight of Tare	174.7		174.7		174.7		174.7		174.7	
Weight of Dry Soil	282.3		285.4		275.4		279.5		276.7	
MOISTURE CONTENT	9.2		11.0		13.5		14.9		16.9	
Ave. Moisture Content										
DRY UNIT WEIGHT	101.1		101.4		102.0		103.6		102.1	

ORIGINAL CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

- SAMPLED FROM MIDDLE OF TAILINGS PILE
- 3' TO 4' DEEP.
- SCALES USED 6R-001 & 6R-002

*CORRELATES TO ENTRY # 037 (CM-4-001)

Soil Type: BROWN-TAN URANIUM TAILINGS

Test No.: (D1557) (NO NUMBER ASSIGNED)

Opt. Moisture	Max. Dry Unit Weight	Date:
14.9	103.6	11/3/88

Tested By: Steven Marks

Reviewed By: Steven Marks Steve Dike

Project: [illegible] GREEN RIVER

QA REVIEWED FOR QUALITY REQUIREMENTS BY 038 QA ENTRY NO. 038

BY SWM 17183

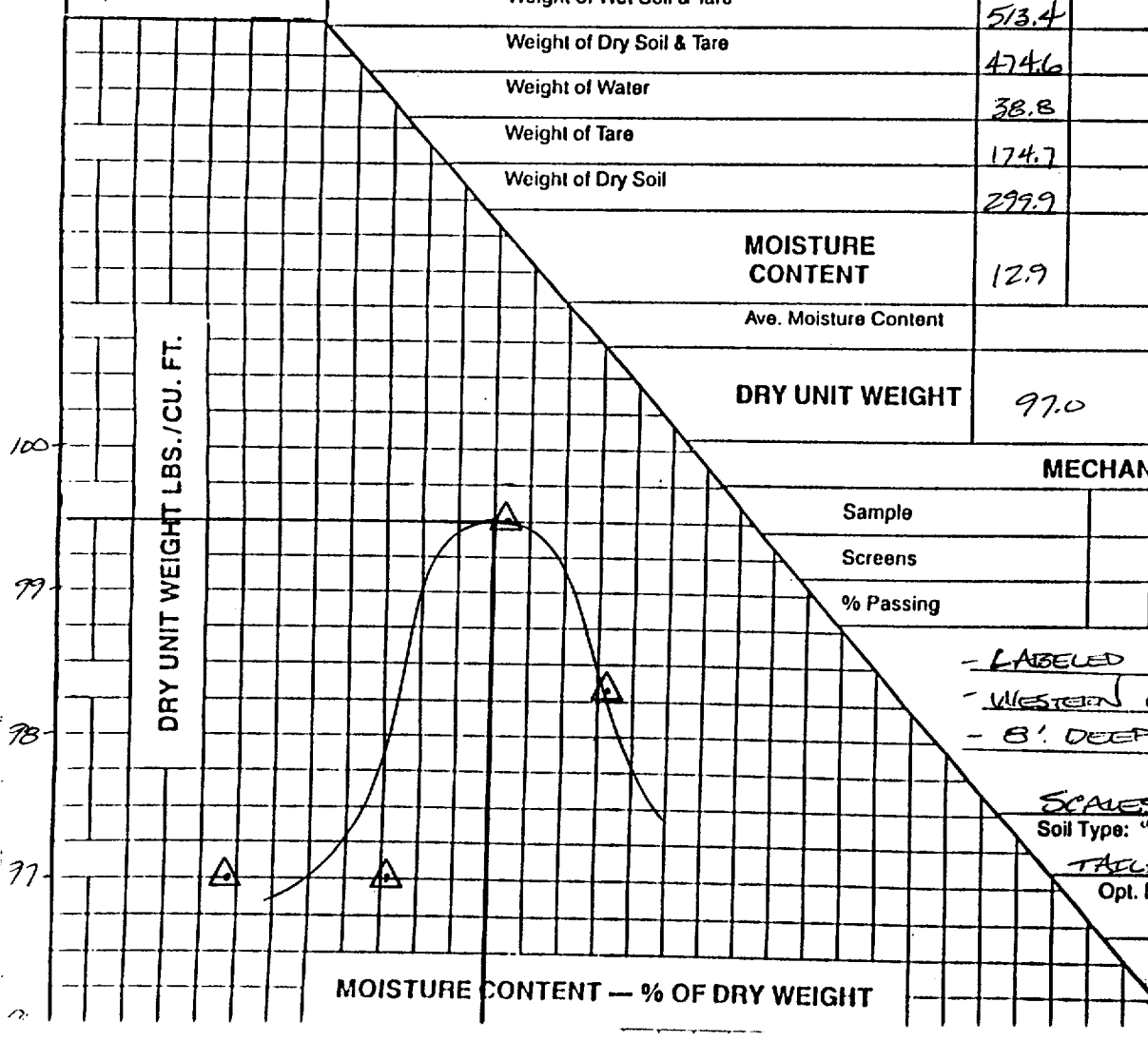
QA ENTRY NO 361

MOORE-FERGUSON MAXIMUM DENSITY DETERMINATION

MORRISON KNUDSEN COMPANY

ASTM D698 METHOD 'A'

Blows Per Layer 25	COMPACTION SAMPLE NO.	+250		+300		+350		+400			
No. Layers 3	Weight of Wet Soil & Mold	13.10		13.17		13.32		13.32			
Tamper Wt. 5.5 lbs	Weight of Mold	9.42		9.42		9.42		9.42			
Drop Ht. 12"	Weight of Wet Soil	3.68		3.75		3.90		3.90			
Mold Dia. 4"	Wet Unit Weight	109.5		111.6		116.1		116.1			
Volume of Sample .0336 FT3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven		
	Weight of Wet Soil & Tare	513.4		575.1		576.4		573.0			
	Weight of Dry Soil & Tare	474.6		522.5		518.8		512.0			
	Weight of Water	38.8		52.6		57.6		61.0			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	299.9		347.8		344.1		337.3			
	MOISTURE CONTENT	12.9		15.1		16.7		18.1			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	97.0		97.0		99.5		98.3			



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing													

- LABELED T-3 BY TAC.
- WESTERN EDGE OF TAILINGS PILE
- 8' DEEP.

SCALES USED: 68-001 & 68-002

Soil Type: "DARK - BROWN" TAILING	Test No.: CM-4-002	
Opt. Moisture 16.5	Max. Dry Unit Weight 99.5	Date: 11/17/88
Tested By: Steven Moody	Reviewed By: Steven Moody	
Project:		

QA ENTRY NO. 248

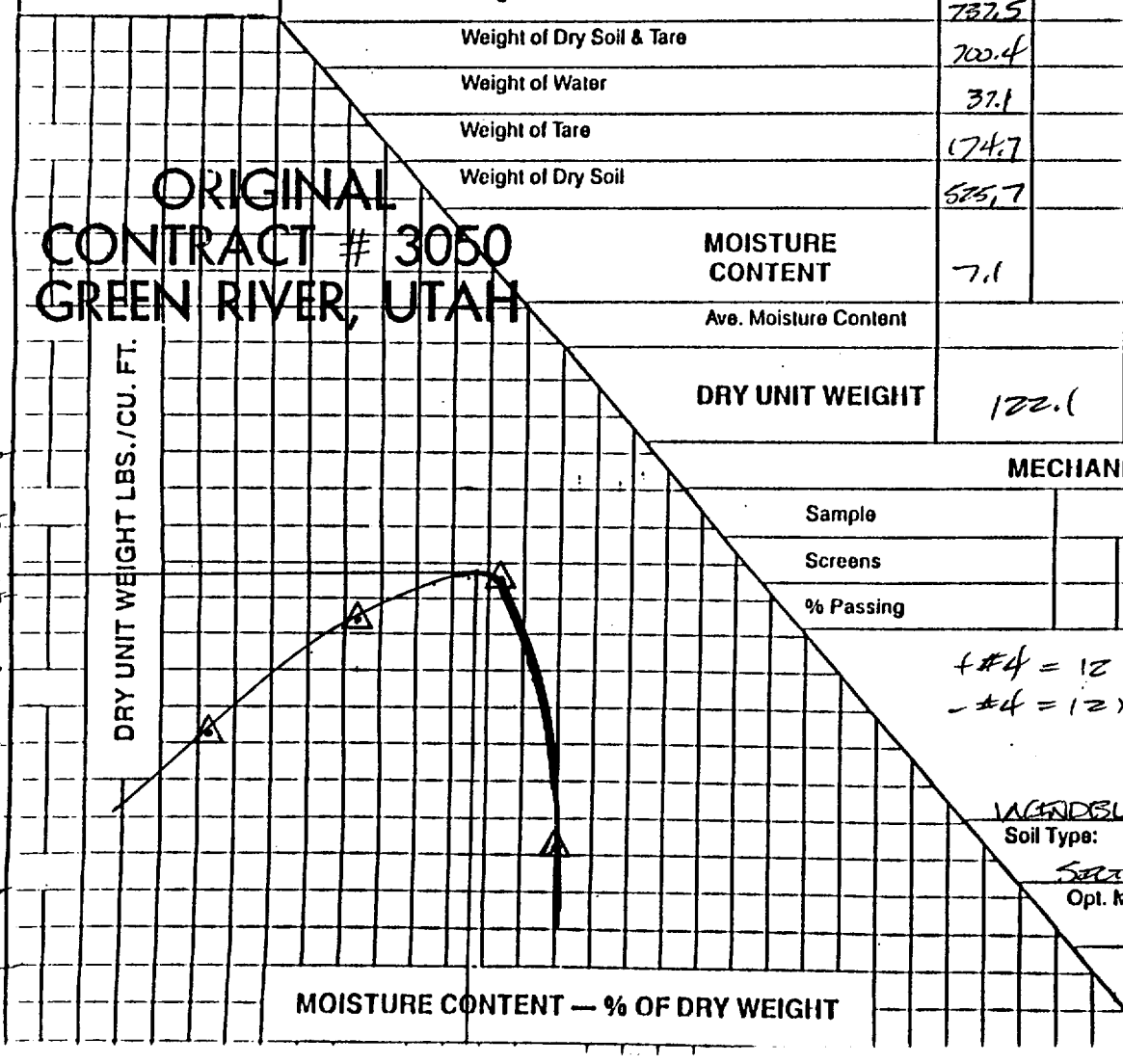
-FERGUSON MAXIMUM DEN TY DETERMINATION

ISON KNUDSEN COMPANY

D698 METHOD "C"

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100		+200		+300		+400			
No. Layers 3	Weight of Wet Soil & Mold	24.65		24.97		25.20		24.93			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 12" & 4"	Weight of Wet Soil	9.77		10.09		10.32		10.05			
Mold Dia. 6"	Wet Unit Weight	130.8		135.1		138.2		134.5			
Volume of Sample .0747 FT3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven		
	Weight of Wet Soil & Tare	737.5		766.9		765.8		778.4			
	Weight of Dry Soil & Tare	700.4		716.8		706.5		713.5			
	Weight of Water	37.1		50.1		59.5		64.9			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	525.7		542.1		531.6		538.8			
	MOISTURE CONTENT	7.1		9.2		11.2		12.0			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	122.1		123.7		124.3		120.1			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					93	79							

+#4 = 12 x .15 = 1.80 lbs
-#4 = 12 x .85 = 10.20 lbs
12 lbs

WB-01
PER - MKE

WINDBLOWN STOCKPILE - SCALES USED: 68-001 & 68-002

Soil Type:	Test No.:	
SILTY SAND w/ GRAVEL	CM-4-004	
Opt. Moisture 10.8	Max. Dry Unit Weight 124.4	Date: 1/13/89
Tested By: Steven Monk	Reviewed By: Steve Dike	
Project:		

MKO FERGUSON MAXIMUM DENSITY DETERMINATION

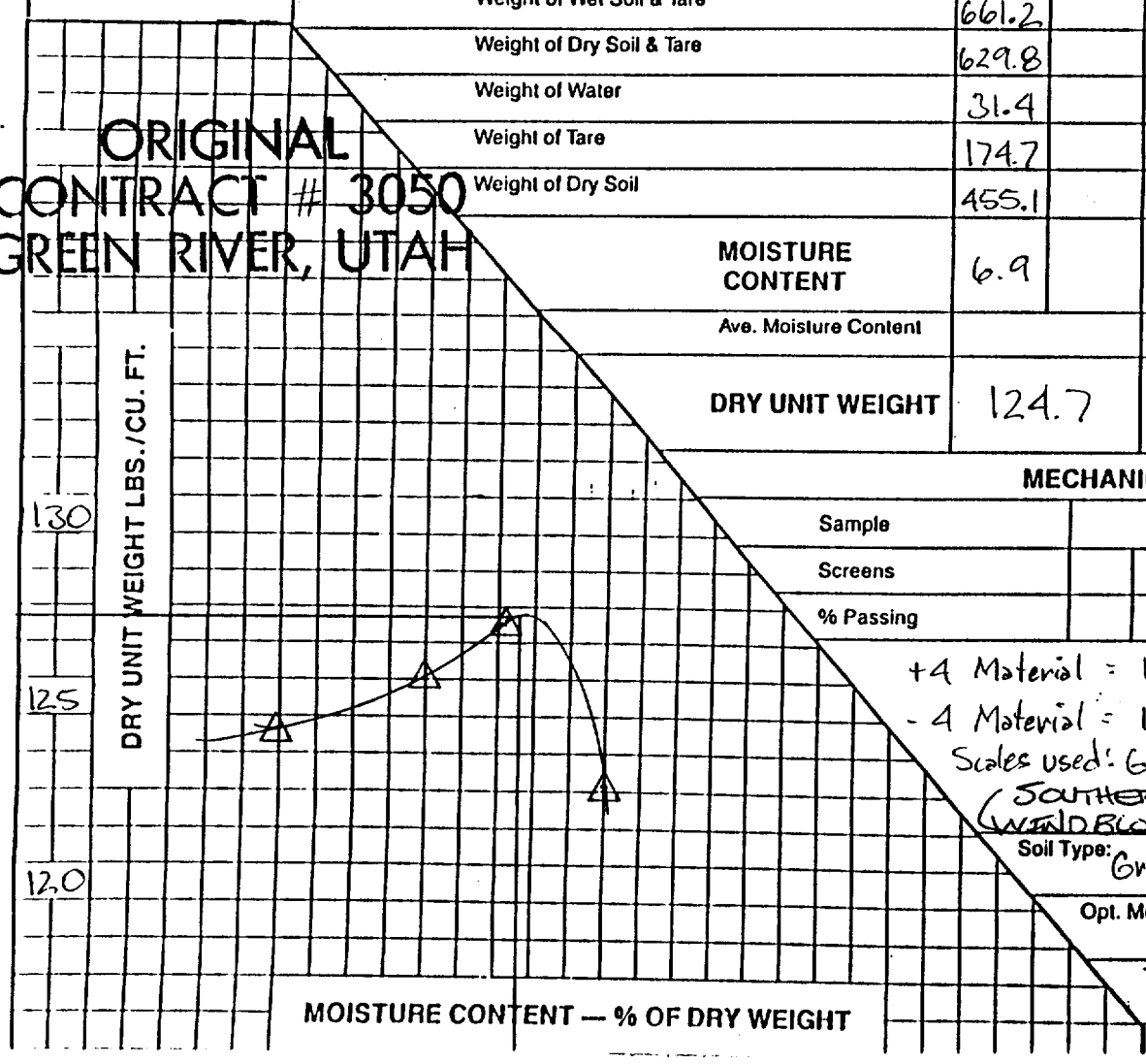
A MORRISON KNUDSEN COMPANY

QA REVIEWED
QUALITY REQUIREMENTS
BY SDM 3/89
QA ENTRY NO. 217

SCALES USED: GR-001 & GR-002

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100	+200	+300	+400	
No. Layers 3	Weight of Wet Soil & Mold	24.84	25.15	25.38	25.14	
Tamper Wt. 5.5 lb	Weight of Mold	14.88	14.88	14.88	14.88	
Drop Ht. 12"	Weight of Wet Soil	9.96	10.27	10.50	10.26	
Mold Dia. 6"	Wet Unit Weight	133.3	137.5	140.6	137.3	
Volume of Sample .0747 cu.ft.	MOISTURE SAMPLE NO.	Oven	Oven	Oven	Oven	
	Weight of Wet Soil & Tare	661.2	653.9	652.0	661.6	
	Weight of Dry Soil & Tare	629.8	614.3	607.7	611.5	
	Weight of Water	31.4	39.6	44.3	50.1	
	Weight of Tare	174.7	174.7	174.7	174.7	
	Weight of Dry Soil	455.1	439.6	433.0	436.8	
	MOISTURE CONTENT	6.9	9.0	10.2	11.5	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	124.7	126.1	127.6	123.1	

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel				Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens				3/4"	#4	#10	#16	#40	#100	#200		
% Passing				89	76							

+4 Material = 12 X .24 = 2.88 lb
-4 Material = 12 X .76 = 9.12 lb
Scales used: GR-001 + GR-002 2.00 lb/per point
(SOUTHERN WINDBLOWN CONTAMINATION STOCKPILE)

ASTM D698
Method "D"
Rock Correction Factors

Soil Type: Gravelly silty sand - tan	Test No.: CM-4-002	
Opt. Moisture 10.3	Max. Dry Unit Weight 127.7	Date: 1-5-89
Tested By: Steve Dike	Reviewed By: Steven Mark	
Project:		

-FERGUSON MAXIMUM DEN ITY DETERMINATION

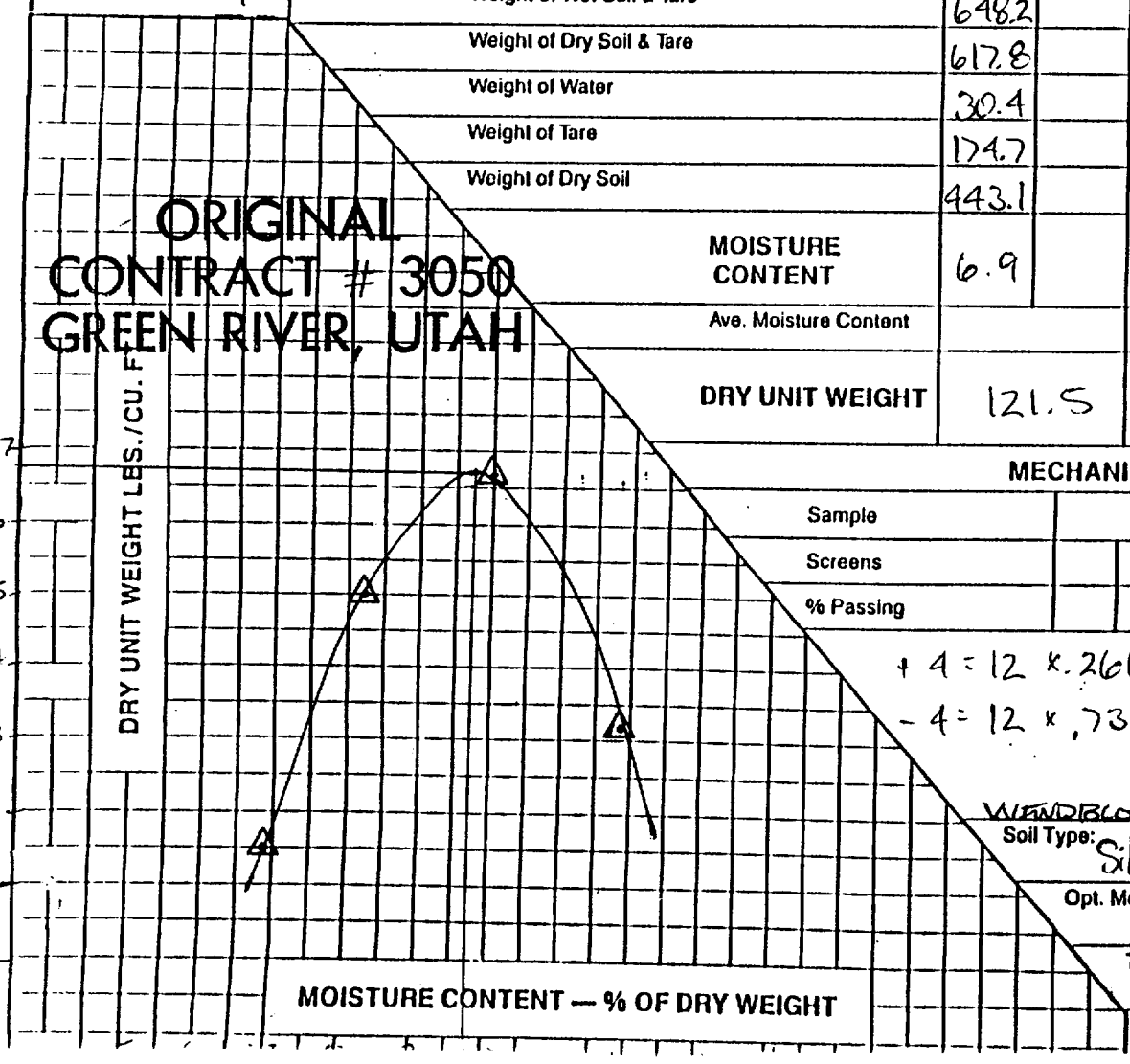
ISON KNUDSEN COMPANY

QA ENTRY NO. 49

Method "

Blows Per Layer 56	COMPACTION SAMPLE NO.	+0	+100	+200	+300	
No. Layers 3	Weight of Wet Soil & Mold	24.58	24.99	25.29	25.18	
Tamper Wt. 5.5 lb	Weight of Mold	14.88	14.88	14.88	14.88	
Drop Ht. 12"	Weight of Wet Soil	9.70	10.11	10.41	10.30	
Mold Dia. 6"	Wet Unit Weight	129.9	135.3	139.4	137.9	
Volume of Sample .0747 cu/ft.	MOISTURE SAMPLE NO.	Oven	Oven	Oven	Oven	
	Weight of Wet Soil & Tare	648.2	748.1	738.9	742.4	
	Weight of Dry Soil & Tare	617.8	704.6	687.7	681.9	
	Weight of Water	30.4	43.5	51.2	60.5	
	Weight of Tare	174.7	174.7	174.7	174.7	
	Weight of Dry Soil	443.1	529.9	513.0	507.2	
	MOISTURE CONTENT	6.9	8.2	10.0	11.9	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	121.5	125.0	126.7	123.2	

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					89.9	73.9							

+4 = 12 x .261 = 3.13
-4 = 12 x .739 = 8.87
12.0016

#WB-02
PER-MKE

WINDBLOWN STOCKPILE (SCALES USED: 69-001 & 69-002)

Soil Type: Silty sand w/ gravel

Test No.: CM-4-005 ~~WB-02~~ SDM 1/18/89

Opt. Moisture 9.7

Max. Dry Unit Weight 126.8

Date: 1-12-89

Tested By: Steve Dike

Reviewed By: [signature]

Project: 3050 - Green River

QA ENTRY NO. 250

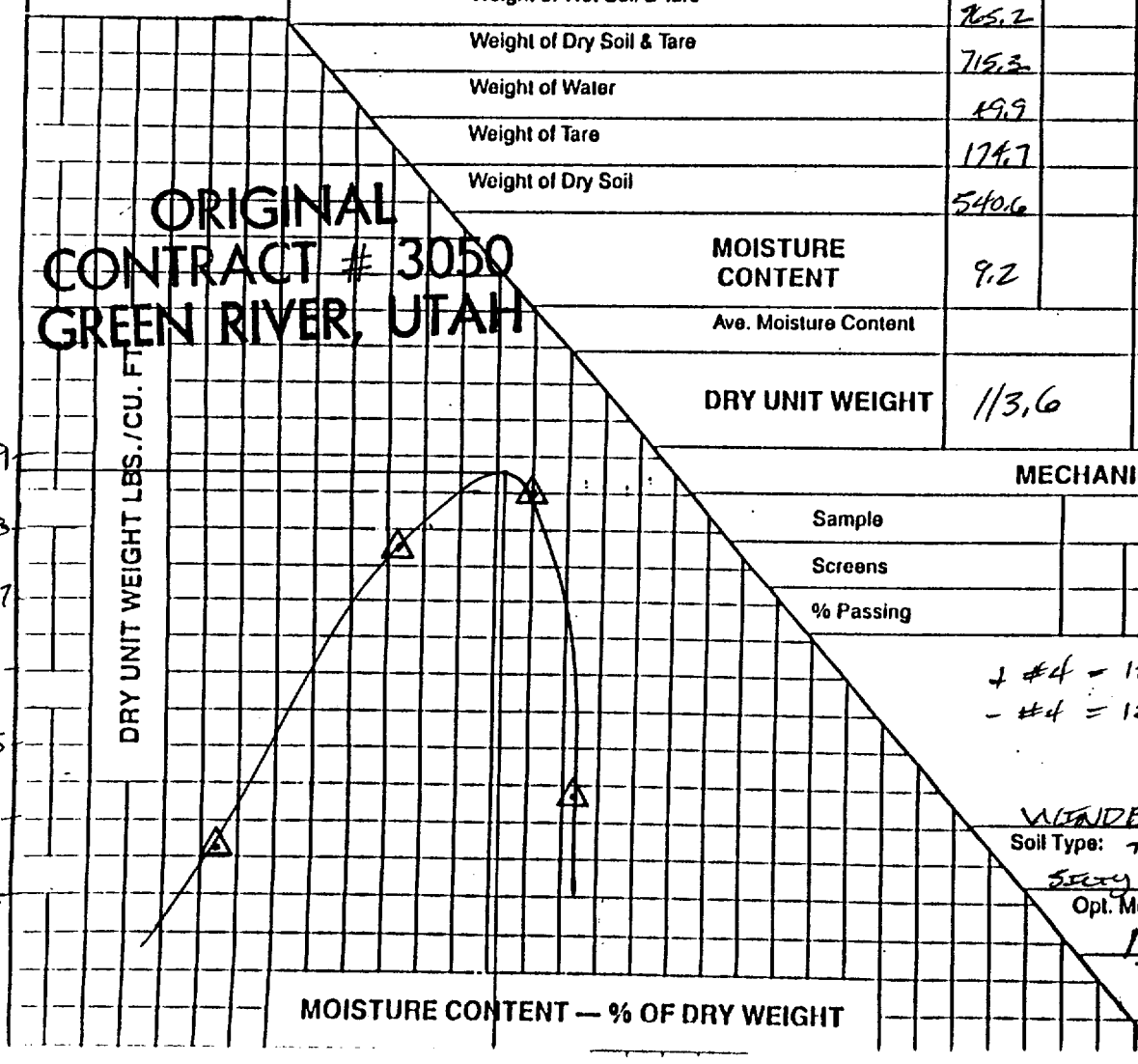
-FERGUSON MAXIMUM DEN TY DETERMINATION

ISON KNUDSEN COMPANY

D698 METHOD C

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100		+200		+300		+400				
No. Layers 3	Weight of Wet Soil & Mold	24.14		24.70		24.93		24.63				
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88				
Drop Ht. 12"	Weight of Wet Soil	9.26		9.82		~~134.5~~ 10.05		9.75				
Mold Dia. 6"	Wet Unit Weight	124.0		131.5		134.5 Corr 11/12/89		130.5				
Volume of Sample .0747 FT³	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven			
	Weight of Wet Soil & Tare	765.2		727.8		736.8		739.7				
	Weight of Dry Soil & Tare	715.3		665.7		669.9		670.0				
	Weight of Water	49.9		57.1		66.9		69.7				
	Weight of Tare	174.7		174.7		174.7		174.7				
	Weight of Dry Soil	540.6		491.0		495.2		495.3				
	MOISTURE CONTENT	9.2		11.6		13.5		14.1				
	Ave. Moisture Content											
	DRY UNIT WEIGHT	113.6		117.8		118.5		114.4				

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing													

+ #4 = 12 x .09 = 1.08 lbs
- #4 = 12 x .91 = 10.92 lbs
12 lbs

WB-03
PER MK-E

WINDBLOWN STOCKPILE (SCALES USED: 6B-001 & 6B-002)

Soil Type: TAN - BROWN SILTY SAND W/ GRAVEL

Test No.: CM-4-006

Opt. Moisture: 13.1

Max. Dry Unit Weight: 118.8

Date: 1/12/89

Tested By: Allen Marks

Reviewed By: Steve Dike

Project:

QA ENTRY NO. 251

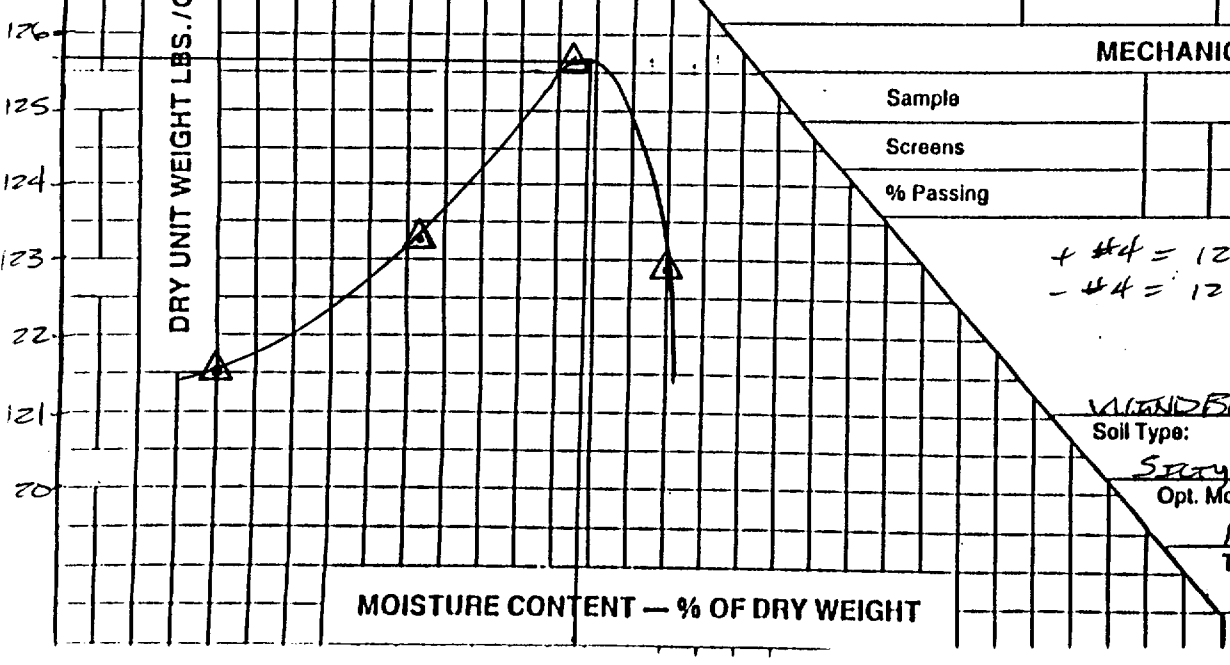
-FERGUSON MAXIMUM DEN ITY DETERMINATION

ARISON KNUDSEN COMPANY

D698 METHOD C

Blows Per Layer 56	COMPACTION SAMPLE NO.	+00		+100		+200		+300			
No. Layers 3	Weight of Wet Soil & Mold	24.50		24.89		25.27		25.16			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 12"	Weight of Wet Soil	9.62		10.01		10.39		10.28			
Mold Dia. 6"	Wet Unit Weight	128.8		134.0		139.1		137.6			
Volume of Sample .0747 FT3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven		
	Weight of Wet Soil & Tare	781.2		781.1		770.3		783.3			
	Weight of Dry Soil & Tare	746.8		732.4		712.5		718.1			
	Weight of Water	34.4		48.7		57.8		65.2			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	572.1		557.1		537.8		543.4			
	MOISTURE CONTENT	6.0		8.7		10.7		12.0			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	121.5		123.3		125.7		122.9			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					93.0	74.2							

+ #4 = 12 lbs x .20 = 2.40 lbs
- #4 = 12 lbs x .80 = 9.60 lbs
12 lbs

WB-04
PER MK-E

WINDBLOWN STOCKPILE (SCALPS USED - 68-001 & 68-002)

Soil Type: SILTY SAND w/ GRAVEL		Test No.: CM-4-007
Opt. Moisture 10.9	Max. Dry Unit Weight 125.7	Date: 1/12/89
Tested By: Glenn Slack		Reviewed By: Steve Duke
Project:		

QA ENTRY N 252

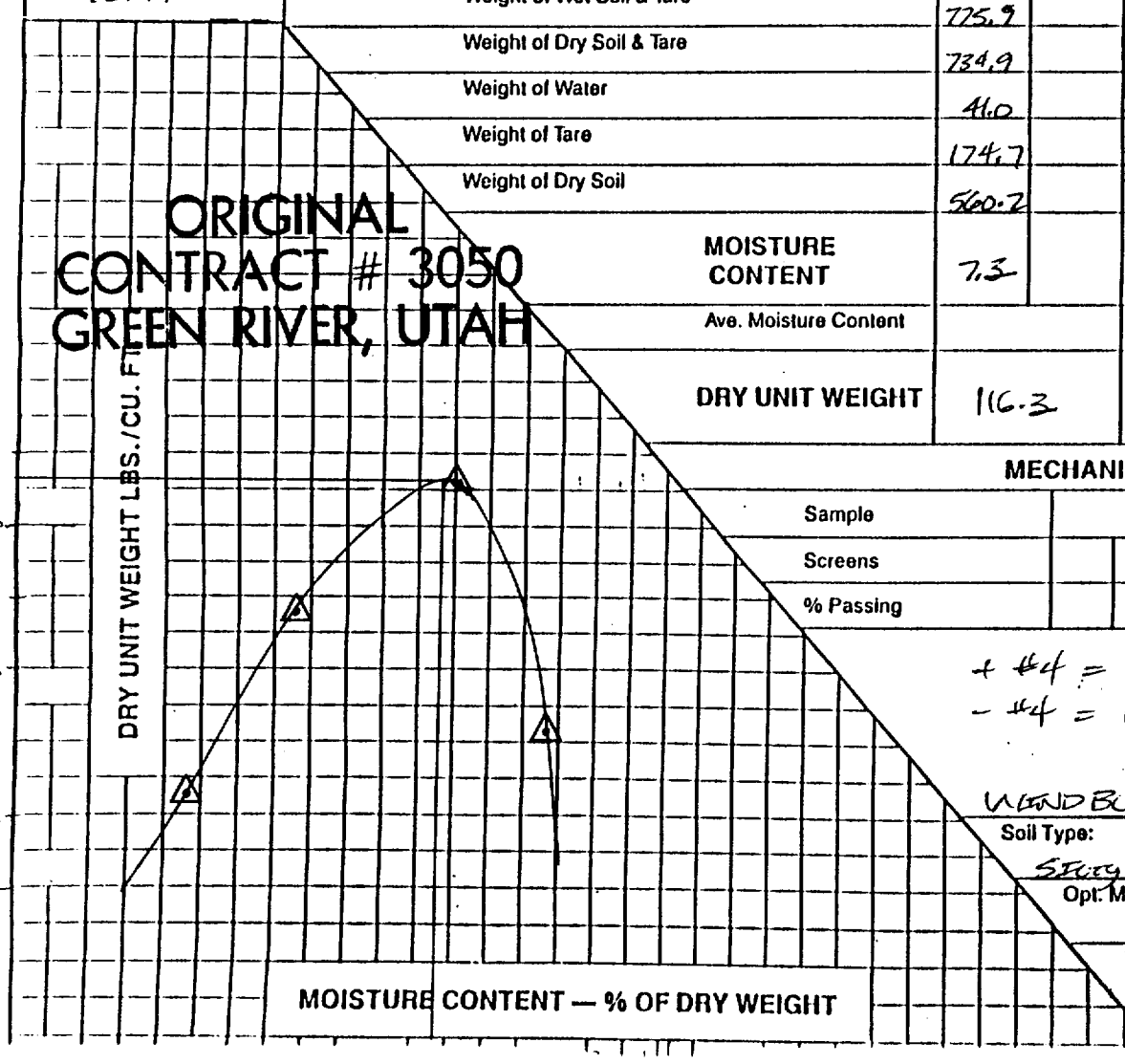
-FERGUSON MAXIMUM DEN TY DETERMINATION

SON KNUDSEN COMPANY

D698 METHOD

Blows Per Layer 56	COMPACTION SAMPLE NO.	#00		#100		#200		#300			
No. Layers 3	Weight of Wet Soil & Mold	24.20		24.53		24.88		24.71			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 12"	Weight of Wet Soil	9.32		9.65		10.00		9.83			
Mold Dia. 6"	Wet Unit Weight	124.8		129.2		133.9		131.6			
Volume of Sample .0747 FT3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven		
	Weight of Wet Soil & Tare	775.9		745.8		717.4		772.5			
	Weight of Dry Soil & Tare	734.9		699.8		663.8		706.8			
	Weight of Water	41.0		46.0		53.6		65.7			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	560.2		525.1		489.1		532.1			
	MOISTURE CONTENT	7.3		8.8		11.0		12.3			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	116.3		118.8		120.6		117.2			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing													

+ #4 = 12 lbs x 9.4% = 1.13 lbs (WB-05 PER MK-E)
- #4 = 12 lbs x 90.6% = 10.87 lbs
12 lbs

WIND BLOWN STOCKPILE (SCALES USED: 69-001 & 69-002)

Soil Type:	Test No.:
SILTY SAND w/ GRAVEL	CM-4-008

Opt. Moisture	Max. Dry Unit Weight	Date:
10.9	120.6	1/11/89

Tested By: [signature] Reviewed By: Steve Dahl

Project:

-FERGUSON MAXIMUM DEN TY DETERMINATION

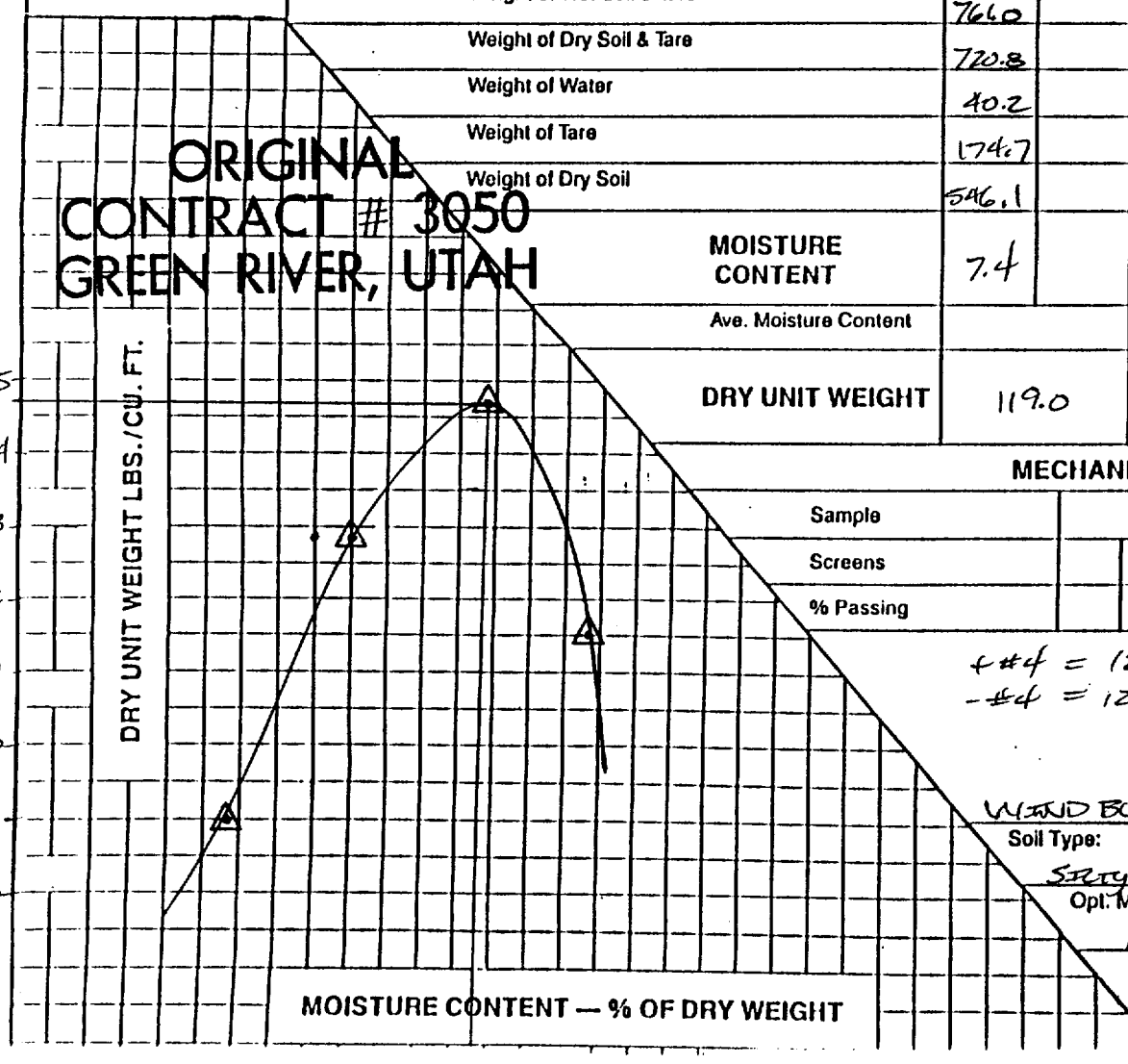
...ISON KNUDSEN COMPANY

BY SDM 189
...A ENTRY NO.

D698 METHOD C"

Blows Per Layer 56	COMPACTION SAMPLE NO.	+00		+100		+200		+300			
No. Layers 3	Weight of Wet Soil & Mold	24.43		24.89		25.21		25.08			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 12"	Weight of Wet Soil	9.55		10.01		10.33		10.20			
Mold Dia. 6"	Wet Unit Weight	127.8		134.0		138.3		136.5			
Volume of Sample .0747 FT3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven		
	Weight of Wet Soil & Tare	766.0		749.7		736.2		715.9			
	Weight of Dry Soil & Tare	720.8		702.0		681.1		656.7			
	Weight of Water	40.2		47.7		55.1		59.2			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	546.1		527.3		506.4		482.0			
	MOISTURE CONTENT	7.4		9.0		10.9		12.3			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	119.0		122.9		124.7		121.5			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					91.5	73.4							

+#4 = 12 lbs x 19.8% = 2.37 lbs
-#4 = 12 lbs x 80.2% = 9.63 lbs
12 lbs

WB-06
PER MK-E

WIND BLOWN STOCKPILE (SCALES USED: GR-001 & GR-002)

Soil Type: TAN - BROWN SILTY SAND W/ GRAVEL

Test No.: CM-4-009

Opt. Moisture: 10.9

Max. Dry Unit Weight: 124.7

Date: 1/11/89

Tested By: [signature]

Reviewed By: Steve Dike

Project:

FERGUSON MAXIMUM DENSITY DETERMINATION

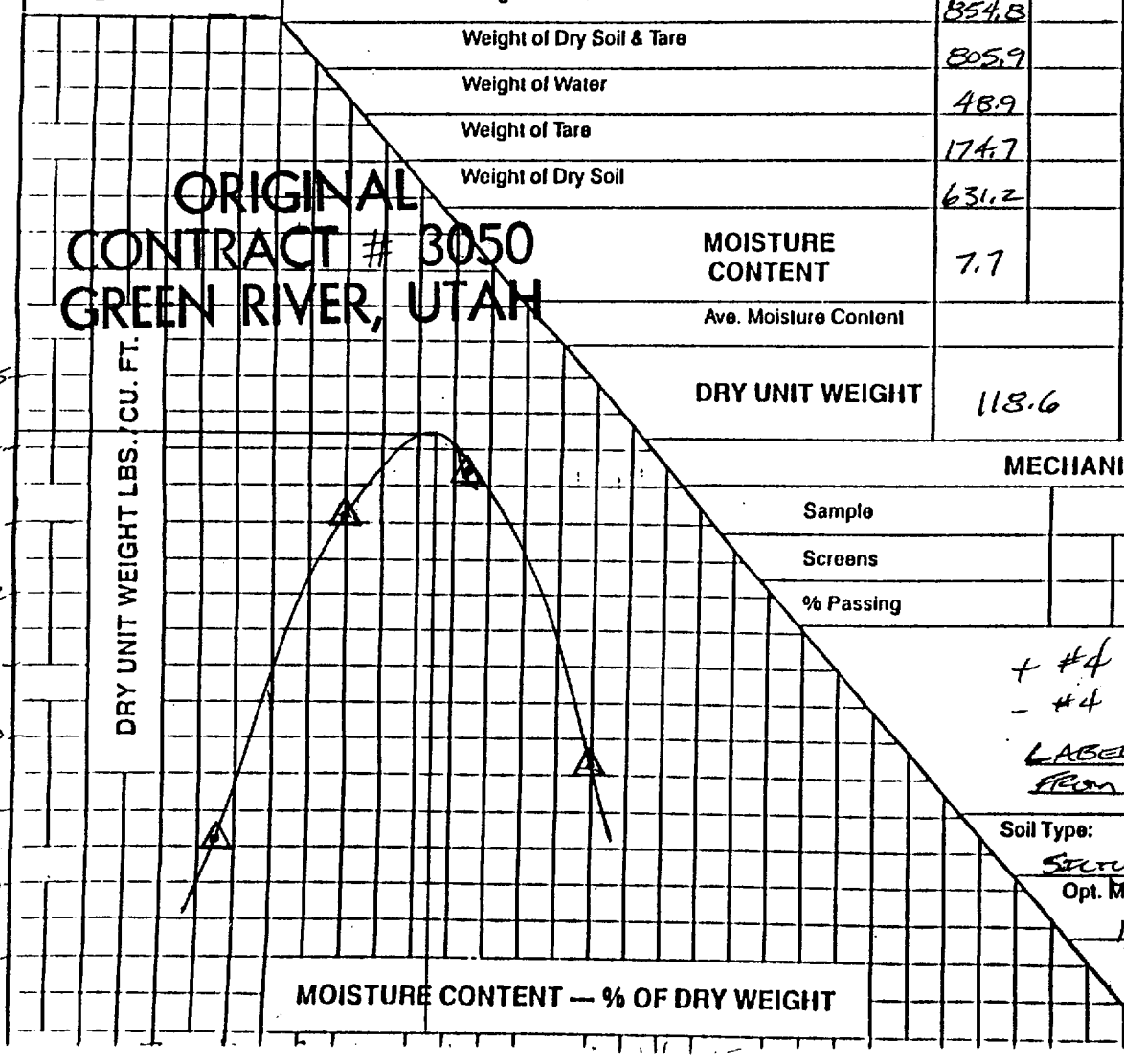
FERGUSON KNUDSEN COMPANY

BY SL 1/16/89
QA ENT 2254

D698 METHOD "D"

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100		+200		+300		+400			
No. Layers 3	Weight of Wet Soil & Mold	24.42		24.95		25.15		24.98			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 12"	Weight of Wet Soil	9.54		10.07		10.27		10.10			
Mold Dia. 6"	Wet Unit Weight	127.7		134.8		137.5		135.2			
Volume of Sample .0747 Ft3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven		
	Weight of Wet Soil & Tare	854.8		875.3		814.5		858.4			
	Weight of Dry Soil & Tare	805.9		814.5		750.3		779.8			
	Weight of Water	48.9		60.8		64.2		78.6			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	631.2		639.8		575.6		605.1			
	MOISTURE CONTENT	7.7		9.5		11.2		13.0			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	118.6		123.1		123.7		119.6			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS	
Screens					3/4	#4	#10	#16	#40	#100	#200	LL	PL
% Passing					90	72.9							

+ #4 12 x .271 = 3.25 lbs
- #4 12 x .729 = 8.75 lbs
12 lbs

SCALES USED: 6B-001 & 6B-002

LABELED WB-07 (PER MK-E)
FROM WINDBLOWN STOCKPILE

Soil Type: SILTY SAND W/GRAVEL		Test No.: CM-4-010
Opt. Moisture 10.7	Max. Dry Unit Weight 124.2	Date: 1/10/89
Tested By: Glenn Marks		Reviewed By: Steve Dike
Project:		

MK-FERGUSON MAXIMUM DENSITY DETERMINATION

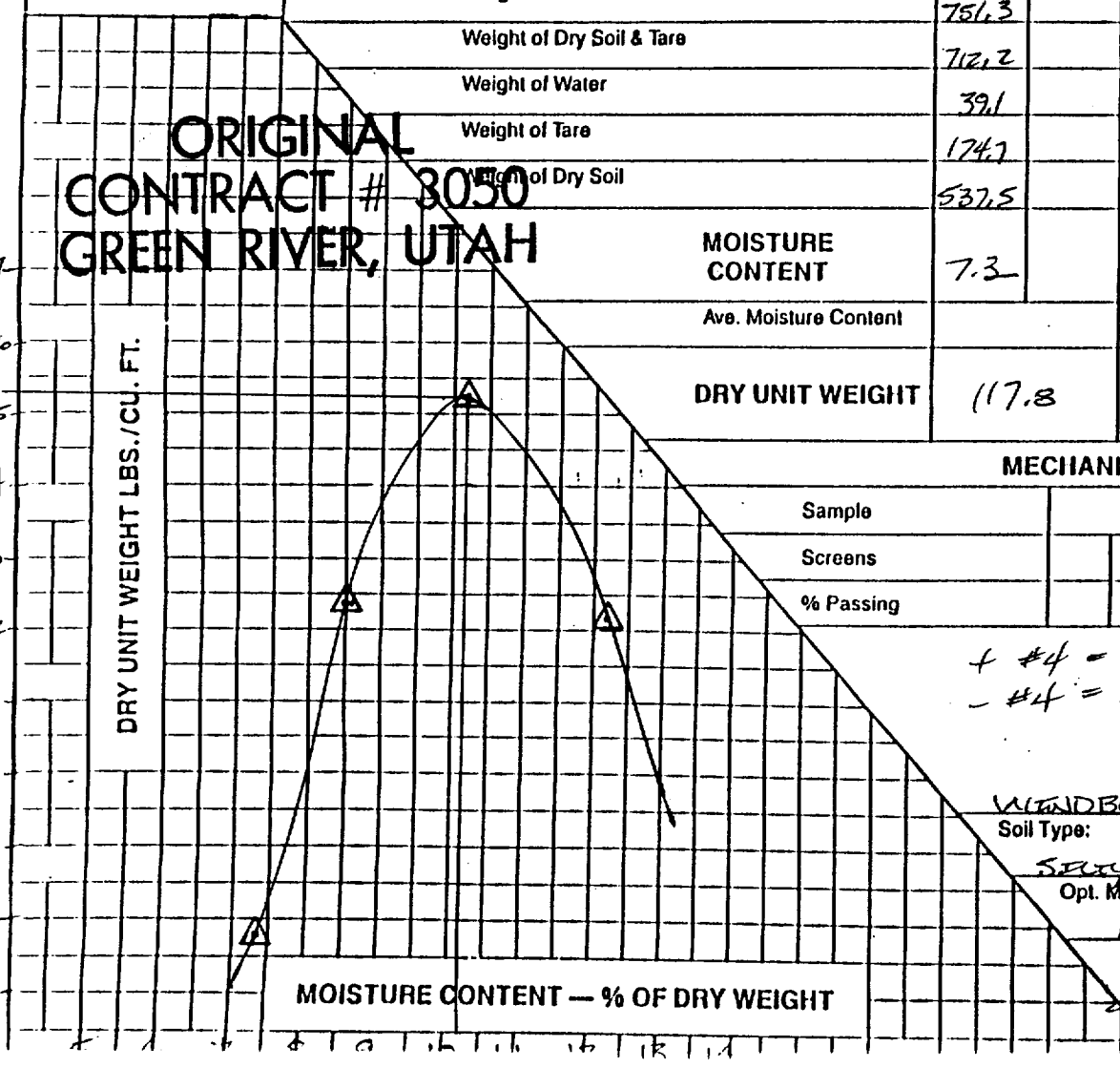
MORRISON KNUDSEN COMPANY

BY SE 11/16/89
QA ENTRY NO. 255

D 698 METHOD "C"

Blows Per Layer 56	COMPACTION SAMPLE NO.	+00		+100		+200		+300			
No. Layers 3	Weight of Wet Soil & Mold	24.32		24.80		25.19		25.12			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 12"	Weight of Wet Soil	9.44		9.92		10.31		10.24			
Mold Dia. 6"	Wet Unit Weight	126.4		132.8		138.0		137.1			
Volume of Sample .0747 FT3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven		
	Weight of Wet Soil & Tare	751.3		763.5		773.1		761.4			
	Weight of Dry Soil & Tare	712.2		717.4		717.6		697.4			
	Weight of Water	39.1		46.1		55.5		64.0			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	537.5		542.7		542.9		522.7			
	MOISTURE CONTENT	7.3		8.5		10.2		12.2			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	117.8		122.4		125.2		122.2			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					91	75							

+ #4 = 12 x .177 = 11.82 lbs
− #4 = 12 x .823 = 9.88 lbs
12 lbs

WB-08
PER MK-E

WINDBLOWN STOCKPILE (SCALES USED: 6R-001 ; 6R-002)

Soil Type:	Test No.:	
SILTY SAND W/ GRAVEL	CM-4-011	
Opt. Moisture 10.2	Max. Dry Unit Weight 125.2	Date: 1/10/89
Tested By: Steve Mack	Reviewed By: Steve Dahl	
Project: [illegible]		

-FERGUSON MAXIMUM DEN TY DETERMINATION

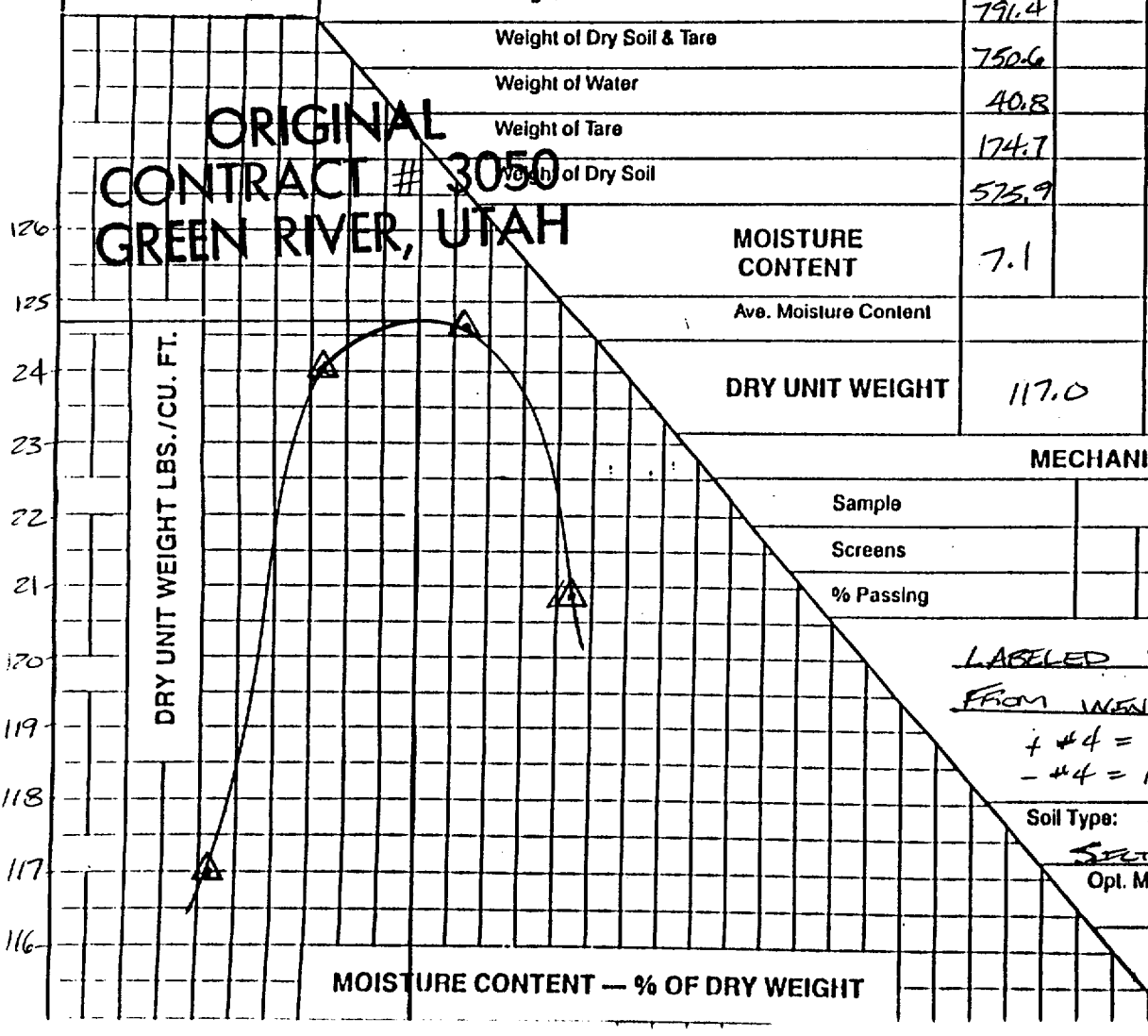
ISON KNUDSEN COMPANY

BY SDM 1/6/89
QA ENTRY N 756

D698 METHOD "C"

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100		+200		+300		+400				
No. Layers 3	Weight of Wet Soil & Mold	24.24		24.94		25.17		25.01				
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88				
Drop Ht. 12"	Weight of Wet Soil	9.36		10.06		10.29		10.13				
Mold Dia. 6"	Wet Unit Weight	125.3		134.7		137.8		135.6				
Volume of Sample .0747 FT3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven			
	Weight of Wet Soil & Tare	791.4		726.5		762.2		715.1				
	Weight of Dry Soil & Tare	750.6		682.6		710.6		656.5				
	Weight of Water	40.8		43.9		56.6		58.6				
	Weight of Tare	174.7		174.7		174.7		174.7				
	Weight of Dry Soil	575.9		502.9		535.9		481.8				
	MOISTURE CONTENT	7.1		8.6		10.6		12.2				
	Ave. Moisture Content											
	DRY UNIT WEIGHT	117.0		124.0		124.6		120.9				

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing													

LABELED WB-09 (PER MK-E) (SCALES USED: GR-001 & GR-002)
FROM WINDBLOWN STOCKPILE
+ #4 = 12 lbs x .124 = 1.49 lbs
- #4 = 12 lbs x .876 = 10.51 lbs
12 lbs

Soil Type: TAN - BROWN SILTY SAND

Test No.: CM-4-012

Opt. Moisture: 10.0

Max. Dry Unit Weight: 124.7

Date: 1/9/89

Tested By: Steven Mark

Reviewed By: Steve Dike

Project:

FERGUSON MAXIMUM DENSITY DETERMINATION

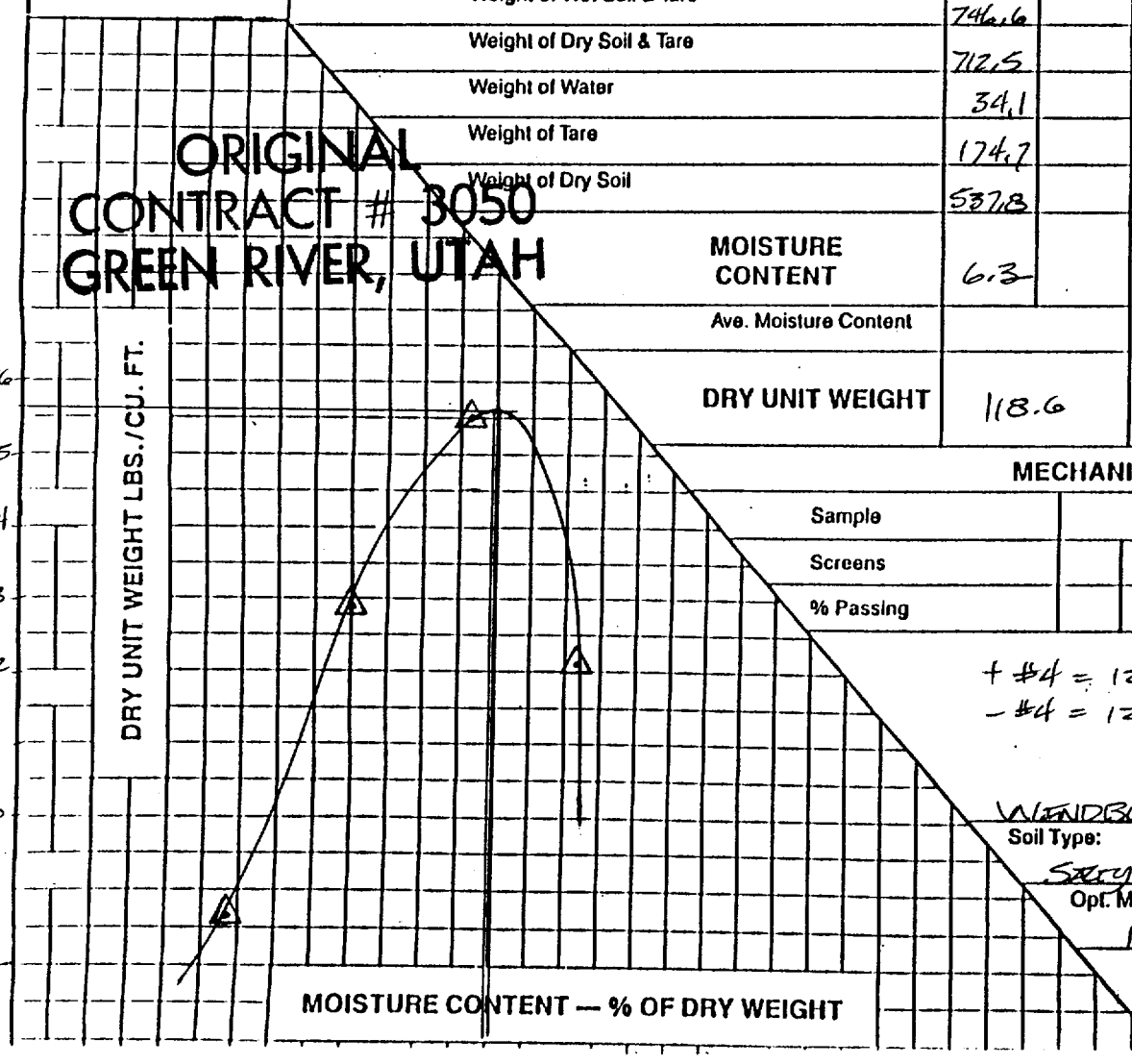
FERGUSON KNUDSEN COMPANY

BY SDM 2/89
QA ENTRY NO 757

D698 METHOD "C"

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100		+200		+300		+400			
No. Layers 3	Weight of Wet Soil & Mold	24.30		24.79		25.15		25.02			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 12"	Weight of Wet Soil	9.42		9.91		10.27		10.14			
Mold Dia. 6"	Wet Unit Weight	126.1		132.7		137.5		135.7			
Volume of Sample .0747 FT3	MOISTURE SAMPLE NO.	#1	Oven	#2	Oven	#3	Oven	#4	Oven		
	Weight of Wet Soil & Tare	746.6		763.9		740.6		757.1			
	Weight of Dry Soil & Tare	712.5		720.2		49.7		699.0			
	Weight of Water	34.1		43.7		174.7		58.1			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	537.8		545.5		516.2		524.3			
	MOISTURE CONTENT	6.3		8.0		9.6		11.1			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	118.6		122.9		125.5		122.1			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					97	90							

+ #4 = 12 x .077 = .92 lbs
- #4 = 12 x .923 = 11.08 lbs
12 lbs

WB-10
PER MK-E

WINDBLOWN STOCKPILE (SCALES USED GR-001 & GR-002)

Soil Type: Silty sand w/ gravel	Test No.: CM-4-013	
Opt. Moisture 10.0	Max. Dry Unit Weight 125.6	Date: 1/9/89
Tested By: Glenn Marks	Reviewed By: Steve Dike	
Project: [illegible]		

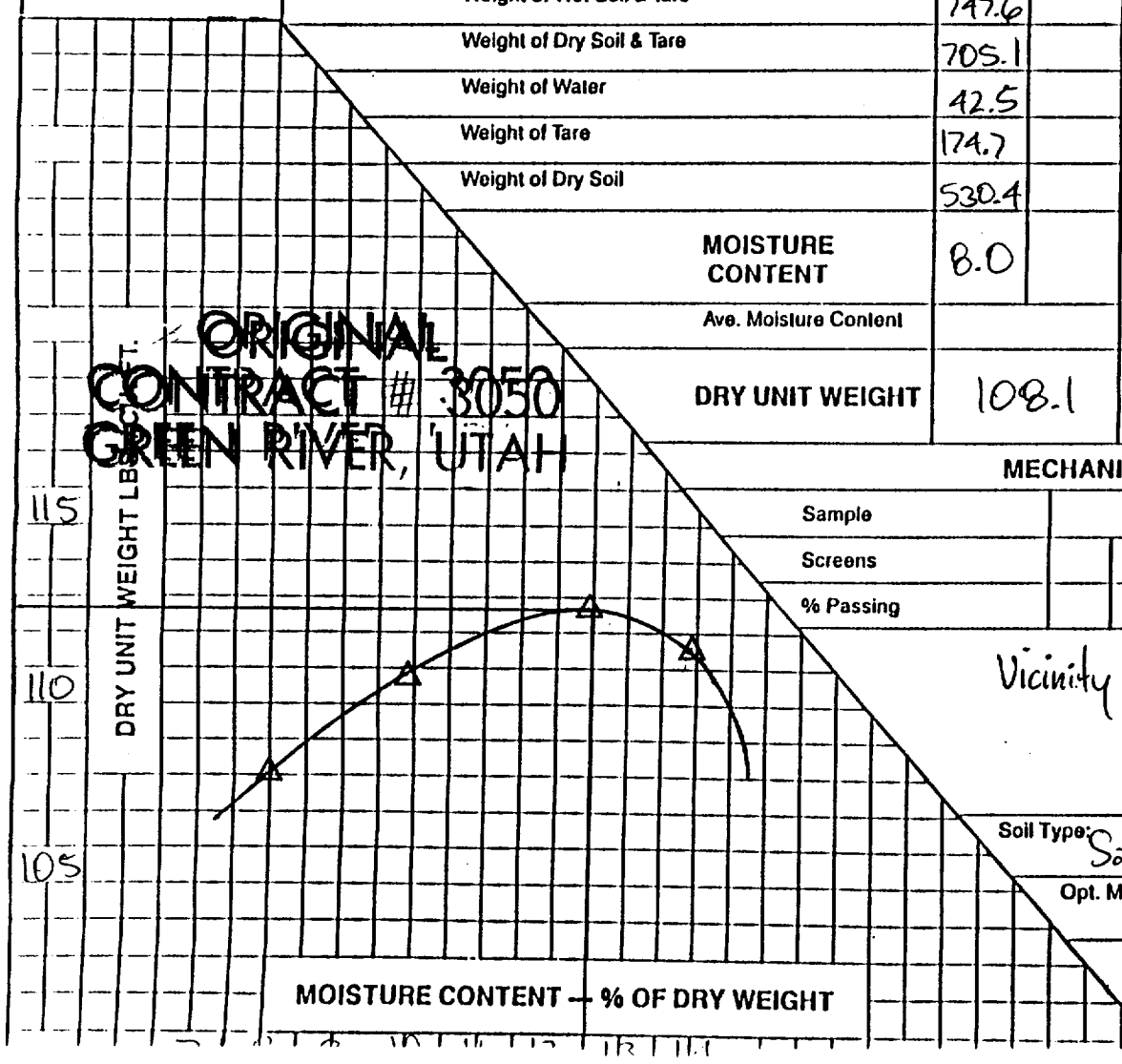
MAXIMUM DENSITY DETERMINATION

FERGUSON KNUDSEN COMPANY

QA ENTRY NO. 328

D698 Method

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100	+200	+300	+400	
No. Layers 3	Weight of Wet Soil & Mold	23.60	23.97	24.35	24.37	
Tamper Wt. 5.5 lb	Weight of Mold	14.88	14.88	14.88	14.88	
Drop Ht. 12"	Weight of Wet Soil	8.72	9.09	9.47	9.49	
Mold Dia. 6"	Wet Unit Weight	116.7	121.7	126.8	127.0	
Volume of Sample .0747 ft.3	MOISTURE SAMPLE NO.	Oven	Oven	Oven	Oven	
	Weight of Wet Soil & Tare	747.6	768.7	760.9	770.7	
	Weight of Dry Soil & Tare	705.1	715.5	696.3	698.2	
	Weight of Water	42.5	53.2	64.6	72.5	
	Weight of Tare	174.7	174.7	174.7	174.7	
	Weight of Dry Soil	530.4	540.8	521.6	523.5	
	MOISTURE CONTENT	8.0	9.8	12.4	13.8	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	108.1	110.8	112.8	111.6	



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					91.6	80.8							

Vicinity Property Contaminated Materials

Scales used: GR-001 + GR-002

Soil Type: DARK-BROWN Sandy gravelly clay

Test No.: CM-4-014

Opt. Moisture 12.5

Max. Dry Unit Weight 112.8

Date: 2-16-89

Tested By: Steve Dike

Reviewed By: Steven Mark

Project: 3050 - Green River

FERGUSON MAXIMUM DENSITY DETERMINATION

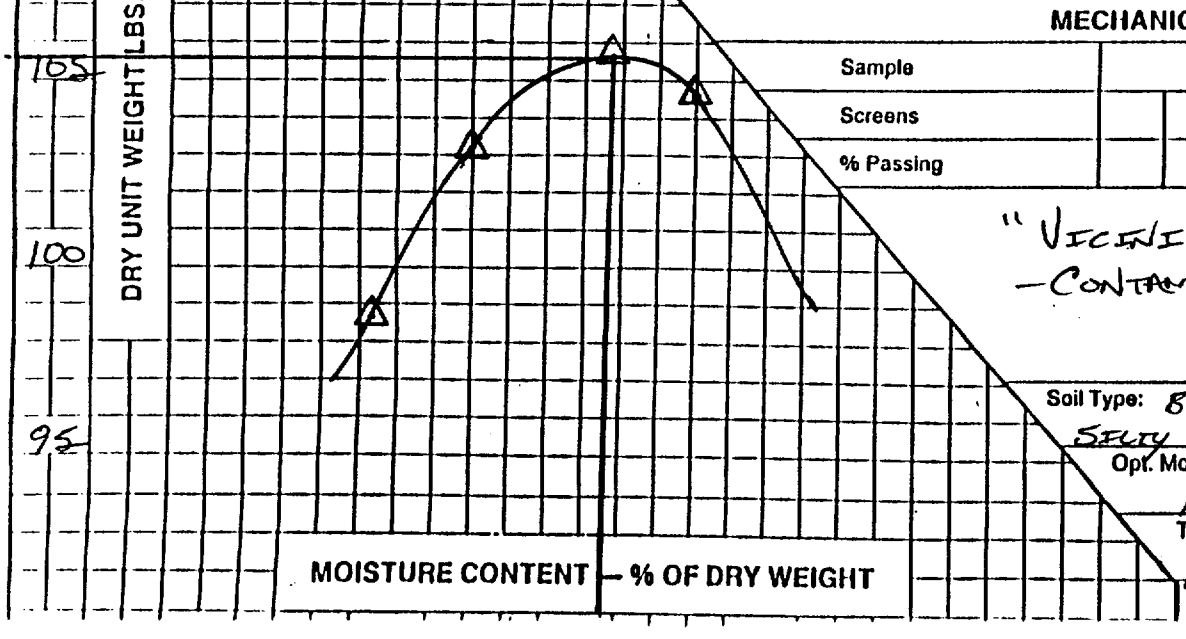
ASSON KNUDSEN COMPANY

D698 — METHOD "C"

QA REVIEWED / QUALITY REQUIREMENTS BY SDM QA ENTRY NO. 1/89 22

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100	+200	+300	+400
No. Layers 3	Weight of Wet Soil & Mold	23.16	23.62	24.00	23.99
Tamper Wt. 5.5#	Weight of Mold	14.88	14.88	14.88	14.88
Drop Ht. 12"	Weight of Wet Soil	8.28	8.74	9.12	9.11
Mold Dia. 6"	Wet Unit Weight	110.8	117.0	122.1	122.0
Volume of Sample .0747 FT3	MOISTURE SAMPLE NO.	Oven	Oven	Oven	Oven
	Weight of Wet Soil & Tare	698.8	713.9	732.5	770.2
	Weight of Dry Soil & Tare	642.3	649.7	658.1	685.7
	Weight of Water	56.5	64.2	74.4	84.5
	Weight of Tare	174.7	174.7	174.7	174.7
	Weight of Dry Soil	467.6	475.0	483.4	511.0
	MOISTURE CONTENT	12.1	13.5	15.4	16.5
	Ave. Moisture Content				
	DRY UNIT WEIGHT	98.8	103.1	105.8	104.7

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					98	92							

"VICINITY PROPERTY STOCKPILE"
— CONTAMINATED MATERIAL

Scales used: GR-001 + GR-002

Soil Type: BROWN / BLACK SILTY CLAY - SLAG.

Test No.: SDM 3/14/89 SM-EF-4-015

Opt. Moisture: 15.4

Max. Dry Unit Weight: 105.8

Date: 3/13/89

Tested By: Steven Marks

Reviewed By: Steve Dube

Project:

MCFERGUSON MAXIMUM DENSITY DETERMINATION

A JOHN KNUDSEN COMPANY

D698 METHOD "C"

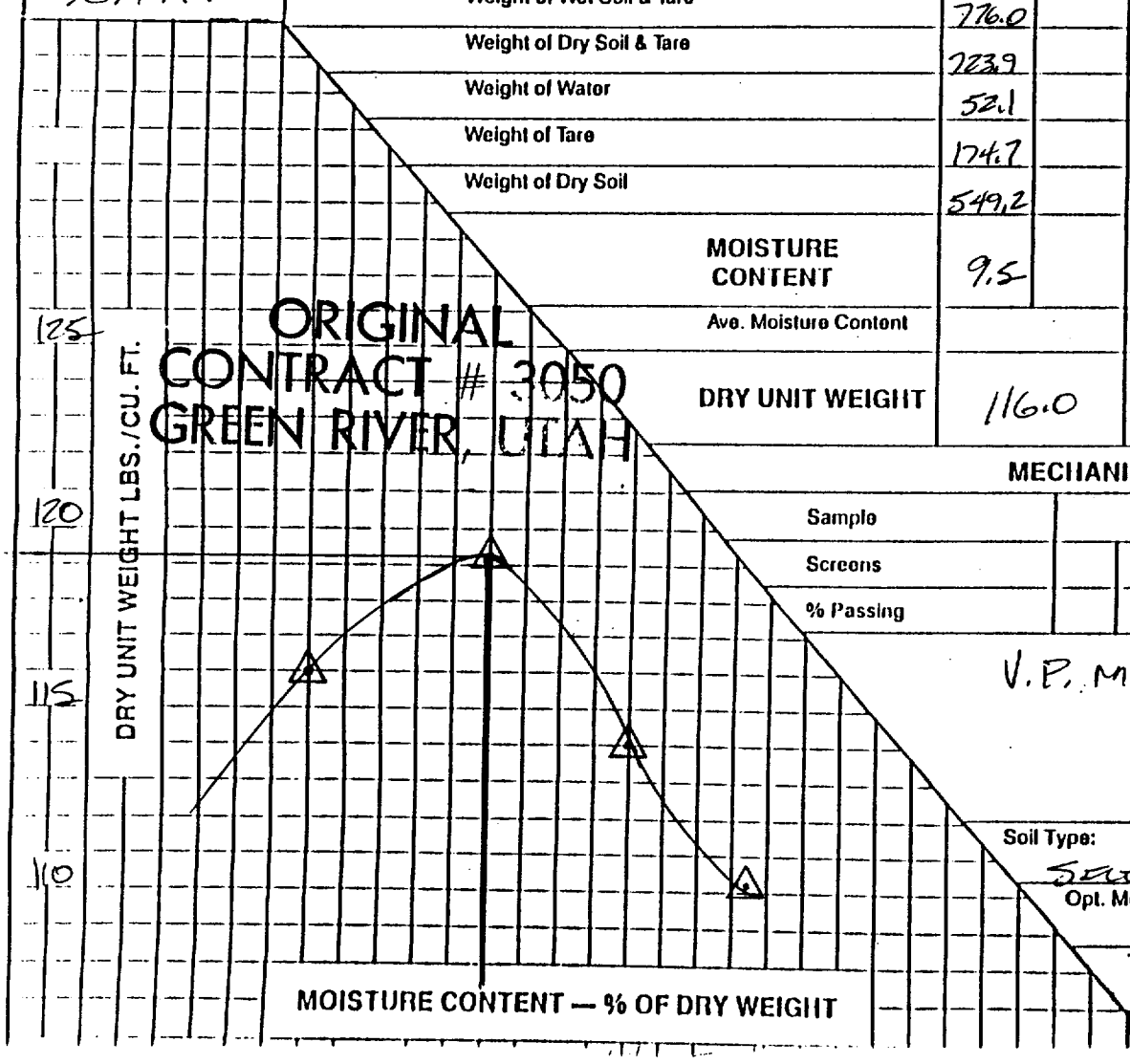
QUALITY REQUIREMENTS BY SDM 4/6/89
QA ENTRY 701

Blows Per Layer	56
No. Layers	3
Tamper Wt.	5.5 lbs
Drop Ht.	12"
Mold Dia.	6"
Volume of Sample	.0747 Ft³

COMPACTION SAMPLE NO.	400	200	300	400	
Weight of Wet Soil & Mold	24.37	24.86	24.59	24.40	
Weight of Mold	14.88	14.88	14.88	14.88	
Weight of Wet Soil	9.49	9.98	9.71	9.52	
Wet Unit Weight	127.0	133.6	130.0	127.4	

MOISTURE SAMPLE NO.	MICRO	MICRO	MICRO	MICRO	OVEN
Weight of Wet Soil & Tare	776.0	764.8	752.6	752.8	759.5
Weight of Dry Soil & Tare	723.9	701.8	686.2	674.5	678.9
Weight of Water	52.1	63.0	76.4	78.3	80.6
Weight of Tare	174.7	174.7	174.7	174.7	174.7
Weight of Dry Soil	549.2	527.1	511.5	499.8	504.2
MOISTURE CONTENT	9.5	12.0	14.0	USED OK → 15.7	16.0
Ave. Moisture Content					
DRY UNIT WEIGHT	116.0	119.3	114.0	110.1	

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					97	85							

V.P. MATERIAL PLACED ON 4/5/89

Scales used: GR-001 + GR-002

Soil Type: BROWN SILTY SAND		Test No.: CM-4-016
Opt. Moisture 12.0	Max. Dry Unit Weight 119.3	Date: 4/5/89
Tested By: Steven Marks		Reviewed By: Steve Dike
Project: GREEN RIVER		

-FERGUSON MAXIMUM DEN TY DETERMINATION

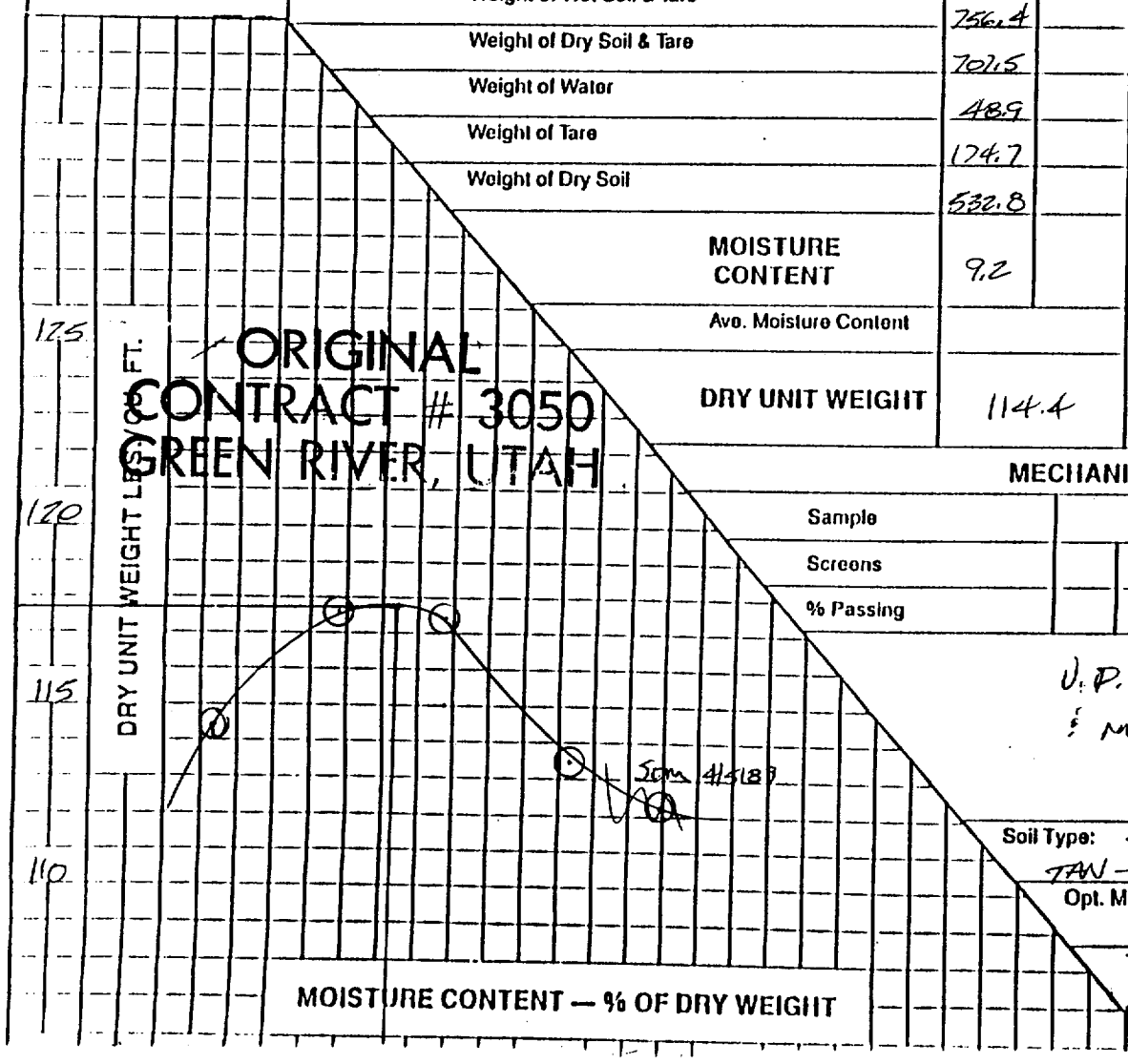
SON KNUDSEN COMPANY

QUALITY RE EMENTS BY SDM 4/6/89 QA ENTRY 202

D698 METHOD "C"

Blows Per Layer 56	COMPACTION SAMPLE NO.	+100	+200	+300	+400
No. Layers 3	Weight of Wet Soil & Mold	24.21	24.62	24.74	24.56
Tamper Wt. 5.5 lbs	Weight of Mold	14.88	14.88	14.88	14.88
Drop Ht. 12"	Weight of Wet Soil	9.33	9.74	9.86	9.68
Mold Dia. 6"	Wet Unit Weight	124.9	130.4	132.0	129.6
Volume of Sample .0747 ft3	MOISTURE SAMPLE NO.	MICRO	MICRO	MICRO	MICRO
	Weight of Wet Soil & Tare	756.4	702.9	776.3	745.2
	Weight of Dry Soil & Tare	702.5	704.9	709.7	674.6
	Weight of Water	48.9	58.0	66.6	70.6
	Weight of Tare	174.7	174.7	174.7	174.7
	Weight of Dry Soil	532.8	530.2	535.0	499.9
	MOISTURE CONTENT	9.2	10.9	12.4	14.1 ~~15.5~~
	Ave. Moisture Content				SD 4-5-89
	DRY UNIT WEIGHT	114.4	117.6	117.4	113.6 HZR

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					96.6	84.5							

U.P. MATERIAL FROM IN PLACE & MIXTURE OF VARIOUS BLOWS

Scales used: GR-001 + GR-002

Soil Type: SILTY SAND TAN - BROWN		Test No.: CM-4-017
Opt. Moisture 11.7	Max. Dry Unit Weight 117.7	Date: 4/5/89
Tested By: Steve Mark		Reviewed By: Steve Dye
Project:		

FERGUSON MAXIMUM DENSITY DETERMINATION

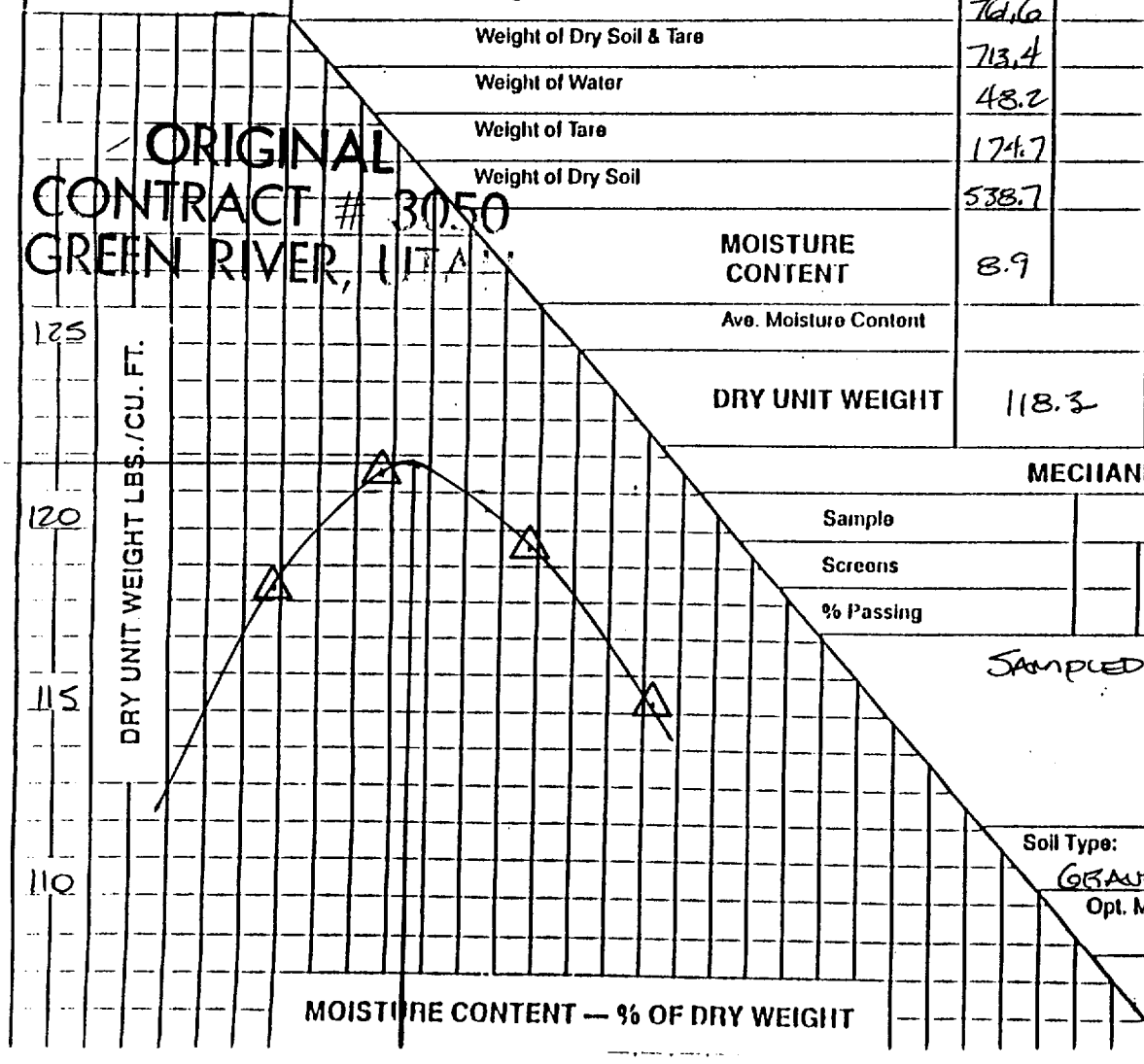
FERGUSON KNUDSEN COMPANY

D698 METHOD "C"

QA REVIEWED FOR QUALITY REQUIREMENTS BY SJ 4/7/89 QA ENTRY 716

Blows Per Layer	56	COMPACTION SAMPLE NO.	+100		+200		+300		+400			
No. Layers	3	Weight of Wet Soil & Mold	24.50		24.90		24.92		24.71			
Tamper Wt.	5.5 lbs	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht.	12"	Weight of Wet Soil	9.62		10.02		10.04		9.83			
Mold Dia.	6"	Wet Unit Weight	128.8		134.1		134.4		131.6			
Volume of Sample	.0747 FT3	MOISTURE SAMPLE NO.	MICRO		MICRO	OVEN	MICRO		MICRO			
		Weight of Wet Soil & Tare	761.6		768.6	756.2	758.4		756.5			
		Weight of Dry Soil & Tare	713.4		713.3	702.8	694.1		684.1			
		Weight of Water	48.2		55.3	55.4	64.3		72.4			
		Weight of Tare	174.7		174.7	174.7	174.7		174.7			
		Weight of Dry Soil	538.7		538.6	526.1	519.4		509.4			
		MOISTURE CONTENT	8.9		USED (10.3) OK	10.5	12.4		14.2			
		Ave. Moisture Content										
		DRY UNIT WEIGHT	118.3		121.6		119.6		115.2			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens					3/4"	#4	#10	#16	#40	#100	#200		
% Passing					92	81							

SAMPLED ON INPLACE U.P. MATERIAL.

Scales used: GR-001 + GR-002

Soil Type: DARK-BROWN GRAVELY SAND

Test No.: CM-4-018

Opt. Moisture: 10.8

Max. Dry Unit Weight: 121.7

Date: 4/6/89

Tested By: Alvin Marks

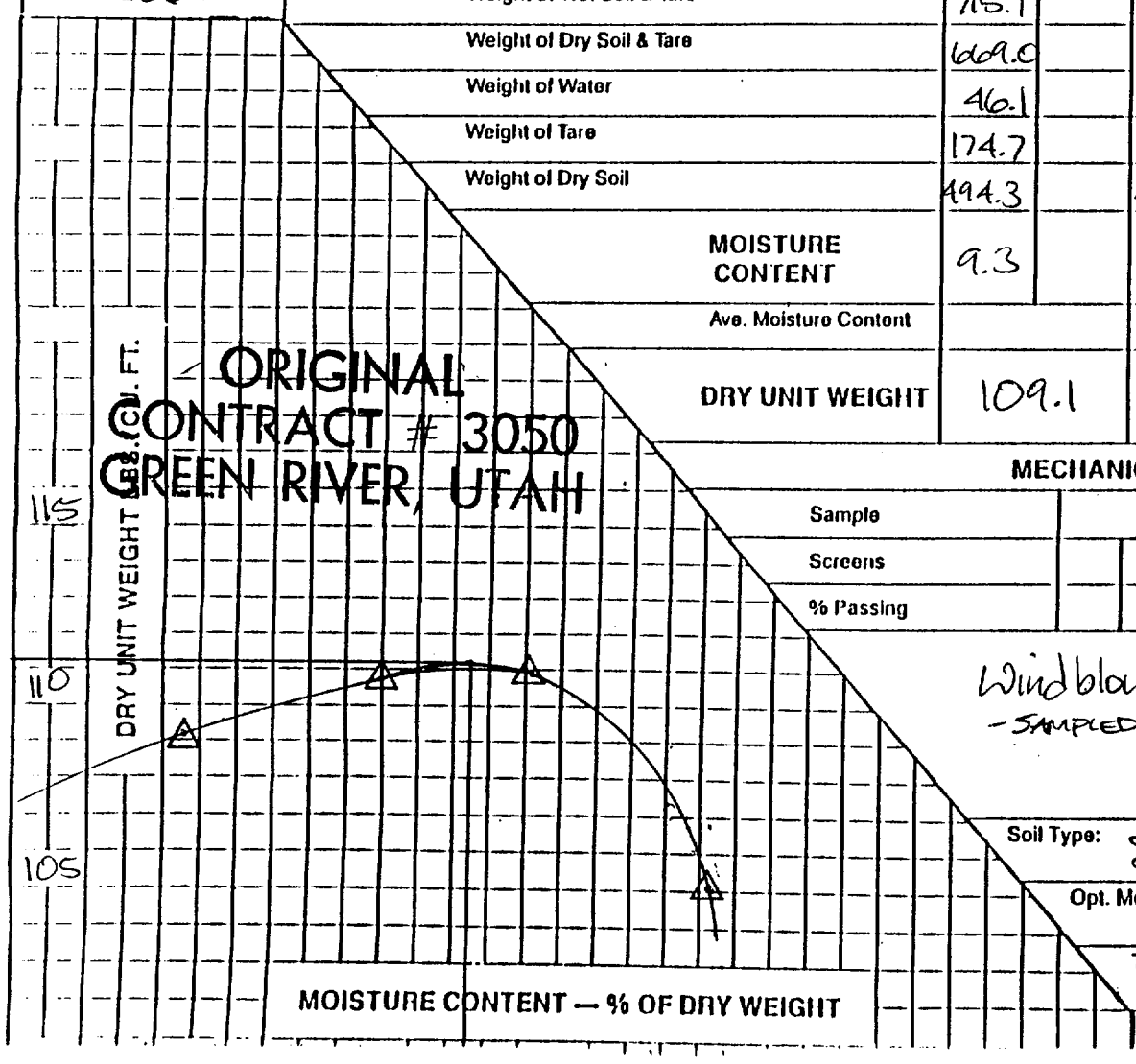
Reviewed By: Steve Dike

Project:

McFERGUSON MAXIMUM DENSITY DETERMINATION

D 698 Method "A"

Blows Per Layer	25	**COMPACTION SAMPLE NO.**	+100	+150	+200	+250
No. Layers	3	Weight of Wet Soil & Mold	13.43	13.59	13.67	13.54
Tamper Wt.	5.516	Weight of Mold	9.42	9.42	9.42	9.42
Drop Ht.	12"	Weight of Wet Soil	4.01	4.17	4.25	4.12
Mold Dia.	4"	Wet Unit Weight	119.3	124.1	126.5	122.6
Volume of Sample	.0336 ft.³	**MOISTURE SAMPLE NO.**				
		Weight of Wet Soil & Tare	715.1	708.6	706.4	704.6
		Weight of Dry Soil & Tare	669.0	651.6	640.7	628.6
		Weight of Water	46.1	57.0	65.7	76.0
		Weight of Tare	174.7	174.7	174.7	174.7
		Weight of Dry Soil	494.3	476.9	466.0	453.9
		MOISTURE CONTENT	9.3	12.0	14.1	16.7
		Ave. Moisture Content				
		DRY UNIT WEIGHT	109.1	110.8	110.9	105.1



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	96.2							

Windblown contaminates
- SAMPLED FROM INPLACE ON 4/7/89.

QA REVIEWED FOR QUALITY REQUIREMENTS
BY SDM 4/7/89
QA ENTRY NO. 727

Scale used: 6R-001 + 6R-002

Soil Type: Silty (Brown) sand		Test No.: CM-4-019
Opt. Moisture 13.2	Max. Dry Unit Weight 111.2	Date: 4-7-89
Tested By: Steve Dike	Reviewed By: Steven Marks	
Project:		

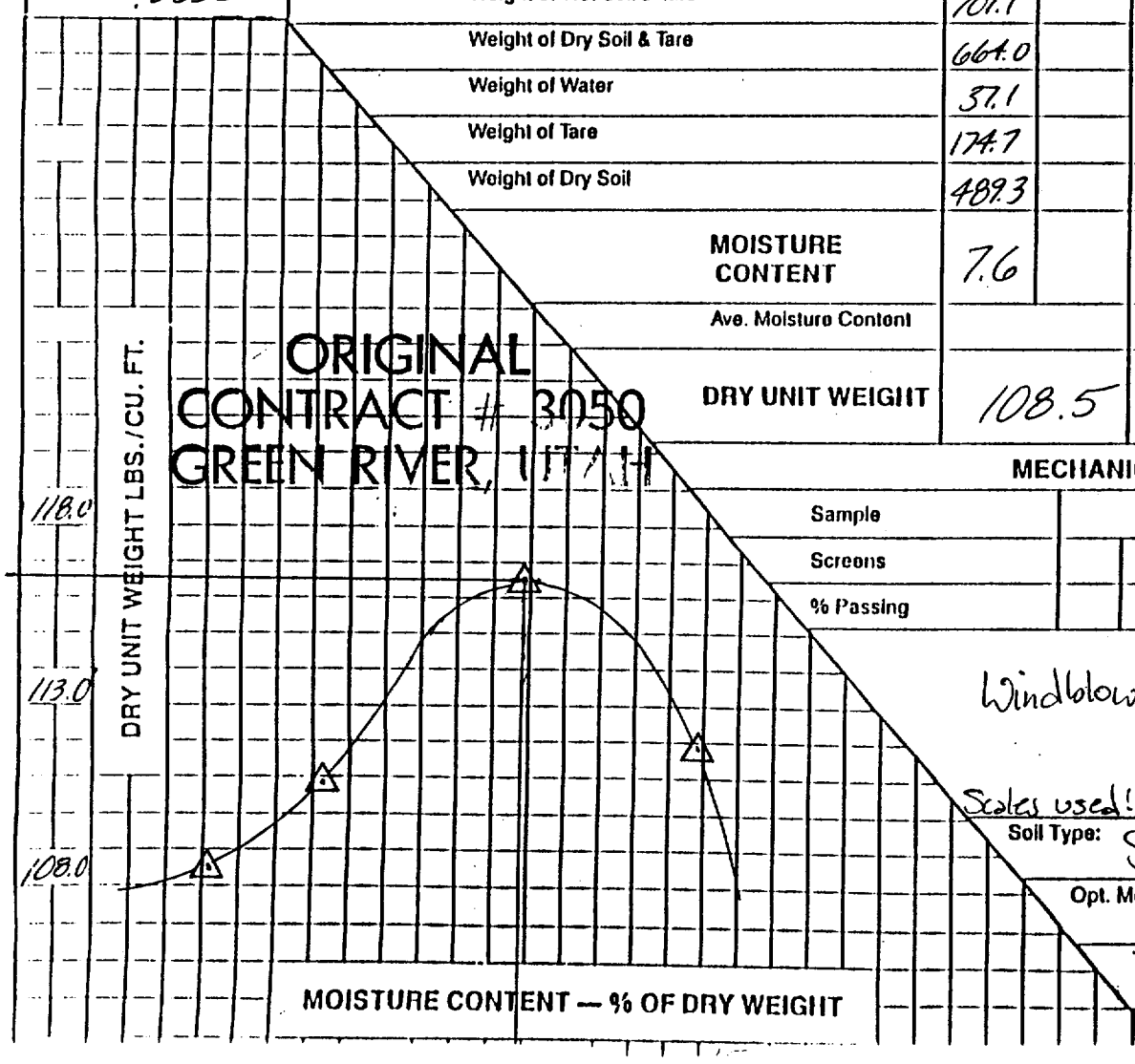
McFERGUSON MAXIMUM DENSITY DETERMINATION

McFERGUSON KNUDSEN COMPANY

ASTM - 698 Method A

Blows Per Layer	25	COMPACTION SAMPLE NO.	+50 m1		+100 m1		+150 m1		+200 m1			
No. Layers	3	Weight of Wet Soil & Mold	13.34		13.49		13.80		13.72			
Tamper Wt.	5.5 #'s	Weight of Mold	9.42		9.42		9.42		9.42			
Drop Ht.	12"	Weight of Wet Soil	3.92		4.07		4.38		4.30			
Mold Dia.	4"	Wet Unit Weight	116.7		121.1		130.4		128.0			
Volume of Sample	.0336	MOISTURE SAMPLE NO.	MICRO		MICRO		MICRO		MICRO			
		Weight of Wet Soil & Tare	701.1		605.9		704.8		707.6			
		Weight of Dry Soil & Tare	664.0		569.6		648.4		640.4			
		Weight of Water	37.1		36.3		56.4		67.1			
		Weight of Tare	174.7		174.7		174.7		174.7			
		Weight of Dry Soil	489.3		394.9		473.7		465.7			
		MOISTURE CONTENT	7.6		9.2		11.9		14.4			
		Ave. Moisture Content										
		DRY UNIT WEIGHT	108.5		110.9		116.5		111.9			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						94.0							

Windblown contaminates

Scale #GR-001 + GR-002

QA REVIEWED FOR QUALITY REQUIREMENTS
BY
QA ENTRY NO.

Scales used: GR-001 + GR-002

Soil Type: Silty Sand
Test No.: CM-~~14~~ 4 020 SW 4-10-89
Opt. Moisture: 11.9
Max. Dry Unit Weight: 116.5
Date: 4-10-89
Tested By: Steve Wilke
Reviewed By: Steve Dike
Project: 3050 Green River - UMTRA

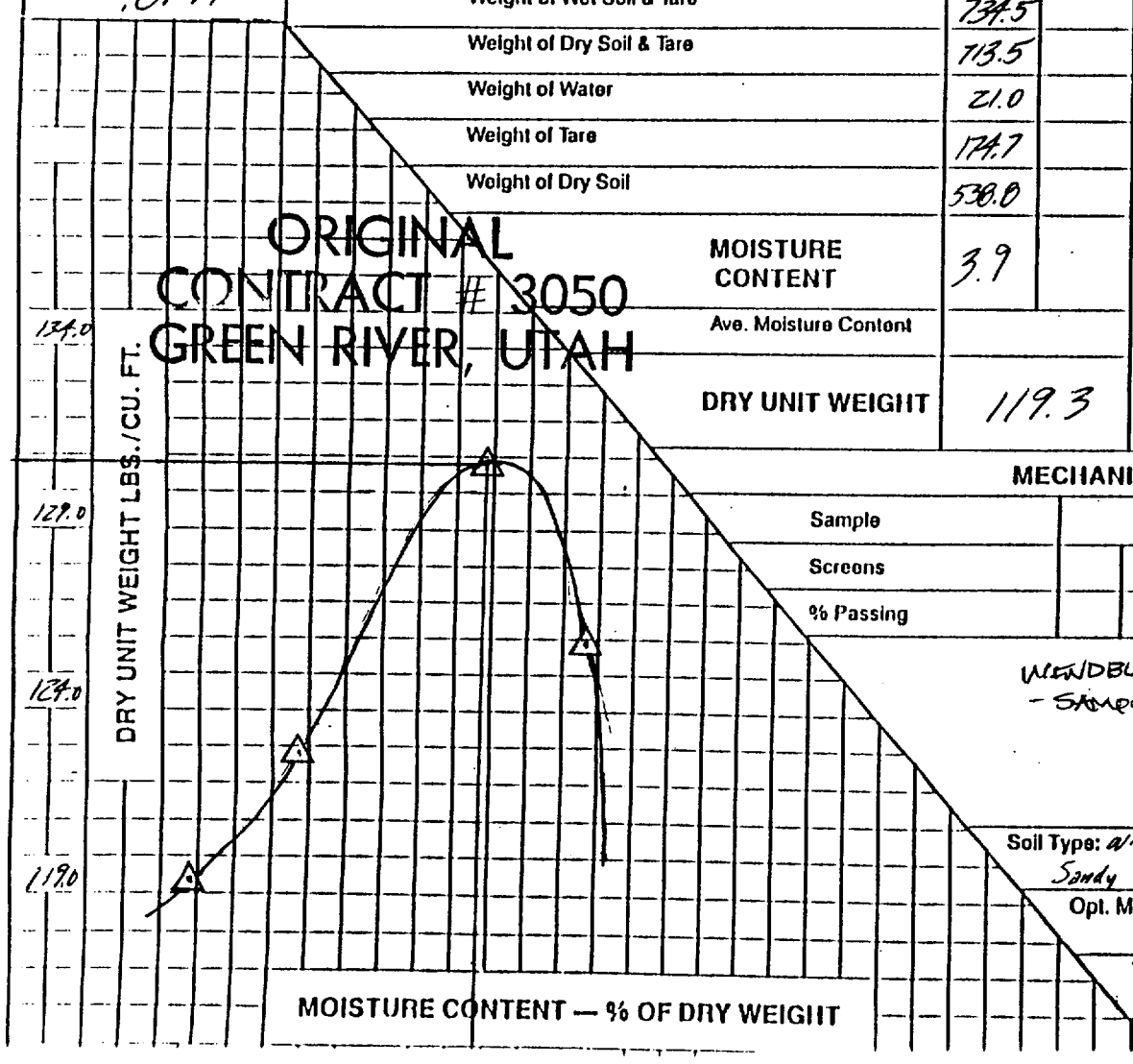
FERGUSON MAXIMUM DENSITY DETERMINATION

ASTM D 1-98 Method D

Blows Per Layer	56
No. Layers	3
Tamper Wt.	5.5 #3
Drop Ht.	12"
Mold Dia.	6"
Volume of Sample	.0747

COMPACTION SAMPLE NO.	+0 ml	+100 ml	+200 ml	+300 ml		
Weight of Wet Soil & Mold	24.14	24.54	25.43	25.24		
Weight of Mold	14.88	14.88	14.88	14.88		
Weight of Wet Soil	9.26	9.66	10.55	10.36		
Wet Unit Weight	124.0	129.3	141.2	138.7		
MOISTURE SAMPLE NO.						
Weight of Wet Soil & Tare	734.5	726.5	732.7	747.2		
Weight of Dry Soil & Tare	713.5	698.7	692.0	698.7		
Weight of Water	21.0	27.8	40.7	48.5		
Weight of Tare	174.7	174.7	174.7	174.7		
Weight of Dry Soil	538.8	524.0	517.3	524.0		
MOISTURE CONTENT	3.9	5.3	7.9	9.3		
Ave. Moisture Content						
DRY UNIT WEIGHT	119.3	122.8	130.9	126.9		

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					99	83.0							

WINDBLOWN CONTAMINATION - SAMPLED INPLACE.

Scale #GR-001 GR-002

QA REVIEWED FOR QUALITY REQUIREMENTS
BY Sam 4/12/89
QA ENTRY NO. 757

Soil Type: windblown contaminated Sandy Silt w/gravel		Test No.: CM-4-021
Opt. Moisture 7.9	Max. Dry Unit Weight 130.9	Date: 4-12-89
Tested By: Sue Wells		Reviewed By: Steven Moore
Project:		

FERGUSON MAXIMUM DENSITY DETERMINATION

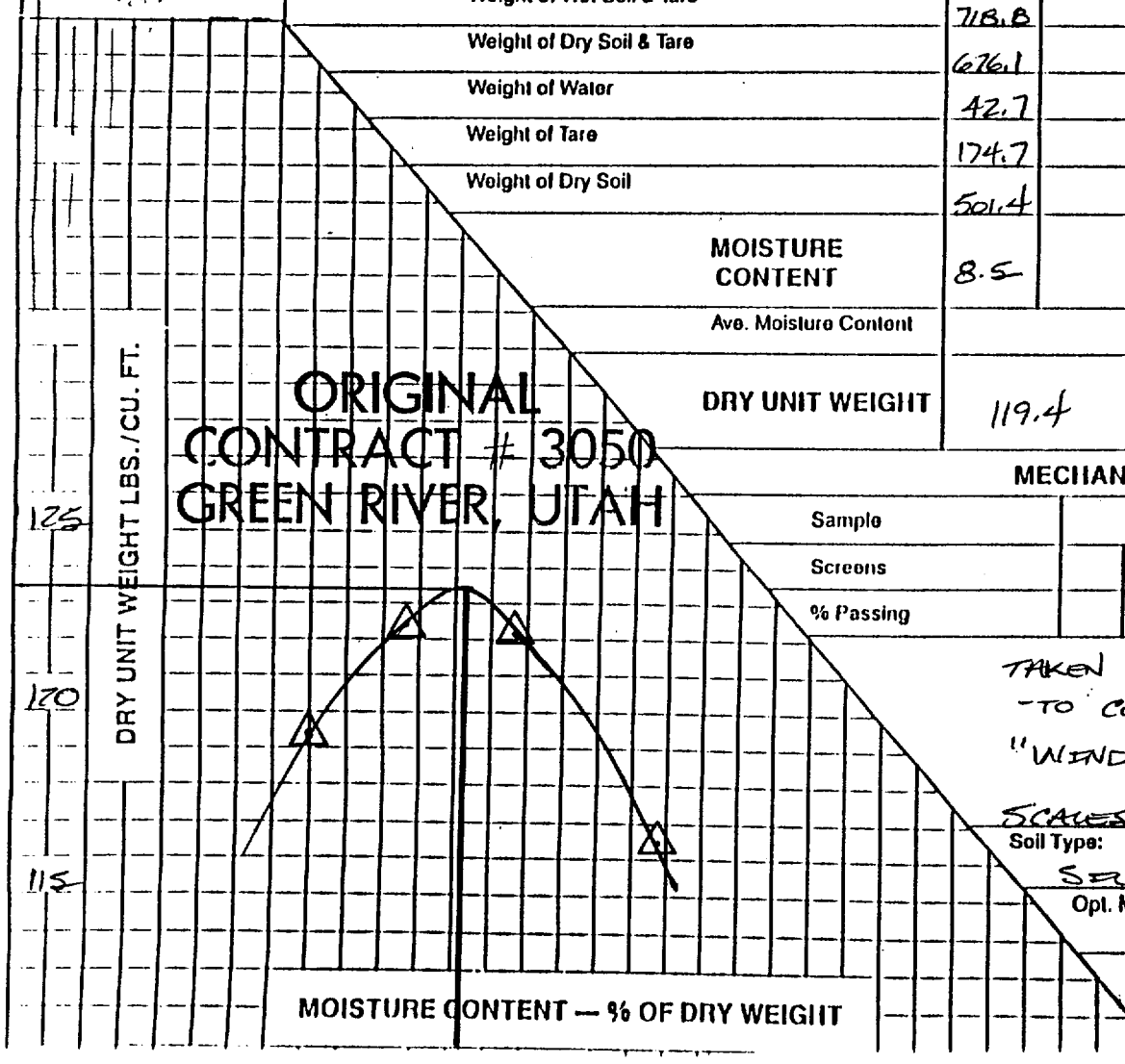
KNUDSEN COMPANY

QUALITY REQ. ...ENTS
BY SDM
QA ENTRY N...

A.S.T.M. D698 "C"

Blows Per Layer	56
No. Layers	3
Hamper Wt.	5.5#
Drop Ht.	12"
Mold Dia.	6"
Volume of Sample	.0747 FT3

COMPACTION SAMPLE NO.	+200	+300	+400	+500		
Weight of Wet Soil & Mold	24.55	24.92	25.03	24.75		
Weight of Mold	14.88	14.88	14.88	14.88		
Weight of Wet Soil	9.67	10.04	10.15	9.87		
Wet Unit Weight	129.5	134.4	135.9	132.1		
MOISTURE SAMPLE NO.	oven	oven	oven	oven		
Weight of Wet Soil & Tare	718.8	752.3	723.4	743.5		
Weight of Dry Soil & Tare	676.1	700.8	667.9	676.5		
Weight of Water	42.7	51.5	55.5	67.0		
Weight of Tare	174.7	174.7	174.7	174.7		
Weight of Dry Soil	501.4	526.1	493.2	501.8		
MOISTURE CONTENT	8.5	9.8	11.3	13.4		
Ave. Moisture Content						
DRY UNIT WEIGHT	119.4	122.4	122.1	116.5		



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing													

TAKEN AT END OF SHIFT ON 4/17/89
-TO COVER PRODUCTION ON 4/18/89.
"WINDBLOWN CONTAMINATION."

SCALES: GR-001 & GG-002

Soil Type:	Test No.:
BROWN SERPY SAND	CM-4-022

Opt. Moisture	Max. Dry Unit Weight	Date:
10.6	123.4	4/17/89

Tested By:	Reviewed By:
Elwin Marks	Steve Dike

Project:

-FERGUSON MAXIMUM DEN TY DETERMINATION

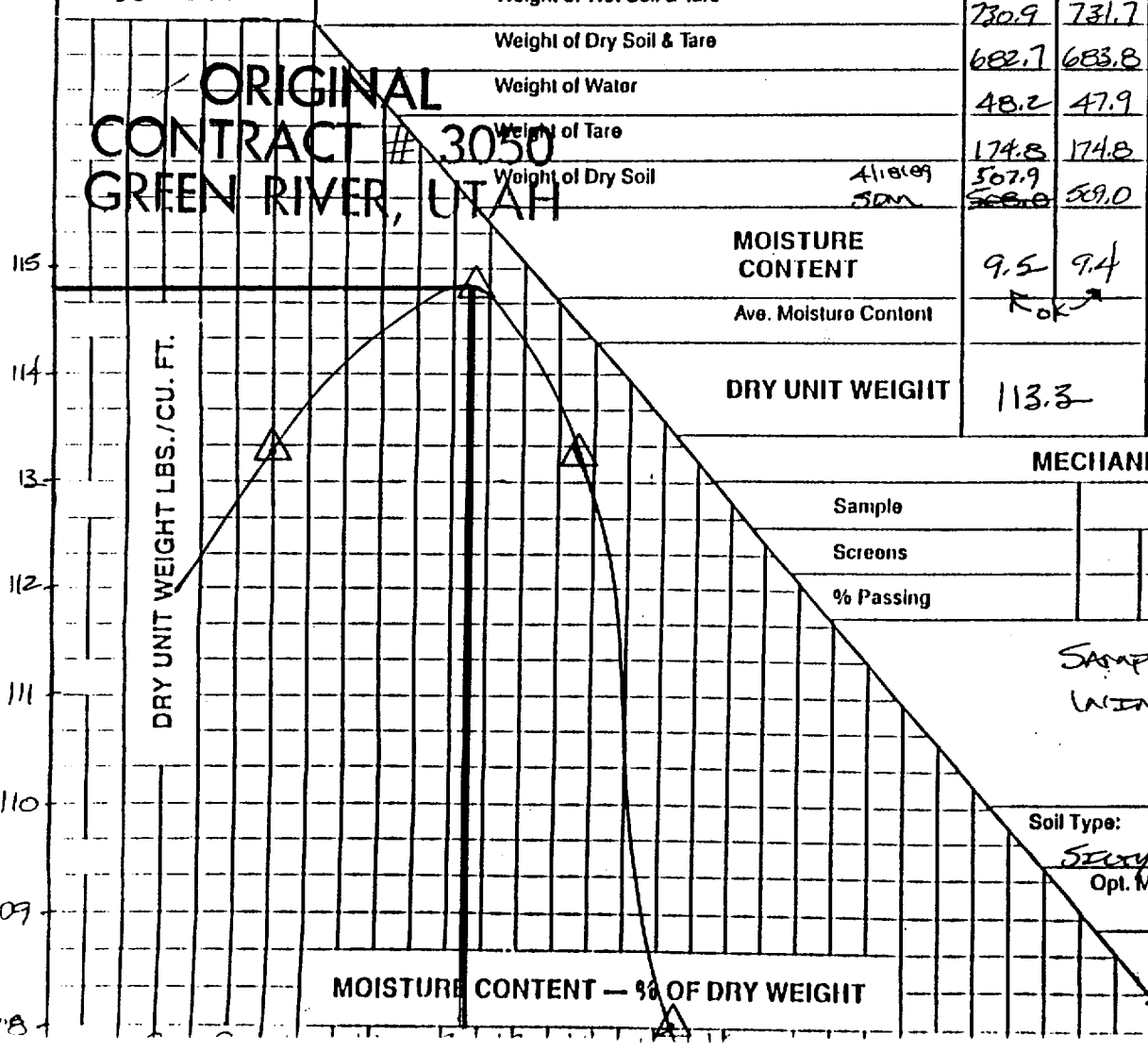
SON KNUDSEN COMPANY

A.S.T.M. D698 "A"

QA REVIEW OK
QUALITY REQUIREMENTS
BY SDM 4/19/89
QA ENTRY 823

Blows Per Layer 25	COMPACTION SAMPLE NO.	+100		+150		+200		+250			
No. Layers 3	Weight of Wet Soil & Mold	13.59		13.75		13.75		13.60			
Tamper Wt. 5 lbs	Weight of Mold	9.42		9.42		9.42		9.42			
Drop Ht. 12"	Weight of Wet Soil	4.17		4.33		4.33		4.18			
Mold Dia. 4"	Wet Unit Weight	124.1		128.9		128.9		124.4			
Volume of Sample .0336 FT3	MOISTURE SAMPLE NO.	MICRO	OVEN	MICRO		MICRO		MICRO			
	Weight of Wet Soil & Tare	730.9	731.7	738.6		722.7		762.6			
	Weight of Dry Soil & Tare	682.7	683.8	676.9		656.1		689.6			
	Weight of Water	48.2	47.9	61.7		66.6		78.0			
	Weight of Tare	174.8	174.8	174.8		174.8		174.8			
	Weight of Dry Soil 4/18/89 SDM	507.9 ~~508.0~~	509.0	502.1		481.3		514.8			
	MOISTURE CONTENT	9.5	9.4	12.3		13.8		15.2 SDM 4/18/89			
	Ave. Moisture Content	OK									
	DRY UNIT WEIGHT	113.3		114.8		113.3		108.0			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	99							

SAMPLED ON NEW MATERIAL ON 4/18/89
WIND BLOWN CONTAMINATED

Scales used: 6R-001 + 6R-002

Soil Type: BROWN SILTY SAND		Test No.: CM-4-023
Opt. Moisture 12.3	Max. Dry Unit Weight 114.8	Date: 4/18/89
Tested By: [illegible]		Reviewed By: Steve Dale
Project:		

-FERGUSON MAXIMUM DEN TY DETERMINATION

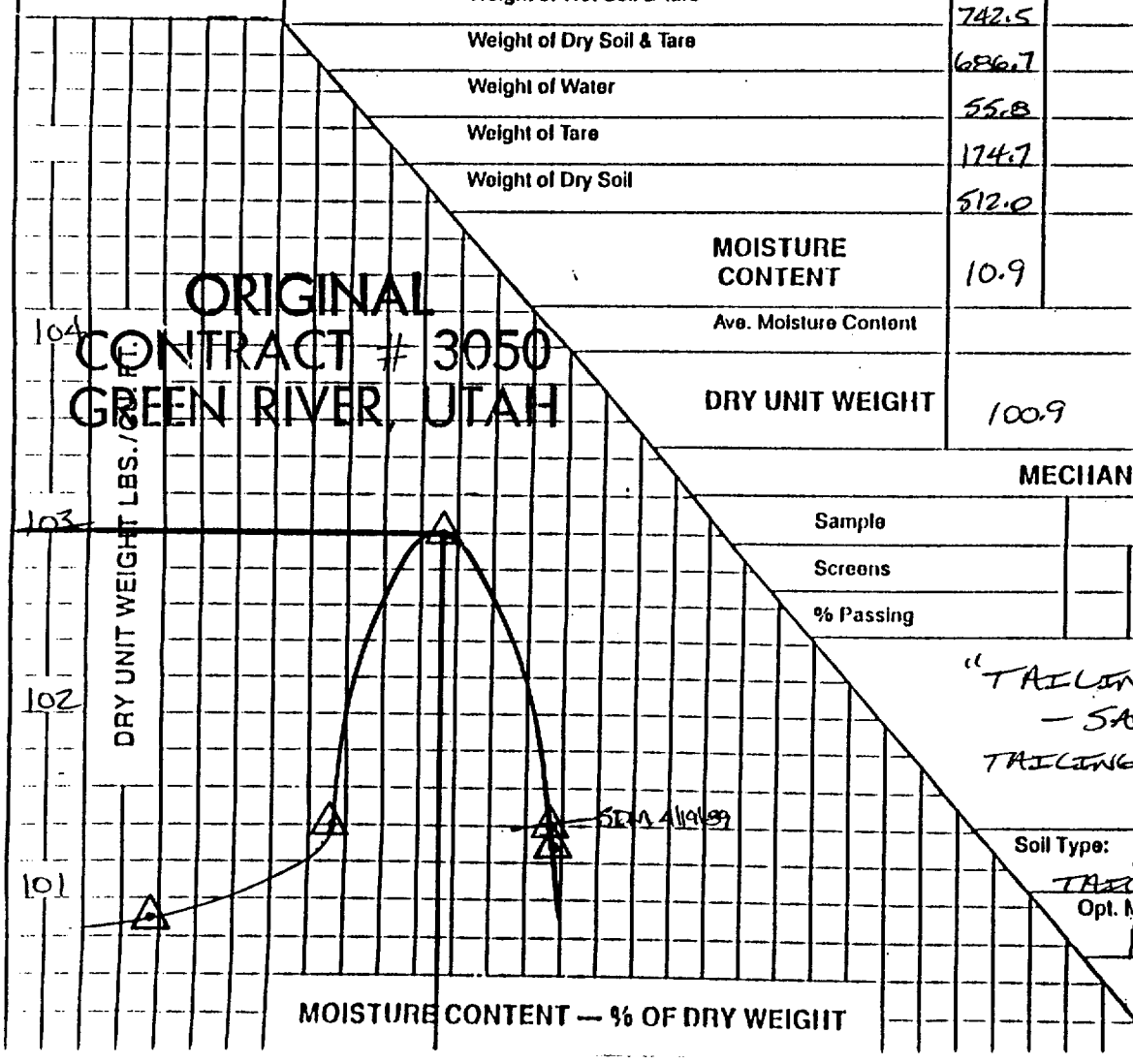
ISON KNUDSEN COMPANY

A.S.T.M D698 METHOD "A"

QA REVIEWE R
QUALITY REQ MENTS
BY SDC 20189
QA ENTRY NO. 841

Blows Per Layer 25	COMPACTION SAMPLE NO.	+250		+300		+350		+400				
No. Layers 3	Weight of Wet Soil & Mold	13.18		13.28		13.39		13.38				
Tamper Wt. 5.5 lbs	Weight of Mold	9.42		9.42		9.42		9.42				
Drop Ht. 12"	Weight of Wet Soil	3.76		3.86		3.97		3.96				
Mold Dia. 4"	Wet Unit Weight	111.9		114.9		118.2		117.9				
Volume of Sample .0336 FT3	MOISTURE SAMPLE NO.	MICRO		MICRO	OVEN	MICRO		MICRO				
	Weight of Wet Soil & Tare	742.5		774.9	793.0	792.9		792.7				
	Weight of Dry Soil & Tare	686.7		704.3	720.8	713.1		705.7				
	Weight of Water	55.8		70.6	72.2	79.8		87.0				
	Weight of Tare	174.7		174.7	174.7	174.7		174.7				
	Weight of Dry Soil	512.0		529.6	546.1	538.4		531.0				
	MOISTURE CONTENT	10.9		13.3	13.2	14.8		16.~~5~~ 4	SD 4-19-89			
	Ave. Moisture Content				ok							
	DRY UNIT WEIGHT	100.9		101.4		103.0		101.~~4~~ 3	SD 4-19-89			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	100							

"TAILINGS"
— SAMPLED FROM THE WEST SIDE OF TAILINGS PILE.

Scales used: GR-001 + GR-002

Soil Type: YELLOW - BROWN ~~TAILINGS SEMI SAND~~

Test No.: CM-4-024

Opt. Moisture: 14.8

Max. Dry Unit Weight: 103.0

Date: 4/19/89

Tested By: Kluen Mont

Reviewed By: Steve Dike

Project:

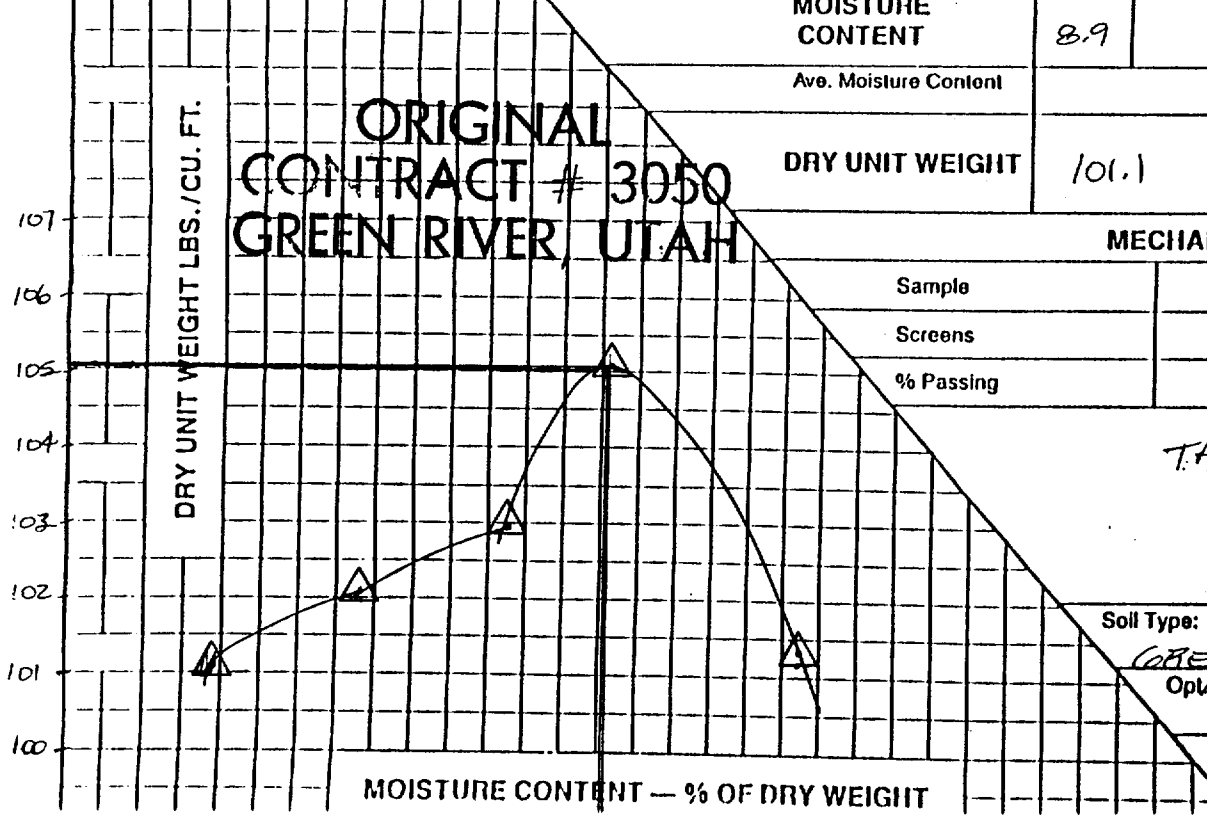
K-FERGUSON MAXIMUM DENSITY DETERMINATION

A MORRISON KNUDSEN COMPANY

A.S.T.M. D698 "A"

QA REVIEWED FOR QUALITY REQUIREMENTS BY SDM 4/21/89 QA ENTRY NO. 8559

Blows Per Layer 25	**COMPACTION SAMPLE NO.**	+250	+300	+350	+400	+450
No. Layers 3	Weight of Wet Soil & Mold	13.12	13.22	13.32	13.45	13.39
Tamper Wt. 5.5#	Weight of Mold	9.42	9.42	9.42	9.42	9.42
Drop Ht. 12"	Weight of Wet Soil	3.70	3.80	3.90	4.03	3.97
Mold Dia. 4"	Wet Unit Weight	110.1	113.1	116.1	119.9	118.2
Volume of Sample .0336 Ft³	**MOISTURE SAMPLE NO.**	OVEN	OVEN	OVEN	OVEN	OVEN
	Weight of Wet Soil & Tare	734.7	748.4	763.3	784.3	749.9
	Weight of Dry Soil & Tare	688.7	692.6	696.3	709.1	667.5
	Weight of Water	46.0	55.8	67.0	75.2	82.4
	Weight of Tare	174.7	174.7	174.7	174.7	174.7
	Weight of Dry Soil	514.0	517.9	521.6	534.4	492.8
	MOISTURE CONTENT	8.9	10.8	12.8	14.1	16.7
	Ave. Moisture Content					
	DRY UNIT WEIGHT	101.1	102.1	102.9	105.1	101.3



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	100							

TAILINGS
FROM INPLACE PILE

Scales used: GR-001 + GR-002

Soil Type: TAILINGS GREY - TAN		Test No.: CM-4-025
Opt. Moisture 14.1	Max. Dry Unit Weight 105.1	Date: 4/19/89
Tested By: Allan Mortz	Reviewed By: Allan Mortz	

-FERGUSON MAXIMUM DEN TY DETERMINATION

A. HARRISON KNUDSEN COMPANY

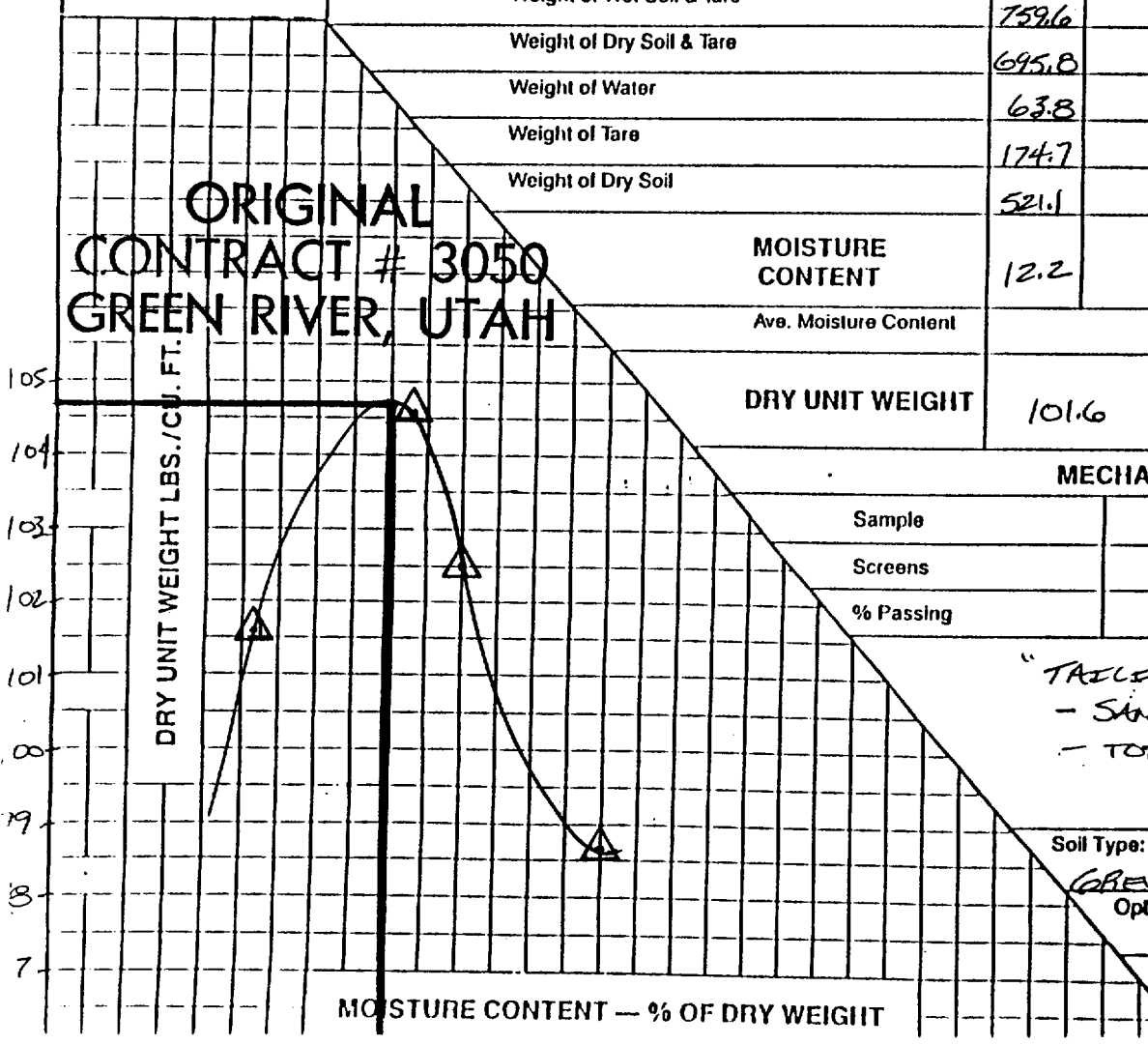
A.S.T.M. D698 METHOD "A"

QA REVIEWED FOR QUALITY REQUIREMENTS BY SOM 89
QA ENTRY NO. 960

Blows Per Layer	25
No. Layers	3
Tamper Wt.	5.5#
Drop Ht.	12"
Mold Dia.	4"
Volume of Sample	.0336 FT3

COMPACTION SAMPLE NO.	+240	+280	+320	+370		
Weight of Wet Soil & Mold	13.25	13.44	13.38	13.30		
Weight of Mold	9.42	9.42	9.42	9.42		
Weight of Wet Soil	3.83	4.02	3.96	3.88		
Wet Unit Weight	114.0	119.6	117.9	115.5		
MOISTURE SAMPLE NO.	OVEN	OVEN	OVEN	OVEN		
Weight of Wet Soil & Tare	759.6	758.8	762.0	777.9		
Weight of Dry Soil & Tare	695.8	685.8	681.0	690.1		
Weight of Water	63.8	73.0	76.0	87.8		
Weight of Tare	174.7	174.7	174.7	174.7		
Weight of Dry Soil	521.1	511.1	506.3	515.4		
MOISTURE CONTENT	12.2	14.3	15.0	17.0		
Ave. Moisture Content						
DRY UNIT WEIGHT	101.6	104.6	102.5	98.7		

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	100							

"TAILINGS"
- SAMPLED NEXT TO WINDBLOWN POLE
- TOP 5' OF TAILINGS

Scales used: GR-001 & GR-002

Soil Type: "TAILINGS" GREY/YELLOW	Test No.: CM-4-026	
Opt. Moisture 14.0	Max. Dry Unit Weight 104.8	Date: 4/20/89
Tested By: [signature]	Reviewed By: [signature]	

CONTRACT [illegible]
GREEN RIVER, UTAH

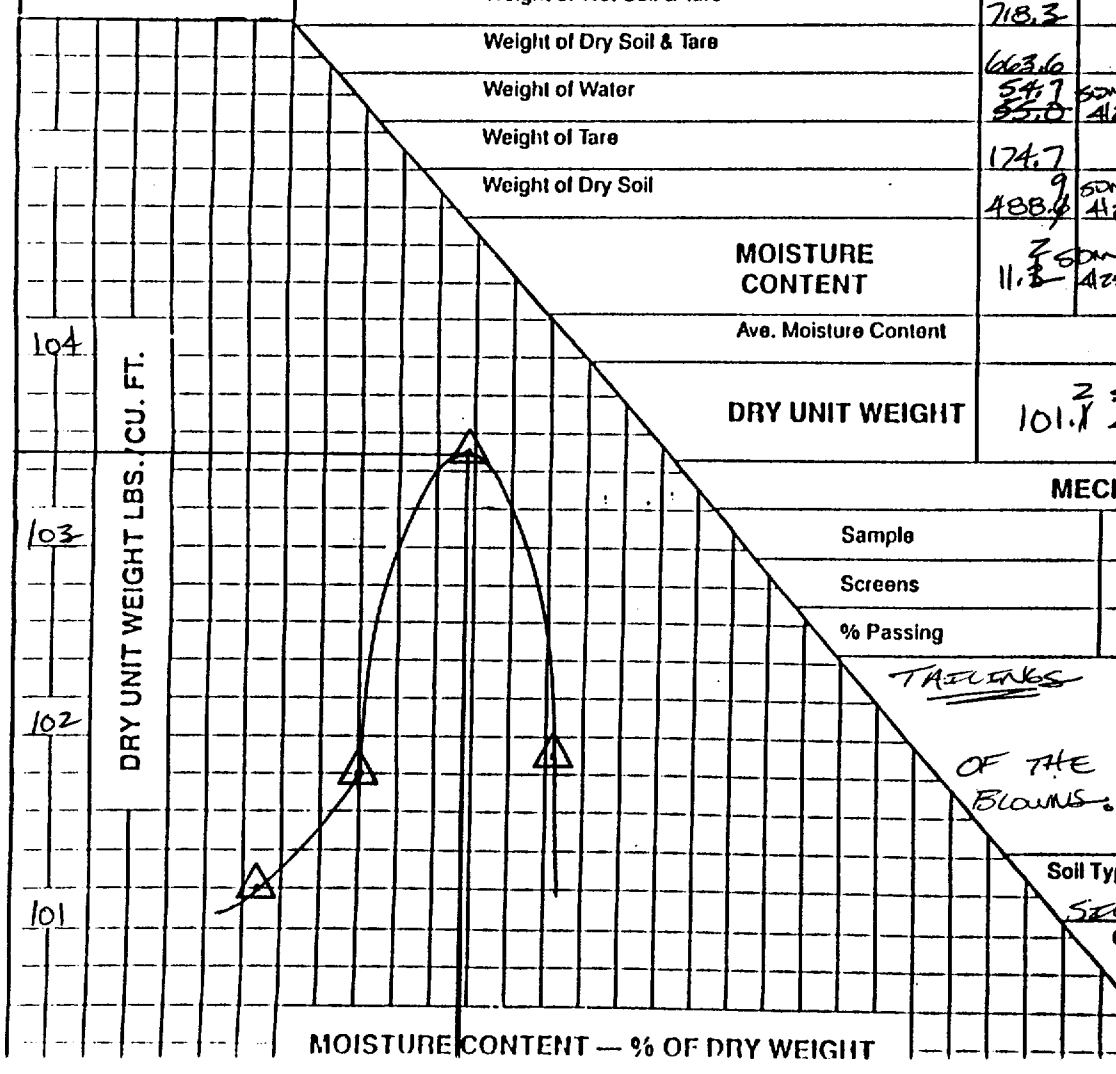
MAXIMUM DENSITY DETERMINATION

K-FERGUSON
A MORRISON KNUDSEN COMPANY

QA REVIEW FOR QUALITY REQUIREMENTS
BY SDM 4/25/89
QA ENTRY NO. 894

A.S.T.M. D-698 METHOD "A"

Blows Per Layer 25	COMPACTION SAMPLE NO.	+200	+250	+300	+350	
No. Layers 3	Weight of Wet Soil & Mold	13.20	13.27	13.38	13.36	
Tamper Wt. 5.5 lbs	Weight of Mold	9.42	9.42	9.42	9.42	
Drop Ht. 12"	Weight of Wet Soil	3.78	3.85	3.96	3.94	
Mold Dia. 4"	Wet Unit Weight	112.5	114.6	117.9	117.3	
Volume of Sample .0336 ft³	MOISTURE SAMPLE NO.	OVEN	OVEN	OVEN	OVEN	
	Weight of Wet Soil & Tare	718.3	751.6	756.3	745.8	
	Weight of Dry Soil & Tare	663.6	687.7	685.3	670.8	
	Weight of Water	54.7 ~~55.0~~ SDM 4/25/89	63.9	71.0	75.0	
	Weight of Tare	174.7	174.7	174.7	174.7	
	Weight of Dry Soil	488.9 ~~488.6~~ SDM 4/25/89	513.0	510.6	496.1	
	MOISTURE CONTENT	11.2 ~~11.3~~ SDM 4/25/89	12.5	13.9	15.1	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	101.1 ~~101.1~~ SDM 4/25/89	101.8	103.5	101.9	



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	100							

TAILINGS

ACQUIRED AT THE CENTRAL EAST SECTION OF THE TAILINGS PILE - EXPOSED NEXT TO WIND-BLOWNS.

Scales used: 6R-001 + 6R-002

Soil Type: GREY / LIGHT YELLOW SILTY SAND TAILINGS

Test No.: CM-4-027

Opt. Moisture: 13.9

Max. Dry Unit Weight: 103.5

Date: 4/24/89

Tested By: [signature]

Reviewed By: [signature]

K-FERGUSON MAXIMUM DENSITY DETERMINATION

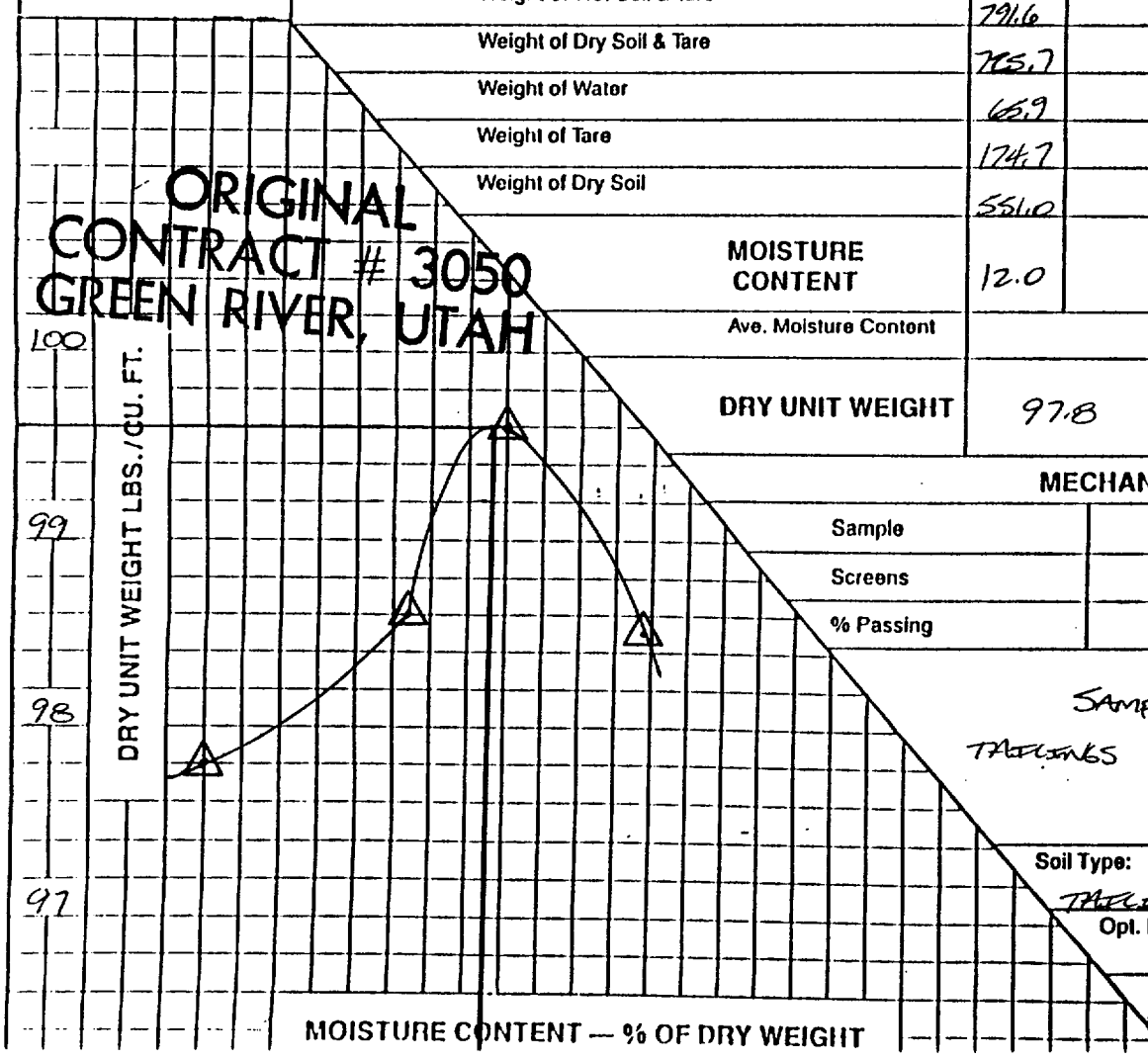
A MORRISON KNUDSEN COMPANY

A.S.T.M. D698 METHOD "A"

QA REVIEWED FOR QUALITY REQUIREMENTS BY SDM 6/89
QA ENTRY NO. 904

Blows Per Layer 25	COMPACTION SAMPLE NO.	+180	+225	+270	+315	
No. Layers 3	Weight of Wet Soil & Mold	13.10	13.22	13.30	13.32	
Tamper Wt. 5.5 lbs	Weight of Mold	9.42	9.42	9.42	9.42	
Drop Ht. 12"	Weight of Wet Soil	3.68	3.80	3.88	3.90	
Mold Dia. 4"	Wet Unit Weight	109.5	113.1	115.5	116.1	
Volume of Sample .0336 ft³	MOISTURE SAMPLE NO.	oven	oven	oven	oven	
	Weight of Wet Soil & Tare	791.6	755.9	764.2	787.3	
	Weight of Dry Soil & Tare	765.7	681.4	682.7	694.2	
	Weight of Water	66.9	74.5	81.5	93.1	
	Weight of Tare	174.7	174.7	174.7	174.7	
	Weight of Dry Soil	551.0	506.7	508.0	519.5	
	MOISTURE CONTENT	12.0	14.7	16.0	17.9	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	97.8	98.6	99.6	98.5	

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	99.6							

SAMPLED FROM THE 3RD 10" LOOSE LIFT ON TAILINGS TEST STRIP.

Scales used: GR-001 + GR-002

Soil Type: GREY-YELLOW TAILINGS		Test No.: CM-4-028
Opt. Moisture 15.8	Max. Dry Unit Weight 99.6	Date: 4/25/89
Tested By: [illegible]	Reviewed By: Steve Dike	

K-FERGUSON MAXIMUM DENSITY DETERMINATION

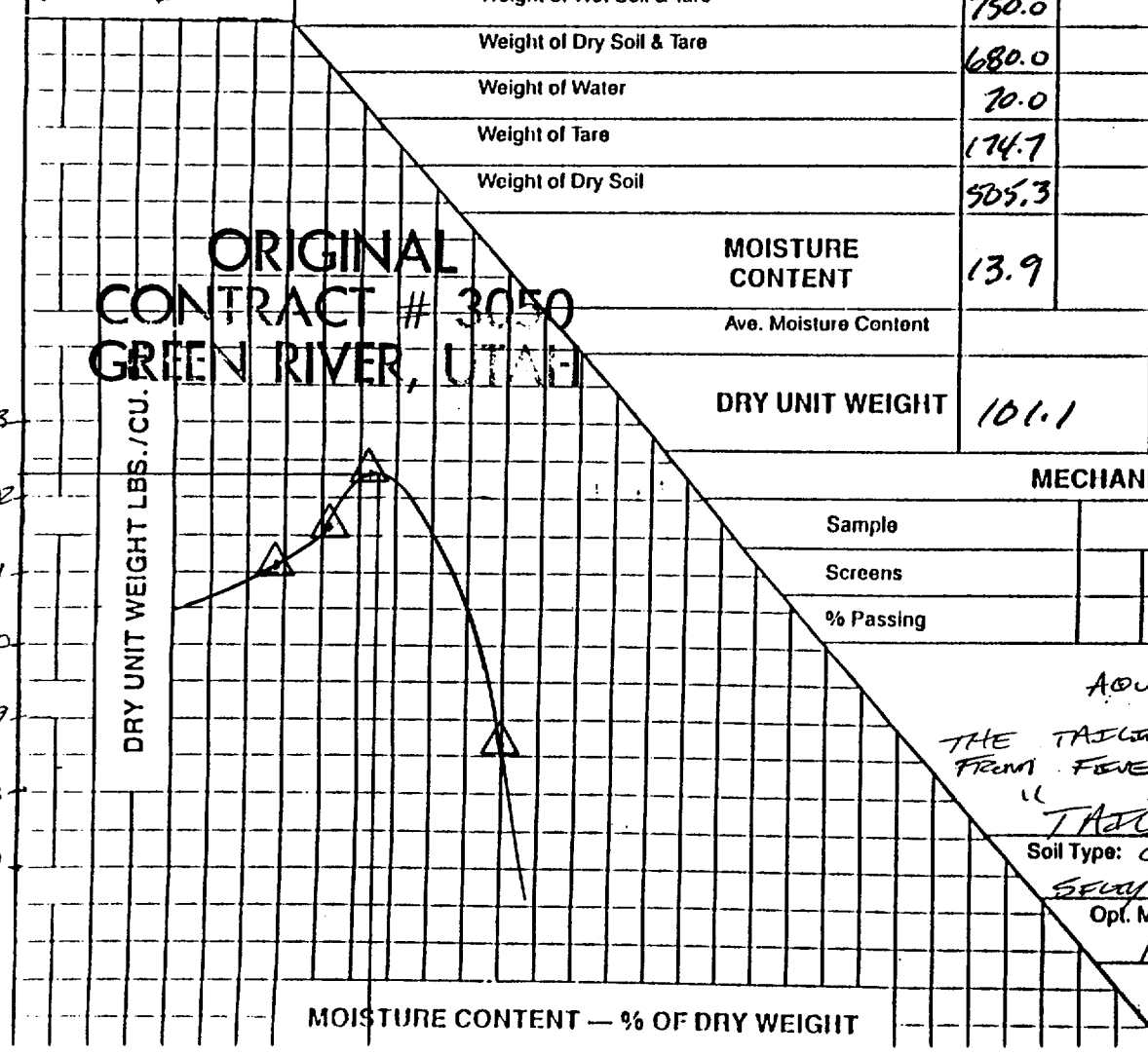
A MORRISON KNUDSEN COMPANY

A.S.T.M. D698 METHOD "A"

QA REVIEWER FOR QUALITY REQUIREMENTS BY SD 4/26/89
QA ENTRY NO. 915

Blows Per Layer 25	COMPACTION SAMPLE NO.		#200		#250		#300		#350			
No. Layers 3	Weight of Wet Soil & Mold		13.29		13.33		13.38		13.30			
Tamper Wt. 5.5#	Weight of Mold		9.42		9.42		9.42		9.42			
Drop Ht. 10"	Weight of Wet Soil		3.87		3.91		3.96		3.88			
Mold Dia. 4"	Wet Unit Weight		115.2		116.4		117.9		115.5			
Volume of Sample .0336	MOISTURE SAMPLE NO.		MICRO		MICRO		MICRO		MICRO			
	Weight of Wet Soil & Tare		750.0		748.7		756.7		765.8			
	Weight of Dry Soil & Tare		680.0		675.7		680.1		680.1			
	Weight of Water		70.0		73.0		76.7		85.7			
	Weight of Tare		174.7		174.7		174.7		174.7			
	Weight of Dry Soil		505.3		501.0		505.3		505.4			
	MOISTURE CONTENT		13.9		14.6		15.2		17.0			
	Ave. Moisture Content											
	DRY UNIT WEIGHT		101.1		101.6		102.3		98.7			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	100							

ADJUSTED FROM THE 4TH 10" LOOSE LIFT OF THE TAILINGS TEST STRIP. COMBINATION OF MATL FROM FIVE SAND CONES TAKEN "TAILINGS". Scales used: 6R001 + 6R002

Soil Type: GREY YELLOW SILTY SAND TAILINGS

Test No.: CM-4-028 SDM 4/27/89

Opt. Moisture: 15.2

Max. Dry Unit Weight: 102.3

Date: 4/26/89

Tested By: Steven Martz

Reviewed By: Steve Dike

Project:

FERGUSON MAXIMUM DENSITY DETERMINATION

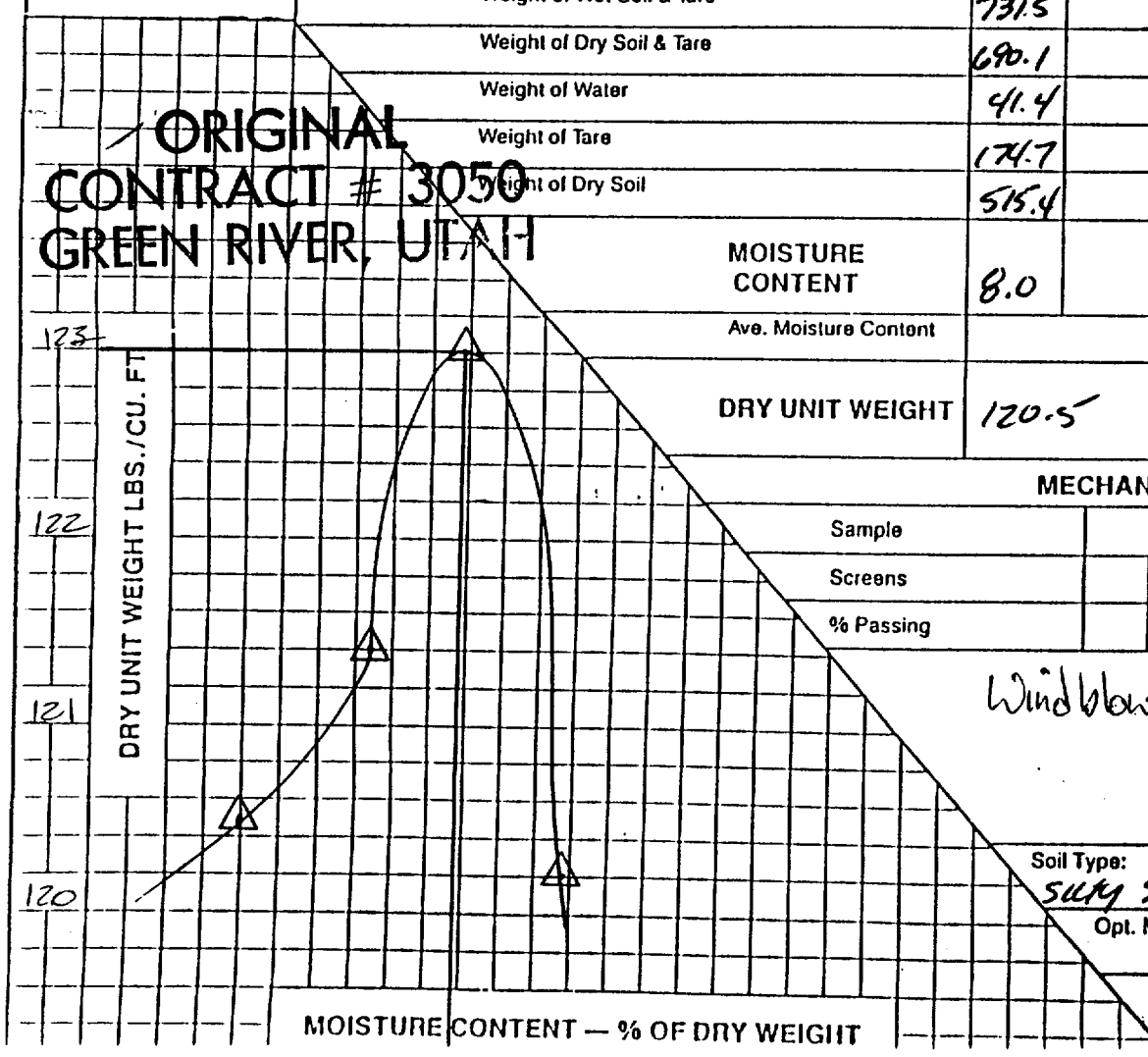
A MORRISON KNUDSEN COMPANY

ASTM D-698-e

QA REVIEWED FOR QUALITY REQ BY SDM 7/89 QA ENTRY NO. 931

Blows Per Layer 56	COMPACTION SAMPLE NO.	+90		+180		+270		+360			
No. Layers 3	Weight of Wet Soil & Mold	24.60		24.83		25.07		24.97			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 10"	Weight of Wet Soil	9.72		9.95		10.19		10.09			
Mold Dia. 6"	Wet Unit Weight	130.1		133.2		136.4		135.1			
Volume of Sample .0747	MOISTURE SAMPLE NO.	MEGSO		MEGSO		MEGSO		MEGSO			
	Weight of Wet Soil & Tare	731.5		737.3		769.4		771.6			
	Weight of Dry Soil & Tare	690.1		687.4		711.0		705.6			
	Weight of Water	41.4		49.9		58.4		66.0			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	515.4		512.7		536.3		530.9			
	MOISTURE CONTENT	8.0		9.7		10.9		12.4			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	120.5		121.4		123.0		120.2			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					95.0	85.0							

Windblown contaminates

Scales used: GR-001 + GR-002

Soil Type: SILTY SAND / w GRAVEL	Test No.: CM-4-030	
Opt. Moisture 10.9	Max. Dry Unit Weight 123.0	Date: 4-27-89
Tested By: [illegible]	Reviewed By: Steve Dike	

K-FERGUSON MAXIMUM DENSITY DETERMINATION

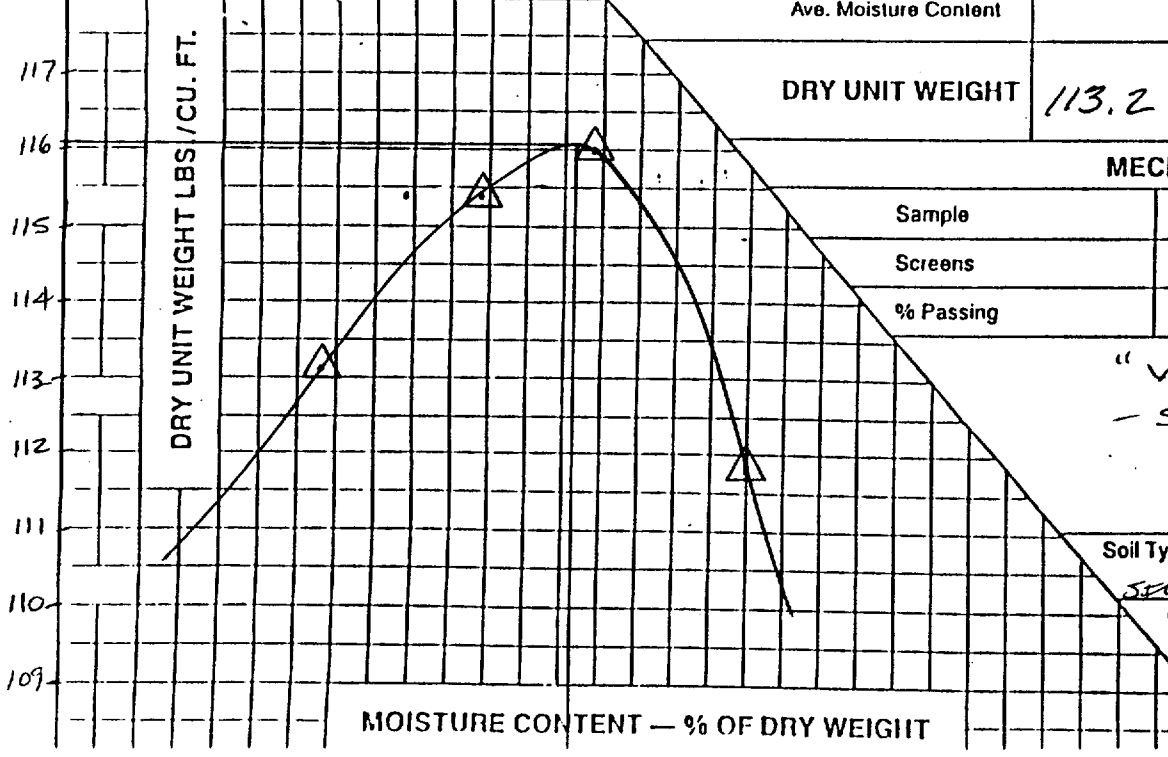
MORRISON KNUDSEN COMPANY

ASTM D-698 - A

QA REVIEW FOR QUALITY REQUIREMENTS BY SDA 4/28/89
QA ENTRY NO. 932

Blows Per Layer 25	COMPACTION SAMPLE NO.	+100	+140	+180	+220	
No. Layers 3	Weight of Wet Soil & Mold	13.56	13.72	13.80	13.72	
Tamper Wt. 5.5 lbs	Weight of Mold	9.42	9.42	9.42	9.42	
Drop Ht. 12"	Weight of Wet Soil	4.14	4.30	4.38	4.30	
Mold Dia. 4"	Wet Unit Weight	123.2	128.0	130.4	128.0	
Volume of Sample .0336 FT3	MOISTURE SAMPLE NO.	OVEN	OVEN	OVEN	OVEN	
	Weight of Wet Soil & Tare	720.6	730.6	743.8	752.2	
	Weight of Dry Soil & Tare	676.6	675.9	681.0	679.1	
	Weight of Water	44.0	54.7	62.8	73.1	
	Weight of Tare	174.7	174.7	174.7	174.7	
	Weight of Dry Soil	501.9	501.2	506.1	504.4	
	MOISTURE CONTENT	8.8	10.9	12.4	14.5	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	113.2	115.4	116.0	111.8	

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS											ATT. LIMITS	
Sample	Gravel					Sand					Fines	LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing													

"WINDBLOWN CONTAMINATES"
- SAMPLED ON 4/27/89

Scales used: GR-001 + GR-002

Soil Type: BROWN - TAN SILTY SAND (WINDBLOWNS)	Test No.: CM-4-031	
Opt. Moisture 12.2	Max. Dry Unit Weight 116.1	Date: 4/27/89
Tested By: [illegible]	Reviewed By: Steve Dike	

K-FERGUSON MAXIMUM DENSITY DETERMINATION

MORRISON KNUDSEN COMPANY

ASTM D-698 (A)

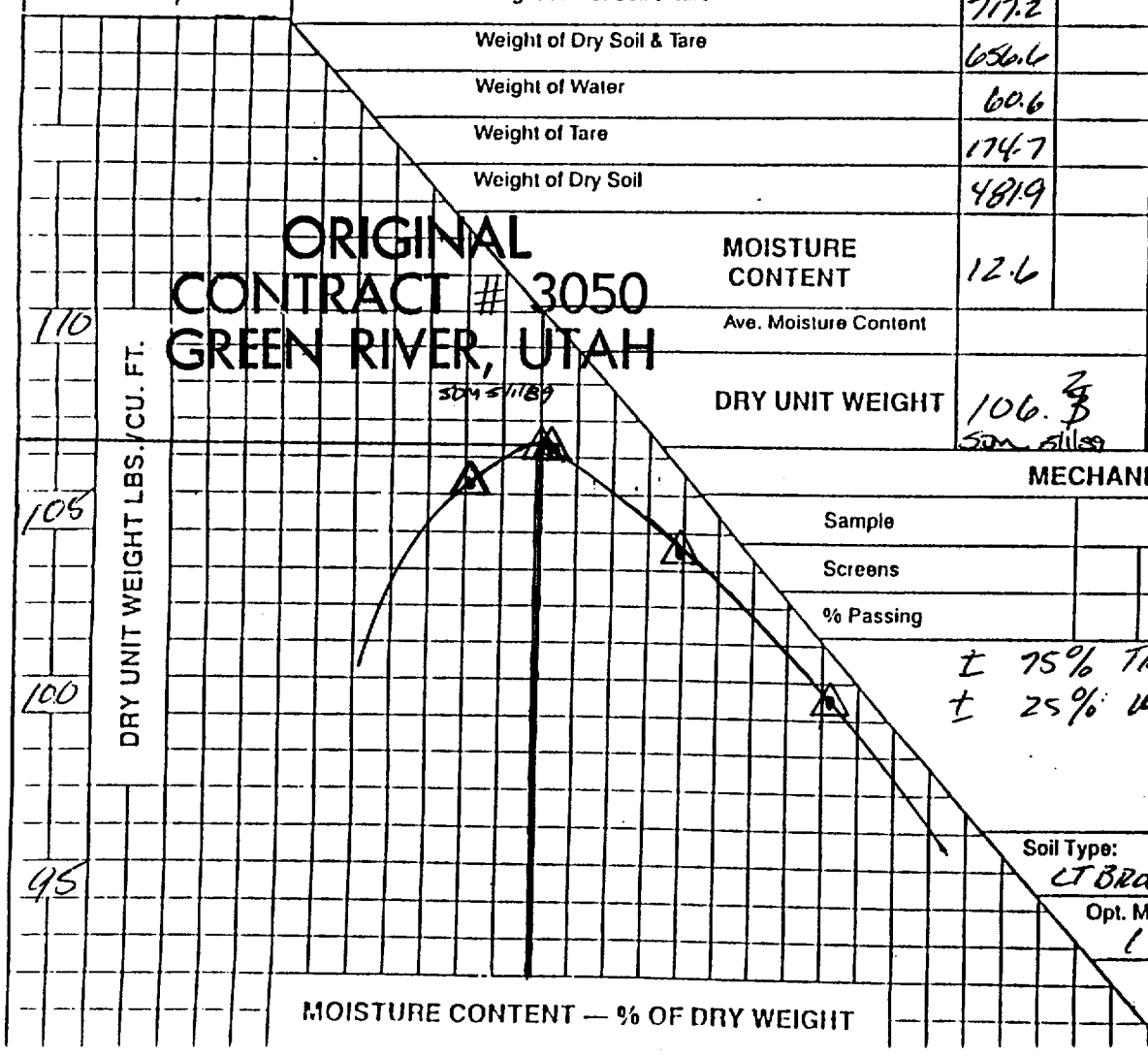
QA REVIEWED FOR QUALITY REQUIREMENTS BY: 5/1/89 QA ENTRY NO. 943

Blows Per Layer	25
No. Layers	3
Tamper Wt.	5.5#
Drop Ht.	12"
Mold Dia.	4"
Volume of Sample	.0336

COMPACTION SAMPLE NO.	170 ML	210 ML	250 ML	290 ML		
Weight of Wet Soil & Mold	13.44	13.52	13.47	13.40		
Weight of Mold	9.42	9.42	9.42	9.42		
Weight of Wet Soil	4.02	4.10	4.05	3.98		
Wet Unit Weight	119.6	122.0	120.5	118.5		

MOISTURE SAMPLE NO.	MICRO		MICRO		MICRO		MICRO			
Weight of Wet Soil & Tare	717.2		754.4		792.5		770.8			
Weight of Dry Soil & Tare	656.6		684.7		710.1		681.7			
Weight of Water	60.6		69.7		~~75.4~~ 83.4		89.1			
Weight of Tare	174.7		174.7		174.7		174.7			
Weight of Dry Soil	481.9		510.0		535.4		507.0			
MOISTURE CONTENT	12.6		13.7		15.4		17.6			
Ave. Moisture Content										
DRY UNIT WEIGHT	106.3 SDM 5/1/89		107.3		104.8 SDM 5/1/89		100.8			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH
SDM 5/1/89



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

± 75% Tailings
± 25% wind blown
SAMPLED ON 5-1-89

Scales used: GR-001 + GR-002

Soil Type: LT BROWN SAND / SL SILTY	Test No.: CM-4-032	
Opt. Moisture 13.5	Max. Dry Unit Weight 107.3	Date: 5-1-89
Tested By: Steve Dike	Reviewed By: Steven West	
Project:		

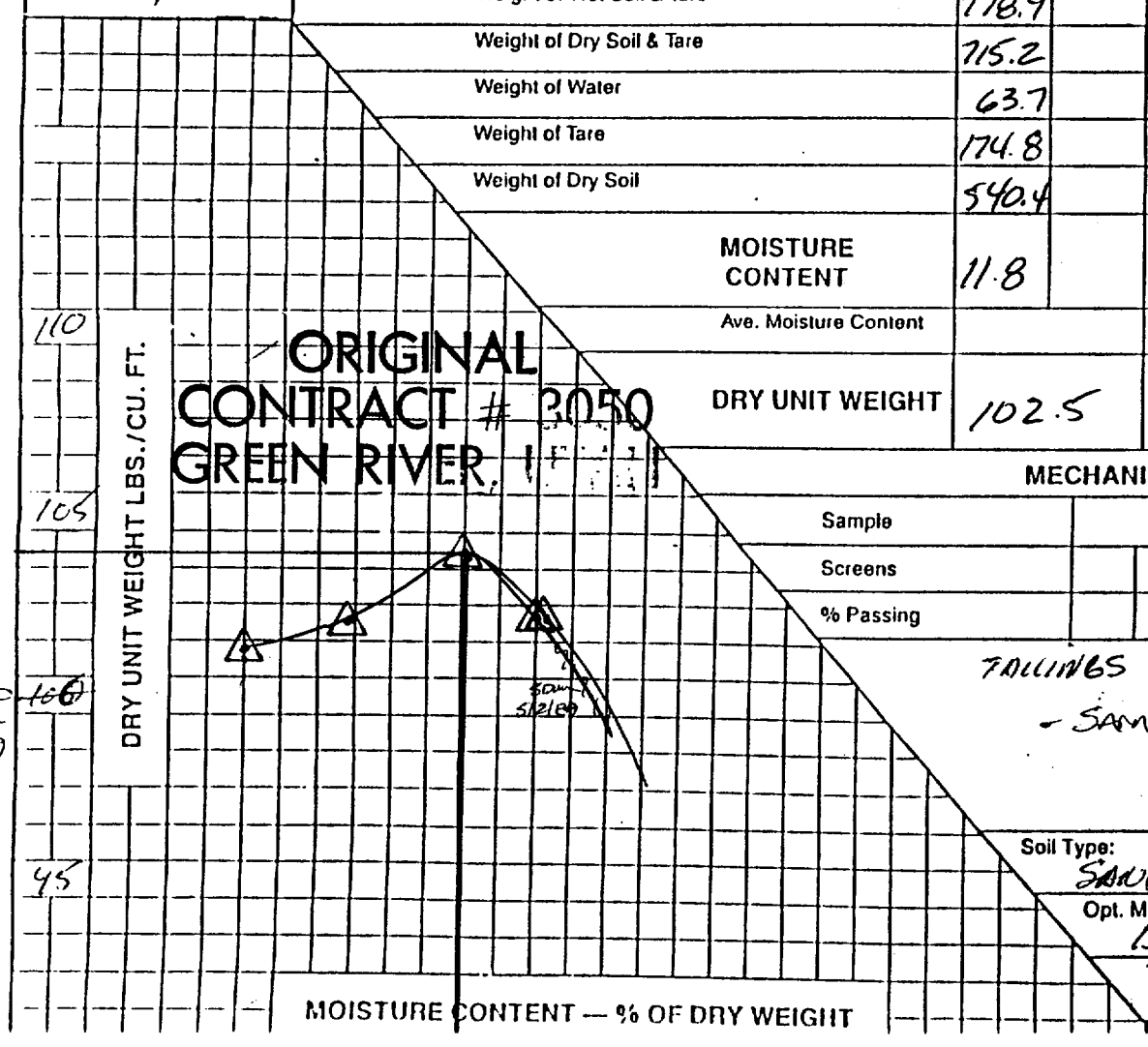
K-FERGUSON MAXIMUM DENSITY DETERMINATION

A MORRISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEWED FOR QUALITY REQUIREMENTS BY 5/2/89 QA ENTRY NO. 950

Blows Per Layer 25	COMPACTION SAMPLE NO.	200 ML		230 ML		260 ML		170 ML					
No. Layers 3	Weight of Wet Soil & Mold	13.27		13.40		13.37		13.20					
Tamper Wt. 5.5#	Weight of Mold	9.42		9.42		9.42		9.42					
Drop Ht. 12"	Weight of Wet Soil	3.85		3.98		3.95		3.78					
Mold Dia. 4"	Wet Unit Weight	114.6		118.5		117.6		112.5					
Volume of Sample .0336	MOISTURE SAMPLE NO.	MICRO		MICRO		MICRO		MICRO					
	Weight of Wet Soil & Tare	778.9		730.5		727.7		764.7					
	Weight of Dry Soil & Tare	715.2		664.5		656.7		708.7					
	Weight of Water	63.7		66.0		71.0		56.0					
	Weight of Tare	174.8		174.8		174.8		174.8					
	Weight of Dry Soil	540.4		489.7		481.9		533.9					
	MOISTURE CONTENT	11.8		13.5		14.7		10.5					
	Ave. Moisture Content												
	DRY UNIT WEIGHT	102.5		104.4		102.5		101.8					



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens					3/4	#4	#10	#16	#40	#100	#200		
% Passing					100	99							

TAILINGS

- SAMPLED FROM IN THE TAILINGS CELL.

SCALES USED: GR-001 + GR-002

Soil Type: SAND sl. silty c+f	Test No.: CM-4-033	
Opt. Moisture 13.5	Max. Dry Unit Weight 104.4	Date: 5-2-89
Tested By: Steve Dibl	Reviewed By: Alvin Nauk	

K-FERGUSON MAXIMUM DENSITY DETERMINATION

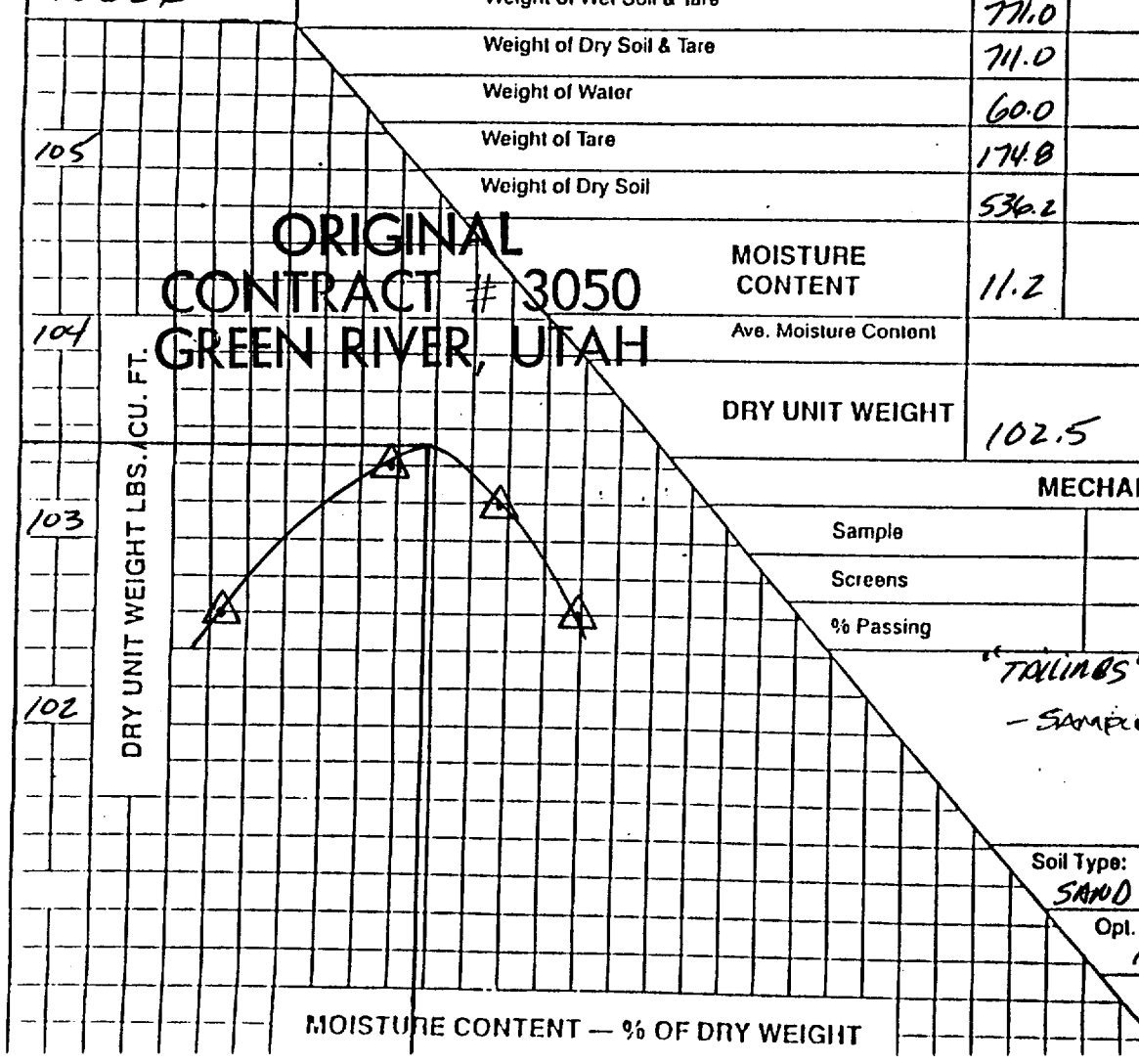
MORRISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEW FOR QUALITY REMINDS BY SL 5/2/89 QA ENTRY NO. 951

Blows Per Layer 25	COMPACTION SAMPLE NO.	180 ML	200 ML	230 ML	260 ML	
No. Layers 3	Weight of Wet Soil & Mold	13.25	13.36	13.40	13.41	
Tamper Wt. 5.8#	Weight of Mold	9.42	9.42	9.42	9.42	
Drop Ht. 12"	Weight of Wet Soil	3.83	3.94	3.98	3.99	
Mold Dia. 4"	Wet Unit Weight	114.0	117.3	118.5	118.8	
Volume of Sample .0336	MOISTURE SAMPLE NO.	MICRO	MICRO	MICRO	MICRO	
	Weight of Wet Soil & Tare	771.0	760.3	778.4	749.6	
	Weight of Dry Soil & Tare	711.0	691.3	700.8	670.8	
	Weight of Water	60.0	69.0	77.6	78.8	
	Weight of Tare	174.8	174.8	174.8	174.8	
	Weight of Dry Soil	536.2	516.5	526.0	496.0	
	MOISTURE CONTENT	11.2	13.4	14.8	15.9	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	102.5	103.4	103.2	102.5	

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel				Sand					Fines	ATT. LIMITS LL	PL
Screens				3/4	#4	#10	#16	#40	#100	#200		
% Passing				100	100							

"TAILINGS"

- SAMPLED FROM IN THE TAILINGS CELL.

SCALES USED BR-002 & BR-001

Soil Type: SAND SC. SILTY LT BR.	Test No.: CM-4-034	
Opt. Moisture 13.8	Max. Dry Unit Weight 103.5	Date: 5-2-89
Tested By: Steve Dike	Reviewed By: Steven Nash	

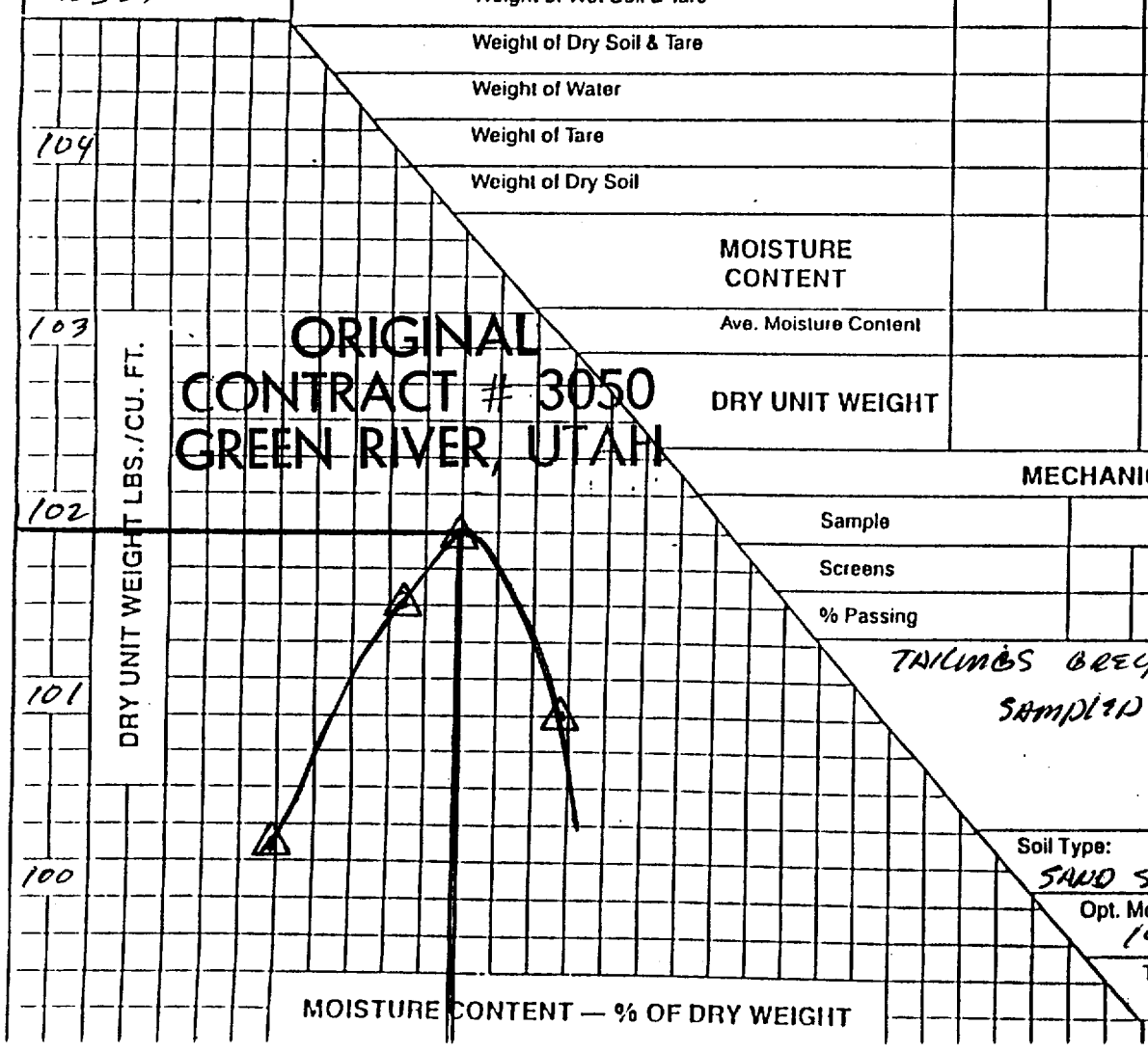
K-FERGUSON MAXIMUM DENSITY DETERMINATION

MORRISON KNUDSEN COMPANY

NSTM - D-698 (A)

QUALITY REQUIREMENTS
BY 5/3/89
QA EXHIBIT NO. 958

Blows Per Layer 25	COMPACTION SAMPLE NO.			240 ML		270 ML		300 ML		330 ML	
No. Layers 3	Weight of Wet Soil & Mold			13.19		13.30		13.34		13.35	
Tamper Wt. 5.5#	Weight of Mold			9.42		9.42		9.42		9.42	
Drop Ht. 12"	Weight of Wet Soil			3.77		3.88		3.92		3.93	
Mold Dia. 4"	Wet Unit Weight			112.2		115.5		116.7		117.0	
Volume of Sample .0336	MOISTURE SAMPLE NO.			MIENO		MIENO		MIENO		MIENO	
	Weight of Wet Soil & Tare			767.3		734.3		760.0		757.3	
	Weight of Dry Soil & Tare			704.1		666.7		686.4		677.9	
	Weight of Water			63.2		67.3		73.6		79.4	
	Weight of Tare			174.7		174.7		174.7		174.7	
	Weight of Dry Soil			529.4		492.3		511.7		503.2	
	MOISTURE CONTENT			11.9		13.7		14.4		15.8	
	Ave. Moisture Content										
	DRY UNIT WEIGHT			100.3		101.6		102.0		101.0	



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

TAILINGS GREY
SAMPLED FROM CELL ON 5-3-89

Scales used: GR-001 + GR-002

Soil Type: SAND SL. SILTY GREY	Test No.: CM-4-03	
Opt. Moisture 14.5	Max. Dry Unit Weight 102.0	Date: 5-3-89
Tested By: Steve Dike	Reviewed By:	
Project:		

K-FERGUSON MAXIMUM DENSITY DETERMINATION

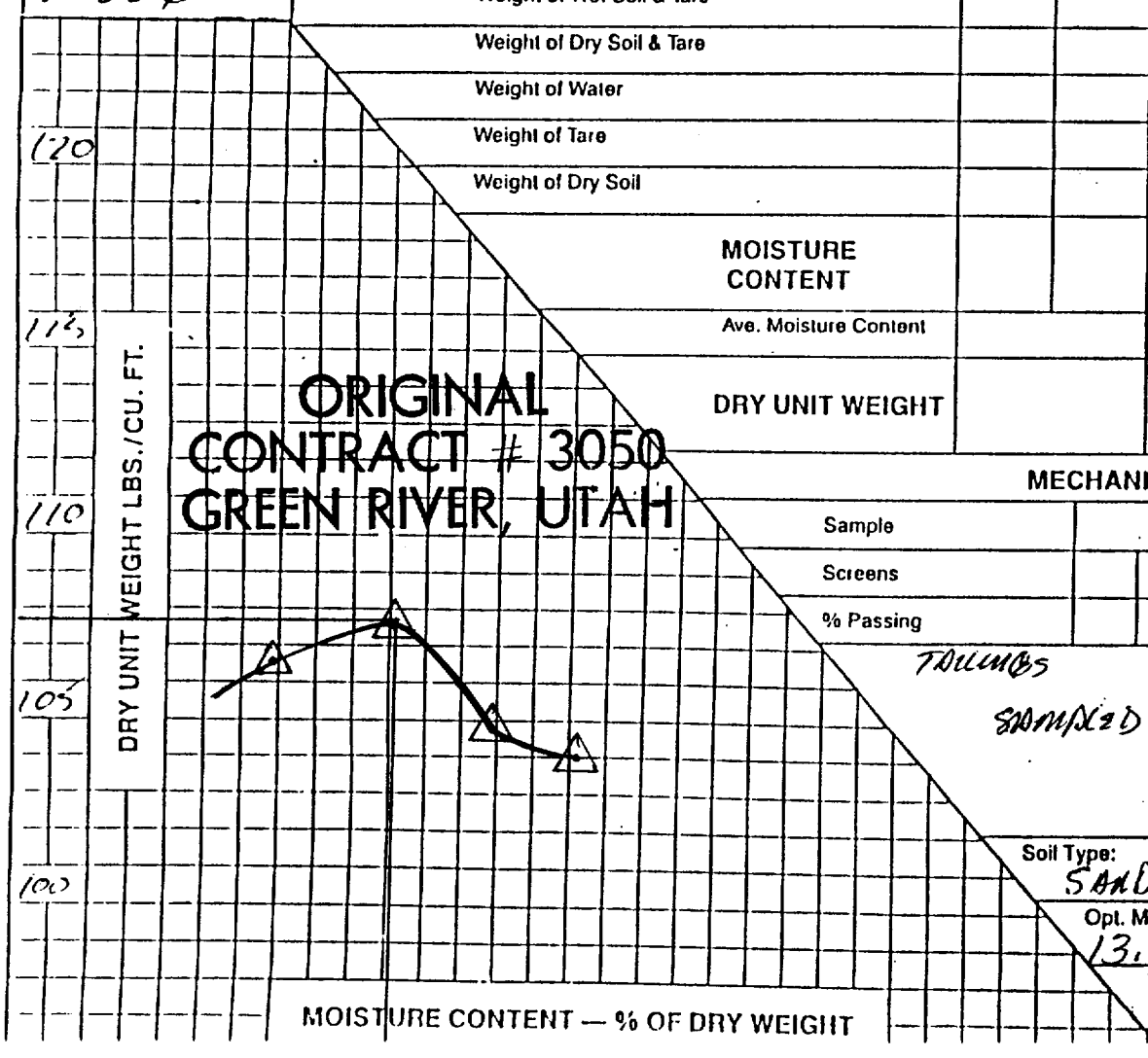
MORRISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEWED FOR QUALITY REQUIREMENTS SDM 5/3/89

QA ENTRY NO. 959

Blows Per Layer 25	COMPACTION SAMPLE NO.			220 ML		190 ML		250 ML		280 ML		
No. Layers 3	Weight of Wet Soil & Mold			13.51		13.41		13.45		13.46		
Tamper Wt. 5.5#	Weight of Mold			9.42		9.42		9.42		9.42		
Drop Ht. 12"	Weight of Wet Soil			4.09		3.99		4.03		4.04		
Mold Dia. 4"	Wet Unit Weight			121.7		118.8		119.9		120.2		
Volume of Sample .0336	MOISTURE SAMPLE NO.			MICRO		MICRO		MICRO	OVEN	MICRO		
	Weight of Wet Soil & Tare			760.8		726.4		757.4	754.8	765.2		
	Weight of Dry Soil & Tare			692.9		670.0		684.1	680.3	685.5		
	Weight of Water			67.9		56.4		73.3	74.5	79.7	SD 5-3-89	
	Weight of Tare			174.7		174.7		174.7	174.7	174.7		
	Weight of Dry Soil			518.2		495.3		509.4	505.6	510.8		
	MOISTURE CONTENT			13.1		11.4		14.4	14.7	15.6		
	Ave. Moisture Content											
	DRY UNIT WEIGHT			107.6		106.6		104.8		104.0		



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

TAILINGS

SAMPLED ON 5-3-89 FROM GREEN RIVER CELL

Scales used: GR-001 + GR-002

Soil Type: SAND SILTY TAN

Test No.: CM-4-038 SDM 5/4/89

Opt. Moisture: 13.1

Max. Dry Unit Weight: ~~106.6~~ 107.6 SD 5-3-89

Date: 5-3-89

Tested By: Steve Dike

Reviewed By: Allen Mintz

K-FERGUSON MAXIMUM DENSITY DETERMINATION

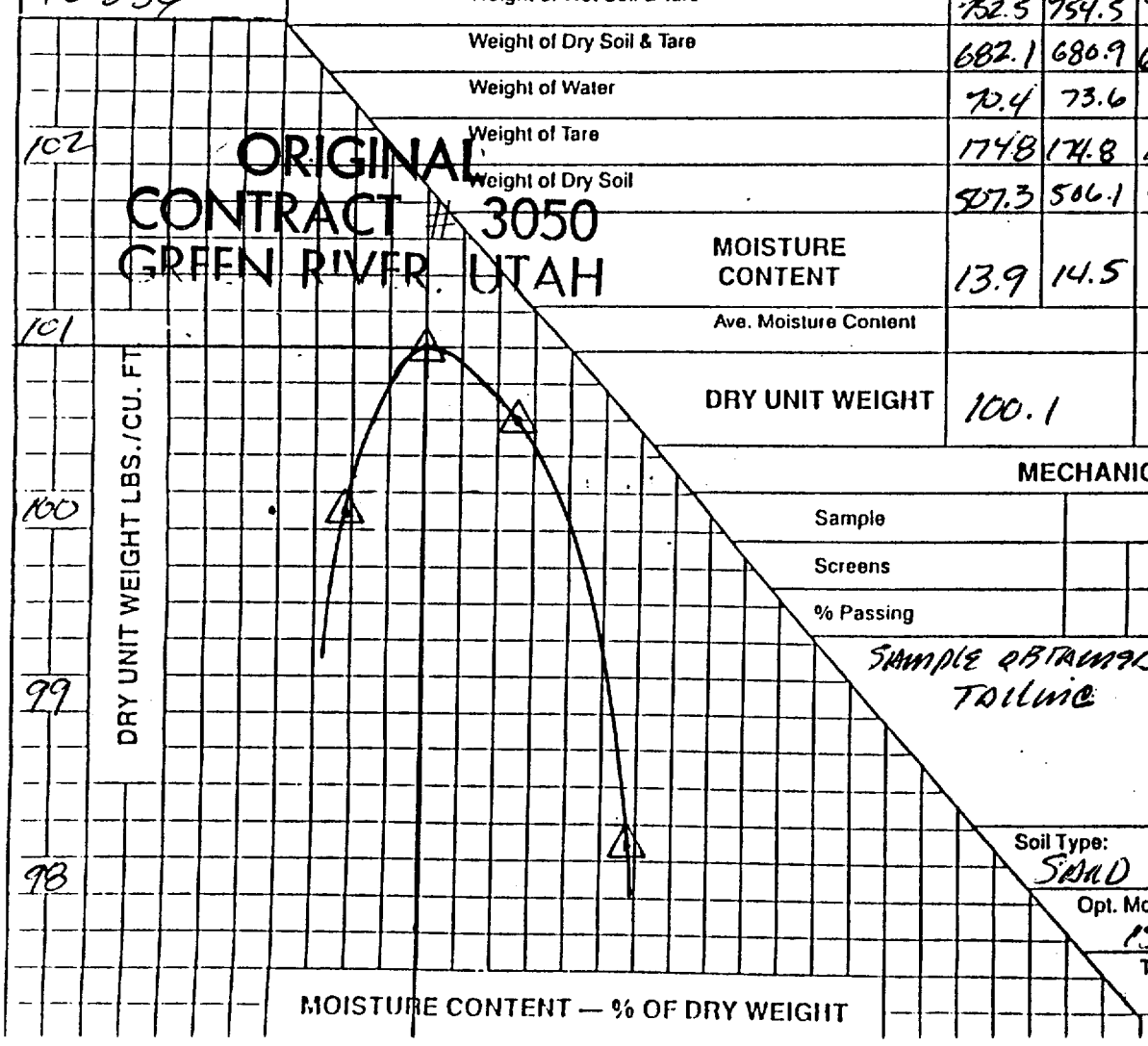
HARRISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEW FOR QUALITY REQUIREMENTS BY SDA 5/5/89 QA ENTRY NO. 921

Blows Per Layer 25	COMPACTION SAMPLE NO.	240 ML		270 ML		300 ML		330 ML			
No. Layers 3	Weight of Wet Soil & Mold	13.25		13.32		13.35		13.31			
Tamper Wt. 5.5#	Weight of Mold	9.42		9.42		9.42		9.42			
Drop Ht. 12"	Weight of Wet Soil	3.83		3.90		3.93		3.89			
Mold Dia. 4"	Wet Unit Weight	114.0		116.1		117.0		115.8			
Volume of Sample .0336	MOISTURE SAMPLE NO.	MICRO	OVEN	MICRO		MICRO		MICRO			
	Weight of Wet Soil & Tare	752.5	754.5	736.8		757.9		765.6			
	Weight of Dry Soil & Tare	682.1	680.9	663.4		676.1		676.3			
	Weight of Water	70.4	73.6	73.4		81.8		89.3			
	Weight of Tare	174.8	174.8	174.8		174.8		174.8			
	Weight of Dry Soil	507.3	506.1	488.6		501.8	SDS 5-4-89 3	501.5			
	MOISTURE CONTENT	13.9	14.5	15.0		16.3		17.8			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	100.1		101.0		100.6		98.3			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

SAMPLE OBTAINED FROM CSCE ON 5-4-89
TAILING

Scales used: GR-001 + GR-002

Soil Type: SAND V. FINE LT GREY		Test No.: CM-4-037
Opt. Moisture 15.0	Max. Dry Unit Weight 101.0	Date: 5-4-89
Tested By: Steve Dove		Reviewed By: [illegible]
Project: [illegible]		

K-FERGUSON MAXIMUM DENSITY DETERMINATION

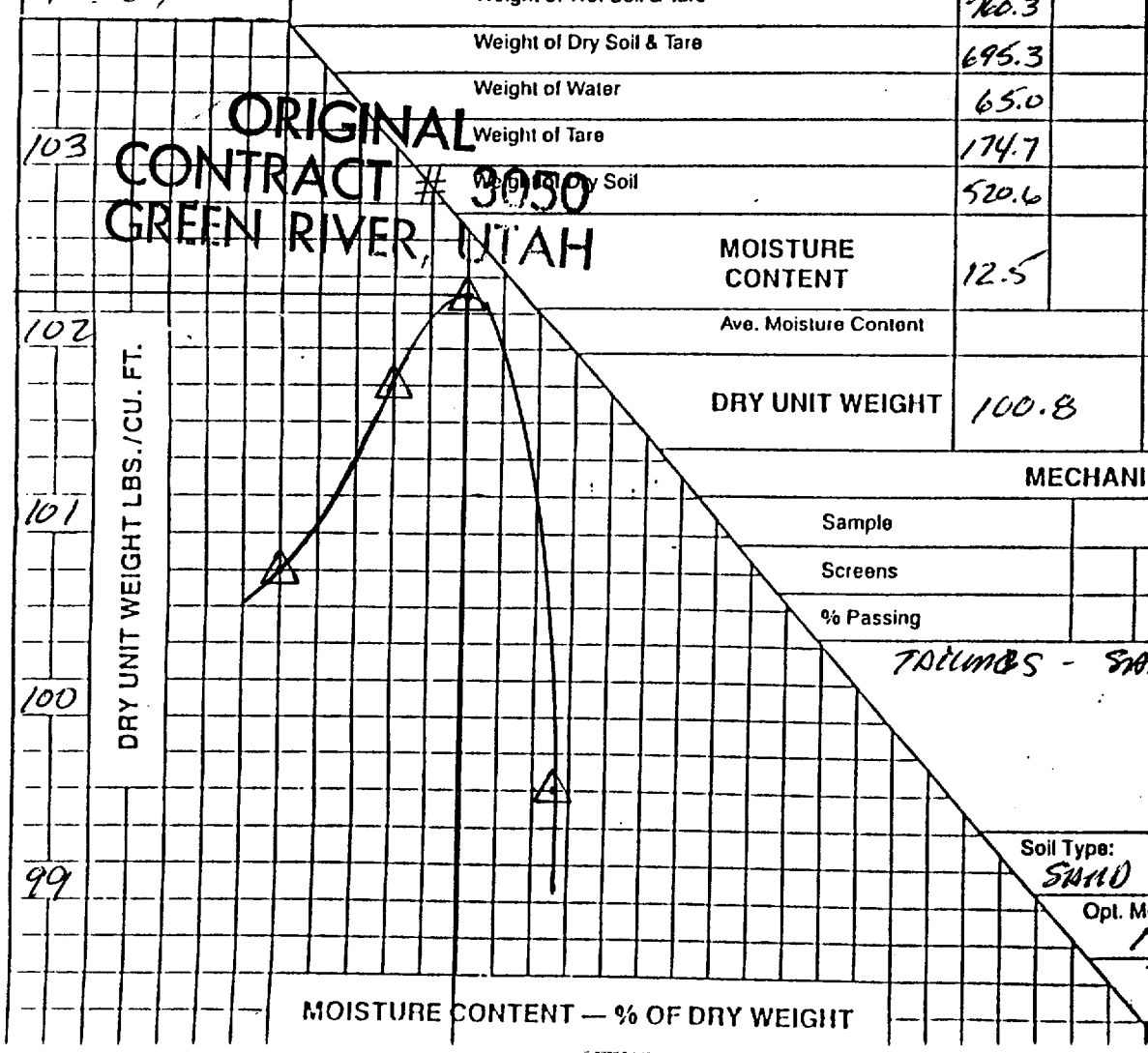
HARRISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEWED FOR QUALITY REQUIREMENTS BY [illegible] 5/4/89 QA ENTRY NO. 968

Blows Per Layer 25	COMPACTION SAMPLE NO.	200 mL	230 mL	260 mL	290 mL	
No. Layers 3	Weight of Wet Soil & Mold	13.23	13.32	13.37	13.31	
Tamper Wt. 5.5#	Weight of Mold	9.42	9.42	9.42	9.42	
Drop Ht. 12"	Weight of Wet Soil	3.81	3.90	3.95	3.89	
Mold Dia. 4"	Wet Unit Weight	113.4	116.1	117.6	115.8	
Volume of Sample .0336	MOISTURE SAMPLE NO.	mieno	mieno	mieno	mieno	
	Weight of Wet Soil & Tare	760.3	764.8	784.4	758.8	
	Weight of Dry Soil & Tare	695.3	692.2	705.0	676.9	
	Weight of Water	65.0	72.6	79.4	81.9	
	Weight of Tare	174.7	174.7	174.7	174.7	
	Weight of Dry Soil	520.6	517.5	530.3	502.2	
	MOISTURE CONTENT	12.5	14.0	15.0	16.3	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	100.8	101.8	102.3	99.6	

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

TAILINGS - SAMPLE FROM CELL ON 5-4-89 P.M

SCREENS USED GR-001 + GR-002

Soil Type: SAND Silty Brown		Test No.: CM-4-038
Opt. Moisture 15.0	Max. Dry Unit Weight 102.3	Date: 5-4-89
Tested By: Steve Dike		Reviewed By: [illegible]
Project:		

K-FERGUSON MAXIMUM DENSITY DETERMINATION

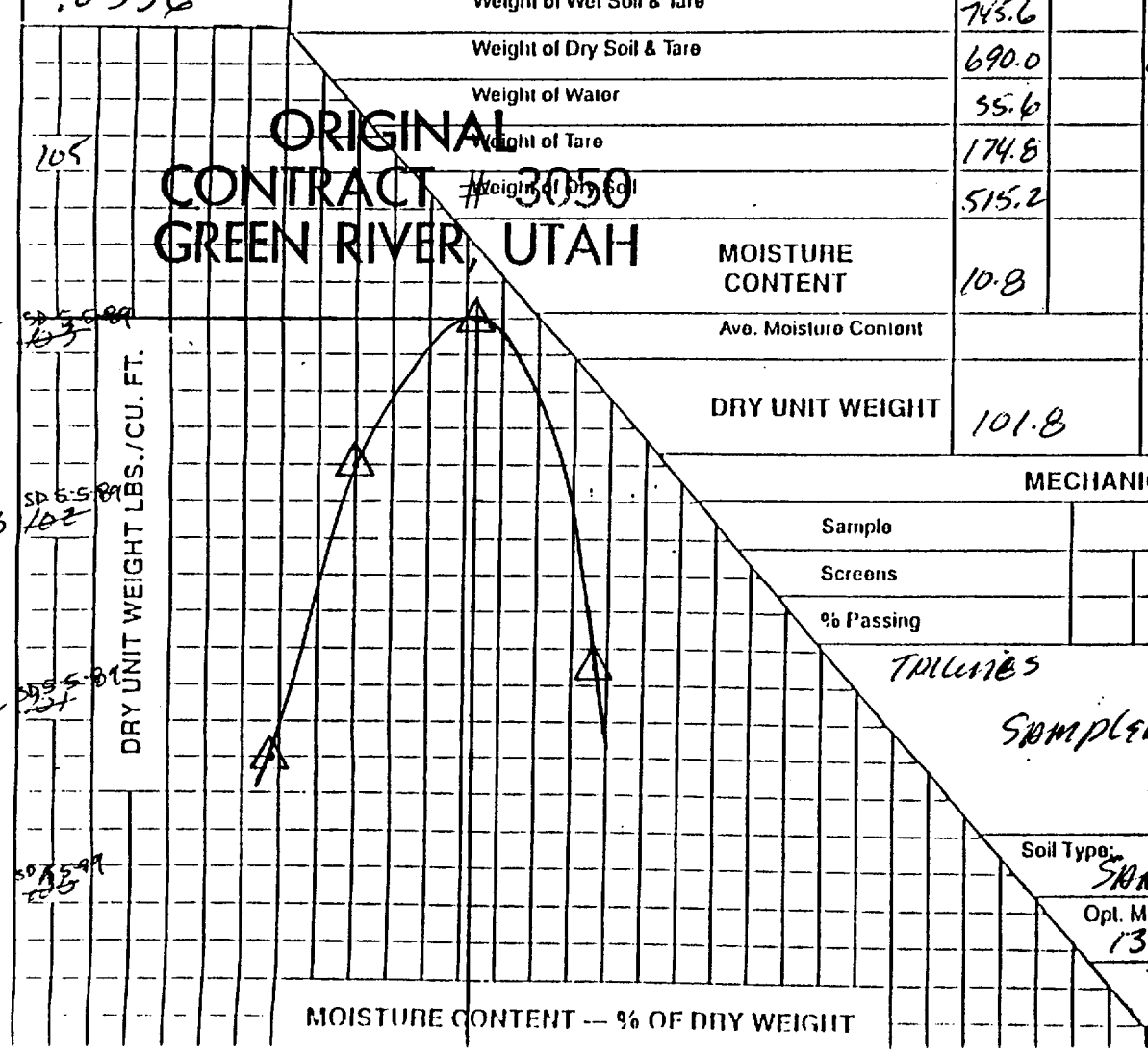
KERRISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEWED BY QUALITY REQUIREMENTS BY SDM 3/89
QA ENTRY No. 985

Blows Per Layer 25	COMPACTION SAMPLE NO.	160 mL		190 mL		210 mL		240 mL			
No. Layers 3	Weight of Wet Soil & Mold	13.21		13.31		13.40		13.38			
Tamper Wt. 5.5 #	Weight of Mold	9.42		9.42		9.42		9.42			
Drop Ht. 12"	Weight of Wet Soil	3.79		3.89		3.98		3.96			
Mold Dia. 4"	Wet Unit Weight	112.8		115.8		118.5		117.9			
Volume of Sample .0336	MOISTURE SAMPLE NO.	MICRO		MICRO	OVEN	MICRO		MICRO			
	Weight of Wet Soil & Tare	745.6		756.1	754.0	773.2		748.6			
	Weight of Dry Soil & Tare	690.0		692.9	691.5	701.3		672.6			
	Weight of Water	55.6		62.2	62.5	71.9		76.0			
	Weight of Tare	174.8		174.8	174.8	174.8		174.8			
	Weight of Dry Soil	515.2		518.1	516.7	526.5		497.8			
	MOISTURE CONTENT	10.8		12.0	12.1	13.7		15.3			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	101.8		103.4		104.2		102.3			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

TAILINGS

SAMPLED FROM CELL ON 5-5-89

Scales used: GR-001 + GR-002

Soil Type: Sand silty (ust) | Test No.: CM-A-039

Opt. Moisture 13.7 | Max. Dry Unit Weight 104.2 | Date: 5-5-89

Tested By: Steve Dike | Reviewed By: Steven Mark

Project:

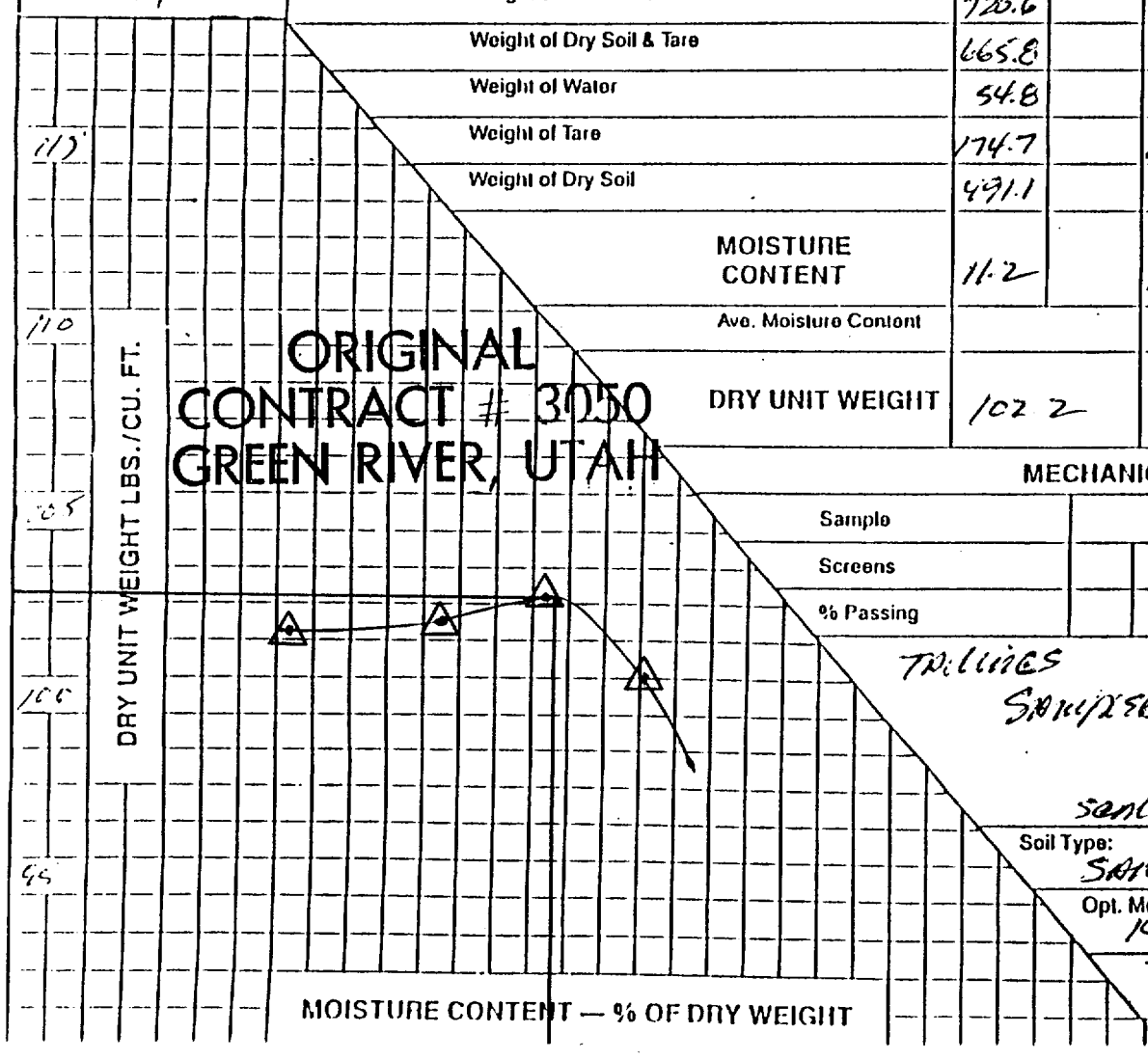
C-FERGUSON MAXIMUM DENSITY DETERMINATION

MORRISON KNUDSEN COMPANY

ASTM D-698 (H)

QA REVIEW FOR QUALITY REQUIREMENTS BY 6/9/89 QA ENTRY 988

Blows Per Layer 25	COMPACTION SAMPLE NO.	210 ML		240 ML		270 ML		300 ML				
No. Layers 3	Weight of Wet Soil & Mold	13.24		13.32		13.39		13.36				
Tamper Wt. 5.5#	Weight of Mold	9.42		9.42		9.42		9.42				
Drop Ht. 12"	Weight of Wet Soil	3.82		3.90		3.97		3.94				
Mold Dia. 4"	Wet Unit Weight	113.7		116.1		118.2		117.3				
Volume of Sample .0336	MOISTURE SAMPLE NO.	MIRO	SD 5-8-89	MIRO ~~763.7~~	OVEN	MIRO		MIRO				
	Weight of Wet Soil & Tare	720.6		763.7	748.7	765.3		757.0				
	Weight of Dry Soil & Tare	665.8		694.7	679.6	689.8		671.0				
	Weight of Water	54.8		69.0	69.1	75.5		80.0				
	Weight of Tare	174.7		174.7	174.7	174.7		174.7				
	Weight of Dry Soil	491.1		520.0	504.9	515.1		496.3				
	MOISTURE CONTENT	11.2		13.3	13.7	14.7		16.1				
	Ave. Moisture Content											
	DRY UNIT WEIGHT	102.2		102.5		103.1		101.0				



ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH

MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100.0							

TAILINGS
SAMPLED FROM CELL 5-8-89

SAMPLES USED BR-001 & BR-002

Soil Type: SAND SILTY TAN

Test No.: CM-4-040

Opt. Moisture 14.8

Max. Dry Unit Weight 103.1

Date: 5-8-89

Tested By: Steve Dibe

Reviewed By: Stan Moore

Project: [illegible]

MAXIMUM DENSITY DETERMINATION

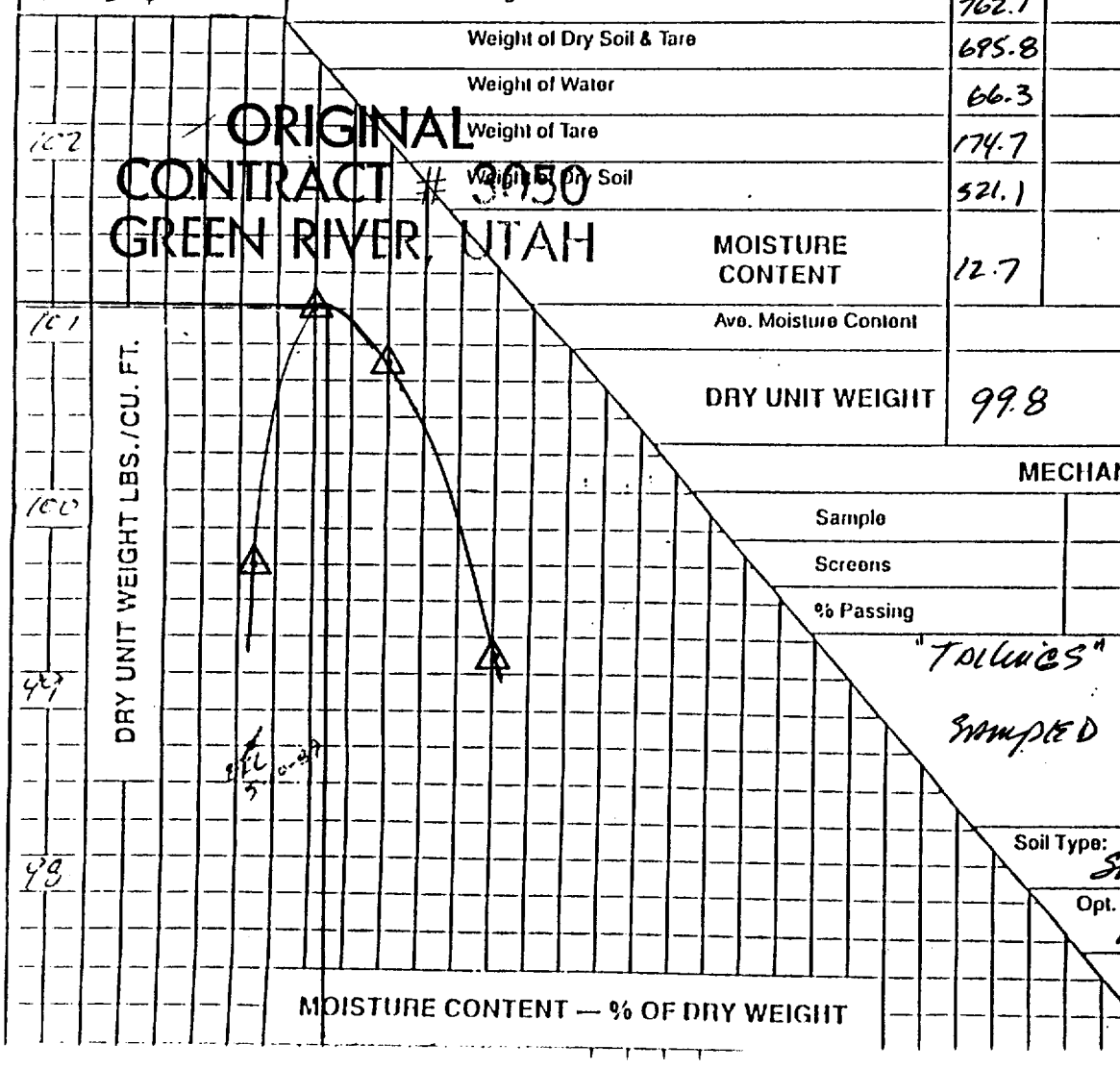
K-FERGUSON
ARISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEW FOR QUALITY REQUIREMENTS BY SD 5/11/89
QA ENTRY 1003

Blows Per Layer 25	COMPACTION SAMPLE NO.	230 ML		260 ML		290 ML		320 ML			
No. Layers 3	Weight of Wet Soil & Mold	13.20		13.28		13.30		13.28			
Tamper Wt. 5.5#	Weight of Mold	9.42		9.42		9.42		9.42			
Drop Ht. 12"	Weight of Wet Soil	3.78		3.86		3.88		3.86			
Mold Dia. 4"	Wet Unit Weight	112.5		114.9		115.5		114.9			
Volume of Sample .0336	MOISTURE SAMPLE NO.	MICRO		MICRO		MICRO	OVEN	MICRO			
	Weight of Wet Soil & Tare	762.1		753.1		780.5	778.3	769.3			
	Weight of Dry Soil & Tare	695.8		684.1		703.8	702.6	687.3			
	Weight of Water	66.3		69.0		76.7	75.7	82.0			
	Weight of Tare	174.7		174.7		174.7	174.7	174.7			
	Weight of Dry Soil	521.1		509.4		529.1	527.9	512.3 SD 5-10-89			
	MOISTURE CONTENT	12.7		13.5		14.5	14.3	16.0			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	99.8		101.2		100.9		99.1			

ORIGINAL
CONTRACT # 3950
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

"TAILINGS"

SAMPLED FROM THE CSCL ON 5-10-89

SEMI-LESS BED BD-001 + CR-002

Soil Type: SAND & BROWN
Test No.: CAR-U-001
Opt. Moisture 13.8
Max. Dry Unit Weight 101.2
Date: 5/10/89
Tested By: Eugene F. Gibson
Reviewed By: Steve Dike
Project: 30 ST ROAD DIKES

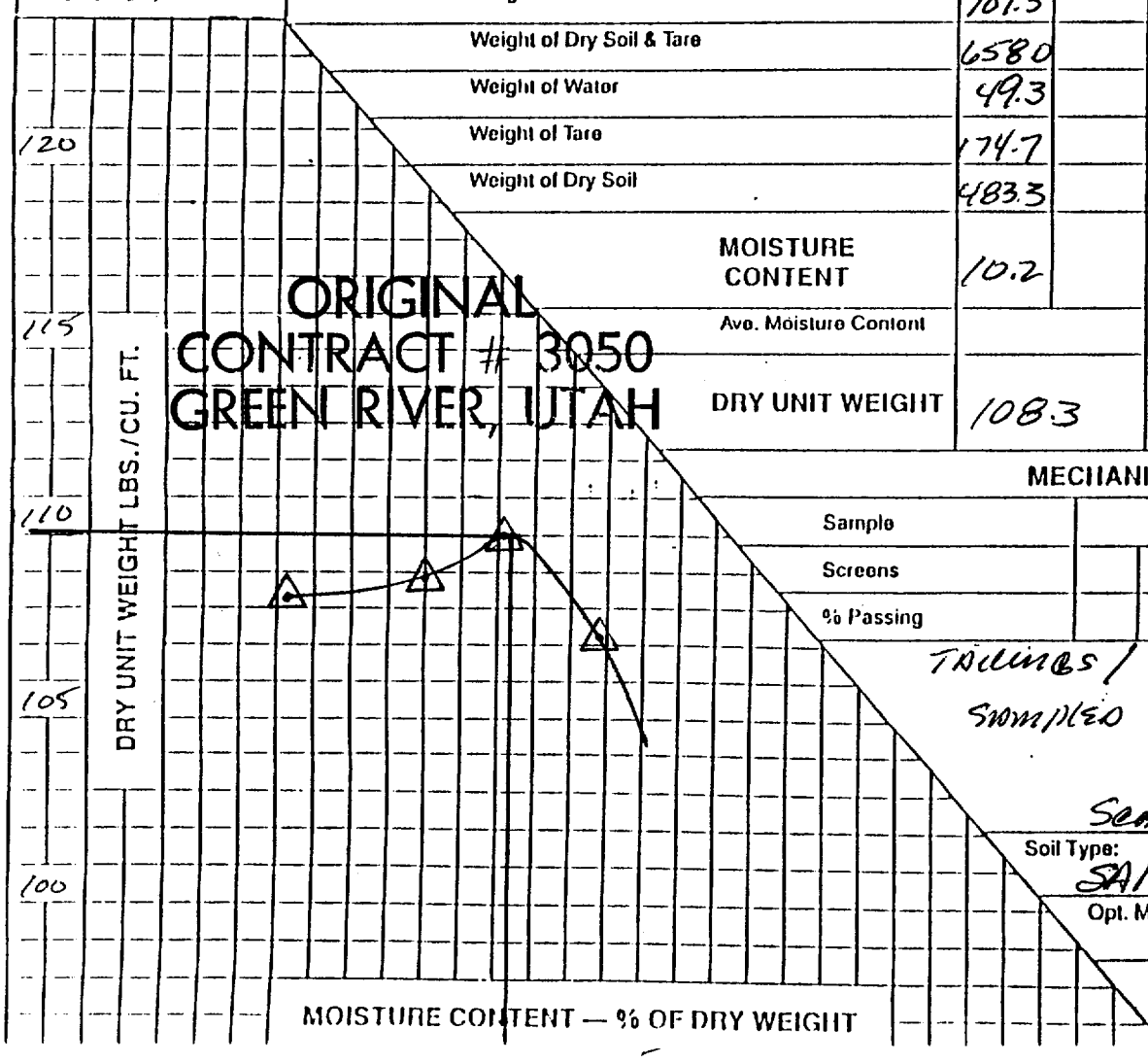
-FERGUSON MAXIMUM DEN ITY DETERMINATION

ISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEW OR QUALITY REQUIREMENTS BY SDM 189
QA ENTRY NO. 034

Blows Per Layer 25	COMPACTION SAMPLE NO.	140 ML	170 ML	200 ML	230 ML	
No. Layers 3	Weight of Wet Soil & Mold	13.43	13.52	13.60	13.54	
Tamper Wt. 5.5 #	Weight of Mold	9.42	9.42	9.42	9.42	
Drop Ht. 12"	Weight of Wet Soil	4.01	4.10	4.18	4.12	
Mold Dia. 4"	Wet Unit Weight	119.3	122.0	124.4	122.6	
Volume of Sample .033 C	MOISTURE SAMPLE NO.	m éno	m éno	m éno	m éno	
	Weight of Wet Soil & Tare	707.3	746.1	752.6	760.9	
	Weight of Dry Soil & Tare	658.0	684.9	685.5	687.0	
	Weight of Water	49.3	61.2	67.1	73.9	
	Weight of Tare	174.7	174.7	174.7	174.7	
	Weight of Dry Soil	483.3	510.2	510.8	512.3	
	MOISTURE CONTENT	10.2	12.0	13.1	14.4	
	Ave. Moisture Content					
	DRY UNIT WEIGHT	108.3	108.9	110.0	107.2	



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	ATT. LIMITS PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

TAILINGS / PREDOMINANTLY TAILINGS SOME IN SITU MATERIAL (
SAMPLED FROM CELL ON 5/15/89

SAMPLES USED GR-001 GR-002

Soil Type: SAND OK BROWN	Test No.: CM-4-042	
Opt. Moisture 13.3	Max. Dry Unit Weight 110.0	Date: 5/15/89
Tested By: [illegible]	Reviewed By: Steve Dile	

Project:

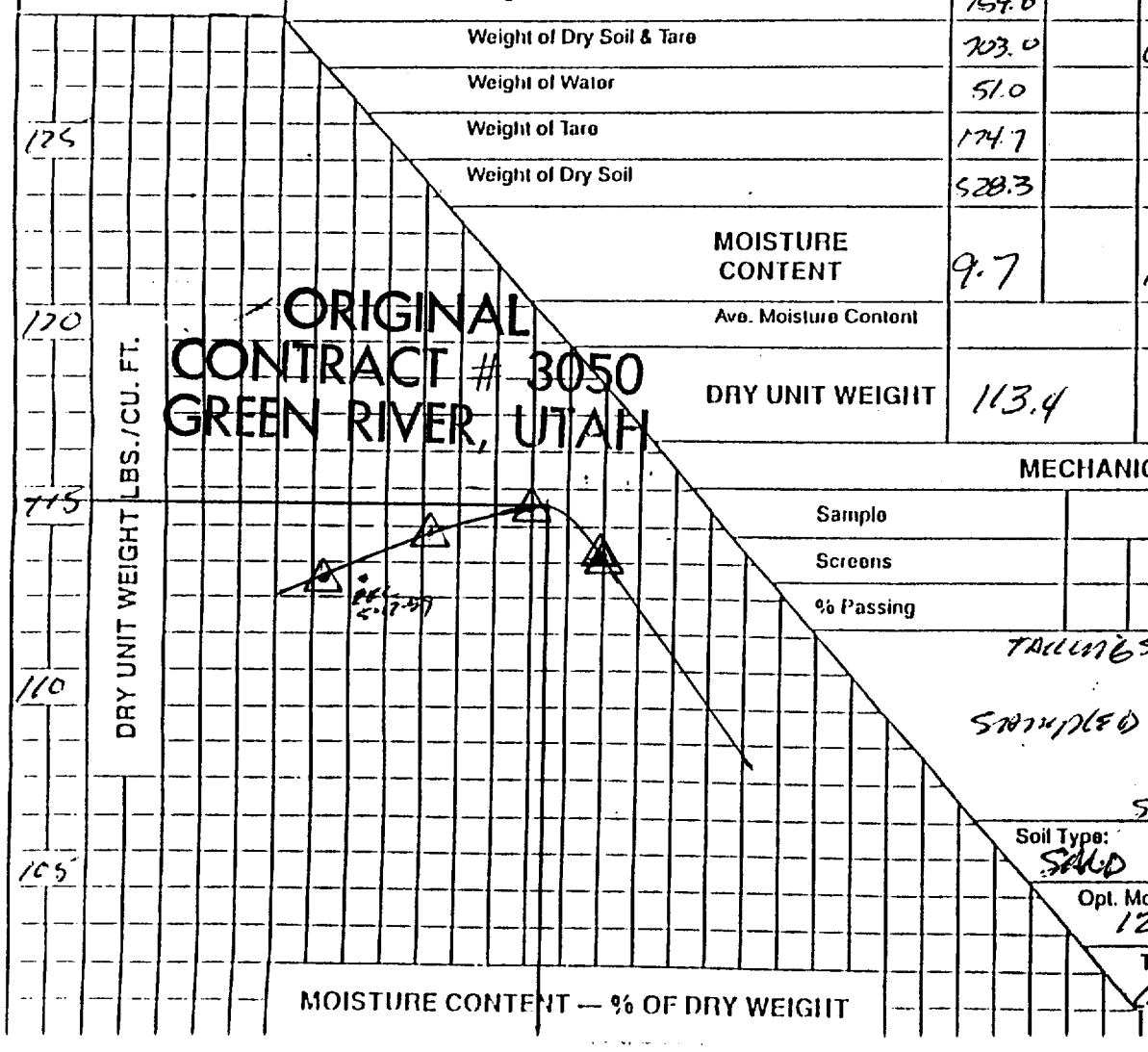
K-FERGUSON MAXIMUM DENSITY DETERMINATION

GRISON KNUDSEN COMPANY

ASTM D-698 (A)

QA REVIEWED FOR QUALITY REQUIREMENTS BY E 5/17/89 QA ENTRY NO. 1051

Blows Per Layer	25	COMPACTION SAMPLE NO.	70 mL		105 mL		135 mL		170 mL			
No. Layers	3	Weight of Wet Soil & Mold	13.60		13.71		13.79		13.77			
Tamper Wt.	5.5#	Weight of Mold	9.42		9.42		9.42		9.42			
Drop Ht.	12"	Weight of Wet Soil	4.18		4.29		4.37		4.35			
Mold Dia.	4"	Wet Unit Weight	124.4		127.7		130.1		129.5			
Volume of Sample	.0330	MOISTURE SAMPLE NO.	MIENO		MIENO		MIENO		MIENO			
		Weight of Wet Soil & Tare	754.0		730.6		770.8		747.6			
		Weight of Dry Soil & Tare	703.0		674.8		704.8		679.8			
		Weight of Water	51.0		55.8		66.0		67.8			
		Weight of Tare	174.7		174.7		174.7		174.7			
		Weight of Dry Soil	528.3		500.1		530.1		505.1			
		MOISTURE CONTENT	9.7		11.2		12.5		13.4			
		Ave. Moisture Content										
		DRY UNIT WEIGHT	113.4		114.8		115.6		114.2			



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing						100							

TAILINGS + SUBGRADE IN SITU MATERIAL SAMPLED FROM CELL ON 5/17/89.

SAMPLES USED GR-001 GR-002

Soil Type: SAND OK BROWN		Test No.: GW-4-043
Opt. Moisture 12.7	Max. Dry Unit Weight 115.6	Date: 5/17/89
Tested By: [signature]		Reviewed By: [signature]
Project:		

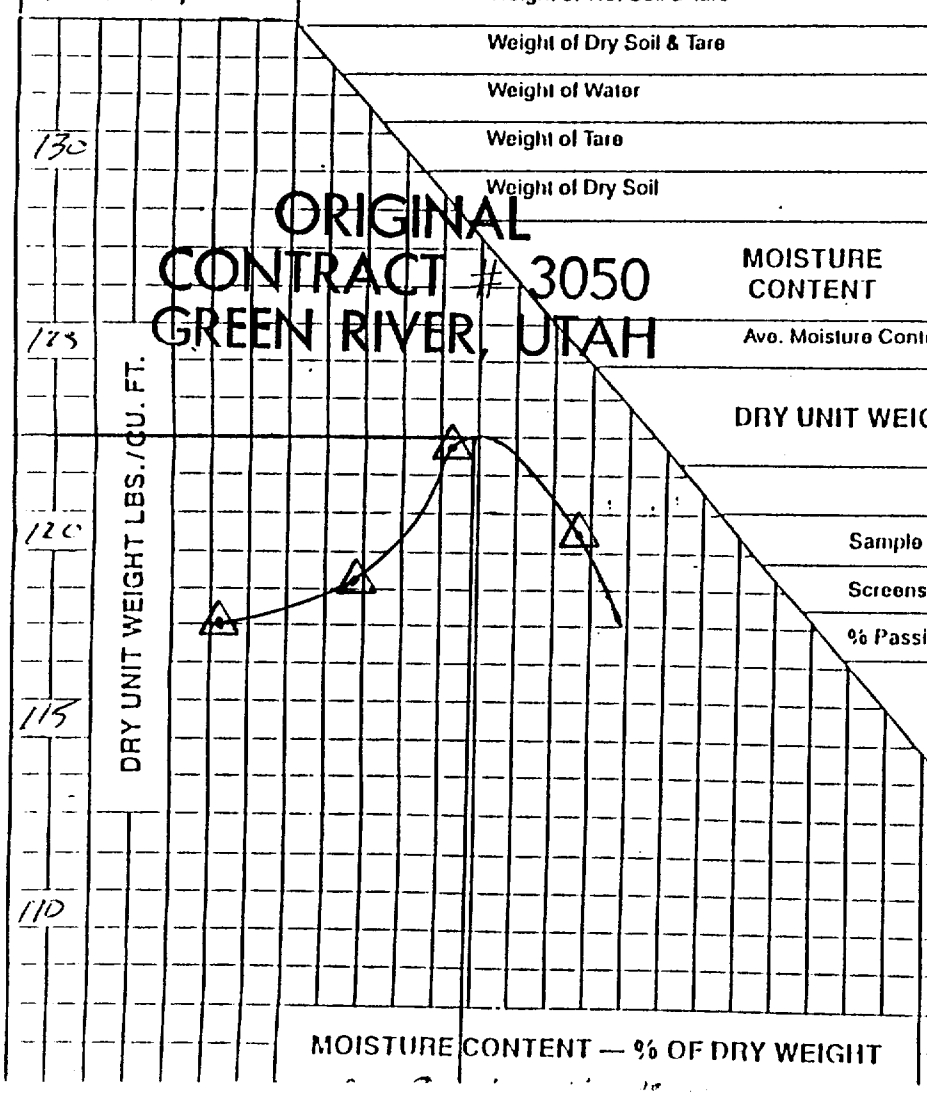
FERGUSON MAXIMUM DENSITY DETERMINATION

ASTM D-698 (C)

QA REVIEW FOR QUALITY REQUIREMENTS BY SD 1/8/89 QA ENTRY No. 1060

Blows Per Layer 56	COMPACTION SAMPLE NO.	0 ML		40 ML		85 ML		120 ML			
No. Layers 3	Weight of Wet Soil & Mold	24.23		24.43		24.90		24.85			
Tamper Wt. 5.5#	Weight of Mold	14.88		14.88		14.88		14.88			
Drop Ht. 12"	Weight of Wet Soil	9.35		9.55		10.02		9.97			
Mold Dia. 6"	Wet Unit Weight	125.2		127.8		134.1		133.5			
Volume of Sample .0747	MOISTURE SAMPLE NO.	[illegible]		[illegible]		[illegible]		[illegible]			
	Weight of Wet Soil & Tare	765.3		743.1		778.2		791.1			
	Weight of Dry Soil & Tare	731.3		702.1		727.6		722.1			
	Weight of Water	34.0		41.0		50.6		59.0			
	Weight of Tare	174.7		174.7		174.7		174.7			
	Weight of Dry Soil	556.6		527.4		552.9		547.4			
	MOISTURE CONTENT	6.1		7.8		9.2		10.8			
	Ave. Moisture Content										
	DRY UNIT WEIGHT	118.0		118.6		122.8		120.5			

ORIGINAL
CONTRACT # 3050
GREEN RIVER, UTAH



MECHANICAL ANALYSIS

Sample	Gravel					Sand					Fines	ATT. LIMITS LL	PL
Screens						#4	#10	#16	#40	#100	#200		
% Passing													

NATIVE SUBGRADE MIXED WITH TAILINGS
MATERIAL SAMPLED FROM CELL 5/18/89

Soil Type: Gravel Sandy (Tailings) Test No.: CM-4-044

Opt. Moisture 9.4 Max. Dry Unit Weight 123.0 Date: 5/18/89

Tested By: [illegible] Reviewed By: Steve Dibl

Project: [illegible]