APPENDIX F
MANUFACTURERS'/SUPPLIERS' QUALITY CONTROL DOCUMENTATION

(CONTINUED)

CONTRACTOR/INSTALLER SUBMITTALS

INSTALLER'S QUALIFICATIONS AND RESUMES

SUPPLIER DOC[illegible]T SUBMITTAL

FDF PROJECT NO.: 20105	CONTRACT NO: FSC-681	SUBMITTAL NO. 20105-PHV-02770-002	REV.: 0	DATE: 05/7/03	Page 1 of 1

FROM:
Petro Environmental Technologies
7851 Palace Dr.
Cincinnati, OH 45429
SIGNATURE: [illegible]

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 5/7/03

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHV-02770-00/2 JLS 5/7/03	0						X			Installation Experience			X	02770 1.04 B5	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE Approver	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	84				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

COMPANY & PERSONAL RESUME ADD TO OVER 10 MILLION SF

RECEIVED BY: [illegible] DATE: 5/13/03

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

5370

ORIGINAL

5370

FLUOR FERNALD, INC.

OSDF CAP/LINER WELDING PROJECT
Project No. 20105 Contract No. FSC-681

SUPPLIER SUBMITTAL No.: 20105-PHV-02270-005 (Rev. 0)

INSTALLATION EXPERIENCE

Document No. PHV-02270-005 (Rev. 0)

May 7, 2003

000006

PETRO
environmental
technologies

THE ISTRE COMPANY

Liner Specialist

13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

5370

Jerry Istre -- Personal Resume

1. City of Dayton, WY – Dayton, WY – 12 Mil Phillips 50,000 sf Sewage Lagoon
2. BFI – Atlanta City, NJ – Poly America – 40 Mil 1,000,000 sf 6 oz Geotextile 1,000,000 sf Landfill Cell
3. Ft. Howard Paper Co. – Savannah, GA. – 40 & 60 Mil Poly America 3,000,000 sf Sludge Ponds
4. Kaiser Aluminum – New Orleans, La.- 40 Mil Poly America 1,000,000 sf 6 oz Geotextile 1,000,000 sf Landfill Cap
5. Inspiration Cooper – Claypool, Az – 40 & 80 Mil Poly America 100,000 sf Acid Pond
6. Hycroft Mine – Winnamucca, NV – 40 Mil Poly America 1,000,000 sf Leach Pad
7. Perry Eng. - Leesburg, Va. – 30 Mil Poly America 1,000,000 sf Landfill Cell
8. U.S. Corps of Eng. – Fayetteville, NC – 12 Mil Phillips 150,000 sf Fuel Tank Storage
9. Summitville Mine – Summitville, CO – 60 mil Poly America 1,000,000 sf Side Slopes Leach Pad
10. Gilt Edge – Deadwood, SD – 60 mil Poly America 1,370,000 sf Geonet 650,000 sf Leach Pad
11. Rollins Enviromental Ser. - Baton Rouge, La. – 80 Mil National Seal 1,000,000 sf Geonet 500,000 sf Geogrid 500,000 sf Landfill Cell
12. Wolverine Tube - Decator, Alabama – 40 Mil National Seal 100,000 sf Acid pond
13. American Cyanamid – Leplace, La.- 20 Mil National Seal 290,000 sf 6 oz Geotextile 290,000 sf Landfill Cap
14. Builders Transport – Dallas Texas – XR-5 national Seal 10,000 sf Tank Containment
15. Manada Const.- Newburg, Pa.- 40 Mil National Seal 211,000 sf Sludge Ponds
16. Cheveron - St James La. – 100 Mil 40,000 sf Tank Containment
17. Ethal Corp -. Baton Rouge, La.- 30 Mil National Seal 500,000 sf 6 oz Geotextile 500,000 sf Landfill Cell
18. Manada Const. – Newburg, Pa.- 60 Mil Poly America 3,000,000 sf Sludge ponds
19. Sun Times – Aurora, IL- 20 Mil Poly America 200,000 sf Landscape Pond
20. Peters Const. – Granite City, IL.- 60 Mil Poly America 1,200,000 sf Landfill Cell
21. Viet Const.- Grove MN - 40 Mil Poly America 250,000 sf Storm Drain Lagoon
22. IL. State – West Chicago, IL- 30 Mil Poly America 70,000 sf 6 oz Geotextile 70,000 sf HWY Containment
23. Wayne Disposal – Belleville, Mi.- 80 Mil Poly America 650,000 sf 6 oz Geotextile 650,000 sf Geonet 650,000 sf Medical Waste Landfill Cell
24. City of Indianapolis – Indianapolis IN.- 60 Mil Poly America 400,000 sf 6 oz Geotextile 400,000 sf Landfill Cell

Deleted: -

INFORMATION ONLY

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: [illegible] Date: 5/13/03

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

25. NB Power – New Castle New Brunswick, Canada – 60 Mil 500,000 sf 6 oz Geotextile 500,000 sf Tank Farm
26. Sydny Steel – Sydny Nova Scotia, Canada – 60 Mil GSE 50,000 sf 6 oz Geotextile 50,000 sf Product Pond

27. Bruin Lagoon – Bruin Lagoon, Pa. – GSE – 200,000 sf 6 oz Geotextile 200,000 sf Landfill Cell
28. USA Steel – Pueblo Co. – GSE – 30 Mil 1,300,000 sf Landfill Cell
29. Hudson Electric – Newburg, NY GSE 60 Mil 1,300,000 sf Geocomposit 1,300,000 sf Gunseal 500,000 sf Landfill Cap and Cell
30. BFI – New Orleans, La. – Drisco Pipe SDR-11 12 Miles of Laterials 6 oz Geotextile 950,400 sf – Methane System
31. Muni of Coboconk – Coboconk, Onterio, Canada – GSE – 60 Mil 800,000 sf Lagoons
32.Muni of Tamagami – Tamagami, Onterio, Canada – GSE – 60 Mil 250,000 sf Lagoon
33. NS Power – North /Sydney, Nova Scotia, Canada – GSE – 60 mil 1,300.000 sf 8 oz Gextile 1,300,000 sf Leach Pad
34. Muni. Of Glecien – Glecien, Alberta, Canada, - GSE – 60 Mil 500,000 sf Lagoon
35. Muni. Of Tamagami – Tamagami, Onterio, Canada – GSE – 80 Mil 250,000 sf lagoon
36. Uniroyal – Elmira, Ont. Canada – GSE – 60 Mil 170,000 sf 6 oz Geotextile 340,000 sf Building Containment
37. Gyr Const. Clyde River NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
38.FBD – Coral Habor, NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
39. Gyr Const. – Igloolic, NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
40. USA Waste – Bethlaham, NH. – GSE – 60 Mil 500.000 sf 8 oz Geotextile 500,000 sf Landfill Cell
41. Terrafix – Lacdubonnie, Manitoba, Canada GSE – 60 Mil 400,000 sf 6 oz Geotextile 800,000 sf Landfill Cell
42. Nortuck Const. – Arviet NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
43. Hovat Const. – Coral Harbor, NWT Canada - GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
44. EB Eddie – Espenola, Ont. Canada - GSE – 80 Mil 500,000 sf 8 oz Geotextile 500,000 sf Acid Pond
45. Muni. Of Rangely – Rangely, Me.- GSE – 300,000 sf Lagoon
46. Muni of Yarmouth – Yarmouth, Ma. – GSE – 40 Mil 500,000 sf Landfill Cap
47.CF Industries – Bartow, Florida – GSE – 40 Mil 1,500,000 sf Mine Cap
48. Cargil – Bartow, Florida – GSE – 80 Mil 60,000 sf Building Roofs
49. C.F. Industries – Bartow, Florida – GSE – 60 Mil 60,000 sf Sumps
50. Labbie and Sons – Brunswick, ME. – GSE – 375,000 sf Landfill Cap
51. City of Warren – Warren ME. – GSE – 300,000 sf Geocomposit 300,000 sf Landfill Cap

THE ISTRE COMPANY

Liner Specialist

13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

5370

Company Resume (Sub-Contract Work)

Terrafix: 425 Attwell Dr, Rexdale Onterio, Canada M9W5C4
Contact: John Mooney
Phone (416-674-0363)
Equipment: Columbine
Jerry Istre Responsibility: (Owner/Superintendent)

1. City of Warren, Maine – GSE 60 Mil 300,000 sf Geocomposit 300,000 sf Landfill Cap March 1996
2. E.B. Eddy paper Mill – Esponola, Onterio, Canada – GSE 80 Mil 500,000 sf Geocomposit 500,000 sf Acid pond
3. City of Rangly Maine – GSE 60 Mil 350,000 sf Sewage Lagoons August 1996
4. City of Yarmouth Ma. GSE 40 Mil 500,000 sf Landfill Cap Sept. 1996
5. USA Waste Bethlahem, New Hampshire – GSE 60 Mil 500,000 sf Geocomposit 500,000 sf 6 oz Geotextile 500,000 sf Landfill Cell November 1996
6. City of Southridge Ma. – GSE 60 Mil 300,000 sf landfill Cell November 1999

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

5370

Company Resume (Sub-Contract Work)

EDCI : Huntsville, Alabama
Contact – Ms. Diane Harris
Phone: 256-551-0372
Equipment : Poly America
Jerry Istre Responsibility: Cold Weather Consultant

1. DOE Fernald – Ross, Ohio – National Seal 80 Mil Textured 400,000 sf GCL 400,000 sf 8 oz Geotextile 1,200,000 sf Landfill Cell # 1 Dec 1997
2. City of Indian Lake, New York – GSE 60 Mil 300,000 sf Geocomposit 300,000 sf Landfill Cap November 1998

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

5370

Petro Environmental
Contact: MR. Mark Mather or Mr. Pete Mather

Phone: 513-489-6789
Equipment: Columbine
Jerry Istre Responsibility: Owner/Superintendent

DOE Fernald – Ross Ohio National Seal 80 Mil. Textured 400,000 sf GCL 400,000 sf 8 oz Geotextile 1,200,000 sf Landfill Cell #1 Oct – Dec. 1997
DOE Fernald – Ross Ohio National Seal 80 Mil. Textured 20,000 sf Decon Pad March 1998
DOE Fernald – Ross Ohio Solmax Textured 80 Mil. Textured 750,000 sf GCL 750,000 sf 8 oz Geotextile 1,200,000 sf Landfill Cell #2 Aug. 1998
DOE Fernald – Ross Ohio HDPE pipe sdr-17 Radiological dust control system 7 Miles March-December 1998
Petro Golf Course – Columbus, Ohio HDPE pipe sdr 11 & 17 Deep water Drainage 11 Miles Feb – July 1999
DOE Fernald – Ross, Ohio GSE Textured 80 Mil 700,000 sf GCL 700,000 sf 8 oz Geotextile 1,200,000 sf Landfill Cell # 3 August 1999
ODOT - Marysville, Ohio Solmax 60 Mil Smooth 19,899 sf HWY Drainage April 2000
Reilly Tar – Dover, Ohio Solmax 60 Mil Textured 50,000 sf GCL 50,000 sf Vault Cap May 2000
DOE Piketon, Ohio GSE Textured 40 Mil Smooth 500,525 sf GCL 500,525 sf Geocomposit 500,525 sf Landfill Cap May 2000
DOE Piketon, Ohio Solmax 80 Mil Smooth 300,000 sf Geocomposit 300,000 sf Landfill Cap Sept. 2000
DOE Fernald – Ross, Ohio GSE 60 Mil Smooth 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf Landfill Cap Cell # 1 June – August 2001
DOE Fernald – Ross, Ohio GSE 80 Mil Textured 25,740 sf Landfill Cell SP-7 Dec 2001

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

SUPPLIER DOCUMENT SUBMITTAL

OF PROJECT NO.: 20105	CONTRACT NO: FSC - 681	SUBMITTAL NO. 20105-PHV-02770-003	REV.: 0	DATE: 06/27/03

FROM:
tro Environmental Technologies
51 Palace Drive
incinnati, OH 45249
SIGNATURE: Signature for David D. Williams

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Linda Schwartz DATE: 7/1/03

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHV-02770-003	0						X			Liner installer's request to waive letter of approval from manufacturer		X		02770-1.04B3	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE ~~(APPROVER)~~ CV	64				
GREGG JOHNSON	60				
BILL ZEBICK (APPROVER) WAZ	60				
MIKE GODBEIL	84				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: ✓ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

RECEIVED BY: Bill Zebick DATE: 7/1/03

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

ORIGINAL

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

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FS-F-4955

5370

FLUOR FERNALD, INC.

OSDF CAP/LINER WELDING PROJECT
Project No. 20105 Contract No. FSC-681

SUPPLIER SUBMITTAL No.: 20105-PHV-02770-003 (Rev. 0)

Letter Requesting Waiver of Manufacturer's Letter of Approval

Document No. PHV-02770-003 (Rev. 0)

June 26, 2003

INFORMATION ONLY

[X] A-Conforms to the Subcontract Requirements
[ ] B-Make Corrections Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Bill Zebel Date: 7/2/03

000014

PETRO
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5370

June 27, 2003

Letter No: FF-005
Revision-001

Mr. Alan Hohnhorst
Contract Administrator
Fluor Fernald, Inc.
P.O. Box 538704
Cincinnati, OH 45253-8704

Contract No.: FSC-681- OSDF Liner/Cap Welding Project

RE: DCN No. 20104-013

Dear Mr. Hohnhorst,

By copy of this revised correspondence Petro Environmental Technologies, Inc. (Petro Environmental) and its lower tier subcontractor, The Istre Company, request that Fluor Fernald Inc. (Fluor) waive the requirement to furnish a copy of the liner installer's letter of approval or license from the Manufacturer. This is currently a requirement in Specification 02770 Section 1.04 A3.

The Istre Company was an approved GSE installer in 2002. However due to back charges from The Istre Company to Fluor, which were associated with the liner installation at Fernald in 2002, that were subsequently passed onto GSE and disputed, GSE has elected not to authorize The Istre Company as a licensed installer.

As you know The Istre Company has participated in the liner installation at Fernald since 1997 and served as the prime liner installer for all of the On-Site Disposal Facility cells and caps since 1999. The Istre Company has satisfactorily performed all work in accordance with the contract requirements. A copy of The Istre Company's qualifications is enclosed.

7851 Palace Drive • Cincinnati, Ohio 45249 • 513.489.5789 • Fax 489.7208
8200 Seville Road • Lodi Ohio 44254 • 330.948.1494 • Fax 948.1933

Therefore, Petro Environmental requests a waiver from the Construction Manager for the requirements set forth in Specification 02770 Section 1.04 A3.

Should you have any questions regarding this letter, please contact the undersigned at 489-6789.

Sincerely,

PETRO ENVIRONMENTAL TECHNOLOGIES, INC.

David D. Williams

Enclosure:

cc: File

j:/cur-jobs/c003-004/correspondence/ff-005Rev-001Liner Installation Qual

THE ISTRE COMPANY

JERRY ISTRE RUSUME

DOE Fernald – Ross Ohio National Seal 80 Mil. Textured 400,000 SF GCL 400,000 SF 8 oz Geotextile 1,200,000 SF Landfill Cell #1 Oct – Dec. 1997
DOE Fernald – Ross Ohio National Seal 80 Mil. Textured 20,000 sf Decon Pad March 1998
DOE Fernald – Ross Ohio Solmax Textured 80 Mil. Textured 750,000 SF GCL 750,000 SF 8 oz Geotextile 1,200,000 SF Landfill Cell #2 Aug. 1998
DOE Fernald – Ross Ohio HDPE pipe sdr-17 Radiological dust control system 7 Miles March-December 1998
Petro Golf Course – Columbus, Ohio HDPE pipe sdr 11 & 17 Deep water Drainage 11 Miles Feb – July 1999
DOE Fernald – Ross, Ohio GSE Textured 80 Mil 700,000 sf GCL 700,000 sf 8 oz Geotextile 1,200,000 SF Landfill Cell # 3 August 1999
ODOT - Marysville, Ohio Solmax 60 Mil Smooth 19,899 SF HWY Drainage April 2000
Reilly Tar – Dover, Ohio Solmax 60 Mil Textured 50,000 SF GCL 50,000 SF Vault Cap May 2000
DOE Piketon, Ohio GSE Textured 40 Mil Smooth 500,525 SF GCL 500,525 SF Geocomposit 500,525 SF Landfill Cap May 2000
DOE Piketon, Ohio Solmax 80 Mil Smooth 300,000 SF Geocomposit 300,000 sf Landfill Cap Sept. 2000
Envirocon – Clairton, Pa Solmax 40 Mil Textured 348,000 SF – December 2000
Wingate – Fort Lauderdale, FA GSE 40 Mil Smooth and Textured 330,000 SF – July 2001
DOE Fernald – Ross, Oh GSE 60 Ml Smooth 335,000 SF– June thru August 2001
TVA – Muscle Shoals, AL Solmax 40 Mil 435,000 SF – September 2001
FMC – Meadville, PA Solmax 40 Mil 783,000 SF – October 2001
DOE Fernald – Ross, Ohio GSE 80 Mil Textured 25,740 SF Landfill Cell SP-7 Dec 2001
Bavarian Landfill – Walton, KY Solmax 40 Mil Textured 261,000 SF – March 2002
Waste Services of the Bluegrass – Georgetown, KY Solmax 60 Mil Textured 297,000 SF – April 2002
DOE Fernald – Ross, OH GSE 80 Mil Textured 1,350,000 SF – July thru November 2002
Hemphill Water Treatment Plant – Atlanta, GA Solmax 60 Mil 250,000 SF – January 2003

2.0 PAST PERFORMANCE

A summary of The Istre Company's past performance is provided in Appendix A. The Istre Company has been involved in the installation of over 3,200,000 s.f. of 80 mil-textured HDPE liner and GCL at Fernald since the projects inception. Selected projects are listed below. Petro Environmental served as the General Contractor on all of the liner installation projects below, except for the capping of Cell 1.

1997- DOE, Fernald, OH
OSDF Phase I, Liner system installation (Cell 1)
400,000 sf of 80-mil textured HDPE, GCL and geotextile

1998- DOE, Fernald, OH
OSDF Phase II, Liner system installation (Cell 2)
750,000 sf of 80-mil textured HDPE, GCL and geotextile

1999- DOE, Fernald, OH
OSDF Phase II, Liner system installation (Cell 3)
700,000 sf of 80-mil textured HDPE, GCL and geotextile

2000- DOE, Piketon, OH
15 acres of GCL, 40-mil HDPE and geocomposite
5 acres of 80-mil HDPE and geocomposite

2001- DOE, Fernald, OH
OSDF Cell Cap
335,000 sf of 60-mil smooth HDPE, GCL and geotextile

2002- DOE, Fernald, OH
OSDF Cell 4 and Cell 5
1,350,000 sf of 80-mil textured HDPE, GCL and geotextile

Use or disclosure of the data contained on this sheet is subject to the restriction on the title page of this proposal

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 2	CONTRACT NO: PHIV2	MITTAL NO. 20104-PHIV2-02770-007	REV.: 0	DATE: 05/06/03	ge 1

FROM:
Fluor Fernald

SIGNATURE: Anumer 5/6/03

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Susan Schwab DATE: 5/7/03

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV2-02770-007	0						X			Resumes of personnel performing seaming operations for geomembrane & GCL (also applies to Phase V - Cell 6 Liner) SUMB. No. 20103-PHV-02770-007, REV0		X		02770-1.04B7	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	60				
BILL ZEBICK	60				
MIKE GODBER	84				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: ✓ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000016

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RECEIVED BY: [signature] DATE: 5/20/03

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

ORIGINAL

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
Rev. 3: 05/14/1999, CT-2.4.2

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 2[illegible]	CONTRACT NO: PHV	SUBMITTAL NO. 20105-PHV-02770-007	REV.: 0	DATE: 05/06/03	Page 1

FROM:
Fluor Fernald

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

SIGNATURE: Zkumar 5/6/03

RECEIVED BY: Susan Schwab DATE: 5/7/03

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHV-02770-007	0						X			Resumes of personnel performing seaming operations for geomembrane & GCL (For attachments, refer to Phase IV - Cell 2 Final Cover) SUBM.# 20104-PHV2-02770-007, Rev 0		X		02770-1.04B7	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	60				
BILL ZEBICK	60				
MIKE GODBER	84				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: ✓ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

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5370

RECEIVED BY: [signature] DATE: 5/20/03

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

ORIGINAL

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

5370

THE ISTRE COMPANY

David Lipps
Master Seamer
Employed March 2002 to November 2002

March 2002	Bavarian Landfill – Walton, Kentucky Solmax 40 Mil Textured - 380,000 SF
April 2002	Waste Services – Georgetown, Kentucky Solmax 40 Mil Textured - 297,000 SF
November 2002	Fernald – Ross, Ohio GSE 80 Mil Textured – 1,350,000 SF

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: _____ Date: 5/20/03

INFORMATION ONLY

THE ISTRE COMPANY

Daniel White
Welding Technician
Employed March 2002 to November 2002

March 2002	Bavarian Landfill – Walton, Kentucky Solmax 40 Mil Textured - 380,000 SF
April 2002	Waste Services – Georgetown, Kentucky Solmax 40 Mil Textured - 297,000 SF
November 2002	Fernald – Ross, Ohio GSE 80 Mil Textured – 1,350,000 SF

THE ISTRE COMPANY

Wesley Griffin
Welding Technician
Employed December 2002 to Present

January 2003	Hemphill WTP – Atlanta, GA Solmax 60 Mil Smooth – 250,000 SF

THE ISTRE COMPANY

Jonathan Tucker
Welding Technician
Employed December 2002 to Present

January 2003	Hemphill WTP – Atlanta, GA Solmax 60 Mil Smooth – 250,000 SF

TEST EQUIPMENT CALIBRATION

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20105	CONTRACT NO: FSC-681	SUBMITTAL NO. 20105-PHV-02770-009	REV.: 0	DATE: 06/02/03	Page 1 of 1

FROM:
Petro Environmental Technologies
7851 Palace Dr.
Cincinnati, OH 45249
SIGNATURE: David W...

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 6/5/03

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHV-02770-009	0							X		Certificate of calibration for field tensiometer and vacuum gauges			X	02770 1.04 D	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC MG 6/12/03	52-7				
CHUCK VANARSDALE (~~APPROVER~~)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER (APPROVER)	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

9200026

RECEIVED BY: Michael Gaeber DATE: 6/12/03
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

5370

ORIGINAL

5370

FLUOR FERNALD, INC.

OSDF CAP/LINER WELDING PROJECT
Project No. 20105 Contract No. FSC-681

SUPPLIER SUBMITTAL No.: 20105-PHV-02270-009 (Rev. 0)

Calibration Certificates

Document No. PHV-02270-009 (Rev. 0)

June 2, 2003

INFORMATION ONLY

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Date: 6/12/03

000027

PETRO environmental technologies

5370

JAY Industrial Controls
555 North Wayne Avenue
Cincinnati, OH 45215
513-733-5200

Certificate of Accuracy

Customer: ISTRE
Address: 13811 EAST POPLAR
City, State, Zip: GLENPOOL, OK 74033

Certification Number: 2223

	Standard	Standard	Standard	Instrument Certified
NIST Number	1686-23446			
Description	ATE-PSI			PRESSURE GAUGE
Manufacturer	Ashcroft			ASHCROFT
Model Number	AQS-2			25 1009 AW 02 L.
Range	0-100 PSIG			0 - 100 PSI
Accuracy	.01%			1 % FULL SCALE
Serial Number	AQS-1686			N / A
Date Certified	9/11/02			MAY 30, 2003

Notes:

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
PSI		PSIG		
0		0		No Readable Error
10		10		No Readable Error
20		20		No Readable Error
30		30		No Readable Error
40		40		No Readable Error
50		50		No Readable Error
60		60		No Readable Error
70		70		No Readable Error
80		80		No Readable Error
90		90		No Readable Error
100		100		No Readable Error

Minor Division	1 PSI
Ambient Temperature	70 ° F.
Barometric Pressure	29.82 IN. HG.
Relative Humidity	49 %

Sales Order Number: 2009328 - 5

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.
We further certify that our calibration system complies with MIL. STD. 45662-

Certified By: Bob Utz
Signature

Date: 5/30/03

5370

JAY Industrial Controls
555 North Wayne Avenue
Cincinnati, OH 45215
513-733-5200

Certificate of Accuracy

Customer: ISTRE
Address: 13811 EAST POPLAR
City, State, Zip: GLENPOOL, OK 74033

Certification Number: 2224

	Standard	Standard	Standard	Instrument Certified
NIST Number	1686-23446			
Description	ATE-PSI			PRESSURE GAUGE
Manufacturer	Ashcroft			ASHCROFT
Model Number	AQS-2			25 1009 AW 02 L
Range	0-100 PSIG			0 - 100 PSI
Accuracy	.01%			1 % FULL SCALE
Serial Number	AQS-1686			N / A
Date Certified	9/11/02			MAY 30, 2003

Notes:

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
PSI		PSIG		
0		0		No Readable Error
10		10		No Readable Error
20		20		No Readable Error
30		30		No Readable Error
40		40		No Readable Error
50		50		No Readable Error
60		60		No Readable Error
70		70		No Readable Error
80		80		No Readable Error
90		90		No Readable Error
100		100		No Readable Error

Minor Division	1 PSI
Ambient Temperature	70 ° F.
Barometric Pressure	29.82 IN. HG.
Relative Humidity	49 %

Sales Order Number: 2009328 - 5

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.
We further certify that our calibration system complies with MIL. STD. 45662-

Certified By: Bob Utz

Date: 5/30/03

R. Utz
Signature

JAY Industrial Controls

5370
555 North Wayne Avenue
Cincinnati, OH 45215
513-733-5200

Certificate of Accuracy

Customer	ISTRE
Address	13811 EAST POPLAR
City, State, Zip	GLENPOOL, OK 74033

Certification Number: 2225

	Standard	Standard	Standard	Instrument Certified
NIST Number	10113-13353			
Description	ATE-PSI			VACUUM GAUGE
Manufacturer	Ashcroft			ASHCROFT
Model Number	AQS-2			25 1009 SW 02 L.
Range	-14/+15			0 - 30 IN. HG. VACUUM
Accuracy	.25%			1 % FULL SCALE
Serial Number	10113			N / A
Date Certified	9/20/02			MAY 30, 2003

Notes:

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
IN. HG. VAC.		IN. HG.		
0.0		0.0		No Readable Error
3.0		3.0		No Readable Error
6.0		6.0		No Readable Error
9.0		9.0		No Readable Error
12.0		12.0		No Readable Error
15.0		15.0		No Readable Error
18.0		18.0		No Readable Error
21.0		21.0		No Readable Error
24.0		24.0		No Readable Error
27.0		27.0		No Readable Error

Minor Division	0.5 IN. HG.
Ambient Temperature	73 ° F.
Barometric Pressure	29.81 IN. HG.
Relative Humidity	49 %

Sales Order Number: 2009328

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.

We further certify that our calibration system complies with MIL. STD. 45662-

Certified By: Bob Utz

Signature

Date: 5/30/03

JAY Industrial Controls

5370

555 North Wayne Avenue
Cincinnati, OH 45215
513-733-5200

Certificate of Accuracy

Customer: ISTRE
Address: 13811 EAST POPLAR
City, State, Zip: GLENPOOL, OK 74033

Certification Number: 2226

	Standard	Standard	Standard	Instrument Certified
NIST Number	10113-13353			
Description	ATE-PSI			VACUUM GAUGE
Manufacturer	Ashcroft			ASHCROFT
Model Number	AQS-2			25 1009 SW 02 L.
Range	-14/+15			0 - 30 IN. HG. VACUUM
Accuracy	.25%			1 % FULL SCALE
Serial Number	10113			N / A
Date Certified	9/20/02			MAY 30, 2003

Notes:

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
IN. HG. VAC.		IN. HG.		
0.0		0.0		No Readable Error
3.0		3.0		No Readable Error
6.0		6.0		No Readable Error
9.0		9.0		No Readable Error
12.0		12.0		No Readable Error
15.0		15.0		No Readable Error
18.0		18.0		No Readable Error
21.0		21.0		No Readable Error
24.0		24.0		No Readable Error
27.0		26.5		-0.5

Minor Division	0.5 IN. HG.
Ambient Temperature	73 ° F.
Barometric Pressure	29.81 IN. HG.
Relative Humidity	49 %

Sales Order Number: 2009328

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.
We further certify that our calibration system complies with MIL. STD. 45662-

Certified By: Bob Utz

Signature

Date: 5/30/03

5370

PWT INC.
Plastic Welding Technologies
INTERNATIONAL

Fax Transmission Sheet

Date: 05/22/03 Fax #: 513-489-7208

To: PETRO ENVIROMENTAL Pages Including Cover: 3

Attn: JERRY ISTRE

From: JUSY

Phone: 800-635-6693
Fax: 530-622-2704

Subject:
CALIBRATION REPORT TO FOLLOW.

000032

6125 Enterprise Drive, #10
Diamond Springs, CA 95619

Ph: (530) 622-2791
Fax (530) 622-2704
www.plasticweldingtechnologies.com

5370

FLW SERVICE CORPORATION

1512 Fulton Place
Fremont, CA 94539
Ph: 510-651-5112 Fax: 510-651-4962
http://www.flw.com

ISO9002 REGISTERED

CERTIFICATE OF CALIBRATION

Prepared For:
PLASTIC WELDING TECHNOLOGIES
6125 ENTERPRISE DRIVE #10
DIAMOND SPRINGS CA 95619

Traceability/Job No: F16417

INSTRUMENT INFORMATION

		As Received	As Left
Inst. Descrip.: DMM	Calibration Site: In Shop		
Manufacturer: FLUKE	Date Rec: 09/27/2002		
Model: 8840A	Date of Cal.: 09/27/2002	In Tolerance	In Tolerance
Serial No.: 5126015	Next Cal. Due: 09/27/2003	Operational	Operational
Cust. ID. No.: N/A	Proc.: MC 1.1		Full Calibration
Accuracy: +-.005% DC	Calibration Result: Passed		Adjusted

Remarks:
CALIBRATED.

STANDARDS USED

ID. No.	Model No.	Manufacturer	Description	Cal Date	Due Date	Uncertainty
FRES233	5700A	FLUKE	CALIBRATOR, MUL	08/27/2002	08/27/2003	8.4PPM

TEST ROOM ENVIRONMENT

Temperature: 23.0C / 73.4 F Relative Humidity: 50.0 % Barometric Pressure: N/A in. Hg

FLW Service Corp. certifies that the above listed instrument meets or exceeds all published specifications. It has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology. Alternatively, accuracies have been derived from accepted values of natural physical constants, or have been derived by the ratio type of self-calibration techniques. This certificate may be reproduced in full. Partial reproduction may be done only with written prior consent of FLW Service Corp. All calibration activities are performed in compliance with ANSI/NCSL Z540-1, and MIL-STD-45662A.

Measurements certified by: [signature] *Date:* 9/27/2002

Title: Senior Tech

000033

FORM P370-15 JULY 97

5370

PWT INC.
Plastic Welding Technologies
INTERNATIONAL

CALIBRATION CERTIFICATE

Customer Name: THE ISTRE CO.
Tensiometer Serial Number: LOAD CELL / INDICATOR

110 Volt ☐
220 Volt ☐
LBS

Device Calibrated: S-Type load cell
Range: 0-500 lbs. Tension
Model No: M2300-500
Serial No: 126721

Readout Model No: 2840AG-24123
Readout Serial No: 10553035-149
Channel No: N/A

Calibration Apparatus:
Dead Weight system w/
Fluke Model 8840A Multimeter

W1	2	R1	810
W2	152	R2	2680
W3	302	R3	4554

Indicator reading with no load: 0

Applied Force lbs.	Output (mv):	Display reading:	Deviation Error:
2	2.425	2	0.00
52	4.296	52	0.00
102	6.168	102	0.00
152	8.040	152	0.00
202	9.909	202	0.00
252	11.776	252	0.00
302	13.657	302	0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 10 V DC

Scale Factor (1):	0.0802	Offset (1):	-63
Scale Factor (2):	0.0800	Offset (2):	-64
Break point:	2680	Calibration Check #	

Traceable to NIST Standards

***NOTE: Readout and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated readouts and load cells are not interchangeable.**

This calibration conforms to the standards set by ASTM E4.

Calibration performed by: BILL AULTZ

Signature: Bill Aultz Date: 5/21/03

000034

6125 Enterprise Drive, #10
Diamond Springs, CA 95619
800-635-6693

Ph: (530) 622-2791
Fax (530) 622-2704
www.plasticweldingtechnologies.com

5370

5/22/03
Jerry Istre/Istre Co.
513 489 ~~6787~~
7208

PWT INC.
Plastic Welding Technologies
INTERNATIONAL

CALIBRATION CERTIFICATE

Customer Name: THE ISTRE CO
Tensiometer Serial Number: LOAD CELL / INDICATOR

110 Volt ☐
220 Volt ☐
LBS

Device Calibrated: S-Type load cell
Range: 0-500 lbs. Tension
Model No: M2300-500
Serial No. 126721

Calibration Apparatus:
Dead Weight system w/
Fluke Model 8840A Multimeter

W1	2	R1	810
W2	152	R2	2680
W3	302	R3	4554

Readout Model No: 2840AG-24123
Readout Serial No: 10553035-149
Channel No: N/A

Indicator reading with no load: 0

Applied Force lbs.	Output (mv):	Display reading:	Deviation Error:
2	2.425	2	0.00
52	4.296	52	0.00
102	6.168	102	0.00
152	8.040	152	0.00
202	9.909	202	0.00
252	11.776	252	0.00
302	13.657	302	0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 10 V DC

Scale Factor (1):	0.0802	Offset (1):	-63
Scale Factor (2):	0.0800	Offset (2):	-64
Break point:	2680	Calibration Check #	

Traceable to NIST Standards

***NOTE: Readout and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated readouts and load cells are not interchangeable.**

This calibration conforms to the standards set by ASTM E4.

Calibration performed by: BILL AULTZ

Signature: Bill Aultz Date: 5/21/03

6125 Enterprise Drive. #10
Diamond Springs, CA 95619
800-635-6693

Ph: (530) 622-2791
Fax (530) 622-2704
www.plasticweldingtechnologies.com

ELECTRICAL LEAK DETECTION WORK PLANS

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV2	SUBMITTAL NO. 20104-PHIV2-02770-011	REV.: 1	DATE: 07/01/03	Page 1 of 15

FROM:
Leak Location Services, Inc.
16124 University Oak
San Antonio, TX 78249
SIGNATURE: Dave Hall

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Teresa Schwab DATE: 7/2/03

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHIV2-02770-011	1						X			Cell 2 and Cell 6 Electrical Leak Detection Testing Work Plan		X		02770-1.04F1	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	6D				
BILL ZEBICK	6D				
Reinard Friske	~~52-7~~ 64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

220000

RECEIVED BY: Summary for CV DATE: 7/16/03
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

5370

ORIGINAL

ES-F-4955
Rev. 3: 05/14/1999, CT-2.4.2

LEAK LOCATION SERVICES, INC.
16124 UNIVERSITY OAK • SAN ANTONIO, TEXAS 78249 • (210) 408-1241 / FAX (210) 408-1242

5370

TEST PLAN FOR ELECTRICAL LEAK DETECTION SURVEY OF OSDF LANDFILL CELL 6 PRIMARY GEOMEMBRANE AND CELL 2 FINAL COVER GEOMEMBRANE

July 1, 2003 - Revision 1

I. INTRODUCTION

This work plan is written for conducting electrical leak detection surveys of landfill Cell 6 primary liner and Cell 2 landfill cap located at the Fernald site in accordance with Section 02770 Part 1.04G of the project specifications and the scope of work for solicitation number F03PB09282. This test plan is based on the assumption that Fluor Fernald, Inc. (Contractor) will provide specific support and labor as described in this plan.

II. WORK PLAN

A. General

The leak detection survey will be conducted on the bare primary geomembrane after the geomembrane installation and prior to covering the primary liner with geotextile and the soil aggregate. A one- or two-person survey crew from LLSI will conduct the survey work. The Contractor will provide the assistance of two supervised laborers to help with the survey.

B. Qualifications and Experience

Leak Location Services, Inc. is the world leader in electrical leak location testing with more than 50 years of combined experience in the subject work. The principals of LLSI began the development of the electrical leak location method at Southwest Research Institute in 1981 with the first commercial leak location survey preformed in 1985. Leak Location Services, Inc. was formed in 1992 as a Texas corporation. In addition:

- LLSI owns the exclusive patent rights on the electrical leak location method covered by United States patents 4,740,757, 4,950,374, 4,947,470, 5,661,406, 6,331,778B1 with an additional foreign patent;

- LLSI has successfully used the electrical leak location method on more than 500 projects world wide including projects at the Fernald site, North America, South America, Europe, The Middle East, The Far East, and Asia;

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Shumay for CV Date: 7/16/03

www.leaklocationservices.com results@leaklocationservices.com

76896

- LLSI has tested more than 85 million square feet of geomembrane. This includes double and single-lined landfills, ponds, lagoons, tanks, vaults, and landfill caps;

- LLSI personnel have surveyed over 7.26 million square feet of bare liner on sixteen separate projects. Table 1 included in the Appendix presents a list of the bare liner surveys performed by LLSI during the past four years;

- Testing has included smooth, textured, and reinforced geomembranes, including HDPE, LLDPE, PVC, XR-5, Hypalon, and Polypropylene in most of the various thicknesses; and

- The principals of LLSI have published more than 25 technical papers about the leak location method and applications.

Currently, all leak location supervisors and senior technicians have a minimum of three years of geomembrane leak location experience including a minimum of 1,000,000 square feet of electrical leak detection testing experience. All technicians currently have a minimum of 40 hours of training with a minimum of 250,000 square feet of liner testing experience. In addition, all LLSI personnel have 40-hour HAZWOPER training pursuant to 29 CFR 1910.120, Mine Safety and Health Administration (MSHA) training, and confined space entry training.

C. Project Personnel

Mr. Martin Morales will function as the lead supervisor for this project and Mr. Herman Flores will function as assistant supervisor. We have also included the résumé of Mr. Bryan Bergemann and Mr. Lance Simmons as an alternate supervisors. A brief résumé of the key field personnel that will perform the survey work are listed below:

MARTIN MORALES

Mr. Morales is a specialist in field applications of the electrical leak location method for geomembrane liners. He has a Bachelor Degree in Electronic Engineering from De Vry Institute. He has five years experience in geomembrane leak location including leading crews for approximately 100 geomembrane leak location projects. These projects have included geomembrane liners for liquid impoundments, storage tanks, landfills, landfill caps, and bare liner surveys. He is thoroughly familiar with the work, including field applications, and equipment construction, troubleshooting, and maintenance.

Mr. Morales is trained and qualified for hazardous waste operations, confined space entry, and work at surface mines.

HERMAN J. FLORES

Mr. Herman Flores is a Project Leader at Leak Location Services, Inc. He has a BS degree in Industrial Technology from Abilene Christian University. He has two years of experience

in field applications of the electrical leak location testing method. Mr. Flores has worked on approximately 60 projects, including leading several projects. He is particularly experienced in surveys of geomembranes covered with earth materials. He is responsible for writing proposals and reports and is thoroughly knowledgeable in the electrical leak location method.

Mr. Flores has completed training for hazardous waste operation per 29 CFR 1910.120. He has completed training on the hazards of hydrogen sulfide, the protective and respiratory equipment needed, and procedures to follow when working around hydrogen sulfide. He has received MSHA training for work at surface mines.

BRYAN BERGEMANN

Mr. Bergemann is a Senior Leak Location Technician with eight years of experience in field applications of the electrical leak location method for geomembrane liners. His experience includes leading crews for approximately 120 geomembrane leak location projects. These projects have included geomembrane liners for liquid impoundments, storage tanks, landfills, and landfill caps, and bare liner surveys. He is thoroughly familiar with the work, including field applications, and equipment construction, troubleshooting, and maintenance.

Mr. Bergemann is trained and qualified for hazardous waste operations, confined space entry, and work at surface mines.

LANCE E. SIMMONS

Mr. Simmons is a Project Leader at Leak Location Services, Inc. He has a BS degree in Geography with a concentration in resource and environmental studies from Southwest Texas State University. He has two years of experience in field applications of the electrical leak location testing method. Mr. Simmons has worked on approximately 60 projects, including leading several projects. Mr. Simmons is particularly experienced in surveys of geomembranes covered with earth materials. He is responsible for writing proposals and reports and is thoroughly knowledgeable in the electrical leak location method.

Mr. Simmons has completed training for hazardous waste operation per 29 CFR 1910.120. He has completed training on the hazards of Hydrogen Sulfide, the protective and respiratory equipment needed, and procedures to follow when working around hydrogen sulfide. He has received MSHA training for work at surface mines.

ROBERT STEPHENS III

Mr. Stephens has a B.A. degree in Mechanical Engineering Technology from Texas A&M University and has worked as a project leader at LLSI since April 1, 2002. He has experience in leak location projects with soil and water covering the geomembrane and bare liner surveys.

Mr. Stephens has received training for hazardous waste operation per 29 CFR 1910.120(e), confined space entry, and MSHA training for work at surface mines.

EDGAR BARRAZA

Mr. Barraza has an Associate of Applied Science in Electronic Engineering Technology from Hallmark Institute and has been employed by LLSI since June 7, 2002. He has experience in leak location projects with soil and water covering the geomembrane and bare liner surveys. Mr. Barraza has received training for hazardous waste operation per 29 CFR 1910.120(e) and has received training MSHA training for work at surface mines.

THANE HEFLEY

Mr. Hefley has an Associate of Applied Science in Electronic Engineering Technology from Hallmark Institute and has been employed at LLSI since July 1, 2002. He has experience in leak location projects with soil and water covering the geomembrane and bare liner surveys. He has received training for hazardous waste operation per 29 CFR 1910.120(e) and has received training MSHA training for work at surface mines.

D. Electrical Leak Detection Work Plan

1. Description of Method

The electrical leak location method is to detect electrical paths through the liner. The outputs of a specialized d.c. power supply are connected to one electrode placed in the electrically conducting material covering the liner and to a second electrode placed in the electrically conducting material located beneath the liner. Electrical current flowing through the leaks in the liner produces localized anomalous areas of high current density near the leaks. These areas are located by making electrical potential measurement scans on the geomembrane material (liner).

A variation of the electrical method is the water puddle test for bare liners. This method detects electrical current flowing through holes in the geomembrane liner using a small amount of water that is put in contact with the liner. A squeegee, sponge, or a water stream is used to push the water over the liner. A low voltage electrical power supply is connected to earth ground and to the leak detector. When a hole in the liner is encountered, electrical current will flow through water in the leak contacting earth ground. The current is monitored using an electronic detector that converts the increase in the current to an audible tone indication. This method does not require the liner to be flooded with water. However, the liner under test must be in complete contact with the supporting sub-grade. Therefore, liner wrinkles and liner trampoline areas cannot be adequately tested.

2. Test Plan

The work is proposed to be conducted on two mobilizations by a one- or two-person leak location survey crew with the assistance of two supervised laborers provided by the Contractor. For the Cell 2 final cover geomembrane, LLSI will mobilize a one- or two-person field crew to the site after the geomembrane is completely installed and LLSI receives written notification from Fluor Fernald, Inc. to proceed. The survey will require four consecutive days to complete.

LLSI will mobilize a second time after the Cell 6 primary geomembrane is completely installed and LLSI receives written notification from Fluor Fernald, Inc. to start the survey work. The survey of the Cell 6 primary geomembrane will require four consecutive days to complete.

The survey will be conducted on the bare geomembrane using the water puddle method. This method does not require the entire liner to be flooded with water. However, the depth of the water in front of the squeegee will be 0.1 inches or greater. Therefore, only the area immediately in front of the squeegee will temporarily be covered with water. The liner area will be systematically scanned with the sensor. When a leak is detected, it will be located and marked for repair. Leak location tests cannot be conducted if the water is frozen, if it is raining, or if the liner is completely wet.

The survey of the geomembrane is proposed to be conducted during the early morning hours when the temperature is less than 83.5 degrees Fahrenheit WBGT. This will minimize the problems of liner wrinkles, folds, or trampolining and maximize the survey sensitivity. In addition, by working in the cooler hours heat stress for the leak location survey crew will be minimized.

3. Voltage and Grounding Requirements

The low voltage DC power supply used for leak location surveys is self contained and does not require an outside power source. Therefore, there are no requirements for a portable motor generator (110 VAC, 5 A) or commercial AC power.

The method requires that a temporary ground electrode be placed in contact with the GCL located below geomembrane under test. Therefore, the Contractor must provide temporary access to the primary GCL at several locations near the edge of geomembrane. The temporary access to the GCL will be available for the duration of the leak location survey. As an alternative, LLSI can provide permanent grounding electrodes or several long continuous bare copper wires to be placed in contact with the non-woven side of the primary GCL located between the primary and secondary geomembranes of Cell 6 and below the geomembrane of Cell 2 landfill cap. The permanent grounding electrodes are installed by the Contractor prior to covering the GCL with the geomembrane.

4. Water Management

One factor for accommodating the simultaneous installation of the liner system and the bare liner testing is the ability to manage the water used for the test so it does not flow into the area where the liner crew is currently installing the liner. This will require the leak location field crew to survey no closer than 100 feet from the liner installers. In addition, the edges of the liner must be temporarily elevated to prevent the water from running off of the liner material and contacting the GCL or the underlying LDS drainage layer. The water that pools on top of the liner material must be removed. The Contractor shall be responsible for removing the water and elevating the edges of liner material. After the liner is tested for leaks and the test results have been

accepted and approved by Fluor Fernald and the CQC Consultant, the liner installers can start installing the subsequent layers of the liner system in the areas that have been tested if this does not interfere with the water hoses and temporary piping used for the bare liner test.

a. Cell 6 Primary Geomembrane

For the Cell 6 Primary Geomembrane, the edges of the liner will not need to be elevated because the testing will be conducted after all the geomembrane is installed. If the water pools become excessive, a small trash pump can be used to remove the water from the landfill cell.

b. Cell 2 Final Cover Geomembrane

For the Cell 2 Final Cover Geomembrane, the lower edges of the liner will need to be elevated to prevent the water from running off the landfill cap and contacting the surrounding soil subgrade. The edges can be temporarily elevated by placing sandbags under the edges of the liner at the bottom of the slopes. The water will have to be removed as it accumulates in the temporary trough created at the base of the slope. This can be done using a small trash pump or by removing a couple of sandbags and draining the water onto the soil subgrade.

5. Safe Work Practices

State and federal law, as well as LLSI company policy, make the safety and health of our employees the first consideration in operating our business. Safety and health in our business must be a part of every operation, and every employee's responsibility at all levels. LLSI intends to comply with all laws concerning the operation of the business and the health and safety of our employees and the public. No employee is required to work at a job known to be unsafe or dangerous to their health. Following the LLSI safety plan, reporting dangerous conditions, and controlling workplace hazards is a condition of employment at LLSI.

LLSI will provide personnel that have current training certificates for working at the Fluor Fernald, Inc. project site. These training certificates are valid until September 24, 2003. Therefore, according to the testing schedule outlined in section 2.0.B (2), (4) of the Scope of Work, the work can be conducted without any further training. If any additional health and safety training is required this will be at no cost to LLSI and will be provided by Fluor Fernald, Inc. or their designated representative. The work will be performed utilizing a one- or two-person field crew from LLSI with the help of two supervised laborers.

Each survey operator provided by LLSI meets the minimum qualifications stated in section 4.0.A.1.c of the Scope of Work. All LLSI personnel are 40 hour HAZWOPER trained and Mine Safety Health and Administration (MSHA) trained. An ELD testing supervisor and ELD survey technician will be provided. One of the ELD personnel will function as the LLSI on-site Health and Safety representative. In addition, LLSI personnel shall follow the safe work practices detailed in the Construction Traveler document numbers 20104-FLR.3.89.06C and 20104-FLR.3.89.09C provided for this scope of work. All equipment that will be used in the field by LLSI

personnel for the performance of this work shall be inspected and approved prior to use by Fluor Fernald.

LLSI safety policy is that accident prevention shall be considered of primary importance in all phases of operation and administration. Zero injuries and illnesses is our goal. Each supervisor must make the safety of all employees an integral part of his or her regular management function. Each employee has the duty to accept and follow established safety regulations and procedures. Every effort will be made to provide adequate training to all LLSI employees. A complete copy of the LLSI safety plan is available at our corporate office.

6. Leak Location Quality Control Procedures

This Work Plan requires the use of prescribed checklists (See Appendix) when conducting a leak location survey. Each item on the checklist will be initialed and dated by the project leader or by a knowledgeable person designated by the project leader. A sample check list is located in the Appendix.

7. Scheduling

LLSI will coordinate the work with the Fluor Fernald, Inc. project manager and will mobilize to the project site upon written notification from the Fluor Fernald, Inc. project manager. The testing of bare liner will start immediately following the mobilization, required set-up, and safety briefing. The work will require approximately eight days on two separate mobilizations.

E. Reporting

The results of the leak detection testing will be reported to a designated field representative of Fluor Fernald, Inc. during the daily progress of the work. The Contractor will be responsible for repairing the leaks while LLSI is on-site. A list of the locations of the leaks found will be submitted to the representative after completion of all leak location field work before the survey crew leaves the site. After the initial repairs, the repaired leaks will be tested. A letter report documenting the work and results of the surveys will be prepared and submitted within seven days after completion of the field work.

III. PREPARATIONS AND SUPPORT REQUIRED FROM CONTRACTOR

Fluor Fernald, Inc. will be responsible for preparing the landfill for the survey and for repairing the damaged liner. Other support to be provided by Fluor Fernald, Inc.:

- Provide two supervised laborers with equipment to help with the leak surveys. This includes moving water hoses and piping, moving sand bags, keeping the survey area clean, and other tasks;

- Provide a water truck with pump, water, and driver. The water truck must provide a minimum of 6 gallons per minute at a pressure of 50 psi and have a capacity of at least 2000 gallons;

- Temporarily elevate the edges of the liner to prevent the water from contacting the primary GCL and secondary drainage layer;

- Provide temporary access to the GCL at several different locations or install permanent ground electrodes;

- Removing excessive water from the liner; and

- All labor and equipment support shall be available during the hours and schedule designated by LLSI, including working through weekends if needed.

IV. QUALITY ASSURANCE

Leak Location Services, Inc. will be required to complete the "Water Puddle Survey Checklist" as part of the testing set-up procedure. In addition, the "Water Puddle Survey Checklist" will be completed whenever the ground connection is moved or otherwise re-established.

APPENDIX

Leak Location Services, Inc.

Safety Check List

(Note: This form is to be completed by the survey team leader before starting the survey)

Date: _____

Site Name: _____

Survey Personnel: _____

Your Name: _____

(Check all that apply. If not checked explain)

- ❑ Grounded structures insulated (if applicable).
- ❑ Hazardous locations identified and barricaded.
- ❑ Site specific safety briefing completed.
- ❑ Location of nearest telephone:
  Emergency telephone number:
  Hospital:
  Plant safety office:
  EMS:
  Fire:
- ❑ Location of nearest shower and eye wash station identified (if applicable).
- ❑ Location of nearest first aid station identified.
- ❑ Location of nearest emergency facility located.

Notes:

Leak Location Services, Inc.

Water Puddle Survey Check List

(Note: This form is to be completed **daily** by the survey team leader before starting the survey.)

Date: _____ Site Name: _____

Start Time: _____ Stop Time: _____

Survey Personnel: _____ _____

_____ _____

Your Name: _____ Panels Surveyed: _____

Leaks Located: _____ Leaks Repaired: _____

Support Required for following day: _____

Note: Describe all leaks located. Document size, shape, and type. (i.e. puncture, cut, hole, seam) Attach a drawing to this daily log showing location of any leaks located and the area surveyed.

(Check all that apply. If not checked explain.)

- ❑ Power supply positive connected to soil or LDZ electrode.
- ❑ GFCI connected to power supply and tested.
- ❑ Check oil level in generator (if applicable).
- ❑ Check survey equipment for:
  - ❑ Hose for leaks.
  - ❑ Connection tight.
  - ❑ Worn squeegee blade.
  - ❑ Wire for cuts or breaks.
  - ❑ Wire connectors tight.
  - ❑ Wiring polarity.
- ❑ Check A.C. line voltage and record in log book.

Turn Power to On

- ❑ Test squeegee probe for correct polarity with reference to ground.
- ❑ Test squeegee probe sensitivity using artificial leak basin or scrape material.

Leak Location Services, Inc.

Report Check List

(Note: This form is to be completed by the survey team leader.)

Site Name: _____ Site Location: _____

Client Name: _____ Your Name: _____

Start Date: _____ End Date: _____ Total Leaks: _____

Area of Survey: _____ Survey Grid Spacing: _____ ft. by _____ ft.

Type of Facility: ❑ Landfill ❑ Pond ❑ Tank ❑ Other _____

Type of Liner: ❑ HDPE ❑ PP ❑ Hypalon ❑ PVC

❑ Smooth ❑ Textured ❑ Reinforced ❑ Other _____

Liner Thickness: ❑ 36-mil ❑ 45-mil ❑ 60-mil ❑ 80-mil ❑ 100-mil

Liner Manufacturer: ❑ Serrot ❑ GSE ❑ Polyflex ❑ AGRU

❑ Other _____

Double geomembrane-lined: ❑ yes ❑ no

Primary/Secondary welded together: ❑ yes ❑ no

Primary liner covered by: ❑ geocomposite ❑ geotextile ❑ Drainage material

❑ Bare liner ❑ Other _____

Drainage material: ❑ gravel (size _____) ❑ sand ❑ soil

❑ Other _____

LDZ has: ❑ GCL ❑ geocomposite ❑ geonet ❑ sand/gravel

❑ Other _____

Side slope riser: ❑ yes ❑ no Gravity drain: ❑ yes ❑ no

Sketch of liner profile on back of sheet: ❑ yes ❑ no

Table 1. List of Bare Liner Surveys Performed by LLSI

No.	Site Name	Location	Facility Type	Area (sq. ft.)	Liner Type	Start Complete	Survey Personnel
1	JRS	Caldwell, ID	Pond	52,000	XR-5	08/19/1999 09/13/1999	B. Bergemann and A. Adames
2	Phelps-Dodge Corp.	Bagdad, AZ	Tank	800	HDPE Stud	01/18/2000 01/26/2000	G. Darilek
3	Griffith Energy Corp.	Kingman, AZ	Pond	158,000	60-mil HDPE	08/01/2000 08/07/2000	M. Morales, G. Darilek and A. Cheung
4	Delaware Solid Waste Authority - Cell 4	Georgetown, DE	Landfill	871,200	60-mil PP	02/27/2001 10/02/2001	B. Bergemann and H. Hernandez
5	Molly Corporation	Mountain Pass, CA	Pond	575,000	60-mil HDPE	04/07/2001 04/11/2001	G. Darilek, M. Morales and H. Hernandez
6	Frederick County DEP - Cell 2A Area B	Frederick, MD	Landfill	556,280	60-mil HDPE	06/01/2001 08/09/2001	B. Bergemann and H. Flores
7	Bell Carter Co.	Corning, CA	Pond	250,000	60-mil HDPE	06/07/2001 06/09/2001	B. Bergemann and H. Hernandez
8	Fernald OSDF Cell 1	Hamilton, OH	Cap	326,700	60-mil HDPE	06/25/2001 08/14/2001	M. Morales and H. Hernandez
9	Arizona Power Corp.	Benson, AZ	Pond	925,650	60-mil HDPE	07/09/2001 07/14/2001	M. Morales and G. Darilek

10	IBP, Inc.	Garden City, KS	Pond	392,000	60-mil HDPE	10/21/2001 10/28/2001	B. Bergemann and L. Simmons
11	PPL Sundance Energy	Casa Grande, AZ	Pond	338,000	60-mil HDPE	05/08/2002 05/18/2002	B. Bergemann
12	Fluor Fernald, Inc.	Hamilton, OH	Cell 4 & 5	650,000	80-mil Textured HDPE	09/24/2002 09/28/2002 and 10/18/2002 10/24/2002	M. Morales and H. Flores
13	IBP, Inc.	Garden City, KS	Pond	587,000	100-mil HDPE	10/15/2002 10/21/2002	B. Bergemann and T. Hefley
14	Shiprock UMTRA	Shiprock, NM	Pond	479,160	45-mil RPP	11/16/2002	B. Bergemann and T. Hefley
15	KEMAPCO Project	Aqaba, Jordan	Pond	408,880	60-mil HDPE	01/13/2003 01/14/2003	D. Laine and B. Bergemann
16	Escalante Station	Prewitt, NM	Pond	696,960	60-mil HDPE	04/15/2003 04/18/2003	M. Morales, H. Flores, L. Simmons, T. Hefley, E. Barraza and R. Stephens

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.:	CONTRACT NO: PHV	SUBMITTAL NO. 20105-PHV-02770-011	REV: 0	Date: 10/03/03	of 18

FROM:
Leak Location Services, Inc.
16124 University Oak
San Antonio, Texas 78249

SIGNATURE: Daren L. Laine

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 10/7/03

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION A	B	C
7	PHV-02770-011A	0						X			Work Plan for ELD Testing		X		02770-1.04G	X		
											of Cell 6 Primary Geomembrane							
											After Placement of LCS Gravel							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
Chuck Van Arsdale (Approver)	64				
Gregg Johnson	60				
Bill Zebick	60				
Reinard Friske	~~52-1~~ 60				
Kwasi Badu-Tweneboah - Geosyntec	38				
Don Pfister (DOE)	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

RECEIVED BY: Chuck Van Arsdale DATE: 10/10/03

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

000052

ORIGINAL

5370

FS-F-4955
Rev. 3: 05/14/1999, CT-2.4.2

LEAK LOCATION SERVICES, INC.

16124 UNIVERSITY OAK • SAN ANTONIO, TEXAS 78249 • (210) 408-1241 / FAX (210) 408-1242

TEST PLAN FOR ELECTRICAL LEAK DETECTION SURVEY OF OSDF LANDFILL CELL 6 PRIMARY GEOMEMBRANE COVERED WITH THE LCS GRAVEL

October 2003 - Revision 0

I. INTRODUCTION

This work plan is written for conducting a leak detection survey of landfill Cell 6 primary geomembrane after the geomembrane is covered with the LCS drainage layer. This test plan is based on the assumption that Fluor Fernald, Inc. (Contractor) will provide specific support and labor as described in this plan.

II. WORK PLAN

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: [illegible] Date: 10/9/03
10
CJ

A. General

The leak detection survey will be conducted on the primary geomembrane after the geomembrane is covered with LCS drainage layer and before placement of the geotextile filter and subsequent protective layers. A two person survey crew from LLSI will conduct the survey work. The Contractor will provide the assistance of two supervised laborers to help with the survey.

B. Qualifications and Experience

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Leak Location Services, Inc. is the world leader in electrical leak location testing with more than 50 years of combined experience in the subject work. The principals of LLSI began the development of the electrical leak location method at Southwest Research Institute in 1981 with the first commercial leak location survey preformed in 1985. Leak Location Services, Inc. was formed in 1992 as a Texas corporation. In addition:

- LLSI owns the exclusive patent rights on the electrical leak location method covered by United States patents 4,740,757, 4,950,374, 4,947,470, 5,661,406, 6,331,778B1 with an additional foreign patent;
- LLSI has successfully used the electrical leak location method on more than 500 projects world wide including projects at the Fernald site, North America, South America, Europe, The Middle East, The Far East, and Asia;
- LLSI has tested more than 85 million square feet of geomembrane. This includes double and single-lined landfills, ponds, lagoons, tanks, vaults, and landfill caps;

- LLSI personnel have surveyed over 7.26 million square feet of bare liner on sixteen separate projects. Table 1 included in the Appendix presents a list of the bare liner surveys performed by LLSI during the past four years.

- Testing has included smooth, textured, and reinforced geomembranes. Including HDPE, LLDPE, PVC, XR-5, Hypalon, and Polypropylene in most of the various thicknesses; and

- The principals of LLSI have published more than 25 technical papers about the leak location method and applications.

Currently, all leak location supervisors and senior technicians have a minimum of three years of geomembrane leak location experience including a minimum of 1,000,000 square feet of electrical leak detection testing experience. All technicians currently have a minimum of 40 hours of training with a minimum of 250,000 square feet of liner testing experience. In addition, all LLSI personnel have 40-hour HASWOPER training pursuant to 29 CFR 1910.120, Mine Safety and Health Administration (MSHA) training, and confined space entry training.

C. Project Personnel

Mr. Martin Morales will function as the lead field supervisor for this project. We have also included the résumés of additional key field personnel that will perform the survey work.

MARTIN MORALES

Mr. Morales is a specialist in field applications of the electrical leak location method for geomembrane liners. He has a Bachelor Degree in Electronic Engineering from De Vry Institute. He has four years experience in geomembrane leak location including leading crews for approximately 70 geomembrane leak location projects. These projects have included geomembrane liners for liquid impoundments, storage tanks, landfills, and landfill caps. He is thoroughly familiar with the work, including field applications, and equipment construction, troubleshooting, and maintenance.

Mr. Morales is trained and qualified for hazardous waste operations, confined space entry, and work at surface mines.

HERMAN J. FLORES

Mr. Herman Flores is a Project Leader at Leak Location Services, Inc. He has a BS degree in Industrial Technology from Abilene Christian University. He has one year of experience in field applications of the electrical leak location testing method. Mr. Flores has worked on approximately 60 projects, including leading several projects. He is particularly experienced in surveys of geomembranes covered with earth materials. He is responsible for writing proposals and reports and is thoroughly knowledgeable in the electrical leak location method.

Mr. Flores has completed training for hazardous waste operation per 29 CFR 1910.120. He has completed training on the hazards of hydrogen sulfide, the protective and respiratory equipment needed, and procedures to follow when working around hydrogen sulfide. He has received MSHA training for work at surface mines.

BRYAN BERGEMANN

Mr. Bergemann is a Senior Leak Location Technician with seven years of experience in field applications of the electrical leak location method for geomembrane liners. His experience includes leading crews for approximately 120 geomembrane leak location projects. These projects have included geomembrane liners for liquid impoundments, storage tanks, landfills, and landfill caps. He is thoroughly familiar with the work, including field applications, and equipment construction, troubleshooting, and maintenance.

Mr. Bergemann is trained and qualified for hazardous waste operations, confined space entry, and work at surface mines.

EDGAR BARRAZA

Mr. Barraza has an Associate of Applied Science in Electronic Engineering Technology from Hallmark Institute. Mr. Barraza has experience in leak location projects with soil or water covering the geomembrane and bare liner surveys. He has worked on several landfill surveys where the landfill was lined with a double-composite liner system.

Mr. Barraza has completed training for hazardous waste operation per 29 CFR 1910.120. He has completed training on the hazards of Hydrogen Sulfide, the protective and respiratory equipment needed, and procedures to follow when working around hydrogen sulfide. Mr. Barraza has received MSHA training for work at surface mines.

D. Electrical Leak Detection Work Plan

1. Description of Method

The electrical leak location method is to detect electrical paths through the geomembrane. A voltage is connected to one electrode placed in the electrically conducting material covering the geomembrane and to a second electrode placed in the electrically conducting material located beneath the geomembrane. Electrical current flowing through the leaks in the liner produces localized anomalous areas of high current density near the leaks. These areas are located by making electrical potential measurement scans on the geomembrane material (liner).

2. Surveys on Earth Materials

Surveys with earth materials covering the geomembrane liner are conducted by making point-by-point potential measurements on the moist surface of the earth materials with special electrodes and storing the measurements in a portable digital data acquisition system. The

potential readings are made using dipole measurements or pole measurements. The data is downloaded in the field to a computer for storage and plotting. When a suspect area is located, manual measurements are made to further localize the position of the leak.

3. Test Plan

The work is proposed to be conducted on one mobilization by a two-person leak location survey crew from LLSI with the assistance of two supervised laborers provided by the Contractor. The survey will require approximately three consecutive days to complete.

A performance test will be utilized for determining the survey line spacing and evaluating sensitivity for the survey on the soil covered geomembrane. An artificial test leak will be used to demonstrate equipment operation. An artificial leak is an electrical simulation of an actual leak through the geomembrane. The artificial leak consists of a metal electrode with the same surface area as the leak that is required to be located. The artificial leak is connected to an insulated wire and placed on top of the geotextile cushion located above the geomembrane. The area surrounding the artificial leak is wetted with approximately one-gallon of water and then covered with the 12-inches of LCS drainage material. The opposite end of the insulated wire that is connected to an artificial leak is placed in contact with the primary gcl.

Leak location measurements are made and recorded along closely-spaced parallel lines in the vicinity of the artificial leak and in an area at least 50 feet by 50 feet centered over the artificial leak. This data is examined in accordance to Appendix A to determine on which survey lines the artificial leak is reliably detected. The horizontal distance from the artificial leak to the farthest survey line that the leak was reliably detected on is define as the leak detection distance. The leak location survey will be performed so that the survey line spacing does not exceed the leak detection distance as defined above.

4. Voltage and Electrical Safety

A 320 VDC isolated power supply is used to impress a voltage across the primary geomembrane for this survey method. The power supply operates on 120 VAC with a 5 amp circuit from a portable motor generator or commercial AC power. A ground fault circuit interrupter is used inline with the AC power to minimize electrical shock hazard.

In addition, the electrical shock hazard is further reduced because the two outputs of the power supply are isolated from each other by the geomembrane. Therefore, electrical current is limited to flowing through holes in the geomembrane which provides an additional safety factor. Direct contact to any holes in the geomembrane is prevented by the 12-inches of LCS drainage material and the geotextile cushion placed over the geomembrane.

To further reduce the potential for electrical shock the following site controls will be implemented during the leak location survey. They are:

- At the first daily morning safety meeting before starting the survey work, LLSI will brief site personnel on the hazards and safety procedures that will be present and implemented during the survey process;

- The position of the source and return electrodes will be flagged with caution warning tape for a five-foot distance surrounding the electrodes;

- Only LLSI trained or LLSI escorted personnel will be allowed on the LCS gravel when the power supply is energized. The power supply is energized when the red warning light is flashing;

- Fluor Fernald shall provide "Restricted Access" or "Do Not Enter" signs that will be posted at strategic access points surrounding the landfill cell by Fluor Fernald as directed by the LLSI site supervisor;

- A safety watch will be stationed at the power supply when the power supply is energized. The power supply will be turned off if unauthorized personnel enter the landfill cell;

- Two-way radio communication will be maintained between the power supply safety watch and the LLSI site supervisor;

- Excavation of leaks will not be allowed unless the power supply is de-energized or the excavation is supervised by LLSI personnel; and

- All leak excavations in the LCS gravel will be flagged with caution tape and only LLSI or authorized personnel accompanied by LLSI will be allowed in the leak excavation when the power supply is energized.

5. Water Management

To detect a leak in the primary geomembrane, some moisture must exist in the leak and the leak must be in contact with material above and below the geomembrane. Under most conditions, adequate moisture will be present in the materials to conduct an effective survey. Adequate moisture is defined as greater than one percent moisture content in materials above the geomembrane. However, to ensure that there is adequate moisture to conduct the survey one or more of the following must occur at least 24 hours prior to the start of the survey:

a. Rainfall of 0.1 inches or greater on the installed bare geomembrane and geotextile cushion; or

b. Uniformly wetting the bare geomembrane and geotextile cushion with an equivalent of 0.1 inches (2,215 gallons of water per acre); or

c. Uniformly wetting the earth materials covering the geomembrane with water to field capacity.

5. Safe Work Practices

State and federal law, as well as LLSI company policy, make the safety and health of our employees the first consideration in operating our business. Safety and health in our business must be a part of every operation, and ev. ry employee's responsibility at all levels. LLSI intends to comply with all laws concerning the operation of the business and the health and safety of our employees and the public. No employee is required to work at a job known to be unsafe or dangerous to their health. Following the LLSI safety plan, reporting dangerous conditions, and controlling workplace hazards is a condition of employment at LLSI.

Each survey operator provided by LLSI meets the minimum qualifications stated in section 4.0.A.1.c of the Scope of Work. All LLSI personnel are 40 hour HAZWOPER trained and Mine Safety Health and Administration (MSHA) trained. An ELD testing supervisor and ELD survey technician will be provided. One of the ELD personnel will function as the LLSI on-site Health and Safety representative. In addition, LLSI personnel shall follow the safe work practices detailed in the Construction Traveler document numbers 20104-FLR.3.89.06C and 20104-FLR.3.89.09C provided for this scope of work. All equipment that will be used in the field by LLSI personnel for the performance of this work shall be inspected and approved prior to use by Fluor Fernald.

LLSI safety policy is that accident prevention shall be considered of primary importance in all phases of operation and administration. Zero injuries and illnesses is our goal. Each supervisor must make the safety of all employees an integral part of his or her regular management function. Each employee has the duty to accept and follow established safety regulations and procedures. Every effort will be made to provide adequate training to all LLSI employees. A complete copy of the LLSI safety plan is available at our corporate office.

6. Leak Location Quality Control Procedures

The QA plan is to use prescribed checklists (See Appendix) when conducting a leak location survey. Each item on the checklist will be initialed and dated by the project leader or by a knowledgeable person designated by the project leader. A sample check list is located in the Appendix.

7. Scheduling

LLSI will coordinate the work with the Fluor Fernald, Inc. project manager and will mobilize to the project site upon written notification from the Fluor Fernald, Inc. project manager. The testing of primary geomembrane covered with the LCS drainage material will start

immediately following the mobilization, required set-up, and safety briefing. The work will require approximately three consecutive days on one mobilizations.

E. Reporting

The results of the leak detection testing will be reported to a designated field representative of the Fluor Fernald, Inc. during the daily progress of the work. The Contractor will be responsible for repairing the leaks while LLSI is on-site. A list of the locations of the leaks found will be submitted to the representative after completion of all leak location field work before the survey crew leaves the site. A letter report documenting the work and results of the surveys will be prepared and submitted within seven days after completion of the field work.

III. PREPARATIONS AND SUPPORT REQUIRED FROM CONTRACTOR

Fluor Fernald, Inc. will be responsible for preparing landfill cell 6 primary geomembrane for the survey and for repairing any damage located. Other support to be provided by the Fluor Fernald, Inc. includes:

- Provide a source of AC power (110 VAC, 5 A);
- Providing temporary access to the primary gcl located between the primary and secondary geomembranes.
- Insuring the geotextile cushion is saturated with water. To detect a leak, moisture must exist in the leak. Therefore, the geotextile and drainage material must be saturated to field capacity with water prior to conducting the leak location survey.
- Providing two supervised laborers with equipment to help lay out the survey string lines;
- Provide one supervised laborers to act as the power supply safety watch;
- Provide a pair of portable radios for the safety watch and the LLSI site Supervisor;
- Uncovering, exposing, and repairing any leaks found;
- If required, providing two supervised laborers to remove dry gravel along the survey lines or wet the survey area with water if necessary for maintaining a good electrical contact with the LCS drainage material;
- If required, providing water, a water truck and driver, for wetting the survey area;
- Removing all standing water from the surface of the drainage gravel; and

- Providing electrical isolation at the perimeter of the cell section under test. Electrical isolation is achieved by leaving approximately a one-foot wide area of geomembrane and geotextile cushion exposed around the perimeter edge of the landfill.

IV. QUALITY ASSURANCE

Leak Location Services, Inc. will be required to complete the "LLSI Soil Survey Checklist" as part of the testing set-up procedure. In addition, equipment operation and detection sensitivity will be verified and documented at the beginning of the survey. The "Performance Verification Test for Soil Surveys" found in Appendix A will be followed and completed prior to conducting the leak location survey of the primary geomembrane.

APPENDIX

Leak Location Services, Inc.

Safety Check List

(Note: This form is to be completed by the survey team leader before starting the survey)

Date: _____

Site Name: _____

Survey Personnel: _____

Your Name: _____

(Check all that apply. If not checked explain)

- ❑ Grounded structures insulated (if applicable).
- ❑ Hazardous locations identified and barricaded (includes source and sink electrode positions).
- ❑ Site specific safety briefing completed.
- ❑ Location of nearest telephone:
  Emergency telephone number:
  Hospital:
  Plant safety office:
  EMS:
  Fire:
- ❑ Location of nearest shower and eye wash station identified (if applicable).
- ❑ Location of nearest first aid station identified.
- ❑ Location of nearest emergency facility located.

Notes:

Leak Location Services, Inc.

Survey Check List

(Note: This form is to be completed **daily** by the survey team leader before starting the survey.)

Date: _____ Site Name: _____

Start Time: _____ Stop Time: _____

Survey Personnel: _____ _____

_____ _____

Your Name: _____ Area Surveyed: _____

Leaks Located: _____ Leaks Repaired: _____

Support Required for following day: _____

Note: Describe all leaks located. Document size, shape, and type. (i.e. puncture, cut, hole, seam) Attach a drawing to this daily log showing location of any leaks located and the area surveyed.

(Check all that apply. If not checked explain.)

- ❑ Power supply positive connected to soil or LDZ electrode.
- ❑ GFCI connected to power supply and tested.
- ❑ Check oil level in generator (if applicable).
- ❑ Check survey equipment for: (check all that apply)
  - ❑ Damaged or broken measurement handles.
  - ❑ Electrolyte fluid level.
  - ❑ Worn or damaged measurement electrodes.
  - ❑ Wire for cuts or breaks.
  - ❑ Wire connectors tight.
  - ❑ Wiring polarity correct.
- ❑ Check A.C. line voltage and record in log book.
- ❑ Check barricade and flagging around source and sink electrodes.

Turn on power supply

- ❑ Record output current and voltage using the attached Field Logs.

Leak Location Services, Inc.

Report Check List

(Note: This form is to be completed by the survey team leader.)

Site Name: _____ Site Location: _____

Client Name: _____ Your Name: _____

Start Date: _____ End Date: _____ Total Leaks: _____

Area of Survey: _____ Survey Grid Spacing _____ ft. by _____ ft.

Type of Facility: ❑ Landfill ❑ Pond ❑ Tank ❑ Other _____

Type of Liner: ❑ HDPE ❑ PP ❑ Hypalon ❑ PVC

❑ Smooth ❑ Textured ❑ Reinforced ❑ Other _____

Liner Thickness: ❑ 36-mil ❑ 45-mil ❑ 60-mil ❑ 80-mil ❑ 100-mil

Liner Manufacturer: ❑ Serrot ❑ GSE ❑ Polyflex ❑ AGRU

❑ Other _____

Double geomembrane-lined: ❑ yes ❑ no

Primary/Secondary welded together: ❑ yes ❑ no

Primary liner covered by: ❑ geocomposite ❑ geotextile ❑ Drainage material

❑ Bare liner ❑ Other _____

Drainage material: ❑ gravel (size _____) ❑ sand ❑ soil

❑ Other _____

LDZ has: ❑ GCL ❑ geocomposite ❑ geonet ❑ sand/gravel

❑ Other _____

Side slope riser: ❑ yes ❑ no Gravity drain: ❑ yes ❑ no

Sketch of liner profile on back of sheet: ❑ yes ❑ no

Leak Location Services, Inc.
Performance Verification Test for Soil Surveys

(Note: This procedure is followed and documented prior to collecting survey data.)

I. INTRODUCTION

The preparations, operation of the system, and survey parameters shall be verified by performing tests over an artificial test leak. An artificial leak is an electrical simulation of a leak consisting of an area of metal the size of the desired leak connected to an insulated wire. The other end of the insulated wire is connected to an electrode in the leak detection zone located between the two geomembranes. The test parameters and procedures shall be:

- An artificial leak with a diameter of 0.25 inches shall be placed on top of the geotextile cushion.
- A minimum of one-gallon of water shall be poured over the test leak and the 12 inches of LCS drainage material replaced over the test leak.

II SENSITIVITY VERIFICATION AND EQUIPMENT CALIBRATION

The equipment operation and survey sensitivity will be verified as follows:

- All sensitivity and calibration data is recorded on an equipment calibration and survey sensitivity work sheet for earth materials.
- A line of data shall be taken and recorded directly over the artificial test leak with the artificial leak disconnected and the power supply turned to on to measure and quantify the background noise level (BN). This data is plotted on the computer to determine the background noise. (*If an actual hole is used as a test leak then this step must be completed before the hole is made in the liner. This data can also be collected on the soil cover in an area where there are no known holes.)*
- The background noise level shall be defined as the difference between the maximum and minimum measured voltage with the artificial leak disconnected or with no test hole in the geomembrane.
- Leak location measurements shall be made and recorded along closely-spaced parallel lines in the vicinity of the artificial leak. This data is the leak signal plus noise signal (S + N). The lines shall be centered on the artificial leak and extend at least 20 feet in front of and in back of the artificial leak.

- The recorded leak location data shall be examined to determine the peak-to-peak leak signal plus noise signal to background noise ratio R = (S +N)/BN for each of the recorded data lines. The measured leak signals must have the characteristics of a leak. Wild data points that deviate from the theoretical leak signals shall not be used to determine R.

- The two farthest lateral lines of data with an R value greater than 3.0 shall be noted. The average of the lateral distanced from the leak for these two lines is defined to be the leak detection distance for the 0.25 inch diameter artificial leak.

III LEAK SURVEY

- The leak location data shall be taken on survey lines spaced no farther apart than twice the leak detection distance determined for a 0.25 inch leak as determined in the performance test described in paragraph II above. The measurement electrode spacing shall be no less that used for the performance test. The spacing between measurements shall be no more than that used for the performance test.

- Data shall be recorded, plotted and analyzed for leak signals. The positions of these leak signals shall be located and the leaks excavated. The leaks shall be repaired or electrically isolated from the earth materials. The leak location survey shall be repeated on the two closest survey lines for a distance extending 20 feet before and beyond the leak to determine if additional leaks are present. If another leak signal is detected, this process shall be repeated until no additional leaks are detected. All field notes are recorded and documented on the prepared LLSI survey line work sheet.

- The Contractor shall be responsible for removing the earth materials and other cover material to expose the located leak(s) and will be responsible for repairing the leak(s).

Leak Location Services, Inc.

Equipment Calibration and Survey Sensitivity Work Sheet for Earth Materials

Name of Site_____ Date_____

Recorder S/N_____Operator_____

Excitation Voltage_____V

Power Supply Output Current_____

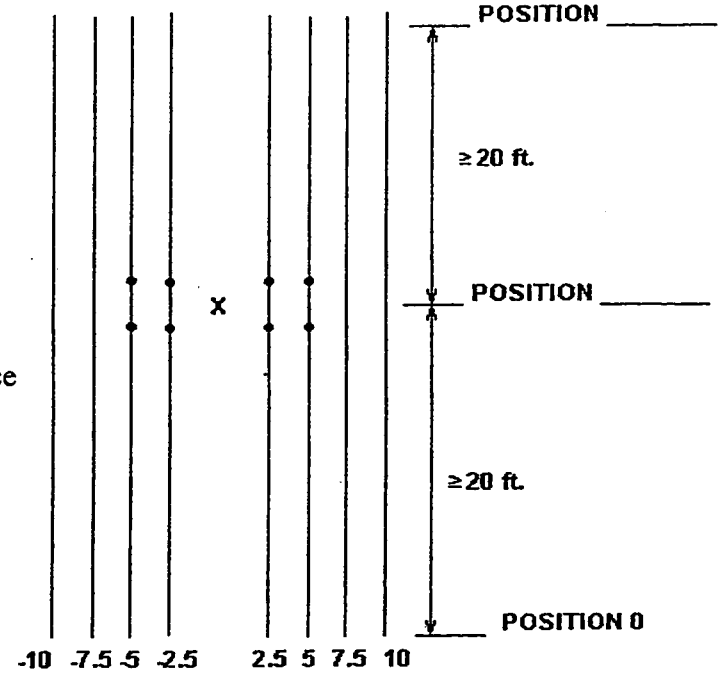
Location of Source (Coordinates referenced to leak)

Size and Construction of Artificial Leak

Location and Depth of Artificial Leak in Layering Sequence

Starting Artificial Leak Current_____
Finishing Artificial Leak Current_____
Data File Name for Measurement of Noise
with Artificial Leak Disconnected_____

Data file Name (if different) for Artificial Leak
Measurements_____



Survey Line Layout for Artificial Leak Test

Noise Peak Positive_____ Noise Peak Negative_____ Peak -to-Peak Noise _____

Line Number / Position (ft.)	Peak Positive	Peak Negative	Signal Level (p-p) PP-PN	Signal/Noise	Pass or Fail
-10					
-7.5					
-5					
-2.5					
0					
2.5					
5					
7.5					
10					

Spacing between farthest passed Line Positions_____ = Maximum Survey Line Spacing

Leak Location Services, Inc.

Survey Line Field Log Work Sheet

Name of Site_____ Date_____

Line and Position of Current Electrode_____

Line Number	File Name(s)	✔ Fld	✔ Ngt	Notes - Position of Signal, Amplitude and Characteristics of Signal, Results of Investigation of Signal, Type of Leak, Measured Size of Leak, Photo Number of Leak
00				
05				
10				
15				
20				
25				
30				
35				
40				
45				
50				
55				
60				
65				
70				
75				
80				
85				
90				
95				

Note: Do not reuse line numbers or file numbers.

Urn through
Jsion Weld (double wedge)
NEedle Hole
SEam
TEe
CUut (linear break with rough edges)
HOle (rounded puncture rims)
PANel
SIde slope
EXtrusion weld
LInear cut
PATch
SOlvent weld
MAchine damage
Penetration
TEar (irregular edges)

Leak Location Services, Inc.

Daily Field Log for Surveys with Earth Materials

Owner's Name of Facility _____ Dates _____

Date/ Time	Location of Source Electrode	Activity (STArt survey, INTermediate reading, STOp surveying)	Power Supply Voltage	Power Supply Current	Other Notes If current changes to a low level, find out why and correct it.

APPENDIX G

FIELD MOISTURE/DENSITY TEST RESULTS

COMPACTED FILL

IN-PLACE NUCLEAR TESTS

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV

DATE: 17 day March month 2003 year MONDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS ((LOOSE) / COMPACTED): 8-12"

MATERIAL SOURCE: Cell #6 Cut Material MATERIAL TYPE (CIRCLE ONE): (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481x + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-01	Haul Road	6" / L-1	CF03-03	18.7	104.4	19.2 —	126.1	105.8	101.3	P	—	—	—	—
CF03-02	Haul Road	6" / L-1	CF03-05	17.1	112.1	17.4 —	129.0	109.9	98.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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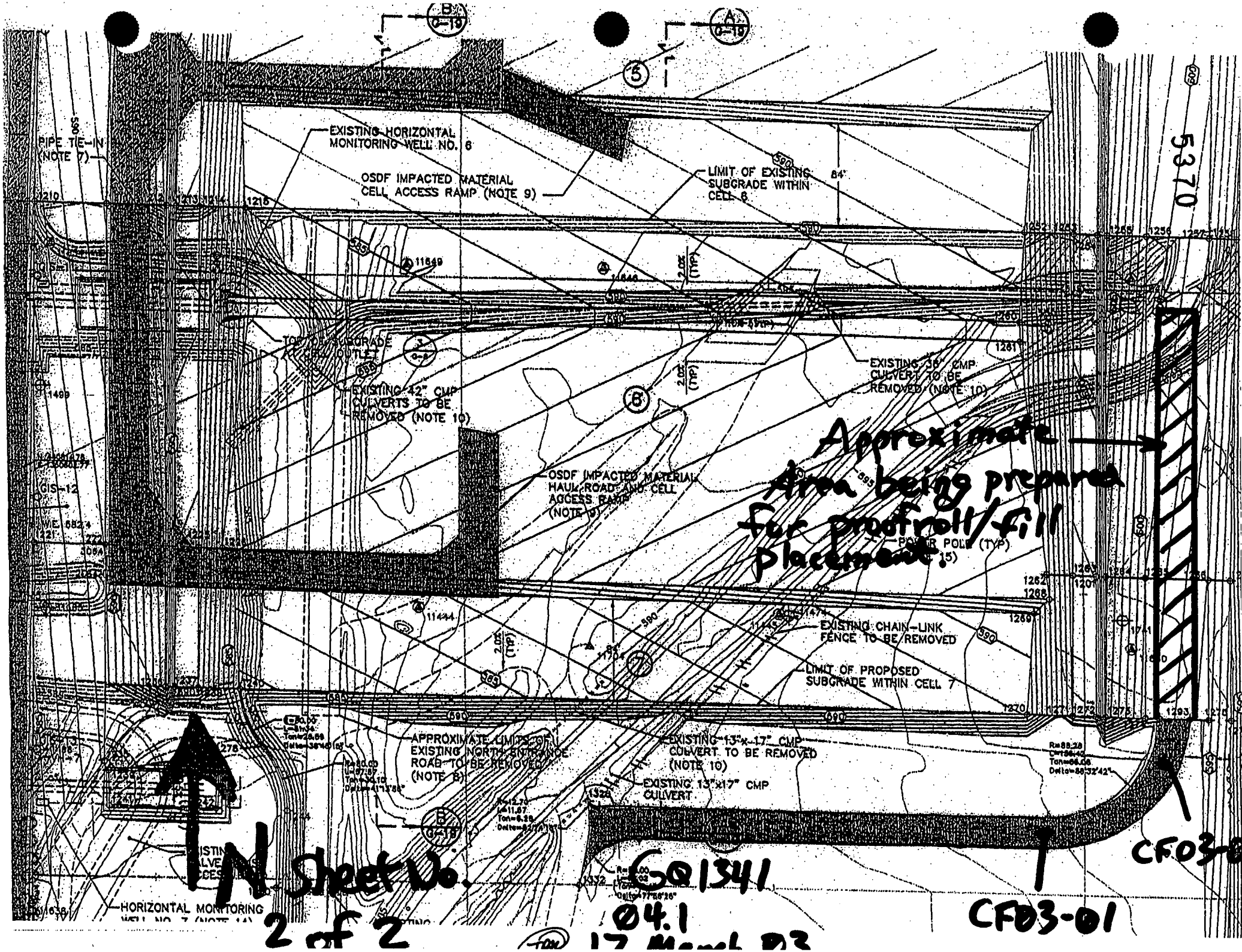
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
TOP OF SUBGRADE AT CELL OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12
5370
Approximate Area being prepared for proofroll/fill placement
N
Sheet No. 2 of 2
G01341
04.1
17 March 03
CF03-01

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV

DATE: 18 day March month 2003 year TUESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / (COMPACTED)) 8"

MATERIAL SOURCE: Cell #6 Cut

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-03	Haul Road	6" / L-1	CF03-1	14.6	117.7	12.3 —	137.5	122.4	104.0	P	—	—	—	—
CF03-04	Haul Road	6" / L-1	CF03-1	14.6	117.7	12.4 —	134.3	119.5	101.5	P	—	—	—	—
CF03-05	Haul Road	6" / L-1	CF03-3	18.7	104.4	21.0 —	123.8	102.3	98.0	P	—	—	—	—
CF03-06	Haul Road	6" / L-1	CF03-1	14.6	117.7	15.9 —	132.6	114.4	97.2	P	—	—	—	—
CF03-07	Haul Road	6" / L-2	CF03-5	17.1	112.1	16.5 —	129.9	111.5	99.5	P	—	—	—	—
CF03-08	Haul Road	6" / L-2	CF03-5	17.1	112.1	17.2 —	128.8	109.9	98.0	P	—	—	—	—
CF03-09	Haul Road	6" / L-3	CF03-5	17.1	112.1	18.6 —	128.9	108.7	97.0	P	—	—	—	—
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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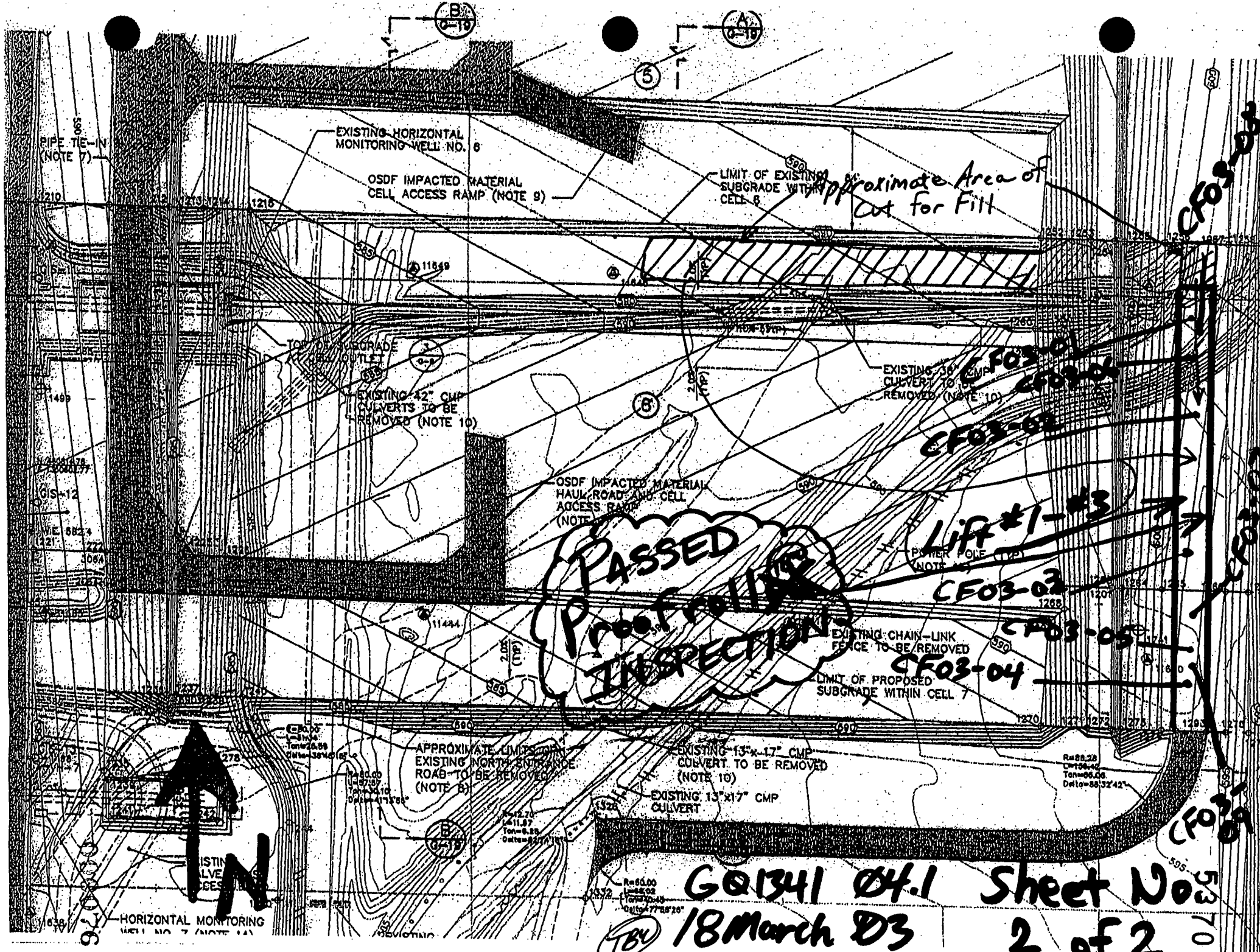
PIPE TIE-IN (NOTE 7)
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
Approximate Area of Cut for Fill
TOP OF SUBGRADE AT CELL OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
GIS-12
N
CF03-08
CF03-06
CF03-07
CF03-02
Lift #1-#3
CF03-03
CF03-05
CF03-04
CF03-09
PASSED Proof Roll INSPECTION
GQ1341 04.1 Sheet No 5
18 March 03
2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G01341 TASK NO.: 04.1

DESCRIPTION: Phase IV

DATE: 19 day March month 2003 year WEDNESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)) 8"

MATERIAL SOURCE: Cell #6 cut

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X+3.3669 QA ID: CAW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-10	East Berm of Cell #6	6" / L-1	CF03-1	14.6	117.7	14.8	134.7	117.3	99.7	P	—	—	—	—
CF03-11	East Berm of Cell #6	6" / L-1	CF03-1	14.6	117.7	15.6	134.9	116.7	99.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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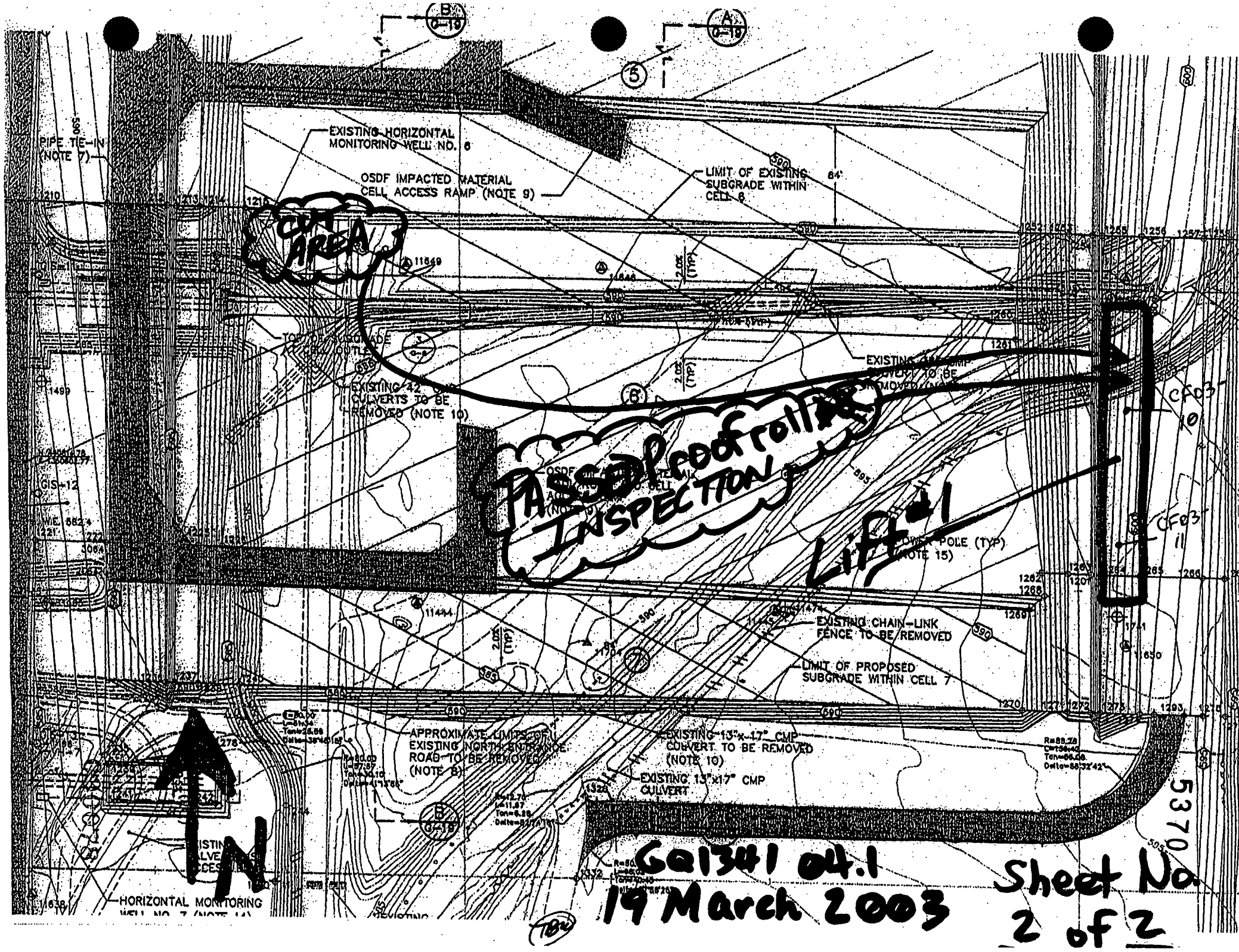
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
PIPE TIE-IN (NOTE 7)
EXISTING 42" CULVERTS TO BE REMOVED (NOTE 10)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
N
CF03-10
CF03-11
AREA 3
PASSED roof rolling INSPECTION
Lift #1
G01341 04.1
19 March 2003
Sheet No. 2 of 2
53 70

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 24 day March month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE) / ~~COMPACTED~~: 8"

MATERIAL SOURCE: Cell #6 NW corner MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = .08481X+3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-12	East Berm	6" / L-3	CF03-1	14.6	117.7	15.2	134.9	117.1	99.5	P	—	—	—	—
CF03-13	East Berm	6" / L-3	CF03-3	18.7	104.4	20.7	125.5	104.0	99.6	P	—	—	—	—
CF03-14	East Berm	6" / L-4	CF03-1	14.6	117.7	12.4	134.6	119.7	101.7	P	—	—	—	—
CF03-15	East Berm	6" / L-4	CF03-1	14.6	117.7	15.0	133.0	115.7	98.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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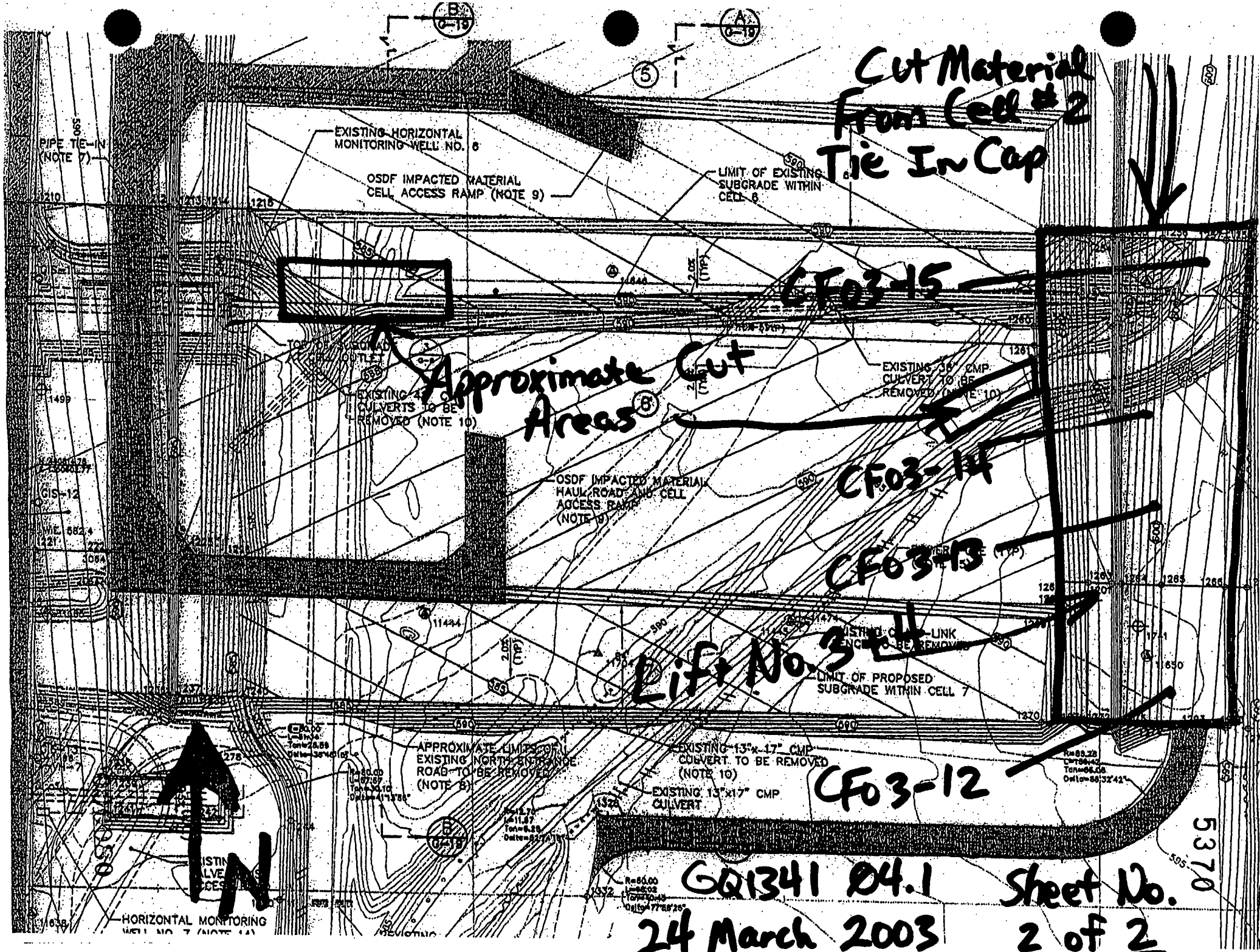
Cut Material From Cell #2 Tie In Cap
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
CF03-15
Approximate Cut Areas
EXISTING 48" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
CF03-14
CF03-13
Lift No. 3
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
CF03-12
N
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GQ1341 04.1
24 March 2003
Sheet No. 2 of 2
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV

DATE: 25 day March month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cell #6 Cut areas MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-16	East Berm	6" / L-5	CF03-1	14.6	117.7	16.1	133.7	115.1	97.8	P	—	—	—	—
CF03-17	East Berm	6" / L-5	CF03-1	14.6	117.7	14.5	133.0	116.1	98.6	P	—	—	—	—
CF03-18	East Berm	6" / L-5	CF03-5	17.1	112.1	19.8	131.4	109.7	97.9	P	—	—	—	—
CF03-19	East Berm	6" / L-5	CF03-1	14.6	117.7	15.7	133.6	115.5	98.1	P	—	—	—	—
CF03-20	East Berm	6" / L-6	CF03-5	17.1	112.1	18.6	128.9	108.7	96.9	P	—	—	—	—
CF03-21	East Berm	6" / L-6	CF03-1	14.6	117.7	15.1	132.0	114.7	97.5	P	—	—	—	—
		/												
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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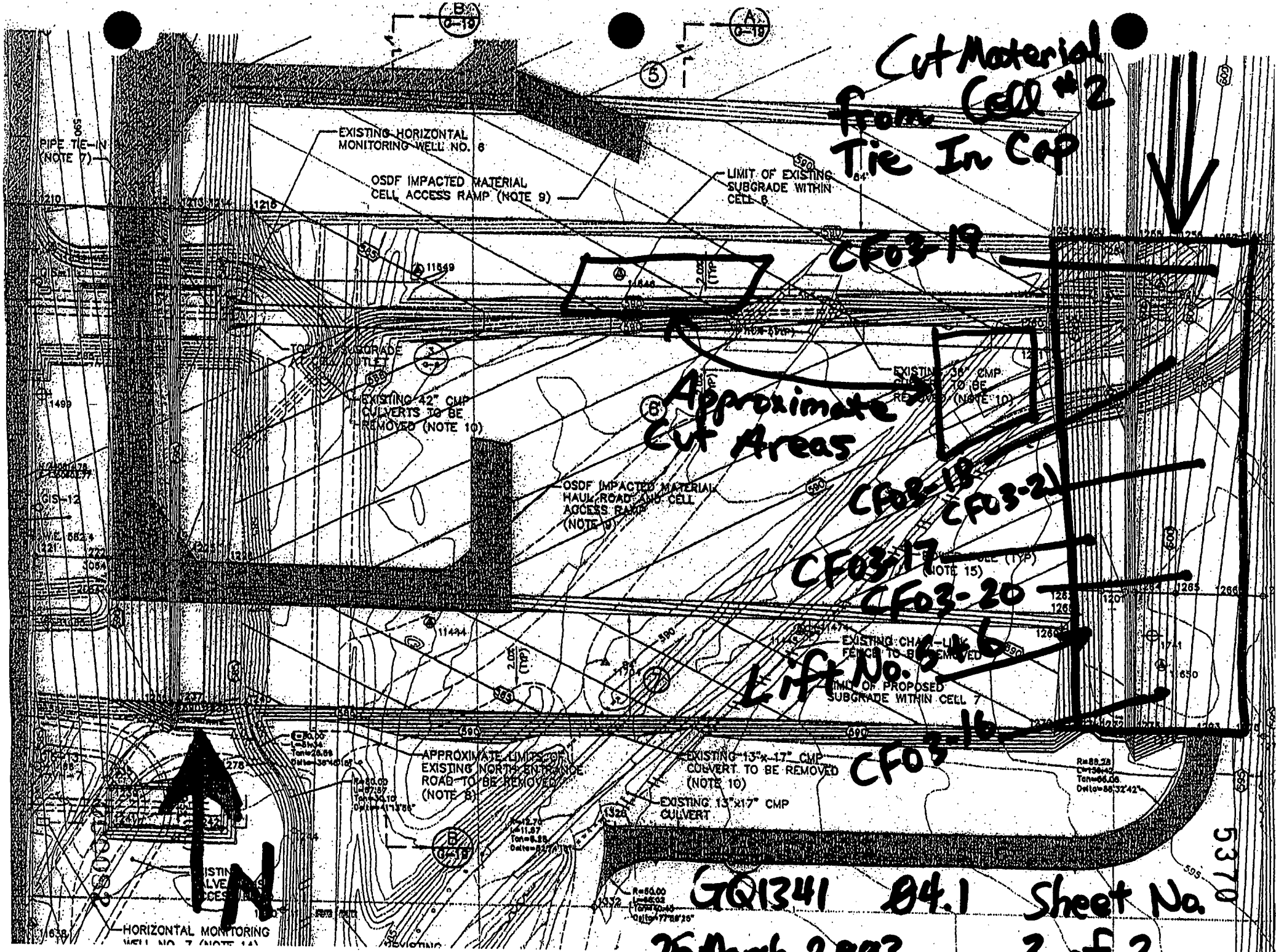

GQ1341 84.1 Sheet No. 2 of 2

25 March 2003

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 27 day March month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cut from Cell #2 and Floor of Cell #6

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-22	East Berm	6" / L-7	CF03-1	14.6	117.7	16.2	128.9	110.9	94.2		F	CF03-23	P	—
CF03-23	East Berm	6" / L-7	CF03-1	14.6	117.7	16.0	131.3	113.2	96.2	P	—	—	—	—
CF03-24	East Berm	6" / L-7	CF03-1	14.6	117.7	16.2	131.9	113.5	96.4	P	—	—	—	—
CF03-25	East Berm	6" / L-7	CF03-1	14.6	117.7	15.5	133.5	115.5	98.1	P	—	—	—	—
CF03-26	East Berm	6" / L-7	CF03-1	14.6	117.7	18.3	129.4	109.4	92.9		F	CF03-27	P	—
CF03-27	East Berm	6" / L-7	CF03-1	14.6	117.7	17.1	131.0	111.9	95.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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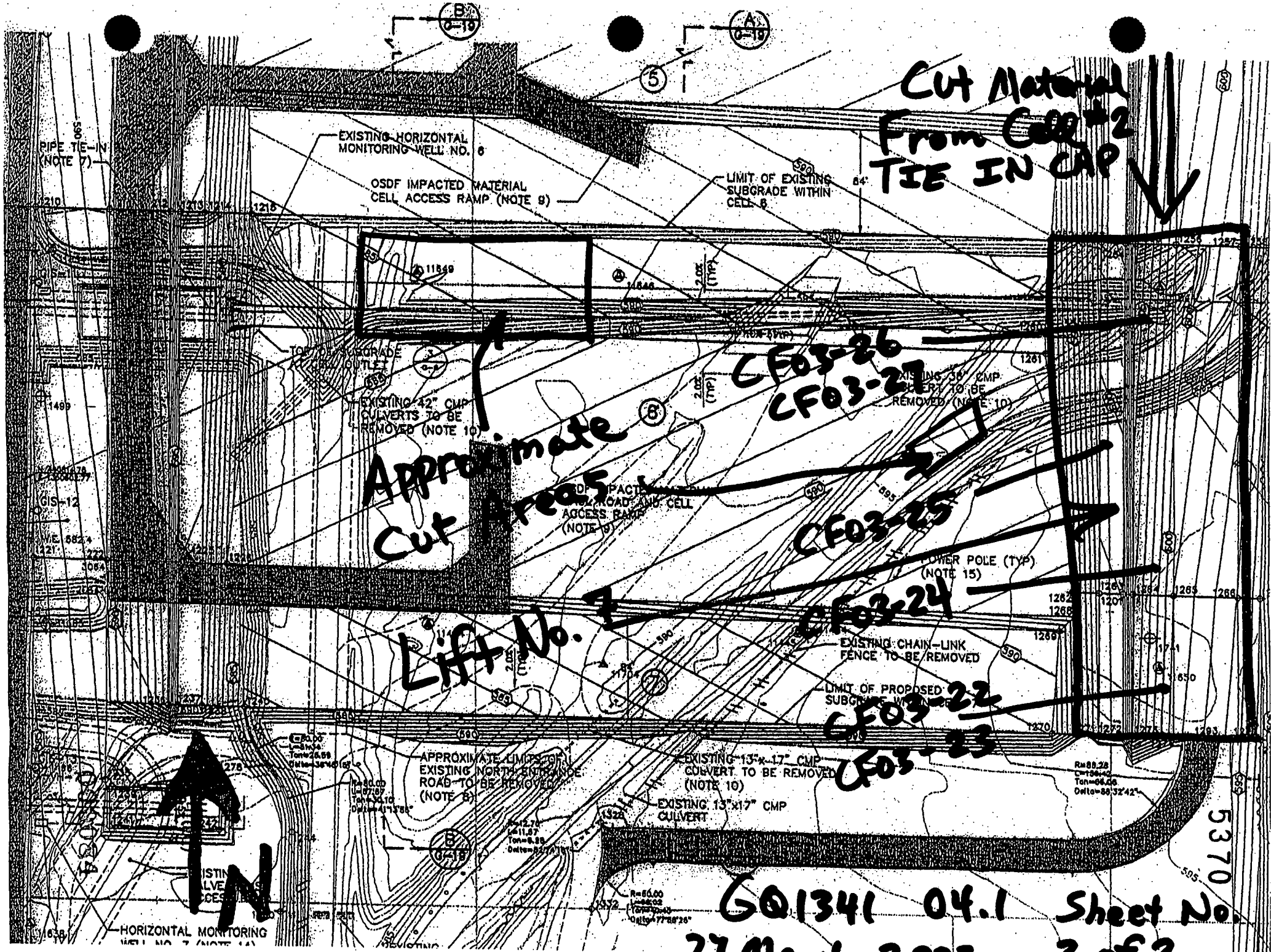
Cut Material From Cell #2 TIE IN CAP
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
CF03-26
CF03-27
Approximate Cut Areas
CF03-25
POWER POLE (TYP) (NOTE 15)
CF03-24
Lift No. 2
EXISTING CHAIN-LINK FENCE TO BE REMOVED
CF03-22
CF03-23
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
N
GIS-12
5370
GQ1341 04.1 Sheet No.
27 March 2003
2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 28 day March month 2003 year FRIDAY

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: Cell #6 Floor Cut and Cell #2/1 Cap TIE-IN AREA MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-28	Cell #6, East Berm	6" / L-8	CF03-1	14.6	117.7	15.8 / —	131.6	113.7	96.6	P	—	—	—	—
CF03-29	Cell #6, East Berm	6" / L-8	CF03-1	14.6	117.7	16.6 / —	132.4	113.6	96.5	P	—	—	—	—
CF03-30	Cell #6, East Berm	8" / L-8	CF03-5	17.1	112.1	17.2 / —	130.8	111.6	99.6	P	—	—	—	—
CF03-31	Cell #6, East Berm	6" / L-8	CF03-1	14.6	117.7	16.1 / —	133.1	114.6	97.4	P	—	—	—	—
CF03-32	Cell #6, East Berm	6" / L-8	CF03-1	14.6	117.7	14.1 / —	134.9	118.2	100.5	P	—	—	—	—
CF03-33	Cell #6, East Berm	6" / L-9	CF03-1	14.6	117.7	16.4 / —	131.8	113.2	96.2	P	—	—	—	—
CF03-34	Cell #6, East Berm	8" / L-9	CF03-1	14.6	117.7	14.8 / —	134.1	116.8	99.2	P	—	—	—	—
CF03-35	Cell #6, East Berm	8" / L-9	CF03-1	14.6	117.7	14.3 / —	CHW ~~119.2~~ 136.2	119.2	101.2	P	—	—	—	—
CF03-36	Cell #6, East Berm	6" / L-10	CF03-5	17.1	112.1	18.3 / —	130.0	109.9	98.0	P	—	—	—	—
CF03-37	Cell #6, East Berm	6" / L-10	CF03-5	17.1	112.1	16.3 / —	130.3	112.0	99.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 28 day March month 2003 year FRIDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: Cell #6 Floor Cut and Cell #2/1 Cap TIE-IN AREA

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-38	Cell #6, East Berm	6" / L-10	CF03-1	14.6	117.7	13.5	135.2	119.1	101.2	P	—	—	—	—
CF03-39	Cell #6, East Berm	6" / L-11	CF03-1	14.6	117.7	14.0	135.4	118.8	100.9	P	—	—	—	—
CF03-40	Cell #6, East Berm	6" / L-11	CF03-1	14.6	117.7	15.7	130.5	112.8	95.9	P	—	—	—	—
CF03-41	Cell #6, East Berm	6" / L-11	CF03-1	14.6	117.7	16.6	132.1	113.3	96.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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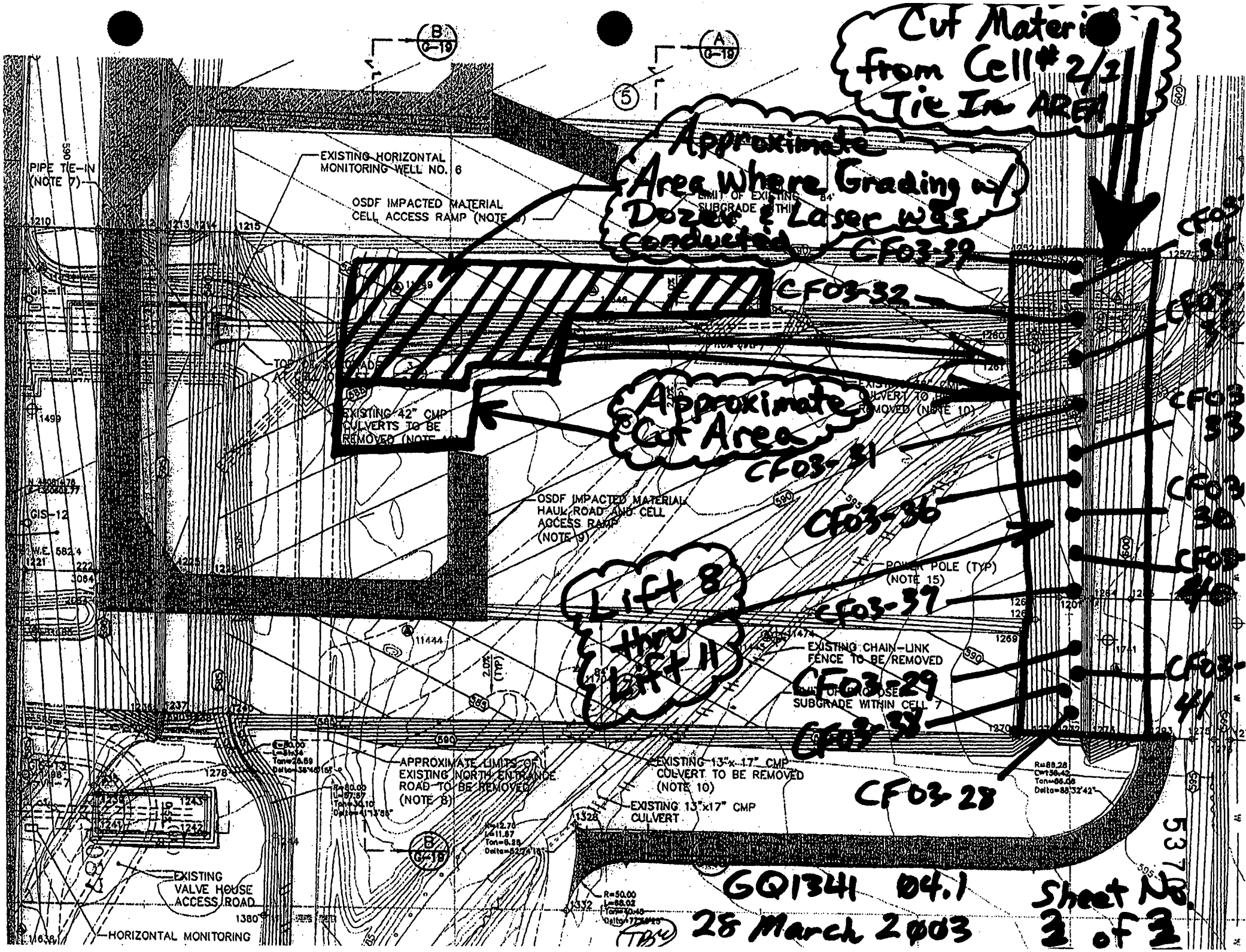
Cut Material from Cell # 2/3 Tie In AREA
Approximate Area Where Grading w/ Dozer & Laser was Conducted
Approximate Cut Area
Lift 8 thru Lift 11
CF03-39
CF03-32
CF03-31
CF03-36
CF03-37
CF03-29
CF03-28
CF03-34
CF03-33
CF03-38
CF03-40
CF03-41
PIPE TIE-IN (NOTE 7)
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 8)
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
EXISTING VALVE HOUSE ACCESS ROAD
HORIZONTAL MONITORING
GIS-11
GIS-12
GIS-13
GQ1341 04.1
28 March 2003
Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 0461

DATE: 31 day March month 2003 year MONDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: Cut material from West side of Cell #6 Cutmaterial from Cell #2/ Cap TIE-IN AREA

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 28979 CORRECTION FACTOR Y = 0.8481x + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-42	East Berm, Cell #6	6" / L-12	PCP-55	11.7	126.5	13.7	139.0	122.3	96.7	P	—	—	—	—
CF03-43	East Berm, Cell #6	6" / L-12	CF03-1	14.6	117.7	15.7	132.5	114.5	97.3	P	—	—	—	—
CF03-44	East Berm, Cell #6	6" / L-13	CF03-5	17.1	112.1	18.4	129.1	109.0	97.3	P	—	—	—	—
CF03-45	East Berm, Cell #6	6" / L-13	CF03-1	14.6	117.7	15.2	131.4	114.0	96.9	P	—	—	—	—
CF03-46	Sed Basin #1 Backfill	6" / L-1	CF03-1	14.6	117.7	16.0	129.7	112.6	95.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) CF03-42 - on 19 April, 2002 K.S. of GeoSyntec tested the fill over and around the 42" CMPs. PCP-55 was used for this fill.

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SHEET NO. 1 OF 2

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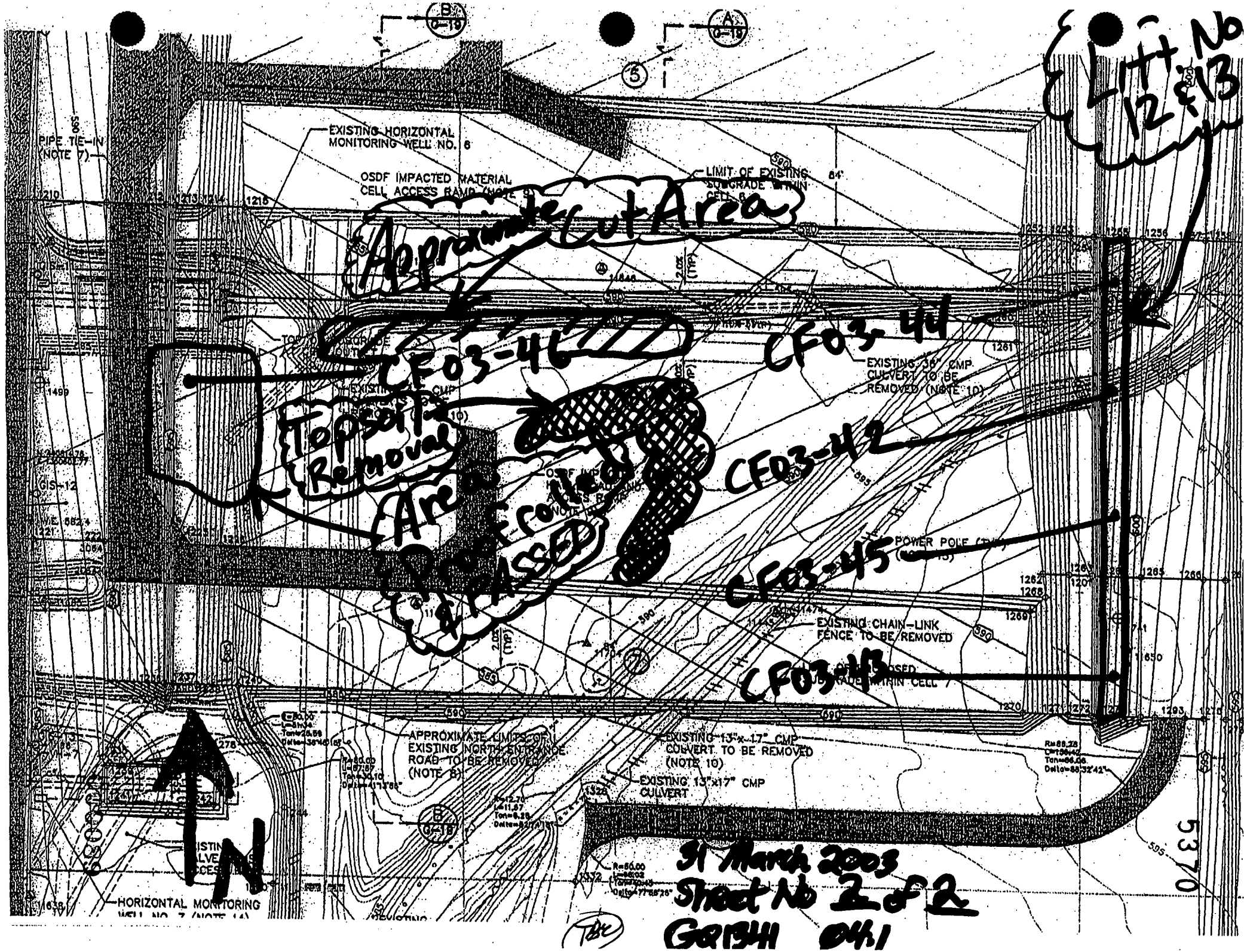
EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
Approximate Cut Area
CF03-41
CF03-44
Topsoil Removal Area
CF03-42
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
POWER POLE
CF03-45
EXISTING CHAIN-LINK FENCE TO BE REMOVED
CF03-46
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
N
31 March 2003
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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 004.1

DESCRIPTION: Phase V

DATE: 1 day April month 2003 year TUESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8-12"

MATERIAL SOURCE: Cut Material from center floor of Cell #6 + Cell #2/2 Cap TIE-IN AREA MATERIAL TYPE: (FILL) SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481x + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-47	West Berm Sed Basin #1 Backfill	6" / L-2	CF03-1	14.6	117.7	14.7	133.5	116.4	98.9	P	—	—	—	—
CF03-48	West Berm Sed Basin #1 Backfill	6" / L-2	CF03-5	17.1	112.1	17.8	127.6	108.3	96.6	P	—	—	—	—
CF03-49	West Berm Sed Basin #1 Backfill	6" / L-2	PCP-55	11.7	126.5	13.6	~~122.2~~ 138.5 CHW	122.3	96.7	P	—	—	—	—
CF03-50	West Berm Sed Basin #1 Backfill	6" / L-3	CF03-1	14.6	117.7	14.7	132.4	115.4	98.0	P	—	—	—	—
CF03-51	West Berm Sed Basin #1 Backfill	6" / L-3	CF03-5	17.1	112.1	18.5	128.6	108.5	96.8	P	—	—	—	—
CF03-52	West Berm Sed Basin #1 Backfill	6" / L-3	CF03-5	17.1	112.1	20.3	126.0	104.7	93.4	—	F	CF03-53	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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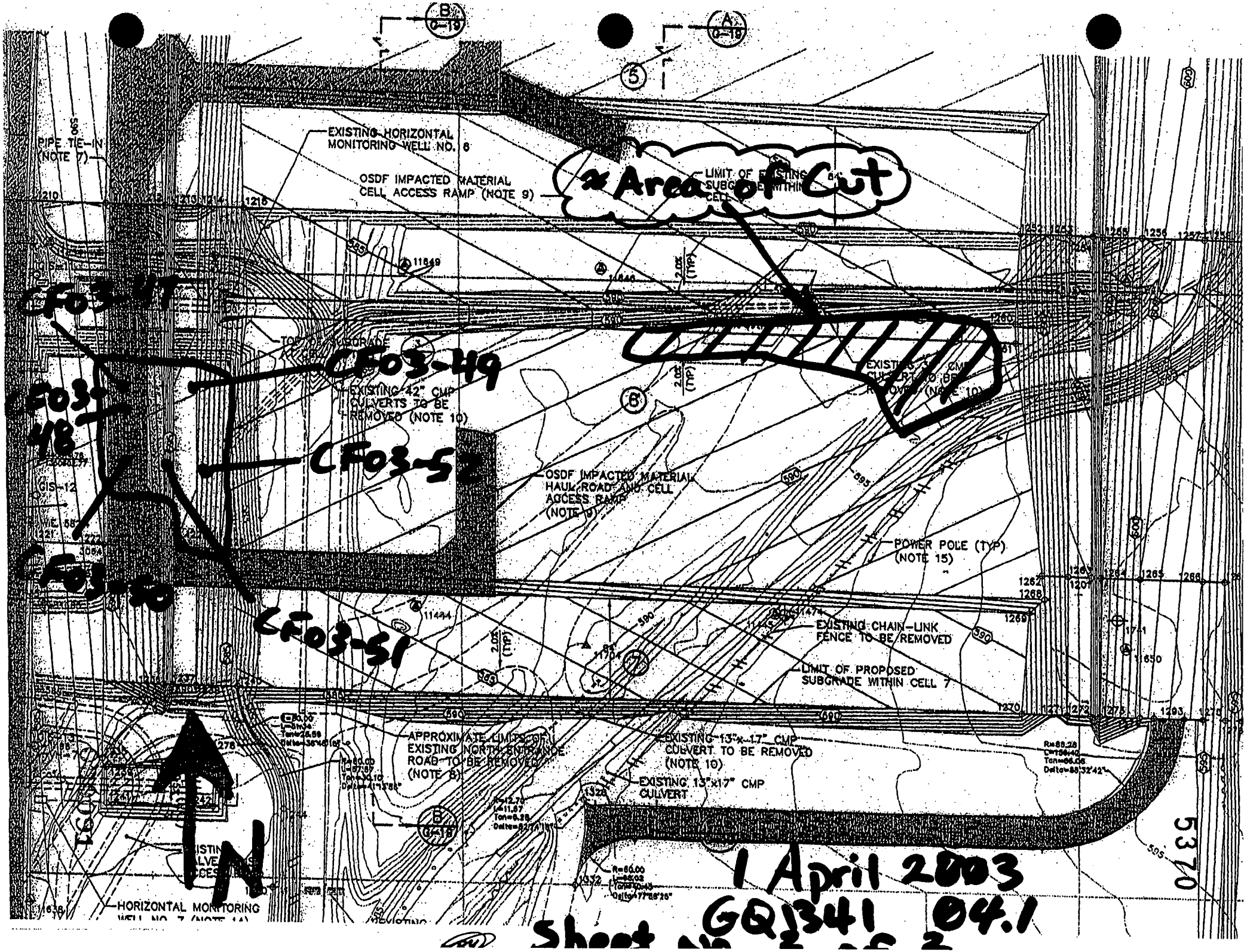
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
≈ Area of Cut
PIPE TIE-IN (NOTE 7)
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
CF03-47
CF03-49
CF03-48
CF03-50
CF03-51
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
N
1 April 2003
GQ1341 04.1
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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 601341 TASK NO.: 041

DESCRIPTION: Phase V

DATE: 2 day April month 2003 year WEDNESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ±95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: MATERIAL CUT FROM Cell #6

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-53	West Berm Sed. Basin Backfill	6" / L-3	CF03-5	17.1	112.1	19.1	139.3 ~~108.6~~ CHW	108.6	96.9	P	—	—	—	—
CF03-54	West Berm Sed. Basin Backfill	6" / L-3	CF03-5	17.1	112.1	16.3	130.7	112.4	100.2	P	—	—	—	—
CF03-55	West Berm Sed. Basin Backfill	6" / L-4	PCP-55	11.7	126.5	10.4	143.2	129.7	102.5	P	—	—	—	—
CF03-56	West Berm Sed. Basin Backfill	6" / L-4	CF03-5	17.1	112.1	17.4	125.5	106.9	95.4	P	—	—	—	—
CF03-57	Undercut Area Center of Cell #6, N. of Drainage Corridor	6" / L-1	CF03-5	17.1	112.1	21.3	124.6	102.7	91.6	—	F	CF03-61	P	—
CF03-58	West Berm Sed. Basin Backfill	6" / L-5	CF03-1	14.6	117.7	16.8	132.0	113.0	96.0	P	—	—	—	—
CF03-59	West Berm Sed. Basin Backfill	6" / L-5	CF03-5	17.1	112.1	19.0	127.7	107.3	95.7	P	—	—	—	—
CF03-60	West Berm Sed. Basin Backfill	6" / L-5	~~CF03-1~~ ~~CF03-5~~	~~14.6~~ ~~17.1~~	~~117.7~~ ~~112.1~~ CHW	14.8	133.2	116.0	98.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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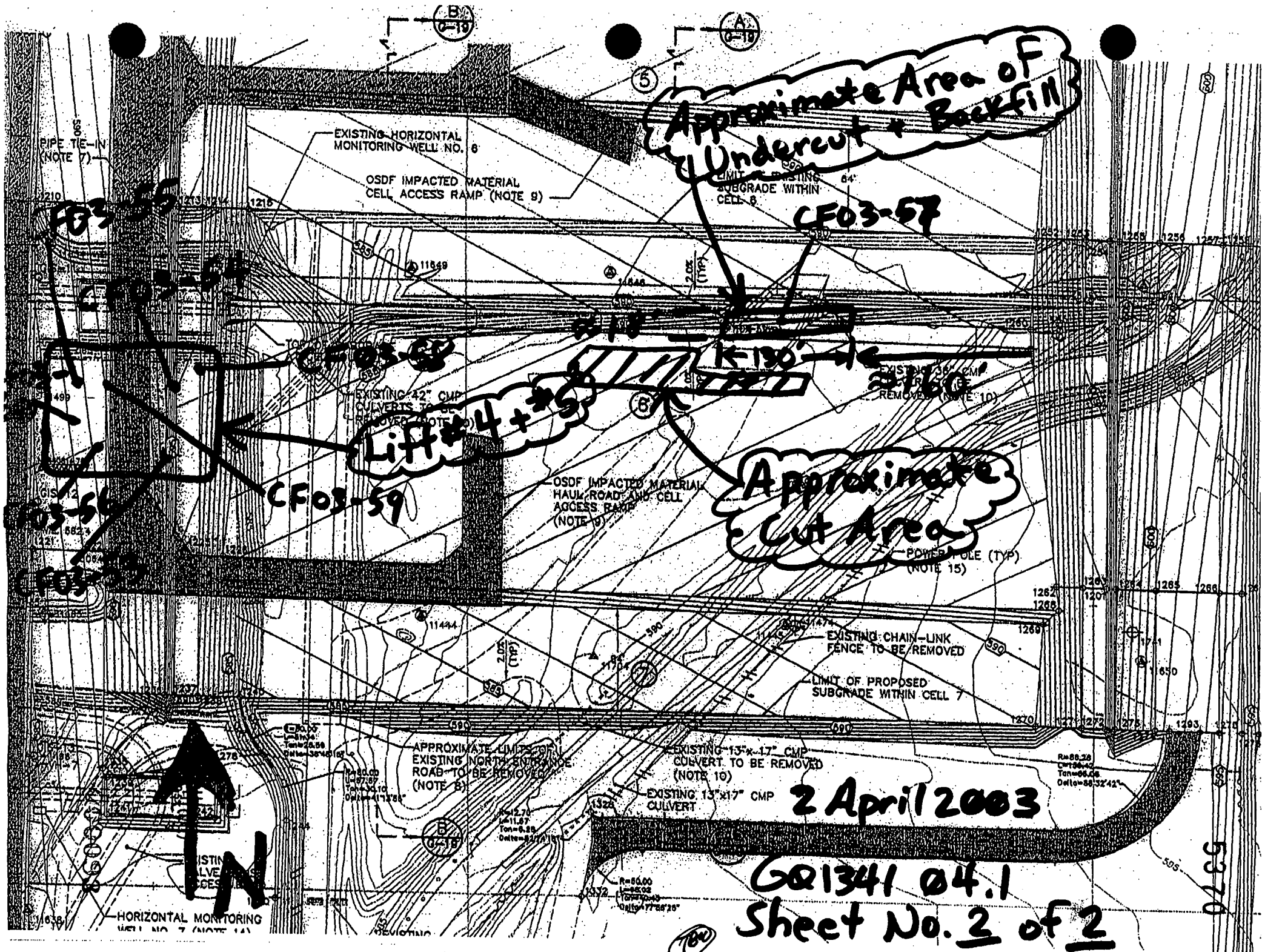
Approximate Area of Undercut + Backfill
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
PIPE TIE-IN (NOTE 7)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
CF03-56
CF03-57
CF03-58
CF03-59
CF03-60
CF03-61
CF03-62
Lift #4 + #5
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
Approximate Cut Area
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
N
2 April 2003
G01341 04.1
Sheet No. 2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 3 day April month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Material Cut From the Floor of Cell #6

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-61	Undercut Area Later of Cell #6, N. of Drainage Corridor	6"/L-1	CF03-5	17.1	112.1	16.9 —	130.4	111.5	99.5	P	—	—	—	—
CF03-62	Sea Basin Backfill West Berm	6"/L-3	CF03-5	17.1	112.1	21.5 —	121.7	100.2	89.4	—	F	CF03-67	P	—
CF03-63	Sea Basin Backfill West Berm	6"/L-3	CF03-1	14.6	117.7	17.4 —	124.6	106.1	90.2	—	F	CF03-68	P	—
CF03-64	Sea Basin Backfill West Berm	6"/L-6	PCP-55	11.7	126.5	11.7 —	~~123.6~~ 138.2 CHW	123.6	97.7	P	—	—	—	—
CF03-65	Sea Basin Backfill West Berm	6"/L-6	CF03-1	14.6	117.7	14.3 —	134.3	117.5	99.8	P	—	—	—	—
CF03-66	Sea Basin Backfill West Berm	6"/L-6	PCP-55	11.7	126.5	12.3 —	138.6	123.4	97.5	P	—	—	—	—
CF03-67	Sea Basin Backfill West Berm	6"/L-3	CF03-5	17.1	112.1	18.4 —	127.3	107.9	95.9	P	—	—	—	—
CF03-68	Sea Basin Backfill West Berm	6"/L-3	CF03-1	14.6	117.7	16.4 —	132.6	113.9	96.8	P	—	—	—	—
CF03-69	Sea Basin Backfill West Berm	6"/L-7	PCP-55	11.7	126.5	12.2 —	136.1	121.3	95.9	P	—	—	—	—
CF03-70	Sea Basin Backfill West Berm	6"/L-7	CF03-1	14.6	117.7	13.9 —	130.5	114.5	97.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 3 day April month 2003 year

SPECIFICATION REQUIREMENTS (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Material Cut from the Floor of Cell #6

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-71	Sed Basin Backfill West Berm	6" / L-7	CF03-4	15.1	114.1	14.2 —	127.8	112.0	98.1	P	—	—	—	—
CF03-72	Sed Basin Backfill West Berm	6" / L-7	CF03-1	14.6	117.7	13.8 —	133.8 CHW	117.9	100.2	P	—	—	—	—
CF03-73	Sed Basin Backfill West Berm	6" / L-7	CF03-1	14.6	117.7	15.1 —	132.4	115.0	97.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 2 OF 3

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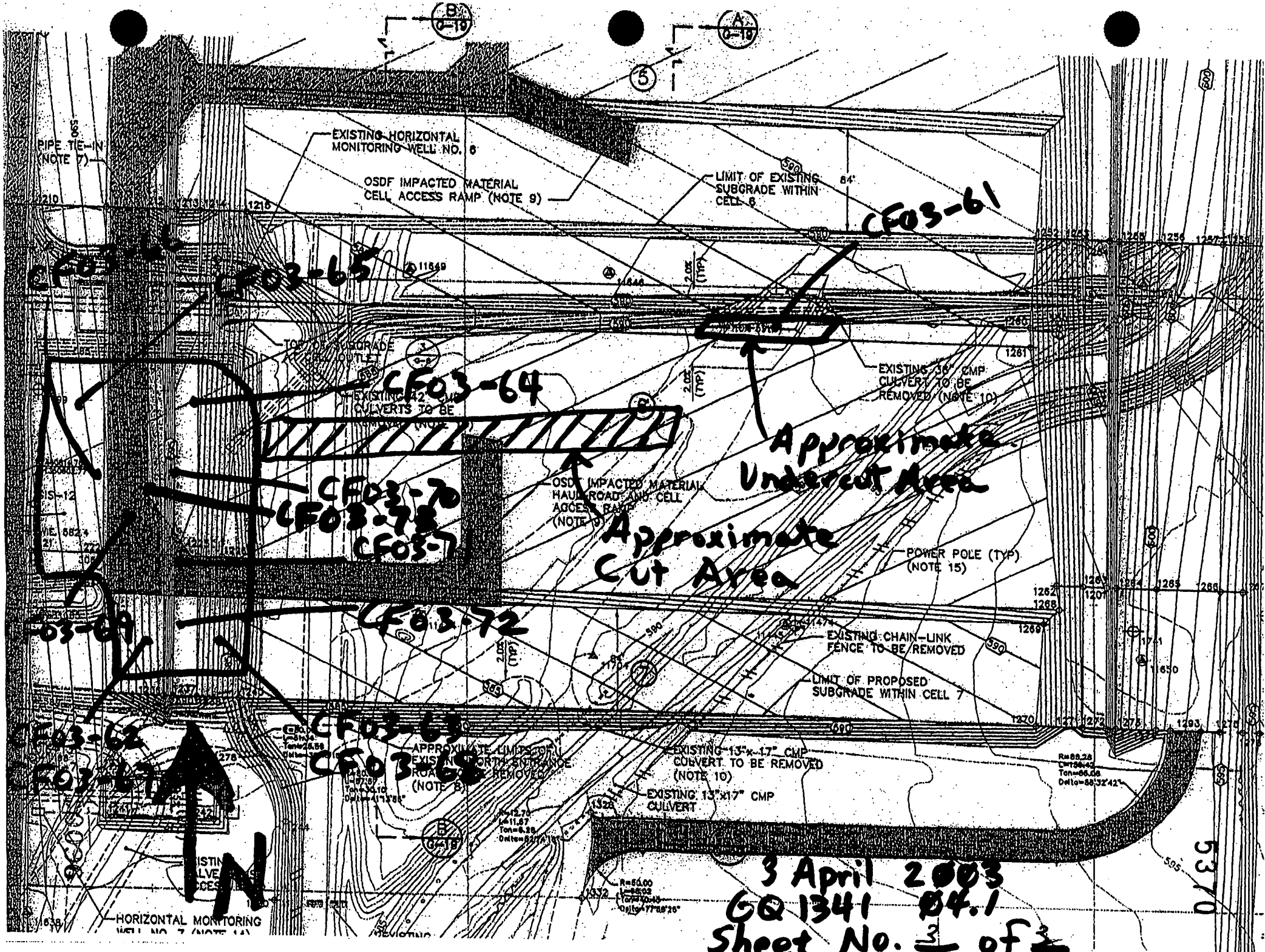
EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 42" CMP CULVERTS TO BE
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
CF03-61
CF03-65
CF03-64
CF03-70
CF03-78
CF03-7
CF03-72
CF03-69
CF03-63
CF03-68
CF03-62
CF03-67
Approximate Undercut Area
Approximate Cut Area
N
3 April 2003
GQ 1341 04.1
Sheet No. 3 of 3
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 4 day April month 2003 year FRIDAY

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: Cut material from Cell #6 Floor

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481x + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-74	Seed Basin Backfill West Berm	6" / L-5	RPSS	11.7	126.5	10.4	142.9	129.4	102.3	P	—	—	—	—
CF03-75	Roadway Front of VH6 - ~ 56	6" / L-8	CF03-5	17.1	112.1	19.4	128.0	107.2	95.6	P	—	—	—	—
CF03-76	Seed Basin Backfill West Berm	6" / L-8	CF03-2	15.1	113.9	17.2	128.9	110.0	96.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: TBC SHEET NO. 1 OF 2

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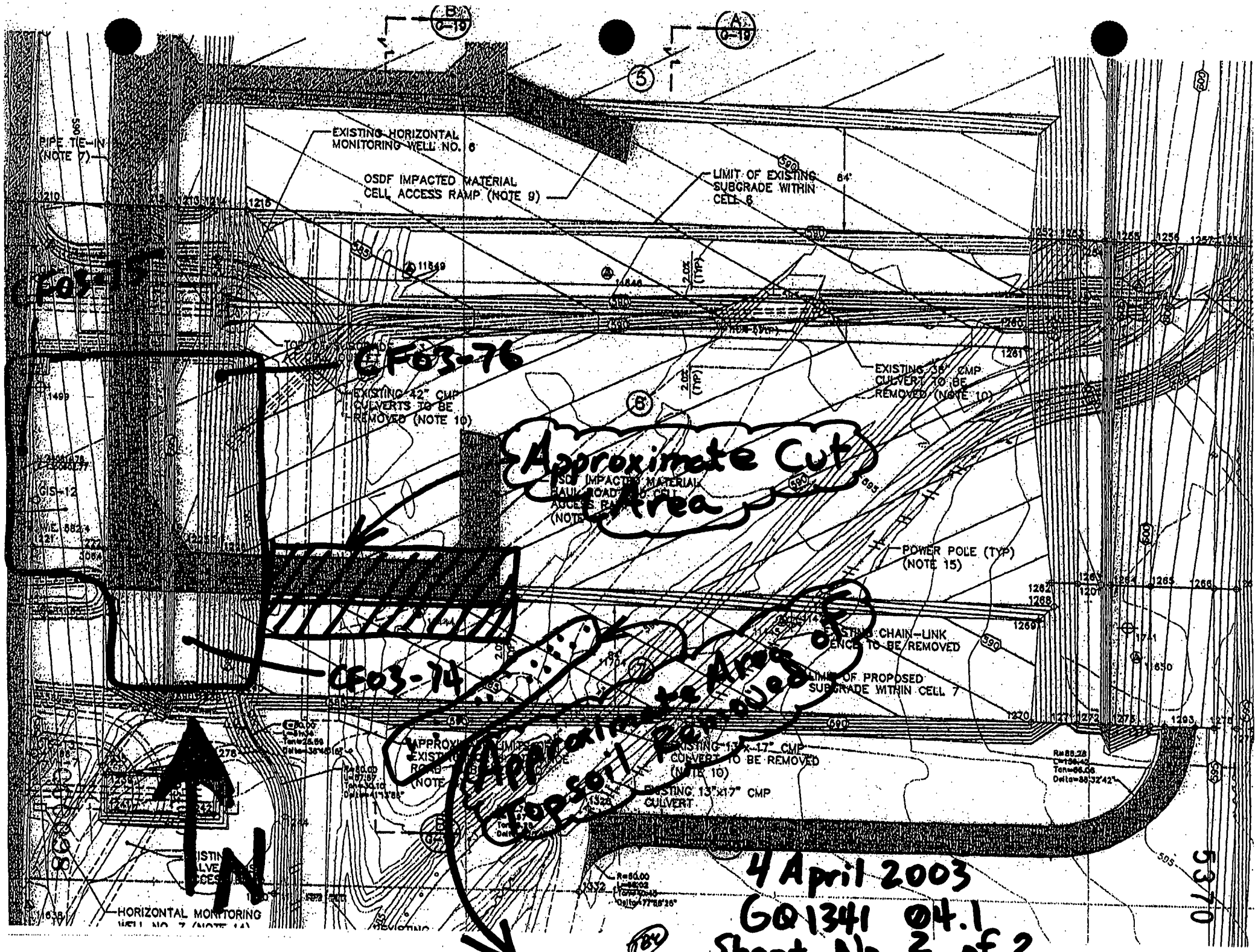
EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12
CF03-75
CF03-76
CF03-74
Approximate Cut Area
Approximate Area of Topsoil Removed
N
4 April 2003
GQ1341 04.1
Sheet No. 3 of 2
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G01341 TASK NO.: 041

DESCRIPTION: Phase I DATE: 09 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Material Cut from Center and West Floor of Cell #6 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-77	Sed Basin Backfill West Berm	6" / L-2	CF03-5	17.1	112.1	17.8	126.3	107.1	95.6	P	—	—	—	—
CF03-78	Sed Basin Backfill West Berm	6" / L-3	CF03-5	17.1	112.1	16.4	125.7	108.0	96.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: SHEET NO. 1 OF 2

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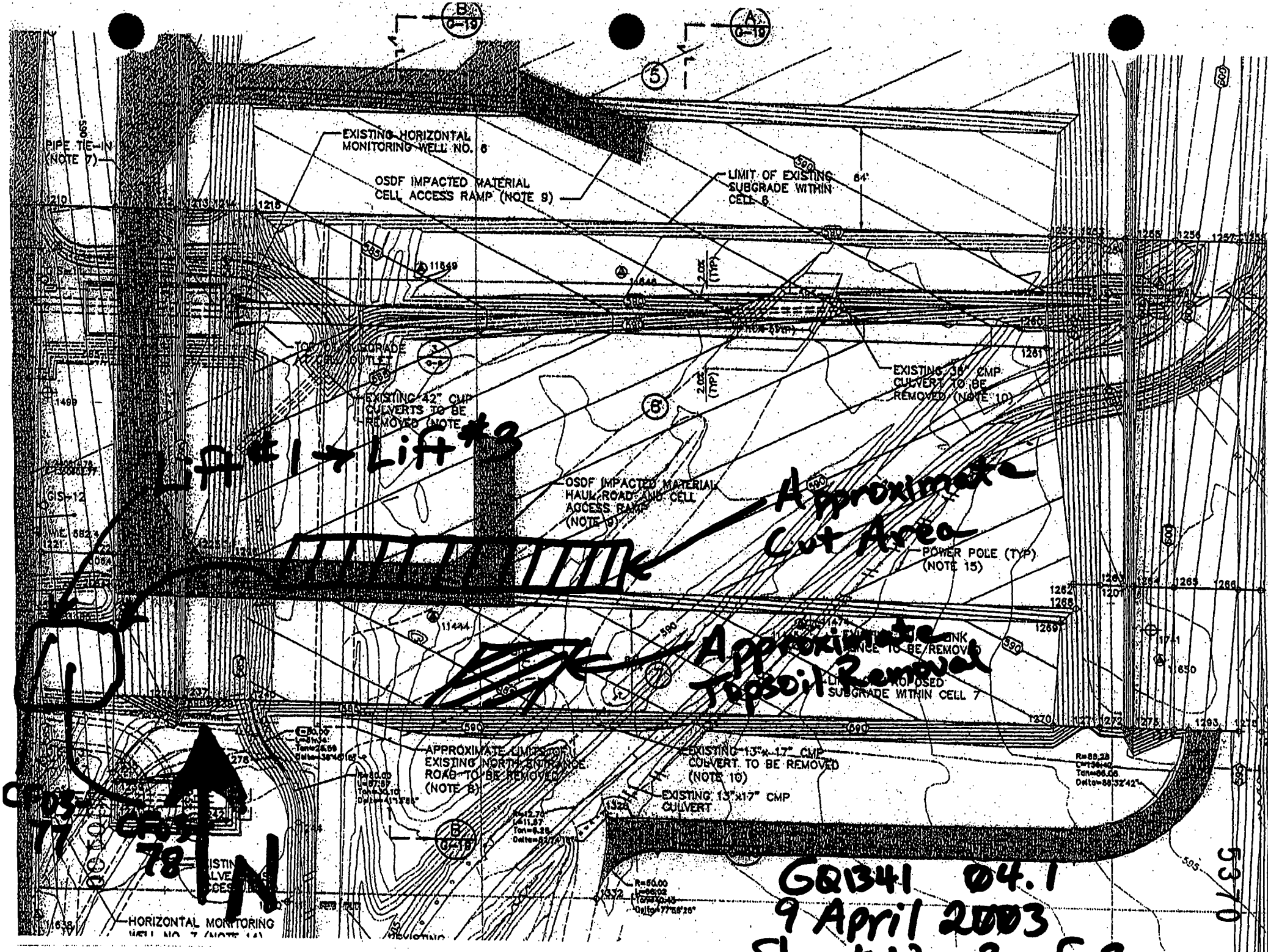
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12
Lift #1 → Lift #3
Approximate Cut Area
Approximate Topsoil Removal
N
GQ1341 04.1
9 April 2003
Sheet No. 2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 041

DESCRIPTION: Phase V

DATE: 10 day April month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cell #7 cut + cut from floor of Cell #6 + Stockpile of Sed Basin #2

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-79	Sed Basin Backfill West Berm	6" / L-4	CF03-5	17.1	112.1	16.7 —	130.2	111.6	99.5	P	—	—	—	—
CF03-80	Sed Basin Backfill West Berm	6" / L-4	CF03-1	14.6	117.7	14.3 —	137.5	120.4	95.1 102.2	P	—	—	—	—
CF03-81	Sed Basin Backfill West Berm	6" / L-8	CF03-5	17.1	112.1	19.1 —	128.4	107.8	96.2	P	—	—	—	—
CF03-82	Cell #6 Floor Southwest Corner	4" / L-1	CF03-1	14.6	117.7	16.9 —	128.8	110.2	93.6	—	F	CF03-88	P	—
CF03-83	Sed Basin Backfill West Berm	6" / L-5	CF02-11	14.5	117.4	17.8 —	130.7	111.0	94.5	—	F	CF03-85	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 2

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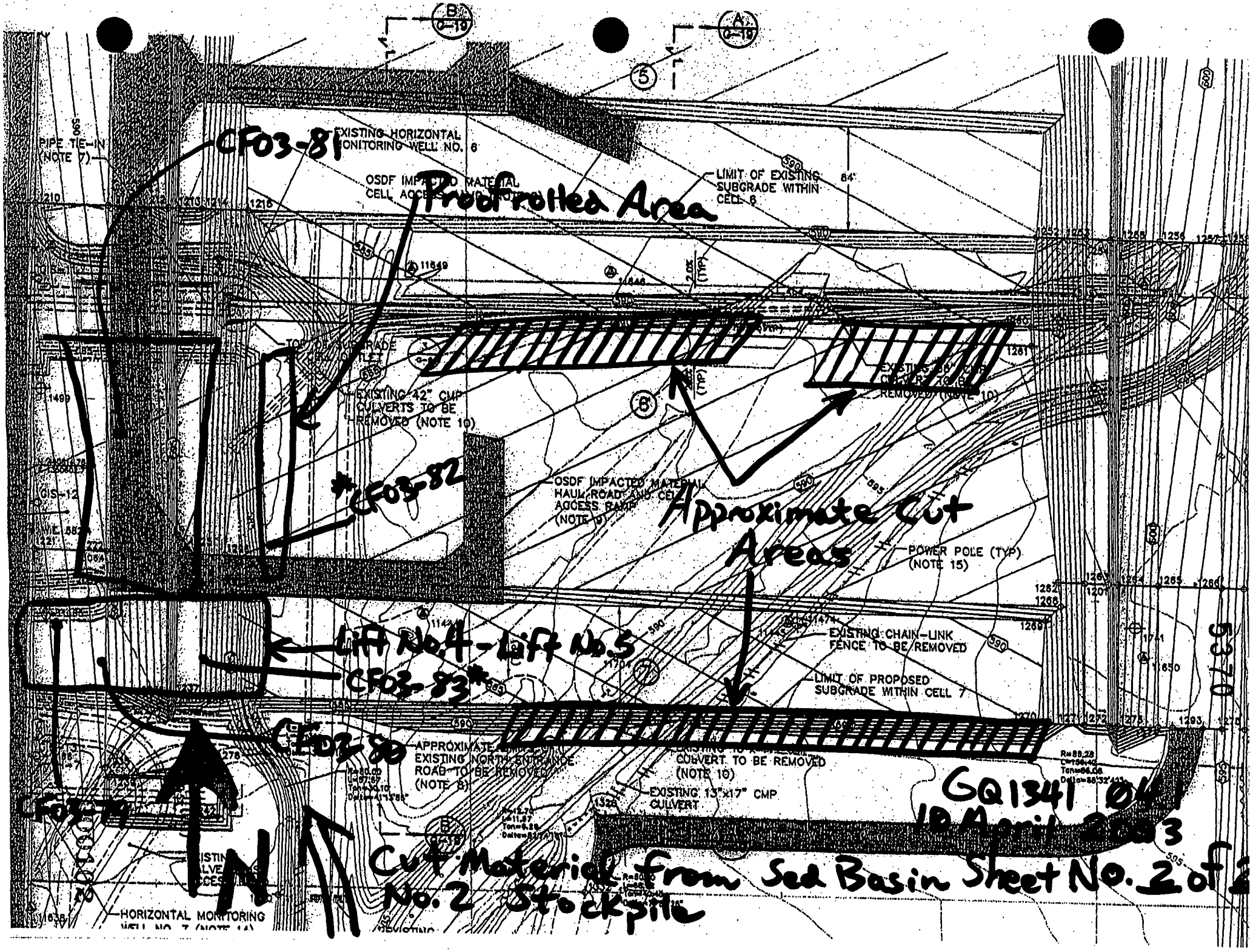
PIPE TIE-IN (NOTE 7)
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
CF03-81
Proofrolled Area
CF03-82
Approximate Cut Areas
Lift No.4 - Lift No.5
CF03-83
CF03-80
CF03-79
N
Cut Material from Sed Basin Sheet No. 2 of 2
No. 2 Stockpile
GQ1341
18 April 2003
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 11 day April month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cell #6, Cell #7, Sed Basin #2 Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-84	Sed Basin #1 Backfill West Berm	6" / L-8	CF03-5	17.1	112.1	16.6 —	127.9	109.7	97.6	P	—	—	—	—
CF03-85	Sed Basin #1 Backfill West Berm	6" / L-5	CF02-11	14.5	117.4	14.5 —	136.8	119.4	101.7	P	—	—	—	—
CF03-86	Sed Basin #1 Backfill West Berm	6" / L-8	CF02-11	14.5	117.4	14.1 —	132.5	116.2	98.9	P	—	—	—	—
CF03-87	Floor of Cell #6	6" / L-1	CF02-11	14.5	117.4	14.6 —	130.6	113.9	97.0	P	—	—	—	—
CF03-88	Floor of Cell #6	8" / L-1	CF03-1	14.6	117.7	16.4 —	132.1	113.5	96.4	P	—	—	—	—
CF03-89	Floor of Cell #6	6" / L-1	CF03-5	17.1	112.1	23.4 —	123.2	99.9	89.1	—	F	CF03-93	P	—
CF03-90	Sed Basin Backfill West Berm	6" / L-9	CF02-11	14.5	117.4	13.5 —	132.8	117.0	99.7	P	—	—	—	—
CF03-91	Sed Basin Backfill West Berm	6" / L-9	CF02-11	14.5	117.4	15.1 —	133.0	115.6	98.4	P	—	—	—	—
CF03-92	Sed Basin Backfill West Berm	6" / L-6	CF02-11	14.5	117.4	15.0 —	133.8	116.2	99.1	P	—	—	—	—
CF03-93	Floor of Cell #6	6" / L-1	CF03-5	17.1	112.1	17.4 —	129.5	110.3	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY:

SHEET NO. 1 OF 4

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 11 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cell #6, Cell #7, Sed Basin #2 Stockpile

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: (CHW)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-94	Floor of Cell #6	6" / L-1	CF03-3	18.7	104.4	21.5	124.8	102.7	98.4	P	—	—	—	—
CF03-95	West Berm	6" / L-10	CF03-5	17.1	112.1	17.8	130.3	119.6	98.7	P	—	—	—	—
CF03-96	West Berm	6" / L-10	CF03-5	17.1	112.1	17.8	128.8	109.3	97.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 2 OF 4

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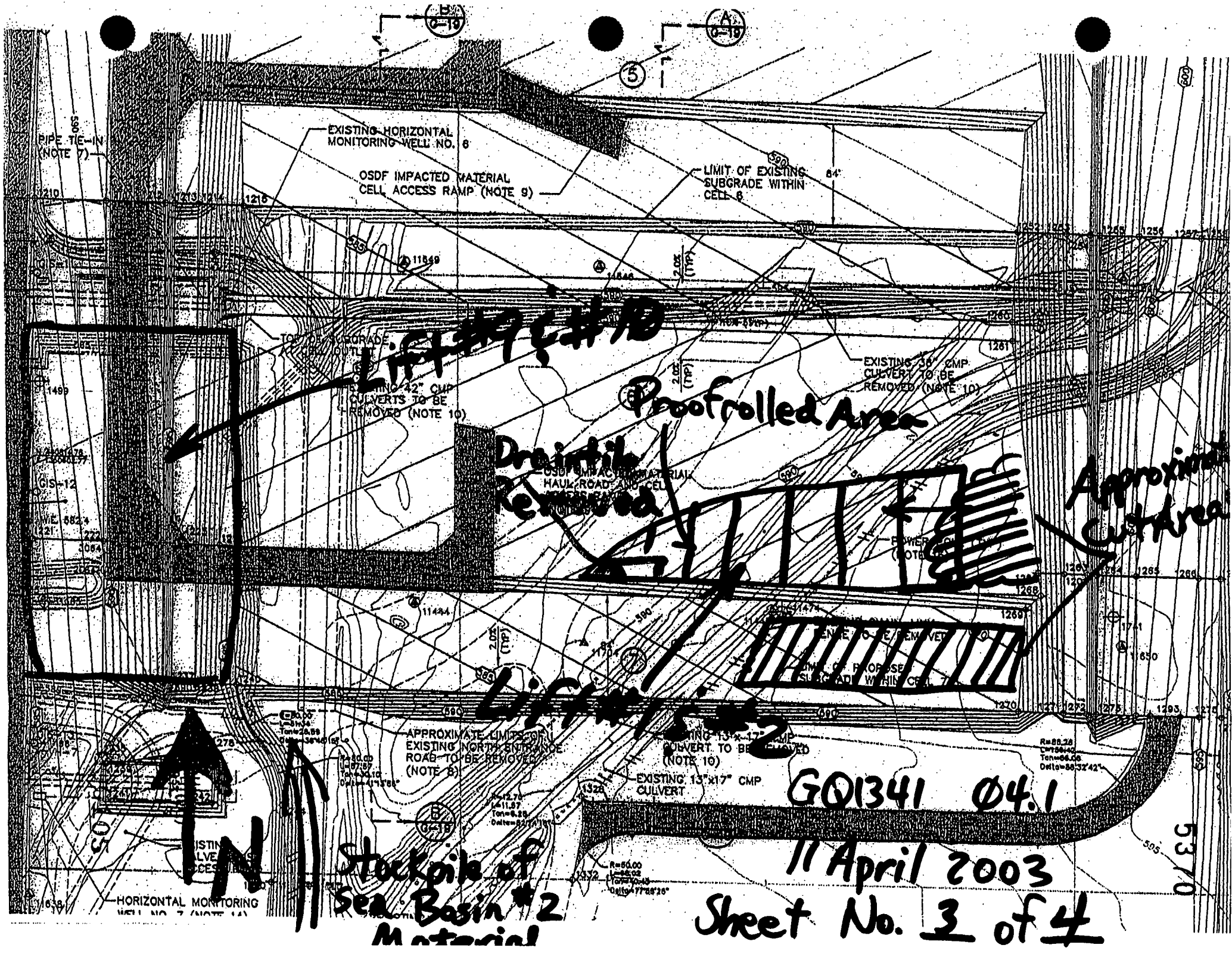
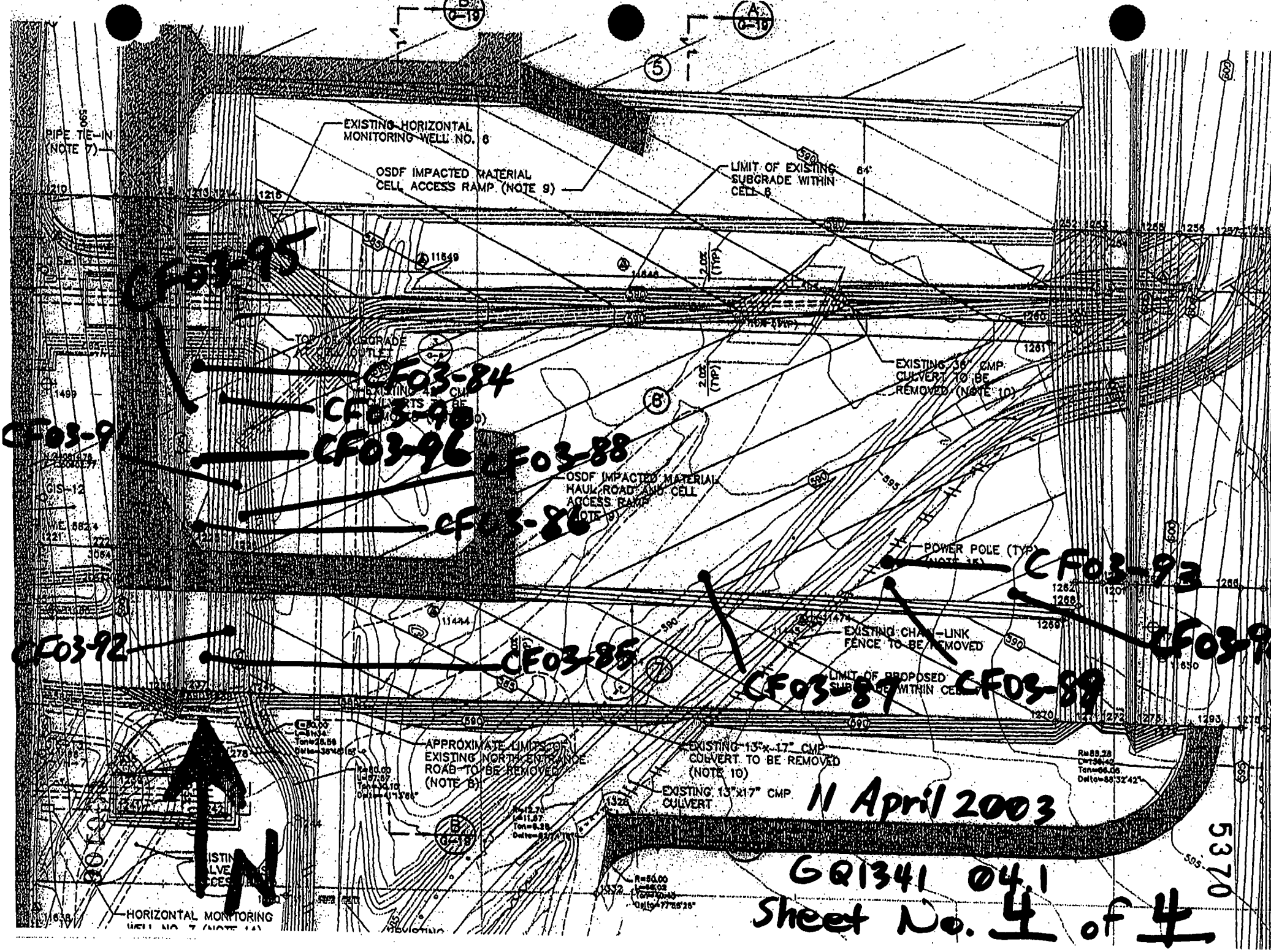

EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
Lift #9 & #10
Proofrolled Area
Approximate Cut Area
Lift #15 #2
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
Stockpile of Sea Basin #2 Material
GQ1341 Ø4.1
11 April 2003
Sheet No. 3 of 4
53/70


EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 19)
POWER POLE (TYP)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
GIS-12
CF03-95
CF03-84
CF03-91
CF03-96
CF03-88
CF03-86
CF03-93
CF03-92
CF03-85
CF03-87
CF03-89
N
11 April 2003
GQ1341 04.1
Sheet No. 4 of 4
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 14 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cell #7 Cut

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-97	West Berm	6" ~~L-10~~ CHW / L-10	CF03-5	17.1	112.1	15.8	128.5	111.0	99.0	P	—	—	—	—
CF03-98	West Berm	6" / L-10	CF03-5	17.1	112.1	17.7	126.7	107.6	96.0	P	—	—	—	—
CF03-99	Cell #6 Floor	6" / L-2	CF03-5	17.1	112.1	14.9	130.9	113.9	101.6	P	—	—	—	—
CF03-100	Cell #6 Floor	6" / L-2	CF03-5	17.1	112.1	14.1	126.4	110.7	98.8	P	—	—	—	—
CF03-101	West Berm	6" / L-11	CF03-1	14.6	117.7	15.3	132.8	115.2	97.9	P	—	—	—	—
CF03-102	West Berm	6" / L-11	CF03-3	18.7	104.4	20.4	125.4	104.1	99.7	P	—	—	—	—
CF03-103	West Berm	8" / L-11	CF03-3	18.5	104.4 ~~106.1~~ CHW	18.5	125.7	106.1	101.6	P	—	—	—	—
CF03-104	West Berm	6" / L-11	CF03-5	17.1	112.1	17.4	130.3	110.9	98.9	P	—	—	—	—
CF03-105	Cell #6 Floor	6" / L-2	CF03-3	18.5	104.4	17.3	123.7	105.4	101.0	P	—	—	—	—
CF03-106	Cell #6 Floor	6" / L-2	CF03-1	14.6	117.7	14.0	134.8	118.2	100.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY:

SHEET NO. 1 OF 4

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 14 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cell #7 Cut

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-107	West Berm	6" / L-12	CF03-1	14.6	117.7	15.3	131.9	114.4	97.2	P	—	—	—	—
CF03-108	West Berm	6" / L-12	CF03-1	14.6	117.7	14.2	133.1	116.5	99.0	P	—	—	—	—
CF03-109	West Berm	6" / L-12	CF03-2	15.1	113.9 CHW	~~12.7~~ 16.8	~~128.8~~	~~110.2~~ CHW 110.2	96.7	P	—	—	—	—
CF03-110	West Berm	6" / L-12	CF03-1	14.6	117.7	12.7	136.8	121.4	103.1	P	—	—	—	—
CF03-111	West Berm	6" / L-12	CF03-1	14.6	117.7	13.8	131.7	115.7	98.3	P	—	—	—	—
CF03-112	West Berm	6" / L-12	CF03-5	17.1	112.1	19.0	128.5	108.0	96.3	P	—	—	—	—
CF03-113	West Road, ≈S.G.	6" / L-9	CF03-3	18.7	104.4	18.4	122.7	103.7	99.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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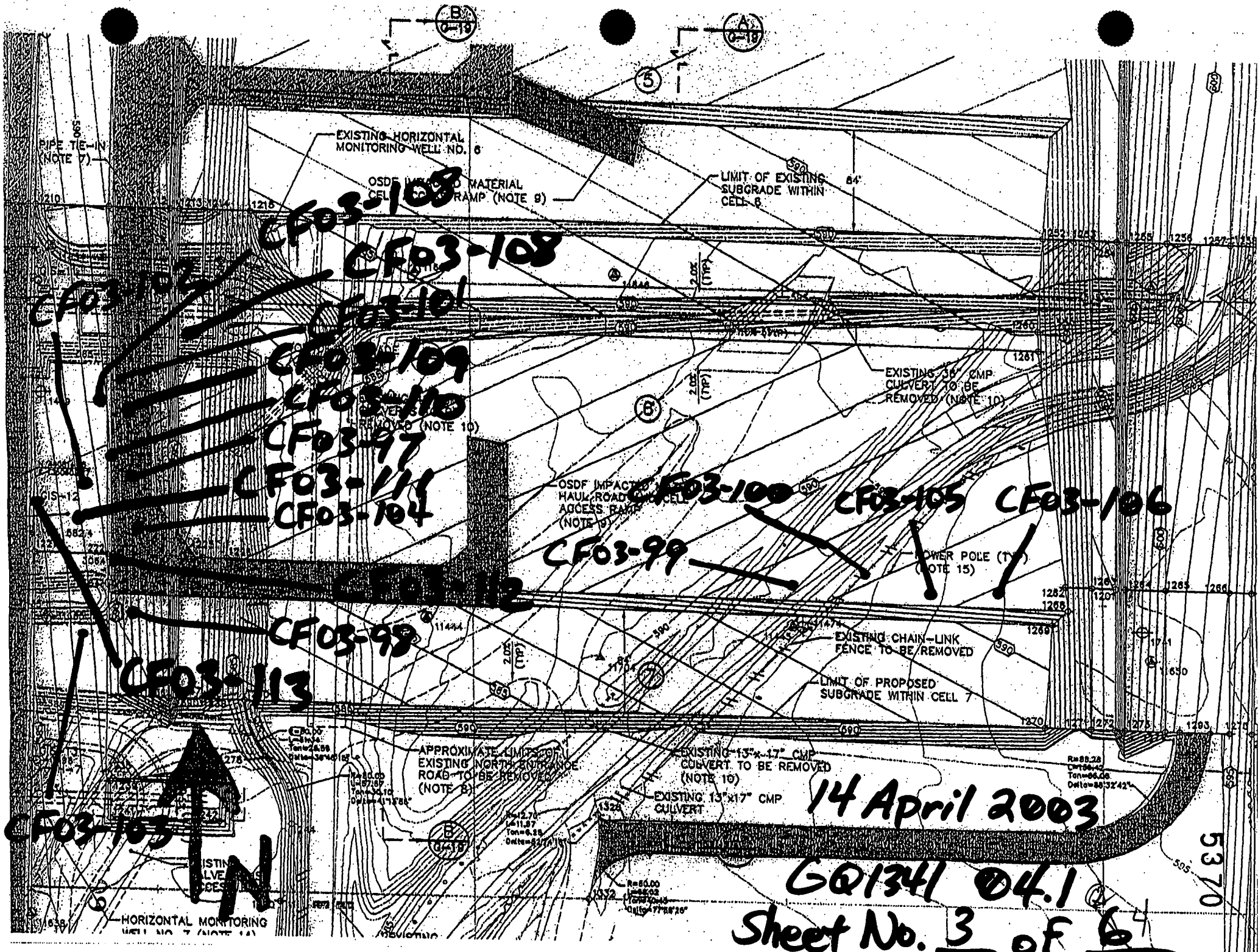
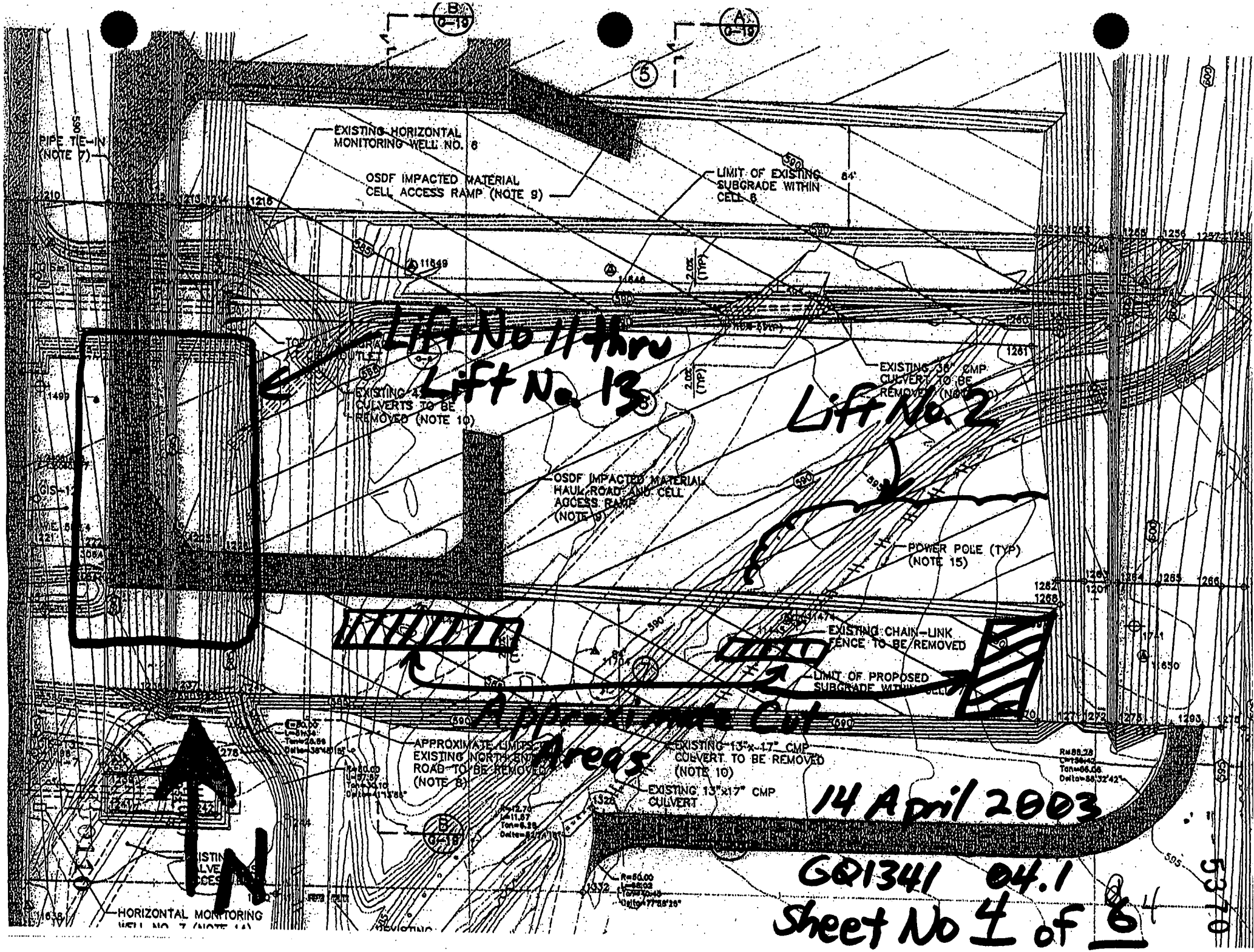

EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
CF03-102
CF03-108
CF03-101
CF03-109
CF03-110
CF03-97
CF03-111
CF03-104
CF03-100
CF03-105
CF03-106
CF03-99
CF03-112
CF03-98
CF03-113
CF03-103
N
14 April 2003
G01341 04.1
Sheet No. 3 of 6
53370


PIPE TIE-IN (NOTE 7)
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
EXISTING 36" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL
APPROXIMATE LIMITS EXISTING NORTH SIDE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
Lift No 11 thru Lift No. 13
Lift No. 2
Approximate Cut Areas
N
14 April 2003
GQ1341 04.1
Sheet No 4 of 8

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 15 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: On Site Cut Material from Cell #7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-114	West Berm of Cell #6	6" / L-13	CF03-3	18.7	104.4	20.1 —	125.9	104.8	100.4	P	—	—	—	—
CF03-115	West Berm of Cell #6	6" / L-13	CF03-1	14.6	117.7	13.6 —	134.9	118.8	100.9	P	—	—	—	—
CF03-116	West Berm of Cell #6	6" / L-13	PCP55	11.7	126.5	12.8 —	138.5	122.8	97.1	P	—	—	—	—
CF03-117	West Berm of Cell #6 over LDS, LCS, LCSR	6" / L-13	CF03-5	17.1	112.1	18.0 —	130.3	110.4	98.5	P	—	—	—	—
CF03-118	West Berm of Cell #6	6" / L-14	CF03-5	17.1	112.1	16.7 —	127.9	109.6	97.8	P	—	—	—	—
CF03-119	West Berm of Cell #6	6" / L-14	CF03-2	15.1	113.9	23.7 —	122.7	99.2	87.1	—	F	CF03-121	P	—
CF03-120	West Berm of Cell #6	6" / L-14	CF03-2	15.1	113.9	23.3 —	124.4	101.0	88.7	—	F	CF03-122	P	—
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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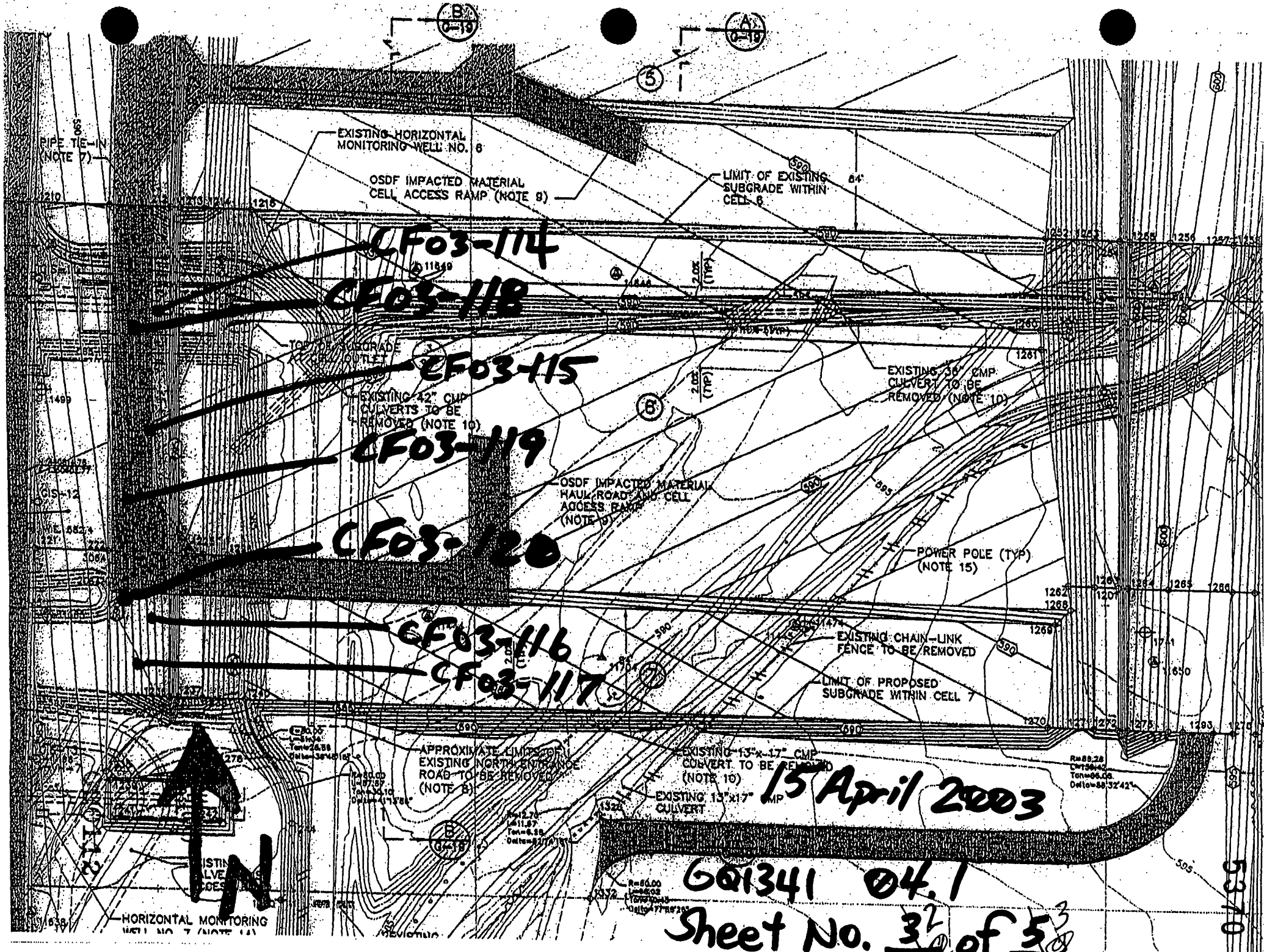
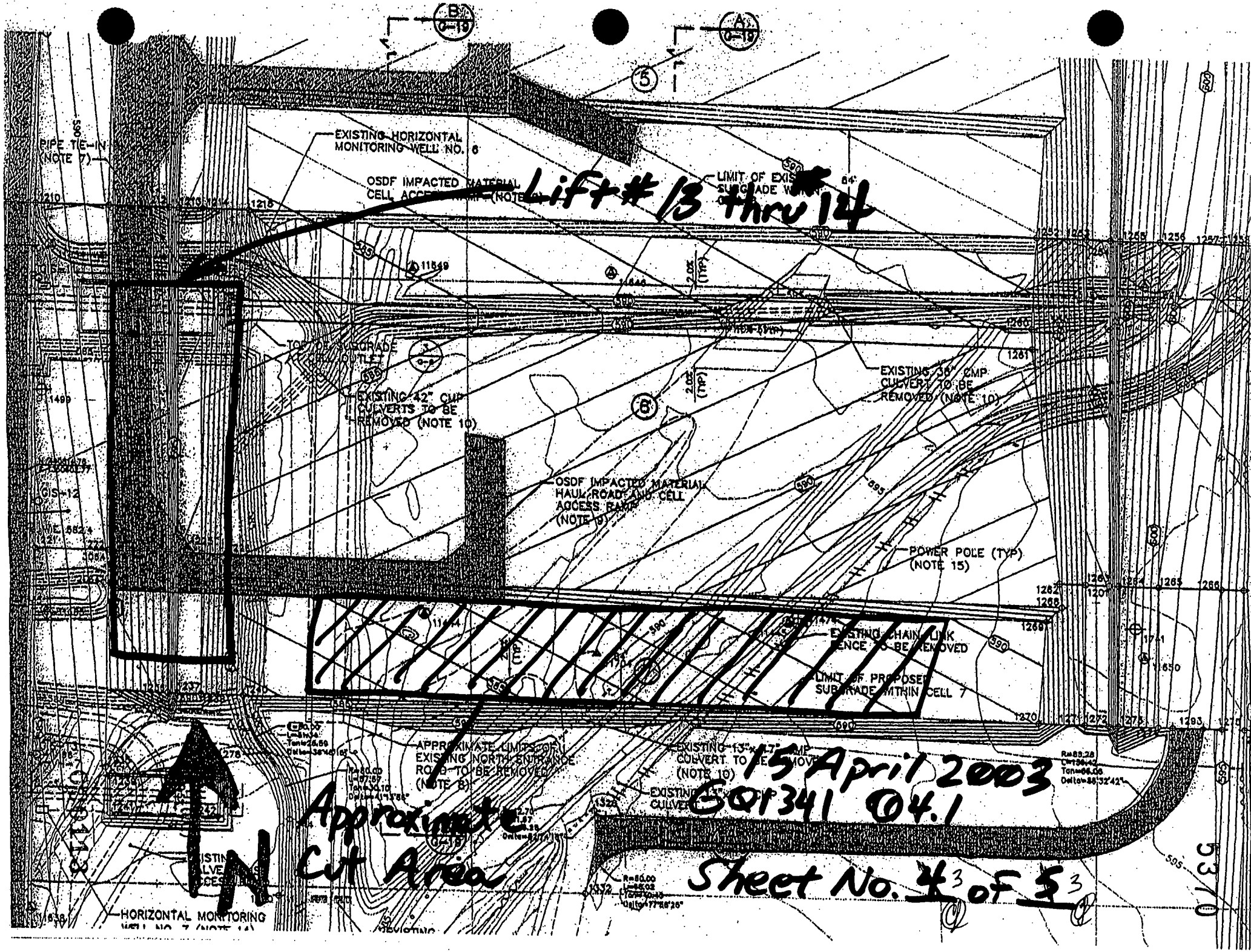

EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
PIPE TIE-IN (NOTE 7)
CF03-114
CF03-118
CF03-115
CF03-119
CF03-120
CF03-116
CF03-117
TOP OF SUBGRADE AT CELL OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
N
15 April 2003
G01341 04.1
Sheet No. 3 of 5


Lift # 13 thru 14
15 April 2003
G01341 04.1
Approximate Cut Area
Sheet No. 4 of 5
N
EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 7
TOP OF SUBGRADE CMP OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13" x 17" CMP CULVERT TO BE REMOVED (NOTE 10)
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 16 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: CELL #7 Cut material + material From Sed Basin #2 Stockpile

MATERIAL TYPE: (FILL) SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-121	Cell #6 West Berm	6" / L-14	CF03-2	15.1	113.9	18.0	130.4	110.5	97.0	P	—	—	—	—
CF03-122	Cell #6 West Berm	6" / L-14	CF03-2	15.1	113.9	17.7	130.0	110.5	97.0	P	—	—	—	—
CF03-123	Cell #6 West Berm	6" / L-14	CF03-3	18.7	104.4	21.7	124.1	102.0	97.7	P	—	—	—	—
CF03-124	Cell #6 West Berm	6" / L-14	CF03-3	18.7	104.4	20.7	122.0	101.0	96.7	P	—	—	—	—
CF03-125	Cell #6 West Berm	6" / L-15	CF03-2	15.1	113.9	14.8	127.8	111.4	97.8	P	—	—	—	—
CF03-126	Cell #6 West Berm	6" / L-1	PCR-55 ~~CF03-1~~	11.7	126.5	12.1	136.9	122.1	96.5	P	—	—	—	—
CF03-127	Cell #6 West Berm	6" / L-2	CF02-11 ~~CF03-1~~	14.5	117.4	12.5	131.5	116.9	99.6	P	—	—	—	—
CF03-128	Cell #6 West Berm	6" / L-15	CF02-11	14.5	117.4	12.2	132.7	118.2	100.7	P	—	—	—	—
CF03-129	Cell #6 West Berm	6" / L-15	CF02-11	14.5	117.4	12.3	130.1	115.9	98.7	P	—	—	—	—
CF03-130	Cell #6 West Berm	6" / L-15	CF02-11	14.5	117.4	11.8	132.0	118.1	100.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 4

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 16 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cell #7 Cut Material + Material From Seq Basin #2 Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: CMW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-131	West Berm Cell #6	6" / L-15	CF02-11	14.5	117.4	12.9 —	132.0	116.9	99.6	P	—	—	—	—
CF03-132	West Berm Cell #6	6" / L-15	CF02-11	14.5	117.4	13.1 —	132.7	117.3	99.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 2 OF 4

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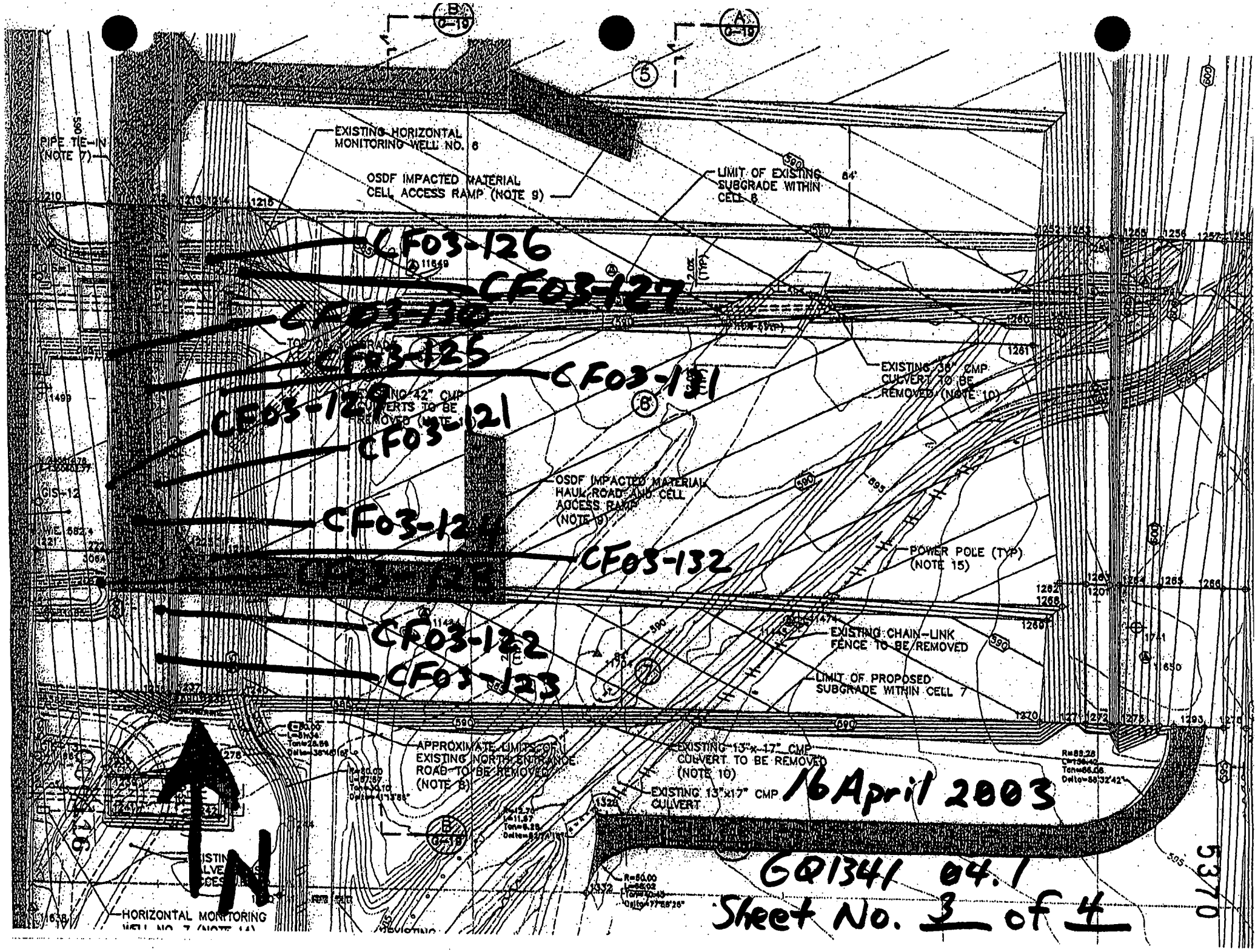
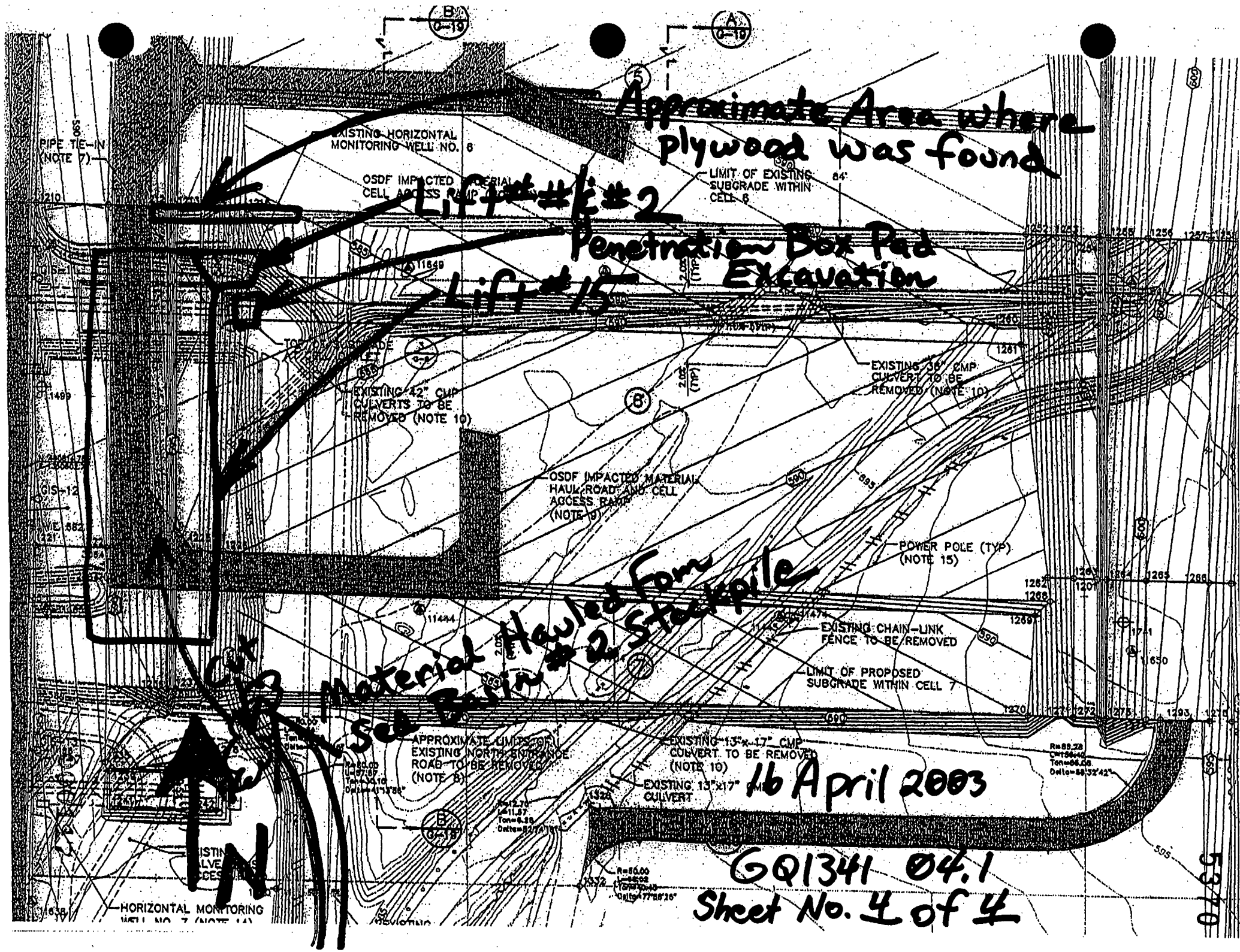

EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
PIPE TIE-IN (NOTE 7)
EXISTING 38" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
CF03-126
CF03-127
CF03-130
CF03-125
CF03-131
CF03-121
CF03-132
CF03-122
CF03-123
16 April 2003
GQ1341 04.1
Sheet No. 3 of 4
53770


Approximate Area where plywood was found
Lift #2
Penetration Box Pad Excavation
Lift #15
Material Hauled from Stockpile
See Basin #2
16 April 2003
GQ1341 04.1
Sheet No. 4 of 4
PIPE TIE-IN (NOTE 7)
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12
N

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 18 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Sea Basin #2 Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: GHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-133	Cell #6 West Berm	6" / L-16	CF02-11	14.5	117.4	16.1	132.4	114.0	97.1	P	—	—	—	—
CF03-134	Cell #6 West Berm	6" / L-16	CF02-11	14.5	117.4	13.7	132.4	116.4	99.1	P	—	—	—	—
CF03-135	Cell #6 West Berm	6" / L-16	CF02-11	14.5	117.4	12.6	132.0	117.2	99.8	P	—	—	—	—
CF03-136	Cell #6 West Berm	6" / L-16	CF02-12	16.2	110.7	15.7	128.8	111.3	100.5	P	—	—	—	—
CF03-137	Cell #6 West Berm	6" / L-16	CF02-12	16.2	110.7	16.4	131.3	112.8	101.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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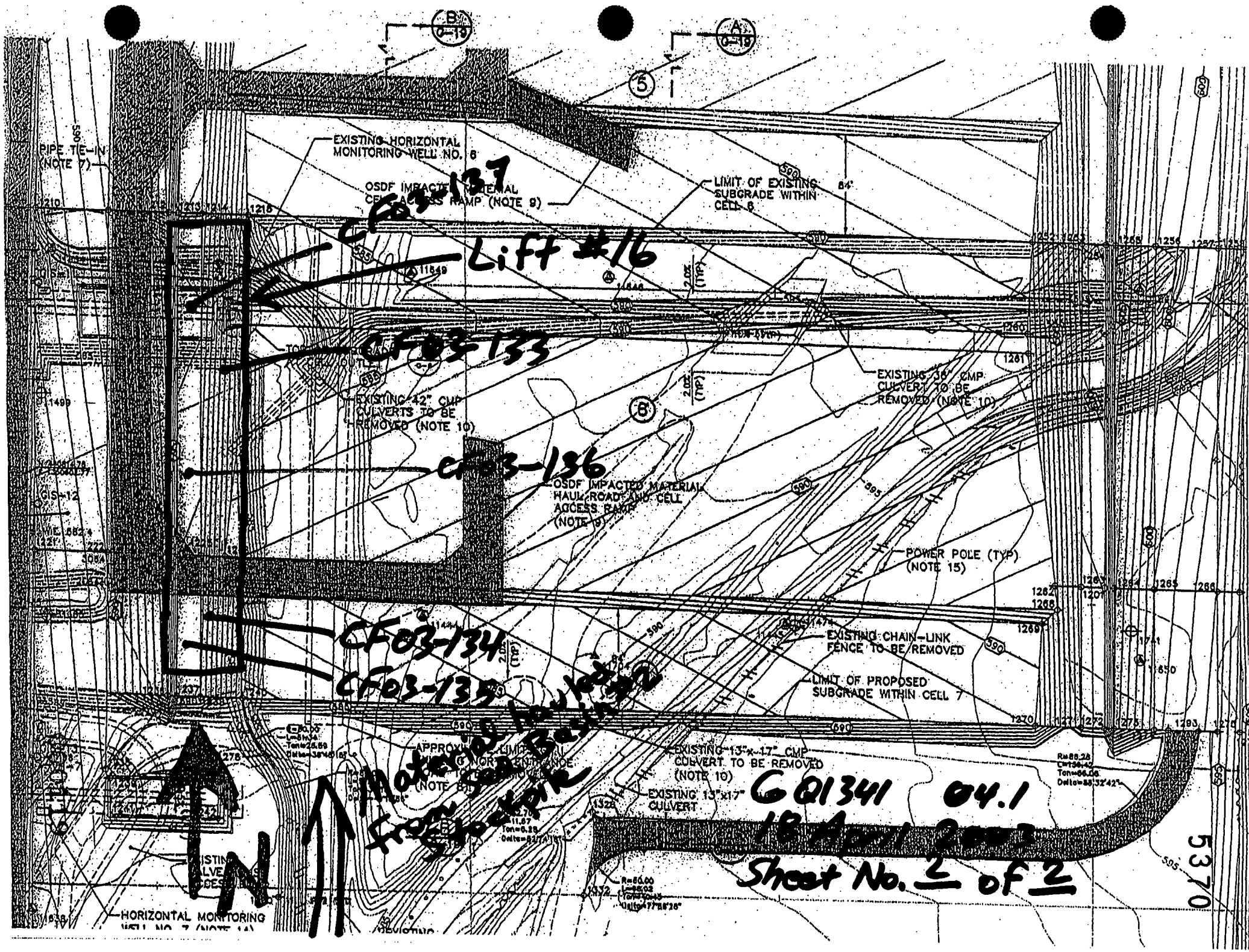
PIPE TIE-IN (NOTE 7)
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 4)
N
CF03-137
Lift #16
CF03-133
CF03-136
CF03-134
CF03-135
G01341 04.1
Sheet No. 2 of 2
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 041

DESCRIPTION: Phase V

DATE: 22 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: ____ MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-138	Cell #6, West Berm	6" / L-17	CF02-11	14.5	117.4	13.9 —	130.0	114.2	97.3	P	—	—	—	—
CF03-139	Cell #6, West Berm	6" / L-17	CF02-11	14.5	117.4	16.0 —	129.3	111.5	95.0	P	—	—	—	—
CF03-140	Cell #6, West Berm	6" / L-17	CF02-11	14.5	117.4	13.5 —	136.9	120.6	102.7	P	—	—	—	—
CF03-141	Cell #6, West Berm	6" / L-17	CF02-11	14.5	117.4	12.4 —	135.4	120.5	102.6	P	—	—	—	—
CF03-142	Cell #6, West Berm	6" / L-17	CF02-11	14.5	117.4	12.5 —	132.0	117.3	99.9	P	—	—	—	—
		/												
		/												
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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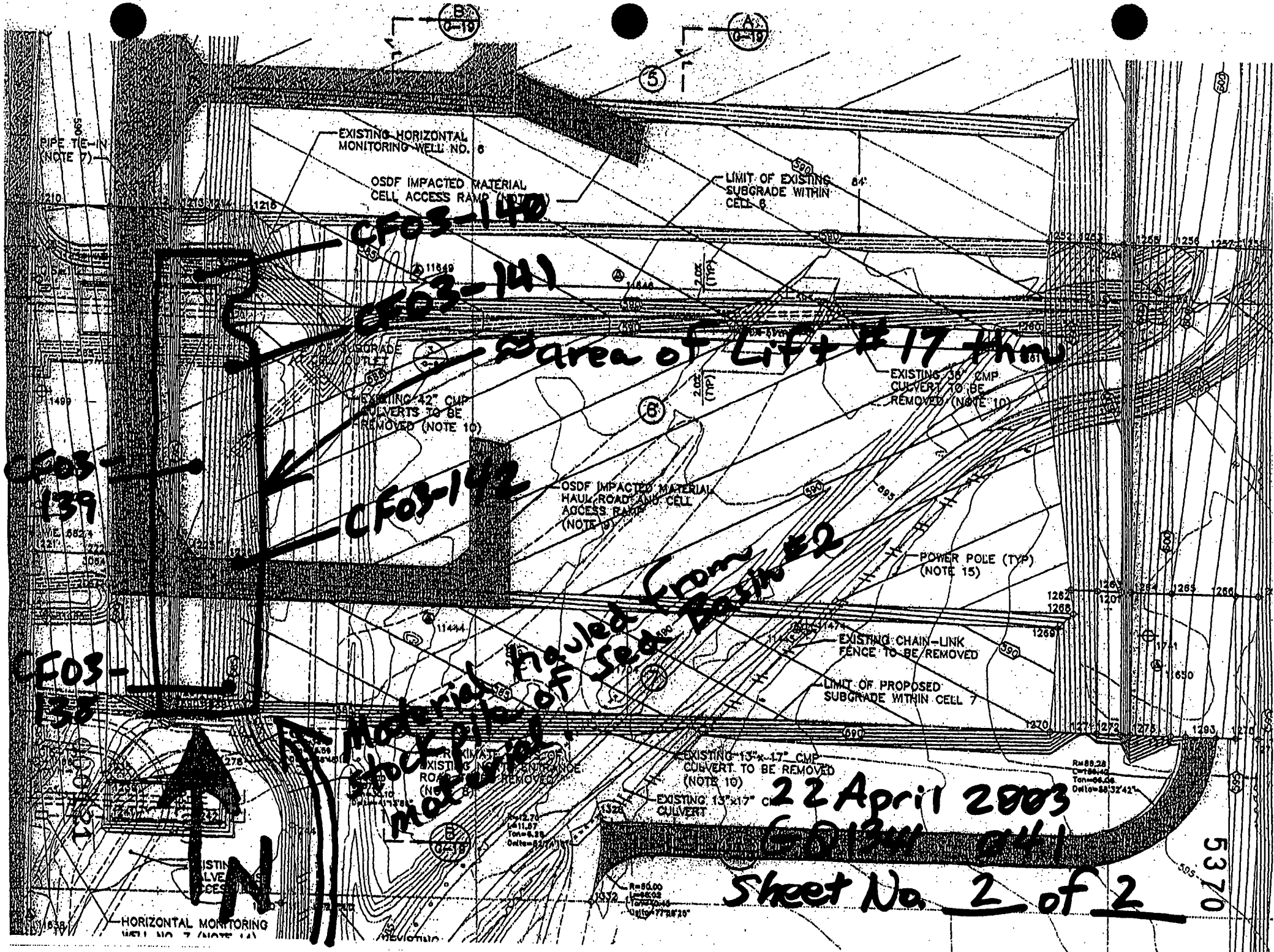
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
CF03-140
CF03-141
Area of Lift #17 thru
SUBGRADE OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
CF03-139
CF03-142
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
hauled from Basin #2
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
CF03-138
Material stockpile material
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
22 April 2003
Sheet No. 2 of 2
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GR1341 TASK NO.: 004.1

DESCRIPTION: Phase V

DATE: 23 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Stockpile of Sed Basin #2 Material

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-143	West Berm, Cell #6	6" / L-18	CF02-11	14.5	117.4	15.6	133.3	115.3	98.2	P	—	—	—	—
CF03-144	West Berm, Cell #7	6" / L-18	CF02-11	14.5	117.4	12.8	135.5	120.1	102.3	P	—	—	—	—
CF03-145	West Berm Cell #6	6" / L-19	CF02-11	14.5	117.4	16.3	132.4	113.8	96.9	P	—	—	—	—
CF03-146	West Berm Cell #6	6" / L-19	CF02-11	14.5	117.4	14.1	133.0	116.6	99.3	P	—	—	—	—
CF03-147	West Berm, Cell #6	6" / L-19	CF02-11	14.5	117.4	13.3	135.7	119.8	102.0	P	—	—	—	—
CF03-148	West Berm, Cell #7	6" / L-19	CF02-11	14.5	117.4	16.9	132.5	113.3	96.5	P	—	—	—	—
CF03-149	Floor of Cell #6	6" / L-2	CF02-11	14.5	117.4	13.6	135.1	118.9	101.3	P	—	—	—	—
CF03-150	West Berm, Cell #6	6" / L-20	CF02-11	14.5	117.4	14.0	132.1	115.9	98.7	P	—	—	—	—
CF03-151	West Berm, Cell #6	6" / L-20	CF02-11	14.5	117.4	14.1	133.0	116.6	99.3	P	—	—	—	—

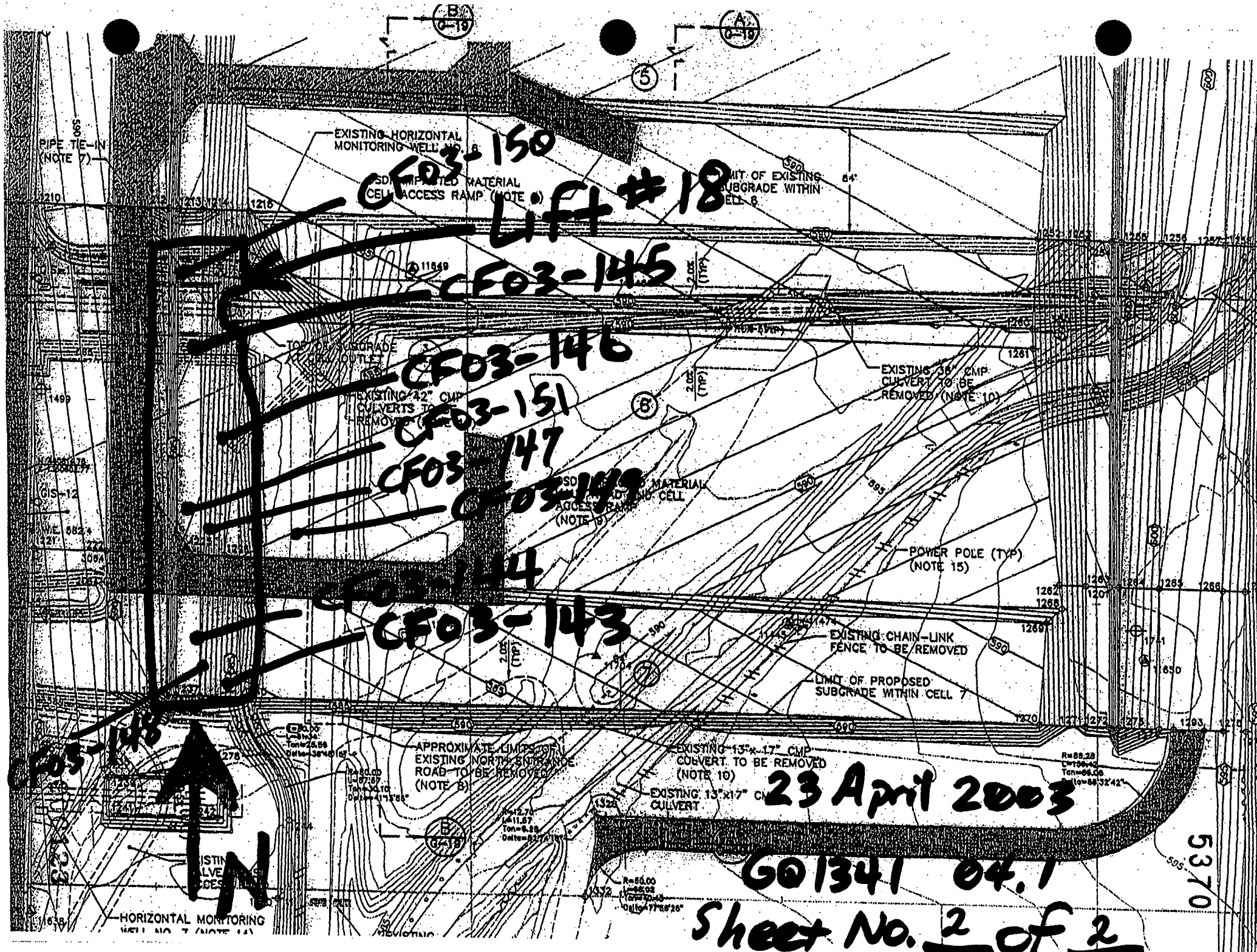
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

0001122

53170

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 1 OF 2


CF03-150
Lift #18
CF03-145
CF03-146
CF03-151
CF03-147
CF03-149
CF03-144
CF03-143
CF03-148
23 April 2003
G01341 04.1
Sheet No. 2 of 2
5370
N
EXISTING HORIZONTAL MONITORING WELL NO. 8
PIPE TIE-IN (NOTE 7)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
TOP OF SUBGRADE AT OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE V

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 24 day APR month 2003 year THURSDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8-12"

MATERIAL SOURCE: SED. BASIN 2 STOCKPILE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TBC)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-152	WEST BERM (CELL 6)	8"/L-21	CF03-7	12.5	122.7	14.3	137.5	120.3	98.0	P	—	—	—	—
CF03-153	↓	8"/L-21	CF03-7	12.5	122.7	13.1	137.1	121.2	98.8	P	—	—	—	—
CF03-154	↓	8"/L-21	CF03-7	12.5	122.7	13.9	136.6	119.9	97.7	P	—	—	—	—
CF03-155	UNDERCUT CELL 7 RUNOUT	8"/L-1	CF03-7	12.5	122.7	13.4	136.7	120.5	98.2	P	—	—	—	—
CF03-156	↓	8"/L-1	CF03-7	12.5	122.7	13.2	135.0	119.2	97.1	P	—	—	—	—
CF03-157	↓	8"/L-2	CF03-7	12.5	122.7	12.7	137.4	121.9	99.3	P	—	—	—	—
CF03-158	↓	8"/L-2	CF03-7	12.5	122.7	14.0	135.5	118.9	96.9	P	—	—	—	—
CF03-159	↓	8"/L-3	CF03-7	12.5	122.7	12.1	138.5	123.6	100.7	P	—	—	—	—
CF03-160	↓	8"/L-3	CF03-7	12.5	122.7	13.1	138.0	122.1	99.5	P	—	—	—	—
CF03-161	WEST BERM-CELL 6	8"/L-22	CF03-7	12.5	122.7	12.6	137.8	122.4	99.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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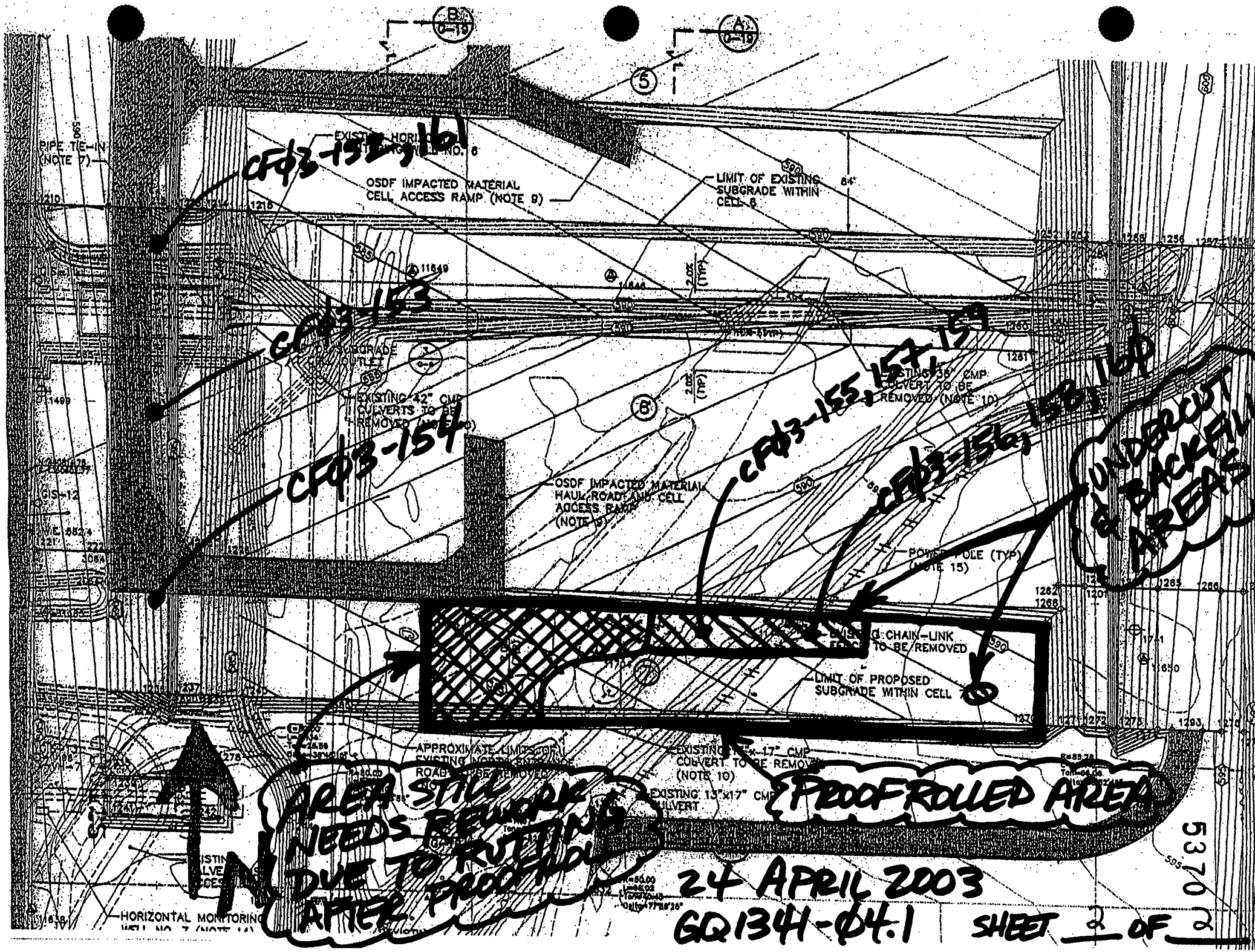
5370


PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
EXISTING 42" CMP CULVERTS TO BE REMOVED
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
CF03-152, 161
CF03-153
CF03-154
CF03-155, 157, 159
CF03-156, 158, 160
UNDERCUT & BACKFILL AREA
PROOF ROLLED AREA
AREA STILL NEEDS REWORK DUE TO RUTTING AFTER PROOFROLL
24 APRIL 2003
GQ1341-04.1
SHEET 2 OF 2
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G01341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 25 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Sed Basin #2 Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: Other

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-162	Cell #6 West Berm	6" / L-22	CF03-7	12.5	122.7	13.5 —	137.2	120.9	98.5	P	—	—	—	—
CF03-163	Cell #6 West Berm	6" / L-22	CF03-7	12.5	122.7	13.8 —	132.7	116.6	95.0	P	—	—	—	—
CF03-164	Cell #6 West Berm	6" / L-22	CF03-7	12.5	122.7	13.7 —	133.4	117.3	95.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CJ SHEET NO. 1 OF 2

000126

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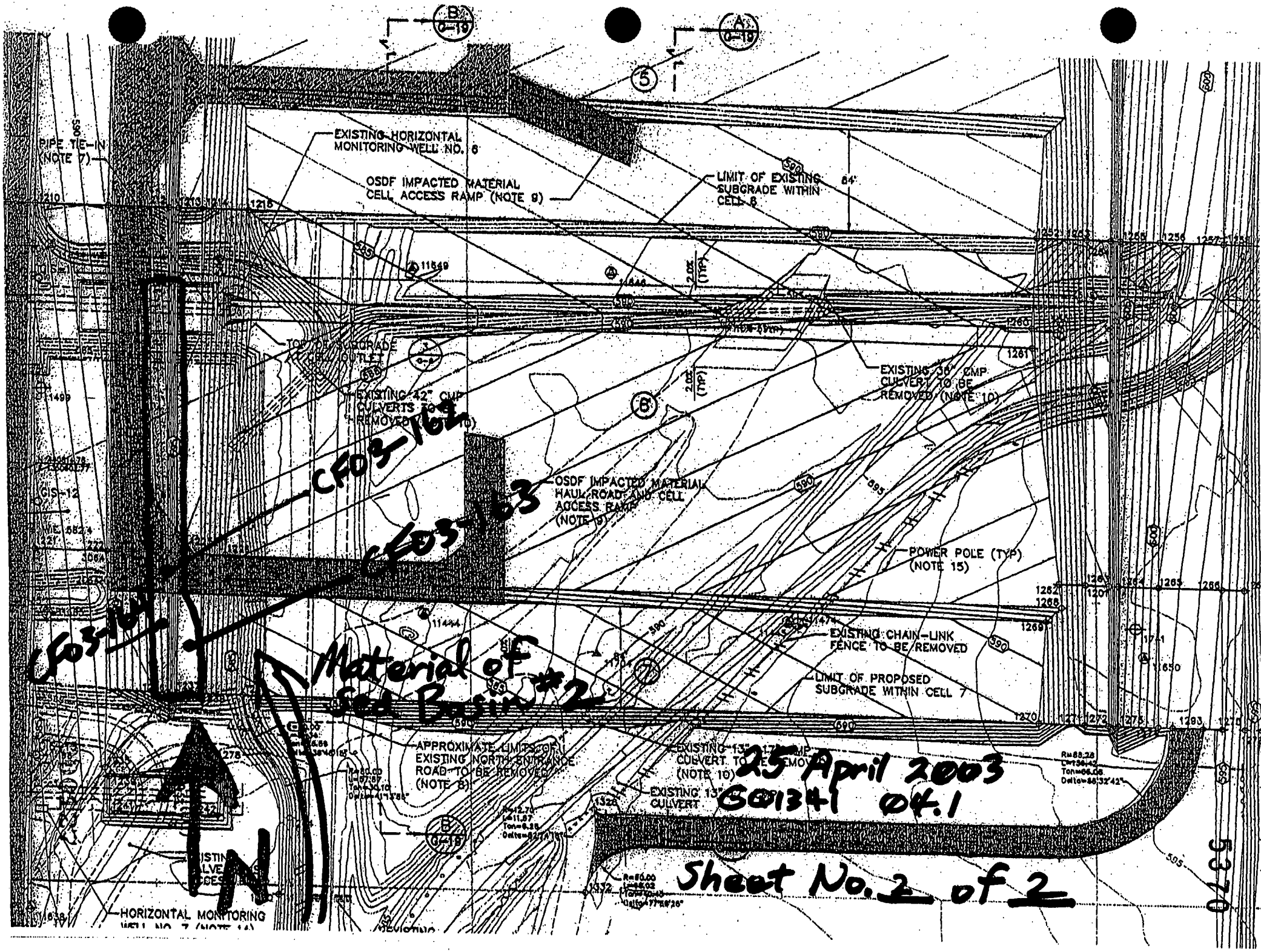
EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
64'
TOP OF SUBGRADE CELL OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13" CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
CIS-12
CF03-162
CF03-163
CF03-161
Material of Sed Basin #2
25 April 2003
G0134-1 04.1
Sheet No. 2 of 2
N

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GO1341 TASK NO.: 04.1

DATE: 28 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: SED Basin #2 Stockpile + Gray Glacial Till Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-165	CELL #6, West Berm	6" / L-22	CF03-7	~~13.0~~ 12.5	~~120.5~~ 122.7	12.7	133.6	118.5	~~98.3~~ 96.6	P	—	—	—	—
CF03-166	CELL #6, WEST Berm	6" / L-22	PCP57	10.5	128.7	10.3	137.8	125.0	97.1	P	—	—	—	—
CF03-167	Cell #6, Floor Undercut	8" / L-2	PCP57	10.5	128.7	9.2	138.5	126.8	98.5	P	—	—	—	—
CF03-168	Cell #6 Floor Undercut	8" / L-3	PCP57	10.5	128.7	9.6	145.1	132.4	102.9	P	—	—	—	—
CF03-169	Cell #6 Floor Undercut	6" / L-1	PCP57	10.5	128.7	8.2	134.8	124.6	96.8	P	—	—	—	—
CF03-170	Cell #6 Floor Undercut	8" / L-2	PCP57	10.5	128.7	7.8	137.9	127.9	99.4	P	—	—	—	—
CF03-171	Cell #6, Floor Undercut	6" / L-3	PCP57	10.5	128.7	9.9	136.9	124.6	96.8	P	—	—	—	—
CF03-172	Cell #6, Floor Undercut	6" / L-4	PCP-57	10.5	128.7	10.2	140.2	127.3	98.9	P	—	—	—	—
CF03-173	Cell #6, Floor Undercut	4" / L-5	CF03-1	14.6	117.7	11.8	133.2	119.2	101.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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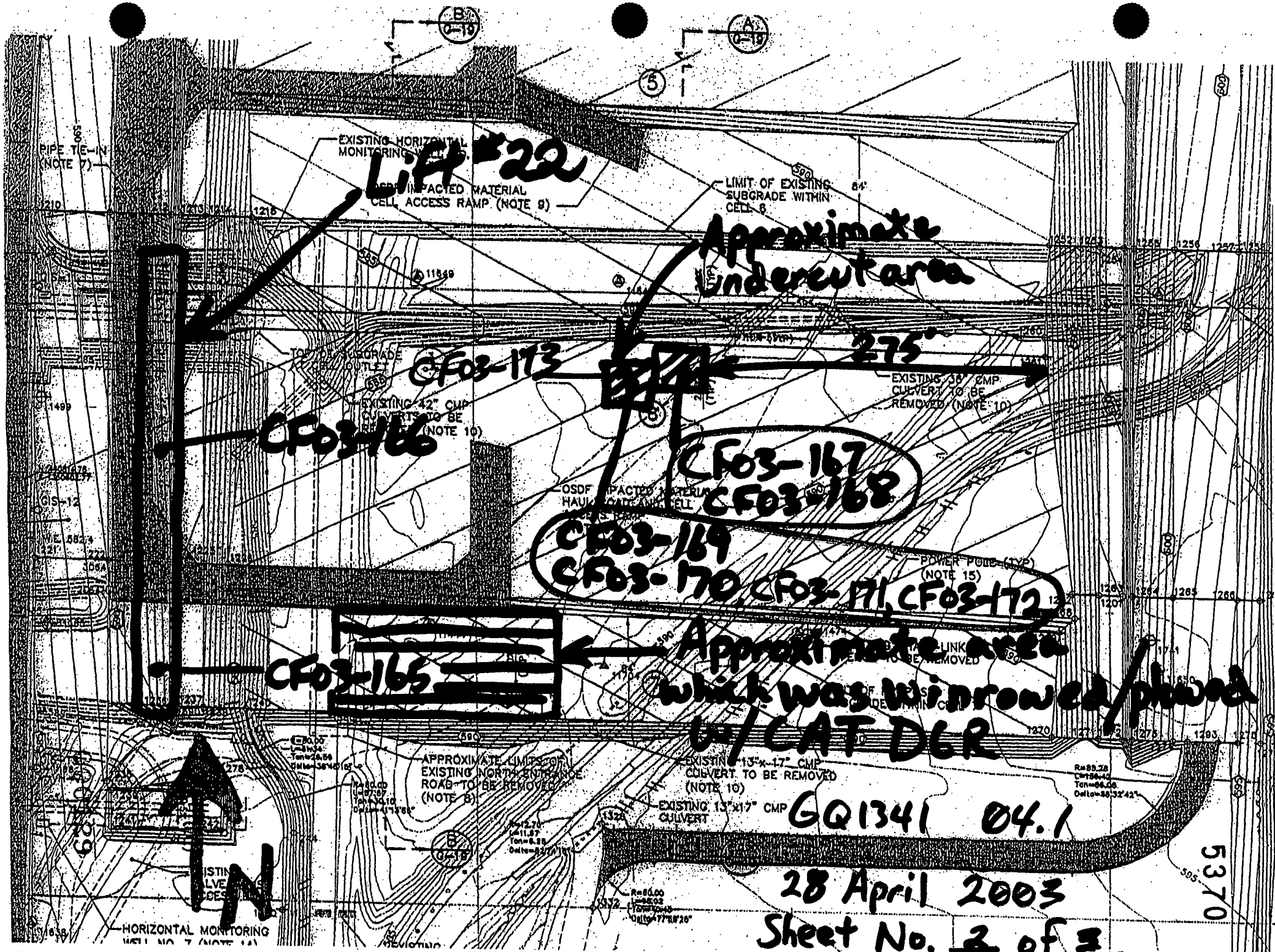
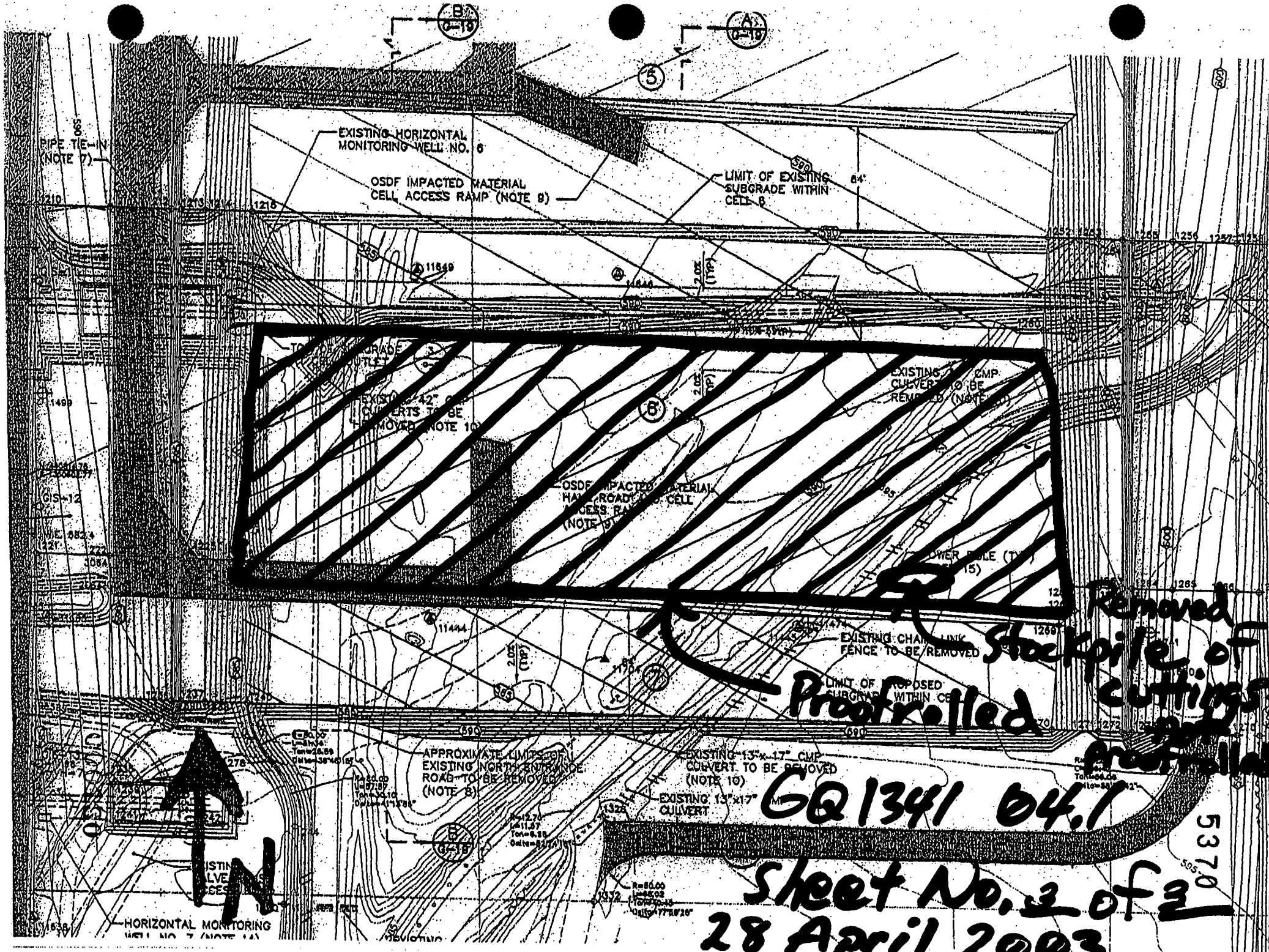

PIPE TIE-IN (NOTE 7)
EXISTING HORIZONTAL MONITORING WELL
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
Lift #22
Approximate Underout area
275'
CF03-173
CF03-166
EXISTING 42" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 30" CMP CULVERT TO BE REMOVED (NOTE 10)
CF03-167
CF03-168
CF03-169
CF03-170, CF03-171, CF03-172
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL
POWER POLE (TYP) (NOTE 15)
CF03-165
Approximate area which was winrowed/placed w/CAT D6R
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
GQ1341 04.1
N
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
28 April 2003
Sheet No. 2 of 3
5370


EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
EXISTING CHAIN LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CULVERT
HORIZONTAL MONITORING
N
Removed
Stockpile of cuttings
Proofrolled
GQ1341 04.1
Sheet No. 2 of 2
28 April 2003
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 041

DESCRIPTION: Phase V

DATE: 29 day April month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: _____ MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-174	Cell #6, Floor Undercut	6" / L-1	PCP-57	10.5	128.7	10.2	139.7	126.8	98.5	P	—	—	—	—
CF03-175	Cell #6, Floor Undercut	6" / L-2	PCP-57	10.5	128.7	10.5	140.9	127.5	99.1	P	—	—	—	—
CF03-176	Cell #6, Floor Undercut	6" / L-2	PCP-57	10.5	128.7	9.4	137.6	125.7	97.7	P	—	—	—	—
CF03-177	Cell #6, Floor Undercut	8" / L-4	PCP-57	10.5	128.7	7.9	142.9	132.4	102.9	P	—	—	—	—
CF03-178	Cell #6, Floor Undercut	8" / L-5	PCP-57	10.5	128.7	11.8	141.5	126.6	98.4	P	—	—	—	—
CF03-179	Cell #6, Floor Undercut	6" / L-6	~~CF02-11~~ CF02-12	~~14.5~~ 16.2	~~111.4~~ 110.7	14.4	126.5	110.6	99.9	P	—	—	—	—
		/												
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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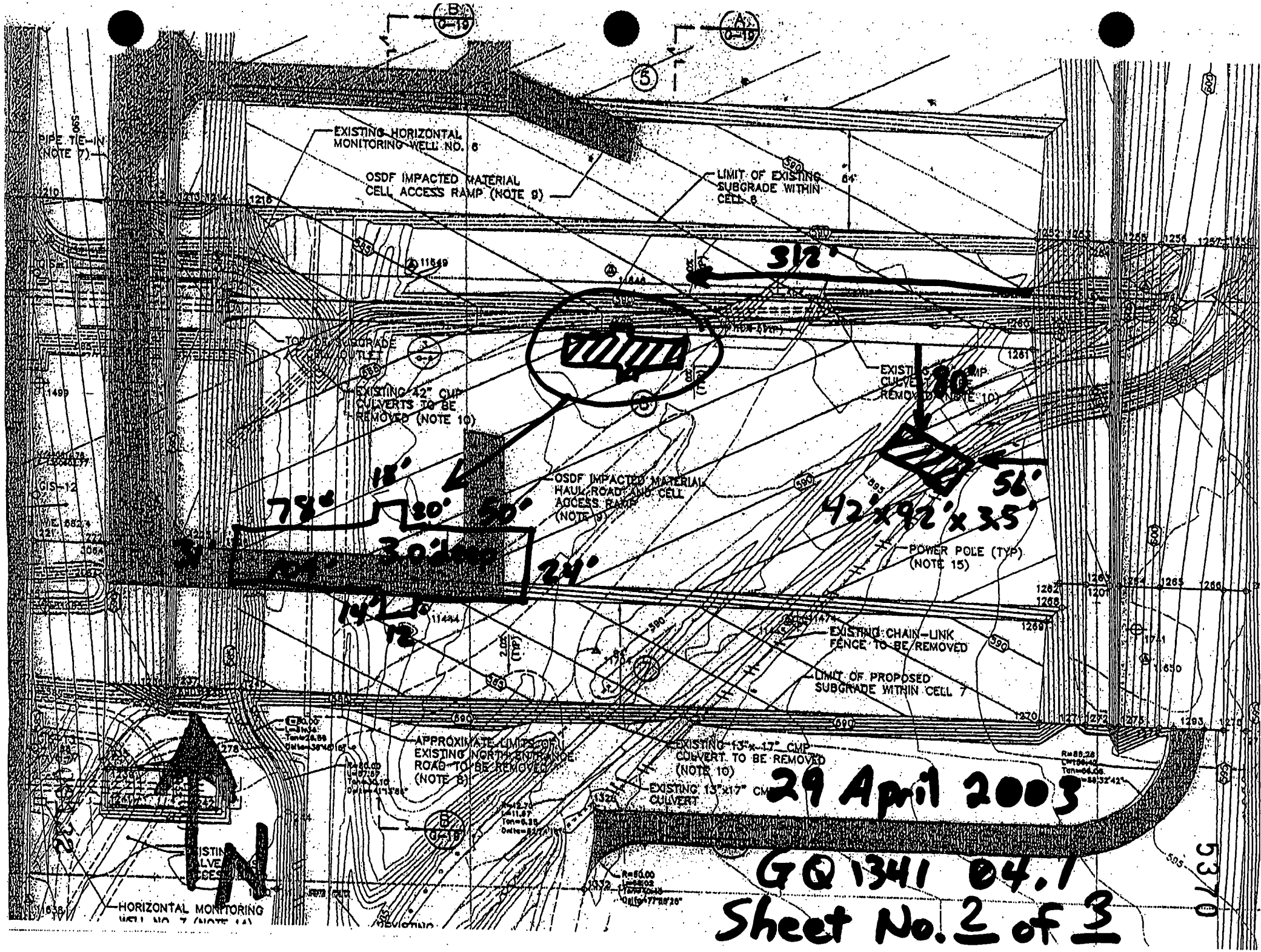
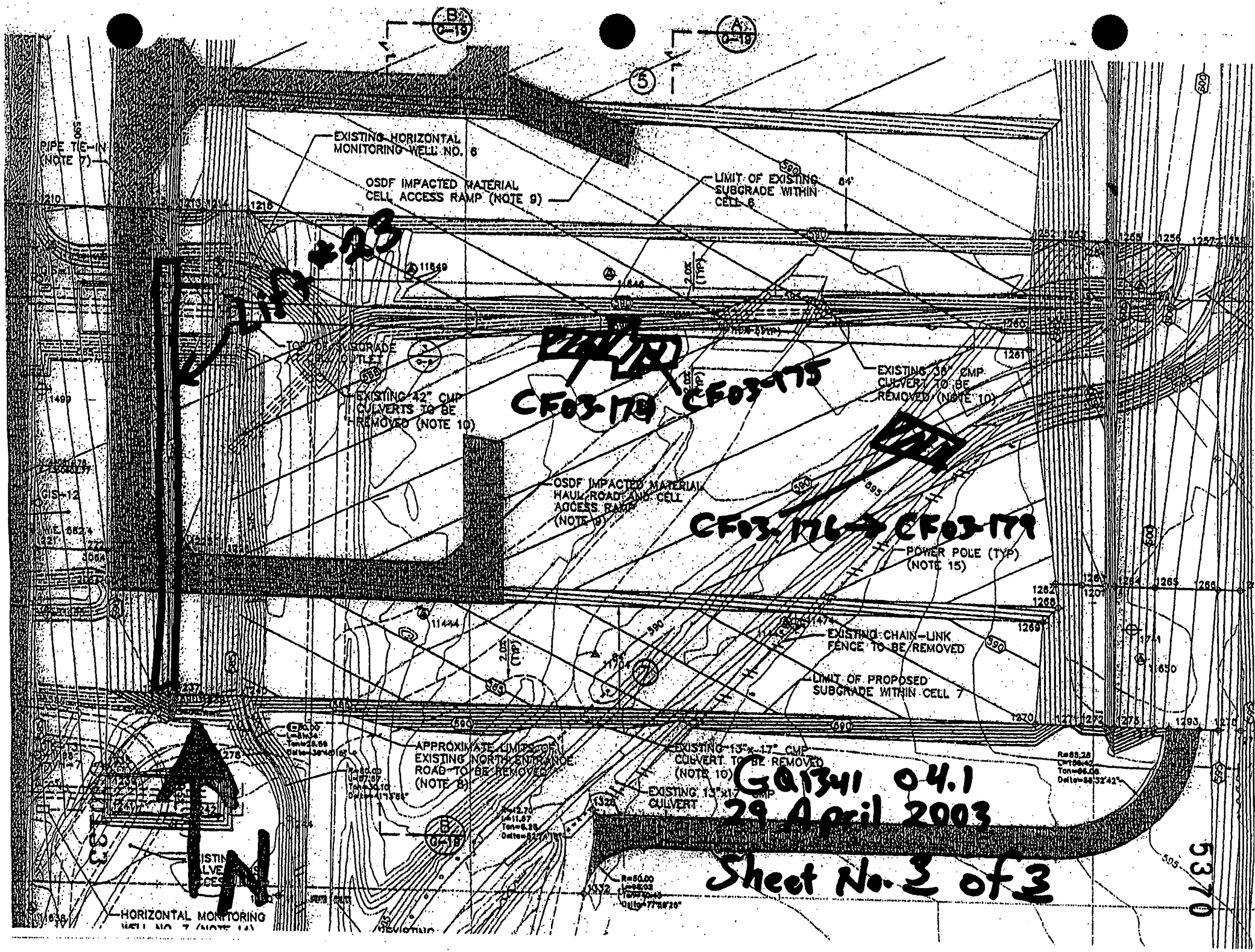
5370


EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
TOP OF SUBGRADE
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 4)
312'
78'
18'
20'
50'
30'
24'
14'
12'
42'x92'x35'
56'
N
29 April 2003
GQ1341 04.1
Sheet No. 2 of 3
5370


EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
PIPE TIE-IN (NOTE 7)
TOP OF SUBGRADE CELL OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12
CF03-178
CF03-175
CF03-176 → CF03-179
G01341 04.1
29 April 2003
Sheet No. 3 of 3
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) PROJECT NO.: GQ1341 TASK NO.: 04.1

LOCATION: FERNALD, OHIO DATE: 30 day APR month 2003 year

DESCRIPTION: PHASE V - CELL #6 WEDNESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED): 8"

MATERIAL SOURCE: GRAY & BROWN TILL FROM BORROW AREA MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID (TBK)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-180	CELL #6 UNDERCUT	8"/L-1	CF02-6	8.7	134.6	10.7	143.5	129.6	96.3	P	–	–	–	–
CF03-181	BACKFILL	8"/L-1	CF02-6	8.7	134.6	9.6	143.5	130.9	97.3	P	–	–	–	–
CF03-182	↓	8"/L-2	CF02-6	8.7	134.6	10.7	144.8	130.8	97.2	P	–	–	–	–
CF03-183	↓	8"/L-2	CF02-6	8.7	134.6	10.0	142.2	129.3	96.1	P	–	–	–	–
CF03-184	↓	8"/L-1	CF02-6	8.7	134.6	9.4	146.3	133.8	99.4	P	–	–	–	–
CF03-185	↓	8"/L-2	CF03-7	12.5	122.7	12.3	137.7	122.6	99.9	P	–	–	–	–
CF03-186	↓	8"/L-3	CF03-7	12.5	122.7	11.5	136.1	122.1	99.5	P	–	–	–	–
CF03-187	↓	8"/L-3	CF03-7	12.5	122.7	12.7	135.9	120.6	98.3	P	–	–	–	–
CF03-188	↓	8"/L-1	CF02-6	8.7	134.6	10.6	143.3	129.5	96.2	P	–	–	–	–
CF03-189	↓	8"/L-2	CF02-6	8.7	134.6	9.6	143.8	131.2	97.5	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ134 TASK NO.: 04.1

DESCRIPTION: P

DATE: 30 day APR month 2003 year WEDNESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ±95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED): 8"

MATERIAL SOURCE: Borrow Area MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (PBC)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
0403-190	Cell 6 Undercut Backfill	8"/L-3	0402-6	8.7	134.6	10.4 —	145.3	131.6	97.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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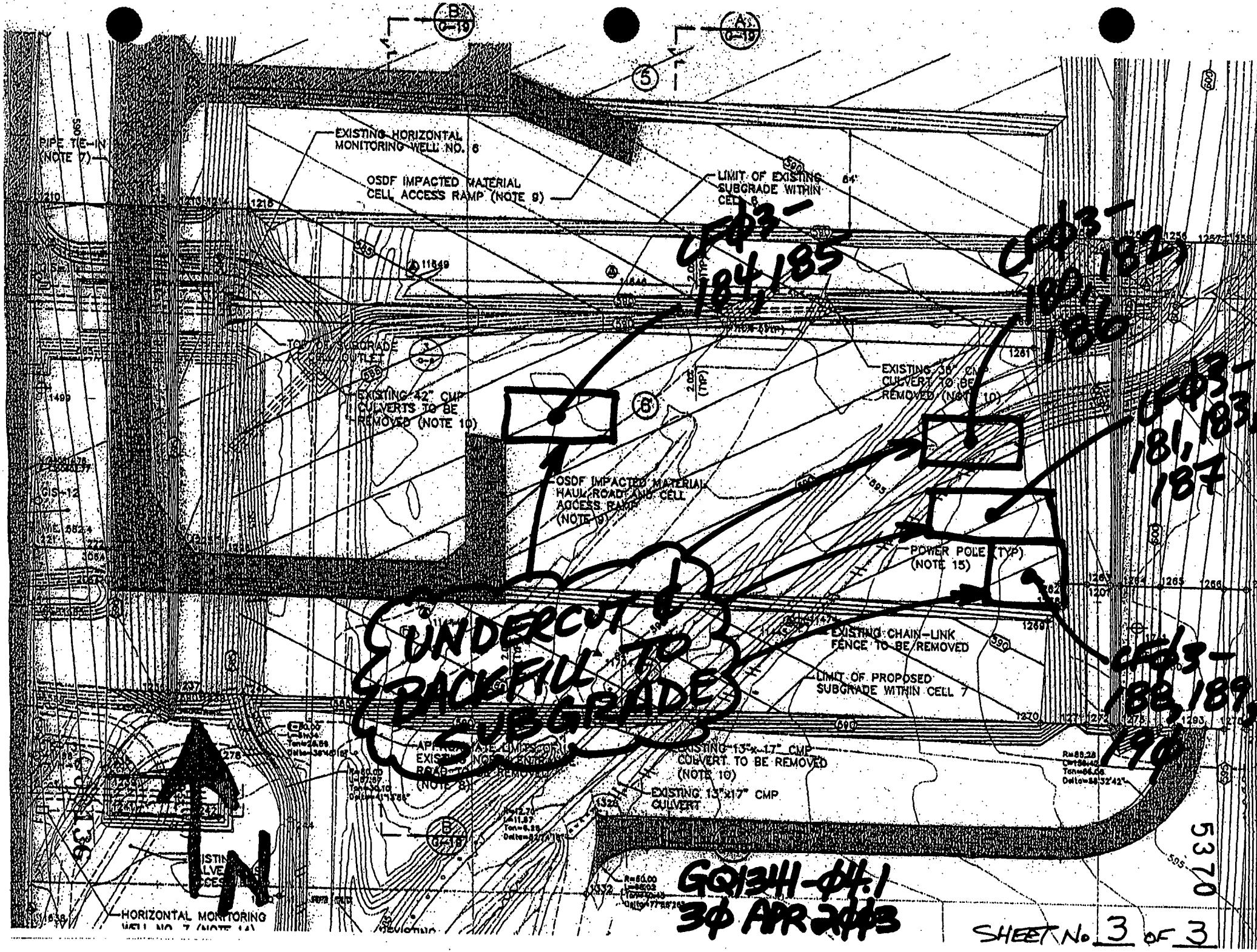
0000135

53170


EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
TOP OF SUBGRADE OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12
N
UNDERCUT & BACKFILL TO SUBGRADE
CF03-184,185
CF03-180,182,186
CF03-181,183,187
CF03-188,189,190
GQ1341-04.1
3Φ APR 2003
5370
SHEET No. 3 OF 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

(ASTM D 3017 AND ASTM D 2922)

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) PROJECT NO.: 9Q1344 TASK NO.: 04.1

LOCATION: FERNALD, OHIO DATE: 01 day MAY month 2003 year

DESCRIPTION: PHASE V - CELL 6

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ~~95~~ % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): ~8"

MATERIAL SOURCE: VARIED MATERIAL TYPE: (FILL) SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: TW

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-191	CELL 6 UNDERCUT BACKFILL	8"/L-4	CF02-6	8.7	134.6	9.6	141.9	129.5	96.2	P	—	—	—	—
CF03-192	WEST BERM CELL 6	8"/L-23	CF03-7	12.5	122.7	13.1	135.6	119.9	97.7	P	—	—	—	—
CF03-193	" " "	8"/L-23	CF03-7	12.5	122.7	13.0	137.2	121.4	98.9	P	—	—	—	—
CF03-194	CELL 6 UNDERCUT BACKFILL	8"/L-5	CF02-6	8.7	134.6	9.0	143.7	131.8	97.9	P	—	—	—	—
CF03-195	" " "	8"/L-6	CF03-7	12.5	122.7	11.4	140.2	125.8	102.5	P	—	—	—	—
CF03-196	" " "	8"/L-1	CF02-6	8.7	134.6	9.3	144.2	131.9	98.0	P	—	—	—	—
CF03-197	" " "	8"/L-1	CF02-6	8.7	134.6	10.9	144.2	130.1	96.7	P	—	—	—	—
CF03-198	" " "	8"/L-2	CF02-6	8.7	134.6	9.4	143.7	131.4	97.6	P	—	—	—	—
CF03-199	" " "	8"/L-2	CF02-6	8.7	134.6	9.7	141.7	129.2	96.0	P	—	—	—	—
CF03-200	" " "	8"/L-1	CF02-6	8.7	134.6	8.3	146.4	135.2	100.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE V - CELL #6

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 01 day MAY month 2003 year (THURSDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): ~8"

MATERIAL SOURCE: VARIOUS

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TBC)

TEST NO. CF03-	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
201	CELL #6 UNDERCUT BACKFILL	8"/L-2	CF02-6	8.7	134.6	10.9	142.5	128.5	95.5	P	—	—	—	—
202	↓	8"/L-1	CF02-6	8.7	134.6	10.1	143.8	130.6	97.0	P	—	—	—	—
203	↓	8"/L-2	CF02-6	8.7	134.6	10.2	142.2	129.0	95.9	P	—	—	—	—
204	↓	8"/L-3	CF02-6	8.7	134.6	10.3	142.9	129.6	96.3	P	—	—	—	—
205	↓	8"/L-3	CF03-7	12.5	122.7	13.3	138.2	122.0	99.4	P	—	—	—	—
206	↓	8"/L-3	CF03-7	12.5	122.7	15.4	134.8	116.8	95.2	P	—	—	—	—
207	↓	8"/L-3	CF03-7	12.5	122.7	14.0	135.0	118.4	96.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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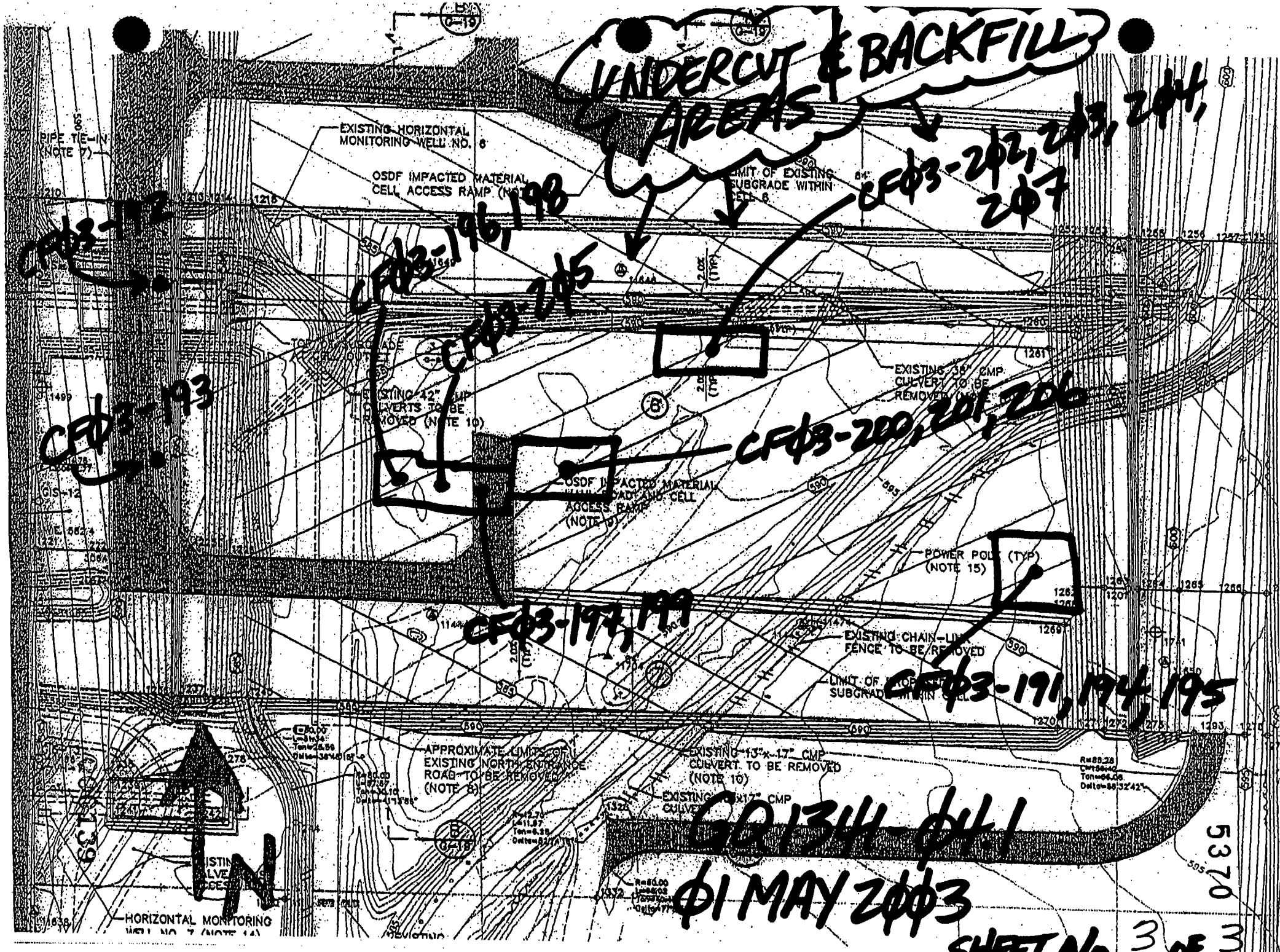
UNDERCUT & BACKFILL AREAS
CF03-202, 203, 204, 207
CF03-196, 198
CF03-205
CF03-193
CF03-200, 201, 206
CF03-197, 199
CF03-191, 194, 195
EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 10)
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
N
5370
01 MAY 2003
SHEET No 3 OF 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE V - CELL 6

PROJECT NO.: GQ134 TASK NO.: 041

DATE: 02 day MAY month 2003 year FRIDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED): ~8"

MATERIAL SOURCE: VARIOUS

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TBD)

TEST NO. CF03 —	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
208	Cell #6 Under Cut/Backfill	8"/L-1	CF02-6	8.7	134.6	9.8	143.3	130.5	97.0	P	—	—	—	—
209		8"/L-1	CF02-6	8.7	134.6	11.1	140.5	126.5	94.0	F	F	211	P	
210		8"/L-2	CF02-6	8.7	134.6	8.3	148.6	137.2	102.0	P	—	—	—	—
211		8"/L-1	CF02-6	8.7	134.6	9.5	141.9	129.6	96.3	P	—	(TBD)	(TBD)	—
212		8"/L-3	CF02-6	8.7	134.6	10.2	142.1	129.0	95.8	P	—	—	—	—
213		8"/L-2	CF02-6	8.7	134.6	9.1	145.7	133.6	99.2	P	—	—	—	—
214		8"/L-4	CF02-6	8.7	134.6	9.3	141.4	129.4	96.1	P	—	—	—	—
215		8"/L-3	CF03-7	12.5	122.7	13.8	135.5	119.0	97.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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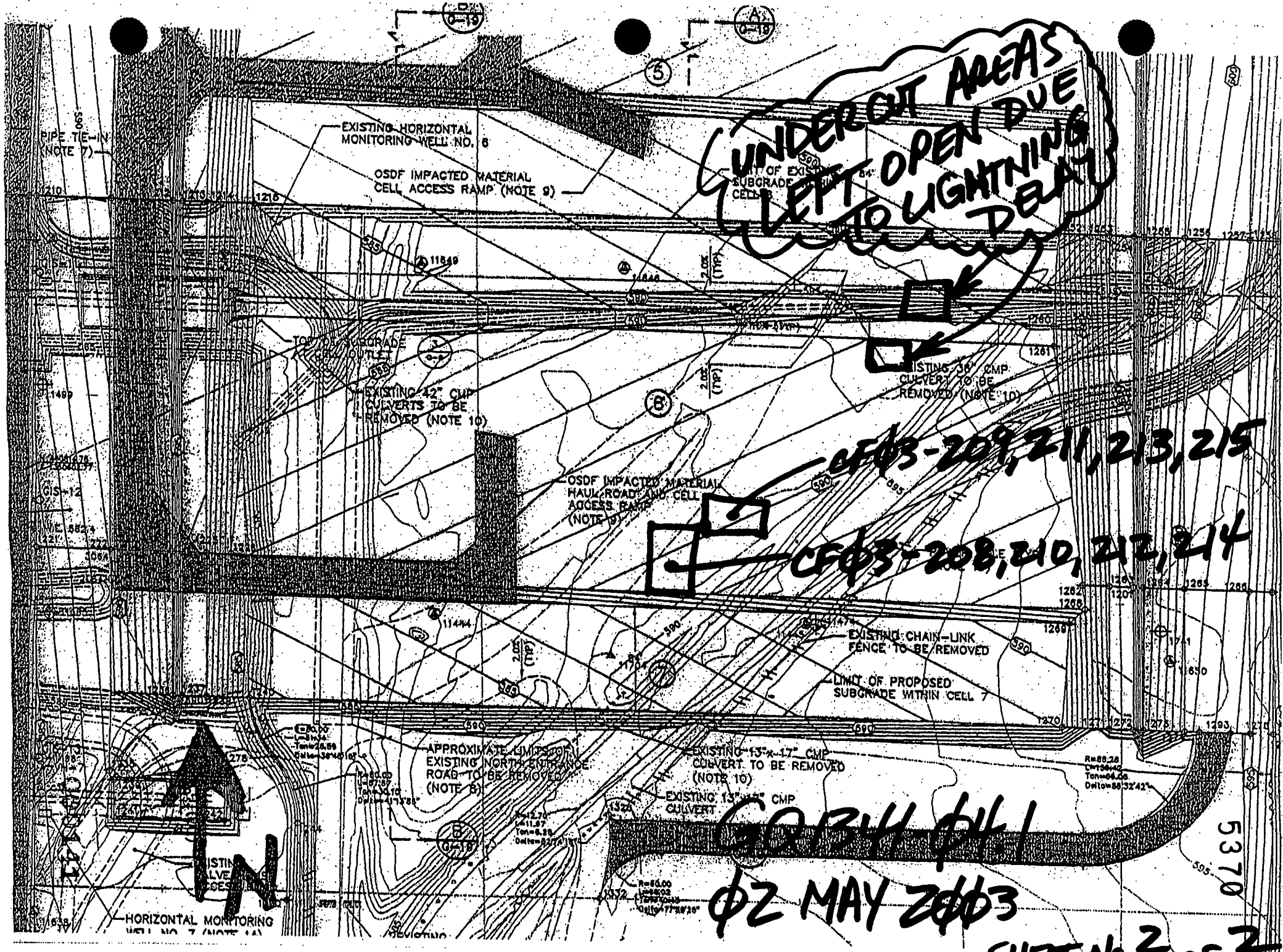
UNDERCUT AREAS LEFT OPEN DUE TO LIGHTNING DELAY
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
PIPE TIE-IN (NOTE 7)
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
CF#3-209, 211, 213, 215
CF#3-208, 210, 212, 214
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12
N
CF#34 #41
02 MAY 2003
5370
SHEET NO 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DATE: 6 day May month 2ØØ3 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/12"

MATERIAL SOURCE: borrow area MATERIAL TYPE (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 344Ø GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION See Attached Map	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CFØ3-216	Cell 6 undercuts	1Ø"/L-5	CFØ3-7	12.5	122.7	14.2	135.8	119.Ø	97.Ø	P	—	—	—	—
CFØ3-217	↓	1Ø"/L-6	CFØ2-1Ø	9.9	13Ø.9	1Ø.8	14Ø.5	126.8	96.9	P	—	—	—	—
CFØ3-218		1Ø"/L-1	CFØ3-7	12.5	122.7	14.8	136.6	119.Ø	97.Ø	P	—	—	—	—
CFØ3-219		1Ø"/L-2	↓	↓	↓	12.9	136.2	12Ø.6	98.3	P	—	—	—	—
CFØ3-22Ø		1Ø"/L-3	CFØ2-1Ø	9.9	13Ø.9	11.4	14Ø.Ø	125.7	96.Ø	P	—	—	—	—
CFØ3-221	↓	1Ø"/L-7	CFØ3-7	12.5	122.7	11.8	131.9	117.9	96.1	P	—	—	—	—
CFØ3-222	Cell 7 undercut	1Ø"/L-1	CFØ2-1Ø	9.9	13Ø.9	11.4	138.8	124.5	95.1	P	—	—	—	—
CFØ3-223	↓	1Ø"/L-2	↓	↓	↓	1Ø.9	139.7	126.1	96.3	P	—	—	—	—
CFØ3-224		1Ø"/L-3				1Ø.5	14Ø.7	127.3	97.2	P	—	—	—	—
CFØ3-225	↓	1Ø"/L-4	CFØ3-7	12.5	122.7	11.2	138.1	124.3	1Ø1.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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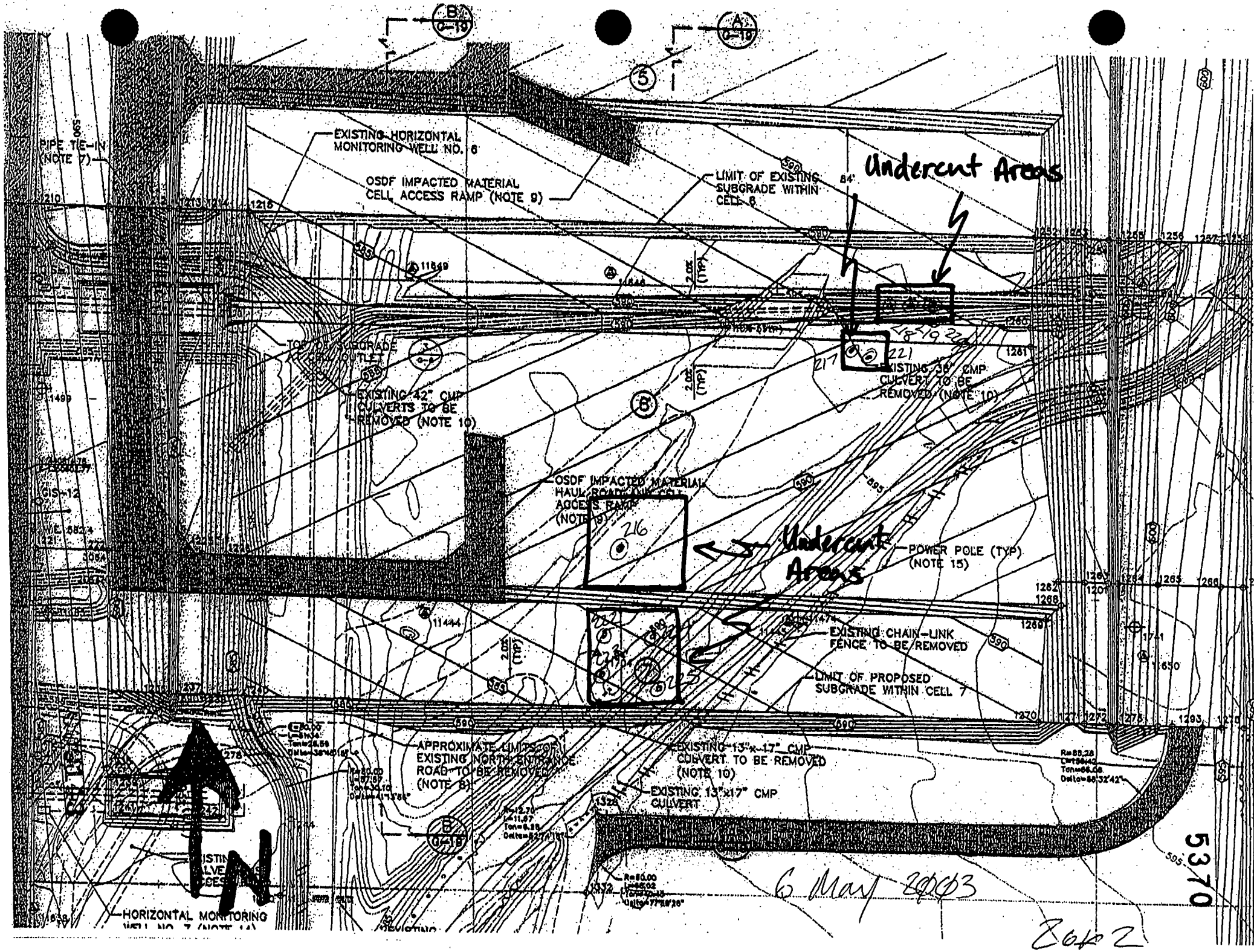
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
Undercut Areas
PIPE TIE-IN (NOTE 7)
TOP OF SUBGRADE OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD ONLY CELL ACCESS RAMP (NOTE 9)
Undercut Areas
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
GIS-12
6 May 2003
5370
2642

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: 6Q1341 TASK NO.: 041

DESCRIPTION: Phase V — DATE: 8 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8" ± 2

MATERIAL SOURCE: borrow area — MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 — GAUGE SERIAL NO. 20979 — CORRECTION FACTOR Y = N/A — QA ID: KS

TEST NO.	TEST LOCATION Cell 7	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-226	See attached map	10" / L-1	CF02-10	9.9	130.9	9.6	141.0	128.7	98.3	P	—	—	—	—
CF03-227	↓	10" / L-2	↓	↓	↓	11.7	140.2	125.5	95.9	P	—	—	—	—
CF03-228	↓	10" / L-3	↓	↓	↓	11.7	139.1	124.5	95.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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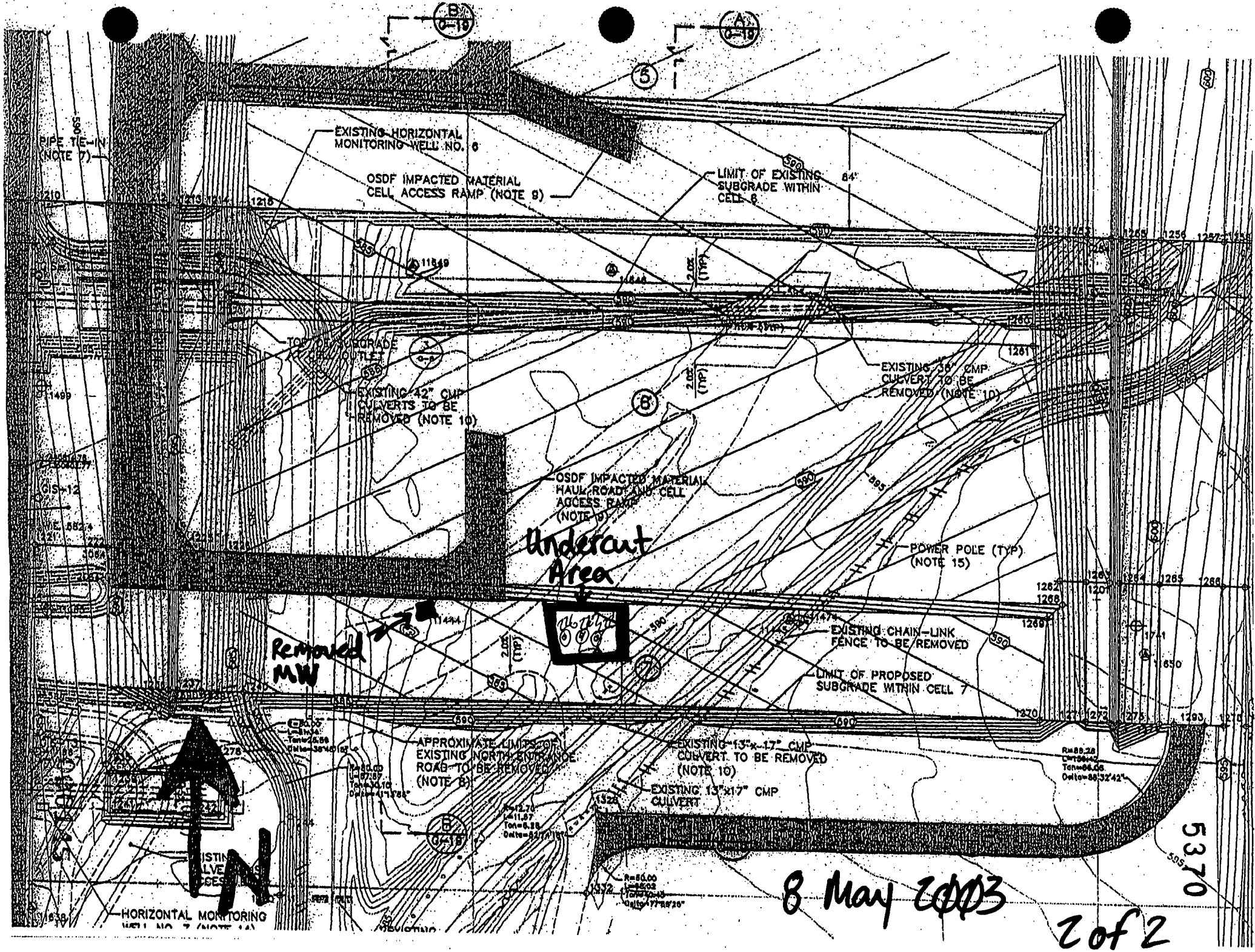
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
TOP OF SUBGRADE OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
Undercut Area
POWER POLE (TYP) (NOTE 15)
Removed MW
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING
N
8 May 2003
2 of 2
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V - Cell 6

DATE: 14 day May month 2003 year WEDNESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Borrow Area Various MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: KS/TBK

TEST NO.	TEST LOCATION See Location Map	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-229	Cell 7 Undercut	8" / L-1	CF02-10	9.9	130.9	8.9	142.3	130.6	99.8	P	—	—	—	—
CF03-230	Cell 6 Undercut	8" / L-1	↓	↓	↓	9.2	142.7	130.7	99.8	P	—	—	—	—
CF03-231	Cell 7 Undercut	8" / L-2	↓	↓	↓	10.6	141.4	127.9	97.7	P	—	—	—	—
CF03-232	Cell 6 Undercut	8" / L-2	↓	↓	↓	7.5	142.2	132.3	101.1	P	—	—	—	—
CF03-233	Cell 7 Undercut	8" / L-3	↓	↓	↓	10.0	141.3	128.5	98.2	P	—	—	—	—
CF03-234	Cell 6 Undercut	8" / L-3	↓	↓	↓	9.8	142.5	129.8	99.2	P	—	—	—	—
CF03-235	Cell 6/7 Undercut	8" / L-4	CF02-6	8.7	134.6	8.6	145.4	133.8	99.4	P	—	—	—	—
CF03-236	Cell 6/7 Undercut	8" / L-4	↓	↓	↓	8.6	142.9	131.6	97.8	P	—	—	—	—
CF03-237	Cell 6/7 Undercut	8" / L-4	↓	↓	↓	7.5	145.0	134.8	100.1	P	—	—	—	—
CF03-238	Cell 6/7 Undercut	8" / L-1	↓	↓	↓	10.4	136.4	123.5	91.8	—	F	240	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature] SHEET NO. 1 OF 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: GQ134 TASK NO.: 041

DESCRIPTION: PHASE V - CELL 6 — DATE: 14 day (WEDNESDAY) MAY month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED): 8"/12"

MATERIAL SOURCE: BORROW AREA - VARIOUS — MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3430 — GAUGE SERIAL NO. 27418 — CORRECTION FACTOR Y = NA — QA ID: TBD/KH

TEST NO. 239	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-239	CELL 6/7 UNDERCUT	8" / L-1	CF02-6	8.7	134.6	8.9	142.2	130.6	97.0	P	—	—	—	—
CF03-240	CELL 6/7 UNDERCUT	8" / L-1	↓	↓	↓	8.7	144.3	132.6	98.5	P	—	—	—	—
CF03-241	CELL 6/7 UNDERCUT	8" / L-5				8.4	142.2	131.2	97.5	P	—	—	—	—
CF03-242	CELL 6/7 UNDERCUT	8" / L-5				8.8	143.0	131.4	97.6	P	—	—	—	—
CF03-243	CELL 6/7 UNDERCUT	8" / L-5				7.8	144.6	134.1	99.6	P	—	—	—	—
CF03-244	CELL 6/7 UNDERCUT	8" / L-2				9.2	142.9	130.9	97.3	P	—	—	—	—
CF03-245	CELL 6/7 UNDERCUT	8" / L-2				8.8	143.0	131.4	97.6	P	—	—	—	—
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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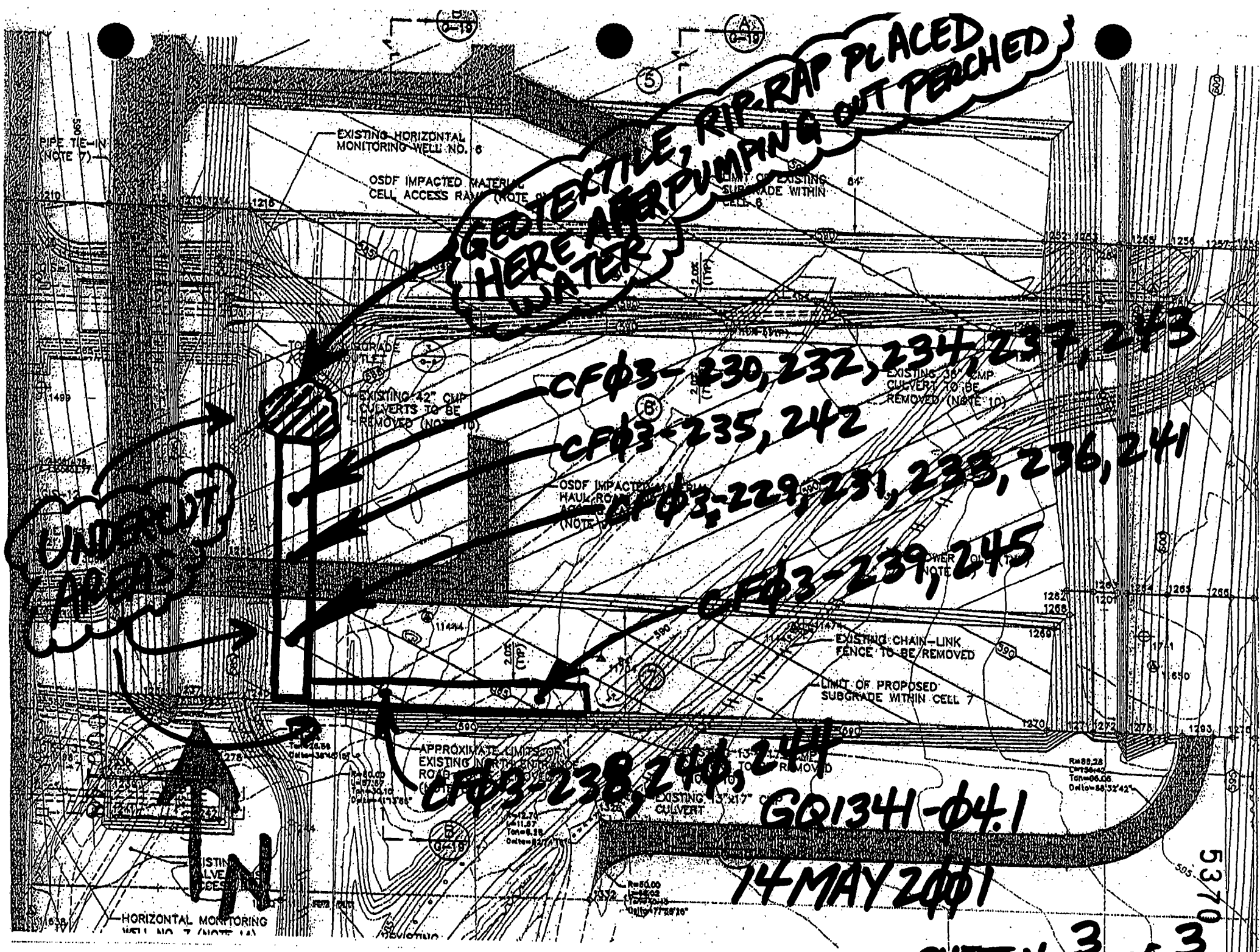
GEOTEXTILE, RIP-RAP PLACED
(HERE AFTER)
PUMPING OUT PERCHED
UNDER DT
AREAS
CF03-230, 232, 234, 237, 243
CF03-235, 242
CF03-229, 231, 233, 236, 241
CF03-239, 245
CF03-238, 240, 244
GQ1341-04.1
14 MAY 2001
EXISTING HORIZONTAL MONITORING WELL NO. 6
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 6
PIPE TIE-IN (NOTE 7)
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD ACCESS RAMP (NOTE 9)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
N
5370
SHEET No 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 90134L TASK NO.: 04.1

DESCRIPTION: Phase V - Cell #6 + 7

DATE: 16 day 5 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: Borrow Area Various MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: ____ (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: (a)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-246	Cell #7 Backfill	8 / L-1	02-2	13.4	119.9	12.6	133.9	113.8	95.0	P	—	—	—	—
CF03-247	↓ ↓ ↓	8 / L-1	02-2	13.4	119.9	10.2	131.2	119.1	99.3	P	—	—	—	—
CF03-248	↓ ↓ ↓	8 / L-1	02-2	13.4	119.9	12.0	132.0	117.9	98.3	P	—	—	—	—
CF03-249	Cell #6 Backfill	8 / L-1	02-3	12.4	121.6	9.2	135.3	123.9	102	P	—	—	—	—
CF03-250	" " "	8 / L-1	02-3	12.4	121.6	10.1	133.9	121.6	100	P	—	—	—	—
CF03-251	↓	8 / L-1	CF02-6	8.7	134.6	8.0	146.4	135.6	100.7	P	—	—	—	—
CF03-252	↓	8 / L-1	CF02-6	8.7	134.6	8.9	140.4	128.9	96.0	P	—	—	—	—
CF03-253	↓	8 / L-2	CF02-6	8.7	134.6	10.1	140.5	~~127.5~~ 127.6	95.0	P	—	—	—	—
CF03-254	↓	8 / L-2	CF02-6	8.7	134.6	9.7	136.7	124.6	93.0	~~P~~	F	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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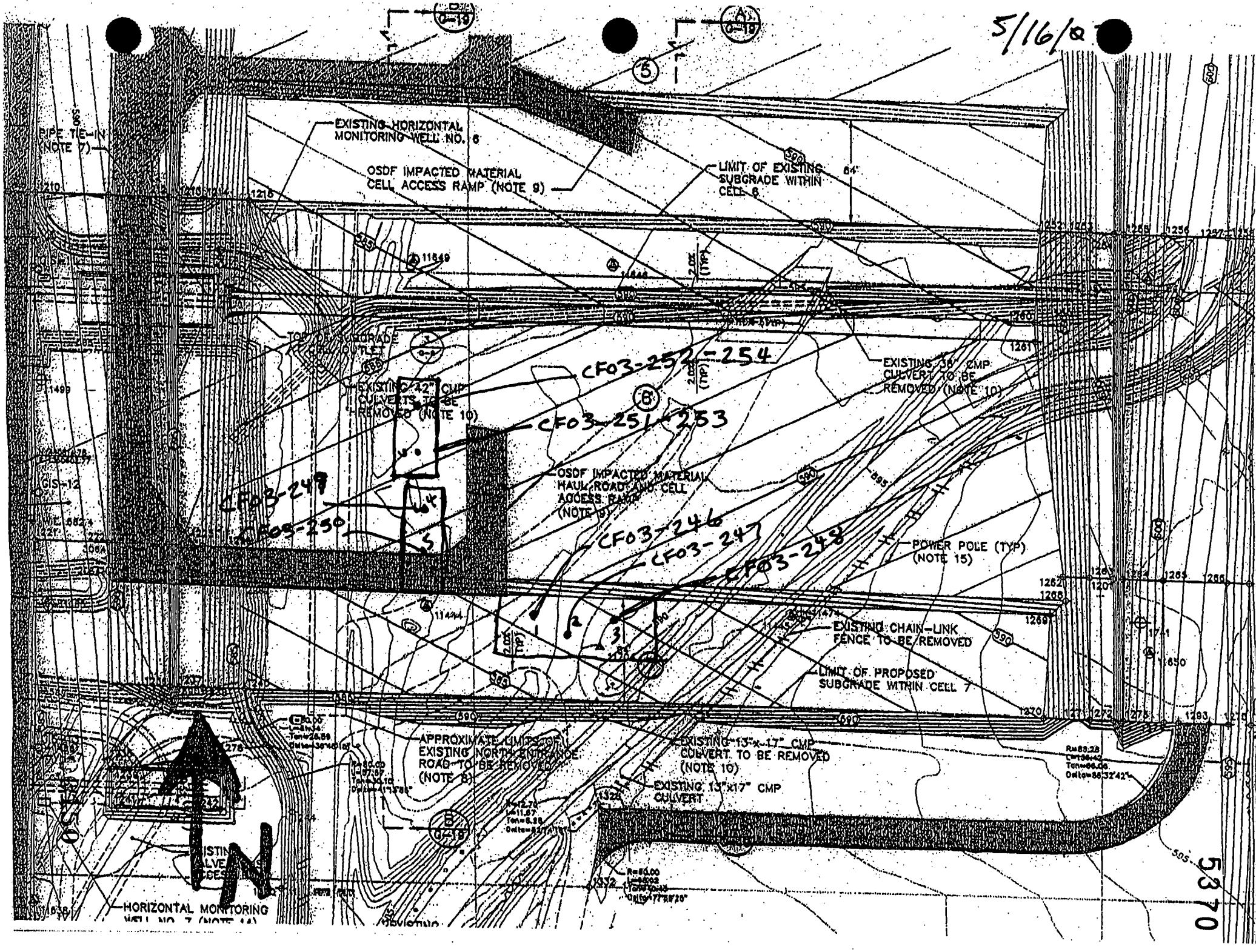
EXISTING HORIZONTAL MONITORING WELL NO. 6
PIPE TIE-IN (NOTE 7)
OSDF IMPACTED MATERIAL CELL ACCESS RAMP (NOTE 9)
LIMIT OF EXISTING SUBGRADE WITHIN CELL 8
TOP OF SUBGRADE CELL OUTLET
EXISTING 42" CMP CULVERTS TO BE REMOVED (NOTE 10)
CF03-252-254
CF03-251-253
CF03-249
CF03-250
EXISTING 36" CMP CULVERT TO BE REMOVED (NOTE 10)
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP (NOTE 9)
CF03-246
CF03-247
CF03-248
POWER POLE (TYP) (NOTE 15)
EXISTING CHAIN-LINK FENCE TO BE REMOVED
LIMIT OF PROPOSED SUBGRADE WITHIN CELL 7
APPROXIMATE LIMITS OF EXISTING NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 8)
EXISTING 13"x17" CMP CULVERT TO BE REMOVED (NOTE 10)
EXISTING 13"x17" CMP CULVERT
HORIZONTAL MONITORING WELL NO. 7 (NOTE 14)
N

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G01341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 22 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Gray Till Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER ~~3480~~ 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-255	Cell #6, NE Corner	6" / L-2	PCP-55	11.7	126.5	14.0	141.2	123.9	97.9	P	—	—	—	—
CF03-256	Cell #6, North center	6" / L-2	CF02-06	8.7	134.6	9.4	141.9	129.7	96.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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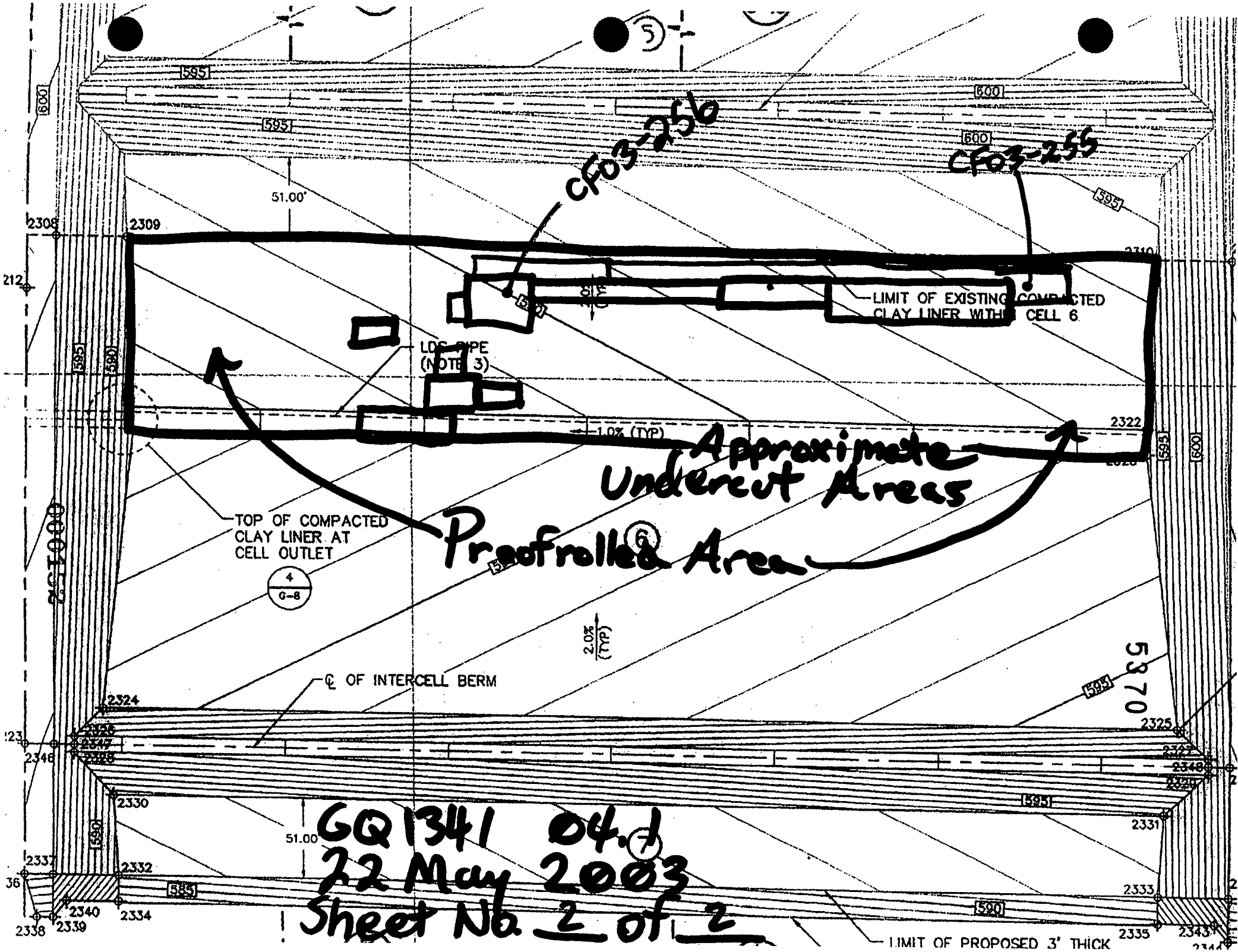
CF03-256
CF03-255
51.00'
2308
2309
2310
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
1.0% (TYP)
2322
Approximate Undercut Areas
Proofrolled Area
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
2.0% (TYP)
℄ OF INTERCELL BERM
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2337
2338
2339
2340
2343
51.00
LIMIT OF PROPOSED 3' THICK
595
600
590
585
GQ1341 04.1
22 May 2003
Sheet No. 2 of 2
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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 64.1

DATE: 23 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Borrow Area - Gray Till Stockpiles + Excavated Material MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-257	Cell #6, N.E. Corner	6" / L-3	PCP57	10.5	128.7	9.8	137.2	125.0	97.1	P	—	—	—	—
CF03-258	Cell #6, North Central	6" / L-3	PCP57	10.5	128.7	10.0	136.8	124.4	96.7	P	—	—	—	—
CF03-259	Cell #6, Drainage Corridor	6" / L-3	PCP55	11.7	126.5	10.2	133.5	121.2	95.8	P	—	—	—	—
CF03-260	Cell #6, North Central	8" / L-3	CF02-06	8.7	134.6	7.2	146.1	136.3	101.3	P	—	—	—	—
CF03-261	Cell #6, N.E. Corner	6" / L-4	PCP57	10.5	128.7	10.8	141.1	127.4	99.0	P	—	—	—	—
CF03-262	Cell #6, North Central	6" / L-4	PCP57	10.5	128.7	10.9	140.5	126.7	98.4	P	—	—	—	—
CF03-263	Cell #6, Drainage Corridor	6" / L-4	PCP57	10.5	128.7	11.1	138.3	124.5	96.7	P	—	—	—	—
		/												
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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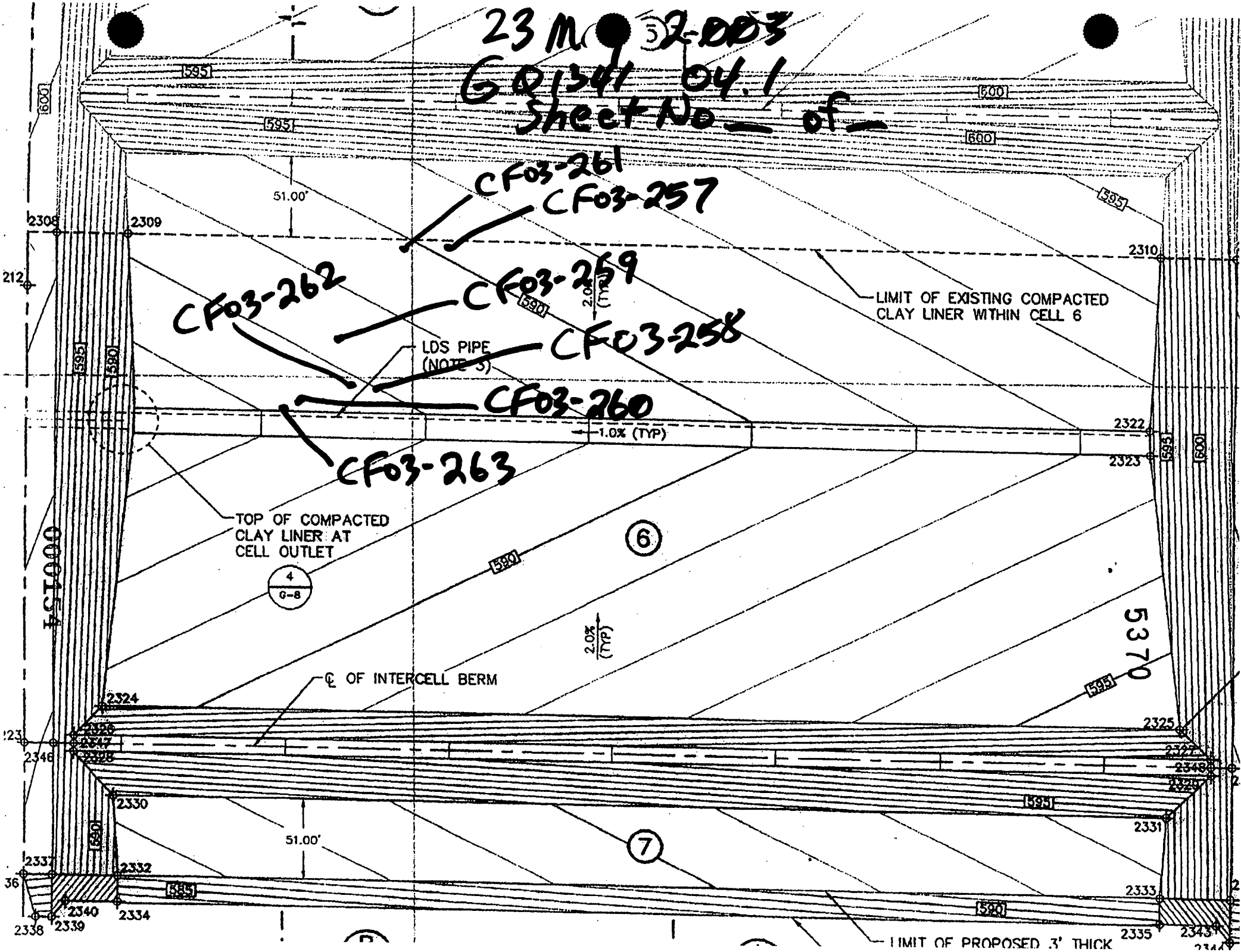
GQ1341 04.1
Sheet No ___ of ___



GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE V, CELL 6 SUBGRADE UNDERCUTS

PROJECT NO.: 60 1341 TASK NO.: 04.1

DATE: 24 day 05 month 03 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: STOCKPILE

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = NA QA ID: KMH

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-264	CELL #6 SUBGRADE	8" / L-1	PCP-57	10.5	128.7	10.4	139.1	126.6	98.4	P				
-265		/ L-2	CF02-06	8.7	134.6	9.7	142.8	130.1	96.7	P				
-266	EAST EXCAVATION	/ L-3				9.6	144.9	132.2	98.2	P				
-267		/ L-4				9.5	144.4	131.8	97.9	P				
-268		/ L-5				9.1	143.6	131.6	97.8	P				
-269		/ L-1	CF03-8	13.4	120.9	13.4	136.2	120.1	99.3	P				
-270	NORTH	/ L-1				10.0	138.0	125.5	103.8	P				
-271		/ L-1				11.0	131.3	118.3	97.8	P				
-272	WEST	/ L-1				12.3	133.9	119.2	98.6		F	272.5	P	
-273	NORTH	/ L-2		8.7	134.6	8.7	141.9	130.5	97.0	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE V, CELL 6 SUBGRADE UNDERCUTS

PROJECT NO.: 601341 TASK NO.: 041

DATE: 24 day 05 month 03 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: STOCKPILE MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-274	WEST	8" / L-1	CF03-8	13.4	120.9	12.3	126.6	112.8	93.2		F	275	P	
-275		/ L-1	↓	↓	↓	13.5	~~133.8~~ 139.2	122.6	101.4	P				
-276		/ L-2				11.9	133.8	119.6	98.9	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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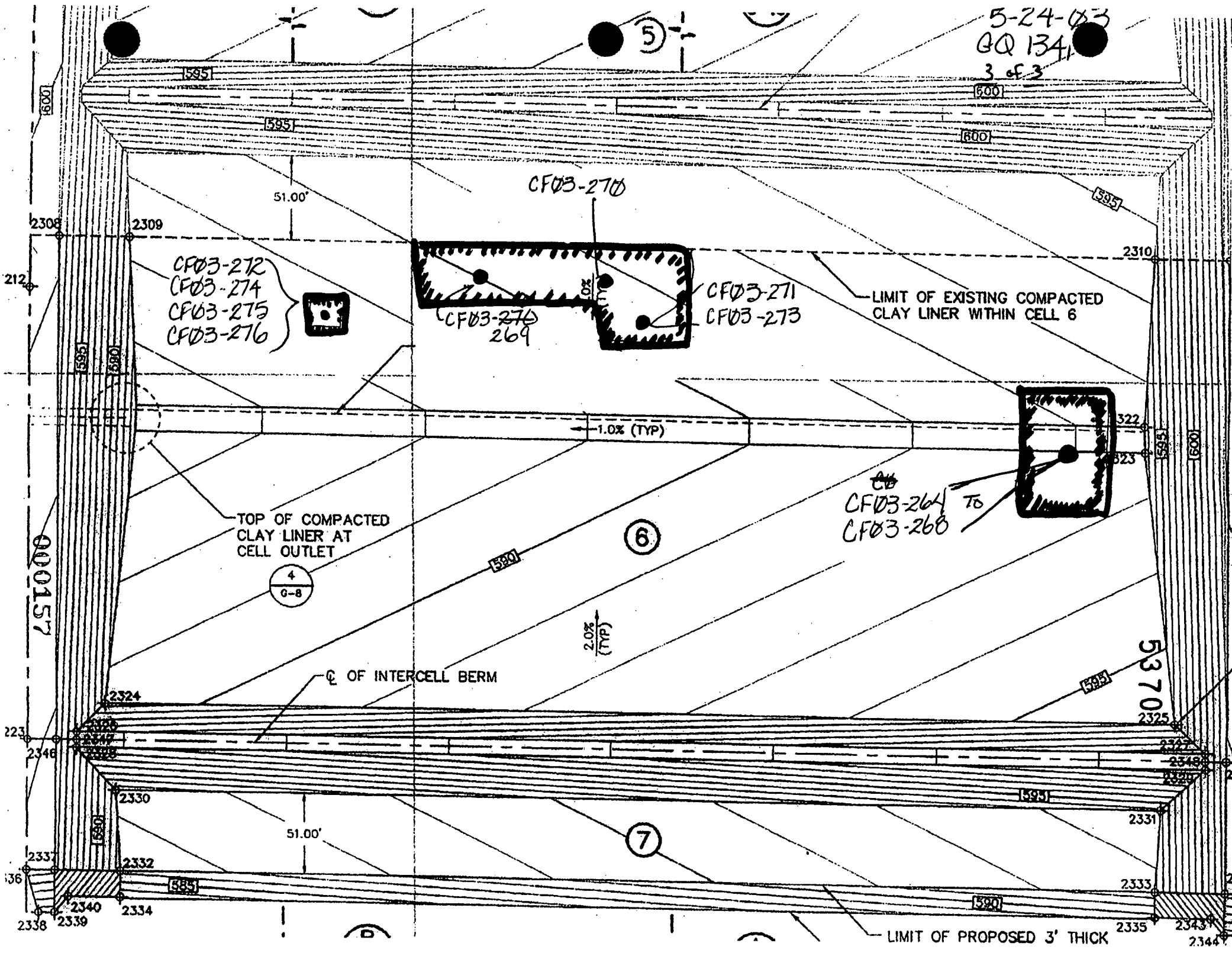
GQ 134
3 of 3



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 28 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Cell#6 Finish Grade Cuttings/Spoils MATERIAL TYPE (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-277	VH7 ≈1' Below S.G.	8" / L-6	03-8	13.4	120.9	12.7	134.7	119.5	98.9	P				
		/												
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: GQ3211 TASK NO.: ~~4.1~~ 3

DATE: 15 day July month 2003 year

SPECIFICATION REQUIREMENTS

SOURCE: Cell 6 Cuttings Stockpile

MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: _____

LIFT THICKNESS (LOOSE/COMPACTED): ~~8~~ 8"

% COMPACTION: 95

MOISTURE RANGE: ± 3%

ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440

NUCLEAR GAUGE SERIAL NO. 20979

COR. FACTOR: N/A

QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
CF03-278	~~20'~~ 20' East of West End of Road, ~~2~~ C/L	8", L-2	CF03-9	11.5	122.5	11.6	136.8	122.5	100.0	P	—	—	—	—	—
CF03-279	~~10'~~ 10' West of Crest ~~2~~ 10' N of CL	8" L-5	CF03-9	11.5	122.5	11.3	140.7	126.5	~~103.4~~ 103.2	P	—	—	—	—	—

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 7 day August month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 9"/5"

MATERIAL SOURCE: Stockpile 02-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: Anchor Trench Backfill

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHOV

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
F03-280 ~~SAT 01~~	Cell #6 East	6"/ L-2	02-4	13.8	117.4	14.2 —	128.0	112.0	95.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

00001160

5370

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 8 day August month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): ≤5"

MATERIAL SOURCE: Stockpile Ø2-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Anchor Trench Backfill

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03 281 ~~CF03 282~~	Cell #6 East AT	6" / L-2	Ø2-4	13.8	117.4	12.2	130.7	116.5	99.2	P	—	—	—	—
CF03 282 ~~CF03 283~~	Cell #6 East AT	6" / L-2	Ø2-4	13.8	117.4	15.5	130.5	112.9	96.2	P	—	—	—	—
CF03 283	Cell #6 East AT	6" / L-3	Ø2-4	13.8	117.4	14.5	131.7	115.0	98.0	P	—	—	—	—
CF03 284	Cell #6 East AT	6" / L-3	Ø2-4	13.8	117.4	15.0	132.0	114.8	97.8	P	—	—	—	—
CF03 285	Cell #6 East AT	6" / L-4	Ø2-4	13.8	117.4	12.0	127.0	113.4	96.6	P	—	—	—	—
CF03 286	Cell #7 East AT	6" / L-2	Ø2-12	13.9	119.0	11.0	~~133.1~~ 119.9 CHW	119.9	100.8	P	—	—	—	—
CF03 287	Cell #7 East AT	6" / L-3	Ø2-4	13.8	117.4	12.4	~~127.3~~ 113.3 CHW	~~127.3~~ 113.3 CHW	96.5	P	—	—	—	—
CF03 288	Cell #7 East AT	6" / L-4	Ø2-12	13.9	119.0	13.0	137.5	121.6	102.3	P	—	—	—	—
CF03 289	Cell #6 East AT	6" / L-4	Ø2-4	13.8	117.4	13.0	131.2	116.0	98.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) AT = Anchor Trench

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 1

0001610

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Ø2-12, 13.9 at 119.0 ØL-4 13.8 at 117.4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V Cell #6 → #7

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 20 day August month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED):

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CAW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-290	West Anchor Trench, Cell #6	6" / L-2	Ø2-12	13.9	119.0	11.6 —	132.8	118.8	99.8	P	—	—	—	—
CF03-291		6" / L-2	Ø2-12	13.9	119.0	11.9 —	136.3	~~122.0~~ 121.8	~~102.0~~ 102.4	P	—	—	—	—
CF03-292		6" / L-3	Ø2-12	13.9	119.0	11.1 —	131.9	118.8	99.8	P	—	—	—	—
CF03-293		6" / L-3	Ø2-12	13.9	119.0	11.6 —	132.9	119.1	100.1	P	—	—	—	—
CF03-294		6" / L-4	Ø2-12	13.9	119.0	11.7 —	132.9	118.9	99.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 1

000182

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V

DATE: 21 day August month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-12 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST: PASS	RETEST: FAIL
CF03-295	West Anchor Trench Cell #6	6" / L-2	02-12	13.9	119.0	11.9	138.7	124.0	104.0	P	—	—	—	—
CF03-296	↓	6" / L-2	02-12	13.9	119.0	14.8	135.9	118.5	99.5	P	—	—	—	—
CF03-297	West Anchor Trench Cell #7	6" / L-2	02-12	13.9	119.0	12.0	135.5	121.0	101.7	P	—	—	—	—
CF03-298	West Anchor Trench Cell #6	6" / L-3	02-12	13.9	119.0	11.3	135.7	122.0	102.5	P	—	—	—	—
CF03-299	West Anchor Trench Cell #7	6" / L-3	02-12	13.9	119.0	14.0	137.4	120.5	101.3	P	—	—	—	—
CF03-300	↓	6" / L-4	02-12	13.9	119.0	12.1	132.5	118.2	99.3	P	—	—	—	—
CF03-301	West Anchor Trench Cell #6	6" / L-4	02-12	13.9	119.0	12.8	134.9	119.5	100.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CW SHEET NO. 1 OF 1

000163

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 03

DESCRIPTION: Phase V STP,

DATE: 19 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +3 LIFT THICKNESS (LOOSE / COMPACTED): 8

MATERIAL SOURCE: ON-Site MATERIAL TYPE (CIRCLE ONE): FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: W

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST F
~~CF03-302~~														
~~SF-001~~	SouthEast of cell #7	8" / L-1	CF02-4	11.2	126.7	10.6	137.3	124.1	97.9	P				
~~SF-002~~ 3	S.T.P Area	8" / L-1	CF02-4	11.2	126.7	11.5	139.4	125.1	98.7	P				
~~SF-003~~ 4		8" / L-1	CF02-4	11.2	126.7	12.3	140.0	124.7	98.4	P				
~~SF-004~~ 5		8" / L-1	CF02-10	9.9	130.9	11.0	142.1	128.0	97.8 ~~98.0~~	P				
~~SF-005~~		8" / L-2												
~~SF-006~~		8" / L-2												
~~SF-007~~		8" / L-2												
~~SF-008~~		8" / L-2												
~~SF-009~~		8" /												
~~SF-010~~		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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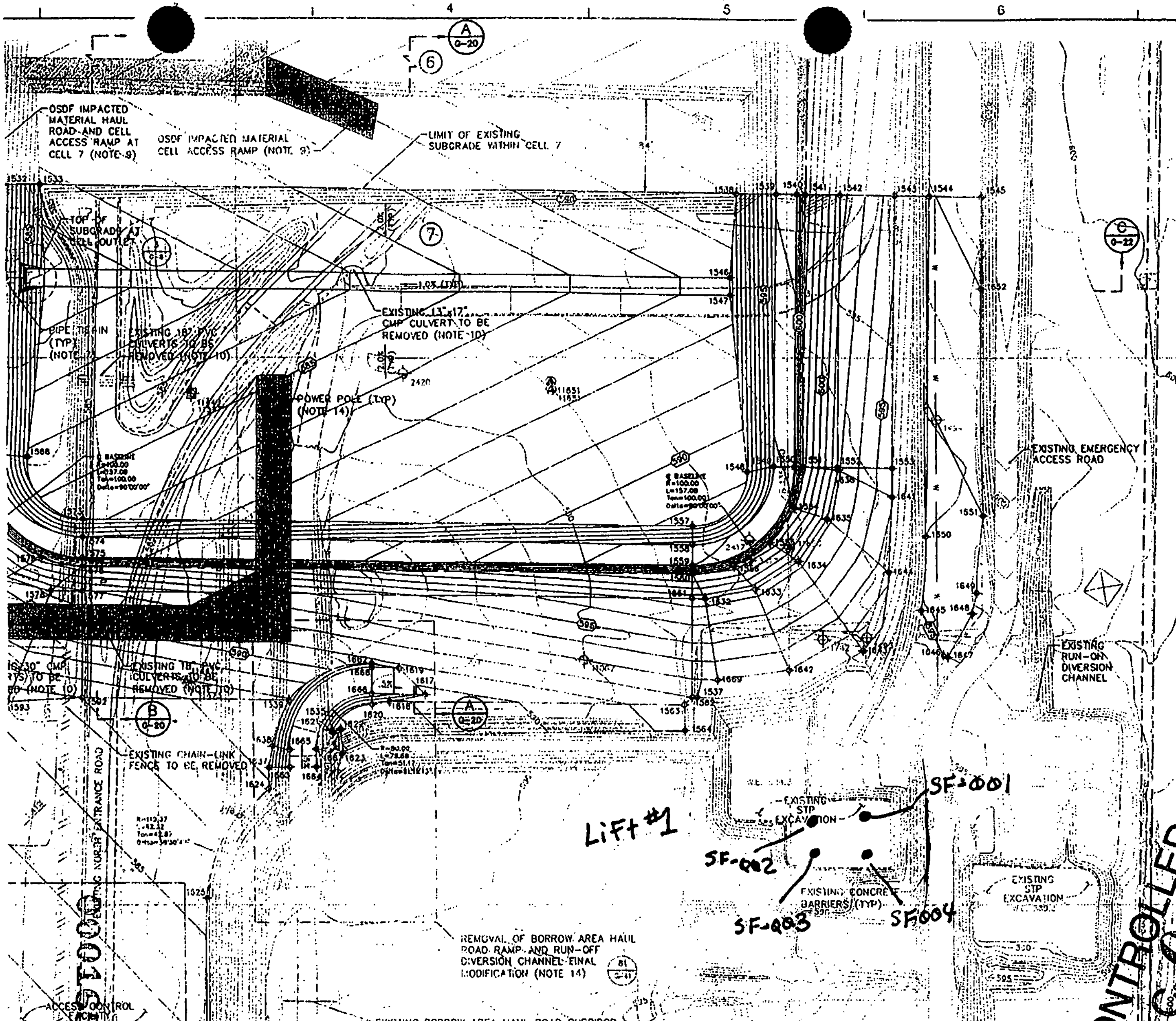
7-14-03 STP In-place test



ECDC CONTROLLED COPY NO. C011

000165

SUBGRADE [illegible]ION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION	POINT NO.	NORTHING	EASTING	ELEVATION
1377	479448.90	1350555.35	570.52	1584	480314.45	1350568.33	581.03
1494	479535.73	1350540.73	571.12	1585	480314.23	1350576.33	577.03
1495	479565.33	1350550.89	571.41	1586	480274.17	1350647.29	583.00
1496	479565.31	1350550.02	571.41	1587	480248.70	1350659.84	581.88
1497	479615.46	1350547.98	571.79	1588	480188.10	1350881.65	579.50
1498	479615.41	1350550.21	571.79	1589	480311.94	1350880.62	583.74
1499	479665.52	1350551.31	572.16	1590	480300.22	1350888.31	585.19
1500	479665.31	1350554.18	572.16	1591	480249.81	1350884.47	581.03
1501	479715.46	1350548.28	572.54	1592	480188.82	1350854.39	585.00
1502	479715.50	1350554.08	572.54	1593	480185.00	1350785.57	585.27
1503	479765.33	1350553.18	572.91	1594	480210.70	1350583.51	580.25
1504	479765.17	1350559.52	572.91	1595	480210.85	1350566.51	580.25
1505	479815.24	1350558.12	573.29	1596	480214.08	1350573.80	576.28
1506	479816.08	1350563.12	573.29	1601	480100.65	1350728.85	584.86
1507	479865.35	1350557.28	573.66	1617	480191.81	1351168.37	589.57
1508	479865.11	1350563.32	573.66	1618	480185.08	1351138.03	588.82
1509	479915.27	1350558.29	574.04	1619	480218.10	1351144.87	590.77
1510	479914.99	1350566.81	574.04	1620	480182.29	1351119.98	588.85
1511	479965.89	1350557.75	574.41	1621	480188.22	1351084.37	588.01
1512	479964.64	1350568.04	574.41	1622	480189.82	1351091.81	588.12
1530	480658.06	1350760.28	580.63	1623	480138.59	1351083.54	587.93
1531	480657.97	1350768.05	581.44	1624	480103.90	1351025.84	588.92
1532	480657.74	1350788.77	581.06	1625	480008.35	1350968.84	585.36
1533	480657.33	1350820.24	582.70	1626	479727.24	1350888.42	577.11
1534	480598.32	1350710.58	588.17	1627	479732.20	1350888.65	578.90
1535	480157.47	1351084.28	588.02	1628	479721.47	1350829.81	579.63
1537	480188.68	1351416.33	592.00	1629	479805.99	1350962.69	583.32
1538	480649.50	1351454.15	589.04	1631	480409.34	1350858.18	584.22
1539	480849.14	1351490.37	598.09	1632	480279.86	1351423.99	591.44
1540	480848.91	1351509.08	598.47	1633	480288.53	1351470.02	587.37
1541	480848.81	1351518.88	603.68	1634	480314.07	1351509.28	587.30
1542	480848.43	1351548.50	598.39	1635	480362.88	1351535.75	597.23
1543	480847.82	1351598.59	595.38	1636	480398.48	1351548.44	597.16
1544	480847.43	1351630.25	598.94	1637	480125.50	1351028.17	587.12
1545	480846.86	1351677.59	597.41	1638	480144.64	1351029.33	587.34
1546	480372.77	1351448.41	587.45	1639	480186.19	1351045.03	587.91
1547	480358.78	1351448.55	587.45	1640	480198.43	1350881.82	579.65
1548	480388.75	1351483.24	590.82	1641	480373.72	1351595.24	594.13
1549	480401.51	1351487.34	596.85	1642	480214.12	1351499.80	593.00
1550	480401.28	1351506.08	597.23	1643	480231.97	1351587.81	592.00
1551	480401.18	1351513.85	602.42	1644	480304.47	1351591.81	593.35
1552	480400.80	1351545.47	607.18	1645	480269.30	1351820.80	595.00
1553	480400.18	1351695.58	594.15	1646	480227.60	1351840.04	595.00
1554	480383.01	1351808.77	602.12	1647	480228.17	1351844.91	595.03
1555	480330.83	1351485.70	601.61	1648	480266.53	1351867.28	595.34
1556	480309.56	1351451.00	601.50	1649	480285.65	1351871.53	595.48
1557	480348.01	1351413.17	591.35	1650	480336.69	1351825.81	595.70
1558	480320.92	1351412.98	595.62	1651	480356.14	1351677.07	596.00
1559	480310.20	1351412.73	596.00	1652	480582.82	1351677.12	597.00
1560	480302.41	1351412.64	601.19	1653	479787.23	1350887.67	577.41
1561	480280.10	1351412.36	597.47	1654	479757.18	1350882.02	577.28
1562	480188.83	1351411.40	592.00	1655	479757.24	1350888.05	577.28
1563	480181.80	1351404.70	581.31	1656	479727.68	1350881.74	577.11
1564	480188.59	1351405.00	581.28	1657	479724.00	1350881.99	577.00
1565	480408.71	1350708.28	587.23	1658	479723.74	1350888.38	577.11
1566	480410.43	1350757.23	585.40	1659	479722.72	1350713.26	577.56
1567	480411.38	1350783.76	589.03	1660	479728.12	1350713.40	577.98
1568	480409.83	1350808.40	584.15	1661	479725.20	1350738.38	578.00
1569	480410.70	1350765.03	580.20	1662	480220.18	1351118.09	590.78
1570	480384.03	1350857.81	583.95	1663	480125.70	1351048.31	593.50
1571	480382.88	1350718.83	588.28	1664	480125.98	1351069.31	593.50
1572	480372.07	1350784.38	595.45	1665	480141.80	1351045.14	597.71
1573	480352.82	1350856.54	585.78	1666	480182.40	1351119.73	592.70
1574	480335.73	1350856.33	580.08	1667	480141.86	1351088.14	592.71
1575	480317.01	1350858.10	580.43	1668	480216.40	1351120.04	592.00
1576	480309.21	1350830.00	595.63	1669	480204.82	1351434.87	593.00
1577	480288.90	1350855.73	591.91	1670	479724.37	1350833.07	581.70
1578	480287.26	1350826.78	591.26	1671	479727.92	1350834.73	581.25
1579	480317.29	1350817.83	585.57	1672	479727.85	1350863.22	581.54
1580	480339.37	1350785.66	595.51	1673	479734.83	1350889.82	581.98
1581	480298.94	1350780.98	590.28	1674	479781.86	1350918.79	582.16
1582	480323.43	1350742.38	559.27	1675	479763.82	1350934.08	582.63
1583	480314.50	1350588.33	581.03	1676	480081.25	1350998.89	588.40

LEGEND

- 590 — EXISTING GROUND ELEVATION (FEET)
- (585) — SUBGRADE ELEVATION (FEET) (NOTE 1)
- 585 — [illegible]
- [illegible]
- [illegible]
- [illegible]
- EXISTING ENHANCED PERMANENT LEACHATE TRANSMISSION SYSTEM PIPE
- EXISTING INTERIM LEACHATE TRANSMISSION SYSTEM PIPE
- EXISTING UNDERGROUND ELECTRIC [illegible]
- SLOPE TOE OR CREST
- EXISTING HORIZONTAL MONITORING WELL WITH COVER SLAB
- [illegible]
- (7) — CELL DESIGNATION
- 1555 — CONSTRUCTION CONTROL POINT
- ACCESS CORRIDOR, ACCESS ROAD, ACCESS RAMP, MAINTENANCE ACCESS, OR HAUL ROAD
- BERM CREST
- GRADING TRANSITION (NOTE 13)
- RIPRAP LIMIT
- DRAINAGE FLOW DIRECTION

GEOTECHNICAL DATA POINTS (NOTE 4)

CONE PENETRATION TESTS

POINT NO.	NORTHING	EASTING	ELEVATION
11446	480467.61	1350858.87	587.88
11447	480204.13	1350830.18	585.44
11448	479771.42	1350839.78	585.14
11647	480124.05	1350893.07	582.74
11651	480471.45	1351285.64	591.89
11651	480478.39	1351285.27	592.02
11656	480326.34	1351801.40	593.45

GEOTECHNICAL BORINGS

POINT NO.	NORTHING	EASTING	ELEVATION
1483	480244.41	1351870.88	-
1484	480444.42	1351635.88	-
1742	480242.41	1351530.88	0.00
11472	479768.43	1350942.89	584.65
11473	480197.91	1350955.16	585.61
11686	480124.05	1350695.40	582.44

PIEZOMETERS

POINT NO.	NORTHING	EASTING	ELEVATION
11703	479883.07	1350780.18	584.12

TYPE 1 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
11087	480223.10	1351313.70	0.00

TYPE 2 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
2417	480332.90	1351464.84	-
2420	480486.37	1351155.73	-

TYPE 3 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
3417	480314.51	1351463.44	-

LYSIMETERS

POINT NO.	NORTHING	EASTING	ELEVATION
11847	480488.17	1350867.90	586.20
11487	479770.39	1350840.70	585.00

NOTES:

1. CLEARING, GRUBBING, AND STRIPPING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02110. SUBGRADE ELEVATIONS CORRESPOND TO TOP OF PREPARED SUBGRADE, INCLUDING ANY COMPACTED FILL. SUBGRADE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
2. ACTIVE VERTICAL MONITORING WELLS AND PIEZOMETERS WITHIN CONSTRUCTION AREA WILL BE ABANDONED BY OWNER PRIOR TO CONSTRUCTION IN THAT AREA.
3. CONTRACTOR SHALL LOCATE AND REMOVE EXISTING SUBDRAIN TILE SYSTEM WITHIN CONSTRUCTION AREA IN ACCORDANCE WITH SPECIFICATION SECTION 02200. REFER TO REFERENCE DRAWINGS

5370

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP
0	02.01.29	CFC SUBMITTAL TO FF/DOE/EPA	LWG	JJA	TEZ	DCP	
B	01.12.17	PRE-FINAL SUBMITTAL TO FF/DOE	LWG	JJA	TEZ	DCP	
A	01.10.22	PRELIMINARY SUBMITTAL TO FF/DOE	TEZ	JJA	LWG	DCP	

50 25 0 50 100
SCALE IN FEET

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I STP

PROJECT NO.: GQ3211 TASK NO.: 03

DATE: 25 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Onsite

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: TW

TEST NO. CF03-306	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST F
~~SF-005~~	N STP Area	8"/L-2	CF02-4	11.2	126.7	11.0	137.7	124.1	98.0	P				
~~SF-006~~ 307		8"/L-2	↓	11.2	126.7	12.4	135.3	120.4	95.0	P				
~~SF-007~~ 308		8"/L-2	CF02-10	9.9	130.9	10.6	140.5	127.0	97.0	P				
~~SF-008~~ 309		8"/L-2	CF02-4	11.2	126.7	12.2	137.6	122.6	96.8 ~~97.0~~	P				
~~SF-009~~ 310	South of STP	8"/L-1	CF02-4	11.2	126.7	11.6	136.9	122.6	96.7	P				
~~SF-010~~ 311	↓	8"/L-1	CF02-10	9.9	130.9	10.5	141.6	128.2	98.0	P				
~~SF-011~~ 312	N. STP AREA	8"/L-3	CF02-10	9.9	130.9	10.5	140.3	126.9	96.9	P				
~~SF-012~~ 313	↓	8"/L-3	CF02-10	9.9	130.9	11.8	139.6	125.3	95.7	P				
~~SF-013~~ 314	↓	6"/L-3	CF02-10	9.9	130.9	17.8	124.5	105.7	80.8	F	F	CF03-324	P	

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

53470

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SHEET NO. 1 OF 2

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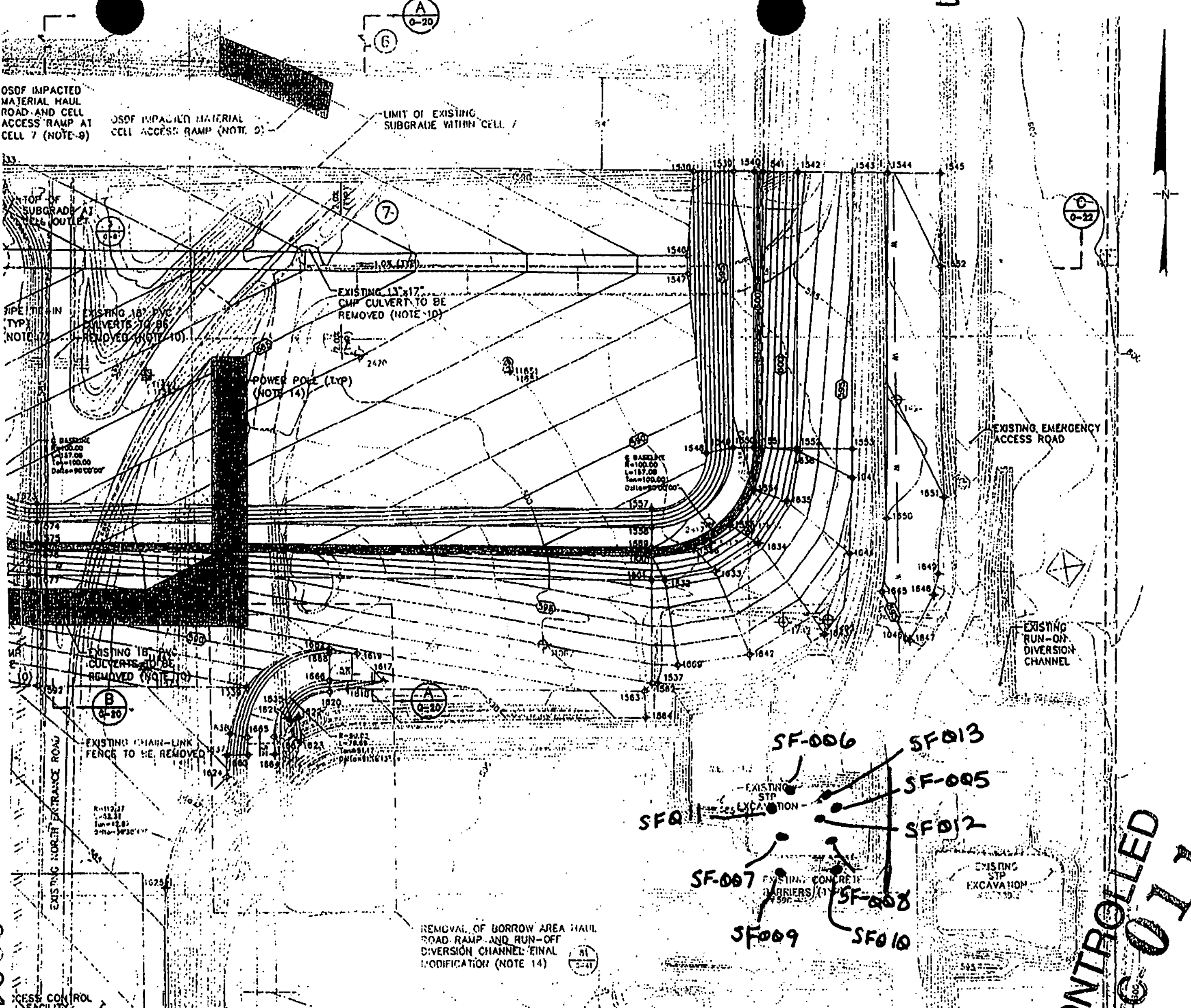
in place density Locations 9-25-03 STP Area



SUBGRADE CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION	POINT NO.	NORTHING	EASTING	ELEVATION
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

LEGEND

- EXISTING GROUND ELEVATION (FEET)
- [illegible]
- [illegible]
- EXISTING ENHANCED PERMANENT LEACHATE TRANSMISSION SYSTEM PIPE
- EXISTING INTERIM LEACHATE TRANSMISSION SYSTEM PIPE
- [illegible]
- SLOPE TOE OR CREST
- EXISTING HORIZONTAL MONITORING WELL [illegible]
- CONSTRUCTION CONTROL POINT
- ACCESS CORRIDOR, ACCESS ROAD, ACCESS RAMP, MAINTENANCE ACCESS, OR HAUL ROAD
- BERM CREST
- GRADING TRANSITION (NOTE 13)
- RIPRAP LIMIT
- DRAINAGE FLOW DIRECTION

5370

GEOTECHNICAL DATA POINTS (NOTE 4)

CONE PENETRATION TESTS

POINT NO.	NORTHING	EASTING	ELEVATION
11446	480487.61	1350986.87	587.88
11447	480304.13	1350950.16	586.44
11448	479771.42	1350939.76	585.14
11647	480124.05	1350893.07	582.74
11651	480171.45	1351285.84	591.88
11851	480478.39	1351285.37	587.02
11650	480328.34	1351801.40	583.45

GEOTECHNICAL BORINGS

POINT NO.	NORTHING	EASTING	ELEVATION
1493	480244.41	1351576.88	-
1494	480444.43	1351635.88	-
1749	480242.41	1351530.98	0.00
11472	479768.43	1350942.89	584.65
11473	480187.91	1350988.16	585.81
11666	480124.09	1350895.40	582.44

PIEZOMETERS

POINT NO.	NORTHING	EASTING	ELEVATION
11703	479893.07	1350780.18	584.12

TYPE 1 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
11067	480223.10	1351313.70	0.00

TYPE 2 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
2417	480332.90	1351484.04	-
7420	480488.57	1351150.73	-

TYPE 3 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
3417	480314.51	1351483.44	-

LYSIMETERS

POINT NO.	NORTHING	EASTING	ELEVATION
11647	480468.17	1350987.56	588.30
11487	479770.39	1350940.70	585.00

NOTES:

1. CLEARING, GRUBBING, AND STRIPPING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02110. SUBGRADE ELEVATIONS CORRESPOND TO TOP OF PREPARED SUBGRADE, INCLUDING ANY COMPACTED FILL. SUBGRADE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.

[illegible] MONITORING WELLS AND PIEZOMETERS WITHIN CONSTRUCTION AREA WILL BE ABANDONED BY OWNER PRIOR TO CONSTRUCTION IN THAT AREA.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY
0	02.01.23	C/C SUBMITTAL TO FF/DOE/EPA	LWO	JJA	TEE	DFP
B	01.12.17	PRE-FINAL SUBMITTAL TO FF/DOE	LWO	JJA	TEE	CCP
A	01.10.23	PRELIMINARY SUBMITTAL TO FF/DOE	TEE	JJA	LWO	DFP

ECDC CONTROLLED COPY NO. C011

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V STP area

PROJECT NO.: G03211 TASK NO.: 03

DATE: 29 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: On-site MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: TW

TEST NO. CF03-315	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~SF014~~ 316	SouthWest of STP	6" / L-2	CF02-10	9.9	130.9	10.9	141.3	127.5	97.4	P				
~~SF015~~ 317	Middle of STP	6" / L-3	↓	↓	↓	10.2	141.4	128.3	98.0	P				
~~SF016~~ 318	↓ ↓ ↓	6" / L-3	CF02-6	8.7	134.6	8.5	144.0	132.7	~~99.0~~ 98.6	P				
~~SF017~~ 319	South East of STP	6" / L-2	CF02-10	9.9	130.9	9.7	141.1	128.6	98.2	P				
~~SF018~~ 320	South West of STP	6" / L-3	↓	↓	↓	11.7	142.2	127.4	97.3	P				
~~SF019~~ 321	South East of STP	6" / L-3	↓	↓	↓	9.2	142.9	130.8	99.9	P				
~~SF020~~	~~South~~ Middle East of STP	6" / L-3	↓	↓	↓	10.0	139.6	126.9	97.0	P				
~~SF021~~		~~8"~~ /												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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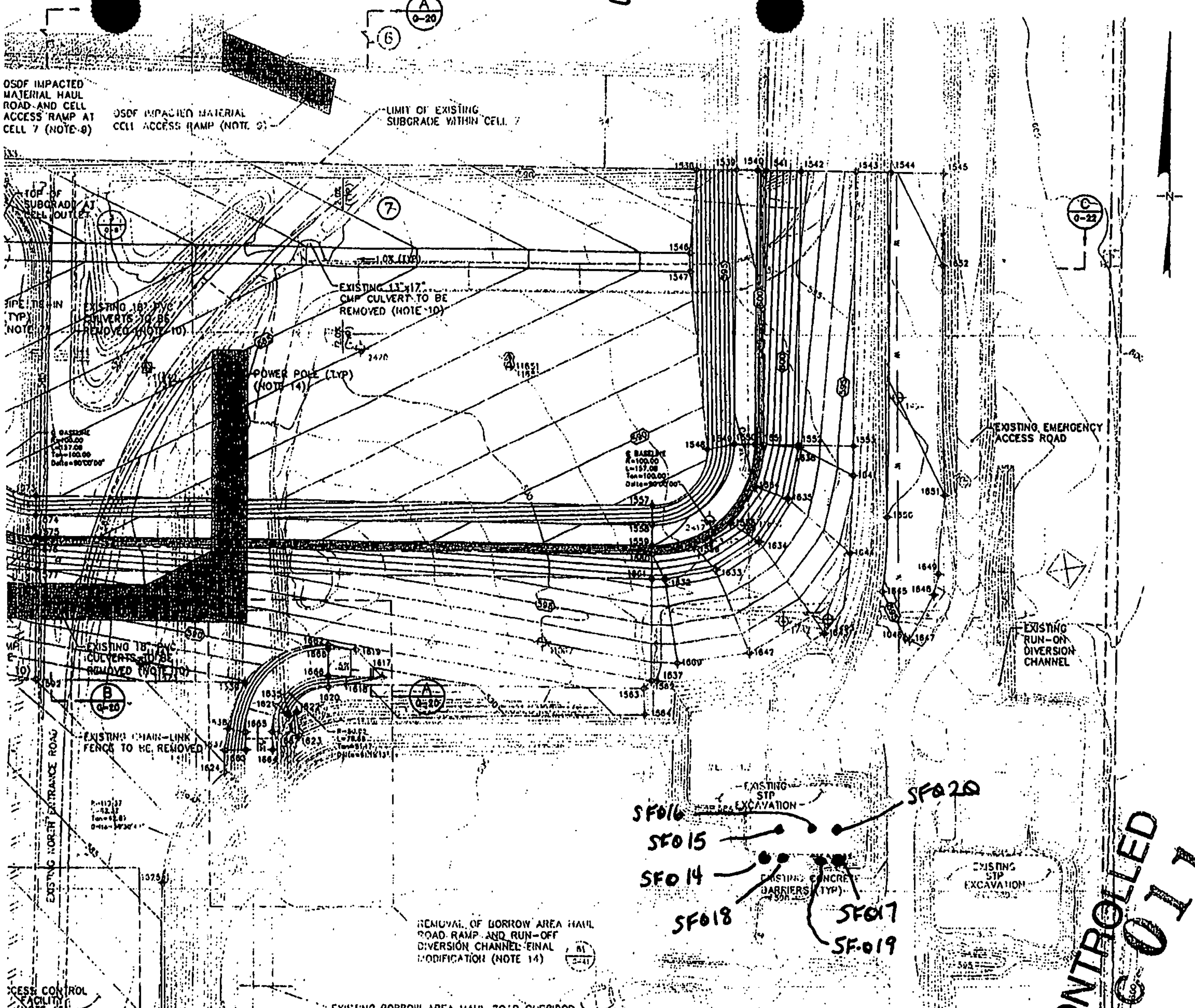
In-place density Locations   9-29-03   STP Area



SUBGRADE CONSTRUCTION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION	POINT NO.	NORTHING	EASTING	ELEVATION
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

LEGEND

- EXISTING GROUND ELEVATION (FEET)
- SUBGRADE ELEVATION (FEET) (TYP.)
- FINISHED GRADE ELEVATION (FEET)
- LEAK DETECTION ... PIPE
- EXISTING ENHANCED PERMANENT LEACHATE TRANSMISSION SYSTEM PIPE
- EXISTING INTERIM LEACHATE TRANSMISSION SYSTEM PIPE
- EXISTING UNDERGROUND ELECTRIC ...
- SLOPE TOE OR CREST
- EXISTING HORIZONTAL MONITORING WELL ...
- CONSTRUCTION CONTROL POINT
- ACCESS CORRIDOR, ACCESS ROAD, ACCESS RAMP, MAINTENANCE ACCESS ...
- BERM CREST
- GRADING TRANSITION (NOTE 13)
- RIPRAP LINE
- DRAINAGE FLOW DIRECTION

5370

GEOTECHNICAL DATA POINTS (NOTE 4)

CONE PENETRATION TESTS

POINT NO.	NORTHING	EASTING	ELEVATION
11446	480467.61	1350966.87	587.88
11447	480304.13	1350990.16	588.45
11448	479771.42	1350930.76	585.14
11647	480124.08	1350893.07	587.74
11681	480471.45	1351288.64	591.89
11851	480478.39	1351286.27	593.02
11558	480326.34	1351501.40	593.45

GEOTECHNICAL BORINGS

POINT NO.	NORTHING	EASTING	ELEVATION
1493	480244.41	1351570.88	-
1494	480444.42	1351635.98	-
1749	480242.41	1351530.98	0.00
11472	479768.43	1350942.89	584.63
11473	480187.91	1350980.16	580.61
11686	480124.06	1350469.40	581.44

PIEZOMETERS

POINT NO.	NORTHING	EASTING	ELEVATION
11703	479883.07	1350780.18	586.12

TYPE 1 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
11087	480223.10	1351313.70	0.00

TYPE 2 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
2417	480332.90	1351484.64	-
2420	480480.37	1351183.73	-

TYPE 3 MONITORING WELLS

POINT NO.	NORTHING	EASTING	ELEVATION
3417	480314.31	1351483.44	-

LYSIMETERS

POINT NO.	NORTHING	EASTING	ELEVATION
11847	480488.17	1350967.86	586.20
11487	479770.39	1350940.70	585.00

NOTES:

1. CLEARING, GRUBBING, AND STRIPPING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02110. SUBGRADE ELEVATIONS CORRESPOND TO TOP OF PREPARED SUBGRADE, INCLUDING ANY COMPACTED FILL. SUBGRADE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
2. ... MONITORING WELLS AND PIEZOMETERS WITHIN CONSTRUCTION AREA WILL BE ABANDONED BY OWNER PRIOR TO CONSTRUCTION IN THAT AREA.

ECDC CONTROLLED COPY NO. C 011

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY
0	02.01.29	CFC SUBMITTAL TO FF/DOE/EPA	LWG	JJA	TEE	DCP
0	01.12.17	PRE-FINAL SUBMITTAL TO FF/DOE	LWG	JJA	TEE	DCP
A	01.10.23	PRELIMINARY SUBMITTAL TO FF/DOE	TEE	JJA	LWG	DCP

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I STP area

PROJECT NO.: G0321 TASK NO.: 03

DATE: 30 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +3 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: onsite MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. CORRECTION FACTOR Y = N/A QA ID:

TEST NO. CF03-322	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~SF-021~~		6"/L-3	CF026	8.7	134.6	8.9	143.1	131.4	~~97.6~~ 97.4	P				
~~SF-022~~ 323		6"/L-3	↓	↓	↓	8.6	143.0	131.7	~~97.8~~ 97.6	P				
~~SF-023~~ 324		8"/L-3	CF02-10	9.9	130.9	9.7	138.0	125.8	96.1	P		CF314 ~~SF013~~	P	
~~SF-024~~ 325	South West of STP	8"/L-4	↓	↓	↓	10.6	138.6	125.3	95.7	P				
~~SF-025~~ 326	South East of STP	8"/L-4	↓	↓	↓	9.9	140.1	127.5	97.4	P				
~~SF-026~~ 327	Middle ~~East of~~ STP	8"/L-4	↓	↓	↓	9.2	143.0	130.9	100	P				
~~SF-027~~ 328	↓	8"/L-4	↓	↓	↓	10.4	140.3	127.0	97.0	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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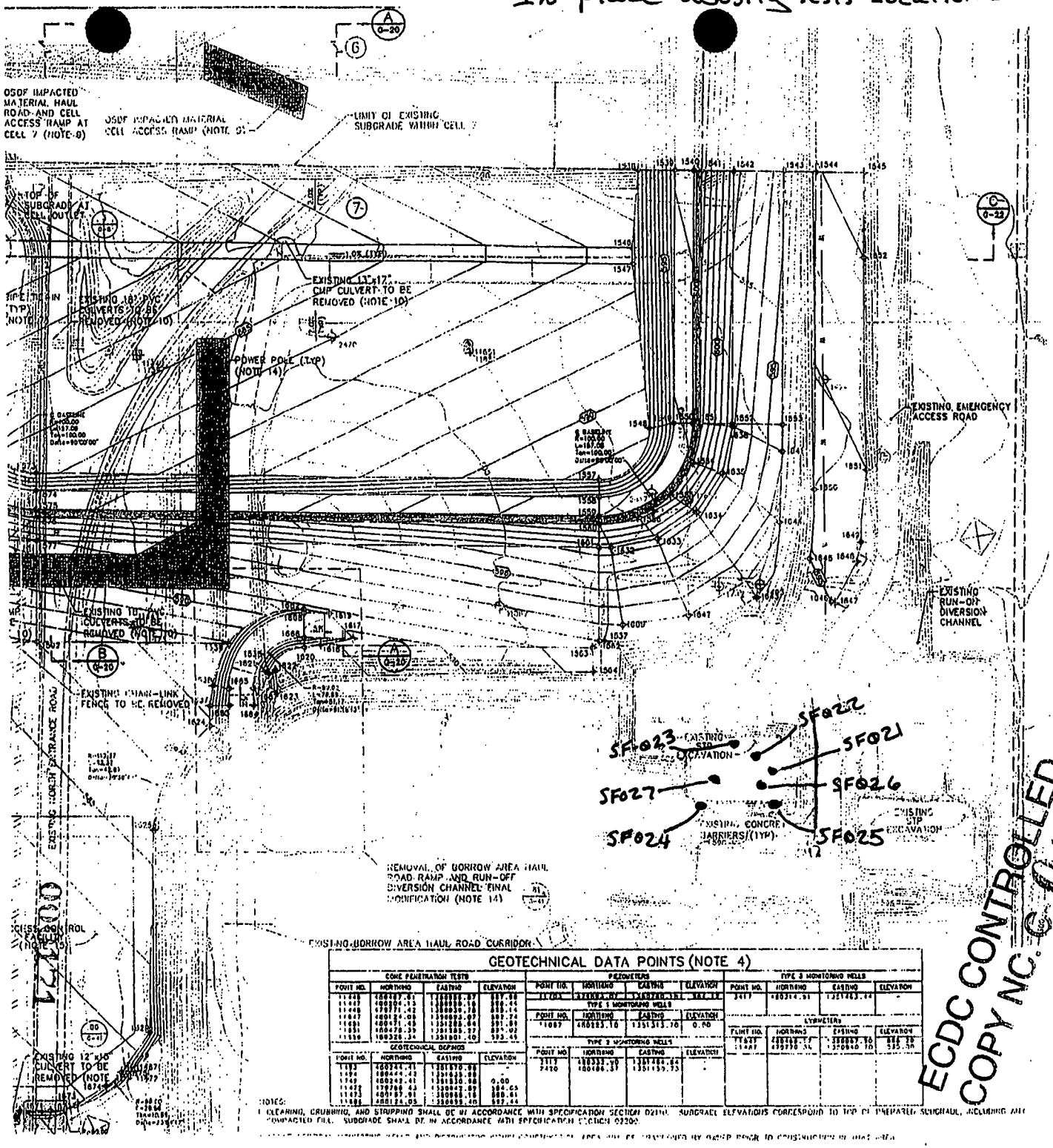
In-place density tests Locations 9-30-03 STP Area



SUBGRADE CONTROL ELEVATION

POINT NO.	NORTHING	EASTING	ELEVATION	POINT NO.	NORTHING	EASTING
1377	479446.99	1350885.38	570.67	1484	480314.48	1350858.32
1484	479885.73	1350846.73	571.12	1485	480314.23	1350858.32
1485	479880.33	1350860.89	571.41	1486	480376.17	1350881.29
1486	479875.31	1350874.31	571.67	1487	480438.10	1350904.26
1487	479815.44	1350847.98	571.79	1488	480498.10	1350881.85
1488	479755.57	1350820.31	571.78	1489	480511.94	1350860.57
1489	479803.82	1350854.10	571.16	1490	480500.32	1350854.31
1490	479866.31	1350854.10	571.16	1491	480498.81	1350884.43
1501	479791.50	1350819.24	571.1	1492	480498.33	1350858.33
1502	479791.33	1350819.10	571.1	1493	480463.00	1350858.33
1503	479785.33	1350819.10	571.1	1494	480416.70	1350833.51
1504	479816.08	1350863.13	573.29	1495	480414.81	1350833.51
1505	479810.14	1350863.13	573.79	1496	480414.08	1350833.08
1506	479816.08	1350863.13	573.29	1497	480380.68	1350738.05
1507	479880.41	1350863.13	573.41	1498	480511.94	1350738.05
1508	479880.11	1350863.32	573.66	1499	480508.06	1350738.03
1509	479816.37	1350856.89	574.04	1519	480314.10	1350144.67
1510	479816.37	1350856.89	574.04	1520	480314.10	1350119.06
1511	479866.33	1350885.78	574.41	1521	480314.10	1350062.57
1512	479866.44	1350868.04	574.41	1522	480316.62	1350001.51
1513	479866.06	1350868.04	574.41	1523	480316.62	1349943.64
1514	480567.97	1350788.08	581.44	1524	480316.62	1349886.04
1515	480567.34	1350788.77	581.00	1525	480316.35	1349828.04
1516	480566.33	1350788.77	581.00	1526	480316.35	1349771.04
1517	480566.33	1350716.56	582.17	1527	479737.33	1349771.04
1518	480567.87	1350716.56	582.17	1528	479737.33	1349828.04
1519	480567.87	1350684.38	582.02	1529	479737.33	1349886.81
1520	480568.49	1350684.38	581.90	1530	479737.33	1349943.09
1521	480568.88	1350684.38	581.04	1531	480409.34	1350062.16
1522	480568.73	1350684.38	581.04	1532	480409.34	1350119.06
1523	480568.73	1350684.38	581.04	1533	480409.34	1350144.07
1524	480568.73	1350684.38	581.04	1534	479737.33	1350119.06
1525	480568.73	1350684.38	581.04	1535	479737.33	1350062.57
1526	480568.73	1350684.38	581.04	1536	479737.33	1350001.51
1527	480568.73	1350684.38	581.04	1537	480316.62	1349943.64
1528	480568.73	1350684.38	581.04	1538	480316.62	1349886.04
1529	480568.73	1350684.38	581.04	1539	480316.62	1349828.04
1530	480401.34	1350684.38	581.33	1540	480316.62	1349771.04
1531	480401.34	1350684.38	581.33	1541	480316.62	1349714.04
1532	480400.80	1350684.38	581.33	1542	480316.62	1349657.04
1533	480400.80	1350684.38	581.33	1543	480316.62	1349600.04
1534	480400.80	1350684.38	581.33	1544	480316.62	1349543.04
1535	480400.80	1350684.38	581.33	1545	480316.62	1349486.04
1536	480400.80	1350684.38	581.33	1546	480316.62	1349429.04
1537	480400.80	1350684.38	581.33	1547	480316.62	1349372.04
1538	480400.80	1350684.38	581.33	1548	480316.62	1349315.04
1539	480400.80	1350684.38	581.33	1549	480316.62	1349258.04
1540	480400.80	1350684.38	581.33	1550	480316.62	1349201.04
1541	480400.80	1350684.38	581.33	1551	480316.62	1349144.04
1542	480400.80	1350684.38	581.33	1552	480316.62	1349087.04
1543	480400.80	1350684.38	581.33	1553	480316.62	1349030.04
1544	480400.80	1350684.38	581.33	1554	480316.62	1348973.04
1545	480400.80	1350684.38	581.33	1555	480316.62	1348916.04
1546	480400.80	1350684.38	581.33	1556	480316.62	1348859.04
1547	480400.80	1350684.38	581.33	1557	480316.62	1348802.04
1548	480400.80	1350684.38	581.33	1558	480316.62	1348745.04
1549	480400.80	1350684.38	581.33	1559	480316.62	1348688.04
1550	480400.80	1350684.38	581.33	1560	479737.33	1348688.04
1551	480400.80	1350684.38	581.33	1561	479737.33	1348745.04
1552	480400.80	1350684.38	581.33	1562	479737.33	1348802.04
1553	480400.80	1350684.38	581.33	1563	479737.33	1348859.04
1554	480400.80	1350684.38	581.33	1564	479737.33	1348916.04
1555	480400.80	1350684.38	581.33	1565	479737.33	1348973.04
1556	480400.80	1350684.38	581.33	1566	479737.33	1349030.04
1557	480400.80	1350684.38	581.33	1567	479737.33	1349087.04
1558	480400.80	1350684.38	581.33	1568	479737.33	1349144.04
1559	480400.80	1350684.38	581.33	1569	479737.33	1349201.04
1560	480400.80	1350684.38	581.33	1570	479737.33	1349258.04
1561	480400.80	1350684.38	581.33	1571	479737.33	1349315.04
1562	480400.80	1350684.38	581.33	1572	479737.33	1349372.04
1563	480400.80	1350684.38	581.33	1573	479737.33	1349429.04
1564	480400.80	1350684.38	581.33	1574	479737.33	1349486.04
1565	480400.80	1350684.38	581.33	1575	479737.33	1349543.04
1566	480400.80	1350684.38	581.33	1576	479737.33	1349600.04
1567	480400.80	1350684.38	581.33	1577	479737.33	1349657.04
1568	480400.80	1350684.38	581.33	1578	479737.33	1349714.04
1569	480400.80	1350684.38	581.33	1579	479737.33	1349771.04
1570	480400.80	1350684.38	581.33	1580	479737.33	1349828.04
1571	480400.80	1350684.38	581.33	1581	479737.33	1349886.81
1572	480400.80	1350684.38	581.33	1582	479737.33	1349943.09
1573	480400.80	1350684.38	581.33	1583	479737.33	1350062.16
1574	480400.80	1350684.38	581.33	1584	479737.33	1350119.06
1575	480400.80	1350684.38	581.33	1585	479737.33	1350144.07
1576	480400.80	1350684.38	581.33	1586	479737.33	1350119.06
1577	480400.80	1350684.38	581.33	1587	479737.33	1350062.57
1578	480400.80	1350684.38	581.33	1588	479737.33	1350001.51
1579	480400.80	1350684.38	581.33	1589	479737.33	1349943.64
1580	480400.80	1350684.38	581.33	1590	479737.33	1349886.04
1581	480400.80	1350684.38	581.33	1591	479737.33	1349828.04
1582	480400.80	1350684.38	581.33	1592	479737.33	1349771.04
1583	480400.80	1350684.38	581.33	1593	479737.33	1349714.04

LEGEND

- EXISTING GROUND ELEVATION (FEET)
- SUBGRADE ELEVATION (FEET)
- HAUL ROAD SURFACE ELEVATION (FEET)
- EXISTING CONTOUR
- EXISTING CONTOUR
- EXISTING ENGINEERED EMERGENCY ACCESS ROAD
- EXISTING DIRECTIONAL DRAINAGE DIVERSION PIPE
- EXISTING DIRECTIONAL DRAINAGE DIVERSION PIPE
- EXISTING GROUND ELEVATION
- PIPE INVERT ELEVATION
- EXISTING HIGHWALLS, HIGHWALLS IN CONTROL ZONE
- EXISTING CONTOUR
- ACCESS CORRIDOR, ACCESS ROAD, RAMP, MAINTENANCE ACCESS, ETC.
- BERM CREST
- GRADING TRANSITION (NOTE 14)
- APRON LIMIT
- DRAINAGE FLOW DIRECTION

GEOTECHNICAL DATA POINTS (NOTE 4)

CONE PENETRATION TESTS			
POINT NO.	NORTHING	EASTING	ELEVATION
11448	480187.81	1350858.87	557.88
11447	480304.13	1350858.18	556.44
11446	479777.42	1350839.78	555.14
11445	480134.08	1350852.07	555.74
11601	480471.48	1351288.64	551.81
11851	480474.34	1351285.37	551.02
11836	480326.34	1351001.40	553.45

GEOTECHNICAL BORINGS			
POINT NO.	NORTHING	EASTING	ELEVATION
1113	480244.41	1351570.88	-
1114	480444.43	1351633.88	-
1149	480243.41	1351530.68	0.00
11472	479788.43	1350447.87	584.63
11473	480197.81	1350868.18	580.61
11482	480124.03	1350859.40	557.44

PIEZOMETERS			
POINT NO.	NORTHING	EASTING	ELEVATION
11003	479883.87	1350780.181	564.12

TYPE 1 MONITORING WELLS			
POINT NO.	NORTHING	EASTING	ELEVATION
11087	480883.10	1351313.10	0.00

TYPE 2 MONITORING WELLS			
POINT NO.	NORTHING	EASTING	ELEVATION
1113	480332.10	1351780.65	-
7430	480486.37	1351133.73	-

TYPE 3 MONITORING WELLS			
POINT NO.	NORTHING	EASTING	ELEVATION
2417	480314.91	1351863.44	-

LYSIMETERS			
POINT NO.	NORTHING	EASTING	ELEVATION
11437	480312.14	1350883.10	586.32
11441	479979.14	1350940.10	585.38

NOTES:

1. CLEARING, GRUBBING, AND STRIPPING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02110. SUBGRADE ELEVATIONS CORRESPOND TO TOP OF PREPARED SUBGRADE, INCLUDING ANY COMPACTED FILL. SUBGRADE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.

REV. NO.	DATE	DESCRIPTION	DES. BY	CH. BY	CHK. BY
0	12.01.99	CFC SUBMITTAL TO FF/DOE/EPA	LWG	JJA	TEZ
B	01.17.97	PRELIMINARY SUBMITTAL TO FF/DOE	LWG	JJA	TEZ
A	08.10.93	PRELIMINARY SUBMITTAL TO FF/DOE	TEZ	JJA	LWG

0 50 100

ECDC CONTROLLED COPY NO. C-011

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V access Road West of cell #6

PROJECT NO.: GQ3211 TASK NO.: 03

DATE: 1 day 10 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3 LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: ON Site

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: W

TEST NO. CF03-329	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~SF-01~~ 330	North of fill	8"/L-1	CF02-6	8.7	134.6	8.6	140.9	129.8	96.4	P				
~~SF-02~~ 331	Middle of fill	8"/L-1	↓	8.7	134.6	8.4	146.0	134.7	100.1	P				
~~SF-03~~ 332	South of fill	8"/L-1	↓	8.7	134.6	7.6	147.5	137.1	101.9	P				
~~SF-04~~ 333	North of fill cell #6	8"/L-2	CF02-10	9.9	130.9	10.4	140.4	127.2	~~100.3~~ 97.2	P				
~~SF-05~~ 334	Middle of fill Road	8"/L-2	CF02-4	11.2	126.7	12.6	138.9	123.4	97.4	P				
~~SF-06~~	South of fill access Rd	8"/L-2	CF02-6	8.7	134.6	8.5	143.1	131.9	98.0	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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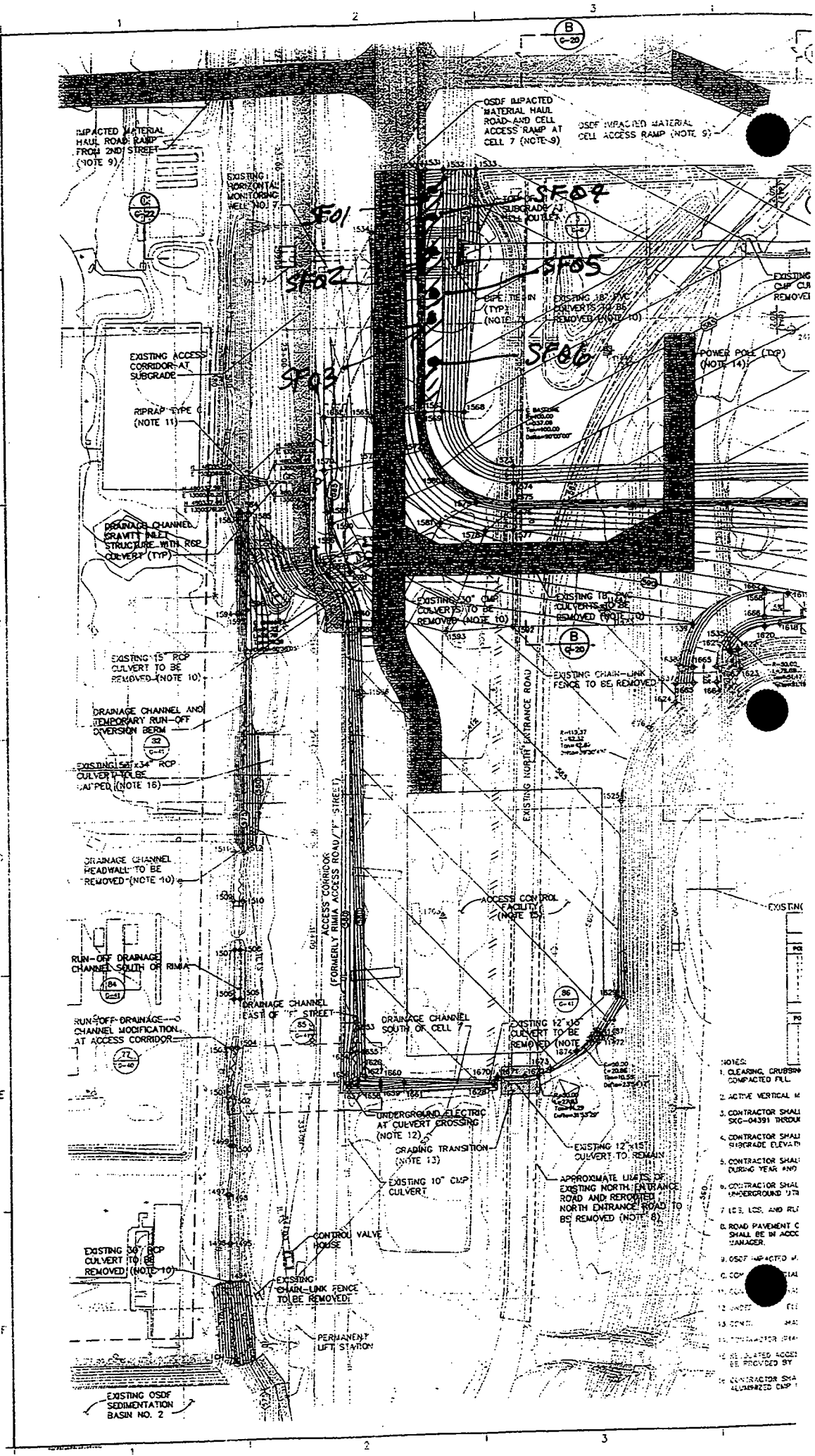
10/1/03

Access Road

West of cell #6

1st + 2nd

Lift



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 03

DESCRIPTION: Phase V Cell # 6 West access Road

DATE: 2 day 10 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Onsite MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO. CF03-335	West Access Road TEST LOCATION from Cell #6	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~SF-07~~ 336	West access Rd from Cell #6	12" / L-3	CF02-6	8.7	134.6	8.6	148.4	136.7	100+	P				
~~SF-08~~		12" / L-3	CF02-6	8.7	134.6	9.0	143.1	131.3	97.5	P				
~~SF-09~~ 337		12" / L-3	CF02-6	8.7	134.6	9.9	141.3	128.5	95.5	P				
~~SF-10~~ 338		12" / L-4		8.7	134.6	9.7	146.2	133.3	99.0	P				
~~SF-11~~ 339		10" / L-4		8.7	134.6	8.8	144.7	133.1	98.9	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO. G03211 TASK NO.: 03

DESCRIPTION: Phase V cell #6 West, access Road

DATE: 3 day 10 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Onsite MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: (Fill)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-340 ~~SF-12~~	Fill West cell #6 South of access Rd	12" / L4	CF02-6	8.7	134.6	9.2	151.9	139.1	103.4	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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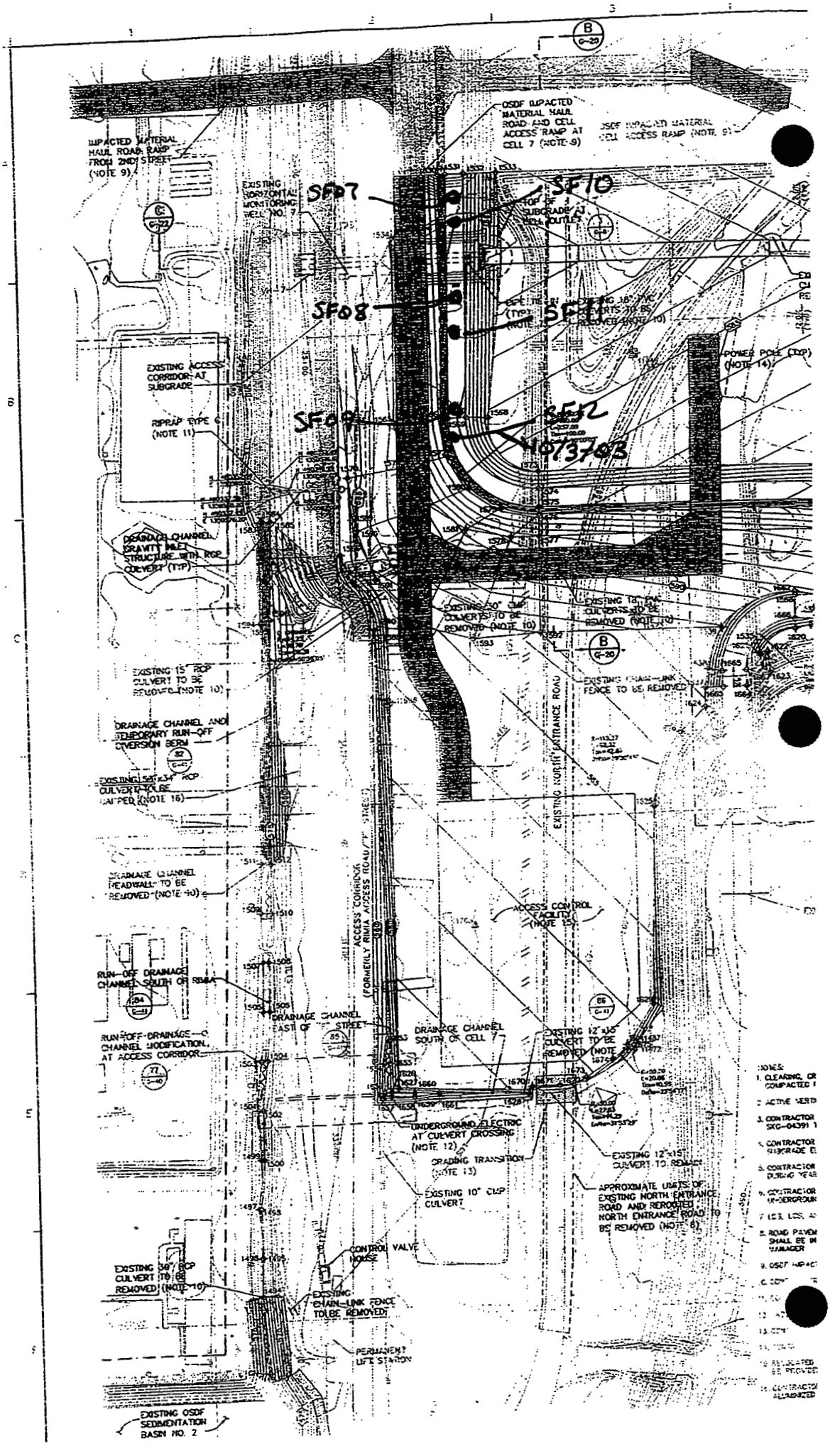
10/2/03
Access Road
West of cell #6
3rd + 4th Lift



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: 6Q3211 TASK NO.: 3

DATE: 18 day October month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE) / COMPACTED): 7"

MATERIAL SOURCE: SP 02-12 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Anchor Trench Backfill

NUCLEAR GAUGE TYPE: TROXLER GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
DRing CF03-341	East Anchor Trench	6" / L2	02-12	13.9	119.0	15.5	133.0	115.1	96.7	P	—	—	—	—
342		6" / L2	02-12	13.9	119.0	14.3	136.0	119.0	100.0	P	—	—	—	—
343		6" / L-3	02-12	13.9	119.0	14.5	134.8	117.7	98.9	P	—	—	—	—
344		6" / L-3	02-12	13.9	119.0	14.6	135.7	118.5	99.6	P	—	—	—	—
345		6" / L-4	02-12	13.9	119.0	15.5	135.0	116.8	98.2	P	—	—	—	—
346		6" / L-4	02-12	13.9	119.0	12.7	132.9	117.9	99.1	P	—	—	—	—
347		6" / L-2	02-12	13.9	119.0	13.4	128.4	113.2	95.1	P	—	—	—	—
348		6" / L-3	02-12	13.9	119.0	13.0	128.3	113.5	95.4	P	—	—	—	—
349		6" / L-3	02-12	13.9	119.0	12.7	130.1	115.4	97.0	P	—	—	—	—
350		6" / L-4	02-12	13.9	119.0	13.3	133.2	117.6	98.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GB3211 TASK NO.: 3

DESCRIPTION: Phase II

DATE: 18 day October month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 27"

MATERIAL SOURCE: _____ MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Anchor Trench Backfill

NUCLEAR GAUGE TYPE: TROXLER GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CFD3-351	East Anchor Trench	6" / L-4	02-2	13.9	119.0	12.5	135.1	120.1	100.9	P	—	—	—	—
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		/												
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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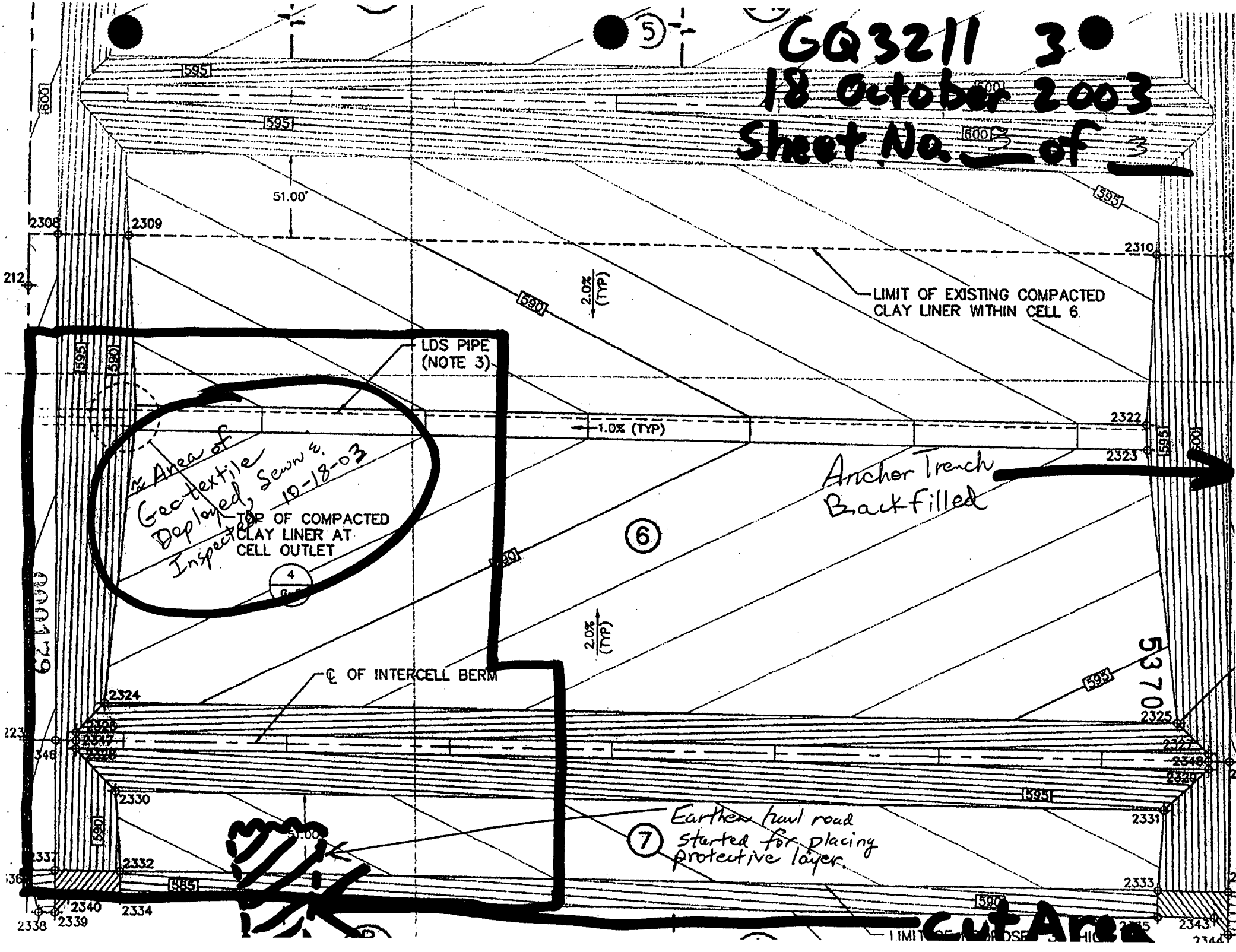
GQ3211 3
18 October 2003
Sheet No. 3 of 3



GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V

DATE: 20 day October month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 7"

MATERIAL SOURCE: SP 02-12 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Anchor trench backfill

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-352	West Anchor Trench	6" / L-2	02-12	13.9	119.0	13.9	134.0	117.6	98.8	P	—	—	—	—
353		6" / L-2	02-12	13.9	119.0	12.7	136.6	121.2	101.8	P	—	—	—	—
354		6" / L-3	02-12	13.9	119.0	12.5	138.0	122.7	103.1	P	—	—	—	—
355		6" / L-3	02-12	13.9	119.0	13.3	137.7	121.5	102.1	P	—	—	—	—
356		6" / L-4	02-12	13.9	119.0	11.4	132.2	118.6	99.7	P	—	—	—	—
357		6" / L-4	02-12	13.9	119.0	12.2	134.8	119.4	100.4	P	—	—	—	—
358		6" / L-2	02-12	13.9	119.0	14.7	134.5	117.2	98.5	P	—	—	—	—
359		6" / L-2	02-12	13.9	119.0	13.0	134.5	119.0	100.0	P	—	—	—	—
360		6" / L-3	02-12	13.9	119.0	13.5	136.7	120.4	101.2	P	—	—	—	—
361		6" / L-3	02-12	13.9	119.0	12.1	132.2	117.9	99.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: G03211 TASK NO.: 3

DATE: 20 day October month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 7"

MATERIAL SOURCE: SP 02-12

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: Anchor Trench Backfill

NUCLEAR GAUGE TYPE: _____ GAUGE SERIAL NO. _____ CORRECTION FACTOR Y = _____ QA ID: _____

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-362	West Anchor Trench	6" / L-4	02-12	13.9	119.0	13.2	136.4	120.5	101.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 2 OF 3

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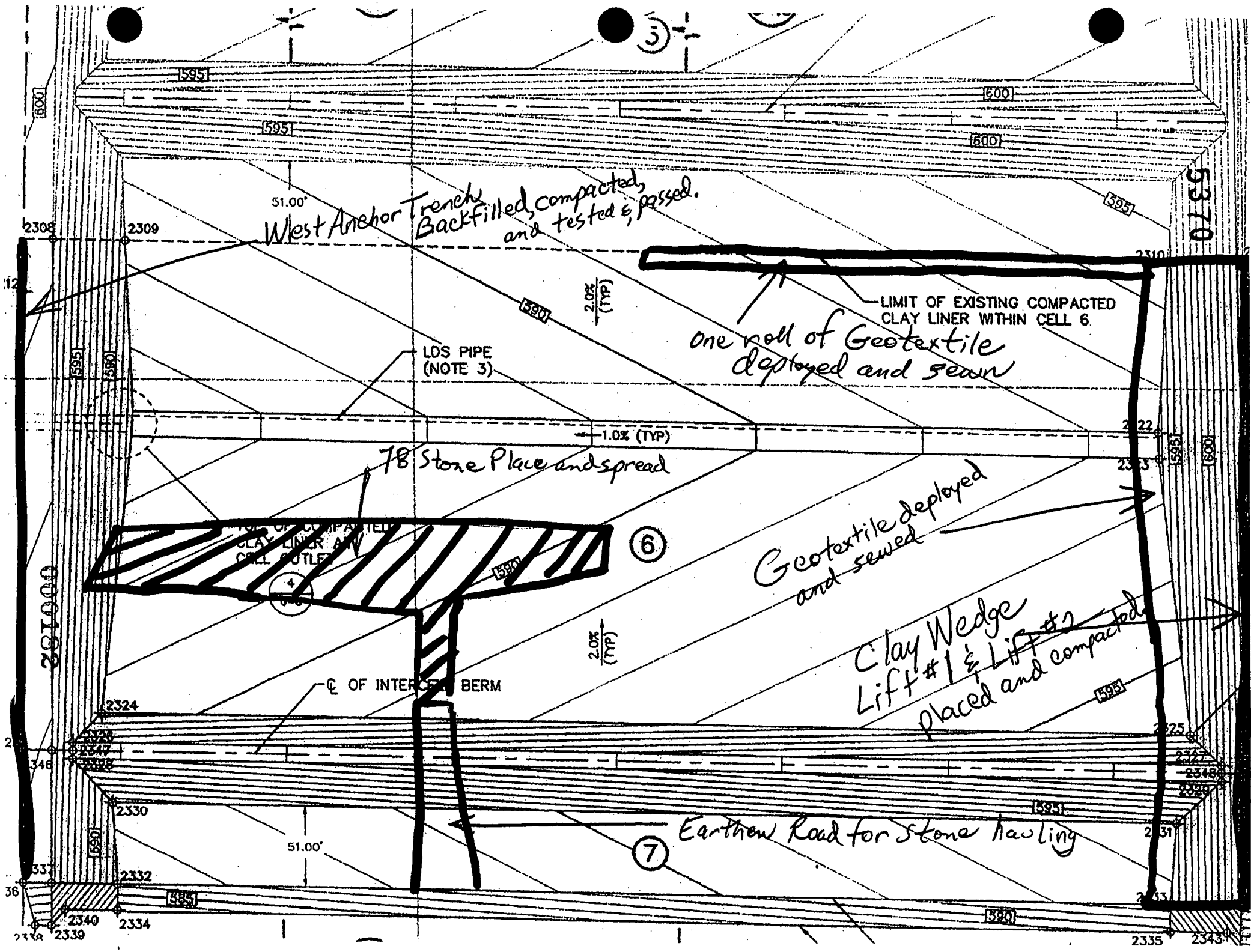
West Anchor Trench Backfilled, compacted, and tested & passed.
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
one roll of Geotextile deployed and sewn
LDS PIPE (NOTE 3)
1.0% (TYP)
78 Stone Place and spread
Geotextile deployed and sewed
Clay Wedge Lift #1 & Lift #2 placed and compacted
℄ OF INTERCELL BERM
Earthen Road for Stone hauling
51.00'
2.0% (TYP)
6
7
4
595
600
590
585
2308
2309
2310
2322
2323
2324
2325
2330
2331
2332
2333
2334
2335
2339
2340
2343
53170
30T000

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL 6/7 - PHASE V

PROJECT NO.: G03211 TASK NO.: 3

DATE: 30 day OCT month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +-3% LIFT THICKNESS (LOOSE/COMPACTED):

MATERIAL SOURCE: CF03-08 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = QA ID: RH

TEST NO. CF03-363	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~CF4-12~~ 364	West End-Haul Road C6	8"/2	CF03-8	13.4	120.9	12.8	138.4	122.7	101.5	P	—	—	—	—
~~CF4-13~~ 365	Center Haul Road-C6	8"/2	CF03-8	13.4	120.9	15.2	131.4	114.1	94.4	—	F	CF3-365 ~~CF4-14~~	P	—
~~CF4-14~~ 366	Center Haul Road-C6	8"/2	CF03-8	13.4	120.9	13.7	137.5	120.9	100.0	P		—	—	—
~~CF4-15~~	East End-Haul Road-C6	8"/2	CF03-8	13.4	120.9	12.9	136.5	120.9	100.0	P		—	—	—
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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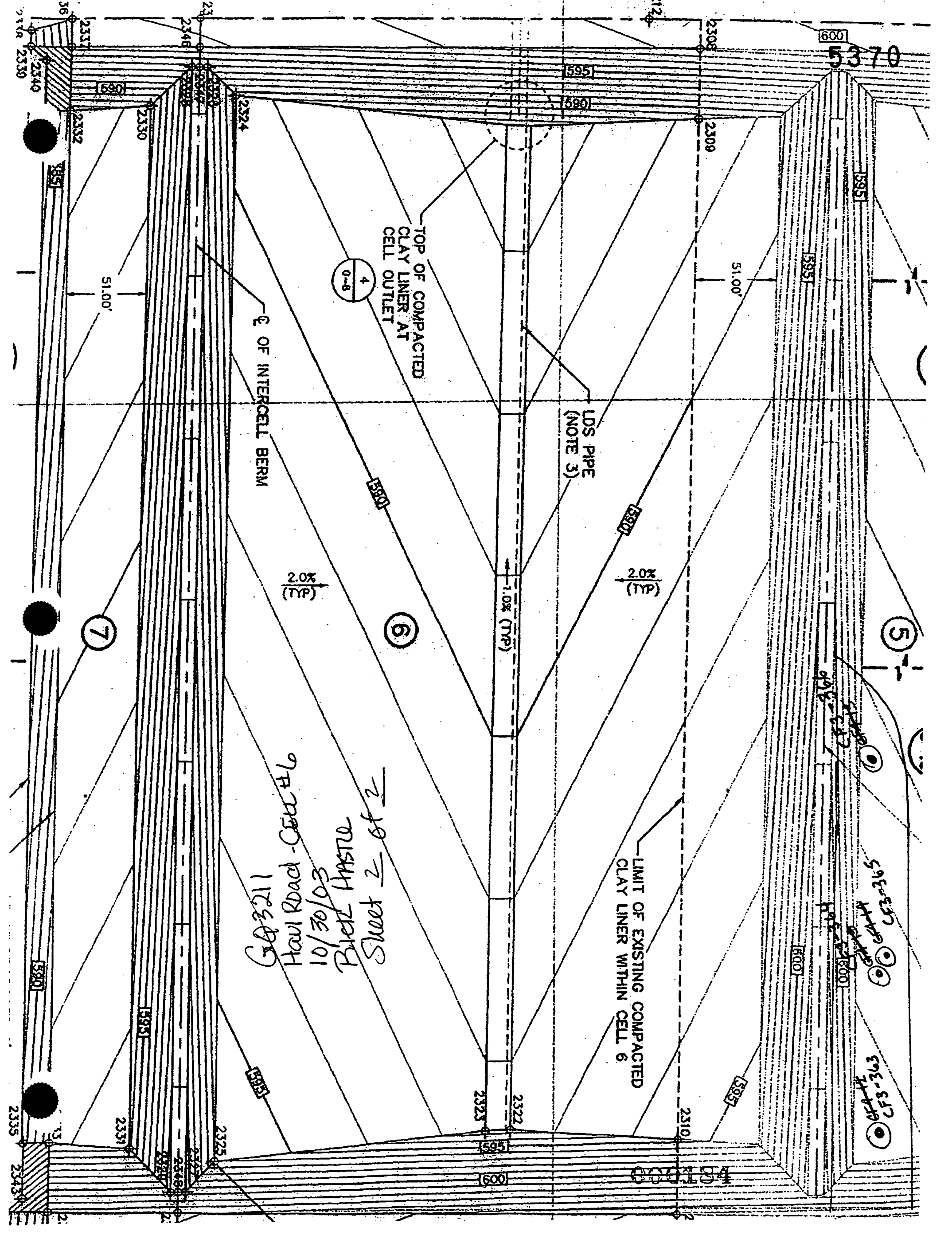

TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
D-8
℄ OF INTERCELL BERM
LDS PIPE (NOTE 3)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
51.00'
51.00'
2.0% (TYP)
2.0% (TYP)
1.0% (TYP)
7
6
5
590
595
600
5370
000184
GQ3211
Haul Road - Cell #6
10/30/03
Sheet 2 of 2
CF3-363
CF3-365

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO. 603211 TASK NO.: 3

DESCRIPTION: CELL 6 - HAUL ROAD / PHASE V

DATE: 31 day OCT month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +3% LIFT THICKNESS (LOOSE / COMPACTED):

MATERIAL SOURCE: CF03-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = QA ID: RH

TEST NO. CF03-367	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~CF4-16~~ 368	WEST HAUL ROAD - C-6	8"/3	CF03-8	13.4	120.9	15.8	134.3	116.0	95.9	P	–	–	–	–
~~CF4-17~~ 369	CENTER HAUL ROAD - C-6	8"/3	CF03-8	13.4	120.9	14.2	135.6	118.8	98.2	P	–	–	–	–
~~CF4-18~~ 370	EAST END HAUL RD - C-6	8"/3	CF03-8	13.4	120.9	18.6	128.1	108.0	89.4	–	F	CF4-20	P	–
~~CF4-19~~ 371	EAST END HAUL RD - C-6	8"/3	CF03-8	13.4	120.9	13.4	135.5	119.5	98.8	P	–	–	–	–
~~CF4-20~~ 372	WEST END HAUL RD - C-6	8"/4	CF03-8	13.4	120.9	13.0	135.7	120.1	99.3	P	–	–	–	–
~~CF4-21~~ 373	CENTER HAUL RD - C-6	8"/4	CF03-8	13.4	120.9	13.6	135.1	118.9	98.3	P	–	–	–	–
~~CF4-22~~ 374	EAST HAUL RD - C-6	8"/4	CF03-8	13.4	120.9	14.6	132.4	115.4	95.8 ~~95.4~~	P	–	–	–	–
~~CF4-23~~ 375	WEST HAUL RD C-6	8"/5	CF03-8	13.4	120.9	15.9	135.1	116.6	96.4	P	–	–	–	–
~~CF4-24~~ 376	CENTER HAUL RD C-6	8"/5	CF03-8	13.4	120.9	13.8	134.4	118.1	97.7	P	–	–	–	–
~~CF4-25~~	EAST HAUL RD C-6	8"/5	CF03-8	13.4	120.9	12.9	139.9	124.0	102.5	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000185

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FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G03211 TASK NO.: 3

DESCRIPTION: CELL 6/7 - PHASE II

DATE: 31 day OCT month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +-3% LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: CF03-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = ____ QA ID: RN

TEST NO. CF03-377	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~CF4-26~~	West End Haul Rd - C-6	8"/6	CF03-8	13.4	120.9	14.8	134.2	117.7	97.4	P	-	-	-	-
~~CF4-27~~ 378	Center - Haul Rd - C-6	8"/6	CF03-8	13.4	120.9	14.3	133.1	116.5	96.4	P	-	-	-	-
~~CF4-28~~ 379	EAST HAUL Rd - C-6	8"/6	CF03-8	13.4	120.9	14.2	134.9	118.1	97.7	P	-	-	-	-

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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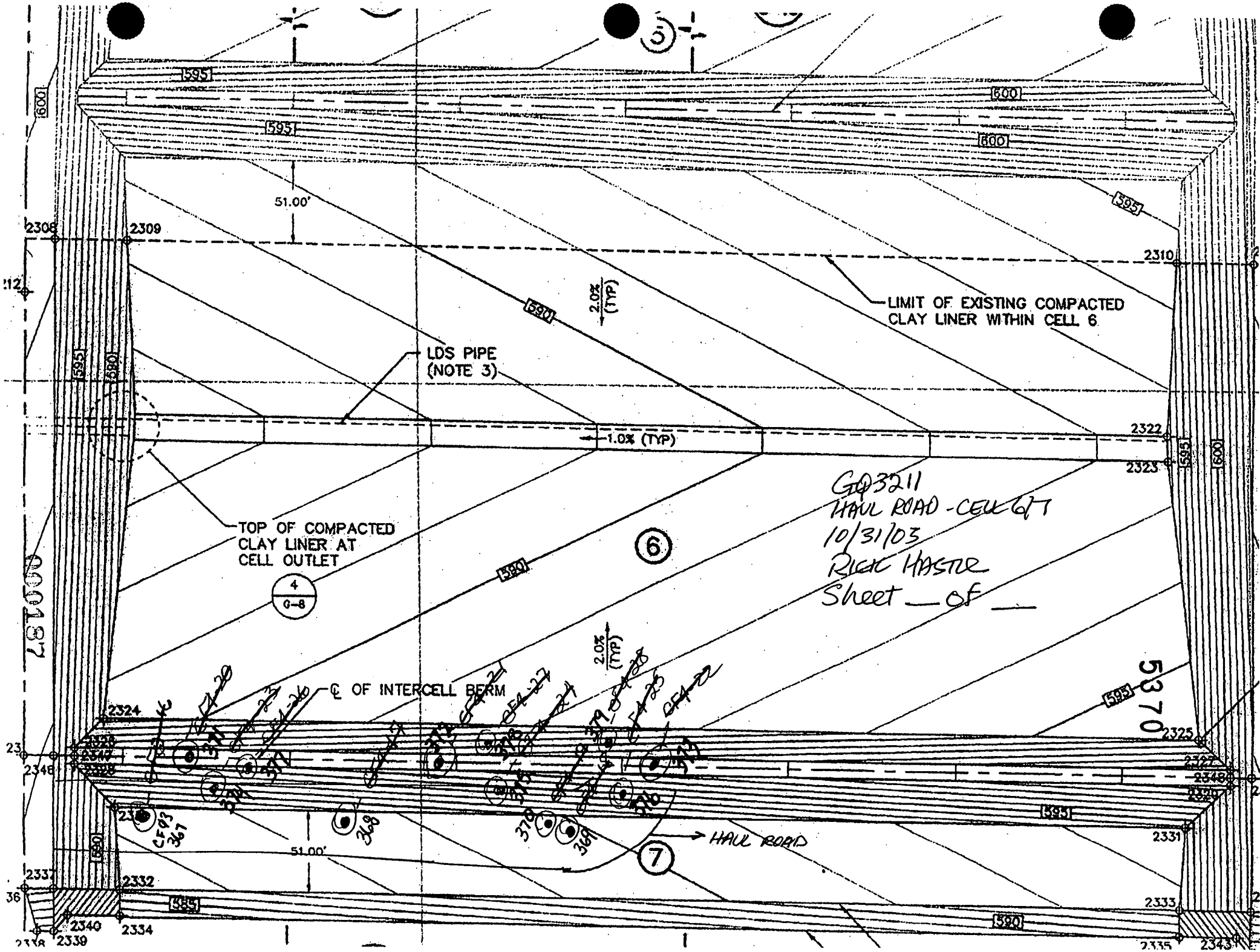
595
600
595
600
600
595
51.00'
2308
2309
2310
590
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
595
590
1.0% (TYP)
2322
2323
595
600
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
6
590
GQ3211
HAUL ROAD - CELL 6/7
10/31/03
RICK HASTIE
Sheet __ of __
2.0% (TYP)
℄ OF INTERCELL BERM
595
2324
2325
2346
2348
595
2331
HAUL ROAD
7
51.00'
590
2337
2332
2333
585
590
2340
2339
2334
2335
2343
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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 2

DATE: 1 day Nov month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): ≈7"

MATERIAL SOURCE: Cell #7 Floor Cut MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
03-380 ~~CF4-1X12~~ CHW	West End, Haul Road Cell #6	8" / 4	CF03-9	11.5	122.5	13.7	134.1	117.9	96.2	P	—	—	—	—
03-381 ~~CF4-1X13~~	East End, Haul Road Cell #6	8" / 4	CF03-9	11.5	122.5	14.4	133.2	116.4	95.0	P	—	—	—	—
F03-382 ~~CF4-1X14~~	Middle, Haul Road Cell #6	10" / 6	CF03-9	11.5	122.5	13.4	134.2	118.4	96.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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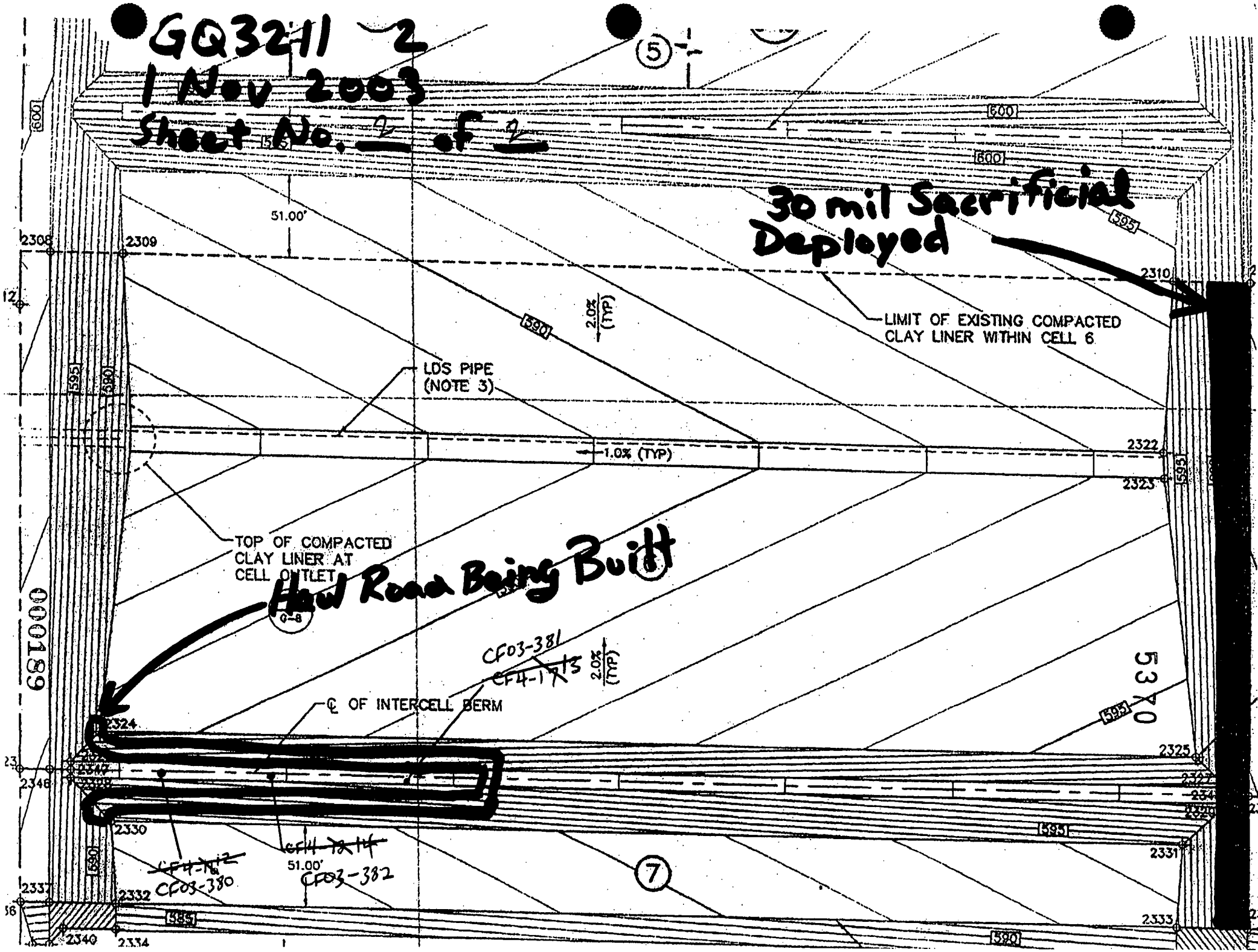
GQ3211 2
1 Nov 2003
Sheet No. 2 of 2



GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: GQ3211 TASK NO.: 2

DATE: 3 day Nov month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 7"

MATERIAL SOURCE: Cell #7 Floor

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO. 383	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF03-~~380~~	Middle, Haul Road Cell #6	8" / 7	CF03-9	11.5	122.5	14.3 —	129.4	113.2	92.4	—	F*	—	—	—
CF03-~~384~~	Haul Road Cell #6	6" / 2	CF03-9	11.5	122.5	14.1 —	136.9	120.0	97.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *The failed lift was shoved off with the dozer after the surveyors confirmed it was too high.

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3 Nov 2003
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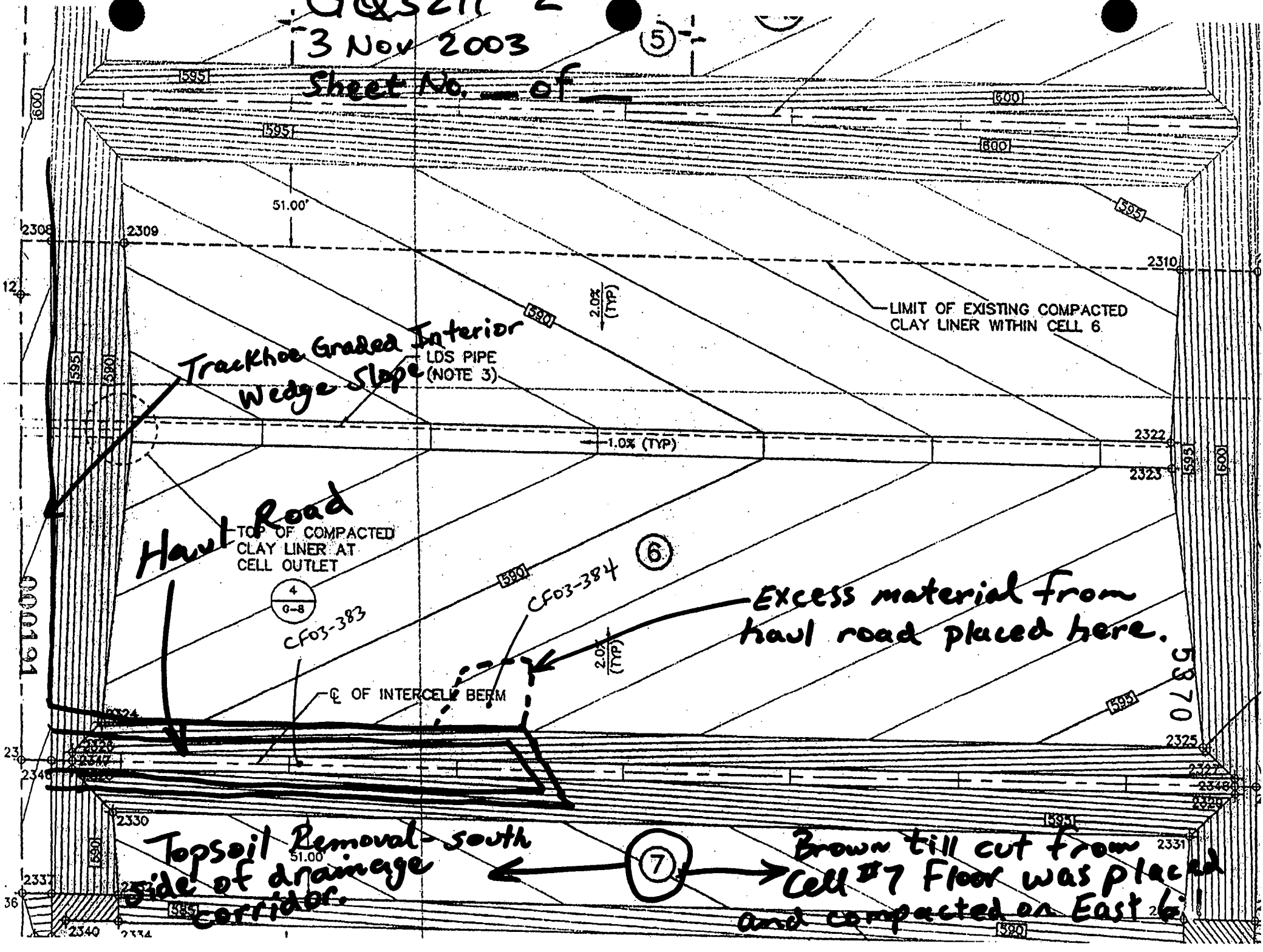

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: GQ3211 TASK NO.: 2

DATE: 4 day Nov month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 22"

MATERIAL SOURCE: Cell #7 floor

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF03-385	Cell #6 Haul Road	8" / 4	CF03-9	11.5	122.5	13.8	136.7	120.1	98.0	P	—	—	—	—
CF03-386	Cell #6 Haul Road	8" / 5	CF03-1	14.6	117.7	15.2	135.2	117.4	99.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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4 Nov 2003
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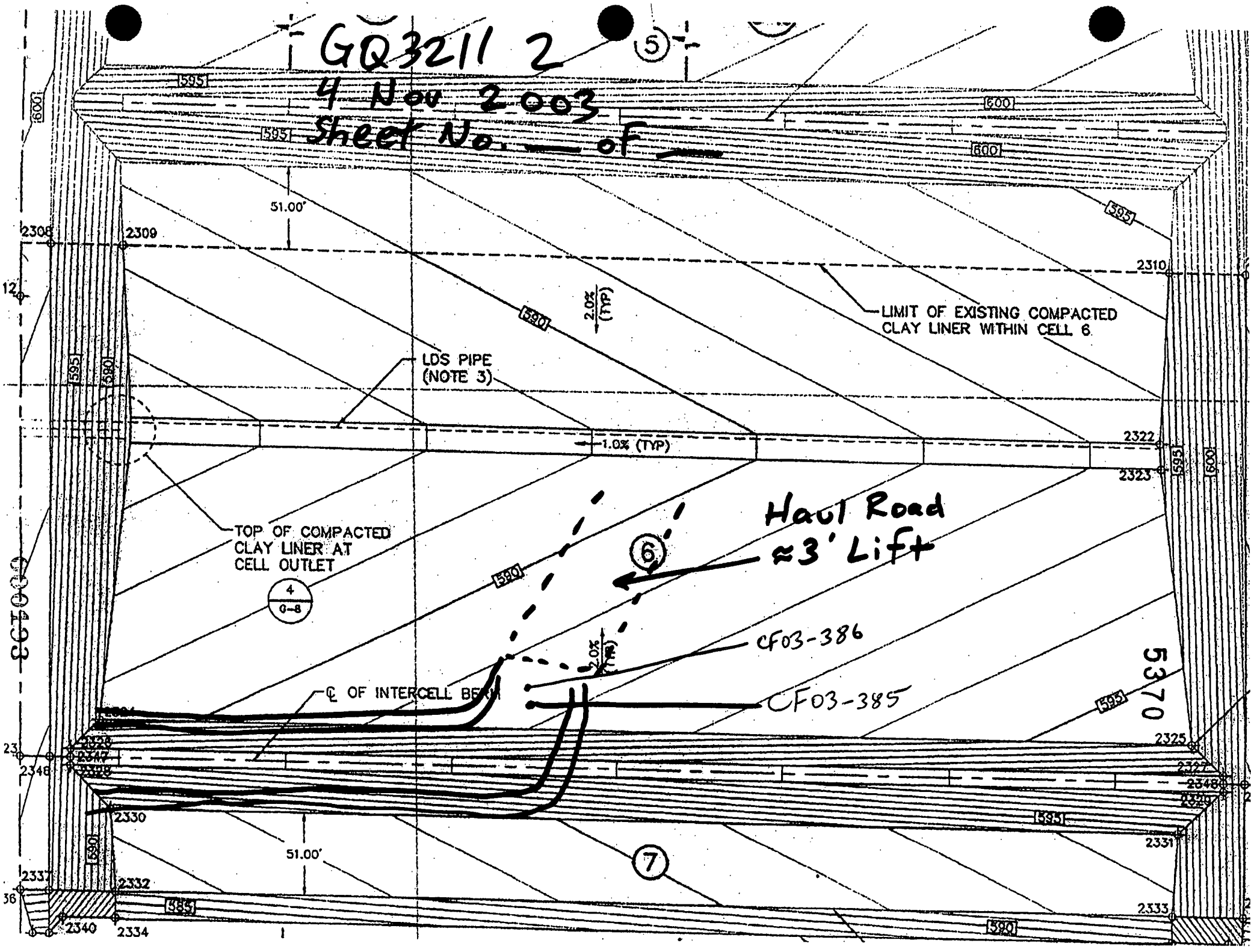

DRIVE CYLINDER TESTS

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 041

DESCRIPTION: Phase III DATE: 19 day Mar month 2002 year

TEST NO.: CF03-07 DC-1

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Haul Road FDT TEST NO.: CF03-07

FIELD TEST DATA – ASTM D 2937 QA ID: DJE

A	CYLINDER NO. 03-11 VOLUME[1] 2617.4 (cf)	0.033354	E	WET UNIT WEIGHT = D/A (lbs)	132.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.77	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	110.3
C	WEIGHT OF CYLINDER 616.4 (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.41			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DJE

O	WT. OF TARE NO. #622 (grams)	8.0	R	WT. OF WATER = P–Q (grams)	82.4
P	WT. OF WET SOIL & TARE (grams)	504.8	S	WT. OF DRY SOIL = Q–O (grams)	414.4
Q	WT. OF DRY SOIL & TARE (grams)	422.4	T	MOISTURE CONTENT = (R/S)X100 (%)	19.9 1.199

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 112.1 (pcf) OPTIMUM MOISTURE CONTENT 17.1 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	3.4	U	FDT MOISTURE CONTENT (%)	16.5
FDT WET UNIT WT. (pcf)	129.9	V	FDT DRY UNIT WT. (pcf)	111.5
DELTA DRY UNIT WT. = F – V	1.2		FDT #	

COMMENTS:

000195

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 25 day Mar month 2003 year

TEST NO.: CF03-18 / ~~CF03-2~~ DC-2

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: East Berm FDT TEST NO.: CF03-18

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-008 VOLUME[1] (cf)	0.033559	E	WET UNIT WEIGHT = D/A (lbs)	130.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.73	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	110.3
C	WEIGHT OF CYLINDER 617.3gr (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.37			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #36 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	75.5
P	WT. OF WET SOIL & TARE (grams)	504.2	S	WT. OF DRY SOIL = Q–O (grams)	420.3
Q	WT. OF DRY SOIL & TARE (grams)	428.7	T	MOISTURE CONTENT = (R/S)X100 (%)	18.0

Tab

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 112.1 (pcf) OPTIMUM MOISTURE CONTENT 17.1 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U		~1.8	U	FDT MOISTURE CONTENT (%)	19.8
FDT WET UNIT WT. (pcf)		131.4	V	FDT DRY UNIT WT. (pcf)	109.7
DELTA DRY UNIT WT. = F – V		0.6		FDT #	

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

-- 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 31 day March month 2003 year

TEST NO.: DC03-3

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ±3%

% COMPACTION: 95 MOISTURE CONTENT RANGE:

FDT LOCATION: Cell 6, East berm FDT TEST NO.: CF03-34

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 0307 VOLUME[1]	(cf)	0.033516	E	WET UNIT WEIGHT = D/A	(lbs) 127.4
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.61	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 105.1
C	WEIGHT OF CYLINDER	(lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.27			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 23	(grams)	8.4	R	WT. OF WATER = P–Q	(grams) 66.9
P	WT. OF WET SOIL & TARE	(grams)	390.4	S	WT. OF DRY SOIL = Q–O	(grams) 315.1
Q	WT. OF DRY SOIL & TARE	(grams)	323.5	T	MOISTURE CONTENT = (R/S)X100	(%) 21.2

1.212

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 117.7 (pcf) OPTIMUM MOISTURE CONTENT 14.6 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U	6.4	U	FDT MOISTURE CONTENT	(%)	14.8
FDT WET UNIT WT. (pcf)	134.1	V	FDT DRY UNIT WT.	(pcf)	116.9
DELTA DRY UNIT WT. = F – V	-11.8		FDT # CF03-34		

COMMENTS:

000197

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FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GR13-11 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 02 day APR month 2003 year

TEST NO.: ~~CF03-49~~ DC03-4

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% OF STD PROCTOR MOISTURE CONTENT RANGE: ±3% OF OMC

FDT LOCATION: CF03-49 (SEE LOGS) FDT TEST NO.: CF03-49

FIELD TEST DATA – ASTM D 2937 QA ID: DLE/TBW

A	CYLINDER NO. 03-05 VOLUME[1] (cf)	.0033465	E	WET UNIT WEIGHT = D/A (lbs)	139.8
B	WEIGHT OF SAMPLE & CYLINDER 2732.9 gm (lbs)	6.02	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	123.0
C	WEIGHT OF CYLINDER 608.1 gm (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.68			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE/TBW

O	WT. OF TARE NO. #23 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	57.8
P	WT. OF WET SOIL & TARE (grams)	488.0	S	WT. OF DRY SOIL = Q–O (grams)	421.9
Q	WT. OF DRY SOIL & TARE (grams)	430.2	T	MOISTURE CONTENT = (R/S)X100 (%)	13.7

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 126.5 (pcf) OPTIMUM MOISTURE CONTENT 11.7 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	0.1	U	FDT MOISTURE CONTENT (%)	13.6
FDT WET UNIT WT. (pcf)	138.9	V	FDT DRY UNIT WT. (pcf)	122.2
DELTA DRY UNIT WT. = F – V	0.8		FDT #	

COMMENTS:

000198

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GR1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 11 day Apr month 2003 year

TEST NO.: DC03-5 / CF03-87

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE:

FDT LOCATION: See location Map FDT TEST NO.: CF03-87

FIELD TEST DATA – ASTM D 2937 QA ID: [illegible]

A	CYLINDER NO. _____ VOLUME[1] (cf)	0.033443	E	WET UNIT WEIGHT = D/A (lbs)	137.2
B	WEIGHT OF SAMPLE & CYLINDER 2699.0 gm (lbs)	5.95	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.9
C	WEIGHT OF CYLINDER 618.0 gm (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.59			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

ELD MOISTURE CONTENT – ASTM D 2216 QA ID: [illegible]

O	WT. OF TARE NO. 36 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	73.5
P	WT. OF WET SOIL & TARE (grams)	505.1	S	WT. OF DRY SOIL = Q–O (grams)	423.2
Q	WT. OF DRY SOIL & TARE (grams)	431.6	T	MOISTURE CONTENT = (R/S)X100 (%)	17.4

1.174

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: _____

DELTA MOISTURE CONTENT = T – U	2.8	U	FDT MOISTURE CONTENT (%)	14.6
FDT WET UNIT WT. (pcf)	130.6	V	FDT DRY UNIT WT. (pcf)	113.9
DELTA DRY UNIT WT. = F – V	3.0		FDT #	

COMMENTS:

000199

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q134 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 16 day Apr month 2003 year

TEST NO.: CF03-118 DC03-~~8~~ compacted F.L.

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: West berm Cell 6 FDT TEST NO.: CF03-118

FIELD TEST DATA – ASTM D 2937 QA ID: ASL

A	CYLINDER NO. 03-10 VOLUME[1] (cf)	0.033461	E	WET UNIT WEIGHT = D/A (lbs)	126.1
B	WEIGHT OF SAMPLE & CYLINDER 2523.5 gr (lbs)	5.56	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	104.9
C	WEIGHT OF CYLINDER 608.8 gr (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.22			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

IELD MOISTURE CONTENT – ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. #36 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	66.2 ~~84.2~~ CHW
P	WT. OF WET SOIL & TARE (grams)	402.8 ~~420.8~~ CHW	S	WT. OF DRY SOIL = Q–O (grams)	328.2
Q	WT. OF DRY SOIL & TARE (grams)	336.6	T	MOISTURE CONTENT = (R/S)X100 (%)	20.2 ~~25.7~~ CHW

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 112.1 (pcf) OPTIMUM MOISTURE CONTENT 17.1 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CHW

DELTA MOISTURE CONTENT = T – U	3.5	U	FDT MOISTURE CONTENT (%)	16.7
FDT WET UNIT WT. (pcf)	127.9	V	FDT DRY UNIT WT. (pcf)	109.6
DELTA DRY UNIT WT. = F – V	-4.7		FDT #	

COMMENTS:

000200

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 23 day Apr month 2003 year

TEST NO.: CF 03-143 Cell-6 DC03-7

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: West berm Cell #6 FDT TEST NO.: CF03-143

FIELD TEST DATA – ASTM D 2937 QA ID: DLC

A	CYLINDER NO. 03-11 VOLUME[1] (cf)	0.033354	E	WET UNIT WEIGHT = D/A (lbs)	135.5
B	WEIGHT OF SAMPLE & CYLINDER 2665.6gr (lbs)	5.88	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	113.5
C	WEIGHT OF CYLINDER 616.4gr (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B-C 2049.2 (lbs)	4.52			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

IELD MOISTURE CONTENT – ASTM D 2216 QA ID:

O	WT. OF TARE NO. #678 (grams)	8.2	R	WT. OF WATER = P-Q (grams)	70.4
P	WT. OF WET SOIL & TARE (grams)	441.8	S	WT. OF DRY SOIL = Q-O (grams)	363.2
Q	WT. OF DRY SOIL & TARE (grams)	371.4	T	MOISTURE CONTENT = (R/S)X100 (%)	19.4

1.194

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 117.4 (pcf) OPTIMUM MOISTURE CONTENT 14.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLC

DELTA MOISTURE CONTENT = T - U		3.8	U	FDT MOISTURE CONTENT (%)	15.6
FDT WET UNIT WT. (pcf)		133.3	V	FDT DRY UNIT WT. (pcf)	115.3
DELTA DRY UNIT WT. = F - V		-1.8		FDT #	

COMMENTS:

000201

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 25 day Apr month 2003 year

TEST NO.: CF03-162 compacted fill (Taken 25 April) DCØ3-8

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: MOISTURE CONTENT RANGE:

FDT LOCATION: FDT TEST NO.: CF 03-162

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. ____ VOLUME[1] (cf) 2728.4	0.033429	E	WET UNIT WEIGHT = D/A (lbs)	139.4
B	WEIGHT OF SAMPLE & CYLINDER (lbs) 614.3 g	6.01	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	120.5
C	WEIGHT OF CYLINDER (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.66			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE/KS

O	WT. OF TARE NO. #32 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	73.5
P	WT. OF WET SOIL & TARE (grams)	550.9	S	WT. OF DRY SOIL = Q–O (grams)	469.0
Q	WT. OF DRY SOIL & TARE (grams)	477.4	T	MOISTURE CONTENT = (R/S)X100 (%)	15.7

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.7 (pcf) OPTIMUM MOISTURE CONTENT 12.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U	2.2	U	FDT MOISTURE CONTENT (%)	13.5
FDT WET UNIT WT. (pcf)	137.2	V	FDT DRY UNIT WT. (pcf)	120.9
DELTA DRY UNIT WT. = F – V	0.4		FDT # CF03-162	

COMMENTS:

000202

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q1341 TASK NO.: Ø4.1

DESCRIPTION: Phase V DATE: 2 day Mar month 2Ø03 year

TEST NO.: DCØ3-9 Cell 6

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Cell #6 Undercut Backfill FDT TEST NO.: CFØ3-199

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. Ø3-11 VOLUME[1] (cf)	Ø.Ø33354	E	WET UNIT WEIGHT = D/A (lbs)	~~136.1~~	136.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.9Ø	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	~~121.4~~	121.5
C	WEIGHT OF CYLINDER (lbs)	1.36	G			
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.54				

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 662 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	39.4	
P	WT. OF WET SOIL & TARE (grams)	372.4	S	WT. OF DRY SOIL = Q–O (grams)	324.7	
Q	WT. OF DRY SOIL & TARE (grams)	333.0	T	MOISTURE CONTENT = (R/S)X100 (%)	12.1	1.121

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 134.6 (pcf) OPTIMUM MOISTURE CONTENT 8.7 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U	2.4	U	FDT MOISTURE CONTENT (%)	9.7	
FDT WET UNIT WT. (pcf)	144.7	V	FDT DRY UNIT WT. (pcf)	129.2	
DELTA DRY UNIT WT. = F – V	~~-7.8~~ 7.7		FDT # CFØ3-199		

COMMENTS:

000203

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q1341 TASK NO. 041

DESCRIPTION: Phase II DATE: 02 day May month 2003 year

TEST NO.: CF03-211 Cell 6 DC03-10

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Cell 6 Undercut Backfill FDT TEST NO.: CF03-211

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-10 VOLUME[1] (cf)	0.033461	E	WET UNIT WEIGHT = D/A (lbs)	139.6
B	WEIGHT OF SAMPLE & CYLINDER 2228g (lbs)	6.01	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	124.3
C	WEIGHT OF CYLINDER 608.8g (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.67			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #670 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	68.3
P	WT. OF WET SOIL & TARE (grams)	630.3	S	WT. OF DRY SOIL = Q–O (grams)	553.7
Q	WT. OF DRY SOIL & TARE (grams)	562.0	T	MOISTURE CONTENT = (R/S)X100 (%)	12.3

1.123

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 134.6 (pcf) OPTIMUM MOISTURE CONTENT 8.7 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	2.8	U	FDT MOISTURE CONTENT (%)	9.5
FDT WET UNIT WT. (pcf)	144.9	V	FDT DRY UNIT WT. (pcf)	129.6
DELTA DRY UNIT WT. = F – V	-5.3		FDT #	

COMMENTS:

000204

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 23 day May month 2003 year

TEST NO.: DC03-11

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 90% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Cell 2 ~~Cap~~ 6 FDT TEST NO.: CF03-255

FIELD TEST DATA – ASTM D 2937 QA ID: ES

A	CYLINDER NO. ~~03-008~~ VOLUME[1] (cf)	0.033559	E	WET UNIT WEIGHT = D/A (lbs)	129.6
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.71	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.3
C	WEIGHT OF CYLINDER (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.35			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: ES

O	WT. OF TARE NO. ~~03-008~~ 656 KS (grams)	318.1	R	WT. OF WATER = P–Q (grams)	39.5
P	WT. OF WET SOIL & TARE (grams)	394.9	S	WT. OF DRY SOIL = Q–O (grams)	347.3
Q	WT. OF DRY SOIL & TARE (grams)	355.4	T	MOISTURE CONTENT = (R/S)X100 (%)	11.4

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 126.5 (pcf) OPTIMUM MOISTURE CONTENT 11.7 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U		-2.6	U	FDT MOISTURE CONTENT (%)	14.0
FDT WET UNIT WT. (pcf)		141.2	V	FDT DRY UNIT WT. (pcf)	123.9
DELTA DRY UNIT WT. = F – V		-7.6		FDT #	

COMMENTS:

000205

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FLUOR FERNALD

5370

ETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

OJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 15 day July month 2003 year

TEST NO.: DC Ø3-12

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Haul Road West of Cell #4 FDT TEST NO.: CFØ3-278

FIELD TEST DATA – ASTM D 2937 QA ID: Cthw

A	CYLINDER NO. 03-05 VOLUME(1) (cf)	.033465	E	WET UNIT WEIGHT = D/A (lbs)	137.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.93	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	120.9
C	WEIGHT OF CYLINDER (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.59			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

F D MOISTURE CONTENT – ASTM D 2216 QA ID: Cthw

O	WT. OF TARE NO. N (grams)	101.7	R	WT. OF WATER = P–Q (grams)	133.8
P	WT. OF WET SOIL & TARE (grams)	1224.8	S	WT. OF DRY SOIL = Q–O (grams)	989.3
Q	WT. OF DRY SOIL & TARE (grams)	1091.0	T	MOISTURE CONTENT = (R/S)X100 (%)	13.5

1.135

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.5 (pcf) OPTIMUM MOISTURE CONTENT 11.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	1.9	U	FDT MOISTURE CONTENT (%)	11.6
FDT WET UNIT WT. (pcf)	136.8	V	FDT DRY UNIT WT. (pcf)	122.5
DELTA DRY UNIT WT. = F – V	-1.6		FDT #	

COMMENTS:

000206

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: CH SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

TERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

5370

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 21 day Aug month 2003 year

TEST NO.: CF03-300 DC03-13

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: West Anchor Trench Cell 6 FDT TEST NO.: CF03-300

FIELD TEST DATA – ASTM D 2937 QA ID: CW/SS

A	CYLINDER NO. 03-10 VOLUME[1]	(cf)	.033461	E	WET UNIT WEIGHT = D/A (lbs)	125.2
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.53	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	110.8
C	WEIGHT OF CYLINDER	(lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.19			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CW/SS

O	WT. OF TARE NO. ~~[illegible]~~ 94	(grams)	8.1	R	WT. OF WATER = P–Q (grams)	39.3
P	WT. OF WET SOIL & TARE	(grams)	350.2	S	WT. OF DRY SOIL = Q–O (grams)	302.8
Q	WT. OF DRY SOIL & TARE	(grams)	310.9	T	MOISTURE CONTENT = (R/S)X100 (%)	13

1.13

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 119.0 (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%) SP02-12

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: SS

DELTA MOISTURE CONTENT = T – U		.9	U	FDT MOISTURE CONTENT (%)	12.1
FDT WET UNIT WT.	(pcf)	132.5	V	FDT DRY UNIT WT. (pcf)	118.2
DELTA DRY UNIT WT. = F – V		7.4		FDT #	

COMMENTS:

000207

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: CA SHEET NO. 1 OF 1

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FLUOR FERNALD

TERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937) 5370

OJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 21 day Aug month 2003 year

TEST NO.: CF-301 DC03-14

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) (FILL) / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +/- 3%

FDT LOCATION: West Anchor Trench Cell 6 FDT TEST NO.: CF03-301

FIELD TEST DATA – ASTM D 2937 QA ID: CW/SS

A	CYLINDER NO. 03-06 VOLUME(1)	(cf)	.03342	E	WET UNIT WEIGHT = D/A	(lbs) 126.5
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.58	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 112.0
C	WEIGHT OF CYLINDER	(lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.23			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

D MOISTURE CONTENT – ASTM D 2216 QA ID: CW/SS

O	WT. OF TARE NO. 618	(grams)	~~429.9~~ 8.1	R	WT. OF WATER = P–Q	(grams) 48.1
P	WT. OF WET SOIL & TARE	(grams)	427.9	S	WT. OF DRY SOIL = Q–O	(grams) 371.7
Q	WT. OF DRY SOIL & TARE	(grams)	379.8	T	MOISTURE CONTENT = (R/S)X100	(%) 12.9

1.129

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 119.0 (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%) SP02-12

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: SS

DELTA MOISTURE CONTENT = T – U		.1	U	FDT MOISTURE CONTENT	(%) 12.8
FDT WET UNIT WT.	(pcf)	134.9	V	FDT DRY UNIT WT.	(pcf) 119.5
DELTA DRY UNIT WT. = F – V		7.5		FDT #	CF03-301

COMMENTS:

000208

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3122 TASK NO.: 3

DESCRIPTION: Phase I DATE: 1 day Oct month 2003 year

TEST NO.: DC03-15

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Compacted Fill

% COMPACTION: 95 MOISTURE CONTENT RANGE: ± 3%

FDT LOCATION: STP Pond Backfill FDT TEST NO.: ~~SFQ26~~ CF03-327

FIELD TEST DATA – ASTM D 2937 QA ID: CHW

A	CYLINDER NO. 03-09 VOLUME[1]	(cf)	0.033447	E	WET UNIT WEIGHT = D/A	(lbs) 143.5
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	6.15	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 127.6
C	WEIGHT OF CYLINDER	(lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.80			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. L-5	(grams)	106.3	R	WT. OF WATER = P–Q	(grams) 74.2
P	WT. OF WET SOIL & TARE	(grams)	775.3	S	WT. OF DRY SOIL = Q–O	(grams) 594.8
Q	WT. OF DRY SOIL & TARE	(grams)	701.1	T	MOISTURE CONTENT = (R/S)X100	(%) 12.5

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 130.9 (pcf) OPTIMUM MOISTURE CONTENT 9.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: _____

DELTA MOISTURE CONTENT = T – U		3.3	U	FDT MOISTURE CONTENT	(%) 9.2
FDT WET UNIT WT.	(pcf)	143.0	V	FDT DRY UNIT WT.	(pcf) 130.9
DELTA DRY UNIT WT. = F – V		3.3		FDT #	

COMMENTS:

000209

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

TERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 693211 TASK NO.: 03

DESCRIPTION: Phase II DATE: 20 day Oct month 2003 year

TEST NO.: DC03-16

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / ~~CLAY~~ / OTHER:

% COMPACTION: 95% / ~~APPROV~~ MOISTURE CONTENT RANGE: ±3% / ~~APPROV~~

FDT LOCATION: East Anchor Trench Cell 6 FDT TEST NO.: CF03-341

FIELD TEST DATA – ASTM D 2937 QA ID: 55

A	CYLINDER NO. 03-06 VOLUME[1]	(cf)	.033429	E	WET UNIT WEIGHT = D/A	(lbs) 132.5
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.78	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 114.1
C	WEIGHT OF CYLINDER	(lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.43			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: 55

O	WT. OF TARE NO. 29	(grams)	8.3	R	WT. OF WATER = P–Q	(grams) 86.0
P	WT. OF WET SOIL & TARE	(grams)	627.1	S	WT. OF DRY SOIL = Q–O	(grams) 532.8
Q	WT. OF DRY SOIL & TARE	(grams)	541.1	T	MOISTURE CONTENT = (R/S)X100	(%) 16.1

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 119.0 (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: 55

DELTA MOISTURE CONTENT = T – U		0.6	U	FDT MOISTURE CONTENT	(%) 15.5
FDT WET UNIT WT.	(pcf)	133.0	V	FDT DRY UNIT WT.	(pcf) 115.1
DELTA DRY UNIT WT. = F – V		1.0		FDT #	

COMMENTS: 96.7% compaction 119.0 @ 13.9

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: Ø3

DESCRIPTION: Phase II DATE: 20 day Oct month 2003 year

TEST NO.: DCØ3-17

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: East Anchor Trench Cell 3 FDT TEST NO.: CFØ3-350

FIELD TEST DATA – ASTM D 2937 QA ID:

A	CYLINDER NO. Ø3-Ø9 VOLUME(1)	(cf)	.033447	E	WET UNIT WEIGHT = D/A	(lbs) 129.8
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.69	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 113.1
C	WEIGHT OF CYLINDER	(lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.34			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: 55

O	WT. OF TARE NO. 31	(grams)	8.3	R	WT. OF WATER = P–Q	(grams) 69.9
P	WT. OF WET SOIL & TARE	(grams)	550.3	S	WT. OF DRY SOIL = Q–O	(grams) 472.1
Q	WT. OF DRY SOIL & TARE	(grams)	480.4	T	MOISTURE CONTENT = (R/S)X100	(%) 14.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 119.Ø (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: 55

DELTA MOISTURE CONTENT = T – U		1.5	U	FDT MOISTURE CONTENT	(%) 13.3
FDT WET UNIT WT.	(pcf)	133.2	V	FDT DRY UNIT WT.	(pcf) 117.6
DELTA DRY UNIT WT. = F – V		4.5		FDT #	

COMMENTS: 98.8% compaction 119.Ø @ 13.9

000211

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 2

DESCRIPTION: Phase V DATE: 4 day Nov month 2003 year

TEST NO.: DCØ3-18

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Cell #6 Haul Road FDT TEST NO.: CF03-386

FIELD TEST DATA – ASTM D 2937 QA ID: CHW

A	CYLINDER NO. 03-10 VOLUME(1) (cf)	.003346	E	WET UNIT WEIGHT = D/A (lbs)	132.7
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.78	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	113.3
C	WEIGHT OF CYLINDER (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.44			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. NSP (grams)	247.7	R	WT. OF WATER = P–Q (grams)	127.2
P	WT. OF WET SOIL & TARE (grams)	1120.2	S	WT. OF DRY SOIL = Q–O (grams)	745.3
Q	WT. OF DRY SOIL & TARE (grams)	993.0	T	MOISTURE CONTENT = (R/S)X100 (%)	17.1

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 117.7 (pcf) OPTIMUM MOISTURE CONTENT 11.6 CHW (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CHW

DELTA MOISTURE CONTENT = T – U	1.9	U	FDT MOISTURE CONTENT (%)	15.2
FDT WET UNIT WT. (pcf)	135.2	V	FDT DRY UNIT WT. (pcf)	117.4
DELTA DRY UNIT WT. = F – V	-4.1		FDT # CF03-386	

COMMENTS:

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CONTOURING LAYER

IN-PLACE NUCLEAR TESTS

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: G01341 TASK NO.: 041

DATE: 14 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Road Cut on Cell #2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440* GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: Other

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT-03-1	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	8.8	139.8	128.6	103.0	P	—	—	—	—
CNT-03-2	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	10.8	132.7	119.8	96.0	P	—	—	—	—
CNT-03-3	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	10.8	135.9	122.7	98.4	P	—	—	—	—
CNT-03-4	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	9.4	132.1	120.8	96.8	P	—	—	—	—
CNT-03-5	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	13.2	134.9	119.2	95.5	P	—	—	—	—
CNT-03-6	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	12.2	133.4	118.9	95.3	P	—	—	—	—
CNT-03-7	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	9.3	134.9	123.5	99.0	P	—	—	—	—
CNT-03-8	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	11.0	134.6	121.2	97.1	P	—	—	—	—
CNT-03-9	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	8.5	130.7	120.5	96.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

*GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY:

SHEET NO. 5 OF 6

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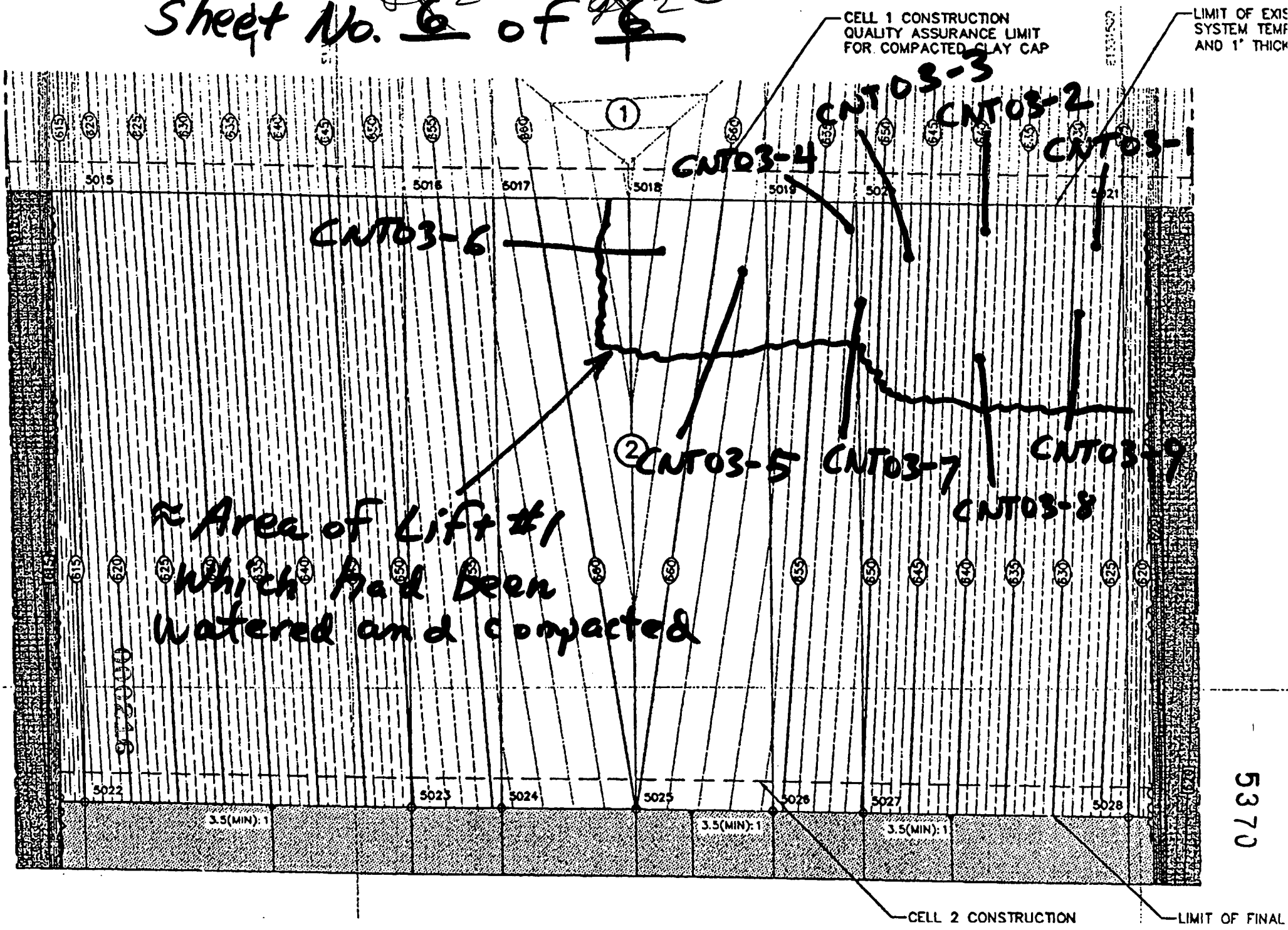
Q134 D4.1 14 April 2003

Sheet No. 6 of 6



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G01341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 15 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Cell #2 Cut Material + Processed Clay

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT03-10	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	12.2	137.5	122.5	98.2	P	—	—	—	—
CNT03-11	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	11.5	136.5	122.4	98.1	P	—	—	—	—
CNT03-12	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	12.6	138.3	122.8	98.4	P	—	—	—	—
CNT03-13	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	10.9	136.9	123.5	99.0	P	—	—	—	—
CNT03-14	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	12.8	136.9	121.4	97.2	P	—	—	—	—
CNT03-15	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	13.5	137.8	121.3	97.2	P	—	—	—	—
CNT03-16	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	11.6	136.7	122.5	98.1	P	—	—	—	—
CNT03-17	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	9.8	138.3	125.9	100.9	P	—	—	—	—
CNT03-18	Cell #2 Contouring Layer	4" / L-1	SP02-6	11.4	124.8	9.7	139.9	126.8	101.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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15 April 2003
GQ1341.04.1
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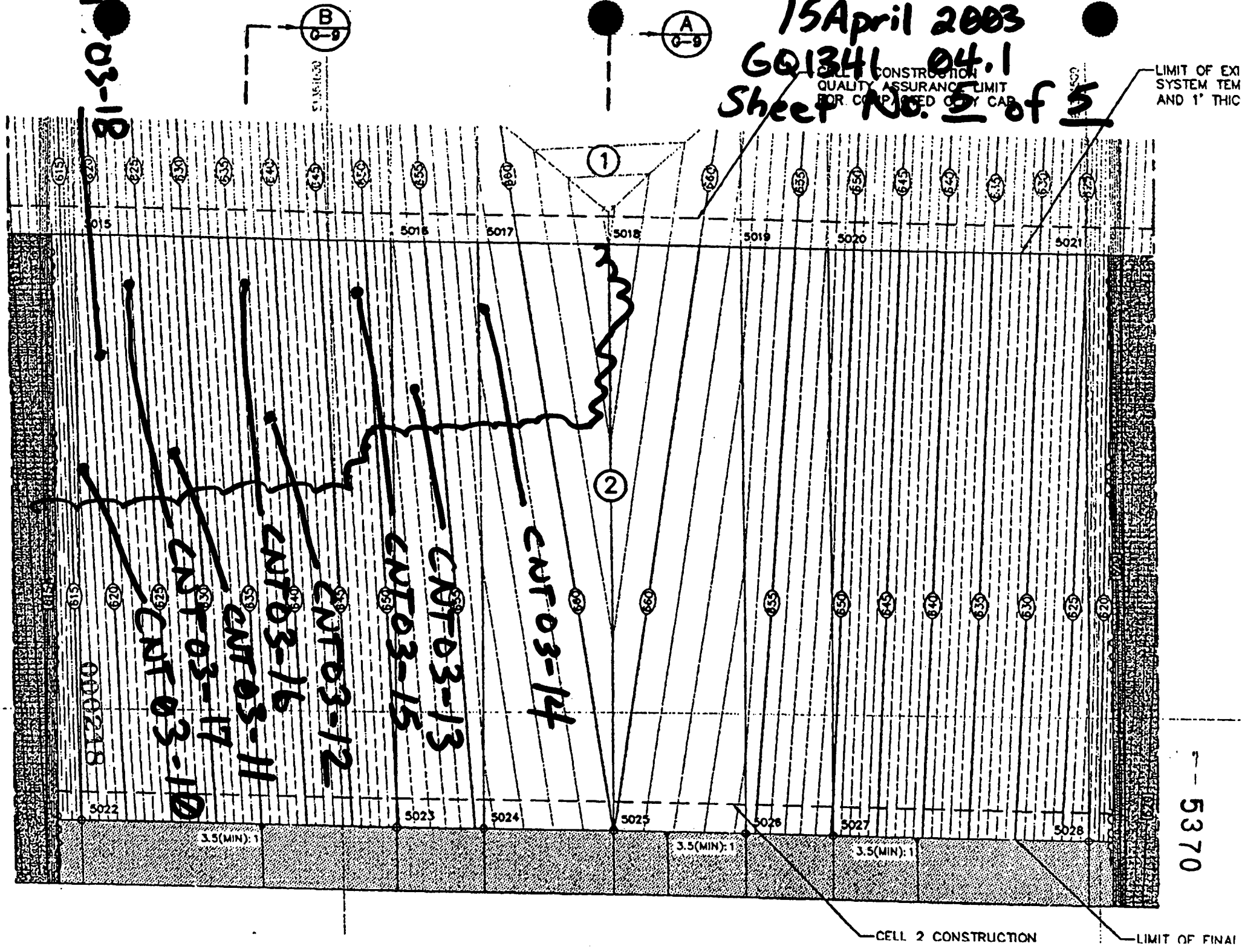

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 6Q1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 16 day April month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 12"

MATERIAL SOURCE: Stockpile 02-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Contouring layer

NUCLEAR GAUGE TYPE: Troxler 3430 GAUGE SERIAL NO. _____ CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION See Attached Sketch	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CNT03-~~18~~		/				~~9.3~~	~~117.0~~ KS	~~107.0~~ KS						
CNT03-~~20~~19	Cell 2 Contouring layer	6"/L-1	02-2	13.4	119.9	11.6	134.8	120.8	100.8	P	—			
CNT03-~~21~~20	Cell 2 Contouring Layer	6"/L-1	02-2	13.4	119.9	13.5	133.4	117.5	98.0	P	—			
CNT03-21	Cell 2 Contouring layer	6"/L-1	02-2	13.4	119.9	12.3	133.9	119.2	99.4	P	—			
		/												
		/												
		/												
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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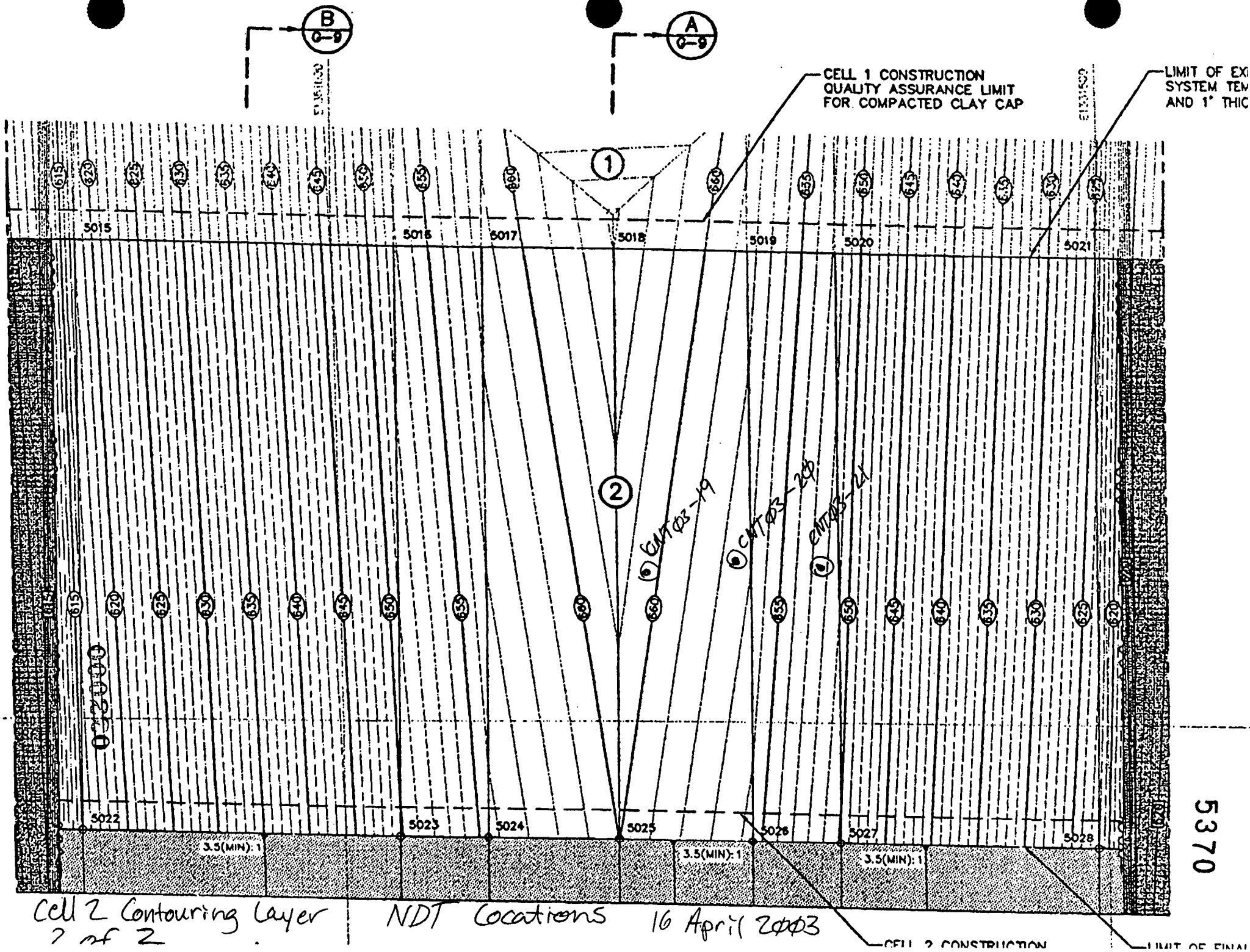

Cell 2 Contouring Layer 2 of 2 NDT Locations 16 April 2003

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 6Q1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 18 day April month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±5% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Stockpile 02-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT03-22	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	11.0 —	135.4	122.0	CHW ~~110~~ 101.8	P	—	—	—	—
CNT-03-23	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	13.4 —	136.8	120.6	100.6	P	—	—	—	—
CNT03-24	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	14.2 —	135.4	118.6	98.9	P	—	—	—	—
CNT-03-25	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	12.7 —	137.2	121.8	101.6	P	—	—	—	—
CNT-03-26	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	11.7 —	135.7	121.5	101.4	P	—	—	—	—
CNT-03-27	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	11.8 —	136.2	121.8	101.6	P	—	—	—	—
CNT-03-28	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	11.0 —	134.7	121.4	101.3	P	—	—	—	—
CNT-03-29	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	12.5 —	136.7	121.6	101.4	P	—	—	—	—
CNT-03-30	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	12.5 —	137.1	121.9	101.7	P	—	—	—	—
CNT-03-31	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	17.9 —	132.0	112.0	93.4	—	F	CNT03-35	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 18 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Stockpile 02-2 MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT03-32	Cell #2, Contouring Layer	~~4" / L-1~~ ~~10"~~	LP02-2	13.4	119.9	12.4	137.5	122.3	102.0	P	—	—	—	—
CNT03-33	Cell #2, Contouring layer	~~4" / L-1~~ ~~10"~~	LP02-2	13.4	119.9	13.6	137.5	121.1	101.0	P	—	—	—	—
CNT03-34	Cell #2, Contouring Layer	~~4" / L-1~~ ~~10"~~	LP02-2	13.4	119.9	13.7	134.5	118.3	98.7	P	—	—	—	—
CNT03-35	Cell #2, Contouring Layer	~~4" / L-1~~	LP02-2	13.4	119.9	12.6	134.7	119.7	99.8	P	—	—	—	—
CNT03-36	Cell #2, contouring Layer	4" / L-1	LP02-2	13.4	119.9	14.4	133.7	116.9	97.5	P	—	—	—	—
CNT03-37	Cell #2, contouring layer	4" / L-1	LP02-2	13.4	119.9	13.7	136.5	120.0	100.1	P	—	—	—	—
CNT03-38	Cell #2, contouring layer	4" / L-1	LP02-2	13.4	119.9	14.0	135.5	118.9	99.2	P	—	—	—	—
CNT03-39	Cell #2, Contouring layer	4" / L-1	LP02-2	13.4	119.9	12.9	136.0	120.5	100.5	P	—	—	—	—
CNT03-40	Cell #2, contouring layer	4" / L-1	LP02-2	13.4	119.9	14.1	135.1	118.4	98.8	P	—	—	—	—
CNT03-41	Cell #2, contouring layer	4" / L-1	LP02-2	13.4	119.9	14.8	131.9	114.9	95.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: G0341 TASK NO.: 0041

DATE: 18 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Stockpile 02-2 MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT03-42	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	~~14.8~~ ~~14.5~~ —	~~131.9~~ 133.2	~~114.9~~ 116.3	97.0	P	—	—	—	—
CNT03-43	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	14.2 —	135.5	118.6	98.9	P	—	—	—	—
CNT03-44	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	14.1 —	135.5	118.7	99.0	P	—	—	—	—
CNT03-45	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	12.7 —	135.6	120.4	100.4	P	—	—	—	—
CNT03-46	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	14.4 —	134.6	117.7	98.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GQ1341 04.1 18April 2003

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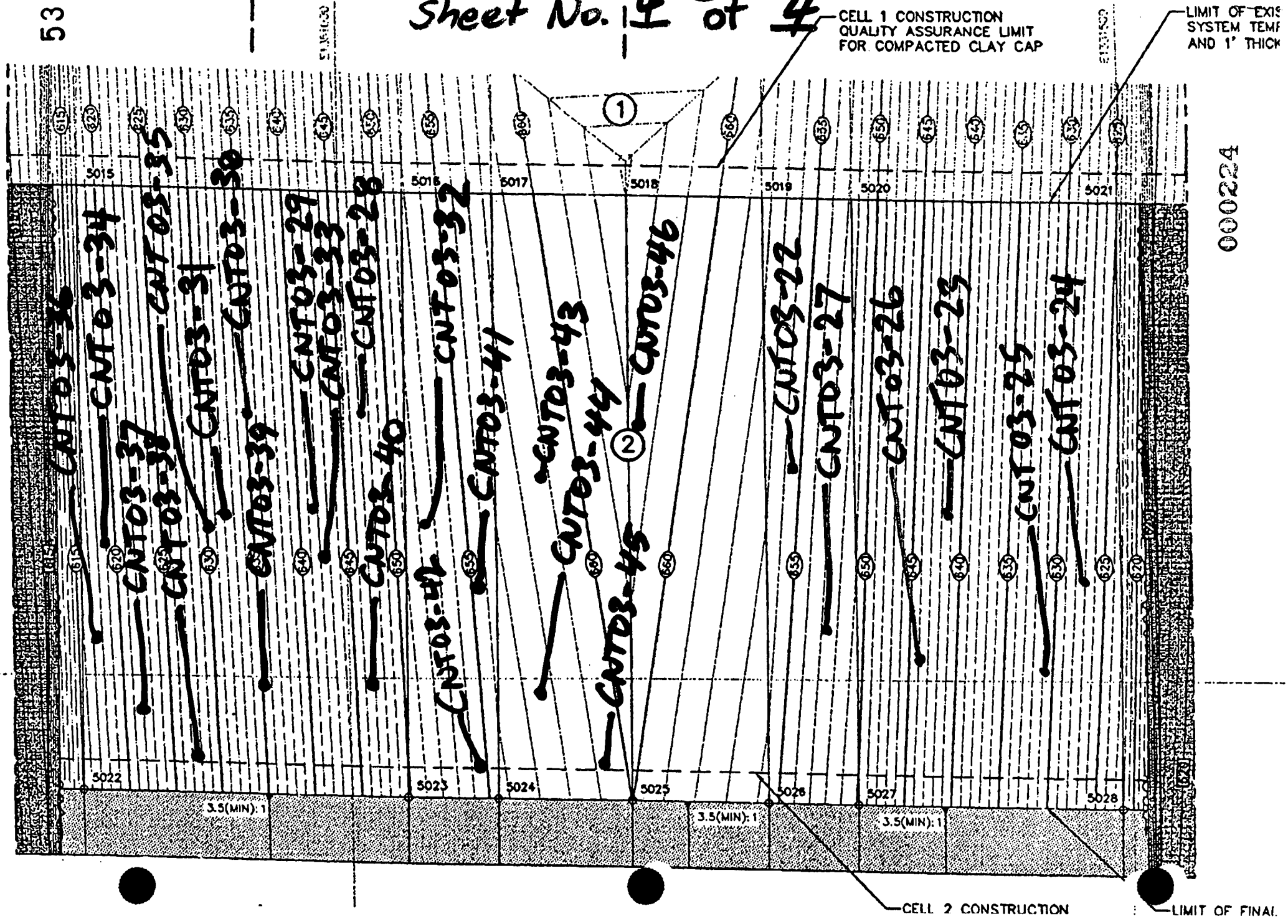

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: 601341 TASK NO.: 04.1

DATE: 22 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Stockpile 02-2 MATERIAL TYPE: (FILL) SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CAW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT03-47	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	15.5 —	132.8	115.0	95.9	P	—	—	—	—
CNT03-48	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	11.0 —	135.4	122.0	101.7	P	—	—	—	—
CNT03-49	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	13.2 —	137.7	121.6	101.4	P	—	—	—	—
CNT03-50	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	12.6 —	134.9	119.8	99.9	P	—	—	—	—
CNT03-51	Cell #2, Contouring Layer	4" / L-1	LP02-2	13.4	119.9	10.6 —	133.4	120.6	100.6	P	—	—	—	—
		/												
		/												
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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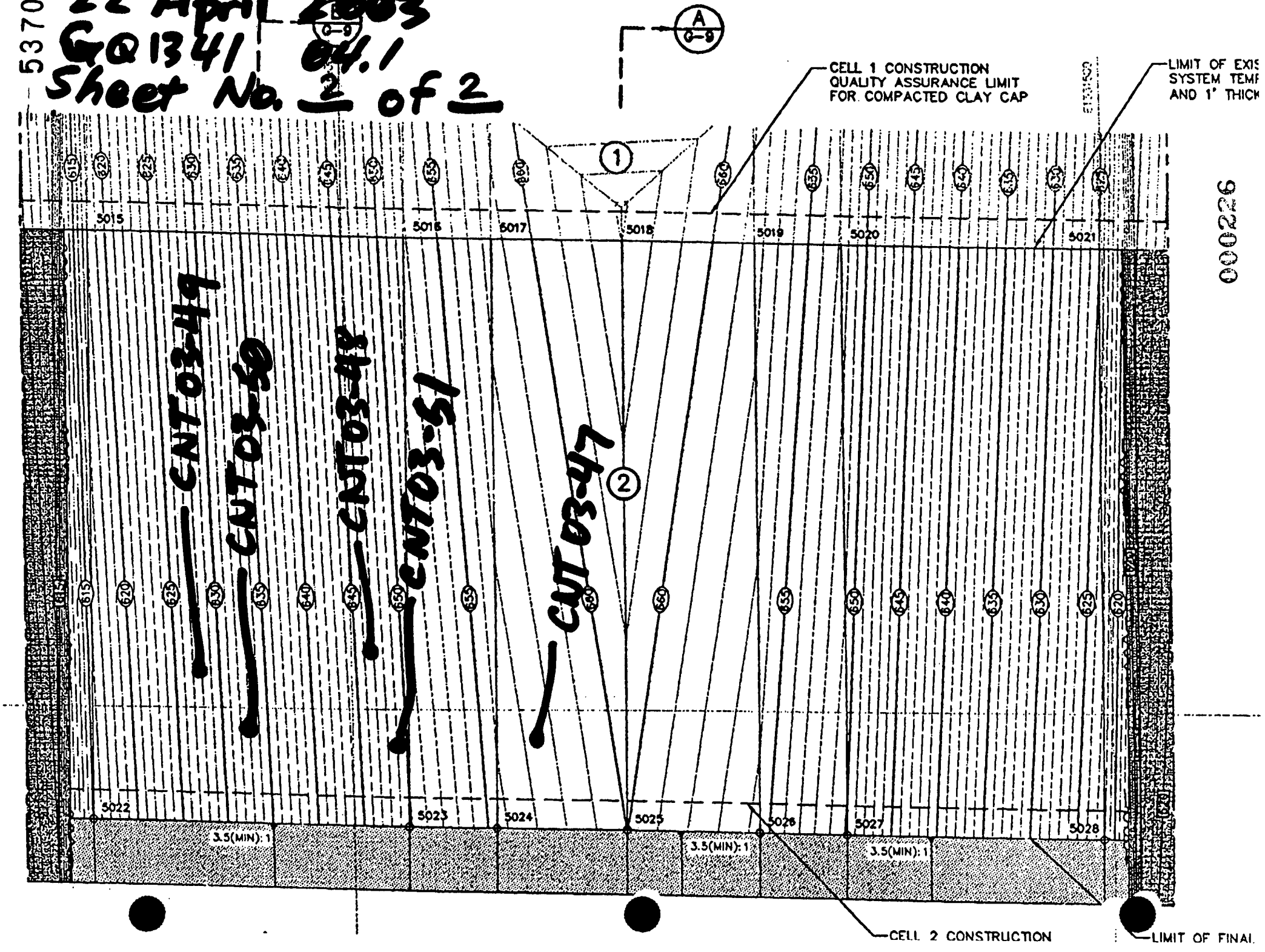
22 April 2003
GQ1341 64.1
Sheet No. 2 of 2



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 23 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 10"

MATERIAL SOURCE: Stockpile 02-3 and 02-4 MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHen

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT-03-52	Contouring Layer Cell #2	4" / L-1	LP02-3	12.4	121.6	12.2 —	138.6	123.5	101.6	P	—	—	—	—
CNT-03-53	Contouring Layer, Cell #2	4" / L-1	LP02-3	12.4	121.6	12.2 —	138.6	123.5	101.6	P	—	—	—	—
CNT03-54	Contouring Layer, Cell #2	4" / L-1	LP02-3	12.4	121.6	11.9 —	137.1	122.5	100.7	P	—	—	—	—
CNT-03-55	Contouring Layer, Cell #2	4" / L-1	LP02-3	12.4	121.6	13.5 —	135.0	118.9	97.8	P	—	—	—	—
CNT03-56	Contouring Layer, Cell #2	4" / L-1	LP02-4	13.8	117.4	16.2 —	132.6	114.2	97.2	P	—	—	—	—
CNT03-57	Contouring Layer, Cell #2	4" / L-1	LP02-4	13.8	117.4	14.8 —	132.3	115.2	98.1	P	—	—	—	—
CNT03-58	Contouring Layer, Cell #2	4" / L-1	LP02-3	12.4	121.6	13.4 —	135.2	119.2	98.0	P	—	—	—	—
CNT03-59	Contouring Layer, Cell #2	4" / L-1	LP02-3	12.4	121.6	14.7 —	132.6	115.7	95.1	P	—	—	—	—
CNT03-60	Contouring Layer, Cell #2	4" / L-1	LP02-3	12.4	121.6	13.6 —	134.2	118.1	97.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature] SHEET NO. 1 OF 2

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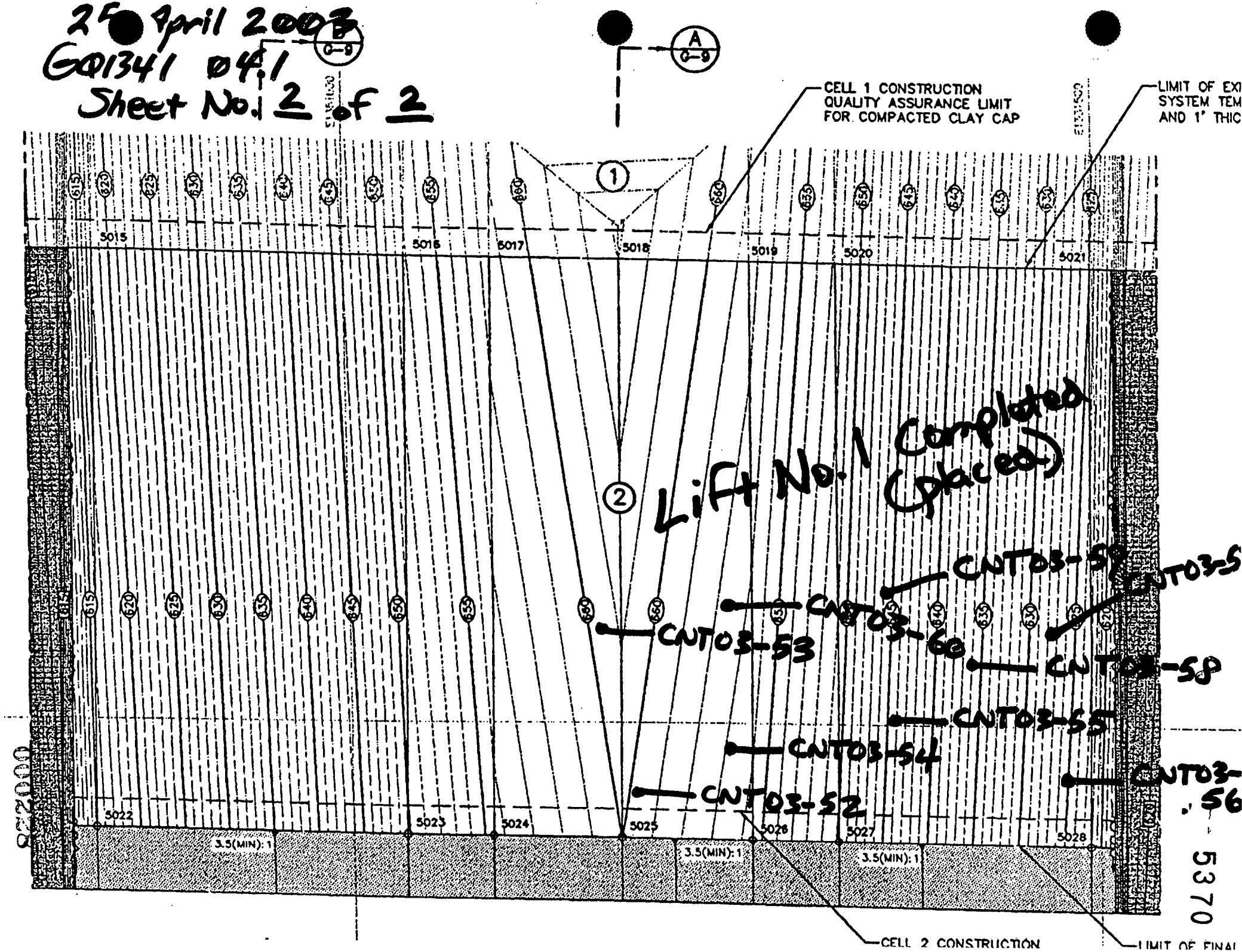
25 April 2003
GQ1341 04.1
Sheet No. 2 of 2



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 601341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 29 day April month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 4"

MATERIAL SOURCE: _____ MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CAW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT 03-61	Cell #2, contouring layer	4" / L-2	CF02-11	14.5	117.4	15.6	132.5	114.7	97.7	P	—	—	—	—
CNT 03-62	Cell #2, contouring layer	6" / L-2	CF02-11	14.5	117.4	12.2	129.0	114.9	97.9	P	—	—	—	—
CNT 03-63	Cell #2, contouring layer	4" / L-2	CF03-7	12.5	122.7	12.9	139.3	123.4	100.6	P	—	—	—	—
CNT 03-64	Cell #2, contouring layer	6" / L-2	CF03-7	12.5	122.7	12.2	136.3	121.5	99.0	P	—	—	—	—
CNT 03-65	Cell #2, contouring layer	4" / L-2	LP02-3	12.4	121.6	11.5	134.4	120.6	99.2	P	—	—	—	—
CNT 03-66	Cell #2, contouring layer	4" / L-2	LP02-1	15.0	116.5	17.0	133.1	113.7	97.6	P	—	—	—	—
CNT 03-67	Cell #2, contouring layer	4" / L-2	CF02-11	14.5	117.4	12.7	132.5	117.5	100.1	P	—	—	—	—
CNT 03-68	Cell #2, contouring layer	6" / L-2	CF03-7	12.5	122.7	11.2	140.0	125.9	102.6	P	—	—	—	—
CNT 03-69	Cell #2, contouring layer	4" / L-2	CF03-7	12.5	122.7	12.2	137.3	122.4	99.7	P	—	—	—	—
CNT 03-70	Cell #2, contouring layer	4" / L-2	CF03-7	12.5	122.7	12.8	134.9	119.5	97.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 29 day April month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/4"

MATERIAL SOURCE: Clay Stockpiles, Sed Basin #2 Material, Cell #6 Floor Undercuts

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CNT03-71	Cell #2, contouring layer	4" / L-2	CF03-7	12.5	122.7	11.1	137.9	124.1	101.1	P	—	—	—	—
CNT03-72	Cell #2, contouring layer	4" / L-2	LP02-6 ~~CF03-6~~	11.4	124.8	9.3	136.2	124.6	99.8	P	—	—	—	—
CNT03-73	Cell #2, contouring layer	4" / L-2	LP02-3	12.4	121.6	10.7	132.4	119.5	98.3	P	—	—	—	—
CNT03-74	Cell #2, contouring layer	4" / L-2	LP02-3	12.4	121.6	14.1	136.5	119.6	98.4	P	—	—	—	—
CNT03-75	Cell #2, contouring layer	4" / L-2	LP02-3	12.4	121.6	13.3	137.3	121.2	99.7	P	—	—	—	—
CNT03-76	Cell #2, contouring layer	4" / L-2	LP02-3	12.4	121.6	16.4	131.3	112.9	92.8	—	F	CNT03-95	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GQ1341 04.1
29 April 2003
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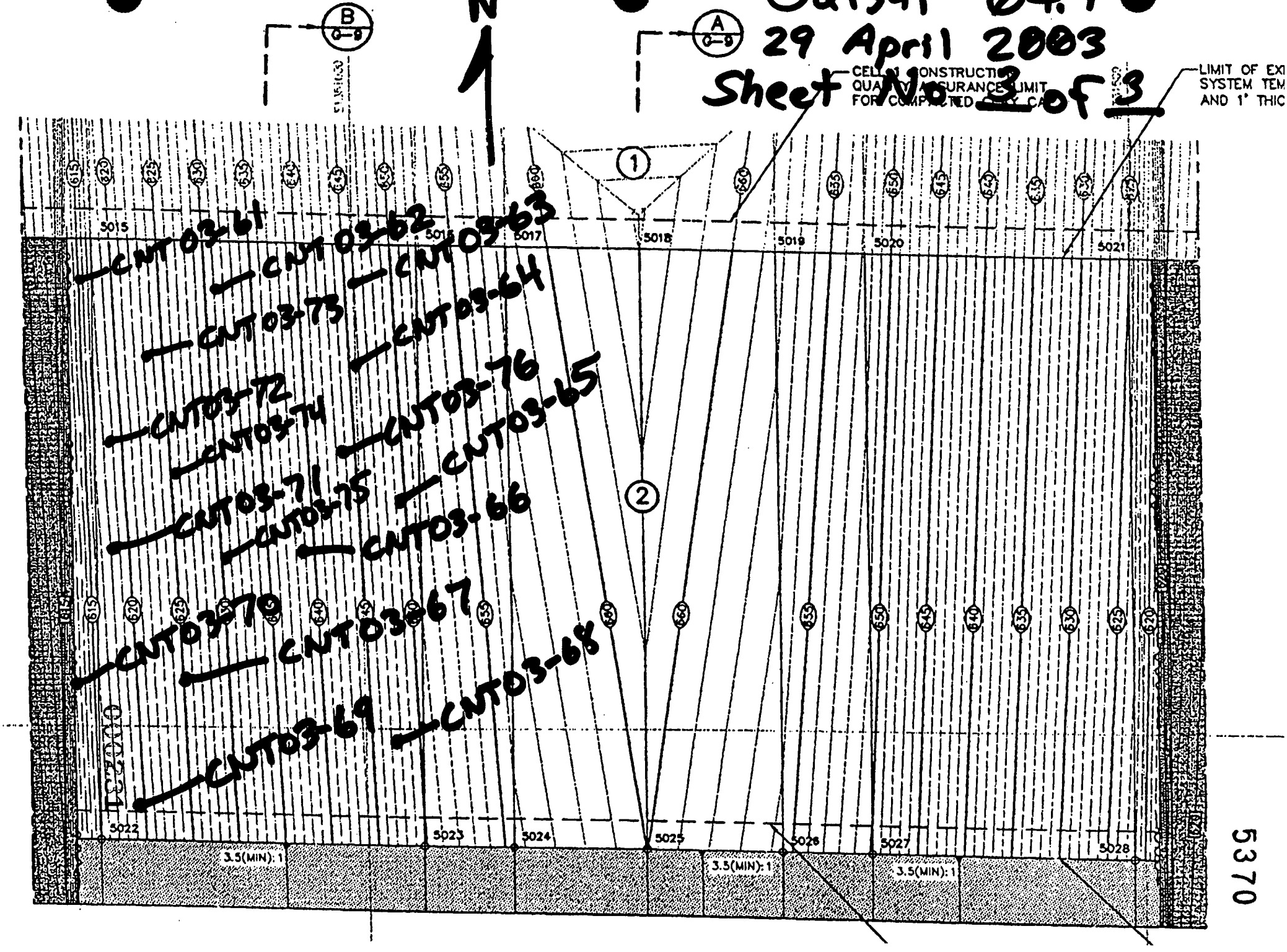

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ134 TASK NO.: 04.1

DESCRIPTION: PHASE V - CELL 2 CAP

DATE: 30 day APR month 2003 year WEDNESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / (COMPACTED): 6-8"

MATERIAL SOURCE: VARIED MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / (OTHER): CONTOURING LAYER

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TBD)/CS

TEST NO. CNT03-	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
77	CELL #2 CAP	8"/L-2	CF03-7	12.5	122.7	12.7	138.5	122.8	100.1	P	—	—	—	—
78	EAST SLOPE	8"/L-2	CF03-7	12.5	122.7	12.6	135.1	120.0	97.8	P	—	—	—	—
79	↓	8"/L-2	CF03-7	12.5	122.7	9.5	127.9	116.8	95.2	P	—	—	—	—
80	↓	8"/L-2	PCP57	10.5	128.7	10.7	141.2	127.6	99.1	P	—	—	—	—
81	↓	8"/L-2	PCP57	10.5	128.7	11.6	141.4	126.7	98.4	P	—	—	—	—
82	↓	8"/L-2	CF03-7	12.5	122.7	11.6	136.7	122.5	99.8	P	—	—	—	—
83	↓	8"/L-2	PCP57	10.5	128.7	11.1	139.8	125.8	97.7	P	—	—	—	—
84	↓	8"/L-2	CF03-7	12.5	122.7	16.0*	134.2	115.7	94.3	*	F	CNT03-103	P	—
85	↓	8"/L-2	CF03-7	12.5	122.7	13.4	136.9	120.7	98.4	P	—	—	—	—
86	↓	8"/L-2	CF03-7	12.5	122.7	12.8	138.8	123.0	100.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * TOO WET IN THIS AREA

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE V - CELL 2 CAP

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 30 day APR month 2003 year (WEDNESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ≥95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED): ~6-8"

MATERIAL SOURCE: VARIES

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / (OTHER) CONTOURING LAYER

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TBW) / (TW)

TEST NO. CNT03-	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
87	CELL #2 CAP	8"/L-2	CF03-7	12.5	122.7	13.6	137.7	121.3	98.9	P	—	—	—	—
88	EAST SLOPE	8"/L-2	CF03-7	12.5	122.7	12.7	132.3	117.3	95.6	P	—	—	—	—
89	↓	8"/L-2	CF03-1	14.6	117.7	15.4	132.3	114.6	97.4	P	—	—	—	—
90	↓	8"/L-2	CF03-1	14.6	117.7	18.0*	131.5	111.4	94.6	*	F	CNT03-104	P	—
91	↓	8"/L-2	PCP57	10.5	128.7	10.7	137.5	124.3	96.6	P	—	—	—	—
92	↓	8"/L-2	CF03-7	12.5	122.7	13.2	132.1	116.7	95.1	P	—	—	—	—
93	↓	8"/L-2	PCP57	10.5	128.7	11.0	140.6	126.6	98.4	P	—	—	—	—
94	↓	8"/L-2	PCP57	10.5	128.7	9.3	136.4	124.9	97.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * TOO WET IN THIS AREA.

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SHEET NO. 2 OF 3

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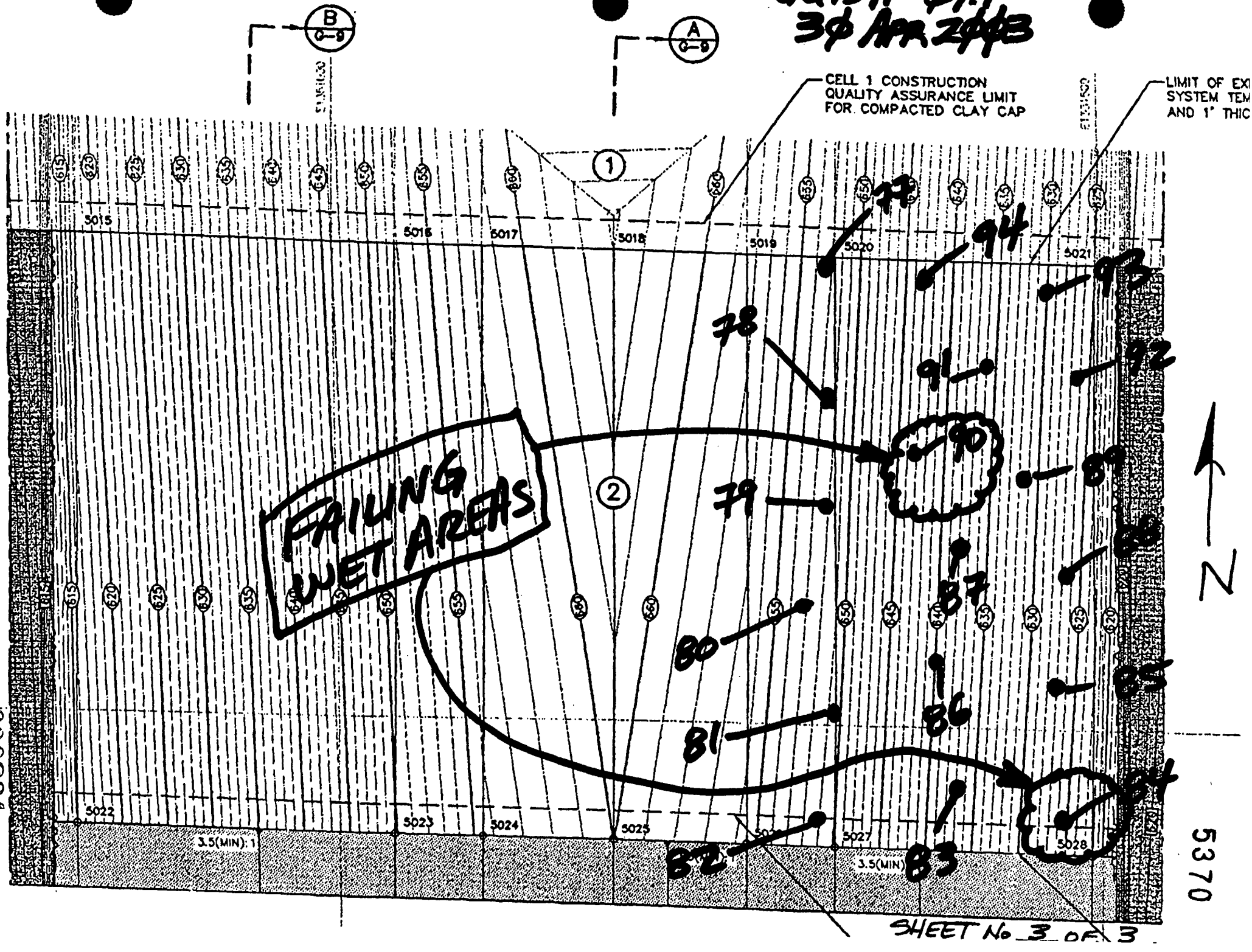
3 Apr 2003



SHEET No 3 OF 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 241

DATE: 12 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 24"

MATERIAL SOURCE: _____ MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CNT03-95	Contouring Layer Cell #2	4" / L-2	LP02-3	12.4	121.6	11.0 —	136.5	123.0	101.1	P	—	—	—	—
CNT03-96		4" / L-2	CF03-7	12.5	122.7	12.0 —	137.0	122.3	99.7	P	—	—	—	—
CNT03-97		4" / L-2	CF03-7	12.5	122.7	10.7 —	138.5	125.1	102.0	P	—	—	—	—
CNT03-98		4" / L-2	LP02-3	12.4	121.6	13.3 —	135.3	119.4	~~97.2~~ 98.2	P	—	—	—	—
CNT03-99		4" / L-2	LP02-3	12.4	121.6	12.7 —	133.7	118.7	97.6	P	—	—	—	—
CNT03-100		4" / L-2	CF03-7	12.5	122.7	11.6 —	136.7	122.4	99.8	P	—	—	—	—
CNT03-101		4" / L-2	LP02-3	12.4	121.6	12.1 —	134.2	119.7	98.4	P	—	—	—	—
CNT03-102		4" / L-2	LP02-3	12.4	121.6	14.3 —	132.5	115.9	95.3	P	—	—	—	—
CNT03-103		4" / L-2	CF03-7	12.5	122.7	10.1 —	131.4	119.4	97.3	P	—	—	—	—
CNT03-104		4" / L-2	CF03-1	14.6	117.7	11.8 —	125.2	~~112.6~~ 111.9	95.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CNT03-95 = CNT03-96 (Retest), CNT03-103 = CNT03-84 (Retest), CNT03-104 = CNT03-98 (Retest)

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SHEET NO. 1 OF 2

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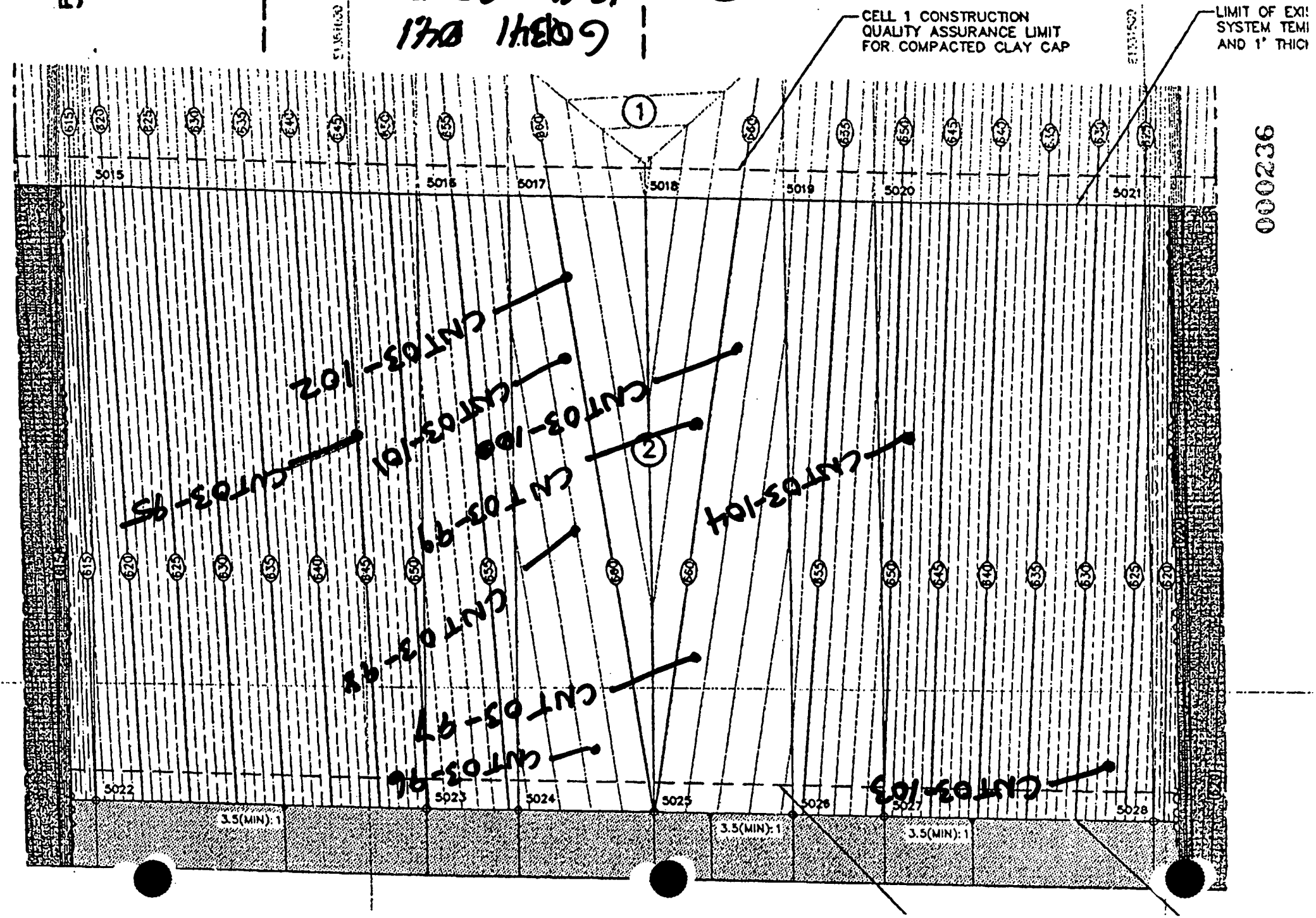
12 May 2003
Sheet No. 2 of 2



0002236

DRIVE CYLINDER TESTS

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 16 day Apr month 2003 year

TEST NO.: CNT 03-18 DT-1 contouring Layer

SPECIFICATION REQUIREMENTS: Cell-2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Contouring Layer

% COMPACTION: 95 MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Cell 2 contouring layer FDT TEST NO.: CNT 03-18

FIELD TEST DATA – ASTM D 2937 QA ID: [illegible]

A	CYLINDER NO. 03-09 VOLUME[1] (cf)	0.033447	E	WET UNIT WEIGHT = D/A (lbs)	137.2
B	WEIGHT OF SAMPLE & CYLINDER 2643.2 gr (lbs)	5.94	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	121.6
C	WEIGHT OF CYLINDER 613.99 gr (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.59			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

IELD MOISTURE CONTENT – ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. #678 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	65.4
P	WT. OF WET SOIL & TARE (grams)	583.7	S	WT. OF DRY SOIL = Q–O (grams)	510.1
Q	WT. OF DRY SOIL & TARE (grams)	518.3	T	MOISTURE CONTENT = (R/S)X100 (%)	12.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT E (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CHW

DELTA MOISTURE CONTENT = T – U	3.1	U	FDT MOISTURE CONTENT (%)	9.7
FDT WET UNIT WT. (pcf)	139.0	V	FDT DRY UNIT WT. (pcf)	126.8
DELTA DRY UNIT WT. = F – V	-5.2		FDT # CNT 03-18	

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 601341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 23 day April month 2003 year

TEST NO.: DT03-2

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Contouring Layer

% COMPACTION: ~~90%~~ 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: West Slope Cell 2 FDT TEST NO.: CNT03-47

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 03-08 VOLUME[1]	(cf)	0.033398	E	WET UNIT WEIGHT = D/A	(lbs) 133.2
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.81	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 115.5
C	WEIGHT OF CYLINDER	(lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.45			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 653	(grams)	8.3	R	WT. OF WATER = P–Q	(grams) 48.3
P	WT. OF WET SOIL & TARE	(grams)	371.8	S	WT. OF DRY SOIL = Q–O	(grams) 315.2
Q	WT. OF DRY SOIL & TARE	(grams)	323.5	T	MOISTURE CONTENT = (R/S)X100	(%) 15.3 1.153

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.6 (pcf) OPTIMUM MOISTURE CONTENT ~~13.2~~ KS (%) 12.4

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS DYE

DELTA MOISTURE CONTENT = T – U		-0.2	U	FDT MOISTURE CONTENT	(%) 15.5
FDT WET UNIT WT.	(pcf)	132.8	V	FDT DRY UNIT WT.	(pcf) 115.0
DELTA DRY UNIT WT. = F – V		0.5		FDT #	CNT03-47

COMMENTS:

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000239

GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: Ø4-1

DESCRIPTION: Phase V DATE: 3Ø day April month 2ØØ3 year

TEST NO.: Cell 2 DTØ3-3

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / (OTHER): Contouring layer

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Cell 2 West Slope FDT TEST NO.: CNTØ3-66

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. ~~Ø3-4Ø8~~ VOLUME[1]	(cf)	Ø.Ø33559	E	WET UNIT WEIGHT = D/A	(lbs) 133.2
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.83	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 115.3
C	WEIGHT OF CYLINDER	(lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.47			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 67Ø	(grams)	8.3	R	WT. OF WATER = P–Q	(grams) 5Ø.7
P	WT. OF WET SOIL & TARE	(grams)	386.7	S	WT. OF DRY SOIL = Q–O	(grams) 327.7
Q	WT. OF DRY SOIL & TARE	(grams)	336.Ø	T	MOISTURE CONTENT = (R/S)X100	(%) 15.5

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 116.5 (pcf) OPTIMUM MOISTURE CONTENT 15.0 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U		1.5	U	FDT MOISTURE CONTENT	(%) 17.Ø
FDT WET UNIT WT.	(pcf)	133.1	V	FDT DRY UNIT WT.	(pcf) 113.7
DELTA DRY UNIT WT. = F – V		1.6		FDT # CNTØ3-66	

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q134 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 12 day May month 2003 year

TEST NO.: DT 03-4

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: CNT03-95 FDT TEST NO.:

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 03-10 VOLUME[1]	(cf)	0.033461	E	WET UNIT WEIGHT = D/A	(lbs) 133.9
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.82	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 116.8
C	WEIGHT OF CYLINDER	(lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.48			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 30	(grams)	8.5	R	WT. OF WATER = P–Q	(grams) 43.10
P	WT. OF WET SOIL & TARE	(grams)	347.3	S	WT. OF DRY SOIL = Q–O	(grams) 295.70
Q	WT. OF DRY SOIL & TARE	(grams)	304.2	T	MOISTURE CONTENT = (R/S)X100	(%) 14.6

1.146

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U		3.6	U	FDT MOISTURE CONTENT	(%) 11.0
FDT WET UNIT WT.	(pcf)	136.5	V	FDT DRY UNIT WT.	(pcf) 123.0
DELTA DRY UNIT WT. = F – V		-6.2		FDT #	

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 602341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 12 day May month 2003 year

TEST NO.: DT03-5

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: CNT03-97 FDT TEST NO.:

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 03-11 VOLUME[1] (cf)	0.033354	E	WET UNIT WEIGHT = D/A (lbs)	133.7
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.82	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.8
C	WEIGHT OF CYLINDER (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.46			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 40 (grams)	8.1	R	WT. OF WATER = P–Q (grams)	48.3
P	WT. OF WET SOIL & TARE (grams)	388.8	S	WT. OF DRY SOIL = Q–O (grams)	332.4
Q	WT. OF DRY SOIL & TARE (grams)	340.5	T	MOISTURE CONTENT = (R/S)X100 (%)	14.5

1.145

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U	3.8	U	FDT MOISTURE CONTENT (%)	10.7
FDT WET UNIT WT. (pcf)	138.5	V	FDT DRY UNIT WT. (pcf)	125.1
DELTA DRY UNIT WT. = F – V	-8.3		FDT # CNT	

COMMENTS:

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000242

COMPACTED CLAY LINER AND CAP

IN-PLACE NUCLEAR TESTS

CELL 2 CAP

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 13 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Stockpile 02-4 and Stockpile 02-8

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-1	Cell #2, Compacted Clay Liner	6" / L-1	LP02-4	13.8	117.4	14.5 / 15.7	134.1	115.9	98.7	P	—	—	—	—
CC03-2		8" / L-1	LP02-4	13.8	117.4	15.5 / 16.5	133.9	114.9	97.9	P	—	—	—	—
CC03-3		6" / L-1	LP02-4	13.8	117.4	15.5 / 16.5	133.9	114.9	97.9	P	—	—	—	—
CC03-4		6" / L-1	LP02-4	13.8	117.4	15.3 / 16.4	134.1	115.2	98.1	P	—	—	—	—
CC03-5		6" / L-1	LP02-4	13.8	117.4	15.1 / 16.2	135.0	116.2	99.0	P	—	—	—	—
CC03-6		6" / L-1	LP02-8	12.2	122.7	13.3 / 14.7	137.2	119.6	97.5	P	—	—	—	—
CC03-7		6" / L-1	LP02-8	12.2	122.7	~~14.2~~ 13.9 / 15.2	134.8	117.0	95.4	P	—	—	—	—
CC03-8		6" / L-1	LP02-8	12.2	122.7	13.7 / 15.0	136.3	118.5	96.6	P	—	—	—	—
CC03-9		6" / L-1	LP02-8	12.2	122.7	11.3 / 13.0	138.5	122.6	99.9	P	—	—	—	—
CC03-10		6" / L-1	LP02-8	12.2	122.7	13.7 / 15.0	136.4	118.6	96.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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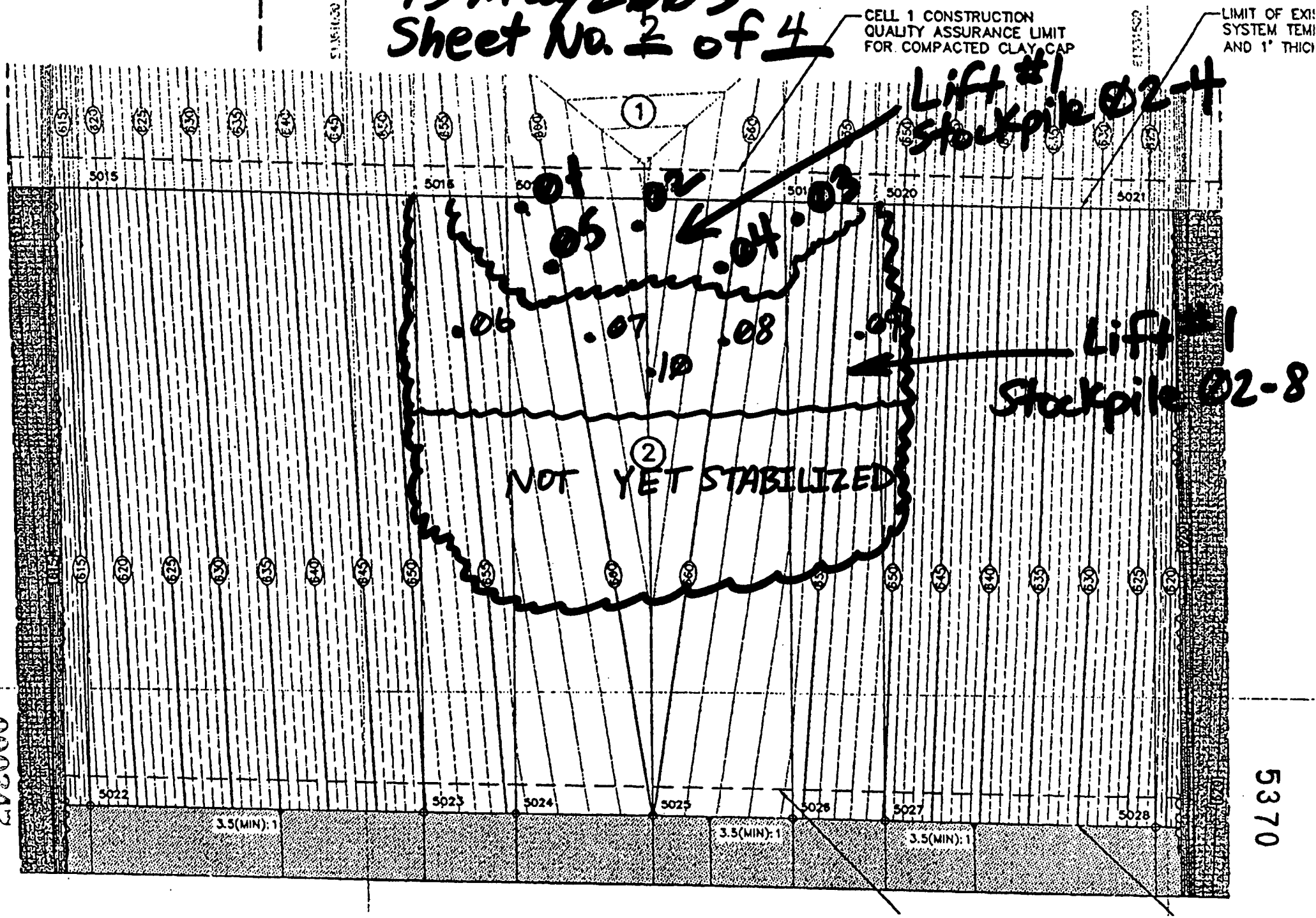
SHEET NO. 1 OF 4

000246

53370

GQ1341 34.1
13 May 2003
Sheet No. 2 of 4



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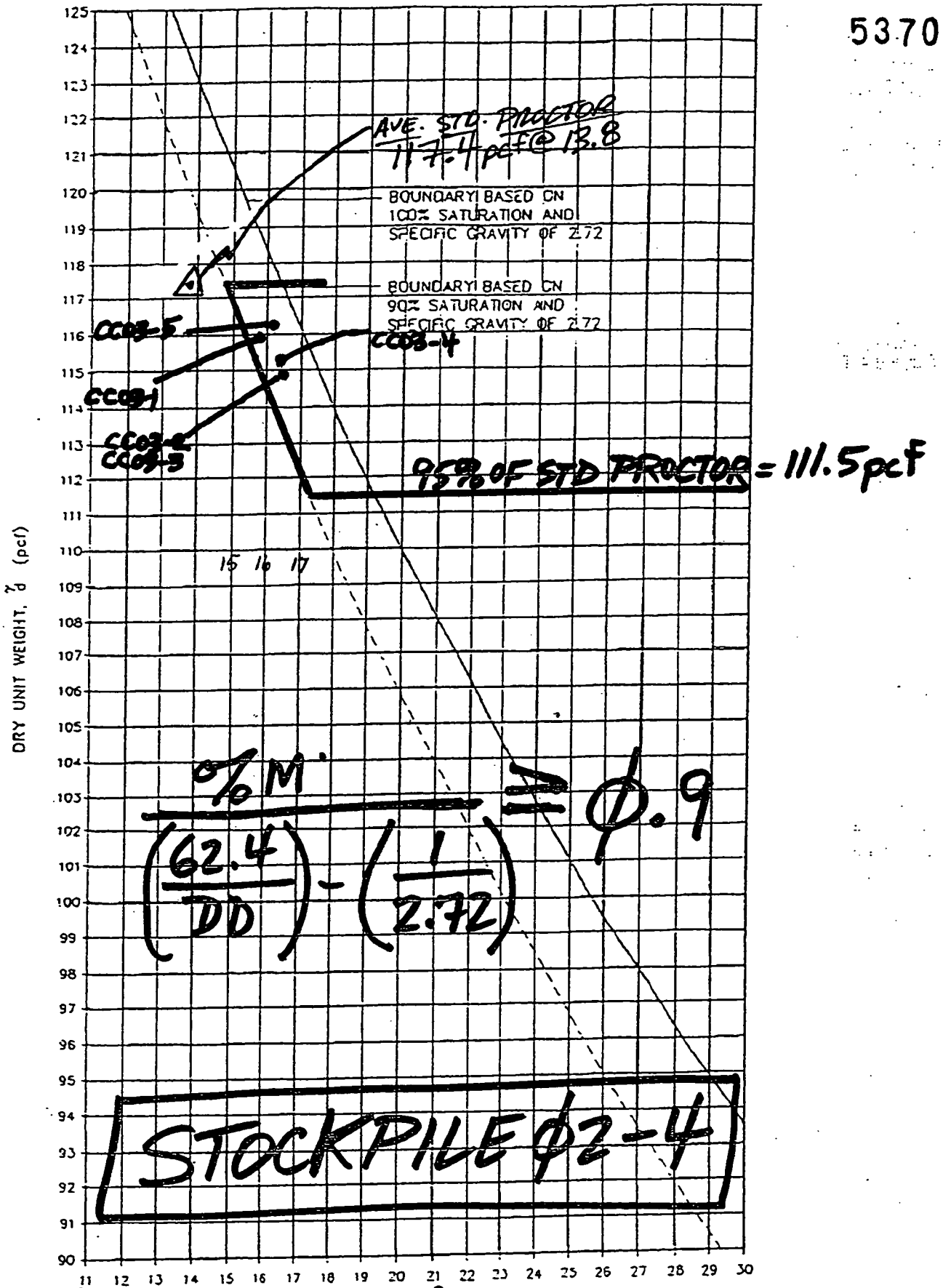


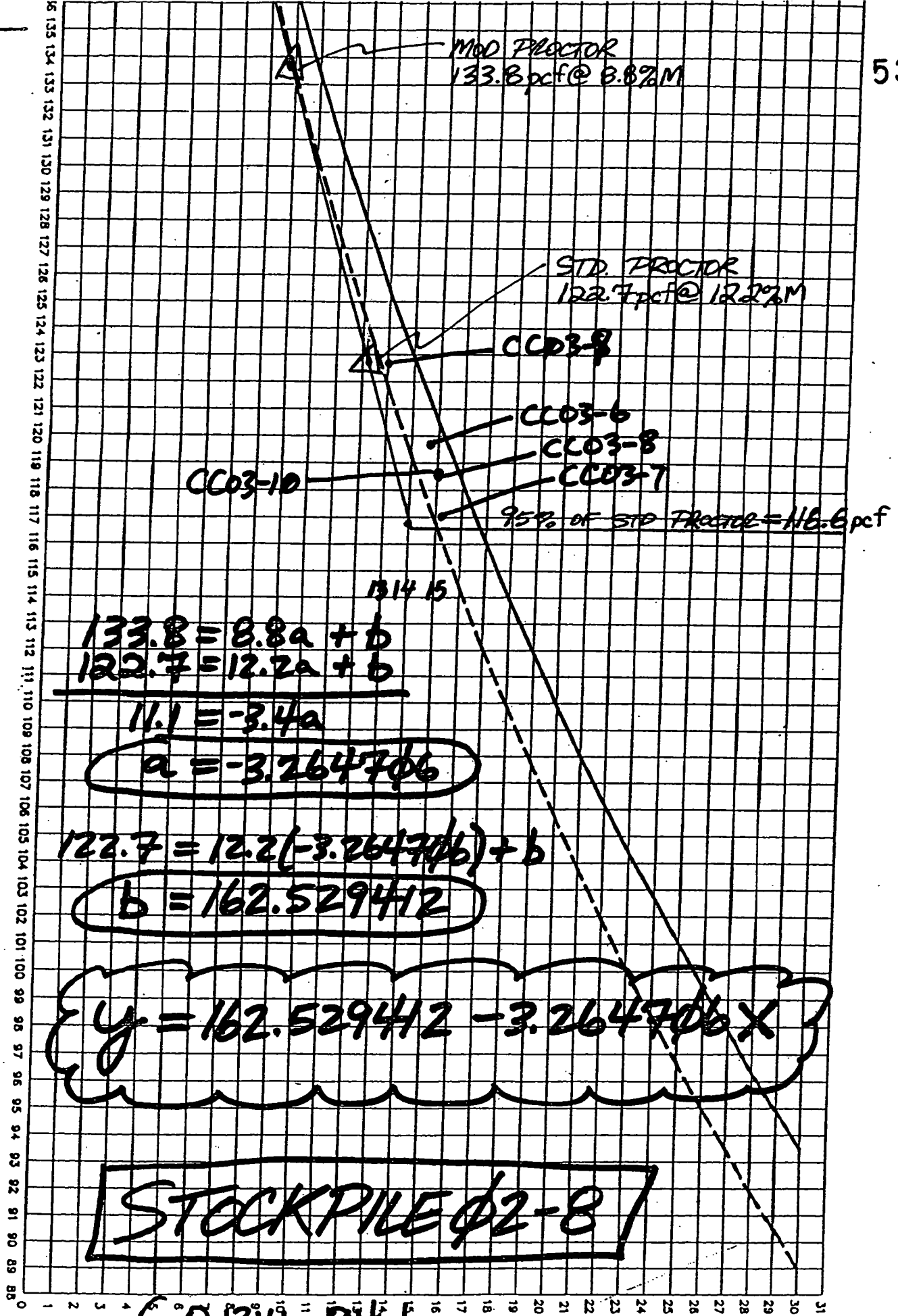
$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq 0.9$$

STOCKPILE 02-4

GQ1341 04.1
13 May 2003
Sheet No. 3 of 4

000248

5370



$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

$y = 162.529412 - 3.264706x$

STOCKPILE Ø2-8

GQ 1341 Ø4.1
13 May 2Ø03
Sheet No. 4 of 4

000249

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 14 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈10"

MATERIAL SOURCE: Stockpile 02-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW TW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CC03-11	Cell #2, Clay Cap	6" / L-1	02-8	12.2	122.7	11.6 / 13.3	136.9	120.8	98.5	P	—	—	—	—
CC03-12		6" / L-1	02-8	12.2	122.7	13.8 / 15.1	136.0	118.2	96.3	P	—	—	—	—
CC03-13		6" / L-1	02-8	12.2	122.7	12.6 / 14.1	135.4	118.7	96.7	P	—	—	—	—
CC03-14		6" / L-1	02-8	12.2	122.7	11.8 / 13.5	139.5	122.9	100.2	P	—	—	—	—
CC03-15		6" / L-1	02-8	12.2	122.7	13.5 / 14.9	135.0	117.5	95.8	P	—	—	—	—
CC03-16		6" / L-1	02-8	12.2	122.7	13.9 / 15.2	135.0	117.2	95.5	P	—	—	—	—
CC03-17		6" / L-1	02-8	12.2	122.7	12.7 / 14.2	136.4	119.4	97.3	P	—	—	—	—
CC03-18		6" / L-1	02-8	12.2	122.7	12.6 / 14.1	136.9	120.0	97.8	P	—	—	—	—
CC03-19		6" / L-1	02-8	12.2	122.7	11.0 / 12.8	138.3	122.6	100.0	P	—	—	—	—
CC03-20		6" / L-1	02-8	12.2	122.7	11.8 / 13.5	139.5	122.9	100.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 7

000250

5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 14 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0+3% LIFT THICKNESS (LOOSE / COMPACTED): ≈10"

MATERIAL SOURCE: Stockpile 02-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: (CHW) TW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-21	Cell #2, Clay Cap	6" / L-1	02-8	12.2	122.7	11.2 / 13.0	136.8	121.1	98.7	P	—	—	—	—
CC03-22		6" / L-1	02-8	12.2	122.7	10.5 / 12.4	137.7	122.5	99.8	P	—	—	—	—
DR CC03-23		6" / L-1	02-8	12.2	122.7	10.3 / 12.2	137.9	122.9	100.2	P	—	—	—	—
CC03-24		6" / L-1	02-8	12.2	122.7	12.4 / 14.0	137.3	120.4	98.1	P	—	—	—	—
CC03-25		6" / L-1	02-8	12.2	122.7	11.7 / 13.4	139.8	123.2	100.5	P	—	—	—	—
CC03-26		6" / L-1	02-8	12.2	122.7	13.0 / 14.5	137.3	119.9	97.7	P	—	—	—	—
CC03-27		6" / L-1	02-8	12.2	122.7	11.2 / 13.0	139.0	123.0	100.3	P	—	—	—	—
CC03-28		6" / L-1	02-8	12.2	122.7	11.3 / 13.0	140.9	124.7	101.9	P	—	—	—	—
CC03-29		6" / L-1	02-8	12.2	122.7	12.0 / 13.6	139.7	123.0	100.2	P	—	—	—	—
CC03-30		6" / L-1	02-8	12.2	122.7	13.3 / 14.7	138.5	120.7	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 14 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈10"

MATERIAL SOURCE: Stockpile 02-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST: PASS	RETEST: FAIL
CC03-31	Cell #2, Clay Cap	6" / L-1	02-8	12.2	122.7	14.0 ~~15.2~~ 15.3	133.8	116.1	94.6	—	F	CC03-46	P	—
~~CC03-32~~	↓	~~6" / L-1~~	~~02-8~~	~~12.2~~	~~122.7~~	~~14.6~~								

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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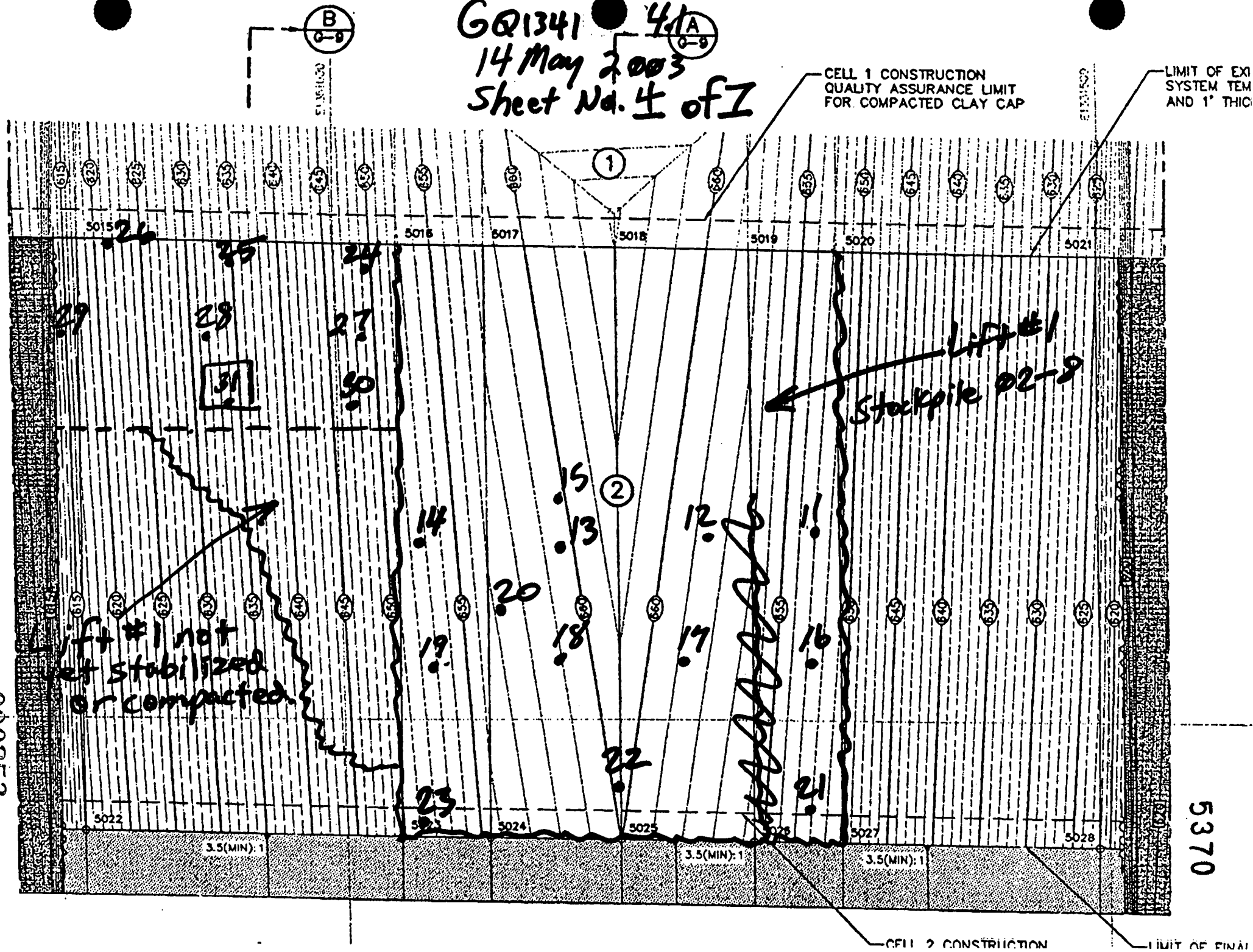
0002252

5370

GQ1341 41
14 May 2003
Sheet No. 4 of 7



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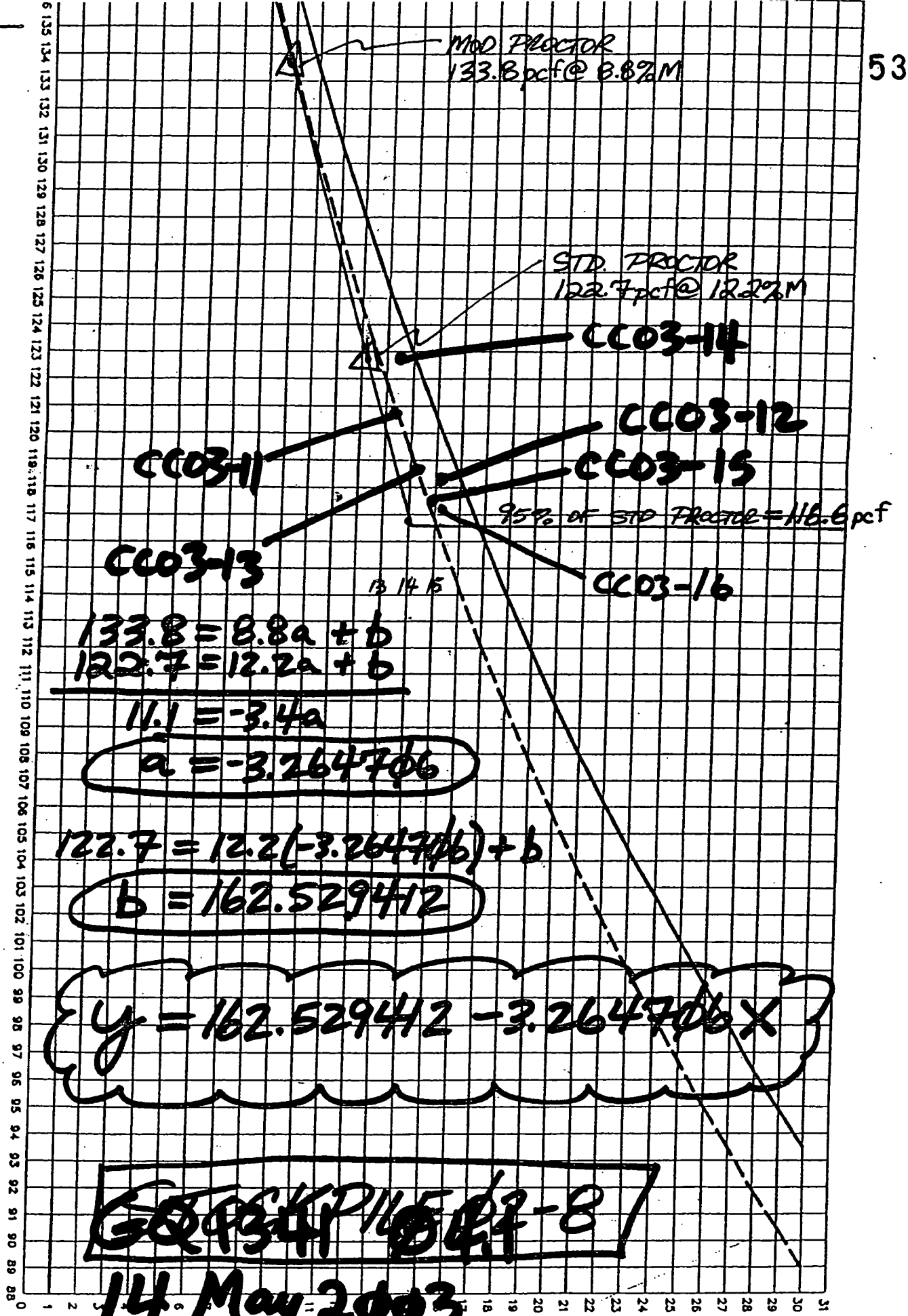


$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

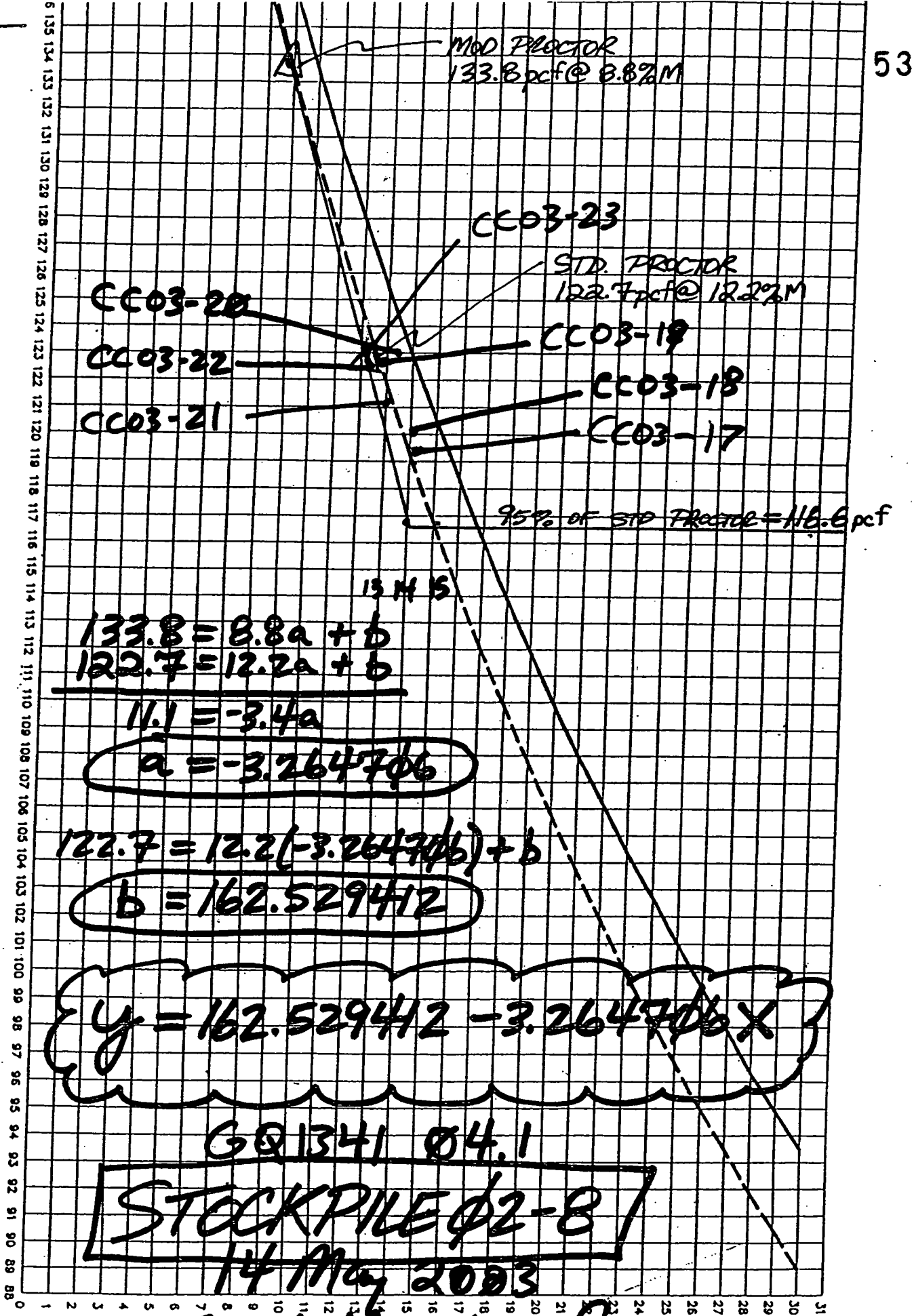
$b = 162.529412$

$y = 162.529412 - 3.264706x$

[GQ-9341 Pg 4 of 8]

14 May 2003

Sheet No. 5 of 7



$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

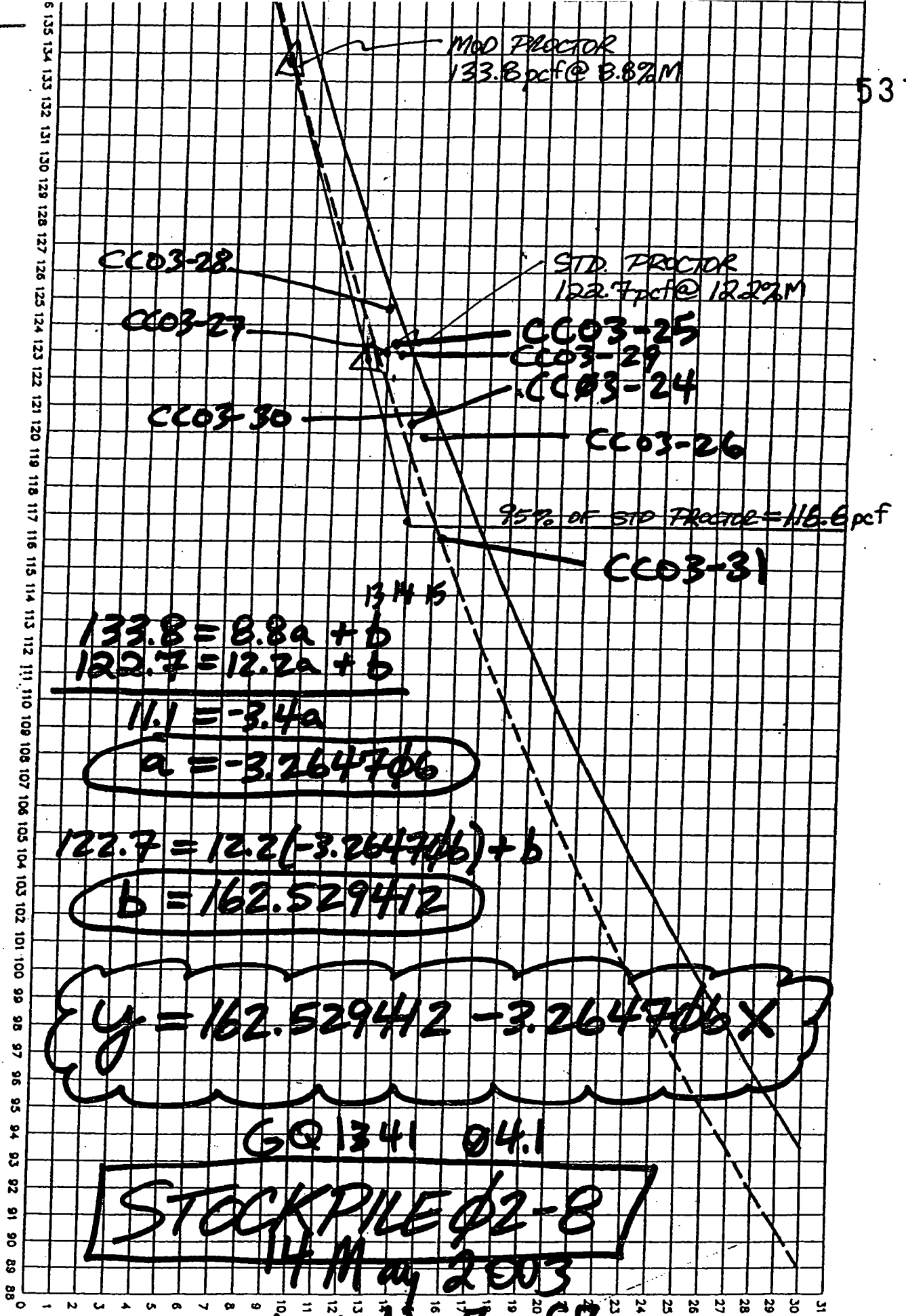
$y = 162.529412 - 3.264706x$

GQ1341 04.1

STOCKPILE 02-8

14 May 2003

Sheet No. 6 of 7



$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

$y = 162.529412 - 3.264706x$

GQ 1341 04.1

STOCKPILE 02-8
14 May 2003

Sheet No 1 of 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 16 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 20"/10"

MATERIAL SOURCE: Stockpile 02-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW KH

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-32	Cell #2 Clay Cap	L-1 / 6"	02-8	12.2	122.7	11.1 / 12.9	141.8	125.6	102.4	P	—	—	—	—
CC03-33		L-1 / 6"	02-8	12.2	122.7	11.6 / 13.3	138.4	122.2	99.6	P	—	—	—	—
CC03-34		L-1 / 6"	02-8	12.2	122.7	13.1 / 14.5	136.2	119.0	96.9	P	—	—	—	—
CC03-35		L-1 / 6"	02-8	12.2	122.7	11.3 / 13.0	137.4	121.6	99.1	P	—	—	—	—
CC03-36		L-1 / 6"	02-8	12.2	122.7	12.5 / 14.0	137.3	120.4	98.1	P	—	—	—	—
CC03-37		L-1 / 6"	02-8	12.2	122.7	11.6 / 13.3	137.5	121.4	98.9	P	—	—	—	—
~~CC03-38~~		~~L-1 / 6"~~	~~02-8~~	~~12.2~~	~~122.7~~									
~~CC03-39~~		~~L-1 / 6"~~	~~02-8~~	~~12.2~~	~~122.7~~									
~~CC03-40~~		~~L-1 / 6"~~	~~02-8~~	~~12.2~~	~~122.7~~									
~~CC03-41~~		~~L-1 / 6"~~	~~02-8~~	~~12.2~~	~~122.7~~									

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

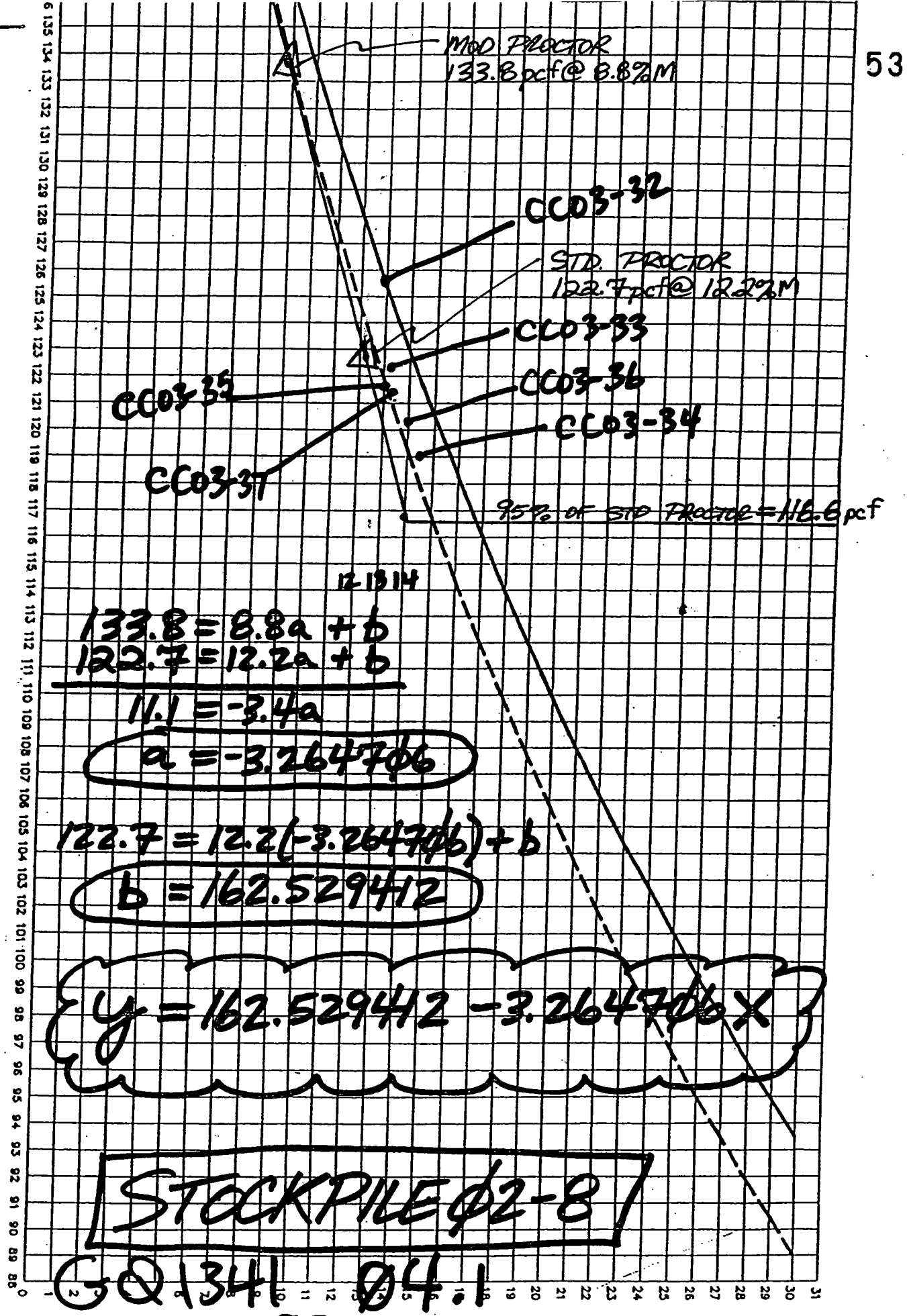
*GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 1 OF 3

000257

53 70

5370



12-13-14

$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

$y = 162.529412 - 3.264706x$

STOCKPILE 02-8

GQ1341 041

16 May 03

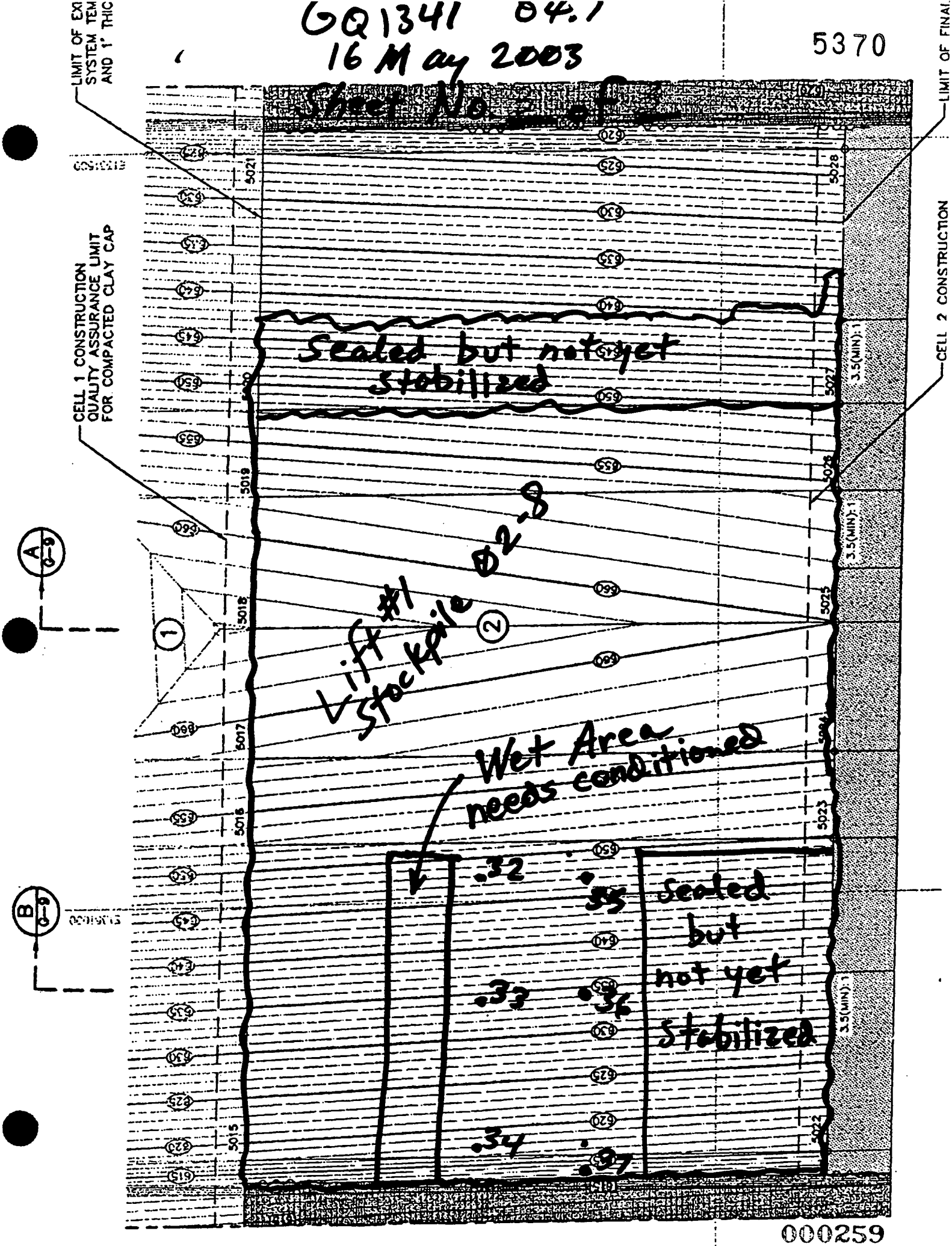
Sheet No. 2 of 3

000258

GQ1341 04.1
16 May 2003

5370

Sheet No. 2 of 2



000259

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO. G04/1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 21 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE / COMPACTED): 8/10"

MATERIAL SOURCE: Stockpile 02-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: CHW KMH

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-38	Cell #2 Clay Cap	6" / L-1	02-8	12.2	122.7	13.2 / 14.6	134.9	117.7	95.9	P	—	—	—	—
CC03-39		6" / L-1	02-8	12.2	122.7	10.6 / 12.3	139.9	124.4	101.3	P	—	—	—	—
CC03-40		6" / L-1	02-8	12.2	122.7	13.5 / 14.9	134.5	117.1	95.4	P	—	—	—	—
CC03-41		6" / L-1	02-8	12.2	122.7	11.5 / 13.2	135.7	119.9	97.7	P	—	—	—	—
CC03-42		6" / L-1	02-8	12.2	122.7	11.5 / 13.2	135.9	120.1	97.9	P	—	—	—	—
CC03-43		6" / L-1	02-8	12.2	122.7	13.2 / 14.6	133.9	116.8	95.2	P	—	—	—	—
CC03-44		6" / L-1	02-8	12.2	122.7	11.9 / 13.5	135.3	119.2	97.2	P	—	—	—	—
CC03-45		6" / L-1	02-8	12.2	122.7	10.4 / 12.3	137.8	122.7	100.0	P	—	—	—	—
CC03-46		6" / L-1	02-8	12.2	122.7	12.2 / 13.8	133.9	117.6	95.8	P	—	—	—	—
CC03-47		6" / L-1	02-8	12.2	122.7	11.4 / 14.1	134.5	117.9	96.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

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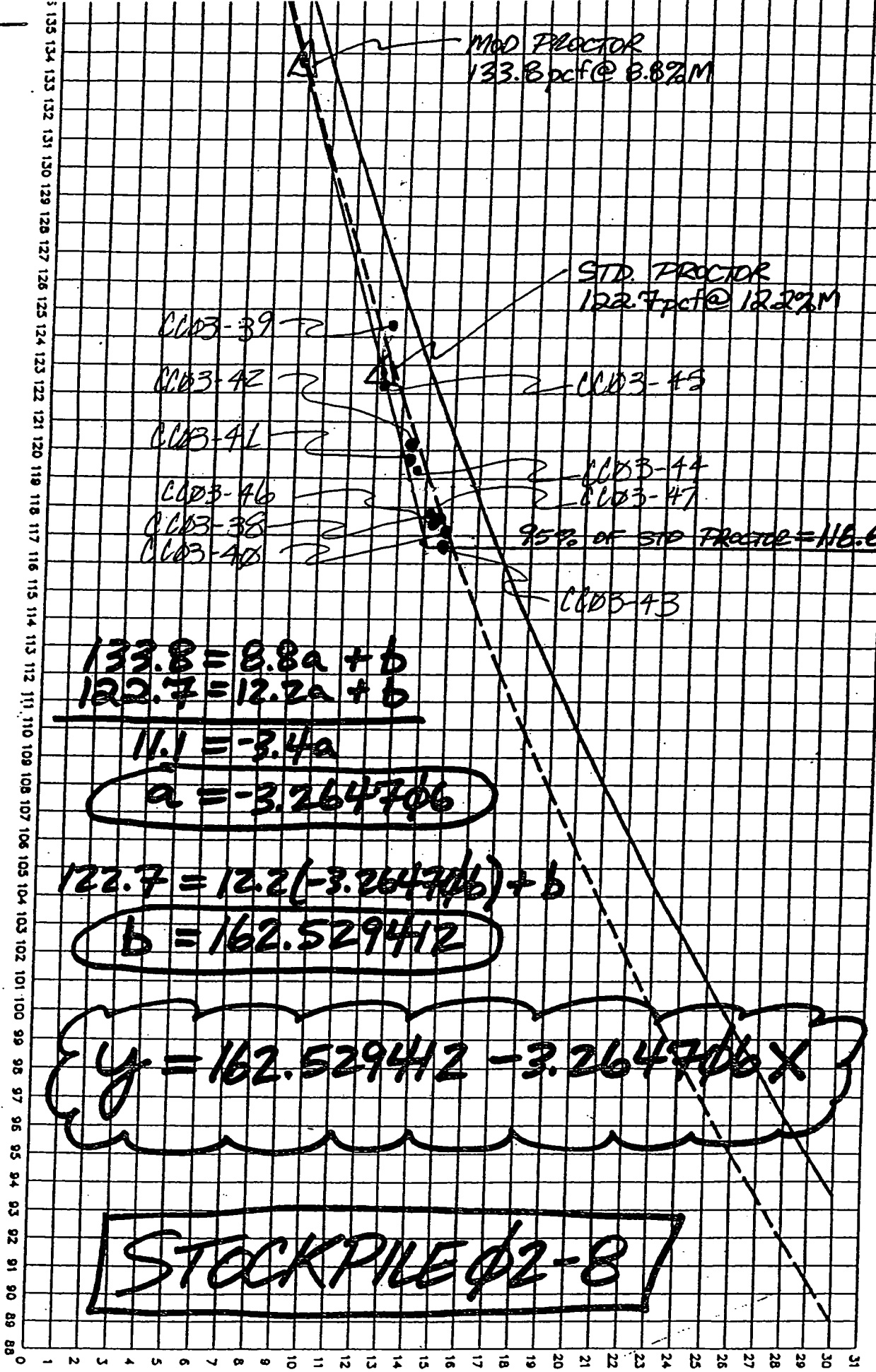
0002660

5370



$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

$y = 162.529412 - 3.264706x$

STOCKPILE Ø2-8

SHEET 3 of 3

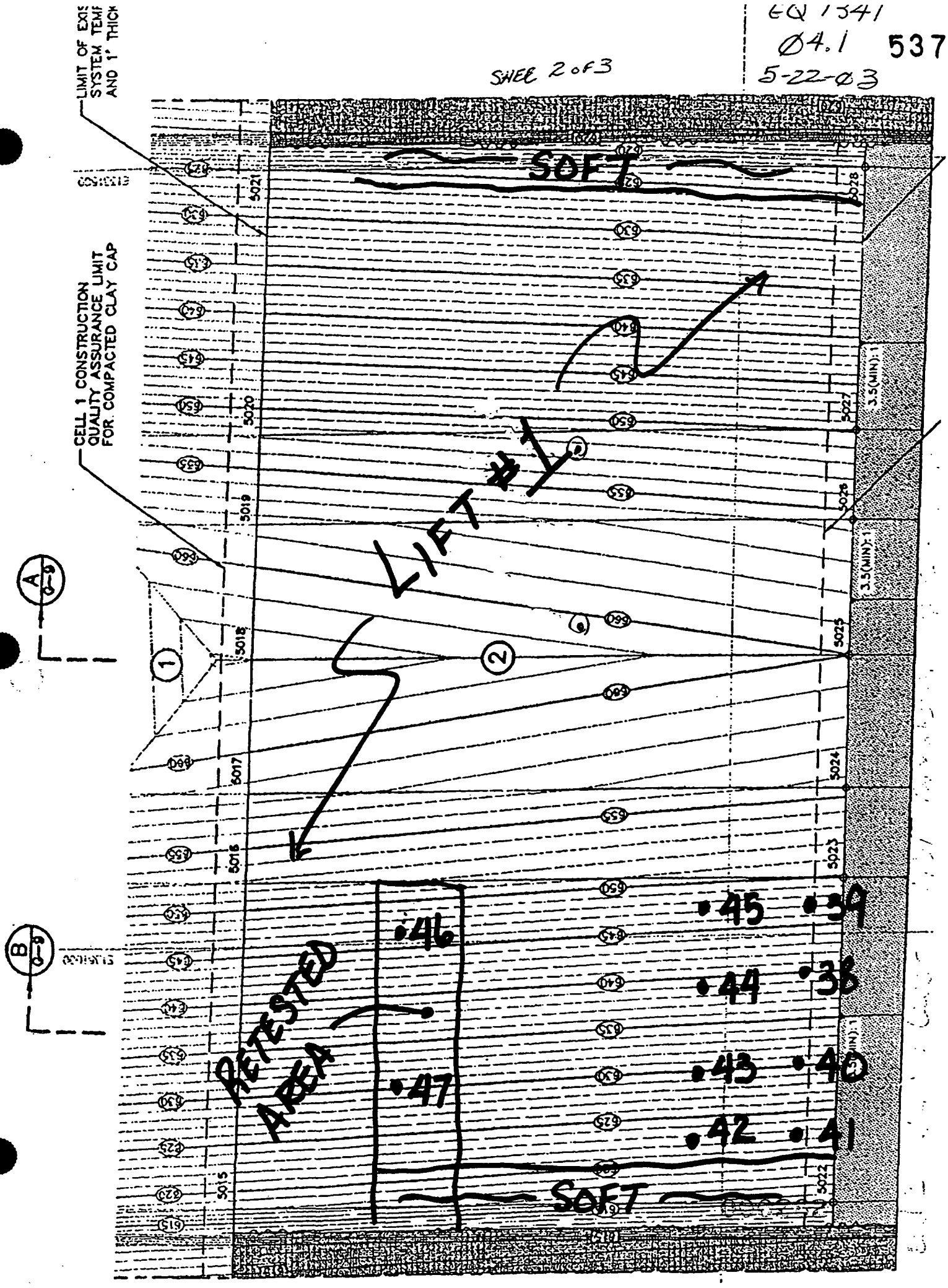
CELL #2 CAP

000261

5-22-Ø3

EQ 1341
Ø4.1 5370
5-22-Ø3

SHEET 2 OF 3



GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE V, CELL #2 Clay Cap

PROJECT NO.: CQ 1341 TASK NO.: 04.1

DATE: 22 day 05 month 03 year

SPECIFICATION REQUIREMENTS: [ASTM D 698] / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE #8 AND #14 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: KMH

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-48	CELL #2 Cap	6" / L-1	02-8	12.2	122.7	11.9 / 13.5	136.8	120.5	98.2	P	—	—	—	—
-49		/				10.0 / 11.9	136.8	122.3	99.6	—	F	50	P	
-50		/				10.6 / ~~13.5~~ 12.6	137.9	~~122.7~~ 122.6	~~100.0~~ 99.9	P	—	—	—	
-51		/				10.3 / 12.2	137.9	122.9	100.2	P	—	—	—	
-52		/				11.6 / 13.3	138.9	122.6	99.9	P	—	—	—	
-53		/				12.7 / 14.2	135.7	118.8	96.8	P	—	—	—	
-54		/				10.9 / 12.7	141.9	125.9	102.6	P	—	—	—	
-55		/				11.7 / 13.4	136.8	120.6	98.3	P	—	—	—	
-56		/				11.6 / 13.3	139.4	123.0	100.2	P	—	—	—	
-57		/				11.4 / 13.1	141.7	125.3	102.1	P	—	—	—	

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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000253

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 041

DESCRIPTION: PHASE V, CELL #2 Clay Cap

DATE: 22 day 05 month 03 year

SPECIFICATION REQUIREMENTS: [ASTM D 698] / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 5% LIFT THICKNESS (LOOSE/[COMPACTED]): 6"

MATERIAL SOURCE: STOCKPILE #8, #14 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: KmR

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-58	CELL #2 Clay Cap	6" / L-1	02-8	12.2	122.7	13.0 / 14.5	138.3	120.8	98.4	P				
-59						13.4 / 14.8	135.2	117.8	96.0	P				
-60						11.1 / 12.9	137.9	122.2	99.5	P				
-61						10.5 / 12.4	137.8	122.6	99.9	P				
-62						10.4 / 12.3	138.8	123.6	100.7	P				
-63						12.3 / 13.9	133.9	117.6	95.8	P				
-64						12.6 / 14.1	134.5	117.8	96.1	P				
-65						13.1 / 14.5	132.6	115.8	94.4	—	F	66		
-66						11.6 / ~~13.8~~ 13.7	135.1	~~118.9~~ 119.2	96.9	P				
-67						11.1 / 12.9	139.4	123.5	100.6	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

53703

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0002264

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 60134 TASK NO.: 04.1

DESCRIPTION: PHASE V, Cell #2 Clay Cap

DATE: 22 day 05 month 03 year

SPECIFICATION REQUIREMENTS: [ASTM D 698] / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Stockpile #8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8331X + 3.6556 QA ID: KMA

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~C003-68~~	~~Cell #2 Clay Cap~~	~~8" / 2~~				~~9.8~~	~~140.0~~							
C003-68	Cell #2 Clay Cap	6" / L-1	002-8	12.2	122.7	11.6 / 13.3	140.4	123.9	101.0	P				
-69						10.9 / 12.7	137.7	122.2	99.6	P				
-70						12.0 / 13.6	136.4	120.1	97.9	P				
~~-71~~														

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature] SHEET NO. 3 OF 3

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SHEET 1 OF 2

DAILY PLACEMENT

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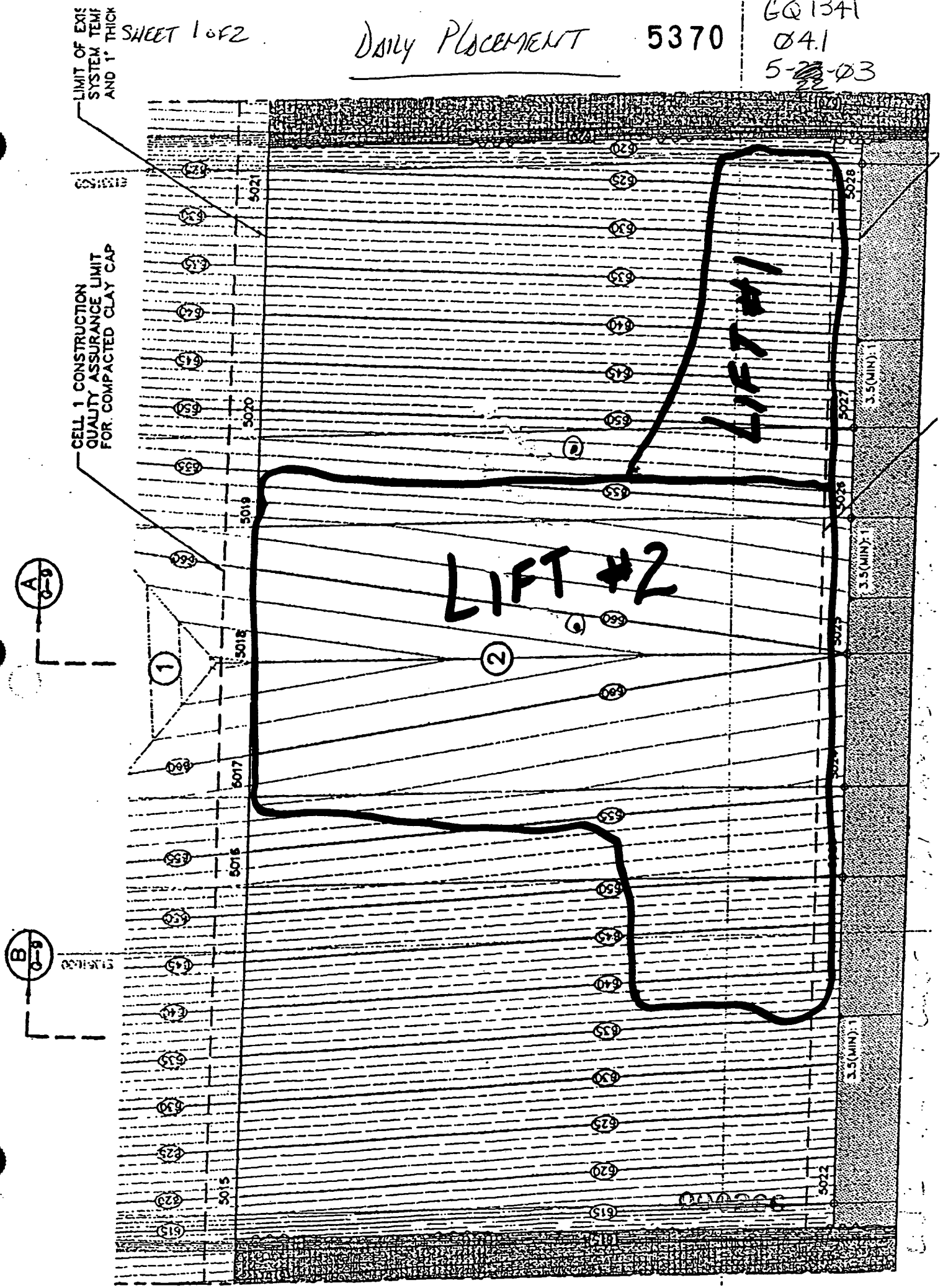
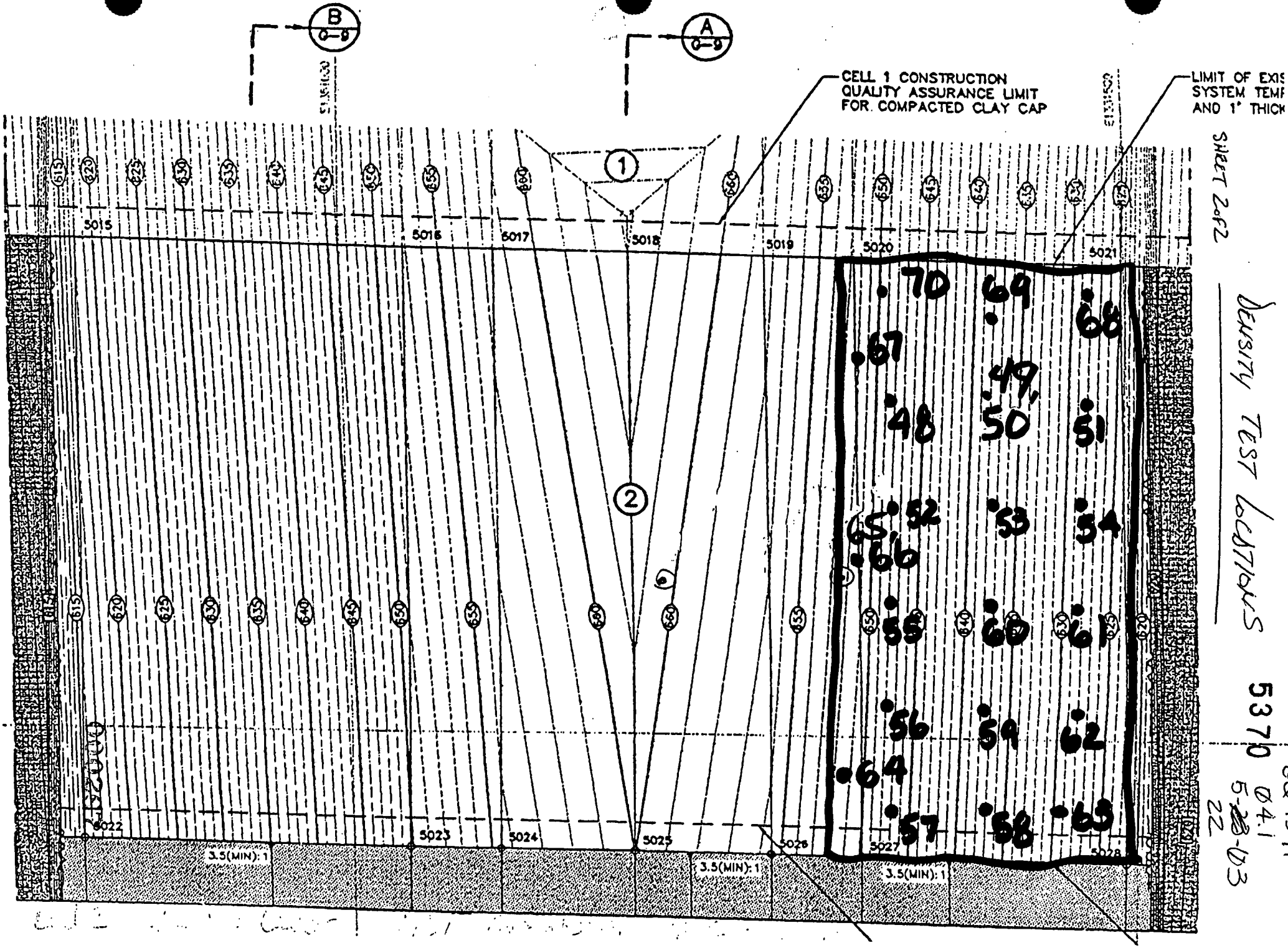
GQ 1341
04.1
5-28-03




B
A
CELL 1 CONSTRUCTION
QUALITY ASSURANCE LIMIT
FOR COMPACTED CLAY CAP
LIMIT OF EXIS
SYSTEM TEMP
AND 1' THICK
SHEET 2 of 2
DENSITY TEST LOCATIONS
5370
04.1
5-23-03
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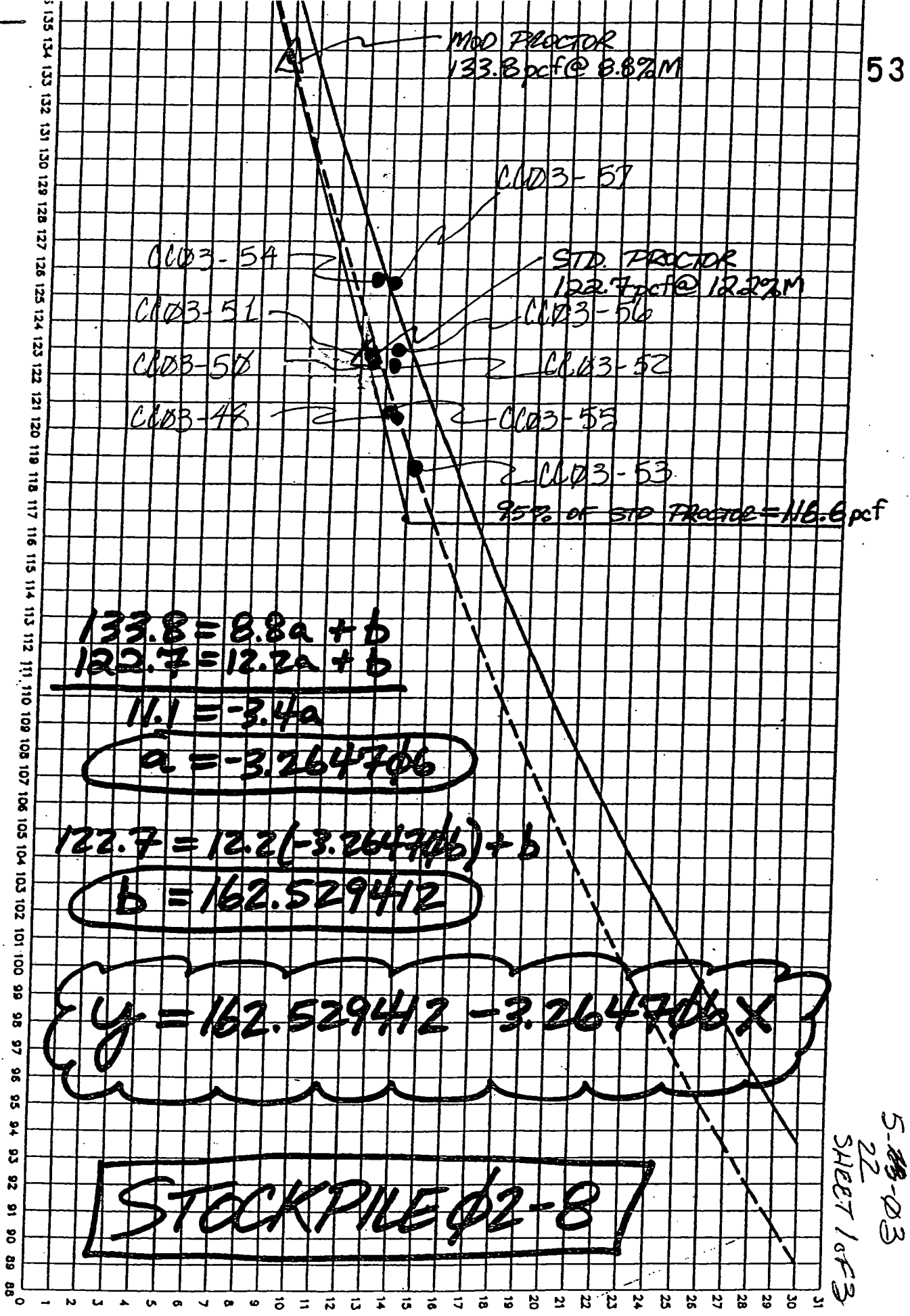


$133.8 = 8.8a + b$

$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

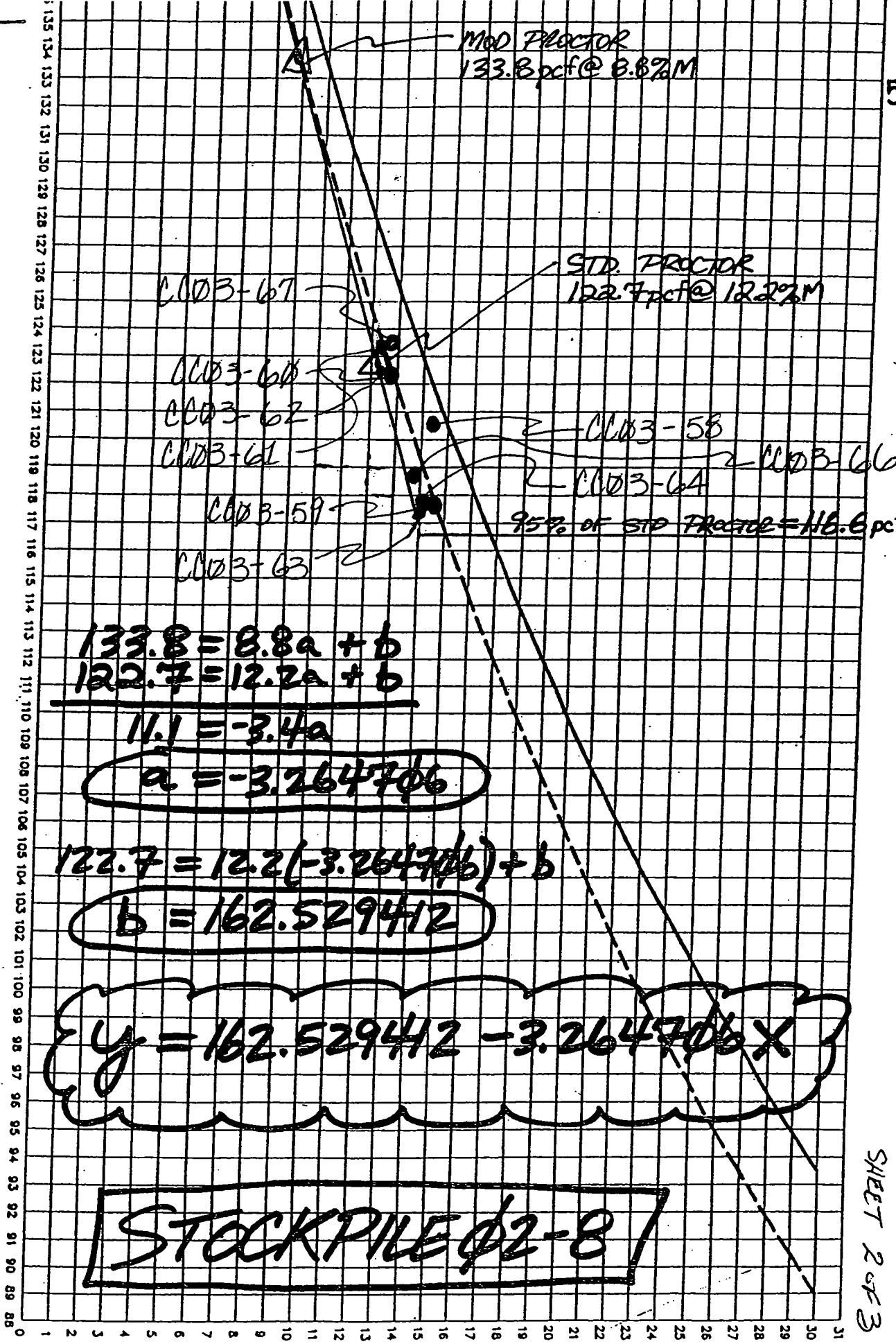
$y = 162.529412 - 3.264706x$

STOCKPILE 02-8

GQ 1341
04.1
5-03-03
22
SHEET 1 of 3

000268

5370



$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

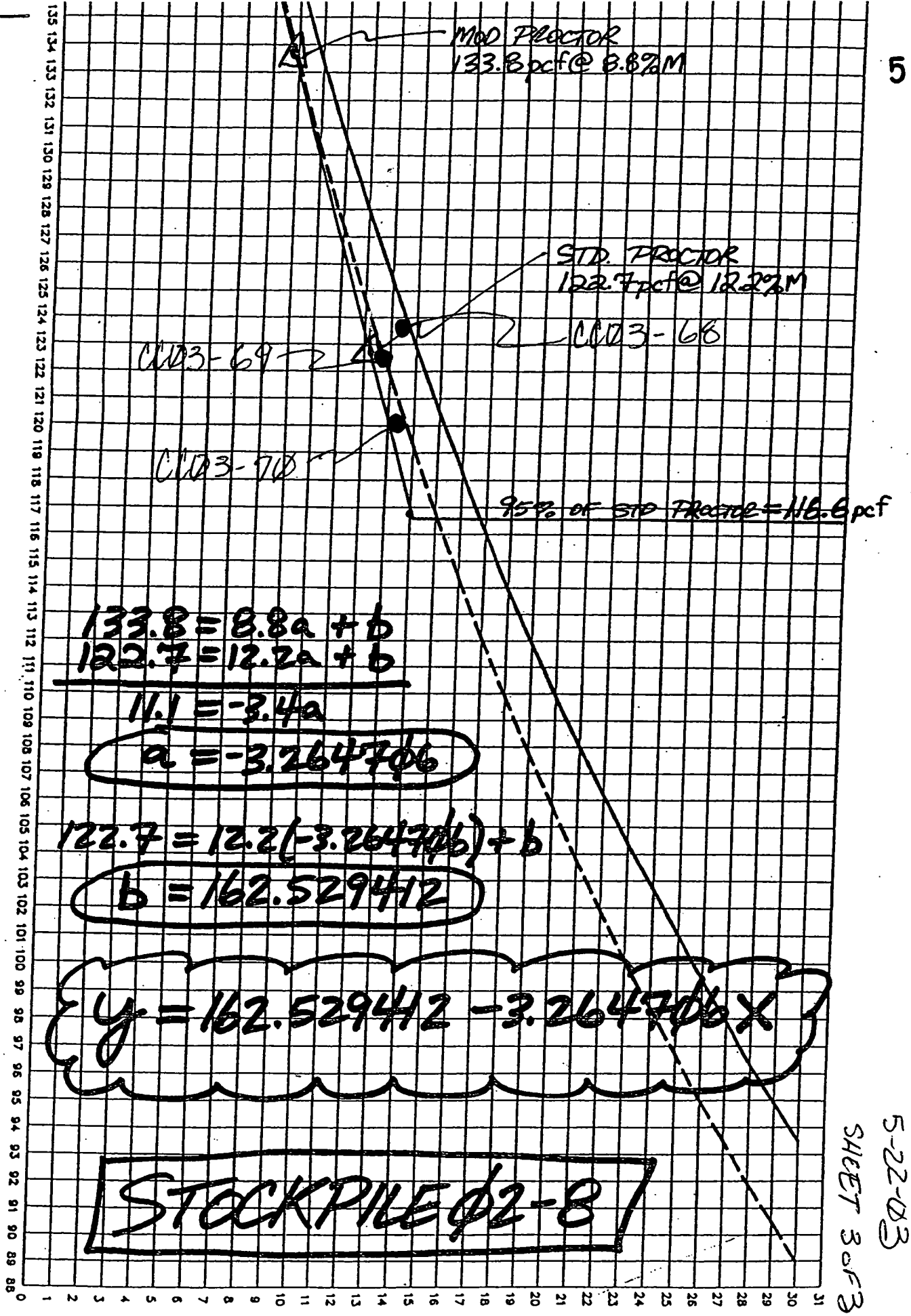
$y = 162.529412 - 3.264706x$

[STOCKPILE 02-8]

GS 1341
04.1
5-22-03
SHEET 2 of 3

000269

5370



$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

$y = 162.529412 - 3.264706x$

STOCKPILE 02-8

GQ 1341
04.1
5-22-03
SHEET 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE V, CELL #2 CLAY CAP

PROJECT NO.: 60 1341 TASK NO.: 04.1

DATE: 23 day 05 month 03 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): ___

MATERIAL SOURCE: STOCKPILE #8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. ___ CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: KMH

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-71	CELL #2 CLAY CAP	8" / L-2	02-8	12.2	122.7	9.6 / 11.6	138.6	124.2	101.2	—	F	CC03-165	P	—
-72	℄	/				11.4 / 13.1	141.3	124.9	101.8	P				
-73		/				12.3 / 13.9	136.7	120.0	97.8	P				
-74		/				12.0 / 13.6	138.1	121.6	99.1	P				
-75		/				11.8 / 13.5	138.9	122.4	99.7	P				
-76		/				12.2 / 13.8	138.4	121.6	99.1	P				
-77	℄	/				11.6 / 13.3	139.4	123.0	100.3	P				
-78		/				10.8 / 12.6	127.5	113.2	92.3	—	F	CC03-166	P	—
-79		/				9.9 / 11.9	140.9	~~92.3~~	102.6	—	F	CC03-167	P	—
-80		/				11.0 / 12.6	139.5	123.7	100.8	P				
									125.9					

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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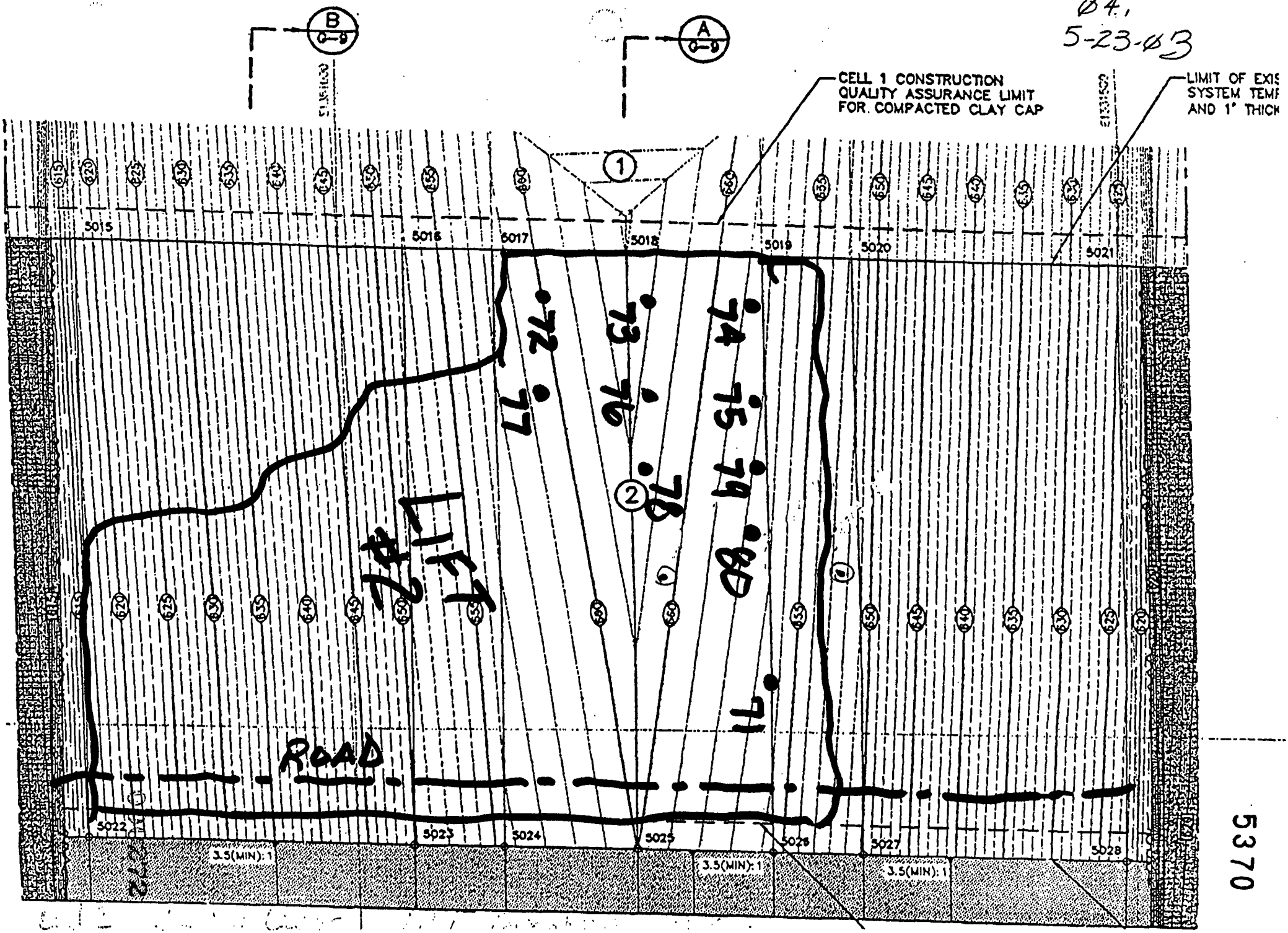
GQ 1
Ø4,
5-23-Ø3



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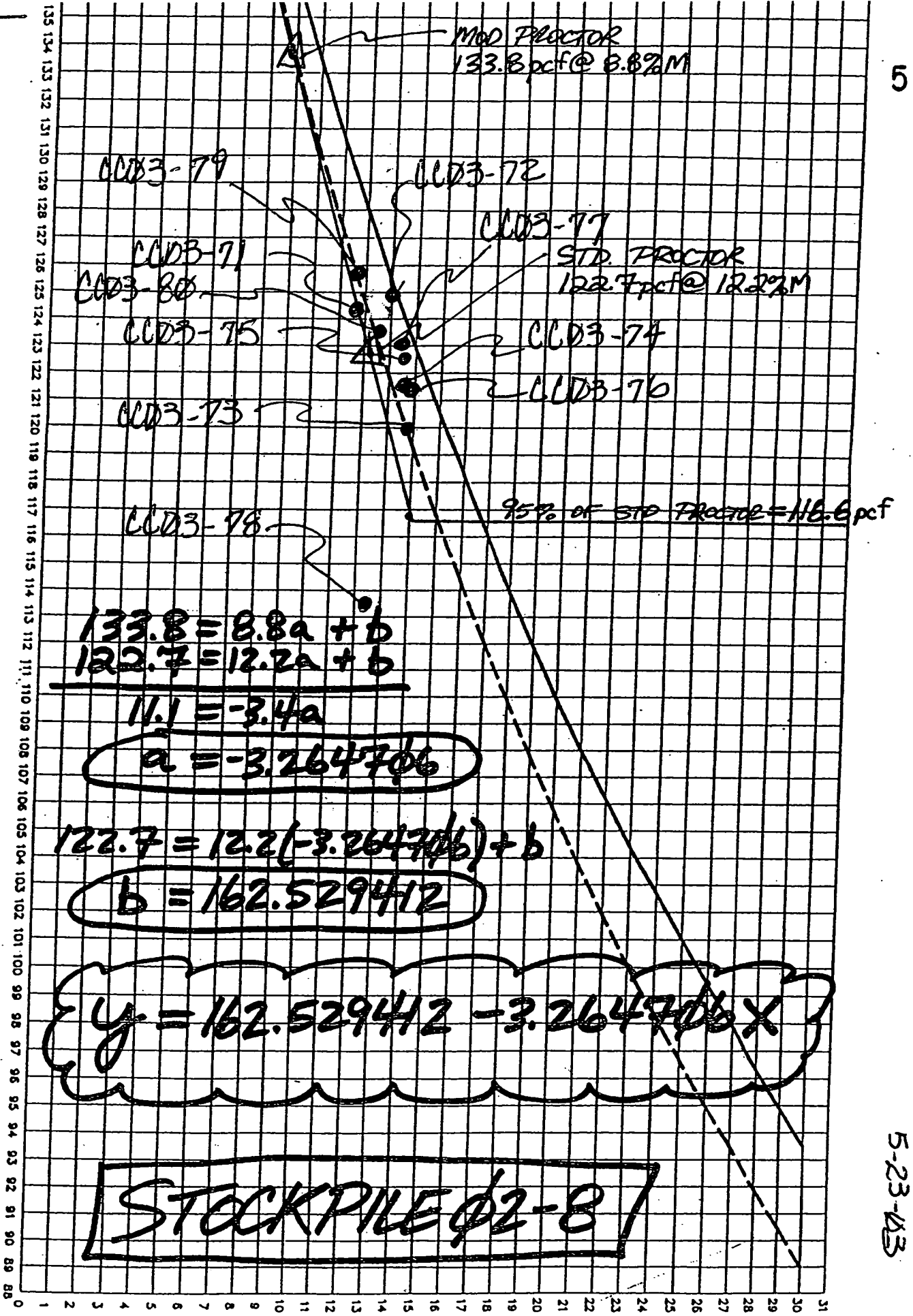

$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

$b = 162.529412$

$y = 162.529412 - 3.264706x$

STOCKPILE 02-8

GO 1341
04.1
5-23-03

000273

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 23 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-13% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-17 / Stockpile 02-7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3430 GAUGE SERIAL NO. CORRECTION FACTOR Y = 0.8311 x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-81	Cell #2 Cap, Clay	6" / L-2	02-8	12.2	122.7	10.5 / 12.4	138.7	123.4	100.6	P	—	—	—	—
CC03-82		6" / L-2	02-8	12.2	122.7	12.4 / 14.0	138.0	121.0	98.6	P	—	—	—	—
CC03-83		6" / L-2	02-8	12.2	122.7	10.3 / 12.2	140.1	124.9	101.8	P	—	—	—	—
CC03-84		6" / L-2	02-8	12.2	122.7	10.4 / 12.3	141.1	125.6	102.4	P	—	—	—	—
CC03-85		6" / L-2	02-8	12.2	122.7	11.4 / 13.1	139.3	123.2	100.4	P	—	—	—	—
CC03-86		6" / L-2	02-8	12.2	122.7	11.3 / 13.0	137.8	121.9	99.3	P	—	—	—	—
CC03-87		6" / L-2	02-8	12.2	122.7	11.1 / 12.9	140.2	124.2	101.2	P	—	—	—	—
CC03-88		6" / L-2	02-8	12.2	122.7	12.7 / 14.2	132.9	117.3	95.6	P	—	—	—	—
CC03-89		6" / L-2	02-8	12.2	122.7	13.2 / 14.6	130.8	114.1	93.0	F	F	CC03-92	P	—
CC03-90		6" / L-2	02-8	12.2	122.7	13.4 / 14.8	133.4	116.2	94.7	A	F	CC03-91	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 23 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02#17 Stockpile 02-7

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3430 GAUGE SERIAL NO. CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-91	Cell #2 Clay Cap	6" / L-2	02-8	12.2	122.7	12.7 / 14.2	133.2	116.6	95.0	P	—	—	—	—
CC03-92		6" / L-2	02-8	12.2	122.7	13.0 / 14.5	134.1	117.1	95.4	P	—	—	—	—
CC03-93		6" / L-2	02-17	14.1	119.3	13.0 / 14.5	133.4	116.5	97.7	—	F	CC03-94	P	—
CC03-94		6" / L-2	02-17	14.1	119.3	14.7 / 15.9	131.9	113.8	95.4	P	—	—	—	—
CC03-95		6" / L-2	02-17	14.1	119.3	13.3 / 14.7	130.9	114.1	95.6	—	F	CC03-96	P	—
CC03-96		6" / L-2	02-17	14.1	119.3	12.8 / 14.3	137.1	119.9	100.5	P	—	—	—	—
CC03-97		6" / L-2	02-17	14.1	119.3	13.7 / 15.0	137.6	119.7 CHW	100.3	P	—	—	—	—
CC03-98		6" / L-2	02-17	14.1	119.3	12.6 / 14.1	137.9	120.9	101.3	P	—	—	—	—
CC03-99		6" / L-2	02-17	14.1	119.3	13.2 / 14.6	134.9	117.7	98.7	P	—	—	—	—
CC03-100		6" / L-2	02-17	14.1	119.3	13.4 / 14.8	134.7	117.3	98.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 23 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-17

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3430 GAUGE SERIAL NO. CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-101	Cell #2 Clay Cap	6" / L-2	02-17	14.1	119.3	~~13.7~~ 15.2 CHW	133.1	114.4	95.9	P	—	—	—	—
CC03-102		6" / L-2	02-17	14.1	119.3	14.0 16.3	133.7	116.0	97.2	P	—	—	—	—
CC03-103		6" / L-2	02-17	14.1	119.3	15.1 15.3	132.9	114.4	95.9	P	—	—	—	—
CC03-104		6" / L-2	02-17	14.1	119.3	14.0 16.2	137.2	119.0	99.7	P	—	—	—	—
CC03-105		6" / L-2	02-17	14.1	119.3	14.5 15.3	132.9	114.9	96.3	P	—	—	—	—
CC03-106		6" / L-2	02-17	14.1	119.3	13.6 15.7	133.8	116.3	97.5	—	F	CC03-107	P	—
CC03-107		6" / L-2	02-17	14.1	119.3	13.8 15.0	135.9	118.1	99.0	P	—	—	—	—
CC03-108		6" / L-2	02-17	14.1	119.3	12.8 15.1	138.1	120.8	101.3	P	—	—	—	—
CC03-109		6" / L-2	02-17	14.1	119.3	14.7 14.3	134.4	116.0	96.7	P	—	—	—	—
CC03-110		6" / L-2	02-17	14.1	119.3	13.2 15.9	135.4	118.2	99.1	P	—	—	—	—
						14.6								

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 3 OF 8

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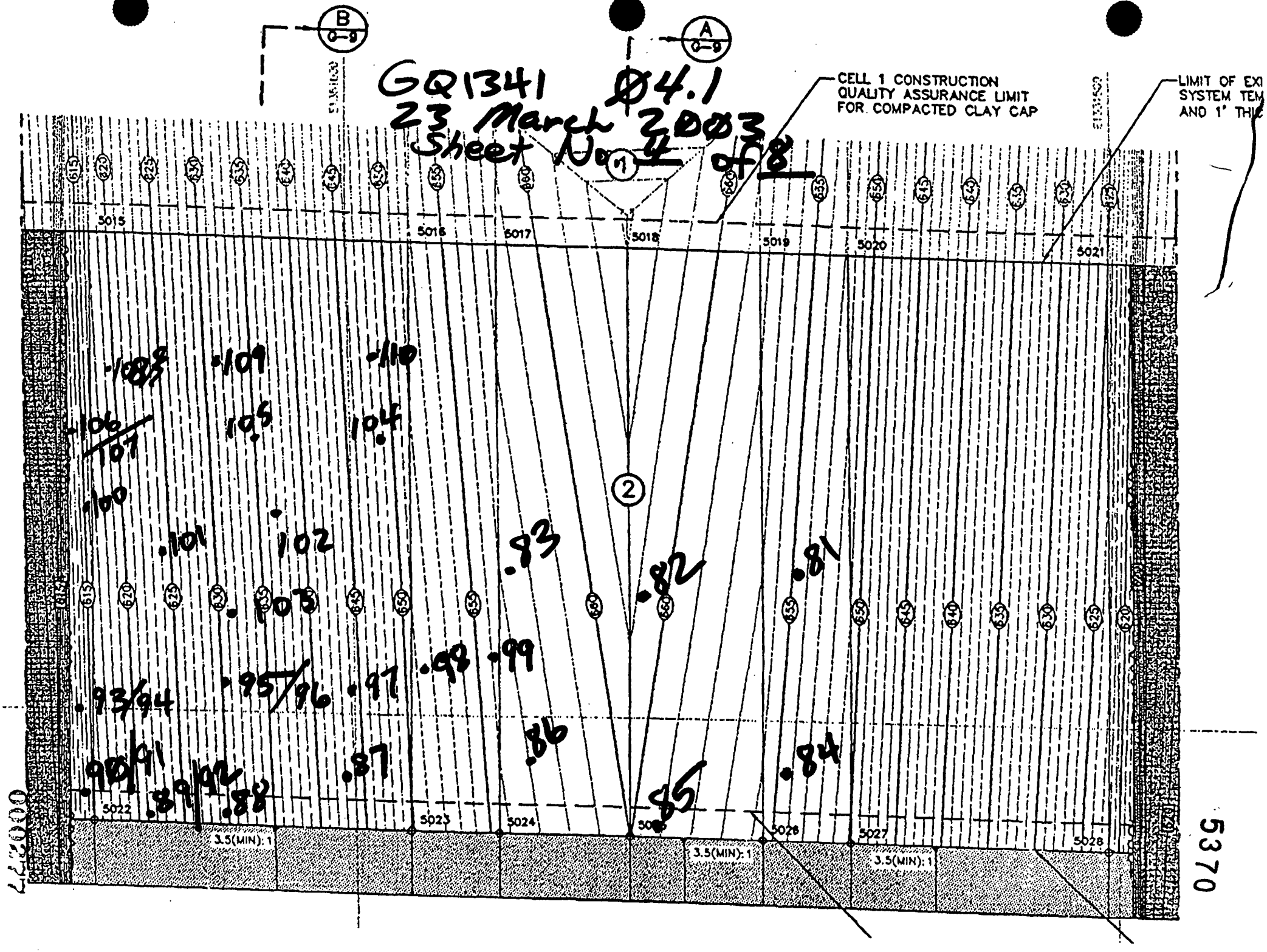
GQ1341 Ø4.1
23 March 2003
Sheet No. 4 of 8



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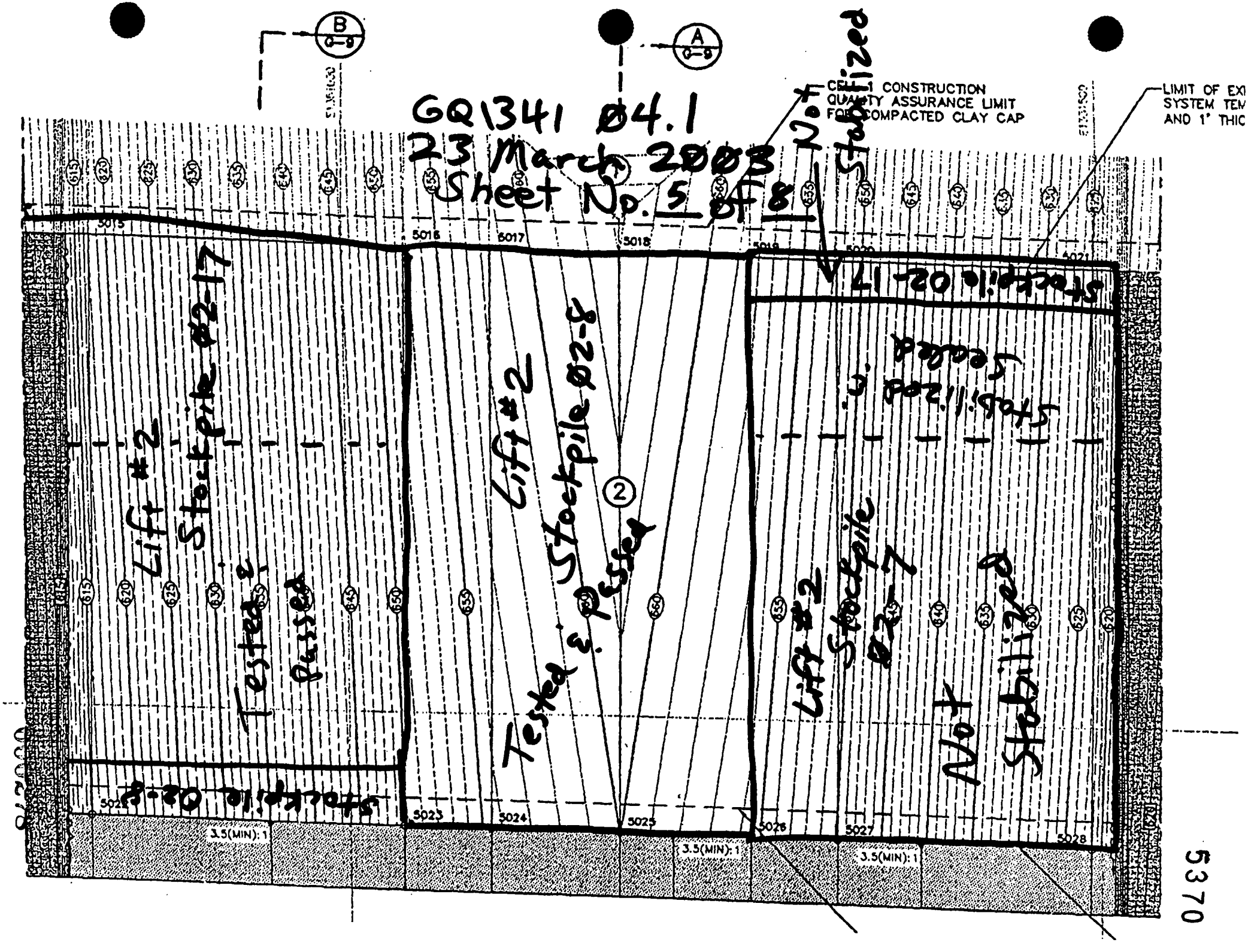
GQ1341 Ø4.1
23 March 2003
Sheet No. 5 of 8
CELL 1 CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY CAP
LIMIT OF EXI SYSTEM TEM AND 1' THIC
Not Stabilized
Lift #2 Stockpile #2-17
Tested & Passed
Lift #2 Stockpile #2-8
Tested & Passed
Lift #2 Stockpile #2-7
Not Stabilized
Stockpile #2-20
Stockpile #2-19
3.5(MIN):1
5015
5016
5017
5018
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5020
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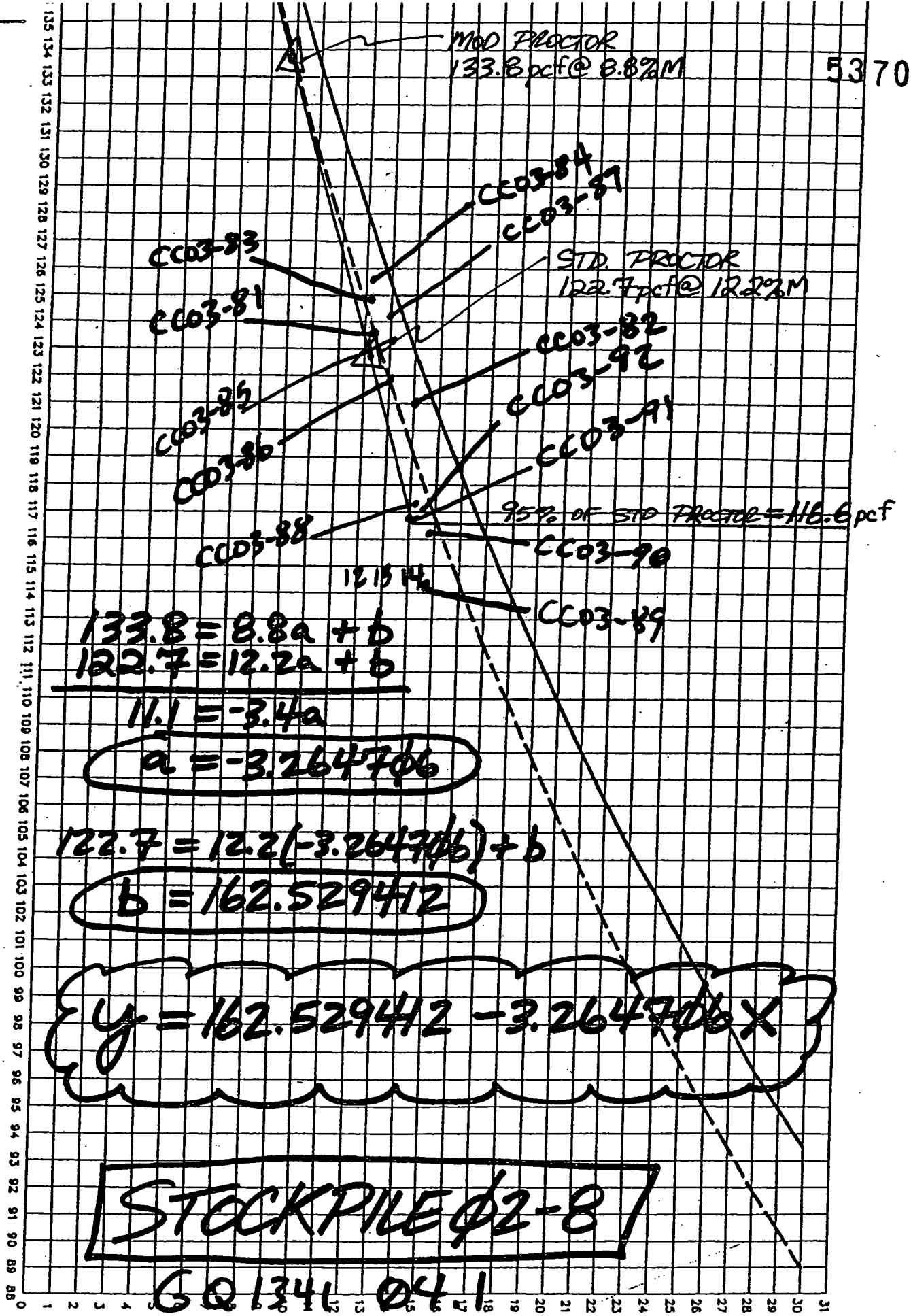


$$133.8 = 8.8a + b$$
$$122.7 = 12.2a + b$$
$$11.1 = -3.4a$$
$$a = -3.264706$$

$$122.7 = 12.2(-3.264706) + b$$
$$b = 162.529412$$

$$y = 162.529412 - 3.264706x$$

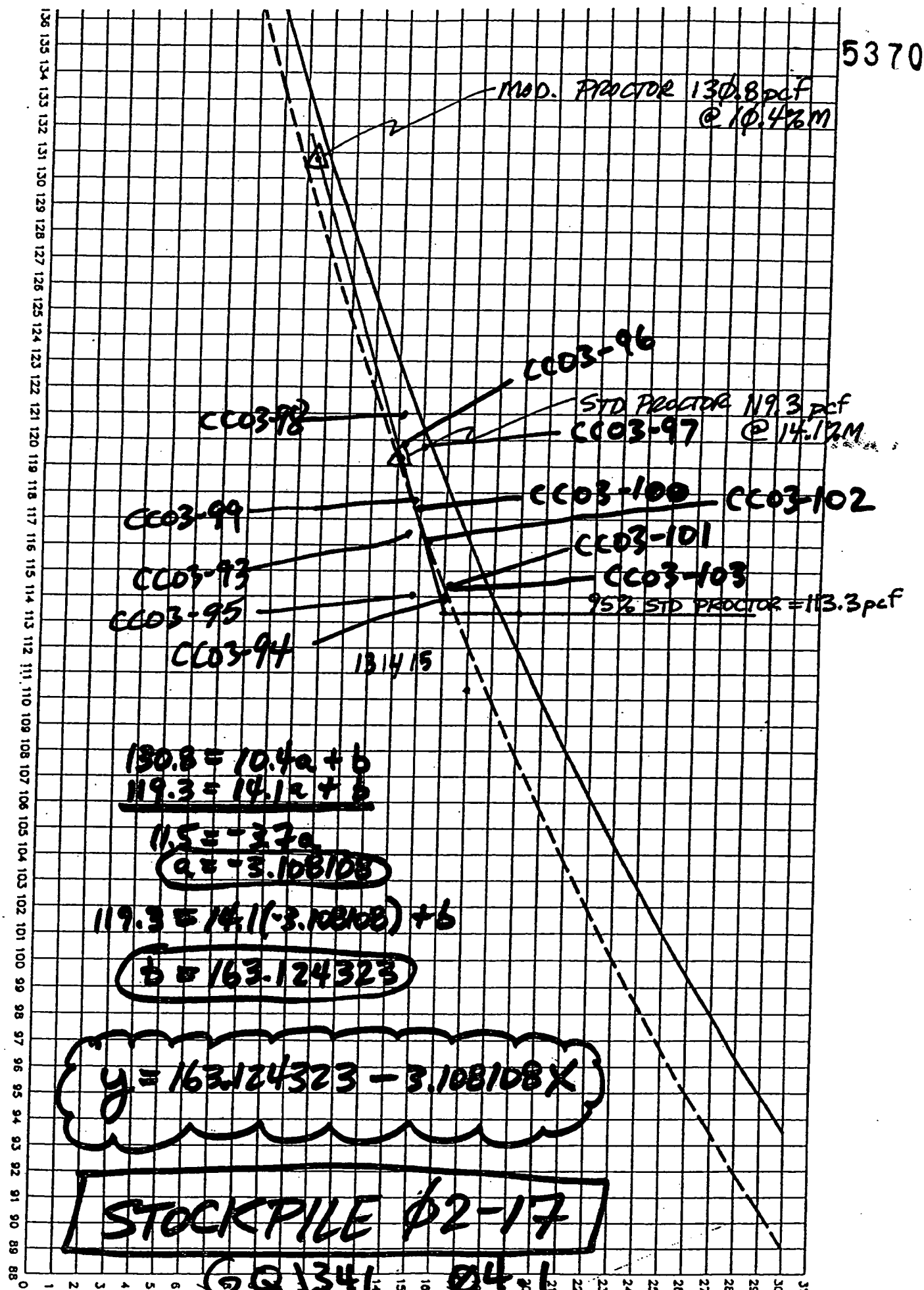
STOCKPILE Ø2-8

GQ1341 Ø41

23 May 2003

Sheet No. 1 of 8

5370



$130.8 = 10.4a + b$
$119.3 = 14.1a + b$

$11.5 = -3.7a$

$a = -3.108108$

$119.3 = 14.1(-3.108108) + b$

$b = 163.124323$

$y = 163.124323 - 3.108108x$

STOCKPILE Ø2-17

GQ1341 Ø4-1

23 March 2003

Sheet No. 1 of 8

000280

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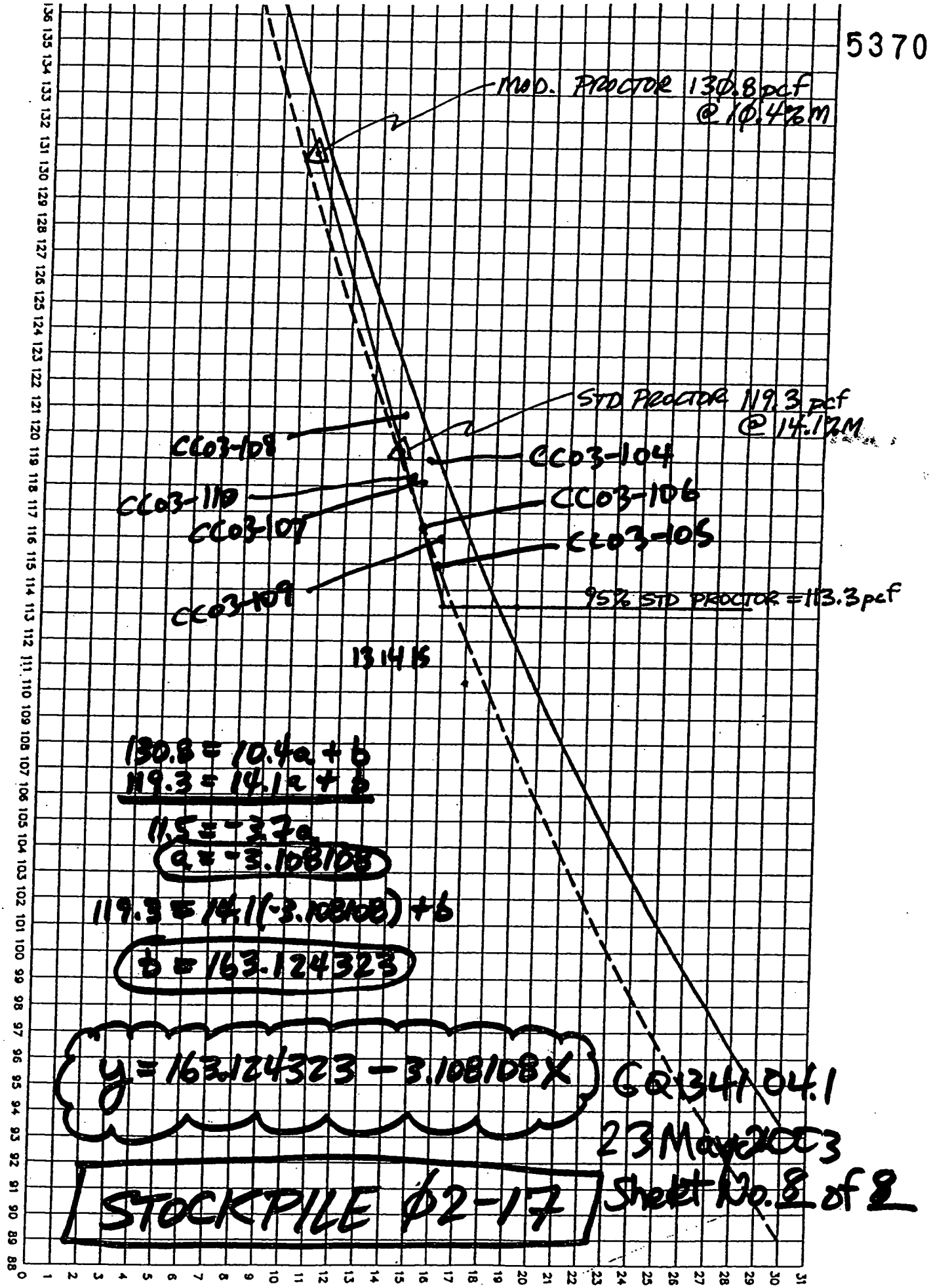

$130.8 = 10.4a + b$
$119.3 = 14.1a + b$

$11.5 = -3.7a$
$a = -3.108108$

$119.3 = 14.1(-3.108108) + b$
$b = 163.124323$

$y = 163.124323 - 3.108108X$

CQ-341041
23 May 2003
Sheet No. 8 of 8

STOCKPILE 02-17

000281

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: Phase I

DATE: 24 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-7 Stockpile 02-17

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-111	Cell #2 Clay Cap	6" / L-2	02-17	14.1	119.3	12.9 / 14.4	138.1	120.7	101.2	P	—	—	—	—
CC03-112		6" / L-2	02-17	14.1	119.3	14.1 / 15.4	133.0	115.3	96.6	P	—	—	—	—
CC03-113		6" / L-2	02-17	14.1	119.3	12.8 / 14.3	137.7	120.5	101.0	P	—	—	—	—
CC03-114		6" / L-2	02-17	14.1	119.3	12.6 / 14.1	137.9	120.9	101.3	P	—	—	—	—
CC03-115		6" / L-2	02-17	14.1	119.3	12.8 / 14.3	137.2	120.0	100.6	P	—	—	—	—
CC03-116		6" / L-2	02-17	14.1	119.3	13.8 / 15.1	136.7	118.8 ~~118.9~~	99.7	P	—	—	—	—
CC03-117		6" / L-2	02-17	14.1	119.3	14.1 / 15.4	133.8	115.9	97.2	P	—	—	—	—
CC03-118		6" / L-2	02-7	12.4	121.4	13.0 / 14.5	138.4	120.9	99.6	P	—	—	—	—
CC03-119		6" / L-2	02-7	12.4	121.4	12.6 / 14.1	136.9	120.0	98.8	P	—	—	—	—
CC03-120		6" / L-2	02-7	12.4 ~~12.54~~	121.4	12.5 / 14.0	134.4	117.9	97.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 24 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-7

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X+3.6556 QA ID: GHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-121	Cell #2 Clay Cap	6" / L-2	02-7	12.4 GHW	121.4	12.9 / 14.4	134.2	117.3	96.6	P	—	—	—	—
CC03-122		6" / L-2	02-7	12.4	121.4	14.1 / 15.4	132.6	114.9	94.6	—	F	CC03-123	P	—
CC03-123		6" / L-2	02-7	12.4	121.4	13.6 / 15.0	133.4	116.0	95.6	P	—	—	—	—
CC03-124		6" / L-2	02-7	12.4	121.4	13.3 / 14.7	133.9	116.7	96.1	P	—	—	—	—
CC03-125		6" / L-2	02-7	12.4	121.4	12.7 / 14.2	135.7	118.8	97.9	P	—	—	—	—
CC03-126		6" / L-2	02-7	12.4	121.4	12.0 / 13.6	138.3	121.7	100.2	P	—	—	—	—
CC03-127		6" / L-2	02-7	12.4	121.4	11.3 / 13.0	138.8	122.8	101.2	P	—	—	—	—
CC03-128		6" / L-2	02-7	12.4	121.4	13.3 / 14.7	135.1	117.8	97.0	P	—	—	—	—
CC03-129		6" / L-2	02-7	12.4	121.4	12.9 / 14.4	135.1	118.1	97.3	P	—	—	—	—
CC03-130		6" / L-2	02-7	12.4	121.4	13.2 / 14.6	134.3	117.2	96.5	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CHECKED BY: [illegible]

SHEET NO. 2 OF 10

0002283

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 24 day May month 03 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-131	Cell #2 Clay Cap	6" / L-2	02-7	12.4	121.4	12.6 / 14.1	135.6	118.8	97.9	P	—	—	—	—
CC03-132		6" / L-2	02-7	12.4	121.4	12.3 / 13.9	134.5	118.1	97.3	P	—	—	—	—
CC03-133		6" / L-2	02-7	12.4	121.4	12.7 / 14.2	136.0	119.1	98.1	P	—	—	—	—
CC03-134		6" / L-2	02-7	12.4	121.4	11.4 / 13.1	137.1	121.2	100.2	P	—	—	—	—
CC03-135		6" / L-2	02-7	12.4	121.4	10.8 / 12.6	136.4	121.1	99.8	P	—	—	—	—
CC03-136		6" / L-2	02-7	12.4	121.4	12.9 / 14.4	134.0	117.1	96.5	P	—	—	—	—
CC03-137		6" / L-2	02-7	12.4	121.4	10.8 / 12.6	134.8	119.7	98.6	—	F	CC03-138	P	—
CC03-138		6" / L-2	02-7	12.4	121.4	11.1 / 12.9	136.0	120.5	99.3	P	—	—	—	—
CC03-139		6" / L-2	02-7	12.4	121.4	11.5 / 13.2	138.4	122.3	100.7	P	—	—	—	—
CC03-140		6" / L-2	02-7	12.4	121.4	10.9 / 12.7	135.9	120.6	99.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 24 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~0 to 3%~~ LIFT THICKNESS (LOOSE/COMPACTED): ~8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHEV

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CC03-141	Cell #2 Clay Cap	6"/L-2	02-7	12.4	121.4	~~12.0~~ 13.6 ~~CHW 137.5~~	137.5	121.0	99.7	P	—	—	—	—
CC03-142	↓	6"/L-2	02-7	12.4	121.4	~~12.5~~ 14.0	135.3	118.7	97.8	P	—	—	—	—
~~CC03-143~~														

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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Needs Stabilized

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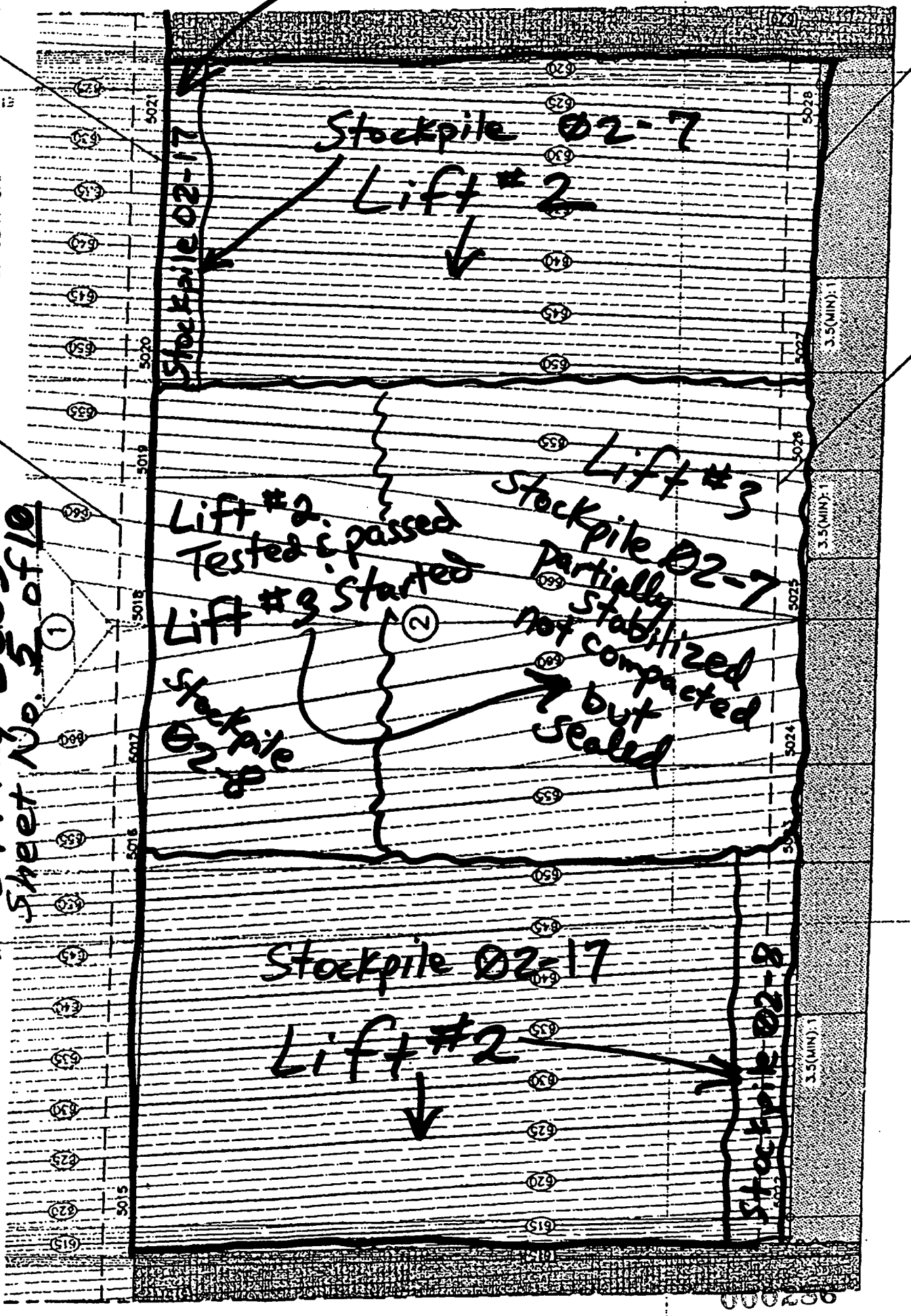

GQ1341 0441
24 May 2003
Sheet No. 3 of 10

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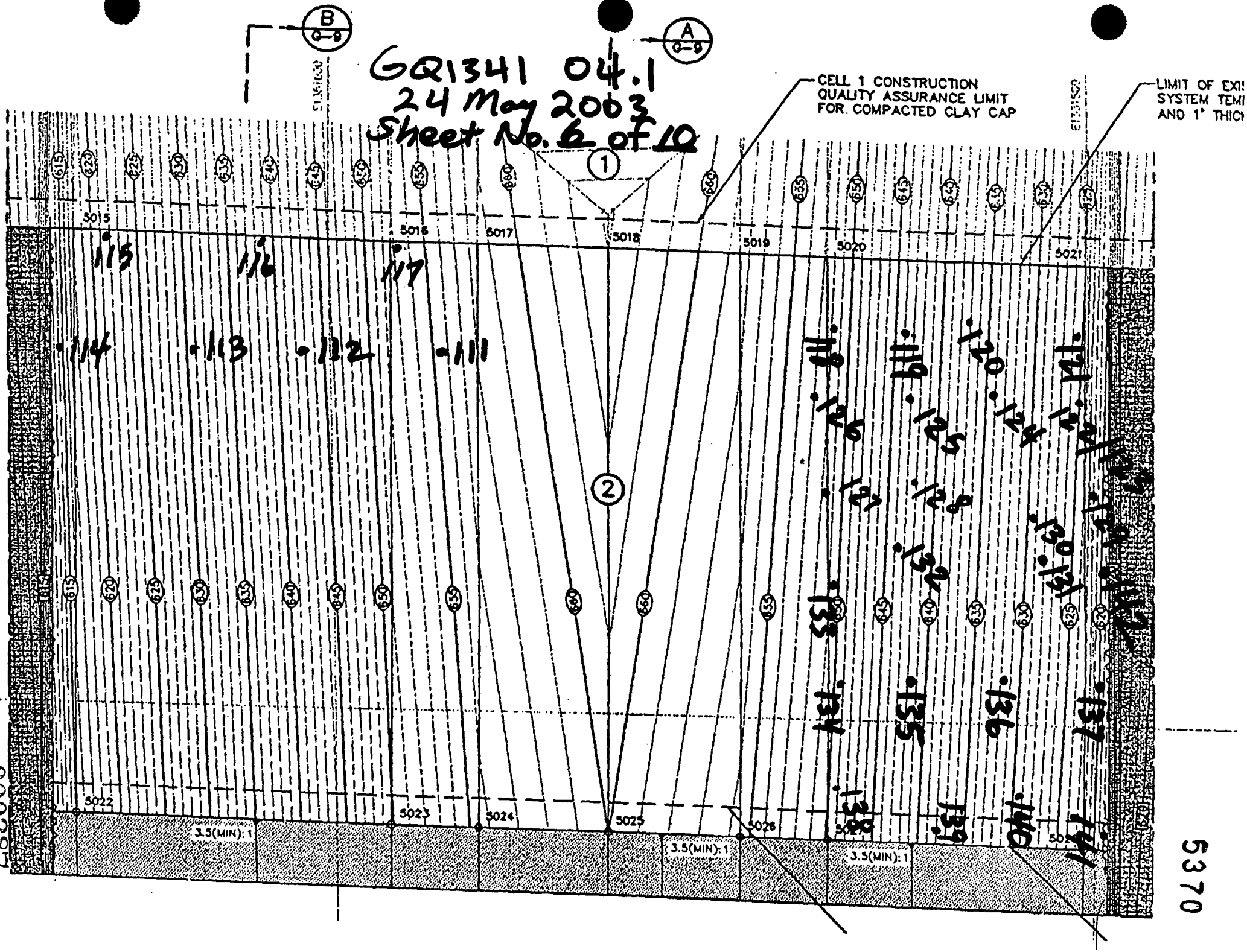
GQ1341 04.1
24 May 2003
Sheet No. 6 of 10



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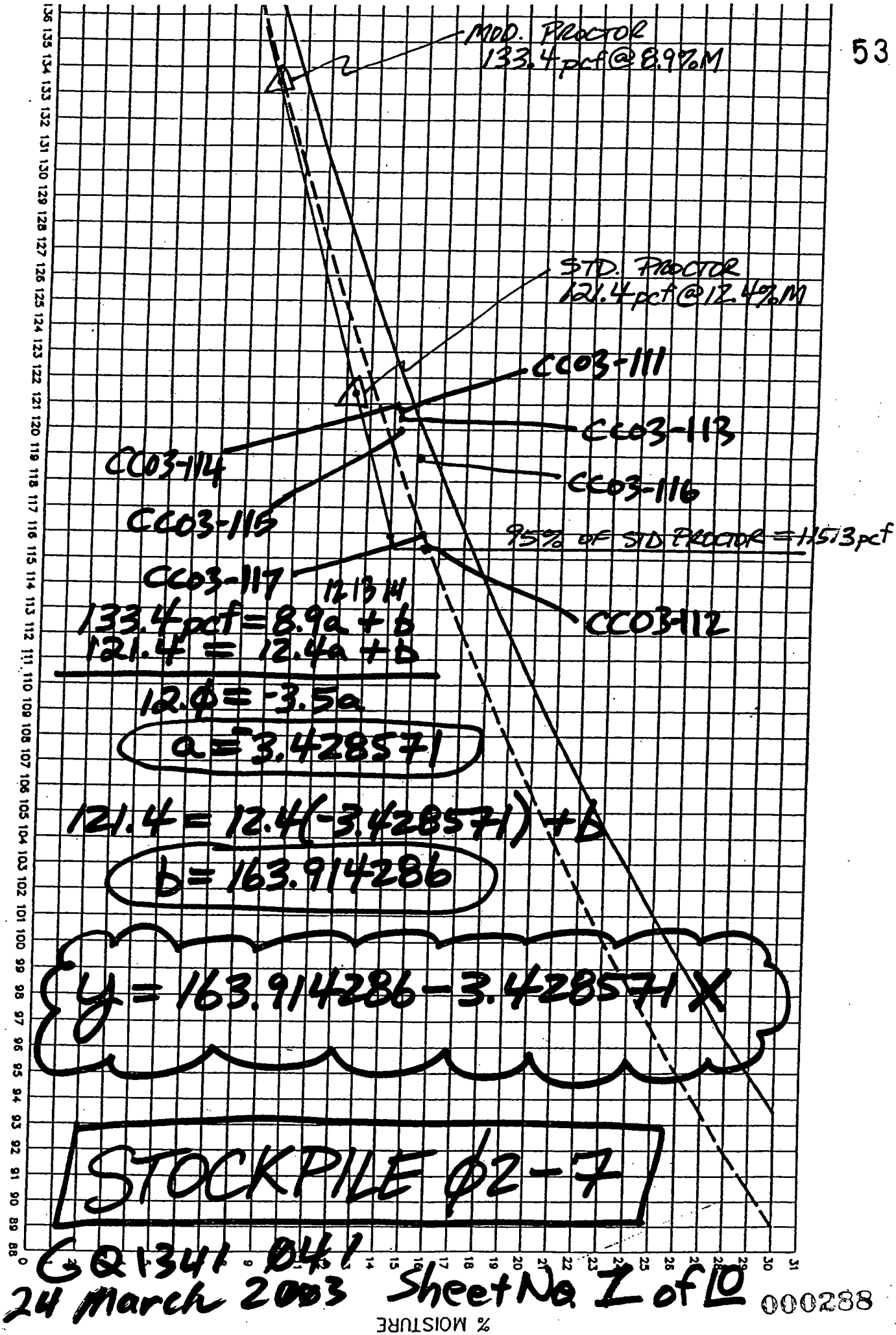
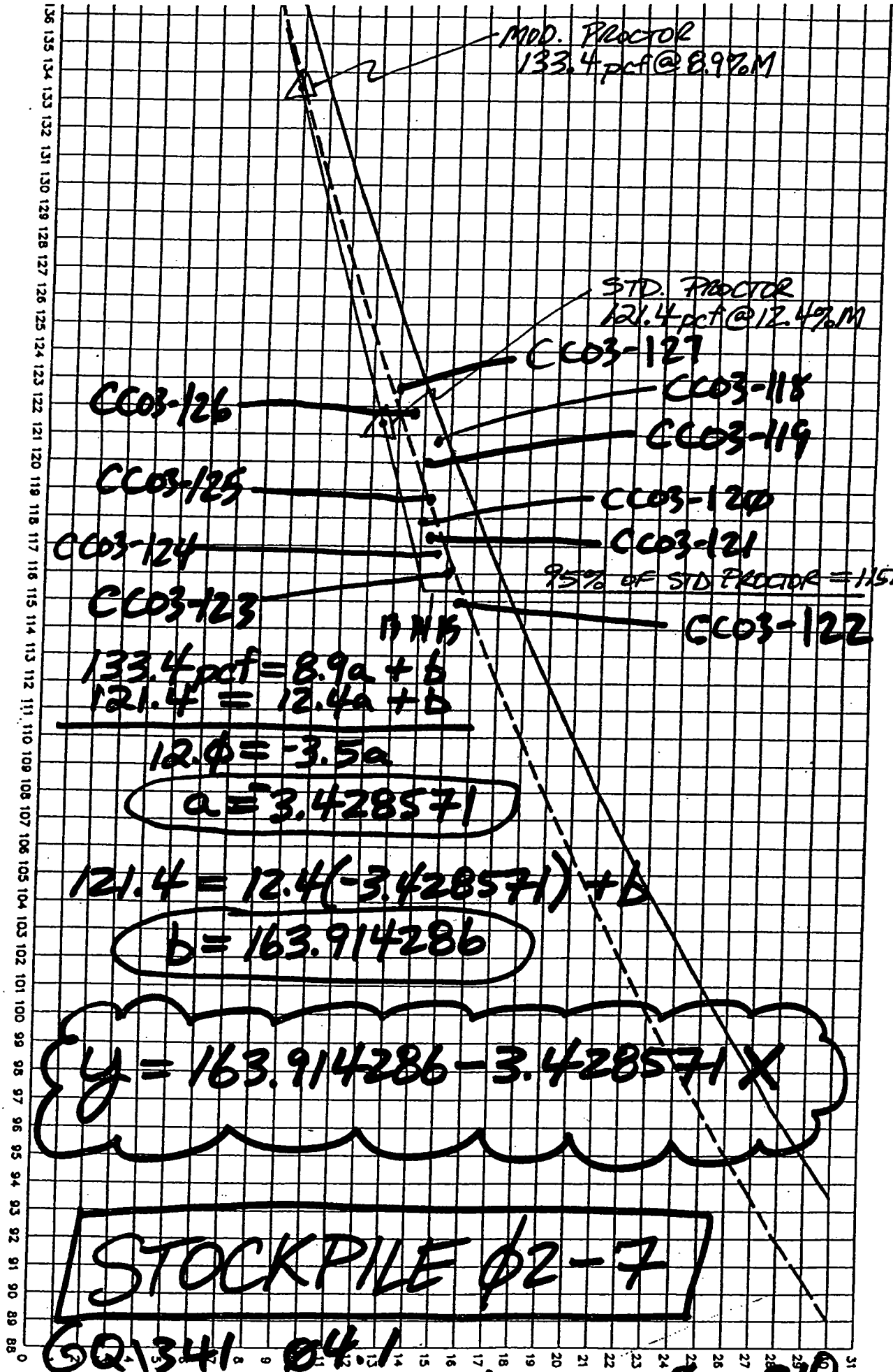


GQ1341 041

24 March 2003 Sheet No. 1 of 10



$133.4\,pcf = 8.9a + b$
$121.4 = 12.4a + b$

$12.0 = -3.5a$

$a = -3.428571$

$121.4 = 12.4(-3.428571) + b$

$b = 163.914286$

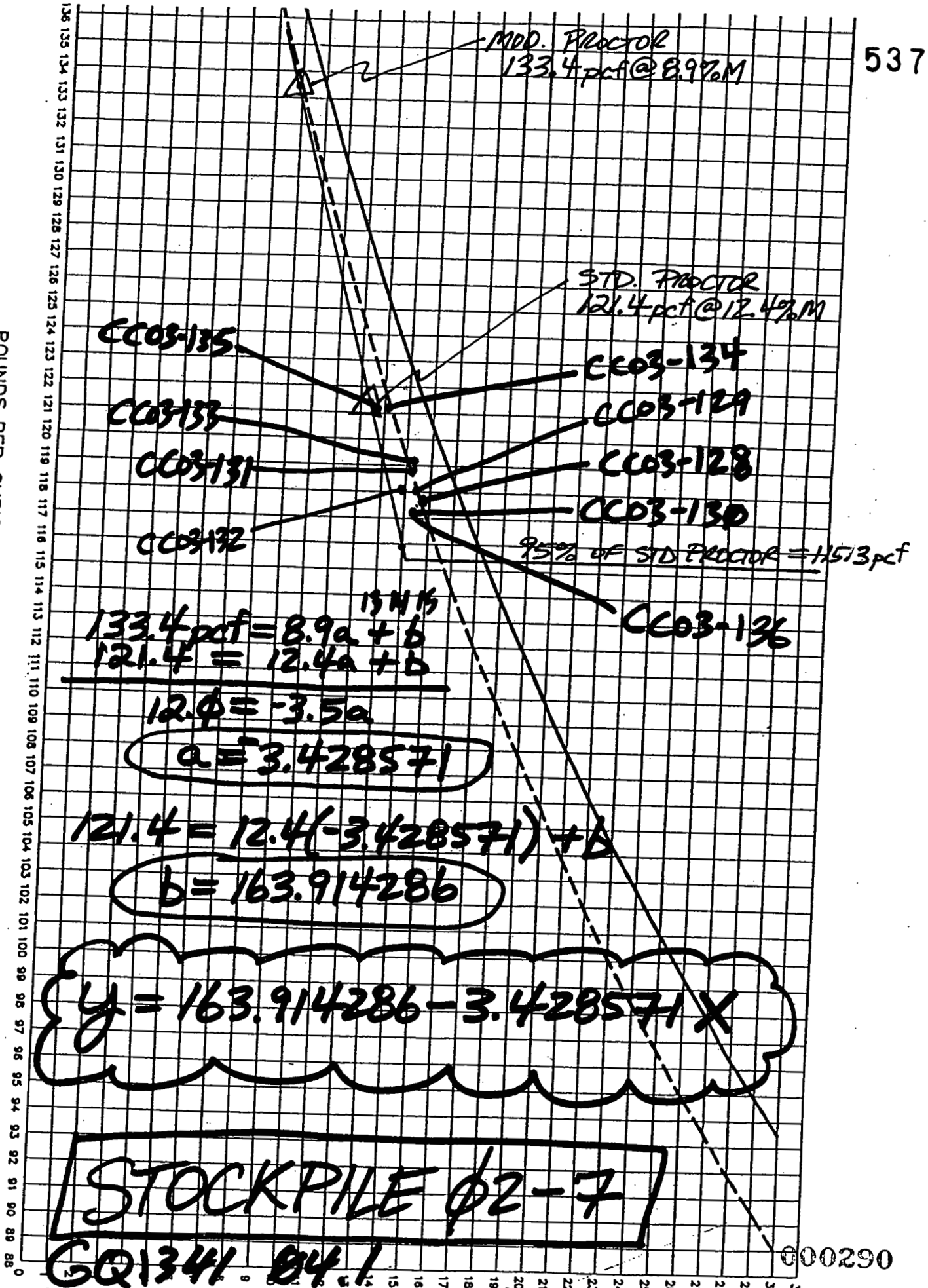
$y = 163.914286 - 3.428571x$

STOCKPILE 02-7

GQ\341 041

24 March 2003 Sheet No. 8 of 10

5370



$133.4\text{pcf} = 8.9a + b$
$121.4 = 12.4a + b$

$12.0 = -3.5a$

$a = -3.428571$

$121.4 = 12.4(-3.428571) + b$

$b = 163.914286$

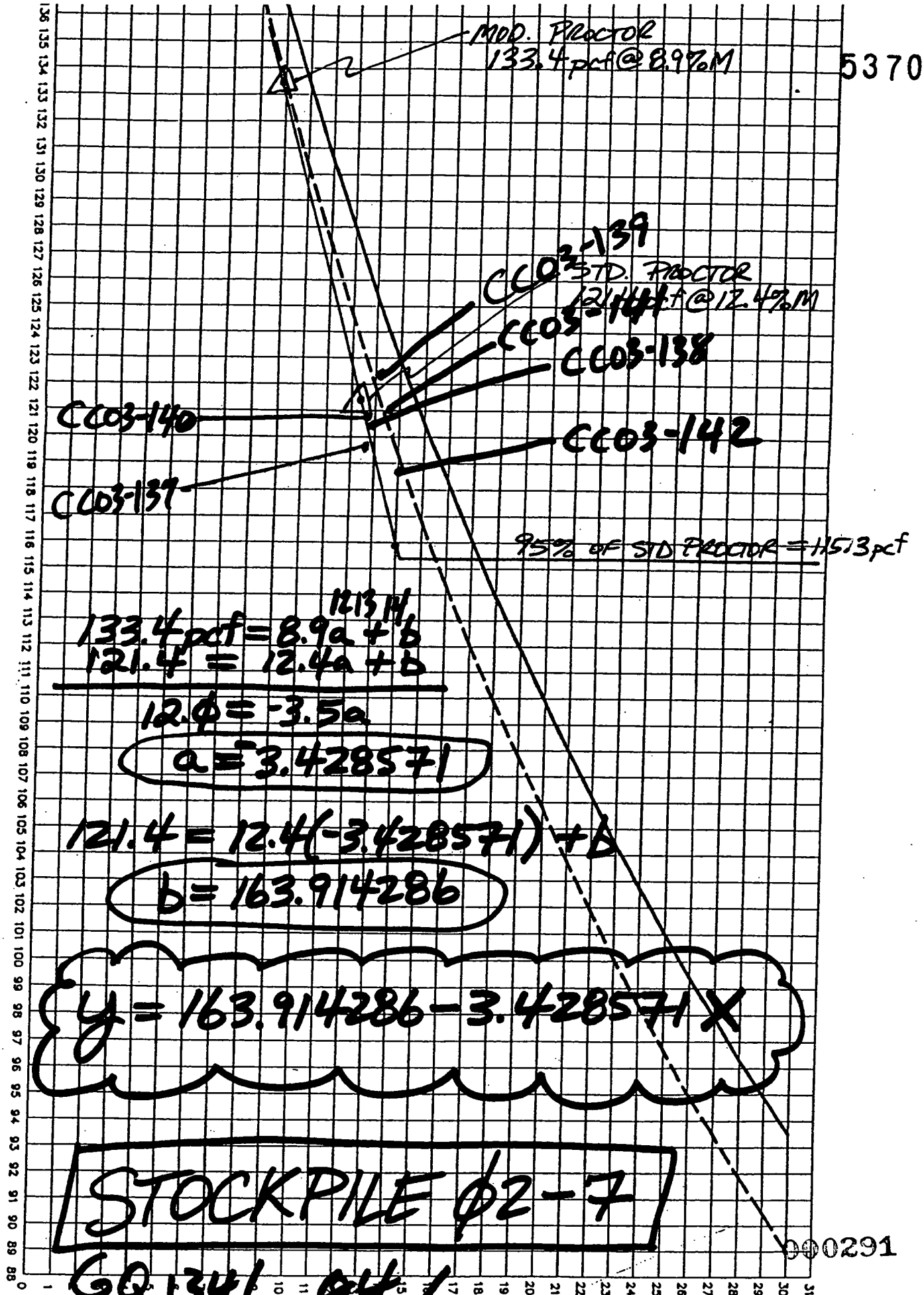
$y = 163.914286 - 3.428571x$

STOCKPILE 02-7

GQ1341 84 1

000290

24 March 2003 Sheet No. 9 of 10



$133.4\,pcf = 8.9a + b$ (12.13 M)

$121.4 = 12.4a + b$

$12.0 = -3.5a$

$a = -3.428571$

$121.4 = 12.4(-3.428571) + b$

$b = 163.914286$

$$y = 163.914286 - 3.428571X$$

STOCKPILE 02-7

GQ1341 04:1

24 March 2003 Sheet No. 10 of 10

5370

000291

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 27 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.831X+3.6556 QA ID: CJW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-143	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	11.0 / 12.8	140.0	124.1	102.2	P	—	—	—	—
CC03-144		6" / L-3	02-7	12.4	121.4	11.5 / 13.2	126.5	111.7	92.0	—	F	CC03-145	P	—
CC03-145		6" / L-3	02-7	12.4	121.4	11.9 / 13.5	139.5	122.9	101.2	P	—	—	—	—
CC03-146		6" / L-3	02-7	12.4	121.4	12.5 / 14.0	137.5	120.6	99.3	P	—	—	—	—
CC03-147		6" / L-3	02-7	12.4	121.4	11.4 / 13.1	137.8	121.8	100.3	P	—	—	—	—
CC03-148		6" / L-3	02-7	12.4	121.4	11.2 / 13.0	141.0	124.8	102.8	P	—	—	—	—
CC03-149		6" / L-3	02-7	12.4	121.4	12.3 / 13.9	136.5	119.8	98.7	P	—	—	—	—
CC03-150		6" / L-3	02-7	12.4	121.4	12.5 / 14.0	139.4	122.3	100.7	P	—	—	—	—
CC03-151		6" / L-3	02-7	12.4	121.4	10.6 / 12.5	139.7	124.2	102.3	P	—	—	—	—
CC03-152		6" / L-3	02-7	12.4	121.4	13.3 / 14.7	136.0	118.6	97.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CJW SHEET NO. 1 OF 9

0002292

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 27 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-153	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	12.2 / 13.8	137.8	121.1	99.8	P	—	—	—	—
CC03-154		6" / L-3	02-7	12.4	121.4	11.4 / 13.1	138.1	122.1	100.6	P	—	—	—	—
CC03-155		6" / L-3	02-7	12.4	121.4	11.4 / 13.1	139.6	123.4	101.6	P	—	—	—	—
CC03-156		6" / L-3	02-7	12.4	121.4	12.1 / 13.7	140.0	123.1	101.4	P	—	—	—	—
CC03-157		6" / L-3	02-7	12.4	121.4	11.8 / 13.5	139.3	122.7	101.1	P	—	—	—	—
CC03-158		6" / L-3	02-7	12.4	121.4	12.6 / 14.1	137.2	120.2	99.0	P	—	—	—	—
CC03-159		6" / L-3	02-7	12.4	121.4	12.4 / 14.0	138.5	121.5	100.1	P	—	—	—	—
CC03-160		6" / L-3	02-7	12.4	121.4	12.1 / 13.7	139.8	123.0	101.3	P	—	—	—	—
CC03-161		6" / L-3	02-7	12.4	121.4	11.8 / 13.5	140.1	123.4	101.6	P	—	—		
CC03-162		6" / L-3	02-7	12.4	121.4	11.0 / 12.8	140.2	124.3	102.4	P	—	—		

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 27 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-163	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	10.8 / 12.6	136.3	121.0	99.7	P	—	—	—	—
CC03-164		6" / L-3	02-7	12.4	121.4	11.3 / 13.0	138.0	122.1	100.6	P	—	—	—	—
CC03-165		6" / L-2	02-8	12.2	122.7	12.0 / 13.6	144.9	127.6	104.0	P	—	—	—	—
CC03-166		6" / L-2	02-8	12.2	122.7	11.3 / 13.0	141.3	125.0	101.9	P	—	—	—	—
CC03-167		6" / L-2	02-8	12.2	122.7	12.6 / 14.1	143.3	125.6	102.4	P	—	—	—	—
		/												
		/												
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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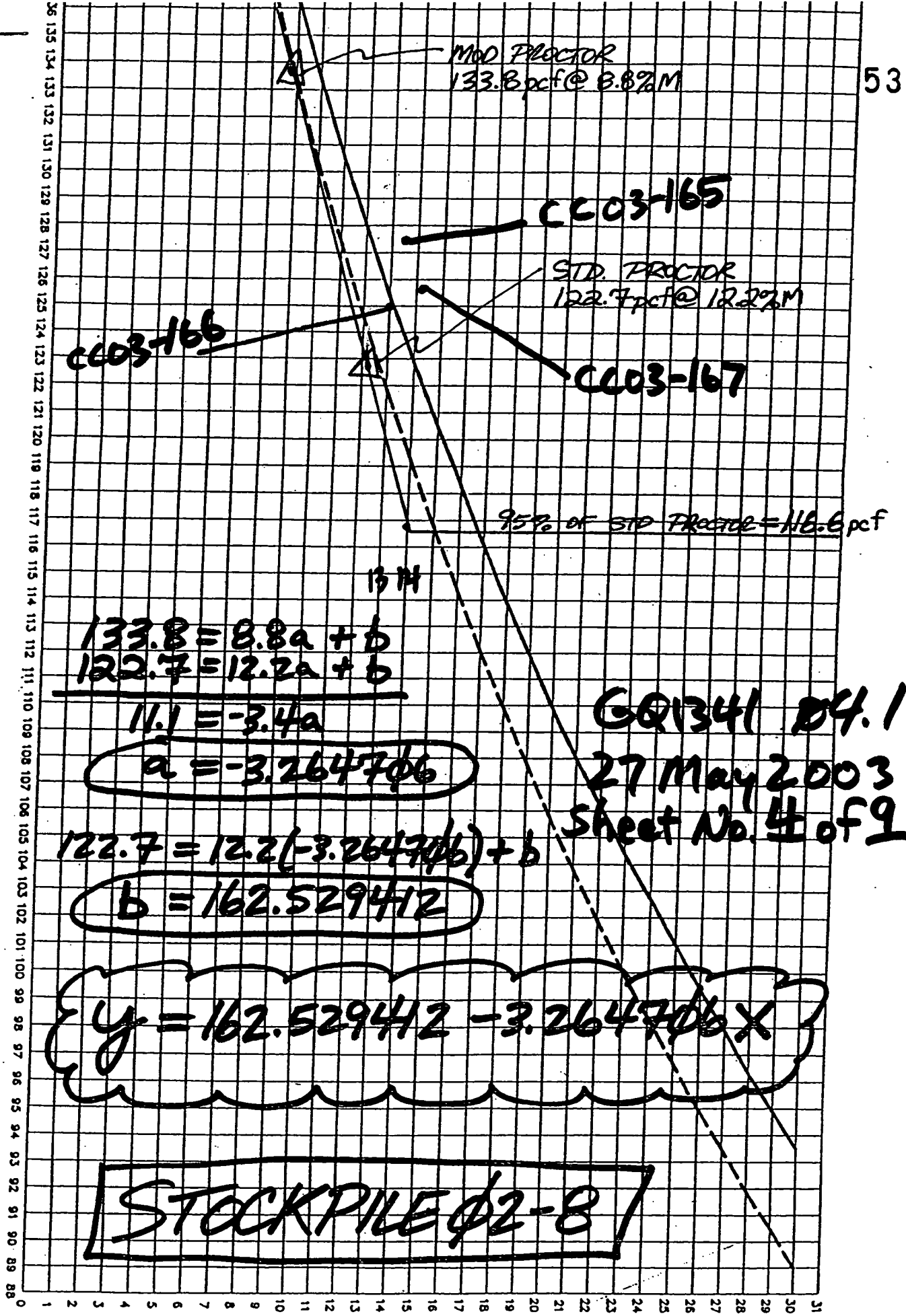


$133.8 = 8.8a + b$
$122.7 = 12.2a + b$

$11.1 = -3.4a$

$a = -3.264706$

$122.7 = 12.2(-3.264706) + b$

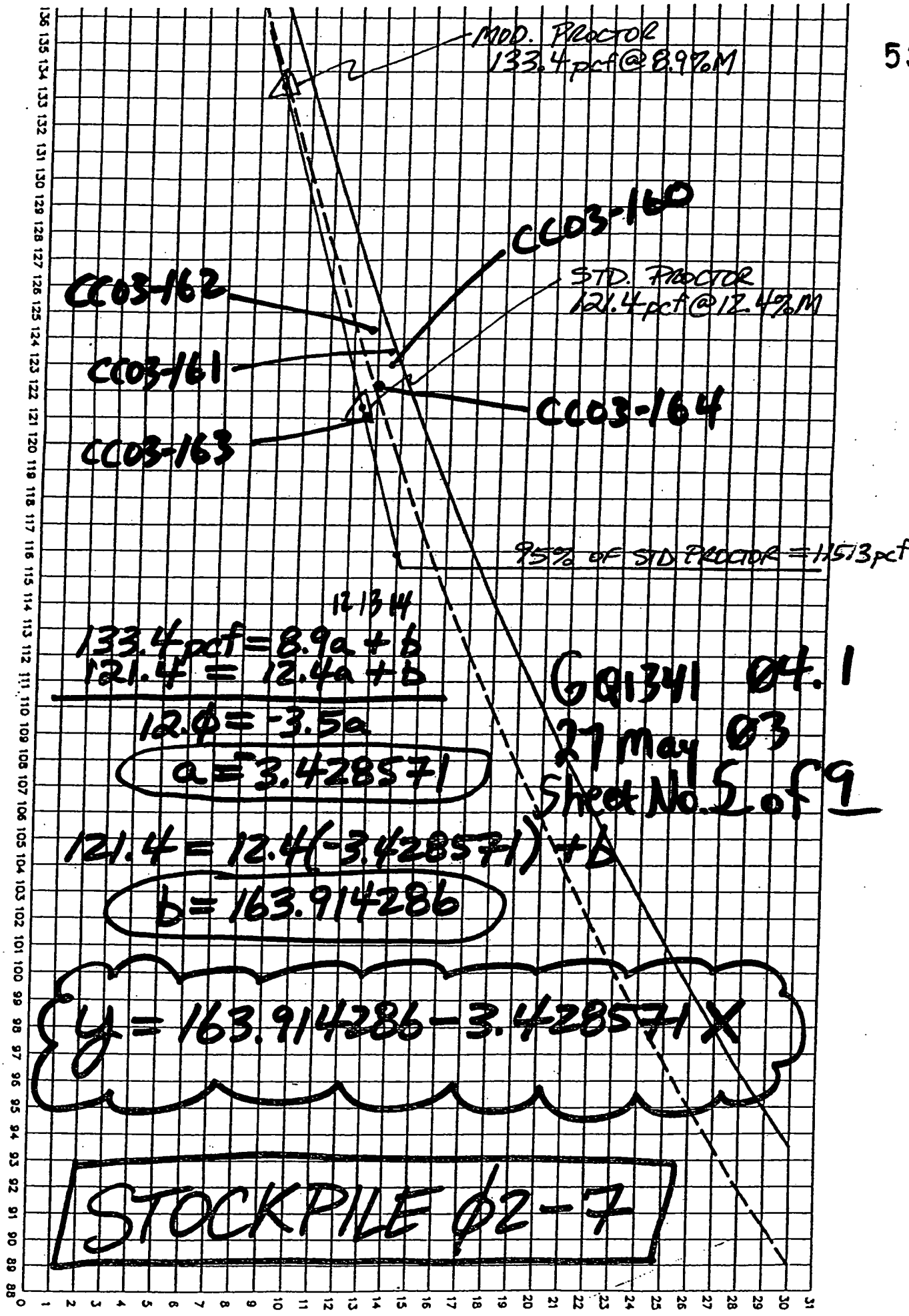
$b = 162.529412$

$y = 162.529412 - 3.264706x$

[STOCKPILE #2-8]

GQ1341 D4.1
27 May 2003
Sheet No. 4 of 9

000295



12/13/14

133.4pcf = 8.9a + b
121.4 = 12.4a + b

12.0 = -3.5a

a = -3.428571

121.4 = 12.4(-3.428571) + b

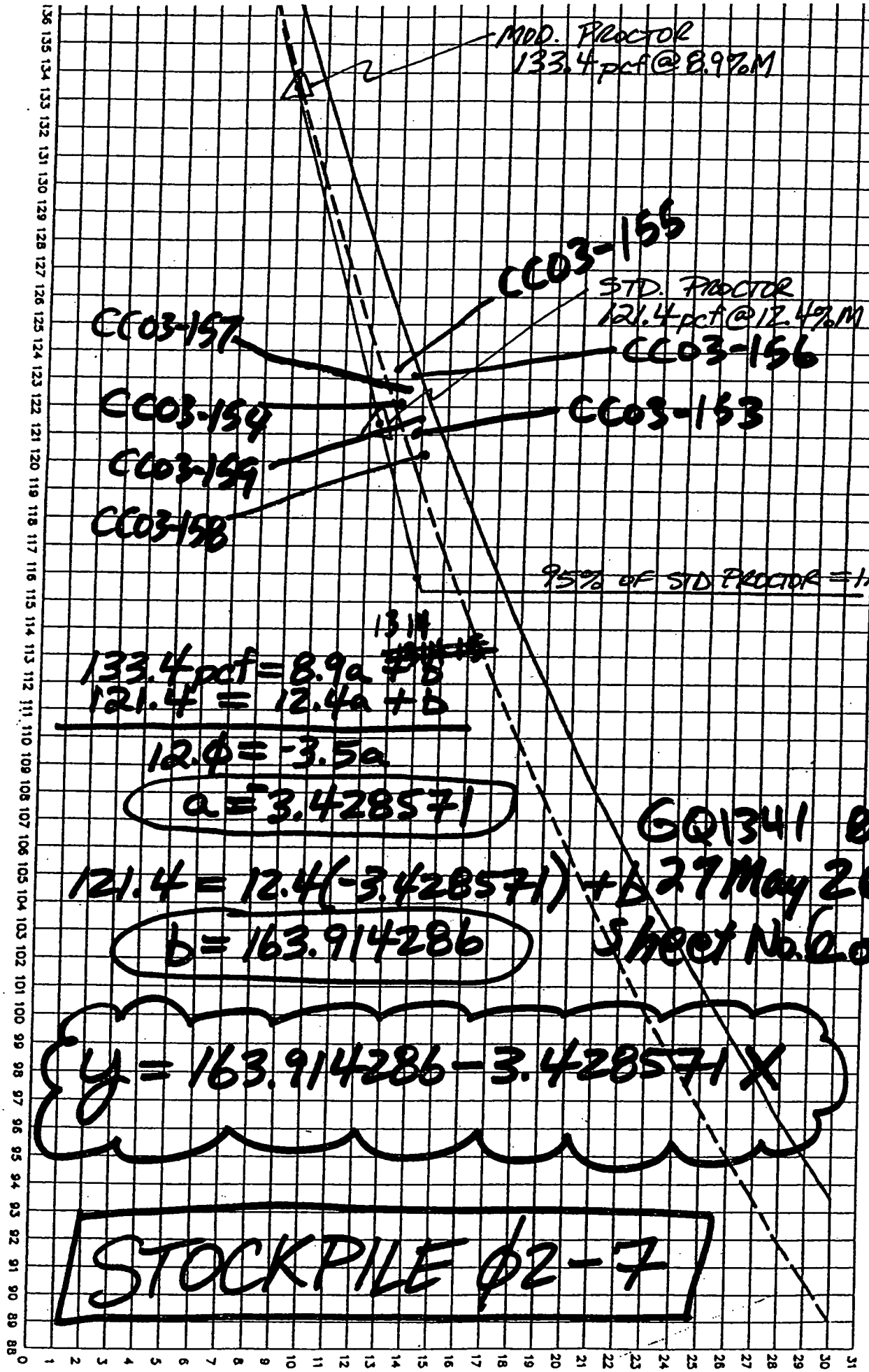
b = 163.914286

y = 163.914286 - 3.428571 X

STOCKPILE 02-7

G01341 04.1
27 May 03
Sheet No. 2 of 9

5370



133.4pcf = 8.9a + b
121.4 = 12.4a + b

12.0 = -3.5a

a = -3.428571

121.4 = 12.4(-3.428571) + b

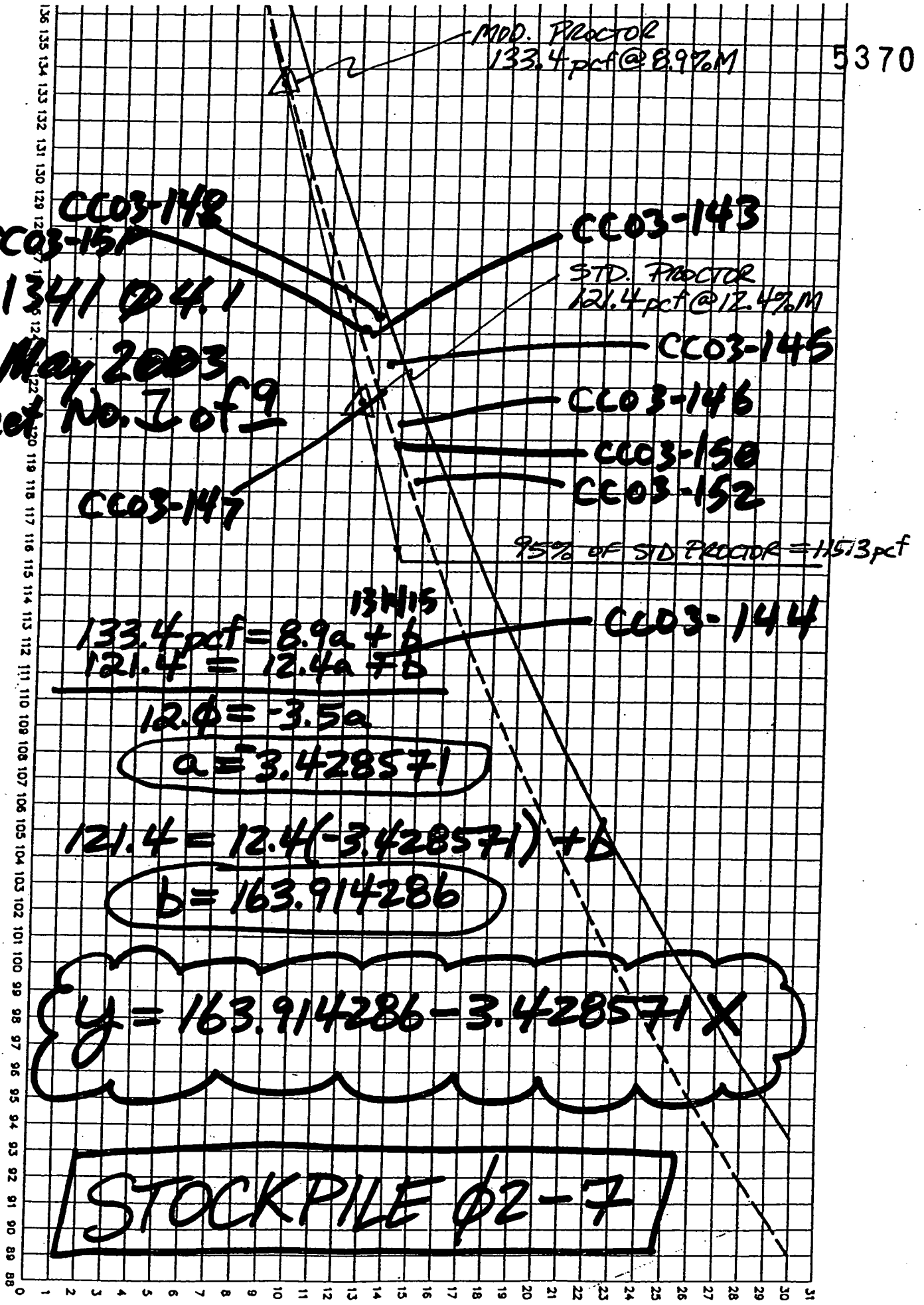
b = 163.914286

GQ1341 04.1
27 May 2003
Sheet No. 6 of 9

$$y = 163.914286 - 3.428571X$$

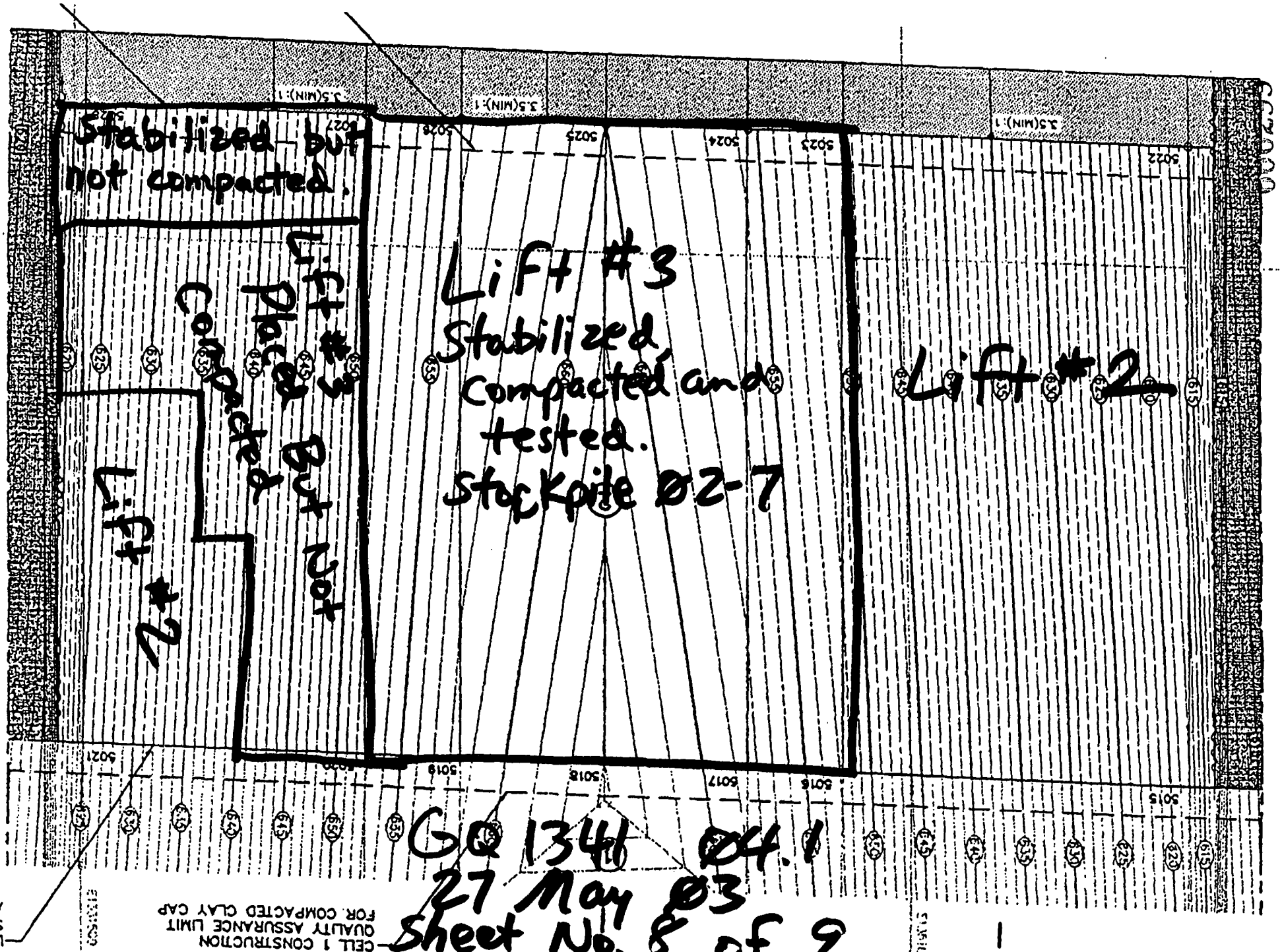
STOCKPILE 02-7

000297


5370
MOD. PROCTOR
133.4pcf@8.9%M
CC03-148
CC03-150
GQ1341 Ø4.1
27 May 2003
Sheet No. 2 of 9
CC03-143
STD. PROCTOR
121.4pcf@12.4%M
CC03-145
CC03-146
CC03-150
CC03-152
CC03-147
95% of STD PROCTOR = 115.3pcf
13H15
CC03-144
133.4pcf = 8.9a + b
121.4 = 12.4a + b
12.Ø = -3.5a
a = -3.428571
121.4 = 12.4(-3.428571) + b
b = 163.914286
y = 163.914286 - 3.428571 X
STOCKPILE Ø2-7
POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE

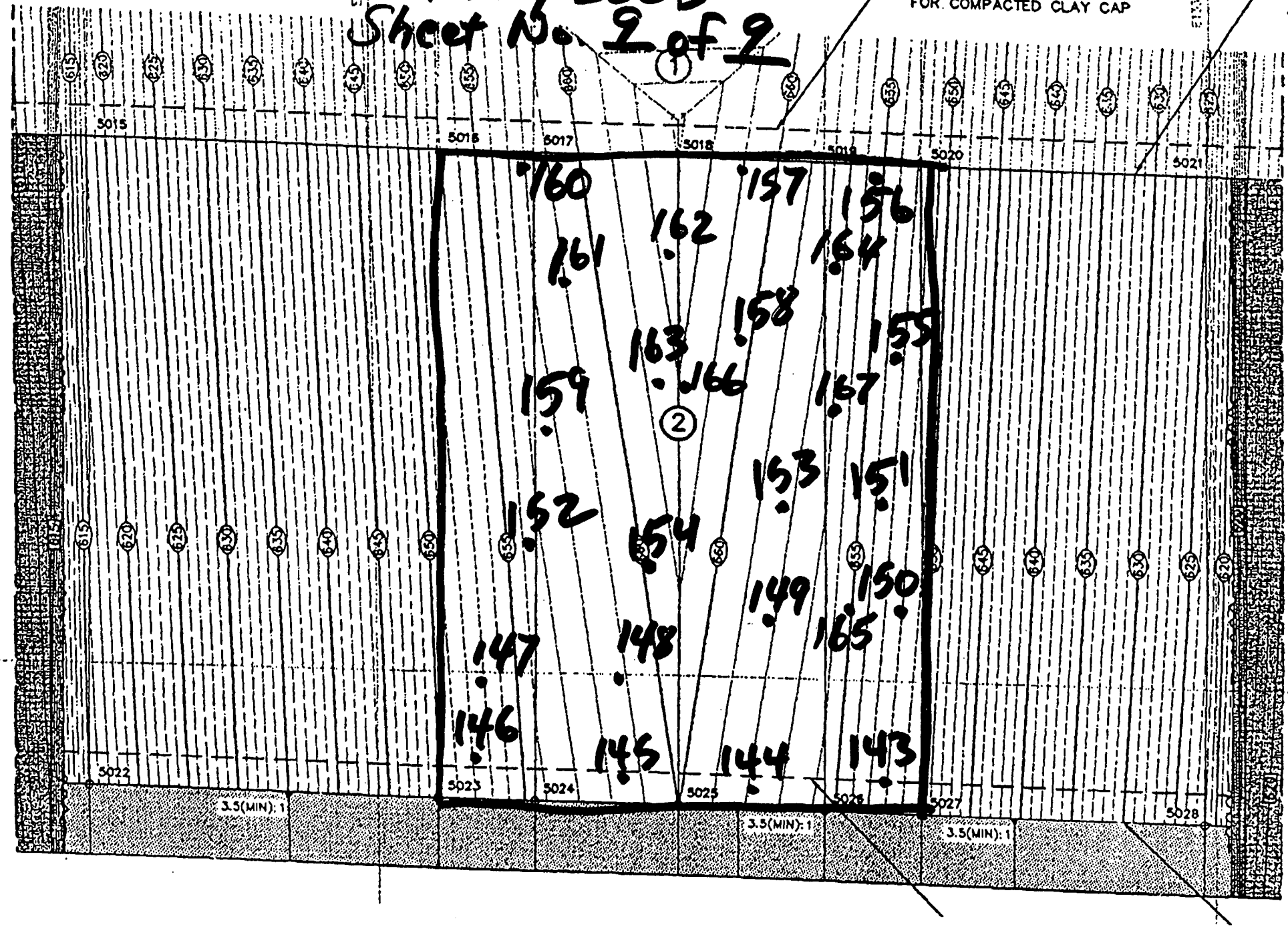
000298

5370



GQ 1341 04.1
27 May 03
Sheet No. 8 of 9

GQ1341 #4.1
27 May 2003
Sheet No. 2 of 2



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GE1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 28 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE) (COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-168	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	11.2 / 13.0	139.1	123.1	101.4	P	—	—	—	—
CC03-169		6" / L-3	02-7	12.4	121.4	11.1 / 12.9	140.7	124.6	102.6	P	—	—	—	—
CC03-170		6" / L-3	02-7	12.4	121.4	13.0 / 14.5	137.5	120.1	98.9	P	—	—	—	—
CC03-171		6" / L-3	02-7	12.4	121.4	11.7 / 13.4	139.8	123.3	101.6	P	—	—	—	—
CC03-172		6" / L-3	02-7	12.4	121.4	14.1 / 15.4	135.6	117.5	96.8	P	—	—	—	—
CC03-173		6" / L-3	02-7	12.4	121.4	12.1 / 13.7	141.0	124.0	102.1	P	—	—	—	—
CC03-174		6" / L-3	02-7	12.4	121.4	11.2 / 13.0	140.8	124.6	102.6	P	—	—	—	—
CC03-175		6" / L-3	02-7	12.4	121.4	13.1 / 14.5	135.8	118.6	97.7	P	—	—	—	—
CC03-176		6" / L-3	02-7	12.4	121.4	10.9 / 12.7	139.9	124.1	102.2	P	—	—	—	—
CC03-177		6" / L-3	02-7	12.4	121.4	11.7 / 13.4	138.9	122.5	100.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 8

000301

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 28 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-178	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	11.0 / 12.8	139.0	123.2	101.5	P	—	—	—	—
CC03-179		6" / L-3	02-7	12.4	121.4	12.9 / 14.4	135.9	118.8	97.9	P	—	—	—	—
CC03-180		6" / L-3	02-7	12.4	121.4	13.2 / 14.6	136.6	119.2	98.2	P	—	—	—	—
CC03-181		6" / L-3	02-7	12.4	121.4	13.6 / 15.0	136.9	119.0	98.0	P	—	—	—	—
CC03-182		6" / L-3	02-7	12.4	121.4	10.6 / 12.5	140.7	125.0	103.0	P	—	—	—	—
CC03-183		6" / L-3	02-7	12.4	121.4	13.5 / 14.9	135.3	117.8	97.0	P	—	—	—	—
CC03-184		6" / L-3	02-7	12.4	121.4	13.2 / 14.6	137.3	119.8	98.7	P	—	—	—	—
CC03-185		6" / L-3	02-7	12.4	121.4	12.0 / 13.6	137.2	120.8	99.5	P	—	—	—	—
CC03-186		6" / L-3	02-7	12.4	121.4	10.6 / 12.5	126.9	112.8	92.9	—	F	CC03-195	P	—
CC03-187		6" / L-3	02-7	12.4	121.4	13.6 / 15.0	135.0	117.4	96.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: SHEET NO. 2 OF 8

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO. GQ1341 TASK NO.: 104.1

DATE: 28 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0 - +3% LIFT THICKNESS (LOOSE)/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-188	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	12.5 / 14.0	138.1	121.1	99.8	P	—	—	—	—
CC03-189		6" / L-3	02-7	12.4	121.4	11.6 / 13.3	138.0	121.8	100.3	P	—	—	—	—
CC03-190		6" / L-3	02-7	12.4	121.4	11.9 / 13.5	138.2	121.8	100.3	P	—	—	—	—
CC03-191		6" / L-3	02-7	12.4	121.4	11.3 / 13.0	137.7	121.9	100.4	P	—	—	—	—
CC03-192		6" / L-3	02-7	12.4	121.4	12.7 / 14.2	137.9	120.8	99.5	P	—	—	—	—
CC03-193		6" / L-3	02-7	12.4	121.4	11.9 / 13.5	139.2	122.6	101.0	P	—	—	—	—
CC03-194	↑	6" / L-3	02-7	12.4	121.4	11.2 / 13.0	136.5	120.8	99.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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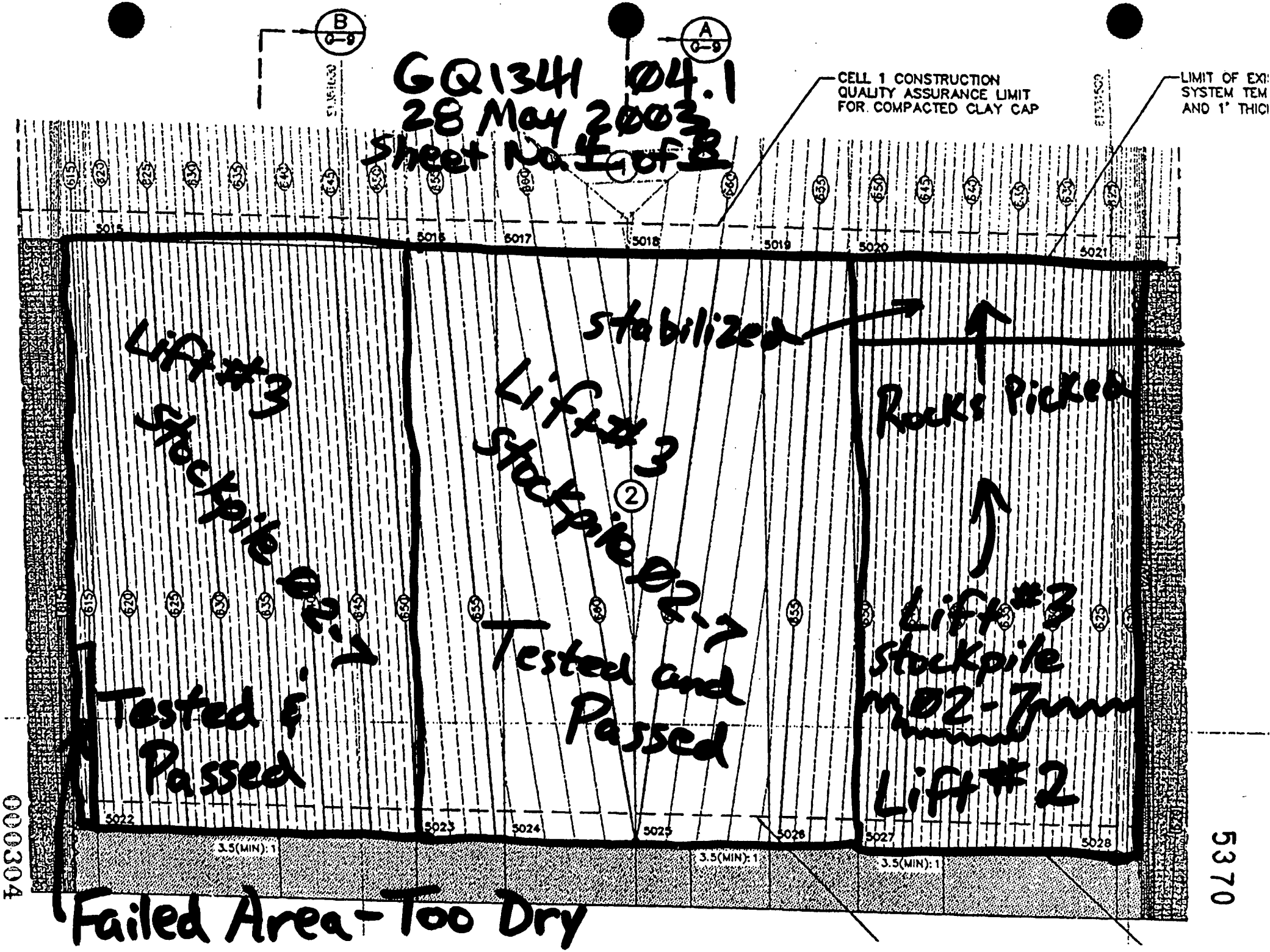
GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 3 OF 8

GQ1341 Ø4.1
28 May 2003
Sheet No. 1 of 3



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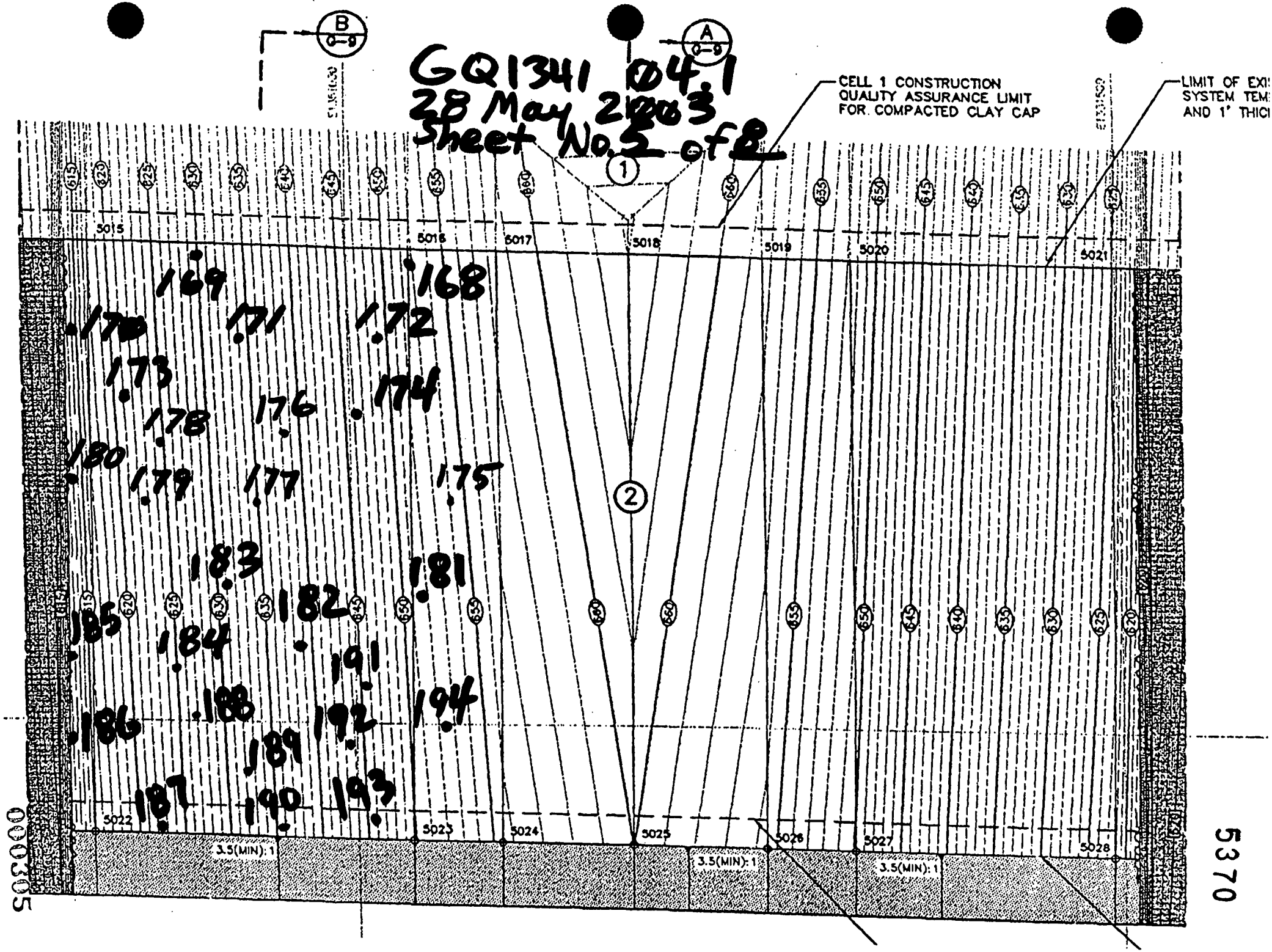
GQ1341 D4.1
28 May 2003
Sheet No. 5 of 8



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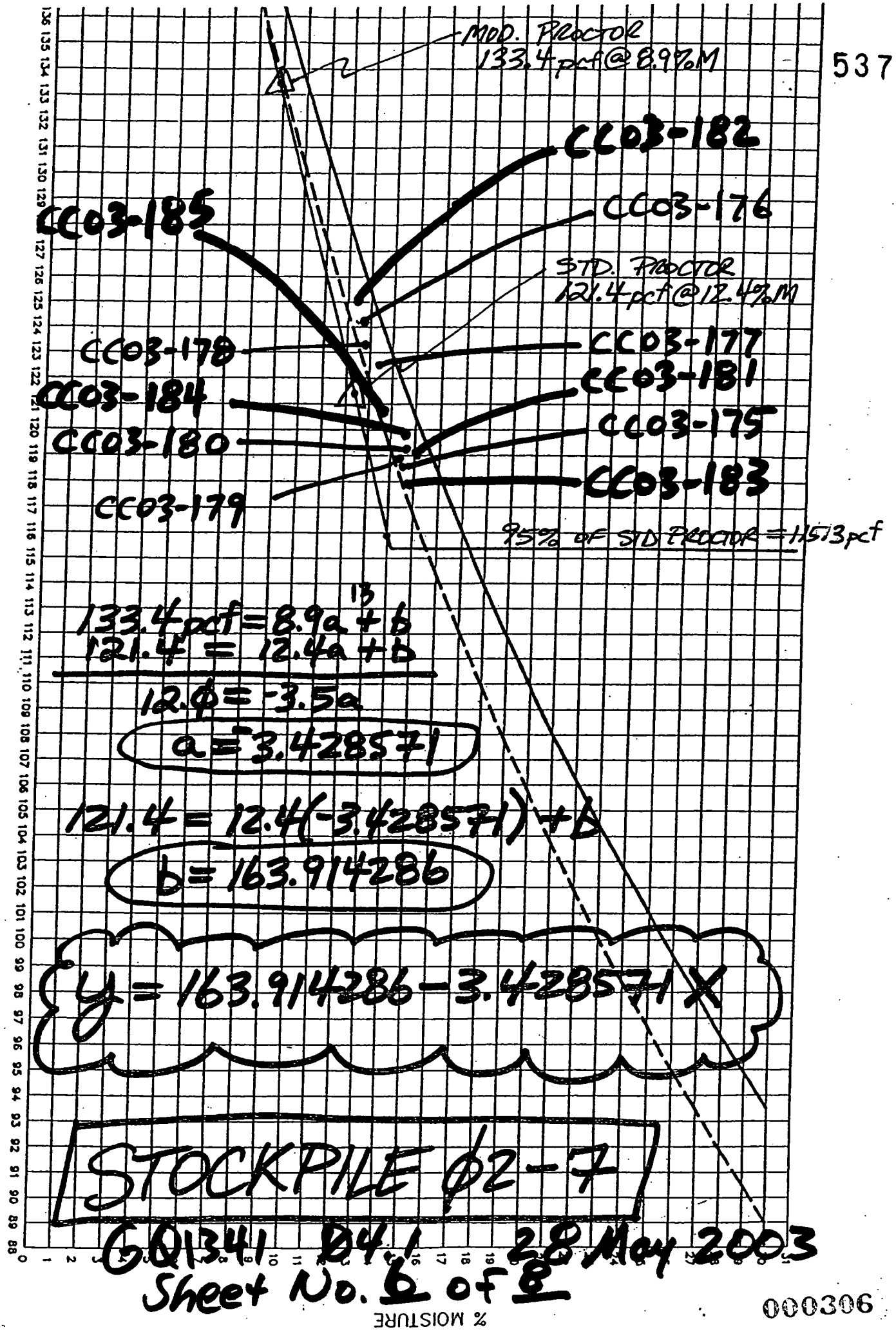


$133.4\,pcf = 8.9a + b$

$121.4 = 12.4a + b$

$12.0 = -3.5a$

$a = -3.428571$

$121.4 = 12.4(-3.428571) + b$

$b = 163.914286$

$y = 163.914286 - 3.428571x$

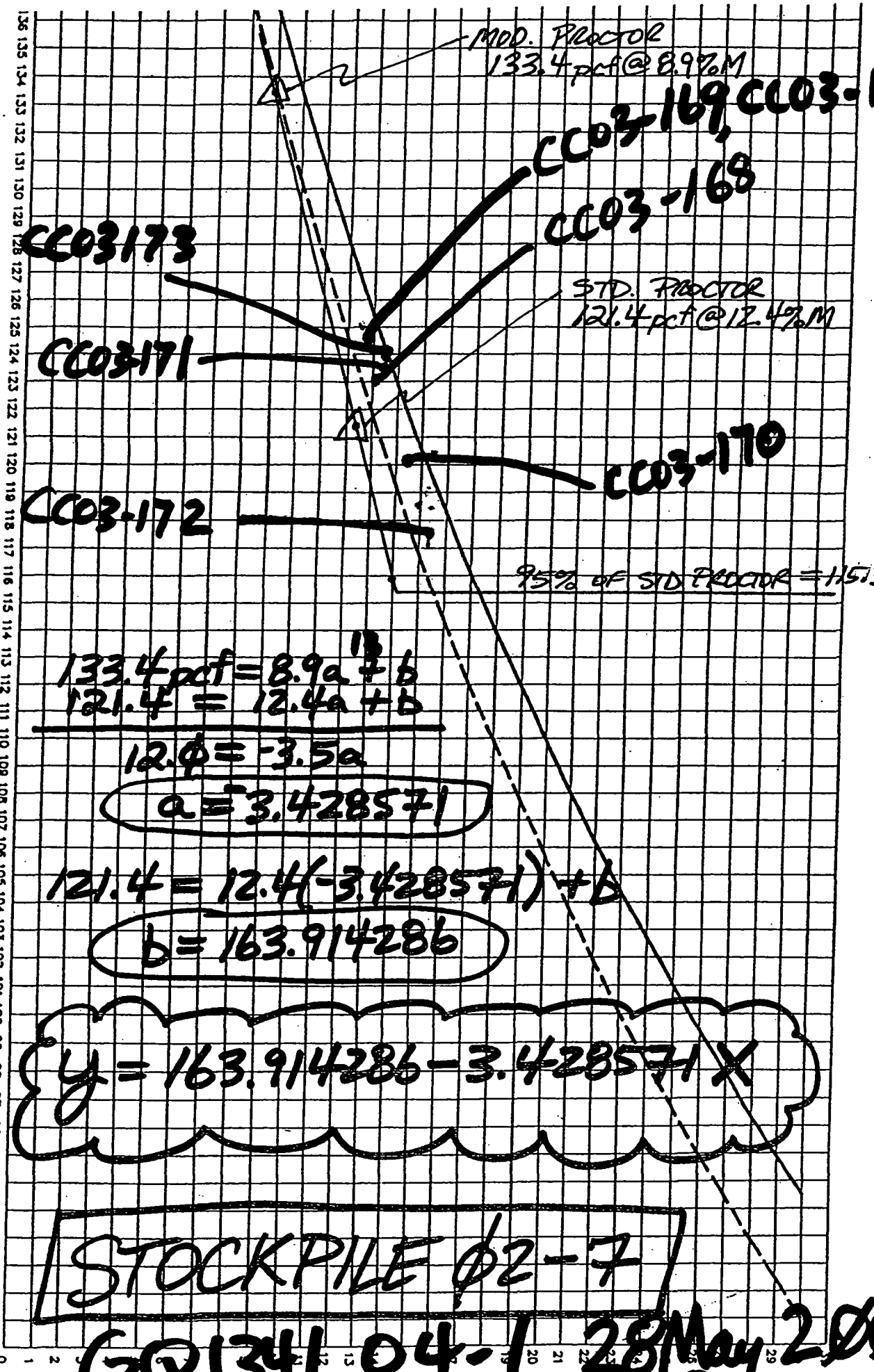
[STOCKPILE 02-7]

GQ1341 04.1 28 May 2003

Sheet No. 6 of 8

000306

5370



$133.4\,pcf = 8.9a + b$
$121.4 = 12.4a + b$

$12.0 = -3.5a$

$a = -3.428571$

$121.4 = 12.4(-3.428571) + b$

$b = 163.914286$

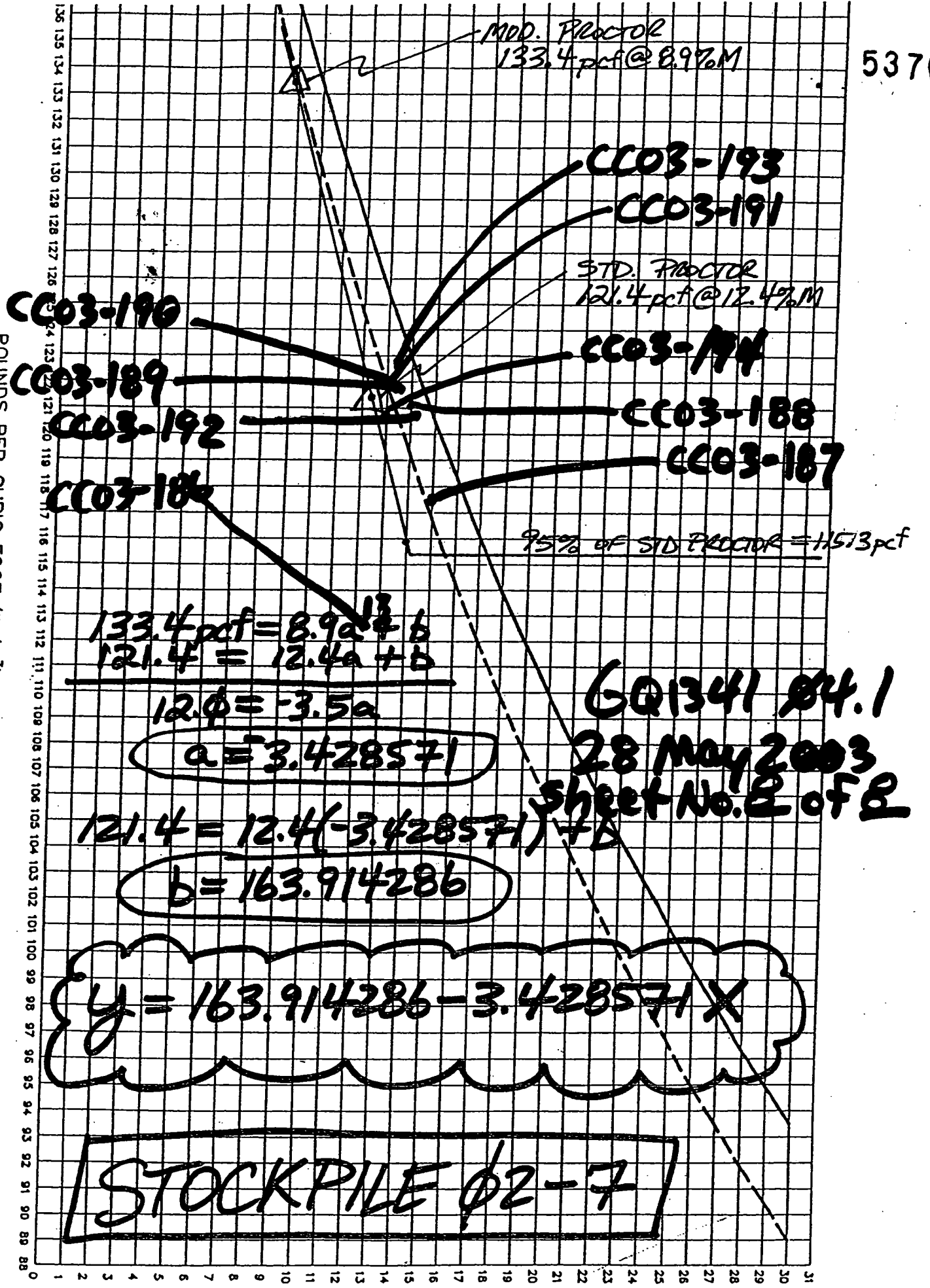
$y = 163.914286 - 3.428571X$

[STOCKPILE 02-7]

GQ1341 04-1 28 May 2003
Sheet No. 1 of 8

000307

5370



$133.4\text{pcf} = 8.9a + b$
$121.4 = 12.4a + b$

$12.0 = -3.5a$

$a = -3.428571$

$121.4 = 12.4(-3.428571) + b$

$b = 163.914286$

$y = 163.914286 - 3.428571x$

GQ1341 #4.1
28 May 2003
Sheet No. 2 of 2

STOCKPILE #2-7

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 29 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): ___

MATERIAL SOURCE: Stockpile 02-7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHOU

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CC03-195	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	10.9 / 12.7	140.9	125.0	102.9	P	—	—	—	—
CC03-196		6" / L-3	02-7	12.4	121.4	13.1 / 14.5	133.4	116.5	96.0	P	—	—	—	—
CC03-197		6" / L-3	02-7	12.4	121.4	11.4 / 13.1	140.1	123.9	102.1	P	—	—	—	—
CC03-198		6" / L-3	02-7	12.4	121.4	13.9 / 15.2	136.7	118.7	97.8	P	—	—	—	—
CC03-199		6" / L-3	02-7	12.4	121.4	11.3 / 13.0	135.0	119.5	98.4	P	—	—	—	—
CC03-200		6" / L-3	02-7	12.4	121.4	11.5 / 13.2	137.3	121.3	99.9	P	—	—	—	—
CC03-201		6" / L-3	02-7	12.4	121.4	12.0 / 13.6	138.9	122.3	100.7	P	—	—	—	—
CC03-202		6" / L-3	02-7	12.4	121.4	12.9 / 14.4	138.9	121.4	100.0	P	—	—	—	—
CC03-203		6" / L-3	02-7	12.4	121.4	11.3 / 13.9	140.5	124.3	102.4	P	—	—	—	—
CC03-204		6" / L-3	02-7	12.4	121.4	11.3 / 13.0	141.4	125.1	103.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 1

000309

537017

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G0134 TASK NO.: 04.1

DESCRIPTION: Phase V

DATE: 29 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CC03-205	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	11.6 / 13.3	138.2	122.0	100.5	P	—	—	—	—
CC03-206		6" / L-3	02-7	12.4	121.4	12.4 / 14.0	137.0	120.2	99.0	P	—	—	—	—
CC03-207		6" / L-3	02-7	12.4	121.4	12.3 / 13.9	138.1	121.2	99.8	P	—	—	—	—
CC03-208		6" / L-3	02-7	12.4	121.4	12.9 / 14.4	134.7	117.7	97.0	P	—	—	—	—
CC03-209		6" / L-3	02-7	12.4	121.4	12.5 / 14.0	135.5	118.9	97.9	P	—	—	—	—
CC03-210		6" / L-3	02-7	12.4	121.4	14.0 / 15.3	135.8	117.8	97.0	P	—	—	—	—
CC03-211		6" / L-3	02-7	12.4	121.4	13.2 / 14.6	136.4	119.0	98.0	P	—	—	—	—
CC03-212		6" / L-3	02-7	12.4	121.4	13.9 / 15.2	135.1	117.2	96.5	P	—	—	—	—
CC03-213		6" / L-3	02-7	12.4	121.4	14.0 / 15.3	136.7	118.6	97.7	P	—	—	—	—
CC03-214		6" / L-3	02-7	12.4	121.4	11.1 / 12.9	128.3	113.6	93.6	—	F	CC03223	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000310

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 29 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0 - +3% LIFT THICKNESS (LOOSE) / COMPACTED: ≈8"

MATERIAL SOURCE: Stockpile 02-7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-215	Cell #2 Clay Cap	6" / L-3	02-7	12.4	121.4	13.3 ~~14.7~~	136.7	119.2	98.2	P	—	—	—	—
CC03-216		6" / L-3	02-7	12.4	121.4	13.5 ~~14.9~~	135.7	118.1	97.3	P	—	—	—	—
CC03-217		6" / L-3	02-7	12.4	121.4	12.4 ~~14.0~~	138.5	121.5	100.1	P	—	—	—	—
CC03-218		6" / L-3	02-7	12.4	121.4	12.5 ~~14.0~~	138.1	121.1	99.8	P	—	—	—	—
CC03-219		6" / L-3	02-7	12.4	121.4	12.4 ~~14.0~~	137.6	120.7	99.4	P	—	—	—	—
CC03-220		6" / L-3	02-7	12.4	121.4	12.3 ~~13.9~~	137.3	120.5	99.3	P	—	—	—	—
CC03-221		6" / L-3	02-7	12.4	121.4	12.1 ~~13.7~~	137.9	121.3	99.9	P	—	—	—	—
CC03-222		6" / L-3	02-7	12.4	121.4	12.9 ~~14.4~~	139.7	122.1	100.6	P	—	—	—	—
CC03-223		6" / L-3	02-7	12.4	121.4	14.0 ~~15.3~~	134.2	116.5	96.0	P	—	—	—	—
CC03-224		6" / L-3	02-7	12.4	121.4	12.0 ~~12.9~~ 13.6 CHW	137.3	120.9	99.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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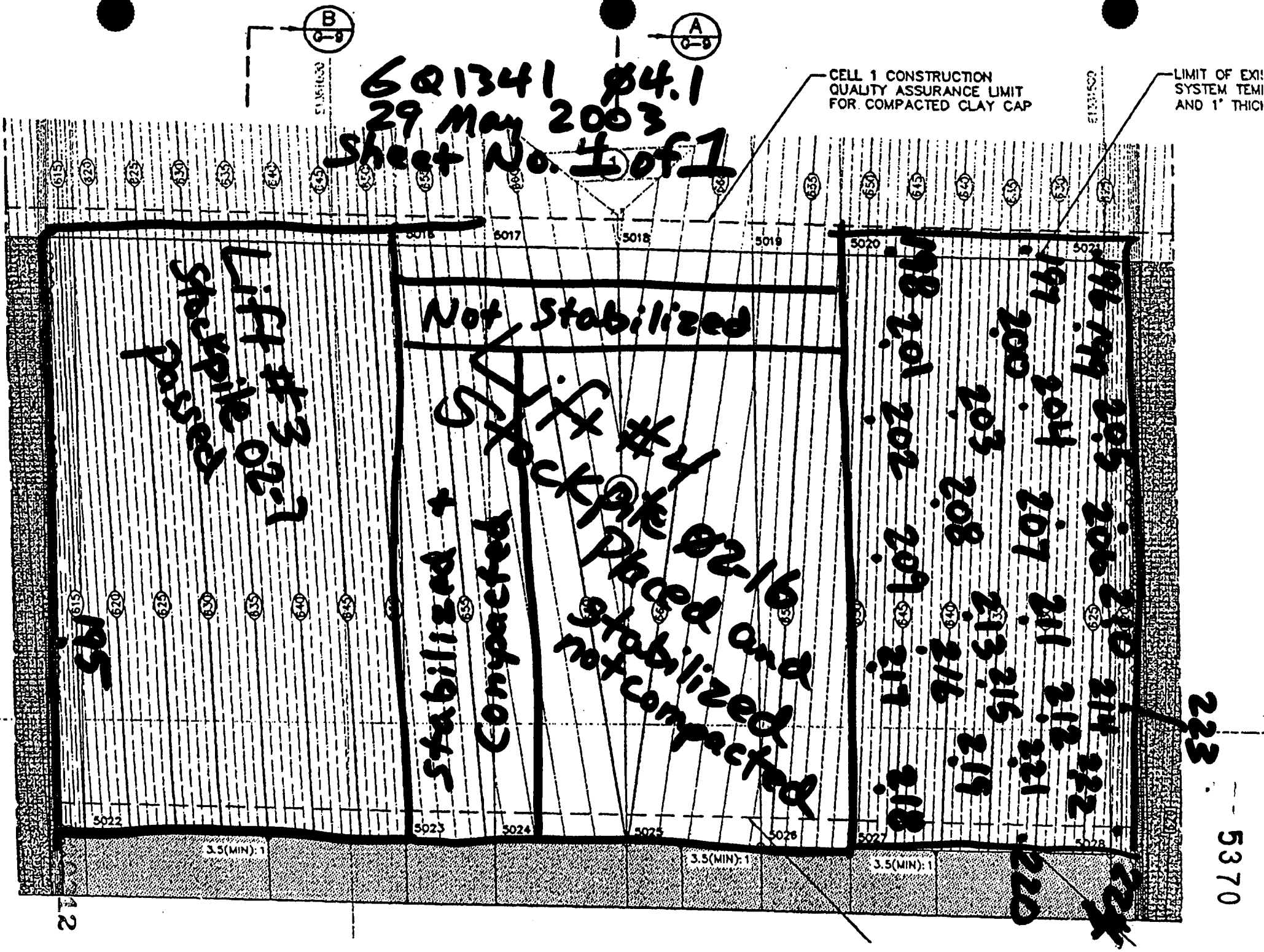
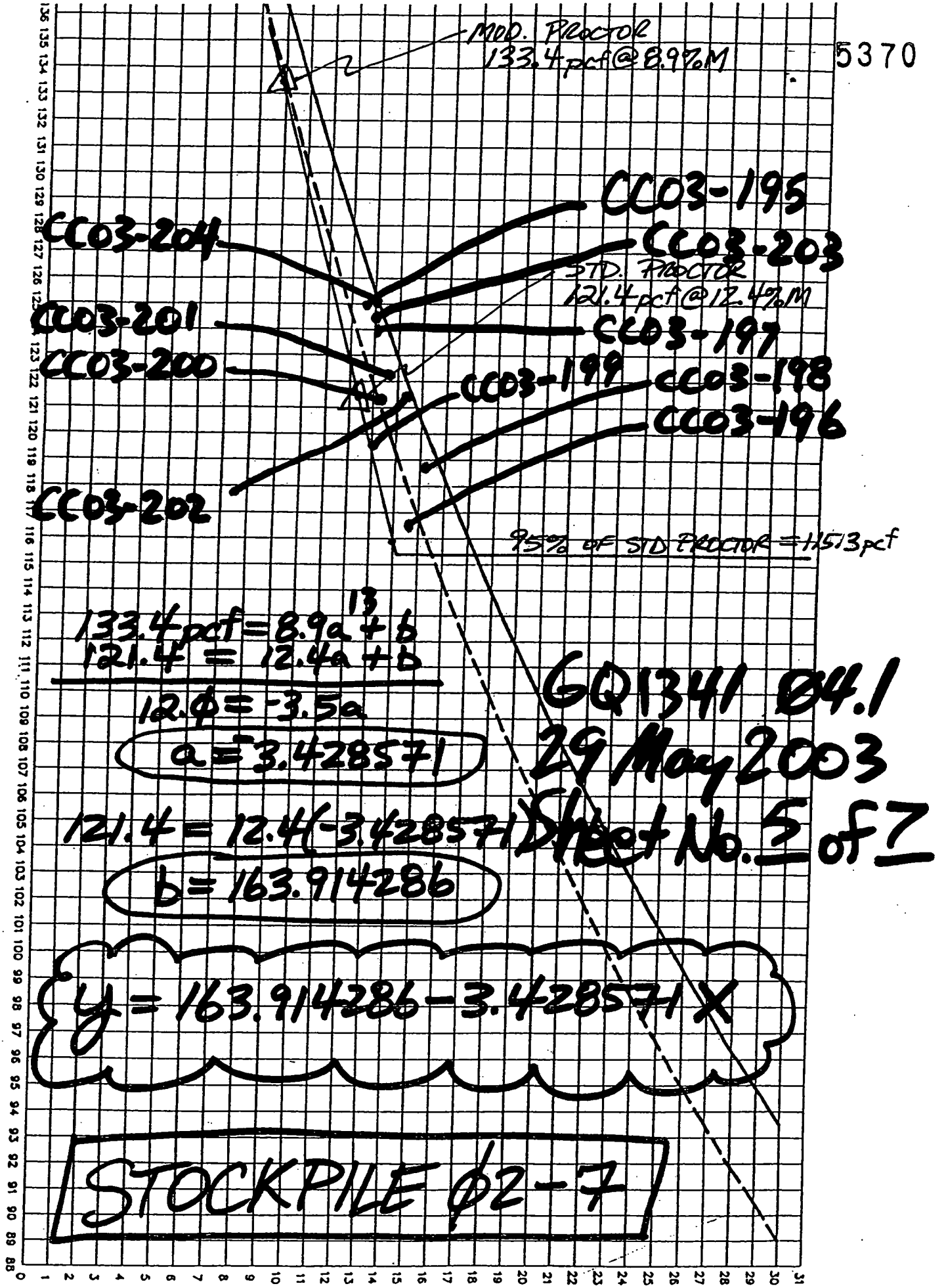
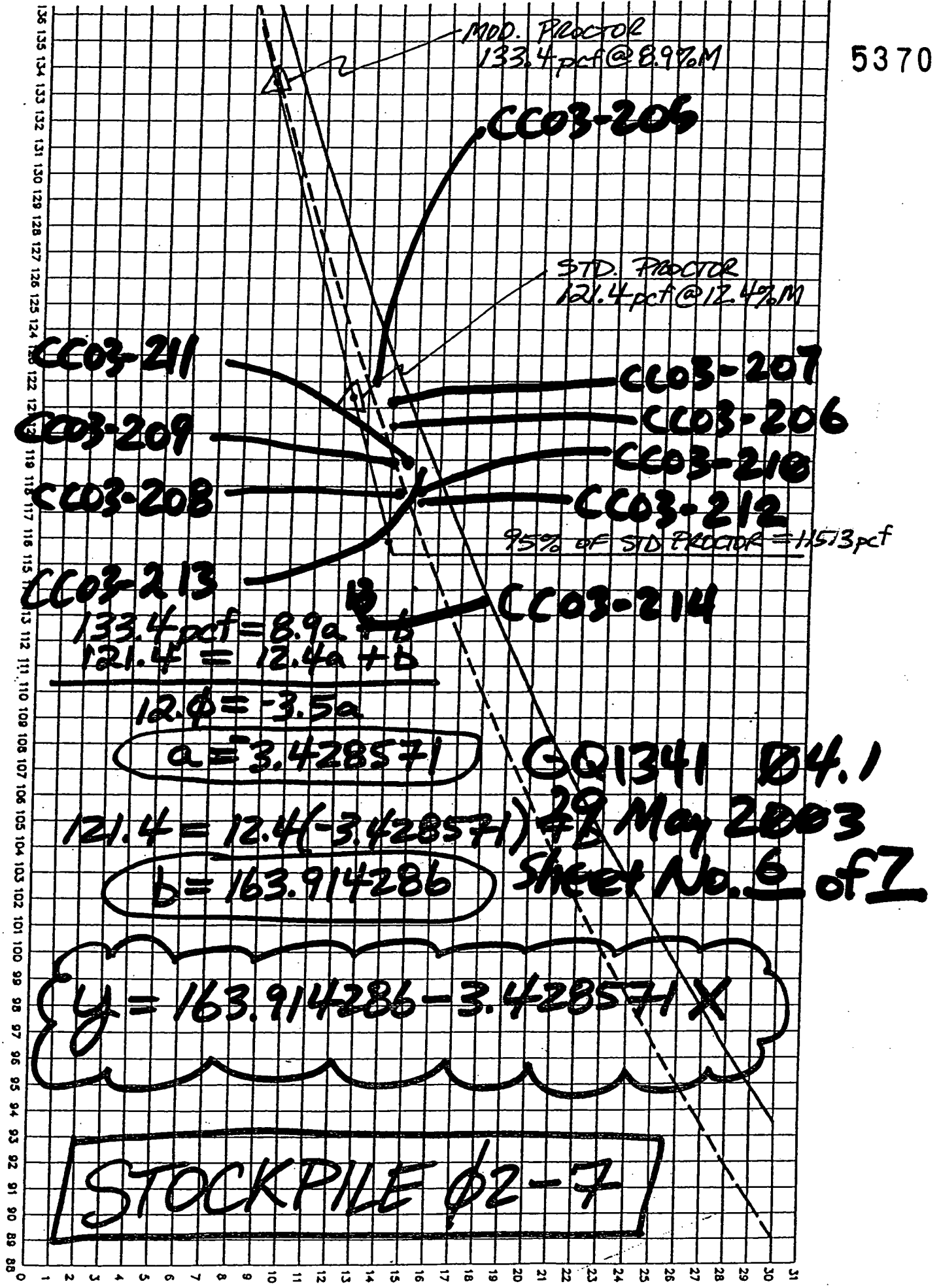
GQ1341 #4.1
29 May 2003
Sheet No. 1 of 1




5370
MOD. PROCTOR
133.4pcf@8.9%M
CC03-195
CC03-204
CC03-203
STD. PROCTOR
121.4pcf@12.4%M
CC03-201
CC03-197
CC03-200
CC03-199
CC03-198
CC03-196
CC03-202
95% of STD PROCTOR = 115.3pcf
133.4pcf = 8.9a + b
121.4 = 12.4a + b
12.0 = -3.5a
a = -3.428571
121.4 = 12.4(-3.428571) + b
b = 163.914286
y = 163.914286 - 3.428571 X
STOCKPILE 02-7
GQ1341 04.1
29 May 2003
Sheet No. 5 of 7
POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE

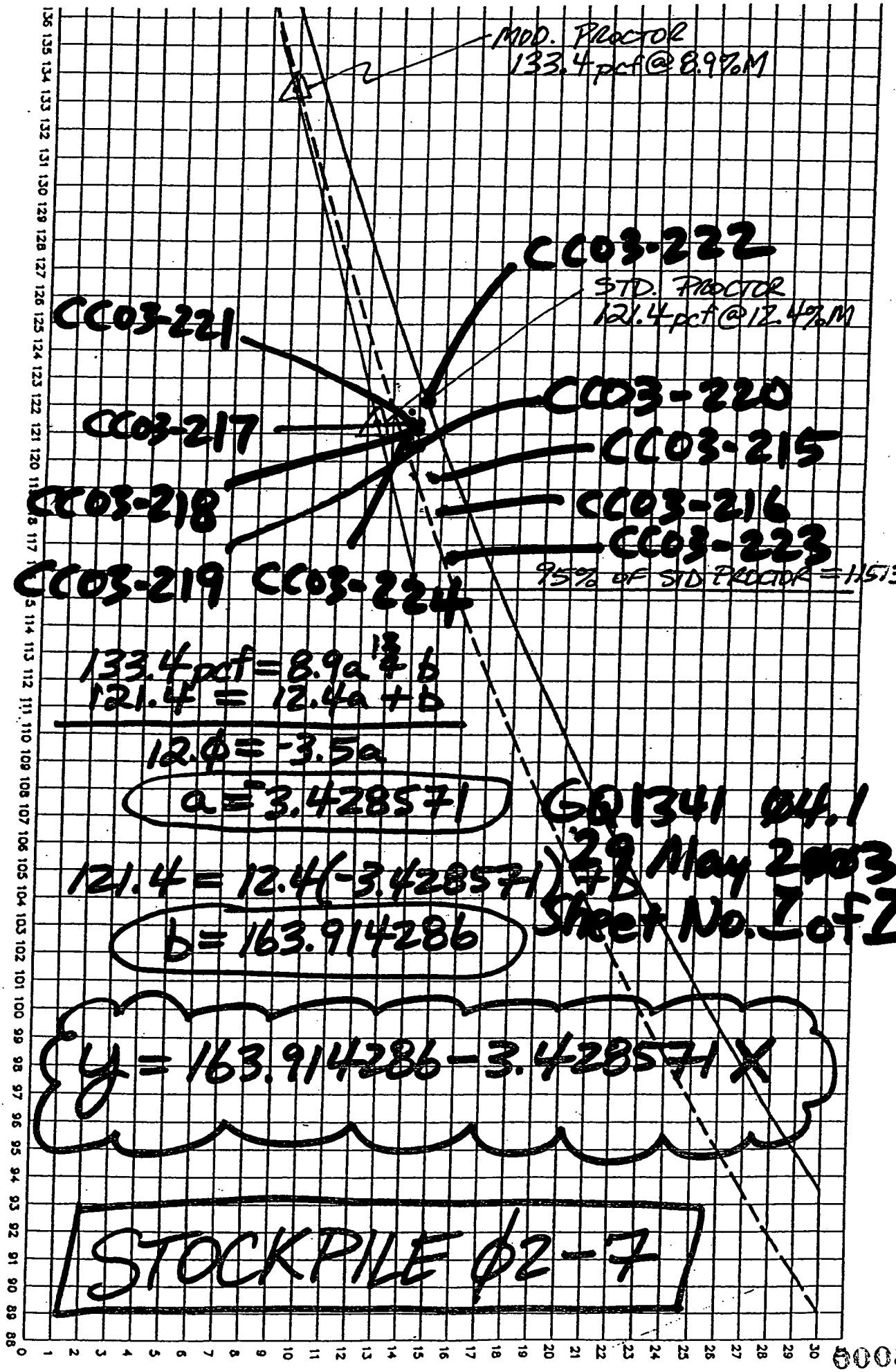
5370



GQ1341 04.1
28 May 2003
Sheet No. 6 of 7

000314

5370



133.4pcf = 8.9a + b
121.4 = 12.4a + b

12.0 = -3.5a

a = -3.428571

121.4 = 12.4(-3.428571) + b

b = 163.914286

$$y = 163.914286 - 3.428571x$$

[STOCKPILE 02-7]

GQ1341 004.1
29 May 2003
Sheet No. 1 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 30 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ~8"

MATERIAL SOURCE: Stockpile 02-16

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-225	Cell #2 Clay Cap	6" / L-4	02-16	13.1	120.9	14.5 / 15.7	134.0	115.8	95.8	P	—	—	—	—
CC03-226		6" / L-4	02-16	13.1	120.9	14.8 / 16.0	130.7	112.7	93.2	—	F	CC03-245	P	—
CC03-227		6" / L-4	02-16	13.1	120.9	14.5 / 15.7	130.5	112.8	93.3	—	F	CC03-254	P	—
CC03-228		6" / L-4	02-16	13.1	120.9	15.0 / 16.1	132.1	113.8	94.1	—	F	CC03-255	P	—
CC03-229		6" / L-4	02-16	13.1	120.9	14.5 / 15.7	134.6	116.3	96.2	P	—	—	—	—
CC03-230		6" / L-4	02-16	13.1	120.9	11.7 / 13.4	138.5	122.1	101.0	P	—	—	—	—
CC03-231		6" / L-4	02-16	13.1	120.9	11.9 / 13.5	137.9	121.5	100.5	P	—	—	—	—
CC03-232		6" / L-4	02-16	13.1	120.9	12.3 / 13.9	137.1	120.36	99.6	P	—	—	—	—
CC03-233		6" / L-4	02-16	13.1	120.9	11.8 / 13.5	138.6	122.1	101.0	P	—	—	—	—
CC03-234		6" / L-4	02-16	13.1	120.9	12.9 / 14.4	136.7	119.5	98.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000316

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase I

DATE: 30 day May month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-1% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-16 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TRAXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-235	Cell #2 Clay Cap	6" / L-4	02-16	13.1	120.9	12.4 / 14.0	136.7	119.9	99.2	P	—	—	—	—
CC03-236		6" / L-4	02-16	13.1	120.9	12.1 / 13.7	138.4	121.7	100.7	P	—	—	—	—
CC03-237		6" / L-4	02-16	13.1	120.9	13.0 / 14.5	135.9	~~118.7~~	98.2	P	—	—	—	—
CC03-238		6" / L-4	02-16	13.1	120.9	12.9 / 14.4	134.5	117.6	97.3	P	—	—	—	—
CC03-239		6" / L-4	02-16	13.1	120.9	12.0 / 13.6	138.5	121.9	100.8	P	—	—	—	—
CC03-240		6" / L-4	02-16	13.1	120.9	12.9 / 14.4	136.5	119.3	98.7	P	—	—	—	—
CC03-241		6" / L-4	02-16	13.1	120.9	12.7 / 14.2	135.7	118.8	98.3	P	—	—	—	—
CC03-242		6" / L-4	02-16	13.1	120.9	11.8 / 13.5	137.5	121.1	100.2	P	—	—	—	—
CC03-243		6" / L-4	02-16	13.1	120.9	12.6 / 14.1	135.1	118.4	97.9	P	—	—	—	—
CC03-244		6" / L-4	02-16	13.1	120.9	12.6 / 14.1	136.1	119.3	98.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000347

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 30 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): ___

MATERIAL SOURCE: Stockpile 02-16 Clay Wedge - Stockpile 98-13 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-245	Cell #2 Clay Cap	6" / L-4	02-16	13.1	120.9	14.2 / 15.5	133.5	115.6	95.6	P	—	—	—	—
CC03-246		6" / L-4	02-16	13.1	120.9	13.4 / 14.8	136.6	119.0	98.4	P	—	—	—	—
CC03-247		6" / L-4	02-16	13.1	120.9	14.2 / 15.5	135.0	116.9	96.7	P	—	—	—	—
CC03-248		6" / L-4	02-16	13.1	120.9	14.0 / 15.3	135.4	117.4	97.1	P	—	—	—	—
CC03-249		6" / L-4	02-16	13.1	120.9	12.0 / 13.6	137.7	121.2	100.2	P	—	—	—	—
CC03-250		6" / L-4	02-16	13.1	120.9	13.9 / 15.2	134.3	116.6	96.4	P	—	—	—	—
CC03-251		6" / L-4	02-16	13.1	120.9	11.8 / 13.5	136.3	120.1	99.3	P	—	—	—	—
CC03-252		6" / L-4	98-13	13.3	120.9	13.1 / 14.5	134.5	117.5	97.2	~~P~~	~~F~~ FNW	~~CHW~~ CC03-253	~~CHW~~ ~~P~~	—
CC03-253		6" / L-4	98-13	13.2	120.9	13.9 / 15.2	138.1	119.9	99.2	P	—	—	—	—

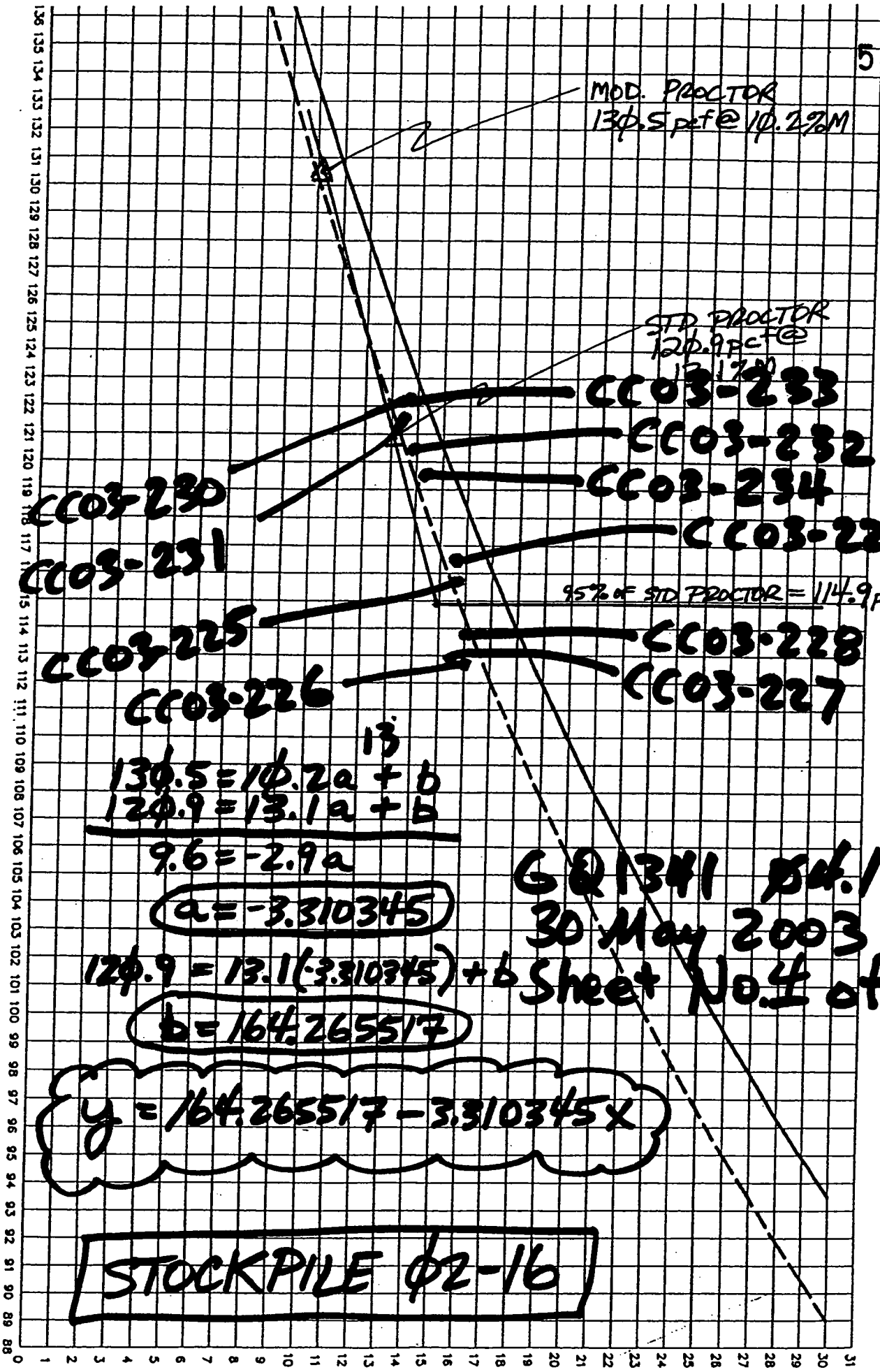
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature]

SHEET NO. 3 OF 12

0000318

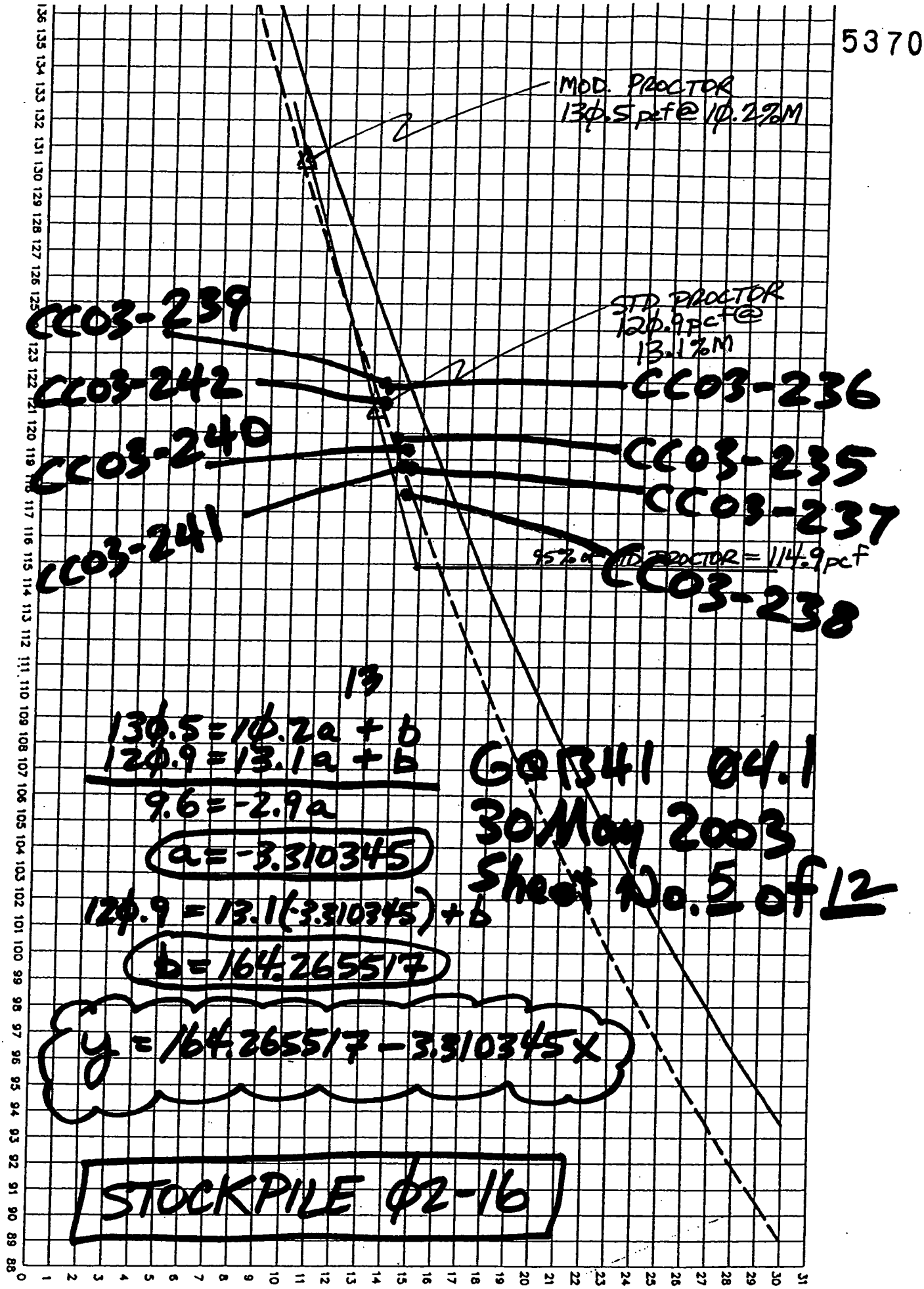
53710



$$13ϕ.5 = 1ϕ.2a + b$$
$$12ϕ.9 = 13.1a + b$$
$$9.6 = -2.9a$$
$$a = -3.310345$$
$$12ϕ.9 = 13.1(-3.310345) + b$$
$$b = 164.2655517$$
$$y = 164.2655517 - 3.310345x$$

GQ1341 ϕ4.1
30 May 2003
Sheet No. 4 of 12

STOCKPILE ϕ2-16



13

$130.5 = 10.2a + b$
$120.9 = 13.1a + b$

$9.6 = -2.9a$

$a = -3.310345$

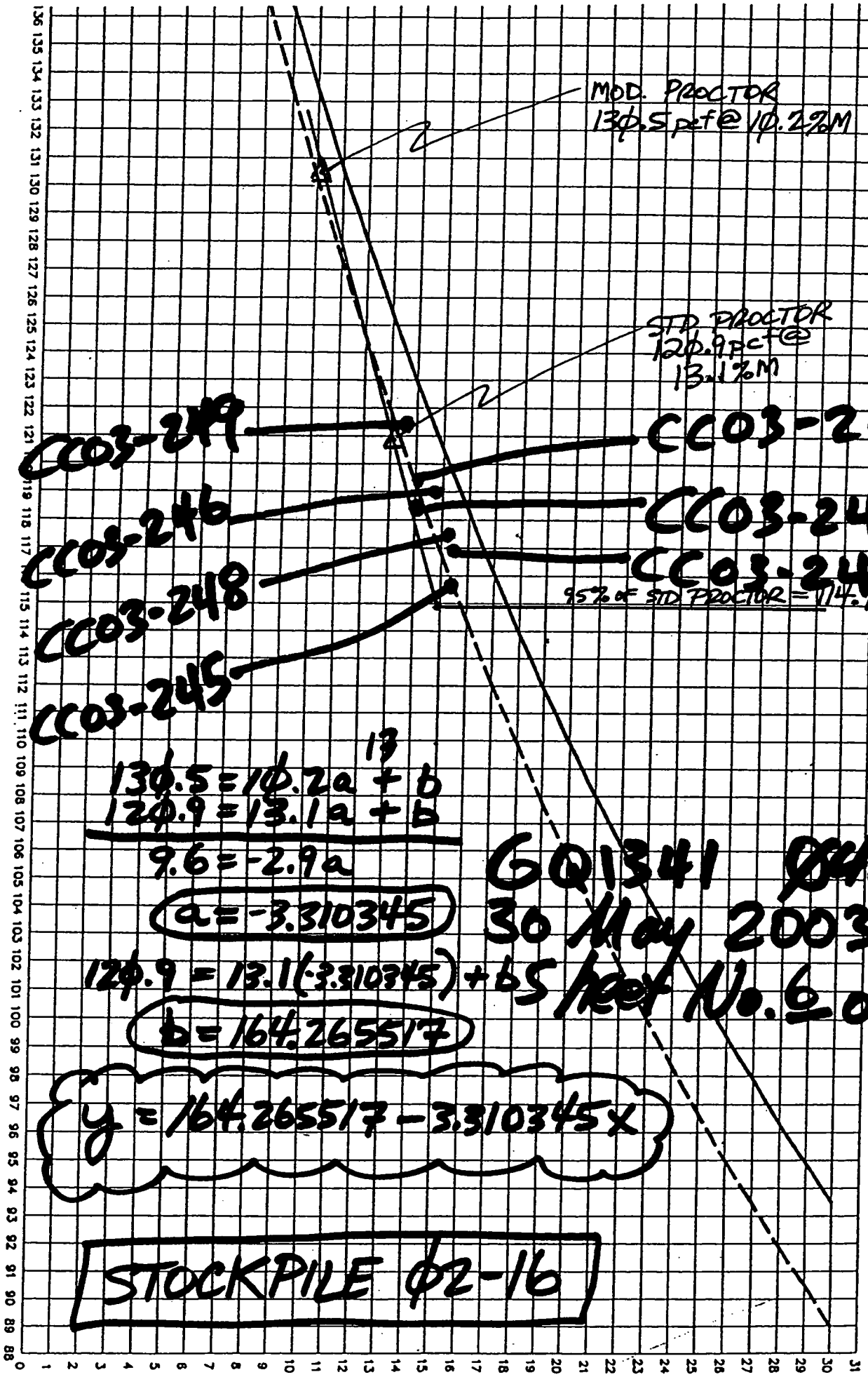
$120.9 = 13.1(-3.310345) + b$

$b = 164.2655517$

$y = 164.2655517 - 3.310345x$

GQ8341 04.1
30 May 2003
Sheet No. 5 of 12

STOCKPILE 02-16



$130.5 = 10.2a + b$ (13)
$120.9 = 13.1a + b$

$9.6 = -2.9a$

$a = -3.310345$

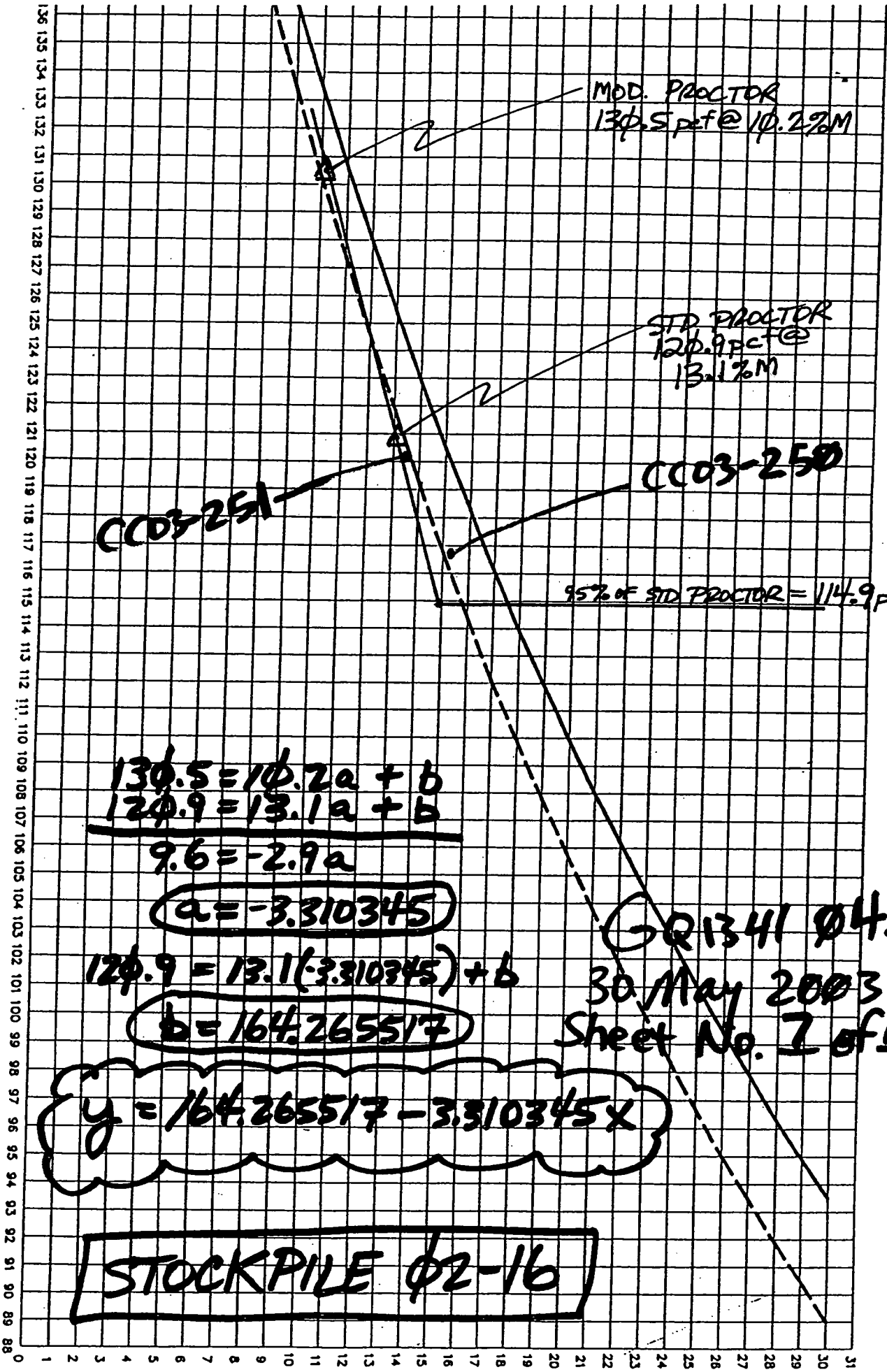
$120.9 = 13.1(-3.310345) + b$

$b = 164.265517$

$y = 164.265517 - 3.310345x$

GQ1341 Rev.1
30 May 2003
Sheet No. 6 of 12

STOCKPILE 02-16



$130.5 = 10.2a + b$
$120.9 = 13.1a + b$

$9.6 = -2.9a$

$a = -3.310345$

$120.9 = 13.1(-3.310345) + b$

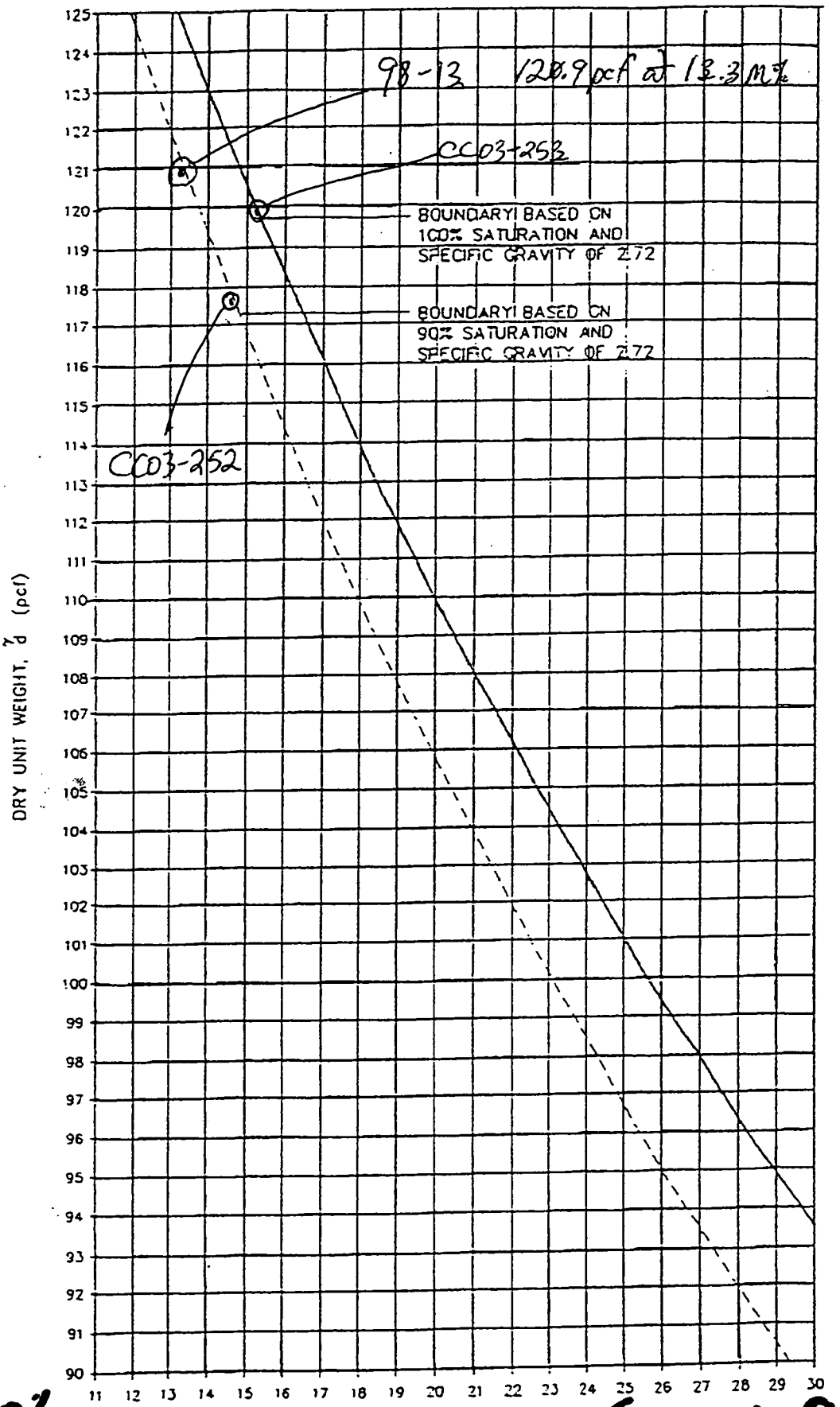
$b = 164.2655517$

$y = 164.2655517 - 3.310345x$

STOCKPILE 02-16

GQ1341 04.1
30 May 2003
Sheet No. 7 of 12

5370



M%

$$\left(\frac{62.4}{DD}\right) - \left(\frac{1}{2.72}\right) \geq 0.9$$

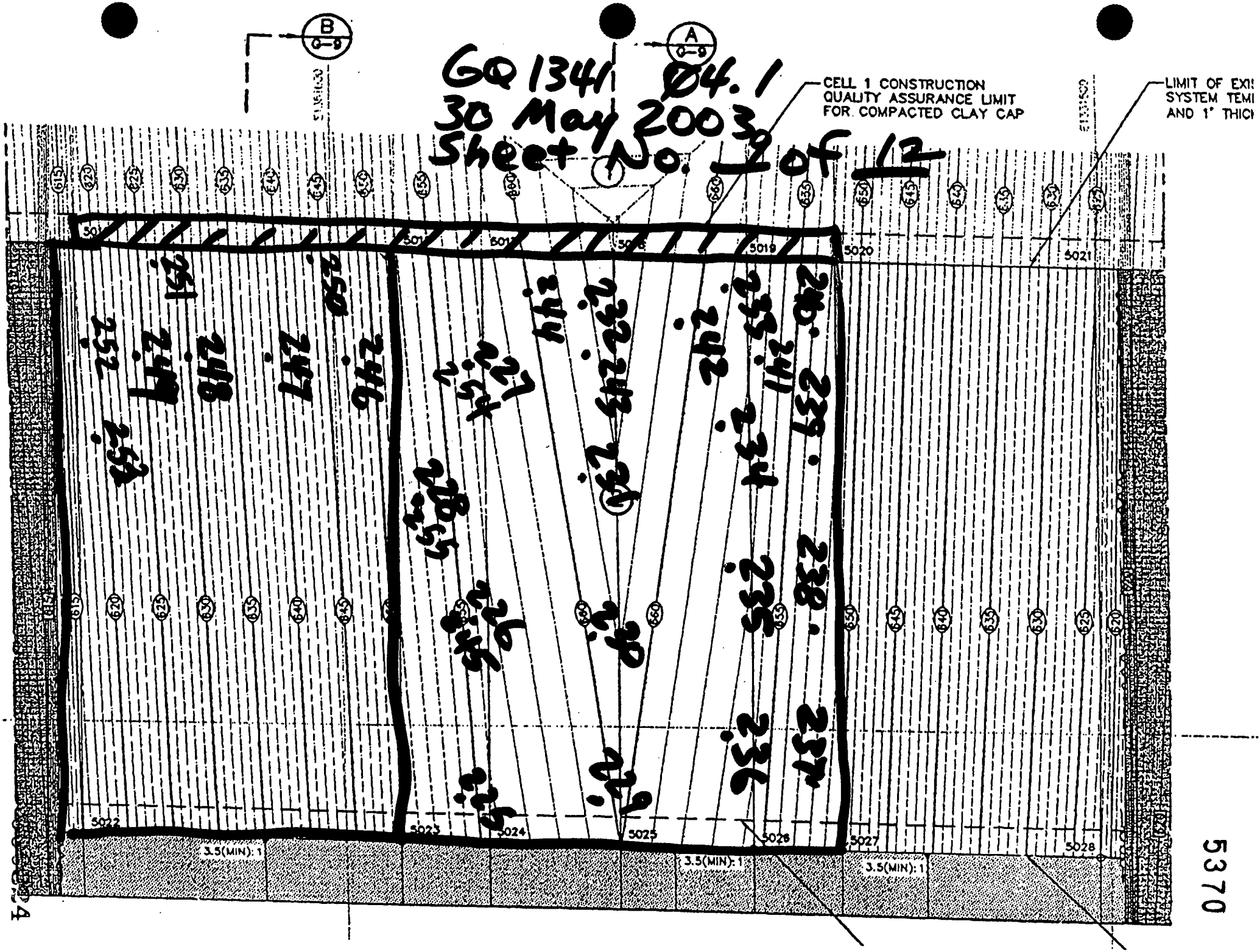
GQ1341 04.1

30 May 2003

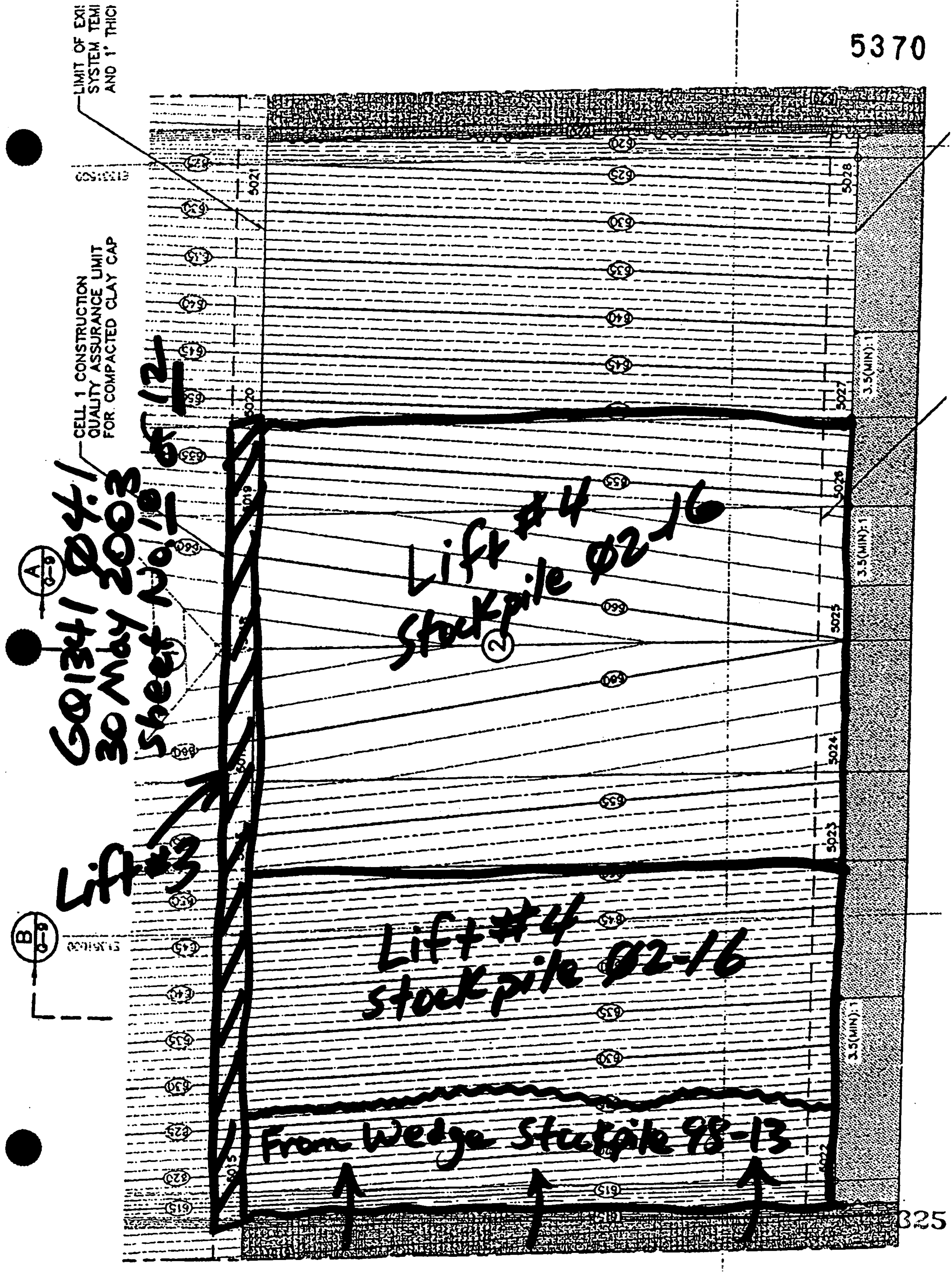
Sheet No. 8 of 12

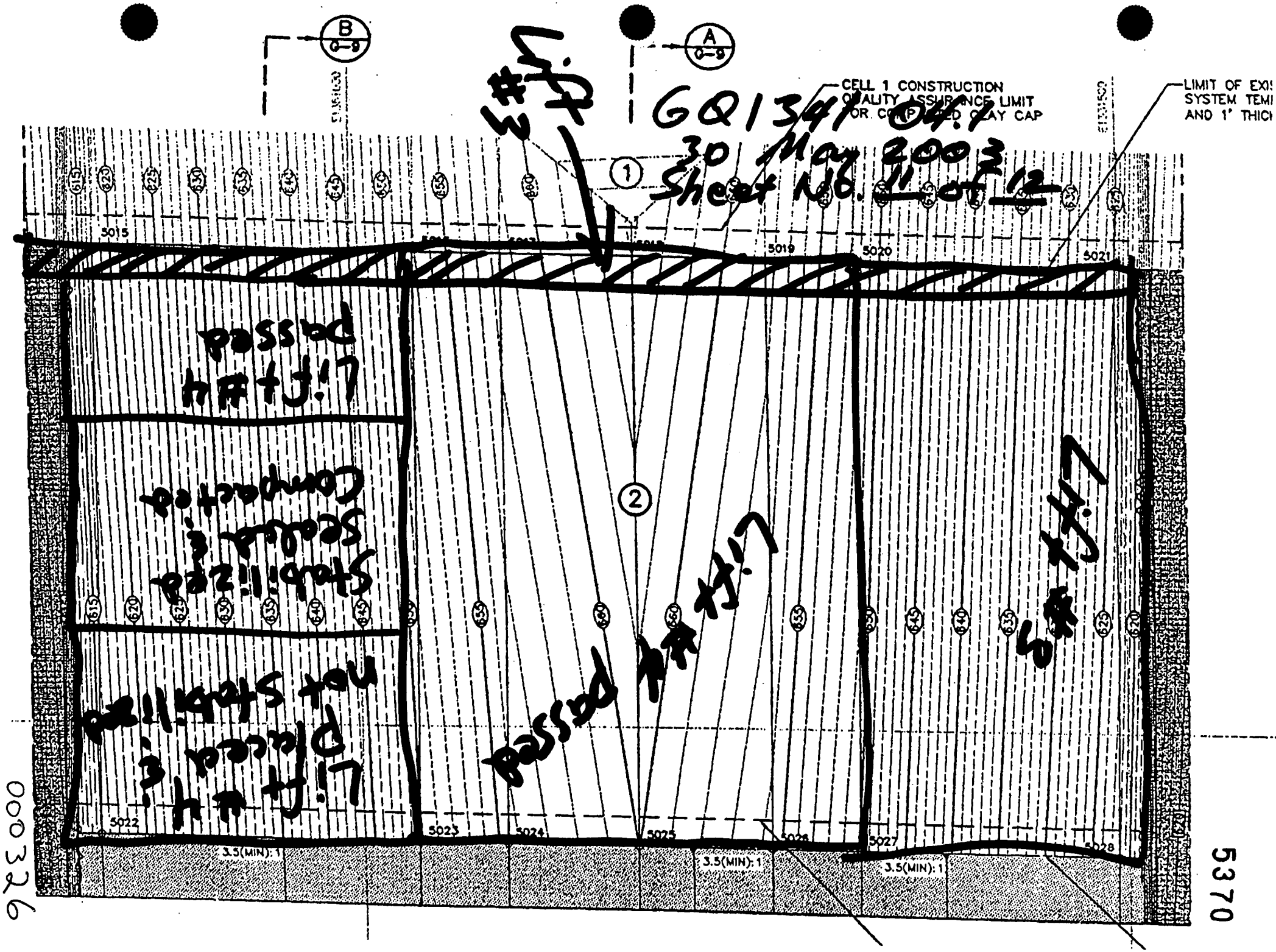
000323

GQ 1341 Ø4.1
30 May 2003
Sheet No. 1 of 12



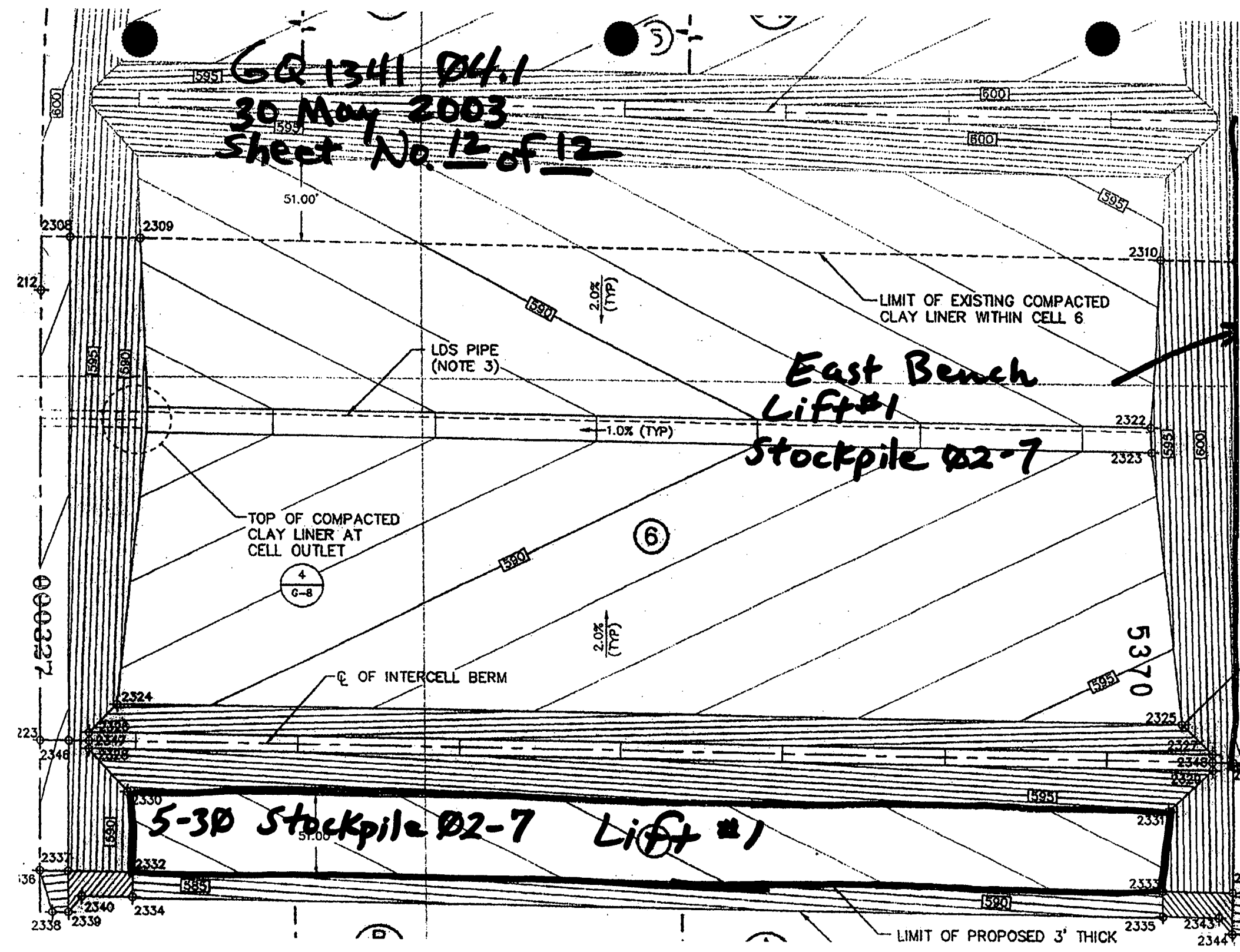
5370


CELL 1 CONSTRUCTION
QUALITY ASSURANCE LIMIT
FOR COMPACTED CLAY CAP
GQ1341/Ø4.1
30 May 2003
Sheet No. 10 of 12
Lift #3
Lift #4
Stockpile Ø2-16
Lift #4
Stockpile Ø2-16
From Wedge Stockpile 98-13
3.5(MIN):1
3.5(MIN):1
3.5(MIN):1
5021
5020
5019
5015
5028
5027
5026
5025
5024
5023
5022



0003326

5370


GQ 1341 04.1
30 May 2003
Sheet No. 12 of 12
51.00'
2308
2309
2310
212
595
600
590
585
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
East Bench
Lift #1
Stockpile 02-7
1.0% (TYP)
2322
2323
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
C-8
6
5370
℄ OF INTERCELL BERM
2324
2325
223
2346
2330
5-30 Stockpile 02-7 Lift #1
2331
2337
2332
2333
2340
2334
2338
2339
2335
2343
2344
LIMIT OF PROPOSED 3' THICK
000327

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ1344 3211 CHW TASK NO.: ~~04~~ 3 CHW

DATE: 2 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 98-13 (wedge) Stockpile 02-16

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-254	Cell #2 Clay Cap	6" / L-4	02-16	13.1	120.9	12.4 14.0	140.6	123.3	102.0	P	—	—	—	—
CC03-255		6" / L-4	02-16	13.1	120.9	11.9 13.5	135.4	119.3 ?	98.7	~~P~~ F	F	CC03-273	P	—
CC03-256		6" / L-4	02-16	13.1	120.9	11.8 13.5	137.9	121.5	100.5	P	—	—	—	—
CC03-257		6" / L-4	02-16	13.1	120.9	12.0 13.6	136.2	119.9	99.2	P	—	—	—	—
CC03-258		6" / L-4	02-16	13.1	120.9	11.6 13.3	137.0	120.9	100.0	P	—	—	—	—
CC03-259		6" / L-4	02-16	13.1	120.9	12.4 14.0	138.8	121.8	100.7	P	—	—	—	—
CC03-260		6" / L-4	02-16	13.1	120.9	12.2 13.8	136.9	120.3	99.5	P	—	—	—	—
CC03-261		6" / L-4	98-13	13.3	120.9	12.2 13.8	137.1	120.5	99.7	P	—	—	—	—
CC03-262		6" / L-4	02-16	13.1	120.9	11.8 13.5	136.8	120.5	99.7	P	—	—	—	—
CC03-263		6" / L-4	02-16	13.1	120.9	12.6 14.1	138.5	121.4	100.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

0003328

GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 7

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 2 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 98-13 (wedge) Stockpile 02-7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CC03-264	Cell #2 Clay Cap	6" / L-4	02-16	13.1	120.9	13.5 14.9	135.5	117.9	97.5	P	—	—	—	—
CC03-265		6" / L-4	02-16	13.1	120.9	12.8 14.3	135.6	118.6	98.1	P	—	—	—	—
CC03-266		6" / L-4	02-16	13.1	120.9	12.9 14.4	134.5	117.6	97.3	P	—	—	—	—
CC03-267		6" / L-4	02-16	13.1	120.9	14.7 15.9	133.0	114.8	~~94.8~~ 95.0 CHW	—	F	CC03-268	P	—
CC03-268		6" / L-4	02-16	13.1	120.9	13.5 14.9	136.4	118.7	98.2	P	—	—	—	—
CC03-269		6" / L-4	02-16	13.1	120.9	13.0 14.5	135.9	~~120.3~~ 118.7 CHW	~~99.5~~ 98.2 CHW	P	—	—	—	—
CC03-270		6" / L-4	02-16	13.1	120.9	11.7 13.4	138.5	122.1	101.0	P	—	—	—	—
CC03-271		6" / L-4	02-16	13.1	120.9	11.9 13.5	136.7	120.4	99.6	P	—	—	—	—
CC03-272		6" / L-4	98-13	13.3	120.9	12.6 14.1	137.7	120.7	99.8	P	—	—	—	—

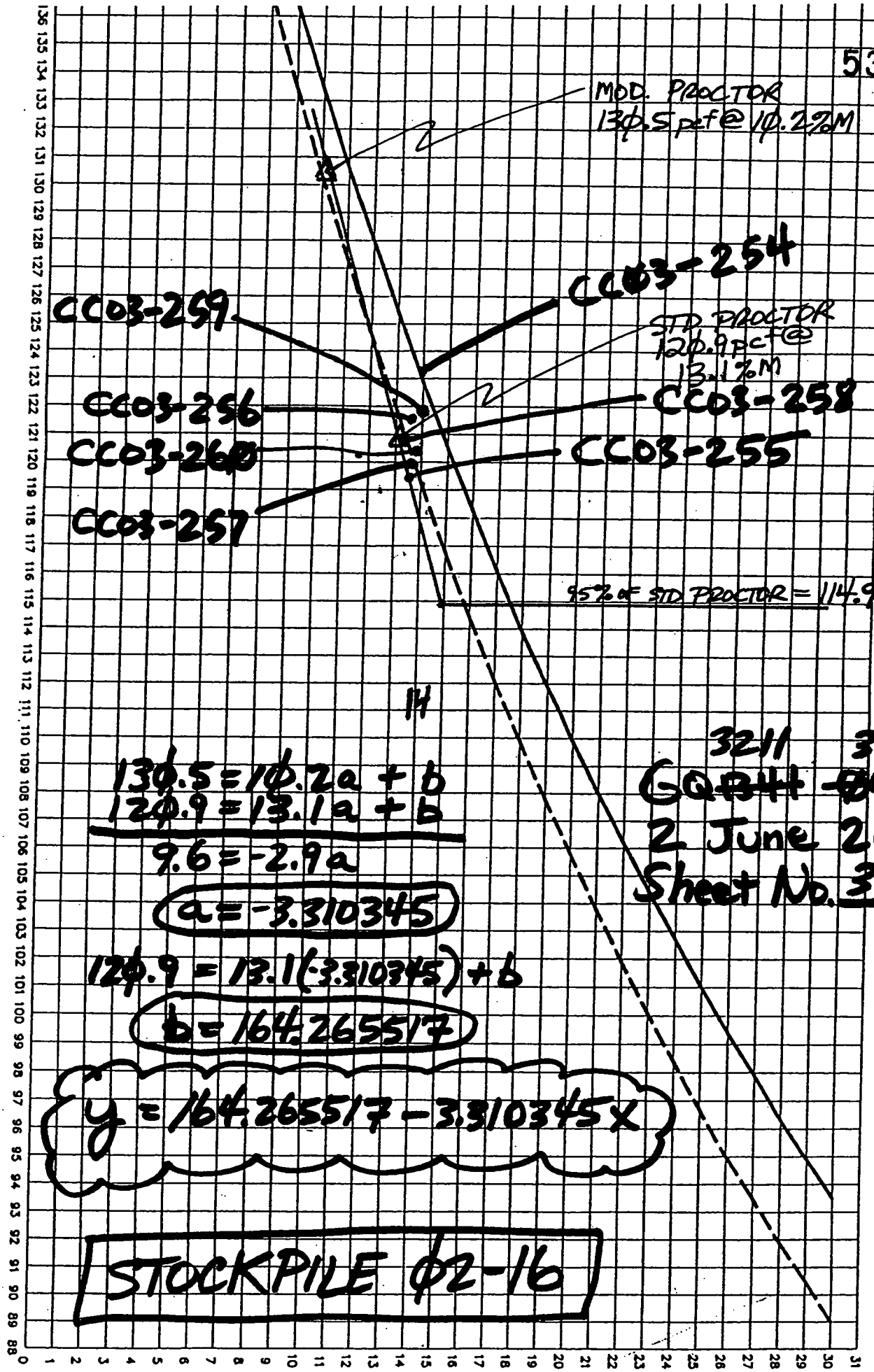
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature]

SHEET NO. 2 OF 7

000329

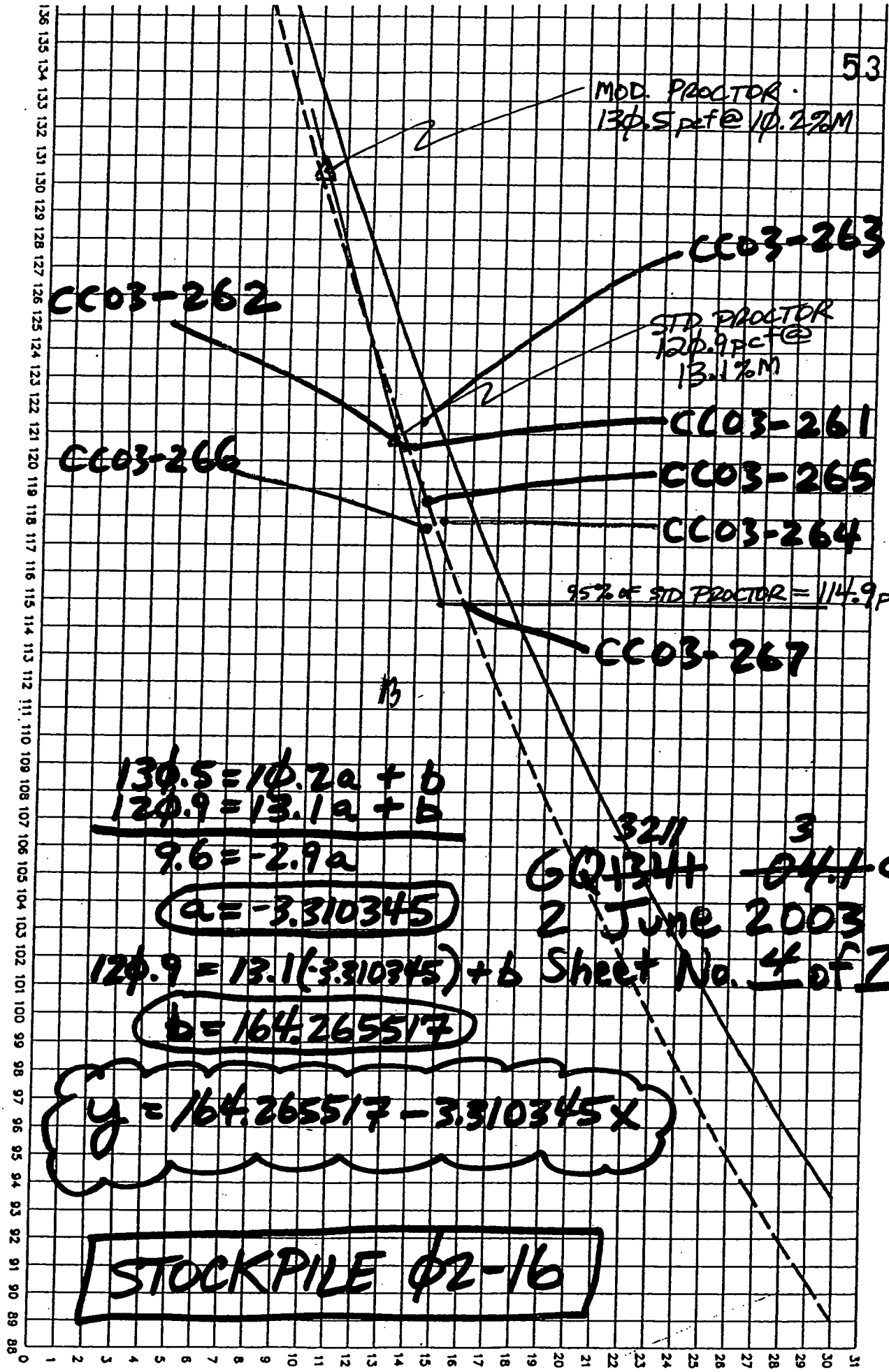
5370



$$130.5 = 10.2a + b$$
$$120.9 = 13.1a + b$$
$$9.6 = -2.9a$$
$$a = -3.310345$$
$$120.9 = 13.1(-3.310345) + b$$
$$b = 164.265517$$
$$y = 164.265517 - 3.310345x$$

3211 3
GQ344 ~~84.1~~ CHM
2 June 2003
Sheet No. 3 of 7

STOCKPILE 02-16



$130.5 = 10.2a + b$
$120.9 = 13.1a + b$

$9.6 = -2.9a$

$a = -3.310345$

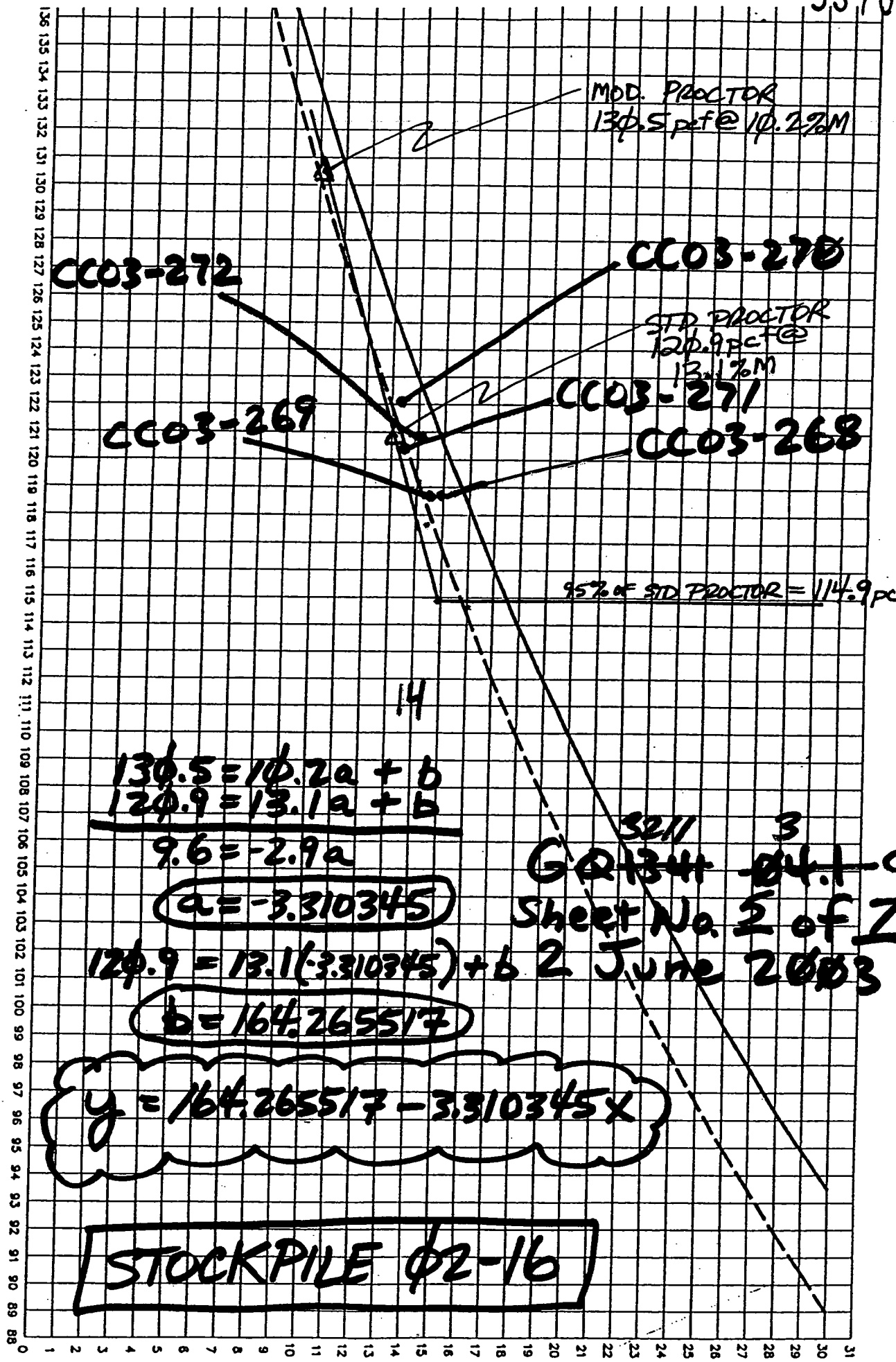
$120.9 = 13.1(-3.310345) + b$

$b = 164.265517$

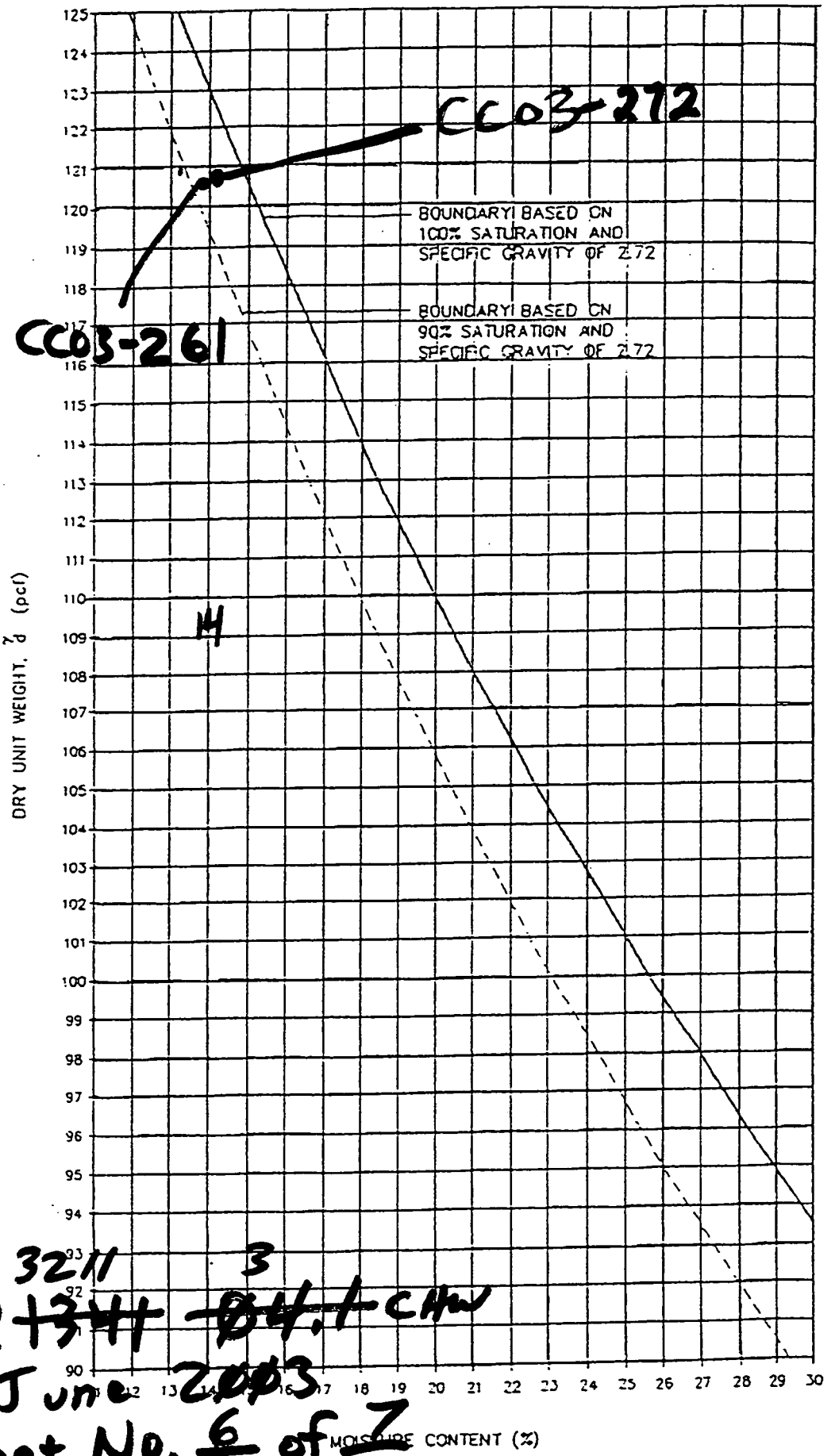
$y = 164.265517 - 3.310345x$

3211 3
GQ-1344 ~~04.1~~ CHW
2 June 2003
Sheet No. 4 of 7

STOCKPILE 02-16


POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE
MOD. PROCTOR
130.5 pcf @ 10.2% M
CC03-272
CC03-270
STD PROCTOR
120.9 pcf @
13.1% M
CC03-271
CC03-269
CC03-268
95% of STD PROCTOR = 114.9 pcf
14
130.5 = 10.2a + b
120.9 = 13.1a + b
9.6 = -2.9a
a = -3.310345
120.9 = 13.1(-3.310345) + b
b = 164.265517
y = 164.265517 - 3.310345x
STOCKPILE 02-16
3211 3
GQ1344 04.1 CHW
Sheet No. 2 of 2
2 June 2003

5370

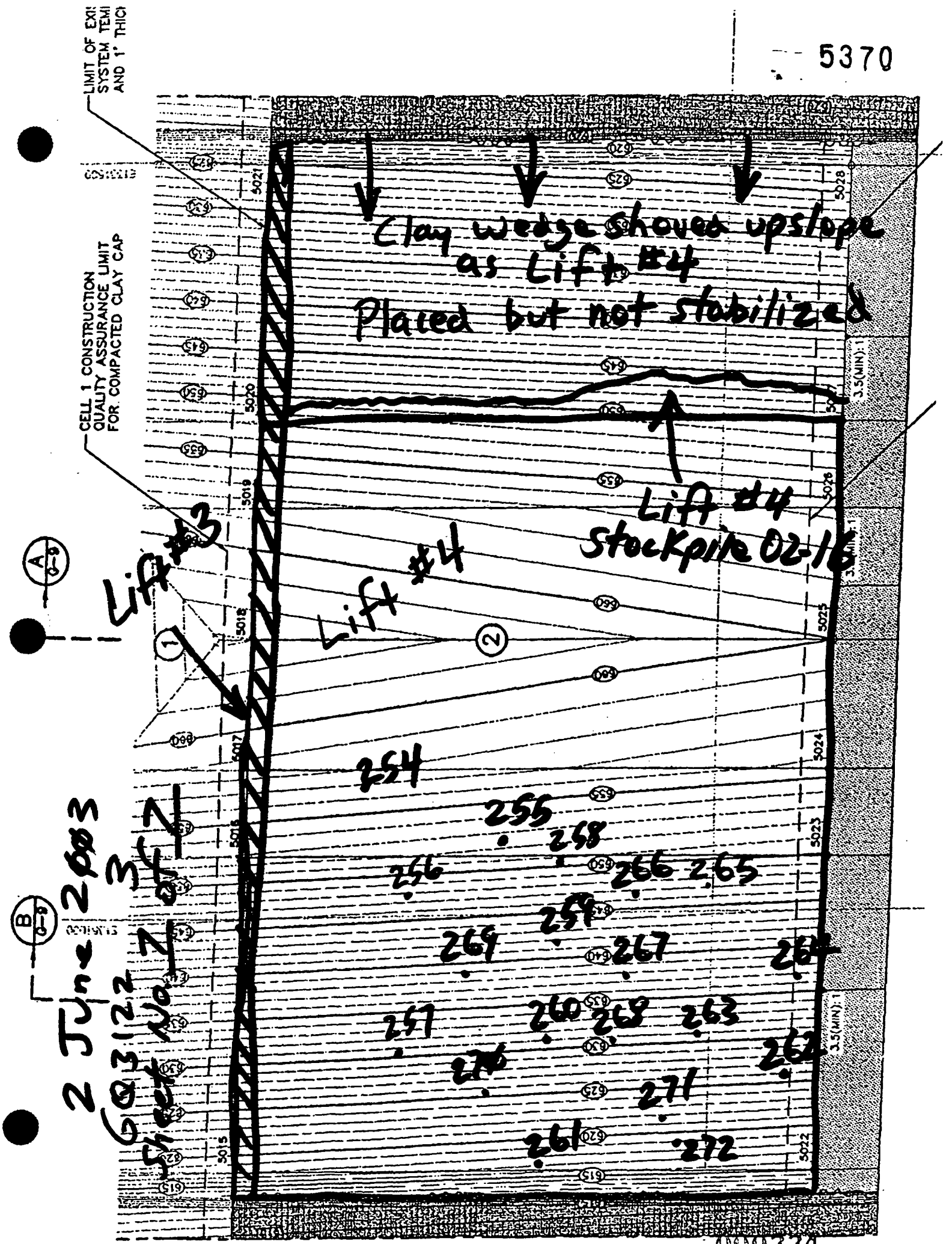


3211 3

GQ ~~1311~~ ~~84.1~~ CHW

2 June 2003

Sheet No. 6 of 7


LIMIT OF EXI
SYSTEM TEMI
AND 1' THIC
CELL 1 CONSTRUCTION
QUALITY ASSURANCE UMIT
FOR COMPACTED CLAY CAP
Clay wedge shoved upslope
as Lift #4
Placed but not stabilized
Lift #4
Stockpile 02-16
Lift #3
Lift #4
3.5(MIN):1
5021
5020
5019
5018
5017
5016
5015
5028
5026
5025
5024
5023
5022
A
B
1
2
254
255
256
258
266
265
269
259
267
257
260
268
263
271
261
272
2 June 2003
6031 22
Sheet No. 2
3 of 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 5 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8" / 4"*

MATERIAL SOURCE: Stockpile 02-16 / Stockpile 98-11

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-273	Cell #2 Clay Cap	6" / L-4	02-16	13.1	120.9	13.4 / 14.8	137.7	119.9	99.2	P	—	—	—	—
CC03-274		4" / L-4	98-11	14.7	116.8	14.6 / 15.8	133.3	115.1	98.5	P	—	—	—	—
CC03-275		4" / L-4	98-11	14.7	116.8	14.4 / 15.6	134.2	116.1	99.4	P	—	—	—	—
CC03-276		4" / L-4	98-11	14.7	116.8	14.4 / 15.6	133.6	115.6	99.0	P	—	—	—	—
CC03-277		4" / L-4	98-11	14.7	116.8	15.9 / 16.9	132.2	113.1	96.8	P	—	—	—	—
CC03-278		4" / L-4	98-11	14.7	116.8	15.6 / 16.6	131.0	112.3	96.1	—	F	CC03-279	P	—
CC03-279		4" / L-4	98-11	14.7	116.8	14.7 / 15.9	133.7	115.4	98.8	P	—	—	—	—
CC03-280		4" / L-4	98-11	14.7	116.8	14.7 / 15.9	131.3	113.3	97.0	—	F	CC03-281	P	—
CC03-281		4" / L-4	98-11	14.7	116.8	15.6 / 16.6	134.0	114.9	98.4	P	—	—	—	—
CC03-282		4" / L-4	98-11	14.7	116.8	14.8 / 16.0	133.4	115.0	98.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * Lift #4 on the East slope was very thin to grade

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CHW

SHEET NO. 1 OF 5

000335

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase IV

DATE: 5 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈4

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CC03-283	Cell #2 Clay Cap	4" / L-4	98-11	14.7	116.8	16.0 / 17.0	133.6	114.2	97.8	P	—	—	—	—
		/												
		/												
		/												
		/												
		/												
		/												
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

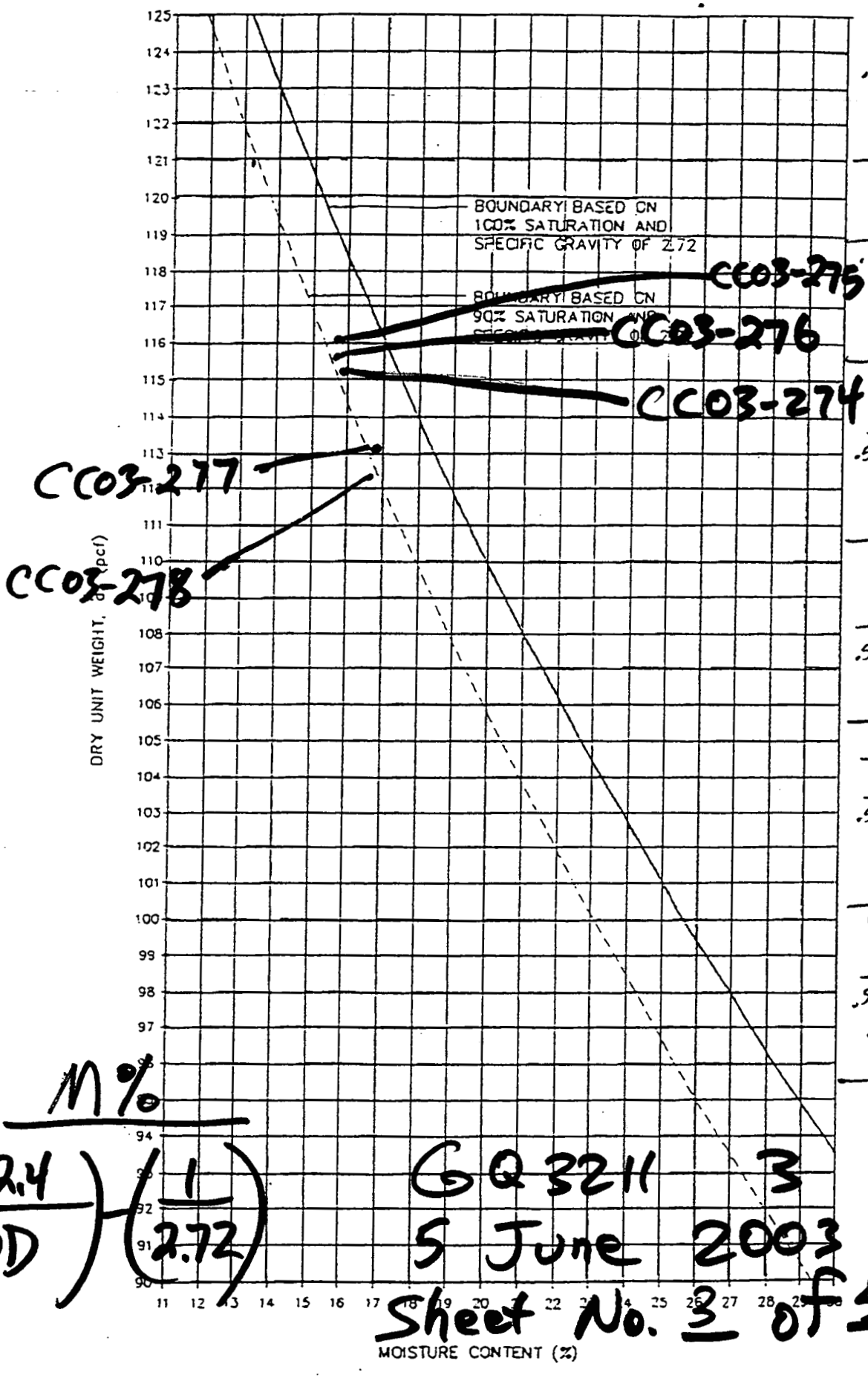
CHW

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: SHEET NO. 2 OF ~~4~~ 5

000336

5310

5370



274
.158
.5421372 - .367647
.1744902
.91

275
.156
.5374677 - .367647
.1698207
.92

276
.156
.5397823 - .367647
.1721453
.91

277
.169
.5517241 - .367647
.1840771
.92

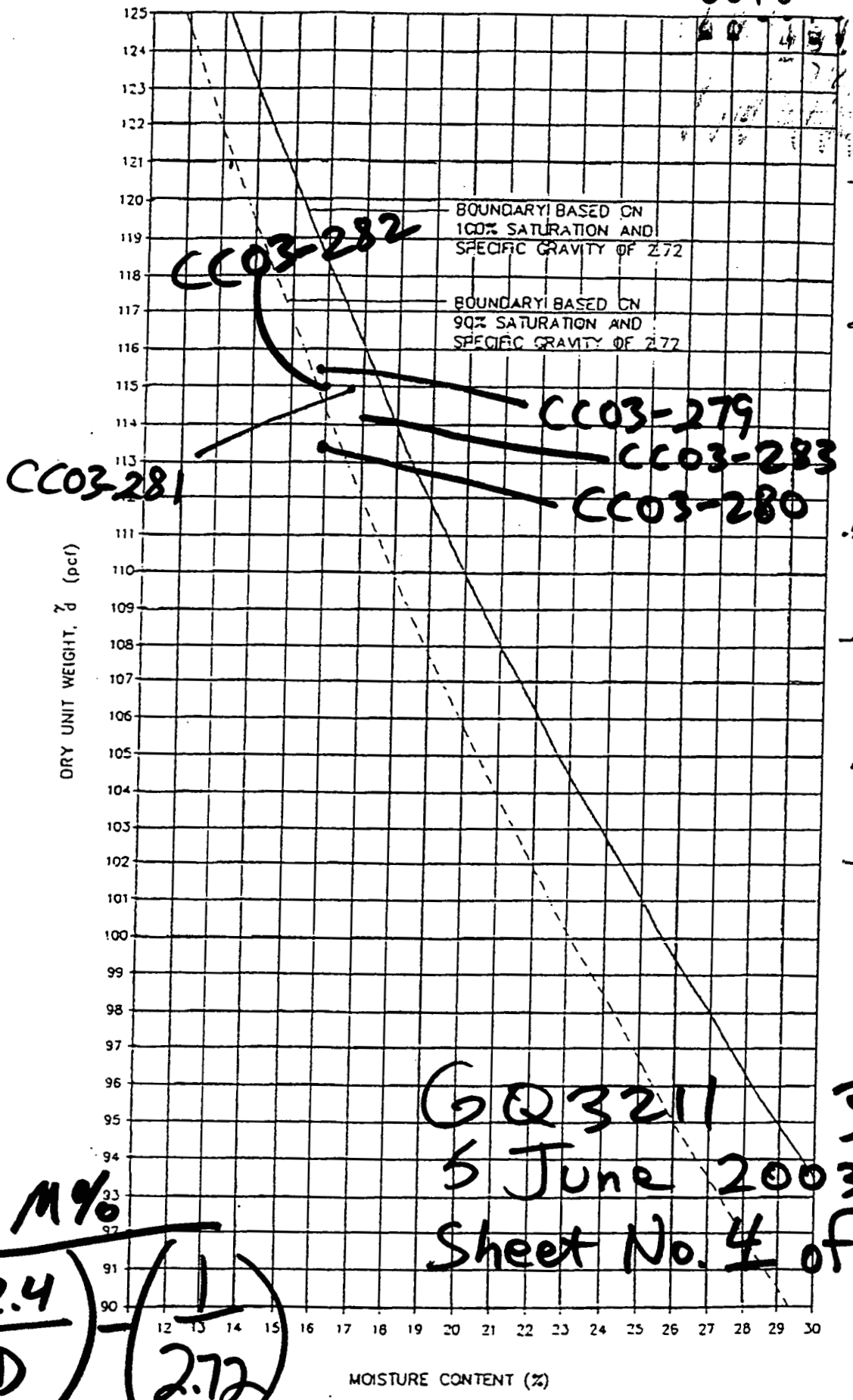
278
.166
.5556544 - .367647
.1880074
.88

279
.159
.5407279 - .36764
.1730809
.92

$$M\% = \left(\frac{62.4}{DD}\right) - \left(\frac{1}{2.72}\right)$$

GQ 3211 3
5 June 2003
Sheet No. 3 of 5

5370



280
.159
.5507502 - .367647
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.87

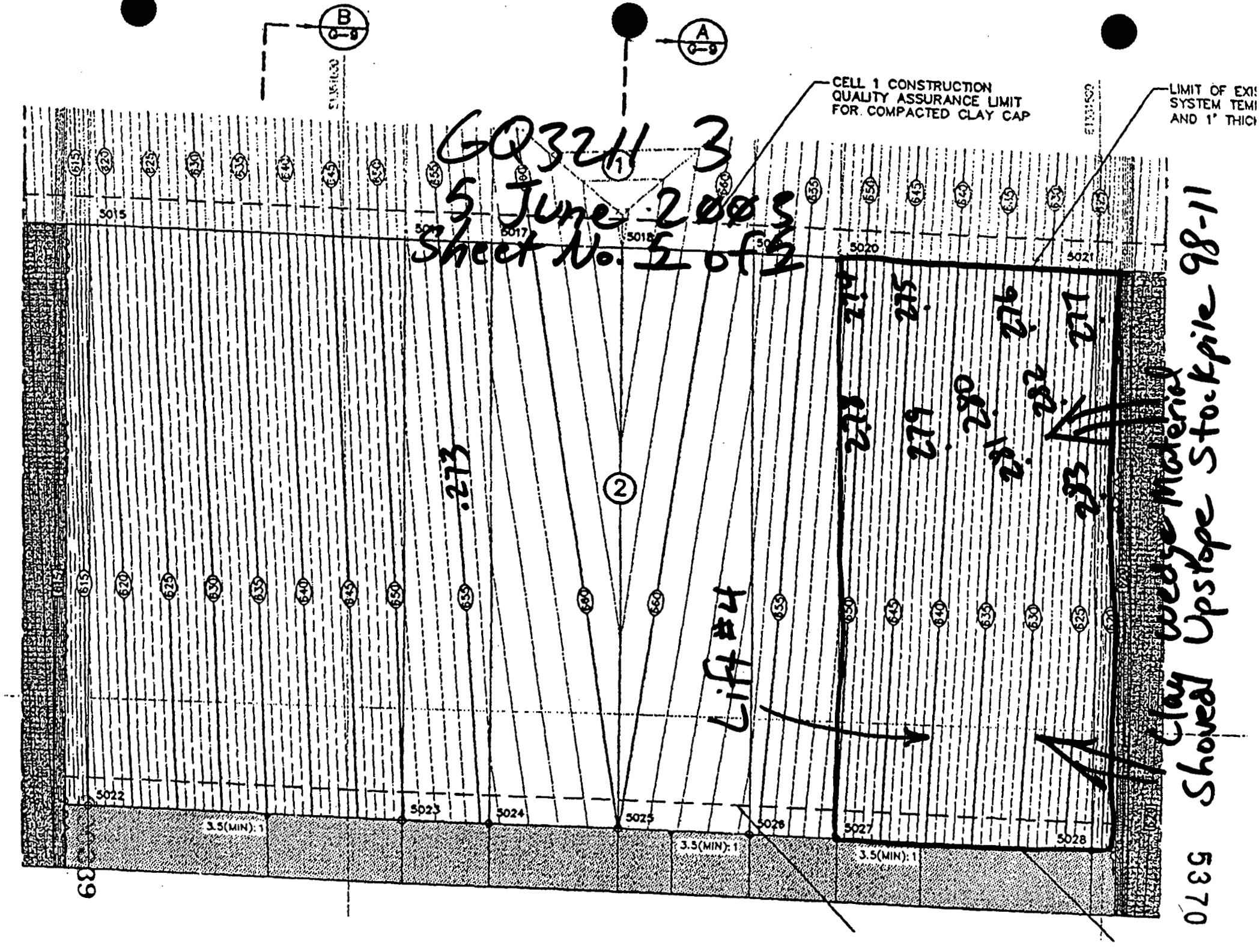
281
.166
.5430809 - .367647
.1754339
.95

282
.160
.5426086 - .367647
.1749616
.91

283
.170
.5464098 - .367647
.1787628
.95

GQ3211 3
5 June 2003
Sheet No. 4 of 5

$$\left(\frac{1}{\frac{62.4}{DD}}\right) - \left(\frac{1}{2.72}\right) = M\%$$


GQ3211 3
5 June 2005
Sheet No. 5 of 5
B
A
CELL 1 CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY CAP
LIMIT OF EXI
SYSTEM TEMI
AND 1' THICK
5015
5017
5018
5020
5021
5022
5023
5024
5025
5026
5027
5028
3.5(MIN): 1
3.5(MIN): 1
3.5(MIN): 1
Lift #4
Clay Borrow Material
Showed Upslope Stockpile 98-11
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: GO3211 TASK NO.: 3

DATE: 6 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/5"

MATERIAL SOURCE: Clay Wedge West ~~Stockpile 98-11~~

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-284	Cell #2 Clay Cap	4" / L-4	98-11	14.7	116.8	15.0 / 16.1	133.3	114.8	98.3	P	—	—	—	—
CC03-285		4" / L-4	98-11	14.7	116.8	16.1 / 17.0	131.9	112.7	96.5	P	—	—	—	—
CC03-286		4" / L-4	98-11	14.7	116.8	15.6 / 16.6	133.8	114.8	98.3	P	—	—	—	—
CC03-287		4" / L-4	98-11	14.7	116.8	15.8 / 16.8	131.7	112.8	96.6	P	—	—	—	—
CC03-288		4" / L-4	98-11	14.7	116.8	15.3 / 16.4	135.0	116.0	99.3	P	—	—	—	—
CC03-289		4" / L-4	98-11	14.7	116.8	16.5 / 17.4	131.0	111.6	95.5	P	—	—	—	—
CC03-290		4" / L-4	98-11	14.7	116.8	15.2 / 16.3	131.1	112.7	96.5	—	F	CC03-291	P	—
CC03-291		4" / L-4	98-11	14.7	116.8	15.5 / 16.5	133.0	114.2	97.8	P	—	—	—	—
CC03-292		4" / L-4	98-11	14.7	116.8	15.8 / 16.8	131.6	112.7	96.5	P	—	—	—	—
CC03-293		4" / L-4	98-11	14.7	116.8	16.0 / ~~16.5~~ 17.0	131.8	112.6	96.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CHECKED BY: [illegible]

SHEET NO. 1 OF 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G03211 TASK NO.: 3

DESCRIPTION: Phase V

DATE: 6 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 5"

MATERIAL SOURCE: Clay Wedge West ~~Stockpile 98-11~~

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC03-294	Cell #2 Clay Cap	4" / L-4	98-11	14.7	116.8	15.9 / 16.9	130.7	111.8	95.7	—	F	CC03-295	P	—
CC03-295	↓	4" / L-4	98-11	14.7	116.8	15.4 / 16.5	134.0	115.0	98.5	P	—	—	—	—
CC03-296		4" / L-4	98-11	14.7	116.8	16.1 / 17.0	133.7	114.3	97.9	P	—	—	—	—
CC03-297		4" / L-4	98-11	14.7	116.8	16.1 / 17.0	131.8	112.6	96.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 2 OF 6

000341

5370

284
.161
.543554 − .367647
.175907
.92

285
.170
.5536823 − .367647
.1860353
.91

98-11
14.7 at 116.8

286
.166
.543554 − .367647
.175907
.94

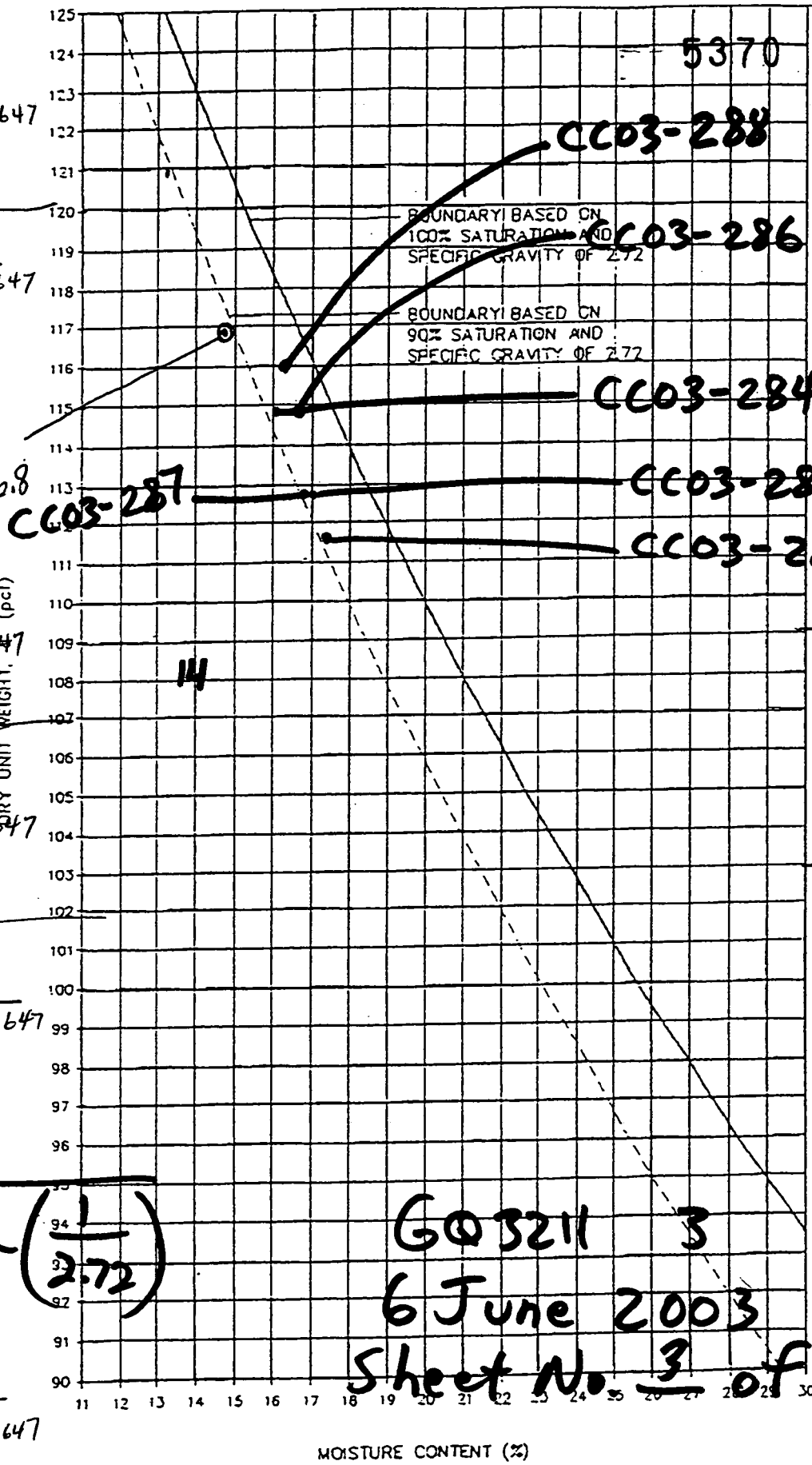
287
.168
.5531914 − .367647
.1855444
.91

288
.164
.537931 − .367647
.170284
.96

M%

$$\left(\frac{62.4}{DD}\right) - \left(\frac{1}{2.72}\right)$$

289
.174
.591397 − .367647
.1914927
.91



GQ3211 3
6 June 2003
Sheet No. 3 of 6

290
.163
.5536823 − .367647
.1860353
.88

291
.165
.5464098 − .367647
.1787628
.92

292
.168
.5536823 − .367647
.1860353
.90

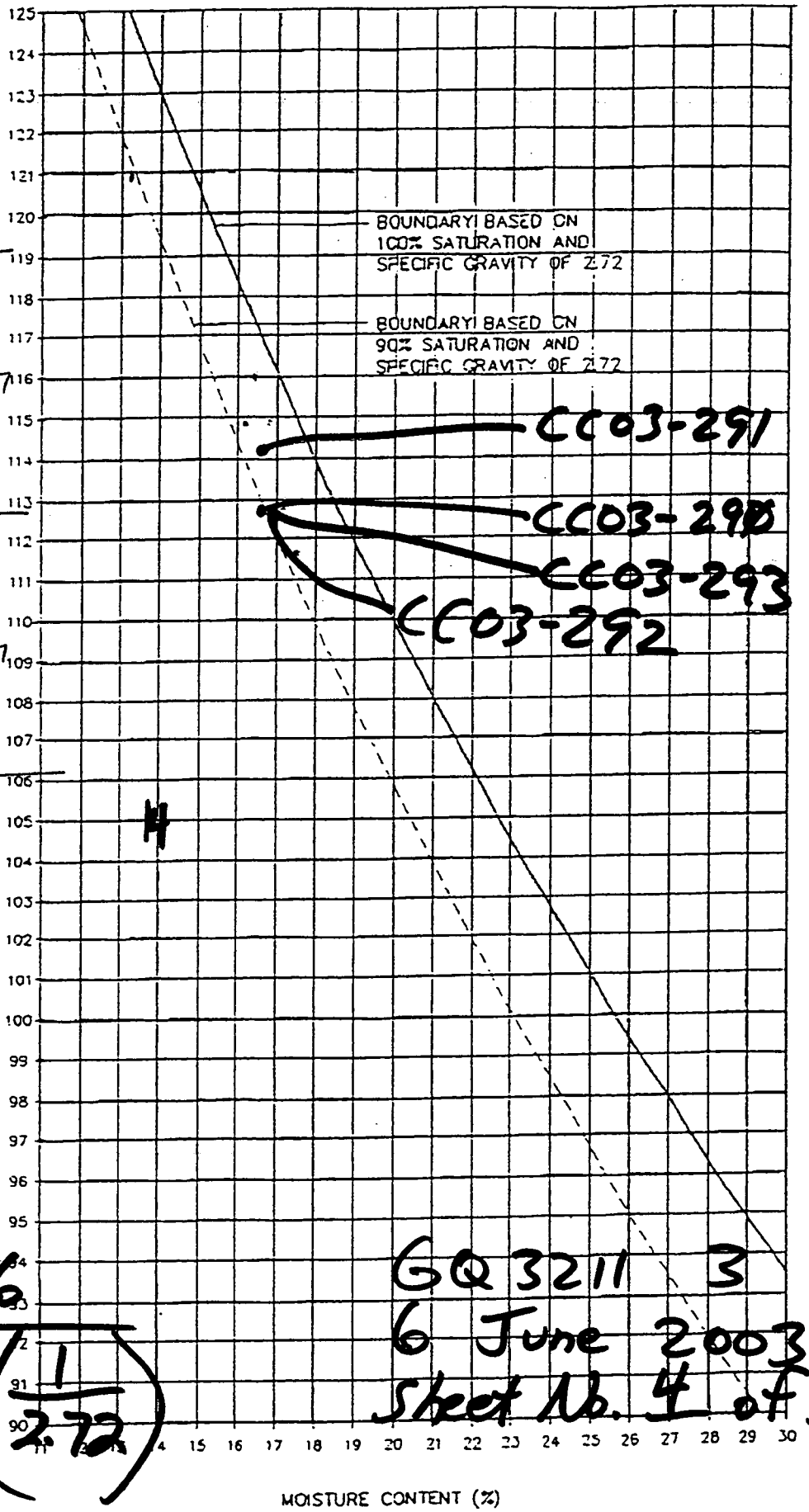
293
.170
.554174 − .367647
.186527
.91

294
.169
.81395 - .367647
.1904925
.89

295
.165
.5426086 - .367647
.1749616
.94

296
.170
.5459317 - .367647
.1782847
.95

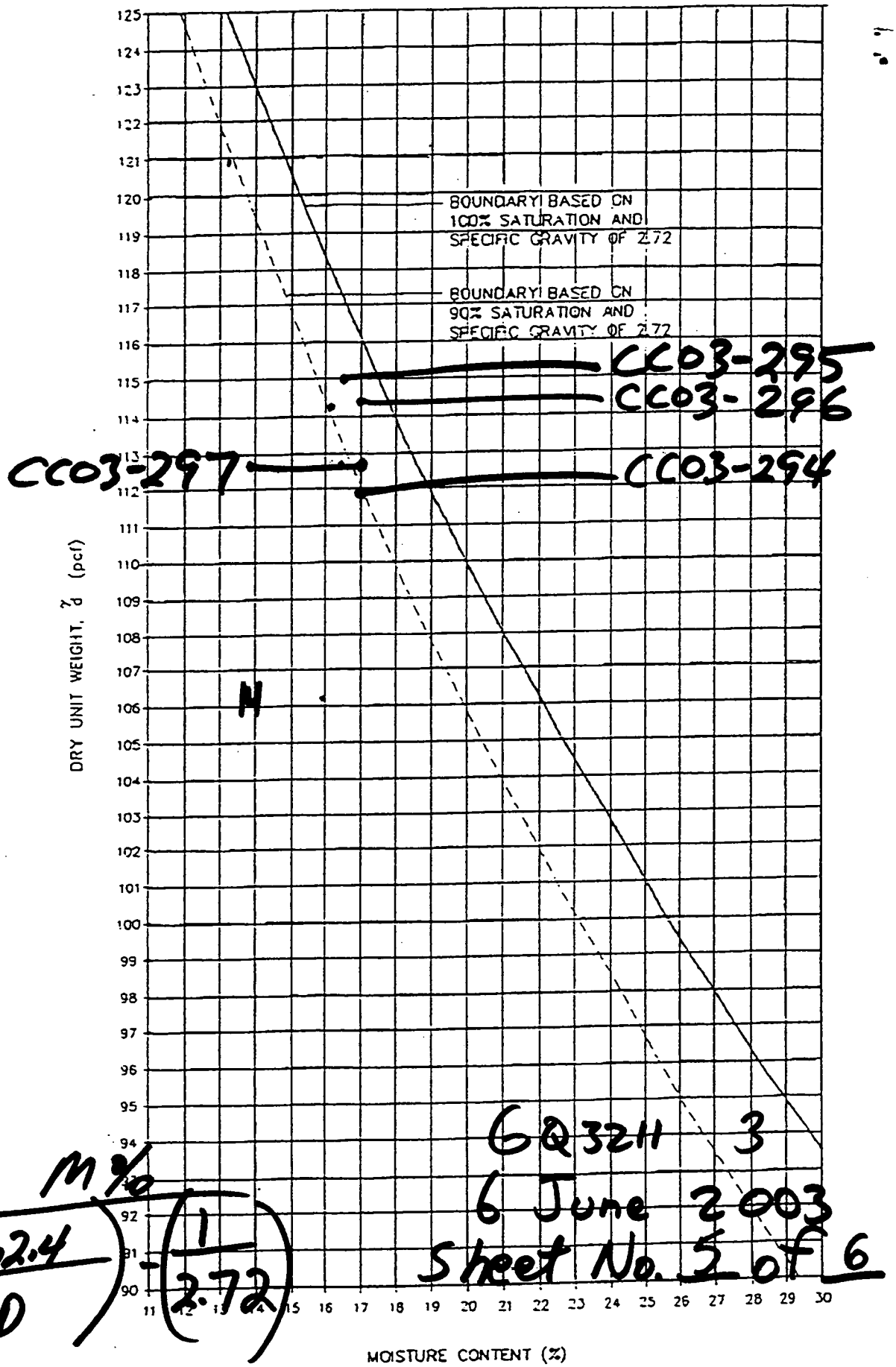
297
.170
.554174 - .367647
.186527
.91



$$m\% = \left(\frac{62.4}{DD}\right) - \left(\frac{1}{2.72}\right)$$

GQ 3211 3
6 June 2003
Sheet No. 4 of 6

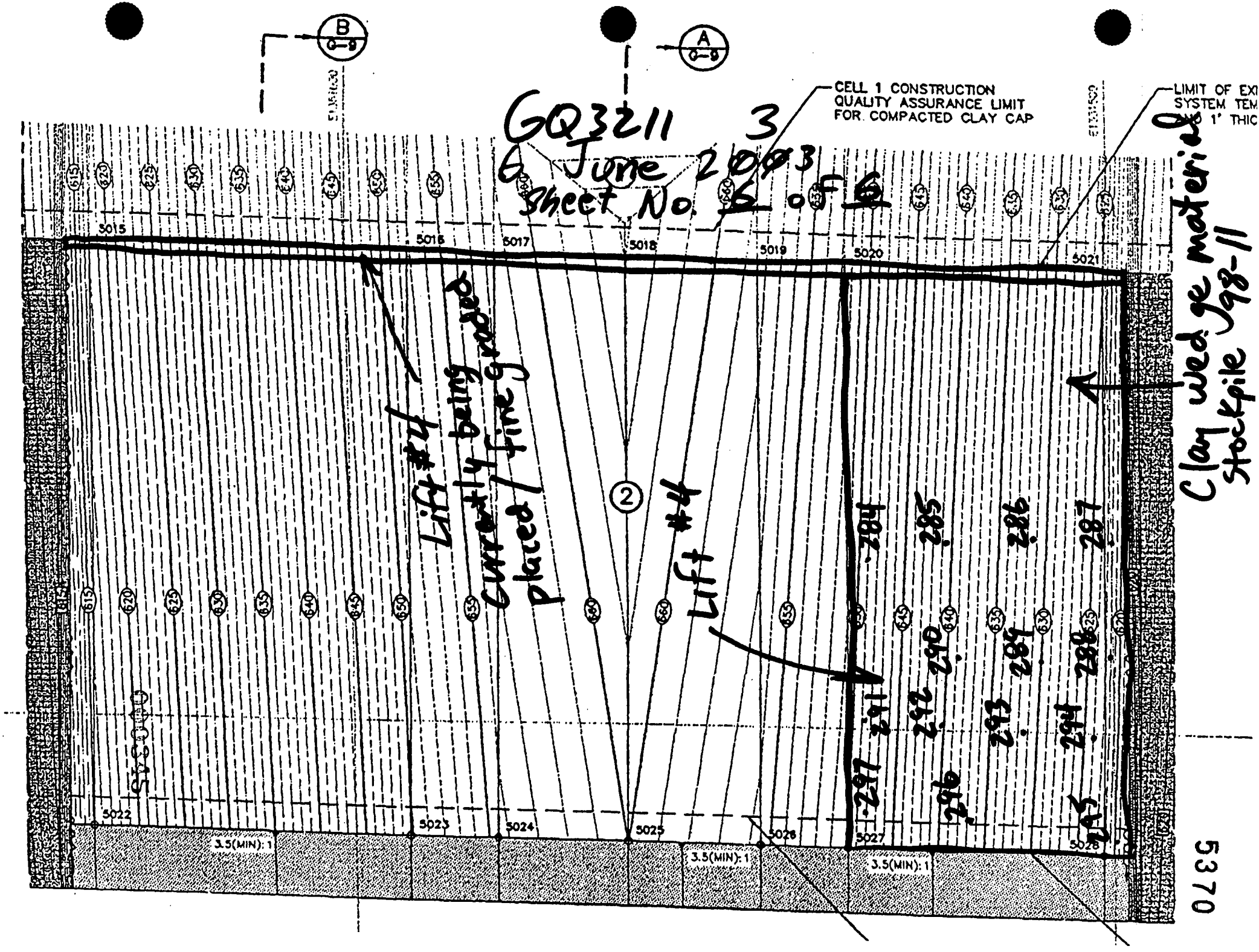
5370



GQ3211 3
6 June 2003
Sheet No. 5 of 6

$$M\% \left(\frac{62.4}{DD}\right)\left(\frac{1}{2.72}\right)$$

000344


GQ3211 3
6 June 2003
Sheet No. 6 of 6
CELL 1 CONSTRUCTION
QUALITY ASSURANCE LIMIT
FOR COMPACTED CLAY CAP
LIMIT OF EXI
SYSTEM TEM
AND 1' THIC
B
A
5015
5016
5017
5018
5019
5020
5021
5022
5023
5024
5025
5026
5027
5028
3.5(MIN):1
3.5(MIN):1
3.5(MIN):1
Lift #4
currently being
placed / fine graded
Lift #4
Clay used as material
stockpile 98-11
282
285
286
287
287
292
290
293
289
294
288
295
296
5370

CELL 6 LINER

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G01341 TASK NO.: 041

DESCRIPTION: Phase V

DATE: 29 day May month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +3% LIFT THICKNESS (LOOSE/COMPACTED): 4"/6"

MATERIAL SOURCE: Stockpile 02-7 / Stockpile 02-16

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X+3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-01	Cell #6 Penetration Box Pad	6" / L-2	02-7	12.4	121.4	10.8 / 12.6	137.5	122.1	100.6	P	—	—	—	—
CL03-02		4" / L-2	02-7	12.4	121.4	10.9 / 12.7	120.9	107.3	88.4	—	F	CL03-3	P	—
CL03-03		4" / L-2	02-7	12.4	121.4	11.6 / 13.3	137.6	121.4	100.0	P	—	—	—	—
CL03-04		6" / L-4	02-16	13.1	120.9	13.5 / 14.9	136.2	118.5	98.0	P	—	—	—	—
CL03-05		6" / L-4	02-16	13.1	120.9	13.7 / 15.0	136.2	118.4	97.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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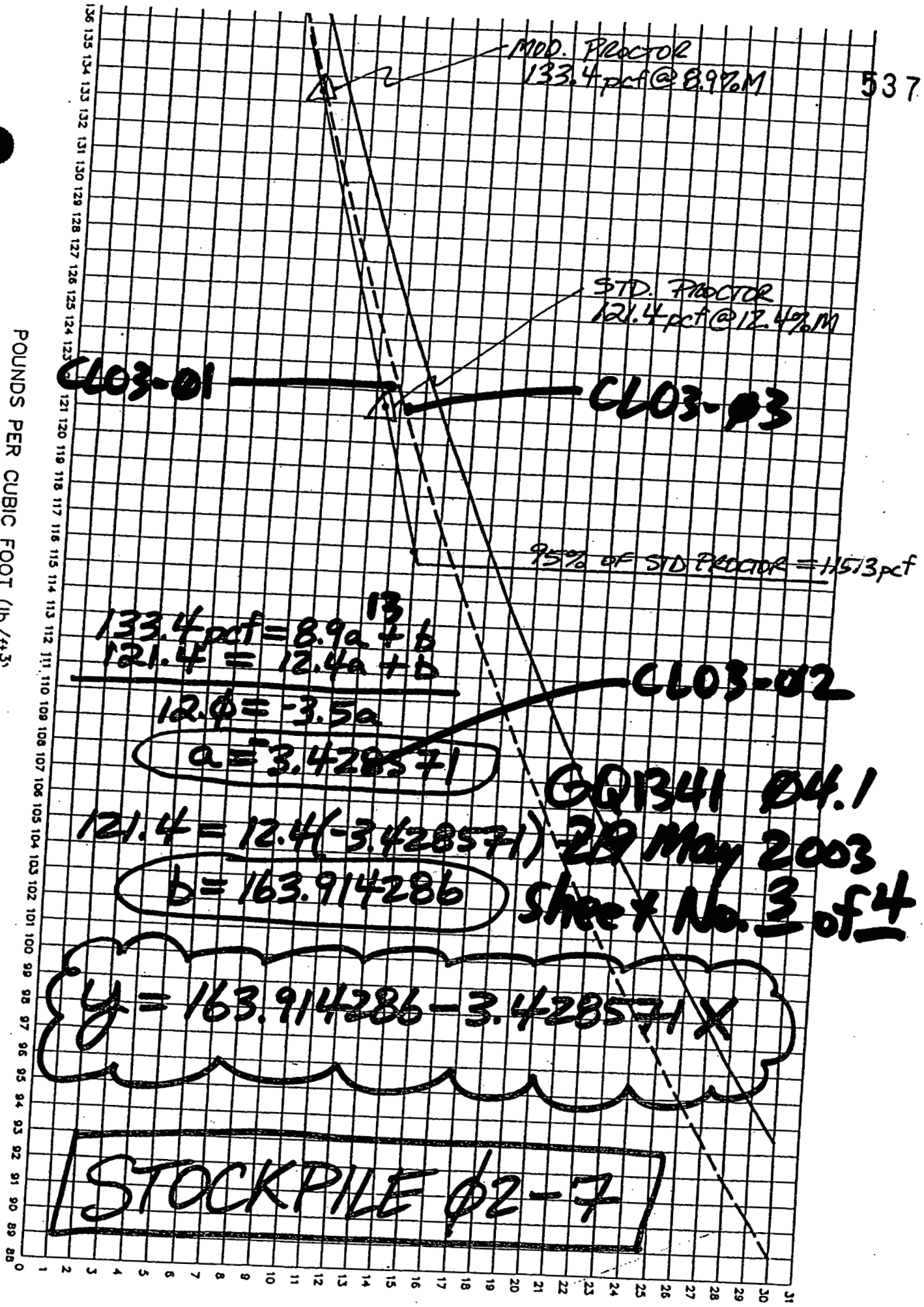
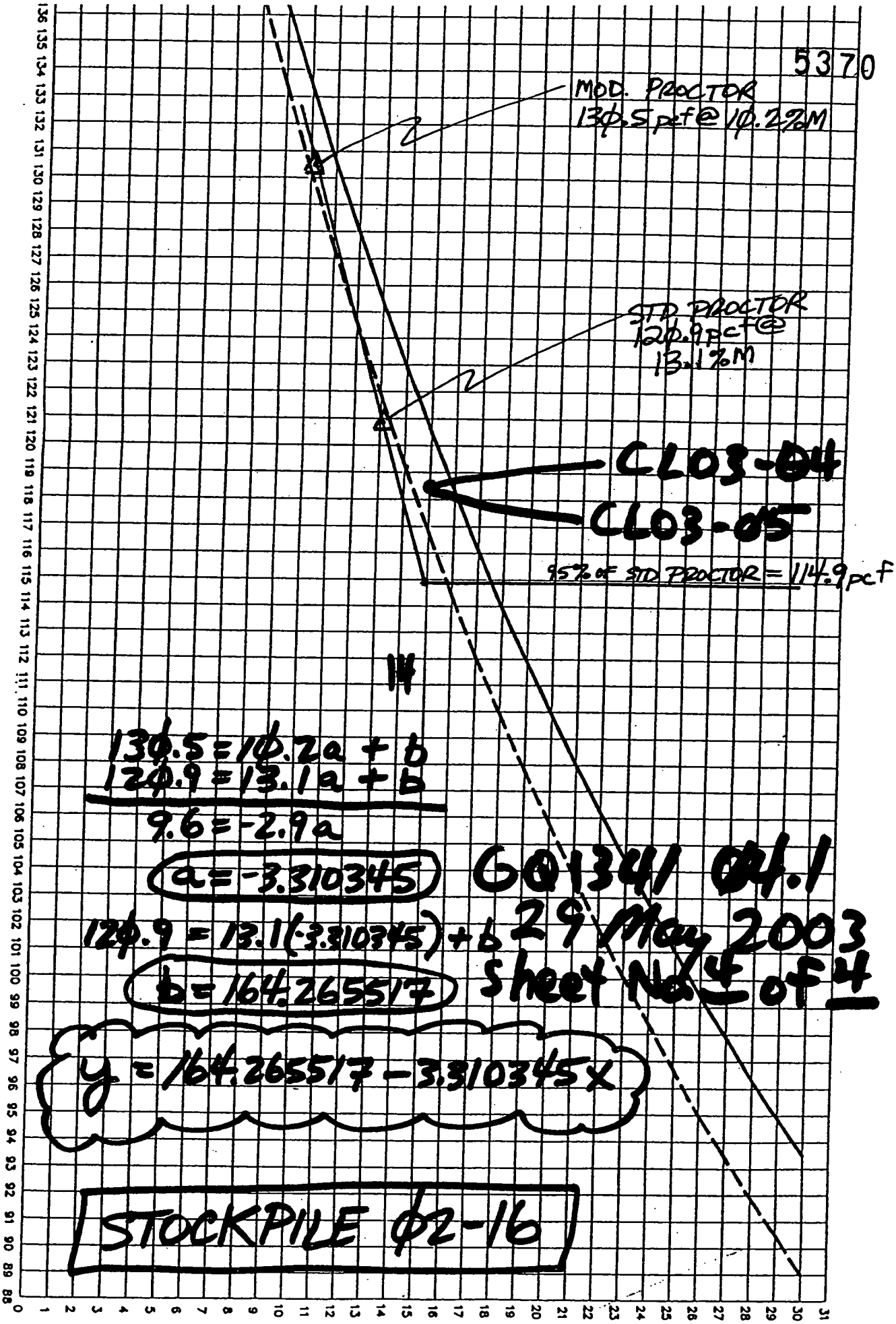
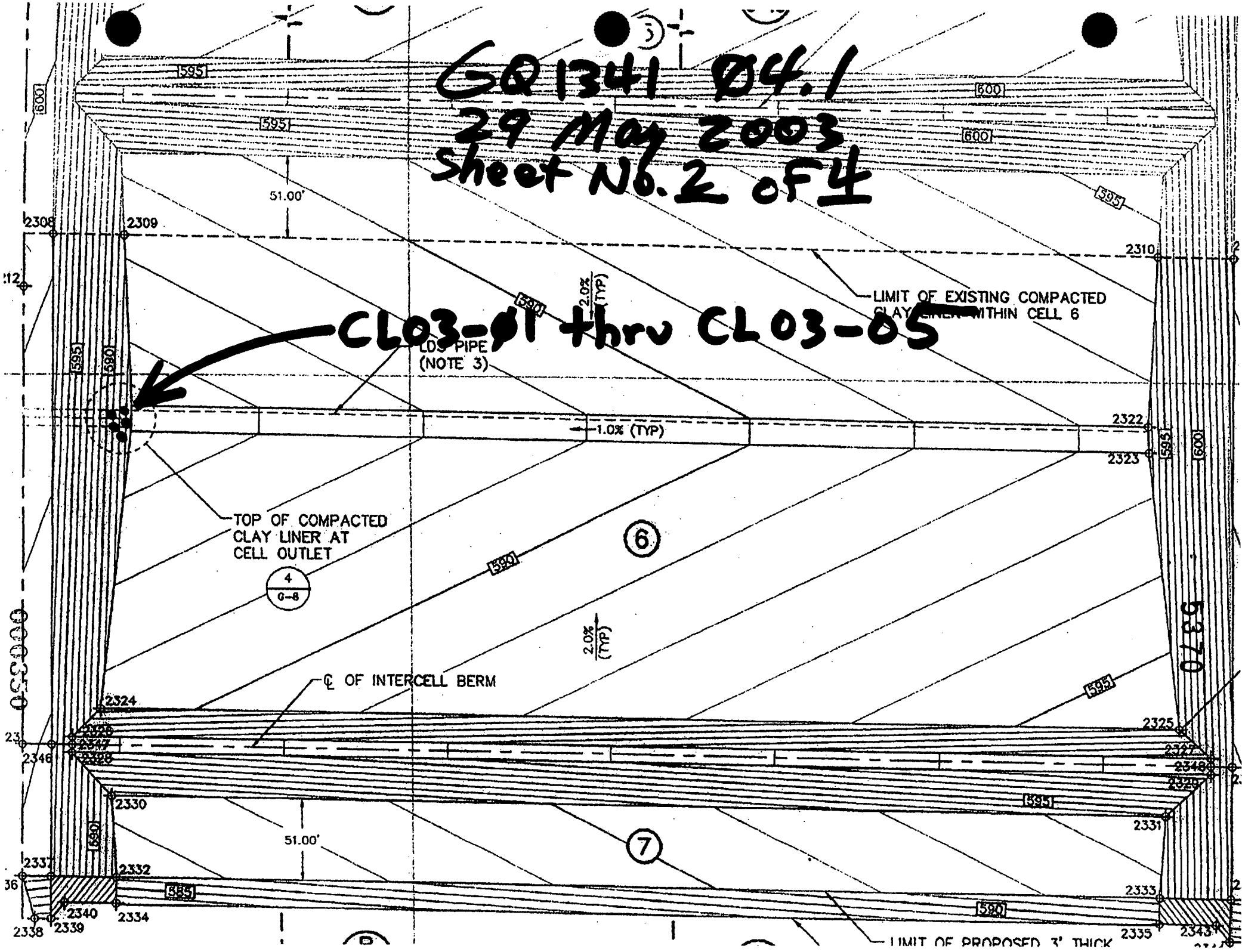

MOD. PROCTOR
133.4 pcf @ 8.9% M
STD. PROCTOR
121.4 pcf @ 12.4% M
CL03-01
CL03-03
95% of STD PROCTOR = 115.3 pcf
133.4 pcf = 8.9a + b
121.4 = 12.4a + b
12.0 = -3.5a
a = -3.428571
121.4 = 12.4(-3.428571) + b
b = 163.914286
CL03-02
GQ1341 04.1
28 May 2003
Sheet No. 3 of 4
y = 163.914286 - 3.428571 x
STOCKPILE 02-7
POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE

5370

000348


5370
MOD. PROCTOR
130.5 pcf @ 10.2%M
STD PROCTOR
120.9 pcf @
13.1%M
CL03-04
CL03-05
95% of STD PROCTOR = 114.9 pcf
POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE
130.5 = 10.2a + b
120.9 = 13.1a + b
9.6 = -2.9a
a = -3.310345
120.9 = 13.1(-3.310345) + b
b = 164.265517
y = 164.265517 - 3.310345x
STOCKPILE 02-16
GQ1341 04.1
29 May 2003
Sheet No 4 of 4

GQ1341 04.1
29 May 2003
Sheet No. 2 of 4



GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: ~~GQ1341~~ 3211 CHW TASK NO.: ~~04.1~~ 3 CHW

DATE: 2 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (~~LOOSE~~/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-06	Clay Liner Cell #7	6" / L-1	02-7	12.4	121.4	12.6 / 14.1	141.8	124.3	102.4	P	—	—	—	—
CL03-07		6" / L-1	02-7	12.4	121.4	12.6 / 14.1	140.4	123.0	101.3	P	—	—	—	—
CL03-08		6" / L-1	02-7	12.4	121.4	12.4 / 14.0	138.9	121.8	100.3	P	—	—	—	—
CL03-09		6" / L-1	02-7	12.4	121.4	10.7 / 12.5	142.0	126.2	104.0	P	—	—	—	—
CL03-10		6" / L-1	02-7	12.4	121.4	12.9 / 14.4	138.0	120.6	99.3	P	—	—	—	—
CL03-11		6" / L-1	02-7	12.4	121.4	13.1 / 14.5	138.1	120.6	99.3	P	—	—	—	—
CL03-12		6" / L-1	02-7	12.4	121.4	10.6 / 12.5	140.3	124.7	102.7	P	—	—	—	—
CL03-13		6" / L-1	02-7	12.4	121.4	11.1 / 12.9	139.3	123.3	101.6	P	—	—	—	—
CL03-14		6" / L-1	02-7	12.4	121.4	14.0 / 15.3	136.9	118.7	97.8	P	—	—	—	—
CL03-15		6" / L-1	02-7	12.4	121.4	11.9 / 13.5	140.1	123.4	101.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 1 OF 6

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pt #340

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: 6Q3211 TASK NO.: 3

DATE: 2 day June month 03 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-16	Cell #7 East Bench	6" / L-1	02-7	12.4	121.4	12.1 / 13.7	138.7	122.0	100.5	P	—	—	—	—
CL03-17	Cell #6 East Bench	6" / L-1	02-7	12.4	121.4	11.2 / 13.0	141.6	125.3	103.2	P	—	—	—	—
CL03-18	↓	6" / L-1	02-7	12.4	121.4	13.7 / 15.0	138.2	120.2	99.0	P	—	—	—	—
CL03-19	↓	6" / L-1	02-7	12.4	121.4	11.9 / 13.5	138.1	121.7	100.2	P	+	—	—	—
CL03-20	Cell #6 NE Corner Floor	6" / L-1	02-16	13.1	120.9	13.0 / 14.5	135.9	118.7	98.2	P	—	—	—	—
CL03-21	↓	6" / L-1	02-16	13.1	120.9	13.6 / 15.0	135.1	117.5	97.2	P	—	—	—	—
CL03-22	↓	6" / L-1	02-16	13.1	120.9	12.9 / 14.4	136.3	119.1	98.5	P	—	—	—	—
CL03-23	↓	6" / L-1	02-16	13.1	120.9	13.6 / 15.0	136.4	118.6	98.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 2 OF 6

0003352

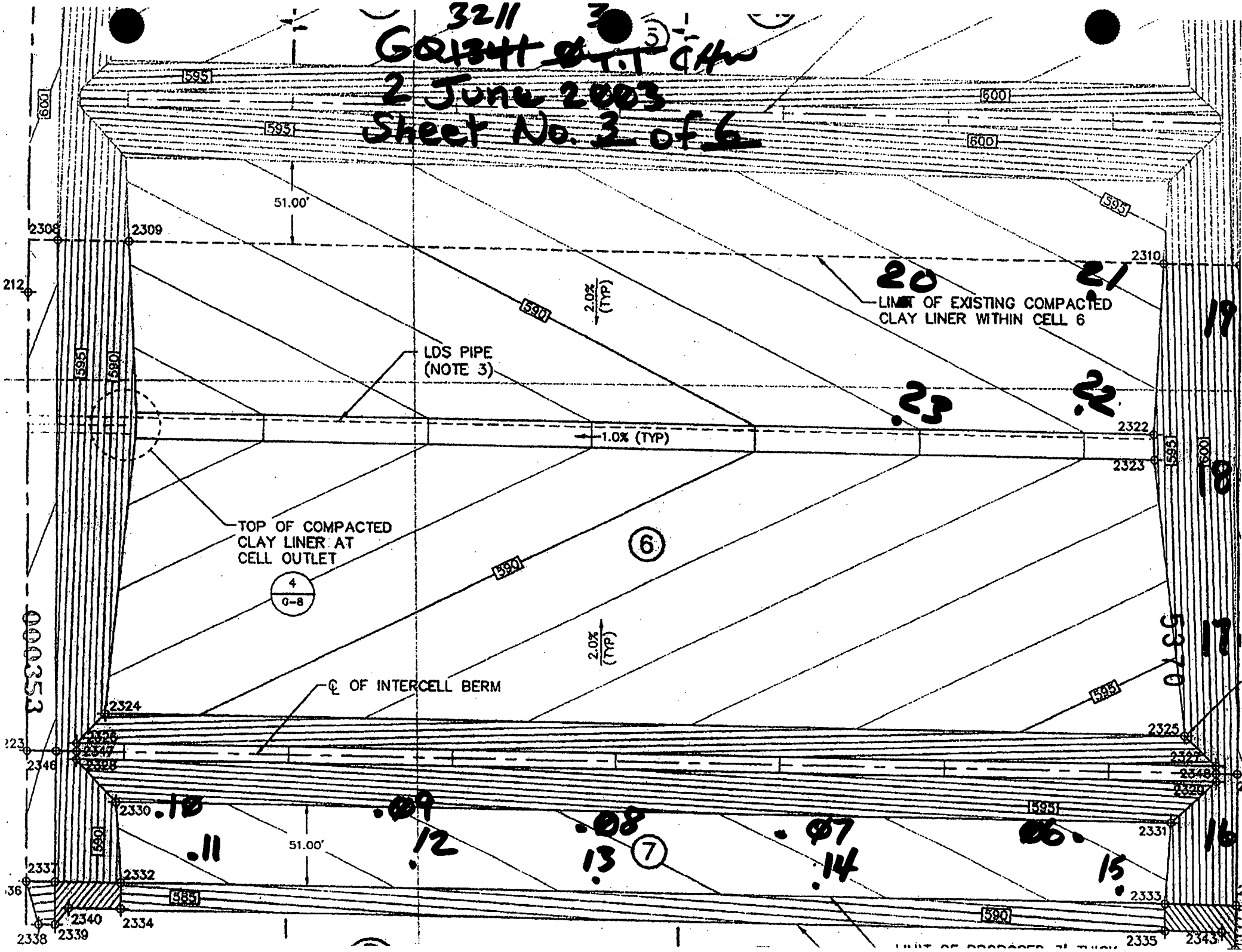
5340

3211

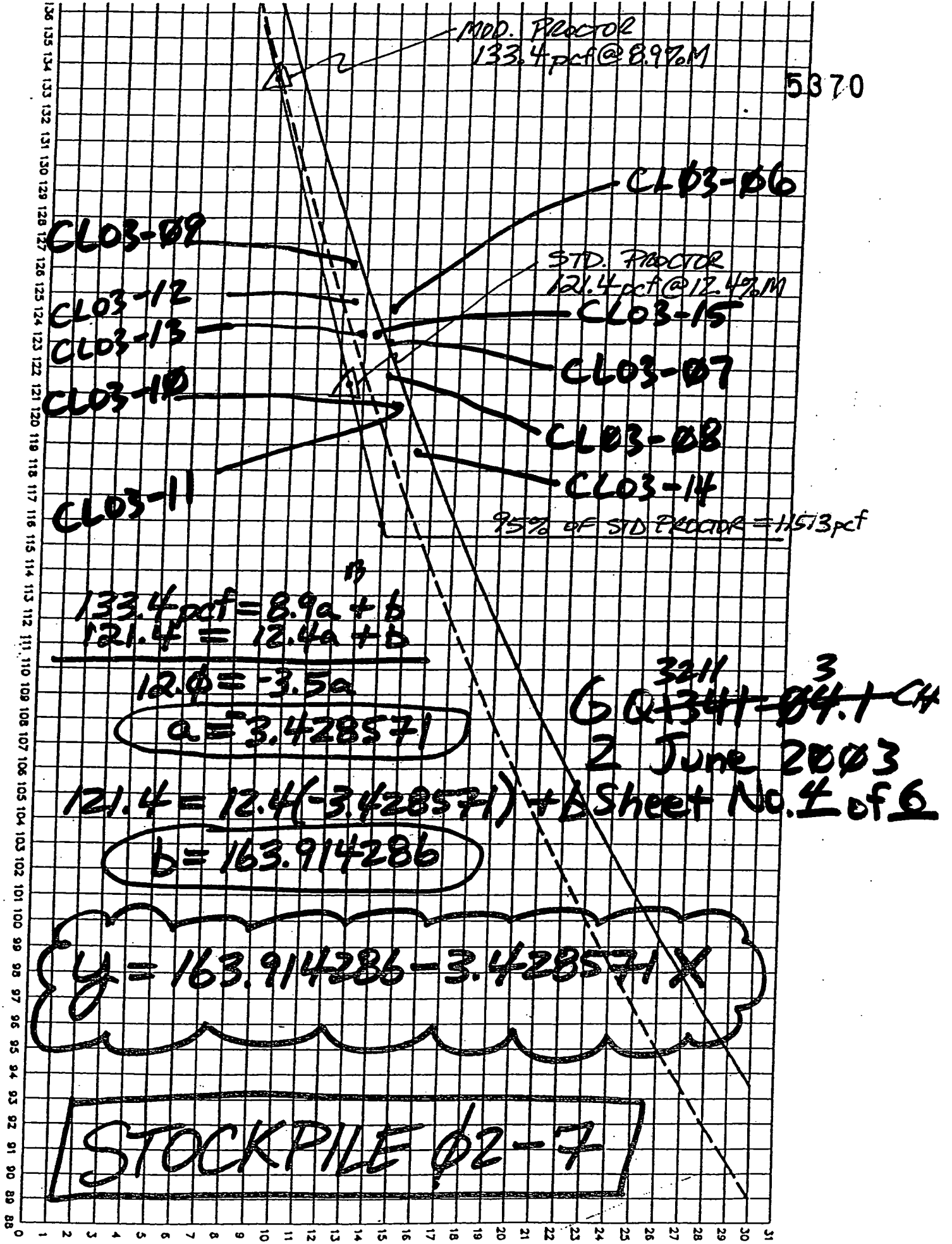
GQ1344 Cell 6 CHW

2 June 2003

Sheet No. 3 of 6

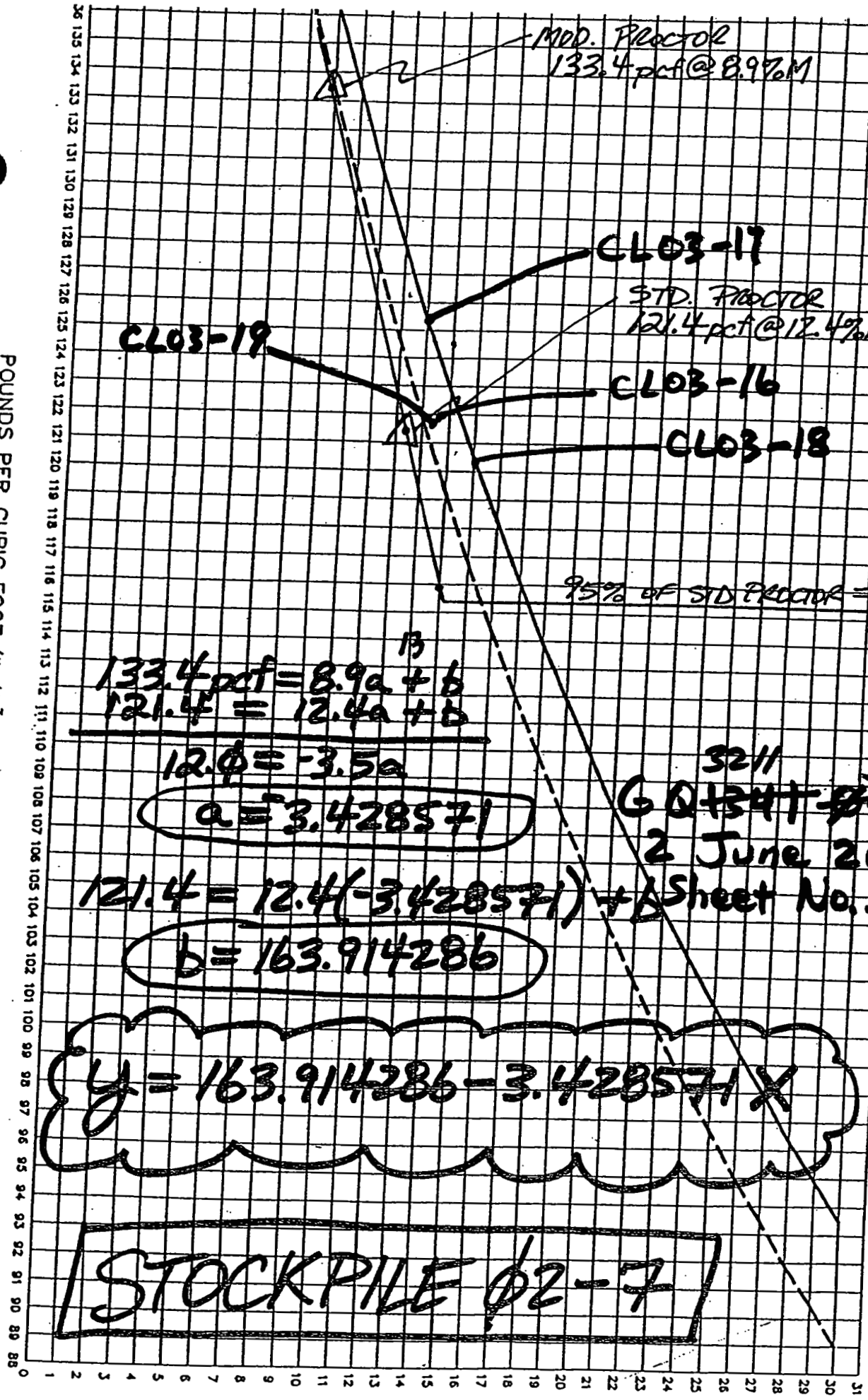


000353



3211
3
6 Q1341-04.1 CH
2 June 2003
Sheet No. 4 of 6

000354



$133.4\text{pcf} = 8.9a + b$
$121.4 = 12.4a + b$

$12.0 = -3.5a$

$a = -3.428571$

$121.4 = 12.4(-3.428571) + b$

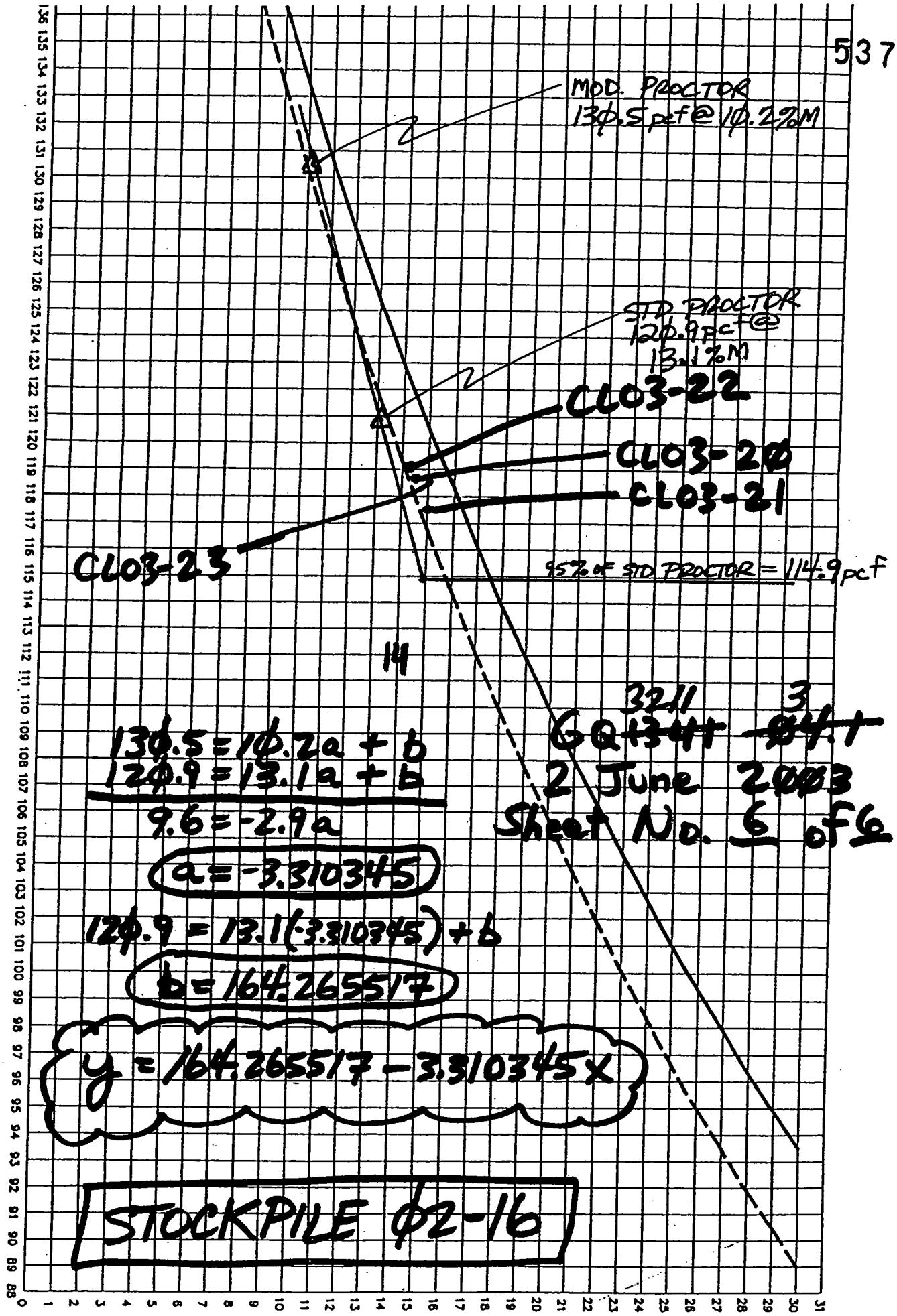
$b = 163.914286$

$y = 163.914286 - 3.428571x$

[STOCKPILE 02-7]

3211 3
GQ+341 + ~~84~~.1 CHW
2 June 2003
Sheet No. 2 of 6

000355



14

$$13Ø.5 = 1Ø.2a + b$$
$$12Ø.9 = 13.1a + b$$
$$9.6 = -2.9a$$
$$a = -3.31Ø345$$
$$12Ø.9 = 13.1(-3.31Ø345) + b$$
$$b = 164.2655517$$
$$y = 164.2655517 - 3.31Ø345x$$

GQ 3211 ~~1344~~ 3 ~~Ø4.1~~
2 June 2Ø03
Sheet No. 6 of 6

STOCKPILE Ø2-16

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GR3211 TASK NO.: 3

DESCRIPTION: Phase V

DATE: 4 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: stockpile Ø2-16

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

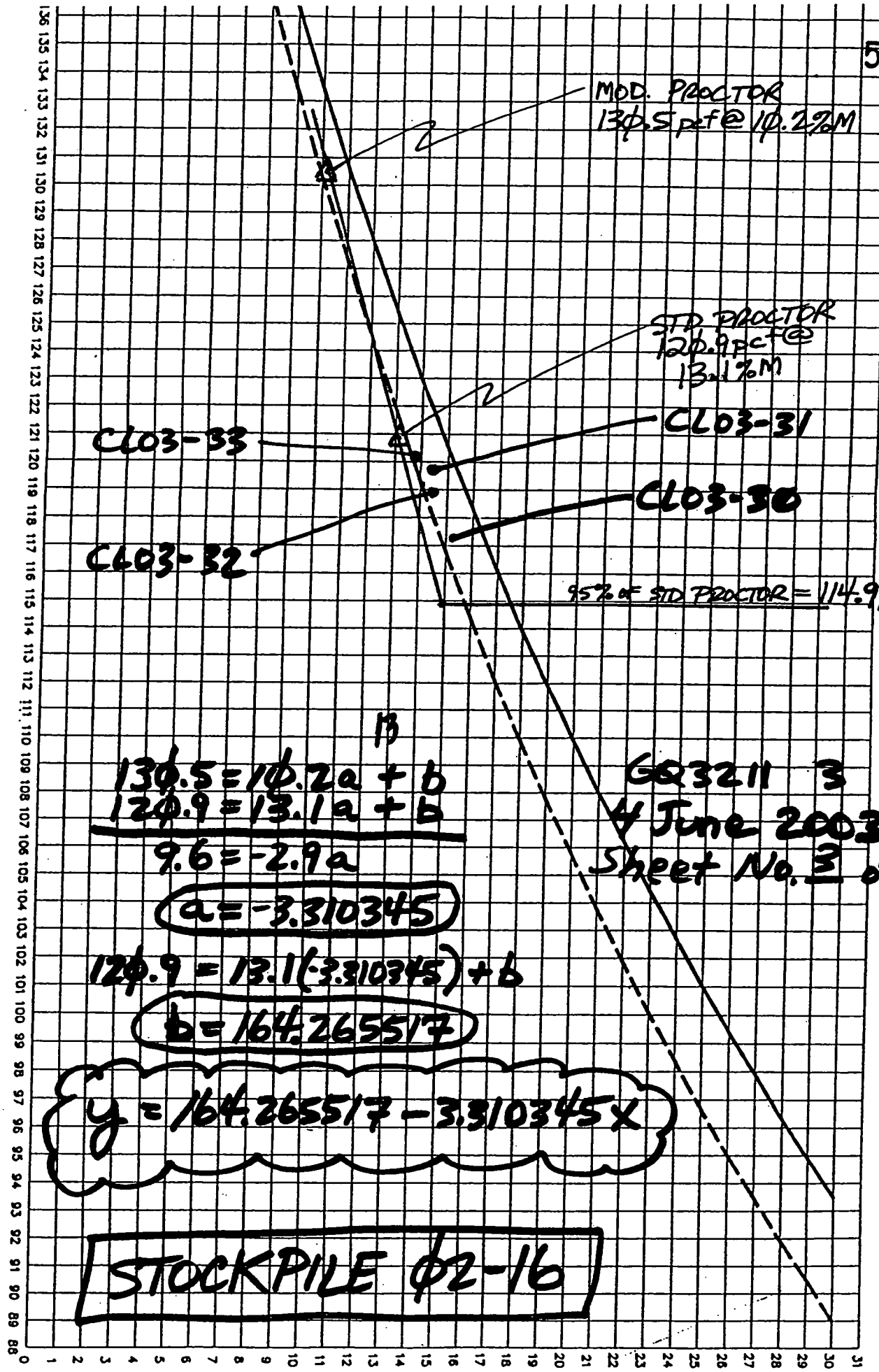
NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

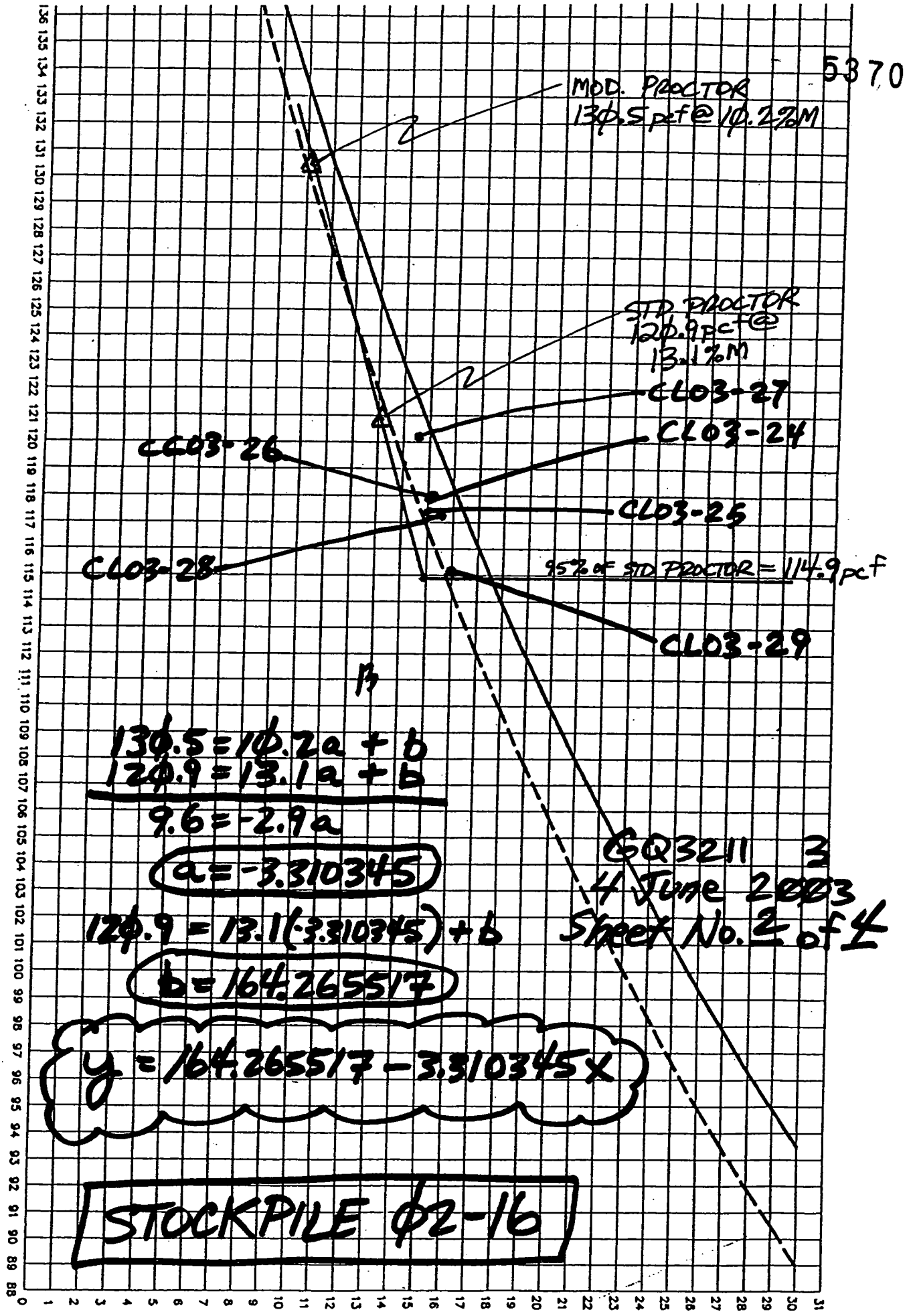
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-24	Cell # 7 Clay Liner	6" / L-2	02-16	13.1	120.9	13.6 / 15.0	135.5	117.8	97.4	P	—	—	—	—
CL03-25		6" / L-2	02-16	13.1	120.9	13.7 / 15.0	135.0	117.4	97.1	P	—	—	—	—
CL03-26		6" / L-2	02-16	13.1	120.9	13.9 / 15.2	135.8	117.9	97.5	P	—	—	—	—
CL03-27		6" / L-2	02-16	13.1	120.9	13.2 / 14.6	137.8	120.2	99.4	P	—	—	—	—
CL03-28		6" / L-2	02-16	13.1	120.9	14.4 / 15.6	135.6	117.7	97.0	P	—	—	—	—
CL03-29		6" / L-2	02-16	13.1	120.9	14.8 / 16.0	133.6	115.2	95.3	P	—	—	—	—
CL03-30		6" / L-2	02-16	13.1	120.9	14.0 / 15.3	135.1	117.2	96.9	P	—	—	—	—
CL03-31		6" / L-2	02-16	13.1	120.9	13.0 / 14.5	136.9	~~121.2~~ 119.6 CHW	~~100.2~~ 98.9 CHW	P	—	—	—	—
CL03-32		6" / L-2	02-16	13.1	120.9	13.3 / 14.7	136.4	118.9	98.3	P	—	—	—	—
CL03-33		6" / L-2	02-16	13.1	120.9	12.2 / 13.8	136.8	120.2	99.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: SHEET NO. 1 OF 4

000357


POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE
MOD. PROCTOR
130.5 pcf @ 10.2%M
STD PROCTOR
120.9 pcf @
13.1%M
CL03-33
CL03-31
CL03-30
CL03-32
95% of STD PROCTOR = 114.9 pcf
13
130.5 = 10.2a + b
120.9 = 13.1a + b
9.6 = -2.9a
a = -3.310345
120.9 = 13.1(-3.310345) + b
b = 164.2655517
y = 164.2655517 - 3.310345x
STOCKPILE 02-16
GQ3211 3
4 June 2003
Sheet No. 3 of 4


5370
MOD. PROCTOR
130.5 pcf @ 10.2%M
STD PROCTOR
120.9 pcf @
13.1%M
CL03-27
CL03-24
CL03-26
CL03-25
CL03-28
95% of STD PROCTOR = 114.9 pcf
CL03-29
13
130.5 = 10.2a + b
120.9 = 13.1a + b
9.6 = -2.9a
a = -3.310345
120.9 = 13.1(-3.310345) + b
b = 164.2655517
y = 164.265517 - 3.310345x
GQ3211 3
4 June 2003
Sheet No. 2 of 4
STOCKPILE 02-16
POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE

GQ3211 3
4 June 2003
Sheet No. 4 of 4

Lift #1 02-16 stockpile

Stabilized & Compacted
Not Tested

Pt #340

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4
G-8

Stockpile 02-5

Lift #1 Stockpile 02-16

65'

65'

53'

℄ OF INTERCELL BERM

Lift #2 passed

51.00'

51.00'

2.0% (TYP)

1.0% (TYP)

2308 2309 2310 2322 2323 2324 2325 2330 2331 2332 2333 2335 2337 2338 2339 2340 2346 2347 2348

595 600 590 585

5 6 7

28 29 25 30 31 32

000360

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: 6Q3211 TASK NO.: 3

DATE: 5 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0- +3% LIFT THICKNESS (LOOSE)/COMPACTED): ≤8"

MATERIAL SOURCE: stockpile Ø2-16

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-34	Cell #6 Floor Clay ~~Cap~~ Liner	6" / L-1	02-16	13.1	120.9	13.3 / 14.7	134.7	117.4	97.1	P	—	—	—	—
CL03-35		6" / L-1	02-16	13.1	120.9	13.8 / 15.1	137.2	119.2	98.6	P	—	—	—	—
CL03-36		6" / L-1	02-16	13.1	120.9	14.1 / 15.4	135.9	117.8	97.4	P	—	—	—	—
CL03-37		6" / L-1	02-16	13.1	120.9	14.2 / 15.5	134.0	116.0	95.9	P	—	—	—	—
CL03-38		6" / L-1	02-16	13.1	120.9	13.2 / 14.6	137.2	119.7	99.0	P	—	—	—	—
CL03-39		6" / L-1	02-16	13.1	120.9	13.7 / 15.0	134.0	116.5	96.4	P	—	—	—	—
CL03-40		6" / L-1	02-16	13.1	120.9	12.0 / 13.6	138.7	122.1	101.0	P	—	—	—	—
CL03-41		6" / L-1	02-16	13.1	120.9	13.8 / 15.1	135.5	117.7	97.4	P	—	—	—	—
CL03-42		6" / L-1	02-16	13.1	120.9	13.3 / 14.7	135.9	118.5	98.0	P	—	—	—	—
CL03-43		6" / L-1	02-16	13.1	120.2	11.7 / 13.4	136.9	120.7	99.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 12

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3122 TASK NO.: 3

DATE: 5 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-16

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-44	Cell #6 Floor Clay ~~Cap~~ Liner	6" / L-1	02-16	13.1	120.9	12.9 / 14.4	137.8	120.5	99.7	P	—	—	—	—
CL03-45		6" / L-1	02-16	13.1	120.9	14.0 / 15.3	134.8	116.9	96.7	P	—	—	—	—
CL03-46		6" / L-1	02-16	13.1	120.9	12.8 / 14.3	137.3	120.1	99.3	P	—	—	—	—
CL03-47		6" / L-1	02-16	13.1	120.9	13.9 / 15.2	136.0	118.1	97.7	P	—	—	—	—
CL03-48		6" / L-1	02-16	13.1	120.9	15.5 / 16.5	133.2	114.3	94.5	—	F	CL03-68	P	—
CL03-49		6" / L-1	02-16	13.1	120.9	14.0 / 15.3	135.5	117.5	97.2	P	—	—	—	—
CL03-50		6" / L-1	02-16	13.1	120.9	15.6 / 16.6	132.0	113.2	93.6	—	F	CL03-69	P	—
CL03-51		6" / L-1	02-16	13.1	120.9	14.9 / 16.0	131.0	112.9	93.4	—	F	CL03-70	P	—
CL03-52		6" / L-1	02-16	13.1	120.9	13.7 / 15.0	135.9	118.2	97.8	P	—	—	—	—
CL03-53		6" / L-1	02-16	13.1	120.9	14.3 / 15.5	134.3	116.3	96.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

0003362

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V

DATE: 5 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 02-16

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-54	Cell #6 Floor Clay Liner	6" / L-1	02-16	13.1	120.9	14.1 / 15.4	136.6	118.4	97.9	P	—	—	—	—
CL03-55		6" / L-1	02-16	13.1	120.9	14.9 / 16.0	135.2	116.6	96.4	P	—	—	—	—
CL03-56		6" / L-1	~~02-16~~	13.1	120.9	13.7 / 15.0	136.4	118.6	98.1	P	—	—	—	—
CL03-57		6" / L-1	02-16	13.1	120.9	13.6 / 15.0	135.1	117.5	97.2	P	—	—	—	—
CL03-58		6" / L-1	02-16	13.1	120.9	12.2 / 13.8	136.3	119.8	99.1	P	—	—	—	—
CL03-59		6" / L-1	02-16	13.1	120.9	12.6 / 14.1	137.0	120.1	99.3	P	—	—	—	—
CL03-60		6" / L-1	02-16	13.1	120.9	12.6 / 14.1	136.7	119.8	99.1	P	—	—	—	—
CL03-61		6" / L-1	02-5	12.2	122.2	12.2 / 13.8	137.0	120.4	98.5	P	—	—	—	—
CL03-62		6" / L-1	02-5	12.2	122.2	13.4 / 14.8	138.1	120.2	99.5	P	—	—	—	—
CL03-63		6" / L-1	02-5	12.2	122.2	13.0 / 14.5	135.8	118.6	97.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G03211 TASK NO.: 3

DESCRIPTION: Phase V

DATE: 5 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED) 6"-8"

MATERIAL SOURCE: Stockpile 02-5

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-64	Cell #6 Floor Clay Liner	6" / L-1	02-5	12.2	122.2	13.2 / 14.6	138.8	121.1	99.1	P	—	—	—	—
CL03-65		6" / L-1	02-5	12.2	122.2	12.1 / 13.7	136.4	120.0	98.2	P	—	—	—	—
CL03-66		6" / L-1	02-5	12.2	122.2	13.7 / 15.0	134.7	117.1	95.8	P	—	—	—	—
CL03-67		6" / L-1	02-5	12.2	122.2	11.9 / 13.5	137.0	120.7	98.8	P	—	—	—	—
CL03-68		6" / L-1	02-16	13.1	120.9	12.1 / 13.7	135.3	119.0	98.4	P	—	—	—	—
CL03-69		6" / L-1	02-16	13.1	120.9	12.7 / 14.2	134.3	117.6	97.3	P	—	—	—	—
CL03-70		6" / L-1	02-16	13.1	120.9	12.7 / 14.2	135.0	118.2	97.8	P	—	—	—	—
CL03-71		6" / L-1	02-5	12.2	122.2	12.4 / 14.0	136.4	119.6	97.9	P	—	—	—	—
CL03-72		6" / L-1	02-5	12.2	122.2	11.7 / 13.4	137.3	121.1	99.1	P	—	—	—	—
CL03-73		6" / L-1	02-5	12.2	122.2	13.8 / 15.1	133.8	116.2	95.1	—	F	CL03-74	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 4 OF 12

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5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 5 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): ___

MATERIAL SOURCE: Stockpile 02-5 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

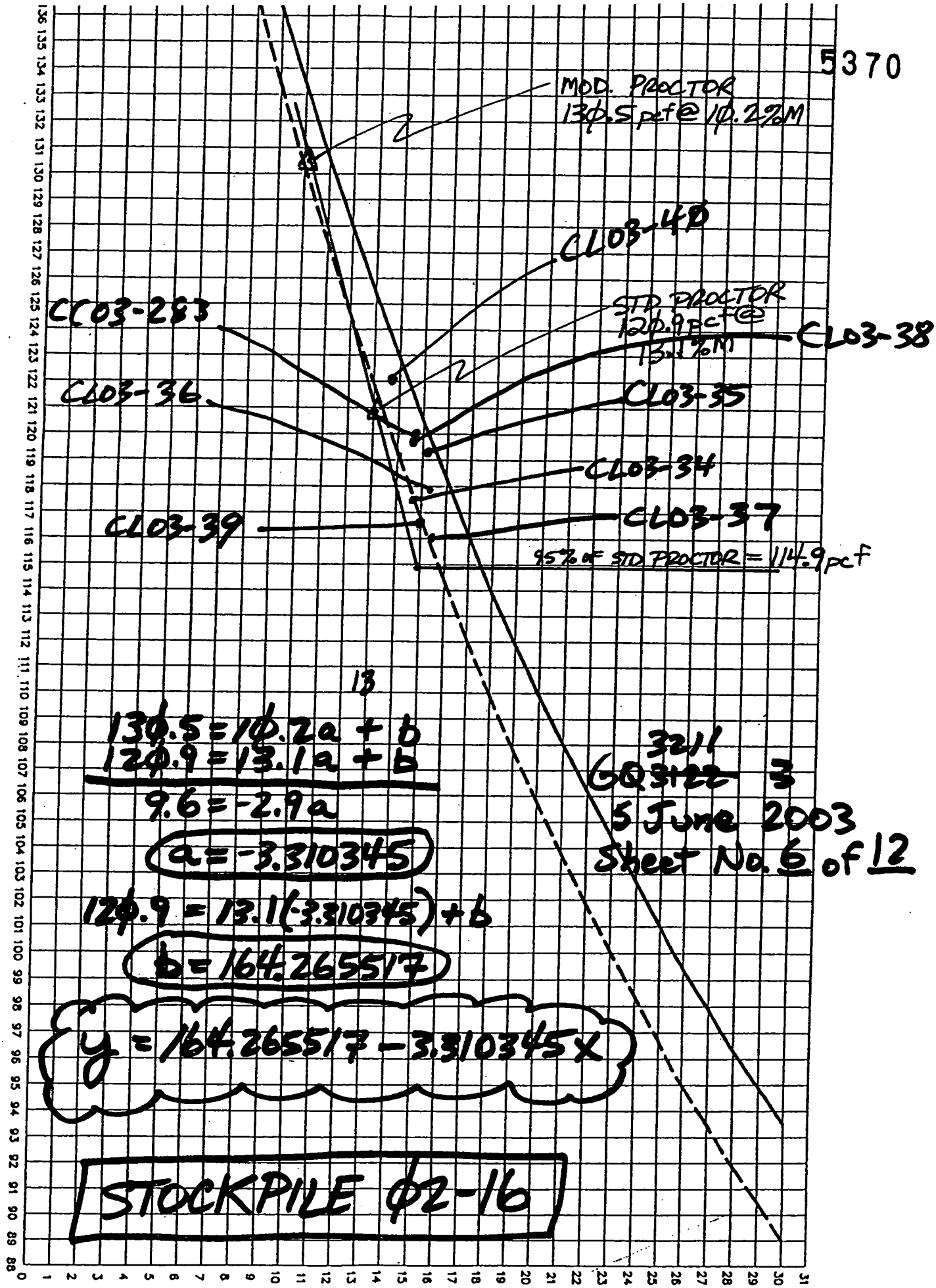
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-74	Cell # 6 Floor Clay Liner	6" / L-1	02-5	12.2	122.2	13.5 / 14.9	136.6	118.9	97.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: ___ SHEET NO. 5 OF 12

000365

93 70



13

$130.5 = 10.2a + b$
$120.9 = 13.1a + b$

$9.6 = -2.9a$

$a = -3.310345$

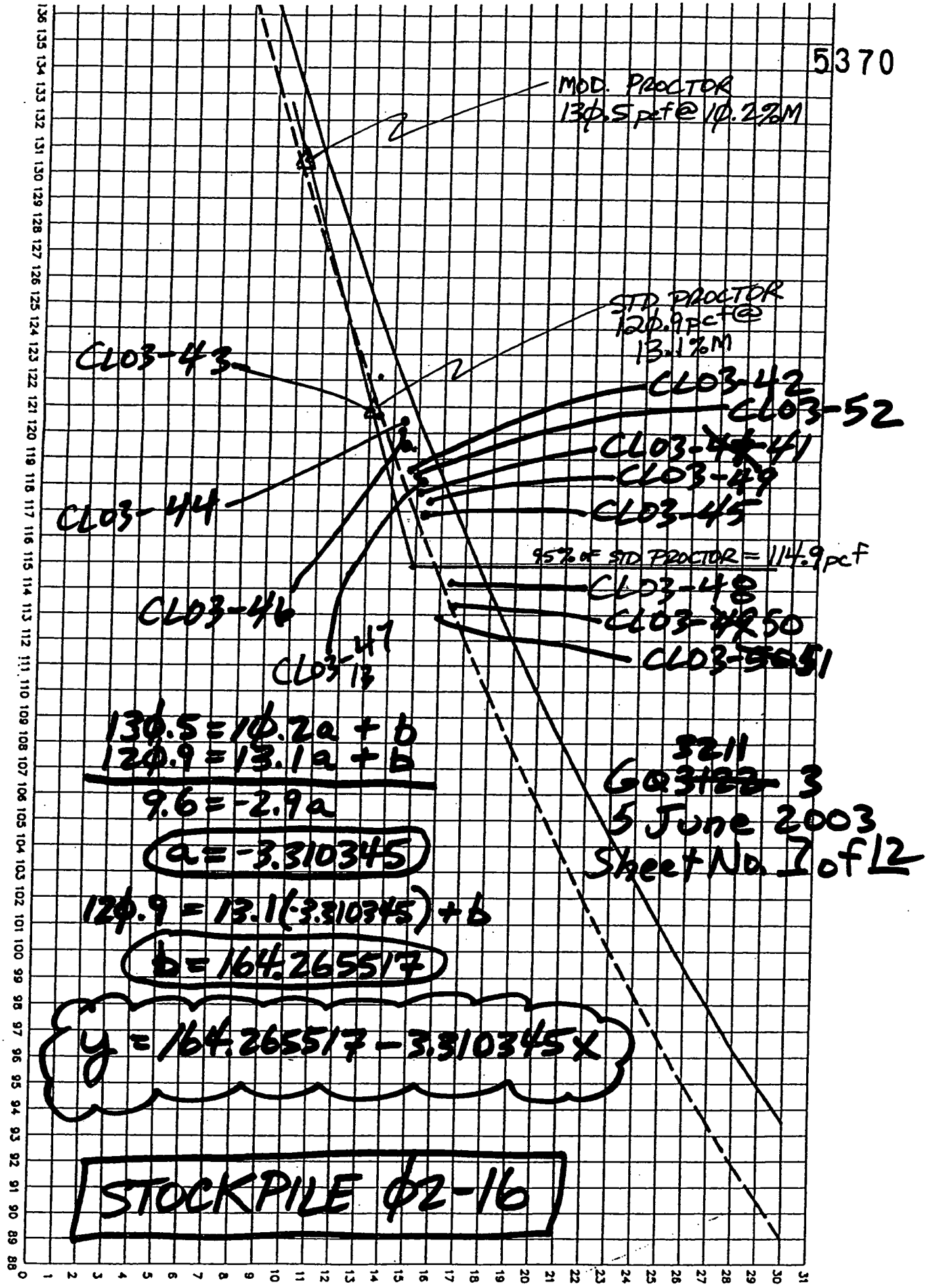
$120.9 = 13.1(-3.310345) + b$

$b = 164.265517$

$y = 164.265517 - 3.310345x$

3211
GQ3122 3
5 June 2003
Sheet No. 6 of 12

STOCKPILE Ø2-16



$130.5 = 10.2a + b$
$120.9 = 13.1a + b$

$9.6 = -2.9a$

$a = -3.310345$

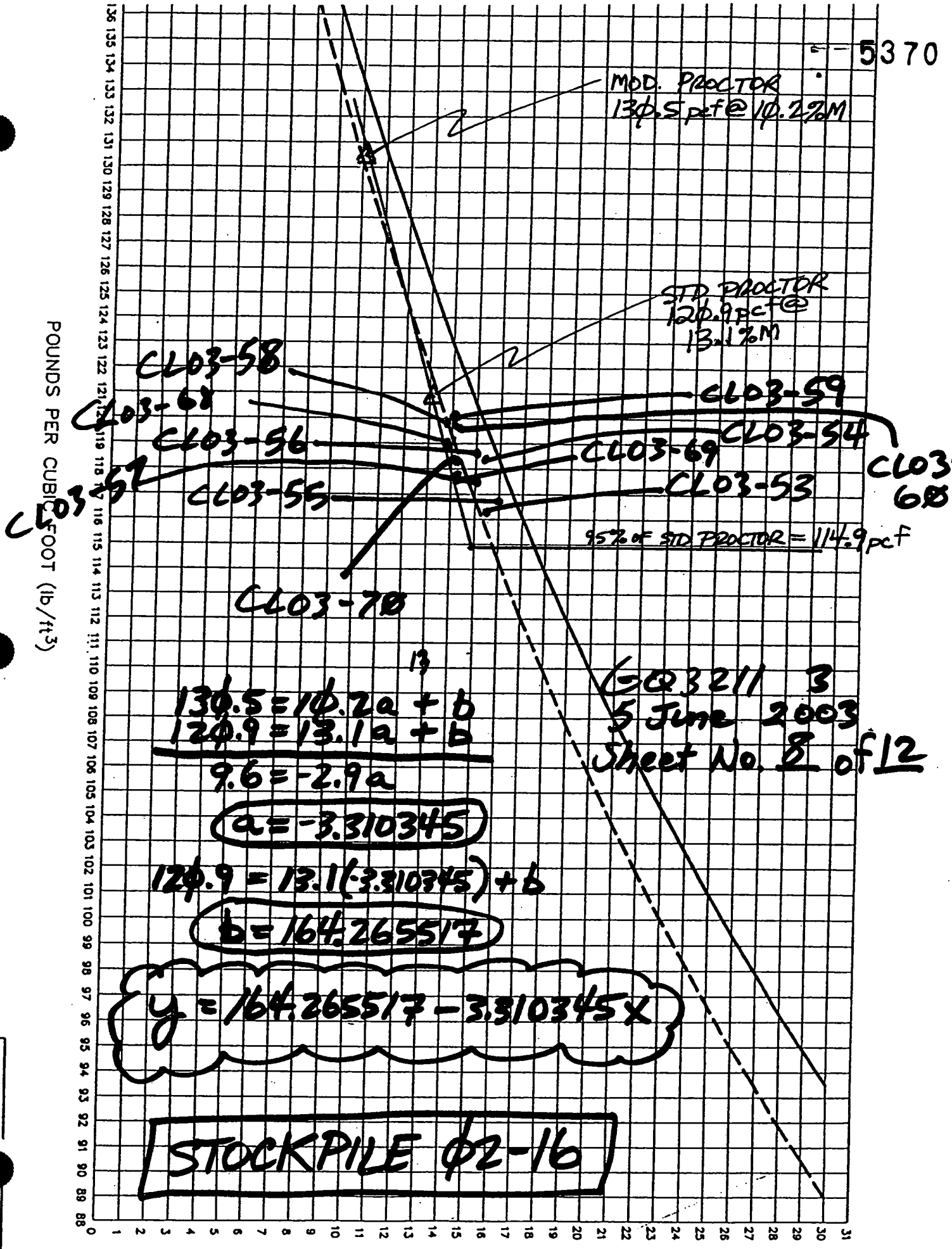
$120.9 = 13.1(-3.310345) + b$

$b = 164.265517$

$y = 164.265517 - 3.310345x$

STOCKPILE 02-16

3211
GQ3122 3
5 June 2003
Sheet No. 1 of 12



$130.5 = 10.2a + b$
$120.9 = 13.1a + b$

$9.6 = -2.9a$

$a = -3.310345$

$120.9 = 13.1(-3.310345) + b$

$b = 164.265517$

$y = 164.265517 - 3.310345x$

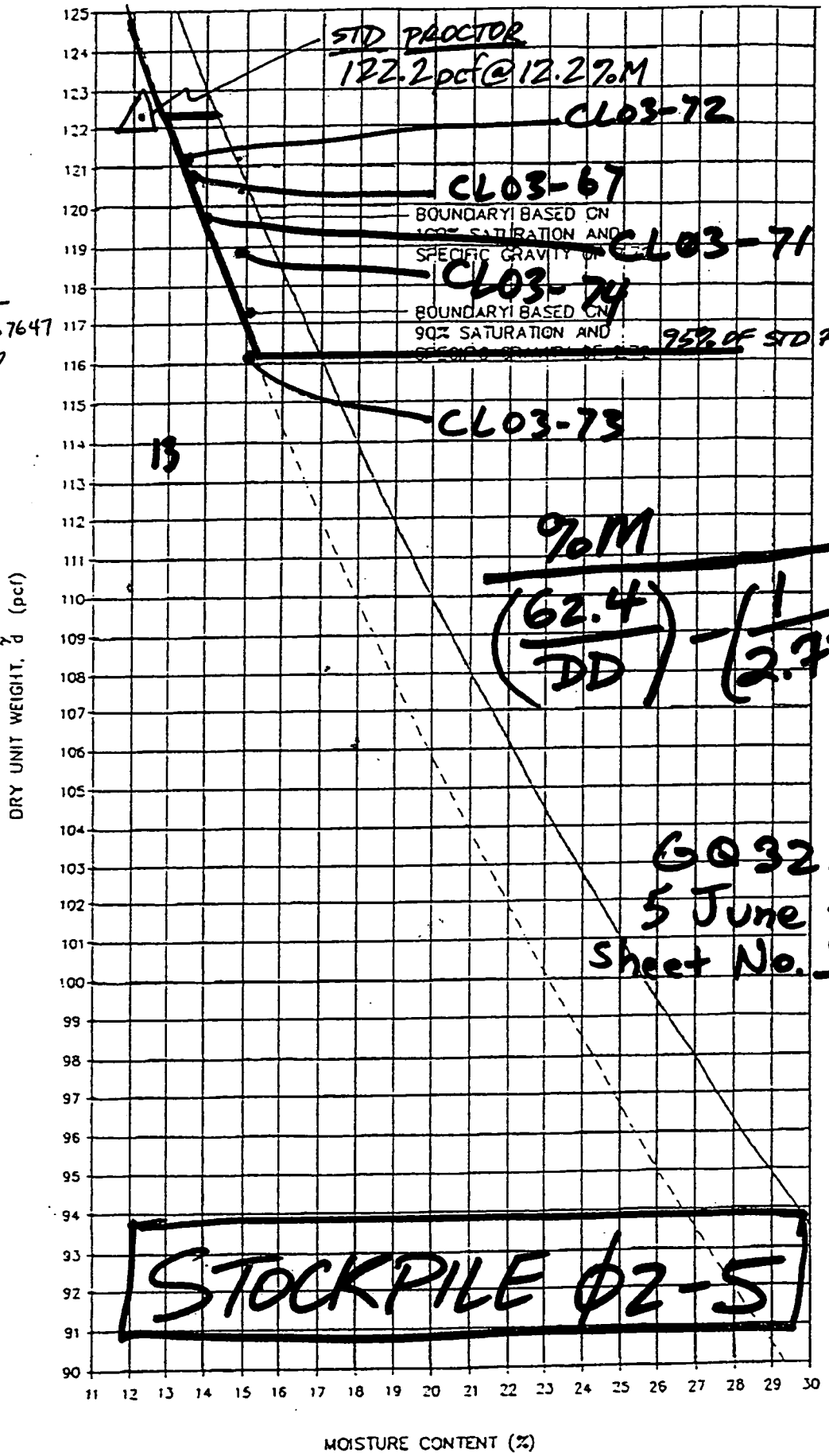
STOCKPILE 02-16

CEQ 3211 3
5 June 2003
Sheet No. 8 of 12

5370

74

.149
.5248107 - .367647
.1571637
.95

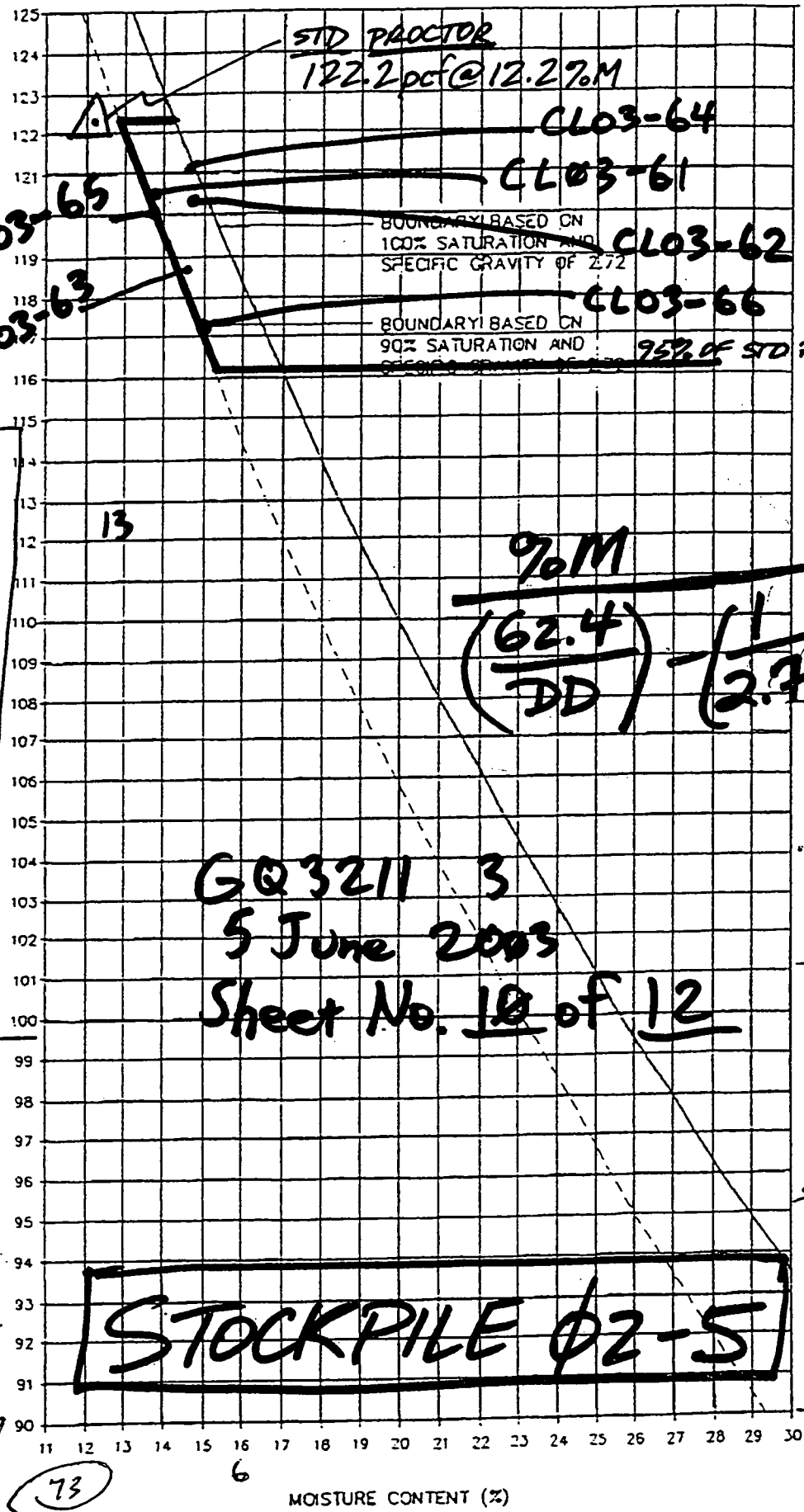


$$\frac{\%M}{\left(\frac{62.4}{DD}\right) - \left(\frac{1}{2.72}\right)} \geq \phi.9$$

GQ3211 3
5 June 2003
Sheet No. 9 of 12

STOCKPILE Ø2-5

000369



$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq \phi.9$$

GQ3211 3
5 June 2003
Sheet No. 10 of 12

STOCKPILE Ø2-5

65
.137
.52 - .367647
.152353
0.90

61
.138
.5182724 - .367647
.1506254
.92

62
.148
.5187032 - .367647
.1510562
.98

63
.145
.5261382 - .367647
.1584912
.91

64
.146
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.1476296
.99

66
.150
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.1652308
.91

67
.135
.5169842 - .367647
.1493372
.90

71
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.1540921
.91

72
.134
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.1476296
.91

73
.151
.5370051 - .367647
.1693581
.89

GQ3211 3
5 June 2003
Sheet No. 11 of 12

Lift #1 Stockpile Ø2-16
Tested and Passed

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

LDS PIPE (NOTE 3)

1.0% (TYP)

Not Yet Stabilized

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

6

4
G-8

Lift #1 Tested & Passed → Stockpile Ø2-16 + Ø2-5

2.0% (TYP)

Lift #2 Started w/ Stockpile Ø2-5

℄ OF INTERCELL BERM

Lift #3 Placed - Not Stabilized
Stockpile Ø2-5

7

51.00'

51.00'

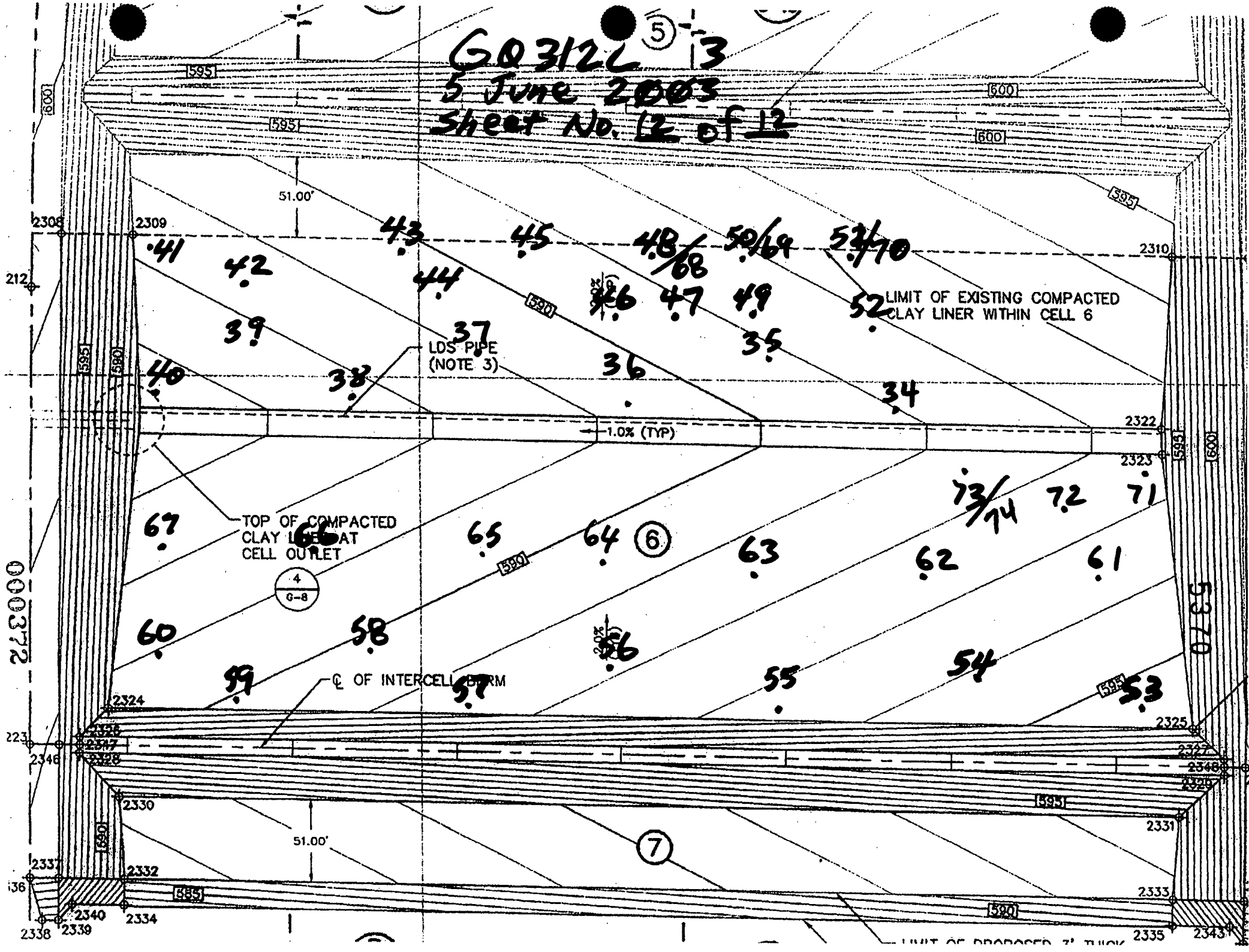
2308 2309 2310 2322 2323 2324 2325 2330 2331 2332 2333 2334 2337 2340 2346 2347 2348

595 600 590 585

3370

000371

GQ 3122 13
5 June 2003
Sheet No. 12 of 12



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0735

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I

PROJECT NO.: 6Q3211 TASK NO.: 3

DATE: 6 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile Ø2-5 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x+3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-75	Cell #7, Floor Clay Liner	6" / L-3	Ø2-5	12.2	122.2	12.3 / 13.9	137.5	120.7	98.8	P	—	—	—	—
CL03-76	↓	6" / L-3	Ø2-5	12.2	122.2	11.1 / 12.9	140.7	124.6	102.0	P	—	—	—	—
CL03-77		6" / L-3	Ø2-5	12.2	122.2	11.9 / 13.5	140.4	123.7	101.2	P	—	—	—	—
CL03-78		6" / L-3	Ø2-5	12.2	122.2	13.4 / 14.8	135.2	117.8	96.4	P	—	—	—	—
CL03-79		6" / L-3	Ø2-5	12.2	122.2	12.2 / 13.8	137.9	121.2	99.2	P	—	—	—	—
CL03-80		6" / L-3	Ø2-5	12.2	122.2	12.9 / 14.4	137.5	120.2	98.4	P	—	—	—	—
CL03-81		6" / L-3	Ø2-5	12.2	122.2	10.4 / 12.3	140.3	124.9	102.2	P	—	—	—	—
CL03-82	Cell #6 Floor Clay Liner	6" / L-3	Ø2-5	12.2	122.2	13.3 / 14.7	135.4	118.0	96.6	P	—	—	—	—
CL03-83	↓	6" / L-3	Ø2-5	12.2	122.2	11.8 / 13.5	138.8	122.3	100.1	P	—	—	—	—
CL03-84		6" / L-3	Ø2-5	12.2	122.2	11.1 / 12.9	140.5	124.4	101.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: ____

SHEET NO. 1 OF 8

000373

53740

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 6 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ~8"

MATERIAL SOURCE: Stockpile 02-5 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-85	Cell #6 Floor, Clay Liner	6" / L-1	02-5	12.2	122.2	12.6 / 14.1	137.4	120.4	98.5	P	—	—	—	—
CL03-86	↓	6" / L-1	02-5	12.2	122.2	11.7 / 13.4	137.9	121.6	99.5	P	—	—	—	—
CL03-87		6" / L-1	02-5	12.2	122.2	12.7 / 14.2	138.6	121.4	99.3	P	—	—	—	—
CL03-88		6" / L-1	02-5	12.2	122.2	11.9 / 13.5	138.2	121.8	99.7	P	—	—	—	—
CL03-89	Cell #6 Floor Clay Liner	6" / L-2	02-5	12.2	122.2	15.1 / ~~16.2~~	134.4	115.8	94.8		F	CL03-90	P	—
CL03-90	↓	6" / L-2	02-5	12.2	122.2	13.7 / 15.0	136.3	118.5	97.0	P	—	—	—	—
CL03-91		6" / L-2	02-5	12.2	122.2	13.9 / 15.2	135.6	117.7	96.3	P	—	—	—	—
CL03-92		6" / L-2	02-5	12.2	122.2	13.3 / 14.7	137.0	119.4	97.7	P	—	—	—	—
CL03-93	Cell #7 Floor Clay Liner	6" / L-3	02-5	12.2	122.2	12.6 / 14.1	137.4	120.4	98.5	P	—	—	—	—
CL03-94	↓	/	02-5	12.2	122.2	11.7 / 13.4	139.9	123.4	~~100.9~~ 101.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 2 OF 8

000374

53708

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 6 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-5 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x+3.6556 QA ID: CAW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-95	Cell #7 Floor, Clay Liner	6" / L-3	02-5	12.2	122.2	12.4 / 14.0	139.8	122.6	100.3	P	—	—	—	—
CL03-96	↓	6" / L-3	02-5	12.2	122.2	11.3 / 13.0	140.0	123.9	101.4	P	—	—	—	—
CL03-97	↓	6" / L-3	02-5	12.2	122.2	11.5 / 13.2	141.6	125.1	102.4	P	—	—	—	—
CL03-98	Penetration Box Pad	6" / L-6	02-5	12.2	122.2	11.8 / 13.5	139.2	122.6	100.3	P	—	—	—	—
CL03-99	Cell #6 Drainage Corridor	6" / L-1	02-5	12.2	122.2	10.7 / 12.5	138.4	123.0	100.7	~~P~~	F	CL03-137	P	—
CL03-100	↓	6" / L-1	02-5	12.2	122.2	12.4 / 14.0	138.4	121.4	99.3	P	—	—	—	—
~~CL03-101~~		/												
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5310

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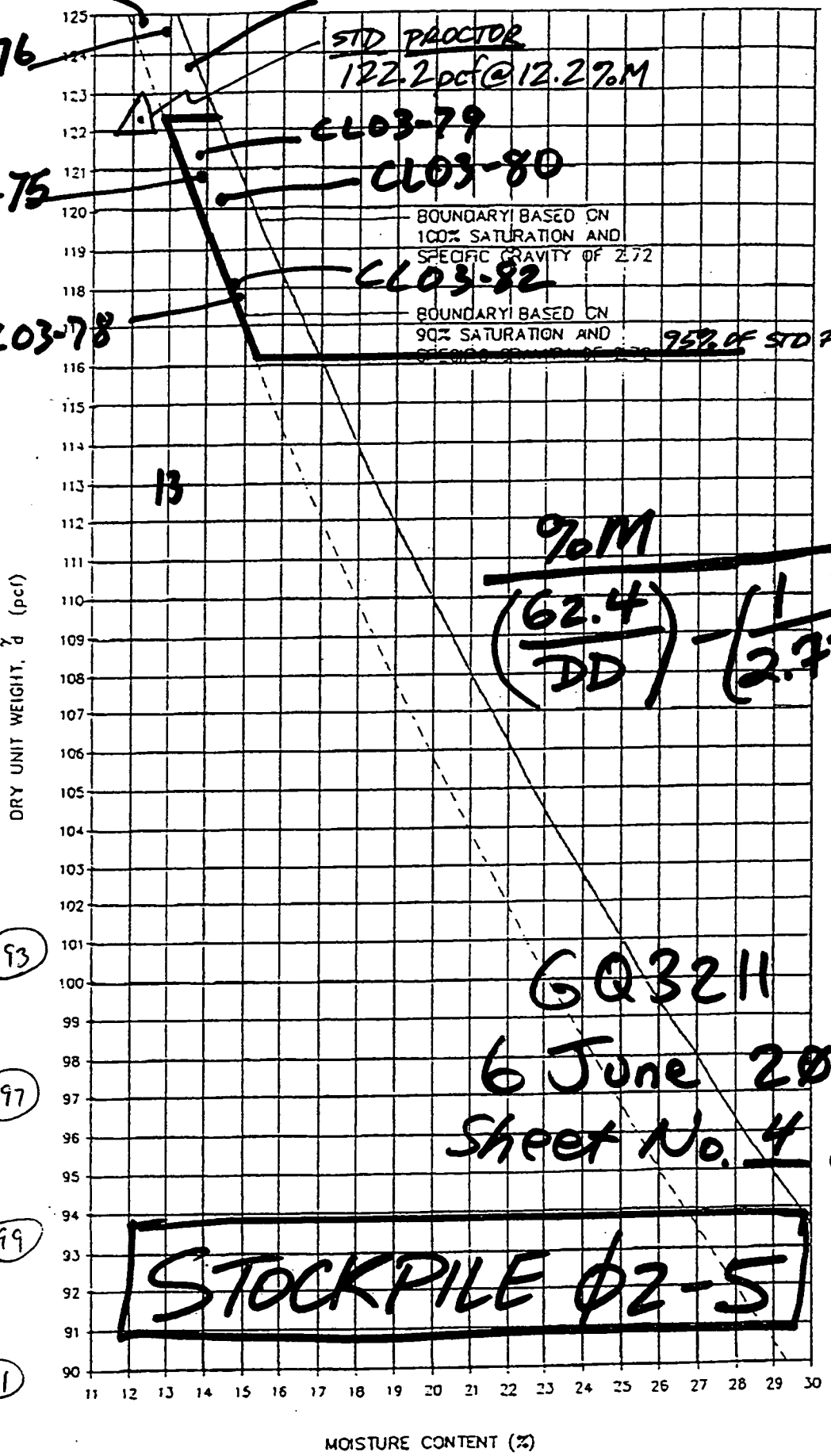
000375

5370



$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq \phi.9$$

GQ3211 3

6 June 2003

Sheet No. 4 of 8

STOCKPILE Ø2-5

80
.144 / .1514877 = .95

81
.123 / .1319526 = .93

82
.147 / .161665 = .91

75
.139 / .1493372 = .93

76
.129 / .1331555 = .97

77
.135 / .1367992 = .99

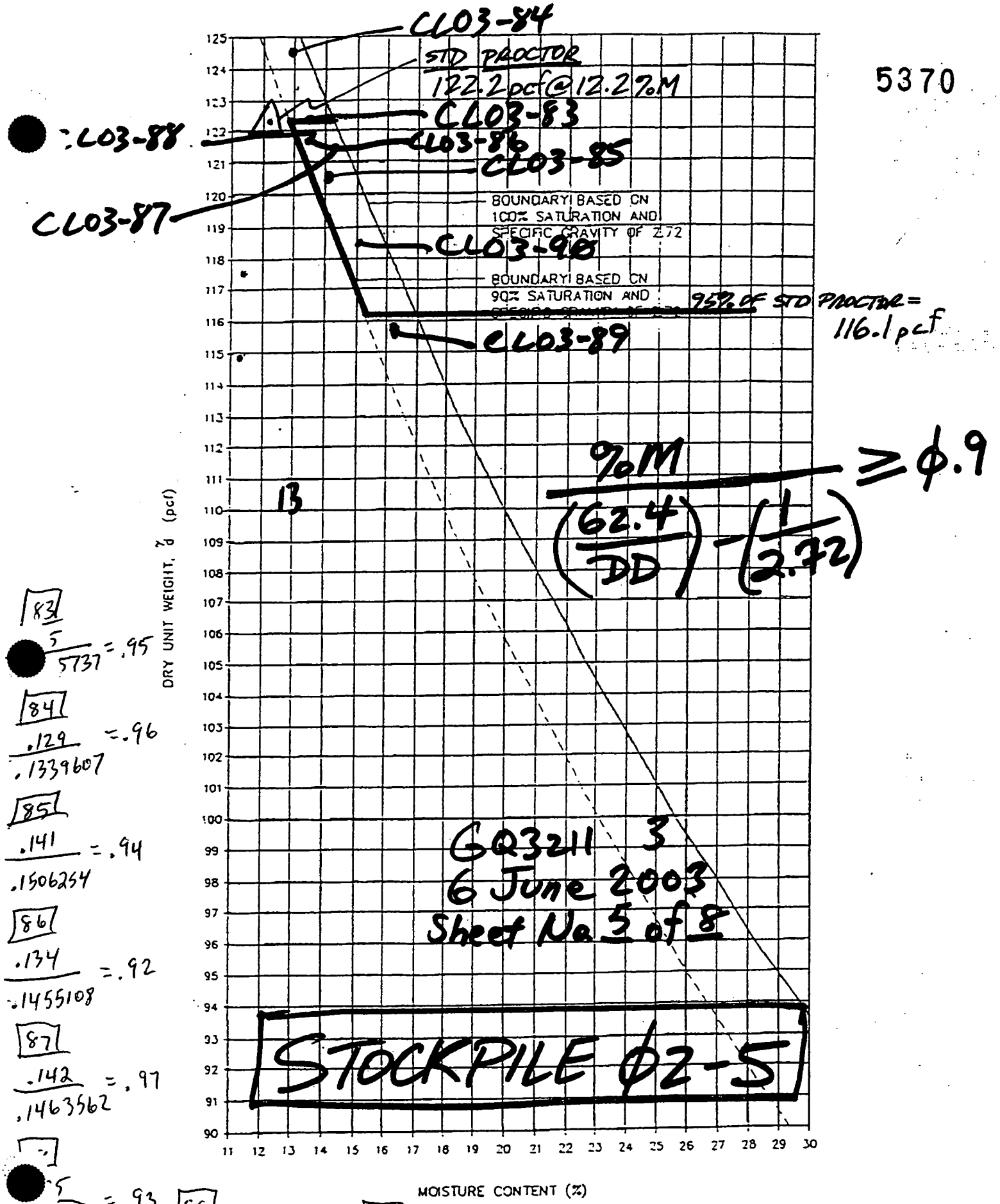
78
.148 / 20643 = .91

79
.138 / .1472044 = .94

$\frac{1}{2.72} = .367647$

000376

5370



83
5/5737 = .95

84
.129/.1339607 = .96

85
.141/.1506254 = .94

86
.134/.1455108 = .92

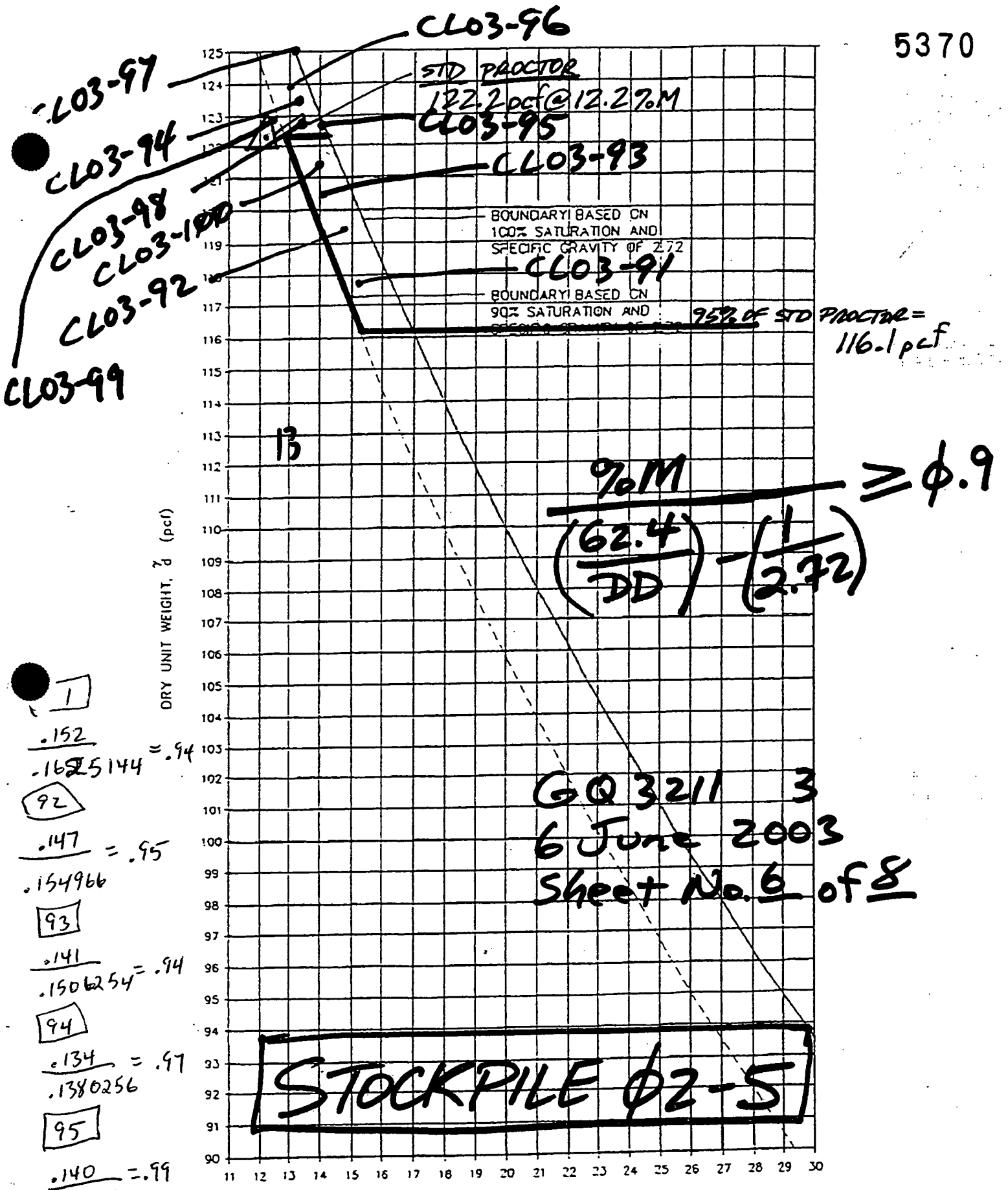
87
.142/.1463562 = .97

5/.1446682 = .93

89
.162/.1716788 = .94

90
.150/.1589352 = .94

000377



1
.152 / .1625144 = .94

92
.147 / .154966 = .95

93
.141 / .1506254 = .94

94
.134 / .1380256 = .97

95
.140 / .1413252 = .99

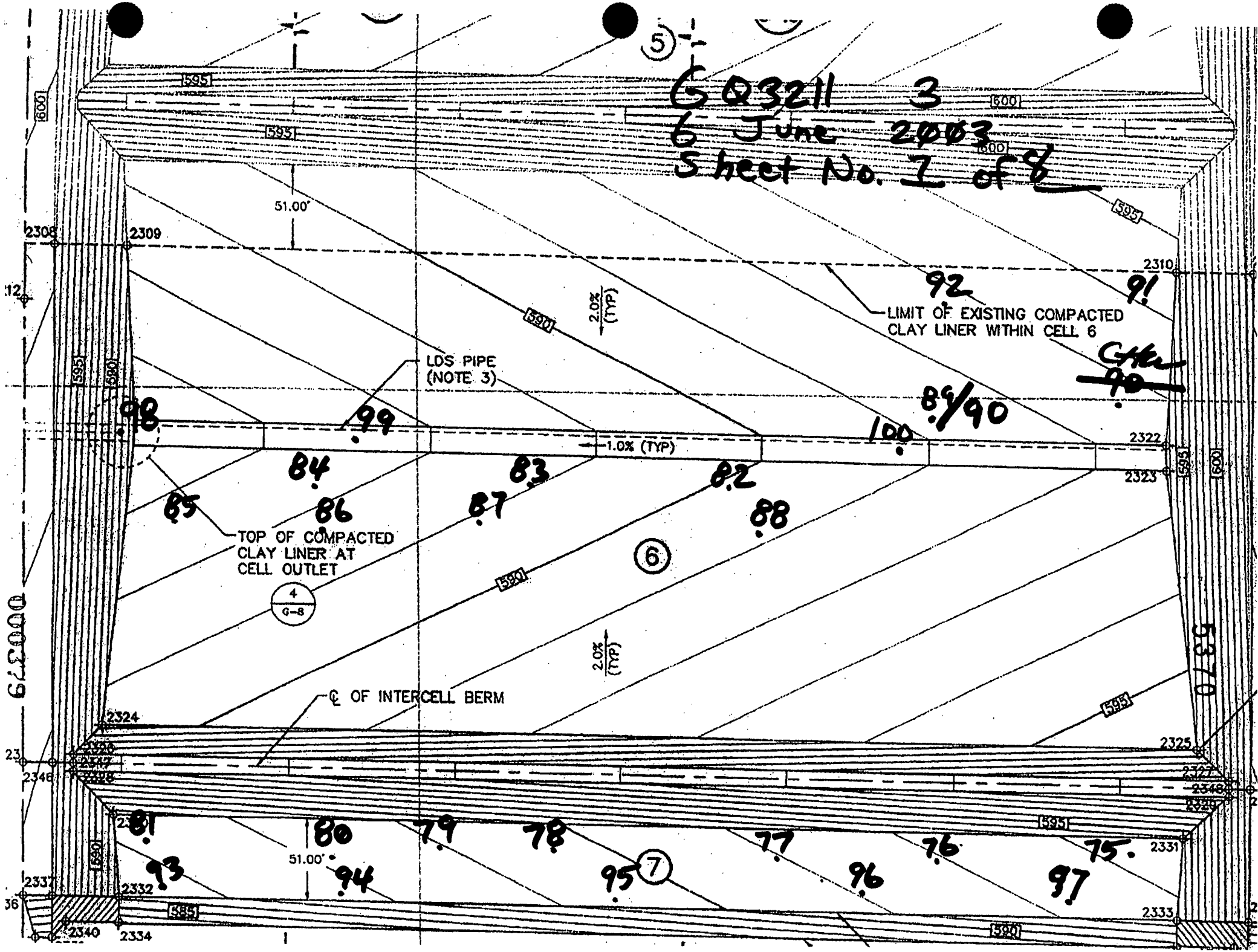
96
.130 / .1359849 = .96

97
.132 / .1311539 100.6

98
.135 / .1413252 = .96

99
.125 / .13967 = .89

100
.140 / .1463562 = .96


G Q3211 3
6 June 2003
Sheet No. 2 of 8
51.00'
2308
2309
2310
2322
2323
2324
2325
2331
2332
2333
2334
2337
2340
2346
595
600
590
585
2.0% (TYP)
1.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
℄ OF INTERCELL BERM
6
7
92
91
98
99
100
89/90
84
83
82
85
86
87
88
81
80
79
78
77
76
75
93
94
95
96
97
000379
53706

GQ 3211 3
6 June 2003
Sheet No. 8 of 8

Lift # 2 Placed, Not Stabilized
Stockpile 02-5

Tested & Passed

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

Drainage Corridor
Lift #1 Tested & Passed

150'

Lift #1 Tested and Passed
Stockpile Ø2-5

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

Lift #2 Placed, Not Stabilized
Stockpile Ø2-5

℄ OF INTERCELL BERM

Lift #3 Tested and Passed, Stockpile Ø2-5

51.00'
2.0% (TYP)
1.0% (TYP)
(NOTE 3)
595
600
590
2308
2309
2310
2322
2323
2324
2325
2330
2331
2332
2333
2334
2337
2340
2346
2347
2348
5370
000380

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 9 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile Ø2-5

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-100	Cell #6 Floor, Clay Liner	6" / L-2	Ø2-5	12.2	122.2	13.4 / 14.8	136.5	118.9	97.3	P	—	—	—	—
CL03-102		6" / L-2	Ø2-5	12.2	122.2	13.5 / 14.9	135.5	117.9	96.5	P	—	—	—	—
CL03-103		6" / L-2	Ø2-5	12.2	122.2	13.8 / 15.1	135.4	117.6	96.2	P	—	—	—	—
CL03-104		6" / L-2	Ø2-5	12.2	122.2	12.2 / 13.8	137.8	121.1	99.1	P	—	—	—	—
CL03-105		6" / L-2	Ø2-5	12.2	122.2	13.7 / 15.0	134.3	116.8	95.6	P	—	—	—	—
CL03-106		6" / L-2	Ø2-5	12.2	122.2	12.4 / 14.0	135.6	118.9	97.3	—	F	CL03-107	P	—
CL03-107		6" / L-2	Ø2-5	12.2	122.2	13.0 / 14.5	138.3	120.8	98.9	P	—	—	—	—
CL03-108		6" / L-2	Ø2-5	12.2	122.2	13.3 / 14.7	137.2	119.6	97.9	P	—	—	—	—
CL03-109		6" / L-2	Ø2-5	12.2	122.2	13.0 / 14.5	135.3	118.2	96.7	P	—	—	—	—
CL03-110		6" / L-2	Ø2-5	12.2	122.2	13.0 / 14.5	134.9	117.8	96.4	—	F	CL03-111	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 11

000381

5870

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 9 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: Ø-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile Ø2-5

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-111	Cell #6 Floor, Clay Liner	6" / L-2	Ø2-5	12.2	122.2	12.7 / 14.2	138.4	121.2	99.2	P	—	—	—	—
CL03-112	Cell #6	6" / L-2	Ø2-5	12.2	122.2	12.1 / 13.7	138.7	122.0	99.8	P	—	—	—	—
CL03-113	Penetration Box Pad	6" / L-8	Ø2-5	12.2	122.2	11.2 / 13.0	141.1	124.9	102.2	P	—	—	—	—
CL03-114	Cell #6 Floor, Clay Liner	6" / L-2	Ø2-5	12.2	122.2	11.4 / 13.1	138.6	122.5	100.2	P	—	—	—	—
CL03-115		6" / L-2	Ø2-5	12.2	122.2	12.8 / 14.3	136.1	119.1	97.5	P	—	—	—	—
CL03-116		6" / L-2	Ø2-5	12.2	122.2	11.7 / 13.4	139.6	123.1	100.7	P	—	—	—	—
CL03-117		6" / L-2	Ø2-5	12.2	122.2	10.6 / 12.5	141.2	125.5	102.7	P	—	—	—	—
CL03-118		6" / L-2	Ø2-5	12.2	122.2	12.3 / 13.9	138.2	121.3	99.3	P	—	—	—	—
CL03-119		6" / L-2	Ø2-5	12.2	122.2	13.8 / 15.1	135.5	117.7	96.3	P	—	—	—	—
CL03-120		6" / L-2	Ø2-5	12.2	122.2	13.1 / 14.5	135.7	118.5	97.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CA SHEET NO. 2 OF 11

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: 603211 TASK NO.: 3

DATE: 9 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈9"

MATERIAL SOURCE: Stockpile 02-5

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-121	Cell #6 Floor Clay Liner	6" / L-2	02-5	12.2	122.2	12.6 / 14.1	138.9	121.7	99.6	P	—	—	—	—
CL03-122		6" / L-2	02-5	12.2	122.2	11.1 / 12.9	141.1	125.0	102.3	P	—	—	—	—
CL03-123		6" / L-2	02-5	12.2	122.2	12.2 / 13.8	139.6	122.7	100.4	P	—	—	—	—
CL03-124		6" / L-2	02-5	12.2	122.2	12.1 / 13.7	139.4	122.6	100.3	P	—	—	—	—
CL03-125		6" / L-2	02-5	12.2	122.2	12.4 / 14.0	139.1	122.0	99.8	P	—	—	—	—
CL03-126		6" / L-2	02-5	12.2	122.2	13.6 / 15.0	136.9	119.0	97.4	P	—	—	—	—
CL03-127	Cell #7 Floor, Clay Liner	6" / L-4	02-5	12.2	122.2	11.6 / 13.3	139.8	123.4	101.0	P	—	—	—	—
CL03-128		6" / L-4	02-5	12.2	122.2	11.1 / 12.9	141.3	125.2	102.5	P	—	—	—	—
CL03-129		6" / L-4	02-5	12.2	122.2	11.9 / 13.5	138.9	122.4	100.2	P	—	—	—	—
CL03-130		6" / L-4	02-5	12.2	122.2	12.0 / 13.6	139.2	122.5	100.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 3 OF 11

0003383

5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V — DATE: 9 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-5 — MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 — GAUGE SERIAL NO. 20979 — CORRECTION FACTOR Y = 0.8311X + 3.6556 — QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-131	Cell #7 Floor, Clay Liner	6" / L-4	02-5	12.2	122.2	11.4 / 13.1	138.2	122.2	100.0	P	—	—	—	—
CL03-132		6" / L-4	02-5	12.2	122.2	11.5 / 13.2	140.2	123.9	101.4	P	—	—	—	—
CL03-133		6" / L-4	02-5	12.2	122.2	10.3 / 12.2	139.5	124.3	101.7	P	—	—	—	—
CL03-134		6" / L-4	02-5	12.2	122.2	11.0 / 12.8	139.6	123.7	101.2 ~~100.2~~	P	—	—	—	—
CL03-135		6" / L-4	02-5	12.2	122.2	11.3 / 13.0	138.3	122.4	100.2	P	—	—	—	—
CL03-136		6" / L-4	02-5	12.2	122.2	11.2 / 13.0	140.0	123.9	101.4	P	—	—	—	—
CL03-137	Cell #6 Drainage Corridor	6" / L-1	02-5	12.2	122.2	11.4 / 13.1	138.4	122.4	100.2	P	—	—	—	—
CL03-138	Cell #6 Floor, Clay Liner	6" / L-2	02-5	12.2	122.2	11.2 / 13.0	141.7	125.4	102.6	P	—	—	—	—
CL03-139		6" / L-2	02-5	12.2	122.2	11.4 / 13.1	137.8	121.8	99.7	P	—	—	—	—
CL03-140		6" / L-2	02-5	12.2	122.2	12.2 / 13.8	138.7	121.9	99.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CHECKED BY: [illegible]

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GR3211 TASK NO.: 3

DATE: 9 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): ___

MATERIAL SOURCE: Stockpile 02-5

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CNW

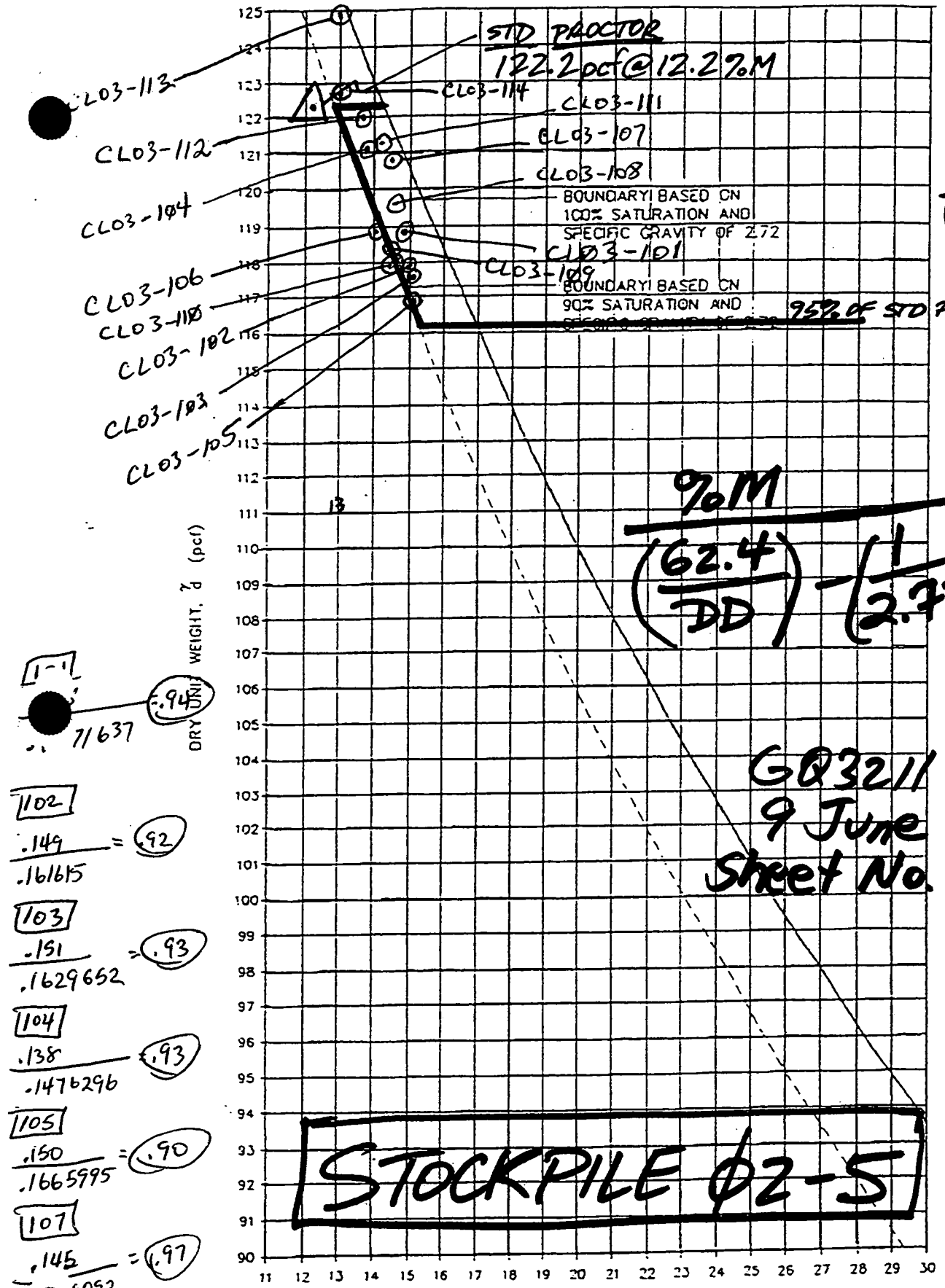
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-141	Cell #6 Floor Clay Liner	6" / L-2	02-5	12.2	122.2	11.7 / 13.4	137.9	121.6	99.5	P	—	—	—	—
CL03-142	↓	6" / L-2	02-5	12.2	122.2	12.7 / 14.2	138.9	121.6	99.5	P	—	—	—	—
CL03-143		6" / L-2	02-5	12.2	122.2	12.2 / 13.8	136.9	120.3	98.4	P	—	—	—	—
CL03-144		6" / L-2	02-5	12.2	122.2	12.5 / 14.0	137.4	120.5	98.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible] SHEET NO. 5 OF 11

000385

6370



$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq \phi.9$$

GQ3211 3
9 June 2003
Sheet No. 6 of 11

STOCKPILE Ø2-5

113 .130 / .1319526 = .99

114 .131 / .1417407 = .92

1-1 .94 / 71637

102 .149 / .161615 = .92

103 .151 / .1629652 = .93

104 .138 / .1476296 = .93

105 .150 / .1665995 = .90

107 .145 / 9092 = .97

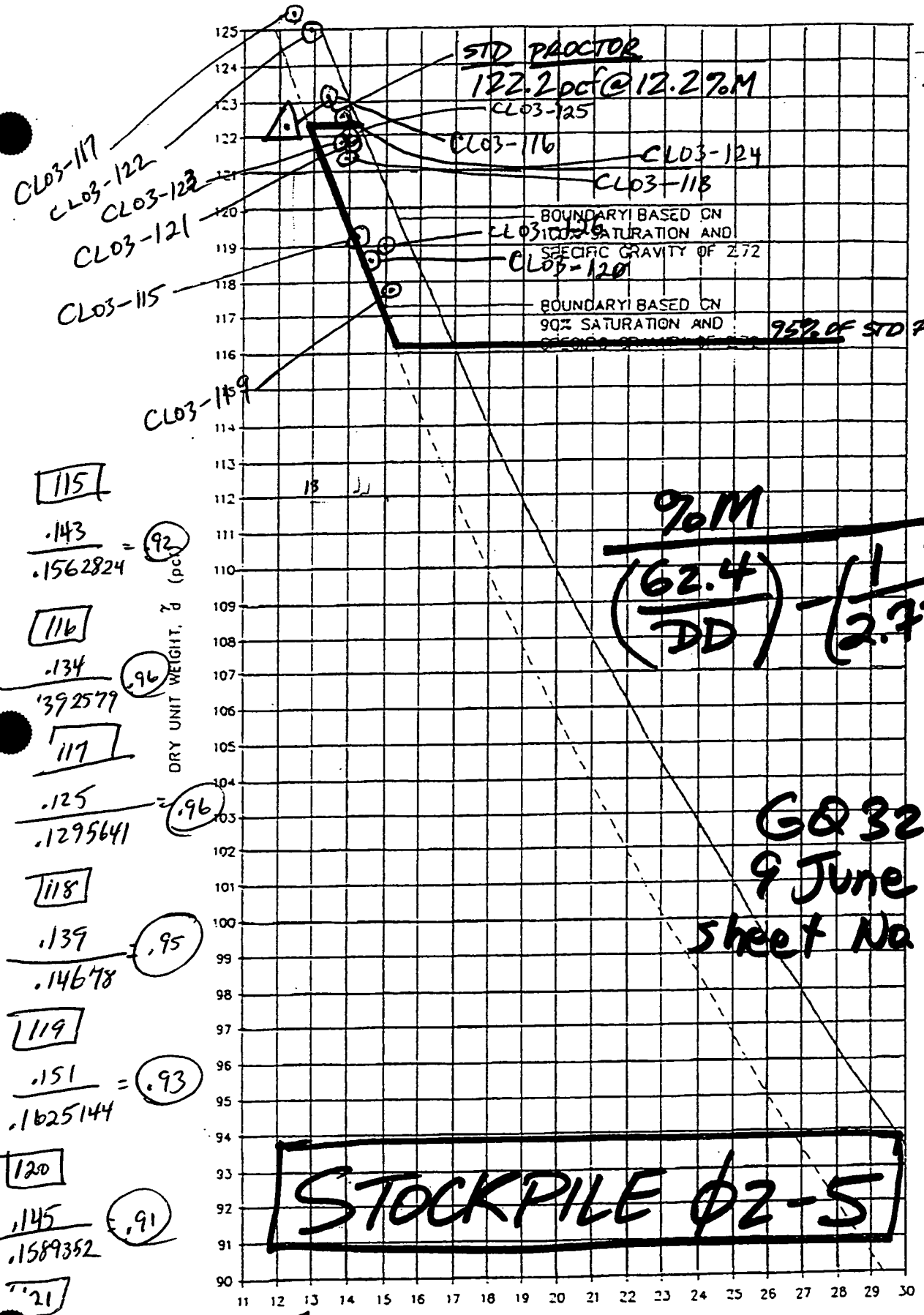
.147 / .1540921 = .95

109 .145 / .1602717 = .90

111 .142 / .1472044 = .96

112 .137 / .1438284 = .95

5370



$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq \phi.9$$

GQ3211 3
9 June 2003
Sheet No 1 of 11

STOCKPILE Ø2-5

115: .143 / .1562824 = .92

116: .134 / .392579 = .96

117: .125 / .1295641 = .96

118: .139 / .14678 = .95

119: .151 / .1625144 = .93

120: .145 / .1589352 = .91

121: [illegible] / .1450842 = .97

122: .129 / .131553 = .98

123: .138 / .1409104 = .98

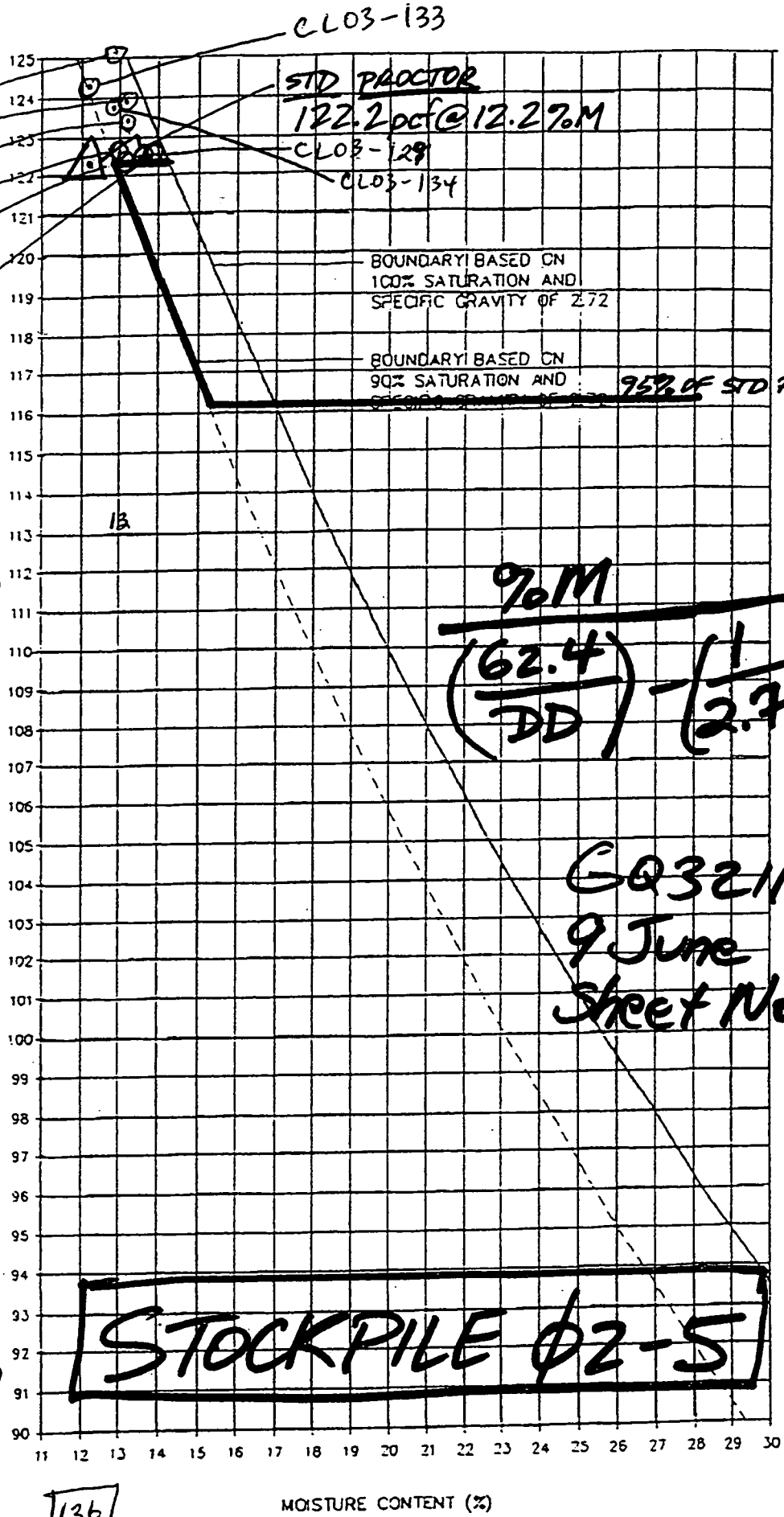
124: .137 / .1413252 = .97

125: .140 / .1438284 = .97

126: .150 / .1567227 = .96

000387

5370



$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq \phi.9$$

GQ3211 3
9 June 2003
Sheet No. 8 of 11

STOCKPILE Ø2-5

127: .133 / .1380256 = .96

128: .129 / .1307555 = .99

129: .35 / .1421569 = .95

130: .136 / .1417407 = .96

131: .131 / .1429912 = .92

132: .132 / .1359849 = .97

133: .122 / .1343642 = .91

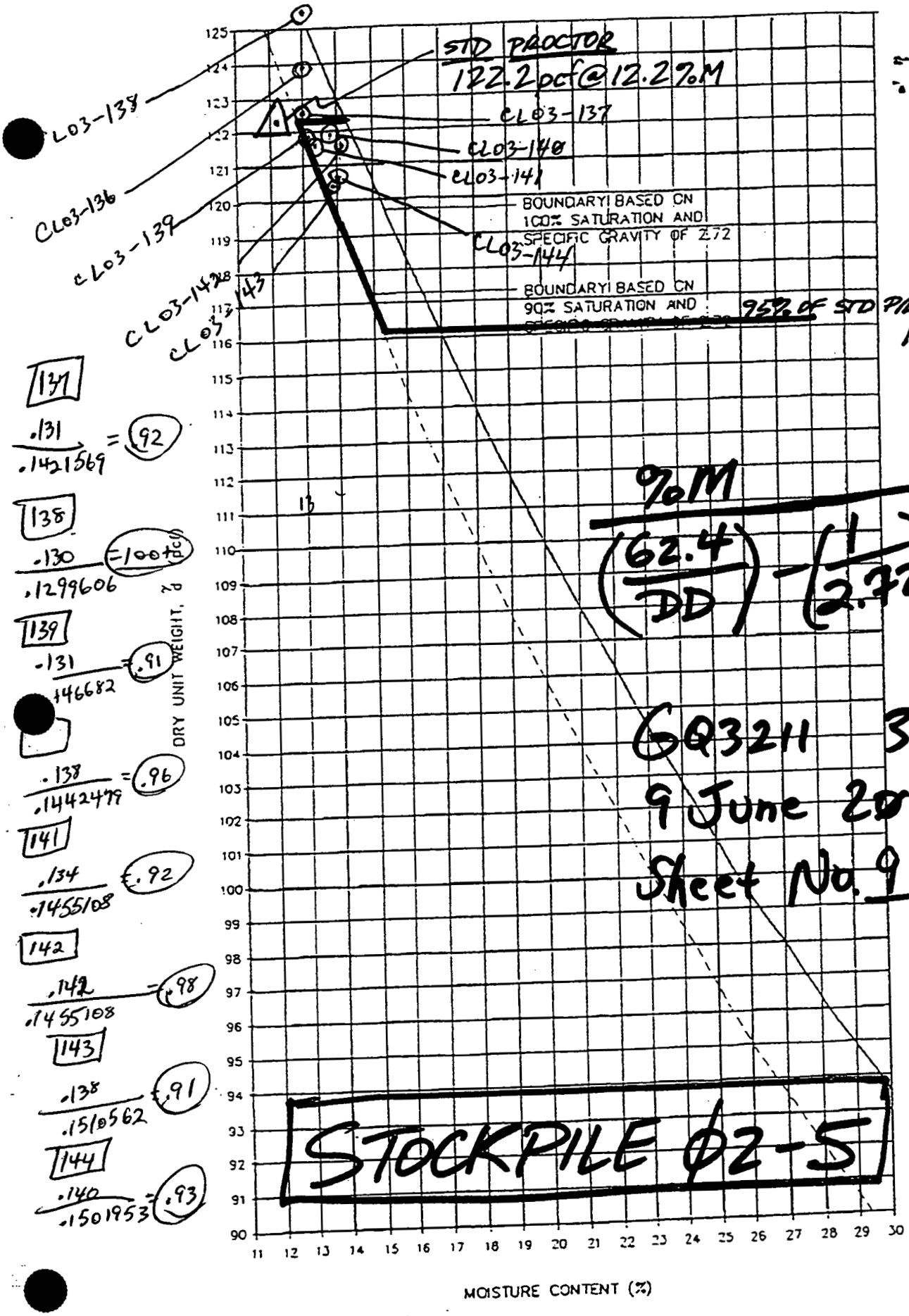
134: .128 / .1407992 = .94

135: .130 / .1421569 = .91

136: .130 / .1359849 = .96

000388

5370



137: .131 / .1421569 = .92

138: .130 / .1299606 = 100 pcf

139: .131 / .146682 = .91

.138 / .1442479 = .96

141: .134 / .1455108 = .92

142: .142 / .1455108 = .98

143: .138 / .1510562 = .91

144: .140 / .1501953 = .93

$$\frac{\%M}{\left(\frac{62.4}{DD}\right) - \left(\frac{1}{2.72}\right)} \geq \phi.9$$

GQ3211 3

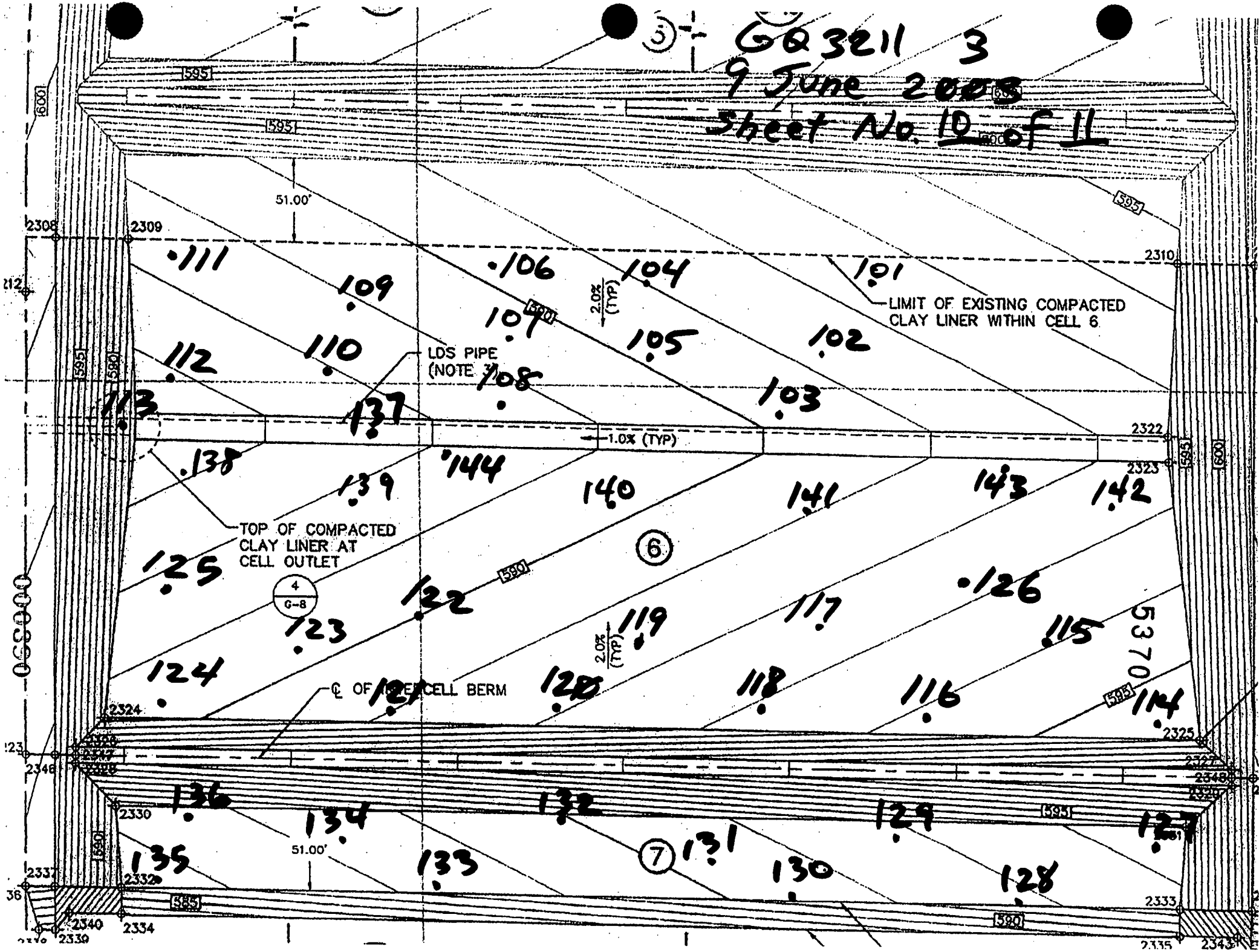
9 June 2003

Sheet No. 9 of 11

STOCKPILE Ø2-5

000389

GQ 3211 3
9 June 2008
Sheet No. 10 of 11



GQ 3211 3
9 June 2003
Sheet No. 11 of 11

Lift #1 Placed
Stockpile Ø2-5

Lift #2 Placed
& stabilized
Stockpile
Ø2-10

Lift #2 Stabilized & Tested -
Passed
Stockpile Ø2-5
Lift #3 Placed

Lift #2
Tested & Passed
Stockpile Ø2-5

Stockpile Ø2-5
Staging for pushing
upslope

Lift #4 Placed - Stockpile Ø2-5

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
℄ OF INTERCELL BERM
1.0% (TYP)
2.0% (TYP)
(NOTE 3)
4 / G-8
6
7
2308
2309
2310
2322
2323
2324
2325
2326
2327
2328
2330
2331
2332
2333
2334
2340
595
600
590
585
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 10 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-5 Cell #2 Cap → Stockpile 02-16

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-145	Cell #6 East Bench Clay Liner	6" / L-2	02-16	13.1	120.9	11.6 / 13.3	139.5	123.1	101.8	P	—	—	—	—
CL03-146		6" / L-2	02-16	13.1	120.9	12.6 / 14.1	140.0	122.7	101.5	P	—	—	—	—
CL03-147		6" / L-2	02-16	13.1	120.9	11.9 / 13.5	138.6	122.1	101.0	P	—	—	—	—
CL03-148	Cell #7 East Bench Clay Liner	6" / L-2	02-16	13.1	120.9	11.6 / 13.3	139.1	122.8	101.6	P	—	—	—	—
CL03-149	Cell #6 Floor, Clay Liner	6" / L-3	02-5	12.2	122.2	12.6 / 14.1	138.3	121.2	99.2	P	—	—	—	—
CL03-150		6" / L-3	02-5	12.2	122.2	12.0 / 13.6	137.9	121.4	99.3	P	—	—	—	—
CL03-151		6" / L-3	02-5	12.2	122.2	13.4 / 14.8	136.3	118.7	97.1	P	—	—	—	—
CL03-152		6" / L-3	02-5	12.2	122.2	12.0 / 13.6	137.2	120.8	98.9	P	—	—	—	—
CL03-153		6" / L-3	02-5	12.2	122.2	11.9 / 13.5	139.1	122.6	100.3	P	—	—	—	—
CL03-154		6" / L-3	02-5	12.2	122.2	12.3 / 14.7	137.6	120.0	98.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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000392

53708

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: G03211 TASK NO.: 3

DATE: 10 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: stockpile 02-5

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-155	Cell #6 Floor, Clay Liner	6" / L-3	02-5	12.2	122.2	11.9 / 13.5	137.9	121.5	99.4	P	—	—	—	—
CL03-156		6" / L-3	02-5	12.2	122.2	13.6 / 15.0	135.6	117.9	96.5	P	—	—	—	—
CL03-157		6" / L-3	02-5	12.2	122.2	13.0 / 14.5	136.5	119.2	97.5	P	—	—	—	—
CL03-158		6" / L-3	02-5	12.2	122.2	13.2 / 14.6	135.5	118.2	96.7	P	—	—	—	—
CL03-159		6" / L-3	02-5	12.2	122.2	12.5 / 14.0	138.5	121.5	99.4	P	—	—	—	—
CL03-160	West Bench Cell #6	6" / L-1	02-10	13.1	120.9	10.2 / 12.1	139.5	124.4	102.9	—	F	CL03-172	P	—
CL03-161	East Bench Cell #6	6" / L-3	02-9	11.8	124.3	9.8 / 11.8	139.3	124.6	100.2	P	—	—	—	—
CL03-162		6" / L-3	02-9	11.8	124.3	10.7 / 12.5	139.8	124.3	100.0	P	—	—	—	—
CL03-163	East Bench Cell #7	6" / L-3	02-9	11.8	124.3	9.9 / 11.9	139.1	124.3	100.0	P	—	—	—	—
CL03-164	Cell #7 Floor Clay Liner	6" / L-5	02-9	11.8	124.3	10.8 / 12.6	140.0	124.3	100.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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000393

53710

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V

DATE: 10 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile Ø2-9

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY (CIRCLE ONE) OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-165	Cell #7 Floor Clay Liner	6" / L-5	Ø2-9	11.8	124.3	11.4 / 13.1	139.0	122.9	98.9	P	—	—	—	—
CL03-166		6" / L-5	Ø2-9	11.8	124.3	10.9 / 12.7	139.7	124.0	99.8	P	—	—	—	—
CL03-167		6" / L-5	Ø2-9	11.8	124.3	12.0 / 13.6	136.9	120.5	96.9	P	—	—	—	—
CL03-168		6" / L-5	Ø2-9	11.8	124.3	10.9 / 12.7	140.4	124.6	100.2	P	—	—	—	—
CL03-169		6" / L-5	Ø2-9	11.8	124.3	12.3 / 13.9	138.8	121.9	98.1	P	—	—	—	—
CL03-170		6" / L-5	Ø2-9	11.8	124.3	11.2 / 13.0	140.2	124.1	99.8	P	—	—	—	—
CL03-171	Cell #7, West Bench	6" / L-1	Ø2-16	13.1	120.9	11.6 / 13.3	140.9	124.4	102.9	P	—	—	—	—
CL03-172	Cell #6, West Bench	6" / L-1	Ø2-16	13.1	120.9	11.8 / 13.5	141.7	124.8	103.2	P	—	—	—	—
CL03-173 CHW	↓	6" / L-1	Ø2-16	13.1	120.9	12.8 / 14.3	140.1	122.6	101.4	P	—	—	—	—
~~CL03-174~~		~~6" / L-1~~	~~Ø2-16~~	~~13.1~~	~~120.9~~ CHW									

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

0003394

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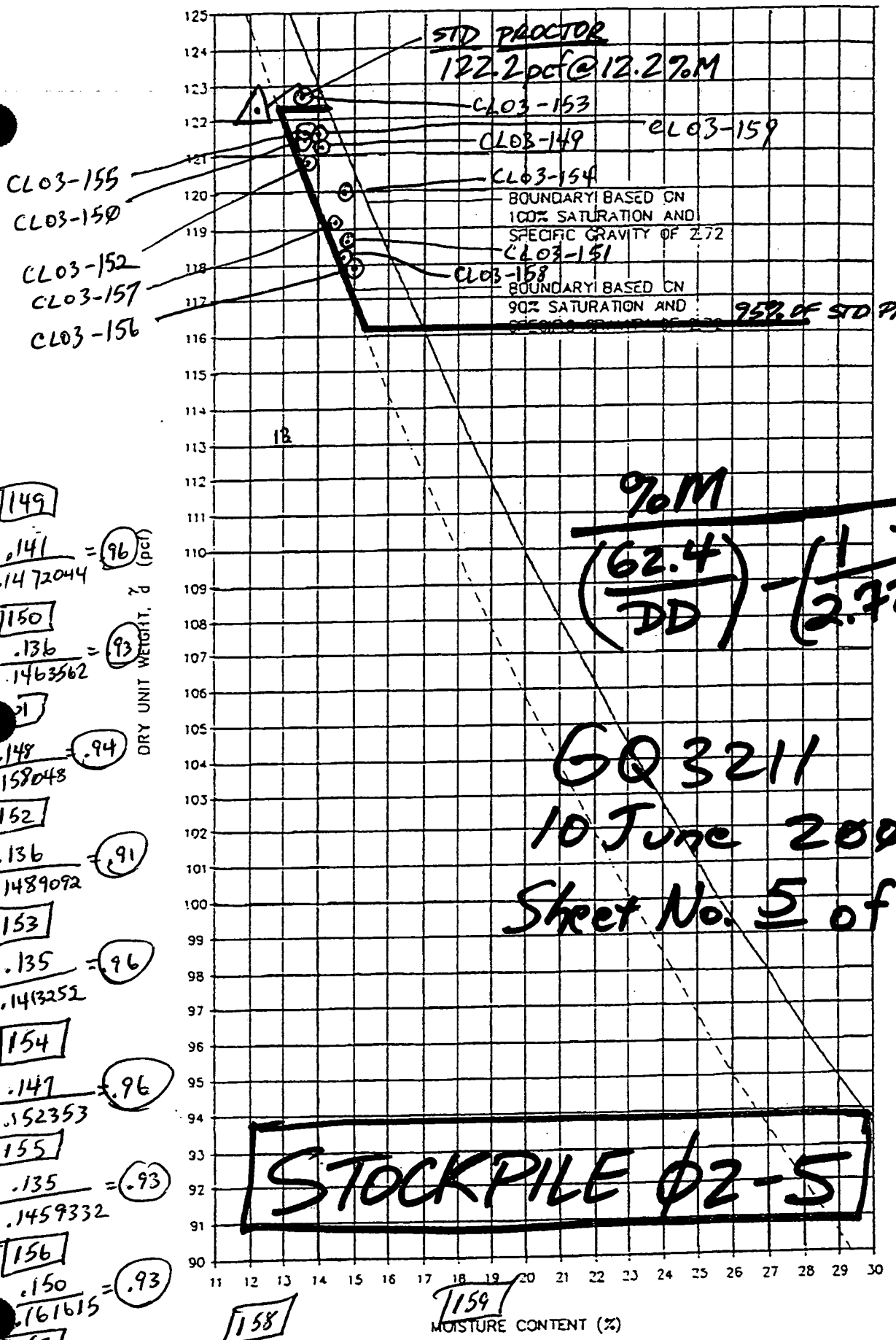


$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq 0.9$$

GQ 3211 3
10 June 2003
Sheet No. 5 of 8

STOCKPILE 02-5

149
.141 / .1472044 = .96

150
.136 / .1463562 = .93

151
.148 / .158048 = .94

152
.136 / .1489092 = .91

153
.135 / .1413252 = .96

154
.147 / .152353 = .96

155
.135 / .1459332 = .93

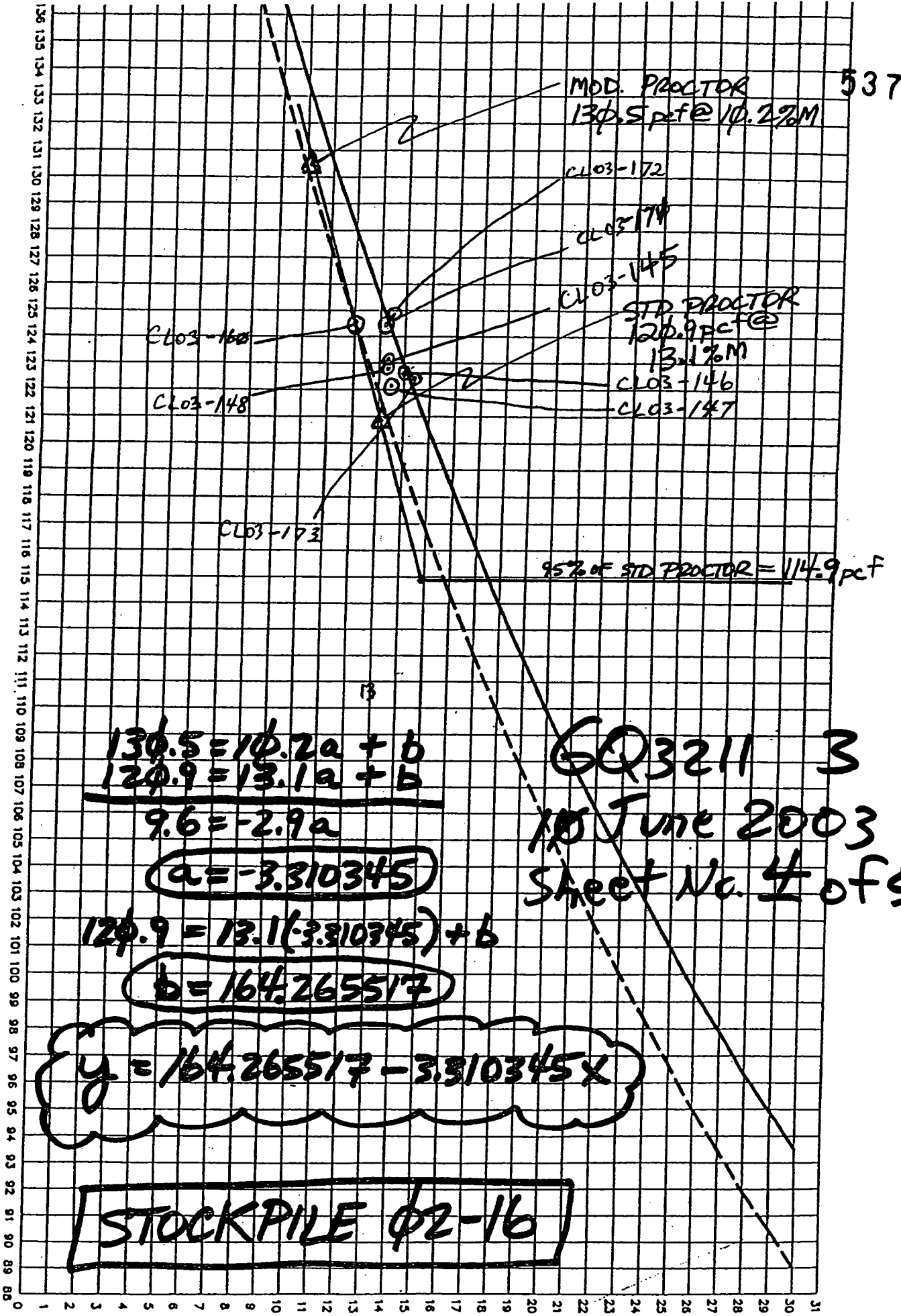
156
.150 / .161615 = .93

157
.145 / .1558429 = .93

158
.146 / .1602717 = .91

159
.140 / .1459332 = .96

5370



$130.5 = 10.2a + b$
$120.9 = 13.1a + b$

$9.6 = -2.9a$

$a = -3.310345$

$120.9 = 13.1(-3.310345) + b$

$b = 164.265517$

$y = 164.265517 - 3.310345x$

STOCKPILE 02-16

GQ3211 3
10 June 2003
Sheet No. 4 of 8

000396

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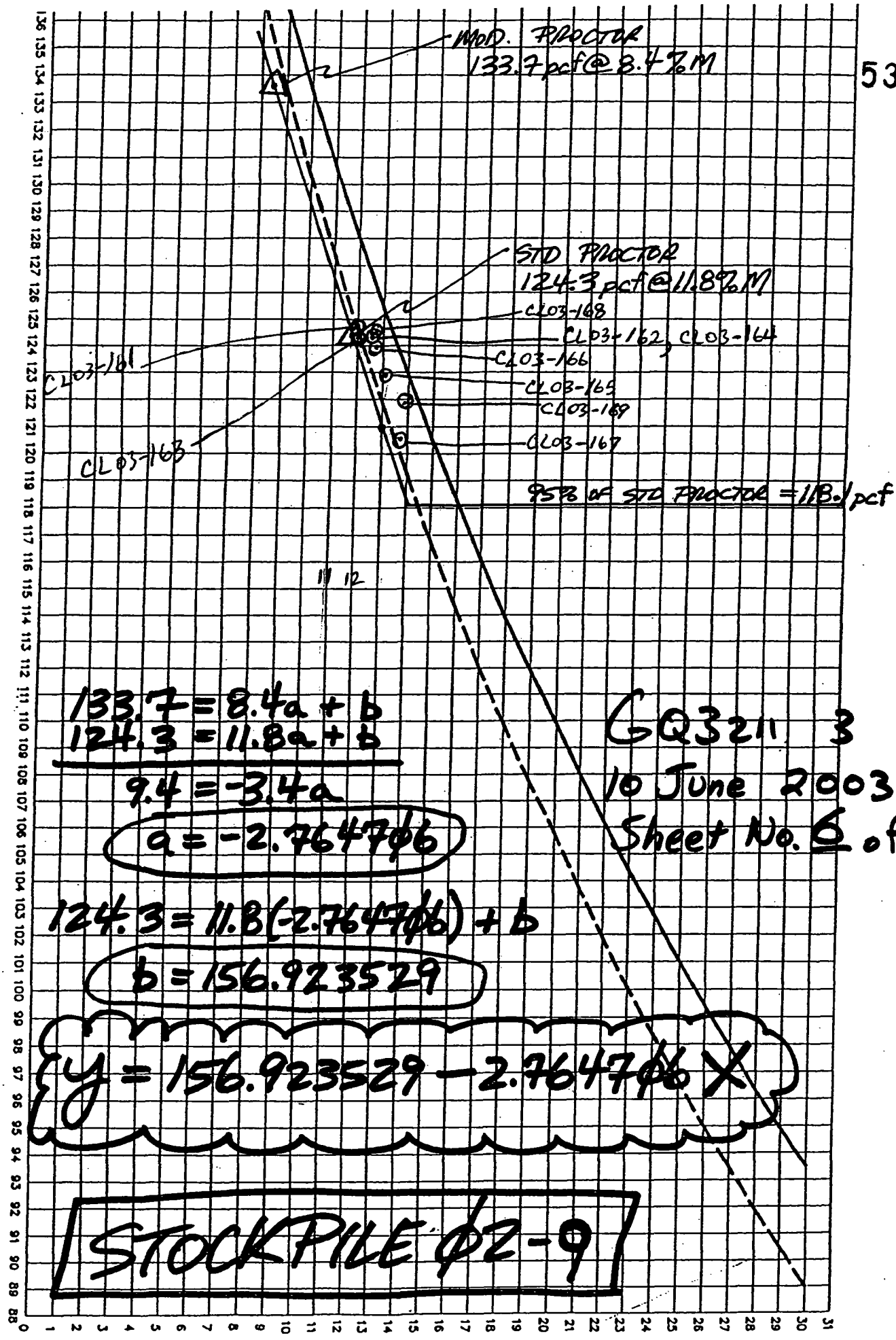


$133.7 = 8.4a + b$
$124.3 = 11.8a + b$

$9.4 = -3.4a$

$a = -2.764706$

$124.3 = 11.8(-2.764706) + b$

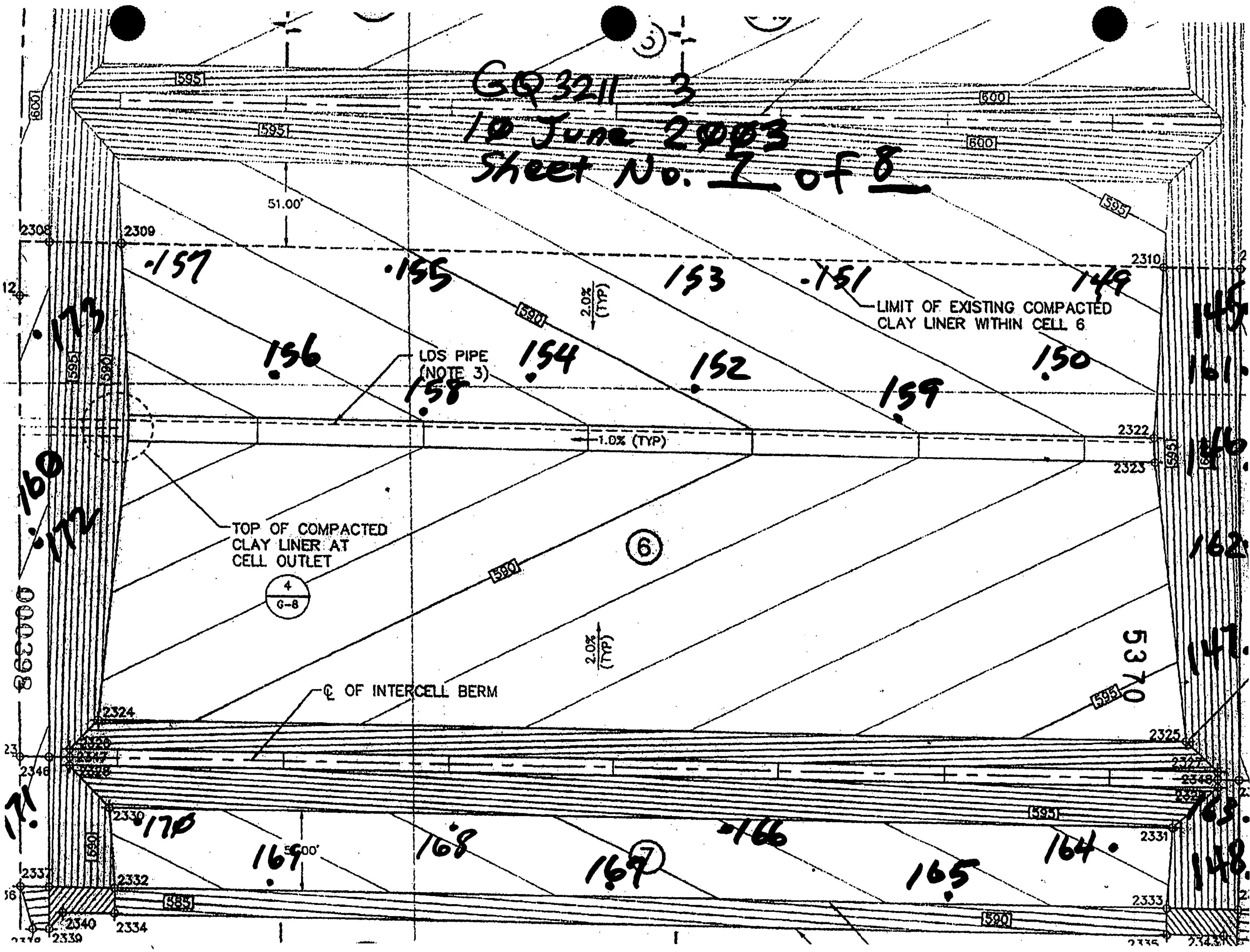
$b = 156.923529$

$y = 156.923529 - 2.764706X$

GQ3211 3
10 June 2003
Sheet No. 6 of 8

STOCKPILE Ø2-9

000397


GQ3211 3
10 June 2003
Sheet No. 1 of 8
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
6
2.0% (TYP)
1.0% (TYP)
℄ OF INTERCELL BERM
51.00'
5.00'
5370
2308
2309
2310
2322
2323
2324
2325
2330
2331
2332
2333
2334
2340
2339
2346
595
600
590
585
000398

GQ3211 3
10 June 2003
Sheet No. 2 of 2

Lift #3 Stockpile Ø2-5
#2 & Lift #3 tested & passed

Lif#1 Failed - Too Dry/Reworked & Passed

TOP OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

4:1

Stockpiled for 4:1 Stockpile

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

Stockpile Ø2-9

Lift #3 Stabilized & Compacted

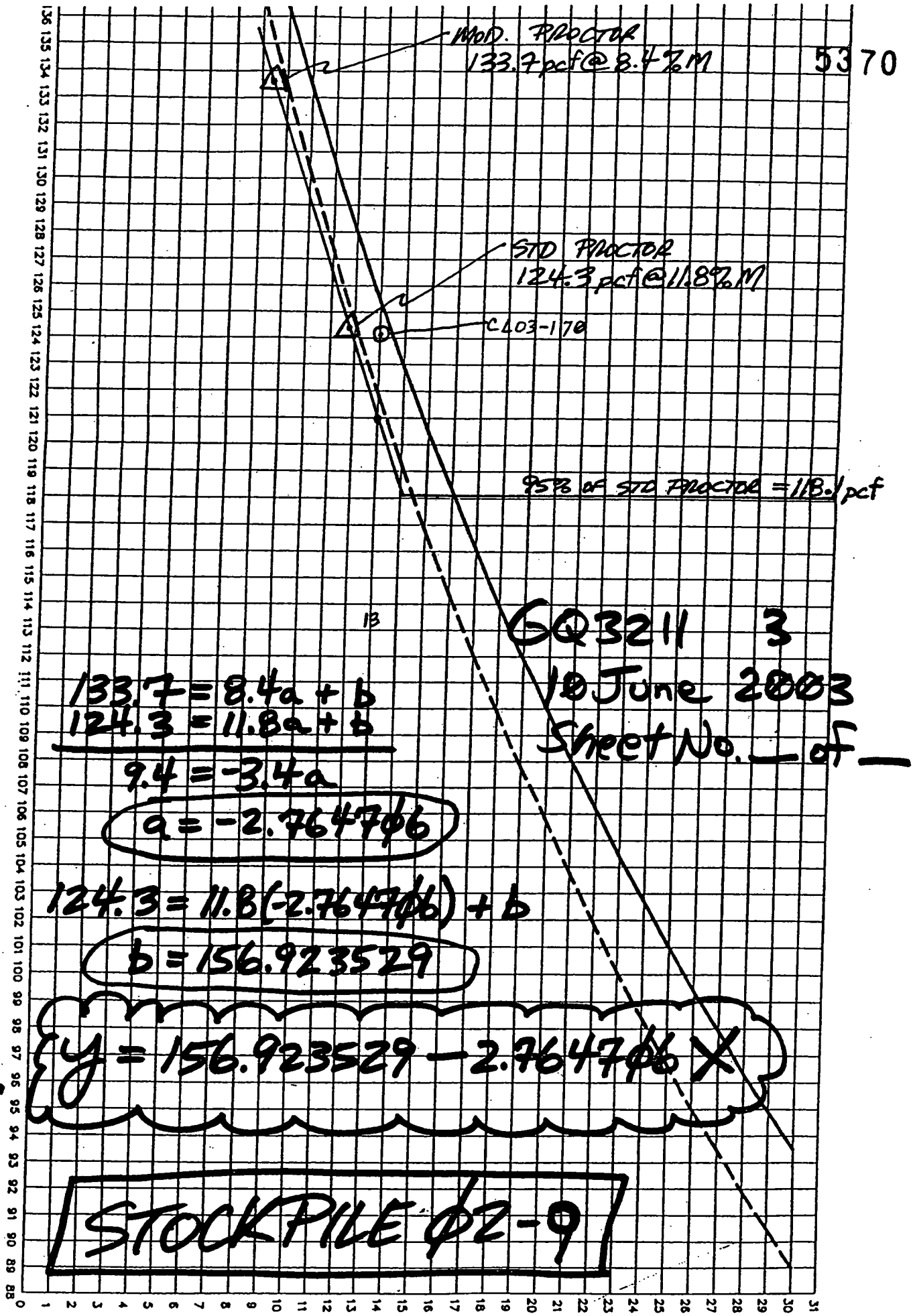
Lift #3 Stockpile Ø2-9

℄ OF INTERCELL BERM

Lift #5 Stockpile Ø2-9

Stockpiled for 4:1 Stockpile Ø2-9

595 600 590 585 2308 2309 2310 2324 2325 2330 2331 2332 2333 2334 2339 2340 2343 51.00' 51.00 2.0% (TYP) 1.0% (TYP) 6 7



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GQ3211 3

10 June 2003

Sheet No. ___ of ___

$133.7 = 8.4a + b$

$124.3 = 11.8a + b$

$9.4 = -3.4a$

$a = -2.764706$

$124.3 = 11.8(-2.764706) + b$

$b = 156.923529$

$y = 156.923529 - 2.764706X$

STOCKPILE Ø2-9

000400

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 11 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-13% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-9 Stockpile 02-5

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-174	Cell #6, East 4:1 Slope	6" / L-1	02-5	12.2	122.2	10.8 / 12.6	141.3	125.5	102.7	P	—	—	—	—
CL03-175	↓	6" / L-1	02-5	12.2	122.2	11.4 / 13.1	138.8	122.7	100.4	P	—	—	—	—
CL03-176	↓	6" / L-1	02-5	12.2	122.2	10.5 / 12.4	142.1	126.4	103.4	P	—	—	—	—
CL03-177	Cell #6 East Bench	6" / L-4	02-5	12.2	122.2	11.5 / 13.2	139.5	123.2	100.8	P	—	—	—	—
CL03-178	Cell #6 East 4:1 Slope	6" / L-1	02-9	11.8	124.3	12.8 / 14.3	138.2	~~121.8~~ 120.9 CHW	97.3	P	—	—	—	—
CL03-179	Cell #~~6~~ East Bench	6" / L-4	02-9	11.8	124.3	10.5 / 12.4	141.1	125.5	101.0	P	—	—	—	—
CL03-180	Cell #6 East 4:1 Slope	6" / L-1	02-5	12.2	122.2	11.8 / 13.5	137.7	121.3	99.3	P	—	—	—	—
CL03-181	Cell #6 Floor, Clay Liner	6" / L-4	02-9	11.8	124.3	11.5 / 13.2	137.8	121.7	97.9 ~~99.6~~ CHW	P	—	—	—	—
CL03-182	↓	6" / L-4	02-9	11.8	124.3	12.3 / 13.9	137.9	121.1	97.4 ~~99.1~~ CHW	P	—	—	—	—
CL03-183	↓	6" / L-4	02-9	11.8	124.3	13.1 / 14.5	138.4	120.9	97.3 ~~99.0~~ CHW	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 8

000401

5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 11 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW/SS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-184	Cell #6 Floor, Clay Liner	6" / L-4	02-9	11.8	124.3	10.9 / 12.7	141.0	125.1	100.6	P	—	—	—	—
CL03-185		6" / L-4	02-9	11.8	124.3	12.1 / 13.7	138.5	121.8	98.0	P	—	—	—	—
CL03-186		6" / L-4	02-9	11.8	124.3	11.5 / 13.2	141.4	125.0	100.6	P	—	—	—	—
CL03-187	(Drainage Corridor)	6" / L-2	02-9	11.8	124.3	11.3 / 13.0	140.0	123.9	99.7	P	—	—	—	—
CL03-188	(Drainage Corridor)	6" / L-2	02-9	11.8	124.3	11.1 / 12.9	141.0	124.9	100.5	P	—	—	—	—
CL03-189		6" / L-4	02-9	11.8	124.3	11.8 / 13.5	139.8	123.2	99.1	P	—	—	—	—
CL03-190		6" / L-4	02-9	11.8	124.3	12.5 / 14.0	139.8	122.6	98.6	P	—	—	—	—
CL03-191		6" / L-4	02-9	11.8	124.3	11.4 / 13.1	140.6	124.3	100.0	P	—	—	—	—
CL03-192		6" / L-4	02-9	11.8	124.3	11.2 / 13.0	139.5	123.5	99.4	P	—	—	—	—
CL03-193	(Drainage Corridor)	6" / L-~~4~~ 2 CHW	02-9	11.8	124.3	12.1 / 13.7	135.6	119.3	96.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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000402

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 11 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW/SS

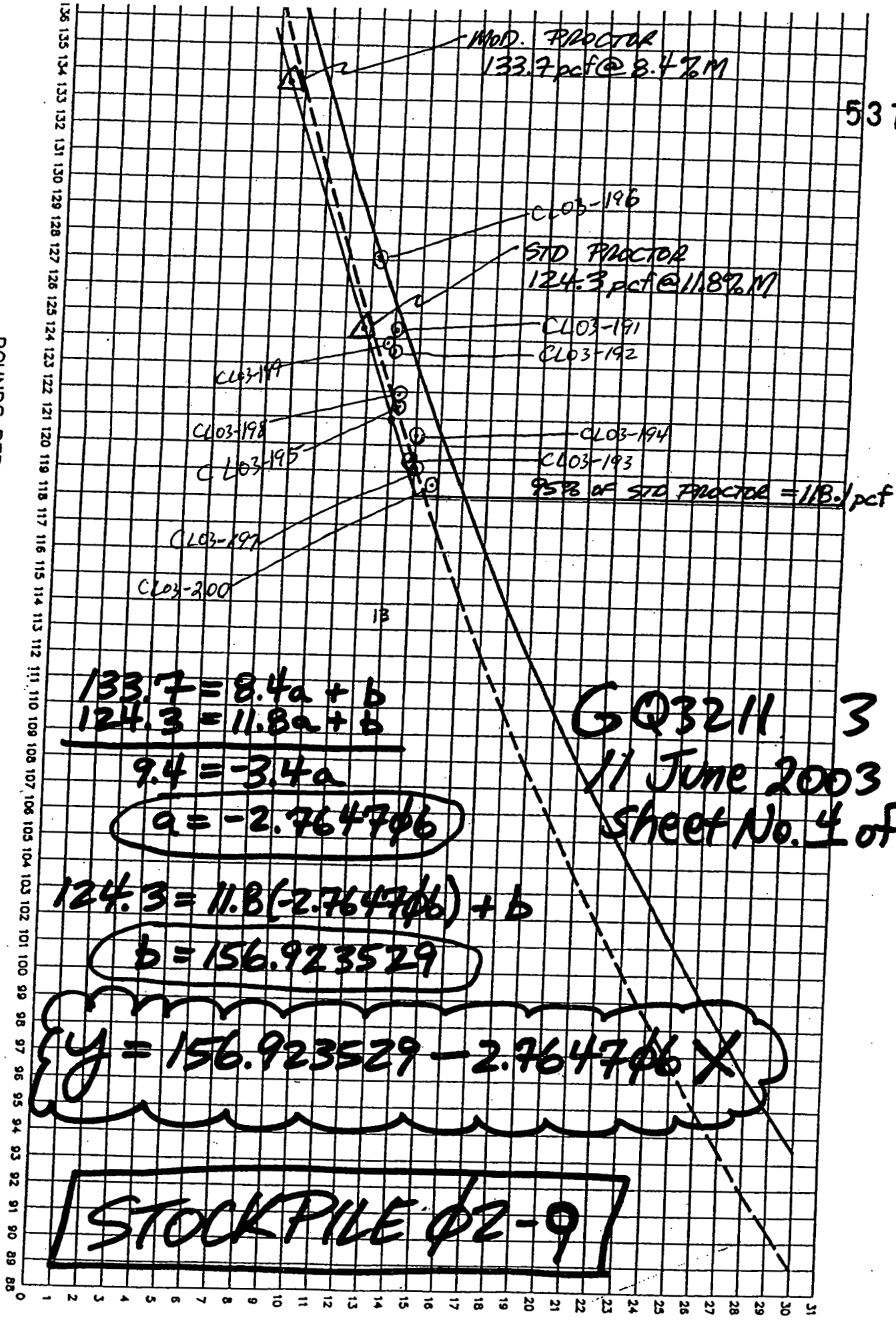
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-194	Cell #6 Floor Clay Liner	6" / L-4	02-9	11.8	124.3	12.5 / 14.0	137.1	120.3	96.8	P	—	—	—	—
CL03-195		6" / L-4	02-9	11.8	124.3	11.6 / 13.3	137.6	121.4	97.7	P	—	—	—	—
CL03-196		6" / L-4	02-9	11.8	124.3	10.4 / 12.3	142.7	127.0	102.2	P	—	—	—	—
CL03-197		6" / L-4	02-9	11.8	124.3	12.5 / 14.0	135.8	119.1	95.8	P	—	—	—	—
CL03-198		6" / L-4	02-9	11.8	124.3	11.6 / 13.3	138.1	121.9	98.1	P	—	—	—	—
CL03-199		6" / L-4	02-9	11.8	124.3	11.0 / 12.8	139.6	123.8	99.6	P	—	—	—	—
CL03-200		6" / L-4	02-9	11.8	124.3	13.3 / 14.7	135.8	118.4	95.3	P	—	—	—	—
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible] SHEET NO. 3 OF 8

0004403

5370



$133.7 = 8.4a + b$
$124.3 = 11.8a + b$

$9.4 = -3.4a$

$a = -2.764706$

$124.3 = 11.8(-2.764706) + b$

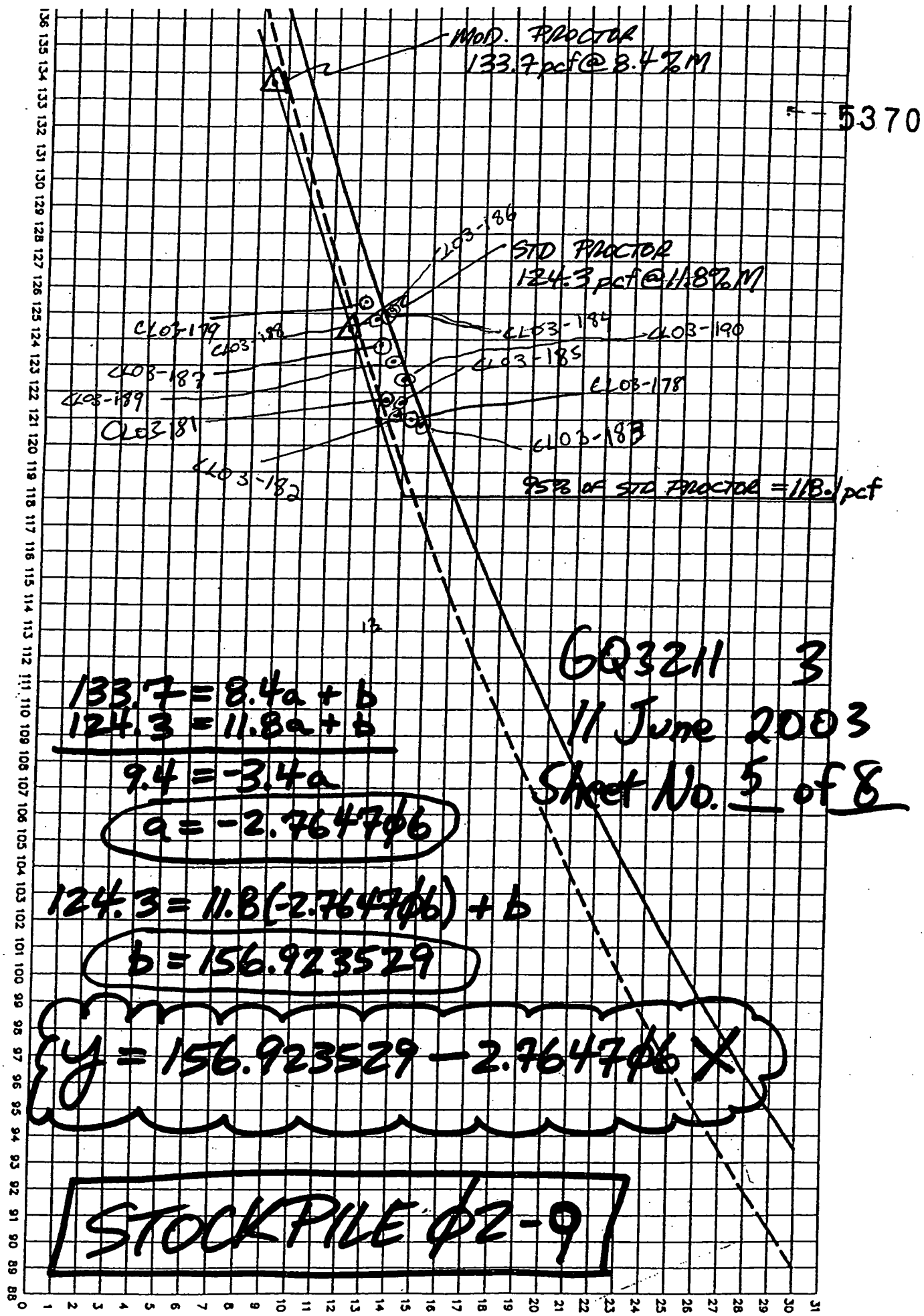
$b = 156.923529$

$y = 156.923529 - 2.764706x$

GQ3211 3
11 June 2003
Sheet No. 4 of 8

STOCKPILE 02-9

000404



5370

GQ3211 3

11 June 2003

Sheet No. 5 of 8

$133.7 = 8.4a + b$

$124.3 = 11.8a + b$

$9.4 = -3.4a$

$a = -2.764706$

$124.3 = 11.8(-2.764706) + b$

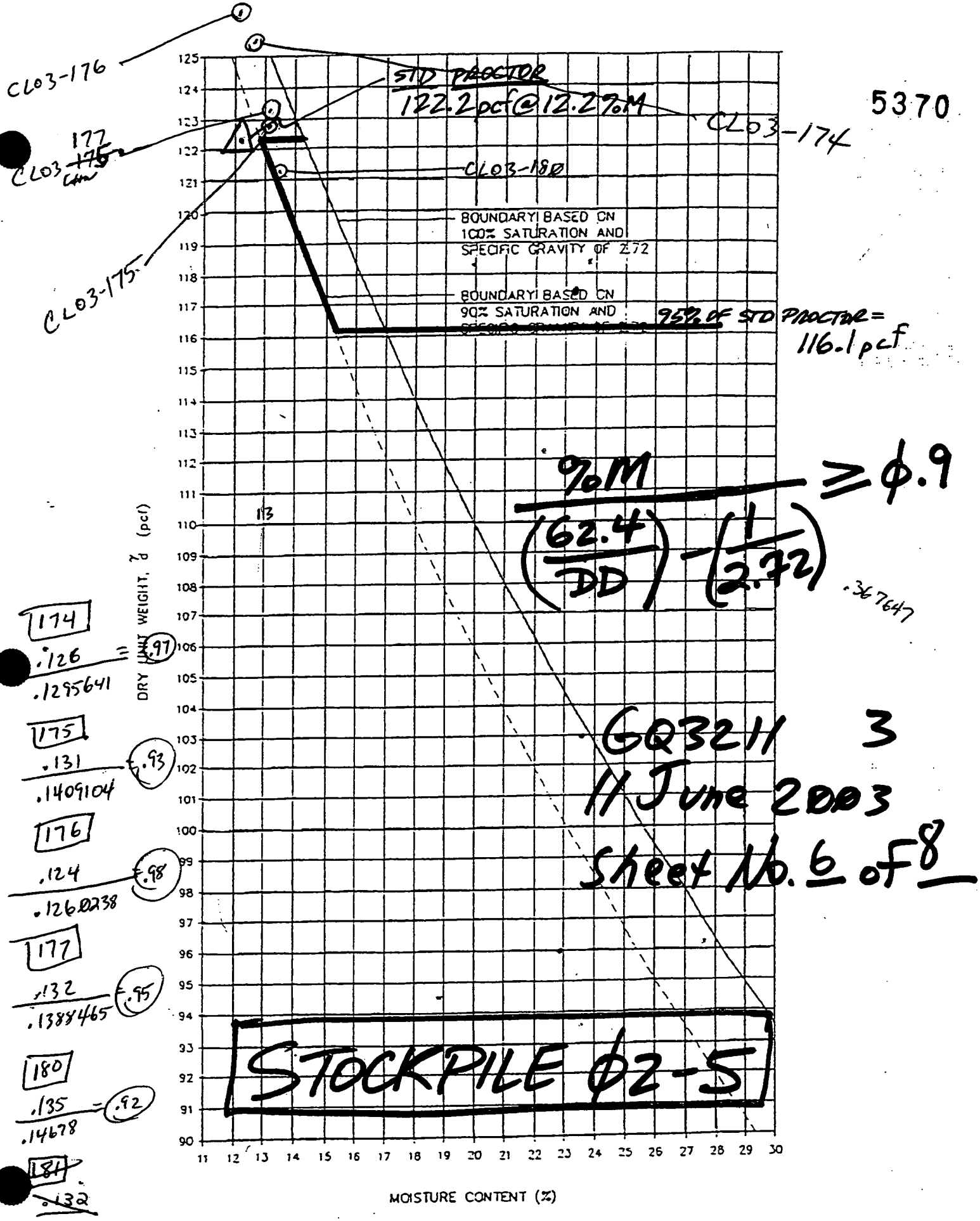
$b = 156.923529$

$y = 156.923529 - 2.764706x$

STOCKPILE 02-9

000405

5370



$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq \phi.9$$

.367647

174: .126 / .1295641 = .97

175: .131 / .1409104 = .93

176: .124 / .1260238 = .98

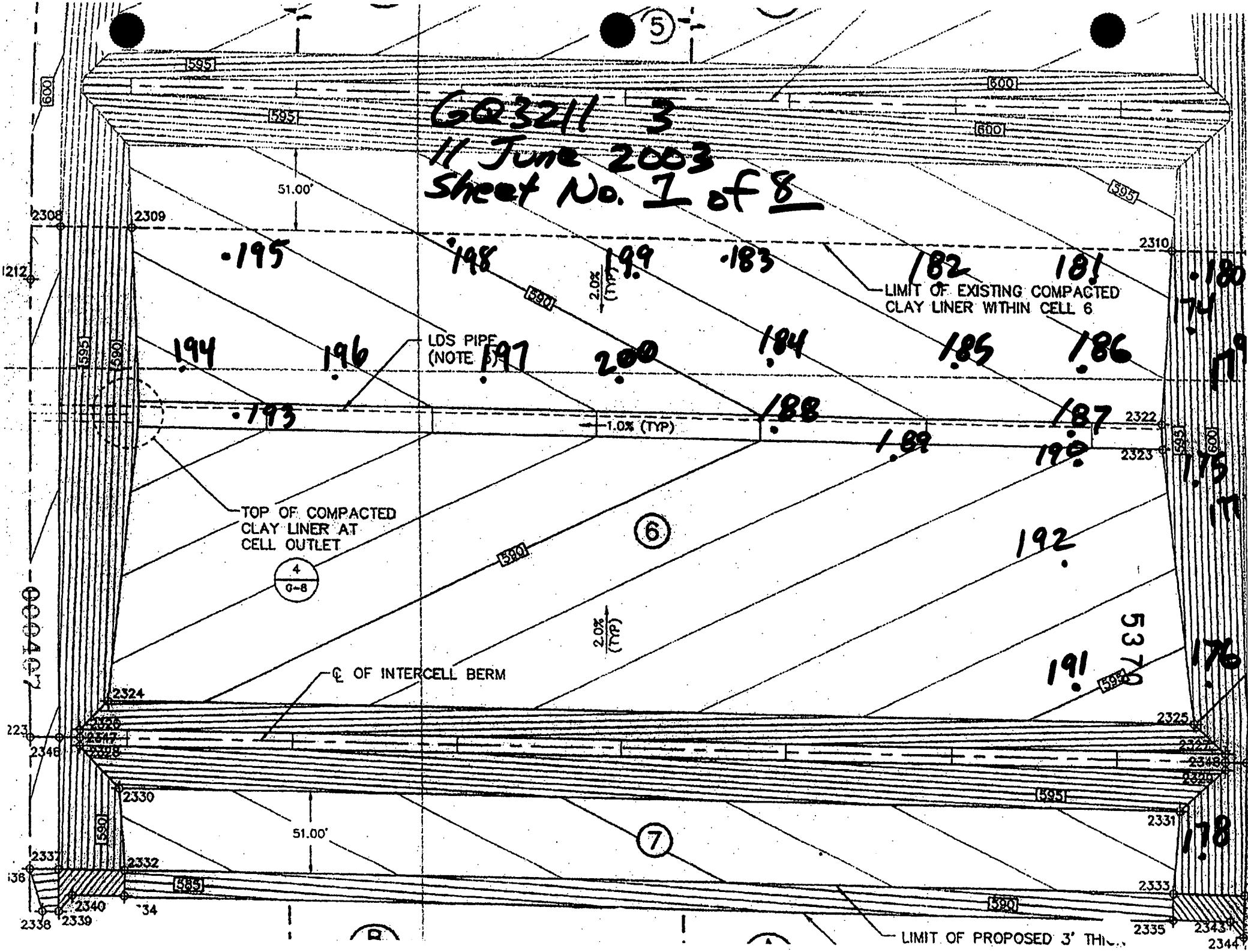
177: .132 / .1388465 = .95

180: .135 / .14678 = .92

~~184~~ .132

GQ3211 3
11 June 2003
Sheet No. 6 of 8

GQ3211 3
11 June 2003
Sheet No. 1 of 8



GQ-211 3
11 June 2003
Sheet No. 8 of 8

Lift #4 Tested and Passed

Lift #4 Tested & Passed
stockpile #2-9

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

LDS PIPE (NOTE 3)

Lift #2, Drainage Corridor Tested & Passed

1.0% (TYP)

Lift #3 Not Yet Stabilized
stockpile #2-9

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4 / G-8

6

Lift #3 stockpile 02-9 Tested & Passed

2.0% (TYP)

℄ OF INTERCELL BERM

Lift #1 Tested & Passed, stockpile 02-5

Stabilizer Stopped at LASER TRIPOD

51.00'

51.00'

LIMIT OF PROPOSED 3' THICK

2308 2309 2310 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2343 2346 2347 2348

595 590 585 600

000408

53170

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 18 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED):

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-201	Cell #6 Floor, Clay Liner	6" / L-3	02-9	11.8	124.3	11.3 / 13.0	139.2	123.2	~~98.6~~ 99.1	P	—	—	—	—
CL03-202		6" / L-3	02-9	11.8	124.3	12.7 / 14.2	137.2	120.1	96.6	P	—	—	—	—
CL03-203		6" / L-3	02-9	11.8	124.3	12.3 / 13.9	138.7	~~122.0~~ 121.8 CHW	98.0	P	—	—	—	—
CL03-204		6" / L-3	02-9	11.8	124.3	13.3 / 14.7	136.8	119.3	96.0	P	—	—	—	—
CL03-205		6" / L-3	02-9	11.8	124.3	12.0 / 13.6	140.3	123.5	99.4	P	—	—	—	—
CL03-206	East Berm 4:1 Slope	6" / L-2	02-9	11.8	124.3	12.2 / 13.8	137.3	120.7	97.1	P	—	—	—	—
CL03-207		6" / L-2	02-9	11.8	124.3	11.2 / 13.0	137.9	122.0	98.1	P	—	—	—	—
CL03-208	East Bench	6" / L-5	02-9	11.8	124.3	10.3 / 12.2	139.1	124.0	99.8	P	—	—	—	—
CL03-209		6" / L-5	02-9	11.8	124.3	13.0 / 14.5	136.0	118.8	95.6	P	—	—	—	—
CL03-210	Cell #6 Floor Clay Liner	6" / L-3	02-9	11.8	124.3	10.9 / 12.7	137.8	122.3	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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0004409

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 18 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED) 8"

MATERIAL SOURCE: Stockpile 02-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-211	Cell #6 Floor, Clay Liner	6" / L-3	02-9	11.8	124.3	10.9 / 12.7	137.8	122.3	98.4	P	—	—	—	—
CL03-212		6" / L-3	02-9	11.8	124.3	10.8 / 12.6	139.6	124.0	99.8	P	—	—	—	—
CL03-213		6" / L-3	02-9	11.8	124.3	12.3 / 13.9	135.3	118.8	95.6	P	—	—	—	—
CL03-214		6" / L-3	02-9	11.8	124.3	10.4 / 12.3	139.1	123.9	99.7	P	—	—	—	—
CL03-215		6" / L-3	02-9	11.8	124.3	11.2 / 13.0	138.5	122.6	98.6	P	—	—	—	—
CL03-216	East Berm 4:1 Slope, Cell #7	6" / L-2	02-9	11.8	124.3	11.6 / 13.3	139.7	123.2	99.2	P	—	—	—	—
CL03-217	↓ Cell #6	6" / L-2	02-9	11.8	124.3	11.2 / 13.0	137.2	121.4	97.7	P	—	—	—	—
CL03-218	East Bench Cell #7	6" / L-5	02-9	11.8	124.3	12.0 / 13.6	139.3	122.6	98.6	P	—	—	—	—
* CL03-219	Cell #6 Floor, Clay Liner	6" / L-3	02-9	11.8	124.3	12.8 / 14.3	137.0	119.9	96.5	P	—	—	—	—
CL03-220	↓	6" / L-3	02-9	11.8	124.3	12.1 / 13.7	138.3	121.6	97.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

63710

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SHEET NO. 2 OF 8

0000410

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 18 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-221	East Berm, 4:1 Slope Cell #6	6" / L-3	02-9	11.8	124.3	11.0 / 12.8	137.5	121.9	98.1	P	—	—	—	—
CL03-222	↓	6" / L-3	02-9	11.8	124.3	11.8 / 13.5	138.9	122.4	98.5	P	—	—	—	—
CL03-223		6" / L-3	02-9	11.8	124.3	11.6 / 13.3	137.9	121.7	97.9	P	—	—	—	—
CL03-224	East Berm 4:1 Slope Cell #7	6" / L-3	02-9	11.8	124.3	12.3 / 13.9	138.4	121.5	97.7	P	—	—	—	—
CL03-225	East Bench Cell #7	6" / L-6	02-9	11.8	124.3	13.0 / 14.5	137.1	119.7	96.3	P	—	—	—	—
CL03-226	East Bench Cell #6	6" / L-6	02-9	11.8	124.3	12.6 / 14.1	138.3	121.2	97.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CHECKED BY: CH

SHEET NO. 3 OF 8

000411

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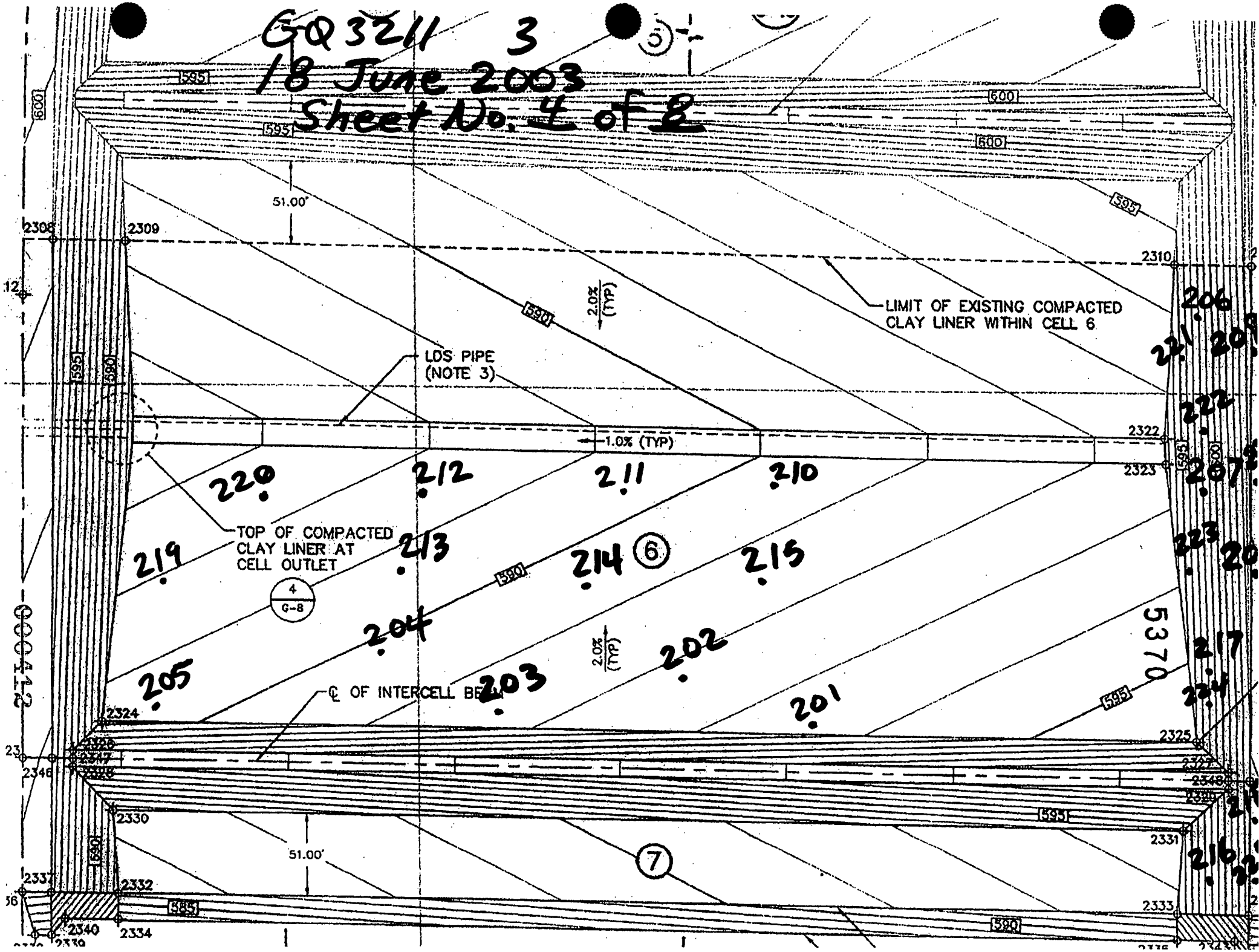
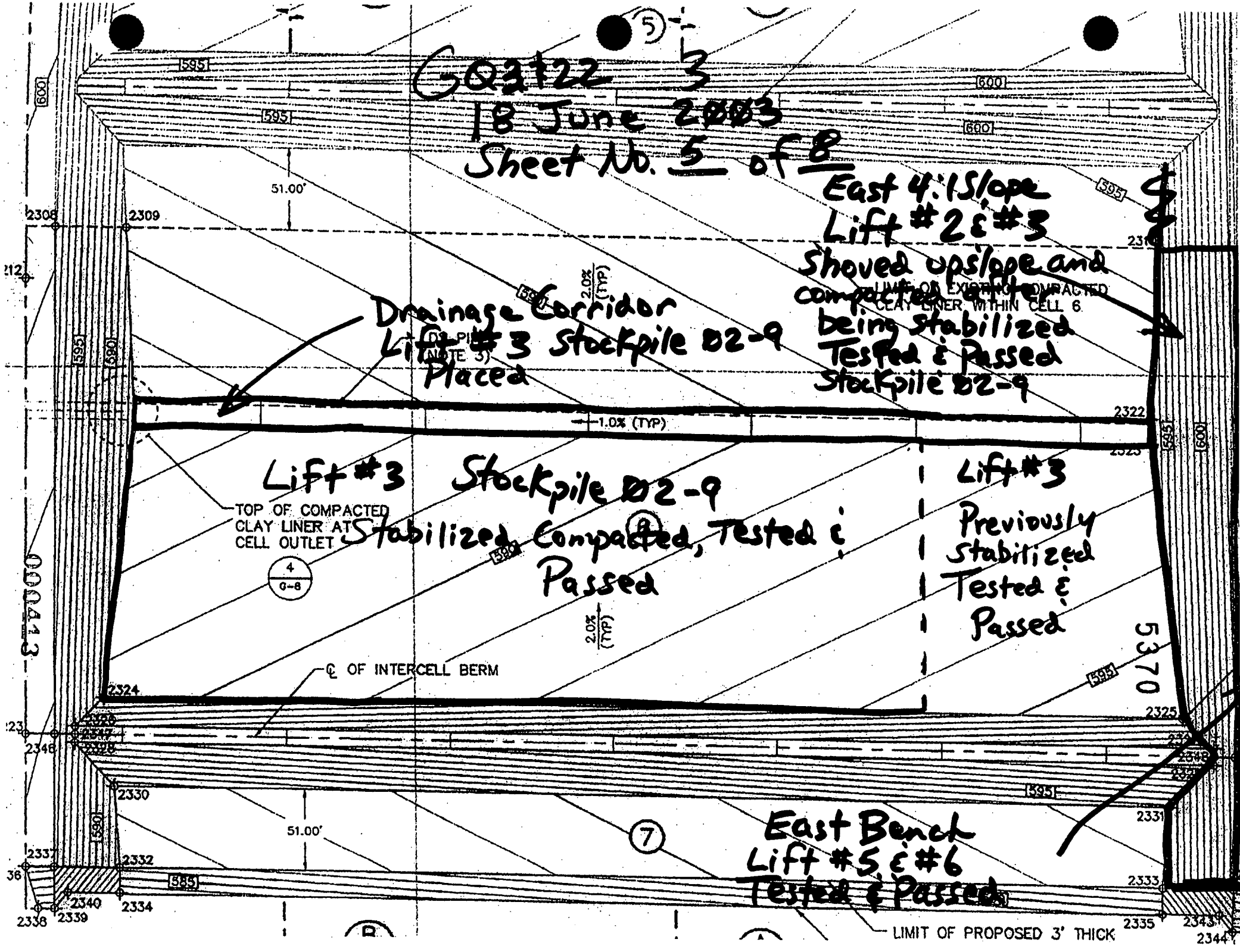
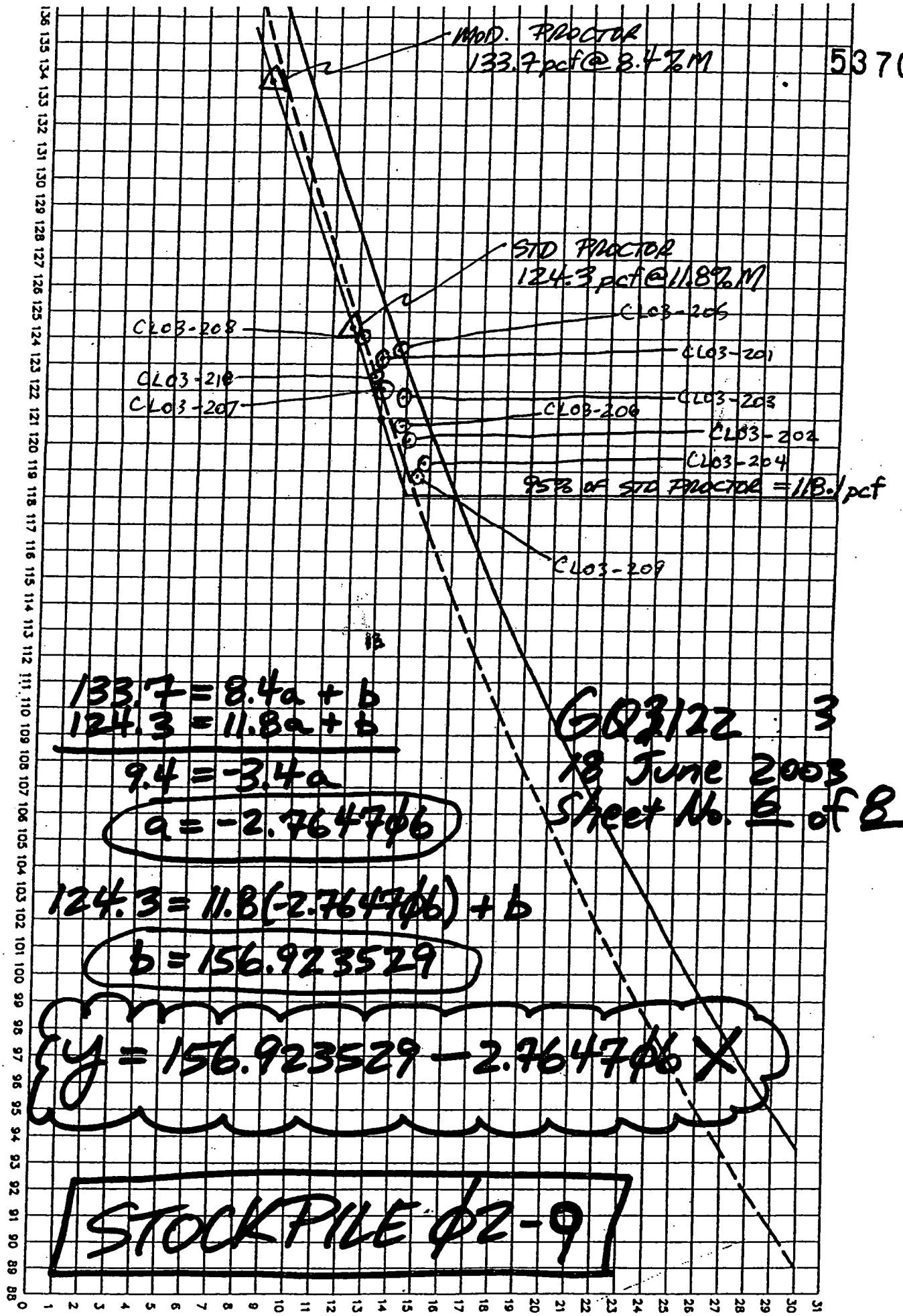
GQ 3211 3
18 June 2003
Sheet No. 4 of 8



000412


GQ3122-3
18 June 2003
Sheet No. 5 of 8
East 4:1 Slope
Lift #2 & #3
Shoved upslope and compacted after being Stabilized Tested & Passed
Stockpile 02-9
Drainage Corridor
Lift #3 Stockpile 02-9
Placed
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
1.0% (TYP)
2.0% (TYP)
Lift #3 Stockpile 02-9
Stabilized Compacted, Tested & Passed
Lift #3
Previously Stabilized Tested & Passed
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
℄ OF INTERCELL BERM
51.00'
East Bench
Lift #5 & #6
Tested & Passed
LIMIT OF PROPOSED 3' THICK
5370
000413



$133.7 = 8.4a + b$
$124.3 = 11.8a + b$

$9.4 = -3.4a$

$a = -2.764706$

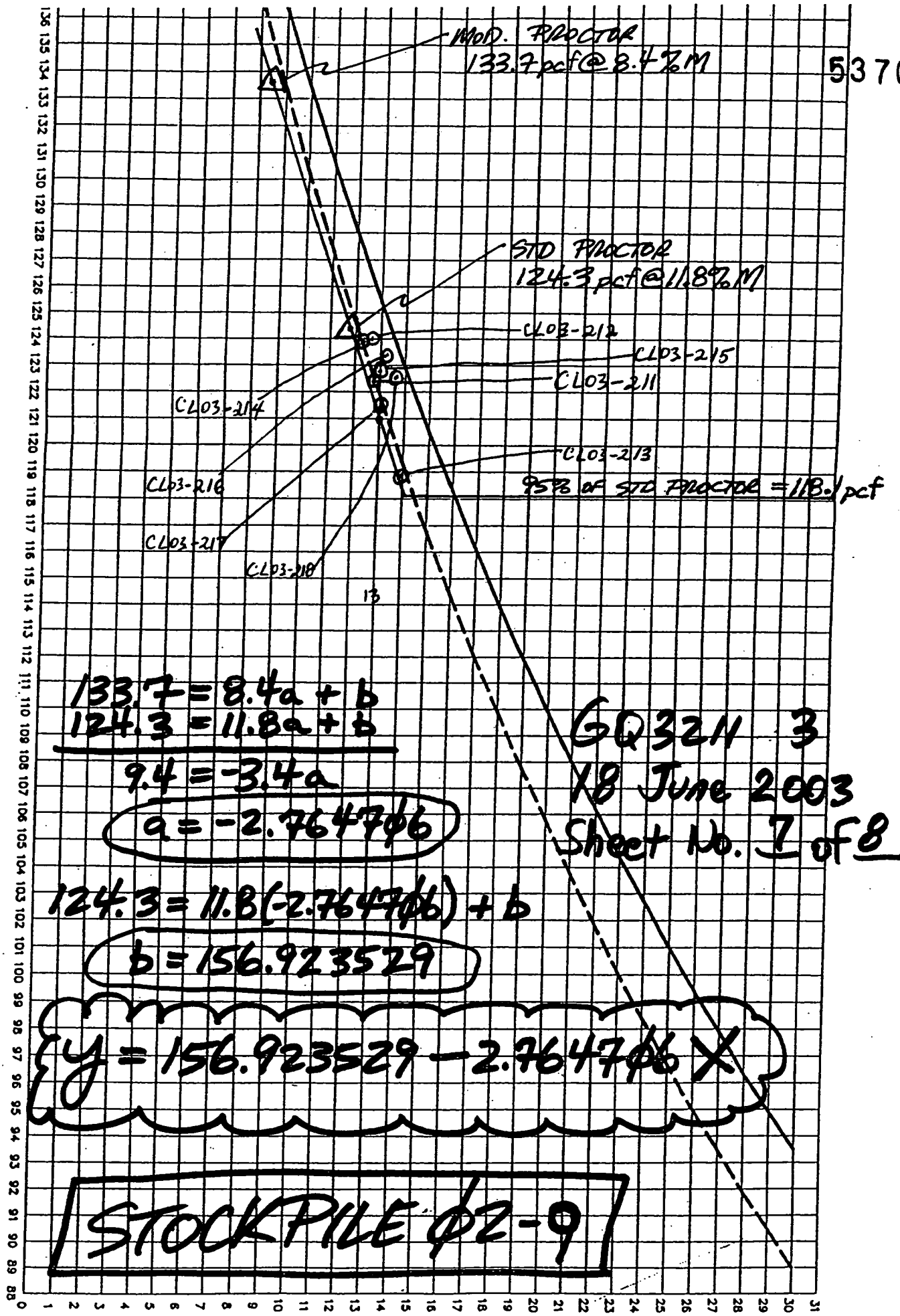
$124.3 = 11.8(-2.764706) + b$

$b = 156.923529$

$y = 156.923529 - 2.764706x$

GQ3122 3
18 June 2003
Sheet No. 6 of 8

STOCKPILE 02-9



$133.7 = 8.4a + b$
$124.3 = 11.8a + b$

$9.4 = -3.4a$

$a = -2.764706$

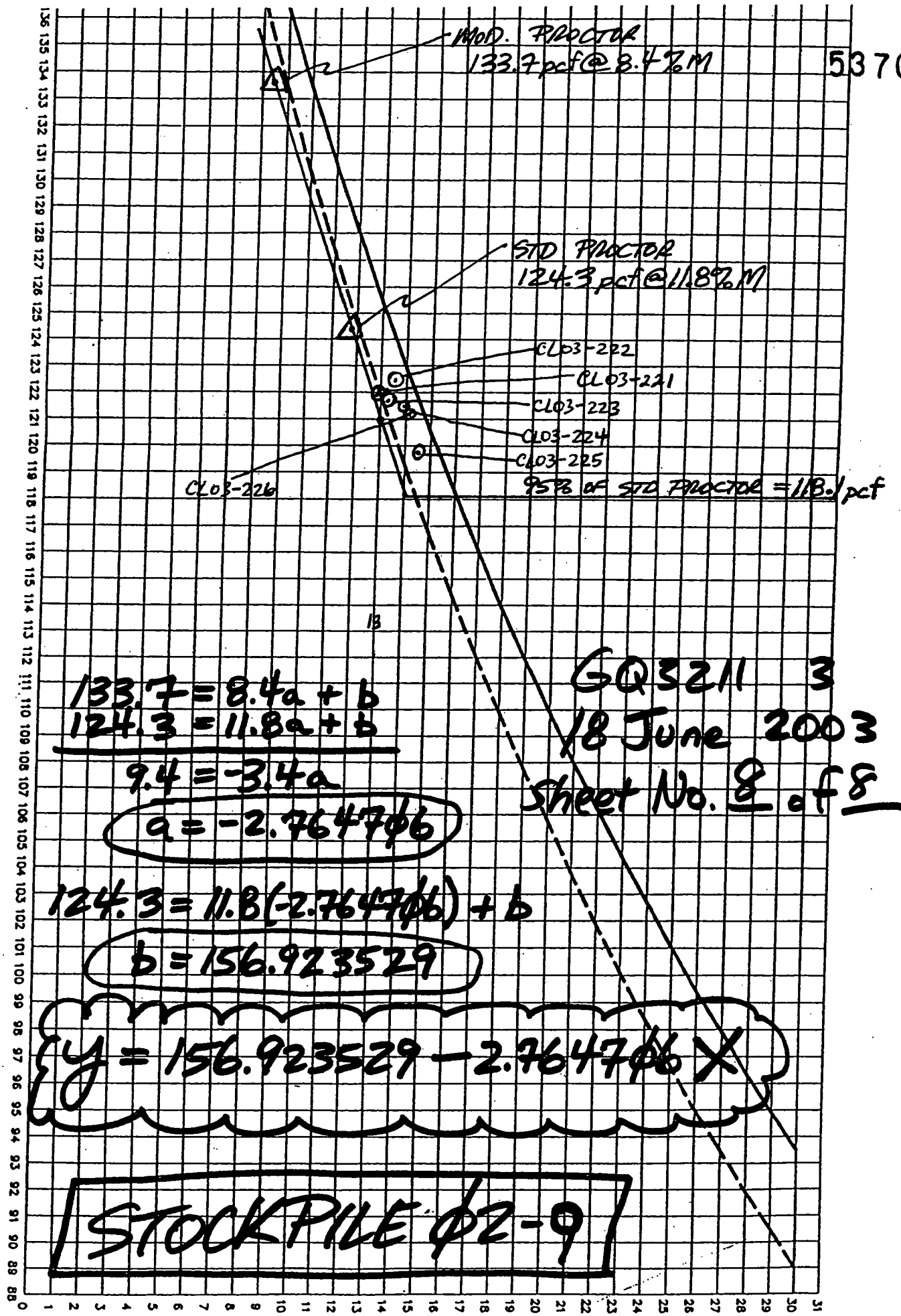
$124.3 = 11.8(-2.764706) + b$

$b = 156.923529$

$y = 156.923529 - 2.764706X$

GQ321 3
18 June 2003
Sheet No. 7 of 8

STOCKPILE Ø2-9



5370

GQ3211 3
18 June 2003
Sheet No. 8 of 8

$133.7 = 8.4a + b$
$124.3 = 11.8a + b$

$9.4 = -3.4a$

$a = -2.764706$

$124.3 = 11.8(-2.764706) + b$

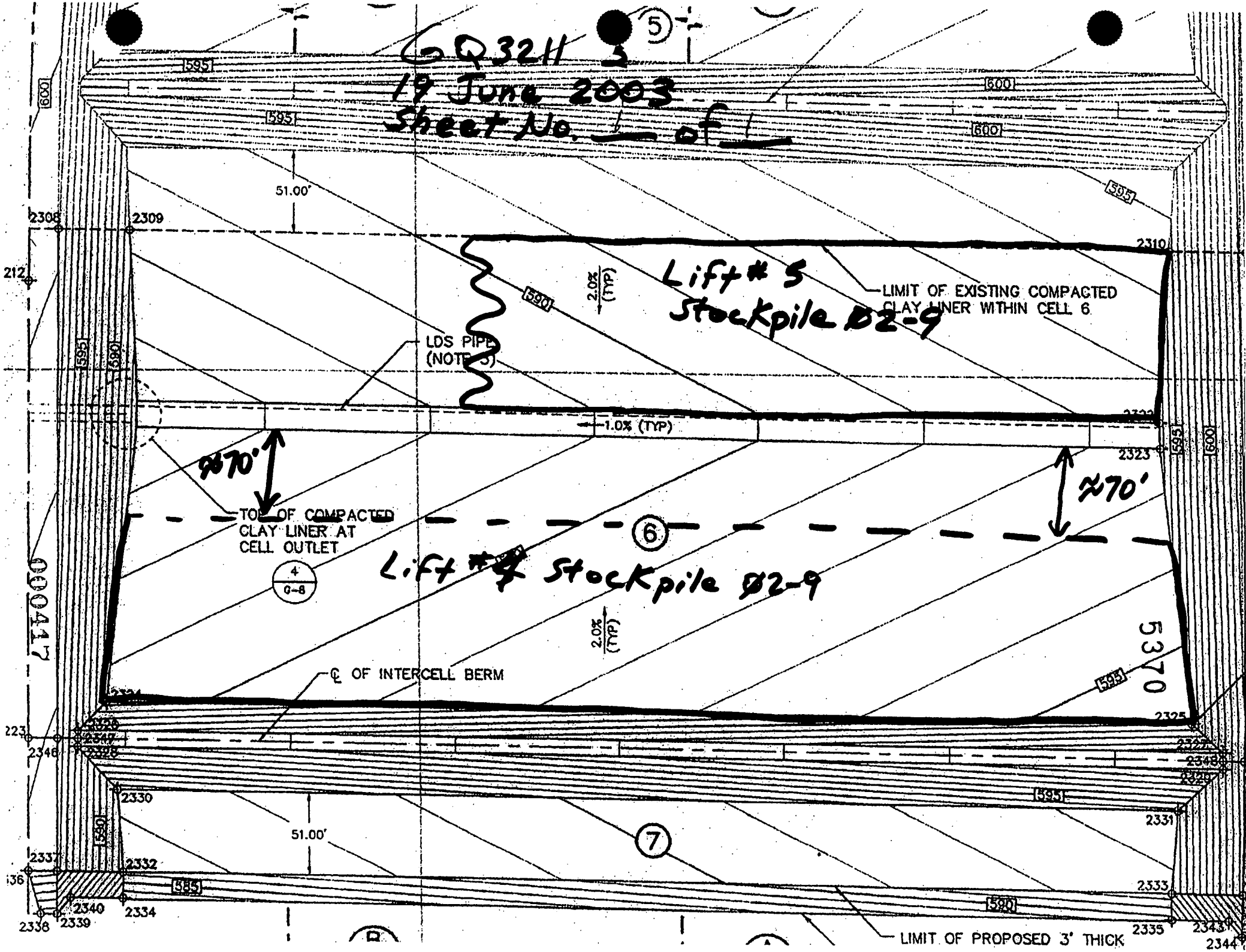
$b = 156.923529$

$y = 156.923529 - 2.764706x$

STOCKPILE 02-9

000416

GQ3211 3
19 June 2003
Sheet No. 1 of 1



000417

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ 3/22 TASK NO.: 3

DATE: ~~19~~ 20 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-227	Cell #6, Drainage Corridor	6" / L-3	02-9	11.8	124.3	11.6 / 13.3	136.8	120.7	97.1	P	—	—	—	—
CL03-228		6" / L-3	02-9	11.8	124.3	13.1 / 14.5	133.0	116.2	93.5	—	F	CL03-243	P	—
CL03-229		6" / L-3	02-9	11.8	124.3	11.2 / 13.0	138.4	122.5	98.6	P	—	—	—	—
CL03-230	Cell #6 Floor, Clay Liner	6" / L-5	02-9	11.8	124.3	11.8 / 13.5	137.1	120.8	97.2	P	—	—	—	—
CL03-231		6" / L-5	02-9	11.8	124.3	10.9 / 12.7	137.9	122.4	98.5	P	—	—	—	—
CL03-232		6" / L-5	02-9	11.8	124.3	11.8 / 13.5	136.4	120.2	96.7	P	—	—	—	—
CL03-233		6" / L-5	02-9	11.8	124.3	11.1 / 12.9	137.4	121.7	97.9	P	—	—	—	—
CL03-234		6" / L-5	02-9	11.8	124.3	10.5 / 12.4	137.9	122.7	98.7	P	—	—	—	—
CL03-235		6" / L-4	02-9	11.8	124.3	10.4 / 12.3	140.0	124.7	100.3	P	—	—	—	—
CL03-236		6" / L-4	02-9	11.8	124.3	10.5 / 12.4	140.2	124.7	100.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 8

000418

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 20 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ~8"

MATERIAL SOURCE: Stockpile 02-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-237	Cell #6 Floor, Clay Liner	6" / L-4	02-9	11.8	124.3	10.6 / 12.5	138.0	122.7	98.7	P	—	—	—	—
CL03-238		6" / L-4	02-9	11.8	124.3	12.1 / 13.7	138.2	121.5	97.7	P	—	—	—	—
CL03-239		6" / L-4	02-9	11.8	124.3	11.3 / 13.0	137.4	121.6	97.8	P	—	—	—	—
CL03-240		6" / L-4	02-9	11.8	124.3	12.4 / 14.0	136.5	119.7	96.3	P	—	—	—	—
CL03-241		6" / L-4	02-9	11.8	124.3	12.3 / 13.9	136.4	119.8	96.4	P	—	—	—	—
CL03-242	Cell #6 Drainage Corridor	6" / L-4	02-9	11.8	124.3	13.3 / 14.7	134.8	117.5	94.5	~~P~~	F	CL03-243	~~P~~	—
CL03-243		6" / L-4	02-9	11.8	124.3	13.2 / 14.6	136.0	118.7	95.5	P	~~F~~	—	—	—
CL03-244	Cell #6 Floor, Clay Liner	6" / L-4	02-9	11.8	124.3	10.7 / 12.5	139.2	123.7	99.5	P	—	—	—	—
CL03-245		6" / L-4	02-9	11.8	124.3	11.9 / 13.5	137.1	120.8	97.2	P	—	—	—	—
CL03-246		6" / L-4	02-9	11.8	124.3	11.3 / 13.0	137.2	121.4	97.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000419

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 20 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-9 & 02-14 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-247	Cell #6 Floor Clay Liner	6" / L-4	02-9	11.8	124.3	10.3 / 12.2	141.7	126.3	101.6	P	—	—	—	—
CL03-248		6" / L-4	02-9	11.8	124.3	12.2 / 13.8	138.6	121.8	98.0	P	—	—	—	—
CL03-249		6" / L-4	02-9	11.8	124.3	11.0 / 12.8	139.5	123.7	99.5	P	—	—	—	—
CL03-250		6" / L-4	02-14	13.9	118.4	13.9 / 15.2	134.5	116.8	98.6	P	—	—	—	—
CL03-251		6" / L-4	02-14	13.9	118.4	13.7 / 15.0	134.7	117.1	98.9	P	—	—	—	—
CL03-252		6" / L-4	02-14	13.9	118.4	13.8 / 15.1	134.3	116.7	98.6	P	—	—	—	—
CL03-253		6" / L-4	02-14	13.9	118.4	12.8 / 14.3	136.4	119.3	100.8	P	—	—	—	—
CL03-254		6" / L-4	02-14	13.9	118.4	11.9 / 13.5	136.3	120.1	101.4	—	F	CL03-255	P	—
CL03-255		6" / L-4	02-14	13.9	118.4	12.6 / 14.1	136.3	119.4	100.8	P	—	—	—	—
CL03-256		6" / L-4	02-14	13.9	118.4	15.7 / 16.7	133.6	114.5	96.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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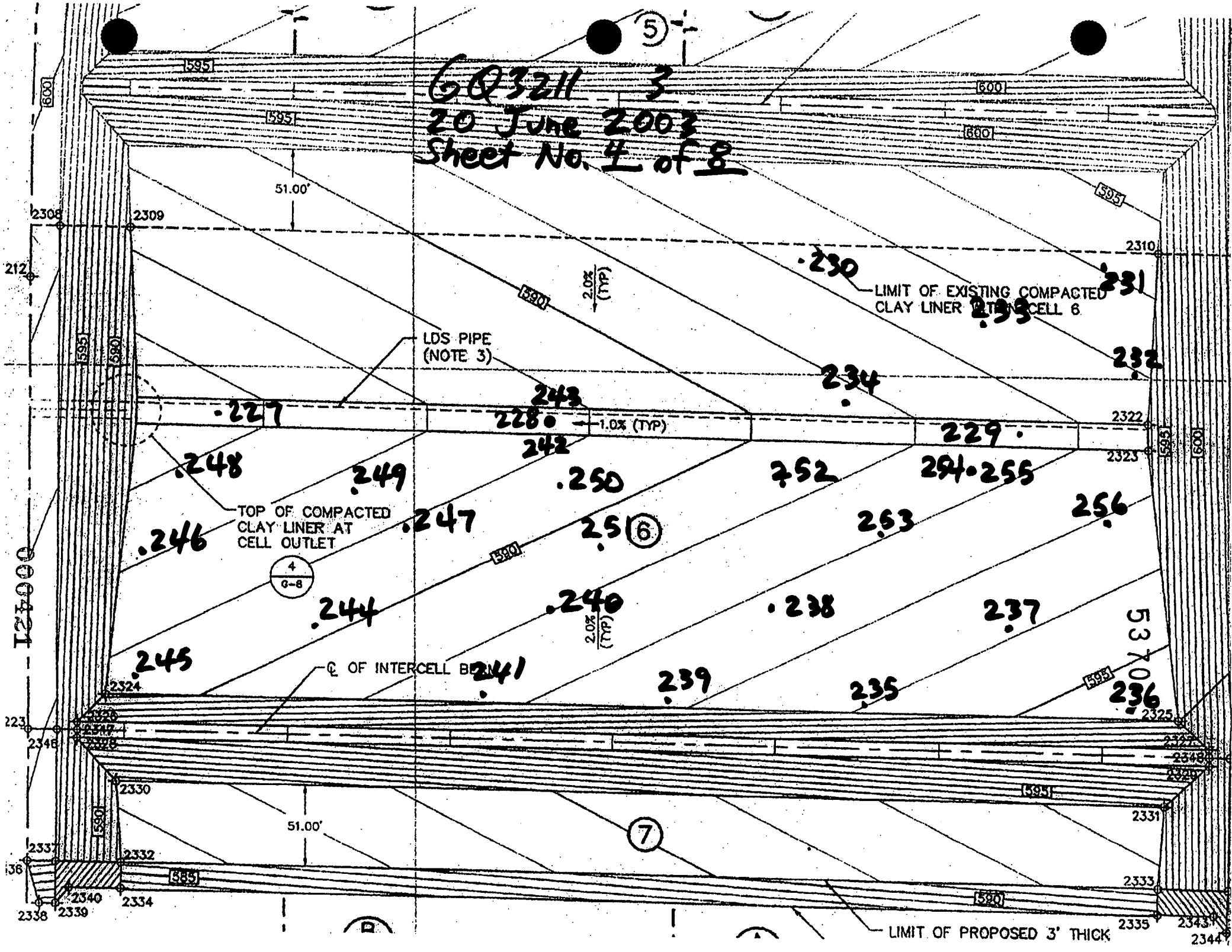
000420

537108


GQ3211 3
20 June 2003
Sheet No. 4 of 8
51.00'
2308
2309
2310
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2338
2339
2340
2343
2344
2346
2347
212
223
136
595
600
590
585
2.0% (TYP)
1.0% (TYP)
LDS PIPE
(NOTE 3)
LIMIT OF EXISTING COMPACTED
CLAY LINER WITHIN CELL 6
TOP OF COMPACTED
CLAY LINER AT
CELL OUTLET
4
G-8
℄ OF INTERCELL BERM
LIMIT OF PROPOSED 3' THICK
5
6
7
.227
.228
.229
.230
.231
.232
.233
.234
.235
.236
.237
.238
.239
.240
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.243
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.256
53 70
00421

GQ3122 3
20 June 2003
Sheet No. 5 of 8

Lift #5
Stockpile Ø2-14

Lift #5
Stockpile Ø2-9

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

LDS PIPE (NOTE 3)

2.0% (TYP)

1.0% (TYP)

Lift #3
Tested & Passed

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4
G-8

≈70' Stockpile Ø2-16

Lift #4 Stockpile Ø2-9

℄ OF INTERCELL BERM

Stockpile Ø2-14

Stockpile Ø2-9

LIMIT OF PROPOSED 3' THICK

51.00'

51.00'

2300 2309 2310 2312 2323 2324 2326 2327 2328 2330 2332 2333 2334 2335 2336 2337 2338 2339 2340 2343 2344 2346 2348

595 600 590 585

5 6 7

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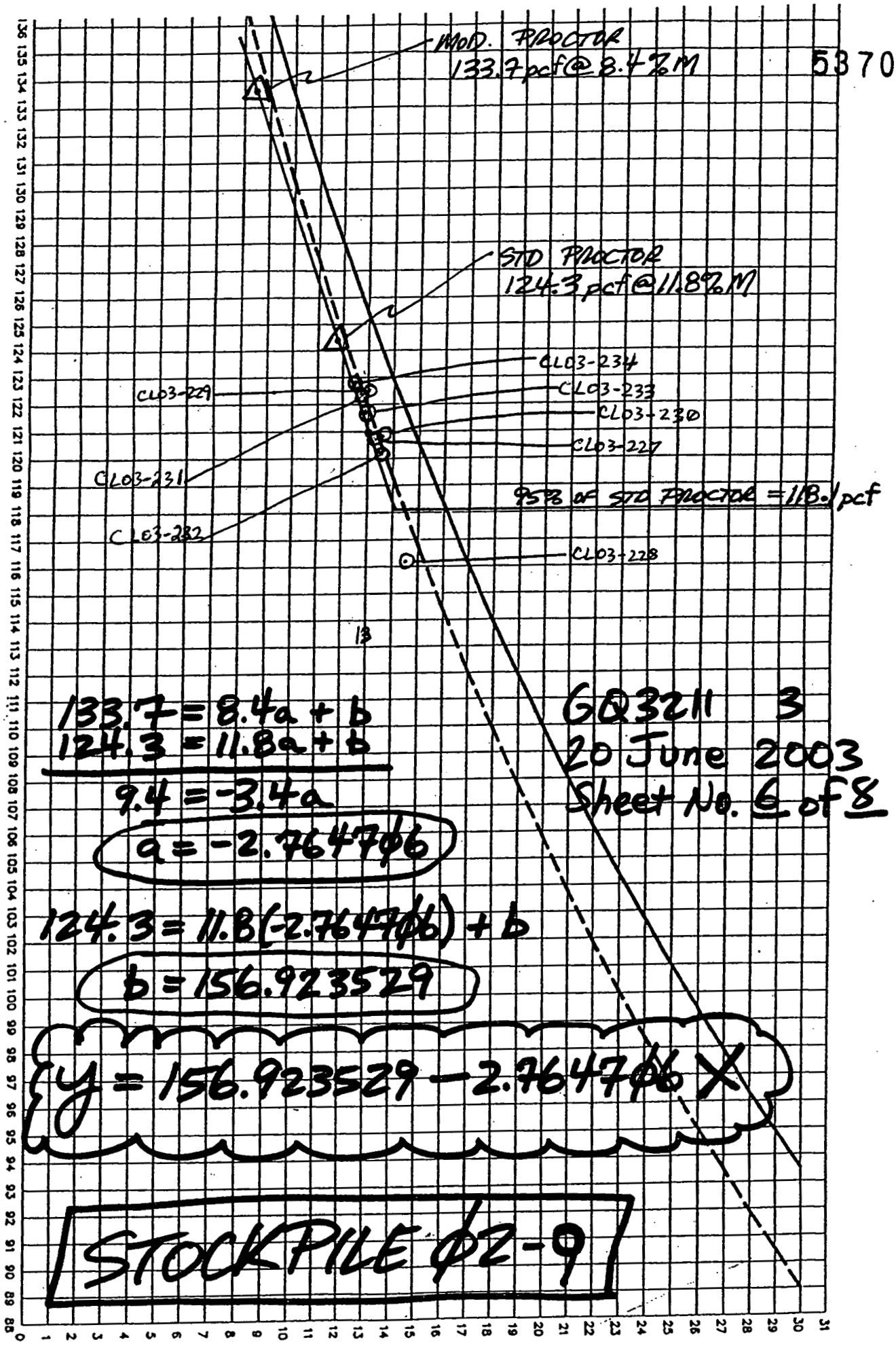
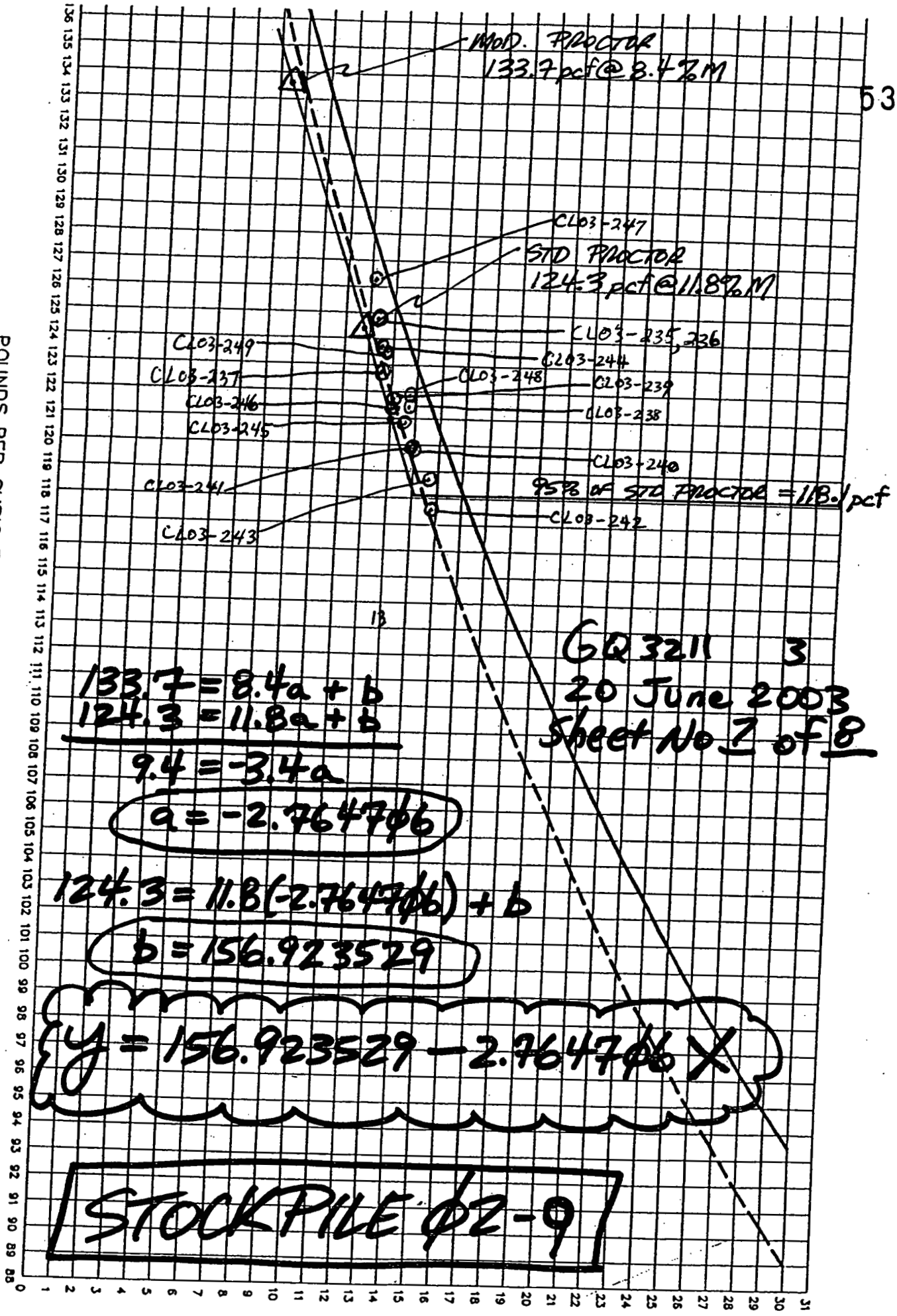

5370
MOD. PROCTOR
133.7 pcf @ 8.4% M
STD PROCTOR
124.3 pcf @ 11.8% M
CL03-234
CL03-233
CL03-230
CL03-227
CL03-229
CL03-231
CL03-232
CL03-228
95% OF STD PROCTOR = 118.1 pcf
13
133.7 = 8.4a + b
124.3 = 11.8a + b
9.4 = -3.4a
a = -2.764706
124.3 = 11.8(-2.764706) + b
b = 156.923529
y = 156.923529 - 2.764706 X
GQ3211 3
20 June 2003
Sheet No. 6 of 8
STOCKPILE 02-9
POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE



GQ 3211 3
20 June 2003
Sheet No 7 of 8

$133.7 = 8.4a + b$
$124.3 = 11.8a + b$

$9.4 = -3.4a$

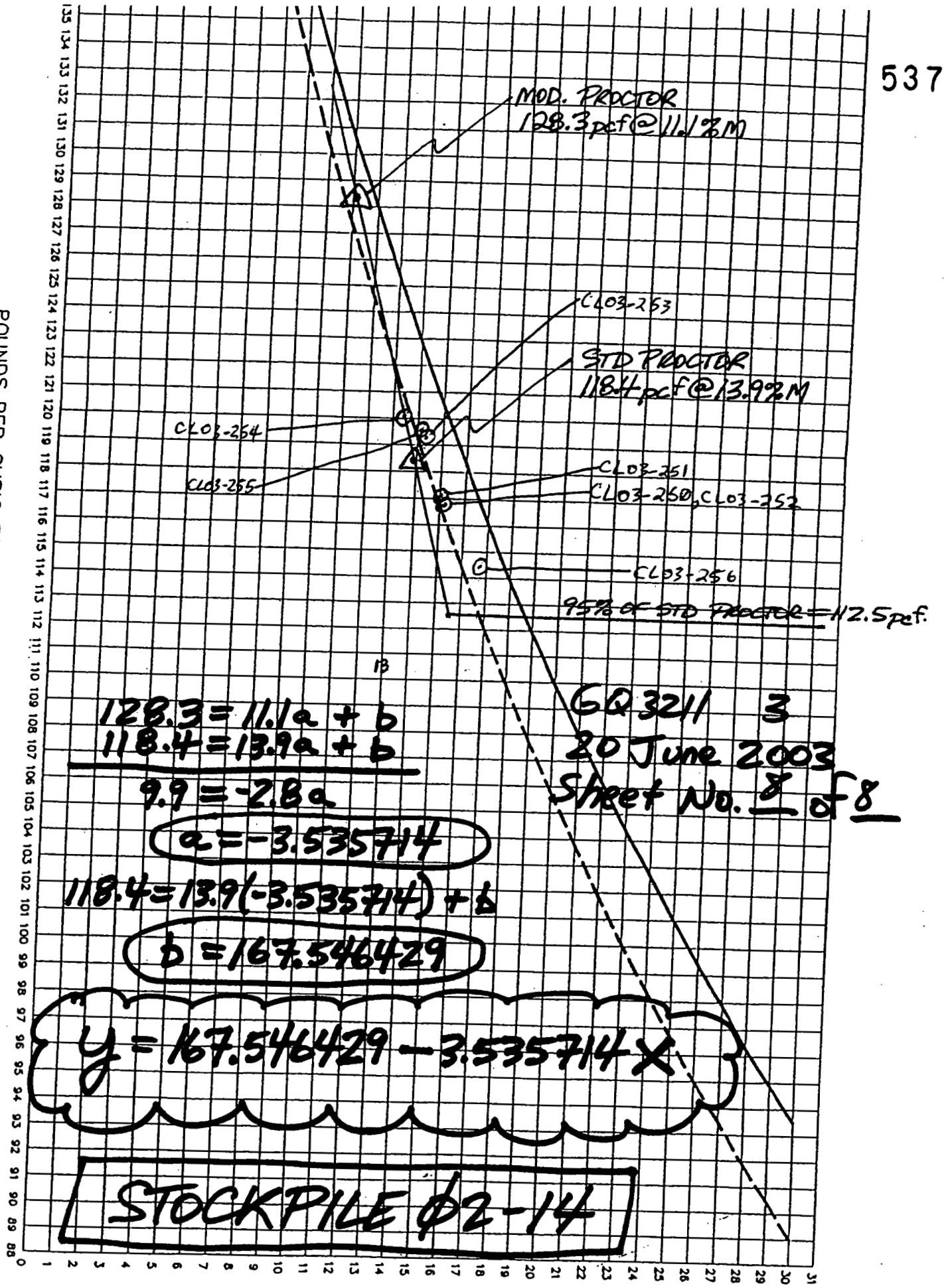
$a = -2.764706$

$124.3 = 11.8(-2.764706) + b$

$b = 156.923529$

$y = 156.923529 - 2.764706X$

STOCKPILE 02-9



$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

$118.4 = 13.9(-3.535714) + b$

$b = 167.546429$

$y = 167.546429 - 3.535714x$

STOCKPILE Ø2-14

GQ 3211 3
20 June 2003
Sheet No. 8 of 8

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: 6Q3211 TASK NO.: 3

DATE: 21 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile Ø2-14 & Ø2-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-257	Cell #6 Floor Clay Liner	6" / L-5	Ø2-14	13.9	118.4	13.7 / 15.0	135.8	118.1	99.7	P	—	—	—	—
CL03-258	↓	6" / L-5	Ø2-14	13.9	118.4	14.6 / 15.8	136.8	118.1	99.7	P	—	—	—	—
CL03-259		6" / L-5	Ø2-14	13.9	118.4	14.8 / 16.0	133.1	114.7	96.9	P	—	—	—	—
CL03-260		6" / L-5	Ø2-14	13.9	118.4	14.4 / 15.6	133.7	115.7	97.7	P	—	—	—	—
CL03-261		6" / L-5	Ø2-14	13.9	118.4	14.6 / 15.8	135.4	116.9	98.7	P	—	—	—	—
CL03-262		6" / L-5	Ø2-14	13.9	118.4	14.7 / 15.9	133.9	115.5	97.6	P	—	—	—	—
CL03-263		6" / L-5	Ø2-14	13.9	118.4	13.9 / 15.2	136.9	118.8	100.3	P	—	—	—	—
CL03-264		6" / L-5	Ø2-14	13.9	118.4	12.6 / 14.1	138.0	120.9	102.1	P	—	—	—	—
CL03-265	Cell #6 Drainage Corridor	6" / L-4	Ø2-14	13.9	118.4	12.9 / 14.4	138.8	121.2	102.4	P	—	—	—	—
CL03-266	↓	6" / L-4	Ø2-14	13.9	118.4	15.4 / 16.5	133.3	114.4	96.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 10

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 21 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-14 & 02-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-~~266~~ 267	Cell #6 Drainage Corridor	6" / L-4	02-14	13.9	118.4	14.9 / 16.0	133.1	114.7	96.9	P	—	—	—	—
CL03-~~268~~ 268	Cell #6 Floor, Clay Liner	6" / L-4	02-14	13.9	118.4	15.0 / 16.1	134.0	115.4	97.5	P	—	—	—	—
CL03-~~269~~ 269	↓	6" / L-4	02-14	13.9	118.4	13.3 / 14.7	136.4	118.9	100.4	P	—	—	—	—
CL03-~~270~~ 270	West Bench Cell #7	6" / L-2	02-9	11.8	124.3	12.3 / 13.9	138.6	121.7	97.9	P	—	—	—	—
CL03-~~271~~ 271	West Bench Cell #6	6" / L-2	02-9	11.8	124.3	11.6 / 13.3	138.2	122.0	98.1	P	—	—	—	—
CL03-272	Cell #6 Floor, Clay Liner	6" / L-5	02-14	13.9	118.4	14.9 / 16.0	134.1	115.6	97.6	P	—	—	—	—
CL03-~~273~~ 274	↓	6" / L-5	02-14	13.9	118.4	12.8 / 14.3	134.8	117.9	99.6	P	—	—	—	—
CL03-~~274~~ 275		6" / L-5	02-14	13.9	118.4	13.7 / 15.0	135.7	118.0	99.7	P	—	—	—	—
CL03-~~275~~ 276		6" / L-5	02-14	13.9	118.4	15.8 / 16.8	131.9	112.9	95.4	P	—	—	—	—
CL03-~~276~~ 277		6" / L-5	02-14	13.9	118.4	13.0 / 14.5	135.7	118.5	100.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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000427

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 21 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-14, 02-9 & 98-11 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 30979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-277	Cell #6 Floor, Clay Liner	6" / L-5	02-14	13.9	118.4	13.6 / 15.0	134.8	117.2	99.0	P	—	—	—	—
CL03-278	East Bench Cell #7	6" / L-7	98-11	14.7	116.8	16.4 / 17.3	134.8	114.9	98.4	P	—	—	—	—
CL03-279	East Bench Cell #6	6" / L-7	98-11	14.7	116.8	14.4 / 15.6	134.9	116.7	99.9	P	—	—	—	—
CL03-280	↓	6" / L-7	98-11	14.7	116.8	13.6 / 15.0	137.5	119.6	102.4	P	—	—	—	—
CL03-281	Cell #6 Floor, Clay Liner	6" / L-5	02-14	13.9	118.4	14.2 / 15.5	135.5	117.3	99.1	P	—	—	—	—
CL03-282		6" / L-5	02-14	13.9	118.4	15.5 / 16.5	131.5	112.9	95.4	P	—	—	—	—
CL03-283		6" / L-5	02-14	13.9	118.4	15.4 / 16.5	132.7	113.9	96.2	P	—	—	—	—
CL03-284		6" / L-5	02-14	13.9	118.4	15.7 / 16.7	132.2	113.3	95.7	P	—	—	—	—
CL03-285		6" / L-5	02-14	13.9	118.4	14.4 / 15.6	135.3	117.0	~~99.6~~ 98.8	P	—	—	—	—
CL03-286	↓	6" / L-5	02-14	13.9	118.4	15.8 / 16.8	131.7	112.8	95.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *Stockpile 98-11 was from cuttings of the Cell #2 Cap East Slope which was hauled to Cell #6.

000428

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION:

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 21 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-287	West Bench	6" / L-2	98-11	14.7	116.8	~~12.3~~ 13.9	136.4	119.7	102.5	—	F	CL03-288	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *Stockpile 98-11 was from cuttings of the Cell #2 Cap East Slope which was hauled to Cell #6.

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000429

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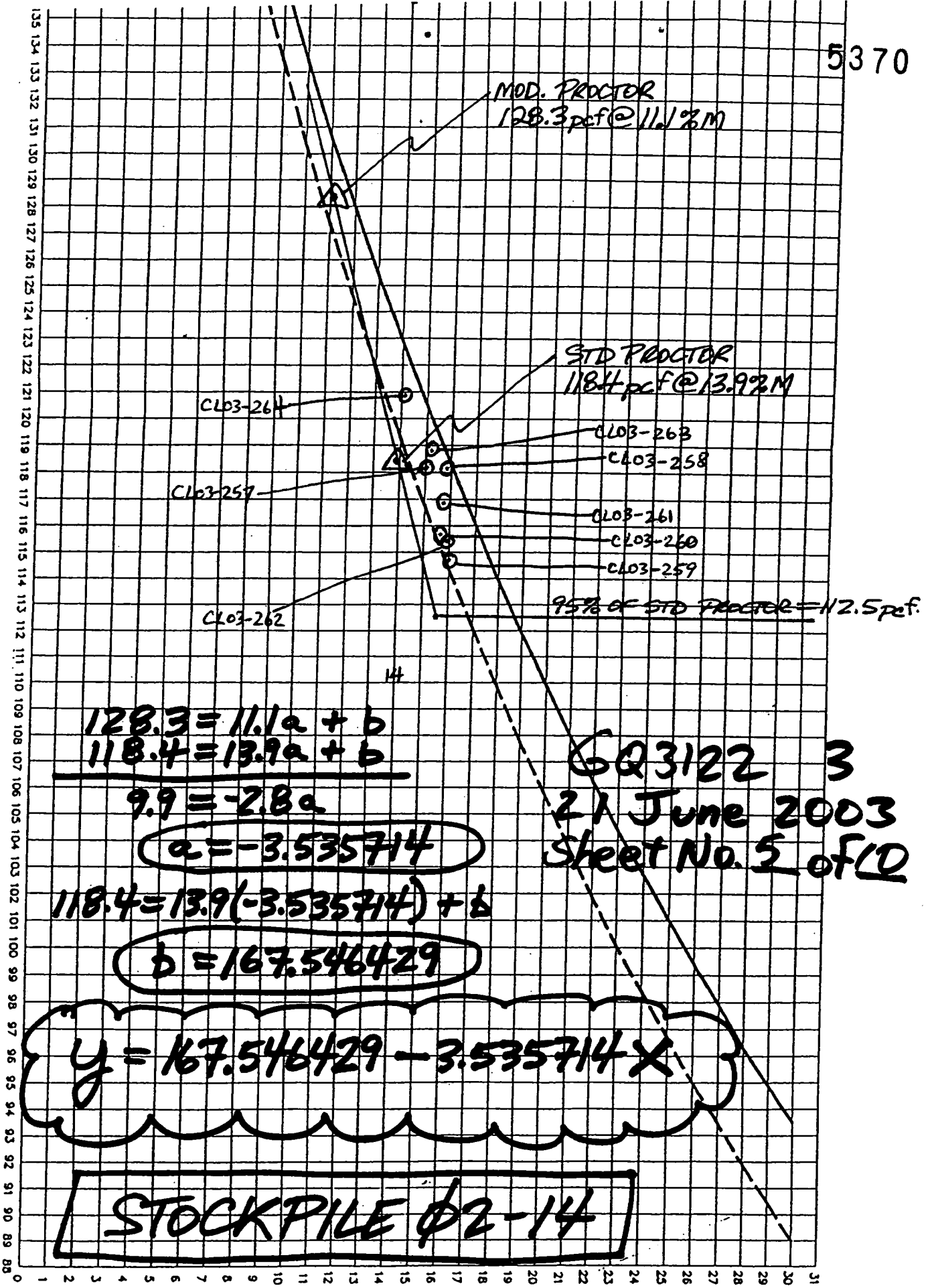


$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

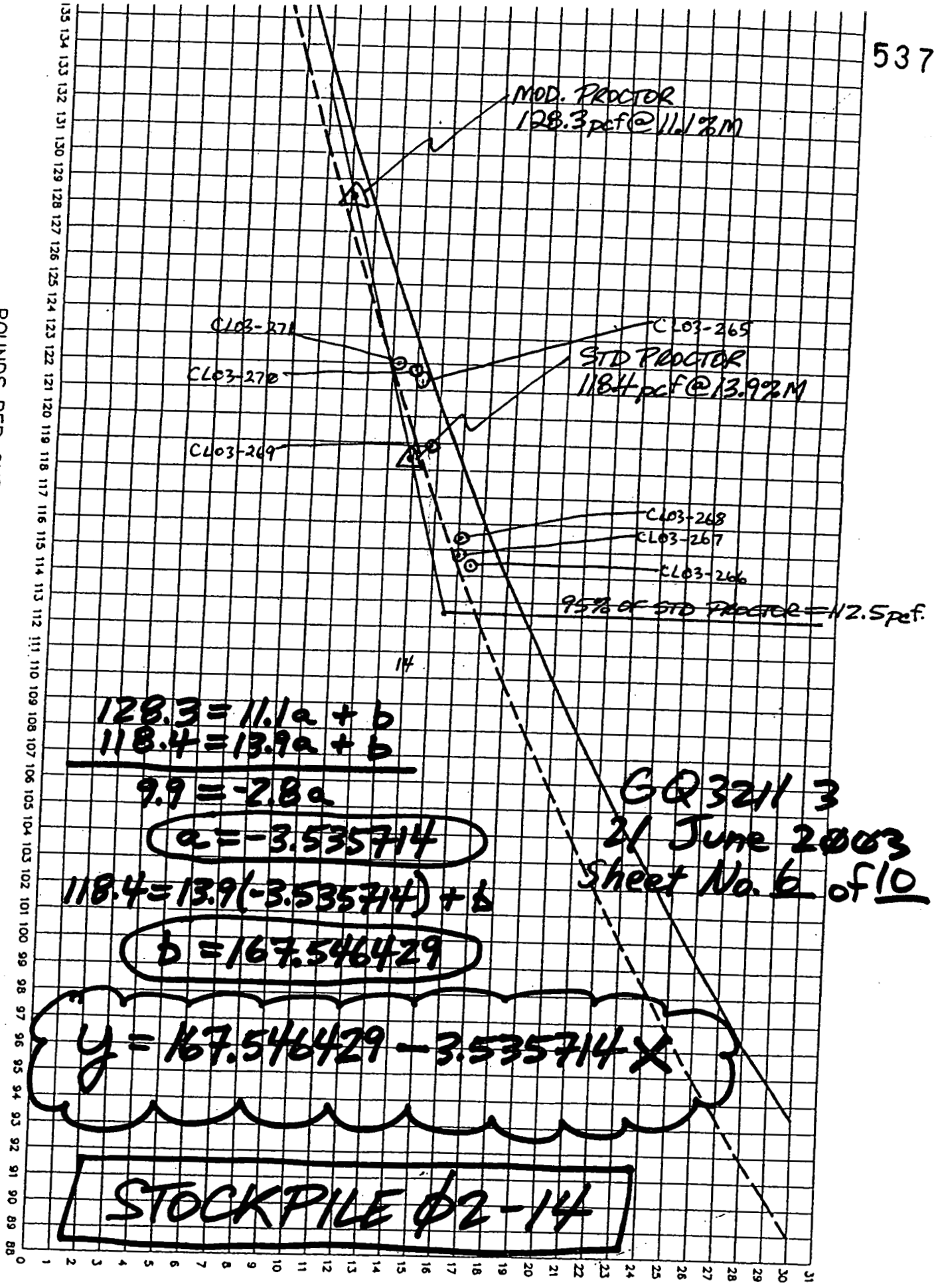
$118.4 = 13.9(-3.535714) + b$

$b = 167.546429$

$y = 167.546429 - 3.535714x$

STOCKPILE Ø2-14

GQ3122 3
21 June 2003
Sheet No. 5 of 10



$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

$118.4 = 13.9(-3.535714) + b$

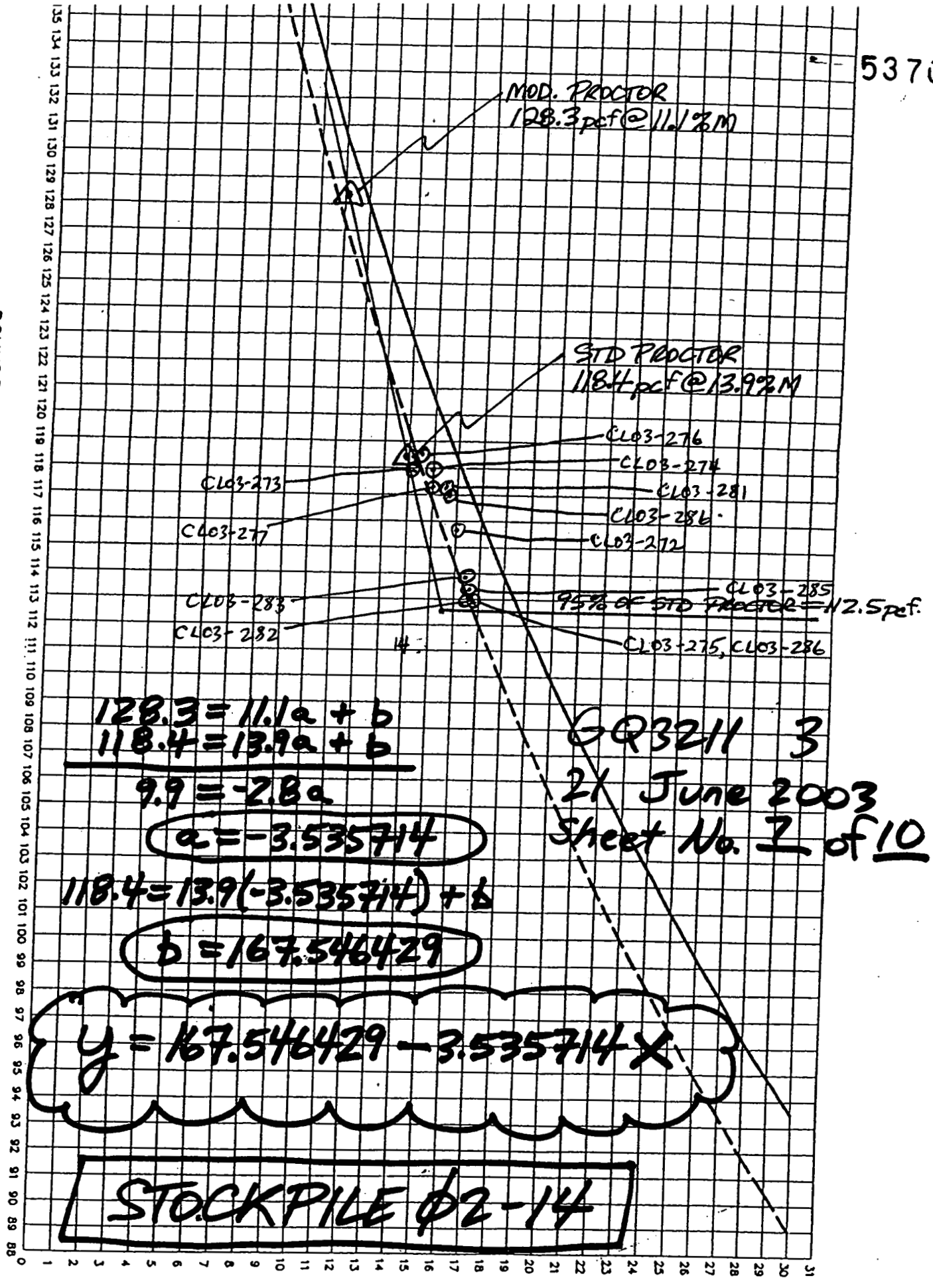
$b = 167.546429$

$y = 167.546429 - 3.535714x$

STOCKPILE Ø2-14

GQ3211 3
21 June 2003
Sheet No. 6 of 10

5370



$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

$118.4 = 13.9(-3.535714) + b$

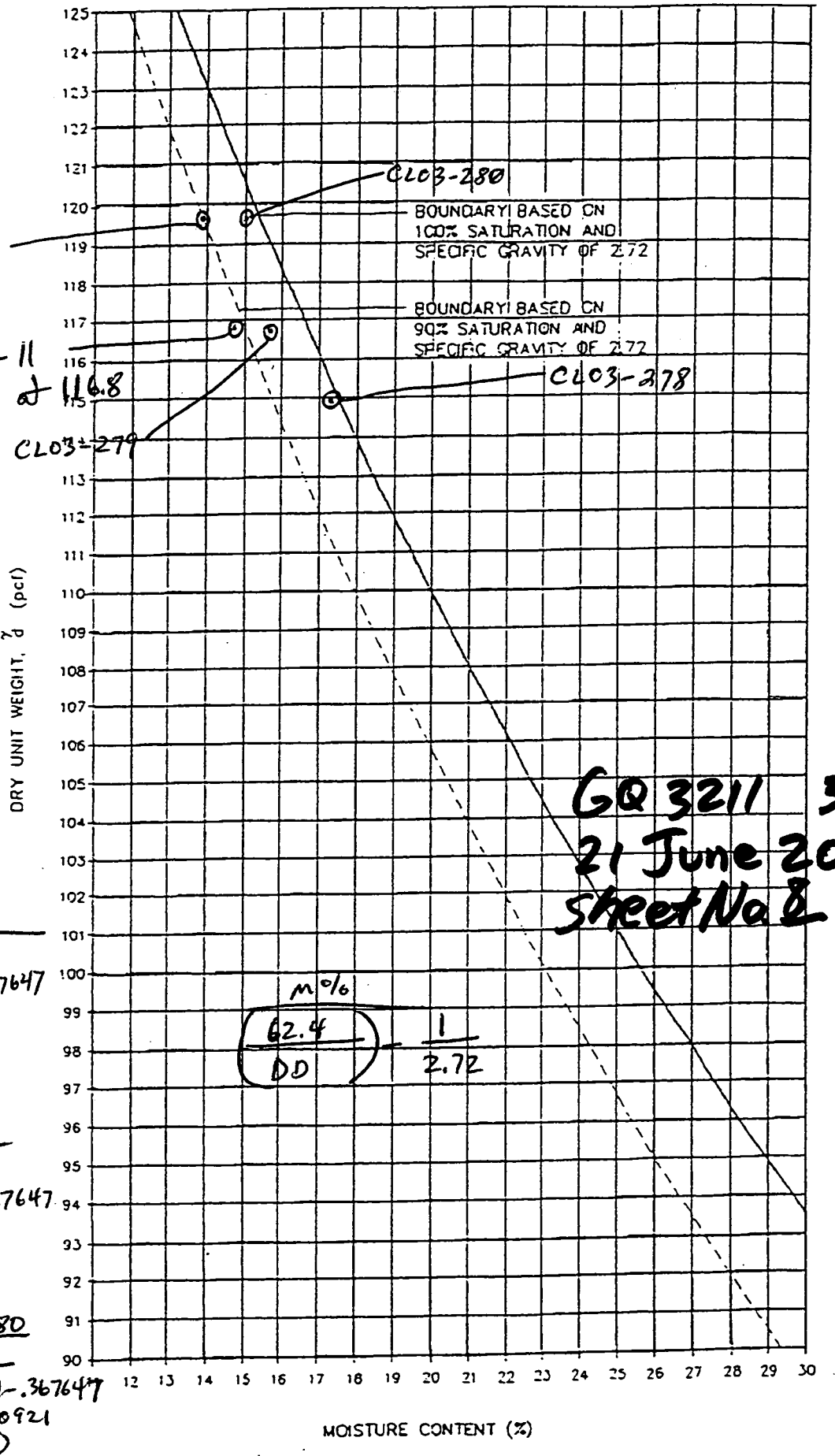
$b = 167.546429$

$y = 167.546429 - 3.535714x$

STOCKPILE Ø2-14

GQ3211 3
21 June 2003
Sheet No. 7 of 10

000432



GQ 3211 3
21 June 2003
Sheet No. 8 of 10

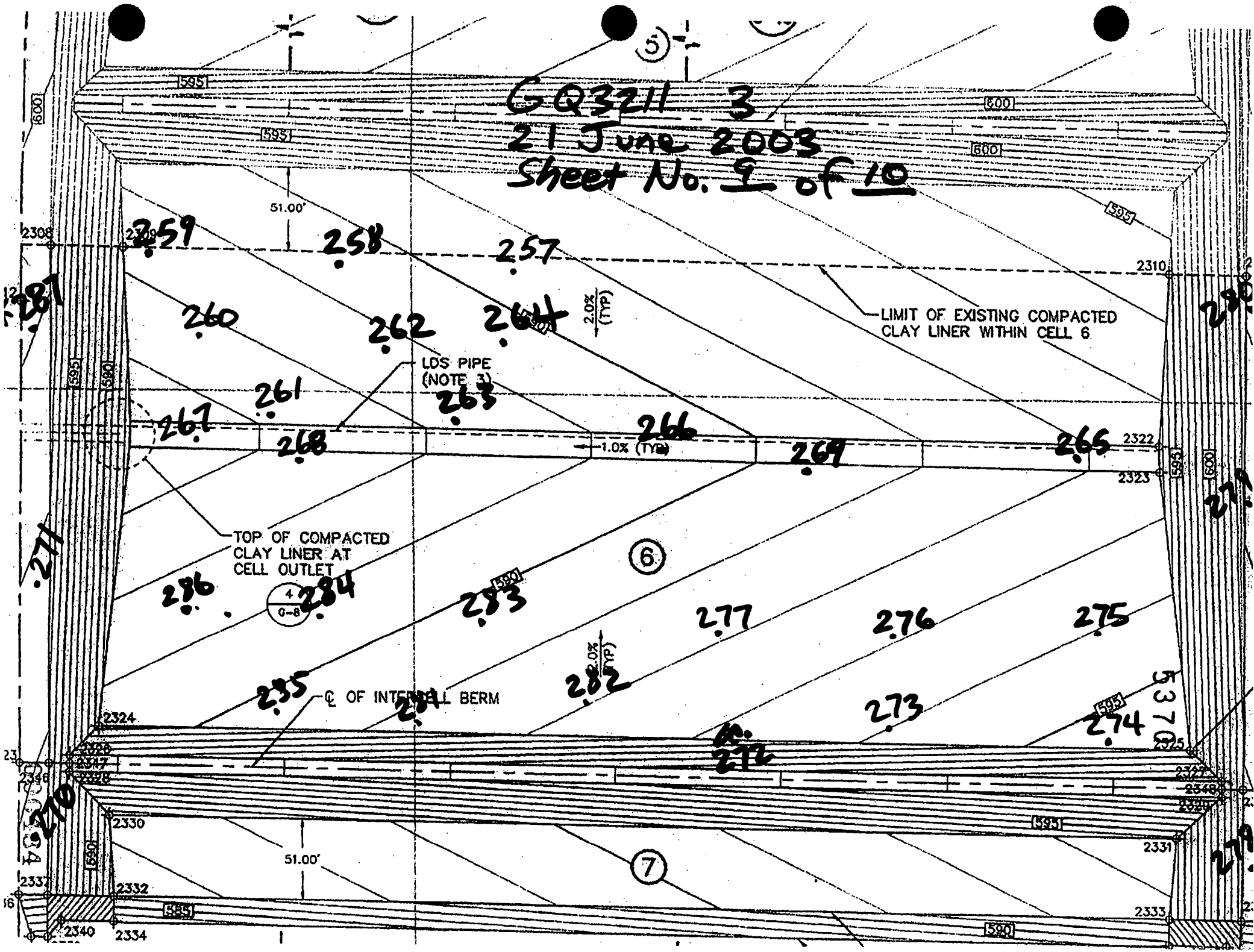
CL03-278
.173
.5430809 - .367647
.1754339
.99

CL03-279
.156
.5347043 - .367647
.1670573
.93

CL03-280
.150
.5217391 - .367647
.1540921
.97

$$\frac{62.4}{DD} - \frac{1}{2.72}$$

GQ3211 3
21 June 2003
Sheet No. 9 of 10



GQ 3211 3
21 June 2003
Sheet No. 10 of 10

Failed: needs water

Lift #7
Final Lift
Stockpile 98-11
passed

Lift #5
Stockpile 02-14
Tested & Passed

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

2.0% (TYP)

PIPE (NOTE 3)

1.0% (TYP)

Lift #4

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4
G-8

6

Lift #5
Stockpile 02-14

Lift #2 Stockpile 02-9 + Stockpile 98-11 from Cell #2 cuttings

Tested & Passed

OF INTERCELL BERM

51.00'

7

2308 2309 2322 2323 2324 2325 2330 2331 2332 2333 2334 2340

595 600 590 585 580

00035000

5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 23 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpiles Ø2-9, Ø2-14, 98-11 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-288	West Bench	6" / L-2	98-11	14.7	116.8	13.6 / 15.0	136.7	118.9	101.8	P	—	—	—	—
CL03-289	Cell #6 Floor, Clay Liner	6" / L-5	Ø2-14	13.9	118.4	15.8 / 16.8	131.5	112.6	95.1	P	—	—	—	—
CL03-290	↓	6" / L-5	Ø2-14	13.9	118.4	14.8 / 16.0	132.7	114.4	96.6	P	—	—	—	—
CL03-291	East 4:1 Slope Cell #7	6" / L-4	Ø2-9	11.8	124.3	13.0 / 14.5	137.0	119.7	96.3	P	—	—	—	—
CL03-292	East 4:1 Slope Cell #6	6" / L-4	Ø2-14	13.9	118.4	14.3 / 15.5	135.0	116.9	98.7	P	—	—	—	—
CL03-293	↓	6" / L-4	Ø2-14	13.9	118.4	14.1 / 15.4	136.7	118.5	100.1	P	—	—	—	—
CL03-294	↓	6" / L-4	Ø2-14	13.9	118.4	14.4 / 15.6	132.7	114.8	97.0	P	—	—	—	—
CL03-295	West 4:1 Slope, Cell #6	6" / L-1	Ø2-14	13.9	118.4	14.3 / 15.5	134.3	116.3	98.2	P	—	—	—	—
CL03-296	↓	6" / L-1	Ø2-14	13.9	118.4	13.3 / 14.7	134.8	117.5	99.2	P	—	—	—	—
CL03-297	West Bench	6" / L-3	Ø2-14	13.9	118.4	13.4 / 14.8	135.7	118.2	99.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 23 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 9"-8"

MATERIAL SOURCE: Stockpile 02-14 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20579 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-298	Cell #6 Floor Clay Liner	6" / L-5	02-14	13.9	118.4	14.9 / 16.0	132.7	114.4	96.6	P	—	—	—	—
CL03-299		6" / L-5	02-14	13.9	118.4	14.0 / 15.3	134.1	116.3	98.2	P	—	—	—	—
CL03-300		6" / L-5	02-14	13.9	118.4	15.1 / 16.2	132.6	114.1	96.4	P	—	—	—	—
CL03-301	East 4:1 Slope Cell #6	6" / L-5	02-14	13.9	118.4	14.1 / 15.4	134.5	116.6	98.5	P	—	—	—	—
CL03-302		6" / L-5	02-14	13.9	118.4	12.3 / 13.9	137.9	121.1	102.3	P	—	—	—	—
CL03-303		6" / L-5	02-14	13.9	118.4	15.9 / 16.9	133.5	114.2	96.5	P	—	—	—	—
CL03-304	Cell #6 Floor Clay Liner	6" / L-5	02-14	13.9	118.4	15.7 / 16.7	132.4	~~114.4~~ 113.5 CHW	~~96.6~~ 95.8 CHW	P	—	—	—	—
CL03-305		6" / L-5	02-14	13.9	118.4	15.3 / 16.4	132.7	114.0	96.3	P	—	—	—	—
CL03-306		6" / L-5	02-14	13.9	118.4	15.6 / 16.6	132.6	113.7	96.0	P	—	—	—	—
CL03-307		6" / L-5	02-14	13.9	118.4	14.4 / 15.6	135.8	~~120.0~~ 117.5 CHW	~~101.3~~ 98.2 CHW	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

53 of 90

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: 6Q3211 TASK NO.: 3

DATE: 23 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 85 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-14 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-308	Cell #6 Floor Clay Liner	6" / L-5	02-14	13.9	118.4	13.1 / 14.5	133.9	116.9	98.7	P	—	—	—	—
CL03-309		6" / L-5	02-14	13.9	118.4	15.5 / 16.5	131.6	113.0	95.4	P	—	—	—	—
CL03-310		6" / L-5	02-14	13.9	118.4	15.2 / 16.3	130.8	112.5	95.0	P	—	—	—	—
CL03-311		6" / L-5	02-14	13.9	118.4	14.6 / 15.8	134.3	116.0	98.0	P	—	—	—	—
CL03-312	East 4:1 Slope Cell #7	6" / L-5	02-9	11.8	124.3	13.2 / 14.6	135.8	118.5	95.3	P	—	—	—	—
CL03-313	West 4:1 Slope Cell #7	6" / L-1	02-14	13.9	118.4	12.6 / 14.1	138.5	121.4	102.5	P	—	—	—	—
CL03-314	Cell #6 Drainage Corridor	6" / L-5	02-14	13.9	118.4	16.5 / 16.5	133.7	114.8	97.0	P	—	—	—	—
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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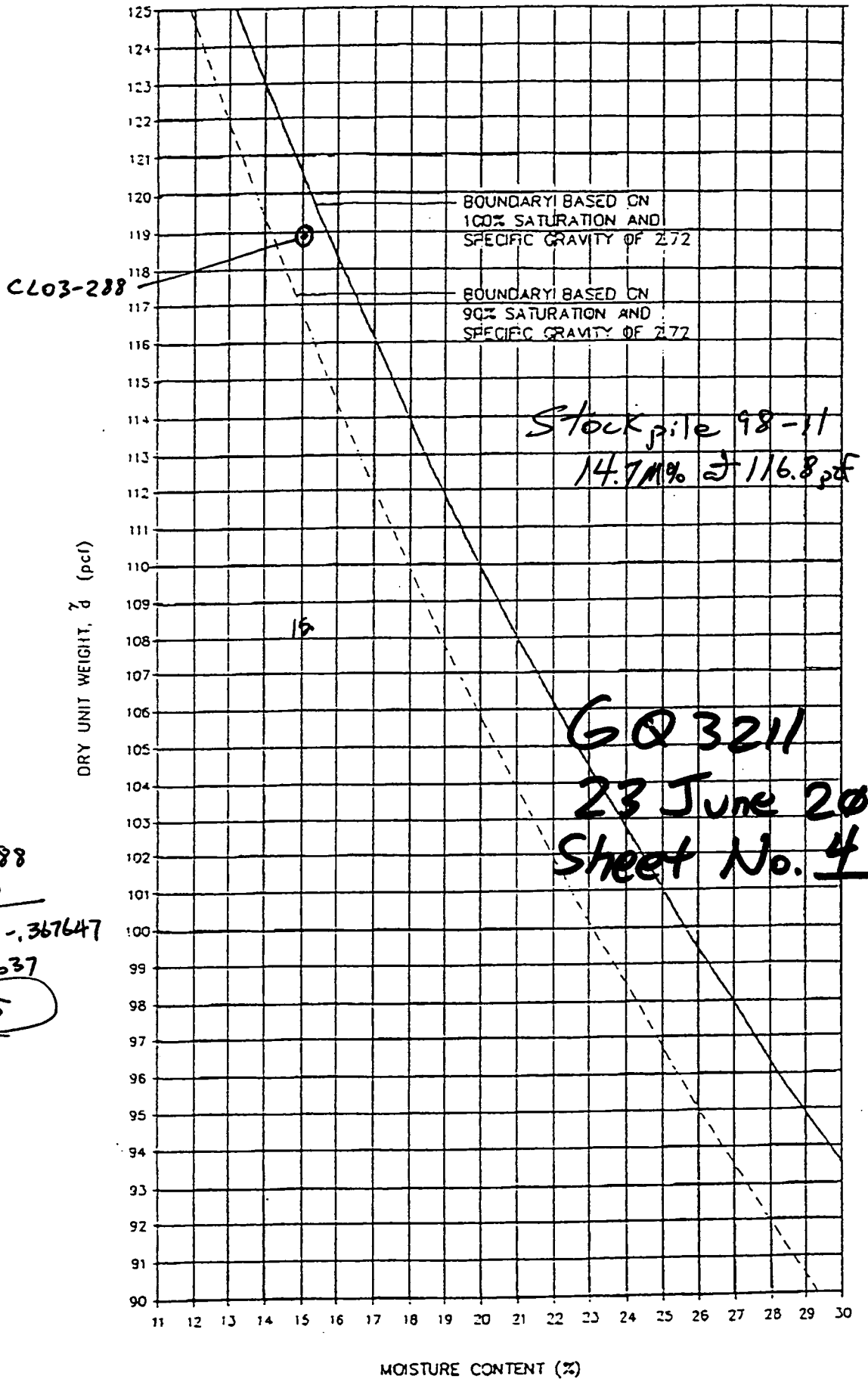
SHEET NO. 3 OF 70



CL03-288
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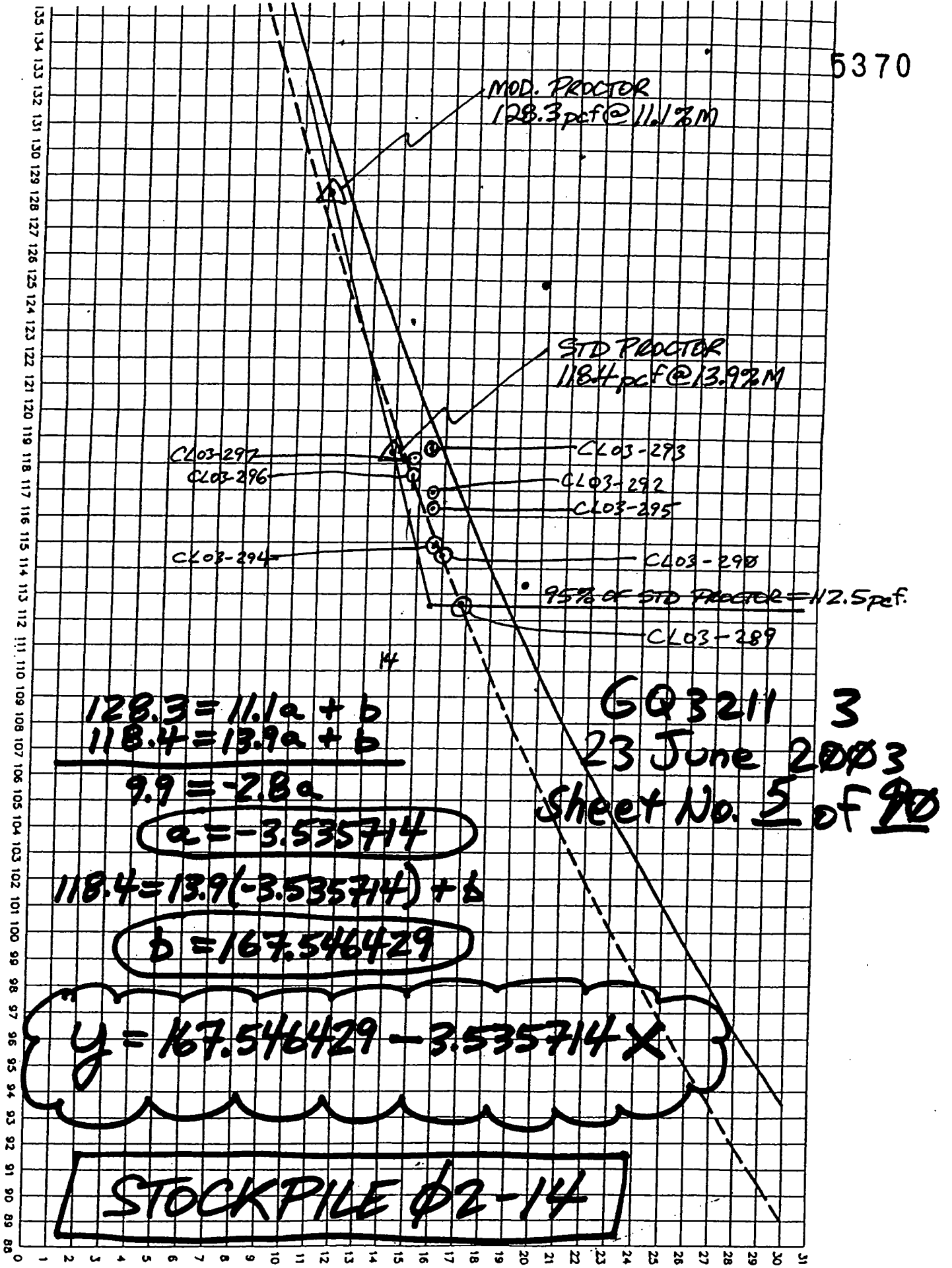
.95



$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

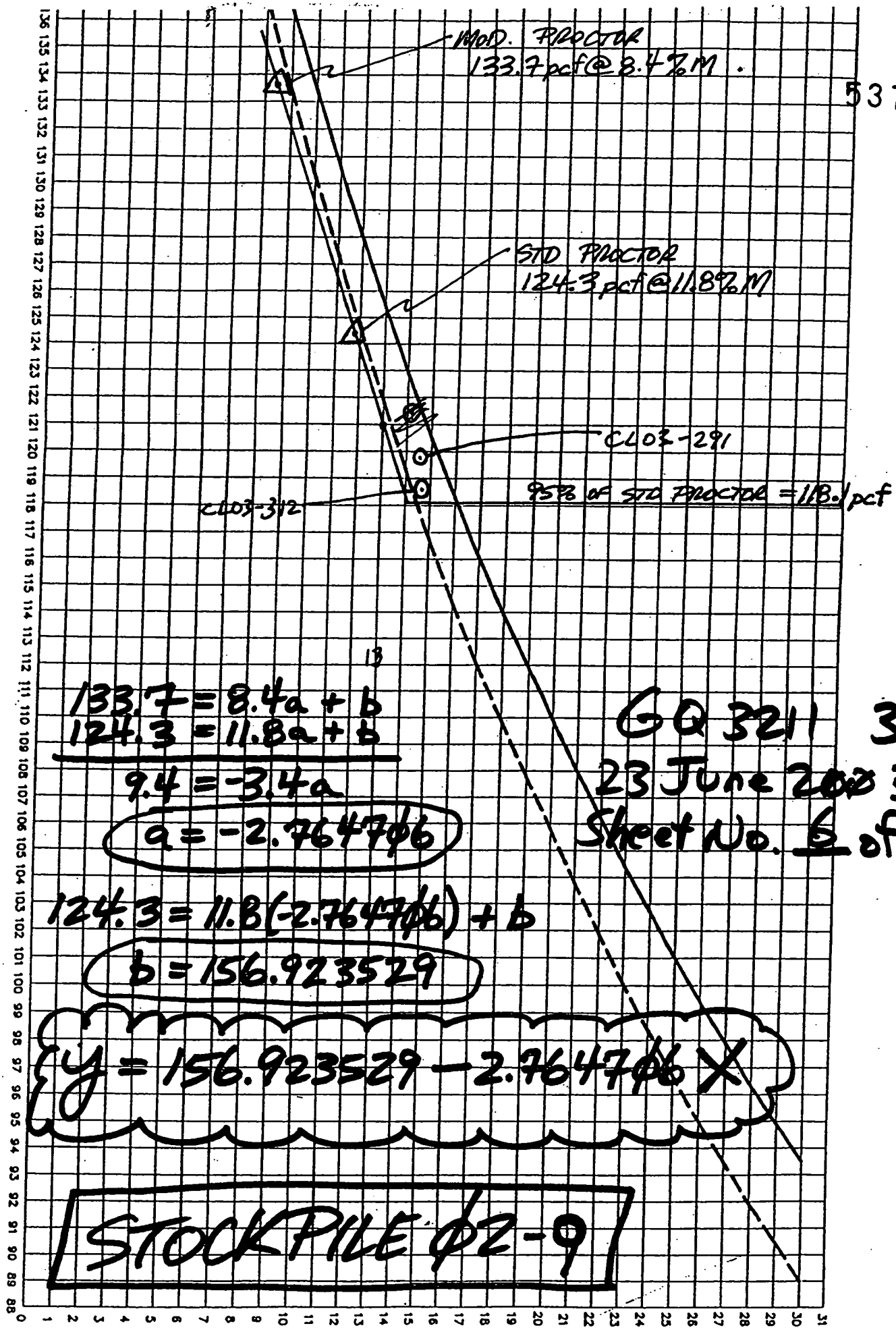
$118.4 = 13.9(-3.535714) + b$

$b = 167.546429$

$y = 167.546429 - 3.535714x$

STOCKPILE Ø2-14

GQ3211 3
23 June 2003
Sheet No. 5 of 20



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$133.7 = 8.4a + b$
$124.3 = 11.8a + b$

$9.4 = -3.4a$

$a = -2.764706$

$124.3 = 11.8(-2.764706) + b$

$b = 156.923529$

$y = 156.923529 - 2.764706x$

GQ 3211 3
23 June 2003
Sheet No. 6 of 10

STOCKPILE 02-9

000441

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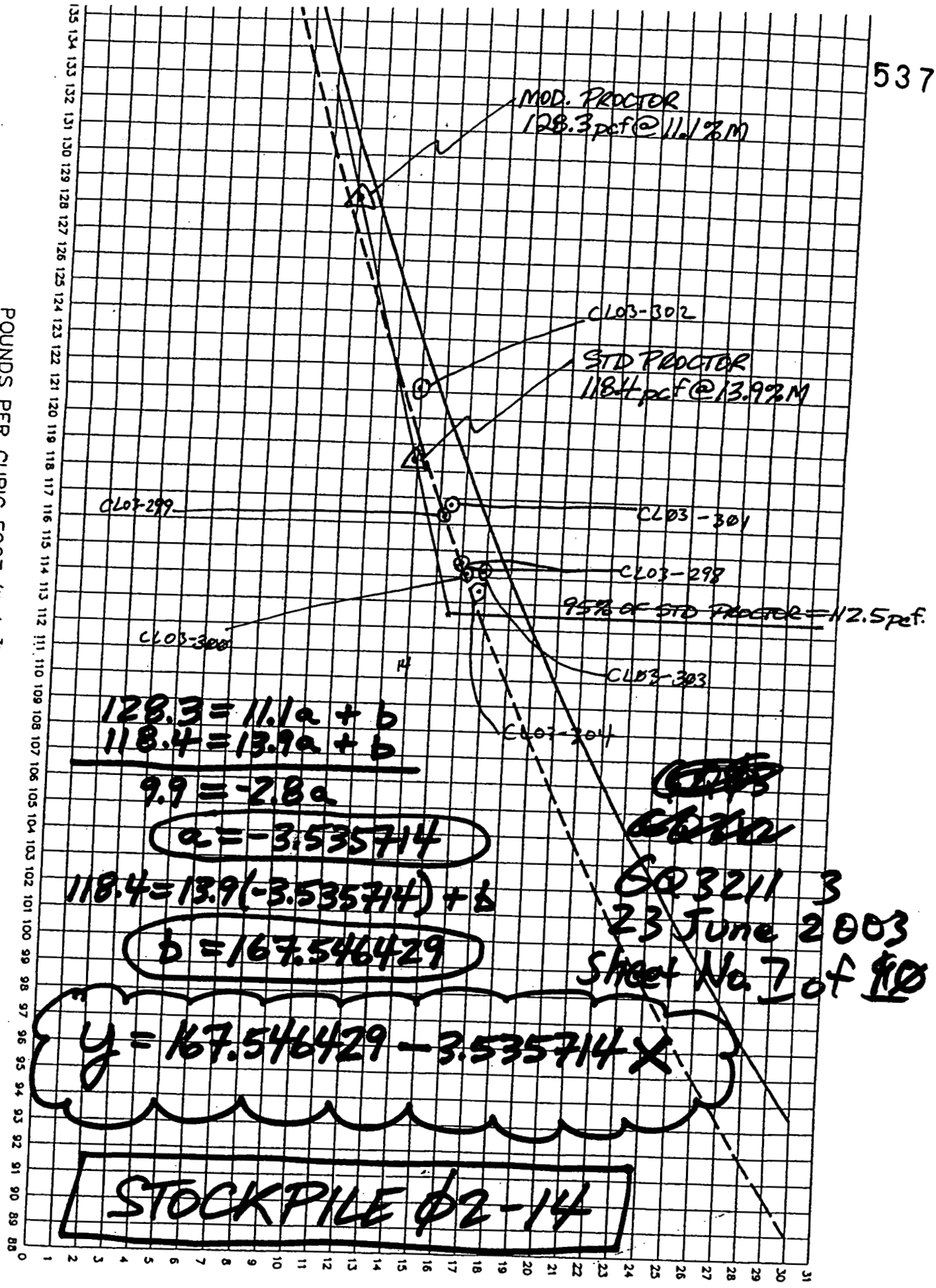


$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

$118.4 = 13.9(-3.535714) + b$

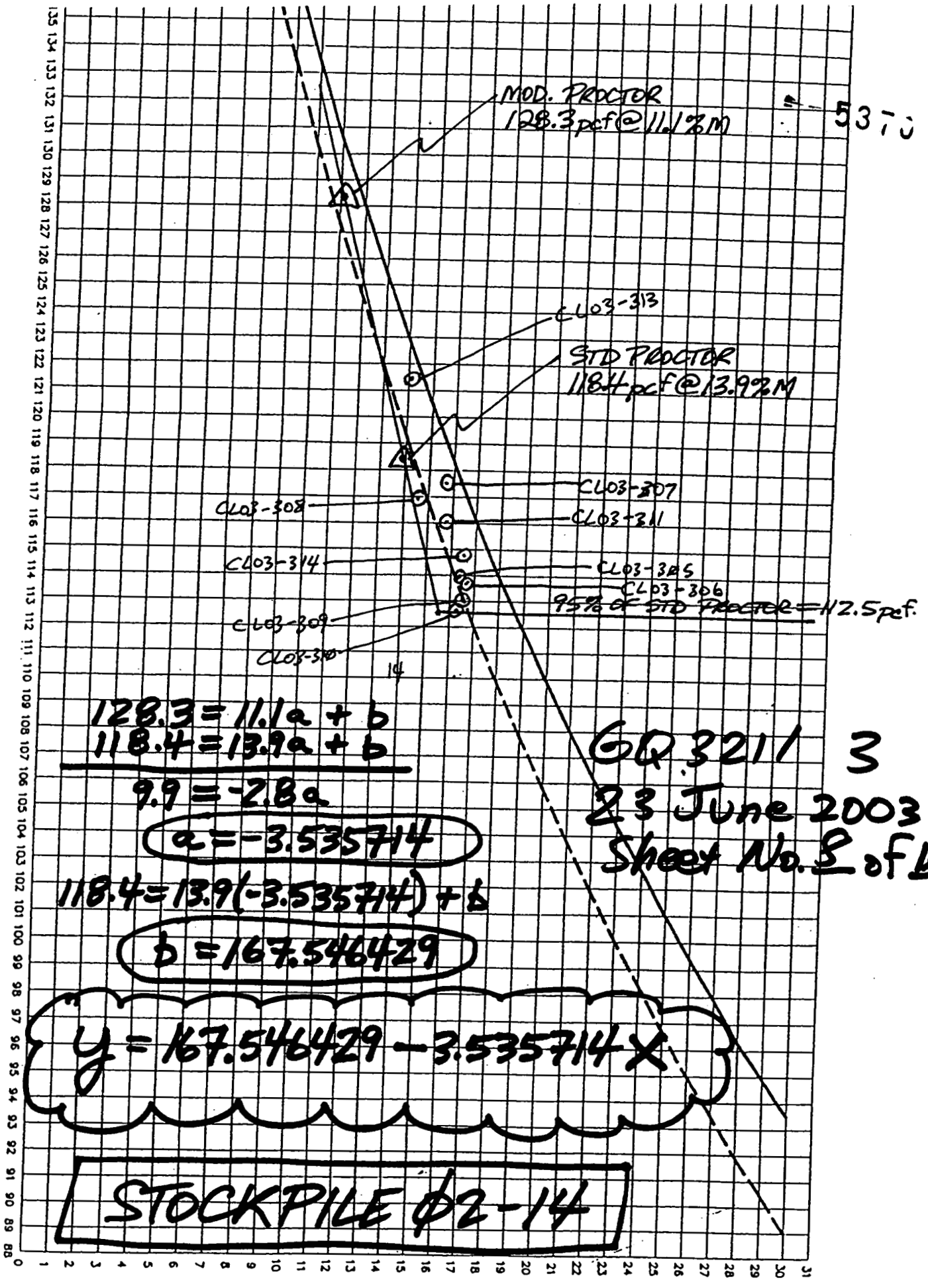
$b = 167.546429$

$y = 167.546429 - 3.535714x$

STOCKPILE Ø2-14

GQ 3211 3
23 June 2003
Sheet No. 7 of 10

000442



$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

$118.4 = 13.9(-3.535714) + b$

$b = 167.546429$

$y = 167.546429 - 3.535714x$

STOCKPILE Ø2-14

GQ 3211 3
23 June 2003
Sheet No. 8 of 10

5370

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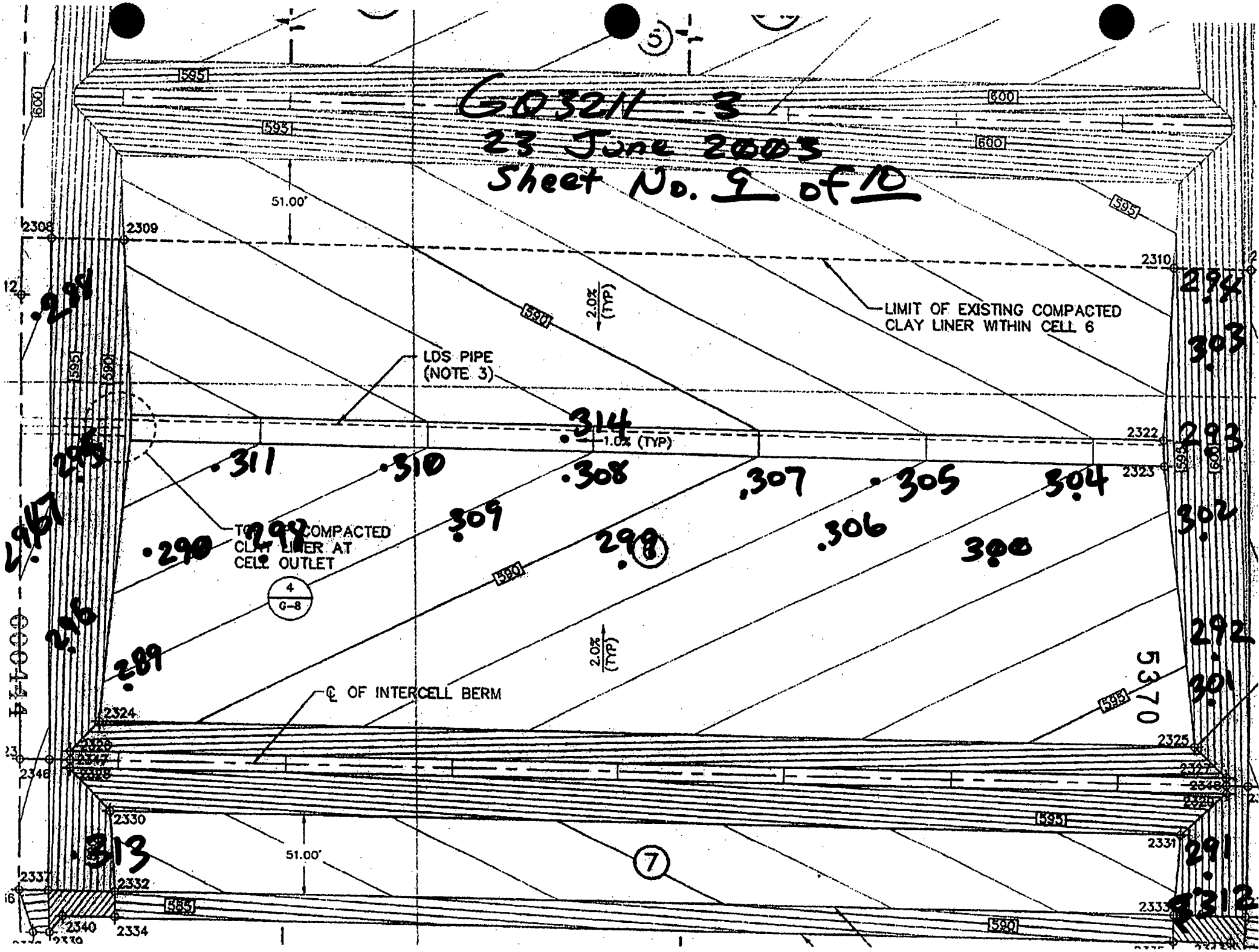
G03211 3
23 June 2003
Sheet No. 9 of 10



GQ3211 3
23 June 2005
Sheet No. 12 of 12

Lift #2 Tested & Passed

Lift #4

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

LDS PIPE (NOTE 3)

Drainage Corridor - Lift #5 Stockpile Ø2-14

Lift #5 Stockpile Ø2-14

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4 / G-8

℄ OF INTERCELL BERM

2.0% (TYP)

1.0% (TYP)

51.00'

6

7

5370

2308 2309 2310 2322 2324 2325 2330 2331 2332 2333 2334 2340

595 600 590 585

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GP3211 TASK NO.: 3

DATE: 24 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ~8"

MATERIAL SOURCE: Stockpile #2-14 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-315	Cell #7 Floor	6" / L-6	#2-14	13.9	118.4	14.5 / 15.7	140.3	121.3	102.4	P	—	—	—	—
CL03-316	Cell #6 → #7 IC Berm	6" / L-1	#2-14	13.9	118.4	15.3 / 16.4	133.6	114.8	97.0	P	—	—	—	—
CL03-317	↓	6" / L-1	#2-14	13.9	118.4	14.5 / 15.7	135.9	117.5	99.2	P	—	—	—	—
CL03-318	Cell #7 Floor	6" / L-6	#2-14	13.9	118.4	12.8 / 14.3	141.8	124.61	*104.8	P	—	—	—	—
CL03-319	Cell #7 East 4:1 Slope	6" / L-6	#2-14	13.9	118.4	13.0 / 14.5	135.9	118.7	100.3	P	—	—	—	—
CL03-320	Cell #6 East 4:1 Slope	6" / L-6	#2-14	13.9	118.4	15.4 / 16.5	132.4	113.6	95.9	P	—	—	—	—
CL03-321	↓	6" / L-6	#2-14	13.9	118.4	14.3 / 15.5	133.6	115.7	97.7	P	—	—	—	—
CL03-322		6" / L-6	#2-14	13.9	118.4	15.3 / 16.4	132.7	114.0	96.3	P	—	—	—	—
CL03-323	Cell #6 → #7 IC Berm	6" / L-6	#2-14	13.9	118.4	15.9 / 16.9	132.3	113.2	95.6	P	—	—	—	—
CL03-324	Cell #7 Floor	6" / L-6	#2-14	13.9	118.4	14.9 / 16.0	134.2	115.7	97.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * This material is probably a mixture of the underlying lift (Stockpile 02-9) and Stockpile #2-14.

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SHEET NO. 1 OF 7

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: 603211 TASK NO.: 3

DATE: 24 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ~8"

MATERIAL SOURCE: Stockpile 02-14 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-325	Cell #6 → Ic Berm	6" / L-1	02-14	13.9	118.4	14.9 / 16.0	137.2	118.3	99.9	P	—	—	—	—
CL03-326	Cell #7 Floor	6" / L-6	02-14	13.9	118.4	15.1 / 16.2	133.2	114.6	96.8	P	—	—	—	—
CL03-327	Cell #6, West 4:1 Slope	6" / L-2	02-14	13.9	118.4	13.2 / 14.6	136.6	119.2	100.7	P	—	—	—	—
CL03-328	↓	6" / L-2	02-14	13.9	118.4	14.2 / 15.5	133.9	115.9	97.9	P	—	—	—	—
CL03-329	Cell #7 West 4:1 Slope	6" / L-2	~~02-14~~ 02-4	~~13.9~~ 13.8	~~118.4~~ 117.4 CHW	12.8 / 14.3	133.0	116.3	99.1	~~P~~	F	CL03-353	P	—
CL03-330	West Bench	6" / L-2	02-14	13.9	118.4	13.5 / 14.9	134.5	117.1	98.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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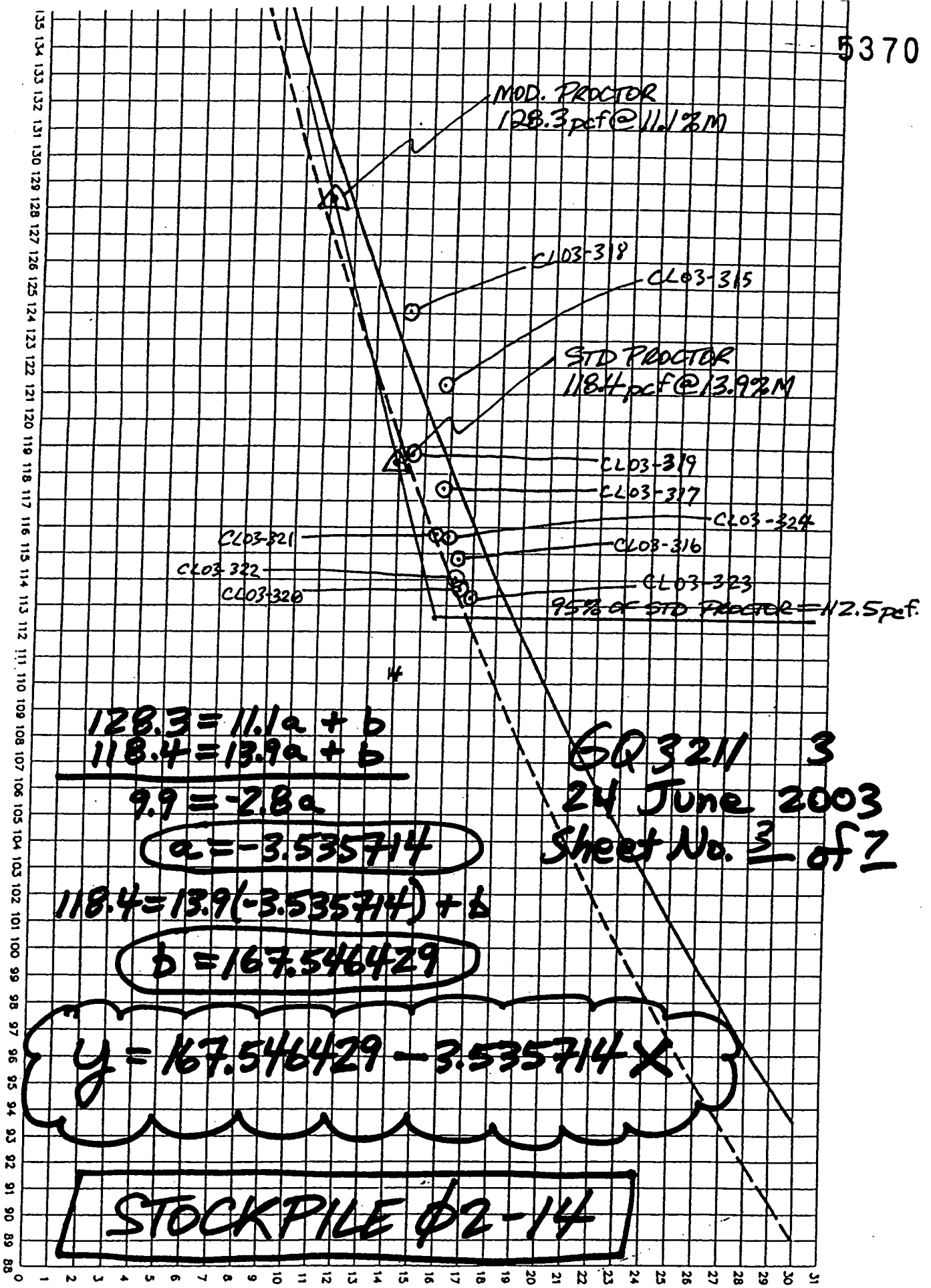
000447

03-10



$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

$118.4 = 13.9(-3.535714) + b$

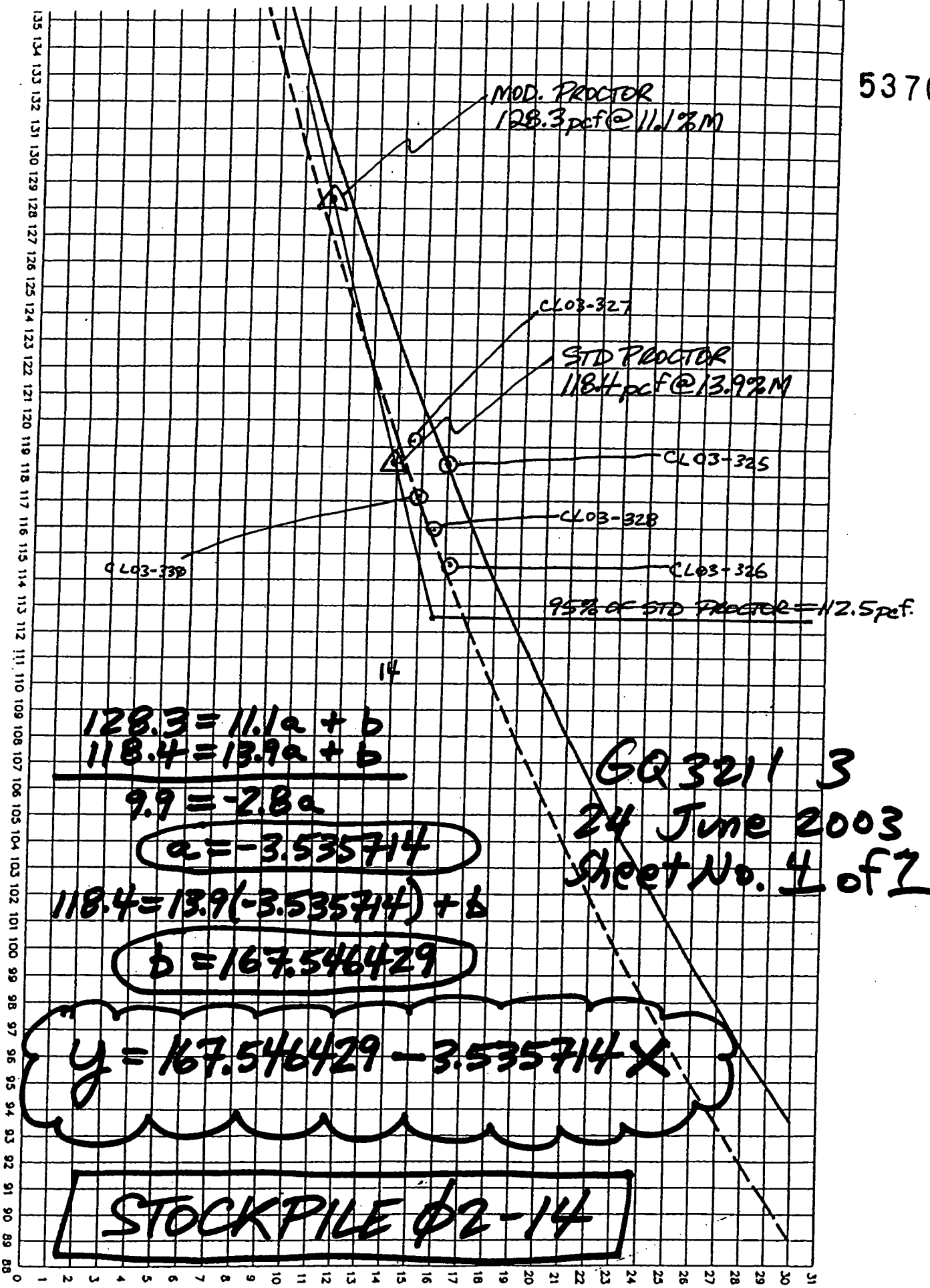
$b = 167.546429$

$y = 167.546429 - 3.535714x$

GQ 3211 3
24 June 2003
Sheet No. 3 of 7

STOCKPILE Ø2-14

5370



$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

$118.4 = 13.9(-3.535714) + b$

$b = 167.546429$

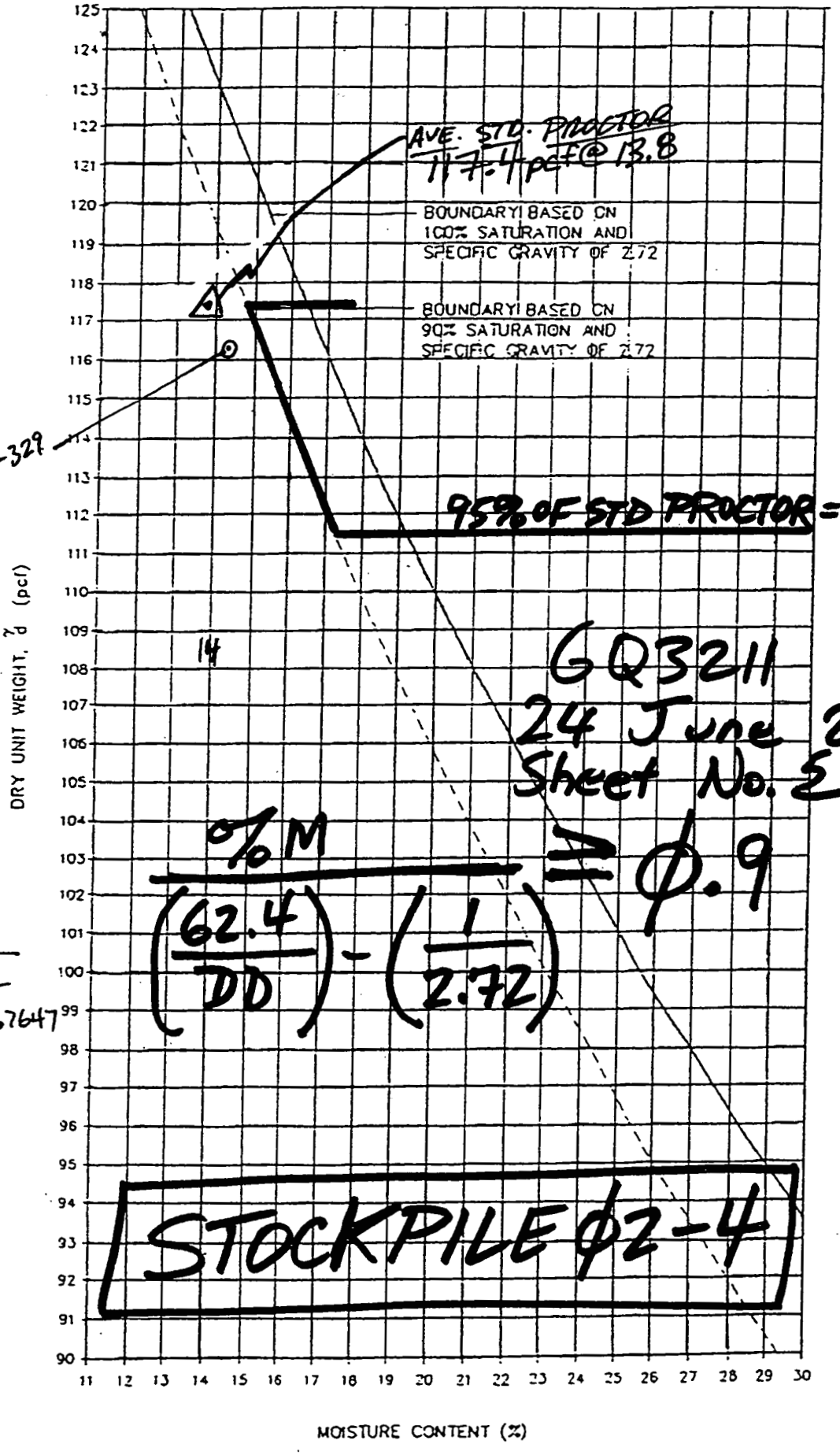
$y = 167.546429 - 3.535714x$

GQ 3211 3
24 June 2003
Sheet No. 4 of 7

STOCKPILE Ø2-14

000449

5370



GQ3211 3
24 June 2003
Sheet No. 2 of 2

$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq 0.9$$

$\frac{.143}{.5365434 - .367647}$

$\frac{.143}{.1688964}$

.84

STOCKPILE 02-4

000450

GQ3211 3
24 June 2003
Sheet No. 2 of 2

51.00'

2308 2309 2310

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

2.0% (TYP)

Lift #4
Stockpile 02-14

LOESS PIPE (NOTE 3)

Lift #6
Stockpile 02-14

1.0% (TYP)

2322 2323

Lift #2
Stockpile 02-14

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4
G-8

6

590 595 600

2.0% (TYP)

53 70

℄ OF INTERCELL BERM

2324 2325

Lift #1 Tested & Passed

Lift #2 Places Eastern ½ Stabilized & Compacted

2346 2347 2348

2330 2331

Stockpile 02-4

51.00'

Lift #6 Tested & Passed

7

Stockpile 02-14

2332 2333

585 590

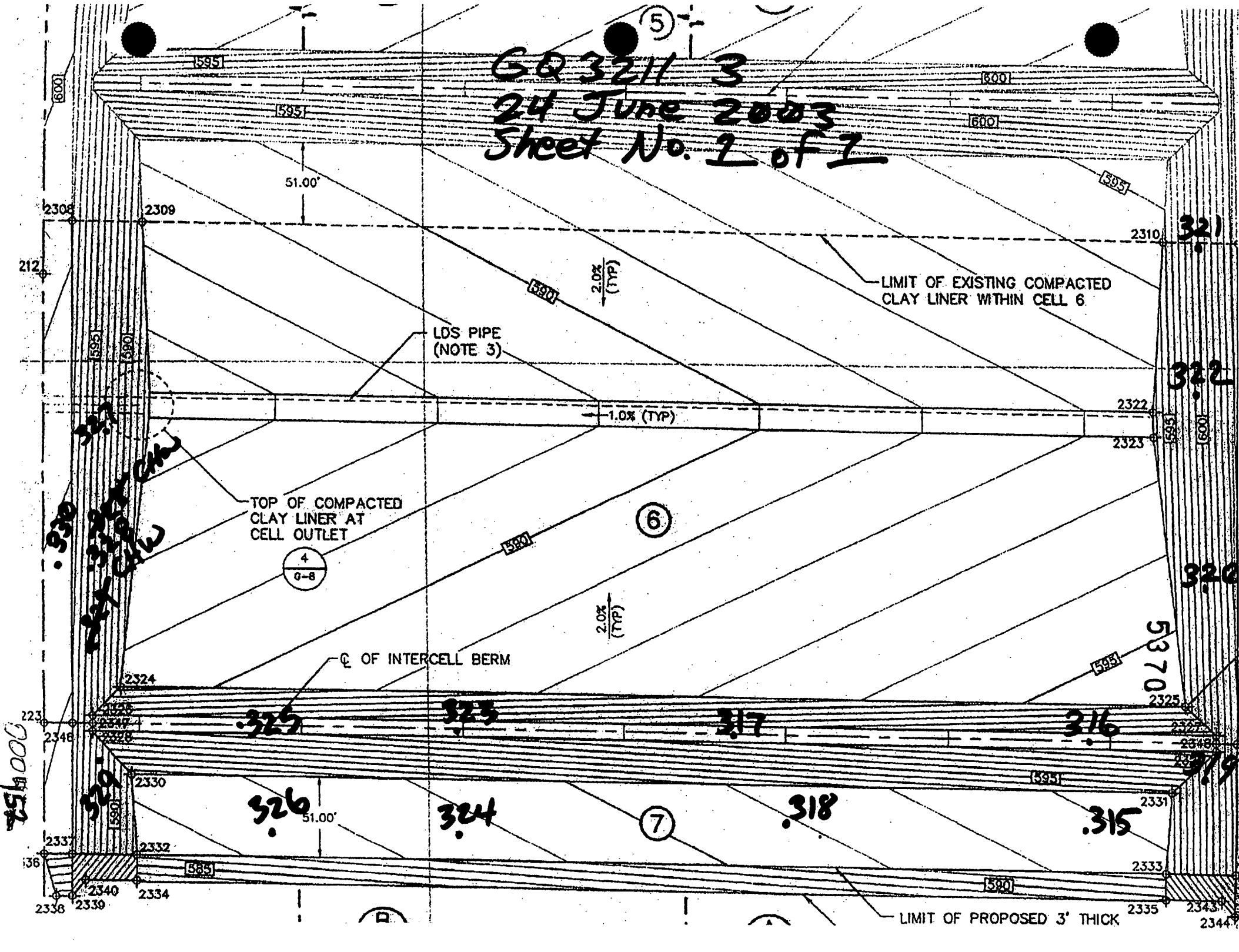
2340 2334 2335 2343

2338 2339 2344

LIMIT OF PROPOSED 3' THICK

000431

GQ 3211 3
24 June 2003
Sheet No. 2 of 2



GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase IV

DATE: 25 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 08"

MATERIAL SOURCE: Stockpile 02-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-331	Cell #6→#7 IC Berm	6" / L-2	02-4	13.8	117.4	14.8 / 16.0	134.1	115.6	98.5	P	—	—	—	—
CL03-332	↓	6" / L-2	02-4	13.8	117.4	15.1 / 16.2	133.6	115.0	98.0	P	—	—	—	—
CL03-333		6" / L-2	02-4	13.8	117.4	15.1 / 16.2	132.7	114.2	97.3	P	—	—	—	—
CL03-334		6" / L-2	02-4	13.8	117.4	14.5 / 15.7	134.2	116.0	98.8	P	—	—	—	—
CL03-335	Cell #7 East 4:1 Slope	6" / L-6	02-14	13.9	118.4	13.6 / 15.0	135.4	117.7	99.4	P	—	—	—	—
CL03-336	Cell #6→#7 IC Berm	6" / L-3	02-15	13.8	119.1	15.6 / 16.6	131.9	113.1	95.0	P	—	—	—	—
CL03-337	↓	6" / L-3	02-15	13.8	119.1	14.6 / 15.8	133.0	114.9	96.5	P	—	—	—	—
CL03-338		6" / L-3	02-15	13.8	119.1	15.8 / 16.8	132.5	113.4	96.2	P	—	—	—	—
CL03-339		6" / L-3	02-15	13.8	119.1	15.2 / 16.3	134.1	115.3	96.8	P	—	—	—	—
~~CL03-340~~														

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 6

0004453

534 06

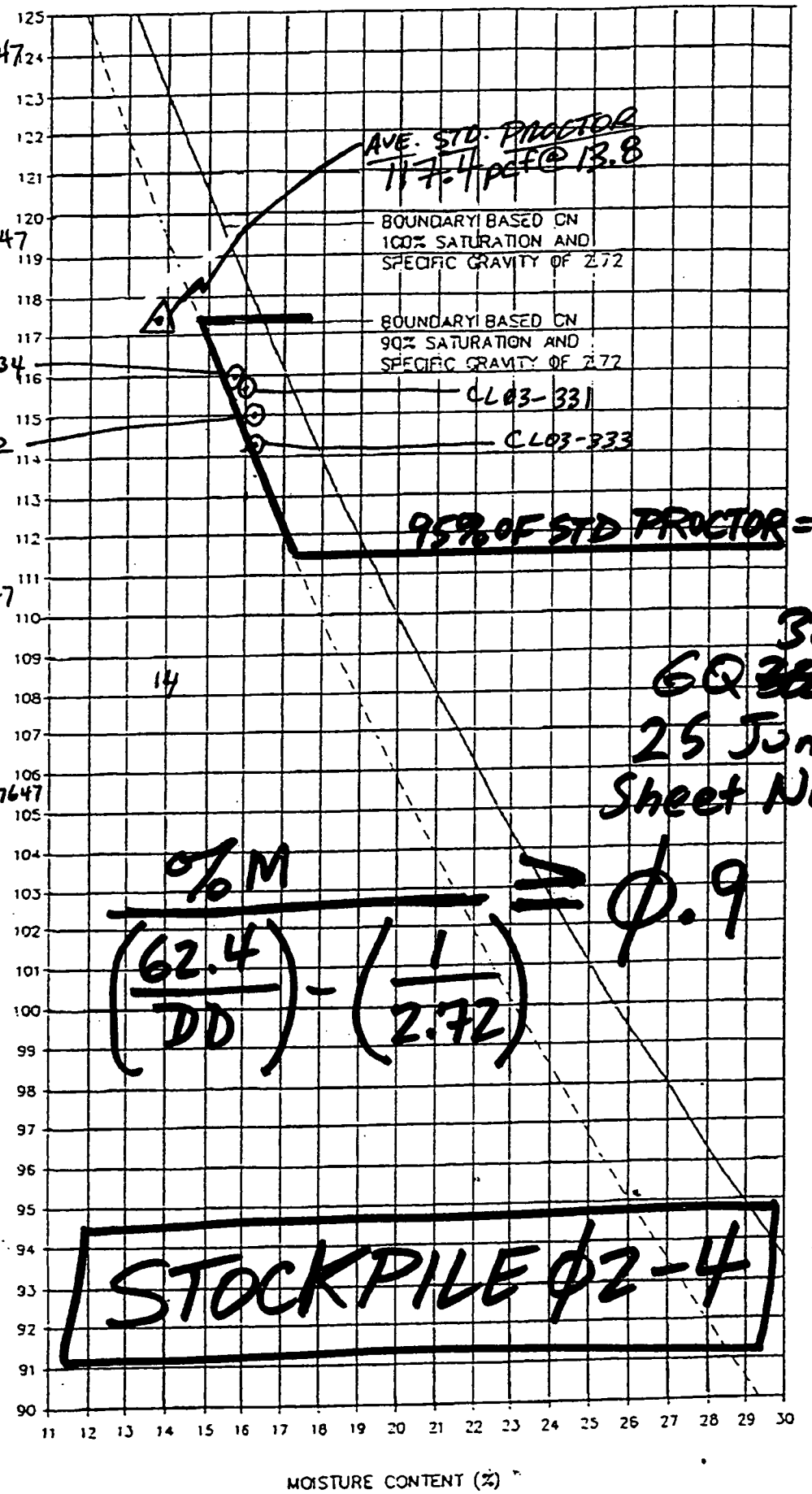
5370

331
.160
.5397923-.367647
.1721453
.93

332
.162
.5426086-.367647
.1749616
.93

333
.162
.5464098-.367647
.1787628
.91

334
.167
.537931-.367647
.170284
.92

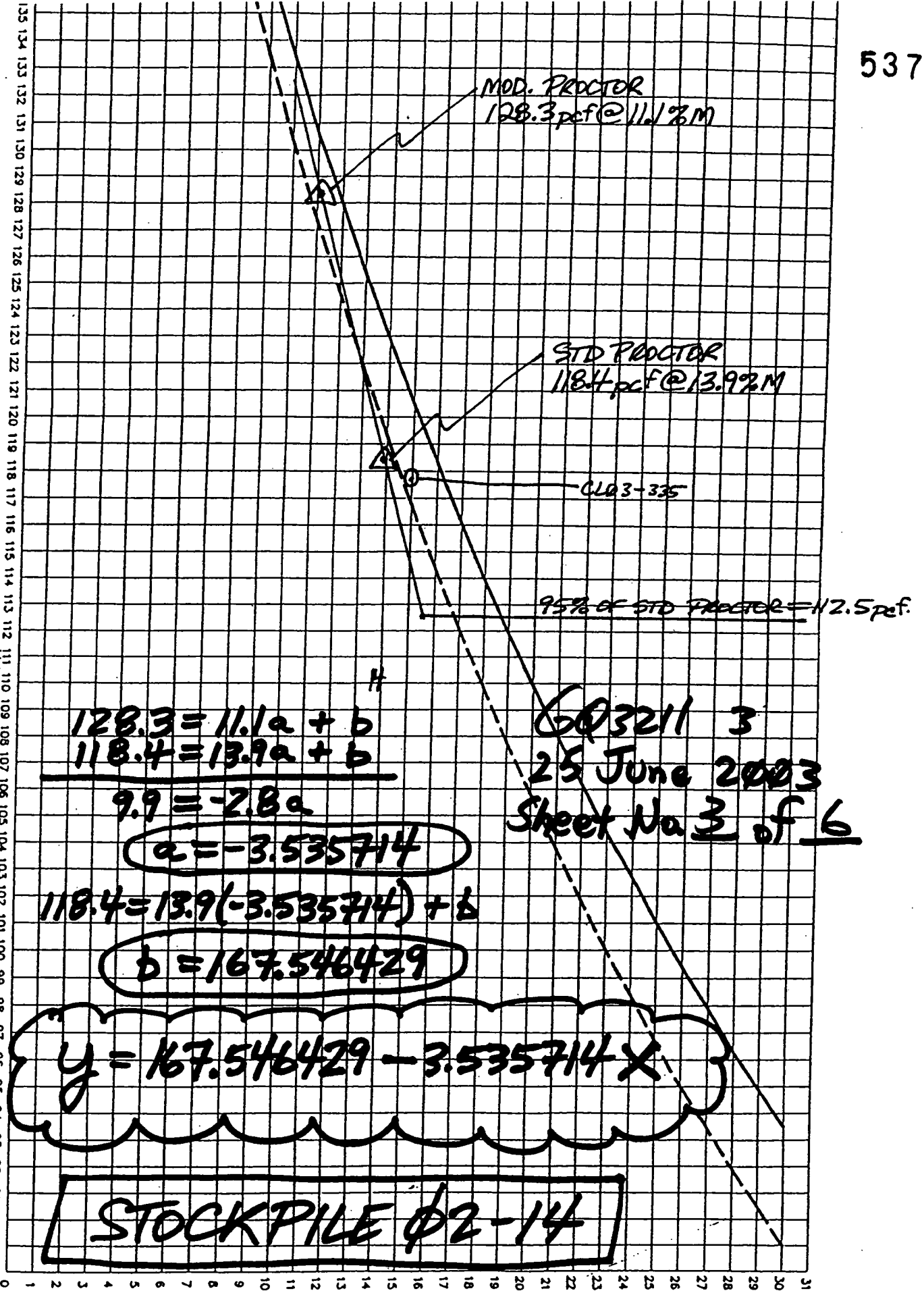


3211
GQ ~~32~~ 3
25 June 2003
Sheet No. 2 of 6

$$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq \phi.9$$

STOCKPILE Ø2-4

000454



$128.3 = 11.1a + b$
$118.4 = 13.9a + b$

$9.9 = -2.8a$

$a = -3.535714$

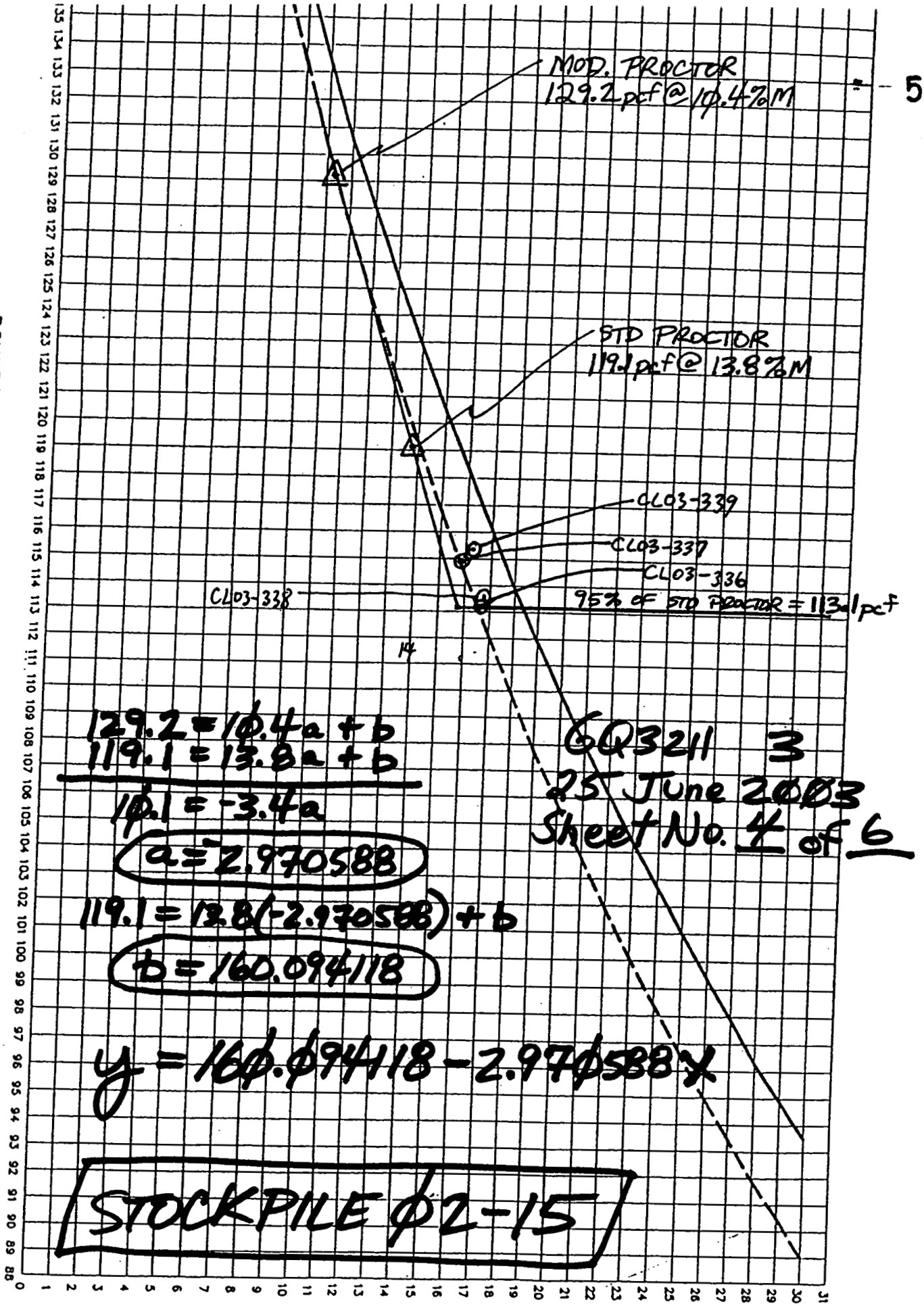
$118.4 = 13.9(-3.535714) + b$

$b = 167.546429$

$y = 167.546429 - 3.535714x$

STOCKPILE Ø2-14

G03211 3
25 June 2023
Sheet No 3 of 6



5370

$129.2 = 10.4a + b$
$119.1 = 13.8a + b$

$10.1 = -3.4a$

$a = -2.970588$

$119.1 = 13.8(-2.970588) + b$

$b = 160.094118$

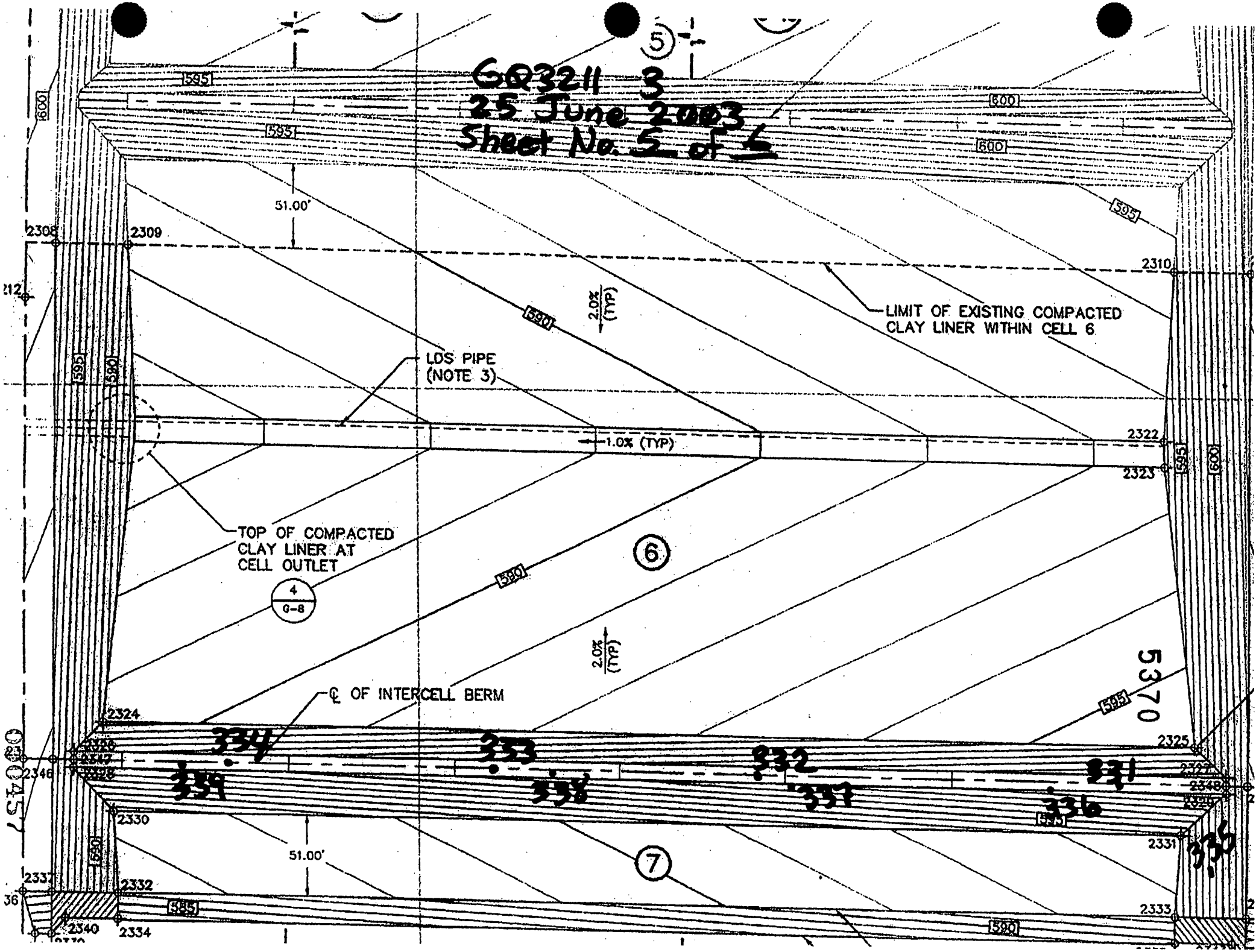
$y = 160.094118 - 2.970588x$

GQ3211 3
25 June 2003
Sheet No. 4 of 6

STOCKPILE 02-15

000456

GQ3211 3
25 June 2003
Sheet No. 5 of 6



GQ 3211 - 3
25 June 2003
Sheet No. 6 of 6

Lift #6
Stockpile 02-4

LINE OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

Stockpile 02-15

LDS PIPE (NOTE 3)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4
G-8

℄ OF INTERCELL BERM

Lift #2 Tested & Passed Stockpile 02-4

Lift #3 Tested & Passed Stockpile 02-15

51.00'

2.0% (TYP)

1.0% (TYP)

6

7

000458

537

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: ~~26~~ 27 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

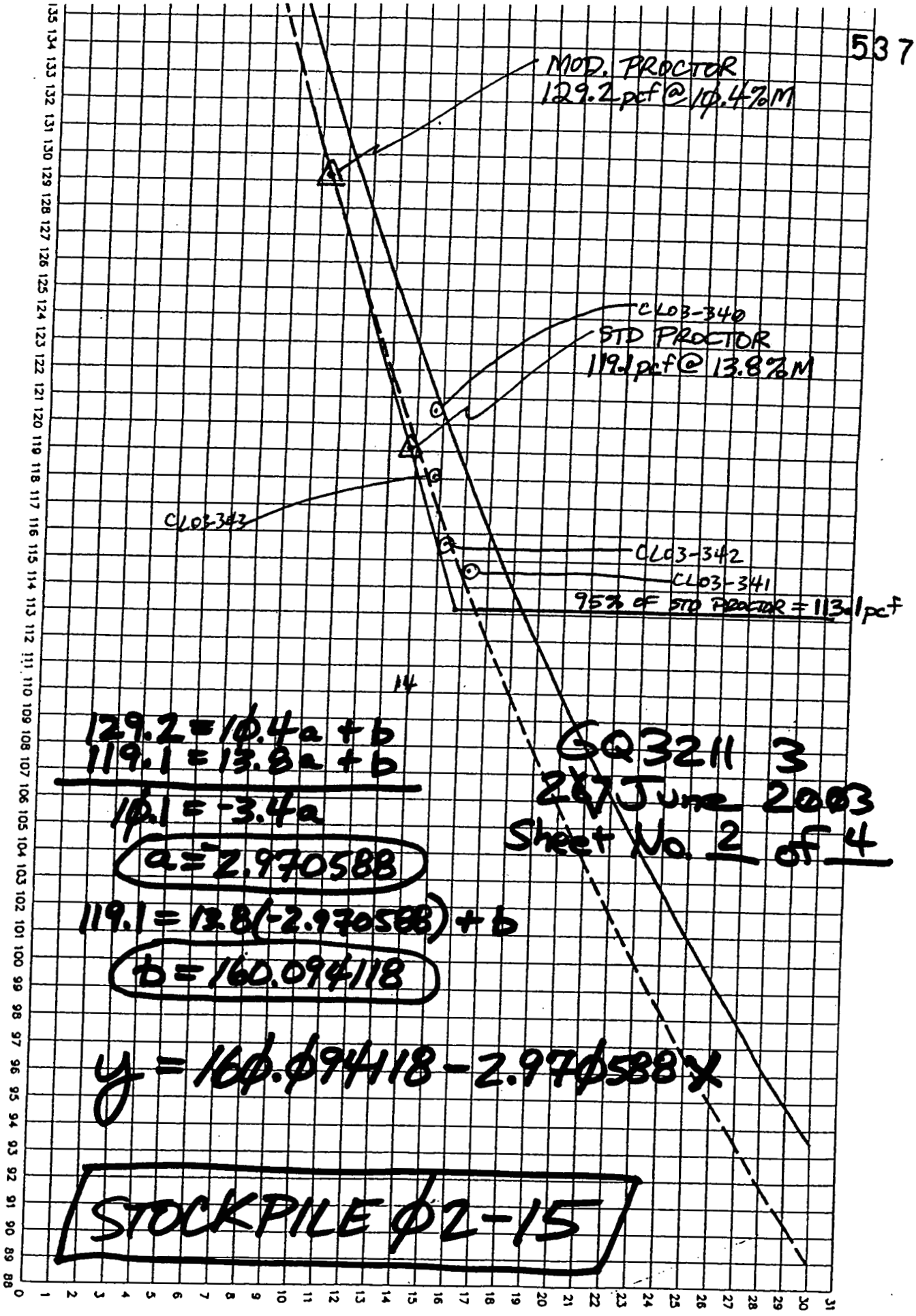
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-340	Cell #1 Floor, Clay Liner	6" / L-7	02-15	13.8	119.1	13.2 14.6	138.1	120.5	101.2	P	—	—	—	—
CL03-341		6" / L-7	02-15	13.8	119.1	15.1 16.2	133.2	114.6	96.2	P	—	—	—	—
CL03-342		6" / L-7	02-15	13.8	119.1	14.0 15.3	138.3	115.6	97.1	P	—	—	—	—
CL03-343		6" / L-7	02-15	13.8	119.1	13.4 14.8	135.6	118.1	99.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 1 OF 4

000459



14

$129.2 = 10.4a + b$
$119.1 = 13.8a + b$

$10.1 = -3.4a$

$a = -2.970588$

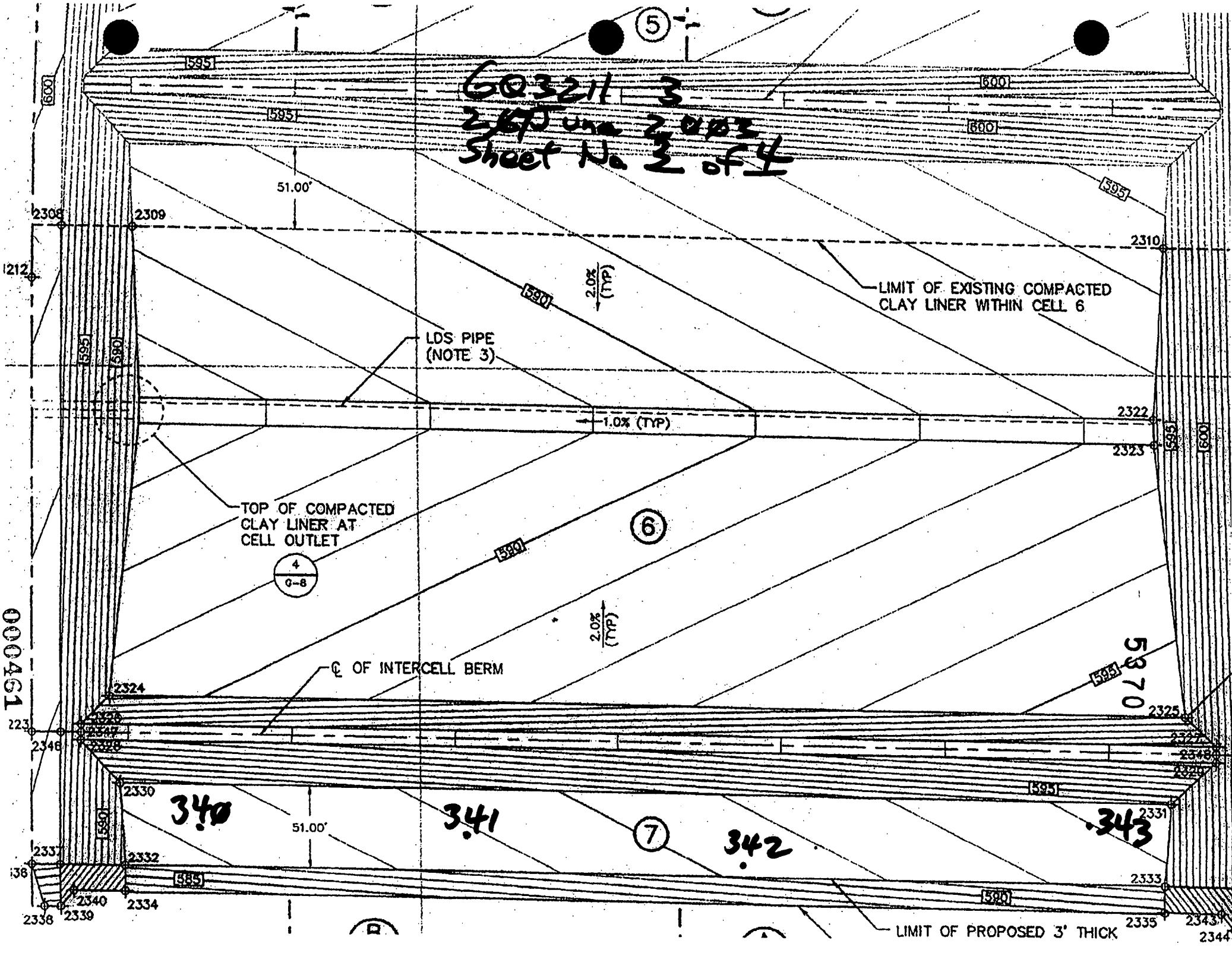
$119.1 = 13.8(-2.970588) + b$

$b = 160.094118$

$y = 160.094118 - 2.970588x$

GQ3211 3
26 June 2003
Sheet No. 2 of 4

[STOCKPILE 02-15]


GQ3211 3
Sheet No. 3 of 4
5
6
7
595
600
590
585
51.00'
2308
2309
2310
2322
2323
2324
2325
2326
2327
2328
2330
2331
2332
2333
2334
2335
2337
2338
2339
2340
2343
2344
2346
2347
2348
1.0% (TYP)
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
℄ OF INTERCELL BERM
LIMIT OF PROPOSED 3' THICK
340
341
342
343
5370
000461

GQ32\\ 3
2&7 June 2003
Sheet No. 4 of 4

5

595
600
595
600
600
595
590
595
590
595
600
590
590
595
590
585
590
595
595
600

51.00'
51.00'

2308
2309
2310
2322
2323
2324
2325
2331
2332
2333
2334
2335
2337
2338
2339
2340
2343
2344
2346
1212
223
136

2.0% (TYP)
1.0% (TYP)

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

LDS PIPE (NOTE 3)

Material Stockpiled from 02-15 for West 4:1 Slope

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4
G-8

6

Lift #4 Stockpile 02-15 Placed Not Stabilized

℄ OF INTERCELL BERM

5370

Lift #7 Stockpile 02-15 Tested & Passed

7

LIMIT OF PROPOSED 3' THICK

000422

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 28 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-15 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-344	Cell #6 → #7 IC Berm	6" / L-4	02-15	13.8	119.1	14.0 / 15.3	134.8	116.9	98.2	P	—	—	—	—
CL03-345	↓	6" / L-4	02-15	13.8	119.1	15.6 / 16.6	132.9	114.0	95.7	P	—	—	—	—
CL03-346		6" / L-4	02-15	13.8	119.1	13.0 / 14.5	136.0	118.8	99.7	P	—	—	—	—
CL03-347		6" / L-5	02-15	13.8	119.1	13.2 / 14.6	135.6	118.3	99.3	P	—	—	—	—
CL03-348		6" / L-5	02-15	13.8	119.1	12.4 / 14.0	136.3	119.6	100.4	P	—	—	—	—
CL03-349	West Bench Cell #6	6" / L-5	02-15	13.8	119.1	13.6 / 15.0	135.8	118.1	99.2	P	—	—	—	—
CL03-350	West 4:1 Slope Cell #6	6" / L-3	02-15	13.8	119.1	12.9 / 14.4	136.6	119.4	100.3	P	—	—	—	—
CL03-351	↓	6" / L-3	02-15	13.8	119.1	12.8 / 14.3	137.0	119.9	100.7	P	—	—	—	—
CL03-352	West Bench Cell #7	6" / L5	02-15	13.8	119.1	13.6 / 15.0	136.1	118.4	99.4	P	—	—	—	—
CL03-353	West 4:1 Cell #7	10" / L-2	02-4	13.8	117.4	12.4 / 14.0	138.0	121.1	*103.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * Retest of failed area, initiall failed due to moisture content

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0004463

53 70

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO. GQ3211 TASK NO.: 3

DATE: 28 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 48"

MATERIAL SOURCE: STOCKPILE 02-15 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-354	Cell #6→#7 IC Berm	6" / L-6	02-10	12.1	123.6	13.7 / 15.0	135.0	117.4	95.0	P	—	—	—	—
CL03-355	↓	6" / L-6	02-10	12.1	123.6	13.6 / 15.0	135.3	117.7	95.2	P	—	—	—	—
CL03-356	West 4:1 Slope Cell #6	6" / L-4	02-15	13.8	119.1	13.3 / 14.7	136.3	118.8	99.7	P	—	—	—	—
CL03-357	West Bench, Cell #6	6" / L-6	02-15	13.8	119.1	13.2 / 14.6	137.6	120.1	100.8	P	—	—	—	—
CL03-358	West 4:1 Slope, Cell #7	6" / L-4	02-15	13.8	119.1	12.5 / 14.0	138.0	121.1	101.7	P	—	—	—	—
CL03-359	West Bench, Cell #7	6" / L-6	02-15	13.8	119.1	12.8 / 14.3	137.2	120.0	100.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature] SHEET NO. 2 OF 8

000464

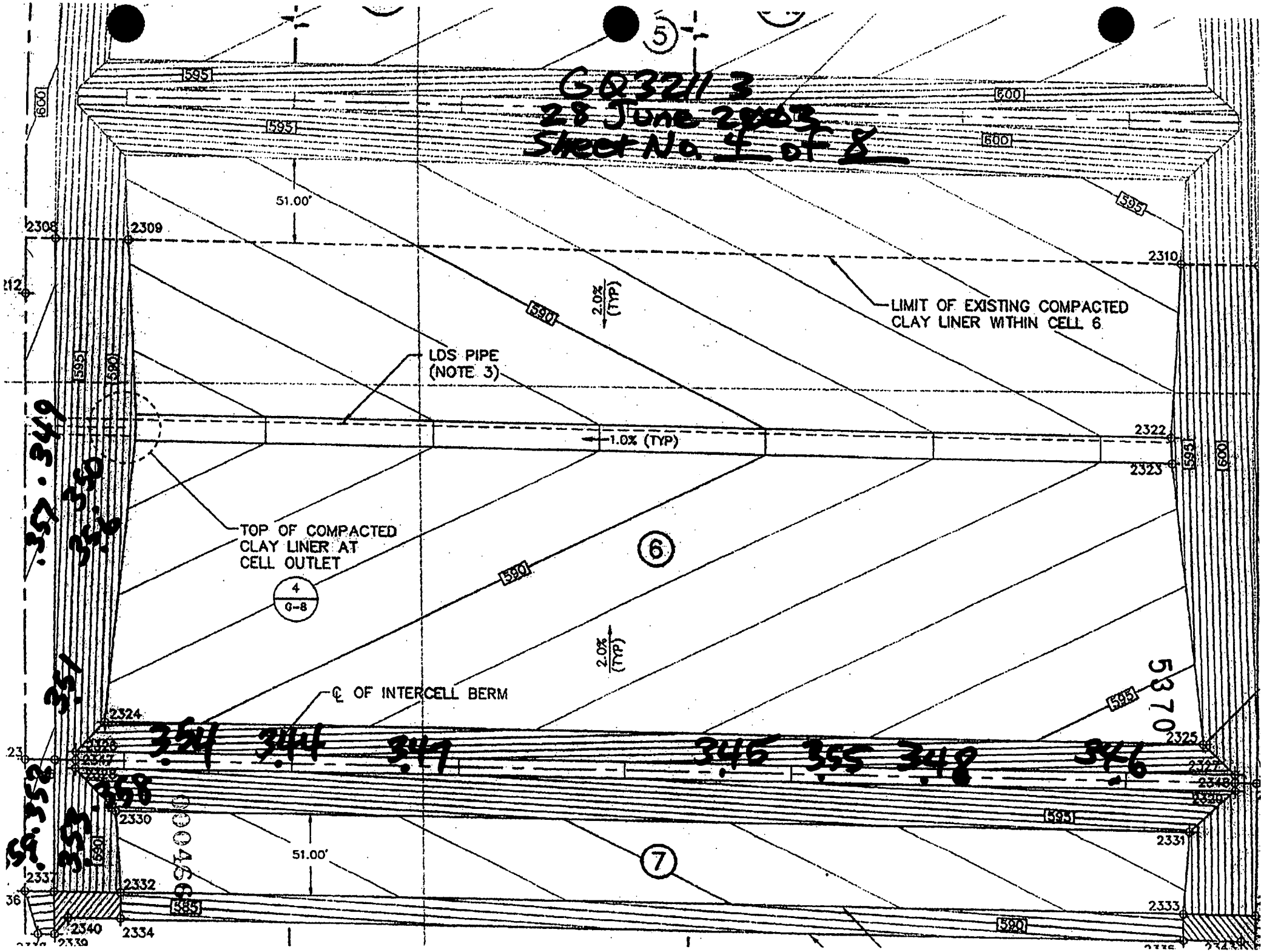
5370

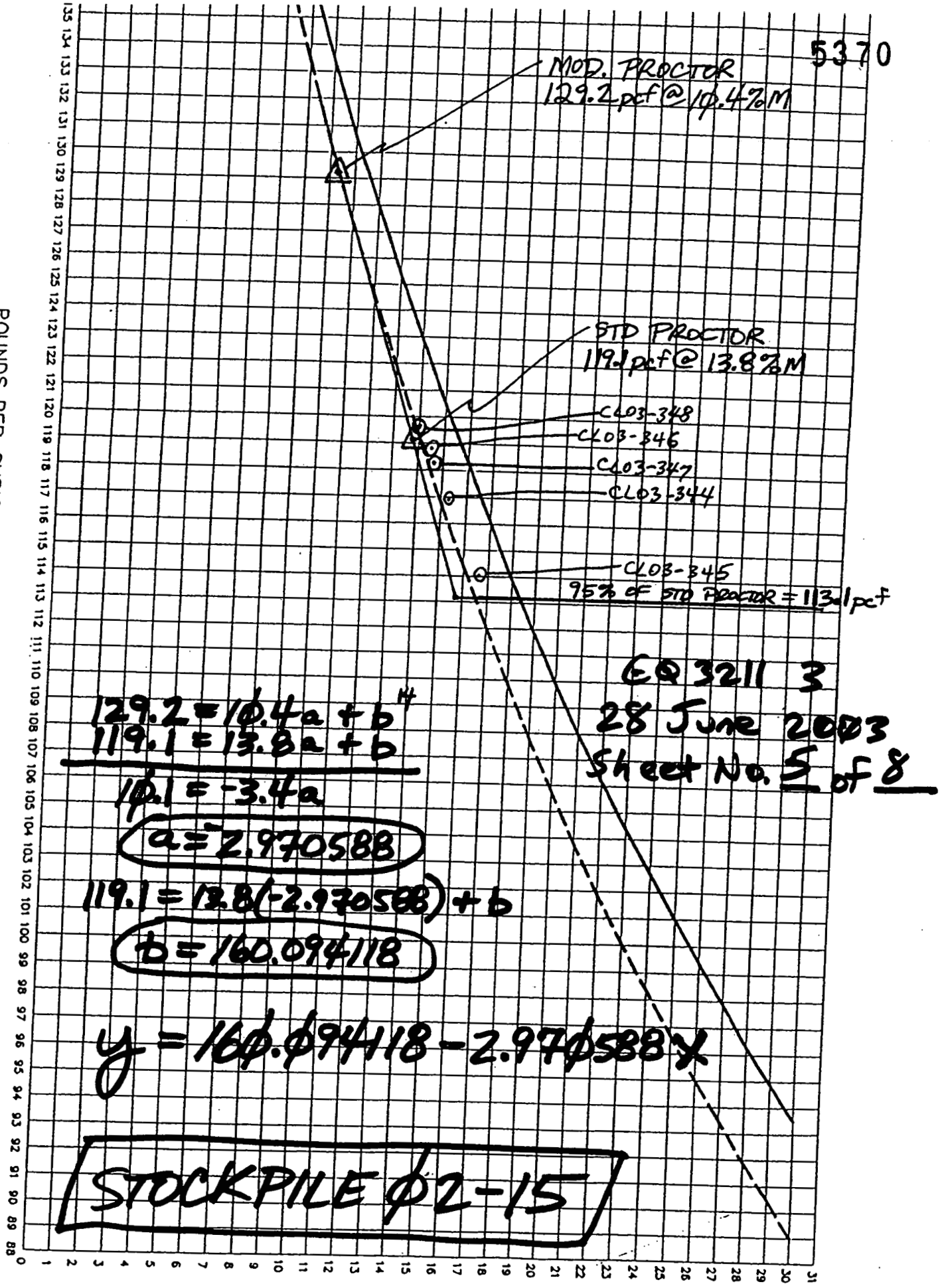
GQ3211 3
28 June 2003
Sheet No. 3 of 8

5

595
600
595
600
600
595
51.00'
2308
2309
2310
212
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
Lift #5 + #6
Stockpile Ø2-15
(NOTE 3)
595
590
1.0% (TYP)
2322
2323
595
600
Lift #3 + #4
Stockpile Ø2-15
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
590
6
Lift #4 Stockpile Ø2-15
Tested & Passed
Lift #5 Stockpile Ø2-15
Tested and Passed
53 70
℄ OF INTERCELL BERM
2324
595
2325
2330
595
2331
51.00'
7
2332
585
2333
2340
2334
590

GQ3211 3
28 June 2003
Sheet No. 4 of 8





EQ 3211 3
28 June 2003
Sheet No. 5 of 8

$129.2 = 10.4a + b$
$119.1 = 13.8a + b$

$10.1 = -3.4a$

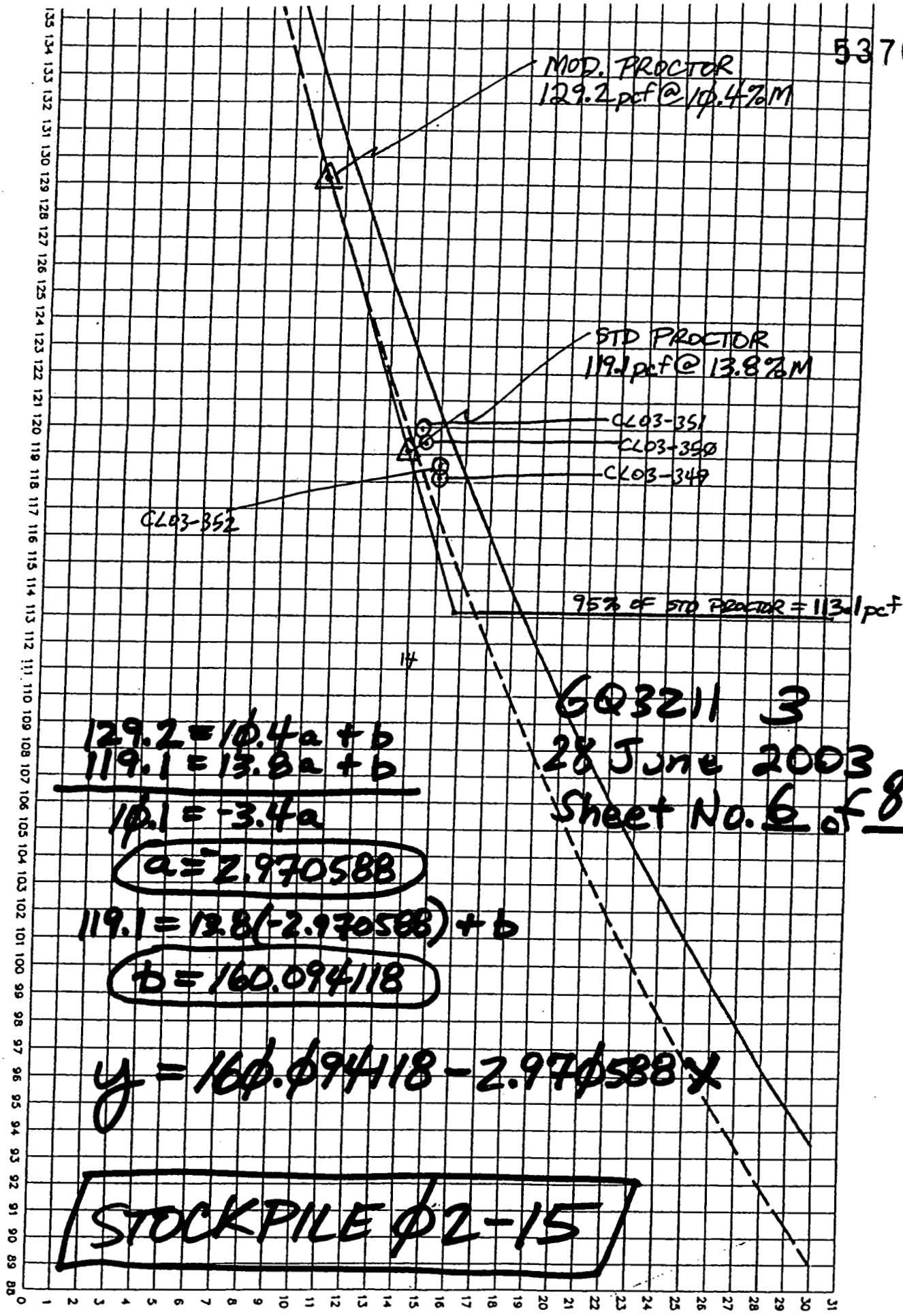
$a = -2.970588$

$119.1 = 13.8(-2.970588) + b$

$b = 160.094118$

$y = 160.094118 - 2.970588x$

STOCKPILE 02-15



GQ3211 3
28 June 2003
Sheet No. 6 of 8

$129.2 = 10.4a + b$
$119.1 = 13.8a + b$

$10.1 = -3.4a$

$a = -2.970588$

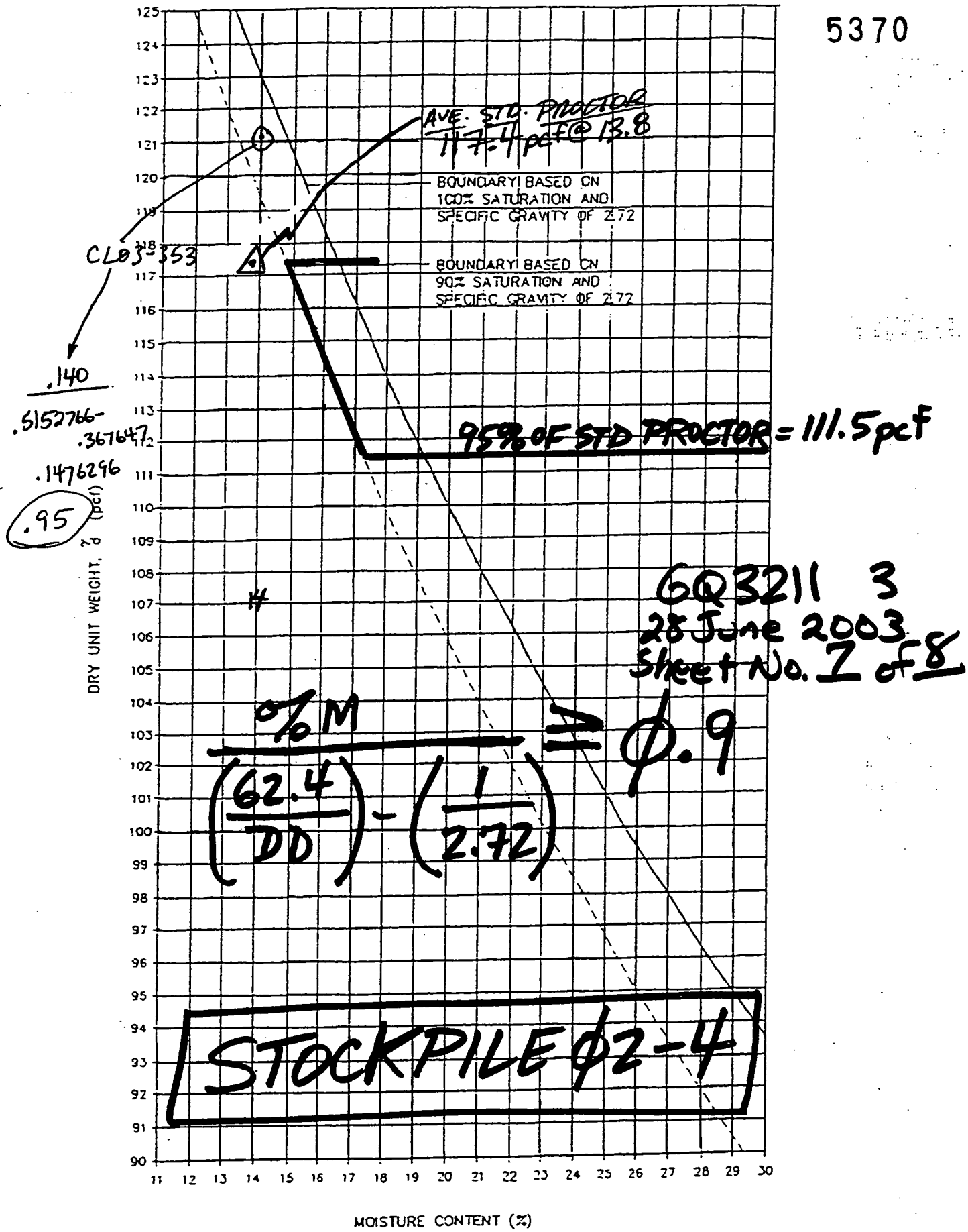
$119.1 = 13.8(-2.970588) + b$

$b = 160.094118$

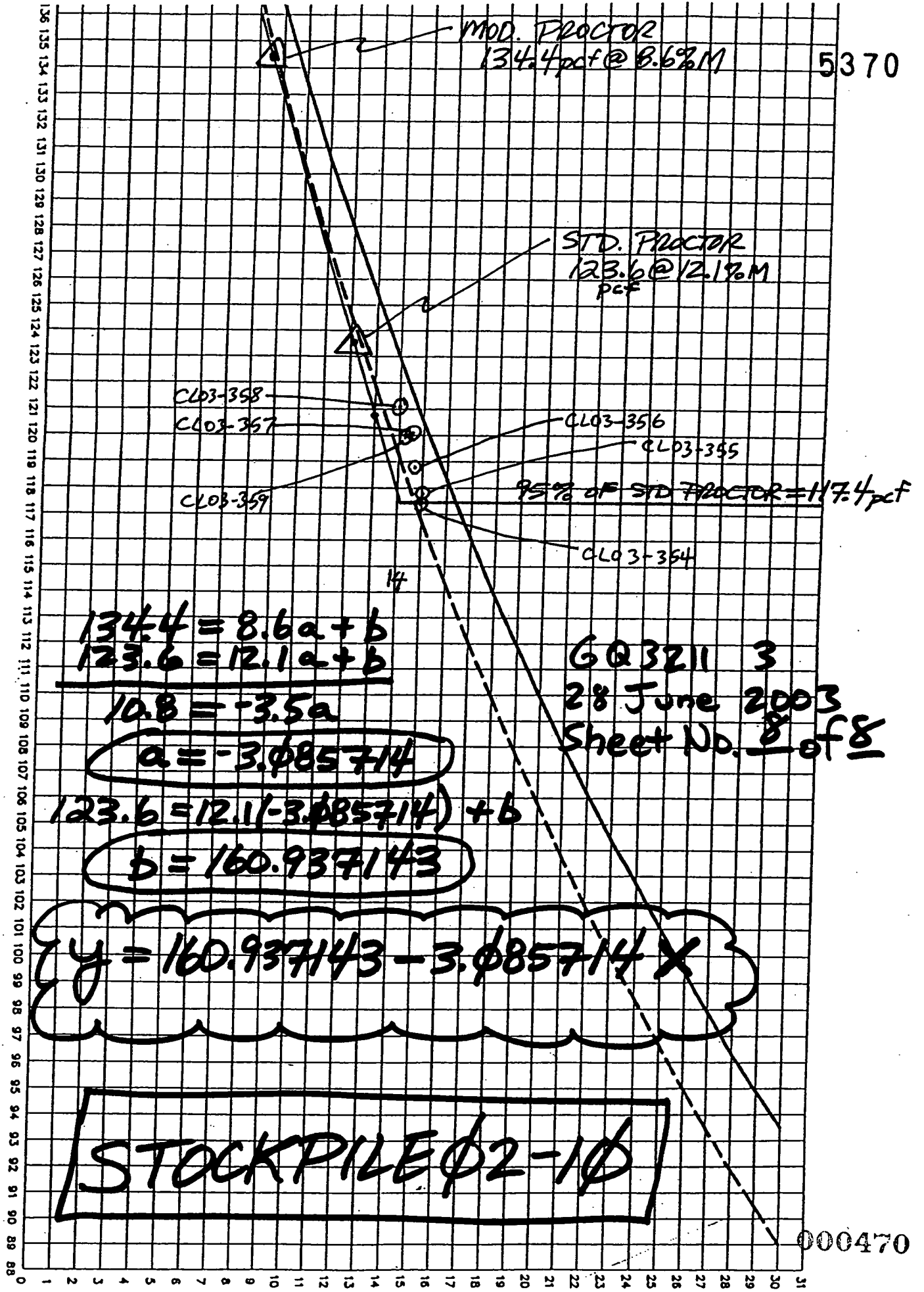
$y = 160.094118 - 2.970588x$

STOCKPILE 02-15

5370


AVE. STD. PROCTOR
117.4 pcf @ 13.8
BOUNDARY BASED ON 100% SATURATION AND SPECIFIC GRAVITY OF 2.72
BOUNDARY BASED ON 90% SATURATION AND SPECIFIC GRAVITY OF 2.72
CL03-353
.140
.5152766-
.367647
.1476296
.95
95% OF STD PROCTOR = 111.5 pcf
GQ3211 3
28 June 2003
Sheet No. 1 of 8
$\frac{\%M}{\left(\frac{62.4}{DD}\right)-\left(\frac{1}{2.72}\right)} \geq \phi.9$
STOCKPILE Ø2-4
DRY UNIT WEIGHT, γd (pcf)
MOISTURE CONTENT (%)

000469



$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

$y = 160.937143 - 3.085714x$

GQ3211 3
28 June 2003
Sheet No. 8 of 8

STOCKPILE 02-10

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 30 day June month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE Ø2-10 Ø2-15

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-360	West Bench Cell #6	6" / L-7	Ø2-15	13.8	119.1	12.7 / 14.2	137.8	120.7	101.3	P	—	—	—	—
CL03-361	West 4:1 Slope Cell #6	6" / L-5	Ø2-15	13.8	119.1	12.5 / 14.0	138.1	121.1	101.7	P	—	—	—	—
CL03-362	West Bench Cell #7	6" / L-7	Ø2-15	13.8	119.1	13.7 / 15.0	135.0	117.4	98.6	P	—	—	—	—
CL03-363	West 4:1 Slope Cell #7	6" / L-5	Ø2-15	13.8	119.1	12.7 / 14.2	137.3	120.2	100.9	P	—	—	—	—
CL03-364	Cell #6 → #7 IC Berm	6" / L-7	Ø2-10	12.1	123.6	12.0 / 13.6	137.7	121.2	98.1	P	—	—	—	—
CL03-365	↓	6" / L-7	Ø2-10	12.1	123.6	13.1 / 14.5	136.1	118.9	96.2	P	—	—	—	—
CL03-366	Cell #6 Floor	6" / L-6	Ø2-15	13.8	119.1	15.4 / 16.5	132.1	113.4	95.2	P	—	—	—	—
CL03-367		6" / L-6	Ø2-15	13.8	119.1	12.3 / 13.9	137.6	120.8	101.4	P	—	—	—	—
CL03-368		6" / L-6	Ø2-15	13.8	119.1	12.8 / 14.3	136.2	119.2	100.1	P	—	—	—	—
CL03-369	↓	6" / L-6	Ø2-15	13.8	119.1	14.5 / 15.7	135.6	117.2	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CA SHEET NO. 1 OF 9

0004271

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 30 day June month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile Ø2-15 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-370	Cell #6 Floor	6" / L-6	Ø2-15	13.8	119.1	13.7 / 15.0	136.1	118.3	99.3	P	—	—	—	—
CL03-371		6" / L-6	Ø2-15	13.8	119.1	14.5 / 15.7	134.6	~~117.2~~ 116.3 CHW	~~98.4~~ 97.6	P	—	—	—	—
CL03-372		6" / L-6	Ø2-15	13.8	119.1	14.2 / 15.5	134.2	116.2	97.6	P	—	—	—	—
CL03-373		6" / L-6	Ø2-15	13.8	119.1	14.1 / 15.4	135.8	117.7	98.8	P	—	—	—	—
CL03-374		6" / L-6	Ø2-15	13.8	119.1	14.4 / 15.6	134.9	116.7	97.9	P	—	—	—	—
CL03-375	Cell #6 → #7 IC Berm	6" / L-8	Ø2-10	12.1	123.6	13.2 / 14.6	136.2	118.8	96.1	P	—	—	—	—
CL03-376		6" / L-8	Ø2-10	12.1	123.6	13.0 / 14.5	137.7	120.3	97.3	P	—	—	—	—
CL03-377	Cell #6 Floor	6" / L-6	Ø2-10	12.1	123.6	12.2 / 13.8	141.1	124.0	100.3	P	—	—	—	—
CL03-378		6" / L-6	Ø2-10	12.1	123.6	12.5 / 14.0	139.6	122.5	99.1	P	—	—	—	—
CL03-379		6" / L-6	Ø2-10	12.1	123.6	11.6 / 13.3	141.1	124.5	100.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

*GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 2 OF 9

000472

5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 30 day June month 2003 year

SPECIFICATION REQUIREMENTS (ASTM D 698) / ASTM D 1557 85 % COMPACTION / MOISTURE RANGE: 0-13% LIFT THICKNESS (LOOSE) COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 30979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-380	Cell #6	6" / L-6	02-10	12.1	123.6	13.4 / 14.8	136.0	118.5	95.9	P	—	—	—	—
CL03-381	↓	6" / L-6	02-10	12.1	123.6	12.0 / 13.6	138.2	121.7	98.5	P	—	—	—	—
CL03-382		6" / L-6	02-10	12.1	123.6	13.0 / 14.5	138.0	120.5	97.5	P	—	—	—	—
CL03-383		6" / L-6	02-10	12.1	123.6	11.6 / 13.3	139.2	122.9	99.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

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0004473

GQ 3211 3
30 June 2003
Sheet No. 4 of 9

Lift #7 Stockpile 02-15

Lift #6
Stabilized & Compacted
Tested & Passed
Stockpile 02-15

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

LDS PIPE (NOTE 3)

1.0% (TYP)

Lift #5 Stockpile 02-15

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4 / G-8

Stabilized
Tested & Passed

Lift #7 Stockpile 02-10

Lift #8

2.0% (TYP)

℄ OF INTERCELL BERM

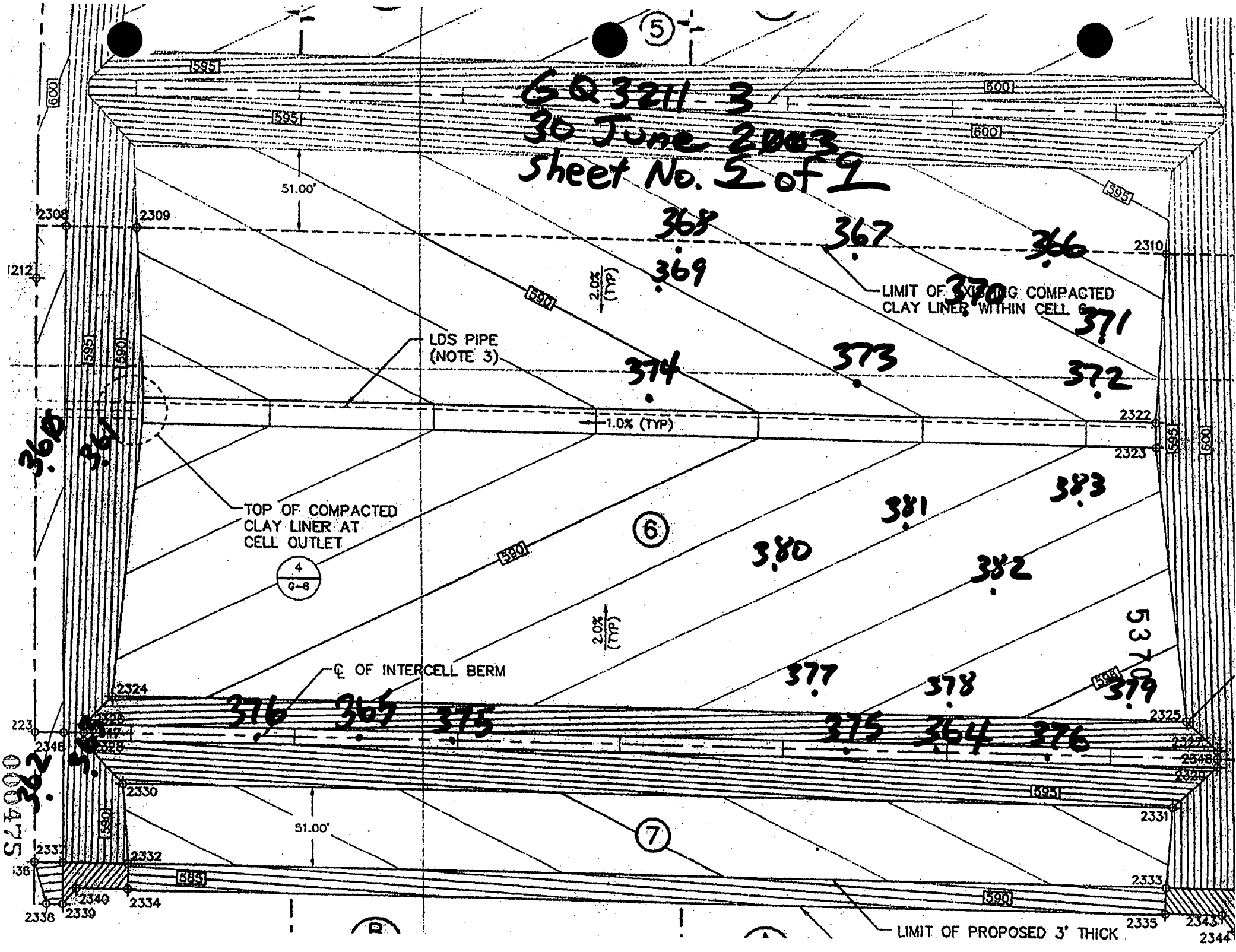
51.00'

LIMIT OF PROPOSED 3' THICK

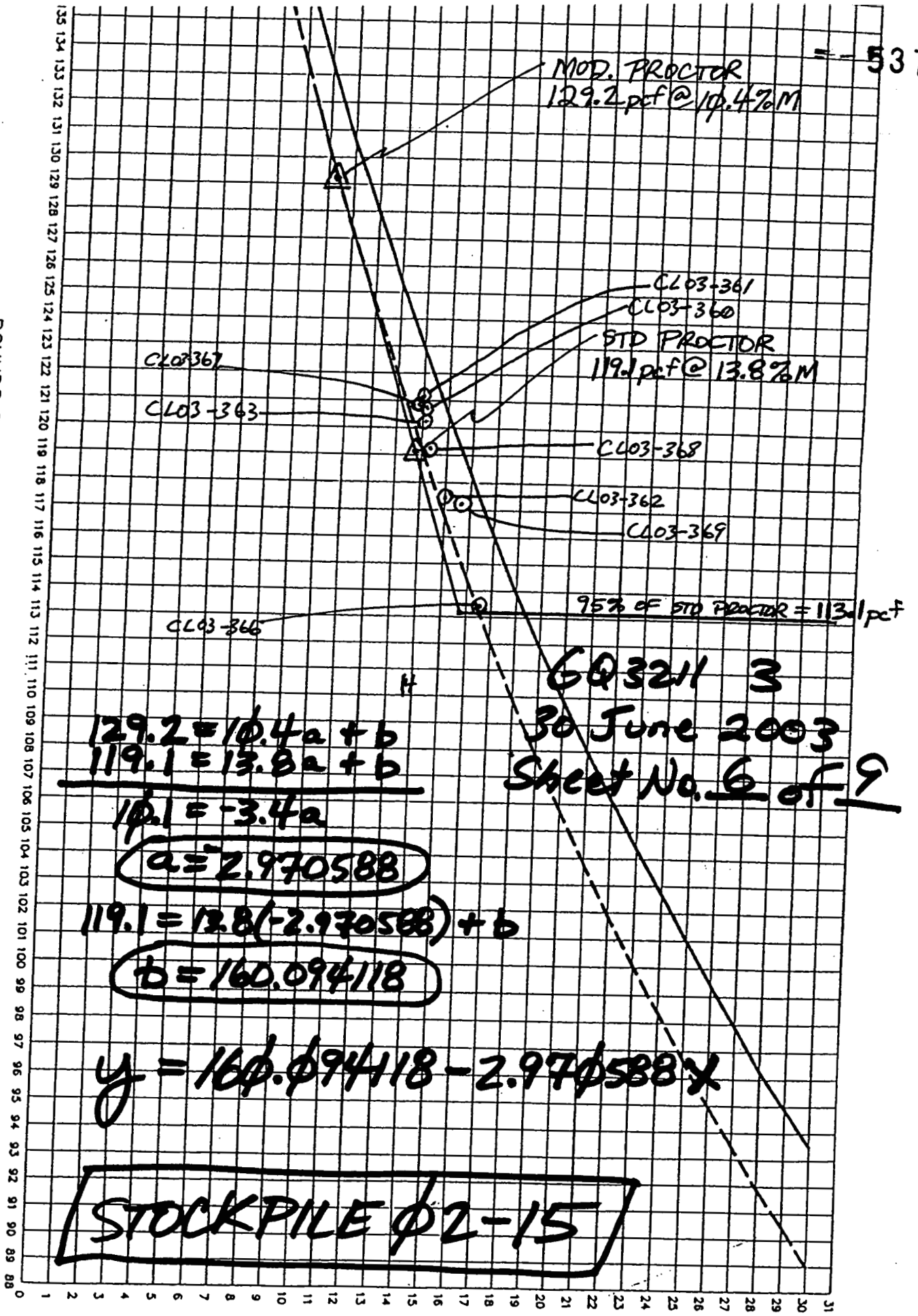
5370

0004474

GQ3211-3
30 June 2003
Sheet No. 2 of 2



000475



5370

GQ3211 3
30 June 2003
Sheet No. 6 of 9

$129.2 = 10.4a + b$
$119.1 = 13.8a + b$

$10.1 = -3.4a$

$a = -2.970588$

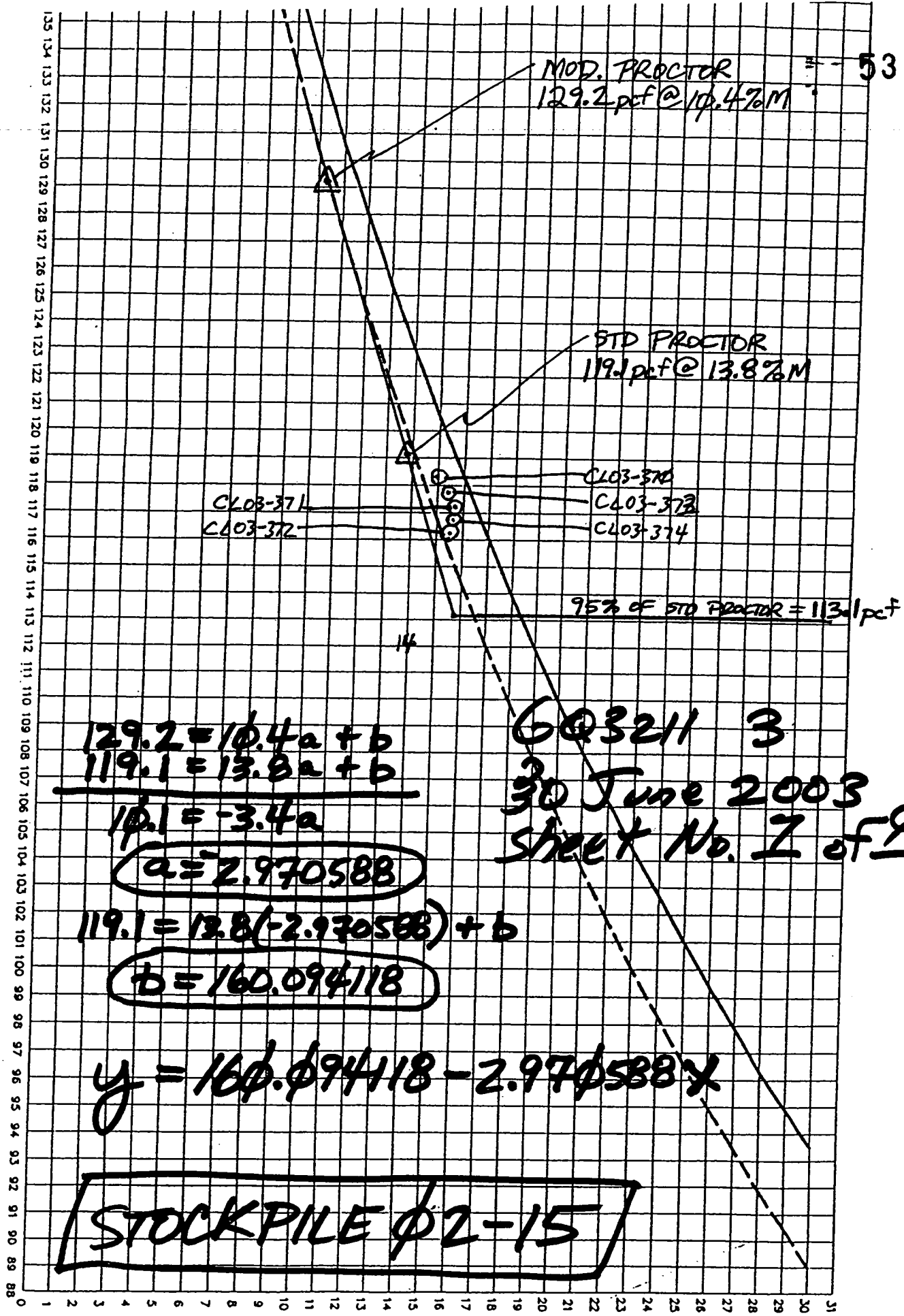
$119.1 = 13.8(-2.970588) + b$

$b = 160.094118$

$y = 160.094118 - 2.970588x$

STOCKPILE 02-15

000476



$129.2 = 10.4a + b$
$119.1 = 13.8a + b$

$10.1 = -3.4a$

$a = -2.970588$

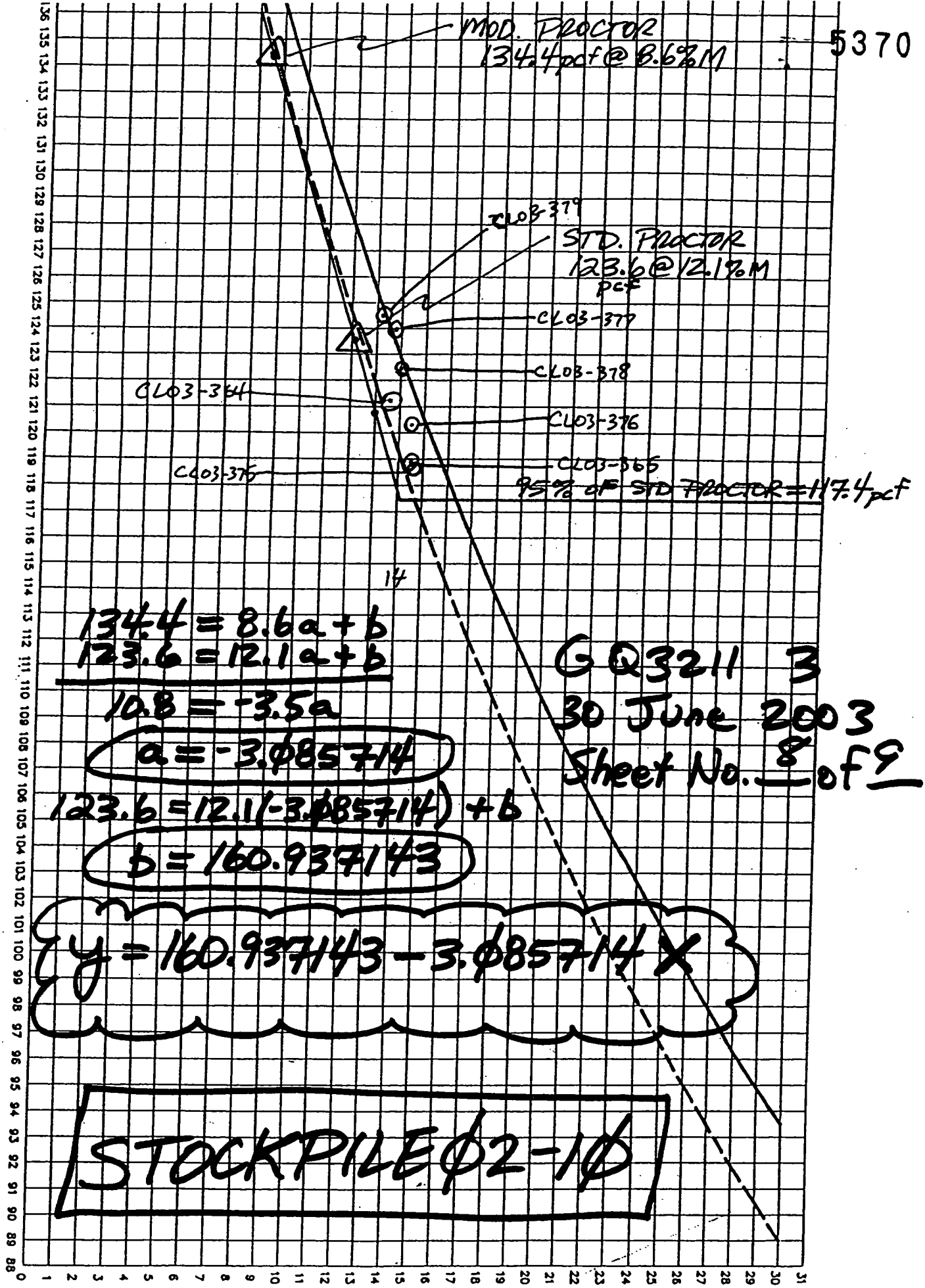
$119.1 = 13.8(-2.970588) + b$

$b = 160.094118$

$y = 160.094118 - 2.970588x$

[STOCKPILE 02-15]

GQ3211 3
30 June 2003
Sheet No. 7 of 9



$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

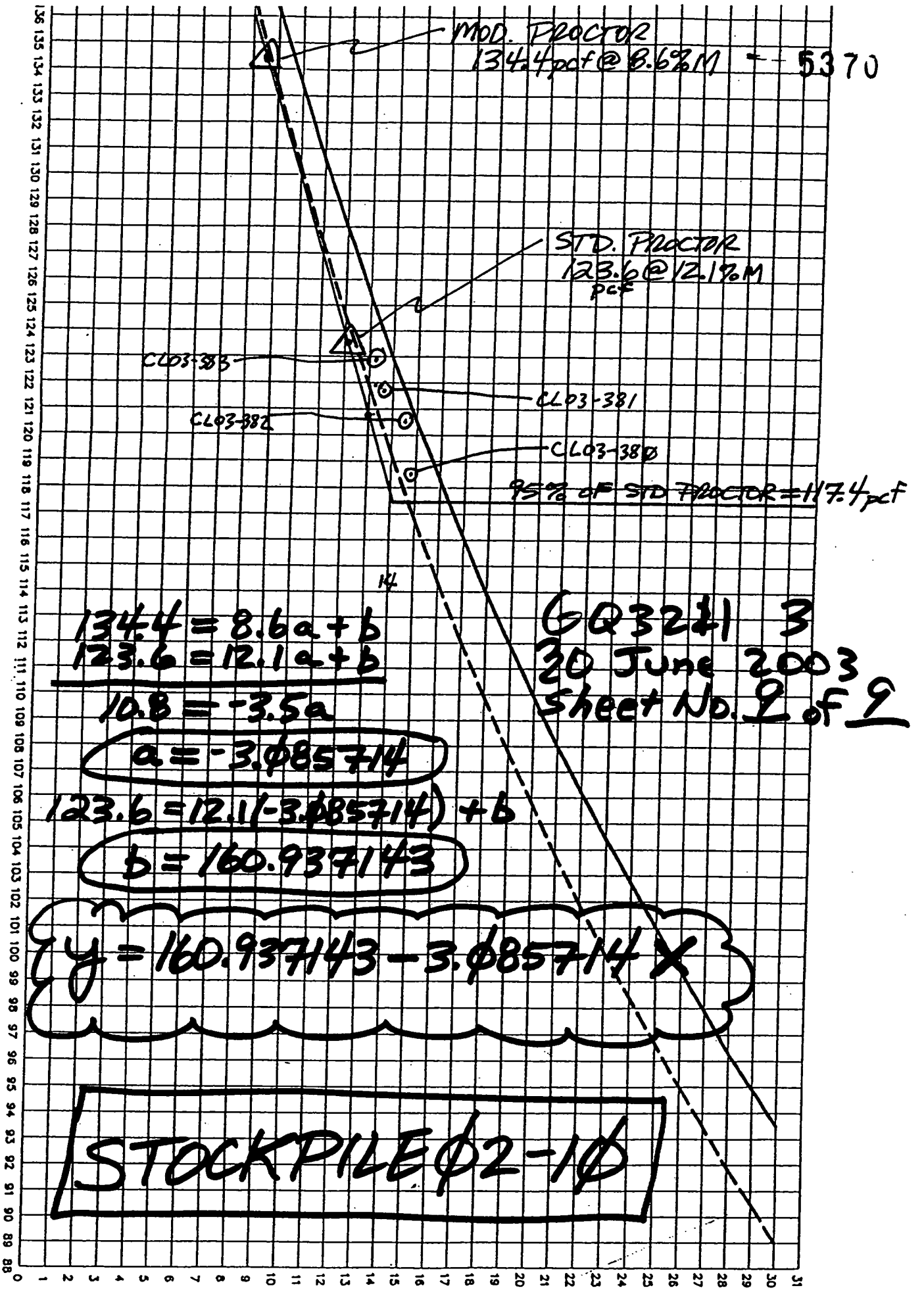
$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

$y = 160.937143 - 3.085714x$

GQ3211 3
30 June 2003
Sheet No. 8 of 9

STOCKPILE 02-10



$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

$y = 160.937143 - 3.085714X$

GQ3241 3
20 June 2003
Sheet No. 9 of 9

STOCKPILE 02-10

000479

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 1 day July month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile Ø2-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-384	Cell #6 Floor	6" / L-6	Ø2-15	13.8	119.1	13.5 / 14.9	136.4	118.7	99.7	P	—	—	—	—
CL03-385	Cell #6 Drainage Corridor	6" / L-6	Ø2-15	13.8	119.1	13.4 / 14.8	136.6	119.Ø	99.9	P	—	—	—	—
CL03-386	Cell #6 Floor	6" / L-6	Ø2-15	13.8	119.1	13.2 / 14.6	138.7	121.Ø	101.6	P	—	—	—	—
CL03-387	↓	6" / L-6	Ø2-15	13.8	119.1	12.8 / 14.3	137.6	120.4	101.1	P	—	—	—	—
CL03-388		6" / L-6	Ø2-15	13.8	119.1	13.Ø / 14.5	138.5	121.Ø	101.6	P	—	—	—	—
CL03-389		6" / L-6	Ø2-15	13.8	119.1	12.4 / 14.Ø	136.5	119.7	100.5	P	—	—	—	—
CL03-390		6" / L-6	Ø2-15	13.8	119.1	12.7 / 14.2	138.9	121.6	102.1	P	—	—	—	—
CL03-391		6" / L-6	Ø2-15	13.8	119.1	12.2 / 13.8	135.6	119.2	100.1	P	—	—	—	—
CL03-392	Cell #6 Drainage Corridor	6" / L-6	Ø2-15	13.8	119.1	13.4 / 14.8	137.4	119.7	100.5	P	—	—	—	—
CL03-393	↓	6" / L-6	Ø2-1Ø	12.1	123.6	10.6 / 12.5	141.4	125.7	101.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

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000450

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G03211 TASK NO.: 3

DESCRIPTION: Phase II

DATE: 1 day July month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-394	Cell #6 Floor	6" / L-6	02-10	12.1	123.6	12.9 / 14.4	137.9	120.5	97.5	P	—	—	—	—
CL03-395		6" / L-6	02-10	12.1	123.6	13.7 / 15.0	136.4	118.6	96.0	P	—	—	—	—
CL03-396		6" / L-6	02-10	12.1	123.6	13.0 / 14.5	138.0	120.5	97.5	P	—	—	—	—
CL03-397		6" / L-6	02-10	12.1	123.6	13.2 / 14.6	136.9	119.5	96.7	P	—	—	—	—
CL03-398		6" / L-6	02-10	12.1	123.6	13.6 / 15.0	136.4	118.6	96.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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0004431

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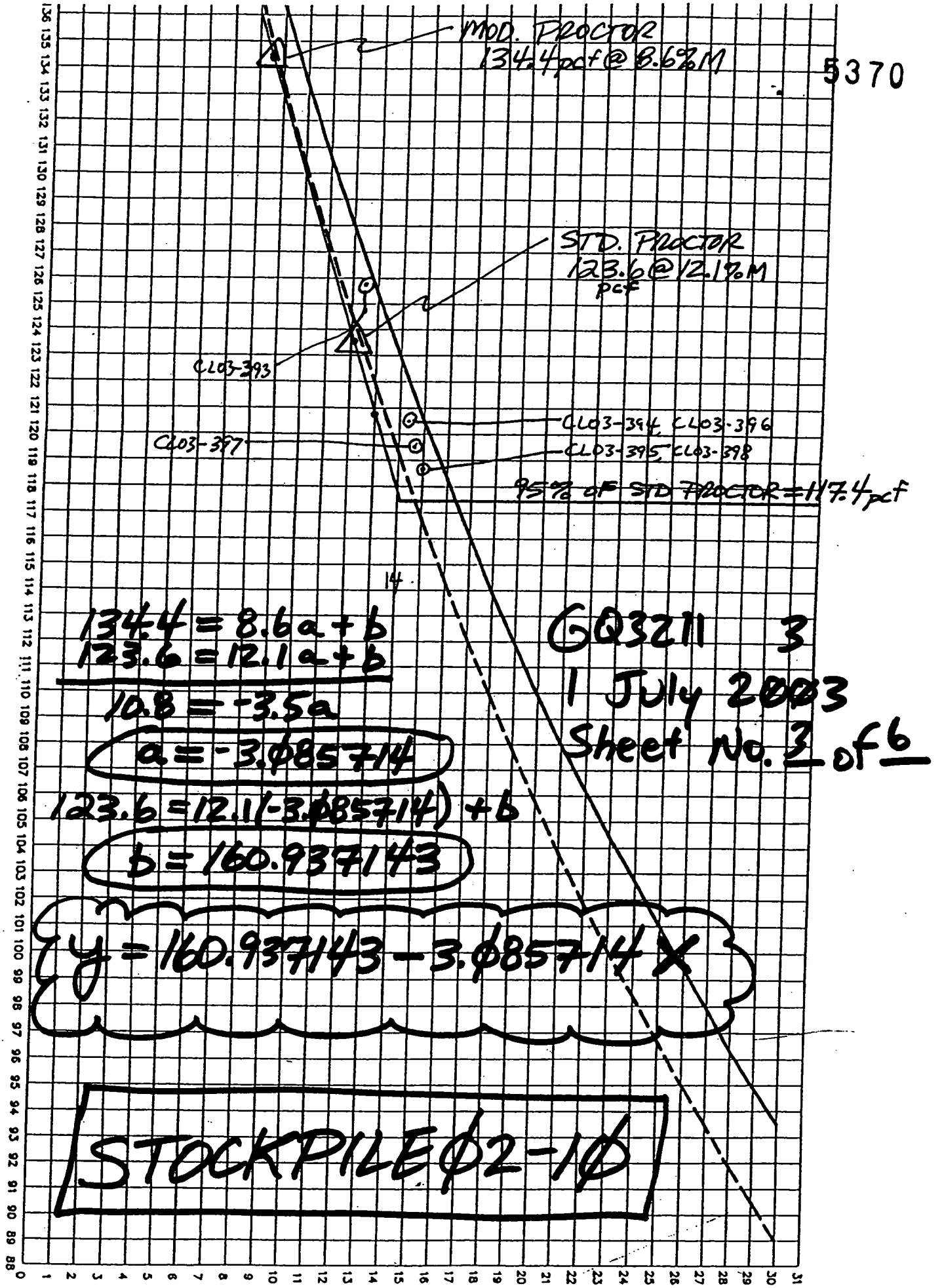
5370



$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

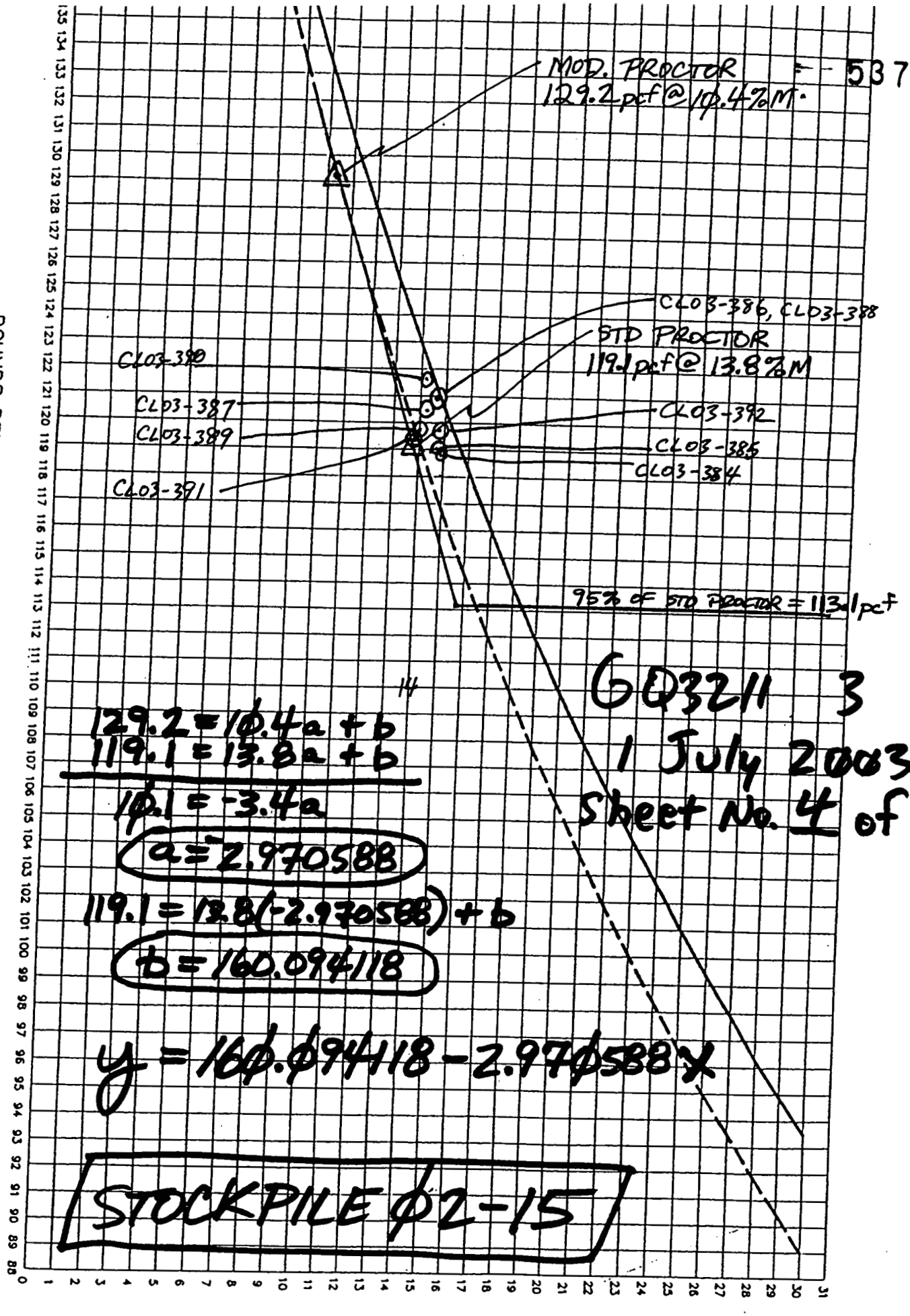
$b = 160.937143$

$y = 160.937143 - 3.085714x$

GQ3211 3
1 July 2003
Sheet No. 3 of 6

STOCKPILE02-10

5370



GQ3211 3
1 July 2003
Sheet No. 4 of 6

$129.2 = 10.4a + b$
$119.1 = 13.8a + b$

$10.1 = -3.4a$

$a = -2.970588$

$119.1 = 13.8(-2.970588) + b$

$b = 160.094118$

$y = 160.094118 - 2.970588x$

STOCKPILE 02-15

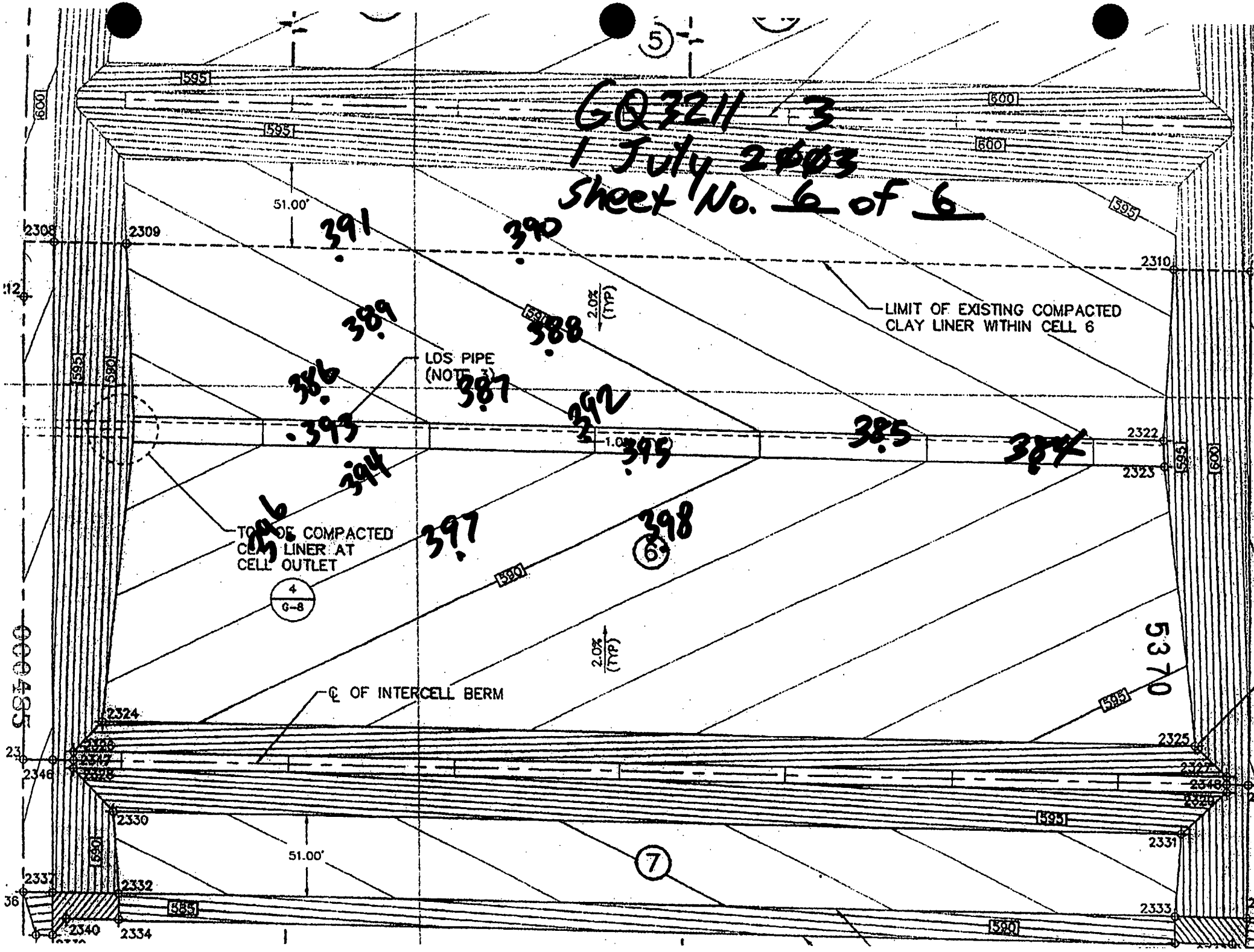
GQ3211 3
1 July 2003
Sheet No. 5 of 6

All boxes welded to drains

Lift #6
Tested & Passed

Lift #6
Stockpile 02-10
Placed & Sealed.

51.00'
2308
2309
2310
595
590
600
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
(NOTE 3)
1.0% (TYP)
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
6&8
6
℄ OF INTERCELL BERM
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2337
2340
7
53770
000454


GQ3211 - 3
1 July 2003
Sheet No. 6 of 6
5
6
7
595
600
590
585
51.00'
2308
2309
2310
2322
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2337
2340
2346
2348
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
TOE OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
℄ OF INTERCELL BERM
2.0% (TYP)
1.0%
391
390
389
388
386
387
392
393
385
384
394
396
397
398
395
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 3 day July month 2003 year

SPECIFICATION REQUIREMENTS (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: Stockpile Ø2-1Ø

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x+3.6556 QA ID: CHW

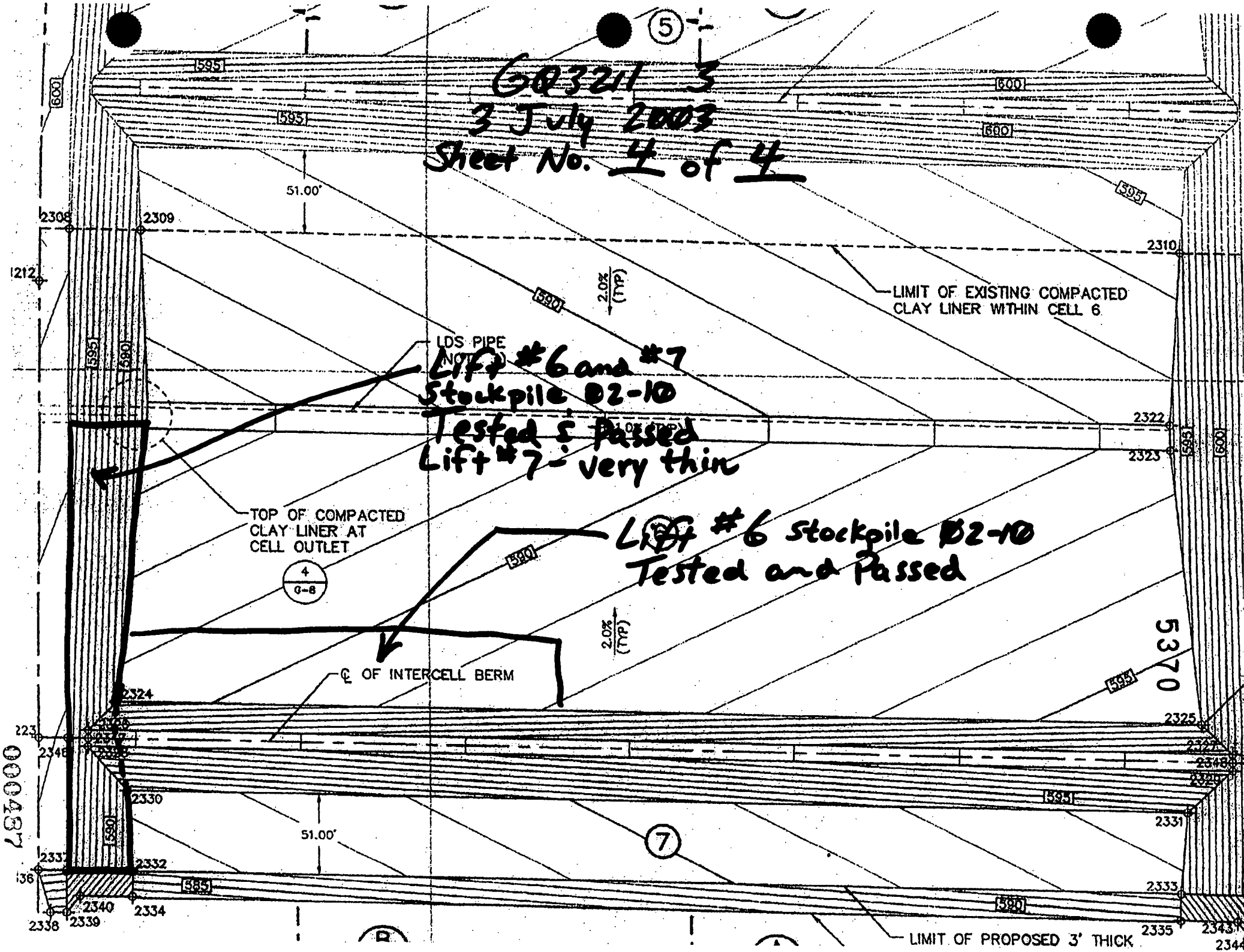
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-399	Cell #6 Floor	6" / L-6	Ø2-10	12.1	123.6	11.9 / 13.5	138.9	122.4	99.Ø	P	—	—	—	—
CL03-400	↓	6" / L-6	Ø2-10	12.1	123.6	12.9 / 14.4	139.8	122.2	98.9	P	—	—	—	—
CL03-401	↓	6" / L-6	Ø2-10	12.1	123.6	13.6 / 15.0	136.7	118.9	96.2	P	—	—	—	—
CL03-402	↓	6" / L-6	Ø2-10	12.1	123.6	11.9 / 13.5	140.1	123.4	99.8	P	—	—	—	—
CL03-403	West 4:1 Slope Cell #6	6" / L-6	Ø2-10	12.1	123.6	11.2 / 13.0	138.2	122.3	98.9	P	—	—	—	—
CL03-404	↓	6" / L-6	Ø2-10	12.1	123.6	10.2 / 12.1	140.9	125.9	101.9	P	—	—	—	—
CL03-405	West 4:1 Slope Cell #7	6" / L-6	Ø2-10	12.1	123.6	12.6 / 14.1	137.1	120.2	97.2	P	—	—	—	—

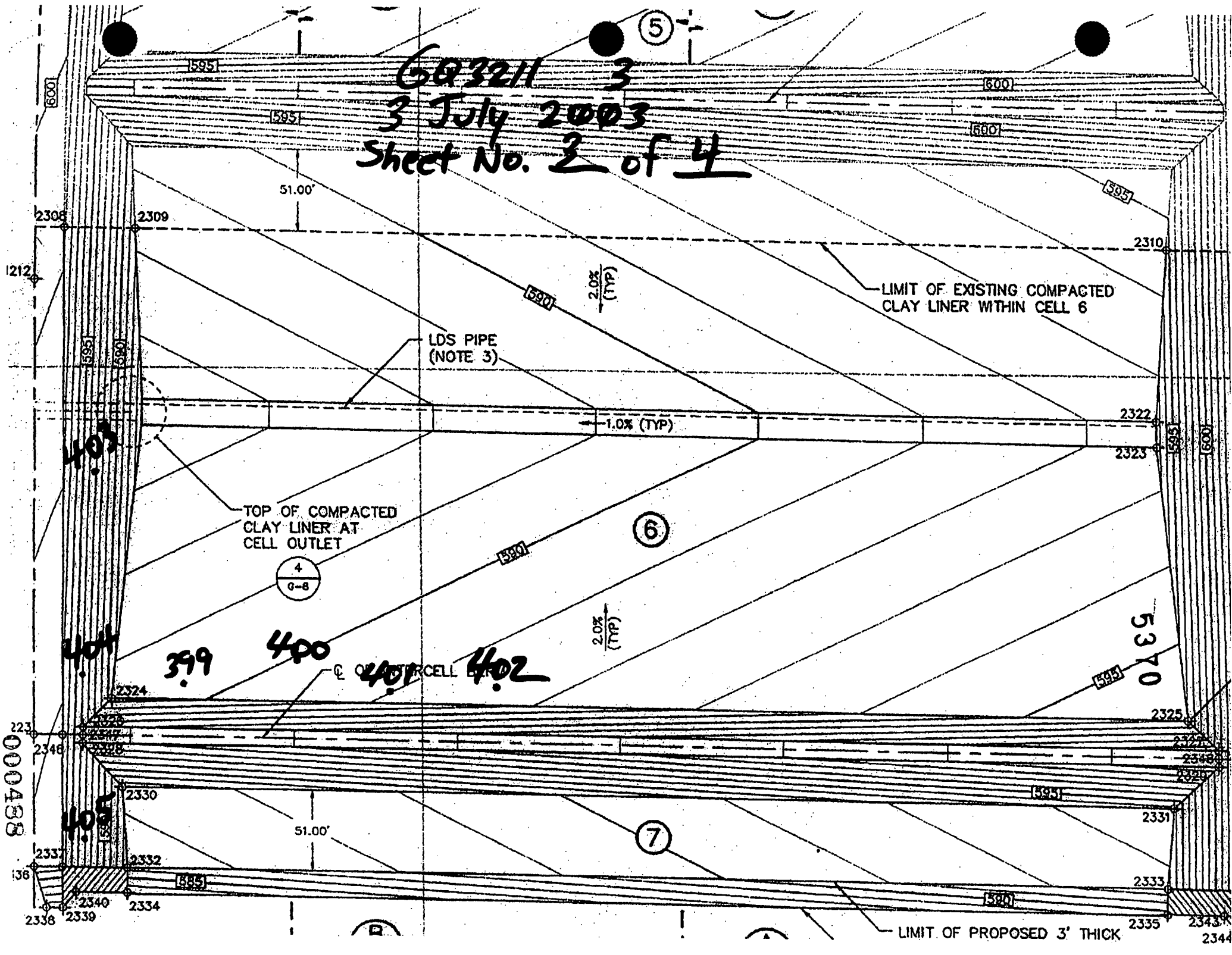
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

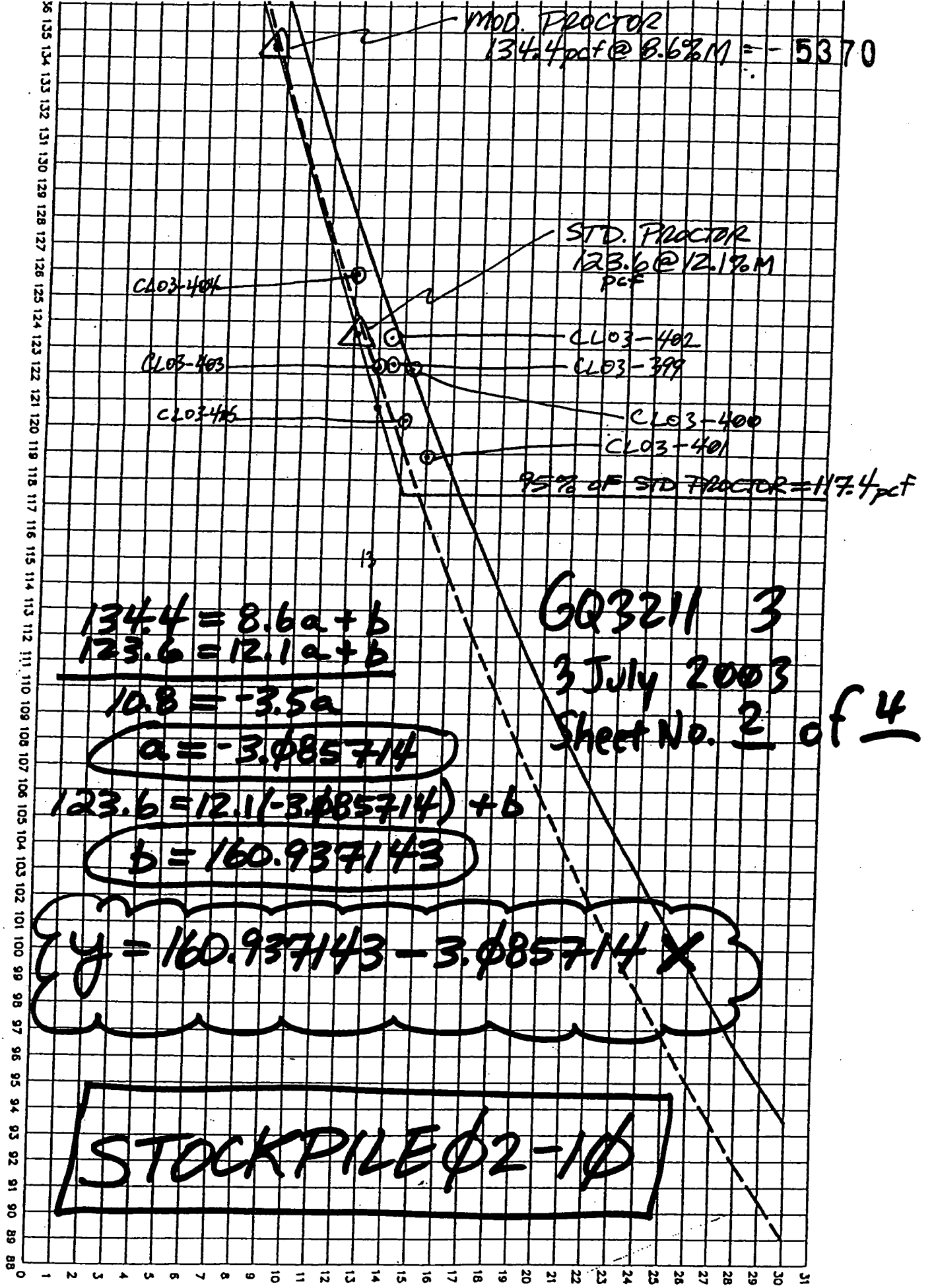
©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 4

000486

5310


GQ321 3
3 July 2003
Sheet No. 4 of 4
5
7
595
600
590
585
51.00'
2308
2309
2310
2322
2323
2324
2325
2330
2331
2332
2333
2334
2335
2338
2339
2340
2348
2343
2344
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTED)
Lift #6 and #7 Stockpile 02-10 Tested & Passed
Lift #7 - very thin
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
Lift #6 Stockpile 02-10 Tested and Passed
℄ OF INTERCELL BERM
5370
LIMIT OF PROPOSED 3' THICK
000487


GQ3211 3
3 July 2003
Sheet No. 3 of 4
51.00'
2308
2309
2310
2322
2323
2324
2325
2330
2331
2332
2333
2334
2335
2337
2338
2339
2340
595
600
590
585
2.0% (TYP)
1.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
6
7
LIMIT OF PROPOSED 3' THICK
403
404
399
400
401
402
405
5370
000438



5370

$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

$y = 160.937143 - 3.085714x$

GQ3211 3

3 July 2003

Sheet No. 2 of 4

STOCKPILE 02-10

000489

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION:

PROJECT NO.: G03211 TASK NO.: 3

DATE: 11 day July month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED):

MATERIAL SOURCE: Stockpile Ø2-10

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-406	West Bench Cell #6	6" / L-3	Ø2-10	12.1	123.6	13.5 / 14.9	137.7	119.8	CHW ~~97.0~~ 96.9	P	—	—	—	—
CL03-407	West 4:1 Slope Cell #6	6" / L-1	Ø2-10	12.1	123.6	13.0 / 14.5	137.1	119.7	96.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CA SHEET NO. 1 OF 4

000490

93170

GQ3211 3
11 July 2003
Sheet No. 3 of 4

Lift #3
Tested & Passed

Lift #1
Tested & Passed

Entire Area
Tracked & /or skimmed
with Dozer

Area worked for
Certification,
Rocks picked.

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

LDS PIPE
(NOTE 3)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

℄ OF INTERCELL BERM

LIMIT OF PROPOSED 3' THICK

2.0% (TYP)

1.0% (TYP)

51.00'

2308 2309 2310 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2337 2338 2339 2340 2343 2344 2346 2347 2348

595 600 590 585

4 5 6 7

1212 1336

1970 ft

2004491

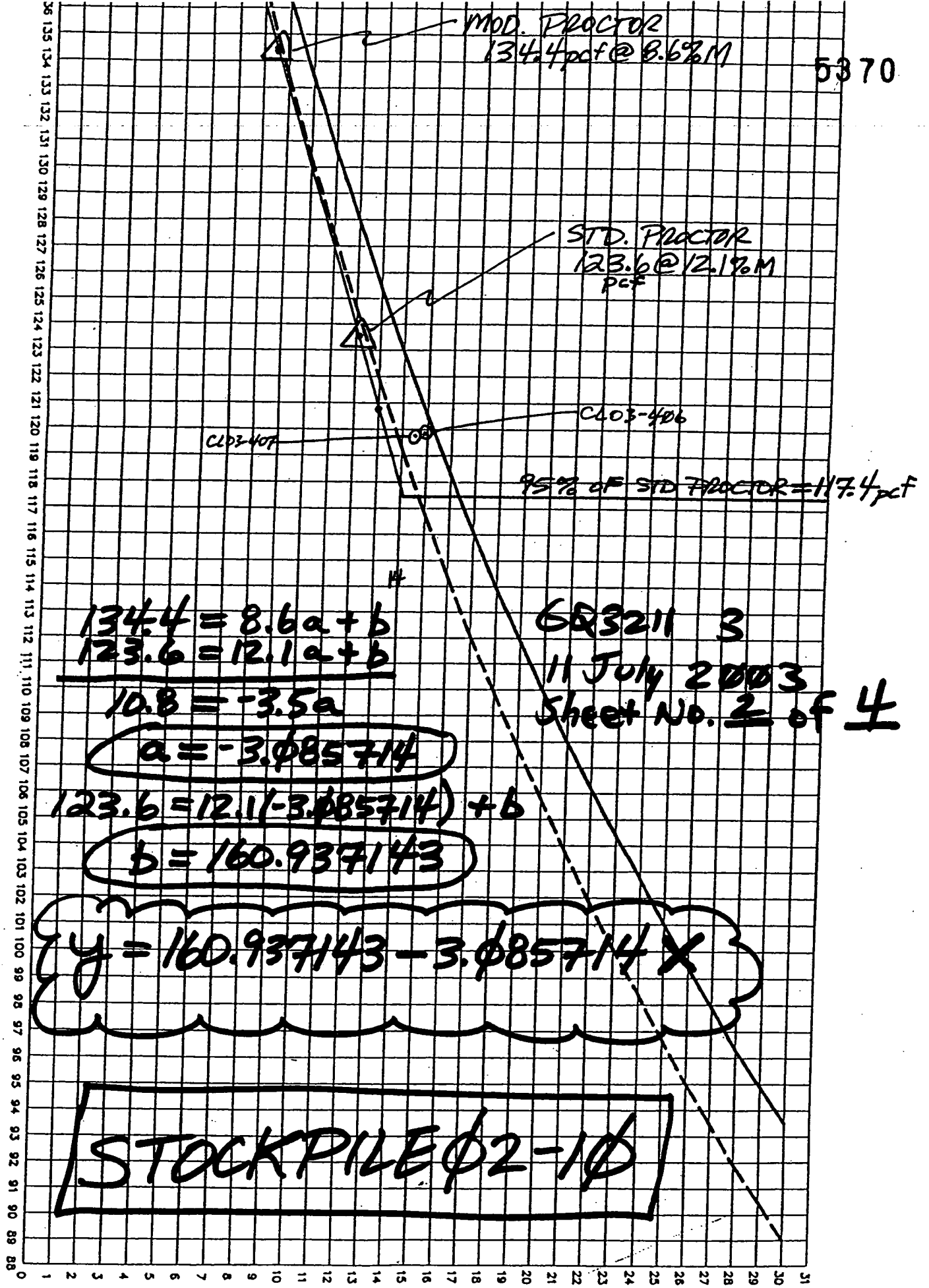
GQ3211 3
11 July 2003
Sheet No. 4 of 4

5

595
600
595
600
600
595
51.00'
2308
2309
2310
406
407
590
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
595
590
LDS PIPE (NOTE 3)
1.0% (TYP)
2322
2323
595
600
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
0-8
6
590
2.0% (TYP)
5370
595
℄ OF INTERCELL BERM
2324
2325
2346
2330
595
2331
51.00'
7
590
2337
2332
2333
585
2340
2334
590
2338
2339
2335
2343
2344
LIMIT OF PROPOSED 3' THICK

0004482

5370



$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

$b = 160.9371143$

$y = 160.937143 - 3.085714X$

STOCKPILE 02-10

6Q3211 3
11 July 2003
Sheet No. 2 of 4

000493

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 12 day July month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/6"

MATERIAL SOURCE: Stockpile Ø2-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.83111 + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-408	Cell #6 → #7 IC Berm	6" / L-3	Ø2-10	12.1	123.6	12.6 / 14.1	137.1	120.2	97.3	P	—	—	—	—
CL03-409	West Bench Cell #6	6" / L-4	Ø2-10	12.1	123.6	13.5 / 14.9	136.0	118.4	95.8	P	—	—	—	—
CL03-410	West 4:1 Slope Cell #6	6" / L-2	Ø2-10	12.1	123.6	13.1 / 14.5	135.2	118.1	95.6	P	—	—	—	—
CL03-411	Backfill #8' West of LCS Box	6" / L-2	Ø2-10	12.1	123.6	11.3 / 13.0	128.4	113.6	91.9	—	F	CL03-412	P	—
CL03-412	↓	6" / L-2	Ø2-10	12.1	123.6	11.1 / 12.9	138.4	122.6	99.2	P	—	—	—	—
CL03-413	West 4:1 Slope Cell #6	6" / L-3	Ø2-10	12.1	123.6	13.2 / 14.6	136.7	119.3	96.5	P	—	—	—	—
CL03-414	West Bench Cell #6	6" / L-5	Ø2-10	12.1	123.6	13.4 / 14.8	135.6	118.1	95.6	P	—	—	—	—
CL03-415	Backfill #6' West of LDS Box	6" / L-3	Ø2-10	12.1	123.6	11.7 / 13.4	136.8	120.6	97.6	P	—	—	—	—
CL03-416	Backfill #5' West of LCS Box	6" / L-3	Ø2-10	12.1	123.6	12.6 / 14.1	134.4	117.8	95.3	P	—	—	—	—
CL03-417	West 4:1 Slope Cell #6	6" / L-4	Ø2-10	12.1	123.6	11.9 / 13.5	138.8	122.3	98.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 1 OF 6

0004494

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 12 day July month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): 8" / 5"

MATERIAL SOURCE: Stockpile 02-10

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311 X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-418	West Bench Cell #6	6" / L-6	02-10	12.1	123.6	13.0 / 14.5	137.0	119.7	96.8	P	—	—	—	—

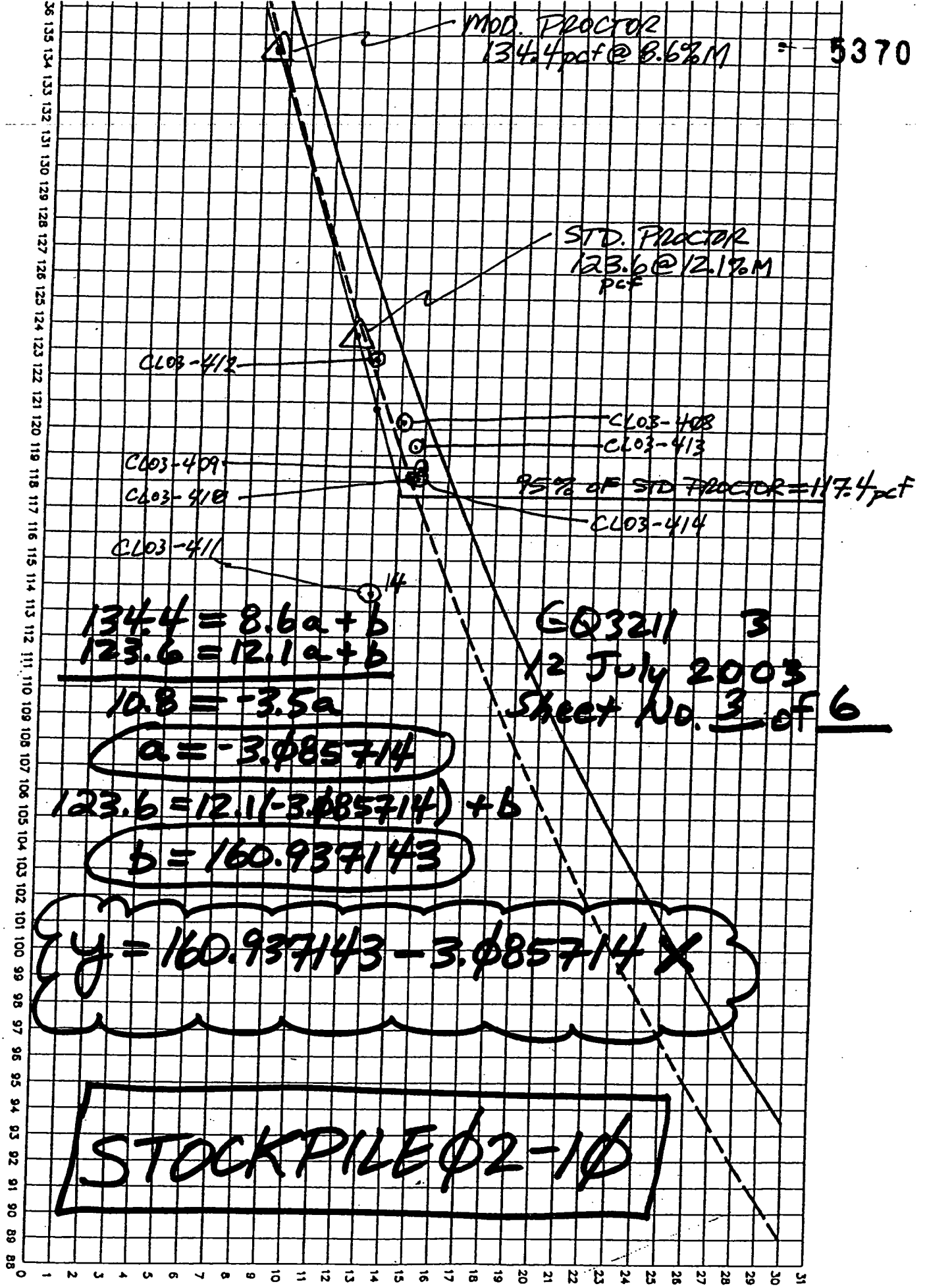
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: ____ SHEET NO. 2 OF 6

000435

5370



134.4 = 8.6a + b
123.6 = 12.1a + b

10.8 = -3.5a

a = -3.085714

123.6 = 12.1(-3.085714) + b

b = 160.937143

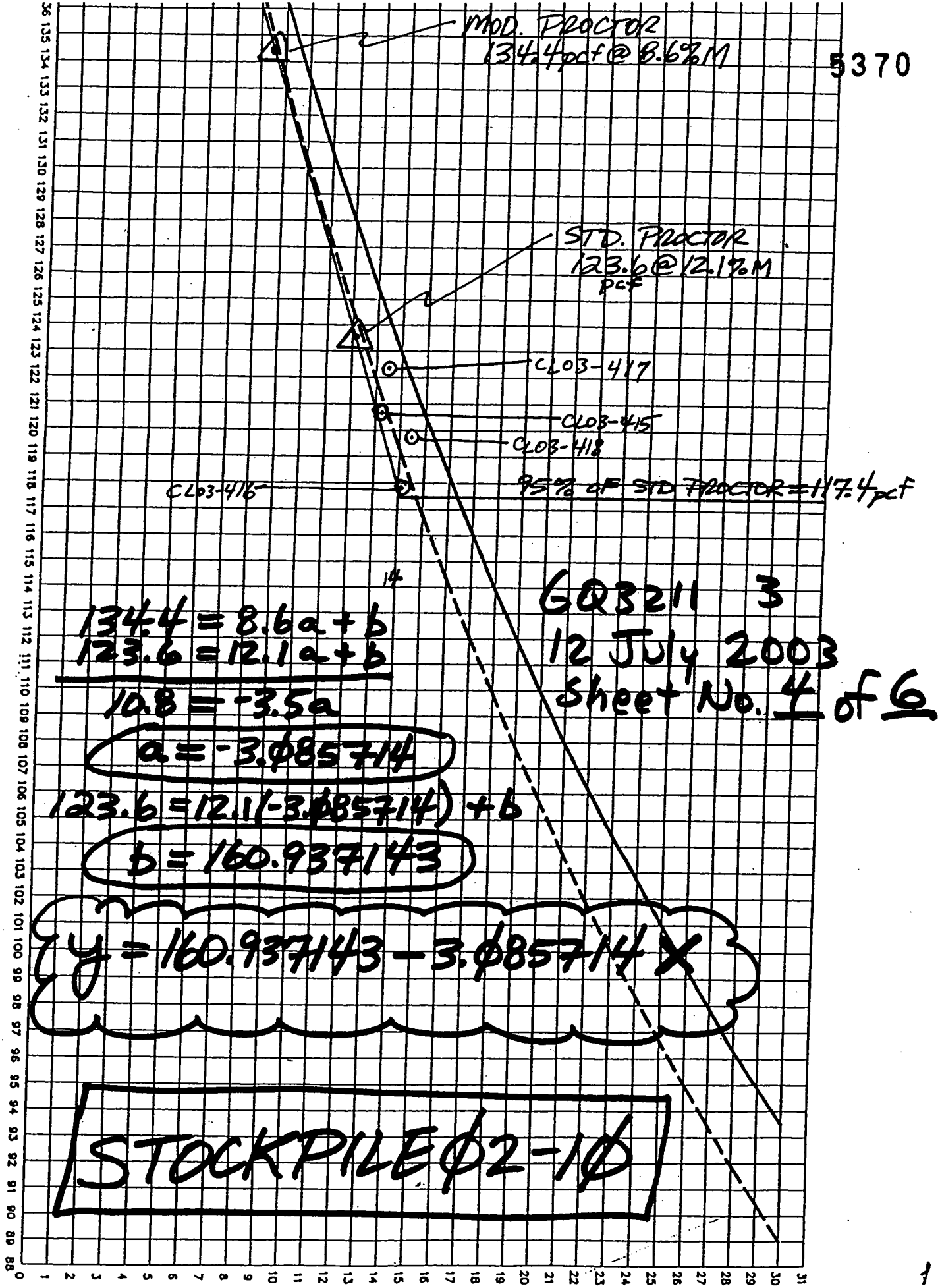
y = 160.937143 - 3.085714 X

[STOCKPILE 02-10]

EQ3211 3
12 July 2003
Sheet No. 3 of 6

000496

5370



$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

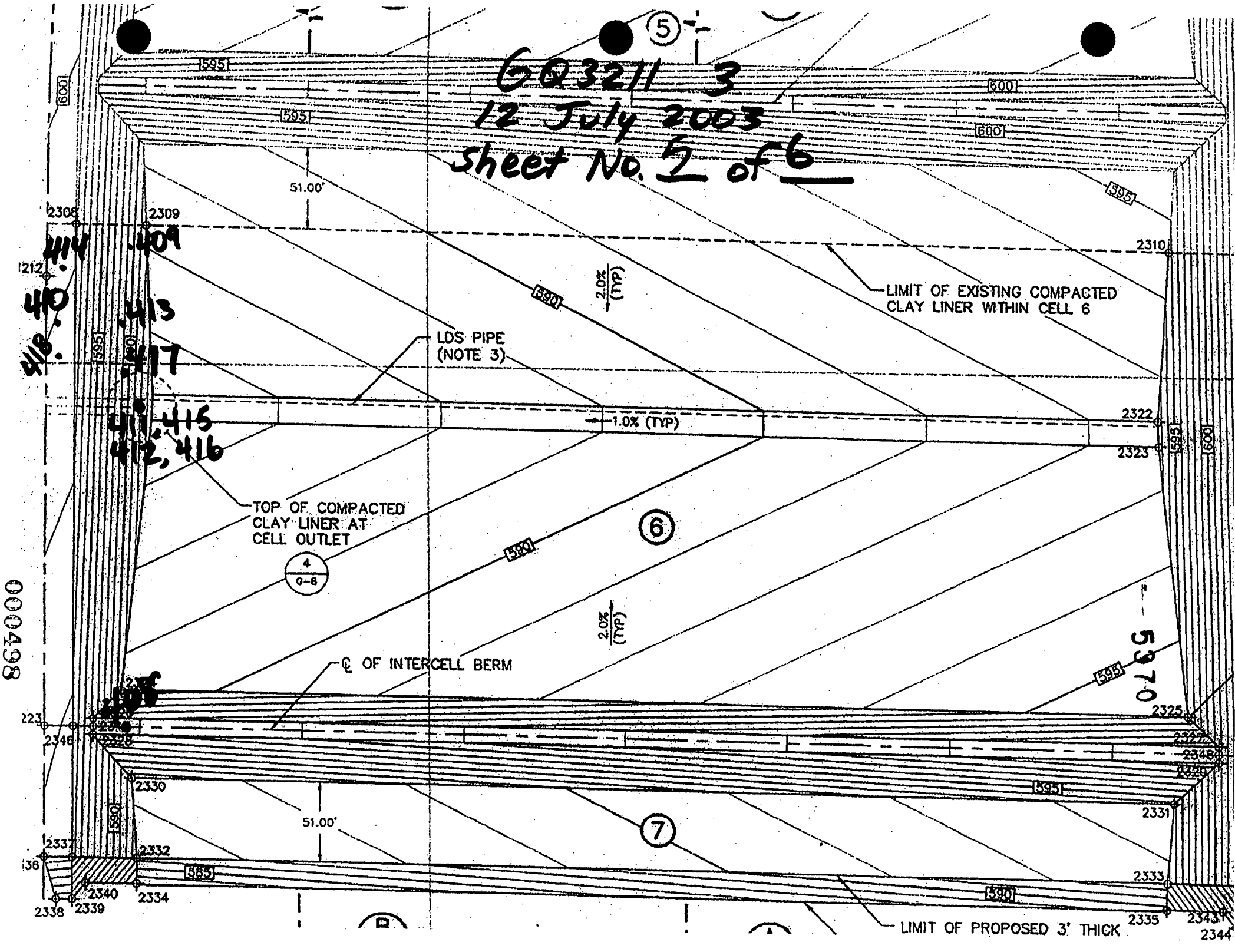
$y = 160.937143 - 3.085714x$

GQ3211 3
12 July 2003
Sheet No. 4 of 6

[STOCKPILE02-10]

000497

GQ3211 3
12 July 2003
Sheet No. 5 of 6



000498

Lift #4 thru #6 GQ3211 3
Tested & Passed 12 July 2003
Stockpile #2-10 Sheet No. 6 of 6

Lift #2 thru #4
Tested & Passed

Area Backfilled and Hand compacted
Lift #1 thru #4 (6)

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6

LDS PIPE (NOTE 3)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4 / G-8

℄ OF INTERCELL BERM

LIMIT OF PROPOSED 3' THICK

2.0% (TYP)

1.0% (TYP)

51.00'

(5) (6) (7)

595 600 590 585

2309 2310 2322 2323 2324 2325 2330 2331 2332 2333 2334 2335 2337 2338 2339 2340 2343 2344 2346 2347 2348

000499

5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 13 day July month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ~~95~~ 98 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (~~LOOSE~~/COMPACTED): 8" 4"

MATERIAL SOURCE: Stockpile 02-10

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

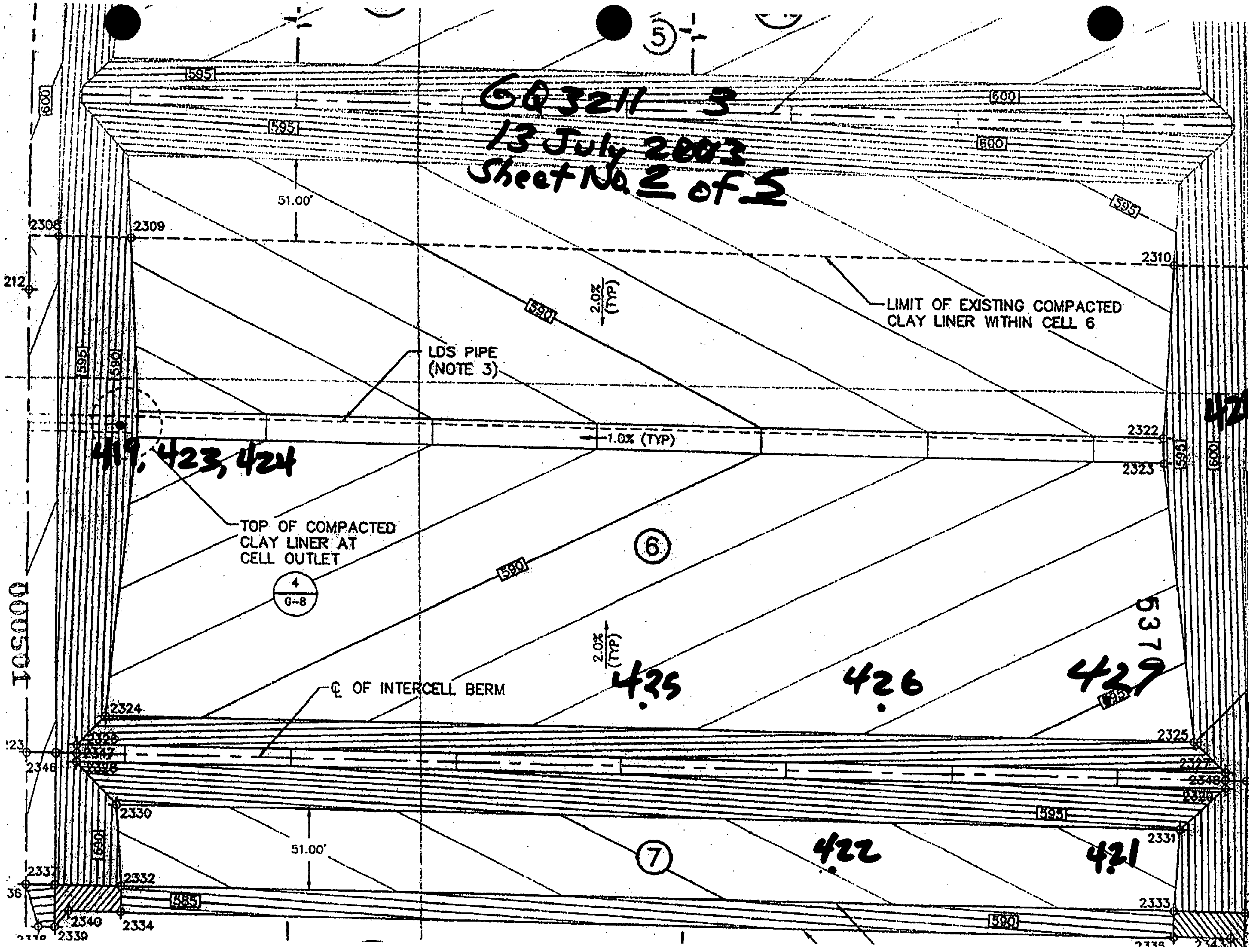
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FA
CL03-419	Backfill ≈12' West of LCSR Box	6" / L-4	02-10	12.1	123.6	10.6 / 12.5	138.4	123.0	99.5	P	—	—	—	—
CL03-420	East Bench	6" / S.G.	02-10	12.1	123.6	11.9 / 13.5	136.9	120.6	97.6	P	—	—	—	—
CL03-421	Cell #7 Floor	6" / S.G.	02-10	12.1	123.6	10.9 / 12.7	141.3	125.4	101.5	P	—	—	—	—
CL03-422	↓	6" / S.G.	02-10	12.1	123.6	10.8 / 12.6	140.3	124.6	100.8	P	—	—	—	—
CL03-423	Backfill ≈10' West of LCSR Box	6" / L-7	02-10	12.1	123.6	10.6 / 12.5	139.4	123.9	100.2	P	—	—	—	—
CL03-424	Backfill ≈10' West of LCS Box	6" / L-8	02-10	12.1	123.6	12.3 / 13.9	136.6	119.9	97.0	P	—	—	—	—
CL03-425	Cell #6 Floor	6" / L-7	02-10	12.1	123.6	13.3 / 14.7	137.7	120.1	97.2	P	—	—	—	—
CL03-426	↓	6" / L-7	02-10	12.1	123.6	11.2 / 13.0	141.8	125.5	101.5	P	—	—	—	—
CL03-427		6" / L-7	02-10	12.1	123.6	10.4 / 12.3	141.7	126.2	102.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 5

000500

534005


GQ3211 3
13 July 2003
Sheet No. 2 of 3
5370
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
1.0% (TYP)
2.0% (TYP)
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4 / G-8
6
7
℄ OF INTERCELL BERM
51.00'
419, 423, 424
425
426
427
422
421
2308
2309
2310
2322
2323
2324
2325
2330
2331
2332
2333
2334
2346
212
595
600
590
585
000501

GQ3211 3
13 July 2003
Sheet No. 3 of 3

Lift #4 thru #8
SP 02-10

Final Lift
Tested & Passed

Lift #7
Tested & Passed
SP 02-10

Final Lift
Tested & Passed

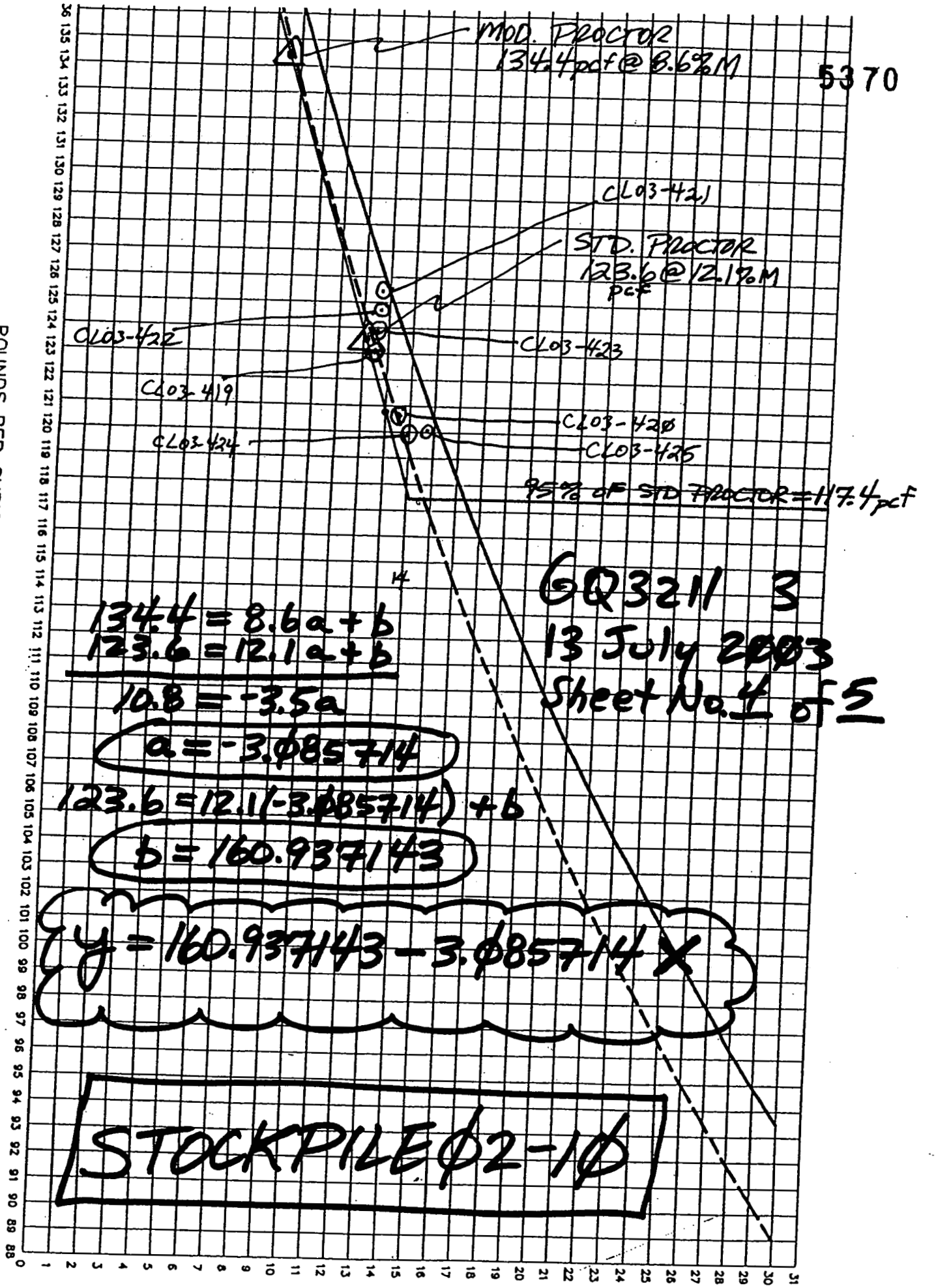
5370

5

6

7

595
600
590
585
51.00'
2308
2309
2310
212
2322
2323
2324
2330
2331
2332
2333
2334
2337
2340
2339
2346
2347
2348
2349
2327
36
23
2.0% (TYP)
1.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
℄ OF INTERCELL BERM
209000



5370

GQ3211 3
13 July 2003
Sheet No. 4 of 5

$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

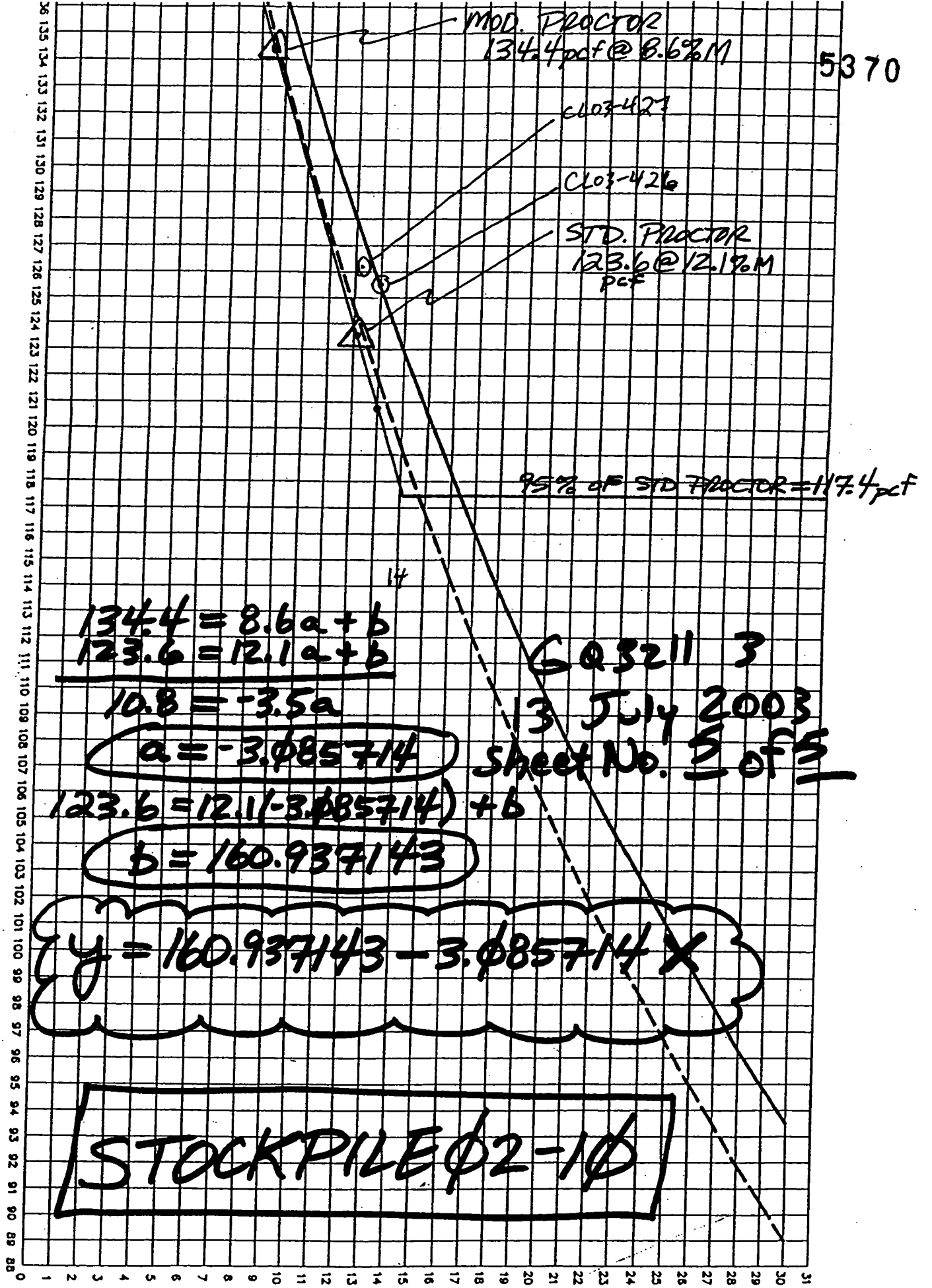
$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

$y = 160.937143 - 3.085714x$

STOCKPILE 02-10

000503



5370

$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

$y = 160.937143 - 3.085714X$

GQ3211 3
13 July 2003
Sheet No. 5 of 5

[STOCKPILE 02-10]

000504

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 14 day July month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Stockpile 02-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: GHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FA
CL03-428	Cell #6 Floor	6" / L-7	02-10	12.1	123.6	13.3 / 14.7	137.4	119.8	96.9	P	—	—	—	—
CL03-429		6" / L-7	02-10	12.1	123.6	12.4 / 14.0	138.2	121.2	98.1	P	—	—	—	—
CL03-430		6" / L-7	02-10	12.1	123.6	13.8 / 15.1	135.9	118.1	95.6	P	—	—	—	—
CL03-431		6" / L-7	02-10	12.1	123.6	11.1 / 12.9	137.4	121.7	98.5	P	—	—	—	—
CL03-432		6" / L-7	02-10	12.1	123.6	13.8 / 15.1	137.5	119.5	96.7	P	—	—	—	—
CL03-433		6" / L-7	02-10	12.1	123.6	13.3 / 14.7	139.7	121.8	98.5	P	—	—	—	—
CL03-434		8" / L-7	02-10	12.1	123.6	12.8 / 14.3	138.2	120.9	97.8	P	—	—	—	—
CL03-435		6" / L-7	02-10	12.1	123.6	11.7 / 13.4	139.5	123.0	99.5	P	—	—	—	—
CL03-436		6" / L-7	02-10	12.1	123.6	11.2 / 13.0	137.0	121.2	98.1	P	—	—	—	—
CL03-437		6" / L-7	02-10	12.1	123.6	12.9 / 14.4	138.4	121.0	97.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: GA SHEET NO. 1 OF 6

000505

5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I

PROJECT NO.: GR3211 TASK NO.: 3

DATE: 14 day July month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): NS

MATERIAL SOURCE: Stockpile 02-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-438	Cell #6 Floor	6" / L-7	02-10	12.1	123.6	11.7 / 13.4	139.9	123.4	99.8	P	—	—	—	—
CL03-439		6" / L-7	02-10	12.1	123.6	12.6 / 14.1	136.9	120.0	97.1	P	—	—	—	—
CL03-440		6" / L-7	02-10	12.1	123.6	12.0 / 13.6	135.4	119.2	96.4	P	—	—	—	—
CL03-441	Cell #6 Drainage Corridor	6" / L-7	02-10	12.1	123.6	13.7 / 15.0	135.0	117.4	95.0	P	—	—	—	—
CL03-442	Cell #6 Floor	6" / L-7	02-10	12.1	123.6	13.2 / 14.6	136.3	118.9	96.2	P	—	—	—	—
CL03-443		6" / L-7	02-10	12.1	123.6	13.6 / 15.0	135.6	117.9	95.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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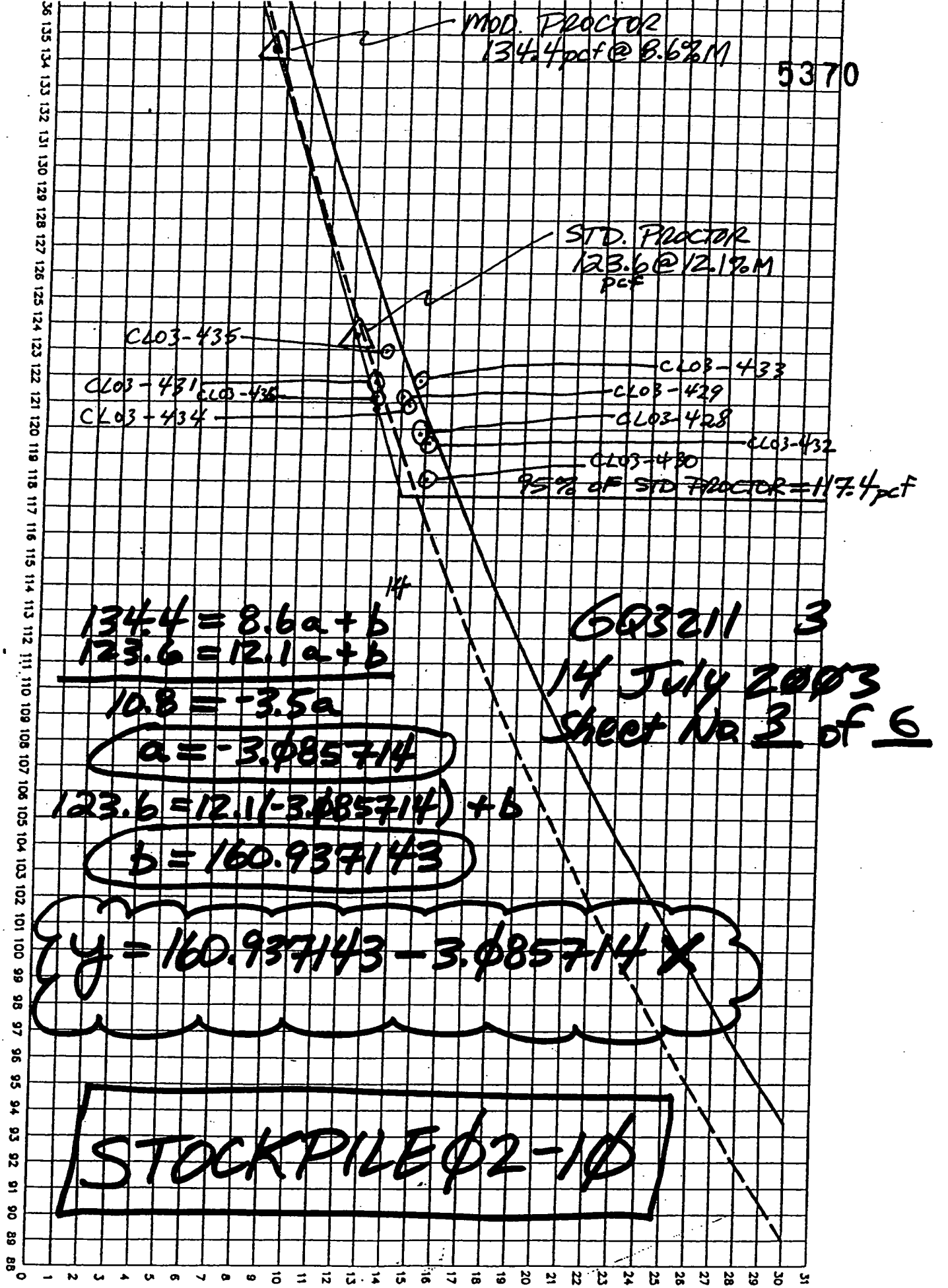
©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 2 OF 6

000506



5370

$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

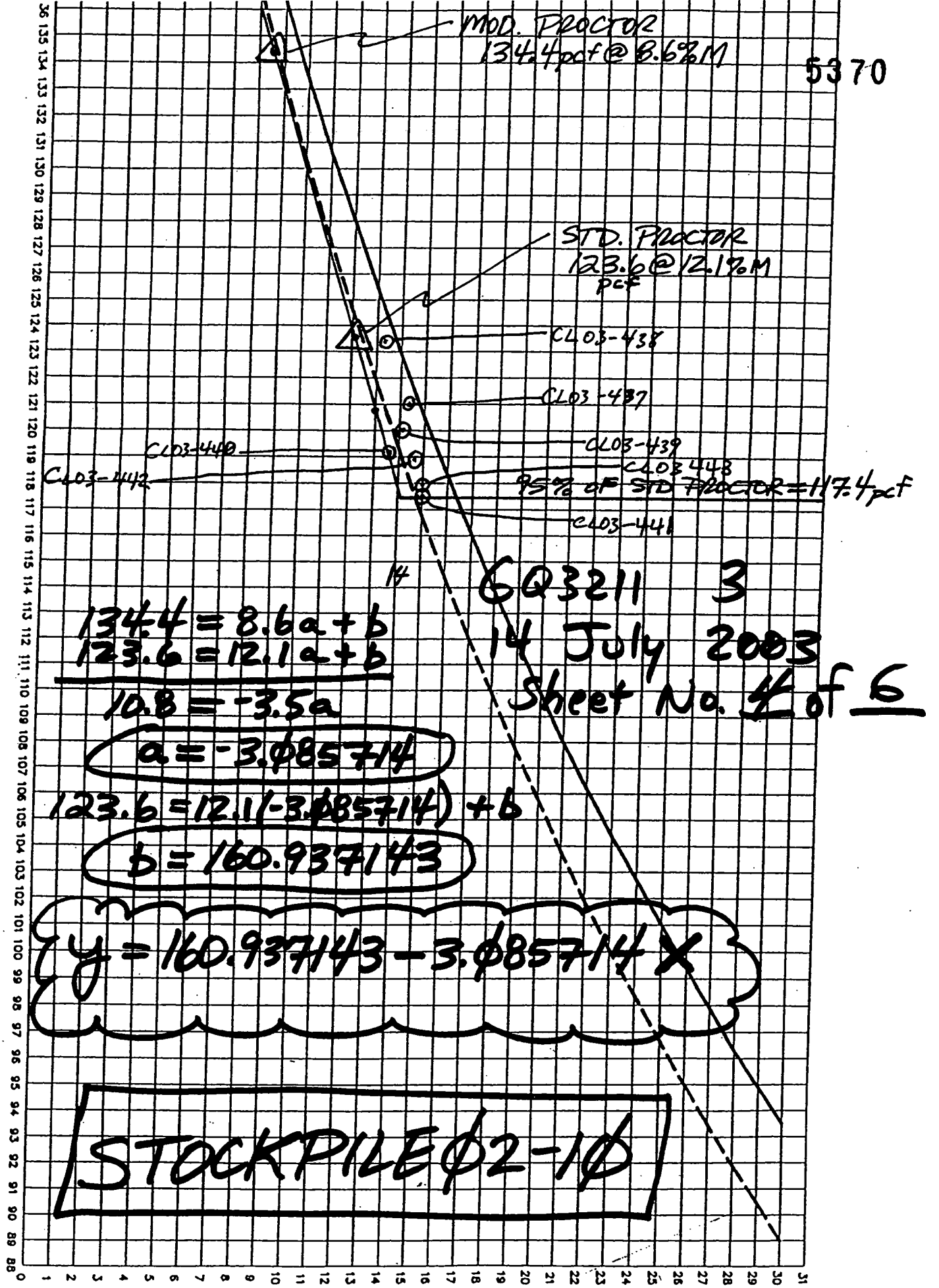
$b = 160.937143$

$y = 160.937143 - 3.085714x$

GQ3211 3
14 July 2003
Sheet No 3 of 6

STOCKPILE 02-10

000507



5370

14

6Q3211 3

14 July 2003

Sheet No. 4 of 6

$134.4 = 8.6a + b$

$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

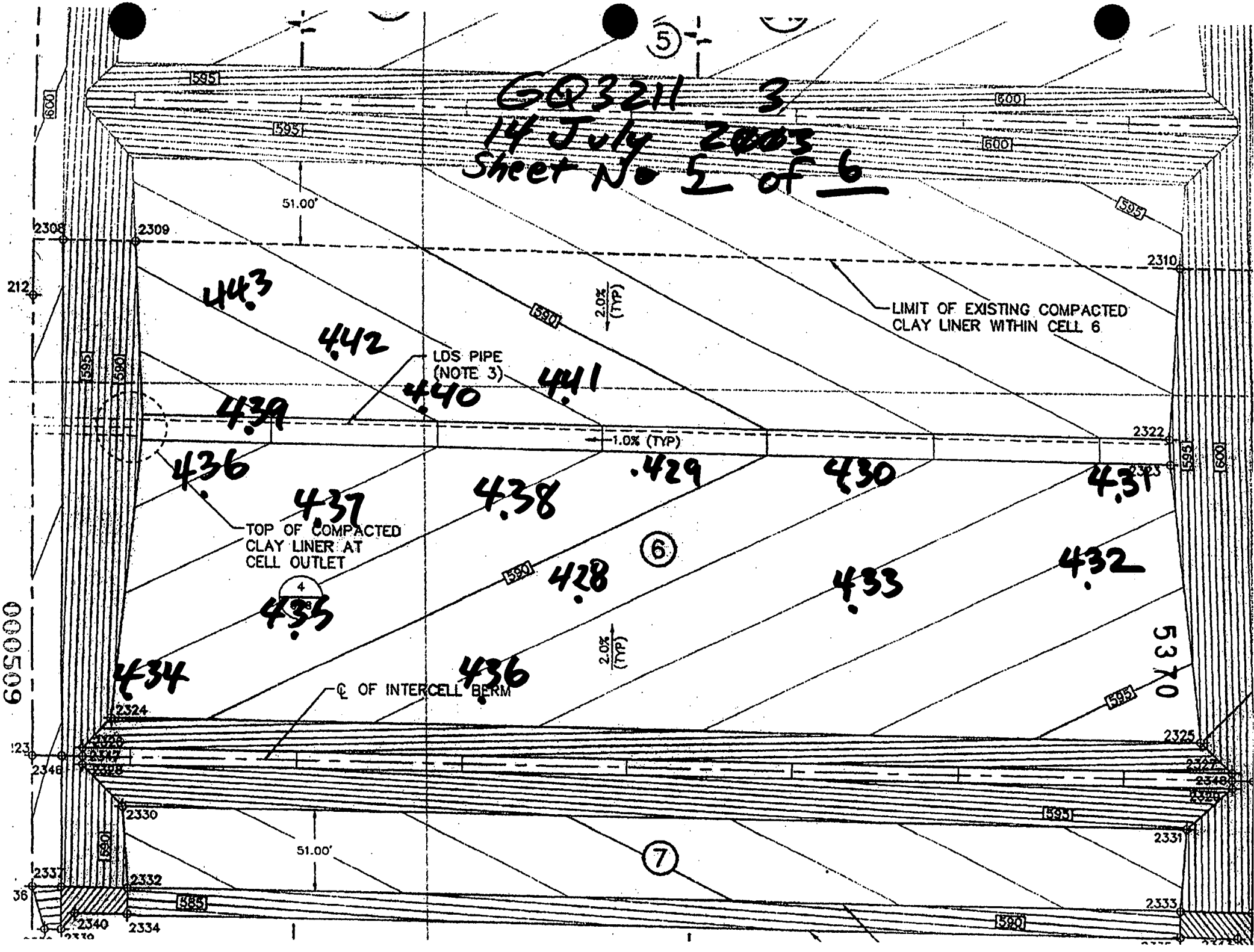
$b = 160.937143$

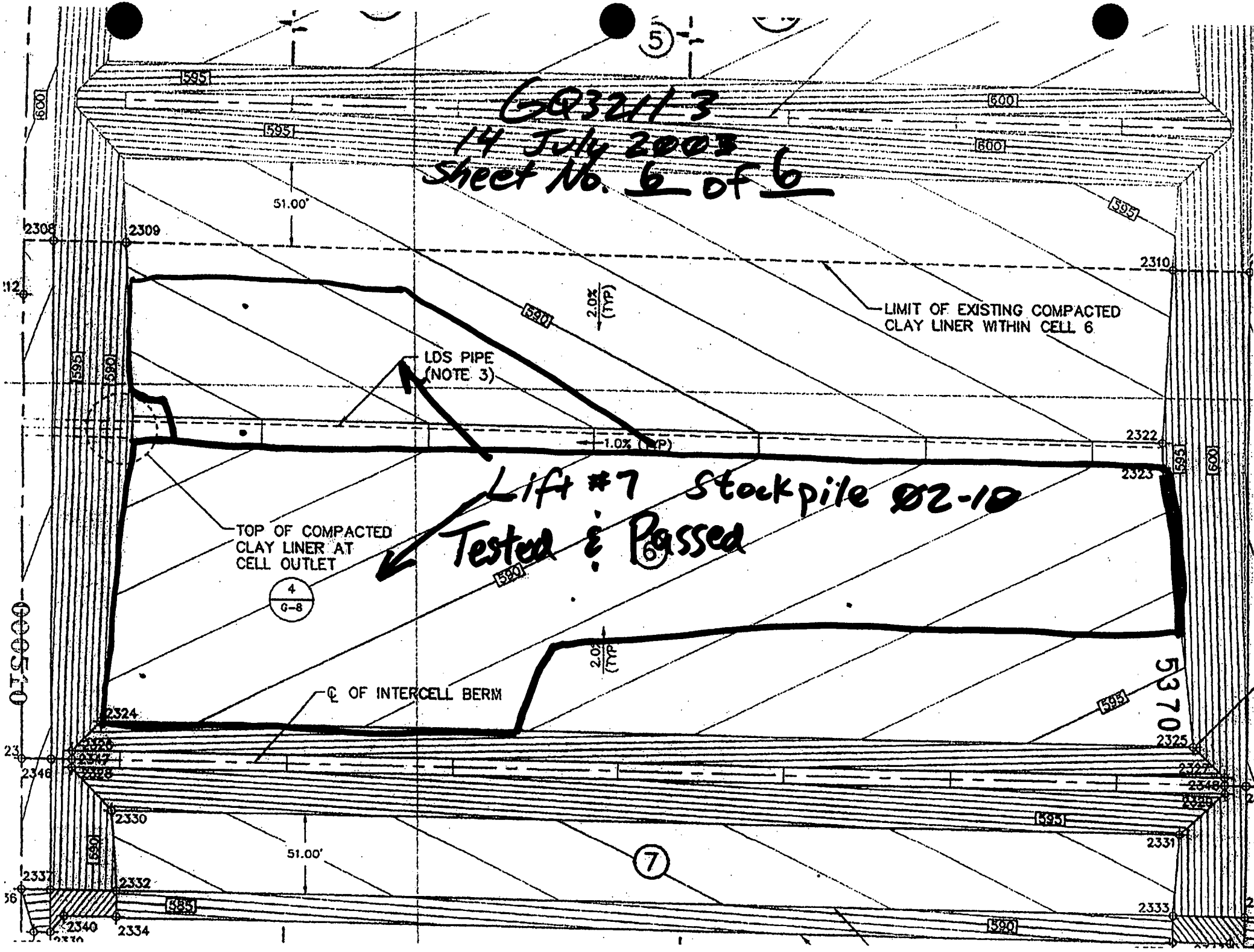
$y = 160.937143 - 3.085714X$

STOCKPILE 02-10

000508

GQ3211 3
14 July 2003
Sheet No 5 of 6




GQ3241-3
14 July 2003
Sheet No. 6 of 6
51.00'
2308
2309
2310
2322
2323
2324
2325
2330
2331
2332
2333
2334
2337
2340
595
600
590
2.0% (TYP)
1.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
Lift #7 Stockpile 02-10
Tested & Passed
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
6
7
℄ OF INTERCELL BERM
005370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: G03211 TASK NO.: 3

DATE: 15 day July month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ~~95~~ APZ % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: Stockpile 02-10

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~CL03-444~~	Cell #6 → #7 IC Berm	6" / L-6	02-10	12.1	123.6	13.3 / 14.7	137.5	119.9	97.0	P	—	—	—	—
CL03-445		6" / L-7	02-10	12.1	123.6	11.8 / 13.5	138.7	122.2	98.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible] SHEET NO. 1 OF 3

000511

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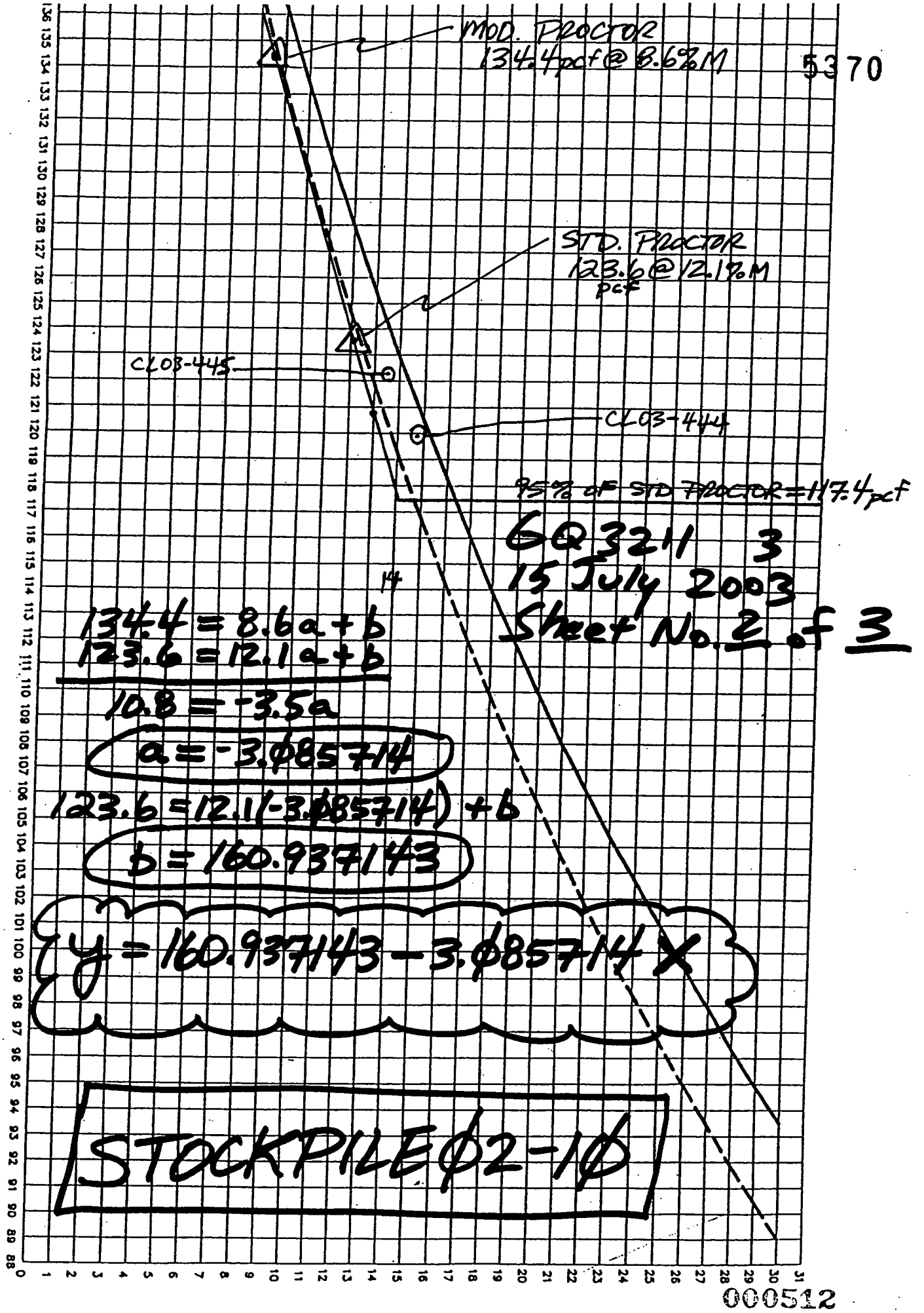


5370

GQ3211 3
15 July 2003
Sheet No. 2 of 3

$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

$y = 160.937143 - 3.085714x$

STOCKPILE 02-10

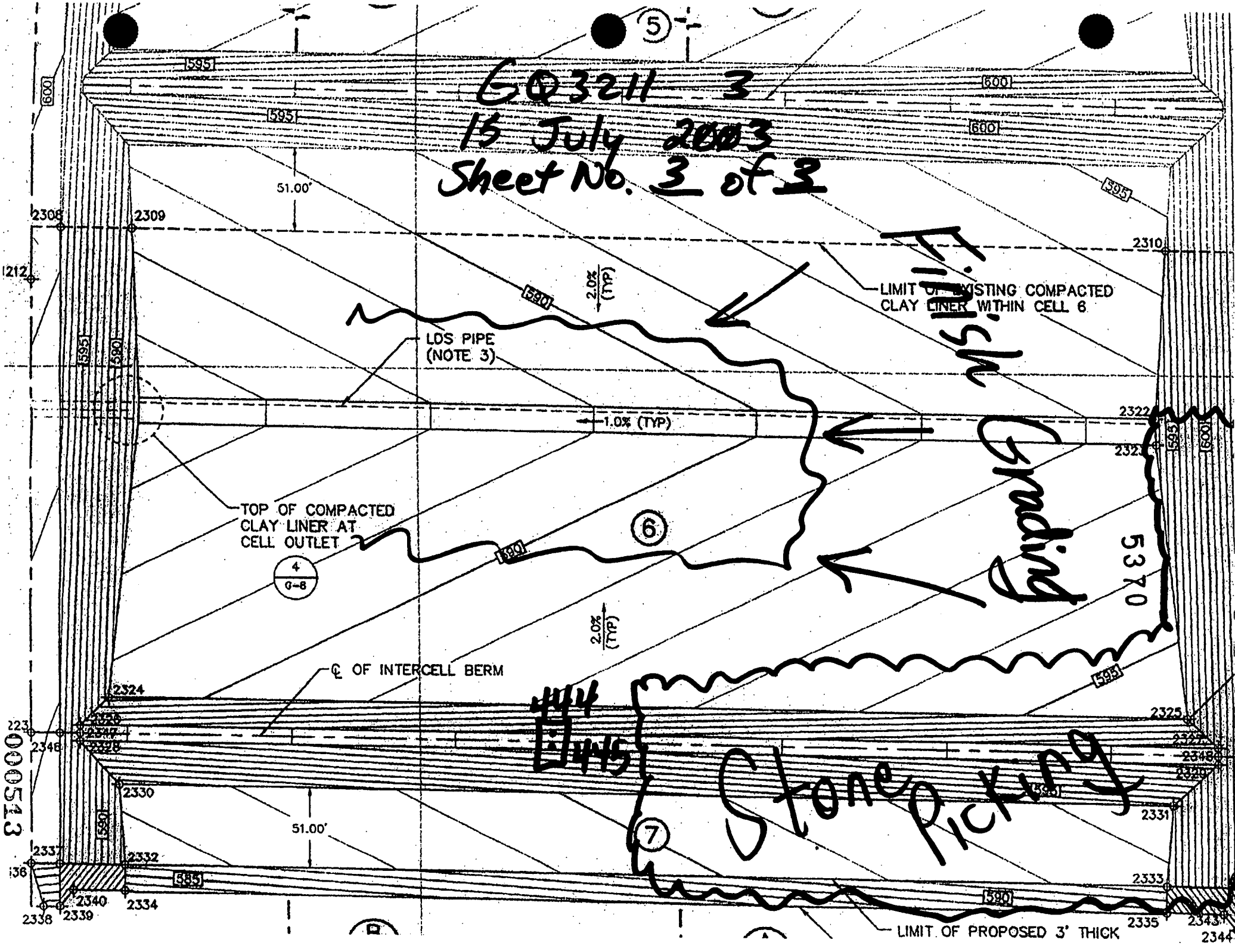
000512

GQ3211 3
15 July 2003
Sheet No. 3 of 3

Finish Grading

Stone Picking

5370



000543

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 16 day July month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED) 8"

MATERIAL SOURCE: Stockpile 02-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8211x + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-446	West Bench Cell #6	6" / L-4	02-10	12.1	123.6	12.9 / 14.4	136.9	119.7	96.8	P	—	—	—	—
CL03-447	West Bench Cell #6	6" / L-5	02-10	12.1	123.6	11.9 / 13.5	138.4	121.9	98.6	P	—	—	—	—
CL03-448	West Bench Cell #6	6" / L-6	02-10	12.1	123.6	10.8 / 12.6	139.9	124.2	100.5	P	—	—	—	—

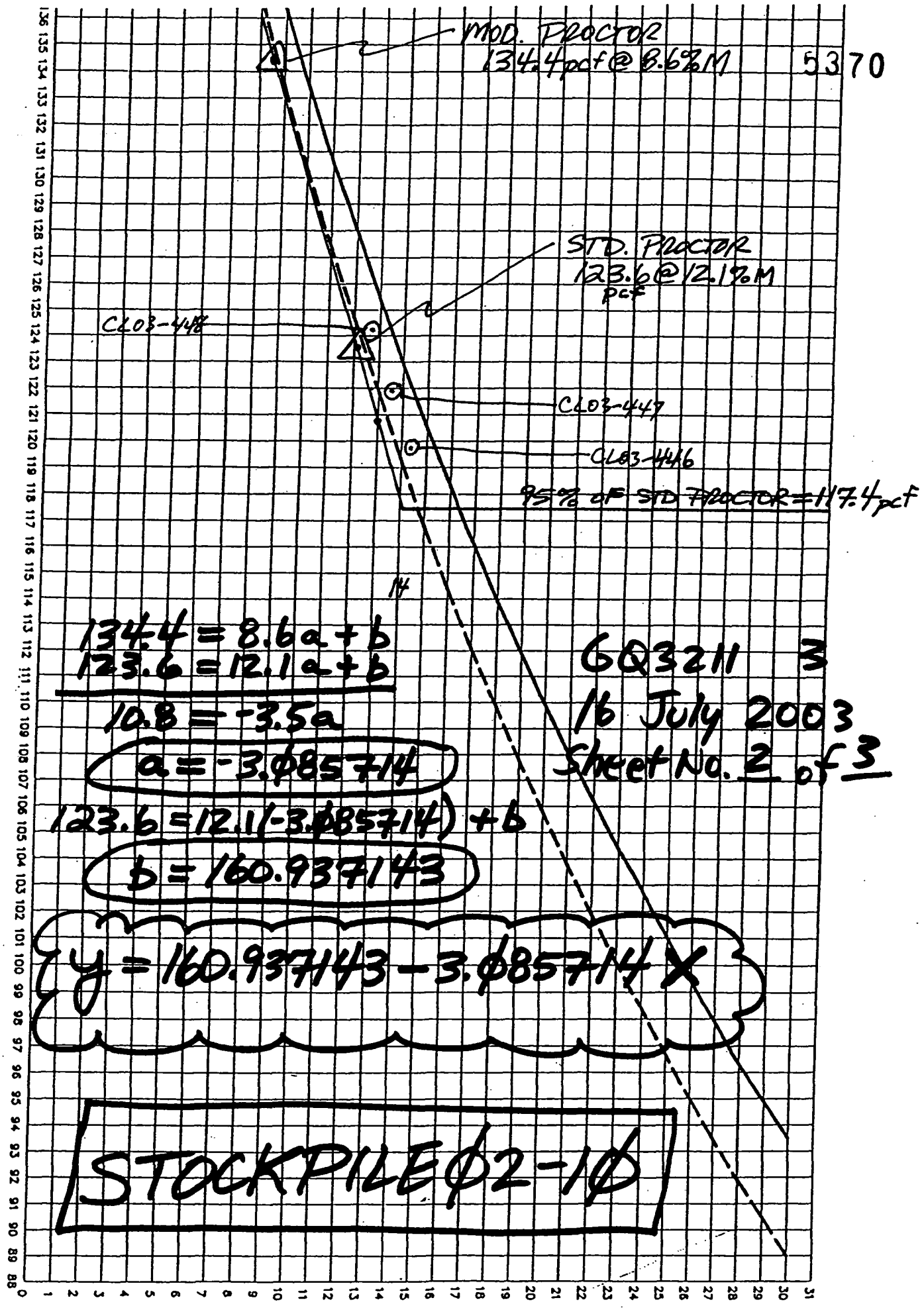
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 1 OF 3

0000514

63 70



5370

$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

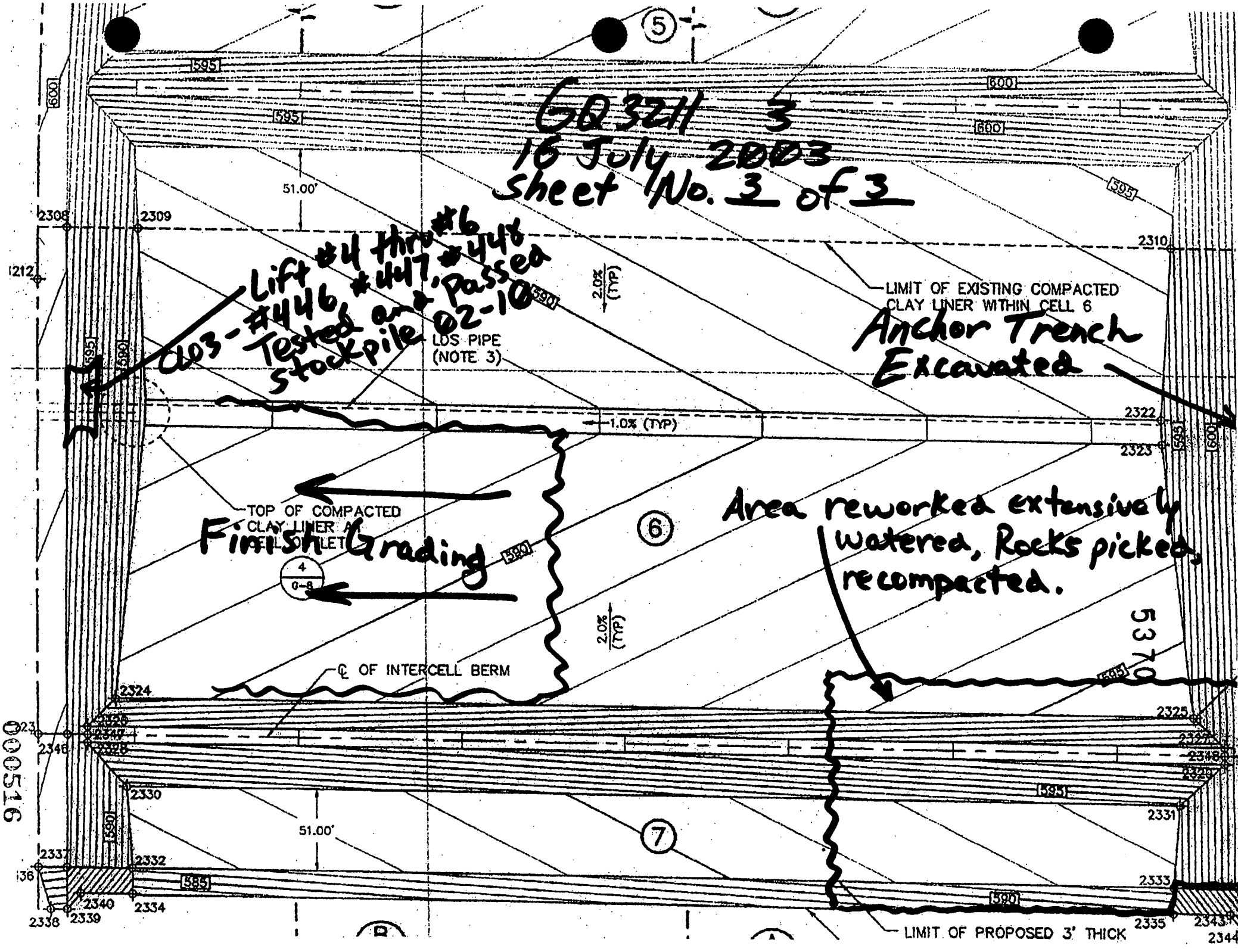
$b = 160.937143$

$y = 160.937143 - 3.085714x$

STOCKPILE 02-10

6Q3211 3
16 July 2003
Sheet No. 2 of 3

000515


GQ 3211 3
16 July 2003
Sheet No. 3 of 3
Lift #4 thru #6
#446, #447, #448
Tested and passed
Stockpile @ 2-10
LDS PIPE
(NOTE 3)
LIMIT OF EXISTING COMPACTED
CLAY LINER WITHIN CELL 6
Anchor Trench
Excavated
1.0% (TYP)
2.0%
(TYP)
TOP OF COMPACTED
CLAY LINER AT
FINISH GRADE
Finish Grading
Area reworked extensively
watered, Rocks picked,
recompacted.
℄ OF INTERCELL BERM
LIMIT OF PROPOSED 3' THICK
51.00'
5370
0005516

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: ~~4.1~~ 3

DESCRIPTION: Phase V

DATE: 18 day July month 2003 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile Ø2-10 MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: LP Clay LIFT THICKNESS (CIRCLE ONE) (LOOSE/COMPACTED): ≈8"

% COMPACTION: 95 MOISTURE RANGE: 0 – +3% ASTM D 698: A (B) C (CIRCLE ONE) / ASTM D 1557: A B C

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 0.8311X + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
CL03-449	West Bench	6"/L-7	Ø2-1Ø	12.1	123.6	10.3/12.2	139.0 /	123.9 /	100.2	P	—	—	—	—	—
CL03-450	West 4:1 Slope	6"/L-6	Ø2-1Ø	12.1	123.6	13.4/14.8	137.1 /	119.4 /	96.6	P	—	—	—	—	—

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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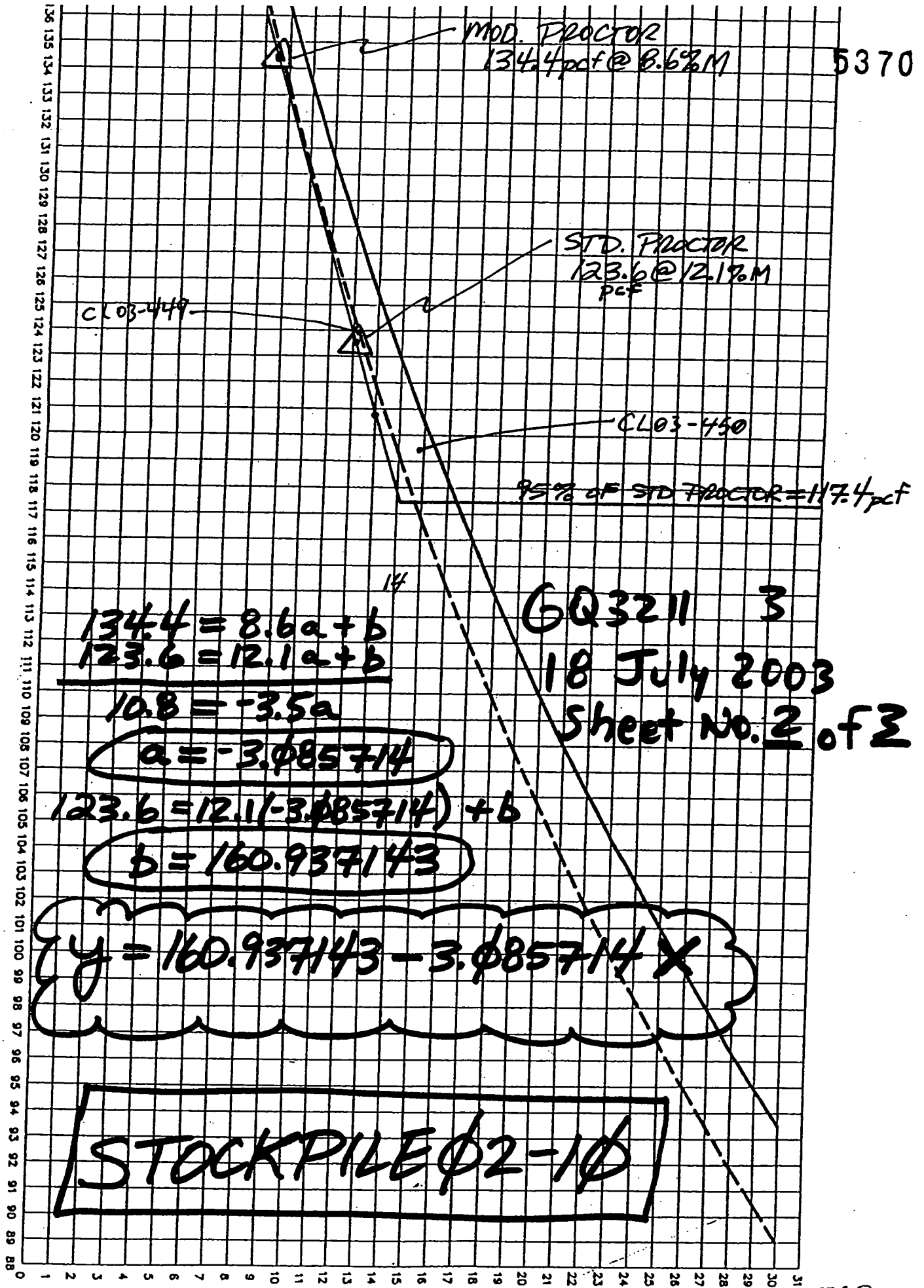


$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

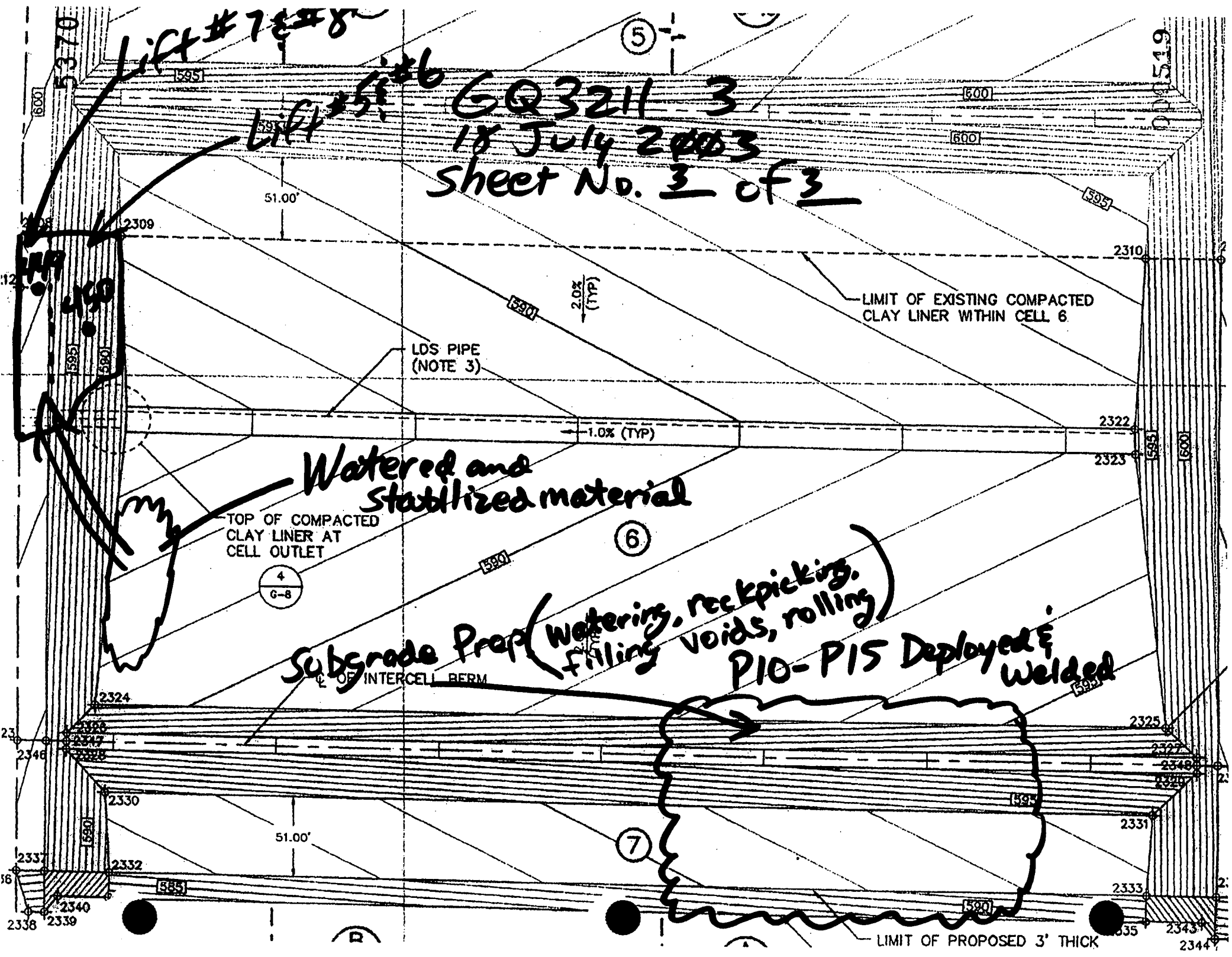
$b = 160.937143$

$y = 160.937143 - 3.085714x$

GQ3211 3
18 July 2003
Sheet No. 2 of 2

[STOCKPILE02-10]

000518


Lift #7 & #8
Lift #5 & #6
GQ3211 3
18 July 2003
Sheet No. 3 of 3
5370
001519
5
6
7
595
600
590
585
51.00'
2309
2310
2322
2323
2324
2325
2326
2327
2328
2330
2331
2332
2333
2337
2338
2339
2340
2343
2344
2346
2348
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
2.0% (TYP)
LDS PIPE (NOTE 3)
1.0% (TYP)
Watered and Stabilized material
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
Subgrade Prep (watering, rockpicking, filling voids, rolling)
P10-P15 Deployed & Welded
℄ OF INTERCELL BERM
LIMIT OF PROPOSED 3' THICK

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 4.13

DESCRIPTION: Phase V

DATE: 25 day July month 2003 year

SPECIFICATION REQUIREMENTS

SOURCE: SP 02-10 MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: _____ LIFT THICKNESS (CIRCLE ONE) (LOOSE/COMPACTED): ≈7"

% COMPACTION: 95 MOISTURE RANGE: 0-+3% ASTM D 698: (CIRCLE ONE) A (B) C / ASTM D 1557: A B C

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 0.8311 + 3.6556 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
CL03-451	West 4:1 Slope	6" L-7	02-10	12.1	123.6	11.5/13.2	137.5	121.5	98.3	P	—	—	—	—	—

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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CHECKED BY: [illegible]

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53370

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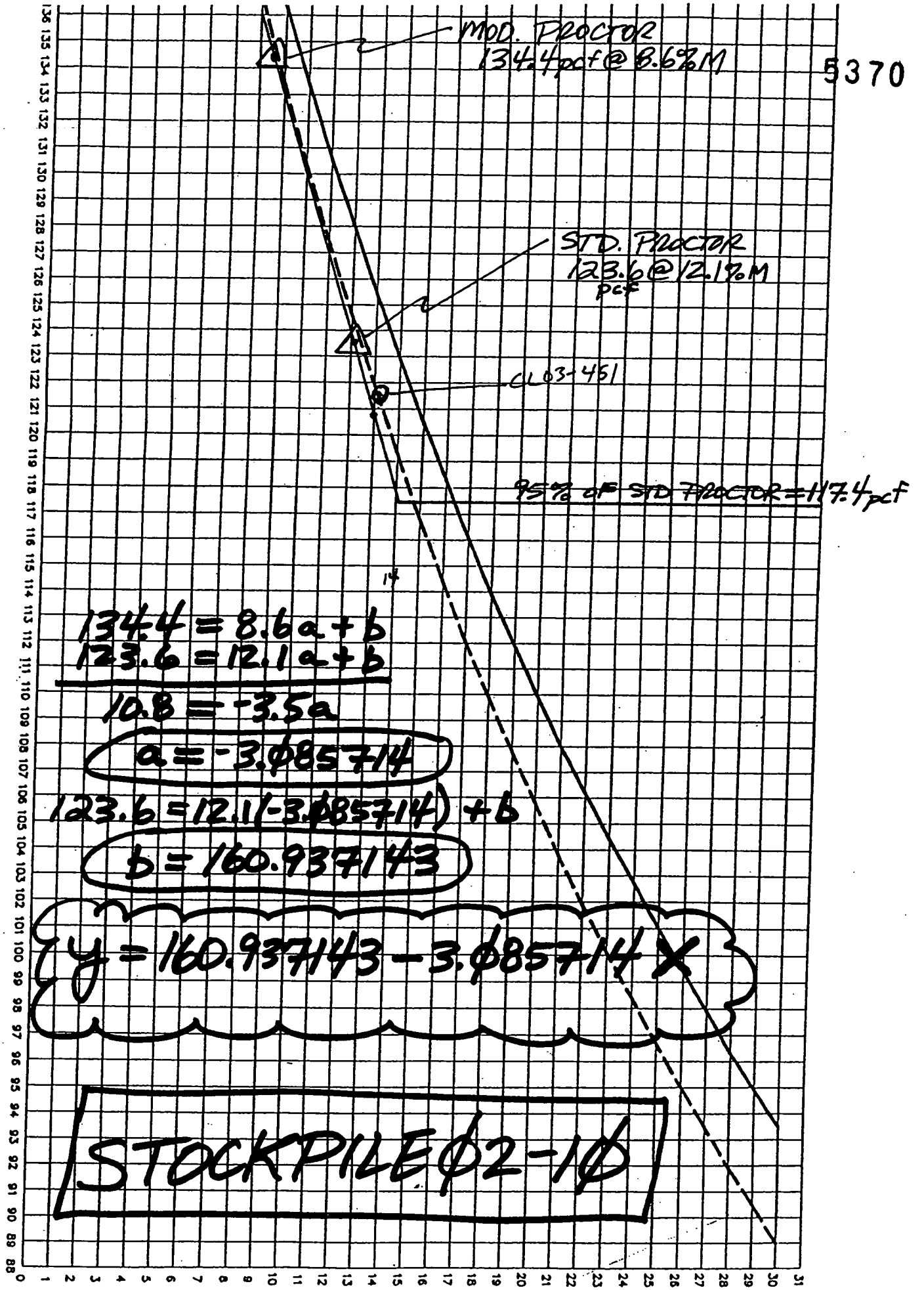


$134.4 = 8.6a + b$
$123.6 = 12.1a + b$

$10.8 = -3.5a$

$a = -3.085714$

$123.6 = 12.1(-3.085714) + b$

$b = 160.937143$

$y = 160.937143 - 3.085714x$

STOCKPILE02-10

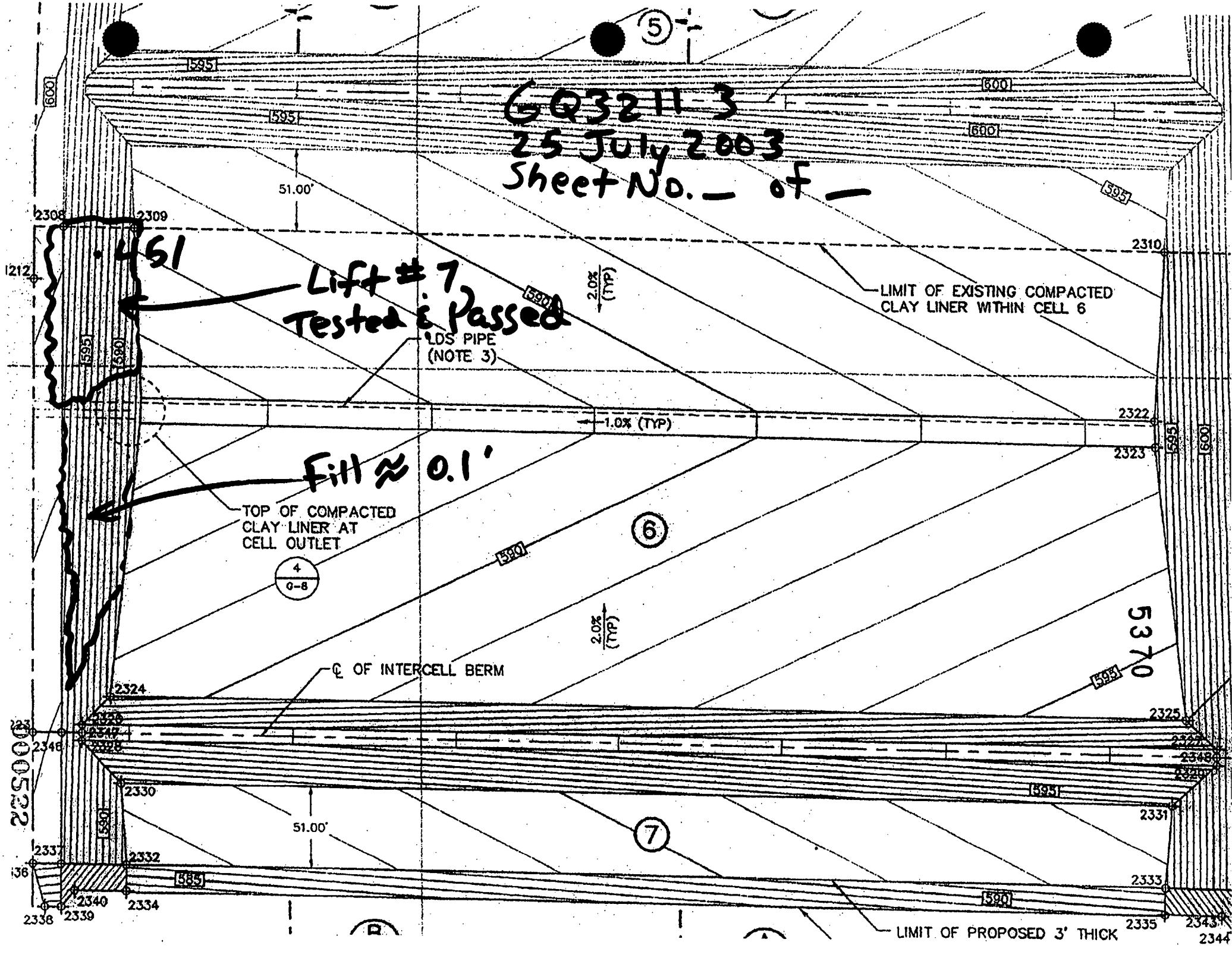
000521

GQ3211-3
25 July 2003
Sheet No. _ of _

Lift #7
Tested & Passed

Fill ≈ 0.1'

5370



000522

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V Cell #6 & 7

PROJECT NO.: GQ3211 TASK NO.: ~~4.1~~ 3

DATE: 7 day 8 month 2003 year

SPECIFICATION REQUIREMENTS

SOURCE: _____ MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: Clay 02-12 LIFT THICKNESS (CIRCLE ONE) (LOOSE) COMPACTED): _____

% COMPACTION: 95% MOISTURE RANGE: 0,+3% ASTM D 698: (CIRCLE ONE) A (B) C / ASTM D 1557: A B C

NUCLEAR GAUGE TYPE: 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 0.8311X + 3.6556 QA ID: _____

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
CL03-452	Cell #6, Sump	8/L-2	02-12	13.9	119.0	~~14.1~~ 14.1	135.3	~~114.2~~ 117.3	~~96.0~~ 98.5	P	—	—	—	—	—
CL03-453	↓	8/L-3	↓	↓	↓	~~14.6~~ 15.8	133.4	~~113.7~~ 115.4	~~95.0~~ 96.8	P	—	—	—	—	—
CL03-454		8/L-4				14.7 ~~15.9~~	132.1	~~113.1~~ 114.9	~~95.0~~ 95.8	P	—	—	—	—	—

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

©GEOSYNTEC CONSULTANTS FILE NO.: B-60711.0 CHECKED BY: [illegible]

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V

DATE: 20 day october month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ≈8"

MATERIAL SOURCE: SP 02-12 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.831X+3.~~3669~~ 6556 CHW QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-~~452~~ 455	Cell #6 East Wedge	6"/L-2	02-12	13.9	119.0	13.5 / 14.9	136.7	119.0	100.0	P	—	—	—	—
CL03-~~453~~ 456	↓	6"/L-2	02-12	13.9	119.0	12.6 / 14.1	136.5	119.6	100.5	P	—	—	—	—
CL03-~~454~~ 457	Cell #7 East Wedge	6"/L-2	02-12	13.9	119.0	13.5 / 14.9	135.8	118.2	99.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH SHEET NO. 1 OF 3

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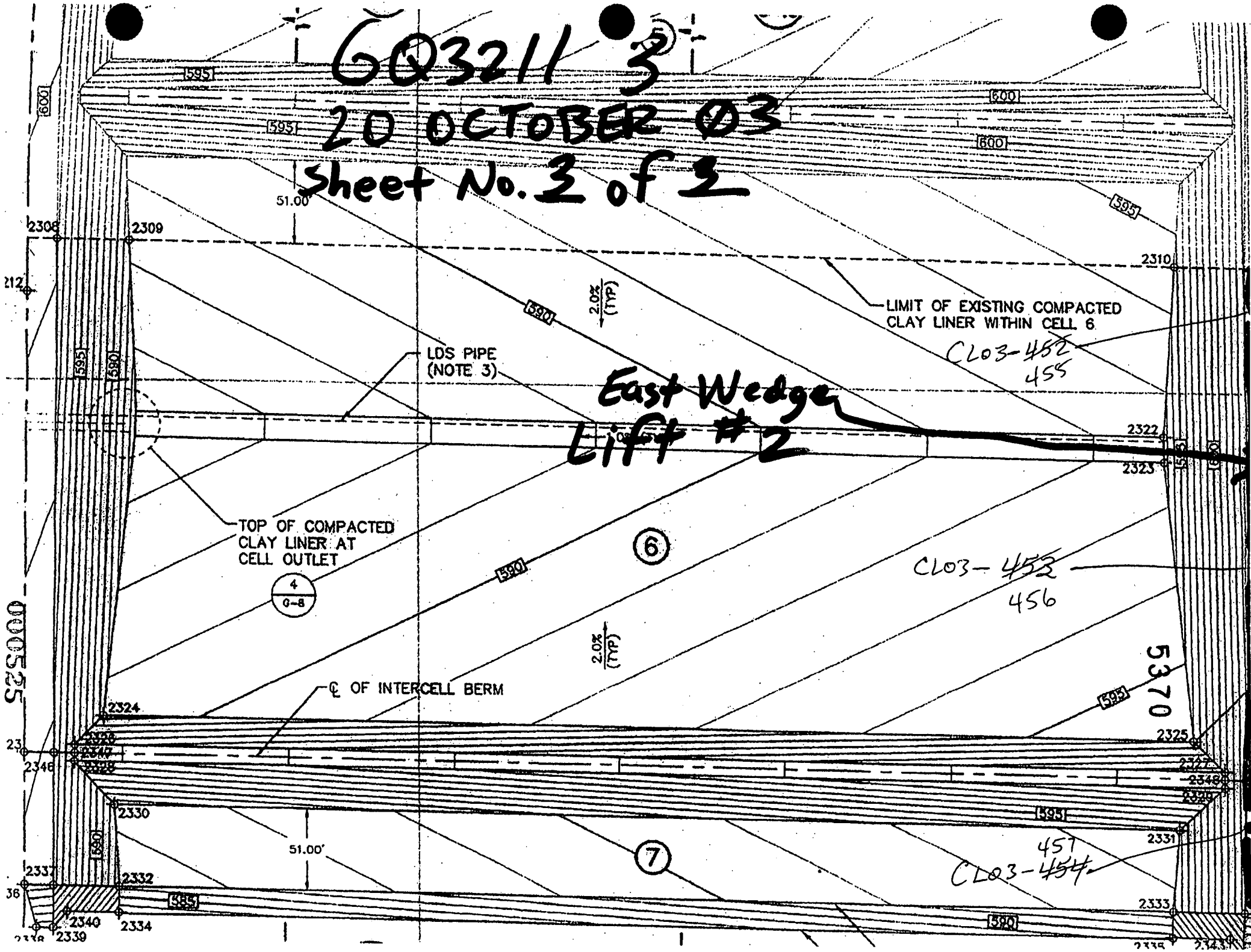
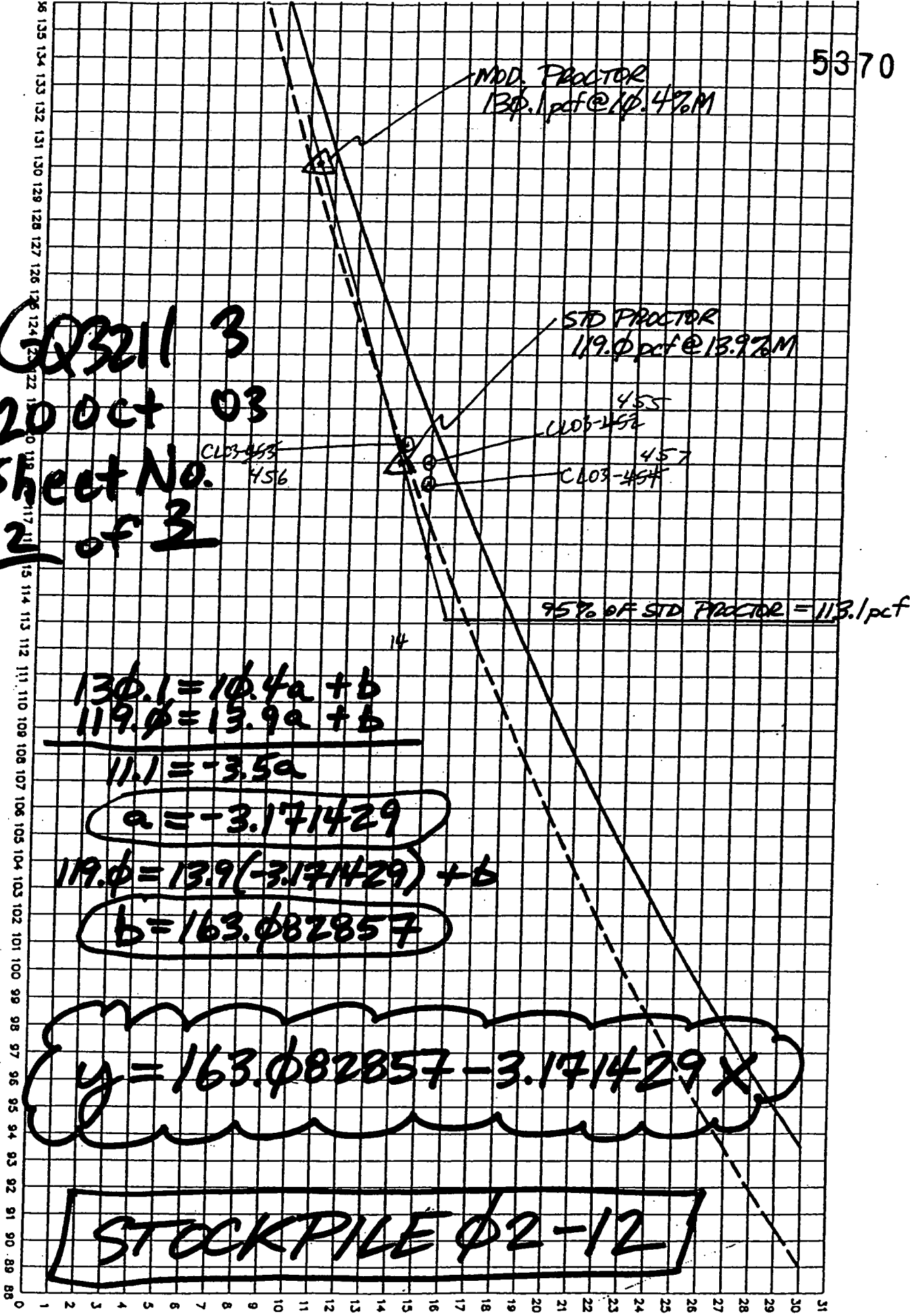
GQ3211 3
20 OCTOBER 03
Sheet No. 3 of 3





GQ3211 3
20 Oct 03
Sheet No. 2 of 3

$130.1 = 10.4a + b$
$119.0 = 13.9a + b$

$11.1 = -3.5a$

$a = -3.171429$

$119.0 = 13.9(-3.171429) + b$

$b = 163.082857$

$y = 163.082857 - 3.171429x$

[STOCKPILE 02-12]

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 3

DATE: 21 day October month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE +0-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/7"

MATERIAL SOURCE: SP 02-12

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: SS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-458	East Clay Wedge	L-3/ 6"	02-12	13.9	119.0	14.3 / 15.5	134.6	116.5	97.9	P	—	—	—	—
CL03-459	↓	6" / L-3	02-12	13.9	119.0	13.5 / 14.9	135.6	118.0	~~97.9~~ 99.2	P	—	—	—	—
CL03-460		6" / L-3	02-12	13.9	119.0	14.1 / 15.4	135.0	118.0 / 117.0	98.3	P	—	—	—	—
CL03-461		6" / L-4	02-12	13.9	119.0	12.7 / 14.2	136.3	119.4	100.3	P	—	—	—	—
CL03-462		6" / L-4	02-12	13.9	119.0	14.0 / 15.3	135.7	117.7	98.9	P	—	—	—	—
CL03-463		6" / L-4	02-12	13.9	119.0	15.6 / 16.6	134.3	115.2	96.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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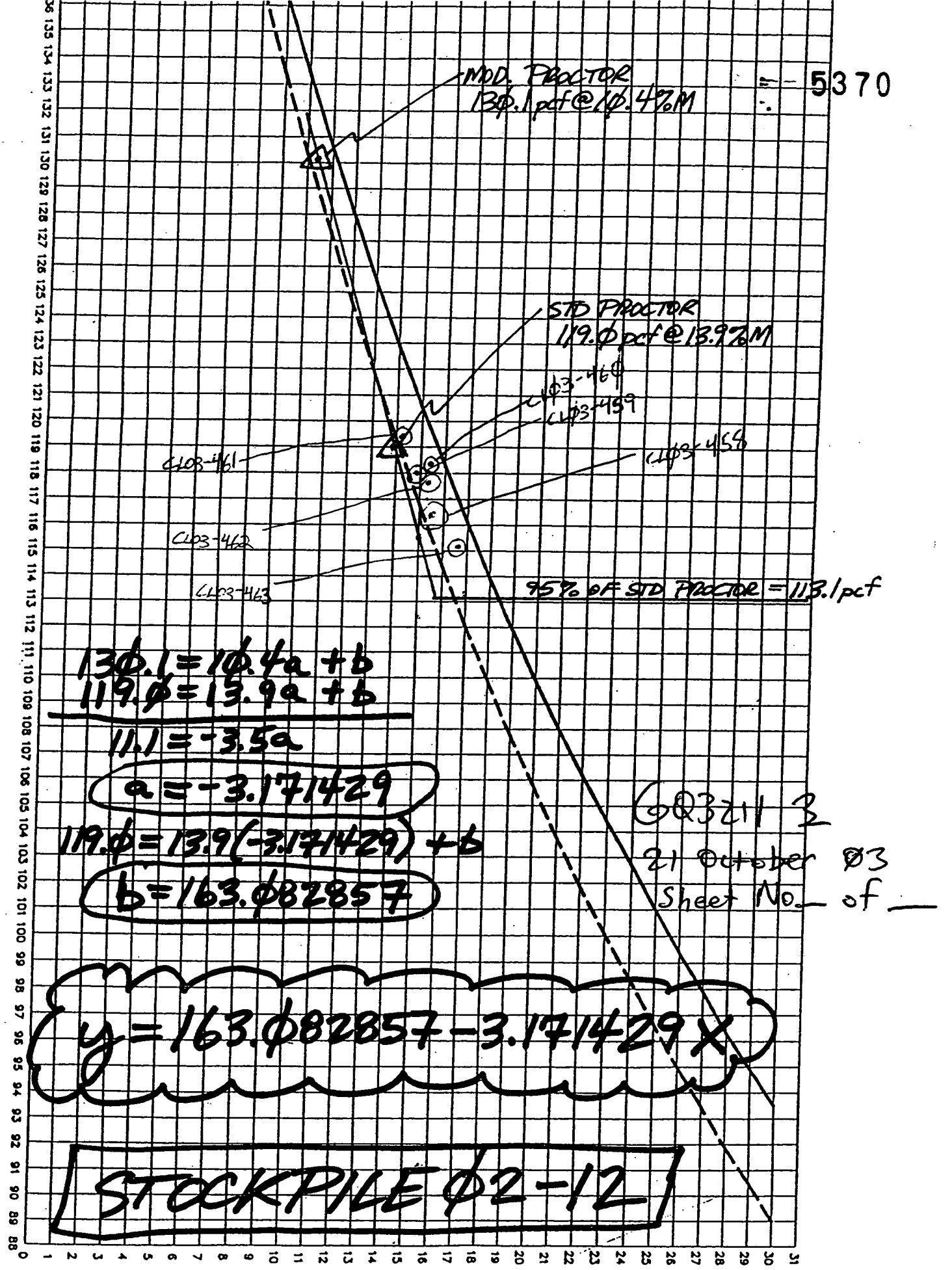


$130.1 = 10.4a + b$
$119.0 = 13.9a + b$

$11.1 = -3.5a$

$a = -3.171429$

$119.0 = 13.9(-3.171429) + b$

$b = 163.082857$

$y = 163.082857 - 3.171429x$

STOCKPILE 02-12

GQ3211 3
21 October 03
Sheet No. ___ of ___

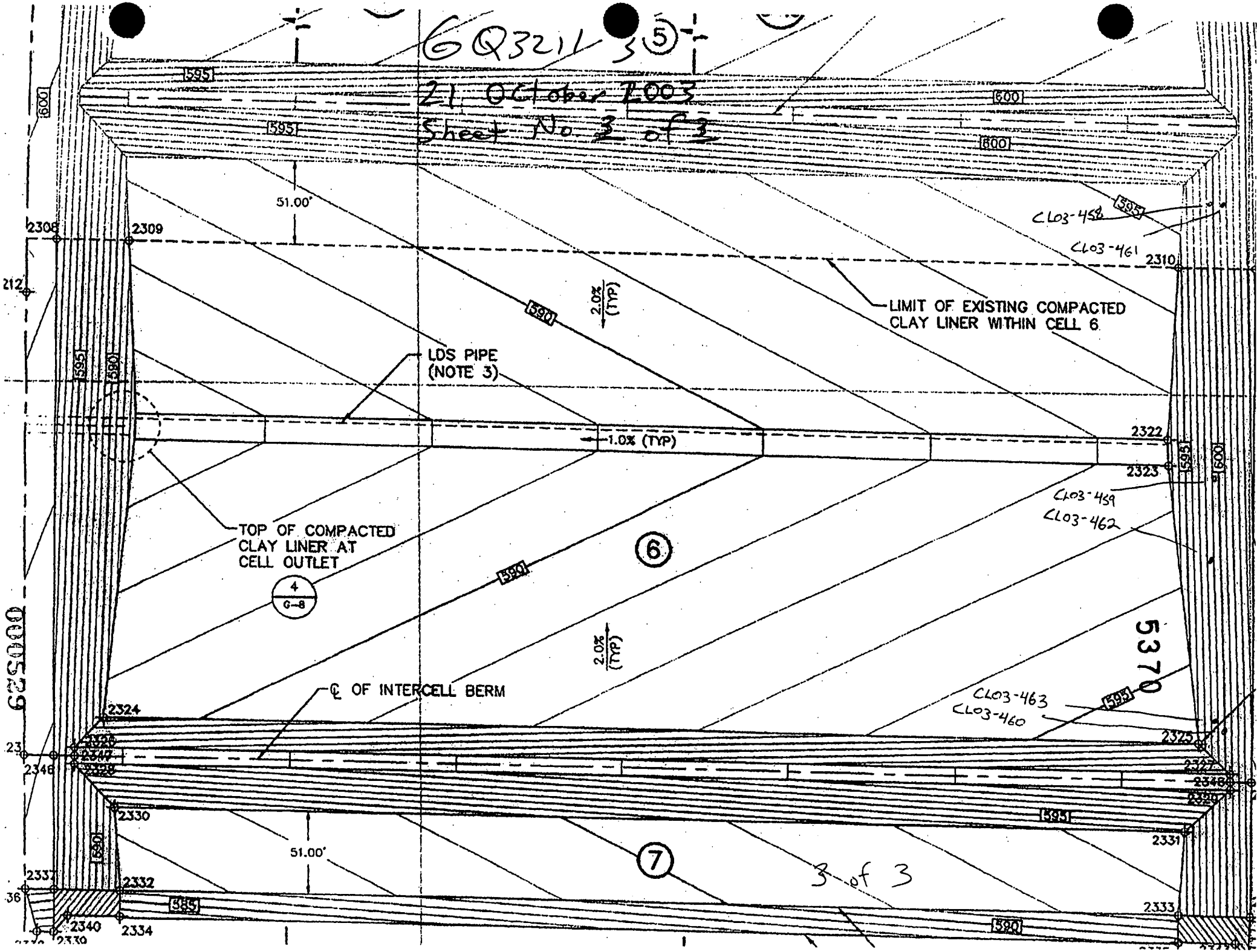
2 of 3

000538

GQ3211 3 5

21 October 2003

Sheet No. 3 of 3



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V

PROJECT NO.: GQ3211 TASK NO.: 03

DATE: 22 day Oct month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 2"

MATERIAL SOURCE: SP02-12 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8311x + 3.6556 QA ID: 55

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL03-464	East Clay Wedge	6" / L-5	02-12	13.9	119.0	16.2 / 17.1	132.2	112.9	94.9	—	F	CL03-468	P	—
CL03-465	↓	6" / L-5	02-12	13.9	119.0	15.8 / 16.8	133.1	114.0	95.8	P		~~CL03-469~~	~~P~~ 22	—
CL03-466		6" / L-5	02-12	13.9	119.0	12.3 / 13.9	134.4	118.0	99.2	—	F	CL03-469	P	—
CL03-467		6" / L-5	02-12	13.9	119.0	12.3 / 13.9	137.7	120.9	101.6	P	—	—	—	—
CL03-468		6" / L-5	02-12	13.9	119.0	13.8 / 15.1	133.2	~~117.0~~ 115.7	~~98.3~~ 97.2	P	—	—	—	—
CL03-469	↓	6" / L-5	02-12	13.9	119.0	13.9 / 15.2	133.8	116.1	97.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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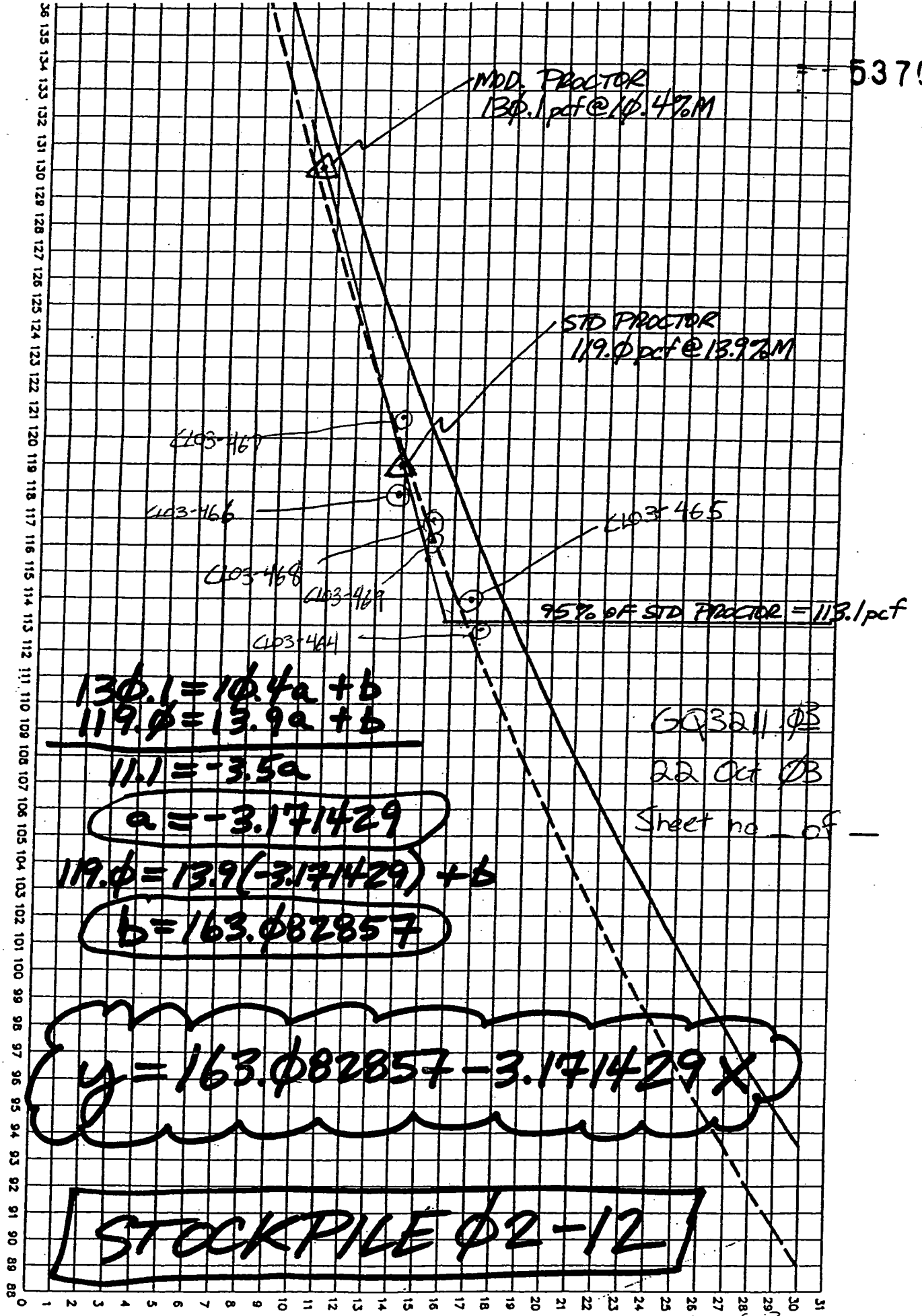

$130.1 = 10.4a + b$
$119.0 = 13.9a + b$

$11.1 = -3.5a$

$a = -3.171429$

$119.0 = 13.9(-3.171429) + b$

$b = 163.082857$

$y = 163.082857 - 3.171429x$

STOCKPILE 02-12

GQ3211.03
22 Oct 03
Sheet no _ of _

2 of 3

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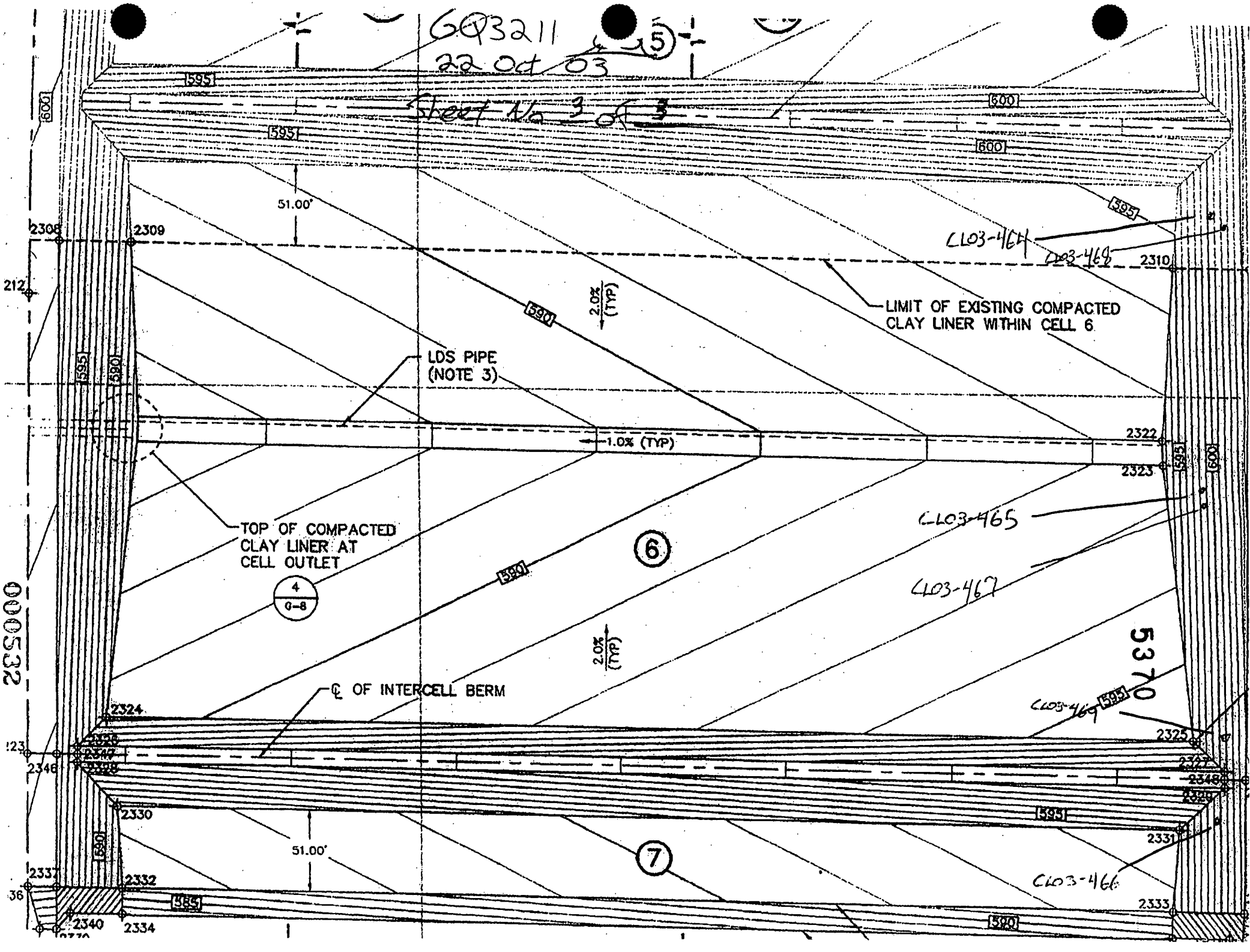
G93211
22 Oct 03
5
Sheet 1 of 3
595
600
590
51.00'
2308
2309
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212
2322
2323
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123
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2348
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2331
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2334
2337
2340
36
2.0% (TYP)
1.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
6
7
℄ OF INTERCELL BERM
CL03-464
CL03-465
CL03-467
CL03-466
5370
000532

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G03211 TASK NO.: 3

DESCRIPTION: CELL 6 - CLAY WEDGE WEST (W.C.W)

DATE: 28 day OCT month 2003 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +-03% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 02-12 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = (0.8311) x + 3.6556 QA ID: RH

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL03-470	N. End Cell 6 W.C.W.	6"/2	02-12	13.9	119.0	14.8 / 16.0	136.7	117.8	99.0%	P	—			
CL03-471	CENTER CELL 6 W.C.W	6"/2	02-12	13.9	119.0	14.8 / 16.0	133.6	115.2	96.8%	P	—			
CL03-472	S. End Cell 6 W.C.W.	6"/2	02-12	13.9	119.0	15.1 / 16.2	134.6	115.8	97.3%	P	—			
CL03-473	N. End Cell 6 W.C.W	6"/3	02-12	13.9	119.0	12.5 / 14.0	137.5	120.6	101.3%	P	—			
CL03-474	CENTER CELL 6 W.C.W.	6"/3	02-12	13.9	119.0	11.8 / 13.5	138.9	122.4	103%	—	F	CL03-475	P	—
CL03-475	CENTER CELL 6 W.C.W.	8"/3	02-12	13.9	119.0	12.3 / 13.9	139.4	122.4	103%	P	—			
CL03-476	SOUTH End CELL 6 W.C.W.	8"/3	02-12	13.9	119.0	12.9 / 14.4	134.7	117.7	98.9%	P	—			
		/	02-12	13.9	119.0									
		/	02-12	13.9	119.0									
		/	02-12	13.9	119.0									

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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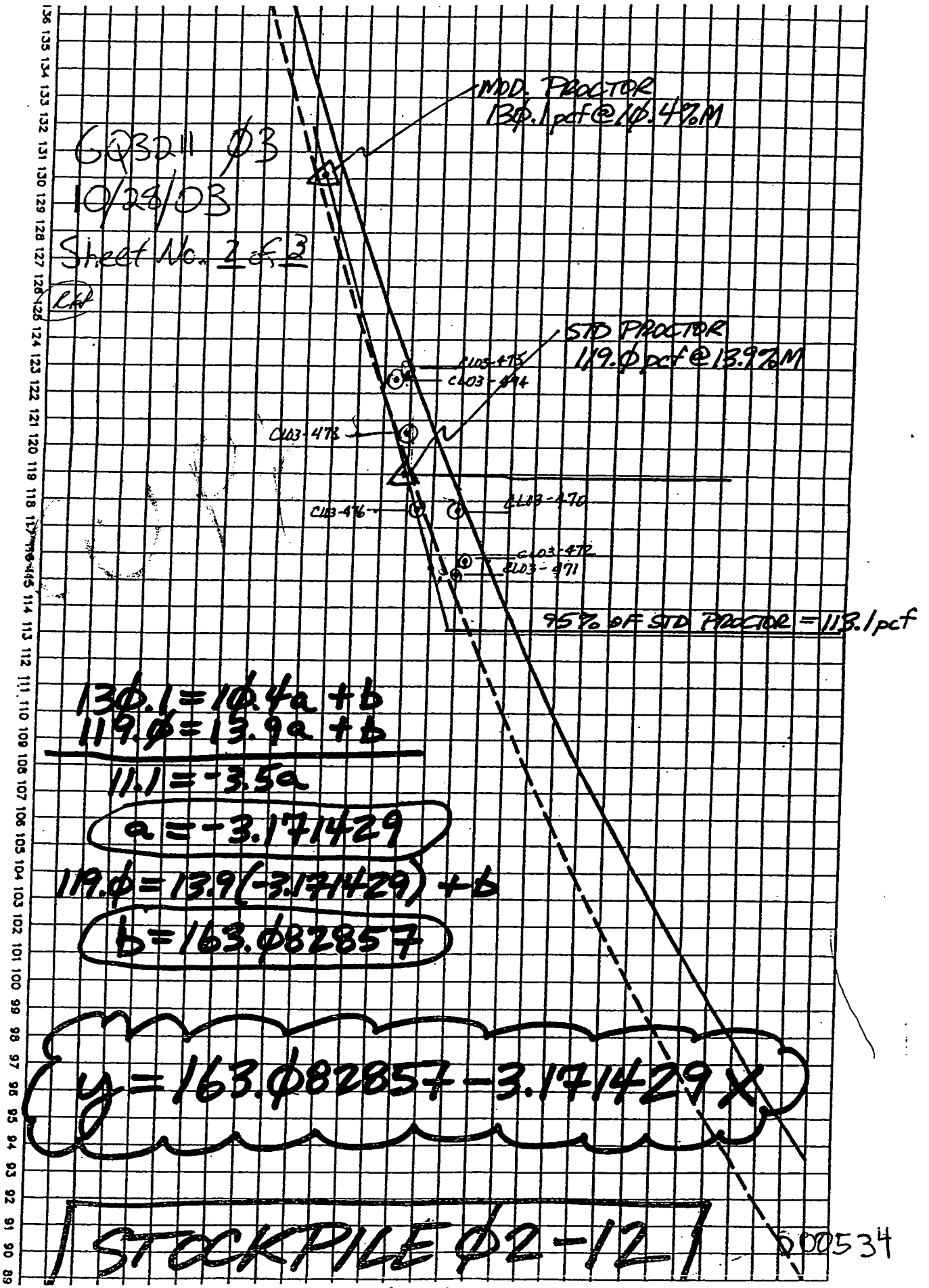


$130.1 = 10.4a + b$
$119.0 = 13.9a + b$

$11.1 = -3.5a$

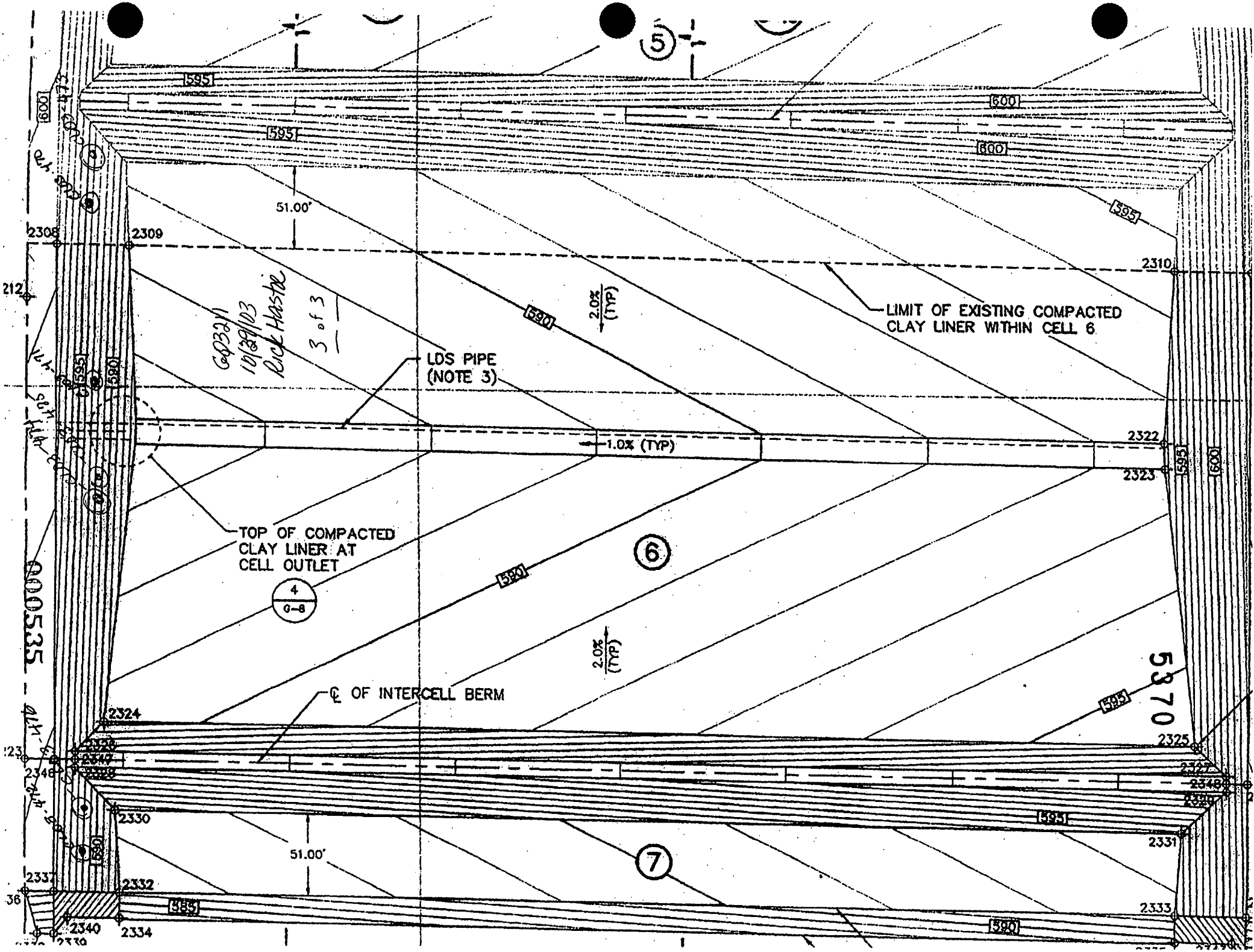
$a = -3.171429$

$119.0 = 13.9(-3.171429) + b$

$b = 163.082857$

$y = 163.082857 - 3.171429x$

STOCKPILE 02-12


5
595
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51.00'
2308
2309
2310
212
590
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
1.0% (TYP)
2322
2323
595
600
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
6-8
6
590
2.0% (TYP)
℄ OF INTERCELL BERM
595
2324
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2348
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595
2331
51.00'
7
2337
2332
585
2333
2340
2334
590
000535
5370

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #6 - CLAY WEST WEDGE - PHASE V

PROJECT NO.: G03211 TASK NO.: 3

DATE: 29 day OCT month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 02-12 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = (0.8311)X + 3.6556 QA ID: RH

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
C103-477	N. End Cell #6 W.C.W.	8" / 4	02-12	13.9	119.0	12.7 / 14.2	135.4	118.6	99.6%	P	–	–	–	–
C103-478	Center Cell #6 W.C.W	8" / 4	02-12	13.9	119.0	12.3 / 14.0	139.0	121.9	102%	P	–	–	–	–
C103-479	S. End Cell #6 W.C.W	8" / 4	02-12	13.9	119.0	12.6 / 14.1	135.8	119.0	100%	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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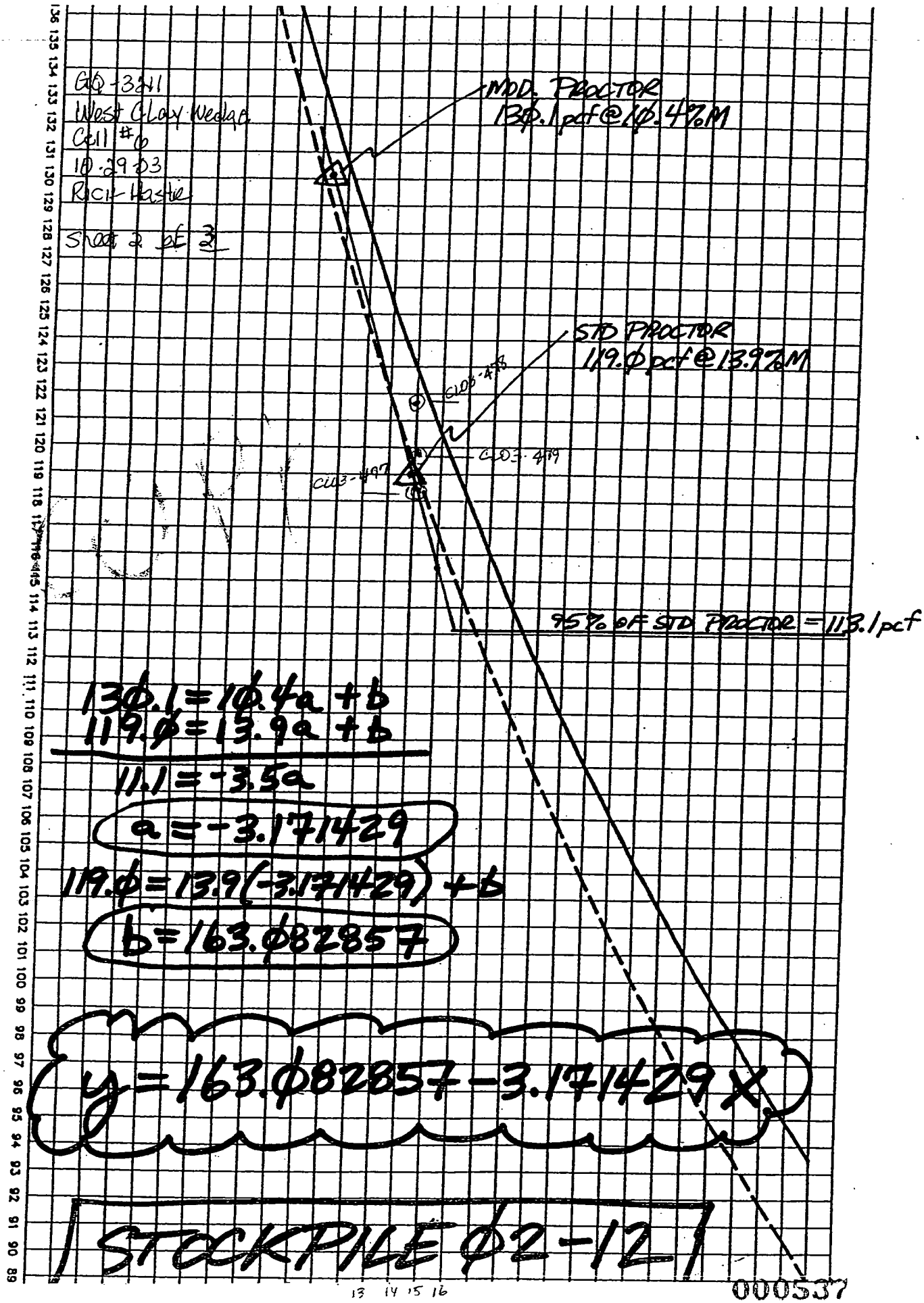


$130.1 = 10.4a + b$
$119.0 = 13.9a + b$

$11.1 = -3.5a$

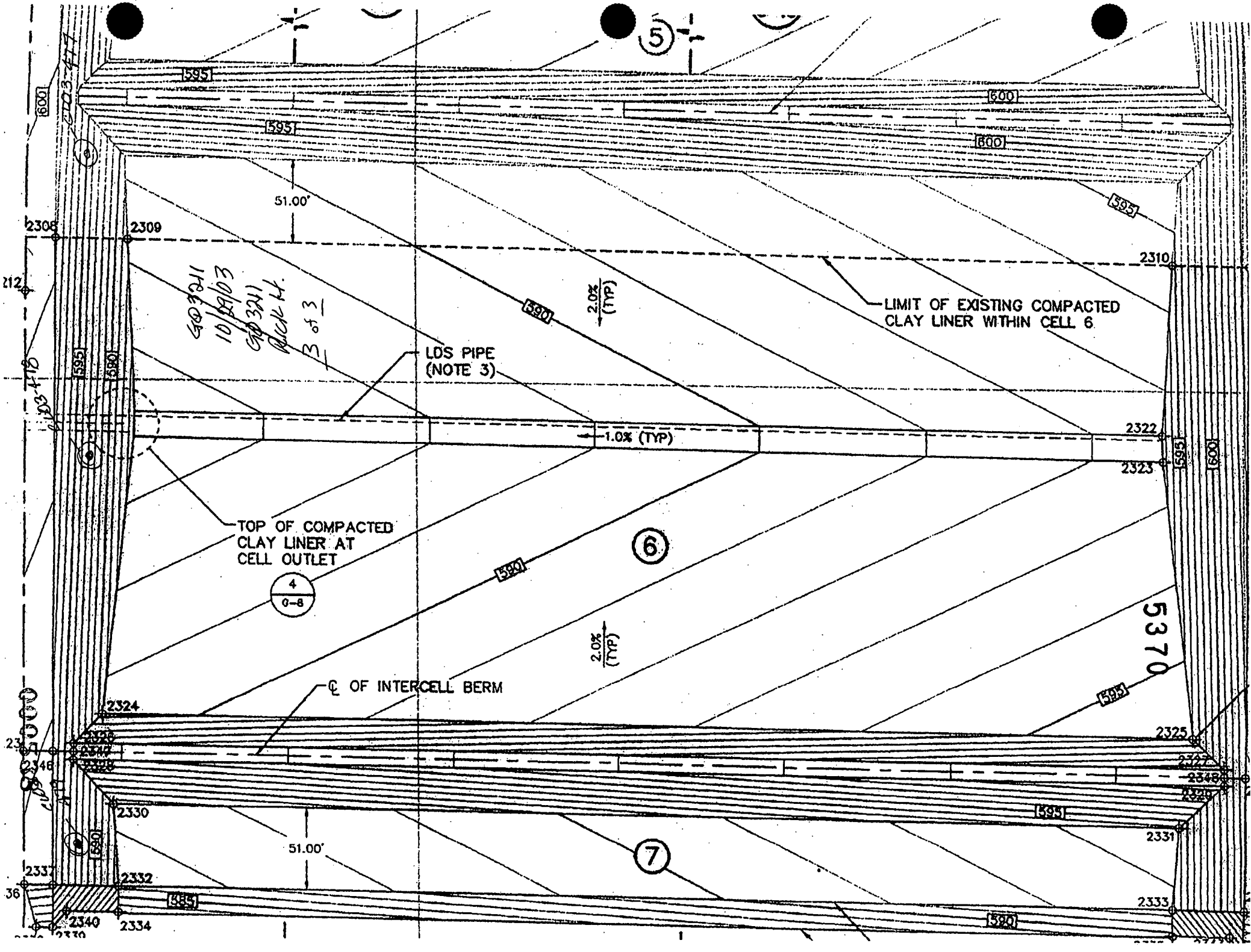
$a = -3.171429$

$119.0 = 13.9(-3.171429) + b$

$b = 163.082857$

$y = 163.082857 - 3.171429x$

STOCKPILE 02-12


5
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51.00'
2308
2309
2310
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590
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
1.0% (TYP)
2322
2323
595
600
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
6
590
2.0% (TYP)
5370
595
℄ OF INTERCELL BERM
2324
2325
2330
595
2331
51.00'
7
2332
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585
2340
2334
590

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #6 WEST CLAY WEDGE - PHASE V

PROJECT NO.: G03211 TASK NO.: 3

DATE: 31 day OCT month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: 02-12 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = (.8311)X + 3.6656 QA ID: RW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
C103-480	South End W.W.-C6	8"/5	02-12	13.9	119.0	15.0 ~~16.1~~	~~130.8~~ 134.8 RW	113.5	95.3	P	-	—	—	—
C103-481	Center W.W.-C6	8"/5	02-12	13.9	119.0	14.0 @ ~~15.2~~ 15.3	135.3	117.4 ~~118.7~~ @	99.7	P	-	—	—	—
C103-482	North W.W.-C6	8"/5	02-12	13.9	119.0	14.1 @ ~~15.5~~ 15.4	135.9	117.8 ~~119.1~~ @	100	P	-	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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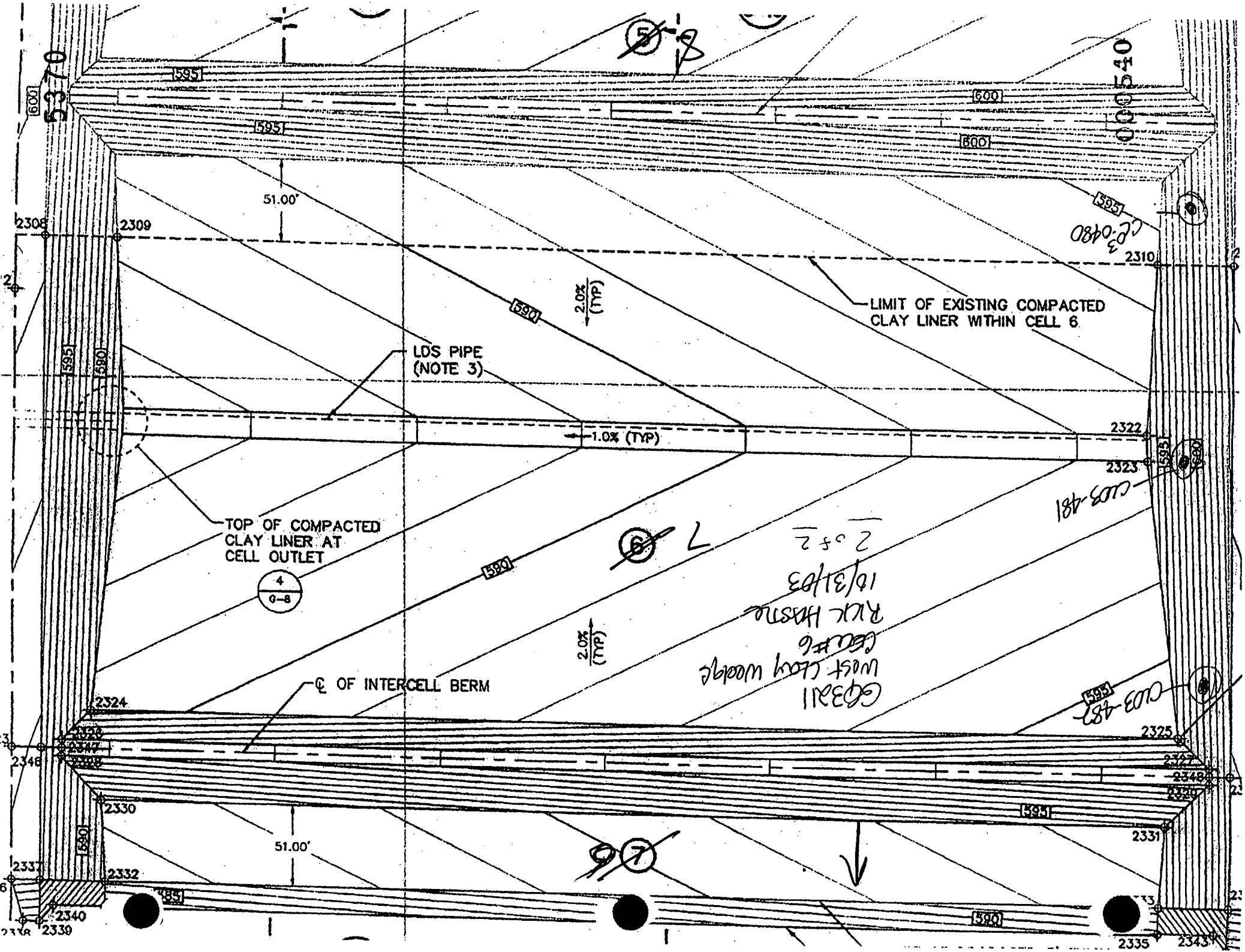
53370
000540
595
600
51.00'
2308
2309
2310
590
2.0% (TYP)
LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 6
LDS PIPE (NOTE 3)
580
1.0% (TYP)
2322
2323
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
4
G-8
℄ OF INTERCELL BERM
2324
2325
2346
2330
2331
2332
2337
2340
2339
2335
2343
CE3-480
CE3-481
CE3-481
CE3311
West Clay wedge
Cell #6
Rick Hastie
10/31/03
2 of 2

DRIVE CYLINDER TESTS

CELL 2 CAP

GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase D DATE: 14 day May month 2003 year

TEST NO.: ~~CC03-2 FS 1~~ DCØ3-1

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY OTHER:

% COMPACTION: 95% w/ Apz MOISTURE CONTENT RANGE: +3%

FDT LOCATION: Cell 2 Cap FDT TEST NO.: CCØ3-2

FIELD TEST DATA – ASTM D 2937 QA ID: DIE

A	CYLINDER NO. 63-11 VOLUME[1] 2660.3 g (cf)	0033354	E	WET UNIT WEIGHT = D/A (lbs)	134.Ø
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.87	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	113.6
C	WEIGHT OF CYLINDER 616.4g (lbs)	1.40	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.47			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. *662 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	87.4
P	WT. OF WET SOIL & TARE (grams)	581.6	S	WT. OF DRY SOIL = Q–O (grams)	485.9
Q	WT. OF DRY SOIL & TARE (grams)	494.2	T	MOISTURE CONTENT = (R/S)X100 (%)	18.Ø

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: _____

DELTA MOISTURE CONTENT = T – U	1.5	U	FDT MOISTURE CONTENT (%)	15.5/16.5
FDT WET UNIT WT. (pcf)	133.9	V	FDT DRY UNIT WT. (pcf)	114.9
DELTA DRY UNIT WT. = F – V	-1.3		FDT #	CCØ3-2

COMMENTS:

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5370

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 15 day May month 2003 year

TEST NO.: 1 DC03-2

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

% COMPACTION: 95% W/ APZ MOISTURE CONTENT RANGE: +3% ~~W APZ~~ KS

FDT LOCATION: Cell 2 Cap FDT TEST NO.: CC03-23

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 03-05 VOLUME[1] (cf)	0.033465	E	WET UNIT WEIGHT = D/A (lbs)	133.3
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.80	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	118.4
C	WEIGHT OF CYLINDER (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.46			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 626 (grams)	8.0	R	WT. OF WATER = P–Q (grams)	42.9
P	WT. OF WET SOIL & TARE (grams)	391.7	S	WT. OF DRY SOIL = Q–O (grams)	340.8
Q	WT. OF DRY SOIL & TARE (grams)	348.8	T	MOISTURE CONTENT = (R/S)X100 (%)	12.6 1.12

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.7 (pcf) OPTIMUM MOISTURE CONTENT 12.2 ~~+3~~ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	~~2.3~~ 0.4	U	FDT MOISTURE CONTENT (%)	14.3/12.2
FDT WET UNIT WT. (pcf)	137.9	V	FDT DRY UNIT WT. (pcf)	122.9
DELTA DRY UNIT WT. = F – V	-4.5		FDT #	

COMMENTS:

000544

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FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 22 day May month 2003 year

TEST NO.: DC03-3

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95% w/ Apt MOISTURE CONTENT RANGE: +3%

FDT LOCATION: Cell 2 Cap FDT TEST NO.: CC03-38

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 03-08 VOLUME[1] (cf)	0033358	E	WET UNIT WEIGHT = D/A (lbs)	133.5
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.82	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.1
C	WEIGHT OF CYLINDER (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.46			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 606 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	58.7
P	WT. OF WET SOIL & TARE (grams)	458.8	S	WT. OF DRY SOIL = Q–O (grams)	391.8
Q	WT. OF DRY SOIL & TARE (grams)	400.1	T	MOISTURE CONTENT = (R/S)X100 (%)	15.0

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.7 (pcf) OPTIMUM MOISTURE CONTENT 12.2 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U	0.4	U	FDT MOISTURE CONTENT (%)	13.2/14.6
FDT WET UNIT WT. (pcf)	134.9	V	FDT DRY UNIT WT. (pcf)	117.7
DELTA DRY UNIT WT. = F – V	-1.6		FDT # CC03-38	

COMMENTS: Stockpile 02-8

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FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 60134 1 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 23 day May month 2003 year

TEST NO.: CC Ø3-69 DCØ3-4 Cell-2 Cap

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 2, East slope FDT TEST NO.: CCØ3-69

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-06 VOLUME[1] (cf)	0.033429	E	WET UNIT WEIGHT = D/A (lbs)	14.9
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	6.06	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	123.8
C	WEIGHT OF CYLINDER 614.3g (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.71	≤4.71		

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. ~~03~~ 606 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	65.7
P	WT. OF WET SOIL & TARE (grams)	550.5	S	WT. OF DRY SOIL = Q–O (grams)	476.5
Q	WT. OF DRY SOIL & TARE (grams)	484.8	T	MOISTURE CONTENT = (R/S)X100 (%)	13.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U	1.1	U	FDT MOISTURE CONTENT (%)	12.7
FDT WET UNIT WT. (pcf)	137.7	V	FDT DRY UNIT WT. (pcf)	122.2
DELTA DRY UNIT WT. = F – V	1.6		FDT #	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase I DATE: 23 day MAY month 2003 year

TEST NO.: CC 03 - 80 DC03-5 CELL 2 CAP

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 2, Center Top FDT TEST NO.: CC03-80

FIELD TEST DATA – ASTM D 2937 QA ID: DME

A	CYLINDER NO. 03-09 VOLUME[1] (cf) 2759.1 in³	0.033447	E	WET UNIT WEIGHT = D/A (lbs)	141.4
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	6.08	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	126.5
C	WEIGHT OF CYLINDER 613.9gr (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.73			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. #626 (grams)	8.0	R	WT. OF WATER = P–Q (grams)	58.8
P	WT. OF WET SOIL & TARE (grams)	565.2	S	WT. OF DRY SOIL = Q–O (grams)	498.4
Q	WT. OF DRY SOIL & TARE (grams)	506.4	T	MOISTURE CONTENT = (R/S)X100 (%)	11.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U		-1.0	U	FDT MOISTURE CONTENT (%)	12.8
FDT WET UNIT WT. (pcf)		139.5	V	FDT DRY UNIT WT. (pcf)	123.7
DELTA DRY UNIT WT. = F – V		2.8		FDT #	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 27 day May month 2003 year

TEST NO.: DC03-6

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 APZ MOISTURE CONTENT RANGE: 0+3 APZ

FDT LOCATION: Cell 2 Clay Cap West slope FDT TEST NO.: CC03-96

FIELD TEST DATA – ASTM D 2937 QA ID:

A	CYLINDER NO. 03-11 VOLUME(1) (cf)	.033354	E	WET UNIT WEIGHT = D/A (lbs)	133.48
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.80	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.4
C	WEIGHT OF CYLINDER (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.45			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID:

O	WT. OF TARE NO. L3 (grams)	189.7	R	WT. OF WATER = P–Q (grams)	95.6
P	WT. OF WET SOIL & TARE (grams)	939.6	S	WT. OF DRY SOIL = Q–O (grams)	654.3
Q	WT. OF DRY SOIL & TARE (grams)	844.0	T	MOISTURE CONTENT = (R/S)X100 (%)	14.6

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	0.3	U	FDT MOISTURE CONTENT (%)	12.8/~~14.3~~	14.3
FDT WET UNIT WT. (pcf)	137.1	V	FDT DRY UNIT WT. (pcf)	119.9	
DELTA DRY UNIT WT. = F – V	-3.5		FDT # CC03-96		

COMMENTS: Large Void Area From Stone in Sample

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase I DATE: 27 day May month 2003 year

TEST NO.: CC03-126 DC03-7

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

% COMPACTION: 95 APZ MOISTURE CONTENT RANGE: 0- +3% APZ

FDT LOCATION: Cell #2 Clay Cap FDT TEST NO.: CC03-126

FIELD TEST DATA – ASTM D 2937 QA ID: CHW

A	CYLINDER NO. 03-08 VOLUME[1]	(cf)	.033398	E	WET UNIT WEIGHT = D/A	(lbs) 135.9
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.89	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 118.5
C	WEIGHT OF CYLINDER	(lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.54			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. L-8	(grams)	193.0	R	WT. OF WATER = P–Q	(grams) 91.6
P	WT. OF WET SOIL & TARE	(grams)	909.7	S	WT. OF DRY SOIL = Q–O	(grams) 625.1
Q	WT. OF DRY SOIL & TARE	(grams)	818.1	T	MOISTURE CONTENT = (R/S)X100	(%) 14.7

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CHW

DELTA MOISTURE CONTENT = T – U		1.1	U	FDT MOISTURE CONTENT	(%) 12.0/13.6
FDT WET UNIT WT.	(pcf)	138.3	V	FDT DRY UNIT WT.	(pcf) 121.7
DELTA DRY UNIT WT. = F – V		-3.2		FDT # CC03-126	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G0341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 27 day May month 2003 year

TEST NO.: CC03-142 DC03-8

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 APZ MOISTURE CONTENT RANGE: 0 - +3% APZ

FDT LOCATION: Cell #2 Cap East Slope FDT TEST NO.: CC03-142

FIELD TEST DATA - ASTM D 2937 QA ID: CHW

A	CYLINDER NO. 03-6 VOLUME[1] (cf)	0.033429	E	WET UNIT WEIGHT = D/A (lbs)	134.9
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.86	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.2
C	WEIGHT OF CYLINDER (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B-C (lbs)	4.51			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT - ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. L-2 (grams)	190.7	R	WT. OF WATER = P-Q (grams)	116.8
P	WT. OF WET SOIL & TARE (grams)	1031.3	S	WT. OF DRY SOIL = Q-O (grams)	723.8
Q	WT. OF DRY SOIL & TARE (grams)	914.5	T	MOISTURE CONTENT = (R/S)X100 (%)	16.1

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.4 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE - ASTM D 2922 AND D 3017 QA ID: CHW

DELTA MOISTURE CONTENT = T - U	2.1	U	FDT MOISTURE CONTENT (%)	12.5/14.0
FDT WET UNIT WT. (pcf)	135.3	V	FDT DRY UNIT WT. (pcf)	118.7
DELTA DRY UNIT WT. = F - V	-2.5		FDT # CC03-142	

COMMENTS:

000550

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 27 day May month 2003 year

TEST NO.: CC03-143 DC03-9

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

% COMPACTION: 95 APZ MOISTURE CONTENT RANGE: 0-+3% APZ

FDT LOCATION: Cell#2 Cap East Slope FDT TEST NO.: CC03-143

FIELD TEST DATA - ASTM D 2937 QA ID: CHW

A	CYLINDER NO. 03-10 VOLUME[1]	(cf)	.033461	E	WET UNIT WEIGHT = D/A	(lbs) 135.6
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.88	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 119.3
C	WEIGHT OF CYLINDER	(lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B-C	(lbs)	4.54			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT - ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. 30/LL4	(grams)	142.0	R	WT. OF WATER = P-Q	(grams) 81.9
P	WT. OF WET SOIL & TARE	(grams)	824.7	S	WT. OF DRY SOIL = Q-O	(grams) 597.8
Q	WT. OF DRY SOIL & TARE	(grams)	742.8	T	MOISTURE CONTENT = (R/S)X100	(%) 13.7

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.4 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE - ASTM D 2922 AND D 3017 QA ID: CHW

DELTA MOISTURE CONTENT = T - U		0.9	U	FDT MOISTURE CONTENT	(%) 11.0/12.8
FDT WET UNIT WT.	(pcf)	140.0	V	FDT DRY UNIT WT.	(pcf) 124.1
DELTA DRY UNIT WT. = F - V		-4.8		FDT # CC03-143	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: ~~01437~~ 1341 TASK NO.: 041

DESCRIPTION: Phase V DATE: 30 day 05 month 03 year

TEST NO.: CC03-168 DC03-10

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 2 Cap, West Slope FDT TEST NO.: CC03-168

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-05 VOLUME[1] (cf)	.033465	E	WET UNIT WEIGHT = D/A (lbs)	135.2	134.8
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.85	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	118.7	118.3
C	WEIGHT OF CYLINDER (lbs)	1.34	G			
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.51				

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 47 (grams)	8.1	R	WT. OF WATER = P–Q (grams)	46.22
P	WT. OF WET SOIL & TARE (grams)	387.7	S	WT. OF DRY SOIL = Q–O (grams)	333.38
Q	WT. OF DRY SOIL & TARE (grams)	341.48	T	MOISTURE CONTENT = (R/S)X100 (%)	13.9

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.4 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U	0.9	U	FDT MOISTURE CONTENT (%)	13.0
FDT WET UNIT WT. (pcf)	139.1	V	FDT DRY UNIT WT. (pcf)	123.1
DELTA DRY UNIT WT. = F – V	~~123.1~~ -4.8		FDT # CC03-168	

COMMENTS: FDT 28 MAY 03

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: ~~CO 1431~~ 1341 TASK NO.: 041

DESCRIPTION: Phase V DATE: 30 day 05 month 03 year

TEST NO.: CC03-198 DC03-11

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 2 East Slope FDT TEST NO.: CC03-198

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-08 VOLUME[1] (cf)	0.03398	E	WET UNIT WEIGHT = D/A (lbs)	130.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.71	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	112.4
C	WEIGHT OF CYLINDER (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.35			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 661 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	58.22
P	WT. OF WET SOIL & TARE (grams)	435.4	S	WT. OF DRY SOIL = Q–O (grams)	368.78
Q	WT. OF DRY SOIL & TARE (grams)	377.18	T	MOISTURE CONTENT = (R/S)X100 (%)	15.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.4 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U	0.6	U	FDT MOISTURE CONTENT (%)	15.2
FDT WET UNIT WT. (pcf)	136.7	V	FDT DRY UNIT WT. (pcf)	118.7
DELTA DRY UNIT WT. = F – V	-6.3		FDT # CC03-198	

COMMENTS: 29 MAY 03

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FLUOR FERNALD

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 601341 TASK NO.: 041

DESCRIPTION: DATE: 030 day 05 month 03 year

TEST NO.: CC03-213 DC03-12

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 2 East Slope FDT TEST NO.: CC03-213

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-06 VOLUME[1] (cf)	0.03429	E	WET UNIT WEIGHT = D/A (lbs)	133.4
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.81	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	114.7
C	WEIGHT OF CYLINDER (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.46			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 303 (grams)	8.31	R	WT. OF WATER = P–Q (grams)	42.87
P	WT. OF WET SOIL & TARE (grams)	314.4	S	WT. OF DRY SOIL = Q–O (grams)	263.22
Q	WT. OF DRY SOIL & TARE (grams)	271.53	T	MOISTURE CONTENT = (R/S)X100 (%)	16.3

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.4 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U	1	U	FDT MOISTURE CONTENT (%)	15.3
FDT WET UNIT WT. (pcf)	136.7	V	FDT DRY UNIT WT. (pcf)	118.6
DELTA DRY UNIT WT. = F – V	-3.9		FDT # CC03-213	

COMMENTS: 29 May 03

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G01431 TASK NO.: 04.1

DESCRIPTION: Phase V DATE: 30 day 05 month 03 year

TEST NO.: DC03-13

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 2, West Slope FDT TEST NO.: CC03-225

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-10 VOLUME[1] (cf)	.033461	E	WET UNIT WEIGHT = D/A (lbs)	133.6
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.81	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	114.3
C	WEIGHT OF CYLINDER (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.47			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 34 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	~~42.39~~ 42.6
P	WT. OF WET SOIL & TARE (grams)	301.9	S	WT. OF DRY SOIL = Q–O (grams)	251.06
Q	WT. OF DRY SOIL & TARE (grams)	259.26	T	MOISTURE CONTENT = (R/S)X100 (%)	16.9

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 120.9 (pcf) OPTIMUM MOISTURE CONTENT 13.1 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U	1.8	U	FDT MOISTURE CONTENT (%)	15.1
FDT WET UNIT WT. (pcf)	134.0	V	FDT DRY UNIT WT. (pcf)	115.8
DELTA DRY UNIT WT. = F – V	–1.5		FDT # CC03-225	

COMMENTS: 30 MAY 03

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FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 03 day June month 2003 year

TEST NO.: CC03-261 DC03-14

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 2 West slope FDT TEST NO.: CC03-261

FIELD TEST DATA – ASTM D 2937 QA ID: DZE/KH

A	CYLINDER NO. 03006 VOLUME[1] 2705.3	(cf)	0.033559	E	WET UNIT WEIGHT = D/A (lbs)	137.1
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.96	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	121.0
C	WEIGHT OF CYLINDER 617.3g	(lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.60			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID:

O	WT. OF TARE NO. #36	(grams)	8.4	R	WT. OF WATER = P–Q (grams)	54.3
P	WT. OF WET SOIL & TARE	(grams)	471.1	S	WT. OF DRY SOIL = Q–O (grams)	408.4
Q	WT. OF DRY SOIL & TARE	(grams)	416.8	T	MOISTURE CONTENT = (R/S)X100 (%)	13.3

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 120.9 (pcf) OPTIMUM MOISTURE CONTENT 13.3 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U		-0.5	U	FDT MOISTURE CONTENT (%)	12.3 13.8
FDT WET UNIT WT.	(pcf)	137.1	V	FDT DRY UNIT WT. (pcf)	120.5
DELTA DRY UNIT WT. = F – V		0.5		FDT #	

COMMENTS:

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FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 603211 TASK NO.: 3

DESCRIPTION: PHASE V DATE: 06 day 06 month 03 year

TEST NO.: CC03-293 DC03-~~X~~ 15

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE:

FDT LOCATION: Cell 2 East slope FDT TEST NO.: CC03-293

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-06 VOLUME[1] (cf)	.033398	E	WET UNIT WEIGHT = D/A (lbs)	130.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	2588.5	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	109.4
C	WEIGHT OF CYLINDER (lbs)	615.8	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	1972.7g →		4.35lb	

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 661 (grams)	8.34	R	WT. OF WATER = P–Q (grams)	69.0
P	WT. OF WET SOIL & TARE (grams)	439.8	S	WT. OF DRY SOIL = Q–O (grams)	362.5
Q	WT. OF DRY SOIL & TARE (grams)	370.8	T	MOISTURE CONTENT = (R/S)X100 (%)	19.0

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U	2.1	U	FDT MOISTURE CONTENT (%)	16.0/16.9
FDT WET UNIT WT. (pcf)	131.8	V	FDT DRY UNIT WT. (pcf)	112.7
DELTA DRY UNIT WT. = F – V	-3.3		FDT # CC03-293	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q3211 TASK NO.: 3

DESCRIPTION: PHASE V DATE: 06 day 06 month 03 year

TEST NO.: CC03-297 DC03-~~17~~ 16

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE:

FDT LOCATION: Cell 2 East Slope FDT TEST NO.: CC03-297

FIELD TEST DATA 03-06 ASTM D 2937 033429 QA ID: KH

A	CYLINDER NO. ~~303~~ VOLUME[1] (cf)	~~8.3~~	E	WET UNIT WEIGHT = D/A (lbs)	129.6
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	2580.1	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	109.6
C	WEIGHT OF CYLINDER (lbs)	614.3	G		
D	WEIGHT OF WET SAMPLE = B-C (lbs)	1965.8		→ 4.33 lb	

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT - ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 303 (grams)	8.3	R	WT. OF WATER = P-Q (grams)	63.6
P	WT. OF WET SOIL & TARE (grams)	420.3	S	WT. OF DRY SOIL = Q-O (grams)	348.4
Q	WT. OF DRY SOIL & TARE (grams)	356.7	T	MOISTURE CONTENT = (R/S)X100 (%)	18.3

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE - ASTM D 2922 AND D 3017 QA ID: _____

DELTA MOISTURE CONTENT = T - U	1.3	U	FDT MOISTURE CONTENT (%)	16.1 / 17.6
FDT WET UNIT WT. (pcf)	131.8	V	FDT DRY UNIT WT. (pcf)	112.6
DELTA DRY UNIT WT. = F - V	-3.0		FDT # CC03-297	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q3211 TASK NO.: 3

DESCRIPTION: PHASE II DATE: 03 day June month 2003 year

TEST NO.: CL 03-06 DØ3-1 Cell 7 Floor

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 7 floor (east FDT TEST NO.: CLØ3-6

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 03-07 VOLUME[1] 2695.4 (cf)	0.033576	E	WET UNIT WEIGHT = D/A (lbs)	137.3
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.94	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	121.4
C	WEIGHT OF CYLINDER 606.9 (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.60			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. #662 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	56.4
P	WT. OF WET SOIL & TARE (grams)	496.6	S	WT. OF DRY SOIL = Q–O (grams)	431.9
Q	WT. OF DRY SOIL & TARE (grams)	440.2	T	MOISTURE CONTENT = (R/S)X100 (%)	13.1

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.4 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

DELTA MOISTURE CONTENT = T – U	-1.Ø	U	FDT MOISTURE CONTENT (%)	12.6/14
FDT WET UNIT WT. (pcf)	141.8	V	FDT DRY UNIT WT. (pcf)	124.3
DELTA DRY UNIT WT. = F – V	-2.9		FDT #	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G03211 TASK NO.: 3

DESCRIPTION: PHASE V DATE: 05 day 06 month 03 year

TEST NO.: CL03-24 DC03-2

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / ~~OTHER~~: ~~CL03-24~~

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: CELL #67 Center Floor FDT TEST NO.: CL03-24

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. D3-11 VOLUME[1] (cf)	~~0.033554~~	E	WET UNIT WEIGHT = D/A (lbs)	134.9
B	WEIGHT OF SAMPLE & CYLINDER 5.86 (lbs)	2657.1	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.2
C	WEIGHT OF CYLINDER 1.36 (lbs)	616.4	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs) 4.499	~~2040.7~~		> 4.5 lbs	

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 605 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	47.9
P	WT. OF WET SOIL & TARE (grams)	353.4	S	WT. OF DRY SOIL = Q–O (grams)	291 ~~222~~.2
Q	WT. OF DRY SOIL & TARE (grams)	305.5	T	MOISTURE CONTENT = (R/S)X100 (%)	16.1

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 120.9 (pcf) OPTIMUM MOISTURE CONTENT 13.1 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U	1.1	U	FDT MOISTURE CONTENT (%)	13.6/15.0
FDT WET UNIT WT. (pcf)	135.5	V	FDT DRY UNIT WT. (pcf)	117.8
DELTA DRY UNIT WT. = F – V	-1.6		FDT # CL03-24	

COMMENTS:

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FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 603211 TASK NO.: 3

DESCRIPTION: PHASE V DATE: 06 day 06 month 03 year

TEST NO.: CL03-34 DC03-3

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 6 Floor (east) FDT TEST NO.: CL03-34

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-09 VOLUME[1] (cf)	0.033447	E	WET UNIT WEIGHT = D/A (lbs)	132.87
B	WEIGHT OF SAMPLE & CYLINDER 5.80 (lbs)	2628.9	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	114.81
C	WEIGHT OF CYLINDER 1.35 (lbs)	613.9	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	2015.0 → 4.44 lb			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 605 (grams)	8.31	R	WT. OF WATER = P–Q (grams)	63.6
P	WT. OF WET SOIL & TARE (grams)	462.7	S	WT. OF DRY SOIL = Q–O (grams)	390.8
Q	WT. OF DRY SOIL & TARE (grams)	399.1	T	MOISTURE CONTENT = (R/S)X100 (%)	16.3

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 120.9 (pcf) OPTIMUM MOISTURE CONTENT ~~KH~~ 13.1 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: ~~13.1~~ KH

DELTA MOISTURE CONTENT = T – U	1.6	U	FDT MOISTURE CONTENT (%)	13.3 / 14.7
FDT WET UNIT WT. (pcf)	134.7	V	FDT DRY UNIT WT. (pcf)	117.4
DELTA DRY UNIT WT. = F – V	-3.23		FDT # CL03-34	

COMMENTS:

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FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Ø3211 TASK NO.: 3

DESCRIPTION: PHASE V DATE: Ø6 day Ø6 month Ø3 year

TEST NO.: CLØ3-61 DCØ3-4

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 6 Floor (east) FDT TEST NO.: CLØ3-61

FIELD TEST DATA – ASTM D 2937 .Ø3344 QA ID: KH

A	CYLINDER NO. Ø2-ØØ7 VOLUME(1) (cf)	~~611.2~~	E	WET UNIT WEIGHT = D/A (lbs)	133.57
B	WEIGHT OF SAMPLE & CYLINDER 5.81 (lbs)	2636.4	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.35
C	WEIGHT OF CYLINDER 1.35 (lbs)	611.2	G		
D	WEIGHT OF WET SAMPLE = B–C 4.465 (lbs)	2025.2 → 4.47 lb			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 34 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	59.9
P	WT. OF WET SOIL & TARE (grams)	472.0	S	WT. OF DRY SOIL = Q–O (grams)	403.8
Q	WT. OF DRY SOIL & TARE (grams)	412.1	T	MOISTURE CONTENT = (R/S)X100 (%)	14.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.2 (pcf) OPTIMUM MOISTURE CONTENT 12.2 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U		1.0	U	FDT MOISTURE CONTENT (%)	12.2 / 13.8
FDT WET UNIT WT. (pcf)		137.0	V	FDT DRY UNIT WT. (pcf)	120.4
DELTA DRY UNIT WT. = F – V	-3.9	~~-4.1~~		FDT # CLØ3-61	

COMMENTS:

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FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GO 3211 TASK NO.: 3

DESCRIPTION: PHASE V DATE: 09 day 06 month 03 year

TEST NO.: CL03-75 DC03-5

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95 APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 7 (east floor) FDT TEST NO.: CL03-75

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-40 VOLUME[1] (cf)	0.03346	E	WET UNIT WEIGHT = D/A (lbs)	137.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	2693.2	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	119.8
C	WEIGHT OF CYLINDER (lbs)	608.8	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	2084.4		> 4.59	

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 47 (grams)	8.12	R	WT. OF WATER = P–Q (grams)	57.5
P	WT. OF WET SOIL & TARE (grams)	460.2	S	WT. OF DRY SOIL = Q–O (grams)	394.58
Q	WT. OF DRY SOIL & TARE (grams)	402.7	T	MOISTURE CONTENT = (R/S)X100 (%)	14.6

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.2 (pcf) OPTIMUM MOISTURE CONTENT 12.2 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U		0.7	U	FDT MOISTURE CONTENT (%)	12.3/13.9
FDT WET UNIT WT. (pcf)		137.5	V	FDT DRY UNIT WT. (pcf)	120.7
DELTA DRY UNIT WT. = F – V	–1	~~-0.9~~		FDT # CL03-75	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Ø3211 TASK NO.: 3

DESCRIPTION: PHASE V DATE: Ø9 day Ø6 month Ø3 year

TEST NO.: CLØ3-1Ø1 DCØ3-6

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 6 East Floor FDT TEST NO.: CLØ3-1Ø1

FIELD TEST DATA – ASTM D 2937 -Ø33516 QA ID: KH

A	CYLINDER NO. Ø3-Ø7 VOLUME[1] (cf)	6Ø	E	WET UNIT WEIGHT = D/A (lbs)	~~135.5~~ 135.5
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	2667.9	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	117.8
C	WEIGHT OF CYLINDER (lbs)	6Ø6.9	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	2Ø61.Ø → 4.54			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 3Ø (grams)	8.5	R	WT. OF WATER = P–Q (grams)	49.31
P	WT. OF WET SOIL & TARE (grams)	385.75	S	WT. OF DRY SOIL = Q–O (grams)	327.94
Q	WT. OF DRY SOIL & TARE (grams)	336.44	T	MOISTURE CONTENT = (R/S)X100 (%)	15.Ø

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.2 (pcf) OPTIMUM MOISTURE CONTENT 12.2 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U		Ø.2	U	FDT MOISTURE CONTENT (%)	13.4 / 14.8
FDT WET UNIT WT. (pcf)		136.5	V	FDT DRY UNIT WT. (pcf)	118.9
DELTA DRY UNIT WT. = F – V	-1.1	~~-1.Ø~~		FDT # CLØ3-1Ø1	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q321/ TASK NO.: 3

DESCRIPTION: Phase V DATE: 16 day June month 03 year

TEST NO.: CL03-115 DC08-~~87~~

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

% COMPACTION: 95% / APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 6 East half FDT TEST NO.: CL03-115

FIELD TEST DATA – ASTM D 2937 QA ID: KH / DTE

A	CYLINDER NO. 03-10 VOLUME(1) 2664.6 (cf)	.033461	E	WET UNIT WEIGHT = D/A (lbs)	135.4
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.87	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	118.00
C	WEIGHT OF CYLINDER 608.8 (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.53			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH / DTE

O	WT. OF TARE NO. 30 (grams)	8.5	R	WT. OF WATER = P–Q (grams)	66.6
P	WT. OF WET SOIL & TARE (grams)	529.2	S	WT. OF DRY SOIL = Q–O (grams)	452.1
Q	WT. OF DRY SOIL & TARE (grams)	460.6	T	MOISTURE CONTENT = (R/S)X100 (%)	14.7

1.147

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.2 (pcf) OPTIMUM MOISTURE CONTENT 12.2 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DTE

DELTA MOISTURE CONTENT = T – U		1.9 / 0.4	U	FDT MOISTURE CONTENT (%)	12.8 / 14.3
FDT WET UNIT WT. (pcf)		119.1	V	FDT DRY UNIT WT. (pcf)	~~+36.1~~
DELTA DRY UNIT WT. = F – V	-1	~~18.0~~		FDT # CL03-115	

119.1

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5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 16 day June month 2003 year

TEST NO.: CL03-138 DC03-8

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95 % MOISTURE CONTENT RANGE:

FDT LOCATION: Cell 6 Cell 6 Floor FDT TEST NO.: CL03-138

FIELD TEST DATA – ASTM D 2937 QA ID: KH/01E

A	CYLINDER NO. 02-007 VOLUME(1) (cf)	0.03344	E	WET UNIT WEIGHT = D/A (lbs)	137.9
B	WEIGHT OF SAMPLE & CYLINDER 2703.7 (lbs)	5.96	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	121.4
C	WEIGHT OF CYLINDER 611.2 (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.61			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #47 (grams)	8.1	R	WT. OF WATER = P–Q (grams)	63.6
P	WT. OF WET SOIL & TARE (grams)	541.1	S	WT. OF DRY SOIL = Q–O (grams)	469.4
Q	WT. OF DRY SOIL & TARE (grams)	477.5	T	MOISTURE CONTENT = (R/S)X100 (%)	13.6

1.135

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.2 (pcf) OPTIMUM MOISTURE CONTENT 12.2 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	0.6	2.7/.5	U	FDT MOISTURE CONTENT (%)	12.2/13.0
FDT WET UNIT WT. (pcf)	141.7		V	FDT DRY UNIT WT. (pcf)	125.4
DELTA DRY UNIT WT. = F – V	-4	17.9		FDT # CL03-138	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ3211 TASK NO.: 3

DESCRIPTION: Phase II DATE: 11 day June month 2003 year

TEST NO.: CL03-159 DC03-X09

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95% APE MOISTURE CONTENT RANGE: +3% APE

FDT LOCATION: Cell 6 Floor Cent. Corridor FDT TEST NO.: CL03-159

FIELD TEST DATA – ASTM D 2937 QA ID: XH/DLE

A	CYLINDER NO. 03-008 VOLUME[1] (cf)	.033559	E	WET UNIT WEIGHT = D/A (lbs)	137.1
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.96	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	119.4
C	WEIGHT OF CYLINDER 617.3 g (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.60			

27.02 cf

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #30 (grams)	8.5	R	WT. OF WATER = P–Q (grams)	75.0
P	WT. OF WET SOIL & TARE (grams)	590.8	S	WT. OF DRY SOIL = Q–O (grams)	507.3
Q	WT. OF DRY SOIL & TARE (grams)	515.8	T	MOISTURE CONTENT = (R/S)X100 (%)	14.8

1.148

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.2 (pcf) OPTIMUM MOISTURE CONTENT 12.2 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	2.3 (.8)	U	FDT MOISTURE CONTENT (%)	12.5 / 14.0
FDT WET UNIT WT. (pcf)	138.5	V	FDT DRY UNIT WT. (pcf)	121.5
DELTA DRY UNIT WT. = F – V	-2.1		FDT #	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 11 day June month 2003 year

TEST NO.: CL03-172 DC03-10

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 6 west bench FDT TEST NO.: CL03-172

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-05 VOLUME[1] (cf)	0.03346.5	E	WET UNIT WEIGHT = D/A (lbs)	138.1
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.96	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	~~129.9~~ 123.1
C	WEIGHT OF CYLINDER 608.1 gm (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.62			

[1] NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #47 (grams)	8.1	R	WT. OF WATER = P–Q (grams)	~~32.1~~ 62.1
P	WT. OF WET SOIL & TARE (grams)	579.6	S	WT. OF DRY SOIL = Q–O (grams)	509.4
Q	WT. OF DRY SOIL & TARE (grams)	517.5	T	MOISTURE CONTENT = (R/S)X100 (%)	~~6.3~~ 12.2 1.063

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 120.9 (pcf) OPTIMUM MOISTURE CONTENT ~~DLE~~ 13% (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	-1.3	~~-5.5~~ ~~2.2~~	U	FDT MOISTURE CONTENT (%)	11.8 / 13.5
FDT WET UNIT WT.	141.7 (pcf)	~~124.8~~	V	FDT DRY UNIT WT. 124.8 (pcf)	~~141.7~~
DELTA DRY UNIT WT. = F – V	-1.7	~~5.1~~		FDT #	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. G03211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 12 day June month 2003 year

TEST NO.: CL 03-181 DC03-~~12~~ 11

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 6 East Floor FDT TEST NO.: CL 03-181

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-10 VOLUME[1] 2699.3 (cf)	0.033461	E	WET UNIT WEIGHT = D/A (lbs)	137.8	
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.95	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	~~122.9~~	121.1
C	WEIGHT OF CYLINDER 6088 gm (lbs)	1.34	G			
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.61				

[1] NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CA

O	WT. OF TARE NO. #36 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	61.9
P	WT. OF WET SOIL & TARE (grams)	518.3	S	WT. OF DRY SOIL = Q–O (grams)	448.0 ~~509.9~~
Q	WT. OF DRY SOIL & TARE (grams)	456.4	T	MOISTURE CONTENT = (R/S)X100 (%)	13.8 ~~12.1~~

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 124.3 (pcf) OPTIMUM MOISTURE CONTENT 18.8 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CA

DELTA MOISTURE CONTENT = T – U	0.6	U	FDT MOISTURE CONTENT (%)	11.5/13.2	
FDT WET UNIT WT. (pcf)	137.8	V	FDT DRY UNIT WT. (pcf)	121.7	
DELTA DRY UNIT WT. = F – V	-0.6 ~~-0.6~~		FDT #		

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

ROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 18 day June month 2003 year

TEST NO.: CL 03 – 201 DC03-X12

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 6 Floor, South Center FDT TEST NO.: CL03-201

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-08 VOLUME[1] (cf)	0.033398	E	WET UNIT WEIGHT = D/A (lbs)	140.1
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	6.04	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	123.4
C	WEIGHT OF CYLINDER 615.8 gm (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.68			

2738.4

TE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

ELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #32 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	59.7
P	WT. OF WET SOIL & TARE (grams)	508.8	S	WT. OF DRY SOIL = Q–O (grams)	440.7
Q	WT. OF DRY SOIL & TARE (grams)	449.1	T	MOISTURE CONTENT = (R/S)X100 (%)	13.5

1.135

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 124.3 (pcf) OPTIMUM MOISTURE CONTENT 11.8 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	2.2/-0.3	U	FDT MOISTURE CONTENT (%)	11.5/12.0
FDT WET UNIT WT. (pcf)	139.2	V	FDT DRY UNIT WT. (pcf)	123.1
DELTA DRY UNIT WT. = F – V	0.3		FDT # CL03-201	

COMMENTS:

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5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ3211 TASK NO.: 3

DESCRIPTION: Phase II DATE: 19 day Jun month 2003 year

TEST NO.: CL03-219 DC03-X13

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95% APZ MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell 6 Floor, West center FDT TEST NO.: CL03-219

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 02-007 VOLUME[1] 2682.7	(cf)	0.03344	E	WET UNIT WEIGHT = D/A (lbs)	136.4
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.91	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	118.7
C	WEIGHT OF CYLINDER 611.2	(lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.56			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #662	(grams)	8.3	R	WT. OF WATER = P–Q (grams)	64.9
P	WT. OF WET SOIL & TARE	(grams)	509.2	S	WT. OF DRY SOIL = Q–O (grams)	436.0
Q	WT. OF DRY SOIL & TARE	(grams)	444.3	T	MOISTURE CONTENT = (R/S)X100 (%)	14.9

1.149

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 124.3 (pcf) OPTIMUM MOISTURE CONTENT 11.8 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	2.3/0.6	U	FDT MOISTURE CONTENT	(%)	12.6/14.3
FDT WET UNIT WT. (pcf)	137.0	V	FDT DRY UNIT WT.	(pcf)	119.9
DELTA DRY UNIT WT. = F – V	1.2		FDT #		

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 23 day June month 2003 year

TEST NO.: CL03-235 DC03-X514

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6 Floor, Clay liner FDT TEST NO.: CL03-235

FIELD TEST DATA – ASTM D 2937 QA ID: DHE

A	CYLINDER NO. 03-08 VOLUME(1) 2905.7 (cf)	0.033398	E	WET UNIT WEIGHT = D/A (lbs)	137.7
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.96	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	122.9
C	WEIGHT OF CYLINDER 615.8 gm (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.60			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DHE

O	WT. OF TARE NO. #653 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	51.2
P	WT. OF WET SOIL & TARE (grams)	485.3	S	WT. OF DRY SOIL = Q–O (grams)	425.8
Q	WT. OF DRY SOIL & TARE (grams)	434.1	T	MOISTURE CONTENT = (R/S)X100 (%)	12.0 1.12

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 124.3 (pcf) OPTIMUM MOISTURE CONTENT DHE 11.8 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DHE

DELTA MOISTURE CONTENT = T – U	1.6 / 0.3	U	FDT MOISTURE CONTENT (%)	10.4 / 12.3
FDT WET UNIT WT. (pcf)	140.0	V	FDT DRY UNIT WT. (pcf)	124.7
DELTA DRY UNIT WT. = F – V	-1.8		FDT #	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 603211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 23 day June month 2003 year

TEST NO.: CL03-257 DC03-15

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6 Floor FDT TEST NO.: CL03-257

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-10 VOLUME[1] (cf) 26.71.5	0.033461	E	WET UNIT WEIGHT = D/A (lbs)	136.0
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.89	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	119.2
C	WEIGHT OF CYLINDER 608.8 gm (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.55			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #678 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	68.7
P	WT. OF WET SOIL & TARE (grams)	563.9	S	WT. OF DRY SOIL = Q–O (grams)	487.0
Q	WT. OF DRY SOIL & TARE (grams)	495.2	T	MOISTURE CONTENT = (R/S)X100 (%)	14.1

1.141

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 118.4 (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U -0.9	0.4 / 0.9	U	FDT MOISTURE CONTENT (%)	13.9 / 15.0
FDT WET UNIT WT. (pcf)	135.8	V	FDT DRY UNIT WT. (pcf)	118.1
DELTA DRY UNIT WT. = F – V	1.1		FDT # CL03-257	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

ROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 23 day June month 2003 year

TEST NO.: CL03-281 DC03-X16

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6 Floor FDT TEST NO.: CL03-281

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-06-8 VOLUME[1] 2635.7 (cf)	0.033559	E	WET UNIT WEIGHT = D/A (lbs)	132.6
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.81	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	114.5
C	WEIGHT OF CYLINDER 617.3 gm (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.45			

TE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

ELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #650 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	74.3
P	WT. OF WET SOIL & TARE (grams)	552.5	S	WT. OF DRY SOIL = Q–O (grams)	469.9
Q	WT. OF DRY SOIL & TARE (grams)	478.2	T	MOISTURE CONTENT = (R/S)X100 (%)	15.8

1.158

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 118.4 (pcf) OPTIMUM MOISTURE CONTENT DLE (%) 13.9

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	1.6 / 0.3	U	FDT MOISTURE CONTENT (%)	14.2 / 15.5
FDT WET UNIT WT. (pcf)	135.5	V	FDT DRY UNIT WT. (pcf)	117.3
DELTA DRY UNIT WT. = F – V	-2.8		FDT #	

COMMENTS:

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DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q3211 TASK NO.: 3

DESCRIPTION: Phase II DATE: 23 day June month 2003 year

TEST NO.: CL03-289 DC03-7817

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6 Floor FDT TEST NO.: CL03-289

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-09 VOLUME(1) (cf)	0.03344	E	WET UNIT WEIGHT = D/A (lbs)	132.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.77	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	112.1
C	WEIGHT OF CYLINDER 6139 gm (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.42			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #15 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	80.4
P	WT. OF WET SOIL & TARE (grams)	539.3	S	WT. OF DRY SOIL = Q–O (grams)	450.5
Q	WT. OF DRY SOIL & TARE (grams)	458.9	T	MOISTURE CONTENT = (R/S)X100 (%)	17.8

1.178

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 118.4 (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	2.0 / 1.0	U	FDT MOISTURE CONTENT (%)	15.8 / 16.8
FDT WET UNIT WT. (pcf)	131.5	V	FDT DRY UNIT WT. (pcf)	112.6
DELTA DRY UNIT WT. = F – V	-0.5		FDT #	

COMMENTS:

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

ROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: 6Q3211 TASK NO.: 8

DESCRIPTION: Phase V DATE: 24 day June month 2003 year

TEST NO.: CL03-314 DC03-~~8~~18

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6 Drainage Corridor FDT TEST NO.: CL03-314

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-06 VOLUME[1] (cf) 2651.5	0.033429	E	WET UNIT WEIGHT = D/A (lbs)	~~134.9~~ 134.
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.85	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.4
C	WEIGHT OF CYLINDER 614.3 gm (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.50			

E: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

ELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #653 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	75.4
P	WT. OF WET SOIL & TARE (grams)	555.5	S	WT. OF DRY SOIL = Q–O (grams)	471.8 ~ 1.159
Q	WT. OF DRY SOIL & TARE (grams)	480.1	T	MOISTURE CONTENT = (R/S)X100 (%)	~~15.9~~ 16.0 ~~15.98~~

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 118.4 (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U		-0.5	U	FDT MOISTURE CONTENT (%)	15.5/16.5
FDT WET UNIT WT. (pcf)		133.7	V	FDT DRY UNIT WT. (pcf)	114.8
DELTA DRY UNIT WT. = F – V		1.6		FDT #	

COMMENTS:

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FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 25 day June month 2003 year

TEST NO.: CL 03-331 DC03-2219

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6/7 IC Berm FDT TEST NO.: CL03-331

FIELD TEST DATA – ASTM D 2937 QA ID: DJE

A	CYLINDER NO. 3-07 VOLUME[1] (cf)	0.03356	E	WET UNIT WEIGHT = D/A (lbs)	132.8
B	WEIGHT OF SAMPLE & CYLINDER 2629.4 gm (lbs)	5.79	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	114.0
C	WEIGHT OF CYLINDER 606.9 gm (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.45			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. #656 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	80.4
P	WT. OF WET SOIL & TARE (grams)	574.9	S	WT. OF DRY SOIL = Q–O (grams)	486.3
Q	WT. OF DRY SOIL & TARE (grams)	494.5	T	MOISTURE CONTENT = (R/S)X100 (%)	16.5

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 117.4 (pcf) OPTIMUM MOISTURE CONTENT 13.8 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KH

DELTA MOISTURE CONTENT = T – U	0.5	U	FDT MOISTURE CONTENT (%)	14.8/16.0
FDT WET UNIT WT. (pcf)	134.1	V	FDT DRY UNIT WT. (pcf)	115.6
DELTA DRY UNIT WT. = F – V	-1.6		FDT #	

COMMENTS:

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: W SHEET NO. 1 OF 1

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: PHASE V CELL 6 DATE: 30 day 06 month 03 year

TEST NO.: DC03-~~82~~ 20

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6 West Bench FDT TEST NO.: 357

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-11 VOLUME[1] (cf)	0.03354	E	WET UNIT WEIGHT = D/A (lbs)	134.0	
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.83	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	~~119~~	116.7
C	WEIGHT OF CYLINDER (lbs)	616.4	G	→ 136		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.47				

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 57 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	~~47.55~~	56.55
P	WT. OF WET SOIL & TARE (grams)	445.8	S	WT. OF DRY SOIL = Q–O (grams)	381.05	
Q	WT. OF DRY SOIL & TARE (grams)	389.25	T	MOISTURE CONTENT = (R/S)X100 (%)	~~12.5~~	14.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 119.1 (pcf) OPTIMUM MOISTURE CONTENT 13.8 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	0.2	~~-2.1~~	U	FDT MOISTURE CONTENT (%)	13.2 /	14.6
FDT WET UNIT WT. (pcf)		137.6	V	FDT DRY UNIT WT. (pcf)	120.1	
DELTA DRY UNIT WT. = F – V	-3.4	-1.6		FDT # 357		

COMMENTS: SAMPLED 28 JUNE 03

GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

ETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

OJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GO3211 TASK NO.: 3

DESCRIPTION: PHASE V DATE: 01 day 07 month 03 year

TEST NO.: CL03-374 DC03-~~22~~21

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / [CLAY] / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6 Floor FDT TEST NO.: 374

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 007 VOLUME[1] (cf)	03344	E	WET UNIT WEIGHT = D/A (lbs)	132.5
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.78	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	115.3
C	WEIGHT OF CYLINDER (lbs)	611.2	G	> 135	
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.43			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

F D MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 665 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	50.6
P	WT. OF WET SOIL & TARE (grams)	397.50	S	WT. OF DRY SOIL = Q–O (grams)	338.6
Q	WT. OF DRY SOIL & TARE (grams)	346.9	T	MOISTURE CONTENT = (R/S)X100 (%)	14.9

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 119.1 (pcf) OPTIMUM MOISTURE CONTENT 13.8 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	-0.7	U	FDT MOISTURE CONTENT (%)	14.4 / 15.6
FDT WET UNIT WT. (pcf)	134.9	V	FDT DRY UNIT WT. (pcf)	116.7
DELTA DRY UNIT WT. = F – V	-1.4		FDT #	

COMMENTS: Sampled 30 June 03

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: W SHEET NO. 1 OF 1

000580

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

ETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

OJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6D3211 TASK NO.: 3

DESCRIPTION: Cell 6 Clay Liner DATE: 02 day 07 month 03 year

TEST NO.: CL03-396 DC03-~~23~~ 22

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: +3% APZ

FDT LOCATION: Cell #6 Floor FDT TEST NO.: CL03-396

FIELD TEST DATA – ASTM D 2937 QA ID: KH

A	CYLINDER NO. 03-05 VOLUME(1) (cf)	033465	E	WET UNIT WEIGHT = D/A (lbs)	134.8
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	2652.3	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	117.9
C	WEIGHT OF CYLINDER 134 (lbs)	608.1	G	5.85	
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.511			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

D MOISTURE CONTENT – ASTM D 2216 QA ID: KH

O	WT. OF TARE NO. 99 (grams)	8.39	R	WT. OF WATER = P–Q (grams)	51.6
P	WT. OF WET SOIL & TARE (grams)	421.5	S	WT. OF DRY SOIL = Q–O (grams)	361.5
Q	WT. OF DRY SOIL & TARE (grams)	369.9	T	MOISTURE CONTENT = (R/S)X100 (%)	14.3

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 123.6 (pcf) OPTIMUM MOISTURE CONTENT 12.1 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	-0.2	U	FDT MOISTURE CONTENT (%)	13.0 / 14.5
FDT WET UNIT WT. (pcf)	138.0	V	FDT DRY UNIT WT. (pcf)	120.5
DELTA DRY UNIT WT. = F – V	-2.6		FDT # CL03-396	

COMMENTS:

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: W SHEET NO. 1 OF 1

000531

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ3211 TASK NO.: 3

DESCRIPTION: Phase II DATE: 14 day July month 2003 year

TEST NO.: CL03-433 DC03-~~24~~23

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% / APZ MOISTURE CONTENT RANGE: ±3% / APZ

FDT LOCATION: Cell 6 Floor FDT TEST NO.: CL03-433

FIELD TEST DATA – ASTM D 2937 QA ID: DZE

A	CYLINDER NO. 03-10 VOLUME[1] (cf)	0.033961	E	WET UNIT WEIGHT = D/A (lbs)	133.6
B	WEIGHT OF SAMPLE & CYLINDER 2639.9 (lbs)	5.81	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	119.1
C	WEIGHT OF CYLINDER 608.8gm (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.47			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DZE

O	WT. OF TARE NO. #659 (grams)	8.1	R	WT. OF WATER = P–Q (grams)	44.7
P	WT. OF WET SOIL & TARE (grams)	419.6	S	WT. OF DRY SOIL = Q–O (grams)	366.8
Q	WT. OF DRY SOIL & TARE (grams)	374.9	T	MOISTURE CONTENT = (R/S)X100 (%)	12.2

1.122

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DZE

DELTA MOISTURE CONTENT = T – U	-1.1 -2.5		U	FDT MOISTURE CONTENT (%)	13.3/14.7
FDT WET UNIT WT. (pcf)	139.7		V	FDT DRY UNIT WT. (pcf)	121.8
DELTA DRY UNIT WT. = F – V	-2.7			FDT #	

COMMENTS:

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: CA SHEET NO. 1 OF 1

000582

GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

ETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

OJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ3211 TASK NO.: 3

DESCRIPTION: Phase II DATE: 14 day July month 2003 year

TEST NO.: CL Ø3 - 420 DC Ø3-~~2~~524

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% / APZ MOISTURE CONTENT RANGE: ±3% / APZ

FDT LOCATION: Cell 6 East Bench FDT TEST NO.: CLØ3-420

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 03-06 VOLUME(1) (cf)	0.033429	E	WET UNIT WEIGHT = D/A (lbs)	138.8
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.99	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	123.2
C	WEIGHT OF CYLINDER 614.3 gm (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.64			

2717.8

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

D MOISTURE CONTENT – ASTM D 2216 QA ID:

O	WT. OF TARE NO. #34 (grams)	8.2 gm	R	WT. OF WATER = P–Q (grams)	54.1
P	WT. OF WET SOIL & TARE (grams)	487.2	S	WT. OF DRY SOIL = Q–O (grams)	424.9
Q	WT. OF DRY SOIL & TARE (grams)	433.1	T	MOISTURE CONTENT = (R/S)X100 (%)	12.7

1.127

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. ____ (pcf) OPTIMUM MOISTURE CONTENT ____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	0.8 / 0.8	U	FDT MOISTURE CONTENT (%)	11.9 / 13.5
FDT WET UNIT WT. (pcf)	136.9	V	FDT DRY UNIT WT. (pcf)	120.6
DELTA DRY UNIT WT. = F – V	2.6		FDT #	

COMMENTS:

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: CJ SHEET NO. 1 OF 1

000583

GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 22 day October month 2003 year

TEST NO.: DC03-~~26~~ 25

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: 0-+3%

FDT LOCATION: East Wedge Cell #6 FDT TEST NO.: CL03-458

FIELD TEST DATA – ASTM D 2937 QA ID: CH

A	CYLINDER NO. 02-007 VOLUME[1] (cf)	.03344	E	WET UNIT WEIGHT = D/A (lbs)	133.7
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.82	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	114.8
C	WEIGHT OF CYLINDER 1.35 (lbs)	611.2g	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.47			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CH

O	WT. OF TARE NO. L3 (grams)	189.2	R	WT. OF WATER = P–Q (grams)	125.9
P	WT. OF WET SOIL & TARE (grams)	1076.3	S	WT. OF DRY SOIL = Q–O (grams)	761.2
Q	WT. OF DRY SOIL & TARE (grams)	950.4	T	MOISTURE CONTENT = (R/S)X100 (%)	16.5

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 119.0 (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CH

DELTA MOISTURE CONTENT = T – U		1.0	U	FDT MOISTURE CONTENT (%)	15.5
FDT WET UNIT WT. (pcf)		134.6	V	FDT DRY UNIT WT. (pcf)	116.5
DELTA DRY UNIT WT. = F – V		1.7		FDT #	CL03-458

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q3211 TASK NO.: 03

DESCRIPTION: Phase II DATE: 28 day Oct month 2003 year

TEST NO.: CL03-475 DC03-~~27~~ 26

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: ≥95% / APZ MOISTURE CONTENT RANGE: ~~13.9~~ ±3% / APZ

FDT LOCATION: West Clay Wedge (center) FDT TEST NO.: CL03-475

FIELD TEST DATA – ASTM D 2937 QA ID: 55

A	CYLINDER NO. ~~03~~-06 VOLUME[1] (cf)	.033429	E	WET UNIT WEIGHT = D/A (lbs)	134.3
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.84	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	116.6
C	WEIGHT OF CYLINDER (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.49			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: 55

O	WT. OF TARE NO. 46 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	99.7
P	WT. OF WET SOIL & TARE (grams)	765.2	S	WT. OF DRY SOIL = Q–O (grams)	657.3
Q	WT. OF DRY SOIL & TARE (grams)	665.5	T	MOISTURE CONTENT = (R/S)X100 (%)	15.2

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 119.0 (pcf) OPTIMUM MOISTURE CONTENT 13.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	1.3	U	FDT MOISTURE CONTENT (%)	13.9
FDT WET UNIT WT. (pcf)	139.4	V	FDT DRY UNIT WT. (pcf)	122.4
DELTA DRY UNIT WT. = F – V	5.8		FDT #	

COMMENTS: SP03-12

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DDC CHECKED BY: CJ SHEET NO. 1 OF 1

000585

VEGETATIVE SOIL LAYER

IN-PLACE NUCLEAR TESTS

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 03

DESCRIPTION: Phase V cell #2 CAP

DATE: 27 day 8 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92 % COMPACTION / MOISTURE RANGE: -4 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: onsite MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative layer

NUCLEAR GAUGE TYPE: troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: TW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST F.
VL-001	East Slope 50' SOP cell 2 (Cell # 2)	8" / L-1	CF03-9	11.5	122.5	9.1 ~~100~~	134.3	123.0	100.4	P	–			
VL-002	100' W of 001	8" / L-1		11.5	122.5	13.6	130.9	115.2	94.0	P	–			
VL-003		8" / L-1		11.5	122.5	11.2	135.1	121.5	99.2	P	–			
VL-004		8" / L-1		11.5	122.5	9.3	133.8	122.5	100	P	–			
VL-005		8" / L-1		11.5	122.5	9.6	137.0	125.1	102.1	P	–			
VL-006		8" / L-1		11.5	122.5	9.5	136.0	124.8	101.9	P	–			
VL-007		8" / L-1		11.5	122.5	13.9	129.7	113.9	92.9	P	–			
VL-008		8" / L-1		11.5	122.5	12.0	133.4	110.2	96.5	P	–			
VL-009		8" / L-1		11.5	122.5	13.9	133.3	117.1	95.6	P	–			
VL-010		8" / L-1		11.5	122.5	10.0	136.0	123.7	100.9	P	–			

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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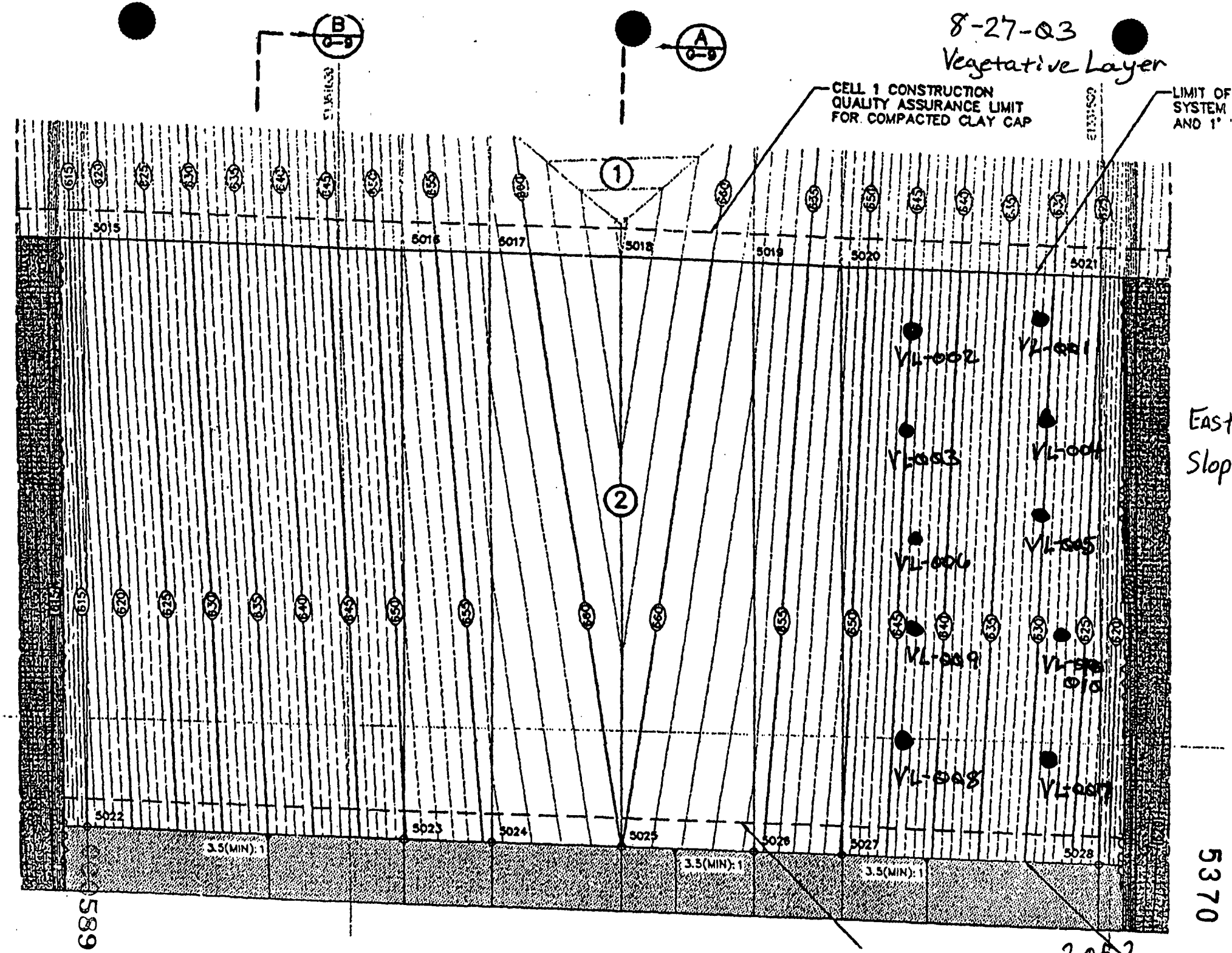
8-27-03
Vegetative Layer



East Slope

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589

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V Cell # 2 CAP

PROJECT NO.: GQ3211 TASK NO.: 03

DATE: 28 day 8 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92 % COMPACTION / MOISTURE RANGE: ±4 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Onsite

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative Layer

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID W

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
VL-011	Crest at top of Cell #2	8"/L-1	CFQ39	11.5	122.5	11.0	133.3	120.1	98.1	P	—			
VL-012		8"/L-1				9.0	135.1	123.9	101.1	P	—			
VL-013		8"/L-1				8.3	138.5	127.9	104.4	P	—			
VL-014		8"/L-1				9.5	137.9	126.0	102.9	P	—			
VL-015		8"/L-1				11.8	135.9	121.6	99.3	P	—			
VL-016		8"/L-1				13.8	128.3	112.7	92.0	P	—			
VL-017		8"/L-1				13.9	132.4	116.3	94.9	P	—			
VL-018		8"/L-1				12.6	133.2	118.3	96.6	P	—			
VL-019		8"/L-1				12.4	131.8	117.2	95.7	P	—			
VL-020		8"/L-1				8.8	137.9	126.8	103.5	P	—			

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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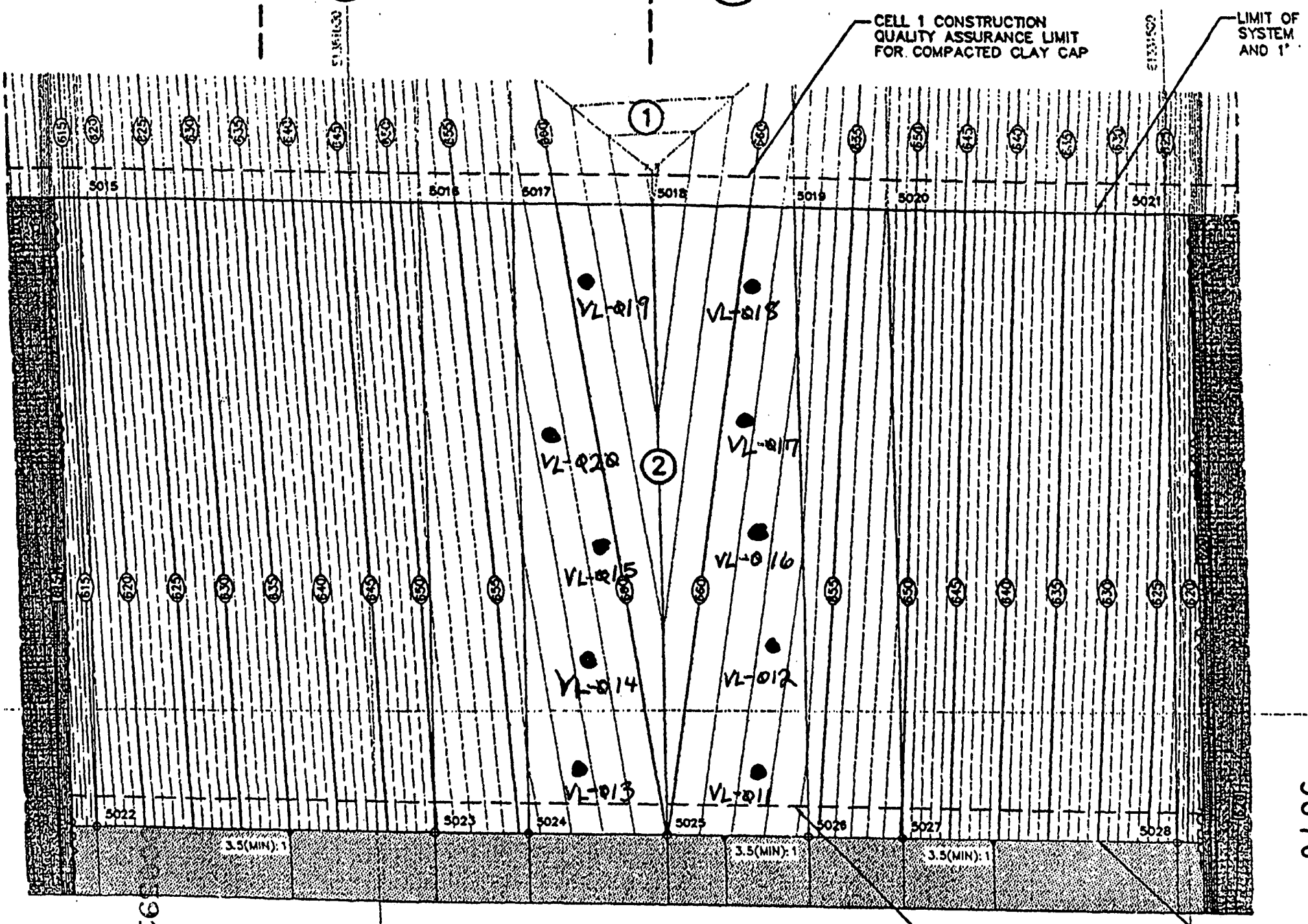
SHEET NO. 1 OF 2

8-28-03
Vegetative Layer #2



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ3211 TASK NO.: 03

DESCRIPTION: Phase V cell #2 CAP

DATE: 28 day 10 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92 % COMPACTION / MOISTURE RANGE: ±4 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: ONSite MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative Layer

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 26979 CORRECTION FACTOR Y = N/A QA ID: (W)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
	CAP Cell #2		SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
VL-021	WEST SLOPE	8" / L-1	CF03-9	11.5	122.5	10.3	135.5	122.9	100.3	P				
VL-022		8" / L-1				11.6	131.9	118.2	96.5	P				
VL-023		6" / L-1				15.3	130.2	112.9	92.2	P				
VL-024		8" / L-1				13.1	129.5	114.4	93.4	P				
VL-025		8" / L-1				12.0	132.3	118.1	96.4	P				
VL-026		8" / L-1				12.1	132.3	118.0	96.3	P				
VL-027		8" / L-1				11.1	134.7	121.3	99.0	P				
VL-028		8" / L-1				11.0	141.4	127.3	104.0	P				
VL-029		8" / L-1				14.0	128.7	113.0	92.2	P				
VL-030		6" / L-1				11.3	136.9	123.0	100.4	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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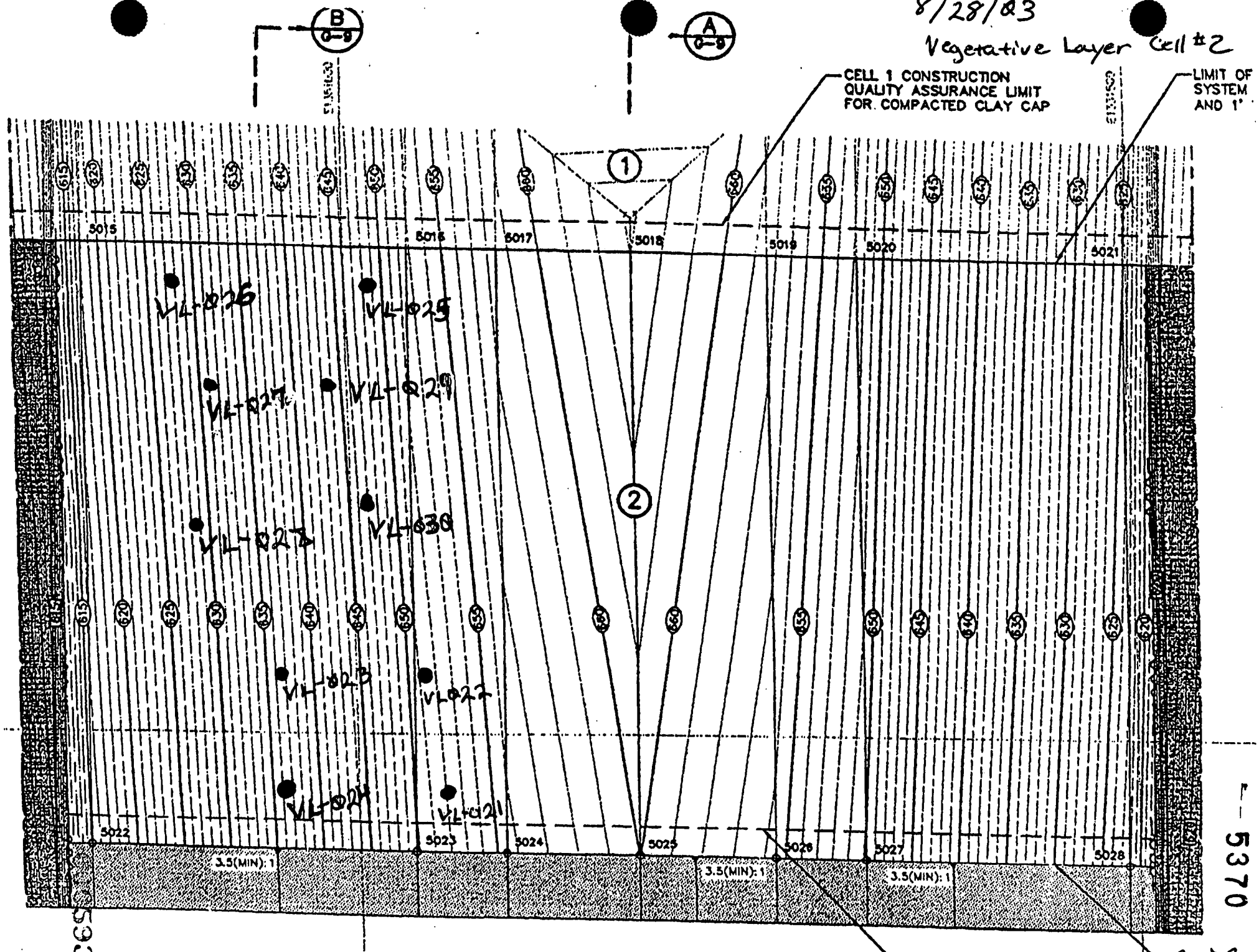
8/28/03

Vegetative Layer Cell #2



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2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I cell #2 CAP

PROJECT NO.: 603211 TASK NO.: 03

DATE: 6 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92 % COMPACTION / MOISTURE RANGE: ±4 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Onsite

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative layer

NUCLEAR GAUGE TYPE: 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = N/A

QA ID: W

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
VL-031	Cell #2 CAP West Slope	8" / L-2	CF03-9	11.5	122.5	10.7	132.5	119.7	97.7	P				
VL-032		8" / L-2				15.2	130.4	113.2	92.4	P				
VL-033		8" / L-2				12.0	132.9	118.7	96.9	P				
VL-034		8" / L-2				12.7	130.1	115.1	94.2	P				
VL-035		8" / L-2				11.9	134.2	119.9	97.9	P				
VL-036		8" / L-2				10.2	137.2	124.5	101.7	P				
VL-037		8" / L-2				13.0	136.2	120.4	98.3	P				
VL-038		8" / L-2				12.2	134.4	119.8	97.8	P				
VL-039		8" / L-2				11.4	134.1	120.4	98.3	P				
VL-040		8" / L-2				12.1	133.8	119.3	97.4	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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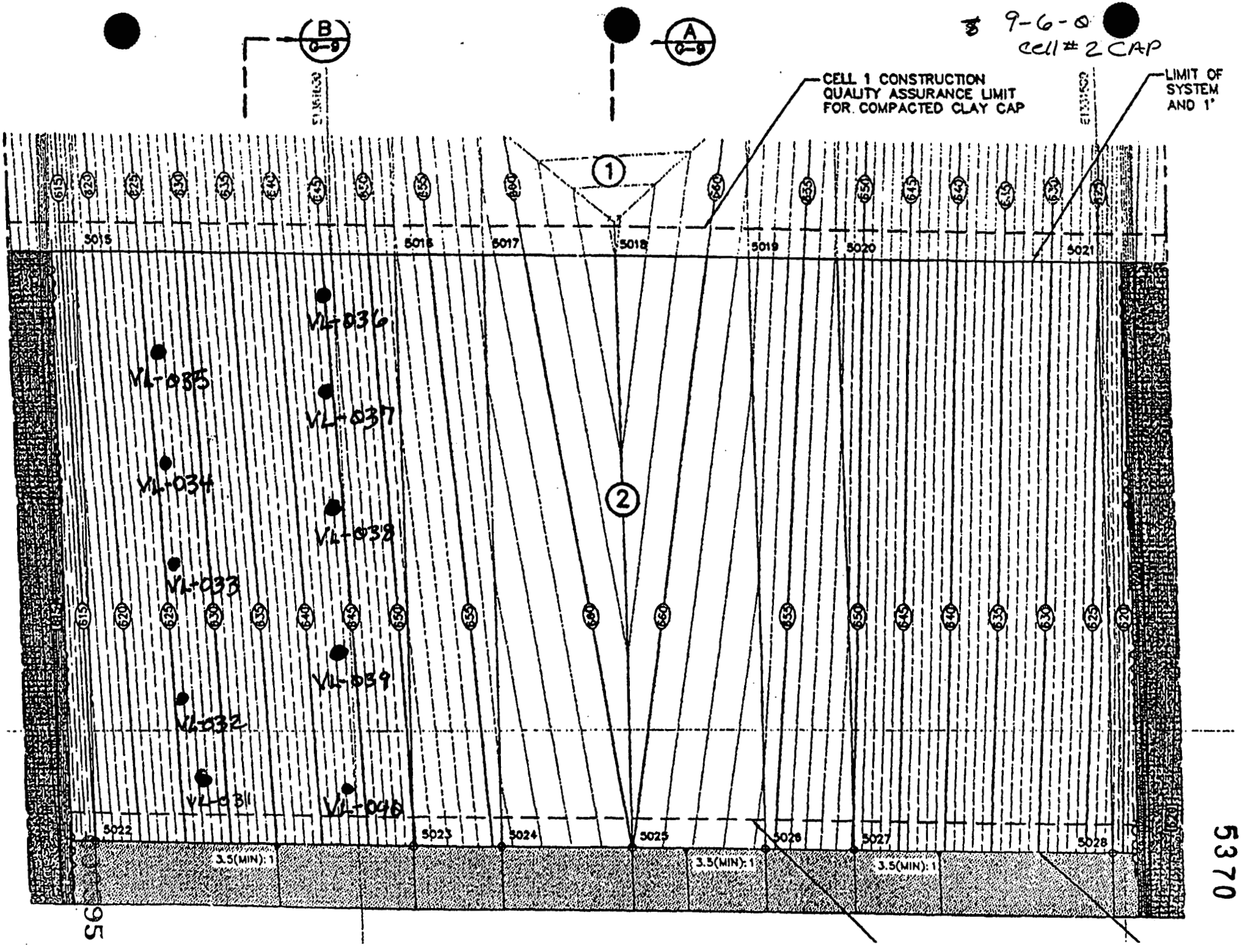
SHEET NO. 1 OF 2


9-6-0
cell # 2 CAP
B
A
CELL 1 CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY CAP
LIMIT OF SYSTEM AND 1'
1
2
5015
5016
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VL-036
VL-035
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VL-032
VL-031
VL-040
3.5(MIN): 1
3.5(MIN): 1
3.5(MIN): 1

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase I Cell #2 CAP, Vegetative Layer

PROJECT NO.: G03211 TASK NO.: 03

DATE: 8 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92 % COMPACTION / MOISTURE RANGE: ±4 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Onsite

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative Layer

NUCLEAR GAUGE TYPE: 3440 Troxler GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: W

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
VL-051	East Slope	8"/L-2	CF039	11.5	122.5	10.9	133.7	120.6	98.4	P				
VL-052		8"/L-2				9.2	130.1	119.2	97.3	P				
VL-053		8"/L-2				7.8	125.0	115.9	94.6	P				
VL-054		8"/L-2				7.8	126.6	~~118.3~~ 117.4	96.0	P				
VL-055		8"/L-2				9.0	133.1	122.1	99.7	P				
VL-056		8"/L-2				9.4	131.2	119.8	97.8	P				
VL-057		8"/L-2				11.0	132.8	~~118.7~~ 119.6	~~96.9~~ 97.7	P				
VL-058		8"/L-2				10.0	126.9	115.3	94.1	P				
VL-059		6"/L-2				12.9	133.5	118.3	96.6	P				
VL-060		8"/L-2				8.9	126.2	115.9	94.6	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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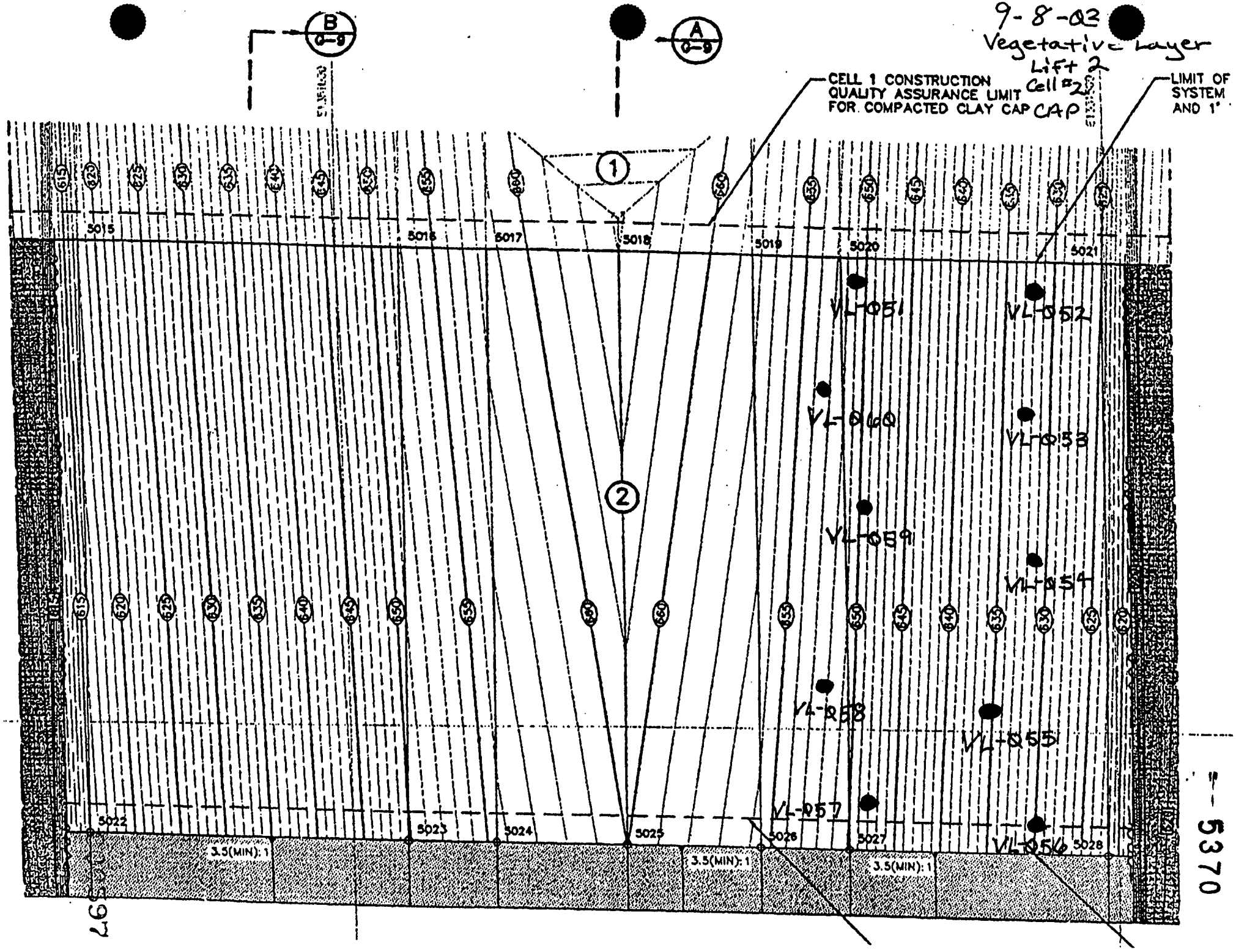
9-8-03
Vegetative Layer
Lift 2
Cell #2
CAP



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G03211 TASK NO.: 03

DESCRIPTION: Phase V Cell # 2, CAP, Vegetative Layer

DATE: 8 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92 % COMPACTION / MOISTURE RANGE: ±4 LIFT THICKNESS (LOOSE/COMPACTED) 8"

MATERIAL SOURCE: ON Site MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative Layer

NUCLEAR GAUGE TYPE: 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: TW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
VL-041	Top of Cell #2	8" / L-2	CF039	11.5	122.5	13.9	129.9	114.1	93.1	P				
VL-042		8" / L-2				11.4	133.6	119.9	97.9	P				
VL-043		8" / L-2				9.1	137.2	125.8	102.7	P				
VL-044		8" / L-2				12.0	127.6	113.9	93.0	P				
VL-045		8" / L-2				10.4	138.5	125.5	102.4	P				
VL-046		8" / L-2				11.8	128.9	115.3	94.1	P				
VL-047		8" / L-2				9.8	140.4	127.8	104.4	P				
VL-048		8" / L-2				12.7	130.8	116.1	94.8	P				
VL-049		8" / L-2				8.5	138.2	127.3	103.9	P				
VL-050		8" / L-2				9.5	134.8	123.2	100.5	P.				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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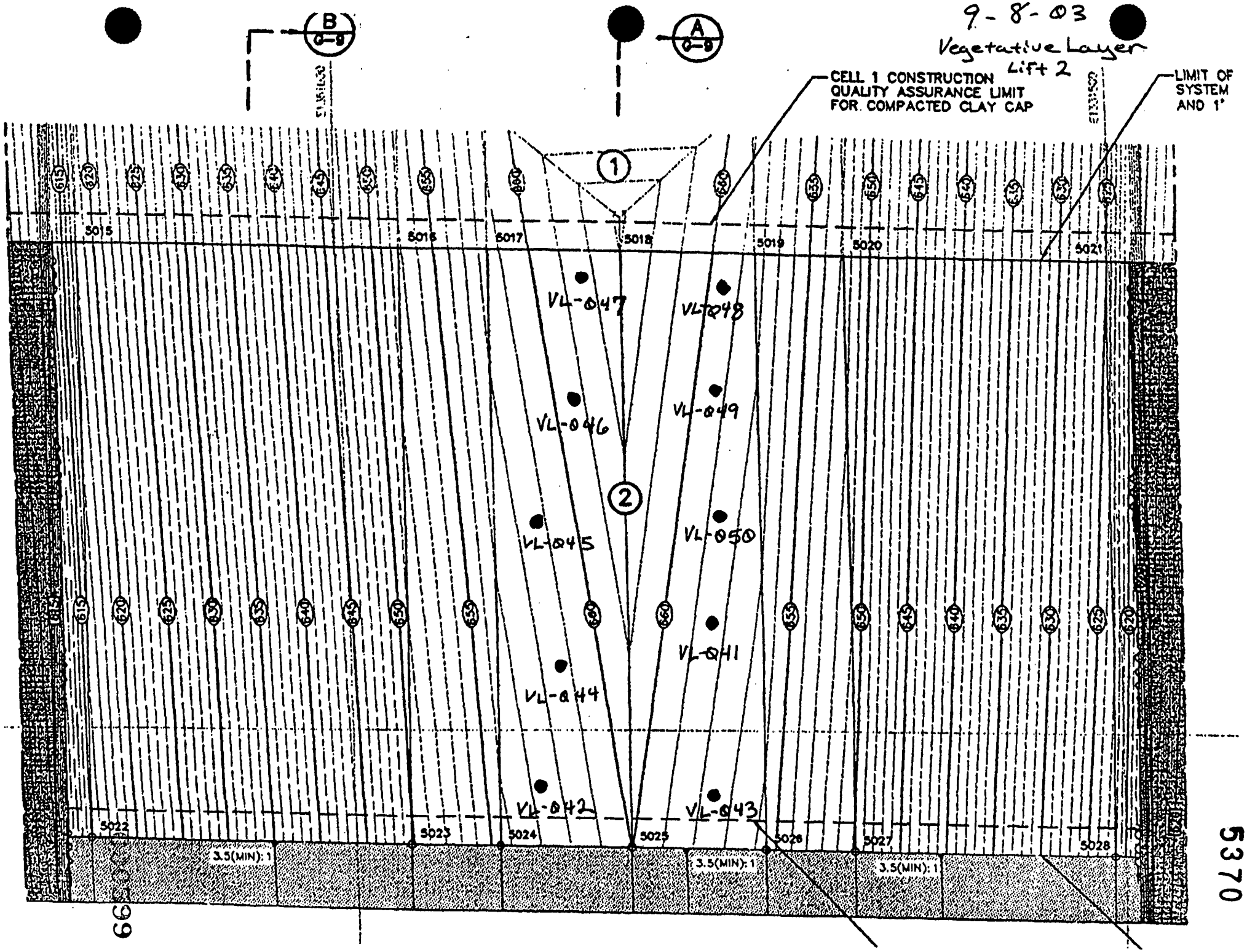
9-8-03
Vegetative Layer
Lift 2



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V cell #2 CAP Vegetative Layer

PROJECT NO. G03211 TASK NO.: 03

DATE: 16 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92% COMPACTION / MOISTURE RANGE: ±4 LIFT THICKNESS (LOOSE/COMPACTED):

MATERIAL SOURCE: Onsite

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative Layer

NUCLEAR GAUGE TYPE: Troxler 3440

GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A

QA ID: (w)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
VL-Q61	West Slope	6"/L-3	CF03-9	11.5	122.5	9.9	129.7	118.1	96.4	P				
VL-Q62		6"/L-3				10.7	131.9	119.1	97.3	P				
VL-Q63		4"/L-3				11.2	130.6	117.4	95.8	P				
VL-Q64		8"/L-3				15.0	132.5	115.5	94.0	P				
VL-Q65		8"/L-3				10.6	132.3	119.6	97.6	P				
VL-Q66		4"/L-3				8.6	129.3	119.1	97.2	P				
VL-Q67		4"/L-3				10.0	128.4	116.7	95.3	P				
VL-Q68		4"/L-3				13.6	131.0	115.3	94.1	P				
VL-Q69		4"/L-3				8.8	128.8	118.4	96.6	P				
VL-Q70		4"/L-3				10.8	133.2	120.2	98.1	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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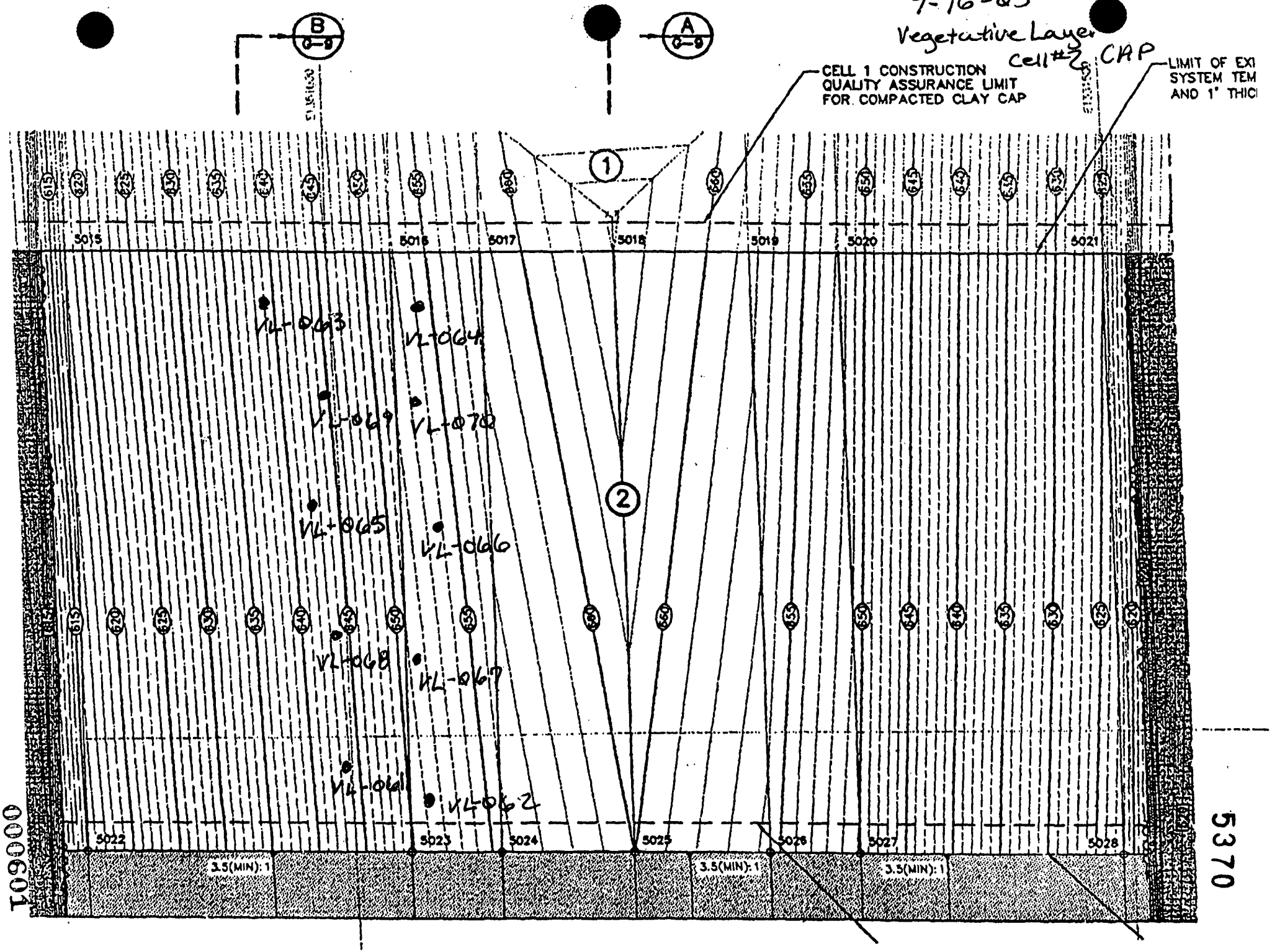
9-16-03
Vegetative Layer
Cell #3 CAP



GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V cell #2 CAP, Vegetative Layer

PROJECT NO.: GQ3211 TASK NO.: 03

DATE: 16 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92 % COMPACTION / MOISTURE RANGE: ±4 LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Onsite

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative Layer

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 28979 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
VL-071	Top of Cell #2 CAP	4"/L-3	CF03-9	11.5	122.5	13.0	127.5	112.8	92.1	P				
VL-072		6"/L-3				13.0	128.2	113.4	92.6	P				
VL-073		6"/L-3				10.0	124.1	112.8	92.1	P				
VL-074		6"/L-3				12.8	127.8	113.3	92.5	P				
VL-075		6"/L-3				13.6	130.4	114.8	93.7	P				
VL-076		6"/L-3				12.2	129.6	115.5	94.3	P				
VL-077		6"/L-3				13.9	131.0	115.1	94.0	P				
VL-078		6"/L-3				14.8	134.8	117.4	95.8	P				
VL-079		6"/L-3				12.9	132.2	117.1	95.6	P				
VL-080		6"/L-3				10.7	125.4	113.3	92.5	P				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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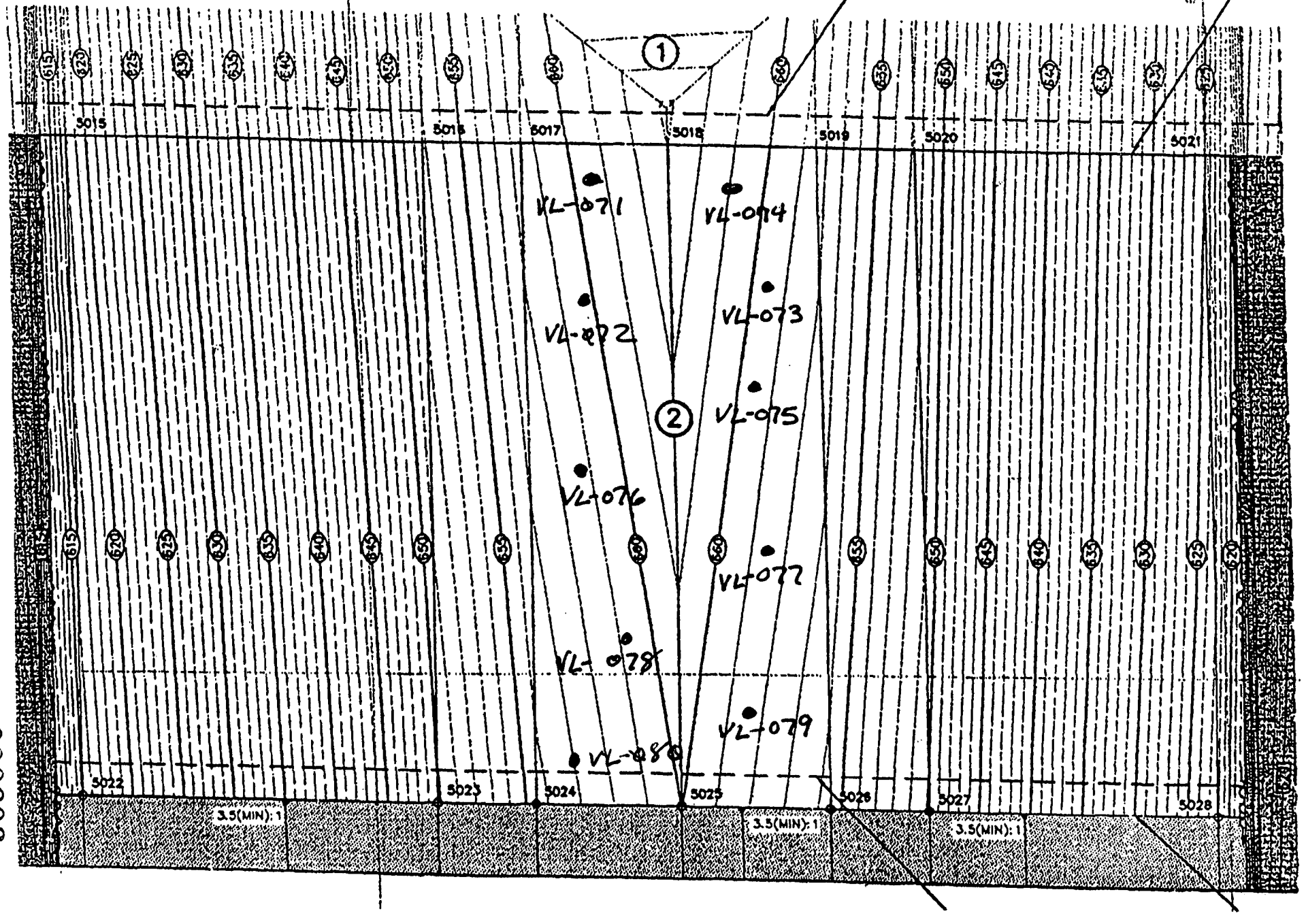
9-16-03
Vegetative cover
cell #2 CAP



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase V cell #2 CAP, Vegetative Layer

PROJECT NO.: GQ3211 TASK NO.: 03

DATE: 16 day 9 month 2003 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 92 % COMPACTION / MOISTURE RANGE: ±4 LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Onsite

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / (OTHER:) Vegetative Layer

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: TW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
VL-081	East Slope of cell #2	6"/L-3	CF03-9	11.5	122.5	9.6	124.3	113.4	92.6	P				
VL-082		6"/L-3				11.0	128.2	115.5	94.3	P				
VL-083		4"/L-3				9.0	128.9	118.9	96.5	P				
VL-084		4"/L-3				9.2	123.6	113.2	92.4	P				
VL-085		6"/L-3				10.6	127.0	114.8	93.7	P				
VL-086		6"/L-3				12.4	130.8	116.4	95.0	P				
VL-087		6"/L-3				10.6	124.8	112.8	92.1	P				
VL-088		6"/L-3				13.4	131.3	115.8	94.5	P				
VL-089		6"/L-3				11.8	129.4	115.7	94.4	P				
VL-090		4"/L-3				10.9	126.2	113.8	92.9	P				

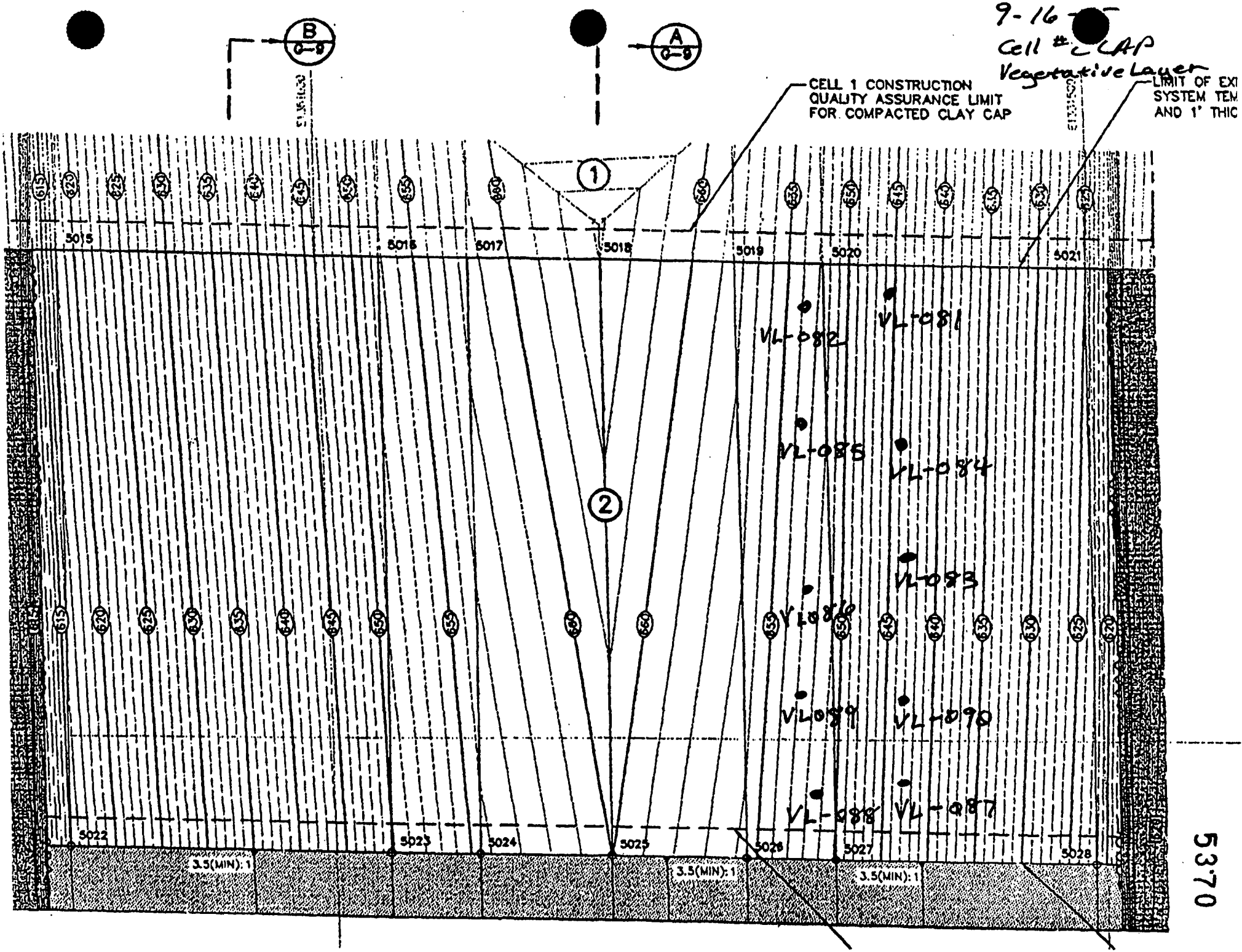
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

5370

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CA SHEET NO. 1 OF 2

0006604

9-16-5
Cell #1 CLAP
Vegetative Layer



000605

5370

DRIVE CYLINDER TESTS

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase IV DATE: 12 day Sept month 2003 year

TEST NO.: West Slope of Cell #2 CAP VDT-1

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Vegetative layer

% COMPACTION: 92 MOISTURE CONTENT RANGE: ±4

FDT LOCATION: West Slope FDT TEST NO.: VL-Ø37

FIELD TEST DATA – ASTM D 2937 QA ID: SS

A	CYLINDER NO. 03-06 VOLUME[1] (cf) 2475.54	.033129	E	WET UNIT WEIGHT = D/A (lbs)	122.7
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.46	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	101.5
C	WEIGHT OF CYLINDER (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.11			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: SS

O	WT. OF TARE NO. 636 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	53.5
P	WT. OF WET SOIL & TARE (grams)	315.1	S	WT. OF DRY SOIL = Q–O (grams)	253.3
Q	WT. OF DRY SOIL & TARE (grams)	261.6	T	MOISTURE CONTENT = (R/S)X100 (%)	21.1

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.5 (pcf) OPTIMUM MOISTURE CONTENT 11.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CL

DELTA MOISTURE CONTENT = T – U	8.1	U	FDT MOISTURE CONTENT (%)	13.0
FDT WET UNIT WT. (pcf)	136.2	V	FDT DRY UNIT WT. (pcf)	120.4
DELTA DRY UNIT WT. = F – V	18.9		FDT #	

COMMENTS:

000607

GEOSYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: CL SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD 5370

.TERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

)JECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase II DATE: 12 day Sept month 2003 year

TEST NO.: TOP of Cell #2 CAP VDT-2

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / (OTHER:) Vegetative Layer

% COMPACTION: 92 MOISTURE CONTENT RANGE: ±4

FDT LOCATION: Top of Cell #2 FDT TEST NO.: VL03-48

FIELD TEST DATA – ASTM D 2937 QA ID: SS

A	CYLINDER NO. 03-11 VOLUME[1] (cf)	.033354	E	WET UNIT WEIGHT = D/A (lbs)	129.8
B	WEIGHT OF SAMPLE & CYLINDER 2584.5 (lbs)	5.69	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	107.5
C	WEIGHT OF CYLINDER (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.33			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

F) MOISTURE CONTENT – ASTM D 2216 QA ID: SS

O	WT. OF TARE NO. 34 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	64.4
P	WT. OF WET SOIL & TARE (grams)	382.9	S	WT. OF DRY SOIL = Q–O (grams)	310.3
Q	WT. OF DRY SOIL & TARE (grams)	318.5	T	MOISTURE CONTENT = (R/S)X100 (%)	20.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.5 (pcf) OPTIMUM MOISTURE CONTENT 11.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CA

DELTA MOISTURE CONTENT = T – U	8.1	U	FDT MOISTURE CONTENT (%)	12.7
FDT WET UNIT WT. (pcf)	130.8	V	FDT DRY UNIT WT. (pcf)	116.1
DELTA DRY UNIT WT. = F – V	8.6		FDT #	

COMMENTS:

000608

EO SYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: CA SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

(1)

ETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

OJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 12 day Sept month 2003 year

TEST NO.: #1 East Slope of Cell #2 CAP VDT-3

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / (OTHER) Vegetative layer

% COMPACTION: 92% MOISTURE CONTENT RANGE: ±4

FDT LOCATION: East Slope FDT TEST NO.: VL03-059

FIELD TEST DATA – ASTM D 2937 QA ID: SS

A	CYLINDER NO. 03-08 VOLUME(1) (cf)	0.03316	E	WET UNIT WEIGHT = D/A (lbs)	120.5
B	WEIGHT OF SAMPLE & CYLINDER 2449g (lbs)	5.4	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	98.5
C	WEIGHT OF CYLINDER 615.8 (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.04			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: SS

O	WT. OF TARE NO. #99 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	70.2
P	WT. OF WET SOIL & TARE (grams)	391.8	S	WT. OF DRY SOIL = Q–O (grams)	313.3
Q	WT. OF DRY SOIL & TARE (grams)	321.6	T	MOISTURE CONTENT = (R/S)X100 (%)	22.4

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 122.5 (pcf) OPTIMUM MOISTURE CONTENT 11.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CS

DELTA MOISTURE CONTENT = T – U	9.5	U	FDT MOISTURE CONTENT (%)	12.9
FDT WET UNIT WT. (pcf)	133.5	V	FDT DRY UNIT WT. (pcf)	118.3
DELTA DRY UNIT WT. = F – V			FDT #	

COMMENTS:

000609

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

ETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

OJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GG3211 TASK NO.: 3

DESCRIPTION: Phase V DATE: 17 day Sept month 2003 year

TEST NO.: VDT 4

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Veg layer

% COMPACTION: ~~90%~~ 92% MOISTURE CONTENT RANGE:

FDT LOCATION: East Slope, Mid Cell #2 FDT TEST NO.: VL03-86

FIELD TEST DATA – ASTM D 2937 QA ID: 55

A	CYLINDER NO. 03-05 VOLUME[1] (cf)	.033465	E	WET UNIT WEIGHT = D/A (lbs)	124.3
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.50	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	100.9
C	WEIGHT OF CYLINDER (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.16			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: 55

O	WT. OF TARE NO. 45 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	75.9
P	WT. OF WET SOIL & TARE (grams)	410.1	S	WT. OF DRY SOIL = Q–O (grams)	326.4
Q	WT. OF DRY SOIL & TARE (grams)	334.2	T	MOISTURE CONTENT = (R/S)X100 (%)	23.3

1.233

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: _____

DELTA MOISTURE CONTENT = T – U	10.9	U	FDT MOISTURE CONTENT (%)	12.4
FDT WET UNIT WT. (pcf)	130.8	V	FDT DRY UNIT WT. (pcf)	116.4
DELTA DRY UNIT WT. = F – V	15.6		FDT #	

COMMENTS:

000610

GEO SYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: CH SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

5370

TERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

OJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ3211 TASK NO.: 3

DESCRIPTION: Phase II DATE: 17 day Sept month 2003 year

TEST NO.: VDT-5

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Veg./Topsoil layer

% COMPACTION: 90% 92% MOISTURE CONTENT RANGE:

FDT LOCATION: East Slope, Crest Cell #2 FDT TEST NO.: VL03-88

FIELD TEST DATA – ASTM D 2937 QA ID: 55

A	CYLINDER NO. 03-11 VOLUME[1] (cf)	.033334	E	WET UNIT WEIGHT = D/A (lbs)	127.1
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.60	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	105.0
C	WEIGHT OF CYLINDER (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.24			

NO DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

F) MOISTURE CONTENT – ASTM D 2216 QA ID: 55

O	WT. OF TARE NO. 623 (grams)	8.0	R	WT. OF WATER = P–Q (grams)	74.4
P	WT. OF WET SOIL & TARE (grams)	436.9	S	WT. OF DRY SOIL = Q–O (grams)	354.5
Q	WT. OF DRY SOIL & TARE (grams)	362.5	T	MOISTURE CONTENT = (R/S)X100 (%)	21.0 1.21

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. _____ (pcf) OPTIMUM MOISTURE CONTENT _____ (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: _____

DELTA MOISTURE CONTENT = T – U	7.6 ~~20.8~~	U	FDT MOISTURE CONTENT (%)	13.4
FDT WET UNIT WT. (pcf)	131.3	V	FDT DRY UNIT WT. (pcf)	115.8
DELTA DRY UNIT WT. = F – V	10.8		FDT #	

COMMENTS: Sample got slightly wet from water truck

000611

EO SYNTEC CONSULTANTS FILE NO. 2-18-DOC CHECKED BY: CH SHEET NO. 1 OF 1

APPENDIX H

GEOSYNTHETIC CONFORMANCE TEST RESULTS

GEOSYNTHETIC CLAY LINER AND CAP

HYDRAULIC CONDUCTIVITY TEST RESULTS

FEBRUARY 2003

033-3486

SUMMARY OF GEOSYNTHETIC CLAY LINER CONFORMANCE TEST RESULTS
GEOSYNTEC FLUOR FERNALD GA

ROLL DESIGNATION	Reference Value	GCL-03-01	GCL-03-02	GCL-03-03	GCL-03-04	GCL-03-05	GCL-03-06	GCL-03-07	GCL-03-08	GCL-03-09	GCL-03-10
HYDRAULIC CONDUCTIVITY (cm/sec) ASTM D5887	<=5.0E-9	4.2E-09	3.2E-09	3.5E-09	2.6E-09	3.6E-09	3.5E-09	3.2E-09	3.3E-09	3.6E-09	3.4E-09

FEBRUARY 2003 033-3486

GEOSYNTHETIC CLAY LINER

Project Name: GEOSYNTEC/FLUOR FERNALD/GA

ROLL DESIGNATION: GCL - 03-01

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	4.2E-09
AVG	4.2E-09

ROLL DESIGNATION: GCL - 03-02

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.2E-09
AVG	3.2E-09

FEBRUARY 2003 033-3486

GEOSYNTHETIC CLAY LINER

Project Name: GEOSYNTEC/FLUOR FERNALD/GA

ROLL DESIGNATION: GCL - 03-03

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.5E-09
AVG	3.5E-09

ROLL DESIGNATION: GCL - 03-04

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	2.6E-09
AVG	2.6E-09

FEBRUARY 2003 033-3486

GEOSYNTHETIC CLAY LINER

Project Name: GEOSYNTEC/FLUOR FERNALD/GA

ROLL DESIGNATION: GCL - 03-05

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.6E-09
AVG	3.6E-09

ROLL DESIGNATION: GCL - 03-06

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.5E-09
AVG	3.5E-09

FEBRUARY 2003 033-3486

GEOSYNTHETIC CLAY LINER

Project Name: GEOSYNTEC/FLUOR FERNALD/GA

ROLL DESIGNATION: GCL - 03-07

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.2E-09
AVG	3.2E-09

ROLL DESIGNATION: GCL - 03-08

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.3E-09
AVG	3.3E-09

FEBRUARY 2003 033-3486

GEOSYNTHETIC CLAY LINER

Project Name: GEOSYNTEC/FLUOR FERNALD/GA

ROLL DESIGNATION: GCL - 03-09

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.6E-09
AVG	3.6E-09

ROLL DESIGNATION: GCL - 03-10

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.4E-09
AVG	3.4E-09

FEBRUARY 2003

033-3486

SUMMARY OF GEOSYNTHETIC CLAY LINER CONFORMANCE TEST RESULTS
GEOSYNTEC FLUOR FERNALD GA

ROLL DESIGNATION	Reference Value	GCL-03-11	GCL-03-12	GCL-03-13	-	-	-	-	-	-	-
HYDRAULIC CONDUCTIVITY (cm/sec) ASTM D5887	<=5.0E-9	3.5E-09	3.1E-09	2.7E-09	-	-	-	-	-		-

FEBRUARY 2003 033-3486

GEOSYNTHETIC CLAY LINER

Project Name: GEOSYNTEC/FLUOR FERNALD/GA

ROLL DESIGNATION: GCL - 03-11

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.5E-09
AVG	3.5E-09

ROLL DESIGNATION: GCL - 03-12

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	3.1E-09
AVG	3.1E-09

FEBRUARY 2003 033-3486

GEOSYNTHETIC CLAY LINER

Project Name: GEOSYNTEC/FLUOR FERNALD/GA

ROLL DESIGNATION: GCL - 03-13

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	2.7E-09
AVG	2.7E-09

ROLL DESIGNATION:

	HYDRAULIC CONDUCTIVITY (cm/sec)
1.	-
AVG	-

DIRECT SHEAR TEST RESULTS

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TEST PROCEDURES AND CONDITIONS
TEST SERIES NUMBER: 03-INTERNAL (I)

Test Specimen Configuration (from top to bottom) and Placement Conditions:

- upper shear box: rigid substrate with textured steel gripping surface;
- Bentomat ST GCL (Sample Nos. GCL-03-01 through GCL-03-13). GCL's initial moisture content and final moisture contents are reported on each final test result presentation; and
- lower shear box: rigid substrate with textured steel gripping surface.

Designated Shear Plane: Within GCL

Test Procedures for Each Normal Stress Condition:

- A fresh GCL specimen was trimmed from the bulk sample of the GCL and placed between two rigid wooden substrates with textured steel gripping surfaces. The ends of each geotextile were then sandwiched between a second rigid wooden substrate prior to testing. The entire test specimen was then placed in the shear box to provide confinement for the exposed bentonite component. The textured steel gripping surfaces were employed to minimize slippage between each geotextile component of the GCL and rigid wood substrate, therefore providing a relatively uniform transfer of shear load onto the GCL specimen.
- Soaking conditions: The GCL specimen was soaked in tap water for 7 days (168 hours) under a normal stress of 3 psi.
- Consolidation conditions: After the 7-day (168-hours) soaking period, the tap water was drained, and the GCL specimen was consolidated for 2 days (48 hours) under each test normal stress.
- Test normal stresses: 5, 20, and 45 psi.
- Constant shear displacement rate: 0.004 in/min.
- The direction of shear for each internal direct shear test was in the direction of manufacture (machine direction) of the GCL sample.
- Each test was sheared until a minimum total shear displacement of 2 in. was achieved.

TEST PROCEDURES AND CONDITIONS
TEST SERIES NUMBER: 03-INTERFACE (G)

Test Specimen Configuration (from top to bottom) and Placement Conditions:

- upper shear box: rigid substrate with textured steel gripping surface;
- Bentomat ST GCL (Sample No. GCL-03-01 through GCL-03-13) with woven geotextile against geomembrane (see below). GCL's initial moisture content and final moisture contents are reported on each final test result presentation;
- 80-mil GSE HDT geomembrane (Sample Nos. GML-03-01 through GML-03-12); and
- lower shear box: supporting substrate.

Test Interface: GCL against geomembrane

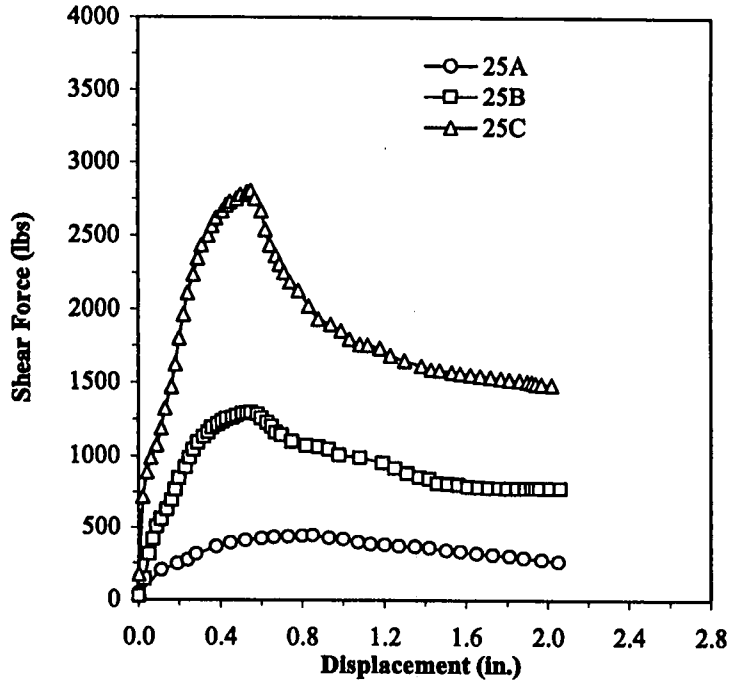
Test Procedures for Each Normal Stress Condition:

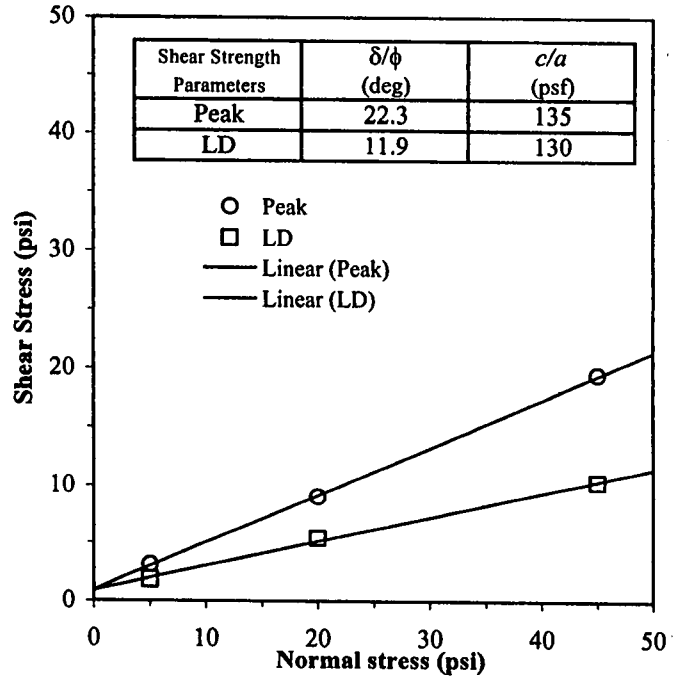
- A fresh specimen of geomembrane was trimmed from the bulk sample and attached to the lower shear box with mechanical compression clamps.
- A fresh specimen of GCL was trimmed from the bulk sample and attached to the upper shear box with mechanical compression clamps. The GCL was oriented so that the woven geotextile component of the GCL was in contact with the geomembrane.
- A rigid substrate with a textured steel gripping surface was placed on top of the GCL. The textured steel gripping surface was used to minimize slippage between the upper geotextile component of the GCL and rigid wooden substrate, therefore providing a relatively uniform transfer of shear load onto the test interface.
- Soaking conditions: The entire test specimen was soaked in tap water for 7 days (168 hours) under a normal stress of 3 psi.
- Consolidation conditions: After the 7-day (168-hour) soaking period, the tap water was drained, and the entire test specimen was consolidated for 2 day (48 hours) under each test normal stress.
- Test normal stresses: 5, 20, and 45 psi.
- Constant shear displacement rate: 0.004 in/min.
- The direction of shear for each interface direct shear test was in the direction of manufacture (machine direction) of the geosynthetic samples.
- Each test was sheared until a minimum total shear displacement of 2 in. was achieved.

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-01I: internal strength of Bentomat ST GCL (Sample No. GCL-03-01 (Lot No. 200304LO/Roll No. 450)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	22.3	135
LD	11.9	130

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
25A	12 x 12	5.0	0.004	3	168	5	48	22.5	92.0	3.09	1.79	1.53 (17 deg)	1.06 (12 deg)	(1)
25B	12 x 12	20.0	0.004	3	168	20	48	22.5	75.5	9.01	5.38	6.11 (17 deg)	2.46 (7 deg)	(1)
25C	12 x 12	45.0	0.004	3	168	45	48	22.5	66.9	19.46	10.28	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

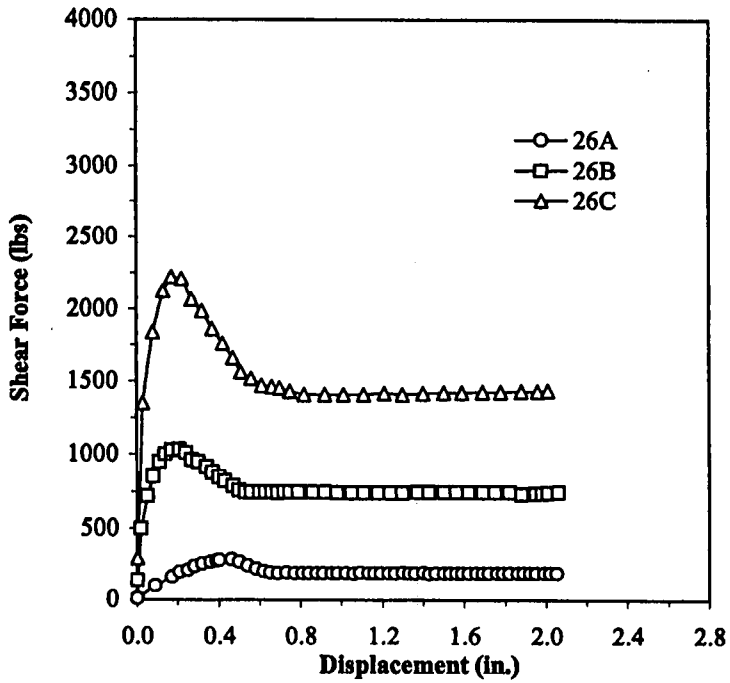
DATE OF TEST:	5 to 14 April 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03031
FILE NO.	

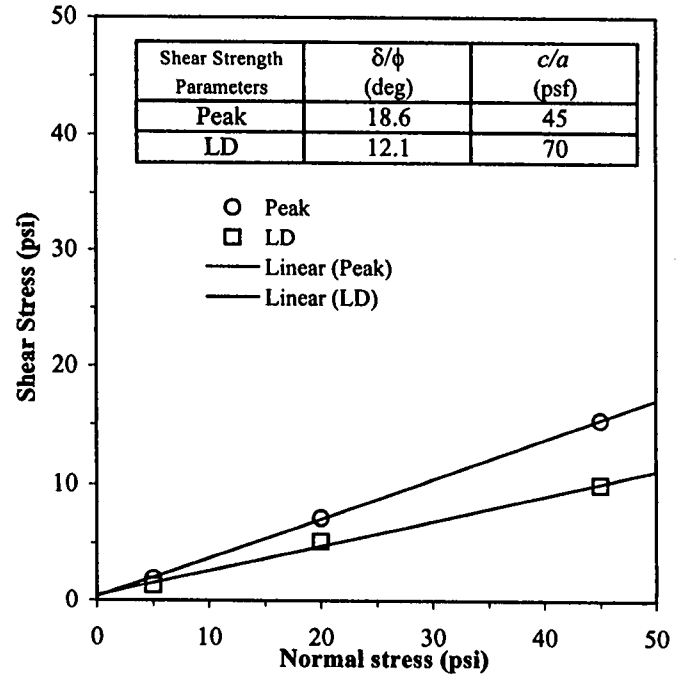
000637

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-01G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-01 (Lot No. 200304LO/Roll No. 450)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-07 (Lot No. 8221514/Roll No. 102103288)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	18.6	45
LD	12.1	70

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
26A	12 x 12	5.0	0.004	3	168	5	48	22.5	94.5	1.94	1.29	1.53 (17 deg)	1.06 (12 deg)	(1)
26B	12 x 12	20.0	0.004	3	168	20	48	22.5	70.4	7.13	5.17	6.11 (17 deg)	2.46 (7 deg)	(1)
26C	12 x 12	45.0	0.004	3	168	45	48	22.5	60.7	15.41	9.95	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

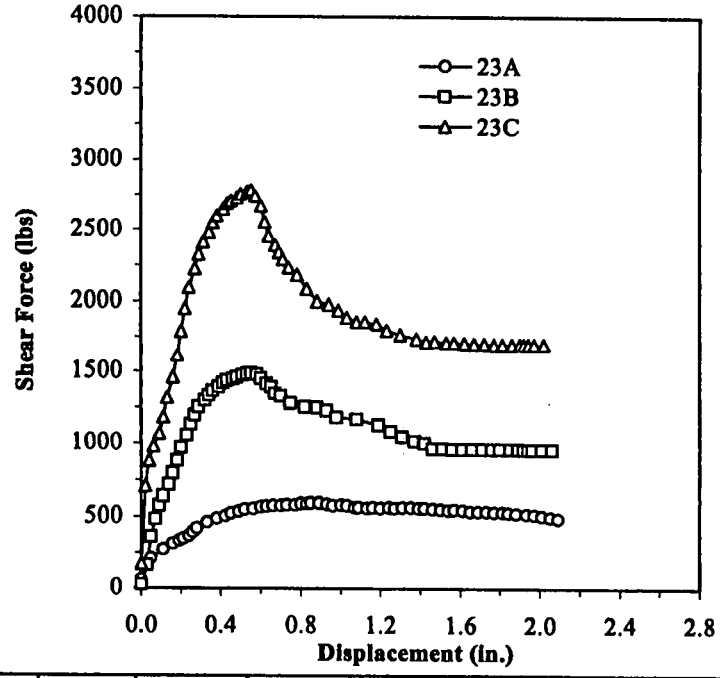
SGI TESTING SERVICES, LLC

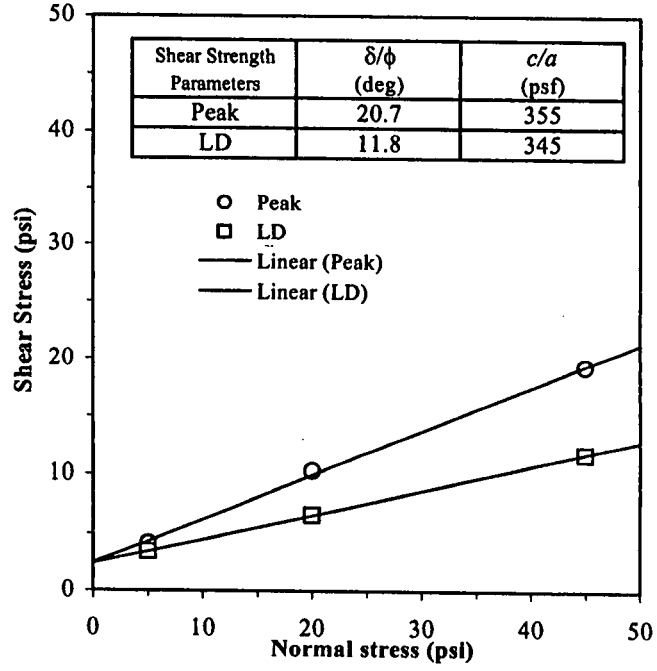
DATE OF TEST:	7 to 16 April 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03031
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-02I: internal strength of Bentomat ST GCL (Sample No. GCL-03-02 (Lot No. 200304LO/Roll No. 495)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	20.7	355
LD	11.8	345

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
23A	12 x 12	5.0	0.004	3	168	5	48	21.8	93.3	4.15	3.40	1.53 (17 deg)	1.06 (12 deg)	(1)
23B	12 x 12	20.0	0.004	3	168	20	48	21.8	74.4	10.33	6.63	6.11 (17 deg)	2.46 (7 deg)	(1)
23C	12 x 12	45.0	0.004	3	168	45	48	21.8	59.6	19.32	11.77	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

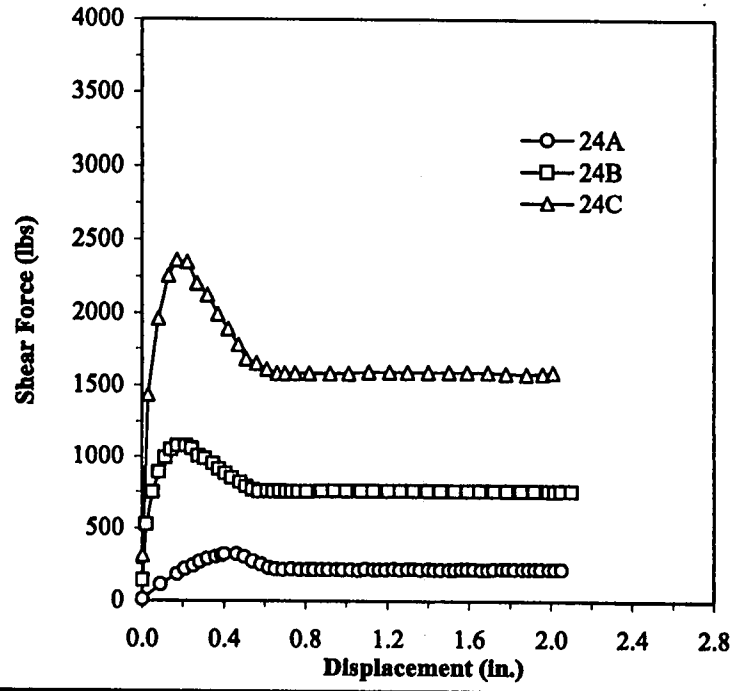
SGI TESTING SERVICES, LLC

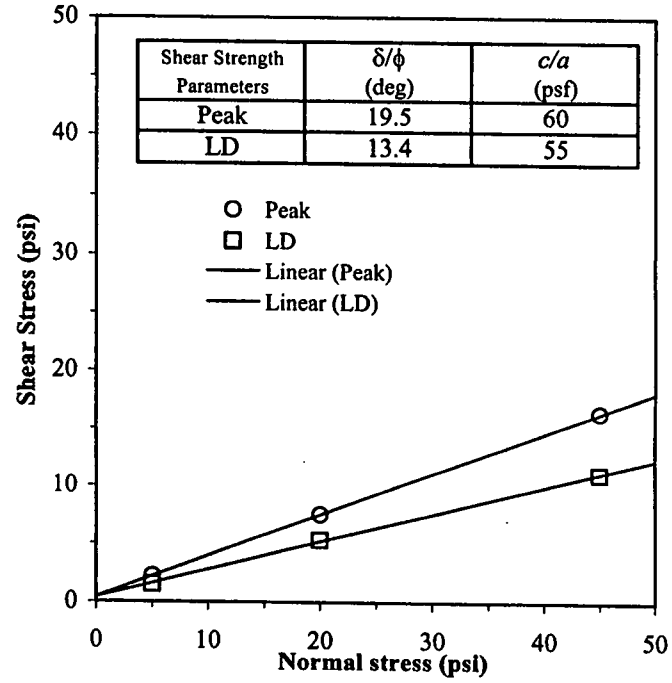
DATE OF TEST:	31 March to 9 April 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03032
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-02G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-02 (Lot No. 200304LO/Roll No. 495)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-12 (Lot No. 8221520/Roll No. 102103347)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	19.5	60
LD	13.4	55

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
24A	12 x 12	5.0	0.004	3	168	5	48	21.8	93.2	2.20	1.51	1.53 (17 deg)	1.06 (12 deg)	(1)
24B	12 x 12	20.0	0.004	3	168	20	48	21.8	71.3	7.46	5.28	6.11 (17 deg)	2.46 (7 deg)	(1)
24C	12 x 12	45.0	0.004	3	168	45	48	21.8	66.1	16.38	11.04	13.76 (17 deg)	5.13 (6.5 deg)	(1)

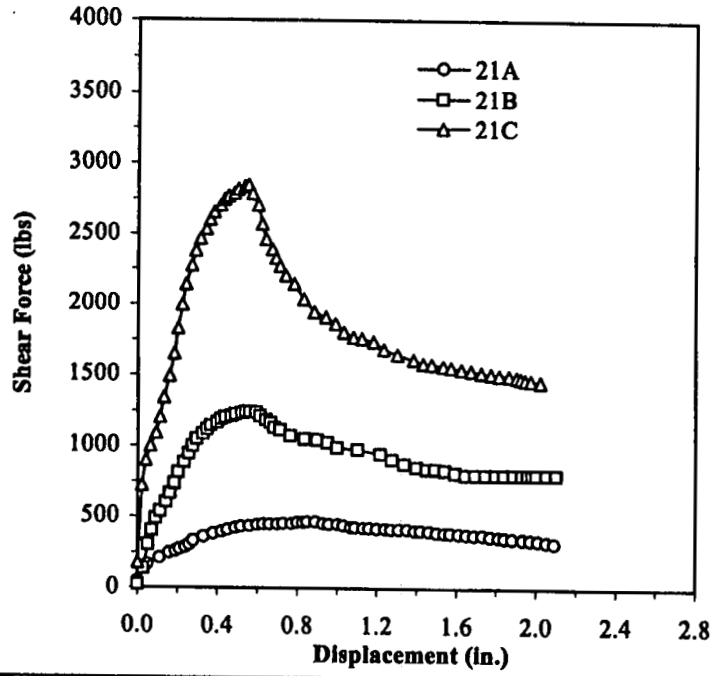
Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

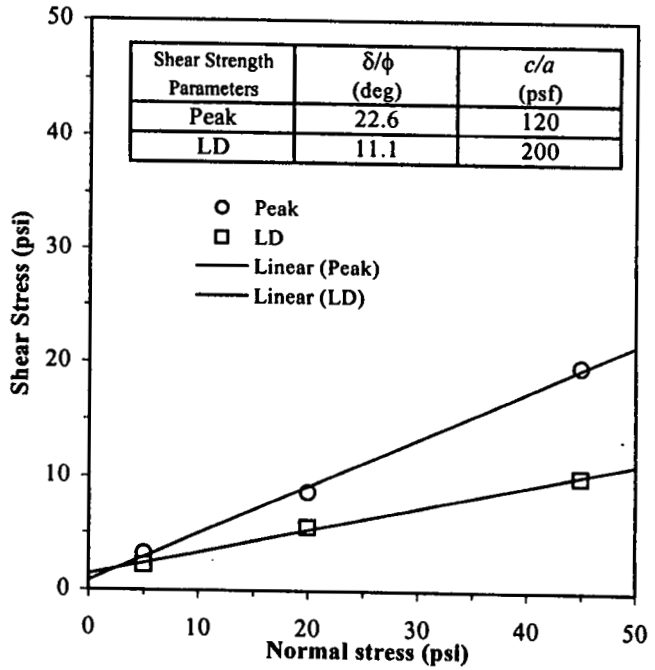
SGI TESTING SERVICES, LLC

DATE OF TEST:	2 to 11 April 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03032
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003
INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-031: internal strength of Bentomat ST GCL (Sample No. GCL-03-03 (Lot No. 200304LO/Roll No. 540)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	22.6	120
LD	11.1	200

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
21A	12 x 12	5.0	0.004	3	168	5	48	22.1	96.9	3.22	2.19	1.53 (17 deg)	1.06 (12 deg)	(1)
21B	12 x 12	20.0	0.004	3	168	20	48	22.1	75.0	8.65	5.56	6.11 (17 deg)	2.46 (7 deg)	(1)
21C	12 x 12	45.0	0.004	3	168	45	48	22.1	57.1	19.75	10.11	13.76 (17 deg)	5.13 (6.5 deg)	(1)

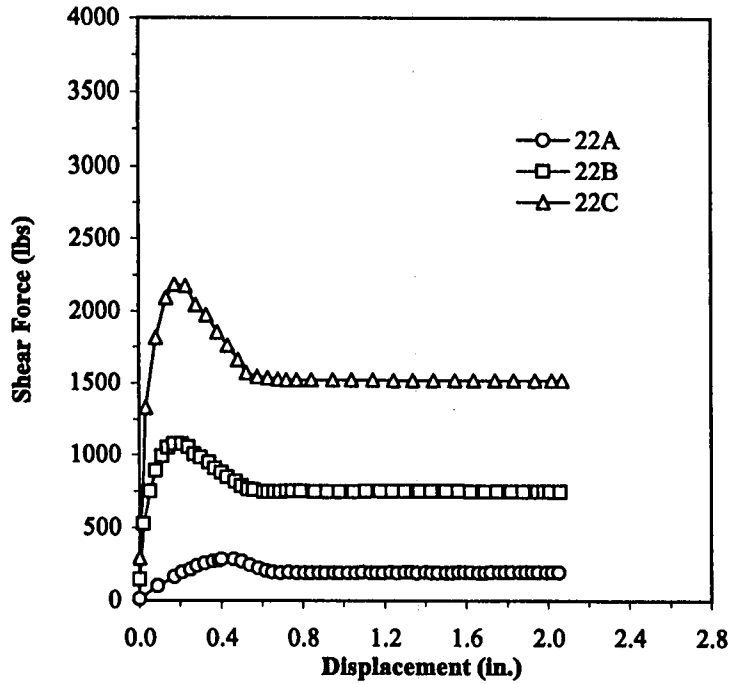
Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

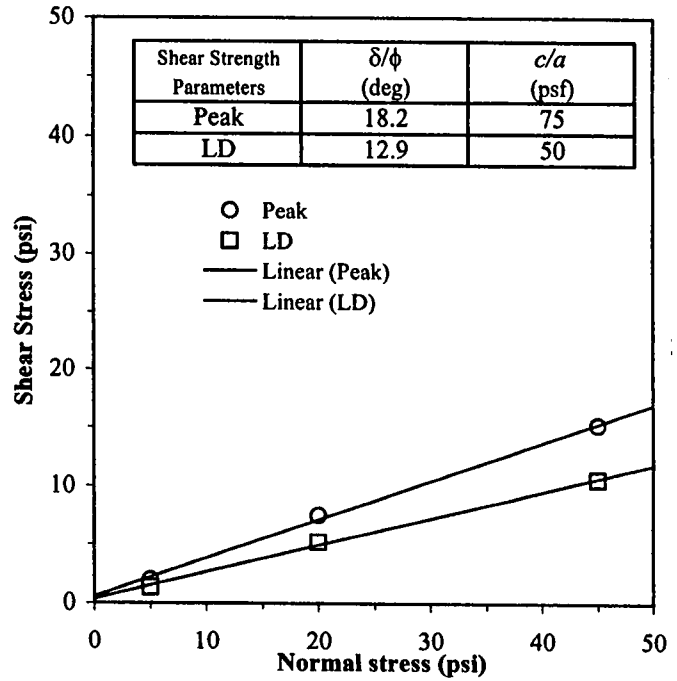
SGI TESTING SERVICES, LLC

DATE OF TEST:	26 March to 4 April 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03033
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003
INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-03G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-03 (Lot No. 200304LO/Roll No. 540)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-11 (Lot No. 8221514/Roll No. 102103335)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	18.2	75
LD	12.9	50

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking Stress (psi)	Soaking Time (hour)	Consolidation Stress (psi)	Consolidation Time (hour)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress Measured τ_p (psi)	Shear Stress Measured τ_{LD} (psi)	Shear Stress Specified τ_p (psi)	Shear Stress Specified τ_{LD} (psi)	Failure Mode
22A	12 x 12	5.0	0.004	3	168	5	48	22.1	96.2	1.94	1.32	1.53 (17 deg)	1.06 (12 deg)	(1)
22B	12 x 12	20.0	0.004	3	168	20	48	22.1	73.1	7.46	5.17	6.11 (17 deg)	2.46 (7 deg)	(1)
22C	12 x 12	45.0	0.004	3	168	45	48	22.1	59.2	15.17	10.53	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

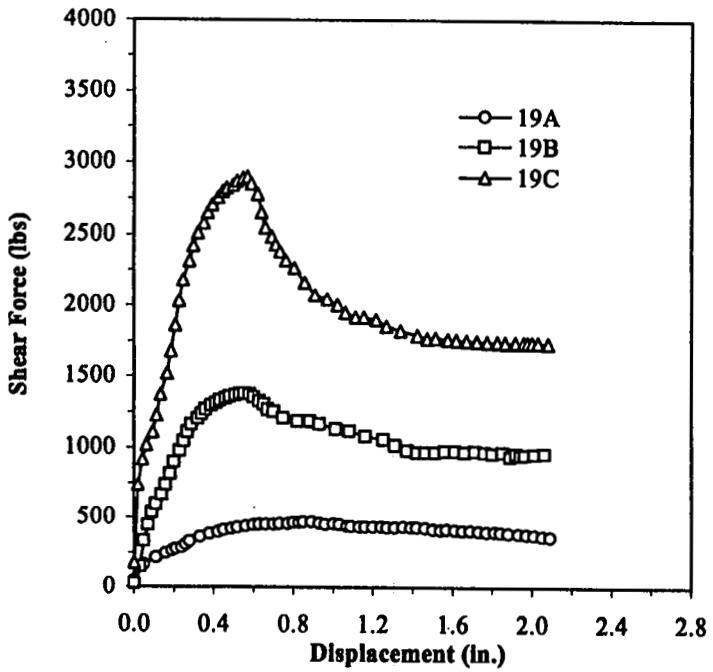
SGI TESTING SERVICES, LLC

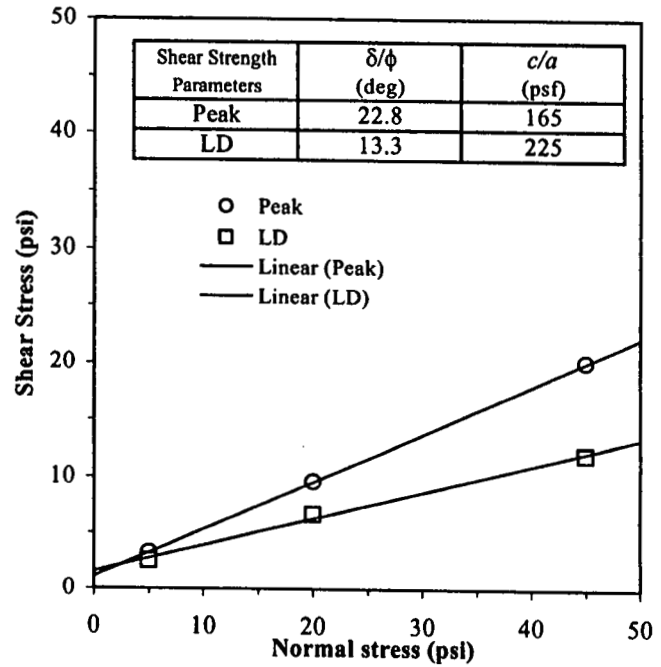
DATE OF TEST:	29 March to 7 April 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03033
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-04I: internal strength of Bentomat ST GCL (Sample No. GCL-03-04 (Lot No. 200305LO/Roll No. 568)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	22.8	165
LD	13.3	225

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
19A	12 x 12	5.0	0.004	3	168	5	48	24.6	88.6	3.25	2.50	1.53 (17 deg)	1.06 (12 deg)	(1)
19B	12 x 12	20.0	0.004	3	168	20	48	24.6	76.4	9.57	6.67	6.11 (17 deg)	2.46 (7 deg)	(1)
19C	12 x 12	45.0	0.004	3	168	45	48	24.6	53.5	20.10	12.07	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

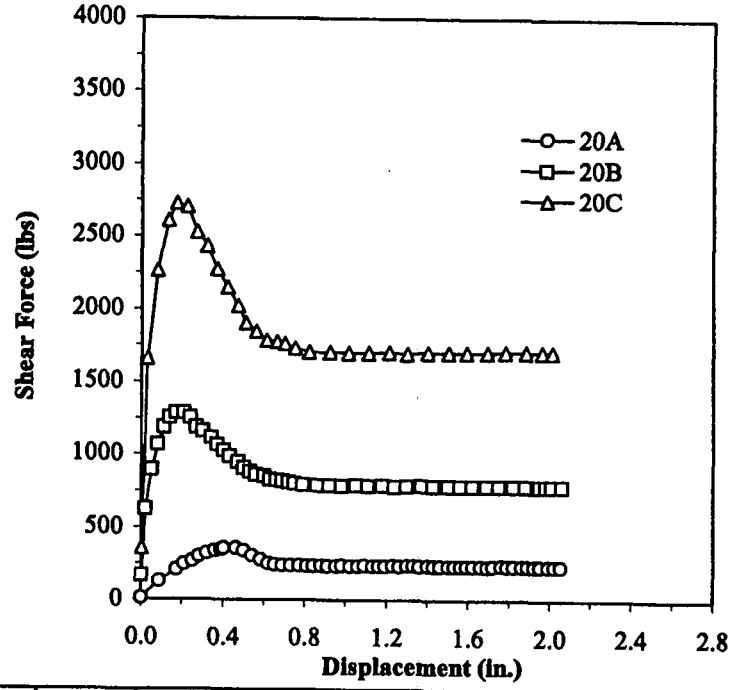
SGI TESTING SERVICES, LLC

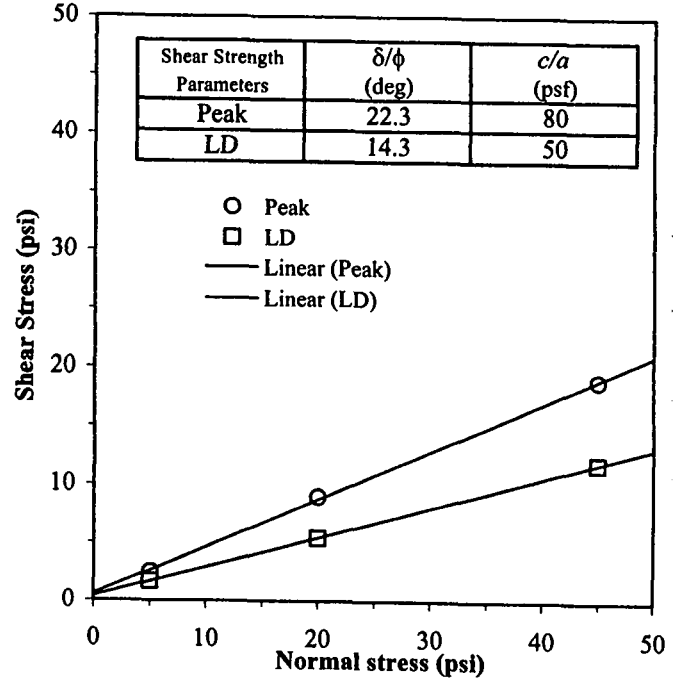
DATE OF TEST:	22 to 31 March 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03034
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-04G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-04 (Lot No. 200305LO/Roll No. 568)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-10 (Lot No. 8221514/Roll No. 102103325)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	22.3	80
LD	14.3	50

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
20A	12 x 12	5.0	0.004	3	168	5	48	24.6	94.4	2.49	1.63	1.53 (17 deg)	1.06 (12 deg)	(1)
20B	12 x 12	20.0	0.004	3	168	20	48	24.6	74.8	8.92	5.44	6.11 (17 deg)	2.46 (7 deg)	(1)
20C	12 x 12	45.0	0.004	3	168	45	48	24.6	60.3	18.92	11.85	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

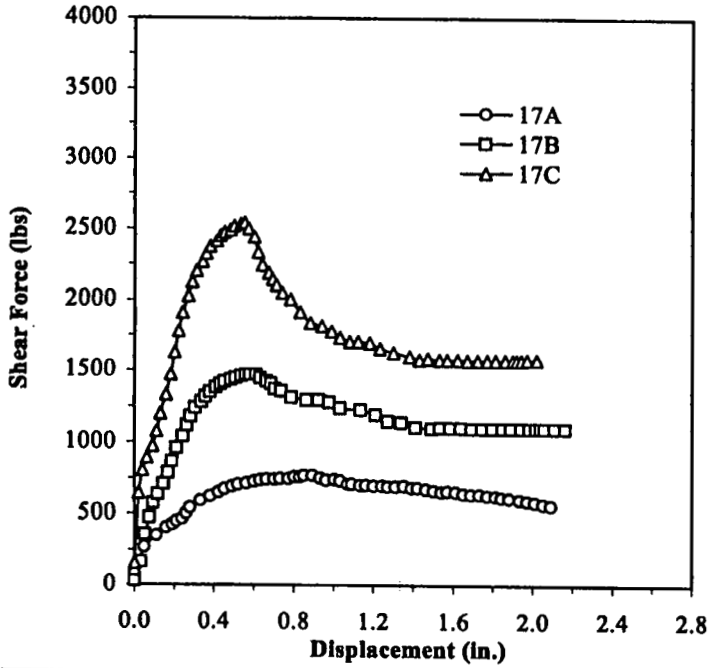
SGI TESTING SERVICES, LLC

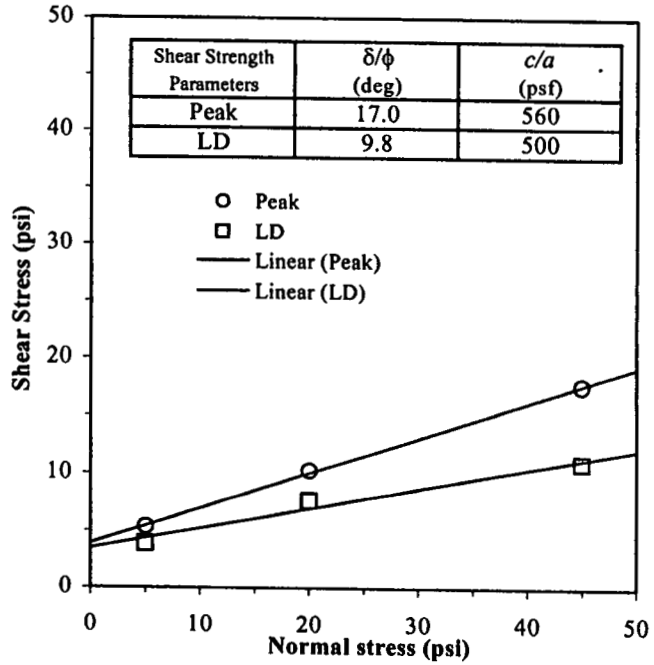
DATE OF TEST:	24 March to 2 April 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03034
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-05I: internal strength of Bentomat ST GCL (Sample No. GCL-03-05 (Lot No. 200305LO/Roll No. 612)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	17.0	560
LD	9.8	500

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking Stress (psi)	Soaking Time (hour)	Consolidation Stress (psi)	Consolidation Time (hour)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress Measured τ_p (psi)	Shear Stress Measured τ_{LD} (psi)	Shear Stress Specified τ_p (psi)	Shear Stress Specified τ_{LD} (psi)	Failure Mode
17A	12 x 12	5.0	0.004	3	168	5	48	23.8	94.8	5.32	3.87	1.53 (17 deg)	1.06 (12 deg)	(1)
17B	12 x 12	20.0	0.004	3	168	20	48	23.8	78.4	10.21	7.63	6.11 (17 deg)	2.46 (7 deg)	(1)
17C	12 x 12	45.0	0.004	3	168	45	48	23.8	50.7	17.62	10.95	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

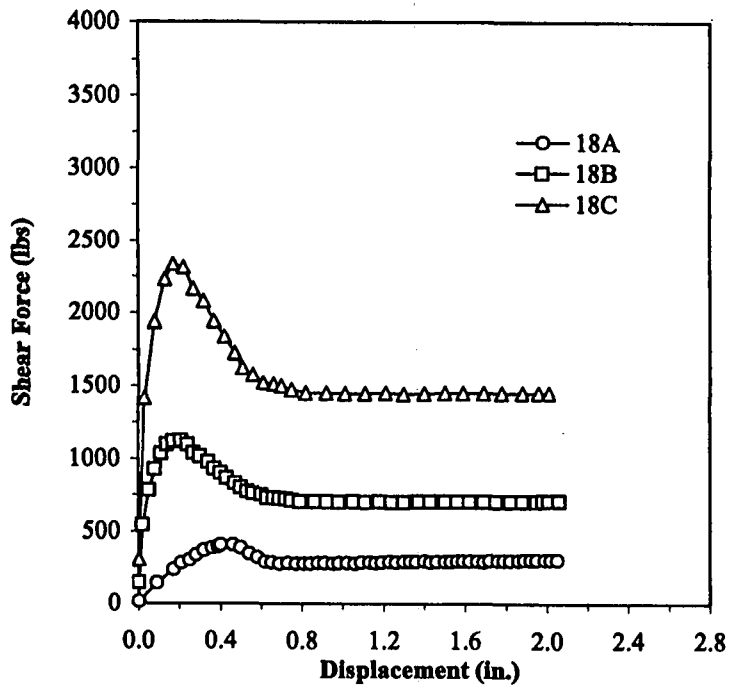
SGI TESTING SERVICES, LLC

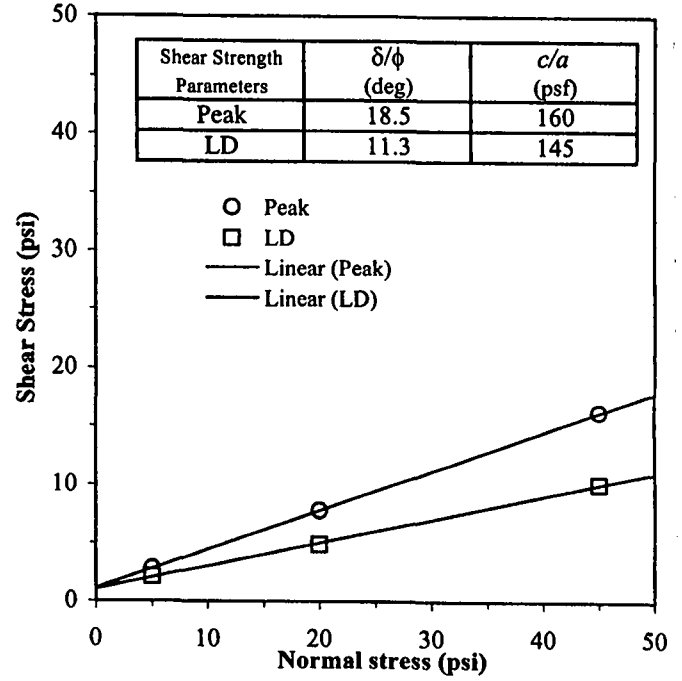
DATE OF TEST:	17 to 26 March 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03035
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-05G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-05 (Lot No. 200305LO/Roll No. 612)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-09 (Lot No. 8221514/Roll No. 102103313)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	18.5	160
LD	11.3	145

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
18A	12 x 12	5.0	0.004	3	168	5	48	23.8	96.1	2.81	2.09	1.53 (17 deg)	1.06 (12 deg)	(1)
18B	12 x 12	20.0	0.004	3	168	20	48	23.8	76.3	7.77	4.90	6.11 (17 deg)	2.46 (7 deg)	(1)
18C	12 x 12	45.0	0.004	3	168	45	48	23.8	62.5	16.21	10.08	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

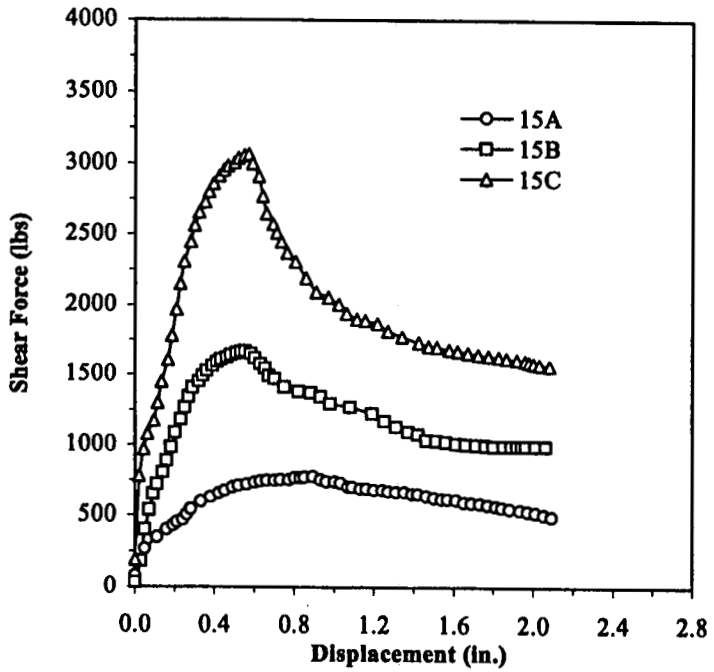
SGI TESTING SERVICES, LLC

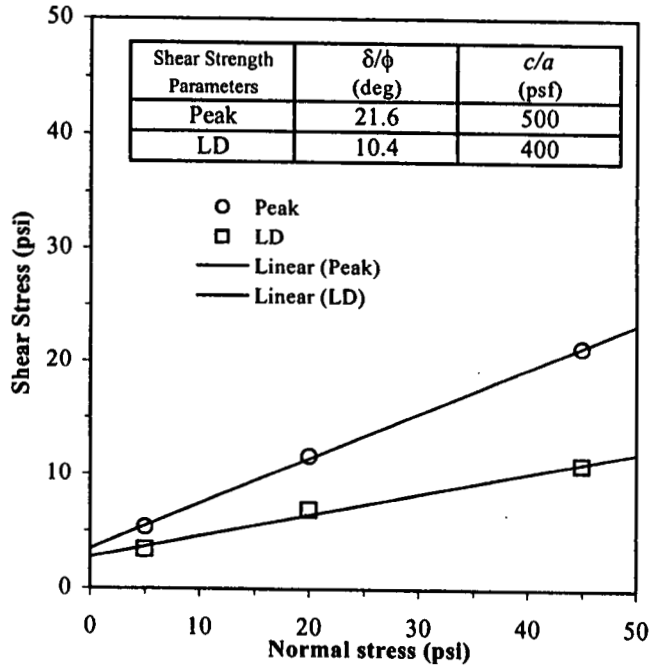
DATE OF TEST:	19 to 28 March 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03035
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-06I: internal strength of Bentomat ST GCL (Sample No. GCL-03-06 (Lot No. 200305LO/Roll No. 657)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	21.6	500
LD	10.4	400

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
15A	12 x 12	5.0	0.004	3	168	5	48	22.2	97.9	5.35	3.40	1.53 (17 deg)	1.06 (12 deg)	(1)
15B	12 x 12	20.0	0.004	3	168	20	48	22.2	77.8	11.58	6.89	6.11 (17 deg)	2.46 (7 deg)	(1)
15C	12 x 12	45.0	0.004	3	168	45	48	22.2	53.0	21.26	10.88	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	12 to 21 March 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03036
FILE NO.	

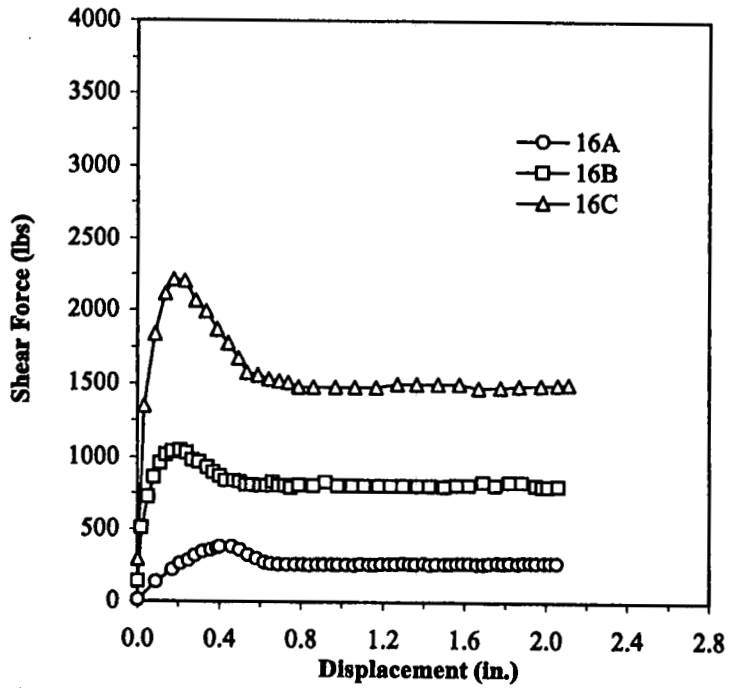
0006637

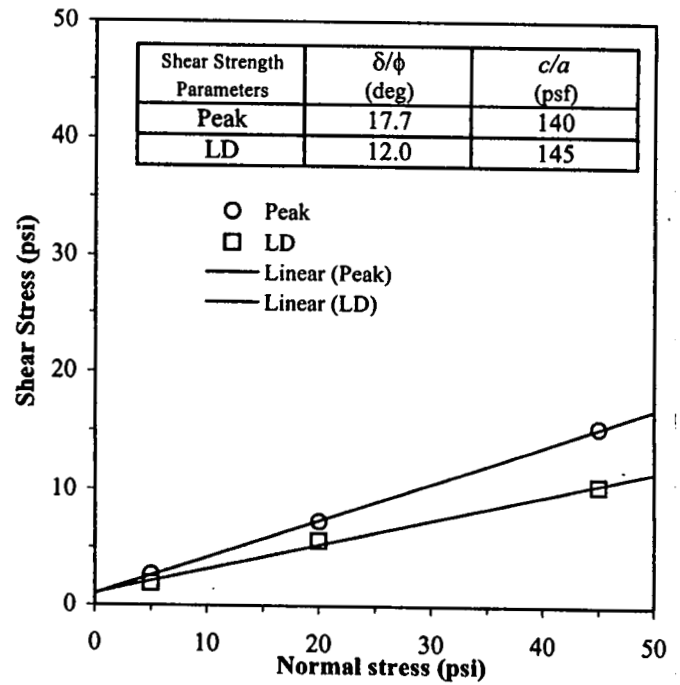
5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-06G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-06 (Lot No. 200305LO/Roll No. 657)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-08 (Lot No. 8221514/Roll No. 102103301)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	17.7	140
LD	12.0	145

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking Stress (psi)	Soaking Time (hour)	Consolidation Stress (psi)	Consolidation Time (hour)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress Measured τ_p (psi)	Shear Stress Measured τ_{LD} (psi)	Shear Stress Specified τ_p (psi)	Shear Stress Specified τ_{LD} (psi)	Failure Mode
16A	12 x 12	5.0	0.004	3	168	5	48	22.2	93.0	2.64	1.87	1.53 (17 deg)	1.06 (12 deg)	(1)
16B	12 x 12	20.0	0.004	3	168	20	48	22.2	73.8	7.22	5.59	6.11 (17 deg)	2.46 (7 deg)	(1)
16C	12 x 12	45.0	0.004	3	168	45	48	22.2	56.5	15.37	10.42	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	15 to 24 March 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03036
FILE NO.	

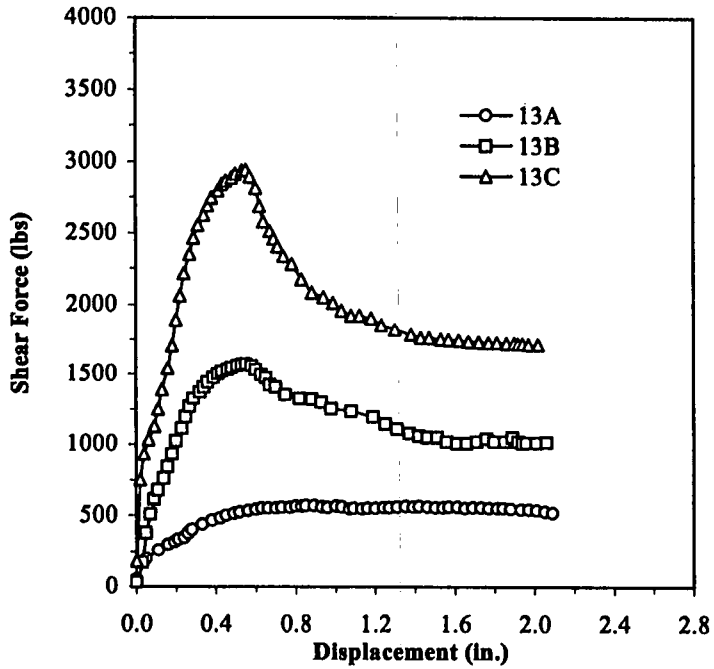
000638

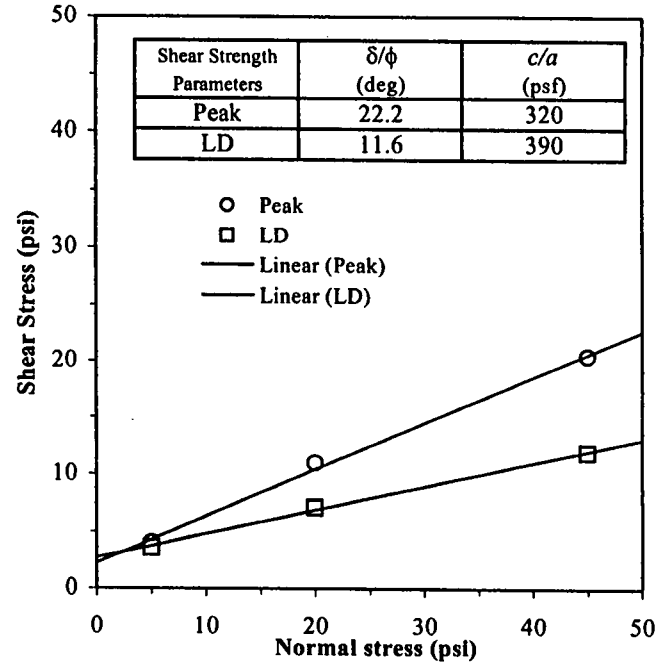
5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-07I: internal strength of Bentomat ST GCL (Sample No. GCL-03-07 (Lot No. 200305LO/Roll No. 702)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	22.2	320
LD	11.6	390

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
13A	12 x 12	5.0	0.004	3	168	5	48	22.4	96.2	3.96	3.61	1.53 (17 deg)	1.06 (12 deg)	(1)
13B	12 x 12	20.0	0.004	3	168	20	48	22.4	73.0	10.92	7.04	6.11 (17 deg)	2.46 (7 deg)	(1)
13C	12 x 12	45.0	0.004	3	168	45	48	22.4	60.5	20.42	11.89	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	8 to 17 March 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03037
FILE NO.	

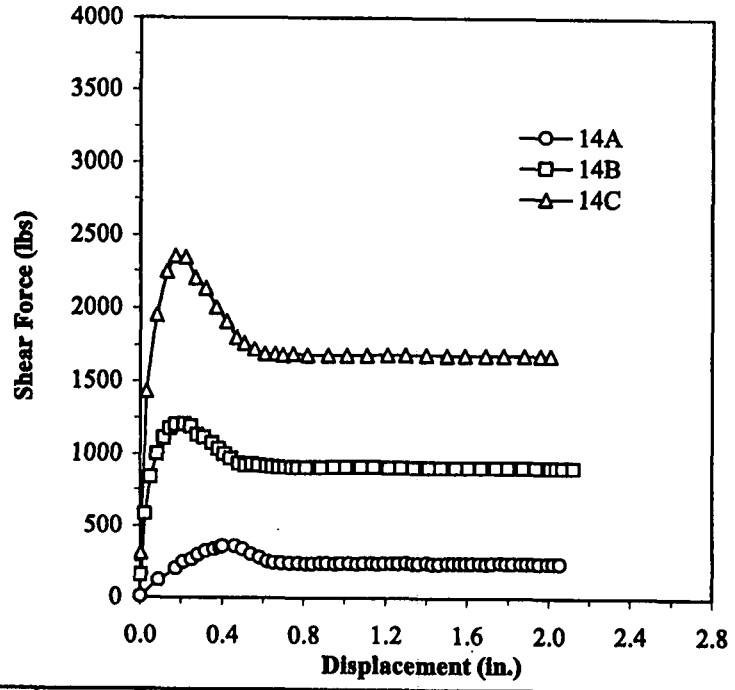
000639

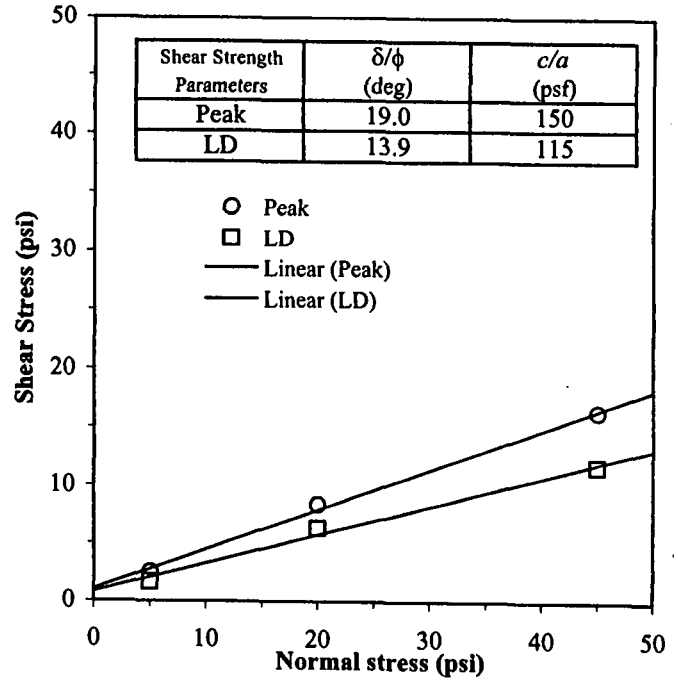
5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-07G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-07 (Lot No. 200305LO/Roll No. 702)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-07 (Lot No. 8221514/Roll No. 102103288)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	19.0	150
LD	13.9	115

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
14A	12 x 12	5.0	0.004	3	168	5	48	22.4	92.9	2.48	1.67	1.53 (17 deg)	1.06 (12 deg)	(1)
14B	12 x 12	20.0	0.004	3	168	20	48	22.4	71.0	8.34	6.28	6.11 (17 deg)	2.46 (7 deg)	(1)
14C	12 x 12	45.0	0.004	3	168	45	48	22.4	52.9	16.33	11.67	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

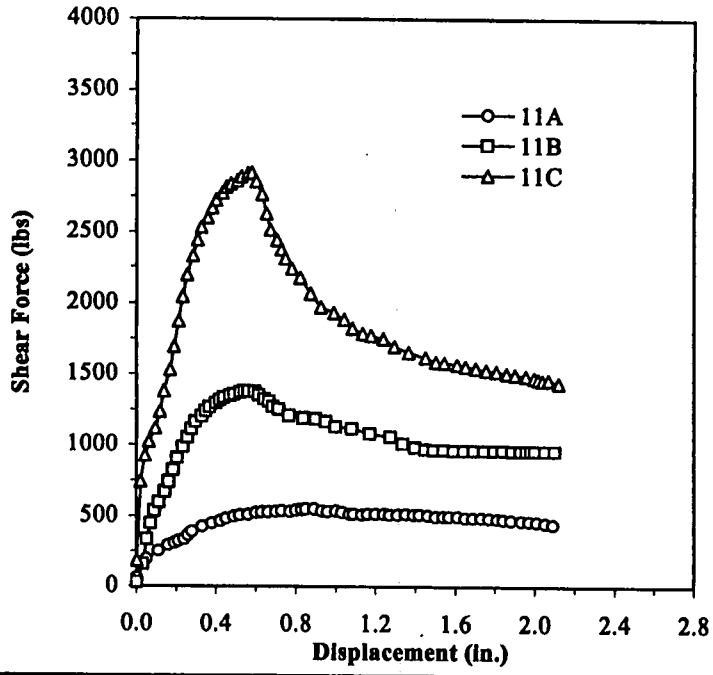
DATE OF TEST:	10 to 19 March 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03037
FILE NO.	

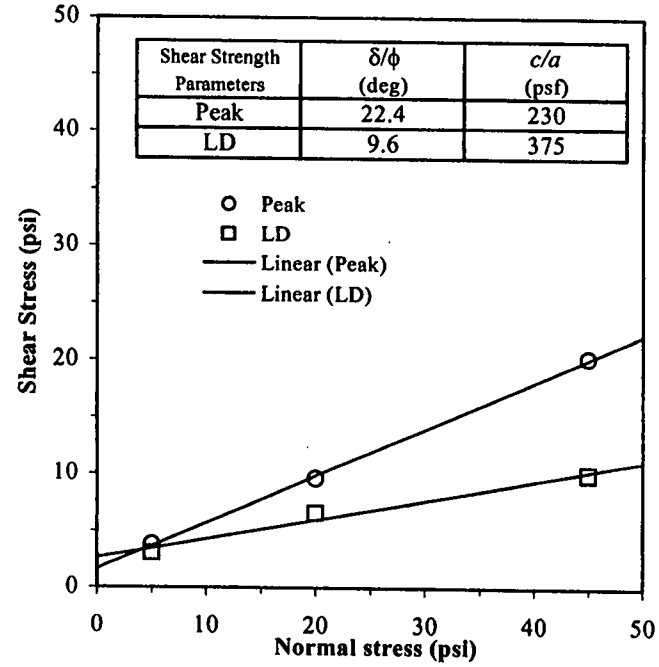
000640

5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003
INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-08I: internal strength of Bentomat ST GCL (Sample No. GCL-03-08 (Lot No. 200305LO/Roll No. 746)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	22.4	230
LD	9.6	375

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking Stress (psi)	Soaking Time (hour)	Consolidation Stress (psi)	Consolidation Time (hour)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress Measured τ_p (psi)	Shear Stress Measured τ_{LD} (psi)	Shear Stress Specified τ_p (psi)	Shear Stress Specified τ_{LD} (psi)	Failure Mode
11A	12 x 12	5.0	0.004	3	168	5	48	22.1	94.9	3.81	3.05	1.53 (17 deg)	1.06 (12 deg)	(1)
11B	12 x 12	20.0	0.004	3	168	20	48	22.1	75.1	9.60	6.64	6.11 (17 deg)	2.46 (7 deg)	(1)
11C	12 x 12	45.0	0.004	3	168	45	48	22.1	59.6	20.24	9.99	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	3 to 12 March 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03038
FILE NO.	

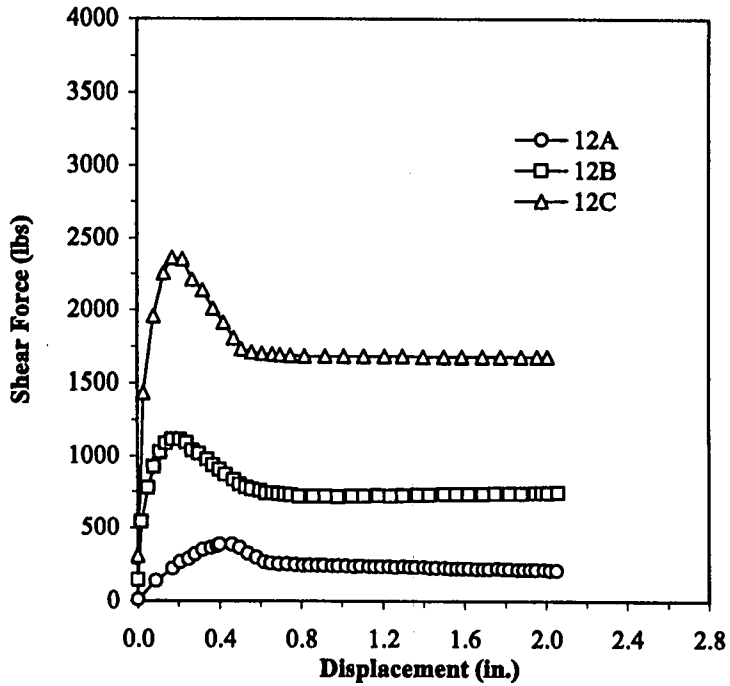
000641

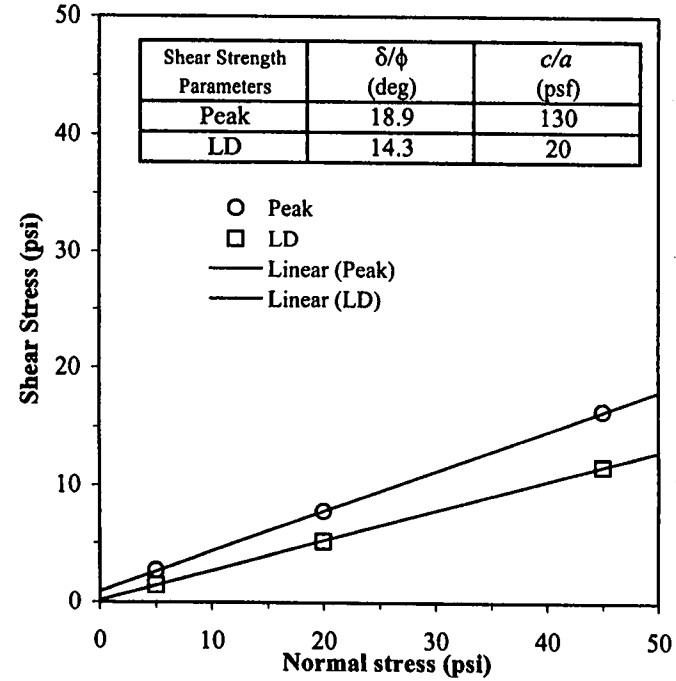
5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-08G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-08 (Lot No. 200305LO/Roll No. 746)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-06 (Lot No. 8221460/Roll No. 102103275)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	18.9	130
LD	14.3	20

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
12A	12 x 12	5.0	0.004	3	168	5	48	22.1	96.9	2.67	1.44	1.53 (17 deg)	1.06 (12 deg)	(1)
12B	12 x 12	20.0	0.004	3	168	20	48	22.1	74.2	7.72	5.17	6.11 (17 deg)	2.46 (7 deg)	(1)
12C	12 x 12	45.0	0.004	3	168	45	48	22.1	57.8	16.39	11.65	13.76 (17 deg)	5.13 (6.5 deg)	(1)

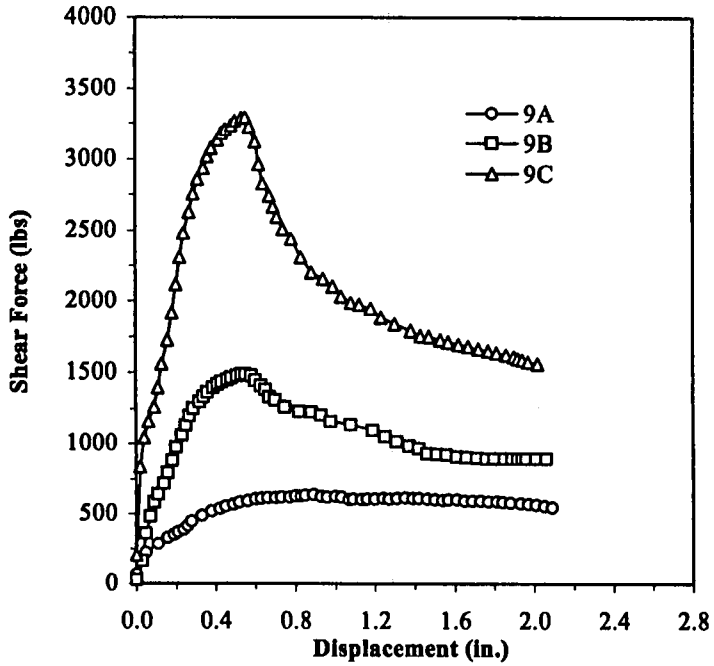
Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

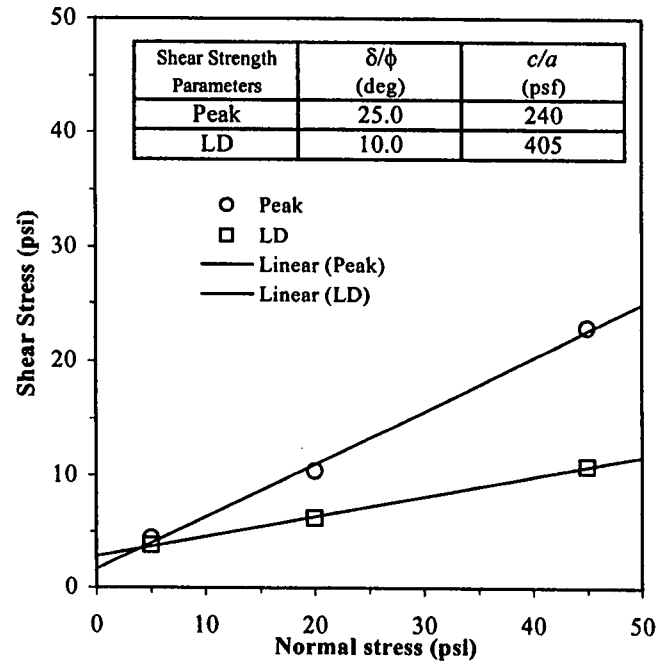
SGI TESTING SERVICES, LLC

DATE OF TEST:	5 to 14 March 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03038
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003
INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-09I: internal strength of Bentomat ST GCL (Sample No. GCL-03-09 (Lot No. 200305LO/Roll No. 790)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	25.0	240
LD	10.0	405

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
9A	12 x 12	5.0	0.004	3	168	5	48	23.1	95.9	4.40	3.79	1.53 (17 deg)	1.06 (12 deg)	(1)
9B	12 x 12	20.0	0.004	3	168	20	48	23.1	74.6	10.35	6.19	6.11 (17 deg)	2.46 (7 deg)	(1)
9C	12 x 12	45.0	0.004	3	168	45	48	23.1	60.5	22.88	10.83	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

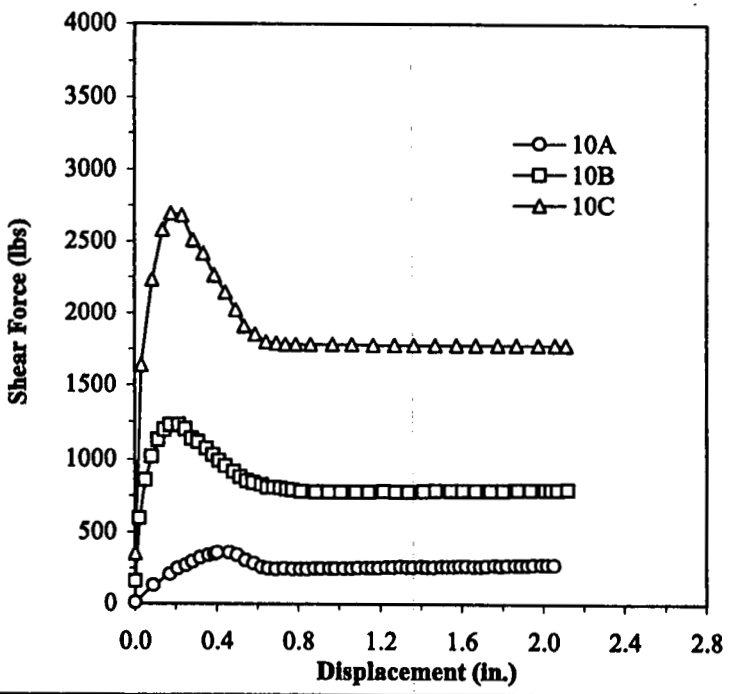
SGI TESTING SERVICES, LLC

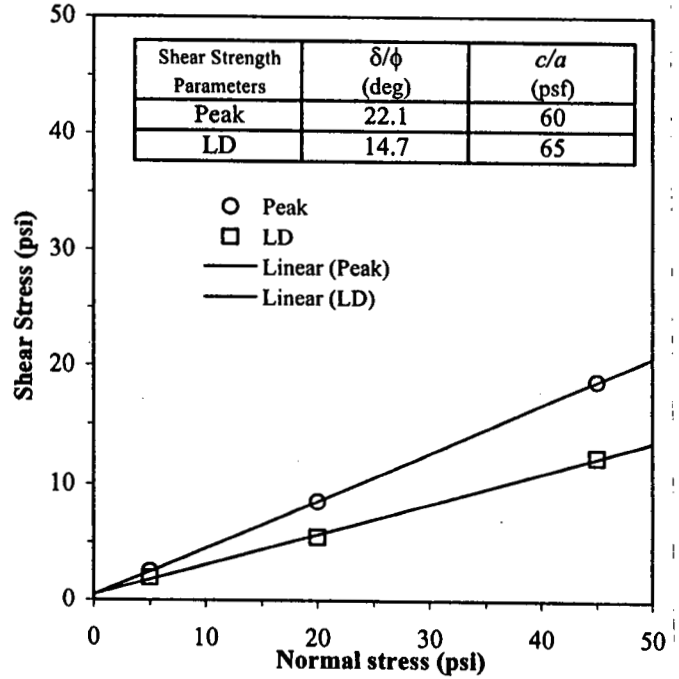
DATE OF TEST:	26 February to 7 March 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03039
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-09G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-09 (Lot No. 200305LO/Roll No. 790)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-05 (Lot No. 8221460/Roll No. 102103263)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	22.1	60
LD	14.7	65

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
10A	12 x 12	5.0	0.004	3	168	5	48	23.1	94.3	2.49	1.90	1.53 (17 deg)	1.06 (12 deg)	(1)
10B	12 x 12	20.0	0.004	3	168	20	48	23.1	71.5	8.51	5.51	6.11 (17 deg)	2.46 (7 deg)	(1)
10C	12 x 12	45.0	0.004	3	168	45	48	23.1	55.3	18.72	12.33	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	1 to 10 March 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03039
FILE NO.	

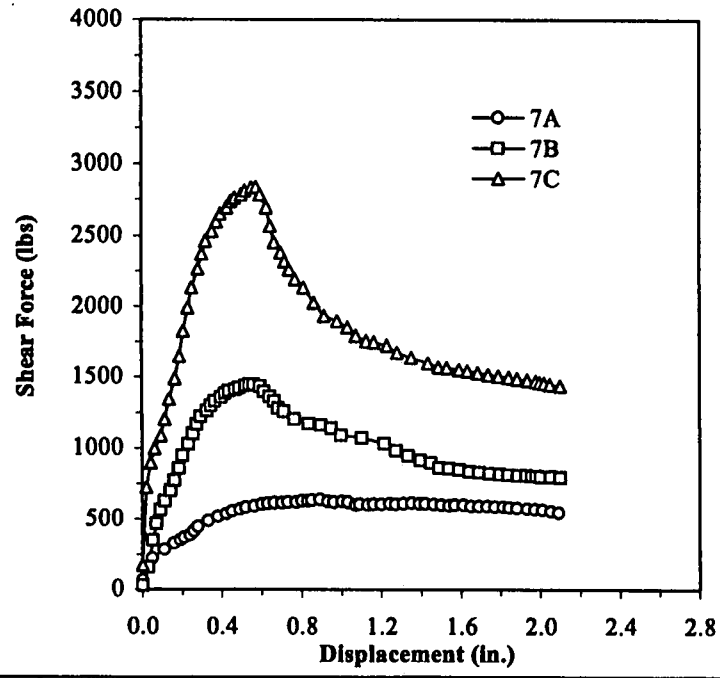
000644

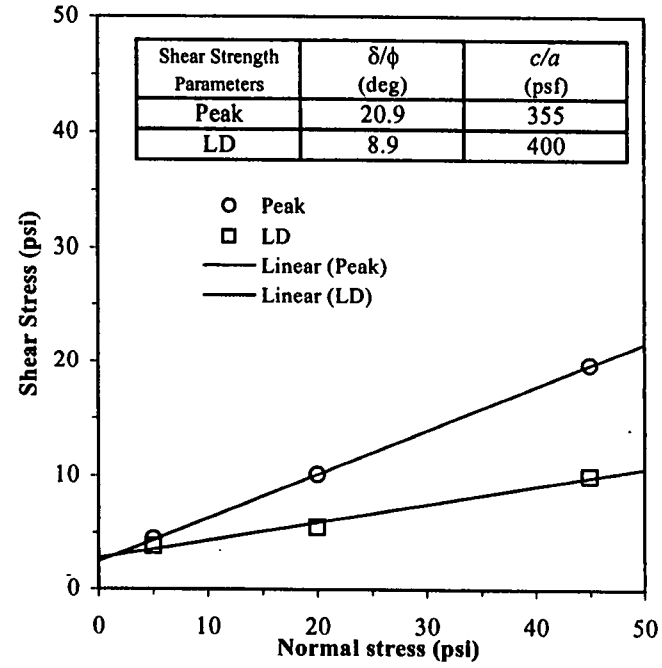
5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-10I: internal strength of Bentomat ST GCL (Sample No. GCL-03-10 (Lot No. 200305LO/Roll No. 834)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	20.9	355
LD	8.9	400

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
7A	12 x 12	5.0	0.004	3	168	5	48	21.3	97.5	4.40	3.79	1.53 (17 deg)	1.06 (12 deg)	(1)
7B	12 x 12	20.0	0.004	3	168	20	48	21.3	77.9	10.06	5.52	6.11 (17 deg)	2.46 (7 deg)	(1)
7C	12 x 12	45.0	0.004	3	168	45	48	21.3	53.2	19.70	9.99	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

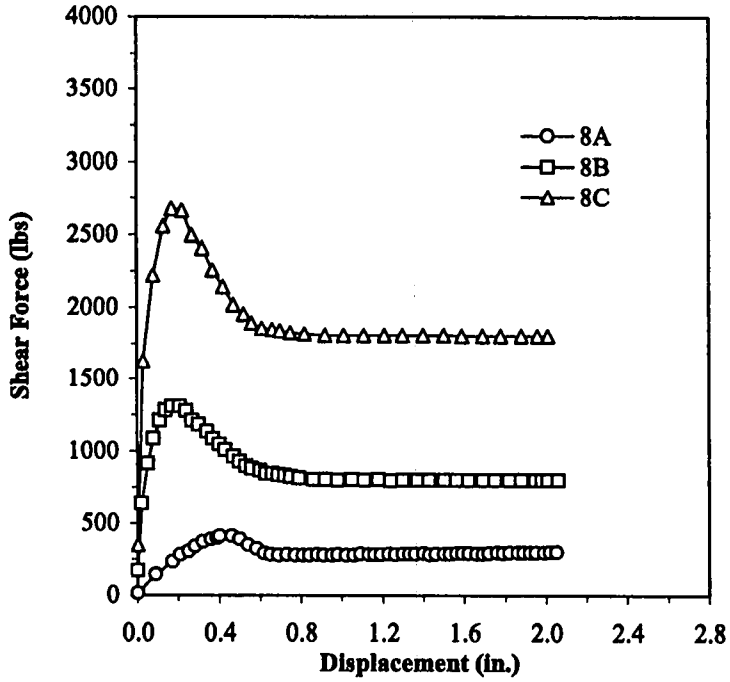
DATE OF TEST:	22 February to 3 March 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03040
FILE NO.	

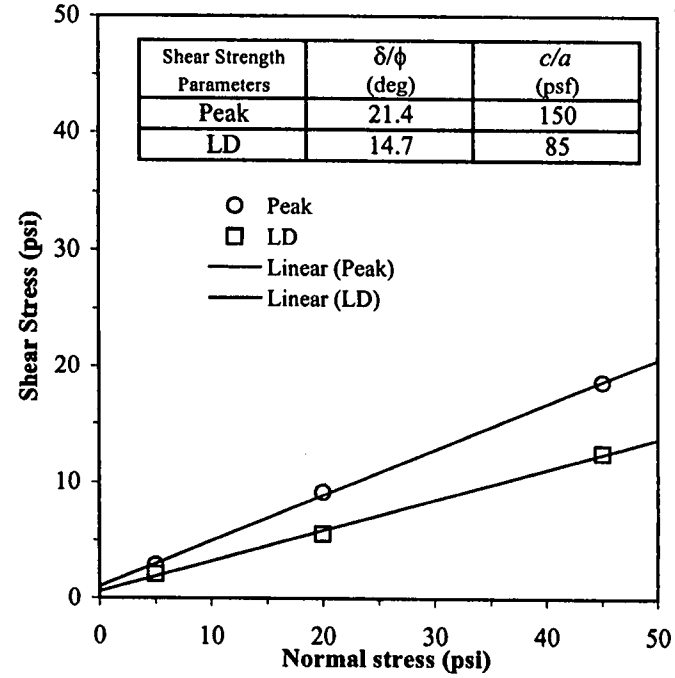
000645

5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003
INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-10G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-10 (Lot No. 200305LO/Roll No. 834)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-04 (Lot No. 8221460/Roll No. 102103252)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	21.4	150
LD	14.7	85

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking Stress (psi)	Soaking Time (hour)	Consolidation Stress (psi)	Consolidation Time (hour)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress Measured τ_p (psi)	Shear Stress Measured τ_{LD} (psi)	Shear Stress Specified τ_p (psi)	Shear Stress Specified τ_{LD} (psi)	Failure Mode
8A	12 x 12	5.0	0.004	3	168	5	48	21.3	94.9	2.85	2.08	1.53 (17 deg)	1.06 (12 deg)	(1)
8B	12 x 12	20.0	0.004	3	168	20	48	21.3	71.2	9.09	5.53	6.11 (17 deg)	2.46 (7 deg)	(1)
8C	12 x 12	45.0	0.004	3	168	45	48	21.3	62.3	18.58	12.51	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

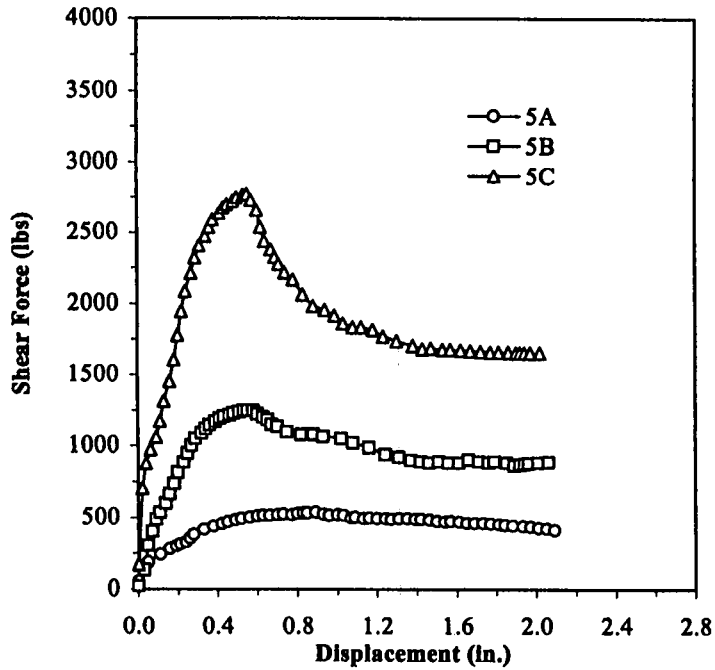
SGI TESTING SERVICES, LLC

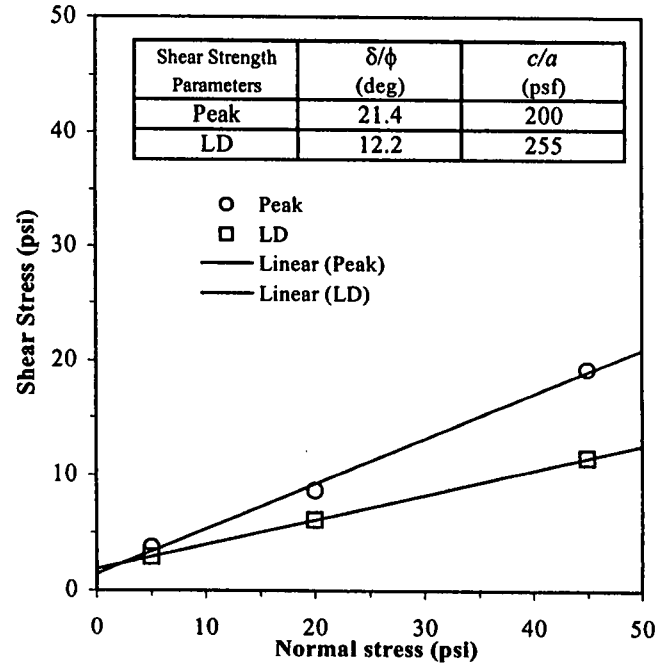
DATE OF TEST:	24 February to 5 March 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03040
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-11I: internal strength of Bentomat ST GCL (Sample No. GCL-03-11 (Lot No. 200305LO/Roll No. 878)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	21.4	200
LD	12.2	255

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
5A	12 x 12	5.0	0.004	3	168	5	48	24.2	98.3	3.72	2.84	1.53 (17 deg)	1.06 (12 deg)	(1)
5B	12 x 12	20.0	0.004	3	168	20	48	24.2	75.0	8.65	6.13	6.11 (17 deg)	2.46 (7 deg)	(1)
5C	12 x 12	45.0	0.004	3	168	45	48	24.2	59.9	19.24	11.48	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	17 to 26 February 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03041
FILE NO.	

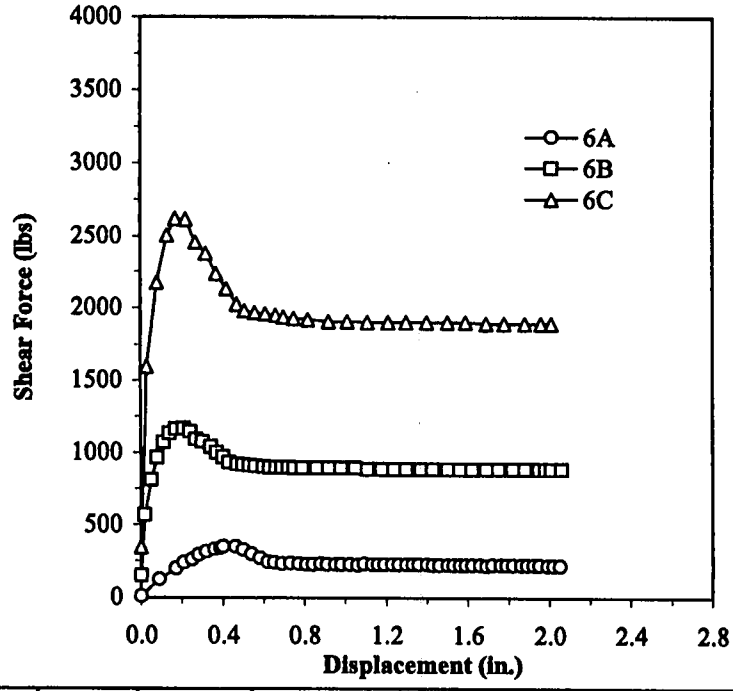
000647

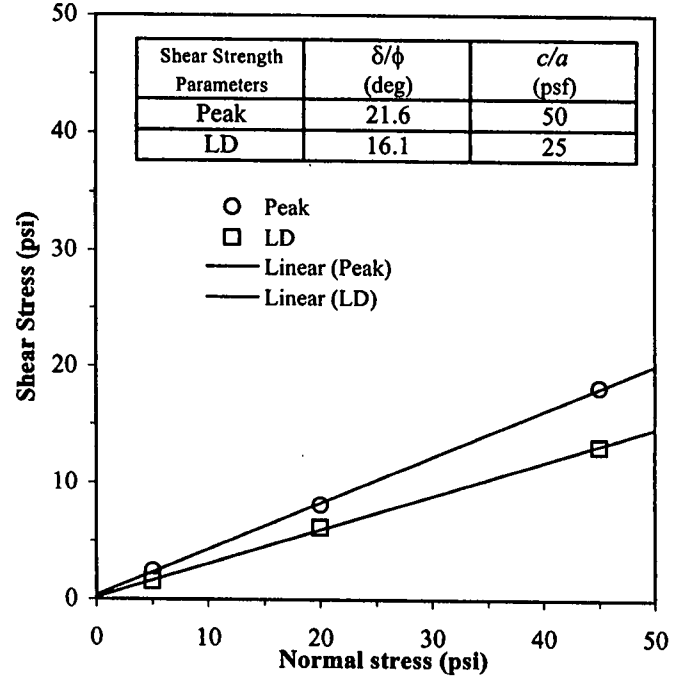
5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-11G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-11 (Lot No. 200305LO/Roll No. 878)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-03 (Lot No. 8221454/Roll No. 102103229)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	21.6	50
LD	16.1	25

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
6A	12 x 12	5.0	0.004	3	168	5	48	24.2	95.2	2.42	1.51	1.53 (17 deg)	1.06 (12 deg)	(1)
6B	12 x 12	20.0	0.004	3	168	20	48	24.2	75.6	8.05	6.12	6.11 (17 deg)	2.46 (7 deg)	(1)
6C	12 x 12	45.0	0.004	3	168	45	48	24.2	60.0	18.19	13.12	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	19 to 28 February 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03041
FILE NO.	

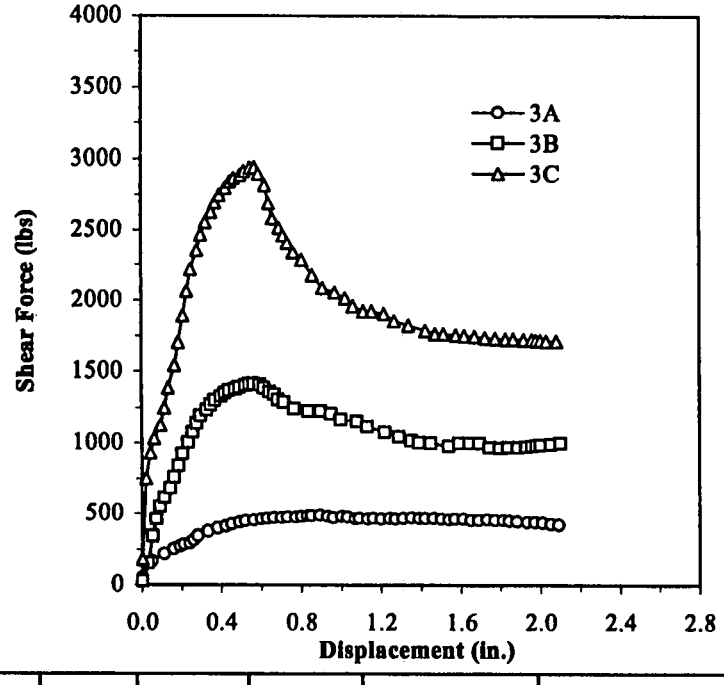
000648

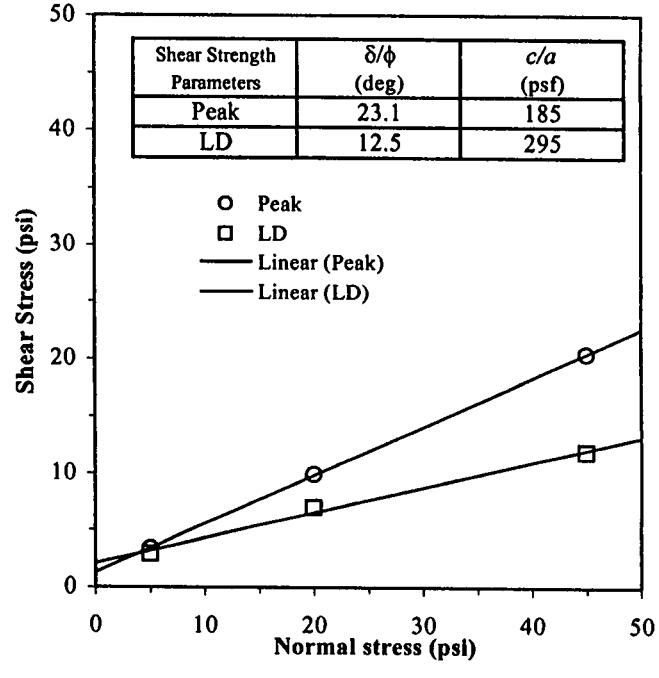
5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-12I: internal strength of Bentomat ST GCL (Sample No. GCL-03-12 (Lot No. 200305LO/Roll No. 921)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	23.1	185
LD	12.5	295

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking Stress (psi)	Soaking Time (hour)	Consolidation Stress (psi)	Consolidation Time (hour)	GCL ω_i (%)	GCL ω_f (%)	Shear Stress Measured τ_p (psi)	Shear Stress Measured τ_{LD} (psi)	Shear Stress Specified τ_p (psi)	Shear Stress Specified τ_{LD} (psi)	Failure Mode
3A	12 x 12	5.0	0.004	3	168	5	48	22.7	99.1	3.37	2.90	1.53 (17 deg)	1.06 (12 deg)	(1)
3B	12 x 12	20.0	0.004	3	168	20	48	22.7	71.6	9.84	6.94	6.11 (17 deg)	2.46 (7 deg)	(1)
3C	12 x 12	45.0	0.004	3	168	45	48	22.7	59.3	20.42	11.89	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	12 to 21 February 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03042
FILE NO.	

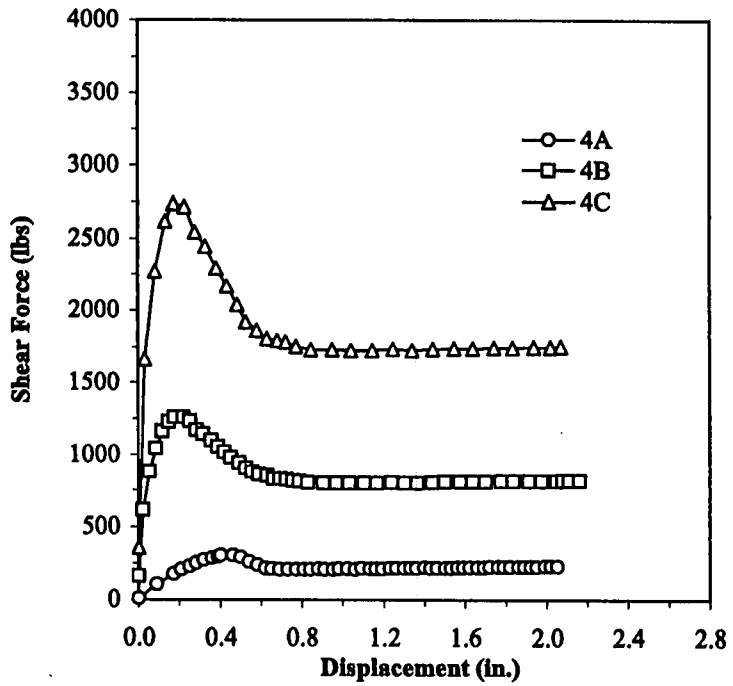
000649

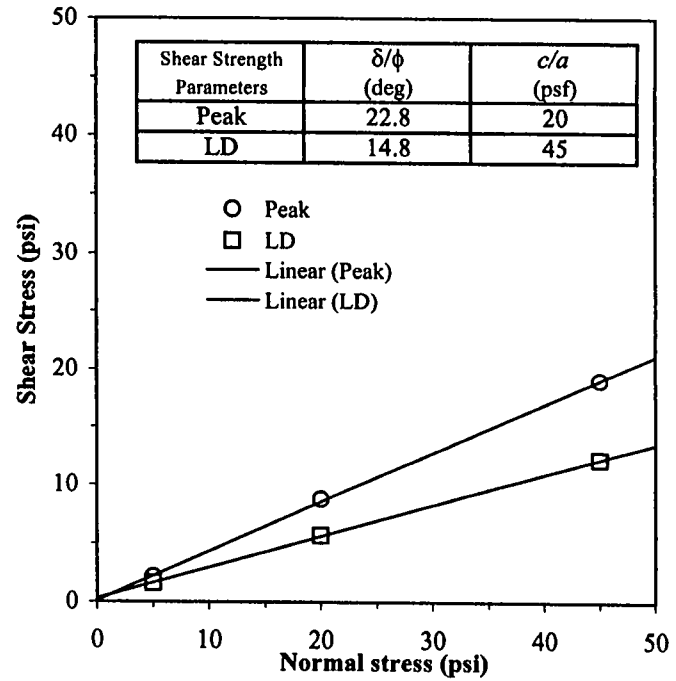
5372

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-12G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-12 (Lot No. 200305LO/Roll No. 921)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-02 (Lot No. 8221454/Roll No. 102103217)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	22.8	20
LD	14.8	45

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
4A	12 x 12	5.0	0.004	3	168	5	48	22.7	97.7	2.12	1.59	1.53 (17 deg)	1.06 (12 deg)	(1)
4B	12 x 12	20.0	0.004	3	168	20	48	22.7	74.1	8.74	5.67	6.11 (17 deg)	2.46 (7 deg)	(1)
4C	12 x 12	45.0	0.004	3	168	45	48	22.7	63.2	19.01	12.17	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

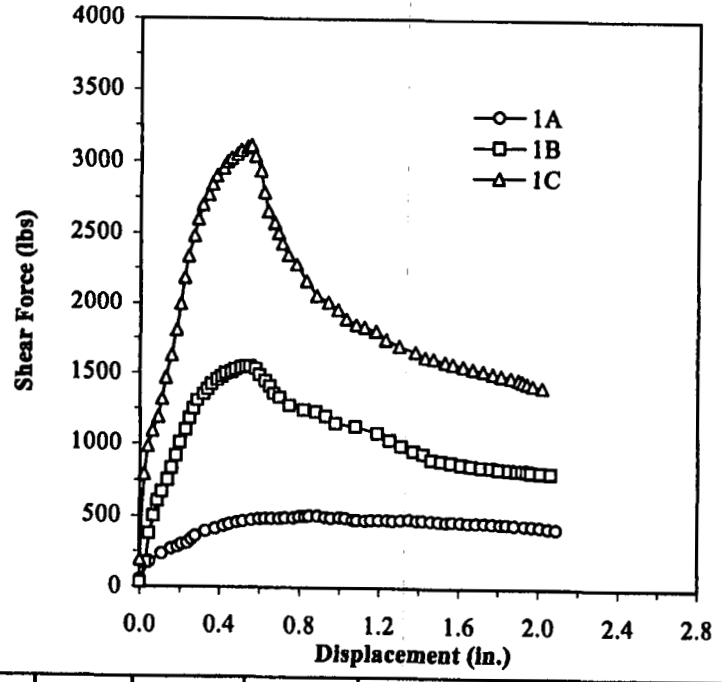
SGI TESTING SERVICES, LLC

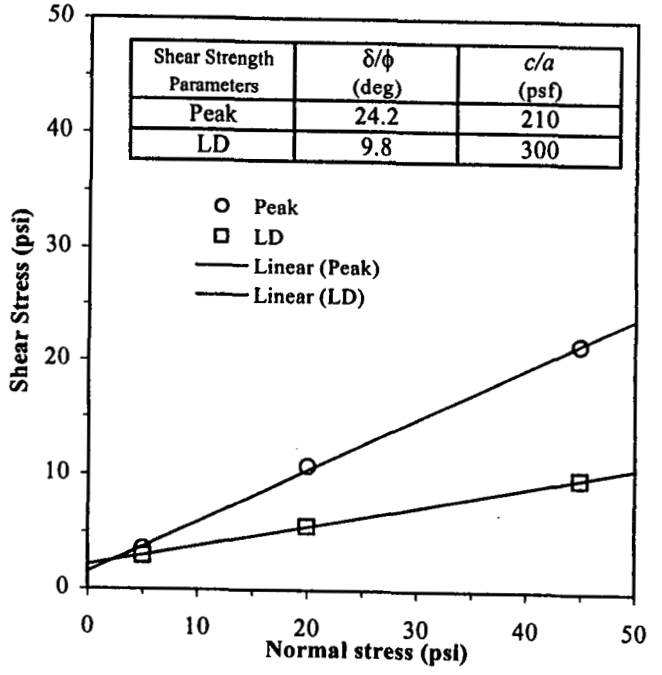
DATE OF TEST:	15 to 24 February 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03042
FILE NO.	

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERNAL DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-13I: internal strength of Bentomat ST GCL (Sample No. GCL-03-13 (Lot No. 200305LO/Roll No. 941)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	24.2	210
LD	9.8	300

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
1A	12 x 12	5.0	0.004	3	168	5	48	21.7	97.2	3.51	2.90	1.53 (17 deg)	1.06 (12 deg)	(1)
1B	12 x 12	20.0	0.004	3	168	20	48	21.7	70.5	10.78	5.62	6.11 (17 deg)	2.46 (7 deg)	(1)
1C	12 x 12	45.0	0.004	3	168	45	48	21.7	57.0	21.56	9.84	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Partial separation of the GCL was observed at the normal stress of 5 psi and complete separation was oberved at the normal stresses of 20 and 45 psi.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	8 to 17 February 2003
FIGURE NO.	A-1
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03043
FILE NO.	

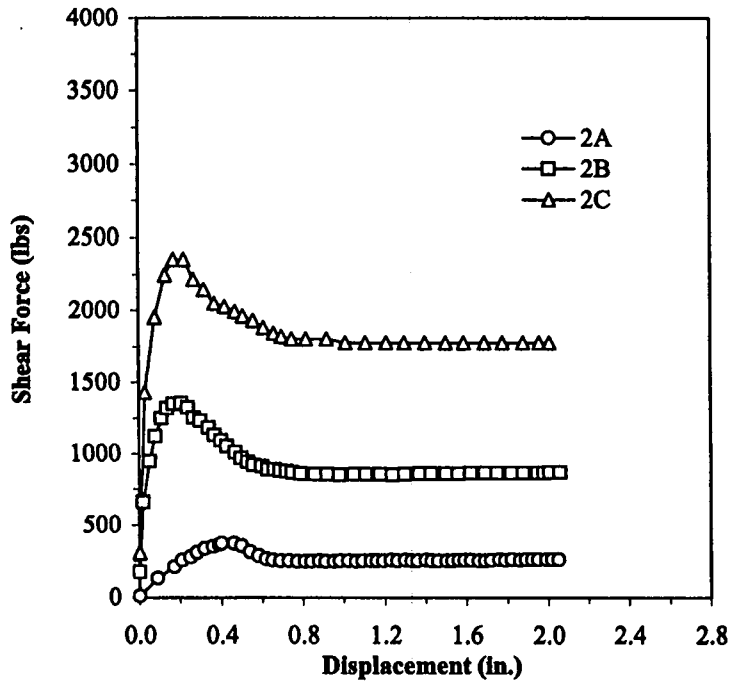
000651

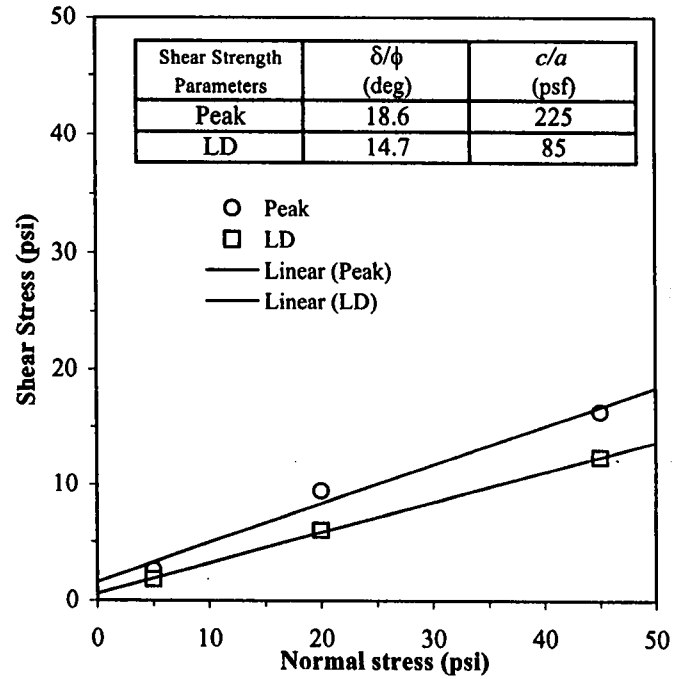
5370

GEOSYNTEC CONSULTANTS, INC. - FERNALD OSDF CONSTRUCTION 2003

INTERFACE DIRECT SHEAR TESTING (ASTM D 6243)

Test Series 03-13G: woven geotextile side of Bentomat ST GCL (Sample No. GCL-03-13 (Lot No. 200305LO/Roll No. 941)) against 80-mil GSE HDT geomembrane (Sample No. GML-03-01 (Lot No. 8221454/Roll No. 102103206)) under soaked, consolidated, and slow shear conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)
Peak	18.6	225
LD	14.7	85

Test No.	Shear Box Size (in. x in.)	Normal Stress (psi)	Shear Rate (in./min)	Soaking		Consolidation		GCL		Shear Stress Measured		Shear Stress Specified		Failure Mode
				Stress (psi)	Time (hour)	Stress (psi)	Time (hour)	ω_i (%)	ω_f (%)	τ_p (psi)	τ_{LD} (psi)	τ_p (psi)	τ_{LD} (psi)	
2A	12 x 12	5.0	0.004	3	168	5	48	21.7	95.0	2.58	1.81	1.53 (17 deg)	1.06 (12 deg)	(1)
2B	12 x 12	20.0	0.004	3	168	20	48	21.7	71.2	9.40	6.00	6.11 (17 deg)	2.46 (7 deg)	(1)
2C	12 x 12	45.0	0.004	3	168	45	48	21.7	57.8	16.33	12.33	13.76 (17 deg)	5.13 (6.5 deg)	(1)

Notes: (1) Sliding (i.e., shear failure) occurred at the GCL-geomembrane interface in each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. The large-displacement (LD) shear strength was calcualted using the shear force measured at 2 inches of displacement. The test results relate only to the samples and laboratory conditions tested.

SGI TESTING SERVICES, LLC

DATE OF TEST:	10 to 19 February 2003
FIGURE NO.	A-2
PROJECT NO.	SGI3012
DOCUMENT NO.	SGI03043
FILE NO.	

GEOMEMBRANE LINER AND CAP

FEBRUARY 2003

033-3486

SUMMARY OF TEXTURED GEOMEMBRANE CONFORMANCE TEST RESULTS

GEOSYNTEC
FLUOR FERNALD
GEORGIA

ROLL DESIGNATION	Reference Value	GM-03-01	GM-03-02	GM-03-03	GM-03-04	GM-03-05	GM-03-06	GM-03-07	GM-03-08	GM-03-09	GM-03-10
THICKNESS (mils) ASTM D5994	>=80	84.4	84.4	84.8	83.4	85.3	84.3	84.7	84.7	83.6	85.3
DENSITY (g/cc) ASTM D1505	>=0.940	0.948	0.948	0.948	0.948	0.948	0.948	0.948	0.947	0.948	0.947
CARBON BLACK CONTENT (%) ASTM D1603	2 - 3	2.66	2.61	2.54	2.62	2.66	2.57	2.48	2.63	2.77	2.61
CARBON BLACK DISPERSION ASTM D5596	1 or 2	1	1	1	1	1	1	1	1	2	1
STRENGTH AT YIELD (ppi)	>=168	237.3	236.9	233.7	228.2	237.8	236.1	234.4	225.2	229.6	237.3
MD/TD (1) ASTM D638	>=168	240.1	239.6	237.7	240.0	237.5	229.9	239.9	238.6	234.0	239.3
STRENGTH AT BREAK (ppi)	>=120	289.7	269.0	283.2	265.9	277.1	274.5	282.8	279.3	292.9	258.3
MD/TD (1) ASTM D638	>=120	258.2	242.1	259.9	223.2	256.5	244.1	257.5	229.1	247.3	241.3
ELONGATION AT YIELD (%)	>=12	15.1	15.6	14.7	15.1	16.0	14.3	14.8	16.1	16.7	15.8
MD/TD (1) ASTM D638	>=12	15.3	14.4	14.6	14.7	14.8	15.4	15.6	15.1	14.5	15.0
ELONGATION AT BREAK (%)	>=100	577	539	559	507	537	533	566	550	571	443
MD/TD (1) ASTM D638	>=100	490	509	556	396	546	460	506	484	456	459

(1) MD/TD corresponds to Machine Direction / Transverse Direction.

memsum

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-01

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	80.5	0.948	2.67	2
2.	80.3	0.948	2.64	1
3.	86.7	0.948		1
4.	86.9			2
5.	86.8			1
6.	82.7			1
7.	85.6			1
8.	84.4			1
9.	85.2			1
10.	84.6			1
AVG	84.4	0.948	2.66	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	251.7	239.1	13.2	15.8	301.6	175.6	553.4	98.8
2.	229.2	232.1	15.6	14.8	286.8	276.9	604.8	598.5
3.	226.1	234.2	15.5	16.5	304.5	283.0	647.0	623.1
4.	233.1	252.9	16.1	14.3	265.1	303.0	542.9	622.8
5.	246.6	242.2	14.9	15.3	290.5	252.3	538.3	508.8
AVG	237.3	240.1	15.1	15.3	289.7	258.2	577	490

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-02

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	82.9	0.948	2.60	1
2.	78.4	0.948	2.61	1
3.	83.8	0.948		1
4.	87.7			1
5.	85.3			2
6.	82.3			2
7.	86.1			1
8.	86.8			2
9.	85.1			1
10.	85.3			1
AVG	84.4	0.948	2.61	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	240.6	237.5	15.0	13.4	208.5	253.6	411.8	528.9
2.	237.7	232.1	15.8	14.5	281.8	289.9	559.8	634.0
3.	242.5	242.1	16.3	14.5	285.9	209.1	571.7	438.6
4.	223.3	246.5	14.8	15.2	256.9	252.4	528.7	514.6
5.	240.6	239.8	16.1	14.5	311.9	205.6	624.5	430.6
AVG	236.9	239.6	15.6	14.4	269.0	242.1	539	509

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-03

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	84.5	0.948	2.55	1
2.	84.9	0.948	2.52	1
3.	84.9	0.948		1
4.	81.3			2
5.	81.1			2
6.	83.2			2
7.	88.5			1
8.	87.4			1
9.	86.2			1
10.	85.9			1
AVG	84.8	0.948	2.54	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	228.9	236.4	14.1	14.3	297.8	251.6	608.9	528.5
2.	237.7	244.1	16.2	14.8	251.4	262.7	485.1	546.5
3.	235.5	225.0	12.9	14.3	258.7	258.2	475.1	580.4
4.	229.1	237.0	16.2	14.8	313.8	248.9	646.1	532.5
5.	237.5	246.1	13.9	14.8	294.4	278.2	578.3	594.4
AVG	233.7	237.7	14.7	14.6	283.2	259.9	559	556

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-04

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	83.4	0.948	2.61	1
2.	80.4	0.948	2.62	1
3.	85.6	0.948		2
4.	85.8			2
5.	85.4			2
6.	80.4			1
7.	83.9			1
8.	81.1			2
9.	81.2			1
10.	86.4			1
AVG	83.4	0.948	2.62	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	230.9	223.9	14.3	13.8	252.8	163.8	498.9	59.7
2.	242.8	246.1	14.5	15.3	196.1	178.0	239.7	247.4
3.	220.6	244.0	15.5	15.3	274.1	253.0	573.3	556.7
4.	216.6	239.7	15.8	15.9	296.2	255.6	620.2	562.7
5.	230.0	246.1	15.3	13.3	310.4	265.8	604.0	554.8
AVG	228.2	240.0	15.1	14.7	265.9	223.2	507	396

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-05

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	87.1	0.948	2.67	1
2.	82.3	0.949	2.65	2
3.	87.1	0.948		2
4.	82.4			2
5.	85.5			1
6.	86.2			1
7.	87.2			1
8.	86.3			1
9.	85.2			1
10.	83.8			1
AVG	85.3	0.948	2.66	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	234.1	242.6	14.1	16.4	283.5	250.5	567.2	510.9
2.	233.1	236.5	17.0	15.1	320.0	269.9	649.3	595.8
3.	237.6	232.0	16.7	14.1	304.1	290.0	611.6	637.6
4.	244.6	247.4	15.9	14.8	191.1	233.1	302.4	486.7
5.	239.8	229.0	16.5	13.5	287.0	238.8	556.4	498.4
AVG	237.8	237.5	16.0	14.8	277.1	256.5	537	546

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-06

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	81.5	0.948	2.57	2
2.	79.5	0.948	2.57	2
3.	87.4	0.948		2
4.	86.8			1
5.	85.4			1
6.	86.4			1
7.	84.9			1
8.	83.5			1
9.	85.9			1
10.	82.1			1
AVG	84.3	0.948	2.57	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	234.8	224.7	12.7	14.8	274.5	242.4	507.1	534.3
2.	233.6	242.3	14.0	15.1	244.8	173.2	480.3	50.0
3.	225.8	229.9	15.1	16.3	267.0	255.9	540.8	545.0
4.	231.5	235.9	14.8	16.1	317.0	315.2	642.8	675.0
5.	254.8	216.5	15.1	14.8	269.4	233.9	495.9	496.3
AVG	236.1	229.9	14.3	15.4	274.5	244.1	533	460

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-07

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	83.8	0.948	2.47	2
2.	80.6	0.948	2.49	1
3.	87.1	0.948		2
4.	83.4			1
5.	86.9			1
6.	86.2			2
7.	85.5			1
8.	81.5			2
9.	86.6			1
10.	85.7			1
AVG	84.7	0.948	2.48	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	234.5	242.9	13.9	16.4	262.4	255.6	508.4	553.5
2.	242.1	245.3	14.7	15.9	237.7	174.5	448.0	149.0
3.	236.4	240.1	15.2	16.1	304.6	257.7	614.7	540.8
4.	230.3	232.5	16.5	14.9	304.8	306.7	633.4	672.7
5.	228.7	238.8	13.9	14.6	304.7	292.9	625.7	615.2
AVG	234.4	239.9	14.8	15.6	282.8	257.5	566	506

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-08

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	80.3	0.947	2.64	2
2.	86.5	0.947	2.62	2
3.	83.0	0.947		1
4.	84.1			1
5.	87.5			1
6.	84.2			1
7.	81.4			1
8.	86.8			2
9.	87.0			1
10.	85.7			2
AVG	84.7	0.947	2.63	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	219.0	232.4	14.1	15.5	231.8	215.1	461.3	461.3
2.	236.2	246.2	15.7	15.0	278.6	209.5	533.8	443.4
3.	234.4	241.2	16.7	15.0	286.2	204.9	560.1	421.1
4.	225.5	230.8	16.9	15.5	284.3	244.9	548.5	532.8
5.	211.0	242.6	17.2	14.7	315.7	271.0	646.4	563.8
AVG	225.2	238.6	16.1	15.1	279.3	229.1	550	484

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-09

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	76.2	0.948	2.85	1
2.	85.4	0.948	2.69	1
3.	80.3	0.948		1
4.	87.1			2
5.	84.8			2
6.	87.4			2
7.	79.4			1
8.	85.1			2
9.	85.1			2
10.	85.0			1
AVG	83.6	0.948	2.77	2

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	231.9	224.1	16.5	14.2	295.0	296.6	594.8	632.1
2.	234.8	241.0	15.5	15.7	304.6	265.2	593.1	540.4
3.	225.8	237.7	16.5	13.4	339.0	174.5	680.3	63.7
4.	232.4	231.4	17.8	14.5	249.5	234.9	459.6	487.7
5.	223.2	235.6	17.3	14.5	276.6	265.4	525.6	556.0
AVG	229.6	234.0	16.7	14.5	292.9	247.3	571	456

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-10

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	84.9	0.947	2.61	1
2.	84.4	0.947	2.60	2
3.	87.5	0.947		1
4.	84.9			1
5.	84.9			1
6.	84.7			1
7.	81.0			1
8.	86.4			2
9.	85.4			1
10.	88.4			1
AVG	85.3	0.947	2.61	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	242.4	242.6	15.9	15.1	227.3	206.2	417.2	441.3
2.	250.2	245.9	15.1	14.4	192.3	255.2	86.0	517.7
3.	237.5	242.7	15.9	15.1	304.4	295.3	595.8	603.0
4.	222.5	231.2	16.4	15.4	236.9	172.5	470.1	155.3
5.	233.9	234.2	15.9	15.1	330.5	277.3	647.3	578.8
AVG	237.3	239.3	15.8	15.0	258.3	241.3	443	459

FEBRUARY 2003

033-3486

SUMMARY OF TEXTURED GEOMEMBRANE CONFORMANCE TEST RESULTS

GEOSYNTEC
FLUOR FERNALD
GEORGIA

ROLL DESIGNATION	Reference Value	GM-03-11	GM-03-12	-	-	-	-	-	-	-	-
THICKNESS (mils) ASTM D5994	>=80	84.4	84.2	-	-	-	-	-	-	-	-
DENSITY (g/cc) ASTM D1505	>=0.940	0.947	0.946	-	-	-	-	-	-	-	-
CARBON BLACK CONTENT (%) ASTM D1603	2 - 3	2.50	2.46	-	-	-	-	-	-	-	-
CARBON BLACK DISPERSION ASTM D5596	1 or 2	2	1	-	-	-	-	-	-	-	-
STRENGTH AT YIELD (ppi)	>=168	234.8	224.4	-	-	-	-	-	-	-	-
MD/TD (1) ASTM D638	>=168	239.7	232.7	-	-	-	-	-	-	-	-
STRENGTH AT BREAK (ppi)	>=120	289.5	308.3	-	-	-	-	-	-	-	-
MD/TD (1) ASTM D638	>=120	246.5	257.2	-	-	-	-	-	-	-	-
ELONGATION AT YIELD (%)	>=12	15.8	17.2	-	-	-	-	-	-	-	-
MD/TD (1) ASTM D638	>=12	14.6	15.0	-	-	-	-	-	-	-	-
ELONGATION AT BREAK (%)	>=100	565	607	-	-	-	-	-	-	-	-
MD/TD (1) ASTM D638	>=100	483	495	-	-	-	-	-	-	-	-

(1) MD/TD corresponds to Machine Direction / Transverse Direction.

memsum

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-11

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	78.1	0.947	2.51	2
2.	85.9	0.947	2.48	2
3.	85.2	0.947		1
4.	83.9			1
5.	85.9			2
6.	85.1			2
7.	86.9			2
8.	83.3			2
9.	82.4			1
10.	87.5			2
AVG	84.4	0.947	2.50	2

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	245.0	228.7	16.3	14.3	263.0	243.6	476.9	494.7
2.	242.1	247.5	14.7	12.8	240.9	197.7	450.6	318.6
3.	229.9	236.9	16.0	15.5	273.5	247.7	544.4	508.7
4.	230.0	241.1	16.5	15.3	336.8	247.9	682.0	489.2
5.	226.9	244.3	15.7	15.1	333.4	295.4	671.1	602.0
AVG	234.8	239.7	15.8	14.6	289.5	246.5	565	483

FEBRUARY 2003 033-3486

GEOMEMBRANE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
SAMPLE NUMBER: GM-03-12

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	CARBON BLACK DISPERSION (category)
1.	84.6	0.946	2.52	2
2.	85.7	0.946	2.40	1
3.	84.4	0.946		1
4.	83.7			2
5.	85.2			1
6.	86.2			1
7.	82.2			1
8.	83.4			1
9.	83.9			1
10.	82.8			1
AVG	84.2	0.946	2.46	1

	YIELD STRENGTH (lb/in. width)		ELONGATION AT YIELD (%)		BREAK STRENGTH (lb/in. width)		ELONGATION AT BREAK (%)	
	MD	TD	MD	TD	MD	TD	MD	TD
1.	227.9	231.8	18.1	15.9	236.4	208.7	457.6	431.0
2.	229.2	253.2	16.3	13.9	285.7	209.3	556.8	191.3
3.	220.8	226.8	17.1	15.7	313.2	269.2	634.8	590.1
4.	217.8	222.0	16.8	14.7	342.9	287.0	688.1	623.1
5.	226.2	229.8	17.8	14.9	363.3	311.6	698.5	641.4
AVG	224.4	232.7	17.2	15.0	308.3	257.2	607	495

GEOTEXTILES

7 oz/yd^2

MARCH 2003

033-3486

SUMMARY OF GEOTEXTILE CONFORMANCE TEST RESULTS

GEOSYNTEC
FLUOR FERNALD
GEORGIA

ROLL DESIGNATION	REFERENCE VALUE	GT-03-7-1	GT-03-7-1R	GT-03-7-2	GT-03-7-3	GT-03-7-4	GT-03-7-5	-	-	-	-
MASS/UNIT AREA (oz/yd²) ASTM D5261	-	7.7	-	8.7	7.8	8.2	8.2	-	-	-	-
GRAB STRENGTH (lbs) MD/TD (1) ASTM D4632	-	216.8	-	251.1	237.9	224.9	248.4	-	-	-	-
	-	242.9	-	275.2	251.1	260.6	280.4	-	-	-	-
GRAB ELONGATION (%) ASTM D4632	-	73	-	77	75	76	75	-	-	-	-
	-	81	-	80	81	82	78	-	-	-	-
TRAPEZOIDAL TEAR STRENGTH (lbs) MD/TD (1) ASTM D4533	-	84.7	-	91.5	86.4	90.7	85.0	-	-	-	-
	-	113.3	-	128.9	111.1	117.8	111.0	-	-	-	-
BURST STRENGTH (psi) ASTM D3786	-	346	377	388	353	369	383	-	-	-	-
PUNCTURE STRENGTH (lbs) ASTM D4833	-	131.5	-	150.7	125.9	137.1	132.1	-	-	-	-
APPARENT OPENING SIZE (mm) ASTM D4751	-	0.075	-	0.087	0.090	0.090	0.090	-	-	-	-
(U.S. SIEVE NO.)	-	200	-	170	170	170	170	-	-	-	-
PERMITTIVITY (sec-1)	-	1.48	-	1.46	1.44	1.48	1.41	-	-	-	-
PERMEABILITY (cm/sec) (2)	-	0.37	-	0.40	0.38	0.41	0.37	-	-	-	-
FLOW RATE (gal/min/ft²) ASTM D4491	-	110.7	-	109.4	107.4	110.7	105.5	-	-	-	-

(1) MD/TD corresponds to Machine Direction / Transverse Direction.
(2) Permeability calculated by multiplying measured thickness by permittivity

MARCH 2003 033-3486

GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-7-1

	MASS PER UNIT AREA (oz/yd²)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)	BURST STRENGTH (psi)
1.	10.11	0.075	1.51	400
2.	7.25	0.075	1.45	310
3.	6.84	0.075	1.41	300
4.	6.52	0.075	1.55	350
5.	6.96	0.075		310
6.	7.10			330
7.	7.57	0.075	1.48	370
8.	7.58			360
9.	7.21			350
10.	9.92			380
AVG	7.7	200	0.37	346

	EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	200	0.37	110.7

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	301.2	244.4	63.3	88.8	103.4	112.1	122.6	139.4
2.	216.4	236.2	74.8	80.3	74.7	126.2	133.4	161.7
3.	192.3	263.1	79.8	80.4	87.4	109.0	110.4	113.7
4.	190.3	223.1	74.5	72.4	79.8	110.6	116.2	131.1
5.	152.1	233.0	70.3	79.5	62.5	97.2	146.0	122.7
6.	200.5	243.9	72.6	77.3	70.9	107.9	112.6	
7.	178.3	261.5	74.7	76.2	82.5	129.6	133.0	
8.	202.0	235.7	77.6	78.6	86.2	122.3	128.1	
9.	227.2	251.0	73.7	82.2	99.1	108.1	171.3	
10.	308.1	237.4	70.0	92.4	100.6	109.9	130.4	
AVG	216.8	242.9	73	81	84.7	113.3	131.5	

APRIL 2003 033-3486

GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-7-1R

	MASS PER UNIT AREA (oz/yd²)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)	BURST STRENGTH (psi)
1.	-	-	-	360
2.	-	-	-	365
3.	-	-	-	410
4.	-	-	-	375
5.	-	-		390
6.	-			375
7.	-	0.000	0.00	390
8.	-			385
9.	-	EQUIVALENT	PERMEABILITY	FLOW RATE 340
10.	-	SIEVE SIZE	(cm/sec)	(gal/min/ft²) 375
AVG	0.0	-	-	- 377

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	-	-	-	-	-	-	-	-
2.	-	-	-	-	-	-	-	-
3.	-	-	-	-	-	-	-	-
4.	-	-	-	-	-	-	-	-
5.	-	-	-	-	-	-	-	-
6.	-	-	-	-	-	-	-	
7.	-	-	-	-	-	-	-	
8.	-	-	-	-	-	-	-	
9.	-	-	-	-	-	-	-	
10.	-	-	-	-	-	-	-	
AVG	0.0	0.0	0	0	0.0	0.0	0.0	

MARCH 2003 033-3486

GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-7-2

	MASS PER UNIT AREA (oz/yd²)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)	BURST STRENGTH (psi)
1.	11.66	0.090	1.33	490
2.	9.28	0.090	1.61	380
3.	8.17	0.090	1.52	370
4.	7.66	0.090	1.39	420
5.	7.92	0.075		350
6.	8.12			400
7.	8.32	0.087	1.46	350
8.	7.25			330
9.	8.13			390
10.	10.31			400
AVG	8.7	170	0.40	388

	EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	170	0.40	109.4

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	287.5	296.8	63.6	82.5	113.1	102.3	191.5	129.4
2.	281.1	325.6	77.9	84.8	100.3	113.1	192.8	127.9
3.	257.7	280.1	84.5	89.1	84.1	150.8	157.7	138.3
4.	247.7	287.0	80.7	78.8	102.1	146.0	162.8	157.7
5.	210.5	280.7	75.3	73.5	98.6	124.6	145.2	135.3
6.	250.2	276.1	83.6	79.9	89.1	127.1	152.6	
7.	180.1	272.2	75.3	74.5	80.2	128.2	142.3	
8.	202.5	249.1	84.1	86.4	71.0	117.4	145.8	
9.	227.0	253.0	75.9	71.9	79.3	141.7	155.4	
10.	366.6	231.4	67.9	77.7	97.3	138.0	125.6	
AVG	251.1	275.2	77	80	91.5	128.9	150.7	

MARCH 2003 033-3486

GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-7-3

	MASS PER UNIT AREA (oz/yd²)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)	BURST STRENGTH (psi)
1.	10.71	0.090	1.56	410
2.	8.21	0.090	1.29	390
3.	6.93	0.090	1.25	350
4.	7.41	0.090	1.64	300
5.	6.51	0.090		340
6.	6.62			360
7.	7.19	0.090	1.44	370
8.	6.73			290
9.	7.49			350
10.	9.77			370
AVG	7.8	170	0.38	353

	EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	170	0.38	107.4

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	186.7	220.0	76.2	77.3	89.4	108.8	150.7	109.5
2.	178.6	262.7	70.5	84.3	83.5	110.1	143.2	121.2
3.	213.0	240.3	75.2	77.7	73.2	104.1	137.8	105.4
4.	383.8	220.5	76.7	74.0	108.7	115.4	121.3	119.9
5.	182.3	259.9	74.8	84.9	70.6	114.1	141.9	108.2
6.	175.9	244.6	73.8	78.1	69.8	99.9	140.9	
7.	401.7	268.6	73.5	85.0	101.4	114.4	121.4	
8.	229.4	256.2	73.4	81.1	104.1	90.7	117.4	
9.	201.9	286.3	74.0	84.0	69.4	124.8	129.2	
10.	226.0	252.1	79.2	85.6	94.1	128.6	120.4	
AVG	237.9	251.1	75	81	86.4	111.1	125.9	

MARCH 2003 033-3486

GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-7-4

	MASS PER UNIT AREA (oz/yd²)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)	BURST STRENGTH (psi)
1.	9.60	0.090	1.54	340
2.	7.58	0.090	1.35	310
3.	7.79	0.090	1.62	360
4.	7.66	0.090	1.41	390
5.	7.87	0.090		400
6.	7.97			380
7.	8.35	0.090	1.48	390
8.	8.13			380
9.	7.76			340
10.	9.59			400
AVG	8.2	170	0.41	369

	EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	170	0.41	110.7

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	286.8	258.8	61.0	79.9	94.5	113.9	130.9	166.1
2.	201.2	277.0	68.8	85.0	91.5	121.8	144.1	109.8
3.	172.8	255.6	70.9	87.5	94.7	127.0	138.0	108.9
4.	211.3	273.7	80.3	78.4	89.7	109.7	147.6	147.8
5.	181.3	274.9	95.0	82.2	85.9	133.1	127.6	134.5
6.	200.5	254.5	74.5	80.2	91.6	127.2	126.3	
7.	192.6	243.9	73.4	77.9	80.5	112.3	141.3	
8.	199.9	254.8	74.8	88.5	88.3	120.8	128.2	
9.	267.0	251.8	93.7	77.7	94.4	108.9	148.3	
10.	335.3	260.7	67.7	82.6	95.9	103.6	157.2	
AVG	224.9	260.6	76	82	90.7	117.8	137.1	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-7-5

	MASS PER UNIT AREA (oz/yd²)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)	BURST STRENGTH (psi)
1.	11.00	0.090	1.29	470
2.	7.31	0.090	1.31	380
3.	6.87	0.090	1.43	360
4.	7.29	0.090	1.61	330
5.	7.54	0.090		370
6.	7.61			330
7.	7.56	0.090	1.41	400
8.	7.84			380
9.	8.20			360
10.	11.09			450
AVG	8.2	170	1.41	383

	EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	170	0.37	105.5

	GRAB STRENGTH (pounds) MD	GRAB STRENGTH (pounds) TD	GRAB ELONGATION (%) MD	GRAB ELONGATION (%) TD	TRAPEZOIDAL TEAR (pounds) MD	TRAPEZOIDAL TEAR (pounds) TD	PUNCTURE STRENGTH (pounds)	
1.	322.3	212.6	63.5	76.3	101.6	104.5	141.3	121.2
2.	212.9	261.1	73.5	81.2	81.9	106.6	108.1	126.1
3.	182.9	286.0	72.5	75.4	64.1	112.6	132.9	159.7
4.	236.9	316.0	79.5	76.8	87.1	108.0	138.4	140.1
5.	222.0	286.0	93.1	75.0	76.3	113.3	108.7	156.0
6.	219.2	259.6	76.2	70.4	76.8	111.2	130.4	
7.	243.8	317.2	79.6	81.1	76.9	107.8	108.4	
8.	220.9	291.1	71.5	77.6	90.5	119.2	133.4	
9.	261.2	273.7	75.4	78.3	89.5	107.2	126.8	
10.	361.7	300.4	69.2	87.2	105.5	119.9	150.5	
AVG	248.4	280.4	75	78	85.0	111.0	132.1	

8 oz/yd^2

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SUMMARY OF GEOTEXTILE CONFORMANCE TEST RESULTS

GEOSYNTEC
FLUOR FERNALD
GEORGIA

ROLL DESIGNATION	REFERENCE VALUE	GT-03-8-1	GT-03-8-2	GT-03-8-3	GT-03-8-4	GT-03-8-5	-	-	-	-	-
MASS/UNIT AREA (oz/yd²) ASTM D5261	-	8.7	8.7	9.1	10.0	8.8	-	-	-	-	-
GRAB STRENGTH (lbs)	-	255.1	245.3	257.7	287.9	268.2	-	-	-	-	-
MD/TD (1)	-	295.8	288.3	276.8	298.8	299.0	-	-	-	-	-
ASTM D4632											
GRAB ELONGATION	-	74	73	72	72	70	-	-	-	-	-
(%)	-	81	80	81	80	80	-	-	-	-	-
ASTM D4632											
TRAPEZOIDAL TEAR STRENGTH	-	99.7	97.0	92.9	104.6	96.2	-	-	-	-	-
(lbs) MD/TD (1)	-	127.6	131.1	125.3	138.4	139.7	-	-	-	-	-
ASTM D4533											
BURST STRENGTH (psi) ASTM D3786	-	448	420	442	450	398	-	-	-	-	-
PUNCTURE STRENGTH (lbs) ASTM D4833	-	149.0	149.0	145.9	162.1	151.5	-	-	-	-	-

(1) MD/TD corresponds to Machine Direction / Transverse Direction.

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-8-1

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	8.96	410
2.	8.14	410
3.	7.74	370
4.	7.86	450
5.	7.61	420
6.	8.83	430
7.	9.48	530
8.	9.36	510
9.	8.89	440
10.	9.71	510
AVG	8.7	448

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	267.4	261.3	63.5	85.6	114.2	122.5	125.0	152.5
2.	271.8	275.3	72.7	82.3	94.0	109.5	130.0	169.4
3.	218.5	312.6	74.6	86.2	103.1	124.5	133.2	153.2
4.	238.0	283.9	72.8	79.0	84.9	133.6	132.7	153.3
5.	241.7	307.5	81.3	80.0	70.7	137.0	126.0	166.7
6.	255.0	324.0	80.0	76.8	112.9	145.6	152.4	
7.	244.0	305.9	76.3	76.9	103.8	144.4	158.4	
8.	276.5	314.9	78.7	80.4	104.2	119.8	157.2	
9.	243.5	296.8	74.2	83.0	99.4	122.6	154.3	
10.	294.9	275.8	70.9	83.3	110.0	116.3	170.5	
AVG	255.1	295.8	74	81	99.7	127.6	149.0	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-8-2

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	9.68	460
2.	7.87	390
3.	7.60	370
4.	8.57	450
5.	8.51	400
6.	8.97	400
7.	8.34	400
8.	8.56	430
9.	9.19	440
10.	10.10	460
AVG	8.7	420

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	277.4	266.7	64.2	81.1	118.8	119.7	156.1	160.2
2.	237.6	295.3	73.9	83.5	82.7	141.9	126.5	156.7
3.	238.3	257.4	76.3	77.6	82.2	126.8	124.5	150.2
4.	185.4	274.0	68.9	75.7	94.2	140.1	134.1	145.7
5.	225.8	288.6	75.2	78.5	83.1	115.6	142.9	171.5
6.	277.6	290.9	82.0	73.8	104.6	128.4	157.7	
7.	243.9	311.7	78.8	77.8	88.2	124.7	159.7	
8.	240.4	279.2	69.1	75.8	100.9	134.2	155.4	
9.	250.2	302.1	72.6	84.0	107.1	141.7	163.3	
10.	276.0	317.0	69.3	87.7	108.5	137.7	130.9	
AVG	245.3	288.3	73	80	97.0	131.1	149.0	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-8-3

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	9.70	450
2.	8.61	390
3.	7.99	400
4.	8.07	460
5.	8.38	390
6.	9.02	470
7.	9.52	490
8.	9.39	440
9.	8.91	500
10.	11.76	430
AVG	9.1	442

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	343.0	259.3	64.3	73.3	104.8	131.9	128.4	155.7
2.	238.5	270.1	68.3	81.2	95.1	97.5	160.9	164.1
3.	236.0	296.5	71.2	90.9	70.7	97.2	145.2	154.8
4.	208.9	249.3	91.9	72.7	74.9	128.8	161.4	146.1
5.	227.2	284.7	73.9	78.8	87.4	114.6	157.3	137.8
6.	227.1	248.5	75.9	75.6	90.4	135.8	113.2	
7.	200.5	274.8	67.1	78.5	95.0	123.7	140.2	
8.	250.2	338.7	74.2	95.5	89.5	119.4	133.8	
9.	249.0	250.3	66.3	80.9	112.6	134.5	133.3	
10.	396.5	295.3	69.8	83.6	108.4	169.3	156.9	
AVG	257.7	276.8	72	81	92.9	125.3	145.9	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-8-4

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	11.37	470
2.	9.37	410
3.	9.09	470
4.	9.01	430
5.	9.72	450
6.	9.80	440
7.	9.49	430
8.	9.60	440
9.	10.01	490
10.	12.75	470
AVG	10.0	450

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	357.2	274.1	62.1	87.9	119.3	113.6	167.3	163.3
2.	265.8	273.7	75.4	85.8	92.3	120.2	158.1	163.5
3.	256.5	290.5	72.9	79.2	119.2	153.9	164.1	169.8
4.	304.4	296.0	79.4	80.1	94.5	147.4	174.5	183.8
5.	215.0	291.5	68.7	74.5	99.8	138.4	145.3	154.3
6.	232.2	300.8	68.4	75.6	98.9	143.6	173.3	
7.	250.2	308.6	73.8	75.7	95.1	156.0	161.6	
8.	239.6	326.0	72.6	75.5	96.8	121.7	149.4	
9.	321.5	337.2	76.9	83.6	92.4	142.1	162.9	
10.	436.4	289.8	65.0	86.3	138.0	146.8	140.9	
AVG	287.9	298.8	72	80	104.6	138.4	162.1	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-8-5

	MASS PER UNIT AREA (oz/yd^2)	BURST STRENGTH (psi)
1.	9.99	410
2.	8.09	450
3.	8.34	380
4.	8.37	370
5.	8.76	390
6.	8.23	380
7.	8.29	320
8.	8.32	380
9.	8.57	450
10.	11.19	450
AVG	8.8	398

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	295.3	248.5	59.0	79.6	119.7	133.8	153.3	165.6
2.	229.7	292.6	67.6	79.6	88.8	121.9	155.5	145.9
3.	237.9	298.8	68.7	79.3	88.1	139.3	147.3	151.2
4.	234.6	318.7	69.2	75.3	81.5	140.7	158.2	141.4
5.	262.4	303.2	79.8	76.2	82.4	138.7	129.0	180.1
6.	245.5	337.9	74.5	78.8	90.9	147.7	161.3	
7.	259.5	315.0	73.1	76.2	88.2	160.7	121.0	
8.	261.6	303.0	76.3	78.8	95.4	151.6	164.5	
9.	268.5	274.8	71.9	86.2	102.2	141.6	126.8	
10.	386.8	297.7	64.8	87.5	125.3	120.8	171.5	
AVG	268.2	299.0	70	80	96.2	139.7	151.5	

10 oz/yd^2

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SUMMARY OF GEOTEXTILE CONFORMANCE TEST RESULTS

GEOSYNTEC
FLUOR FERNALD
GEORGIA

ROLL DESIGNATION	REFERENCE VALUE	GT-03-10-1	GT-03-10-2	GT-03-10-3	GT-03-10-4	GT-03-10-5	GT-03-10-6	GT-03-10-7	GT-03-10-8	GT-03-10-9	-
MASS/UNIT AREA (oz/yd²) ASTM D5261	-	11.1	10.8	10.5	10.7	10.6	10.9	10.0	11.4	10.6	-
GRAB STRENGTH (lbs)	-	313.0	328.7	310.9	301.5	317.9	315.2	318.6	358.5	313.3	-
MD/TD (1)	-	362.2	364.1	371.3	369.0	392.6	368.6	355.6	383.6	349.7	-
ASTM D4632											
GRAB ELONGATION	-	76	75	80	80	77	76	78	71	71	-
(%)	-	81	88	87	83	82	84	82	82	80	-
ASTM D4632											
TRAPEZOIDAL TEAR STRENGTH	-	125.8	121.8	115.3	114.2	121.5	120.3	114.4	139.4	120.2	-
(lbs) MD/TD (1)	-	152.1	150.6	147.5	158.8	163.2	143.9	151.3	174.7	154.5	-
ASTM D4533											
BURST STRENGTH (psi) ASTM D3786	-	568	553	508	517	538	547	489	575	546	-
PUNCTURE STRENGTH (lbs) ASTM D4833	-	188.9	178.7	166.6	183.0	188.4	206.2	178.3	205.1	185.4	-

(1) MD/TD corresponds to Machine Direction / Transverse Direction.

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-1

	MASS PER UNIT AREA (oz/yd^2)	BURST STRENGTH (psi)
1.	13.29	680
2.	11.16	570
3.	10.41	570
4.	10.38	510
5.	9.63	550
6.	9.93	490
7.	10.74	580
8.	10.26	590
9.	11.56	530
10.	13.46	610
AVG	11.1	568

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	302.7	372.6	74.7	81.3	169.2	161.7	223.0	200.4
2.	345.8	311.9	72.3	80.5	127.4	147.7	214.4	184.3
3.	315.2	371.1	77.0	85.8	111.8	151.3	191.0	175.6
4.	250.7	369.5	73.6	79.8	106.8	151.3	187.7	198.7
5.	278.3	330.2	77.5	77.5	114.1	164.7	205.8	184.9
6.	305.2	358.3	79.5	79.2	129.3	140.1	177.9	
7.	295.2	377.7	74.5	79.2	106.7	146.3	151.0	
8.	310.6	364.6	77.3	80.5	118.0	155.4	176.9	
9.	422.7	392.5	77.6	81.9	132.0	156.6	172.7	
10.	303.6	373.3	73.8	84.5	142.3	145.6	189.2	
AVG	313.0	362.2	76	81	125.8	152.1	188.9	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-2

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	13.44	590
2.	10.28	550
3.	10.74	580
4.	9.81	480
5.	9.65	460
6.	10.51	550
7.	10.36	500
8.	10.21	550
9.	10.74	620
10.	12.50	650
AVG	10.8	553

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	384.7	398.7	75.1	87.3	152.4	173.6	196.8	215.6
2.	366.0	420.8	76.4	94.3	120.4	169.8	245.8	195.4
3.	342.4	376.4	71.2	86.8	118.3	135.5	170.4	158.7
4.	284.4	351.8	75.7	89.1	106.4	148.1	168.0	171.3
5.	296.4	345.9	74.5	81.6	117.0	142.6	172.2	180.2
6.	309.4	381.6	77.1	83.3	119.8	145.5	167.9	
7.	296.8	347.7	78.7	84.9	118.3	155.5	161.7	
8.	324.6	365.9	79.6	90.9	113.7	147.5	133.2	
9.	324.0	348.6	77.2	85.3	129.9	147.9	163.2	
10.	357.9	303.2	64.9	92.5	121.9	140.2	179.7	
AVG	328.7	364.1	75	88	121.8	150.6	178.7	

MARCH 2003 033-3486

GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-3

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	12.64	560
2.	10.89	580
3.	10.86	540
4.	10.13	510
5.	10.01	470
6.	9.16	480
7.	9.28	460
8.	9.93	470
9.	10.09	490
10.	12.32	520
AVG	10.5	508

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	380.8	356.8	76.3	83.6	143.2	155.9	183.2	157.2
2.	318.8	410.7	82.2	85.7	116.0	138.1	176.3	118.5
3.	280.3	398.5	79.2	83.6	122.7	141.4	171.5	160.1
4.	287.8	364.0	80.6	82.3	110.1	172.9	185.3	165.5
5.	297.6	404.6	80.7	87.4	101.0	145.6	174.3	170.6
6.	288.3	367.4	84.0	91.5	100.9	149.3	154.4	
7.	260.5	373.0	79.7	84.5	105.7	144.5	172.6	
8.	320.4	351.3	82.0	83.6	96.3	161.8	195.0	
9.	301.5	329.5	78.3	86.0	115.9	134.7	142.7	
10.	372.5	357.4	78.6	97.0	141.6	130.8	172.3	
AVG	310.9	371.3	80	87	115.3	147.5	166.6	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-4

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	13.45	580
2.	11.04	610
3.	10.05	520
4.	10.18	470
5.	9.63	480
6.	10.06	560
7.	10.21	530
8.	10.42	510
9.	10.19	470
10.	11.66	440
AVG	10.7	517

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	374.0	392.3	75.0	84.2	138.6	179.7	229.5	173.7
2.	288.5	426.6	75.6	85.8	133.2	171.0	182.1	190.4
3.	311.5	392.6	85.2	85.5	118.4	134.7	177.2	192.3
4.	297.6	420.1	80.3	86.2	108.0	178.9	202.1	174.5
5.	290.7	369.8	82.3	79.9	108.3	161.4	172.1	178.0
6.	297.6	325.8	87.1	72.6	106.3	181.2	176.0	
7.	262.3	340.0	81.7	77.8	109.4	150.7	200.3	
8.	285.5	354.2	77.3	86.8	94.5	146.7	171.1	
9.	260.9	342.0	79.8	85.3	105.4	156.5	155.4	
10.	346.7	326.8	76.1	88.8	119.8	127.1	170.5	
AVG	301.5	369.0	80	83	114.2	158.8	183.0	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-5

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	13.03	580
2.	10.68	590
3.	10.54	550
4.	10.44	530
5.	10.09	520
6.	9.93	550
7.	9.54	500
8.	9.99	500
9.	10.24	560
10.	11.15	500
AVG	10.6	538

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	360.4	376.8	69.9	87.1	128.5	147.1	200.8	204.3
2.	315.0	372.1	76.9	78.5	116.7	142.0	181.7	215.6
3.	315.7	391.7	76.6	81.2	117.5	177.2	172.2	205.2
4.	302.1	437.2	82.7	84.6	133.2	164.8	196.8	213.3
5.	317.6	406.6	80.8	79.5	126.8	165.8	166.5	192.4
6.	323.5	407.0	80.7	78.4	114.6	179.2	171.5	
7.	280.9	423.9	78.4	82.1	111.4	155.2	184.7	
8.	290.2	367.7	73.9	79.0	92.2	177.1	163.6	
9.	315.0	384.7	74.0	81.9	127.1	152.8	193.1	
10.	358.3	358.7	73.4	85.9	147.4	171.1	163.8	
AVG	317.9	392.6	77	82	121.5	163.2	188.4	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-6

	MASS PER UNIT AREA (oz/yd^2)	BURST STRENGTH (psi)
1.	12.38	580
2.	10.91	570
3.	11.76	590
4.	11.01	510
5.	10.73	540
6.	9.80	540
7.	9.90	530
8.	10.33	500
9.	10.47	550
10.	12.10	560
AVG	10.9	547

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	318.3	379.5	66.0	88.1	168.5	123.1	245.4	202.3
2.	309.9	337.0	74.1	81.9	106.1	137.8	214.2	200.7
3.	301.1	347.9	74.1	80.5	127.9	139.8	212.9	183.8
4.	313.0	417.9	79.4	84.3	105.4	157.7	195.2	154.8
5.	325.8	367.9	77.7	83.3	102.4	119.7	213.3	202.1
6.	270.2	391.5	75.7	83.7	134.6	163.8	202.5	
7.	301.2	361.2	76.6	80.5	101.7	131.9	194.0	
8.	297.7	371.1	75.2	86.3	103.2	141.5	231.7	
9.	309.0	363.4	75.2	87.5	118.1	159.6	196.6	
10.	406.2	349.0	83.1	87.1	135.4	163.9	243.1	
AVG	315.2	368.6	76	84	120.3	143.9	206.2	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-7

	MASS PER UNIT AREA (oz/yd^2)	BURST STRENGTH (psi)
1.	11.60	570
2.	10.31	540
3.	9.67	460
4.	9.56	440
5.	8.92	480
6.	9.39	490
7.	9.00	430
8.	9.67	460
9.	10.04	500
10.	11.66	520
AVG	10.0	489

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	360.8	332.1	74.3	80.2	124.5	132.7	203.5	169.6
2.	303.5	339.5	78.9	78.9	118.7	131.2	183.5	148.1
3.	277.2	347.8	72.9	80.5	93.6	153.1	166.5	174.9
4.	300.3	358.4	81.7	80.3	127.4	174.1	183.6	179.0
5.	300.0	358.5	74.9	81.3	102.7	141.5	178.0	189.3
6.	331.8	376.5	79.8	79.6	101.0	164.6	185.2	
7.	293.0	379.9	80.4	78.8	106.2	156.0	173.7	
8.	308.3	381.9	79.2	85.2	119.9	146.5	186.7	
9.	321.2	351.8	76.7	82.4	120.3	164.1	160.3	
10.	390.2	329.4	76.8	88.2	130.2	149.3	192.9	
AVG	318.6	355.6	78	82	114.4	151.3	178.3	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-8

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	13.48	550
2.	11.11	630
3.	10.78	620
4.	11.20	600
5.	10.71	550
6.	10.58	510
7.	10.00	560
8.	11.08	530
9.	11.81	610
10.	12.94	590
AVG	11.4	575

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	438.2	369.0	71.7	87.7	171.8	171.0	194.3	178.6
2.	351.0	400.5	72.3	85.7	164.2	194.0	184.3	231.9
3.	339.0	359.0	73.7	75.3	105.6	180.1	189.6	189.9
4.	311.7	407.7	69.7	80.3	111.6	163.7	208.9	253.8
5.	334.7	419.7	76.3	80.3	134.4	195.4	209.7	222.4
6.	344.0	388.2	73.7	78.7	128.6	177.3	211.5	
7.	318.2	372.0	72.7	81.0	121.7	156.0	219.5	
8.	339.5	388.2	69.0	76.3	155.4	152.4	229.7	
9.	383.2	371.2	66.0	87.7	139.8	165.7	162.1	
10.	425.2	360.0	69.0	85.7	161.0	191.0	189.6	
AVG	358.5	383.6	71	82	139.4	174.7	205.1	

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-10-9

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	13.16	630
2.	10.96	540
3.	10.44	570
4.	10.73	520
5.	9.56	450
6.	9.61	550
7.	9.19	590
8.	10.34	480
9.	10.91	550
10.	11.30	580
AVG	10.6	546

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	386.2	332.7	69.3	82.0	129.7	150.7	229.5	168.4
2.	274.5	352.5	68.0	84.7	124.1	147.4	216.5	162.2
3.	311.2	387.5	73.3	78.0	106.6	163.7	207.2	183.4
4.	300.0	390.5	74.0	77.3	110.9	174.0	213.4	167.5
5.	300.7	325.5	73.3	75.0	104.9	157.5	198.3	185.7
6.	287.7	377.0	74.7	79.0	119.9	155.2	157.1	
7.	291.5	348.7	76.3	73.3	103.9	151.1	186.0	
8.	301.7	339.5	66.0	78.7	121.0	156.2	173.9	
9.	316.2	313.5	69.3	79.7	126.7	148.7	170.1	
10.	363.0	330.0	70.0	90.0	154.3	140.2	162.0	
AVG	313.3	349.7	71	80	120.2	154.5	185.4	

16 oz/yd^2

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SUMMARY OF GEOTEXTILE CONFORMANCE TEST RESULTS

GEOSYNTEC
FLUOR FERNALD
GEORGIA

ROLL DESIGNATION	REFERENCE VALUE	GT-03-16-1	GT-03-16-2	-	-	-	-	-	-	-	-
MASS/UNIT AREA (oz/yd²) ASTM D5261	-	16.3	17.3	-	-	-	-	-	-	-	-
GRAB STRENGTH (lbs)	-	484.3	492.9	-	-	-	-	-	-	-	-
MD/TD (1)	-	572.5	546.3	-	-	-	-	-	-	-	-
ASTM D4632											
GRAB ELONGATION	-	76	77	-	-	-	-	-	-	-	-
(%)	-	76	77	-	-	-	-	-	-	-	-
ASTM D4632											
TRAPEZOIDAL TEAR STRENGTH	-	162.8	162.5	-	-	-	-	-	-	-	-
(lbs) MD/TD (1)	-	225.2	235.3	-	-	-	-	-	-	-	-
ASTM D4533											
BURST STRENGTH (psi) ASTM D3786	-	773	837	-	-	-	-	-	-	-	-
PUNCTURE STRENGTH (lbs) ASTM D4833	-	267.9	258.6	-	-	-	-	-	-	-	-

(1) MD/TD corresponds to Machine Direction / Transverse Direction.

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GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-16-1

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	19.57	910
2.	15.97	840
3.	14.90	760
4.	14.68	750
5.	16.15	730
6.	15.05	750
7.	15.41	780
8.	16.30	750
9.	16.37	650
10.	18.97	810
AVG	16.3	773

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	601.5	516.2	65.7	77.7	175.6	218.4	263.8	287.5
2.	457.5	504.0	76.0	70.7	149.5	258.4	237.0	262.7
3.	448.2	565.7	78.3	74.0	123.4	215.6	232.2	294.4
4.	459.0	582.0	80.3	74.3	171.5	213.4	258.1	270.3
5.	439.2	593.2	80.7	74.0	142.0	234.9	255.2	284.3
6.	411.7	630.2	76.3	74.3	169.4	231.4	281.1	
7.	441.7	614.0	76.7	70.0	157.1	216.4	258.4	
8.	446.7	598.5	80.0	78.0	156.2	211.9	269.1	
9.	470.0	575.0	75.0	79.7	178.0	229.1	245.1	
10.	667.7	546.0	67.3	84.7	205.0	222.7	319.6	
AVG	484.3	572.5	76	76	162.8	225.2	267.9	

MARCH 2003 033-3486

GEOTEXTILE TEST RESULTS

PROJECT NUMBER: 033-3486
PROJECT NAME: GEOSYNTEC/FLUOR FERNALD/GA
ROLL DESIGNATION: GT-03-16-2

	MASS PER UNIT AREA (oz/yd²)	BURST STRENGTH (psi)
1.	22.08	960
2.	18.10	890
3.	17.86	880
4.	16.47	840
5.	15.61	940
6.	15.35	780
7.	16.92	740
8.	15.89	820
9.	15.53	710
10.	19.57	810
AVG	17.3	837

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)		PUNCTURE STRENGTH (pounds)	
	MD	TD	MD	TD	MD	TD		
1.	690.0	484.7	74.0	81.3	167.5	259.3	303.8	239.7
2.	476.2	558.0	76.3	81.0	163.5	238.0	232.1	263.1
3.	442.2	532.0	76.3	75.3	158.3	239.9	264.2	240.9
4.	413.0	558.7	78.0	74.3	166.6	254.5	249.9	249.7
5.	458.5	573.7	82.3	76.0	155.7	262.0	274.7	258.3
6.	459.7	526.7	82.0	70.3	159.9	251.9	298.9	
7.	430.2	581.7	78.0	75.3	178.6	217.4	269.7	
8.	438.5	525.0	79.7	74.3	162.6	195.0	223.9	
9.	470.2	561.7	78.3	75.7	139.9	221.3	269.5	
10.	650.0	560.5	68.7	83.0	172.0	213.6	239.9	
AVG	492.9	546.3	77	77	162.5	235.3	258.6	