



DEPARTMENT OF THE ARMY
 NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
 P.O. BOX 60267
 NEW ORLEANS, LOUISIANA 70160-0267

4/11/11 - Sunday
RE: -

REPLY TO
 ATTENTION OF:

Operations Division
 Western Evaluation Section

JUN 20 2011

SUBJECT: MVN 2011-0563 WB
 Nationwide Permit 12

Mr. Kenneth Bernhard
 C/O Tim Morton and Associates, Inc.
 730 E. Kaliste Saloom Road
 Lafayette, Louisiana 70508

Gentlemen:

This is regarding your letter dated March 4, 2011, to install and maintain an electrical line bore across the Atchafalaya River located near Butte LaRose, Louisiana in St. Martin Parish, Louisiana.

This office has determined that your project is authorized by Nationwide Permit Number 12, as found in the March 12, 2007, Federal Register, Final Notice of Issuance, Reissuance, and Modification of Nationwide Permits (72 FR 11180). Enclosed is a copy of the nationwide permit and the general conditions with which you must comply.

The following special conditions are being made a part of this authorization:

Our Real Estate Division has indicated that your project is located in an area over which the federal government holds real estate interest. No work may be performed under this permit until a real estate instrument is issued by our Real Estate Division. If you require further information regarding real estate matters, call (504) 862-1295.

Applicant should be made aware that the proposed work areas within the river batture should be restored back to pre project conditions immediately upon completion of work.

No drilling or excavation will be performed when river stage on the Carrollton gage is elevation +11.0 or higher.

You are reminded of Nationwide Permit General Condition Number 26 that requires that you provide a signed certification stating that the authorized work was conducted in accordance with the permit, including any special conditions, and that mitigation (if required) was completed in accordance with the permit. We have attached this form. The permittee must sign the attached form and a copy of the nationwide permit authorization letter must be attached. Send this to the Department of the Army, New Orleans District Corps of Engineers, Post Office Box 60267, New Orleans, Louisiana 70160-0267. Place this to the attention of CEMVN-OD-SW.

ADD
June 20 2011
OD-SW
ADD
June 20 2011

The proposed work would neither affect any species listed as endangered by the U.S. Departments of Interior or Commerce, nor affect any habitat designated as critical to the survival and recovery of any endangered species.

This determination is only applicable to the permit program administered by the U.S. Army Corps of Engineers. It does not eliminate the need to obtain other applicable federal, state or local approvals before beginning work.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2012. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit."

The New Orleans District Regulatory Branch is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete and return the attached Customer Service Survey or go to the survey found on our web site at <http://per2.nwp.usace.army.mil/survey.html>.

Should you have any further questions concerning this matter, please contact Mrs. Darlene Herman of this office at (504) 862-2287.

Sincerely,

Pete J. Serio
Chief, Regulatory Branch

Enclosure

Dear Permittee:

Under the terms of the nationwide permit approval granted to you, you are required by federal regulations, to complete and return this "Completion Notice" accompanied by a copy of your authorization letter to our office at the following address:

CEMVN-OD-SW
Chief, Western Evaluation Section
U.S. Army Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160-0267

If at a later date you decide not to perform the work, as approved by the nationwide permit, please advise this office so that your file can be so noted. If you have any questions and would like to speak with a Corps of Engineers representative, please call (504) 862-2287.

COMPLETION NOTICE

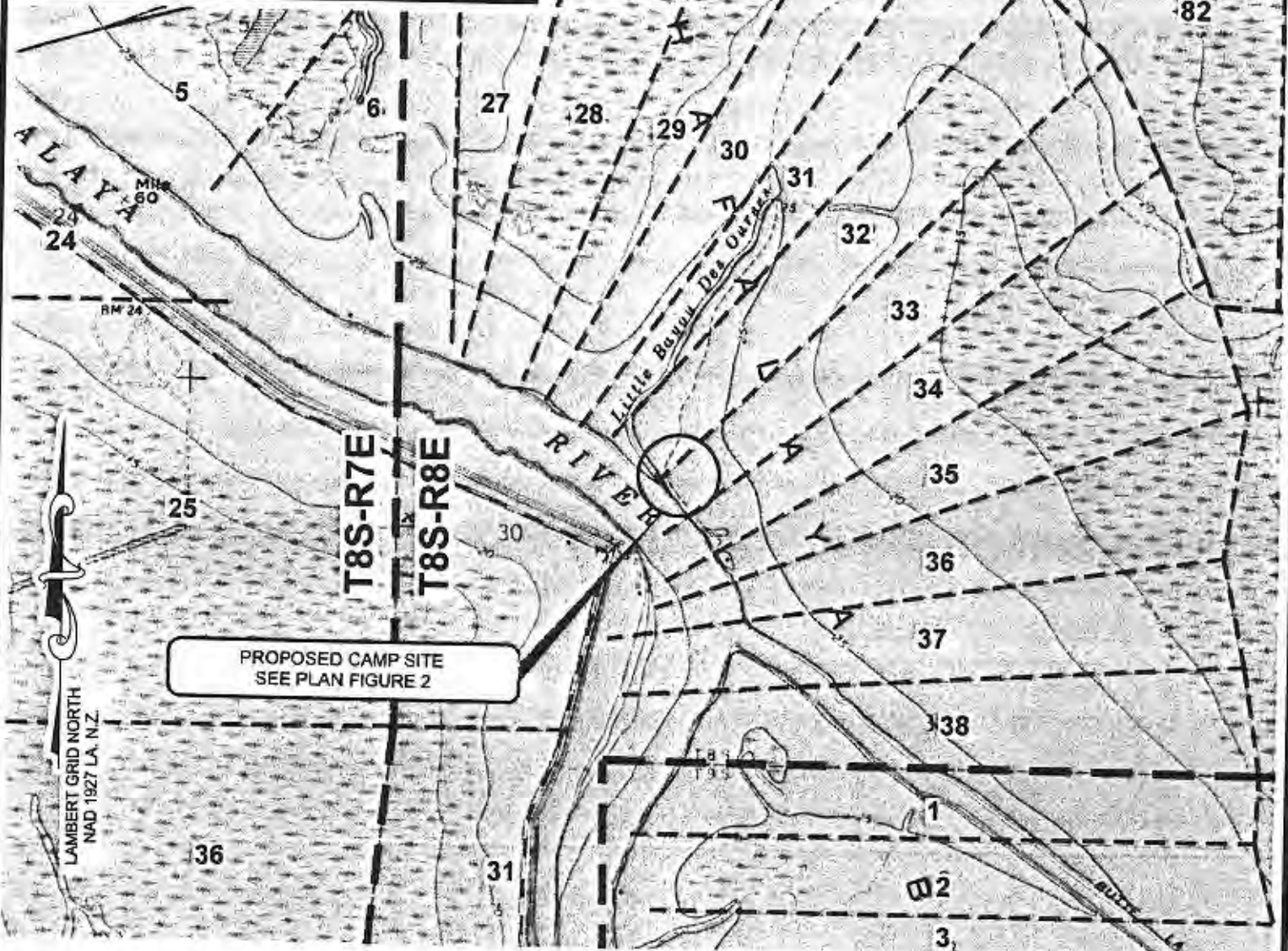
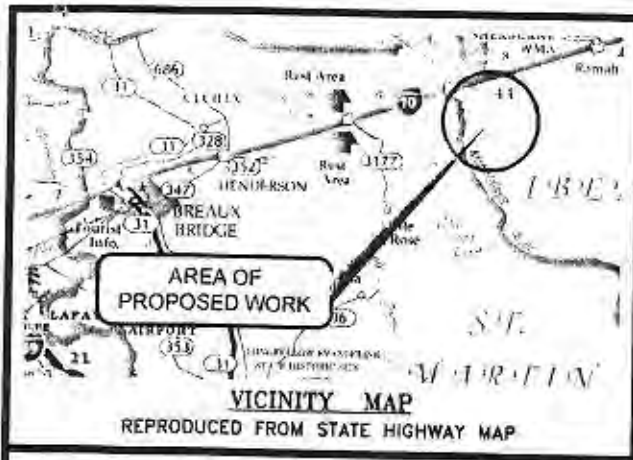
Permit Number: MVN-2011-0563 WB

Kenneth Bernhard

The work authorized in the permit referenced above was completed in accordance with the Department of the Army authorization and applicable general and specific conditions. In addition, mitigation (if required) was completed in accordance with the permit conditions.

Name (Please print)

Signature



KENNY BERNHARD
LAFAYETTE, LOUISIANA

VICINITY PLAT
PROPOSED CAMP SITE
ST. MARTIN PARISH, LOUISIANA

SCALE: 1" = 2,000'

JULY 29, 2010

PREPARED BY:

TIM MORTON & ASSOCIATES, INC.
 REGULATORY & ENVIRONMENTAL CONSULTANTS
 LAFAYETTE, LOUISIANA

FIGURE 1
 MAP NO. C-FIG 1

JOB NO. 10-124


 LAMBERT GRID NORTH
 NAD 1927 LA. S.Z.

PROP. CAMP	
X=	3,168,609' (83)
Y=	666,115' (83)
Lat=	30°19'52.3"N
Lon=	91°41'20.6"W
X=	1,887,808' (27)
Y=	605,406' (27)

PROP. BARN	
80' X 80'	

PROP. CAMP	
80' X 80'	

PROP. BOAT DOCK (STEEL BARGE)	
16' X 50'	

PROP. BOAT DOCK	
X=	3,168,294' (83)
Y=	665,762' (83)
Lat=	30°19'48.8"N
Lon=	91°41'24.2"W
X=	1,887,494' (27)
Y=	605,052' (27)

WATER WELL
AS PER BOARD
OF HEALTH

SEWER SYSTEM
AS PER BOARD
OF HEALTH

1,000'
AREA TO BE SELECTIVELY CLEARED
±23 ACRES

1,000'
AREA TO BE SELECTIVELY CLEARED
±23 ACRES
1,000'




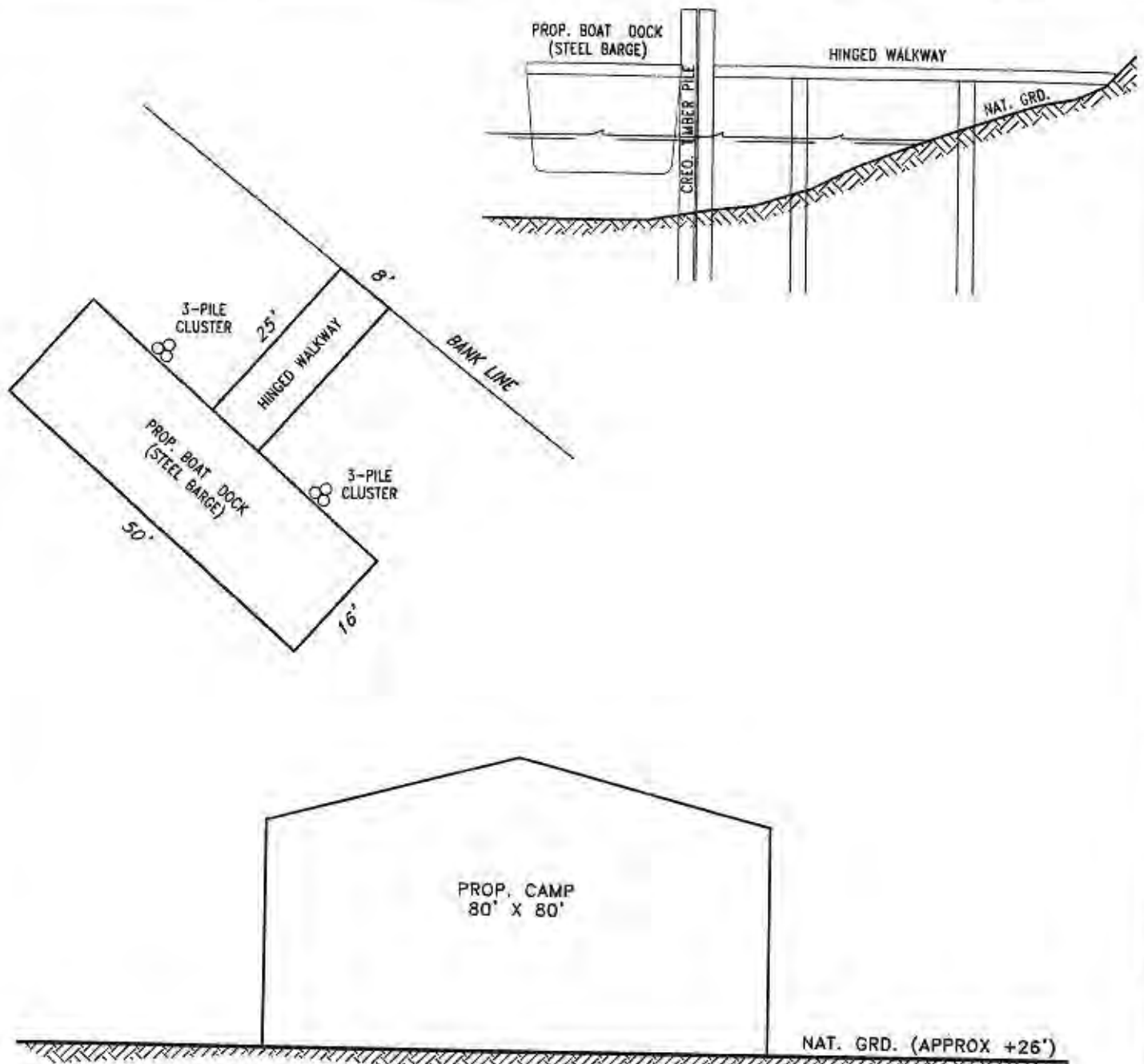
PREPARED BY:

TIM MORTON & ASSOCIATES, INC.
 REGULATORY & ENVIRONMENTAL CONSULTANTS
 LAFAYETTE, LOUISIANA
 JOB NO. 10-124

FIGURE 2
 MAP NO. C-FIG 2

KENNY BERNHARD
 LAFAYETTE, LOUISIANA

VICINITY PLAT
PROPOSED CAMP SITE
ST. MARTIN PARISH, LOUISIANA
 SCALE: 1" = 300'
 JULY 29, 2010



ELEVATION
NOT TO SCALE

PREPARED BY:



TIM MORTON & ASSOCIATES, INC.
REGULATORY & ENVIRONMENTAL CONSULTANTS
LAFAYETTE, LOUISIANA

JOB NO. 10-124

FIGURE 3

MAP NO. C-FIG 2

KENNY BERNHARD
LAFAYETTE, LOUISIANA

VICINITY PLAT
PROPOSED CAMP SITE
ST. MARTIN PARISH, LOUISIANA

SCALE: 1" = 300'

JULY 29, 2010

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

SEP 13 2010

OMB APPROVAL NO. 0710-0003
EXPIRES: 31 August 2012

Public reporting burden for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

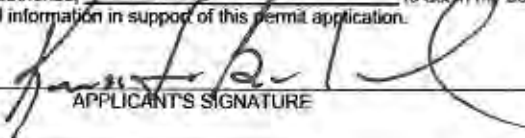
1. APPLICATION NO. MVN-2010-02256-WB	2. FIELD OFFICE CODE	3. DATE RECEIVED SEP 13 2010	4. DATE APPLICATION COMPLETE
---	----------------------	---------------------------------	------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Kenneth Middle - Last - Bernhard Company - E-mail Address -	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required) First - Tim Middle - Last - Morton Company - Tim Morton & Associates, Inc. E-mail Address - timtm@tmac.com
6. APPLICANT'S ADDRESS Address - 200 Lainstair Drive City - Lafayette State - LA Zip - 70503 Country - USA	9. AGENT'S ADDRESS Address - 718 E. Acade Canyon Road City - Lafayette State - LA Zip - 70508 Country - USA
7. APPLICANT'S PHONE NOs. W/AREA CODE a. Residence 337/988-5502 b. Business 337/232-9680 c. Fax	10. AGENT'S PHONE NOs. W/AREA CODE a. Residence b. Business 337/234-5124 c. Fax 337/235-3632

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Tim Morton & Associates, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.


APPLICANT'S SIGNATURE

8-12-10
DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions) Proposed Camp Site	
13. NAME OF WATERBODY, IF KNOWN (if applicable) Atchafalaya River	14. PROJECT STREET ADDRESS (if applicable) Address: City - State - Zip -
15. LOCATION OF PROJECT Latitude: *N 30° 19' 48.3" Longitude: *W 91° 41' 24.2" 30.33022 -91.69006	
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID Municipality Section - 31 & 32 Township - 85 Range - 85	

17. DIRECTIONS TO THE SITE
The project is located on the left descending bank of the Atchafalaya River at a site approximately 2-miles south of Interstate Highway 10 at the Butte La Rose exit.

18. Nature of Activity (Description of project, include all features)

Drive pilings to install a boat dock and a walkway in the Atchafalaya River, perform selective clearing on +/- 23 acres of property, drill a water well and install a sewer system, and construct an 80-foot by 80-foot camp and an 80-foot by 80-foot barn. We believe that the area to be cleared and the camp/barn construction activities will occur in an area that is considered non-jurisdictional. A Letter of Permission [33 CFR 325.2(e)] or approval under (General Permit)NOD-1 is requested for the boat dock and walkway.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

Construct a camp site.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

No dredging/filling in wetlands will occur.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
N/A		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres N/A
Or
Liner Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Minimal impacts to waterbottoms will occur.

24. Is Any Portion of the Work Already Complete? Yes No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list)

Address - State of Louisiana, Division of Administration, P. O. Box 44124
City - Baton Rouge State - LA Zip - 70804-4124

26. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits.

27. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants
730 E. Kaliste Saloom Road
Lafayette, LA 70508

(337) 234-5124

(337) 235-3632 (FAX)

March 4, 2011

MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

Re: Kenneth Bernhard, Proposed Electrical Line Bore, Atchafalaya River, Butte La Rose Area, St. Martin Parish, Louisiana

Dear Mr. Duke,

Mr. Kenneth Bernhard proposes to directionally drill a utility crossing across the Atchafalaya River near Butte La Rose, Louisiana, for the purpose of providing electricity to his property which is located on the left descending bank of the river. It is anticipated that an 8-inch diameter hole would be directionally drilled across the river and three 2-inch pipes would be run in that hole. The bore entry point would be located on Mr. Bernhard's property. The bore exit point would be located in the batture at a site approximately 332-feet from the centerline of the Atchafalaya River Protection levee and approximately 114-feet from the bank of the river. A stability control line survey was conducted at the project site by Eustis Engineering, and a report of their findings is included with this application. In accordance with those findings, the bore exit point would be located approximately 117-feet riverward of the levee stability control line.

In accordance with the burial requirements outlined in the New Orleans District, Corps of Engineers' May 31, 2010 Public Notice, the proposed utility line crossing would be bored a minimum of 15-feet below the mudline of the Atchafalaya River. A minimum distance of 20-feet would be maintained between the bore and the levee stability control line. Approval for the installation of these proposed pipelines is requested under Nationwide Permit No. 12 from your agency.

We believe that the proposed project site falls within an area in which the Corps of Engineers has a real estate interest. U.S. Government Easement No. DACW29-9-11-66 was granted to Mr. Bernhard by your agency for the purpose of constructing and maintaining the camp site, boat dock and walkway which this proposed utility line will serve. The applicant hereby respectfully requests that the utility line that is proposed in this application be included for coverage in the aforementioned Real Estate Consent.

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants

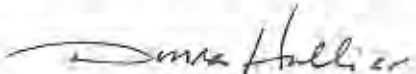
MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
Page Two
March 4, 2011

If additional information is required, please advise. I may be reached at 337/735-3882. Thank you for your consideration of this application.

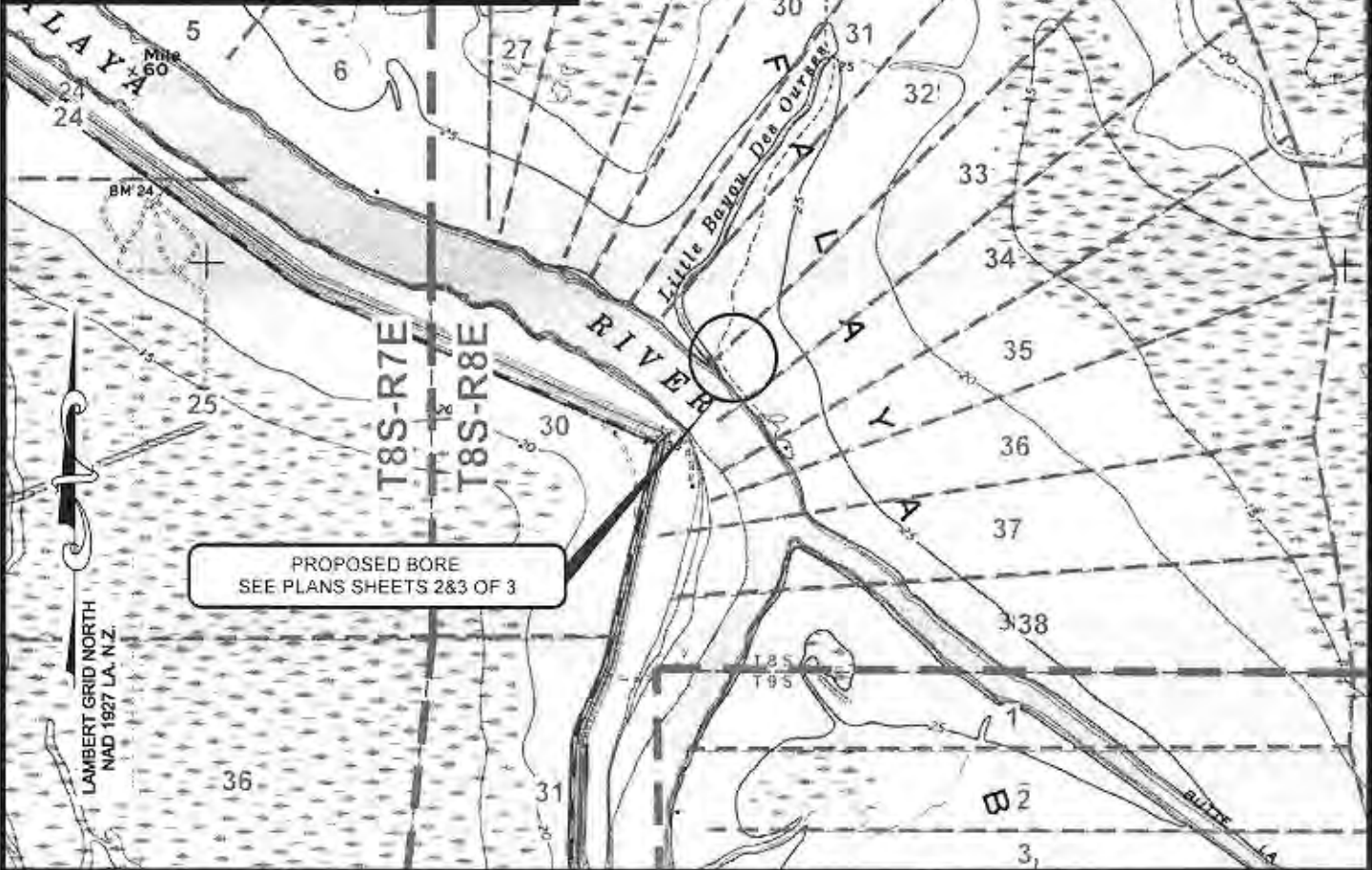
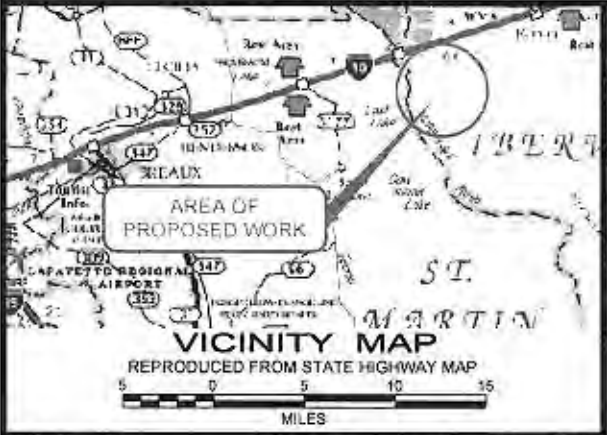
Sincerely,

TIM MORTON & ASSOCIATES, INC.



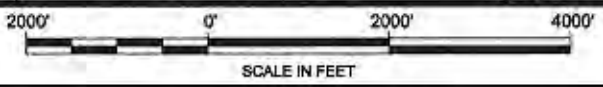
Donna Hollier, CPS
Agent for Kenneth Bernhard

dh
Attachments



LOCATION MAP

REPRODUCED FROM USGS BUTTE LA ROSE QUADRANGLE



KENNETH BERNHARD

200 Llainsfair Drive
Lafayette, LA 70503

PROPOSED BORE
BUTTE LA ROSE AREA
ST. MARTIN PARISH, LOUISIANA

PREPARED BY



JOB NO. 100776

DWG: REP

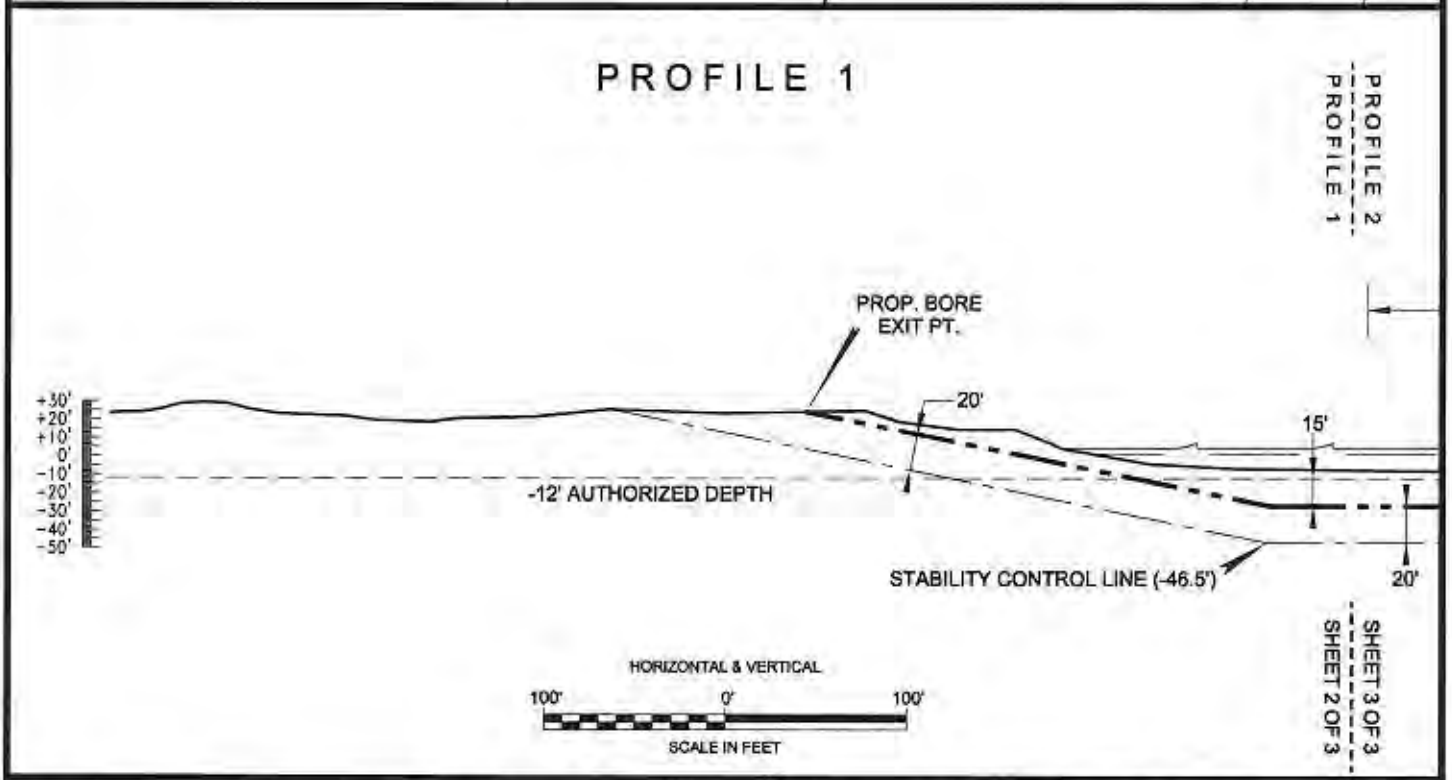
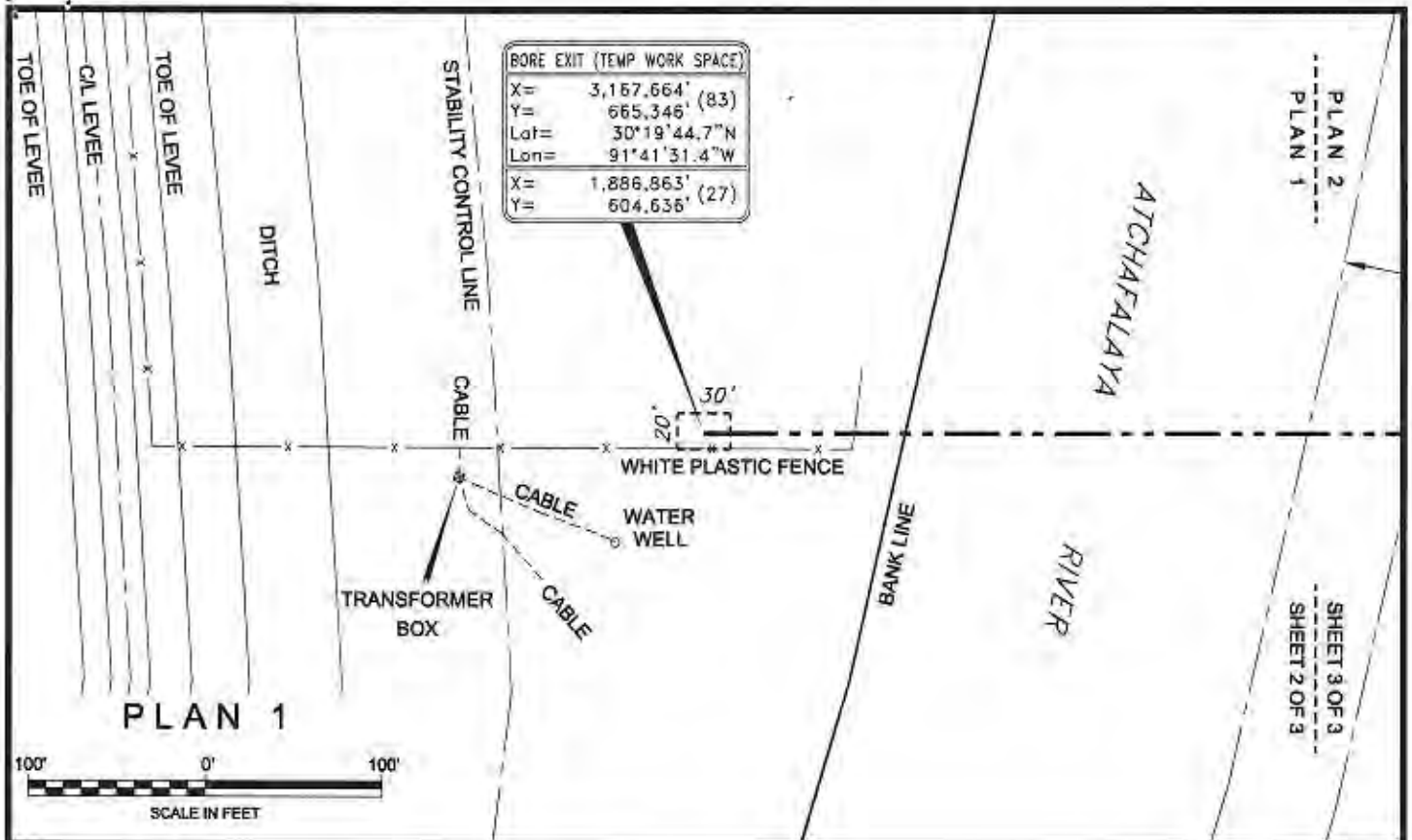
CHK: HEK

REVISED:

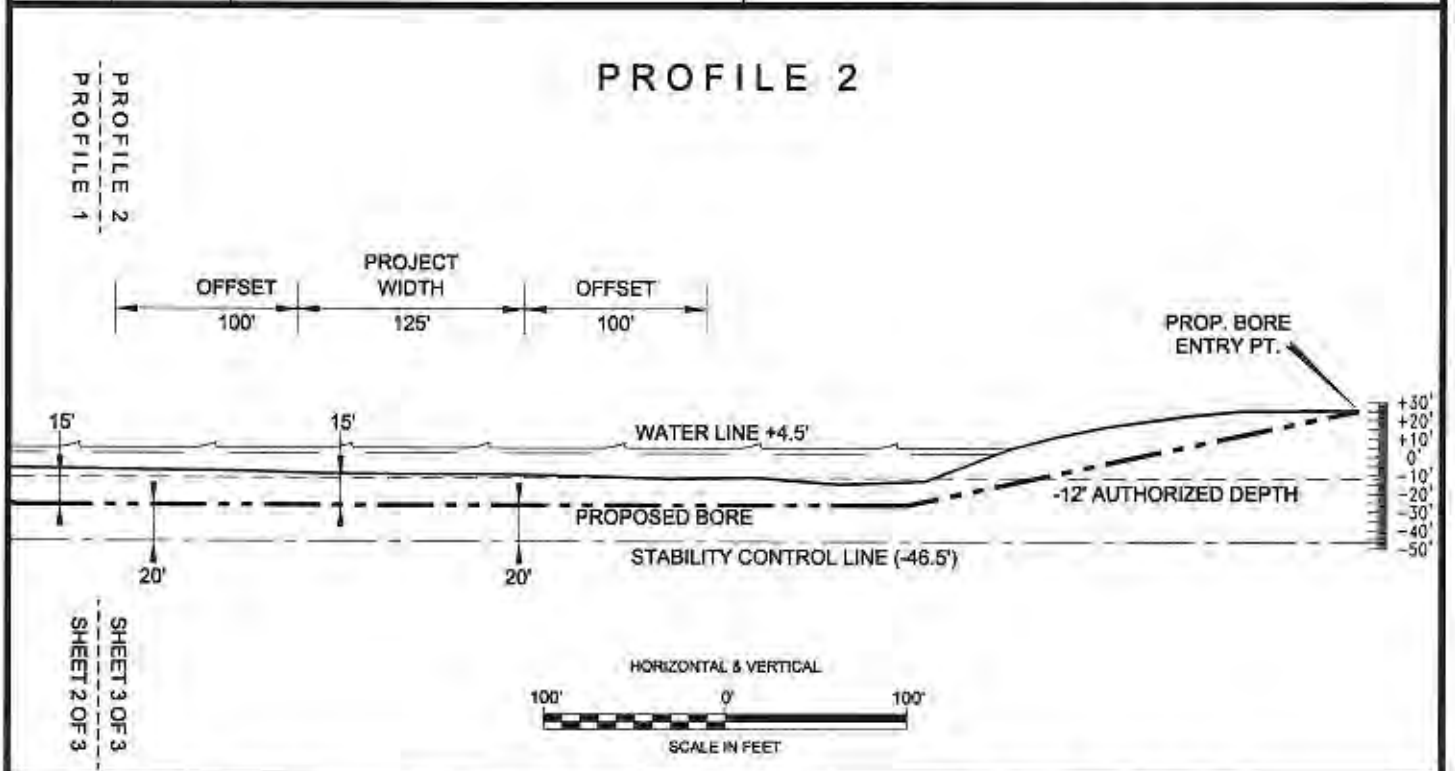
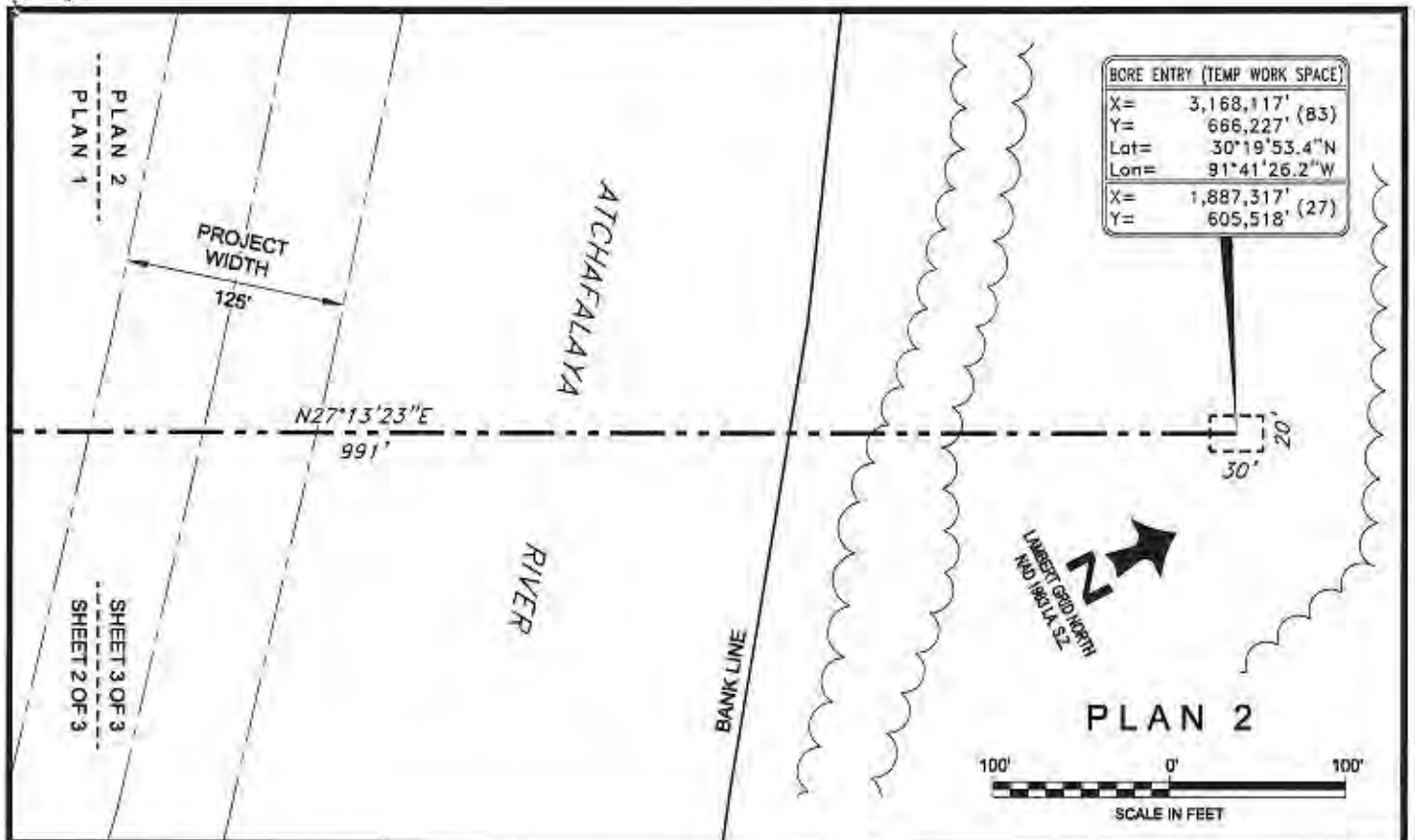
DATE: 3/15/2011

FILENAME: L:\08S08E\100776\C100776.DWG

SHEET 1 OF 3



KENNETH BERNHARD 200 Llainsfair Drive Lafayette, LA 70503		PROPOSED BORE BUTTE LA ROSE ST. MARTIN PARISH, LOUISIANA	
PREPARED BY C&C Technologies SURVEY SERVICES 730 E KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 281-0860 LA REGISTRATION NUMBER: 330	JOB NO. 100776	DWG: REP	CHK: HEK
FILENAME: L:\08S08E\100776\C100776A.DWG		REVISED:	DATE: 3/15/2011
			SHEET 2 OF 3



KENNETH BERNHARD 200 Lainsfair Drive Lafayette, LA 70503		PROPOSED BORE BUTTE LA ROSE ST. MARTIN PARISH, LOUISIANA	
PREPARED BY C&C Technologies SURVEY SERVICES 730 E. KAUSTE SALOOM ROAD, LAFAYETTE, LA (337) 281-0880 LA REGISTRATION NUMBER: 330	JOB NO. 100776	DWG: REP	CHK: HEK
FILENAME: L:\08S08E\100776\C100776A.DWG		REVISED:	DATE: 3/15/2011
			SHEET 3 OF 3

GEOTECHNICAL INVESTIGATION
BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA
EUSTIS ENGINEERING PROJECT NO. L0125

FOR
BERNHARD MECHANICAL CONTRACTORS, INC.
LAFAYETTE, LOUISIANA

26 JANUARY 2011



EUSTIS ENGINEERING SERVICES, L.L.C.

202 PARK WEST DRIVE
SCOTT, LOUISIANA 70583
PN 337-268-9755 | FN 337-268-9756
EMAIL: INFO@EUSTISENG.COM | SITE: WWW.EUSTISENG.COM

26 January 2011

Bernhard Mechanical Contractors, Inc.
Post Office Box 62690
Lafayette, Louisiana 70596-2690

Attention Mr. Kenneth Bernhard

Gentlemen:

Geotechnical Investigation
Bernhard Mechanical Contractors, Inc.
Horizontal Directional Drill Crossing
Atchafalaya River
Butte La Rose, Louisiana
Eustis Engineering Project No. L0125

Transmitted are three copies (two bound and one unbound) of our report covering a geotechnical investigation for the subject project. An electronic copy of this report has been sent to you.

Thank you for asking us to perform these services.

Yours very truly,

EUSTIS ENGINEERING SERVICES, L.L.C.

SHAUN R. SIMON, P.E.

SRS:brp/kdl



GEOTECHNICAL INVESTIGATION
BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA
EUSTIS ENGINEERING PROJECT NO. L0125

FOR
BERNHARD MECHANICAL CONTRACTORS, INC.
LAFAYETTE, LOUISIANA

By
Eustis Engineering Services, L.L.C.
Scott, Louisiana

26 JANUARY 2011

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	1
SCOPE	2
SOIL BORINGS	2
LABORATORY TESTS	4
DESCRIPTION OF SUBSOIL CONDITIONS	4
Stratigraphy	4
Ground Water	5
ENGINEERING ANALYSES	5
Furnished Information	5
Stability Analyses	5
Levee Reconstruction	6
ADDITIONAL GEOTECHNICAL SERVICES	7
FIGURES 1 THROUGH 4	
APPENDICES I AND II	

GEOTECHNICAL INVESTIGATION
BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA
EUSTIS ENGINEERING PROJECT NO. L0125

INTRODUCTION

1. This report contains the results of a geotechnical investigation performed for the proposed horizontal directional drill crossing of the Atchafalaya River for utilities to be installed. The project site is in the vicinity of levee Station 2845+00 near Butte La Rose, Louisiana. The work was performed in general accordance with the scope outlined in Eustis Engineering Services, L.L.C.'s proposal dated 12 October 2010, which was accepted on 29 November 2010 by Mr. Kenneth Bernhard.

2. This report has been prepared in accordance with generally accepted geotechnical engineering practice for the exclusive use of Bernhard Mechanical Contractors, Inc., and their designated representatives for specific application to the subject site. In the event of any changes in the nature, design, or location of the proposed horizontal directional drill crossing, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified and verified in writing. Should these data be used by anyone other than Bernhard Mechanical Contractors and their designated representatives, they should contact Eustis Engineering for interpretation of data and to secure any other information pertinent to this project.

3. Recommendations and conclusions contained in this report are to some degree subjective having partial basis in engineering judgement and experience particular

to the design engineer. For this reason, the report in its entirety should not be included in the contract plans and specifications. However, the results of the soil borings and laboratory tests contained in Appendix I of this report may be included in the plans and specifications.

4. Further note, the analyses and recommendations contained in this report are based, in part, on data obtained from the soil borings. The individual boring logs are considered representative of subsurface conditions at their respective locations on the dates completed. No warranty is given that the logs are representative of subsurface conditions at other locations or times. The nature and extent of variations in subsurface conditions between and away from the boring locations may not become evident until construction. If such variations then appear, it will be necessary to reevaluate the recommendations contained in this report.

SCOPE

5. The investigation included the drilling of soil test borings to evaluate subsoil conditions and stratification, and to obtain samples of the various substrata. Soil mechanics laboratory tests, performed on samples obtained from the borings, were used to evaluate the physical properties of the subsoils. Engineering analyses, based on the soil borings and laboratory tests were made to determine recommendations regarding site preparation, drainage, placement and compaction of fill, slope stability, and construction recommendations.

SOIL BORINGS

6. Three undisturbed borings were made at the site (in the vicinity of the U.S. Army Corps of Engineer's levee baseline Station 2845+00) on 7 and 8 December 2010. Prior to drilling, permission was received from the Atchafalaya Basin Levee District including letters of no objection from the USACE and State of Louisiana, Office of

Coastal Protection and Restoration. Boring 1 was made to a depth of 100 feet at the levee centerline. Boring 2 was made to a depth of 60 feet at the flood side toe of the levee. Boring 3 was made on the river's bank to a depth of 60 feet. The approximate locations of the borings are shown on Figure 1. The GPS coordinates of the actual locations are provided on the boring logs in Appendix I. Ground surface elevations at the boring locations were furnished by C & C Technologies, Inc.

7. Detailed descriptive logs of the borings and laboratory tests are shown in both tabular and graphical form in Appendix I. Upon completion of drilling the borings, the holes were backfilled in accordance with current regulatory requirements and as stipulated by the permit.
8. The undisturbed soil borings were made with a truck mounted rotary type drill rig. Undisturbed samples of cohesive or semi-cohesive subsoils were obtained at close intervals or changes in stratum using a 3-in. diameter thinwall Shelby tube sampler. The samples were immediately extruded from the sampler, inspected, and visually classified by Eustis Engineering's soil technician. Pocket penetrometer tests were performed on the soil samples to give a general indication of their shear strength or consistency. The results of these tests are shown on the boring logs in Appendix I under the column heading "PP." Representative samples were then promptly placed in moisture proof containers and sealed for preservation of their natural moisture content.
9. Cohesionless and semi-cohesive soils were obtained during the performance of in situ Standard Penetration Tests. This test consists of driving a 2-in. diameter splitspoon sampler 1 foot into the soil after first seating the sampler 6 inches. A 140-lb weight dropped 30 inches is used to advance the sampler. The number of blows required to drive the sampler through the final 1-ft increment is indicative of the relative density or approximate consistency of the subsoils tested. The results

of the Standard Penetration Tests are shown on the boring logs in Appendix I under the column heading "SPT." Representative samples were placed in moisture proof containers for preservation of their natural moisture content.

LABORATORY TESTS

10. Soil mechanics laboratory tests, consisting of natural water content, unit weight, unconfined compression shear (UC), and one-point unconsolidated undrained triaxial compression shear (OB), were performed on undisturbed samples obtained from the borings. In addition, Atterberg liquid and plastic limits tests were performed on selected representative samples to aid in classification of the subsoils and to give an indication of their relative compressibility. The results of the laboratory tests are summarized on the boring logs in Appendix I.

DESCRIPTION OF SUBSOIL CONDITIONS

Stratigraphy

11. Our interpretation of the stratigraphy at the boring locations is shown on the logs in Appendix I. Reference to the boring logs shows the Atchafalaya River guide levee comprises loose to dense brown and tan silty sand to el 21.5 (NAVD 88 Datum). Beneath the levee deposits and beginning at the ground surface in Boring 3, deposits of very soft to stiff gray, brown, tan, and dark gray clay, sandy clay, organic clay, and loose brown sandy silt extend to depths ranging from el 0 to el -9. These deposits are interspersed by loose to medium dense tan, brown, and gray sand and silty sand in Boring 1 between el 19.5 and el 17.5 and in Borings 2 and 3 between el 15.5 and el 13.5. Deposits of very loose to dense gray sand, silty sand, and clayey sand extend from el 0 to el -21 in Borings 1 and 2 and to the termination of Boring 3 at el -34.5. Continuing in Borings 1 and 2, deposits of soft to stiff gray clay and sandy clay were encountered to the termination of the borings.

Ground Water

12. In order to determine the ground water conditions at the time of the field investigation, observations were made in Boring 2. The boring was drilled without the addition of water to a depth of 15 feet. Free water was not encountered in the boring. After a period of 15 hours, the hole was observed to be dry to the 15-ft depth.
13. The depth to ground water will vary with climatic conditions, drainage improvements, water levels in the nearby Atchafalaya River, and other factors. The depth to ground water should be determined by those persons responsible for construction immediately prior to beginning work.

ENGINEERING ANALYSES

Furnished Information

14. We understand a horizontal directional drill will be required to provide utilities from the west bank of the Atchafalaya River to the east bank. The USACE has requested a stability control line be established for the project. The USACE has furnished a low water level of el 1.7 in the Atchafalaya River. Topographic and hydrographic surveys of the site dated 9 December 2010 were performed by C & C Technologies.

Stability Analyses

15. Design Methodology. Soil parameters utilized in our analyses are shown on Figure 2. A cross-section was furnished by C & C Technologies and is dated 9 December 2010. Stability analyses were performed using the USACE's Stability with UPLIFT program which uses the LMVD Method of Planes. The input and output runs for the

stability analyses are included as Appendix II. A minimum factor of safety equal to 1.3 was assumed for this method of analysis.

16. Levee Stability - Existing Conditions. Slope stability analyses were performed to evaluate the stability of the levee at low water conditions. These analyses assumed a low water level (LWL) in the Atchafalaya River at el 1.7 and are based on current survey data. The results of these analyses, shown on Figure 3, indicate a minimum factor of safety of 1.86 for the existing levee conditions.
17. Stability Control Line. Analyses have been performed to establish a stability control line for the proposed horizontal directional drill. The results of our analyses are shown on Figure 4 and indicate a minimum factor of safety of 1.31 assuming a 1 vertical on 5 horizontal degraded bank from el 26 to el -46.5. The horizontal directional drill should be conducted in accordance with the permit.

Levee Reconstruction

18. After the project is complete, it will be necessary to reconstruct and reshape the batture area to its existing cross-section should damage occur. It may be necessary to import cohesive (Unified Soil Classification CH/CL) material. Cohesive fill should have an organic content no greater than 9% as determined by ASTM D 2974, Method C, a maximum Atterberg liquid limit of 75, and a plasticity index no less than 10. The fill should have less than 35% sand retained on the No. 200 sieve by ASTM D 1140. The exposed surface should be scarified before fill is placed. The cohesive fill should be placed in 8 to 10-in. lifts and compacted near optimum moisture to at least 95% of its maximum dry density determined by ASTM D 698. Reconstruction should also meet all permit requirements.
19. Quality Control. Density tests should be performed on each lift of the compacted fill to determine if the contractor has achieved the recommended density. All

clearing, filling, and compaction operations should be accomplished only during periods of dry weather. The contractor should exercise caution during and after inclement weather to ensure subsoil support is not degraded by construction operations.

ADDITIONAL GEOTECHNICAL SERVICES

20. To provide continuity between the investigation, design, and construction phases, Eustis Engineering should be retained to provide additional services during completion of the project. These services may include consultation during design and construction, reviewing geotechnical aspects of plans and specifications, providing inspection of excavations, reviewing site drainage plans and construction sequences proposed by the contractor, testing and approval of proposed fill, and any other soils and materials testing services. Eustis Engineering offers a complete range of materials testing services which will provide quality control during construction and conformance to design specifications.

21. In summary, Eustis Engineering should be retained to monitor all geotechnical related work performed by the contractor. If construction problems arise, Eustis Engineering should be notified to participate in the development of solutions. This participation permits the geotechnical engineer to evaluate the effects of unanticipated conditions and propose solutions on the geotechnical design assumptions particular to the project. The design geotechnical engineer may also be able to judge how site specific soil and ground water conditions will affect the success of a proposed construction alternative.



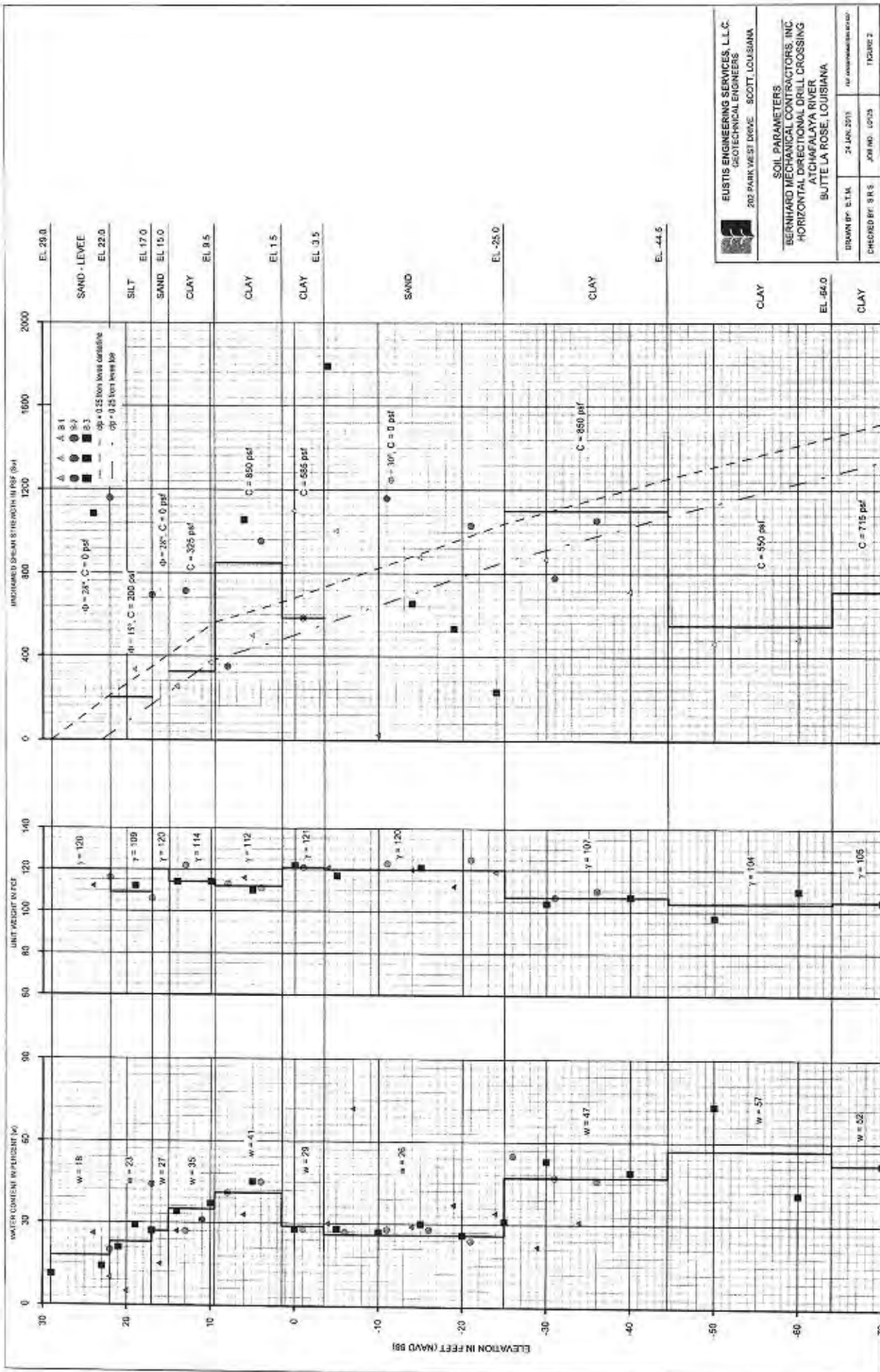
 **EUSTIS ENGINEERING SERVICES, LLC.**
GEOTECHNICAL ENGINEERS
302 PARK WEST DRIVE SCOTT, LOUISIANA

LOCATION OF BORINGS
BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA

DRAWN BY: ETM	24 JAN 2011	FILE NUMBER: DRP
CHECKED BY: SRS	JOB NO. 10125	FIGURE 1

Ⓢ DENOTES UNDISTURBED SOIL BORINGS DRILLED 7 AND 8 DECEMBER 2010.

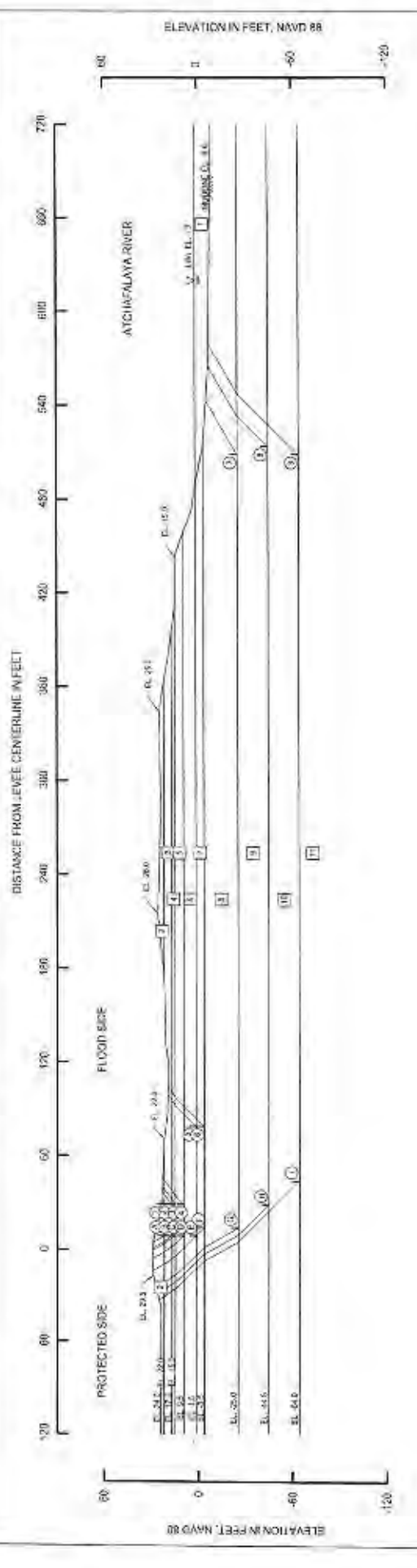
NOT TO SCALE



EUSTIS ENGINEERING SERVICES, L.L.C.
 GEOTECHNICAL ENGINEERS
 202 PARK WEST DRIVE SCOTT, LOUISIANA

SOIL PARAMETERS
 BERNHARD MECHANICAL CONTRACTORS, INC.
 HORIZONTAL DIRECTIONAL DRILL CROSSING
 ATCHAFALEYA RIVER
 BUTTE LA ROSE, LOUISIANA

DRAWN BY: E.L.K. 24 JUN 2018 For use on the job only
 CHECKED BY: S.R.S. JON.HO. 10/23 TCR/RC2



SOIL NO.	DESCRIPTION	FRICTION ANGLE IN DEGREES	LIMIT WEIGHT IN PCF	COHESION IN PSF		FACTOR OF SAFETY
				AVG.	BASE	
1	WATER	0	62.4	0	0	
2	SAND	28	120	0	0	2.89
3	SILT	15	105	200	200	3.30
4	SAND	28	120	0	0	2.92
5	CLAY	0	114	375	375	1.87
6	CLAY	0	112	850	850	3.47
7	CLAY	0	121	585	585	3.21
8	SAND	30	120	0	0	3.98
9	CLAY	0	107	850	850	2.25
10	CLAY	0	104	550	550	1.86
11	CLAY	0	105	715	715	

FAILURE SURFACE	SUMMATION OF FORCES IN KIPI-FT		FACTOR OF SAFETY
	RESISTING	DRIVING	
(1)	7.23	2.50	2.89
(2)	19.85	5.95	3.33
(3)	21.57	7.39	2.92
(4)	21.88	11.80	1.87
(5)	86.36	24.89	3.47
(6)	94.97	29.58	3.21
(7)	525.49	131.85	3.98
(8)	434.88	193.51	2.25
(9)	464.81	250.04	1.86

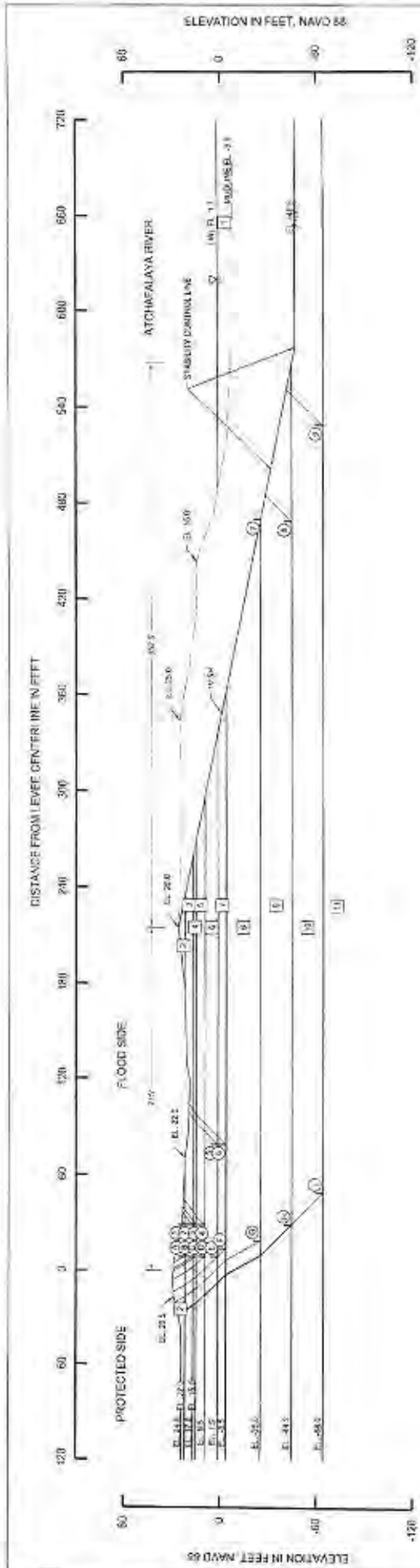
- NOTES:
1. SLOPE STABILITY ANALYSES PERFORMED BY LAND METHOD OF PLANES
 2. FACTOR OF SAFETY COMPUTED AS RATIO OF RESISTING TO DRIVING FORCES
 3. LEVEE CROSS-SECTION AND RIVER BANK CONFIGURATION BASED ON SURVEY DATED 9 DECEMBER 2010 BY C & C TECHNOLOGIES.

EUSTIS ENGINEERING SERVICES, L.L.C.
 27453 MAGNOLIA COSTUMEZONAL ENGINEERS 59017 LOUISIANA

SLOPE STABILITY ANALYSES FLOOD SIDE OF LEVEE EXISTING CONDITIONS

BERNHARD MECHANICAL CONTRACTORS, INC.
 10000 W. LAFAYETTE BOULEVARD
 BUTTE LA ROSE, LOUISIANA

DRAWN BY: J.L.S. PLOT DATE: 25 JAN 11 0000 PLOT FILE: 10000008
 CHECKED BY: S.R.S. JOB NO.: 10179 **FIGURE 3**



- NOTES:
1. SLOPE STABILITY ANALYSES PERFORMED BY LAND METHOD OF PLANES.
 2. FACTOR OF SAFETY COMPUTED AS RATIO OF RESISTING TO DRIVING FORCES.
 3. LEVEE CROSS SECTION AND RIVER BANK CONFIGURATION BASED ON SURVEY DATED 9 DECEMBER 2010 BY G & C TECHNOLOGIES

FAILURE SURFACE	SUMMATION OF FORCES IN KIPS/FT.		FACTOR OF SAFETY
	RESISTING	DRIVING	
(A)	7.23	2.30	2.85
(B)	18.65	5.55	3.35
(C)	21.57	7.39	2.92
(D)	21.68	11.60	1.87
(E)	86.36	24.89	3.47
(F)	94.87	28.56	3.21
(G)	407.69	145.17	2.85
(H)	382.45	229.53	1.67
(I)	425.20	325.78	1.31

SOIL NO.	DESCRIPTION	FRICTION ANGLE IN DEGREES	UNIT WEIGHT IN PCF	COHESION IN PSF	
				AVG.	BASE
1	WATER	0	62.4	0	0
2	SAND	28	120	0	0
3	SILT	15	109	200	200
4	SAND	28	120	0	0
5	CLAY	0	114	325	325
6	CLAY	0	112	650	650
7	CLAY	0	121	555	555
8	SAND	30	120	0	0
9	CLAY	0	107	850	850
10	CLAY	0	104	550	550
11	CLAY	0	105	715	715



EUSTIS ENGINEERING SERVICES, L.L.C.
 GEOTECHNICAL ENGINEERS
 2940 WEST PARKWAY
 SUITE 100
 BUTTE LA ROSE, LOUISIANA 70504

SLOPE STABILITY ANALYSES FLOOD SIDE OF LEVEE STABILITY CONTROL LINE











BERNHARD MECHANICAL CONTRACTORS, INC.
 HORIZONTAL DIRECTIONAL DRILL CROSSING
 ATCHAFALAYA RIVER
 BUTTE LA ROSE, LOUISIANA

DRAWN BY: JLS
 CHECKED BY: S.A.S.
 PLOT DATE: 25 FEB 11
 JOB NO.: 10125

SCALE: 1"=50'-0"
 SHEET NO.: 4 OF 4
FIGURE 4



LEGEND AND NOTES FOR
LOG OF BORING AND TEST RESULTS

PP	Pocket penetrometer resistance in tons per square foot					
SPT	Standard Penetration Test: Number of blows of a 140-lb. hammer dropped 30 inches required to drive 2-in. O.D., 1.4-in. I.D. sampler a distance of 1 foot into the soil after first seating it 6 inches					
SPLR	Type of Sampling	 Shelby	 SPT	 Auger	 No sample	
SYMBOL	Clay	Silt	Sand	Peat/Humus	Shells	Stone/Gravel
						
	Predominant type shown heavy; Modifying type shown light					

USC Unified Soil Classification
DENSITY Unit weight in pounds per cubic foot

SHEAR TESTS

TYPE

UC Unconfined compression shear
OB Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
UU Unconsolidated undrained triaxial compression shear
CU Consolidated undrained triaxial compression shear
DS Direct shear
 ϕ Angle of internal friction in degrees
c Cohesion in pounds per square foot

ATTERBERG LIMITS

LL Liquid Limit
PL Plastic Limit
PI Plasticity index

OTHER TESTS

CON Consolidation
PD Particle size distribution (sieve and/or hydrometer)
k Coefficient of permeability in centimeters per second
SP Swelling pressure in pounds per square foot

Other laboratory test results reported on separate figures

GENERAL NOTES

- (1) If a ground water depth is shown on the boring log, these observations were made at the time of drilling and were measured below the existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal fluctuations and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction immediately prior to beginning work.
- (2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.



BUTTE LA ROSE, LOUISIANA

Ground Elev.: 29.2 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125 Date Drilled: 12/07/10 Boring: 1 Refer to "Legends & Notes"

Scale in Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	σ	C	LL	PL	PI	
0					Loose brown & tan silty sand w/gravel	SM	1	0-2	11									
					w/clay pockets		2	2-4										
		4					3	4.5-6	14									
	0.25	6			Soft gray & tan sandy clay w/decayed wood	CL	4	6.5-8	21									
					Loose gray fine sand w/clay pockets	SP	5	8-10	29	87	112	UC	--	335				
	0.25				Soft gray & tan sandy clay w/roots	CL	6	10-12	27									
	0.00				Soft gray & brown sandy clay w/roots & wood	CL	7	13-15	34	85	114	UC	--	265				
							8	18-19	37	84	114	UC	--	370				
	0.75				Soft gray clay w/silty sand pockets	CH	9	23-24	45	76	110	UC	--	500				
	1.25				Stiff gray & tan clay w/silty sand pockets	CH	10	28-29	28	95	122	UC	--	1100				
	0.00				Dense gray clayey sand w/clay pockets	SC	11	33-34	28	91	117	OB	0	1005	25	18	9	
	0.00				Medium dense gray silty sand w/clay pockets	SM	12	38-39	27									
	0.00						13	43-44	30	93	121	OB	0	880				
	0.00						14	48-49	26									

Comments: Latitude: 30°19'41.8"N Longitude: 91°41'33.3"W



BUTTE LA ROSE, LOUISIANA

Ground Elev.: 29.2 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125 Date Drilled: 12/07/10 Boring: 1 Refer to "Legends & Notes"

Scale in Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	σ	C	LL	PL	PI	
50					Soft gray sandy clay	CL	15	53-54	31									
60	1.75				Medium stiff gray clay w/decayed wood & roots	CH	16	58-59	53	104	UC	--	870					
70	1.00				w/shell fragments & silty sand pockets		17	63-64										
	1.75						18	68-69	49	107	UC	--	715					
	1.50						19	73-74										
	1.00				Soft gray clay w/trace of organic matter & decayed wood	CH	20	78-79	73	97	UC	--	465					
	0.75						21	83-84										
	0.50				w/silty sand pockets		22	88-89	41	110	UC	--	485					
	1.00						23	93-94										
	2.25				Medium stiff gray clay w/silt pockets & lenses	CH	24	98-99	52	105	UC	--	715					

Comments: Latitude: 30°19'41.8"N Longitude: 91°41'33.3"W



BUTTE LA ROSE, LOUISIANA

Ground Elev.: 23.2 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125 Date Drilled: 12/07-08/10 Boring: 2 Refer to "Legends & Notes"

Scale in Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	σ	C	LL	PL	PI	
0	1.00				Dense brown & tan silty sand w/clay pockets & roots	SM	1	0-2	20	97	116	OB	0	1160				
	1.00				Medium stiff gray & brown clay w/silty sand pockets & decayed wood	CH	2	2-4				UC	--	695				
	0.75				Soft gray sandy clay	CL	3	4-6	44	74	106	UC	--					
	0.00				Medium dense brown silty sand w/clay pockets	SM	4	6-8	36			OB	0	715	28	15	13	
10	0.00				Very soft gray sandy clay	CL	5	8-10	27	96	122	OB	0					
	0.00				Soft brown & gray sandy clay w/trace of decayed wood	CL	6	10-12	31			UC	--					
	0.00				Medium stiff gray clay w/silty sand pockets	CH	7	13-15	41	80	113	OB	0	350				
	1.75				Medium stiff gray & tan sandy clay	CL	8	18-19	45	76	111	UC	--	955				
	0.75				Medium dense gray silty sand	SM	9	23-24	28	95	121	UC	--	585				
30							10	26-29	27									
					Stiff gray clay w/decayed wood & fine sand pockets	CH	11	33-34	28	97	123	OB	0	1160	NP	NP		
40							12	38-39	28									
							13	43-44	24	100	125	OB	0	1030				
50							14	48-49	55									

Comments: Latitude: 30°19'42.2"N Longitude: 91°41'33.1"W



BUTTE LA ROSE, LOUISIANA

Ground Elev.: 23.2 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125 Date Drilled: 12/07-08/10 Boring: 2 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	S P L R	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
									Dry	Wet	Type	ø	C	LL	PL	PI	
50	1.25			Medium stiff gray clay w/decayed wood, roots, & fine sand pockets	CH	15	53-54	47	73	107	UC	780					
60	2.25			Stiff gray clay w/fine sand pockets	CH	16	58-59	46	75	110	UC	1055					
70																	
80																	
90																	
100																	

Comments: Latitude: 30°19'42.2"N Longitude: 91°41'33.1"W



BUTTE LA ROSE, LOUISIANA

Ground Elev.: 25.5 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125 Date Drilled: 12/08/10 Boring: 3 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests		Atterberg Limits			Other Tests
										Dry	Wet	Type	σ	C	LL	PL	
0	1.75				Stiff brown & tan sandy clay w/roots, organic matter, & decayed wood	CL	1	0-2	26	89	112	UC	--	1085			
	0.00	3			Loose brown sandy silt w/clay pockets	ML	2	2-4	10								
		6			Loose brown sandy silt		3	4.5-6	5								
10					Loose gray & tan silty sand	SM	4	6-8									
	0.00				Soft gray sandy clay w/organic matter	CL	5	8.5-10	15								
	1.25				Stiff gray clay w/roots & silt pockets	CH	6	10-12	27								
20							7	13-15	31								
	1.50						8	18-19	33	87	116	UC	--	1055			
	2.00				Stiff reddish-brown clay w/silt pockets	CH	9	23-24									
	0.50				Stiff gray clay w/silty sand pockets & lenses, decayed wood, & roots	CH	10	28-29	30	93	121	UC		1790			
					Medium stiff dark gray organic clay w/wood & roots	OH	11	32-33	72								
					Medium dense gray silty sand w/clay pockets & lenses	SM	12	33-34	207								
40					Loose gray clayey sand w/decayed wood & trace of organic matter	SC	13	38-39	28	93	120	OB	0	855			
	0.00				Medium dense gray clayey sand w/wood & roots	SC	14	43-44	37								
50							15	48-49	34	84	112	OB	0	535			

Comments: Latitude: 30°19'44.8"N Longitude: 91°41'31.9"W



BUTTE LA ROSE, LOUISIANA

Ground Elev.: 25.5 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125 Date Drilled: 12/08/10 Boring: 3 Refer to "Legends & Notes"

Scale in Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests		Atterberg Limits			Other Tests
										Dry	Wet	Type	c	LL	PL	PI	
50					Very loose gray fine sand	SP	16	53-54	22	97	119	OB	0	230			
60		13			Medium dense gray silty sand w/wood	SM	17	58.5-60	31								
70																	
80																	
90																	
100																	

Comments: Latitude: 30°19'44.8"N Longitude: 91°41'31.9"W

BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA
EUSTIS ENGINEERING PROJECT NO. L0125

SUMMARY OF COMPUTER RUNS FOR UPLIFT ANALYSES

FIGURE NUMBER INDICATED ON REPORT DATED 26 JANUARY 2011	DESCRIPTION OF ANALYSIS	FILENAME
3	Flood Side of Levee - Existing Conditions	s/1a.txt
4	Flood Side of Levee - Stability Control Line	s/13.txt

**** STABILITY WITH UPLIFT ****

EE L0125- BERNHARD- Existing Slope Stability
 Floodside - water at 1.7
 12 PROFILES
 1 VERTICALS
 UPLIFT WITH 1 PIEZOMETRIC GRADE LINES

* * STRATUM 2 ACT. WEDGE LOC. 90165.0 EL. 22.0 PASS. WEDGE LOC. 180.0 EL. 22.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	22.0	240.	0.	128.	264.	128.
100.0	22.0	240.	0.	128.	264.	128.
120.0	22.0	300.	0.	160.	280.	160.
131.0	22.0	600.	0.	319.	361.	319.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 136.3						
139.0	22.0	840.	0.	447.	425.	425.
150.0	22.0	900.	0.	479.	441.	441.
150.0	22.0	900.	0.	479.	441.	441.
162.0	22.0	840.	0.	446.	425.	425.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 164.7						
174.0	22.0	480.	0.	255.	329.	255.
189.0	22.0	180.	0.	96.	248.	96.
227.0	22.0	0.	0.	0.	200.	0.
243.0	22.0	-125.	0.	0.	999999.	0.
275.0	22.0	-187.	0.	0.	999999.	0.
286.0	22.0	-62.	0.	0.	999999.	0.
331.0	22.0	0.	0.	0.	200.	0.
STRATUM 2 STARTS FAILURE POSSIBLE FROM DIST. 331.0						
371.0	22.0	480.	0.	255.	329.	255.
436.0	22.0	240.	0.	128.	264.	128.
500.0	22.0	360.	0.	191.	296.	191.
520.0	22.0	0.	0.	0.	200.	0.
537.0	22.0	-187.	0.	0.	999999.	0.
552.0	22.0	-312.	0.	0.	999999.	0.
569.0	22.0	-437.	0.	0.	999999.	0.
600.0	22.0	-437.	0.	0.	999999.	0.
616.0	22.0	-780.	0.	0.	999999.	0.
628.0	22.0	-1092.	0.	0.	999999.	0.
646.0	22.0	-1267.	0.	0.	999999.	0.
STRATUM 2 STARTS FAILURE POSSIBLE FROM DIST. 646.0						
647.0	22.0	-1267.	0.	0.	999999.	0.
660.0	22.0	-1267.	0.	0.	999999.	0.
672.0	22.0	-1267.	0.	0.	999999.	0.
722.0	22.0	-1267.	0.	0.	999999.	0.
915.0	22.0	-1267.	0.	0.	999999.	0.
1000.0	22.0	-1267.	0.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 22.0 DP 422. RP 748.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	22.0	2720.	1738.	0.	4282.	2.95

CRIT. ACTIVE LOC 165.0 EL 22.0 DA 2720. RA 1738.

DIS.	EL.	DP	RP	DB	RB	FS
170.0	22.0	1070.	1894.	0.	1794.	3.29
175.0	22.0	690.	1221.	0.	3192.	3.03
180.0	22.0	422.	748.	0.	4282.	2.95
185.0	22.0	220.	390.	0.	5105.	2.89
190.0	22.0	120.	212.	0.	5668.	2.93

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195.0	22.0	90.	159.	0.	6102.	3.04
200.0	22.0	64.	113.	0.	6473.	3.13
205.0	22.0	42.	75.	0.	6782.	3.21
210.0	22.0	25.	45.	0.	7027.	3.27
215.0	22.0	13.	22.	0.	7210.	3.31

* * STRATUM 3 ACT. WEDGE LOC. 90165.0 EL. 17.0 PASS.WEDGE LOC. 180.0 EL. 17.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	17.0	785.	0.	410.	417.	410.
100.0	17.0	785.	0.	410.	417.	410.
120.0	17.0	845.	0.	426.	449.	426.
131.0	17.0	1145.	0.	507.	609.	507.
139.0	17.0	1385.	0.	571.	736.	571.
150.0	17.0	1445.	0.	587.	768.	587.
150.0	17.0	1445.	0.	587.	768.	587.
162.0	17.0	1385.	0.	571.	736.	571.
174.0	17.0	1025.	0.	475.	545.	475.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 187.3						
189.0	17.0	725.	0.	394.	385.	385.
227.0	17.0	545.	0.	346.	290.	290.
243.0	17.0	327.	0.	288.	174.	174.
275.0	17.0	218.	0.	258.	116.	116.
286.0	17.0	436.	0.	317.	232.	232.
331.0	17.0	545.	0.	346.	290.	290.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 348.8						
371.0	17.0	1025.	0.	475.	545.	475.
436.0	17.0	785.	0.	410.	417.	410.
500.0	17.0	905.	0.	442.	481.	442.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 508.1						
520.0	17.0	545.	0.	346.	290.	290.
537.0	17.0	218.	0.	258.	116.	116.
552.0	17.0	0.	0.	200.	0.	0.
569.0	17.0	-125.	0.	200.	999999.	200.
600.0	17.0	-125.	0.	200.	999999.	200.
616.0	17.0	-468.	0.	200.	999999.	200.
628.0	17.0	-780.	0.	200.	999999.	200.
646.0	17.0	-955.	0.	200.	999999.	200.
STRATUM 3 STARTS FAILURE POSSIBLE FROM DIST. 646.0						
647.0	17.0	-955.	0.	200.	999999.	200.
660.0	17.0	-955.	0.	200.	999999.	200.
672.0	17.0	-955.	0.	200.	999999.	200.
722.0	17.0	-955.	0.	200.	999999.	200.
915.0	17.0	-955.	0.	200.	999999.	200.
1000.0	17.0	-955.	0.	200.	999999.	200.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 17.0 DP 3008. RP 4892.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	17.0	8431.	5695.	0.	7348.	3.31

CRIT. ACTIVE LOC 165.0 EL 17.0 DA 8431. RA 5695.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	17.0	4499.	6393.	0.	2634.	3.74
175.0	17.0	3690.	5563.	0.	5069.	3.44
180.0	17.0	3008.	4892.	0.	7348.	3.31
185.0	17.0	2484.	4459.	0.	9493.	3.30
190.0	17.0	2243.	4260.	0.	11490.	3.47
195.0	17.0	2100.	4134.	0.	13373.	3.66
200.0	17.0	1961.	4015.	0.	15194.	3.85
205.0	17.0	1827.	3904.	0.	16951.	4.02
210.0	17.0	1697.	3802.	0.	18645.	4.18
215.0	17.0	1572.	3706.	0.	20276.	4.33

s11a.out

* * STRATUM 4 ACT. WEDGE LOC. 90165.0 EL. 15.0 PASS.WEDGE LOC. 180.0 EL. 15.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	15.0	1025.	0.	545.	325.	325.
100.0	15.0	1025.	0.	545.	325.	325.
120.0	15.0	1085.	0.	577.	325.	325.
131.0	15.0	1385.	0.	737.	325.	325.
139.0	15.0	1625.	0.	864.	325.	325.
150.0	15.0	1685.	0.	896.	325.	325.
150.0	15.0	1685.	0.	896.	325.	325.
162.0	15.0	1625.	0.	864.	325.	325.
174.0	15.0	1265.	0.	673.	325.	325.
189.0	15.0	965.	0.	513.	325.	325.
227.0	15.0	785.	0.	417.	325.	325.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	239.8		
243.0	15.0	567.	0.	301.	325.	301.
275.0	15.0	458.	0.	244.	325.	244.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	282.7		
286.0	15.0	676.	0.	359.	325.	325.
331.0	15.0	785.	0.	417.	325.	325.
371.0	15.0	1265.	0.	673.	325.	325.
436.0	15.0	1025.	0.	545.	325.	325.
500.0	15.0	1145.	0.	609.	325.	325.
520.0	15.0	785.	0.	417.	325.	325.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	529.0		
537.0	15.0	458.	0.	243.	325.	243.
552.0	15.0	240.	0.	128.	325.	128.
569.0	15.0	0.	0.	0.	325.	0.
600.0	15.0	0.	0.	0.	325.	0.
616.0	15.0	-343.	0.	0.	999999.	0.
628.0	15.0	-655.	0.	0.	999999.	0.
646.0	15.0	-830.	0.	0.	999999.	0.
STRATUM 4 STARTS FAILURE POSSIBLE FROM DIST.			646.0			
647.0	15.0	-830.	0.	0.	999999.	0.
660.0	15.0	-830.	0.	0.	999999.	0.
672.0	15.0	-830.	0.	0.	999999.	0.
722.0	15.0	-830.	0.	0.	999999.	0.
915.0	15.0	-830.	0.	0.	999999.	0.
1000.0	15.0	-830.	0.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 15.0 DP 4612. RP 8082.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	15.0	11464.	7605.	0.	4875.	3.00

CRIT. ACTIVE LOC 165.0 EL 15.0 DA 11464. RA 7605.

DIS.	EL.	DP	RP	DB	RB	FS
170.0	15.0	6364.	10115.	0.	1625.	3.79
175.0	15.0	5412.	8967.	0.	3250.	3.27
180.0	15.0	4612.	8082.	0.	4875.	3.00
185.0	15.0	4077.	7462.	0.	6500.	2.92
190.0	15.0	3812.	7121.	0.	8125.	2.99
195.0	15.0	3624.	6916.	0.	9750.	3.10
200.0	15.0	3441.	6719.	0.	11375.	3.20
205.0	15.0	3262.	6530.	0.	13000.	3.31
210.0	15.0	3088.	6348.	0.	14625.	3.41
215.0	15.0	2918.	6174.	0.	16250.	3.51

* * STRATUM 5 ACT. WEDGE LOC. 120.0 EL. 9.5 PASS.WEDGE LOC. 180.0 EL. 9.5

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ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	9.5	1652.	0.	325.	850.	325.
100.0	9.5	1652.	0.	325.	850.	325.
120.0	9.5	1712.	0.	325.	850.	325.
131.0	9.5	2012.	0.	325.	850.	325.
139.0	9.5	2252.	0.	325.	850.	325.
150.0	9.5	2312.	0.	325.	850.	325.
150.0	9.5	2312.	0.	325.	850.	325.
162.0	9.5	2252.	0.	325.	850.	325.
174.0	9.5	1892.	0.	325.	850.	325.
189.0	9.5	1592.	0.	325.	850.	325.
227.0	9.5	1412.	0.	325.	850.	325.
243.0	9.5	1194.	0.	325.	850.	325.
275.0	9.5	1085.	0.	325.	850.	325.
286.0	9.5	1303.	0.	325.	850.	325.
331.0	9.5	1412.	0.	325.	850.	325.
371.0	9.5	1892.	0.	325.	850.	325.
436.0	9.5	1652.	0.	325.	850.	325.
500.0	9.5	1772.	0.	325.	850.	325.
520.0	9.5	1412.	0.	325.	850.	325.
537.0	9.5	1085.	0.	325.	850.	325.
552.0	9.5	867.	0.	325.	850.	325.
569.0	9.5	627.	0.	325.	850.	325.
600.0	9.5	627.	0.	325.	850.	325.
616.0	9.5	0.	0.	325.	850.	325.
628.0	9.5	-312.	0.	325.	999999.	325.
646.0	9.5	-487.	0.	325.	999999.	325.
STRATUM 5 STARTS FAILURE POSSIBLE FROM DIST. 646.0						
647.0	9.5	-487.	0.	325.	999999.	325.
660.0	9.5	-487.	0.	325.	999999.	325.
672.0	9.5	-487.	0.	325.	999999.	325.
722.0	9.5	-487.	0.	325.	999999.	325.
915.0	9.5	-487.	0.	325.	999999.	325.
1000.0	9.5	-487.	0.	325.	999999.	325.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 9.5 DP 11759. RP 10986.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	9.5	12571.	7633.	0.	19500.	46.94
125.0	9.5	13097.	7705.	0.	17875.	27.34
130.0	9.5	14346.	7970.	0.	16250.	13.61
135.0	9.5	16355.	8606.	0.	14625.	7.45
140.0	9.5	18633.	9387.	0.	13000.	4.85
145.0	9.5	20724.	10299.	0.	11375.	3.64
150.0	9.5	22237.	11066.	0.	9750.	3.04
155.0	9.5	22878.	11432.	0.	8125.	2.75
160.0	9.5	22971.	11565.	0.	6500.	2.59
165.0	9.5	22575.	11500.	0.	4875.	2.53
170.0	9.5	21344.	11226.	0.	3250.	2.66
175.0	9.5	19273.	10574.	0.	1625.	3.09
180.0	9.5	16635.	9474.	0.	0.	4.20
185.0	9.5	14457.	8578.	0.	-1625.	6.63
190.0	9.5	12785.	7969.	0.	-3250.	15.31

CRIT. ACTIVE LOC 165.0 EL. 9.5 DA 22575. RA 11500.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	9.5	14223.	12442.	0.	1625.	3.06
175.0	9.5	12813.	11585.	0.	3250.	2.70
180.0	9.5	11759.	10986.	0.	4875.	2.53
185.0	9.5	10979.	10675.	0.	6500.	2.47
190.0	9.5	10539.	10471.	0.	8125.	2.50
195.0	9.5	10226.	10275.	0.	9750.	2.55
200.0	9.5	9918.	10086.	0.	11375.	2.60
205.0	9.5	9614.	9905.	0.	13000.	2.65
210.0	9.5	9314.	9732.	0.	14625.	2.70

215.0 9.5 8988. 9357. 0. sla.out 16250. 2.73

* * STRATUM 6 ACT. WEDGE LOC. 120.0 EL. 1.5 PASS. WEDGE LOC. 230.0 EL. 1.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	1.5	2548.	500.	850.	585.	585.
100.0	1.5	2548.	500.	850.	585.	585.
120.0	1.5	2608.	500.	850.	585.	585.
131.0	1.5	2908.	500.	850.	585.	585.
139.0	1.5	3148.	500.	850.	585.	585.
150.0	1.5	3208.	500.	850.	585.	585.
150.0	1.5	3208.	500.	850.	585.	585.
162.0	1.5	3148.	500.	850.	585.	585.
174.0	1.5	2788.	500.	850.	585.	585.
189.0	1.5	2488.	500.	850.	585.	585.
227.0	1.5	2308.	500.	850.	585.	585.
243.0	1.5	2090.	500.	850.	585.	585.
275.0	1.5	1981.	500.	850.	585.	585.
286.0	1.5	2199.	500.	850.	585.	585.
331.0	1.5	2308.	500.	850.	585.	585.
371.0	1.5	2788.	500.	850.	585.	585.
436.0	1.5	2548.	500.	850.	585.	585.
500.0	1.5	2668.	500.	850.	585.	585.
520.0	1.5	2308.	500.	850.	585.	585.
537.0	1.5	1981.	500.	850.	585.	585.
552.0	1.5	1763.	500.	850.	585.	585.
569.0	1.5	1523.	500.	850.	585.	585.
600.0	1.5	1523.	500.	850.	585.	585.
616.0	1.5	896.	500.	850.	585.	585.
628.0	1.5	336.	187.	850.	585.	585.
646.0	1.5	22.	12.	850.	585.	585.
647.0	1.5	12.	13.	850.	585.	585.
FAILURE SURFACE IN STRATA	6 EL.	1.5	DIST.	647.0	STRENGTH	850.0
660.0	1.5	12.	13.	850.	999999.	850.
672.0	1.5	12.	13.	850.	999999.	850.
722.0	1.5	12.	13.	850.	999999.	850.
935.0	1.5	12.	13.	850.	999999.	850.
1000.0	1.5	12.	13.	850.	999999.	850.

ASSUMED CRIT. PASSIVE LOC. 230.0 EL. 1.5 DP 20442. RP 20477.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	1.5	29405.	21120.	0.	64350.	11.82
125.0	1.5	30047.	21190.	0.	61425.	10.73
130.0	1.5	31299.	21262.	0.	58500.	9.23
135.0	1.5	33198.	21363.	0.	55575.	7.64
140.0	1.5	35952.	21787.	0.	52650.	6.12
145.0	1.5	38881.	22503.	0.	49725.	5.03
150.0	1.5	41420.	23335.	0.	46800.	4.32
155.0	1.5	43399.	24235.	0.	43875.	3.86
160.0	1.5	44455.	24872.	0.	40950.	3.59
165.0	1.5	44483.	25106.	0.	38025.	3.48
170.0	1.5	43546.	25172.	0.	35100.	3.49
175.0	1.5	41617.	25019.	0.	32175.	3.67
180.0	1.5	39040.	24621.	0.	29250.	4.00
185.0	1.5	35805.	23746.	0.	26325.	4.59
190.0	1.5	32504.	22682.	0.	23400.	5.52

CRIT. ACTIVE LOC 165.0 EL 1.5 DA 44483. RA 25106.

DIST.	EL.	DP	RP	DB	RB	FS
205.0	1.5	24692.	23153.	0.	23400.	3.62
210.0	1.5	24104.	22635.	0.	26325.	3.83
215.0	1.5	23395.	21979.	0.	29250.	3.62

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220.0	1.5	22522	21291.	0.	32175.	3.58
225.0	1.5	21488	20756.	0.	35100.	3.52
230.0	1.5	20442	20477.	0.	38025.	3.48
235.0	1.5	19596	20307.	0.	40950.	3.47
240.0	1.5	19009	20139.	0.	43875.	3.50
245.0	1.5	18658	19972.	0.	46800.	3.56
250.0	1.5	18357	19807.	0.	49725.	3.62

* STRATUM 7 ACT. WEDGE LOC. 120.0 EL. -3.5 PASS. WEDGE LOC. 230.0 EL. -3.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
0	-3.5	3153.	813.	585.	1351.	585.
100.0	-3.5	3153.	813.	585.	1351.	585.
120.0	-3.5	3213.	813.	585.	1386.	585.
131.0	-3.5	3513.	813.	585.	1559.	585.
139.0	-3.5	3753.	813.	585.	1698.	585.
150.0	-3.5	3813.	813.	585.	1732.	585.
150.0	-3.5	3813.	813.	585.	1732.	585.
162.0	-3.5	3753.	813.	585.	1698.	585.
174.0	-3.5	3393.	813.	585.	1490.	585.
189.0	-3.5	3093.	813.	585.	1317.	585.
227.0	-3.5	2913.	813.	585.	1213.	585.
243.0	-3.5	2695.	813.	585.	1087.	585.
275.0	-3.5	2586.	813.	585.	1024.	585.
286.0	-3.5	2804.	813.	585.	1150.	585.
331.0	-3.5	2913.	813.	585.	1213.	585.
371.0	-3.5	3393.	813.	585.	1490.	585.
436.0	-3.5	3153.	813.	585.	1351.	585.
500.0	-3.5	3273.	813.	585.	1420.	585.
520.0	-3.5	2913.	813.	585.	1213.	585.
537.0	-3.5	2586.	813.	585.	1024.	585.
552.0	-3.5	2368.	813.	585.	898.	585.
569.0	-3.5	2128.	813.	585.	760.	585.
600.0	-3.5	2128.	813.	585.	759.	585.
SHEAR STRENGTHS ARE		EQUAL	585.0 AT DIST.	607.7		
616.0	-3.5	1501.	813.	585.	397.	397.
628.0	-3.5	941.	500.	585.	255.	255.
646.0	-3.5	627.	325.	585.	175.	175.
647.0	-3.5	617.	325.	585.	169.	169.
660.0	-3.5	528.	325.	585.	117.	117.
672.0	-3.5	324.	325.	585.	0.	0.
FAILURE SURFACE IN STRATA		7 EL.	-3.5 DIST.	672.0	STRENGTH	585.0
722.0	-3.5	324.	325.	585.	999999.	585.
915.0	-3.5	324.	325.	585.	999999.	585.
1000.0	-3.5	324.	325.	585.	999999.	585.

ASSUMED CRIT. PASSIVE LOC. 230.0 EL. -3.5 DP 32273. RP 26157.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-3.5	43631.	26927.	0.	64350.	10.34
125.0	-3.5	44299.	26970.	0.	61425.	9.53
130.0	-3.5	45624.	27040.	0.	58500.	8.37
135.0	-3.5	47579.	27112.	0.	55575.	7.11
140.0	-3.5	50214.	27213.	0.	52650.	5.91
145.0	-3.5	53299.	27637.	0.	49725.	4.92
150.0	-3.5	56365.	28353.	0.	46800.	4.21
155.0	-3.5	58909.	29185.	0.	43875.	3.72
160.0	-3.5	60763.	30085.	0.	40950.	3.41
165.0	-3.5	61580.	30721.	0.	38025.	3.24
170.0	-3.5	60909.	30956.	0.	35100.	3.22
175.0	-3.5	59227.	31022.	0.	32175.	3.32
180.0	-3.5	56718.	30869.	0.	29250.	3.53
185.0	-3.5	53642.	30471.	0.	26325.	3.88
190.0	-3.5	49915.	29596.	0.	23400.	4.49
195.0	-3.5	46373.	28532.	0.	20475.	5.33

CRIT: ACTIVE LOC 170.0 EL -3.5 DA s11a.out
60909. RA 30956.

DIS.	EL.	DP	RP	DB	RB	FS
205.0	-3.5	37617.	28485.	0.	20475.	3.43
210.0	-3.5	36790.	27829.	0.	23400.	3.41
215.0	-3.5	35799.	27141.	0.	26325.	3.38
220.0	-3.5	34646.	26606.	0.	29250.	3.31
225.0	-3.5	33442.	26327.	0.	32175.	3.26
230.0	-3.5	32273.	26157.	0.	35100.	3.22
235.0	-3.5	31345.	25989.	0.	38025.	3.21
240.0	-3.5	30675.	25822.	0.	40950.	3.23
245.0	-3.5	30242.	25657.	0.	43875.	3.28
250.0	-3.5	29858.	25494.	0.	46800.	3.33

* π STRATUM 8 ACT. WEDGE LOC. 120.0 EL. -25.0 PASS. WEDGE LOC. 660.0 EL. -25.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-25.0	5733.	2156.	2065.	850.	850.
100.0	-25.0	5733.	2156.	2065.	850.	850.
120.0	-25.0	5793.	2156.	2100.	850.	850.
131.0	-25.0	6093.	2156.	2273.	850.	850.
139.0	-25.0	6333.	2156.	2411.	850.	850.
150.0	-25.0	6393.	2156.	2446.	850.	850.
150.0	-25.0	6393.	2156.	2446.	850.	850.
162.0	-25.0	6333.	2156.	2411.	850.	850.
174.0	-25.0	5973.	2156.	2203.	850.	850.
189.0	-25.0	5673.	2156.	2030.	850.	850.
227.0	-25.0	5493.	2156.	1926.	850.	850.
243.0	-25.0	5275.	2156.	1801.	850.	850.
275.0	-25.0	5166.	2156.	1738.	850.	850.
286.0	-25.0	5384.	2156.	1864.	850.	850.
331.0	-25.0	5493.	2156.	1927.	850.	850.
371.0	-25.0	5973.	2156.	2204.	850.	850.
436.0	-25.0	5733.	2156.	2065.	850.	850.
500.0	-25.0	5853.	2156.	2134.	850.	850.
520.0	-25.0	5493.	2156.	1926.	850.	850.
537.0	-25.0	5166.	2156.	1738.	850.	850.
552.0	-25.0	4948.	2156.	1612.	850.	850.
569.0	-25.0	4708.	2156.	1473.	850.	850.
600.0	-25.0	4708.	2156.	1473.	850.	850.
616.0	-25.0	4081.	2156.	1111.	850.	850.
628.0	-25.0	3521.	1844.	968.	850.	850.
646.0	-25.0	3207.	1669.	888.	850.	850.
647.0	-25.0	3197.	1669.	883.	850.	850.
SHEAR STRENGTHS ARE EQUAL			850.0 AT DIST.	655.2		
660.0	-25.0	3108.	1669.	831.	850.	831.
672.0	-25.0	2904.	1669.	713.	850.	713.
722.0	-25.0	2732.	1669.	614.	850.	614.
915.0	-25.0	2588.	1669.	531.	850.	531.
1000.0	-25.0	2588.	1669.	530.	850.	530.

ASSUMED CRIT. PASSIVE LOC. 660.0 EL. -25.0 DP 35684. RP 26817.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-25.0	139529.	69924.	0.	458955.	5.35
125.0	-25.0	140529.	70490.	0.	454705.	5.27
130.0	-25.0	142657.	71756.	0.	450455.	5.13
135.0	-25.0	145899.	73674.	0.	446205.	4.98
140.0	-25.0	149983.	75779.	0.	441955.	4.76
145.0	-25.0	154076.	77484.	0.	437705.	4.58
150.0	-25.0	157796.	78500.	0.	433455.	4.41
155.0	-25.0	161117.	79003.	0.	429205.	4.27
160.0	-25.0	164185.	79552.	0.	424955.	4.13
165.0	-25.0	166330.	79869.	0.	420705.	4.04
170.0	-25.0	166812.	79620.	0.	416455.	3.99

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175.0	-25.0	165409.	78549.	0.	412205.	3.99
180.0	-25.0	162495.	77003.	0.	407955.	4.04
185.0	-25.0	158792.	75490.	0.	403705.	4.11
190.0	-25.0	154494.	74010.	0.	399455.	4.21
195.0	-25.0	149996.	72632.	0.	395205.	4.33

CRIT. ACTIVE LOC 170.0 EL -25.0 DA 166812. RA 79620.

DIST.	EL.	DP	RP	DB	RB	FS
640.0	-25.0	39502.	33215.	0.	399500.	4.02
645.0	-25.0	38381.	32009.	0.	403750.	4.01
650.0	-25.0	37425.	30298.	0.	408000.	4.00
655.0	-25.0	36528.	28504.	0.	412250.	3.99
660.0	-25.0	35684.	26817.	0.	416455.	3.99
665.0	-25.0	34967.	25384.	0.	420488.	3.99
670.0	-25.0	34451.	24352.	0.	424276.	3.99
675.0	-25.0	34099.	23648.	0.	427854.	4.00
680.0	-25.0	33768.	22986.	0.	431366.	4.01
685.0	-25.0	33441.	22333.	0.	434829.	4.02

* * STRATUM 9 ACT. WEDGE LOC. 120.0 EL. -44.5 PASS.WEDGE LOC. 660.0 EL. -44.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-44.5	7820.	3375.	850.	550.	550.
100.0	-44.5	7820.	3375.	850.	550.	550.
120.0	-44.5	7880.	3375.	850.	550.	550.
131.0	-44.5	8180.	3375.	850.	550.	550.
139.0	-44.5	8420.	3375.	850.	550.	550.
150.0	-44.5	8479.	3375.	850.	550.	550.
150.0	-44.5	8479.	3375.	850.	550.	550.
162.0	-44.5	8419.	3375.	850.	550.	550.
174.0	-44.5	8059.	3375.	850.	550.	550.
189.0	-44.5	7759.	3375.	850.	550.	550.
227.0	-44.5	7579.	3375.	850.	550.	550.
243.0	-44.5	7361.	3375.	850.	550.	550.
275.0	-44.5	7253.	3375.	850.	550.	550.
286.0	-44.5	7471.	3375.	850.	550.	550.
331.0	-44.5	7580.	3375.	850.	550.	550.
371.0	-44.5	8059.	3375.	850.	550.	550.
436.0	-44.5	7820.	3375.	850.	550.	550.
500.0	-44.5	7939.	3375.	850.	550.	550.
520.0	-44.5	7579.	3375.	850.	550.	550.
537.0	-44.5	7252.	3375.	850.	550.	550.
552.0	-44.5	7034.	3375.	850.	550.	550.
569.0	-44.5	6795.	3375.	850.	550.	550.
600.0	-44.5	6794.	3375.	850.	550.	550.
616.0	-44.5	6167.	3375.	850.	550.	550.
628.0	-44.5	5607.	3062.	850.	550.	550.
646.0	-44.5	5294.	2887.	850.	550.	550.
647.0	-44.5	5284.	2888.	850.	550.	550.
660.0	-44.5	5195.	2888.	850.	550.	550.
672.0	-44.5	4991.	2888.	850.	550.	550.
722.0	-44.5	4818.	2888.	850.	550.	550.
915.0	-44.5	4674.	2888.	850.	550.	550.
1000.0	-44.5	4674.	2888.	850.	550.	550.

ASSUMED CRIT. PASSIVE LOC. 660.0 EL. -44.5 DP 111905. RP 56202.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-44.5	271286.	102479.	0.	297000.	2.86
125.0	-44.5	271960.	102531.	0.	294250.	2.83
130.0	-44.5	273372.	102670.	0.	291500.	2.79
135.0	-44.5	275533.	102879.	0.	288750.	2.74
140.0	-44.5	278435.	103099.	0.	286000.	2.67

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145.0	-44.5	281933.	103735.	0.	283250.	2.61
150.0	-44.5	286013.	105072.	0.	280500.	2.54
155.0	-44.5	290491.	107031.	0.	277750.	2.47
160.0	-44.5	294913.	109128.	0.	275000.	2.41
165.0	-44.5	298737.	110767.	0.	272250.	2.35
170.0	-44.5	301346.	111712.	0.	269500.	2.31
175.0	-44.5	302843.	112204.	0.	266750.	2.28
180.0	-44.5	303609.	112751.	0.	264000.	2.26
185.0	-44.5	303139.	113021.	0.	261250.	2.25
190.0	-44.5	301206.	112709.	0.	258500.	2.26
195.0	-44.5	297874.	111555.	0.	255750.	2.28
200.0	-44.5	293547.	109996.	0.	253000.	2.31
205.0	-44.5	288871.	108496.	0.	250250.	2.34
210.0	-44.5	283959.	107009.	0.	247500.	2.39

CRIT. ACTIVE LOC 185.0 EL -44.5 DA 303139. RA 113021.

DIS.	EL.	DP	RP	DS	RB	FS
640.0	-44.5	118300.	60131.	0.	250250.	2.29
645.0	-44.5	116593.	58660.	0.	253000.	2.28
650.0	-44.5	115024.	57587.	0.	255750.	2.27
655.0	-44.5	113429.	56865.	0.	258500.	2.26
660.0	-44.5	111905.	56202.	0.	261250.	2.25
665.0	-44.5	110598.	55548.	0.	264000.	2.25
670.0	-44.5	109634.	54904.	0.	266750.	2.25
675.0	-44.5	108967.	54298.	0.	269500.	2.25
680.0	-44.5	108366.	53769.	0.	272250.	2.25
685.0	-44.5	107804.	53320.	0.	275000.	2.26

** STRATUM 10 ACT. WEDGE LOC. 140.0 EL. -64.0 PASS.WEDGE LOC. 660.0 EL. -64.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-64.0	9848.	4594.	550.	715.	550.
100.0	-64.0	9848.	4594.	550.	715.	550.
120.0	-64.0	9908.	4594.	550.	715.	550.
131.0	-64.0	10208.	4594.	550.	715.	550.
139.0	-64.0	10448.	4594.	550.	715.	550.
150.0	-64.0	10507.	4594.	550.	715.	550.
150.0	-64.0	10507.	4594.	550.	715.	550.
162.0	-64.0	10447.	4594.	550.	715.	550.
174.0	-64.0	10087.	4594.	550.	715.	550.
189.0	-64.0	9787.	4594.	550.	715.	550.
227.0	-64.0	9607.	4594.	550.	715.	550.
243.0	-64.0	9389.	4594.	550.	715.	550.
275.0	-64.0	9281.	4594.	550.	715.	550.
286.0	-64.0	9499.	4594.	550.	715.	550.
331.0	-64.0	9608.	4594.	550.	715.	550.
371.0	-64.0	10087.	4594.	550.	715.	550.
436.0	-64.0	9848.	4594.	550.	715.	550.
500.0	-64.0	9967.	4594.	550.	715.	550.
520.0	-64.0	9607.	4594.	550.	715.	550.
537.0	-64.0	9280.	4594.	550.	715.	550.
552.0	-64.0	9062.	4594.	550.	715.	550.
569.0	-64.0	8823.	4594.	550.	715.	550.
600.0	-64.0	8822.	4594.	550.	715.	550.
616.0	-64.0	8195.	4594.	550.	715.	550.
628.0	-64.0	7635.	4281.	550.	715.	550.
646.0	-64.0	7322.	4106.	550.	715.	550.
647.0	-64.0	7312.	4106.	550.	715.	550.
660.0	-64.0	7223.	4106.	550.	715.	550.
672.0	-64.0	7019.	4106.	550.	715.	550.
722.0	-64.0	6846.	4106.	550.	715.	550.
915.0	-64.0	6702.	4106.	550.	715.	550.
1000.0	-64.0	6702.	4106.	550.	715.	550.

ASSUMED CRIT. PASSIVE LOC. 660.0 EL. -64.0 DP 226644. RP 75268.

ACTIVE WEDGE DATA

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DIST.	ELEV.	DA	RA	DB	RB	FS
140.0	-64.0	450292.	123930.	0.	286000.	2.17
145.0	-64.0	453427.	123991.	0.	283250.	2.13
150.0	-64.0	456752.	124139.	0.	280500.	2.09
155.0	-64.0	460123.	124351.	0.	277750.	2.04
160.0	-64.0	463382.	124581.	0.	275000.	2.01
165.0	-64.0	466703.	125288.	0.	272250.	1.97
170.0	-64.0	469767.	126694.	0.	269500.	1.94
175.0	-64.0	472460.	128689.	0.	266750.	1.91
180.0	-64.0	474605.	130771.	0.	264000.	1.90
185.0	-64.0	475854.	132344.	0.	261250.	1.88
190.0	-64.0	476092.	133213.	0.	258500.	1.87
195.0	-64.0	475766.	133705.	0.	255750.	1.87
200.0	-64.0	475137.	134248.	0.	253000.	1.86
205.0	-64.0	473604.	134466.	0.	250250.	1.86
210.0	-64.0	470971.	134085.	0.	247500.	1.87
215.0	-64.0	467056.	132858.	0.	244750.	1.88
220.0	-64.0	462202.	131291.	0.	242000.	1.90
225.0	-64.0	457047.	129804.	0.	239250.	1.93

CRIT. ACTIVE LOC 200.0 EL -64.0 DA 475137. RA 134248.

DIS.	EL.	DP	RP	DB	RB	FS
640.0	-64.0	234702.	77718.	0.	242000.	1.89
645.0	-64.0	232392.	77063.	0.	244750.	1.88
650.0	-64.0	230361.	76418.	0.	247500.	1.87
655.0	-64.0	228440.	75805.	0.	250250.	1.87
660.0	-64.0	226644.	75268.	0.	253000.	1.86
665.0	-64.0	225098.	74811.	0.	255750.	1.86
670.0	-64.0	223931.	74432.	0.	258500.	1.86
675.0	-64.0	223079.	74132.	0.	261250.	1.86
680.0	-64.0	222295.	73911.	0.	264000.	1.87
685.0	-64.0	221553.	73762.	0.	266750.	1.87

EE L0125- BERNHARD- Existing Slope Stability

Floodside - Water at 1.7

40, 20, 0.5, 10, 1, 0
 11, 1, 2, 1
 150
 0, 62.4, 0, 0
 28, 120, 0, 0
 15, 109, 200, 200
 28, 120, 0, 0
 0, 114, 325, 325
 0, 112, 850, 850
 0, 121, 585, 585
 30, 120, 0, 0
 0, 107, 850, 850
 0, 104, 550, 550
 0, 105, 715, 715
 0, 24, 100, 24, 120, 24.5, 131, 27, 139, 29, 150, 29.5, 162, 29, 174, 26
 189, 23.5, 227, 22, 243, 20, 275, 19, 286, 21, 331, 22, 371, 26, 436, 24
 500, 25, 520, 22, 537, 19, 552, 17, 569, 15, 600, 15, 616, 9.5, 628, 4.5
 646, 1.7, 1000, 1.7, 9999.9, 0
 0, 24, 100, 24, 120, 24.5, 131, 27, 139, 29, 150, 29.5, 162, 29, 174, 26
 189, 23.5, 227, 22, 243, 20, 275, 19, 286, 21, 331, 22, 371, 26, 436, 24
 500, 25, 520, 22, 537, 19, 552, 17, 569, 15, 600, 15, 616, 9.5, 628, 4.5
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 0, 22, 227, 22, 243, 20, 275, 19, 286, 21, 331, 22, 520, 22, 537, 19
 552, 17, 569, 15, 600, 15, 616, 9.5, 628, 4.5, 646, 1.7, 647, 1.5, 660, 0
 672, -3.5, 722, -6.5, 915, -9, 1000, -9, 9999.9, 0
 0, 17, 552, 17, 569, 15, 600, 15, 616, 9.5, 628, 4.5, 646, 1.7, 647, 1.5
 660, 0, 672, -3.5, 722, -6.5, 915, -9, 1000, -9, 9999.9, 0
 0, 15, 569, 15, 600, 15, 616, 9.5, 628, 4.5, 646, 1.7, 647, 1.5, 672, -3.5
 722, -6.5, 915, -9, 1000, -9, 9999.9, 0
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 1000, -9, 9999.9, 0
 0, 1.5, 647, 1.5, 672, -3.5, 722, -6.5, 915, -9, 1000, -9, 9999.9, 0
 0, -3.5, 672, -3.5, 722, -6.5, 915, -9, 1000, -9, 9999.9, 0
 0, -25, 1000, -25, 9999.9, 0
 0, -44.5, 1000, -44.5, 9999.9, 0
 0, -64, 1000, -64, 9999.9, 0
 0, -70, 1000, -70, 9999.9, 0
 0, 9.5, 616, 9.5, 628, 4.5, 646, 1.7, 1000, 1.7, 9999.9, 0
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 3, 90165, 17, 180, 17, 10
 170, 175, 180, 185, 190, 195, 200, 205, 210, 215
 4, 90165, 15, 180, 15, 10
 170, 175, 180, 185, 190, 195, 200, 205, 210, 215
 5, 120, 9.5, 180, 9.5, 10
 170, 175, 180, 185, 190, 195, 200, 205, 210, 215
 6, 120, 1.5, 230, 1.5, 10
 205, 210, 215, 220, 225, 230, 235, 240, 245, 250
 7, 120, -3.5, 230, -3.5, 10
 205, 210, 215, 220, 225, 230, 235, 240, 245, 250
 8, 120, -25, 660, -25, 10
 640, 645, 650, 655, 660, 665, 670, 675, 680, 685
 9, 120, -44.5, 660, -44.5, 10
 640, 645, 650, 655, 660, 665, 670, 675, 680, 685
 10, 140, -64, 660, -64, 10
 640, 645, 650, 655, 660, 665, 670, 675, 680, 685

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**** STABILITY WITH UPLIFT ****

EE L0125- BERNHARD- Stability Control Line
 Floodside - Water at 1.7
 12 PROFILES
 1 VERTICALS
 UPLIFT WITH 1 PIEZOMETRIC GRADE LINES

* * STRATUM 2 ACT. WEDGE LOC. 90165.0 EL. 22.0 PASS.WEDGE LOC. 180.0 EL. 22.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	22.0	240.	0.	128.	264.	128.
100.0	22.0	240.	0.	128.	264.	128.
120.0	22.0	300.	0.	160.	280.	160.
131.0	22.0	600.	0.	319.	361.	319.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 136.3						
139.0	22.0	840.	0.	447.	425.	425.
150.0	22.0	900.	0.	479.	441.	441.
150.0	22.0	900.	0.	479.	441.	441.
162.0	22.0	840.	0.	446.	425.	425.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 164.7						
174.0	22.0	480.	0.	255.	329.	255.
189.0	22.0	180.	0.	96.	248.	96.
227.0	22.0	0.	0.	0.	200.	0.
243.0	22.0	-125.	0.	0.	999999.	0.
275.0	22.0	-187.	0.	0.	999999.	0.
286.0	22.0	-62.	0.	0.	999999.	0.
297.5	22.0	-46.	0.	0.	999999.	0.
305.3	22.0	-36.	0.	0.	999999.	0.
331.0	22.0	0.	0.	0.	200.	0.
STRATUM 2 STARTS FAILURE POSSIBLE FROM DIST. 331.0						
371.0	22.0	480.	0.	255.	329.	255.
391.0	22.0	0.	0.	0.	200.	0.
416.0	22.0	-312.	0.	0.	999999.	0.
426.0	22.0	-437.	0.	0.	999999.	0.
453.5	22.0	-780.	0.	0.	999999.	0.
492.5	22.0	-1267.	0.	0.	999999.	0.
STRATUM 2 STARTS FAILURE POSSIBLE FROM DIST. 492.5						
493.5	22.0	-1267.	0.	0.	999999.	0.
518.5	22.0	-1267.	0.	0.	999999.	0.
626.0	22.0	-1267.	0.	0.	999999.	0.
723.5	22.0	-1267.	0.	0.	999999.	0.
733.5	22.0	-1267.	0.	0.	999999.	0.
1000.0	22.0	-1267.	0.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 22.0 DP 422. RP 748.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	22.0	2720.	1738.	0.	4282.	2.95

CRIT. ACTIVE LOC 165.0 EL 22.0 DA 2720. RA 1738.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	22.0	1070.	1894.	0.	1794.	3.29
175.0	22.0	690.	1221.	0.	3192.	3.03
180.0	22.0	422.	748.	0.	4282.	2.95
185.0	22.0	220.	390.	0.	5105.	2.89
190.0	22.0	120.	212.	0.	5668.	2.93
195.0	22.0	90.	159.	0.	6102.	3.04
200.0	22.0	64.	113.	0.	6473.	3.13
205.0	22.0	42.	75.	0.	6782.	3.21

210.0 22.0 25. 45. 0. s113.out 3.27
 215.0 22.0 13. 22. 0. 7027. 3.31
 0. 7210.

* * STRATUM 3 ACT. WEDGE LOC. 90165.0 EL. 17.0 PASS. WEDGE LOC. 180.0 EL. 17.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	17.0	785.	0.	410.	417.	410.
100.0	17.0	785.	0.	410.	417.	410.
120.0	17.0	845.	0.	426.	449.	426.
131.0	17.0	1145.	0.	507.	609.	507.
139.0	17.0	1385.	0.	571.	736.	571.
150.0	17.0	1445.	0.	587.	768.	587.
150.0	17.0	1445.	0.	587.	768.	587.
162.0	17.0	1385.	0.	571.	736.	571.
174.0	17.0	1025.	0.	475.	545.	475.
SHEAR STRENGTHS ARE EQUAL			403.2 AT DIST.	187.3		
189.0	17.0	725.	0.	394.	385.	385.
227.0	17.0	545.	0.	346.	290.	290.
243.0	17.0	327.	0.	288.	174.	174.
275.0	17.0	218.	0.	258.	116.	116.
286.0	17.0	436.	0.	317.	232.	232.
297.5	17.0	464.	0.	324.	247.	247.
305.3	17.0	483.	0.	329.	257.	257.
331.0	17.0	545.	0.	346.	290.	290.
SHEAR STRENGTHS ARE EQUAL			403.2 AT DIST.	348.8		
371.0	17.0	1025.	0.	475.	545.	475.
391.0	17.0	545.	0.	346.	290.	290.
416.0	17.0	0.	0.	200.	0.	0.
426.0	17.0	-125.	0.	200.	999999.	200.
453.5	17.0	-468.	0.	200.	999999.	200.
492.5	17.0	-955.	0.	200.	999999.	200.
STRATUM 3 STARTS FAILURE POSSIBLE FROM DIST.			492.5			
493.5	17.0	-955.	0.	200.	999999.	200.
518.5	17.0	-955.	0.	200.	999999.	200.
626.0	17.0	-955.	0.	200.	999999.	200.
723.5	17.0	-955.	0.	200.	999999.	200.
733.5	17.0	-955.	0.	200.	999999.	200.
1000.0	17.0	-955.	0.	200.	999999.	200.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 17.0 DP 3008, RP 4892.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	17.0	8431.	5695.	0.	7348.	3.31

CRIT. ACTIVE LOC 165.0 EL 17.0 DA 8431, RA 5695.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	17.0	4499.	6393.	0.	2634.	3.74
175.0	17.0	3690.	5563.	0.	5069.	3.44
180.0	17.0	3008.	4892.	0.	7348.	3.31
185.0	17.0	2484.	4459.	0.	9493.	3.30
190.0	17.0	2243.	4260.	0.	11490.	3.47
195.0	17.0	2100.	4134.	0.	13373.	3.66
200.0	17.0	1961.	4015.	0.	15194.	3.85
205.0	17.0	1827.	3904.	0.	16951.	4.02
210.0	17.0	1697.	3802.	0.	18645.	4.18
215.0	17.0	1572.	3706.	0.	20276.	4.33

* * STRATUM 4 ACT. WEDGE LOC. 90165.0 EL. 15.0 PASS. WEDGE LOC. 180.0 EL. 15.0

ASSUMED FAILURE SURFACE DATA

5113.000

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	15.0	1025.	0.	545.	325.	325.
100.0	15.0	1025.	0.	545.	325.	325.
120.0	15.0	1085.	0.	577.	325.	325.
131.0	15.0	1385.	0.	737.	325.	325.
139.0	15.0	1625.	0.	864.	325.	325.
150.0	15.0	1685.	0.	896.	325.	325.
150.0	15.0	1685.	0.	896.	325.	325.
162.0	15.0	1625.	0.	864.	325.	325.
174.0	15.0	1265.	0.	673.	325.	325.
189.0	15.0	965.	0.	513.	325.	325.
227.0	15.0	785.	0.	417.	325.	325.
SHEAR STRENGTHS ARE EQUAL 325.0 AT DIST. 239.8						
243.0	15.0	567.	0.	301.	325.	301.
275.0	15.0	458.	0.	244.	325.	244.
SHEAR STRENGTHS ARE EQUAL 325.0 AT DIST. 282.7						
286.0	15.0	676.	0.	359.	325.	325.
297.5	15.0	704.	0.	374.	325.	325.
305.3	15.0	723.	0.	384.	325.	325.
331.0	15.0	785.	0.	417.	325.	325.
371.0	15.0	1265.	0.	672.	325.	325.
391.0	15.0	785.	0.	417.	325.	325.
SHEAR STRENGTHS ARE EQUAL 325.0 AT DIST. 399.0						
416.0	15.0	240.	0.	127.	325.	127.
426.0	15.0	0.	0.	0.	325.	0.
453.5	15.0	-343.	0.	0.	999999.	0.
492.5	15.0	-830.	0.	0.	999999.	0.
STRATUM 4 STARTS FAILURE POSSIBLE FROM DIST. 492.5						
493.5	15.0	-830.	0.	0.	999999.	0.
518.5	15.0	-830.	0.	0.	999999.	0.
626.0	15.0	-830.	0.	0.	999999.	0.
723.5	15.0	-830.	0.	0.	999999.	0.
733.5	15.0	-830.	0.	0.	999999.	0.
1000.0	15.0	-830.	0.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 15.0 DP 4612. RP 8082.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	15.0	11464.	7605.	0.	4875.	3.00

CRIT. ACTIVE LOC 165.0 EL 15.0 DA 11464. RA 7605.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	15.0	6364.	10115.	0.	1625.	3.79
175.0	15.0	5412.	8967.	0.	3250.	3.27
180.0	15.0	4612.	8082.	0.	4875.	3.00
185.0	15.0	4077.	7462.	0.	6500.	2.92
190.0	15.0	3812.	7121.	0.	8125.	2.99
195.0	15.0	3624.	6916.	0.	9750.	3.10
200.0	15.0	3441.	6719.	0.	11375.	3.20
205.0	15.0	3262.	6530.	0.	13000.	3.31
210.0	15.0	3088.	6348.	0.	14625.	3.41
215.0	15.0	2918.	6174.	0.	16250.	3.51

* * STRATUM 5 ACT. WEDGE LOC. 120.0 EL. 9.5 PASS. WEDGE LOC. 180.0 EL. 9.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	9.5	1652.	0.	325.	850.	325.
100.0	9.5	1652.	0.	325.	850.	325.
120.0	9.5	1712.	0.	325.	850.	325.
131.0	9.5	2012.	0.	325.	850.	325.
139.0	9.5	2252.	0.	325.	850.	325.

					s113.out	
150.0	9.5	2312.	0.	325.	850.	325.
150.0	9.5	2312.	0.	325.	850.	325.
162.0	9.5	2252.	0.	325.	850.	325.
174.0	9.5	1892.	0.	325.	850.	325.
189.0	9.5	1592.	0.	325.	850.	325.
227.0	9.5	1412.	0.	325.	850.	325.
243.0	9.5	1194.	0.	325.	850.	325.
275.0	9.5	1085.	0.	325.	850.	325.
286.0	9.5	1303.	0.	325.	850.	325.
297.5	9.5	1331.	0.	325.	850.	325.
305.3	9.5	1350.	0.	325.	850.	325.
331.0	9.5	1412.	0.	325.	850.	325.
371.0	9.5	1892.	0.	325.	850.	325.
391.0	9.5	1412.	0.	325.	850.	325.
416.0	9.5	867.	0.	325.	850.	325.
426.0	9.5	627.	0.	325.	850.	325.
453.5	9.5	0.	0.	325.	850.	325.
492.5	9.5	-487.	0.	325.	999999.	325.
STRATUM 5	STARTS	FAILURE	POSSIBLE	FROM	DIST.	492.5
493.5	9.5	-487.	0.	325.	999999.	325.
518.5	9.5	-487.	0.	325.	999999.	325.
626.0	9.5	-487.	0.	325.	999999.	325.
723.5	9.5	-487.	0.	325.	999999.	325.
733.5	9.5	-487.	0.	325.	999999.	325.
1000.0	9.5	-487.	0.	325.	999999.	325.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 9.5 DP 11759. RP 10986.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	9.5	12571.	7633.	0.	19500.	46.94
125.0	9.5	13097.	7705.	0.	17875.	27.34
130.0	9.5	14346.	7970.	0.	16250.	13.61
135.0	9.5	16355.	8606.	0.	14625.	7.45
140.0	9.5	18633.	9387.	0.	13000.	4.85
145.0	9.5	20724.	10299.	0.	11375.	3.64
150.0	9.5	22237.	11066.	0.	9750.	3.04
155.0	9.5	22878.	11432.	0.	8125.	2.75
160.0	9.5	22971.	11565.	0.	6500.	2.59
165.0	9.5	22575.	11500.	0.	4875.	2.53
170.0	9.5	21344.	11226.	0.	3250.	2.66
175.0	9.5	19273.	10574.	0.	1625.	3.09
180.0	9.5	16635.	9474.	0.	0.	4.20
185.0	9.5	14457.	8578.	0.	-1625.	6.65
190.0	9.5	12785.	7969.	0.	-3250.	15.31

CRIT. ACTIVE LOC 165.0 EL 9.5 DA 22575. RA 11500.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	9.5	14223.	12442.	0.	1625.	3.06
175.0	9.5	12813.	11585.	0.	3250.	2.70
180.0	9.5	11759.	10986.	0.	4875.	2.53
185.0	9.5	10979.	10675.	0.	6500.	2.47
190.0	9.5	10539.	10471.	0.	8125.	2.50
195.0	9.5	10226.	10275.	0.	9750.	2.55
200.0	9.5	9918.	10086.	0.	11375.	2.60
205.0	9.5	9614.	9905.	0.	13000.	2.65
210.0	9.5	9314.	9732.	0.	14625.	2.70
215.0	9.5	8988.	9357.	0.	16250.	2.73

** STRATUM 6 ACT. WEDGE LOC: 120.0 EL. 1.5 PASS. WEDGE LOC: 230.0 EL. 1.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	1.5	2548.	500.	850.	585.	585.
100.0	1.5	2548.	500.	850.	585.	585.

							g113.out
120.0	1.5	2608.	500.	850.	585.	585.	
131.0	1.5	2908.	500.	850.	585.	585.	
139.0	1.5	3148.	500.	850.	585.	585.	
150.0	1.5	3208.	500.	850.	585.	585.	
150.0	1.5	3208.	500.	850.	585.	585.	
162.0	1.5	3148.	500.	850.	585.	585.	
174.0	1.5	2788.	500.	850.	585.	585.	
189.0	1.5	2488.	500.	850.	585.	585.	
227.0	1.5	2308.	500.	850.	585.	585.	
243.0	1.5	2090.	500.	850.	585.	585.	
275.0	1.5	1981.	500.	850.	585.	585.	
286.0	1.5	2199.	500.	850.	585.	585.	
297.5	1.5	2227.	500.	850.	585.	585.	
305.3	1.5	2246.	12.	850.	585.	585.	
331.0	1.5	2308.	13.	850.	585.	585.	
371.0	1.5	2788.	13.	850.	585.	585.	
391.0	1.5	2308.	13.	850.	585.	585.	
416.0	1.5	1763.	13.	850.	585.	585.	
426.0	1.5	1523.	13.	850.	585.	585.	
453.5	1.5	896.	13.	850.	585.	585.	
492.5	1.5	22.	13.	850.	585.	585.	
493.5	1.5	12.	13.	850.	585.	585.	
FAILURE SURFACE IN STRATA 6 EL. 1.5 DIST. 493.5 STRENGTH 850.0							
518.5	1.5	12.	13.	850.	999999.	850.	
626.0	1.5	12.	13.	850.	999999.	850.	
723.5	1.5	12.	13.	850.	999999.	850.	
733.5	1.5	12.	13.	850.	999999.	850.	
1000.0	1.5	12.	13.	850.	999999.	850.	

ASSUMED CRIT. PASSIVE LOC. 230.0 EL. 1.5 DP 20442. RP 20477.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	1.5	29405.	21120.	0.	64350.	11.82
125.0	1.5	30047.	21190.	0.	61425.	10.73
130.0	1.5	31299.	21262.	0.	58500.	9.23
135.0	1.5	33198.	21363.	0.	55575.	7.64
140.0	1.5	35952.	21787.	0.	52650.	6.12
145.0	1.5	38881.	22503.	0.	49725.	5.03
150.0	1.5	41420.	23335.	0.	46800.	4.32
155.0	1.5	43399.	24235.	0.	43875.	3.86
160.0	1.5	44455.	24872.	0.	40950.	3.59
165.0	1.5	44483.	25106.	0.	38025.	3.48
170.0	1.5	43546.	25172.	0.	35100.	3.49
175.0	1.5	41617.	25019.	0.	32175.	3.67
180.0	1.5	39040.	24621.	0.	29250.	4.00
185.0	1.5	35805.	23746.	0.	26325.	4.59
190.0	1.5	32504.	22682.	0.	23400.	5.52

CRIT. ACTIVE LOC 165.0 EL 1.5 DA 44483. RA 25106.

DIS.	EL.	DP	RP	DB	RB	FS
205.0	1.5	24692.	23153.	0.	23400.	3.62
210.0	1.5	24104.	22635.	0.	26325.	3.63
215.0	1.5	23395.	21979.	0.	29250.	3.62
220.0	1.5	22522.	21291.	0.	32175.	3.58
225.0	1.5	21488.	20756.	0.	35100.	3.52
230.0	1.5	20442.	20477.	0.	38025.	3.48
235.0	1.5	19596.	20307.	0.	40950.	3.47
240.0	1.5	19009.	20139.	0.	43875.	3.50
245.0	1.5	18658.	19972.	0.	46800.	3.56
250.0	1.5	18357.	19807.	0.	49725.	3.62

* * STRATUM 7 ACT. WEDGE LOC. 120.0 EL. -3.5 PASS.WEDGE LOC. 230.0 EL. -3.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
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s113,000

.0	-3.5	3153.	813.	585.	1351.	585.
100.0	-3.5	3153.	813.	585.	1351.	585.
120.0	-3.5	3213.	813.	585.	1386.	585.
131.0	-3.5	3513.	813.	585.	1559.	585.
139.0	-3.5	3753.	813.	585.	1698.	585.
150.0	-3.5	3813.	813.	585.	1732.	585.
150.0	-3.5	3813.	813.	585.	1732.	585.
162.0	-3.5	3753.	813.	585.	1698.	585.
174.0	-3.5	3393.	813.	585.	1490.	585.
189.0	-3.5	3093.	813.	585.	1317.	585.
227.0	-3.5	2913.	813.	585.	1213.	585.
243.0	-3.5	2695.	813.	585.	1087.	585.
275.0	-3.5	2586.	813.	585.	1024.	585.
286.0	-3.5	2804.	813.	585.	1150.	585.
297.5	-3.5	2832.	813.	585.	1166.	585.
305.3	-3.5	2851.	325.	585.	1458.	585.
331.0	-3.5	2913.	325.	585.	1494.	585.
371.0	-3.5	3393.	325.	585.	1771.	585.
391.0	-3.5	2913.	325.	585.	1494.	585.
416.0	-3.5	2368.	325.	585.	1179.	585.
426.0	-3.5	2128.	325.	585.	1041.	585.
453.5	-3.5	1501.	325.	585.	679.	585.
SHEAR STRENGTHS ARE EQUAL 585.0 AT DIST. 460.8						
492.5	-3.5	627.	325.	585.	175.	175.
493.5	-3.5	617.	325.	585.	169.	169.
518.5	-3.5	324.	325.	585.	0.	0.
FAILURE SURFACE IN STRATA 7 EL. -3.5 DIST. 518.6 STRENGTH 585.0						
626.0	-3.5	324.	325.	585.	999999.	585.
723.5	-3.5	324.	325.	585.	999999.	585.
733.5	-3.5	324.	325.	585.	999999.	585.
1000.0	-3.5	324.	325.	585.	999999.	585.

ASSUMED CRIT. PASSIVE LOC. 230.0 EL. -3.5 DP 32273. RP 26157.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-3.5	43631.	26927.	0.	64350.	10.34
125.0	-3.5	44299.	26970.	0.	61425.	9.53
130.0	-3.5	45624.	27040.	0.	58500.	8.37
135.0	-3.5	47579.	27112.	0.	55575.	7.11
140.0	-3.5	50214.	27213.	0.	52650.	5.91
145.0	-3.5	53299.	27637.	0.	49725.	4.92
150.0	-3.5	56365.	28353.	0.	46800.	4.21
155.0	-3.5	58909.	29185.	0.	43875.	3.72
160.0	-3.5	60763.	30085.	0.	40950.	3.41
165.0	-3.5	61580.	30721.	0.	38025.	3.24
170.0	-3.5	60909.	30956.	0.	35100.	3.22
175.0	-3.5	59227.	31022.	0.	32175.	3.32
180.0	-3.5	56718.	30869.	0.	29250.	3.53
185.0	-3.5	53642.	30471.	0.	26325.	3.88
190.0	-3.5	49915.	29596.	0.	23400.	4.49
195.0	-3.5	46373.	28532.	0.	20475.	5.33

CRIT. ACTIVE LOC 170.0 EL -3.5 DA 60909. RA 30956.

DIST.	EL.	DP	RP	DB	RB	FS
205.0	-3.5	37617.	28485.	0.	20475.	3.43
210.0	-3.5	36790.	27829.	0.	23400.	3.41
215.0	-3.5	35799.	27141.	0.	26325.	3.36
220.0	-3.5	34646.	26606.	0.	29250.	3.31
225.0	-3.5	33442.	26327.	0.	32175.	3.26
230.0	-3.5	32273.	26157.	0.	35100.	3.22
235.0	-3.5	31345.	25989.	0.	38025.	3.21
240.0	-3.5	30675.	25822.	0.	40950.	3.23
245.0	-3.5	30242.	25657.	0.	43875.	3.28
250.0	-3.5	29858.	25494.	0.	46800.	3.33

* * STRATUM 8 ACT. WEDGE LOC. 120.0 EL. -25.0 PASS. WEDGE LOC. 620.0 EL. -25.0

s113.out

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-25.0	5733.	2156.	2065.	850.	850.
100.0	-25.0	5733.	2156.	2065.	850.	850.
120.0	-25.0	5793.	2156.	2100.	850.	850.
131.0	-25.0	6093.	2156.	2273.	850.	850.
139.0	-25.0	6333.	2156.	2411.	850.	850.
150.0	-25.0	6393.	2156.	2446.	850.	850.
150.0	-25.0	6393.	2156.	2446.	850.	850.
162.0	-25.0	6333.	2156.	2411.	850.	850.
174.0	-25.0	5973.	2156.	2203.	850.	850.
189.0	-25.0	5673.	2156.	2030.	850.	850.
227.0	-25.0	5493.	2156.	1926.	850.	850.
243.0	-25.0	5275.	2156.	1801.	850.	850.
275.0	-25.0	5166.	2156.	1738.	850.	850.
286.0	-25.0	5384.	2156.	1864.	850.	850.
297.5	-25.0	5412.	2156.	1880.	850.	850.
305.3	-25.0	5431.	1669.	2172.	850.	850.
331.0	-25.0	5493.	1669.	2208.	850.	850.
371.0	-25.0	5973.	1669.	2485.	850.	850.
391.0	-25.0	5493.	1669.	2208.	850.	850.
416.0	-25.0	4948.	1669.	1893.	850.	850.
426.0	-25.0	4708.	1669.	1755.	850.	850.
453.5	-25.0	4081.	1669.	1393.	850.	850.
492.5	-25.0	3207.	1669.	888.	850.	850.
493.5	-25.0	3197.	1669.	883.	850.	850.
SHEAR STRENGTHS ARE EQUAL 850.0 AT DIST. 498.3						
518.5	-25.0	2904.	1669.	713.	850.	713.
626.0	-25.0	1666.	1669.	0.	850.	0.
723.5	-25.0	1666.	1669.	0.	999999.	0.
733.5	-25.0	1666.	1669.	0.	999999.	0.
1000.0	-25.0	1666.	1669.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 620.0 EL. -25.0 DP 22272. RP 57.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-25.0	139529.	69924.	0.	375571.	3.80
125.0	-25.0	140529.	70490.	0.	371321.	3.79
130.0	-25.0	142657.	71756.	0.	367071.	3.63
135.0	-25.0	145899.	73674.	0.	362821.	3.53
140.0	-25.0	149983.	75779.	0.	358571.	3.40
145.0	-25.0	154076.	77484.	0.	354321.	3.28
150.0	-25.0	157796.	78500.	0.	350071.	3.16
155.0	-25.0	161117.	79003.	0.	345821.	3.06
160.0	-25.0	164185.	79552.	0.	341571.	2.97
165.0	-25.0	166330.	79869.	0.	337321.	2.90
170.0	-25.0	166812.	79620.	0.	333071.	2.86
175.0	-25.0	165409.	78549.	0.	328821.	2.85
180.0	-25.0	162495.	77003.	0.	324571.	2.86
185.0	-25.0	158792.	75490.	0.	320321.	2.90
190.0	-25.0	154494.	74010.	0.	316071.	2.95
195.0	-25.0	149996.	72632.	0.	311821.	3.01
200.0	-25.0	145574.	71335.	0.	307571.	3.07

CRIT. ACTIVE LOC 175.0 EL -25.0 DA 165409. RA 78549.

DIST.	EL.	DP	RP	DB	RB	FS
600.0	-25.0	22820.	1137.	0.	326698.	2.85
605.0	-25.0	22618.	738.	0.	327478.	2.85
610.0	-25.0	22460.	425.	0.	328091.	2.85
615.0	-25.0	22345.	198.	0.	328539.	2.85
620.0	-25.0	22272.	57.	0.	328821.	2.85
625.0	-25.0	22242.	1.	0.	328937.	2.85
626.0	-25.0	22242.	0.	0.	328941.	2.85

* W STRATUM 9 ACT. WEDGE LOC. 120.0 EL. -44.5 PASS WEDGE LOC. 620.0 EL. -44.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-44.5	7820.	3375.	850.	550.	550.
100.0	-44.5	7820.	3375.	850.	550.	550.
120.0	-44.5	7880.	3375.	850.	550.	550.
131.0	-44.5	8180.	3375.	850.	550.	550.
139.0	-44.5	8420.	3375.	850.	550.	550.
150.0	-44.5	8479.	3375.	850.	550.	550.
150.0	-44.5	8479.	3375.	850.	550.	550.
162.0	-44.5	8419.	3375.	850.	550.	550.
174.0	-44.5	8059.	3375.	850.	550.	550.
189.0	-44.5	7759.	3375.	850.	550.	550.
227.0	-44.5	7579.	3375.	850.	550.	550.
243.0	-44.5	7361.	3375.	850.	550.	550.
275.0	-44.5	7253.	3375.	850.	550.	550.
286.0	-44.5	7471.	3375.	850.	550.	550.
297.5	-44.5	7498.	3375.	850.	550.	550.
305.3	-44.5	7517.	2888.	850.	550.	550.
331.0	-44.5	7580.	2888.	850.	550.	550.
371.0	-44.5	8059.	2888.	850.	550.	550.
391.0	-44.5	7579.	2888.	850.	550.	550.
416.0	-44.5	7034.	2888.	850.	550.	550.
426.0	-44.5	6794.	2888.	850.	550.	550.
453.5	-44.5	6167.	2888.	850.	550.	550.
492.5	-44.5	5294.	2888.	850.	550.	550.
493.5	-44.5	5284.	2888.	850.	550.	550.
518.5	-44.5	4991.	2888.	850.	550.	550.
626.0	-44.5	3753.	2888.	850.	550.	550.
723.5	-44.5	2883.	2888.	850.	550.	550.
FAILURE SURFACE IN STRATA	9	EL. -44.5	DIST. 723.5	STRENGTH	850.0	
733.5	-44.5	2883.	2888.	850.	999999.	850.
1000.0	-44.5	2883.	2888.	850.	999999.	850.

ASSUMED CRIT. PASSIVE LOC. 620.0 EL. -44.5 DP 74601. RP 29323.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-44.5	271286.	102479.	0.	275000.	2.07
125.0	-44.5	271960.	102531.	0.	272250.	2.03
130.0	-44.5	273372.	102670.	0.	269500.	2.02
135.0	-44.5	275533.	102879.	0.	266750.	1.99
140.0	-44.5	278435.	103099.	0.	264000.	1.94
145.0	-44.5	281933.	103735.	0.	261250.	1.90
150.0	-44.5	286013.	105072.	0.	258500.	1.86
155.0	-44.5	290491.	107031.	0.	255750.	1.82
160.0	-44.5	294913.	109128.	0.	253000.	1.78
165.0	-44.5	298737.	110767.	0.	250250.	1.74
170.0	-44.5	301346.	111712.	0.	247500.	1.71
175.0	-44.5	302843.	112204.	0.	244750.	1.69
180.0	-44.5	303609.	112751.	0.	242000.	1.68
185.0	-44.5	303139.	113021.	0.	239250.	1.67
190.0	-44.5	301206.	112709.	0.	236500.	1.67
195.0	-44.5	297874.	111555.	0.	233750.	1.68
200.0	-44.5	293547.	109996.	0.	231000.	1.69
205.0	-44.5	288871.	108496.	0.	228250.	1.71
210.0	-44.5	283959.	107009.	0.	225500.	1.73

CRIT. ACTIVE LOC 185.0 EL -44.5 DA 303139. RA 113021.

DIST.	EL.	DP	RP	DB	RB	FS
600.0	-44.5	78757.	33215.	0.	228250.	1.67
605.0	-44.5	77600.	33150.	0.	231000.	1.67
610.0	-44.5	76500.	32156.	0.	233750.	1.67
615.0	-44.5	75499.	30739.	0.	236500.	1.67
620.0	-44.5	74601.	29323.	0.	239250.	1.67

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
625.0	-44.5	73805.	27906.	0.	242000.	1.67
630.0	-44.5	73090.	26489.	0.	244750.	1.67
635.0	-44.5	72414.	25073.	0.	247500.	1.67
640.0	-44.5	71775.	23656.	0.	250250.	1.67
645.0	-44.5	71172.	22240.	0.	253000.	1.67

* * STRATUM 10 ACT. WEDGE LOC. 140.0 EL. -64.0 PASS.WEDGE LOC. 690.0 EL. -64.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
0	-64.0	9848.	4594.	550.	715.	550.
100.0	-64.0	9848.	4594.	550.	715.	550.
120.0	-64.0	9908.	4594.	550.	715.	550.
131.0	-64.0	10208.	4594.	550.	715.	550.
139.0	-64.0	10448.	4594.	550.	715.	550.
150.0	-64.0	10507.	4594.	550.	715.	550.
150.0	-64.0	10507.	4594.	550.	715.	550.
162.0	-64.0	10447.	4594.	550.	715.	550.
174.0	-64.0	10087.	4594.	550.	715.	550.
189.0	-64.0	9787.	4594.	550.	715.	550.
227.0	-64.0	9607.	4594.	550.	715.	550.
243.0	-64.0	9389.	4594.	550.	715.	550.
275.0	-64.0	9281.	4594.	550.	715.	550.
286.0	-64.0	9499.	4594.	550.	715.	550.
297.5	-64.0	9526.	4594.	550.	715.	550.
305.3	-64.0	9545.	4106.	550.	715.	550.
331.0	-64.0	9608.	4106.	550.	715.	550.
371.0	-64.0	10087.	4106.	550.	715.	550.
391.0	-64.0	9607.	4106.	550.	715.	550.
416.0	-64.0	9062.	4106.	550.	715.	550.
426.0	-64.0	8822.	4106.	550.	715.	550.
453.5	-64.0	8195.	4106.	550.	715.	550.
492.5	-64.0	7322.	4106.	550.	715.	550.
493.5	-64.0	7312.	4106.	550.	715.	550.
518.5	-64.0	7019.	4106.	550.	715.	550.
626.0	-64.0	5781.	4106.	550.	715.	550.
723.5	-64.0	4911.	4106.	550.	715.	550.
733.5	-64.0	4828.	4106.	550.	715.	550.
1000.0	-64.0	4828.	4106.	550.	715.	550.

ASSUMED CRIT. PASSIVE LOC. 690.0 EL. -64.0 DP 146856. RP 25415.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
140.0	-64.0	450292.	123930.	0.	302500.	1.49
145.0	-64.0	453427.	123991.	0.	299750.	1.47
150.0	-64.0	456752.	124139.	0.	297000.	1.44
155.0	-64.0	460123.	124351.	0.	294250.	1.42
160.0	-64.0	463382.	124581.	0.	291500.	1.39
165.0	-64.0	466703.	125288.	0.	288750.	1.37
170.0	-64.0	469767.	126694.	0.	286000.	1.36
175.0	-64.0	472460.	128689.	0.	283250.	1.34
180.0	-64.0	474605.	130771.	0.	280500.	1.33
185.0	-64.0	475854.	132344.	0.	277750.	1.32
190.0	-64.0	476092.	133213.	0.	275000.	1.32
195.0	-64.0	475766.	133705.	0.	272250.	1.31
200.0	-64.0	475137.	134248.	0.	269500.	1.31
205.0	-64.0	473604.	134466.	0.	266750.	1.31
210.0	-64.0	470971.	134085.	0.	264000.	1.31
215.0	-64.0	467056.	132858.	0.	261250.	1.31
220.0	-64.0	462202.	131291.	0.	258500.	1.32
225.0	-64.0	457047.	129804.	0.	255750.	1.32
230.0	-64.0	451605.	128311.	0.	253000.	1.32

CRIT. ACTIVE LOC. 205.0 EL. -64.0 DA 473604. RA 134466.

DIST. EL. DP RP DB RB FS

s113.out

665.0	-64.0	152188.	32498.	0.	253000.	1.31
670.0	-64.0	151048.	31082.	0.	255750.	1.31
675.0	-64.0	149944.	29665.	0.	258500.	1.31
680.0	-64.0	148877.	28249.	0.	261250.	1.31
685.0	-64.0	147848.	26832.	0.	264000.	1.31
690.0	-64.0	146856.	25415.	0.	266750.	1.31
695.0	-64.0	145900.	23999.	0.	269500.	1.31
700.0	-64.0	144982.	22582.	0.	272250.	1.31
705.0	-64.0	144102.	21265.	0.	275000.	1.31
710.0	-64.0	143267.	20349.	0.	277750.	1.31

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EE L0125- BERNHARD- Stability Control Line
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665, 670, 675, 680, 685, 690, 695, 700, 705, 710

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March 16, 2011

MEMORANDUM FROM: U.S. ARMY Corps of Engineers, New Orleans
Regulatory Branch

TO: U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency
National Marine Fisheries Service
Louisiana Department of Environmental Quality
Louisiana Department of Wildlife and Fisheries
State Historic Preservation Officer

SUBJECT: Pre-discharge Notification
Nationwide Permit 12
MVN 2011-0563 WB

1. Enclosed is an application from Kenneth Bernhard to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish, Louisiana.
2. The proposed work appears to be eligible for authorization under the provisions of **Nationwide Permit No. 12** as found in the 12 March 2007 Federal Register, Final Notice of Issuance, Reissuance, and Modification of Nationwide Permits (72 FR 11180).
3. Please review the proposed project for its compliance with the terms and conditions of the nationwide permit. You must notify this office within **10 days** of the date of this letter.
4. Point of contact is Darlene Herman, (504) 862-2287.



Project Manager
Western Evaluation Section

Enclosures

MODE = MEMORY TRANSMISSION

START=MAR-16 10:47

END=MAR-16 11:03

FILE NO.=058

STN NO.	COMM.	STATION NAME/EMAIL ADDRESS/TELEPHONE NO.	PAGES	DURATION
001	OK	DEQ	006/006	00:01:17
002	OK	EPA	006/006	00:01:11
003	OK	NMFS	006/006	00:05:18
004	OK	LDWF	006/006	00:00:58
005	OK	SHPO	006/006	00:02:56
006	OK	USFWS	006/006	00:01:15

-USCOE EASTERN EVAL SEC -

***** UF-7000 ***** -504-862-2117 - ***** - 5048622117- *****


March 16, 2011

MEMORANDUM FROM: U.S. ARMY Corps of Engineers, New Orleans
Regulatory Branch

TO: U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency
National Marine Fisheries Service
Louisiana Department of Environmental Quality
Louisiana Department of Wildlife and Fisheries
State Historic Preservation Officer

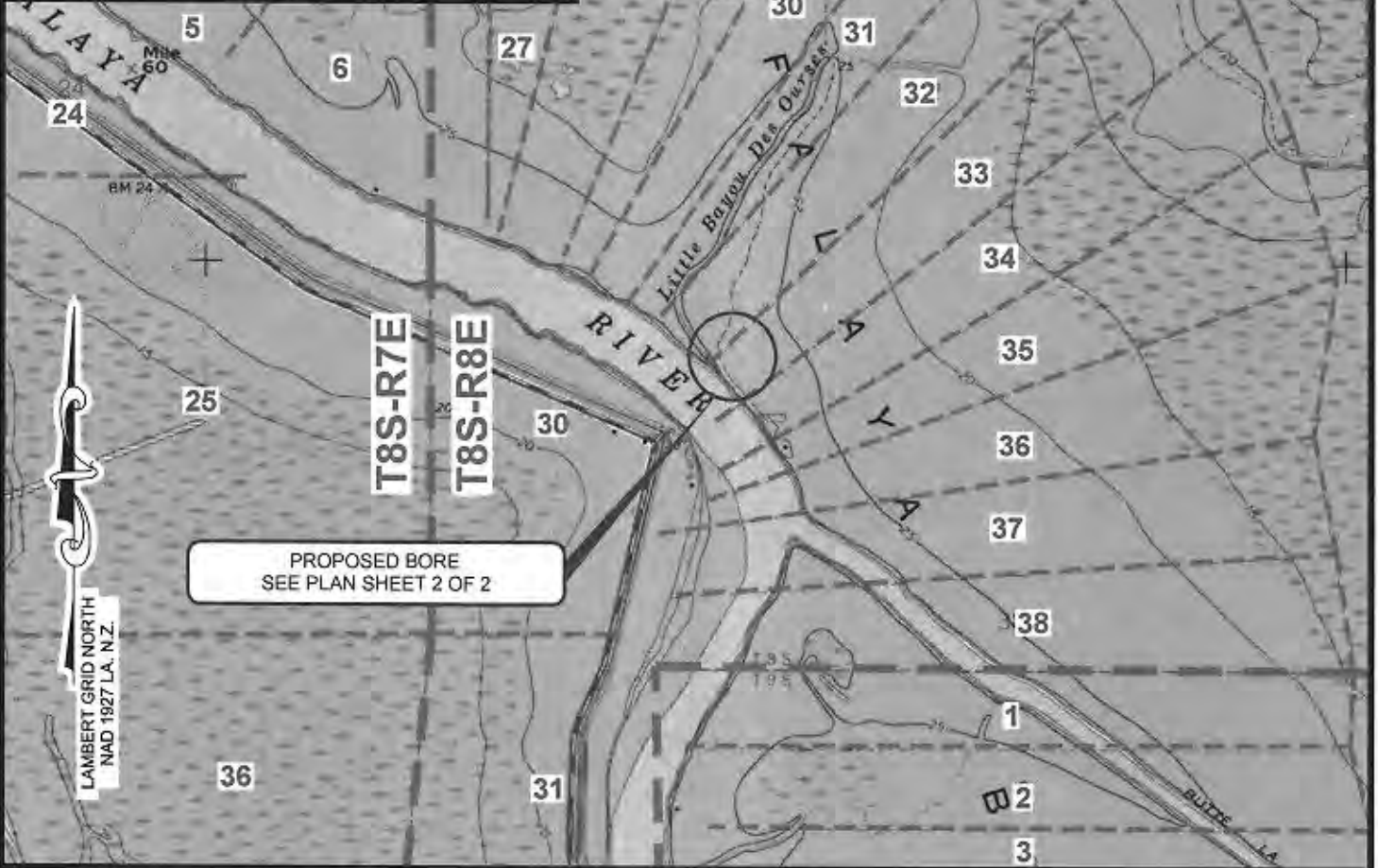
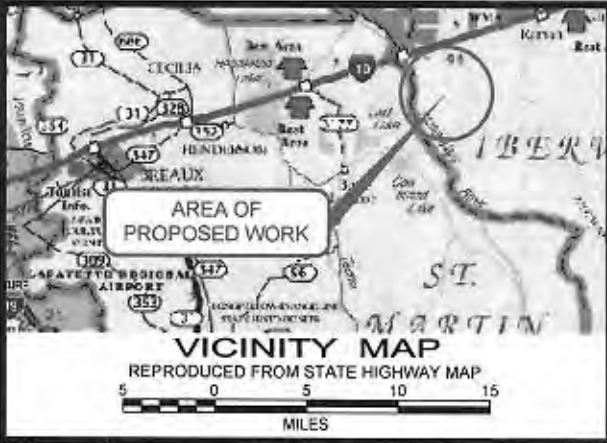
SUBJECT: Pre-discharge Notification
Nationwide Permit 12
MVN 2011-0363 WB

1. Enclosed is an application from Kenneth Bernhard to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish, Louisiana.
2. The proposed work appears to be eligible for authorization under the provisions of **Nationwide Permit No. 12** as found in the 12 March 2007 Federal Register, Final Notice of Issuance, Reissuance, and Modification of Nationwide Permits (72 FR 11180).
3. Please review the proposed project for its compliance with the terms and conditions of the nationwide permit. You must notify this office within **10 days** of the date of this letter.
4. Point of contact is Darlene Herman, (504) 862-2287.


Project Manager
Western Evaluation Section

Enclosures

old



LOCATION MAP

REPRODUCED FROM USGS BUTTE LA ROSE QUADRANGLE

KENNETH BERNHARD

200 Llainsfair Drive
Lafayette, LA 70503

PROPOSED BORE
BUTTE LA ROSE AREA
ST. MARTIN PARISH, LOUISIANA

PREPARED BY **C&C Technologies**
SURVEY SERVICES
730 E. NALISTE SALOOM ROAD, LAFAYETTE, LA (337) 281-0860
LA. REGISTRATION NUMBER: 330

JOB NO. 100776

DWG: REP

CHK: HEK

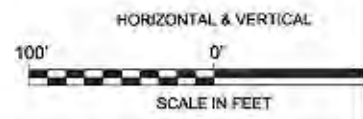
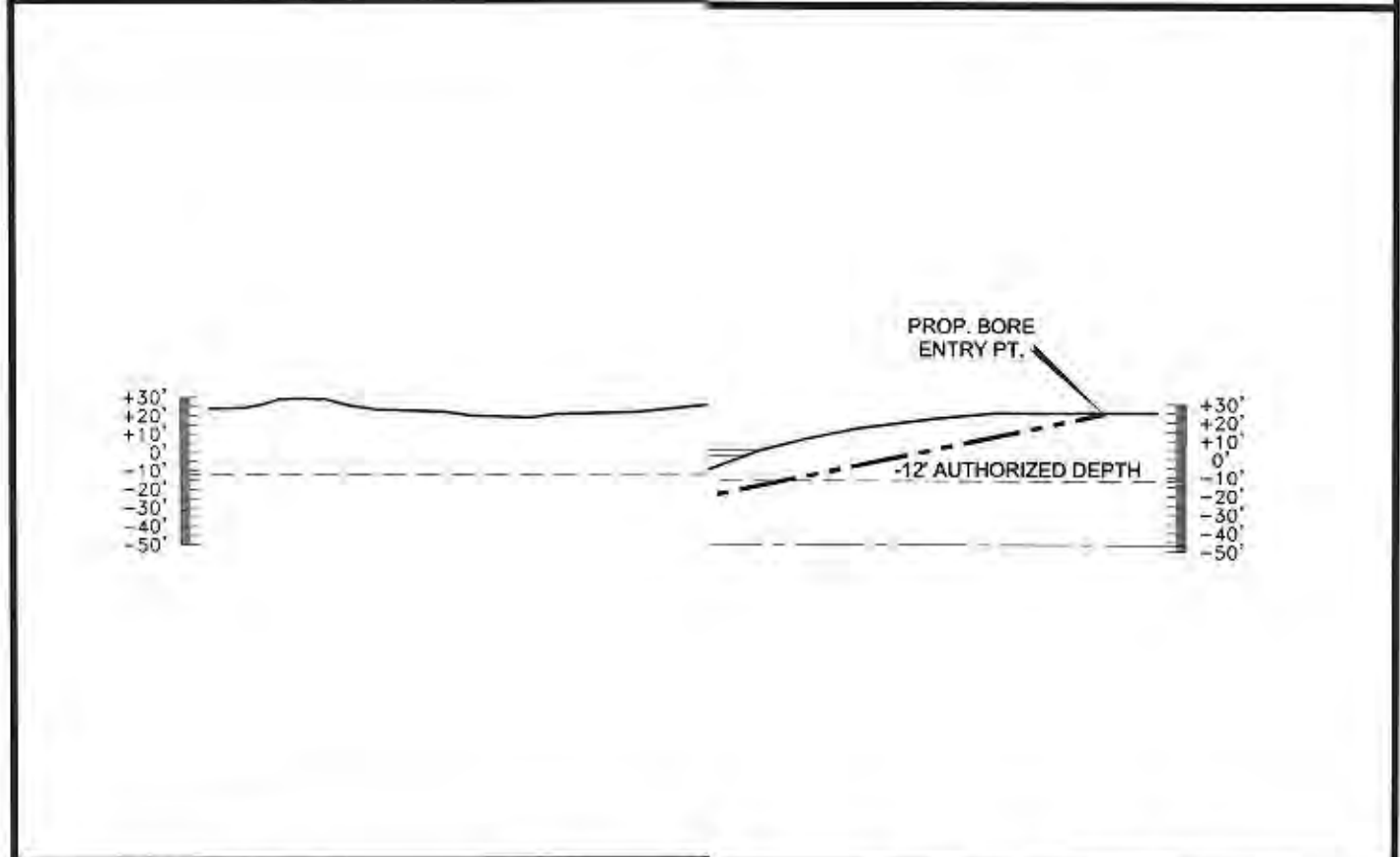
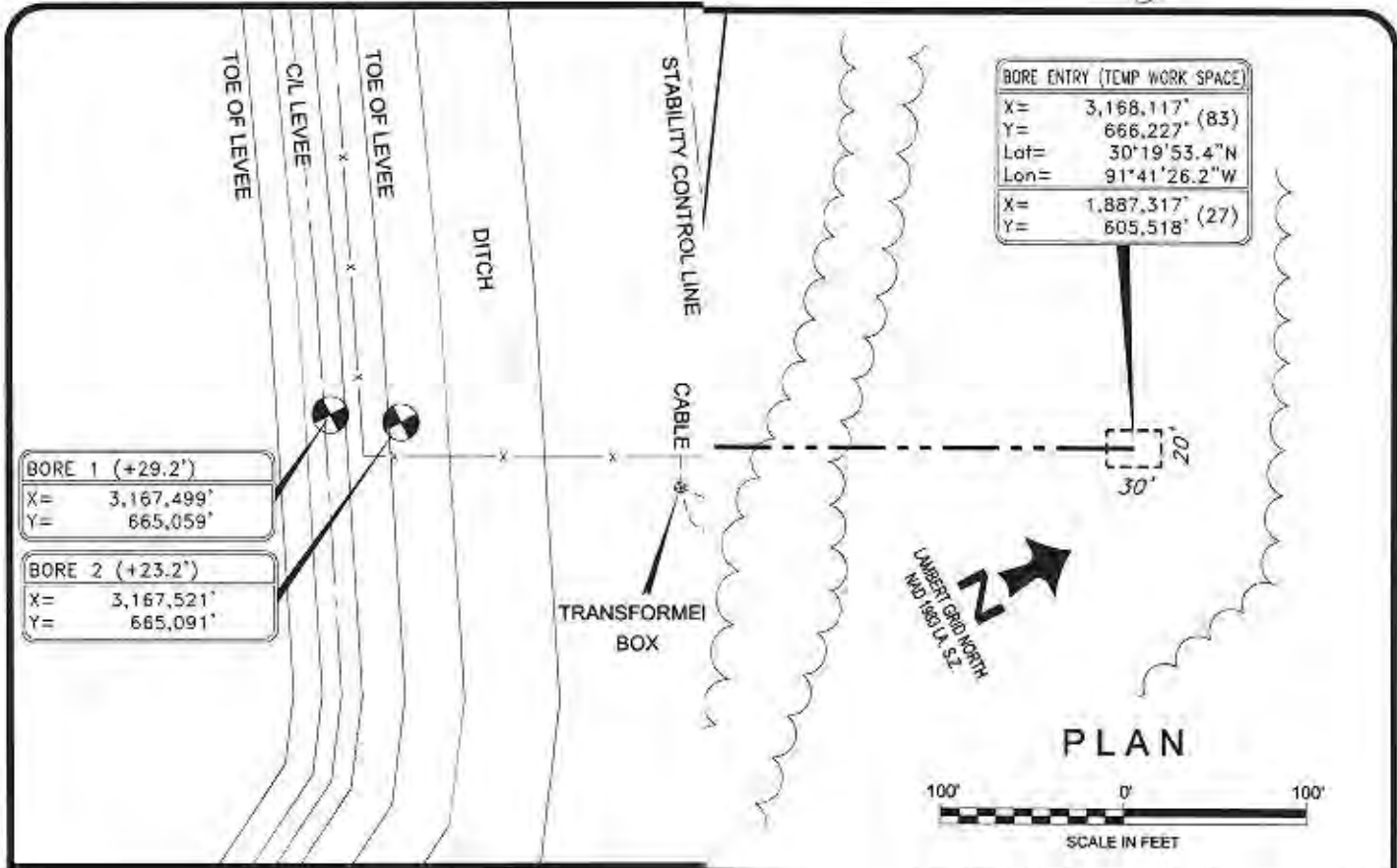
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DATE: 2/24/2011

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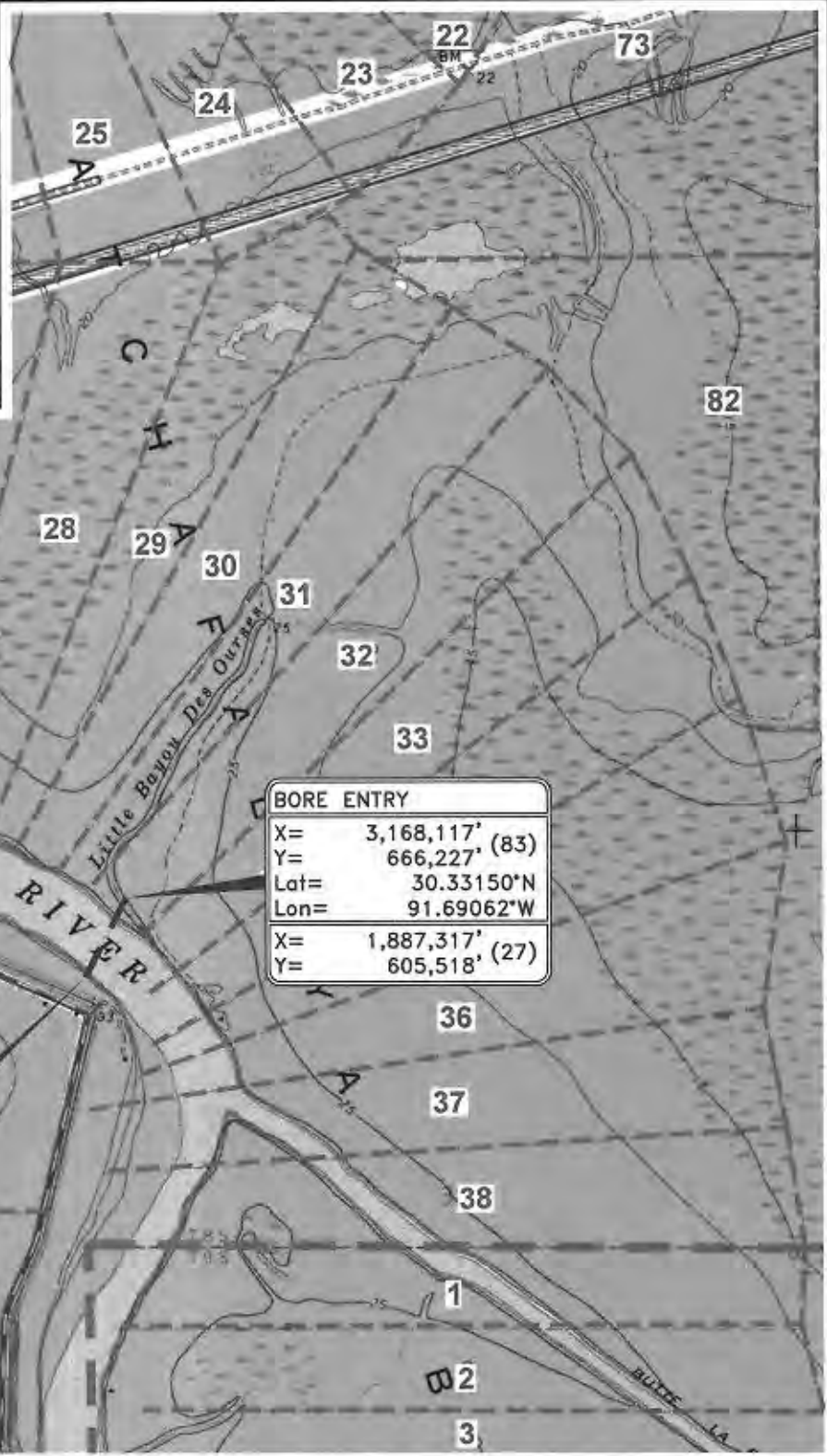
SHEET 1 OF 2

Old



PROPOSED BORE
BUTTE LA ROSE
ST. MARTIN PARISH, LOUISIANA

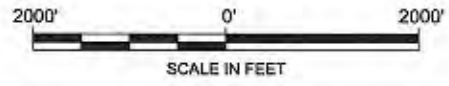
Wetlands



BORE ENTRY	
X=	3,168,117' (83)
Y=	666,227' (83)
Lat=	30.33150°N
Lon=	91.69062°W
X=	1,887,317' (27)
Y=	605,518' (27)

BORE EXIT	
X=	3,167,664' (83)
Y=	665,346' (83)
Lat=	30.32908°N
Lon=	91.69205°W
X=	1,886,863' (27)
Y=	604,636' (27)

LAMBERT GRID NORTH
NAD 1927 LA. N.Z.



REFERENCE: BASE MAP FROM U.S.G.S. QUADRANGLE MAP "BUTTE LA ROSE, LA." 1968, REVISED 1994, AT A SCALE OF 1:24000.

PREPARED BY:

 **TIM MORTON & ASSOCIATES, INC.**
REGULATORY & ENVIRONMENTAL CONSULTANTS
LAFAYETTE, LOUISIANA

FIGURE 1

MAP NO. FIG1

JOB NO. 10-124

KENNY BERNHARD
LAFAYETTE, LOUISIANA

VICINITY PLAT
PROPOSED POWERLINE BORE
ST. MARTIN PARISH, LOUISIANA

SCALE: 1" = 2,000'

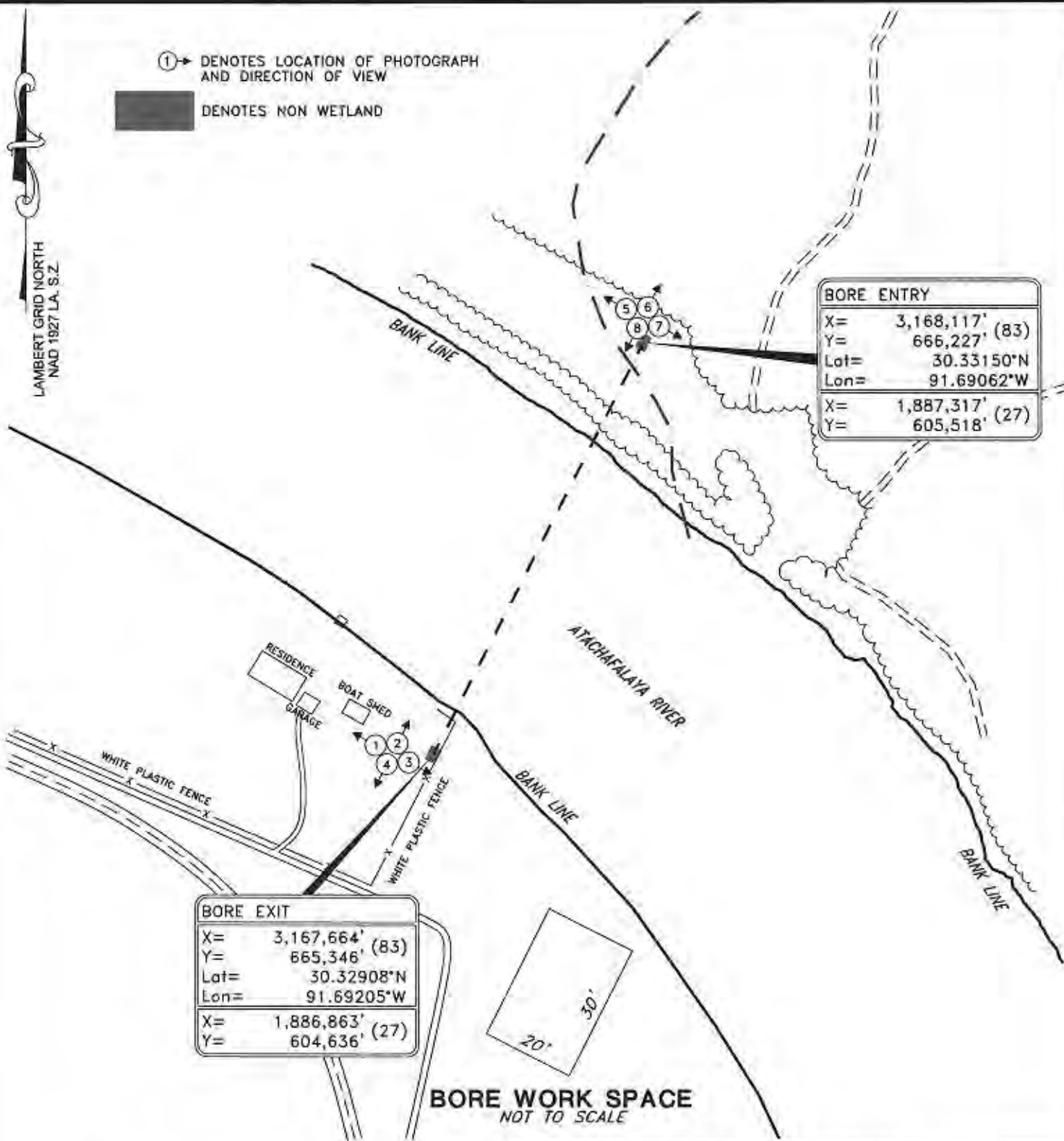
FEBRUARY 16, 2011

① → DENOTES LOCATION OF PHOTOGRAPH AND DIRECTION OF VIEW

■ DENOTES NON WETLAND

LAMBERT GRID NORTH
NAD 1927 LA, S.Z

BORE ENTRY	
X=	3,168,117' (83)
Y=	666,227' (83)
Lot=	30.33150°N
Lon=	91.69062°W
X=	1,887,317' (27)
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BORE EXIT	
X=	3,167,664' (83)
Y=	665,346' (83)
Lot=	30.32908°N
Lon=	91.69205°W
X=	1,886,863' (27)
Y=	604,636' (27)



BORE WORK SPACE
NOT TO SCALE

KENNY BERNHARD
LAFAYETTE, LOUISIANA

VICINITY PLAT
PROPOSED POWERLINE BORE
ST. MARTIN PARISH, LOUISIANA

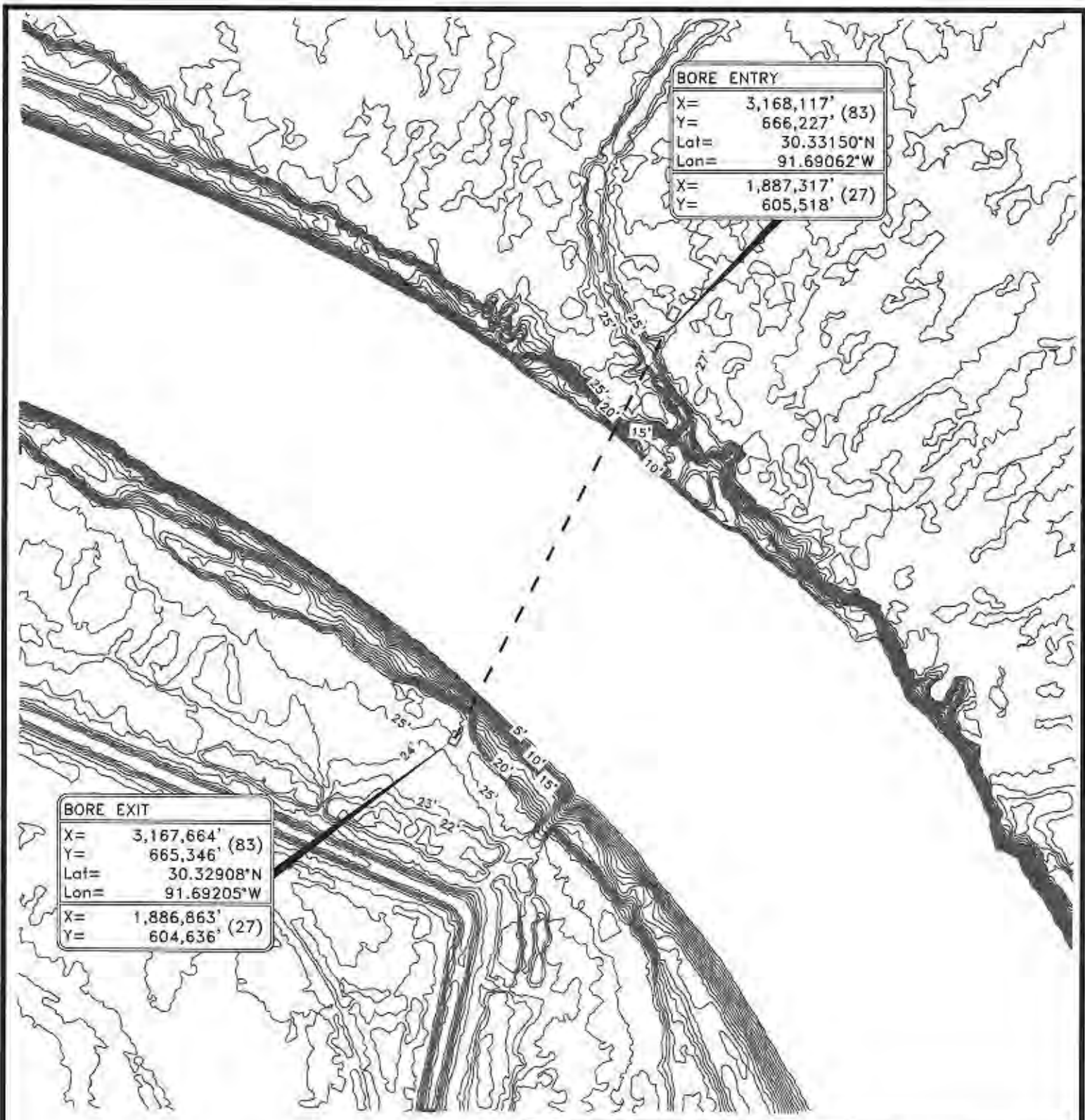
PREPARED BY:
 **TIM MORTON & ASSOCIATES, INC.**
REGULATORY & ENVIRONMENTAL CONSULTANTS
LAFAYETTE, LOUISIANA

FIGURE 2
MAP NO. C-FIG 2

SCALE: 1" = 300'

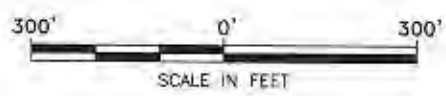
FEBRUARY 15, 2011

JOB NO. 10-124



BORE ENTRY	
X=	3,168,117' (83)
Y=	666,227' (83)
Lat=	30.33150°N
Lon=	91.69062°W
X=	1,887,317' (27)
Y=	605,518' (27)

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Lon=	91.69205°W
X=	1,886,863' (27)
Y=	604,636' (27)



KENNY BERNHARD
LAFAYETTE, LOUISIANA

PROPOSED POWERLINE BORE
LIDAR MAP
ST. MARTIN PARISH, LOUISIANA

PREPARED BY:

TIM MORTON & ASSOCIATES, INC.
 REGULATORY & ENVIRONMENTAL CONSULTANTS
 LAFAYETTE, LOUISIANA

FIGURE 3
MAP NO. FIG3

SCALE: 1" = 300'

FEBRUARY 16, 2011



PHOTO NO. 1



PHOTO NO. 2

PREPARED BY:



TIM MORTON & ASSOCIATES, INC.
REGULATORY & ENVIRONMENTAL CONSULTANTS
LAFAYETTE, LOUISIANA

JOB NO. 10-124

KENNY BERNHARD
LAFAYETTE, LOUISIANA

PROPOSED POWERLINE BORE
ST. MARTIN PARISH, LOUISIANA



PHOTO NO. 3



PHOTO NO. 4

PREPARED BY:



TIM MORTON & ASSOCIATES, INC.
REGULATORY & ENVIRONMENTAL CONSULTANTS
LAFAYETTE, LOUISIANA

JOB NO. 10-124

KENNY BERNHARD
LAFAYETTE, LOUISIANA

PROPOSED POWERLINE BORE
ST. MARTIN PARISH, LOUISIANA



PHOTO NO. 5



PHOTO NO. 6

PREPARED BY:



TIM MORTON & ASSOCIATES, INC.
REGULATORY & ENVIRONMENTAL CONSULTANTS
LAFAYETTE, LOUISIANA

JOB NO. 10-124

KENNY BERNHARD
LAFAYETTE, LOUISIANA

PROPOSED POWERLINE BORE
ST. MARTIN PARISH, LOUISIANA



PHOTO NO. 7



PHOTO NO. 8

PREPARED BY:



TIM MORTON & ASSOCIATES, INC.
REGULATORY & ENVIRONMENTAL CONSULTANTS
LAFAYETTE, LOUISIANA

JOB NO. 10-124

KENNY BERNHARD
LAFAYETTE, LOUISIANA

PROPOSED POWERLINE BORE
ST. MARTIN PARISH, LOUISIANA



BOBBY JINDAL
GOVERNOR

State of Louisiana

DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

ROBERT J. BARHAM
SECRETARY

JIMMY L. ANTHONY
ASSISTANT SECRETARY

March 18, 2011

Mr. Pete J. Serio, Chief
Regulatory Branch
United States Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

RE: *Application Number: MVN-2011-0563-WB*
Applicant: Kenneth Bernhard
Notice Date: March 16, 2011


Dear Mr. Serio:

The professional staff of the Louisiana Department of Wildlife and Fisheries (LDWF) has reviewed the above referenced notice. Based upon this review, the following has been determined:

It is anticipated that the proposed activity will have minimal or no long-term adverse impacts to wetland functions and, therefore, we have no objection.

The Louisiana Department of Wildlife and Fisheries appreciates the opportunity to review and provide recommendations to you regarding this proposed activity. Please do not hesitate to contact Habitat Section biologist Chris Davis at 225-765-2642 should you need further assistance.

Sincerely,


Kyle F. Balkum
Biologist Program Manager

cd



United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

March 31, 2011



APR 04 2011

Mr. Pete Serio
Chief, Regulatory Branch
New Orleans District
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Mr. Serio:

The U.S. Fish and Wildlife Service (Service) has reviewed Permit Application Number MVN-2011-0563 WB, received by this office March 16, 2011. Kenneth Bernhard has requested authorization under Nationwide Permit No. 12 to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish, Louisiana. These comments are submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Pallid Sturgeon

The proposed utility line would be bored under the Atchafalaya River which supports the endangered pallid sturgeon (*Scaphirhynchus albus*). The pallid sturgeon is a fish found in Louisiana, in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana. Habitat loss through river channelization and dams has adversely affected this species throughout its range.

Louisiana Black Bear Critical Habitat

The proposed entry bore point for the utility line occurs within the boundaries of critical habitat Unit 2 for the threatened Louisiana black bear (*Ursus americanus luteolus*). On April 9, 2009, the Service designated 1,330,000 acres of critical habitat (published in Volume 74, No. 45 of the Federal Register) for the Louisiana black bear under the ESA. Critical habitat identifies geographic areas containing features that are essential to the conservation of a threatened or endangered species, and which may require special management considerations or protection. Within the critical habitat boundary, only those areas that contain the physical and biological elements essential to support the life cycle needs of the Louisiana black bear are considered "critical habitat." The Service has determined that those elements be defined as breeding habitat and corridors within bottomland and upland hardwood forests and adjacent vegetated areas.

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and corridors within bottomland and upland hardwood forests and adjacent vegetated areas. Designation of critical habitat does not affect land ownership or establish a refuge or preserve, and only applies to situations where federal implementation, funding, or a federal permit is involved, such as with the currently proposed project.

Although the proposed site is not known to support breeding females, it may be used as a travel corridor by bears (e.g., dispersing male bears). The Service strongly urges hunters and other members of the public to avoid bears, if at all possible. Bears will typically avoid humans; however, with this type of activity and its encroachment into bear habitat, bear sightings may occur. In order to prevent sightings from becoming confrontations, campsite visitors should be cautioned to not leave food or garbage in or around the campsite, as bears can become attracted and accustomed to human food quite easily. Once bears become habituated to human food sources, they often learn to associate areas of higher human density (i.e., residential, commercial, and industrial areas) with a readily available food source. As a result, human-bear conflicts occur, and it becomes difficult, if not impossible, to deter nuisance behavior even through forced relocation of the offending animal. In such cases, the only alternatives are to place the animal in permanent captivity or destroy it.

Project Recommendations

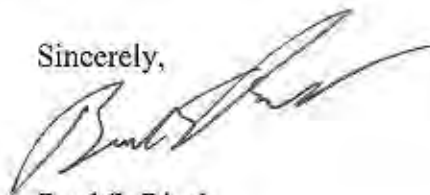
The applicant has stated that boring the entry point would require clearing approximately 30 ft. x 20 ft. (0.014 acres) of vegetation within an area previously approved for partial clearing (see our concurrence letter dated January 5, 2011, regarding permit MVN-2010-2256). Therefore, it appears that impacts to bear critical habitat have been minimized. The applicant also indicates that he would directionally drill the utility line underneath the Atchafalaya River, effectively minimizing impacts to pallid sturgeon habitat. The Service recommends that the following measures be implemented to ensure that adverse affects to the Louisiana black bear and pallid sturgeon are further minimized, and that fish and wildlife resource conservation receives equal consideration with other project purposes:

1. If the applicant will be required to provide compensatory mitigation (pursuant to Section 404 of the Clean Water Act) for all unavoidable project-associated wetland habitat losses, such mitigation should be accomplished within the boundaries of critical habitat Unit 2 of the Louisiana black bear. That mitigation project should be selected and designed in consultation with the Corps of Engineers, the Service, and other interested natural resource agencies, and should be implemented concurrently with project construction.
2. We recommend the applicant implement standard erosion control measures at the bore entry and exit holes to minimize sedimentation into the river. The applicant should also ensure that his Horizontal Directional Drilling and contingency plans are designed so that the risk of frac-outs or drilling fluid loss is minimized. Such plans should be reviewed and approved by the Corps.

Incorporation of the above conditions into the issued permit would reduce the potential for project-related impacts on the Louisiana black bear and pallid sturgeon. Nevertheless, the Corps has the affirmative responsibility to determine whether permit issuance is "likely, or not likely, to adversely affect" pallid sturgeon or Louisiana black bears and their critical habitat, and to request our concurrence with that determination in accordance with the applicable consultation provisions of the ESA.

We appreciate the opportunity to comment on the proposed project. Please contact Rob Smith (337/291-3134) of this office to continue the consultation process.

Sincerely,



Brad S. Rieck
Deputy Supervisor
Louisiana Ecological Services Office

cc: EPA, Dallas, TX
LDWF, Baton Rouge, LA
NMFS, Baton Rouge, LA

Herman 2287
Quinn



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

APR 25 2011

Operations Division
Western Evaluation Section

SUBJECT: MVN 2011-0563 WB

U.S. Fish and Wildlife Service
Attn: Endangered Species Coordinator
646 Cajundome Blvd., Suite 400
Lafayette, Louisiana 70506

Gentlemen:

This is in reference to your letter dated March 31, 2011, concerning Mr. Kenneth Bernhard to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish, Louisiana. The Black Bear habitat in that area is not anticipated to be substantially adversely impacted inclusive of denning trees or sites and also will not directly adversely impact the Pallid Sturgeon or its critical habitat.

We have determined, and are requesting your concurrence, that the proposed work is not likely to adversely affect Louisiana black bears and Pallid Sturgeon or habitat proposed to be identified as critical for recovery of these species.

If you have any questions relating to this proposed project or the determination, please contact Ms. Darlene Herman at (504) 862-2287.

Sincerely,

FILE

Pete J. Serio
Chief, Regulatory Branch

HPD
Duke
OD-SW
HPD
For Serio
OD-S

Herman, Darlene C MVN

From: Herman, Darlene C MVN
Sent: Wednesday, June 01, 2011 11:07 AM
To: 'Robert_V_Smith@fws.gov'
Subject: Kenneth Bernhard MVN 2011-0563 WB (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hey Rob -

I need to check the status of a concurrence letter for Mr. Kenneth Bernhard to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish.

Thanks and Have A Great Week!

Darlene Herman
Environmental Protection Specialist
U.S. Army Corps of Engineers
Regulatory Branch, Western Evaluation Section
(504) 862-2287

In order to assist us in improving our service to you, please complete the survey found at:
<http://per2.nwp.usace.army.mil/survey.html>

Classification: UNCLASSIFIED
Caveats: NONE

Herman, Darlene C MVN

From: Robert_V_Smith@fws.gov
Sent: Wednesday, June 01, 2011 11:21 AM
To: Herman, Darlene C MVN
Subject: Re: Kenneth Bernhard MVN 2011-0563 WB (UNCLASSIFIED)

It's second from the top of my stack. We should have a response to you by June 10. This past month has been pretty busy.

Rob Smith
Fish and Wildlife Biologist
US Fish and Wildlife Service, Ecological Services
646 Cajundome Blvd, Suite 400
Lafayette, Louisiana 70506
Office: (337) 291-3134
Fax: (337) 291-3139
robert.v.smith@fws.gov

Inactive hide details for "Herman, Darlene C MVN" <Darlene.C.Herman@usace.army.mil>"Herman, Darlene C MVN" <Darlene.C.Herman@usace.army.mil>

"Herman, Darlene C MVN" <Darlene.C.Herman@usace.army.mil>

06/01/2011 11:07 AM

To

<Robert.V.Smith@fws.gov>

cc

Subject

Kenneth Bernhard MVN 2011-0563 WB (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hey Rob -

I need to check the status of a concurrence letter for Mr. Kenneth Bernhard to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish.

Thanks and Have A Great Week!

Darlene Herman

Herman, Darlene C MVN

Bernhard

From: Robert_V_Smith@fws.gov
Sent: Friday, March 18, 2011 11:01 AM
To: Herman, Darlene C MVN
Subject: MVN-2011-0563

Darlene,

Can I have a deadline extension to respond to the subject permit application? Also, could you give me a call about it?

Rob Smith
Fish and Wildlife Biologist
US Fish and Wildlife Service, Ecological Services
646 Cajundome Blvd, Suite 400
Lafayette, Louisiana 70506
Office: (337) 291-3134
Fax: (337) 291-3139
robert.v.smith@fws.gov



United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506



June 6, 2011

JUN 08 2011

Ms. Darlene Herman
Environmental Scientist
New Orleans District
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Ms. Herman:

Please reference your letter dated May 11, 2011, regarding your determination of effects to threatened and endangered species from Permit Application Number MVN-2011-0563 WB. Kenneth Bernhard has requested authorization under Nationwide Permit No. 12 to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish, Louisiana. The U.S. Fish and Wildlife Service (Service) submits these comments in accordance with provisions of the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

The proposed utility line would be bored under waters that support the endangered pallid sturgeon (*Scaphirhynchus albus*) and the entry hole of that bore would occur within the boundaries of critical habitat Unit 2 for the threatened Louisiana black bear (*Ursus americanus luteolus*). You have stated the entry and exit holes would require the temporary clearing of approximately 0.014 acres of vegetation near the banks of the Atchafalaya River and work areas will be restored to pre-project conditions. No dredging or fill of the river will occur. Minimal and temporary disturbance to riparian areas adjacent to pallid sturgeon habitat would occur. You have also stated that the applicant's boring plan has been reviewed and approved by the Engineering Division of the U.S. Army Corps of Engineers. Therefore, we concur with your determination that the proposed project is not likely to adversely affect the pallid sturgeon.

As state above, a minimal amount of temporary clearing of vegetation (approximately 0.007 acres from the entry hole) would occur within the boundaries of critical habitat Unit 2 for the Louisiana black bear within an area previously approved for partial clearing (see our concurrence letter dated January 5, 2011, regarding permit MVN-2010-2256). It would also occur outside known core breeding habitat for the bear. No mitigation will be required due to the limited and temporary nature of the project's impacts. Although the proposed site is not known to support breeding females, it may be used as a travel corridor by bears (e.g., dispersing male bears) between the upper and lower Atchafalaya Basin sub-populations. As indicated in our letter of March 31, 2011, the Service strongly urges hunters and other members of the public to avoid bears, if at all possible. Bears will typically avoid humans; however, with this type of activity and its encroachment into bear habitat, bear sightings may occur. In order to prevent sightings from becoming confrontations, campsite visitors should be cautioned to not leave food or garbage in or around the campsite, as bears can become accustomed and

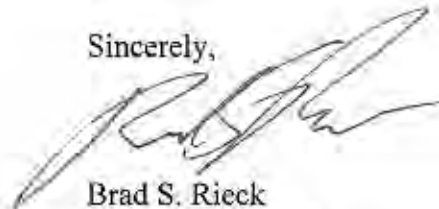
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quite easily. Once bears become habituated to human food sources, they often learn to associate areas of higher human density (i.e., residential, commercial, and industrial areas) with a readily available food source. As a result, human-bear conflicts occur, and it becomes difficult, if not impossible, to deter nuisance behavior even through forced relocation of the offending animal. In such cases, the only alternatives are to place the animal in permanent captivity or destroy it.

Bears would still be able to travel through the area relatively unimpeded. For those reasons, the proposed project would not negatively impact the functions and conservation role of critical habitat Unit 2. Accordingly, the Service concurs with your determination that the proposed project is not likely to adversely affect the Louisiana black bear or destroy or adversely affect its critical habitat at the unit level. In concurring with your determination, we have not relied on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 C.F.R. 402.02; instead, we have relied on the statutory provisions of the Endangered Species Act.

No further endangered species consultation will be required for this project as proposed. We appreciate the opportunity to comment on the proposed project. Please contact Rob Smith (337/291-3134) of this office for further questions.

Sincerely,



Brad S. Rieck
Acting Supervisor
Louisiana Ecological Services Office

cc: LDWF, Baton Rouge, LA

- yes no [If "no," do not complete the rest of this section and include an explanation of why not here]
- (2) Is the impact in the service area of an approved mitigation bank? yes no
- i. Does the mitigation bank have appropriate number and resource type of credits available? yes no
- (3) Is the impact in the service area of an approved in-lieu fee program? yes no
- i. Does the in-lieu fee program have appropriate number and resource type of credits available? yes no
- (4) Check the selected compensatory mitigation option(s):
- mitigation bank credits
 - in-lieu fee program credits
 - permittee-responsible mitigation under a watershed approach
 - permittee-responsible mitigation, on-site and in-kind
 - permittee-responsible mitigation, off-site and out-of-kind
- (5) If a selected compensatory mitigation option deviates from the order of the options presented in §332.3(b)(2)-(6), explain why the selected compensatory mitigation option is environmentally preferable. Address the criteria provided in §332.3(a)(1) (i.e., the likelihood for ecological success and sustainability, the location of the compensation site relative to the impact site and their significance within the watershed, and the costs of the compensatory mitigation project):

Determination (Reference General Condition 27(e)):

The proposed activity, with proposed mitigation (if applicable) would result in no more than minimal individual and cumulative adverse environmental effects and would not be contrary to the public interest. [add in, if applicable: "provided the special conditions and/or modifications identified in the above are incorporated."] This project complies with all terms and conditions of NWP (add #)/RGP (add #)/GP (PGP) including any applicable regional conditions.

PREPARED BY:

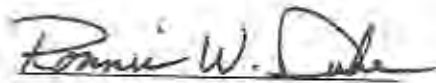
Project Manager



Date: 6/15/2011

REVIEWED BY:

Western Evaluation Section Chief



Date June 20, 2011

*Admin (JSM)
Drew*



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT CORPS OF ENGINEERS
P.O. BOX 50267
NEW ORLEANS, LOUISIANA 70160-0267

FILE COPY

REPLY TO
ATTENTION OF:

MAY 11 2011

Operations Division
Western Evaluation Section

SUBJECT: MVN 2011-0563 WB

U.S. Fish and Wildlife Service
Attn: Endangered Species Coordinator
646 Cajundome Blvd., Suite 400
Lafayette, Louisiana 70506

Gentlemen:

This is in reference to your letter dated March 31, 2011, concerning Mr. Kenneth Bernhard to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish, Louisiana. The Black Bear habitat in that area is not anticipated to be substantially adversely impacted inclusive of denning trees or sites and also will not directly adversely impact the Pallid Sturgeon or its critical habitat.

The proposed impacts are temporary concerning the entry and exit points for the proposed line, therefore no mitigation will be required for this activity. The permittee will be required to restore work areas to pre-project conditions. The proposed activity has been reviewed by Engineering Division and they stated no objection to the installation of the line.

We have determined, and are requesting your concurrence, that the proposed work is not likely to adversely affect Louisiana black bears and Pallid Sturgeon or habitat proposed to be identified as critical for recovery of these species.

If you have any questions relating to this proposed project or the determination, please contact Ms. Darlene Herman at (504) 862-2287.

Sincerely,

Pete J. Serio
Chief, Regulatory Branch

ADD
Duke
OW-SW
FILE COPY
ADD
Ser
OW-S



United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

March 31, 2011



APR 04 2011

Mr. Pete Serio
Chief, Regulatory Branch
New Orleans District
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Mr. Serio:

The U.S. Fish and Wildlife Service (Service) has reviewed Permit Application Number MVN-2011-0563 WB, received by this office March 16, 2011. Kenneth Bernhard has requested authorization under Nationwide Permit No. 12 to install and maintain an electrical line beneath the Atchafalaya River in St. Martin Parish, Louisiana. These comments are submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Pallid Sturgeon

The proposed utility line would be bored under the Atchafalaya River which supports the endangered pallid sturgeon (*Scaphirhynchus albus*). The pallid sturgeon is a fish found in Louisiana, in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana. Habitat loss through river channelization and dams has adversely affected this species throughout its range.

Louisiana Black Bear Critical Habitat

The proposed entry bore point for the utility line occurs within the boundaries of critical habitat Unit 2 for the threatened Louisiana black bear (*Ursus americanus luteolus*). On April 9, 2009, the Service designated 1,330,000 acres of critical habitat (published in Volume 74, No. 45 of the Federal Register) for the Louisiana black bear under the ESA. Critical habitat identifies geographic areas containing features that are essential to the conservation of a threatened or endangered species, and which may require special management considerations or protection. Within the critical habitat boundary, only those areas that contain the physical and biological elements essential to support the life cycle needs of the Louisiana black bear are considered "critical habitat." The Service has determined that those elements be defined as breeding habitat and corridors within bottomland and upland hardwood forests and adjacent vegetated areas.

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IN AMERICA

and corridors within bottomland and upland hardwood forests and adjacent vegetated areas. Designation of critical habitat does not affect land ownership or establish a refuge or preserve, and only applies to situations where federal implementation, funding, or a federal permit is involved, such as with the currently proposed project.

Although the proposed site is not known to support breeding females, it may be used as a travel corridor by bears (e.g., dispersing male bears). The Service strongly urges hunters and other members of the public to avoid bears, if at all possible. Bears will typically avoid humans; however, with this type of activity and its encroachment into bear habitat, bear sightings may occur. In order to prevent sightings from becoming confrontations, campsite visitors should be cautioned to not leave food or garbage in or around the campsite, as bears can become attracted and accustomed to human food quite easily. Once bears become habituated to human food sources, they often learn to associate areas of higher human density (i.e., residential, commercial, and industrial areas) with a readily available food source. As a result, human-bear conflicts occur, and it becomes difficult, if not impossible, to deter nuisance behavior even through forced relocation of the offending animal. In such cases, the only alternatives are to place the animal in permanent captivity or destroy it.

Project Recommendations

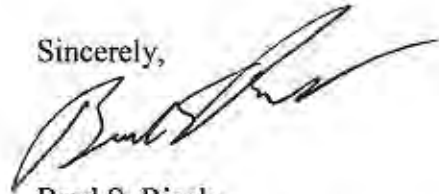
The applicant has stated that boring the entry point would require clearing approximately 30 ft. x 20 ft. (0.014 acres) of vegetation within an area previously approved for partial clearing (see our concurrence letter dated January 5, 2011, regarding permit MVN-2010-2256). Therefore, it appears that impacts to bear critical habitat have been minimized. The applicant also indicates that he would directionally drill the utility line underneath the Atchafalaya River, effectively minimizing impacts to pallid sturgeon habitat. The Service recommends that the following measures be implemented to ensure that adverse affects to the Louisiana black bear and pallid sturgeon are further minimized, and that fish and wildlife resource conservation receives equal consideration with other project purposes:

1. If the applicant will be required to provide compensatory mitigation (pursuant to Section 404 of the Clean Water Act) for all unavoidable project-associated wetland habitat losses, such mitigation should be accomplished within the boundaries of critical habitat Unit 2 of the Louisiana black bear. That mitigation project should be selected and designed in consultation with the Corps of Engineers, the Service, and other interested natural resource agencies, and should be implemented concurrently with project construction.
2. We recommend the applicant implement standard erosion control measures at the bore entry and exit holes to minimize sedimentation into the river. The applicant should also ensure that his Horizontal Directional Drilling and contingency plans are designed so that the risk of frac-outs or drilling fluid loss is minimized. Such plans should be reviewed and approved by the Corps.

Incorporation of the above conditions into the issued permit would reduce the potential for project-related impacts on the Louisiana black bear and pallid sturgeon. Nevertheless, the Corps has the affirmative responsibility to determine whether permit issuance is "likely, or not likely, to adversely affect" pallid sturgeon or Louisiana black bears and their critical habitat, and to request our concurrence with that determination in accordance with the applicable consultation provisions of the ESA.

We appreciate the opportunity to comment on the proposed project. Please contact Rob Smith (337/291-3134) of this office to continue the consultation process.

Sincerely,



Brad S. Rieck
Deputy Supervisor
Louisiana Ecological Services Office

cc: EPA, Dallas, TX
LDWF, Baton Rouge, LA
NMFS, Baton Rouge, LA

Herman, Darlene C MVN

From: Herman, Darlene C MVN
Sent: Wednesday, May 11, 2011 1:57 PM
To: 'Robert_V_Smith@fws.gov'
Subject: Kenneth Bernhard MVN 2011-563 WB (UNCLASSIFIED)
Attachments: document2011-05-11-135251.pdf

Classification: UNCLASSIFIED
Caveats: NONE

Please see attachment.

Thanks,
Darlene

Classification: UNCLASSIFIED
Caveats: NONE

Herman, Darlene C MVN

From: Robert_V_Smith@fws.gov
Sent: Monday, May 09, 2011 1:29 PM
To: Herman, Darlene C MVN
Subject: MVN-2011-0563

Darlene,

I just wanted to remind you about the phone message I left you on May 2. Please note that the determination you emailed me about the subject project should include the Corps' basis for an NLAA determination (e.g., the level of impacts, would the recommendations we provided be implemented, etc.). I would need that additional information before we could appropriately respond.

Rob Smith
Fish and Wildlife Biologist
US Fish and Wildlife Service, Ecological Services
646 Cajundome Blvd, Suite 400
Lafayette, Louisiana 70506
Office: (337) 291-3134
Fax: (337) 291-3139
robert.v.smith@fws.gov

*Add paragraph -
The permit should be returned to include ^{recommendations made} ~~your~~ ^{to} ~~address~~ ^{potential} for projects-related impacts ^{as the} ~~as~~ ^{blank} ~~is~~ - a pull-in 5 to argue.*

CEMVN-OD-W (OD-SW/3 May 11)

Oberlies/2313

SUBJECT: MVN-2011-0563-WB
Kenneth Bernhard

Operations Manager, Completed Works

13 May 11

FOR C/Reg Br Attn: Darlene Herman

We have completed our review of the subject permit application. The applicant's plans are acceptable and a letter of no objection has been forwarded to the Atchafalaya Basin Levee District.



Amy E. Powell

Operations Manager, Completed Works

2 Encls
added 1 encl
2. Ltr of no obj



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

May 13, 2011

REPLY TO
ATTENTION OF

Operations Division
Operations Manager
Completed Works

Mr. John Grezaffi, President
Board of Commissioners
Atchafalaya Basin Levee District
Post Office Box 170
Port Allen, Louisiana 70767

Dear Mr. Grezaffi:

We have received a copy of a letter request dated March 4, 2011, from Tim Morton & Associates, Inc., on behalf of Kenneth Bernhard, concerning permission to directionally drill three 2-inch pipes beneath the Atchafalaya River and exit on the floodside of the right descending Atchafalaya River levee, vicinity of levee station 2847+00, at Butte La Rose, Louisiana, in St. Martin Parish.

We have no objection to your Board's issuance of a permit for that portion of the work which is under your jurisdiction provided:

- a. The work is accomplished in accordance with the above referenced letter and accompanying drawings, copy enclosed.
- b. All drilling and excavation work is performed and completed when the stage of the Mississippi River is below elevation +11.0 feet on the Carrollton gage, at New Orleans, Louisiana. Information concerning current river stages may be obtained on our website at WWW.VAD.USACE.NM/C011/.
- c. Any damage to the levee or river bank resulting from the applicant's activities is repaired at the applicant's expense.
- d. That should changes in the location or section of the existing levee and/or river, or in the generally prevailing conditions in the vicinity, be required in the future in the public interest, the applicant shall make changes in the project concerned, or in the arrangement thereof, as may be necessary to satisfactorily meet the situation and shall bear the cost thereof.

This letter of no objection is based upon engineering criteria, and no interpretation or comments regarding local laws, zoning, or ordinances concerning property rights, etc., have been made. Additionally, this letter of no objection does not obviate the applicant's requirement to obtain federal, state, or local permits required by law.

If you have any questions, please contact me or Karen Oberlies of my office at 504-862-2241 or 504-862-2313, respectively. Additionally, future correspondence concerning this project should reference our Letter of No Objection number 11-313. This will allow us to more easily locate records of previous correspondence, and thus provide a quicker response.

Please furnish this office a copy of your permit if the applicant's proposal is approved by your Board.

Sincerely,

Amy E. Powell
Operations Manager, Completed Works

Enclosure

Copies Furnished:

OCPR, Baton Rouge, Attn: Antonio German

OCPR, Lafayette, Attn: Rick Dugas

Tim Morton & Associates, Inc.

Attn: Donna Hollier, CPS

C/Engr Div

Area Engr, LAO

C/ Reg Br Attn: Darlene Herman

May 3, 2011

MEMORANDUM FOR: OPERATIONS MANAGER, COMPLETED WORKS
ATTENTION: AMY POWELL

SUBJECT: Review of Permit Application

1. The attached permit application is forwarded for your review. Please forward your response within 2 days of the date of this memorandum.
2. Information relative to this application is as follows:

APPLICANT: Kenneth Bernhard

APPLICATION NUMBER: MVN 2011-0563 WB

PROJECT MANAGER: Darlene Herman x2287



Pete J. Serio
Chief, Regulatory Branch

Encls

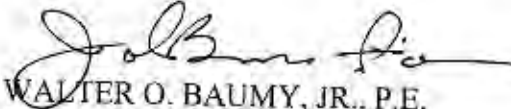
1. Engr Comments
2. Application
3. Drawings

21 April 2011

MEMORANDUM FOR: Chief/CEMVN-OD-SW

SUBJECT: Review of Permit MVN-2011-0563-WB to install an electrical line by boring with a directional drill beneath the Atchafalaya River at approximate Mile 60 by Kenneth Bernhard near Butte La Rose, St. Martin Parish, Louisiana (Mailtrax #11-6397)

1. Reference CEMVN-OD-SW memorandum dated 23 March 2011 requesting review of the subject permit.
2. Engineering Division has reviewed the subject permit request. We have no adverse comments regarding the subject permit request provided the following changes and/or additions are made an integral part of the letter of no objection. Written verification of these provisions should be requested and the agreements made part of our files. Accomplishment of the above negates the necessity of further review of the permit request by us.
 - a. No drilling or excavation will be performed when river stage on the Carrollton gage is elevation +11.0 or higher.
3. Point of contact for this permit review is Jason Binet, telephone extension 2127.


WALTER O. BAUMY, JR., P.E.
Chief, Engineering Division

Encl
Nc

CF: CEMVN-ED-F (Bivona)

CEMVN-OD-SW

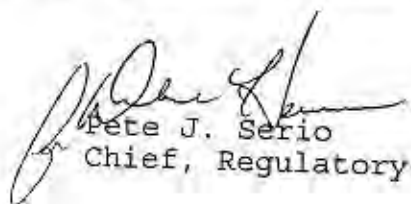
11-6398
March 23, 2011

MEMORANDUM FOR C/Engineering Div

SUBJECT: MVN 2011-0563 WB

1. Submitting application by Kenneth Bernhard for an electrical line bore, beneath the Atchafalaya River in Butte LaRose area in St. Martin Parish, Louisiana.
2. Please respond within 10 working days of this memo. A lack of response will construed as a no comment.
3. If you need assistance call Darlene Herman at X2287.

Encls


Pete J. Serio
Chief, Regulatory Branch

March 16, 2011

MEMORANDUM FOR: Mike Lowe

SUBJECT: Review of Permit Application for need of Engineering Division Review.

1. The attached permit application is forwarded for your determination as to need for an Engineering Division Review. Please forward your response within 2 days of the date of this memorandum.
2. Information relative to this application is as follows:

APPLICANT: Kenneth Bernhard

APPLICATION No.: MVN 2011-0563 WB

PROJECT MANAGER: Darlene Herman X2287


 Pete J. Serio
 Chief, Regulatory Branch

- 2 Encls
 1. Appl. form
 2. Set of dwgs.


CEMVN-OD-G 1st end

DATE: 3/18/2011

FOR: Chief, Regulatory Branch

Reference permit application forwarded for determination as to need for a Engineering Division Review.

- a. Forward application to Engineering Division review. Review time may be charged to J2KG9K
- b. The impacts are minor. Engineering review is not required. See "other" for conditions or additional comments (if any).
- c. Other. See enclosed comments.


 OPERATIONS MANAGER .

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants
730 E. Kaliste Saloom Road
Lafayette, LA 70508

(337) 234-5124

(337) 235-3632 (FAX)

March 4, 2011

MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

Re: Kenneth Bernhard, Proposed Electrical Line Bore, Atchafalaya River, Butte La Rose Area, St. Martin Parish, Louisiana

Dear Mr. Duke,

Mr. Kenneth Bernhard proposes to directionally drill a utility crossing across the Atchafalaya River near Butte La Rose, Louisiana, for the purpose of providing electricity to his property which is located on the left descending bank of the river. It is anticipated that an 8-inch diameter hole would be directionally drilled across the river and three 2-inch pipes would be run in that hole. The bore entry point would be located on Mr. Bernhard's property. The bore exit point would be located in the batture at a site approximately 332-feet from the centerline of the Atchafalaya River Protection levee and approximately 114-feet from the bank of the river. A stability control line survey was conducted at the project site by Eustis Engineering, and a report of their findings is included with this application. In accordance with those findings, the bore exit point would be located approximately 117-feet riverward of the levee stability control line.

In accordance with the burial requirements outlined in the New Orleans District, Corps of Engineers' May 31, 2010 Public Notice, the proposed utility line crossing would be bored a minimum of 15-feet below the mudline of the Atchafalaya River. A minimum distance of 20-feet would be maintained between the bore and the levee stability control line. Approval for the installation of these proposed pipelines is requested under Nationwide Permit No. 12 from your agency.

We believe that the proposed project site falls within an area in which the Corps of Engineers has a real estate interest. U.S. Government Easement No. DACW29-9-11-66 was granted to Mr. Bernhard by your agency for the purpose of constructing and maintaining the camp site, boat dock and walkway which this proposed utility line will serve. The applicant hereby respectfully requests that the utility line that is proposed in this application be included for coverage in the aforementioned Real Estate Consent.

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants

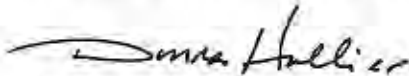
MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
Page Two
March 4, 2011

If additional information is required, please advise. I may be reached at 337/735-3882. Thank you for your consideration of this application.

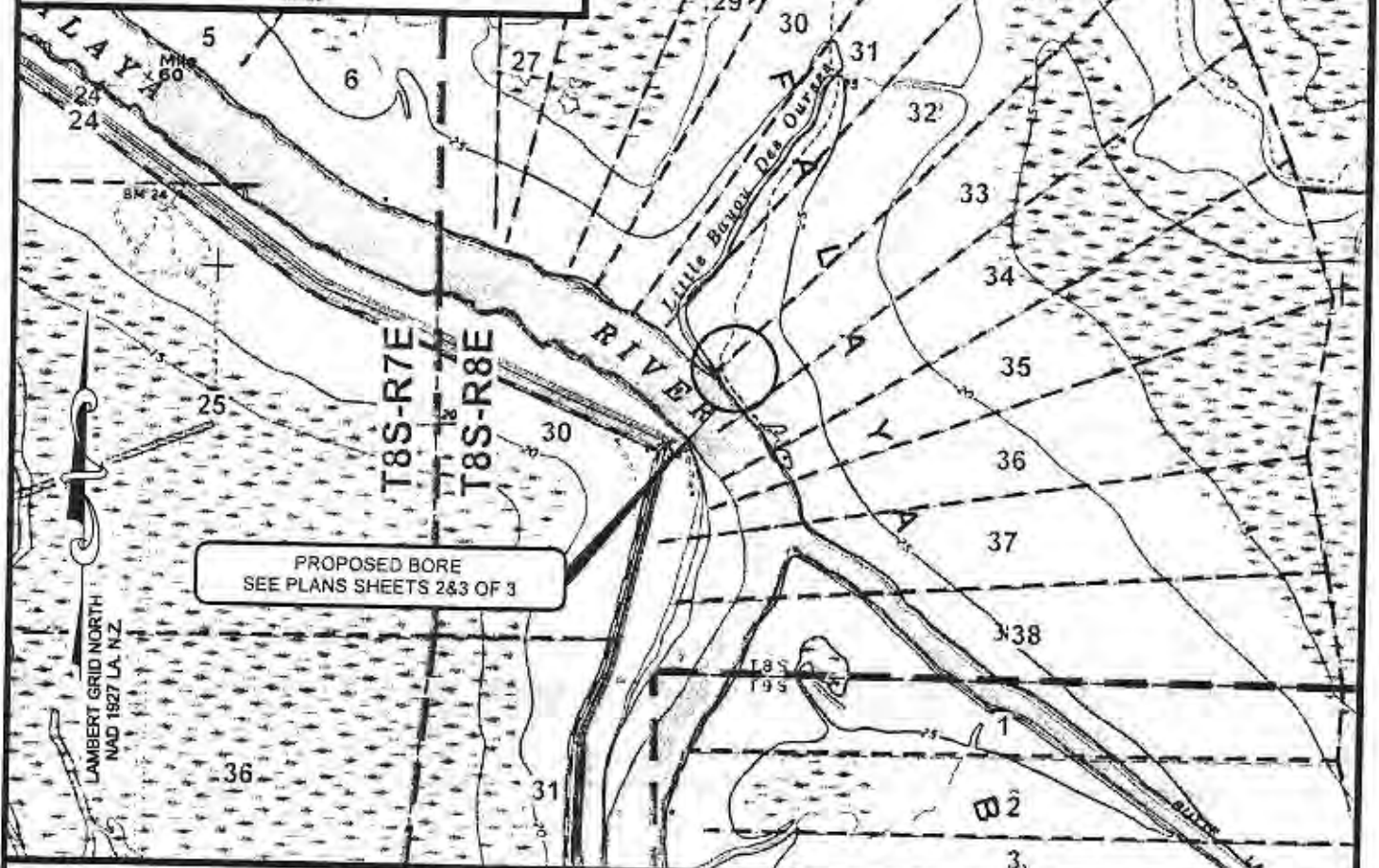
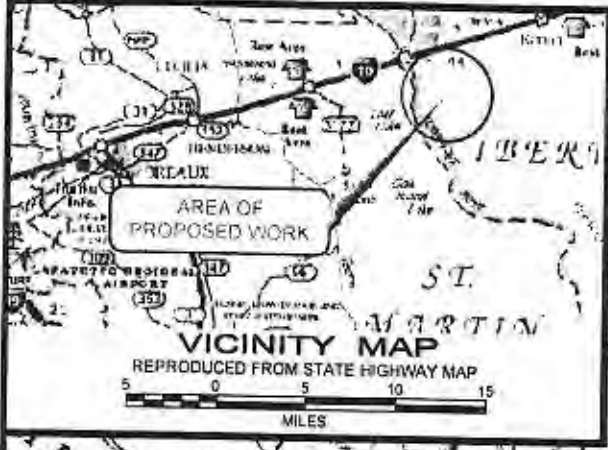
Sincerely,

TIM MORTON & ASSOCIATES, INC.



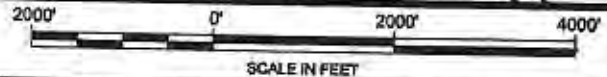
Donna Hollier, CPS
Agent for Kenneth Bernhard

dh
Attachments



LOCATION MAP

REPRODUCED FROM USGS BUTTE LA ROSE QUADRANGLE



KENNETH BERNHARD
200 Llainsfair Drive
Lafayette, LA 70503

PROPOSED BORE
BUTTE LA ROSE AREA
ST. MARTIN PARISH, LOUISIANA

PREPARED BY C&I Technologies

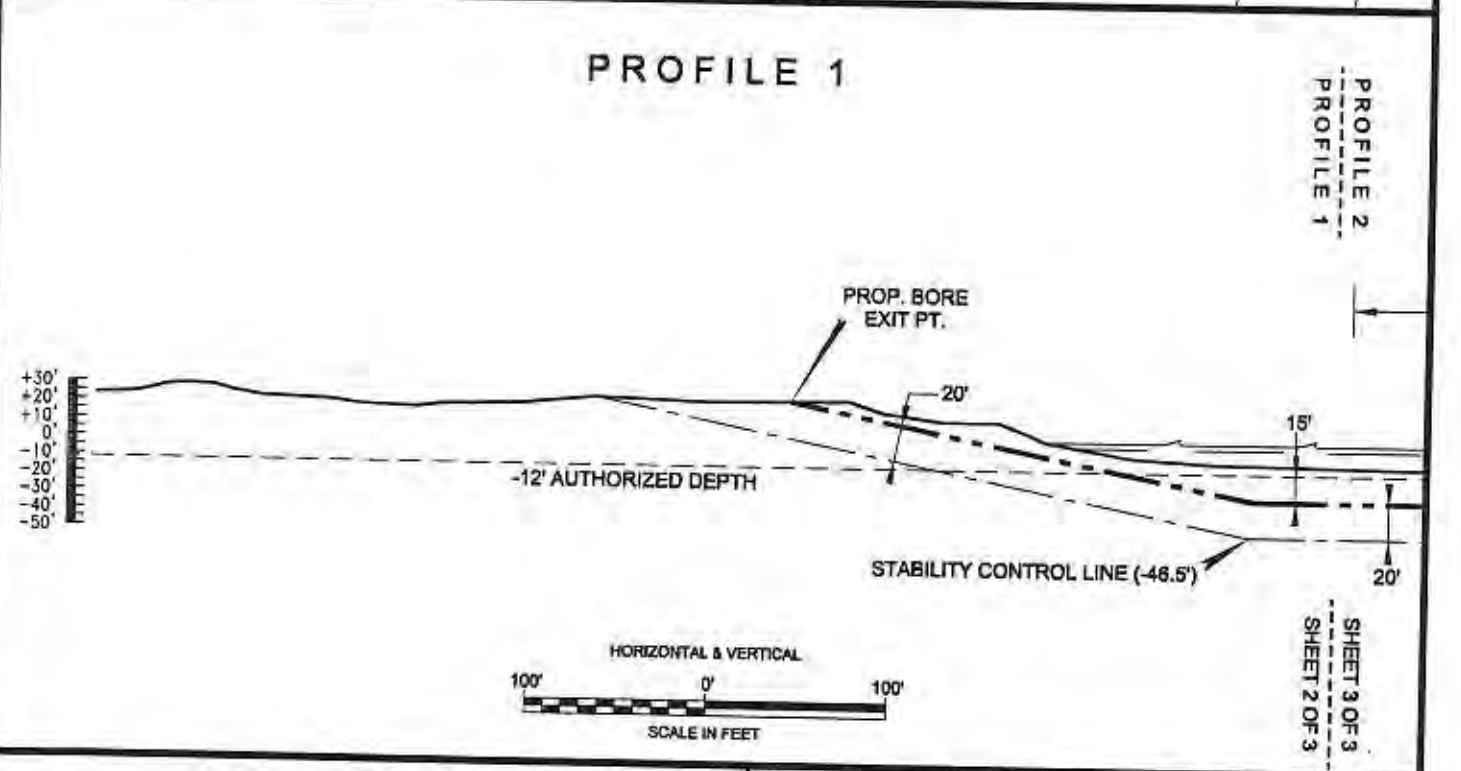
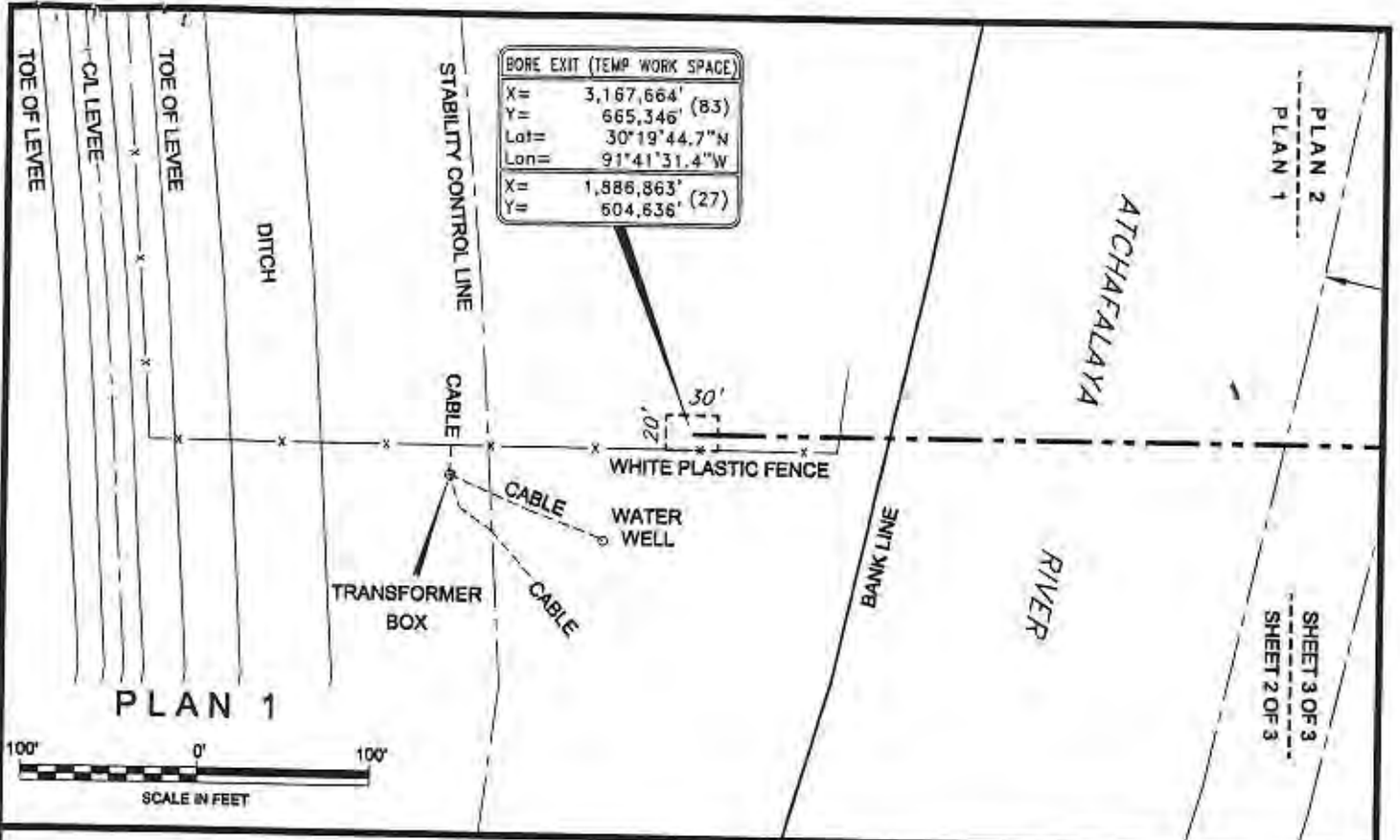
JOB NO. 100776 DWG: REP CHK: HEK

REVISED:

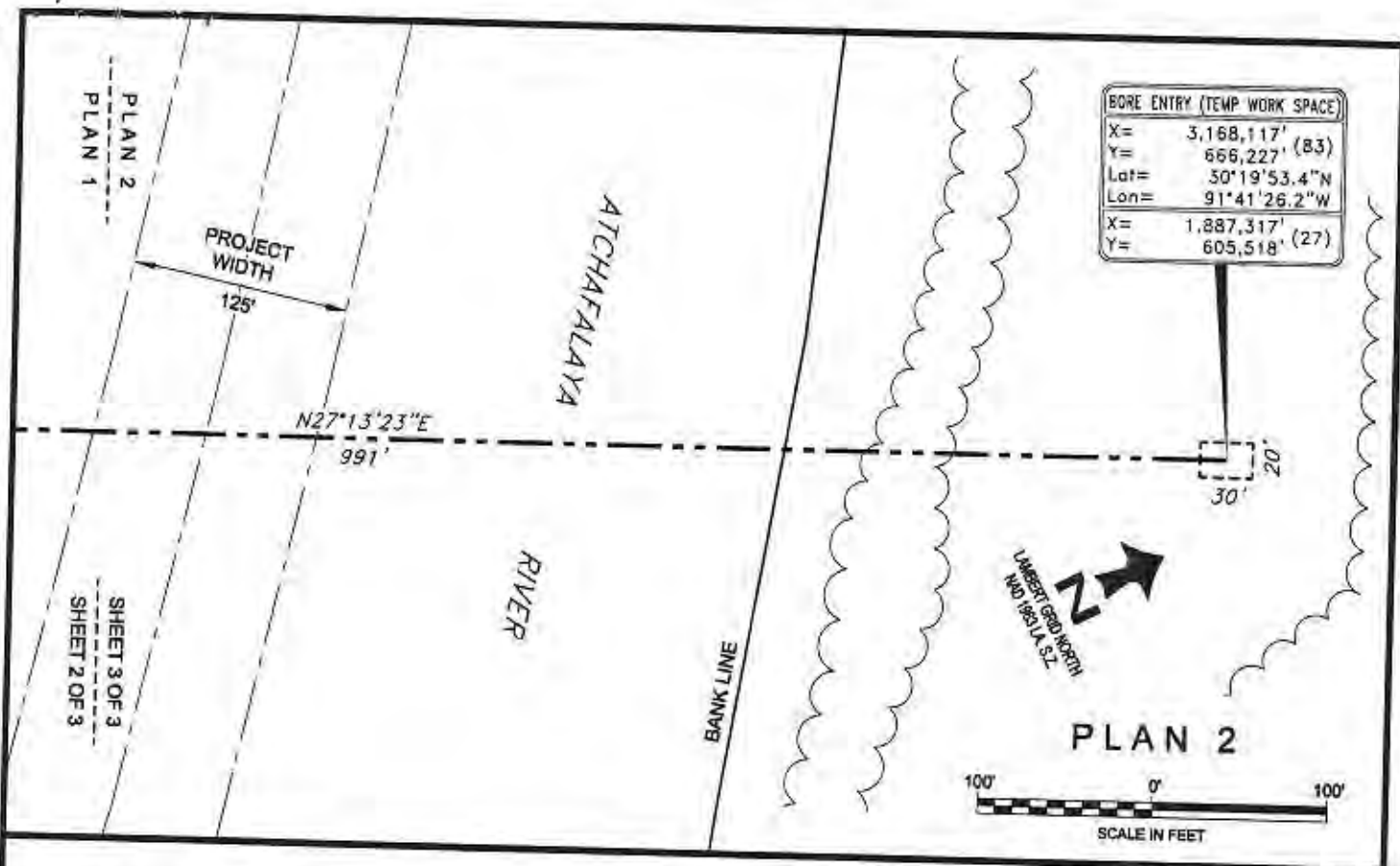
DATE: 3/15/2011

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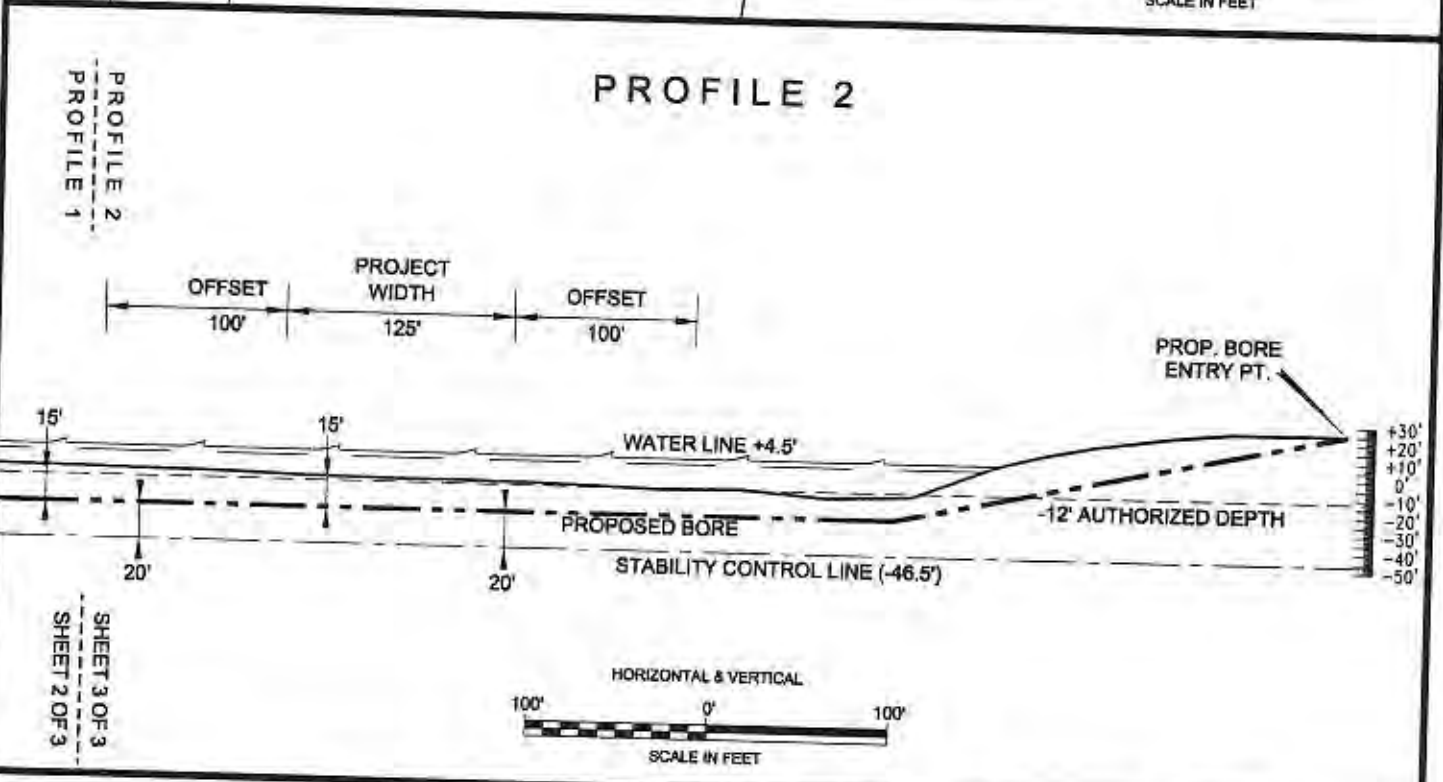
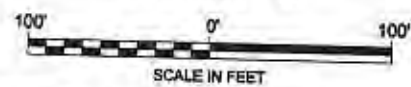
SHEET 1 OF 3



KENNETH BERNHARD 200 Llainsfair Drive Lafayette, LA 70503		PROPOSED BORE BUTTE LA ROSE ST. MARTIN PARISH, LOUISIANA			
PREPARED BY C&C Technologies SURVEY SERVICES 730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 281-0880 LA. REGISTRATION NUMBER: 330	JOB NO. 100776	DWG: REP	CHK: HEK	REVISED:	DATE: 3/15/2011
FILENAME: L:\08S08E\100776\IC100776A.DWG			SHEET 2 OF 3		



BORE ENTRY (TEMP WORK SPACE)	
X=	3,168,117' (83)
Y=	666,227' (83)
Lat=	30°19'53.4\"N
Lon=	91°41'26.2\"W
X=	1,887,317' (27)
Y=	605,518' (27)



KENNETH BERNHARD 200 Llainsfair Drive Lafayette, LA 70503	PROPOSED BORE BUTTE LA ROSE ST. MARTIN PARISH, LOUISIANA		
PREPARED BY C&C Technologies SURVEY SERVICES 730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA, (337) 281-0900 LA. REGISTRATION NUMBER: 330	JOB NO. 100776 DWG: REP CHK: HEK REVISED:	DATE: 3/15/2011	SHEET 3 OF 3
FILENAME: L:\08S08E\100776\IC100776A.DWG			

March 16, 2011

MEMORANDUM FOR: Mike Lowe

SUBJECT: Review of Permit Application for need of Engineering Division Review.

- 1. The attached permit application is forwarded for your determination as to need for an Engineering Division Review. Please forward your response within 2 days of the date of this memorandum.
- 2. Information relative to this application is as follows:

APPLICANT: Kenneth Bernhard

APPLICATION No.: MVN 2011-0563 WB

PROJECT MANAGER: Darlene Herman X2287


 Pete J. Serio
 Chief, Regulatory Branch

- 2 Encls
- 1. Appl. form
 - 2. Set of dwgs.


CEMVN-OD-G 1st end

DATE: 3/18/2011

FOR: Chief, Regulatory Branch

Reference permit application forwarded for determination as to need for a Engineering Division Review.

- a. Forward application to Engineering Division review. Review time may be charged to J2K69K
- b. The impacts are minor. Engineering review is not required. See "other" for conditions or additional comments (if any).
- c. Other. See enclosed comments.


 OPERATIONS MANAGER .

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants
730 E. Kaliste Saloom Road
Lafayette, LA 70508

(337) 234-5124

(337) 235-3632 (FAX)

March 4, 2011

MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

Re: Kenneth Bernhard, Proposed Electrical Line Bore, Atchafalaya River, Butte La Rose Area, St. Martin Parish, Louisiana

Dear Mr. Duke,

Mr. Kenneth Bernhard proposes to directionally drill a utility crossing across the Atchafalaya River near Butte La Rose, Louisiana, for the purpose of providing electricity to his property which is located on the left descending bank of the river. It is anticipated that an 8-inch diameter hole would be directionally drilled across the river and three 2-inch pipes would be run in that hole. The bore entry point would be located on Mr. Bernhard's property. The bore exit point would be located in the batture at a site approximately 332-feet from the centerline of the Atchafalaya River Protection levee and approximately 114-feet from the bank of the river. A stability control line survey was conducted at the project site by Eustis Engineering, and a report of their findings is included with this application. In accordance with those findings, the bore exit point would be located approximately 117-feet riverward of the levee stability control line.

In accordance with the burial requirements outlined in the New Orleans District, Corps of Engineers' May 31, 2010 Public Notice, the proposed utility line crossing would be bored a minimum of 15-feet below the mudline of the Atchafalaya River. A minimum distance of 20-feet would be maintained between the bore and the levee stability control line. Approval for the installation of these proposed pipelines is requested under Nationwide Permit No. 12 from your agency.

We believe that the proposed project site falls within an area in which the Corps of Engineers has a real estate interest. U.S. Government Easement No. DACW29-9-11-66 was granted to Mr. Bernhard by your agency for the purpose of constructing and maintaining the camp site, boat dock and walkway which this proposed utility line will serve. The applicant hereby respectfully requests that the utility line that is proposed in this application be included for coverage in the aforementioned Real Estate Consent.

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants

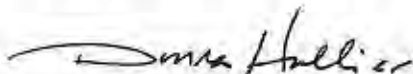
MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
Page Two
March 4, 2011

If additional information is required, please advise. I may be reached at 337/735-3882. Thank you for your consideration of this application.

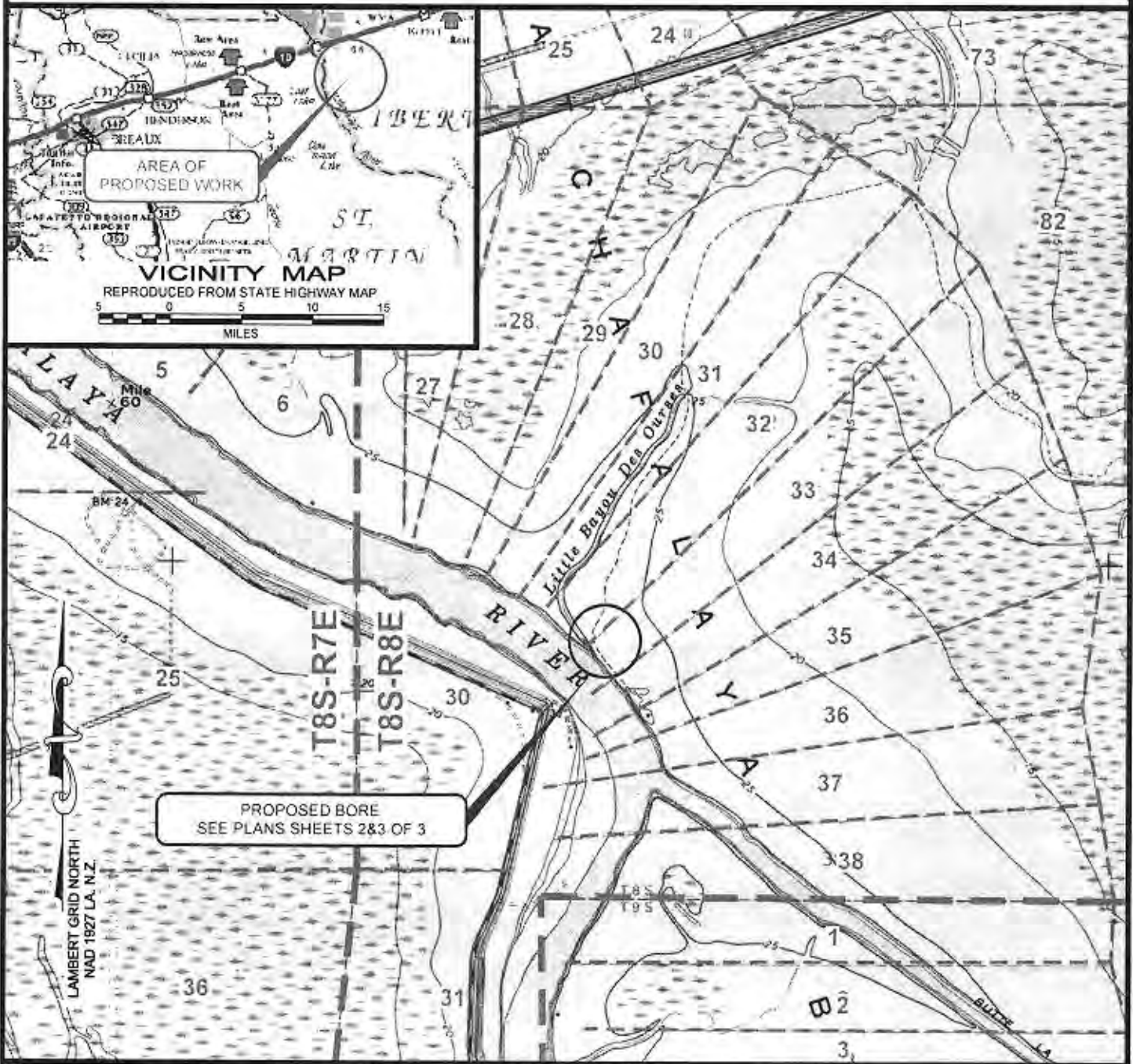
Sincerely,

TIM MORTON & ASSOCIATES, INC.



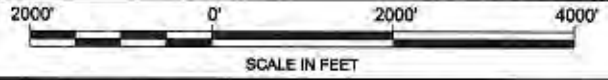
Donna Hollier, CPS
Agent for Kenneth Bernhard

dh
Attachments



LOCATION MAP

REPRODUCED FROM USGS BUTTE LA ROSE QUADRANGLE



KENNETH BERNHARD

200 Llainsfair Drive
Lafayette, LA 70503

**PROPOSED BORE
BUTTE LA ROSE AREA
ST. MARTIN PARISH, LOUISIANA**

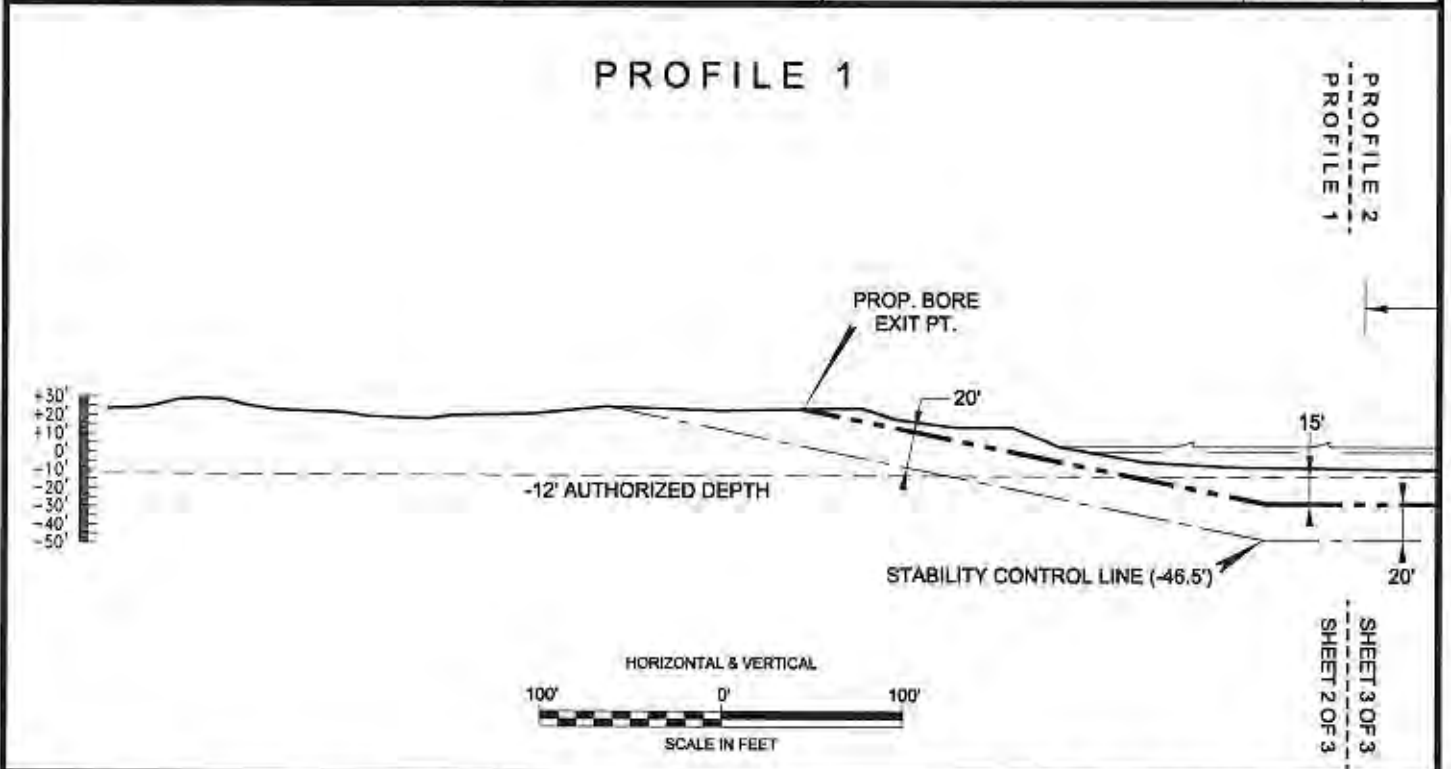
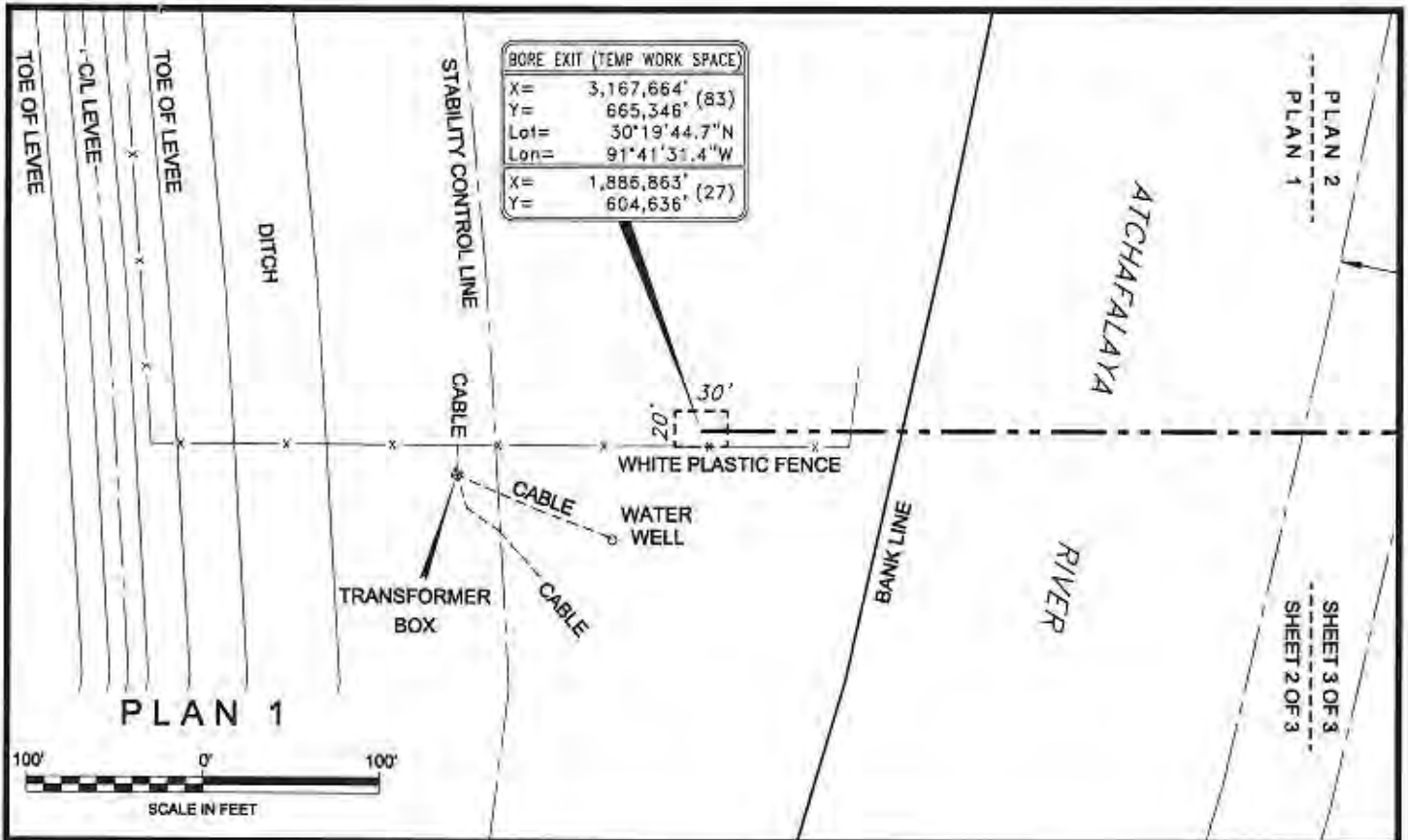
PREPARED BY C&C Technologies

JOB NO. 100776 DWG: REP CHK: HEK REVISED:

DATE: 3/15/2011

FILENAME: L:\08S08E\100776\C100776.DWG

SHEET 1 OF 3



<p>KENNETH BERNHARD 200 Llainsfair Drive Lafayette, LA 70503</p>		<p>PROPOSED BORE BUTTE LA ROSE ST. MARTIN PARISH, LOUISIANA</p>	
<p>PREPARED BY C&C Technologies SURVEY SERVICES 730 E. KALISTE SALOOM ROAD, LAFAYETTE, LA (337) 281-0600 LA REGISTRATION NUMBER: 330</p>	<p>JOB NO. 100776</p>	<p>DWG: REP</p>	<p>CHK: HEK</p>
<p>FILENAME: L:\08S08E\100776\C100776A.DWG</p>		<p>REVISED:</p>	<p>DATE: 3/15/2011</p>
<p>SHEET 2 OF 3</p>			

MEMORANDUM FOR: Chief/CEMVN-OD-SW

SUBJECT: Review of Permit MVN-2011-0563-WB to install an electrical line by boring with a directional drill beneath the Atchafalaya River at approximate Mile 60 by Kenneth Bernhard near Butte La Rose, St. Martin Parish, Louisiana (Mailtrax #11-6397)

1. Reference CEMVN-OD-SW memorandum dated 23 March 2011 requesting review of the subject permit.
2. Engineering Division has reviewed the subject permit request. We have no adverse comments regarding the subject permit request provided the following changes and/or additions are made an integral part of the letter of no objection. Written verification of these provisions should be requested and the agreements made part of our files. Accomplishment of the above negates the necessity of further review of the permit request by us.
 - a. No drilling or excavation will be performed when river stage on the Carrollton gage is elevation +11.0 or higher.
3. Point of contact for this permit review is Jason Binet, telephone extension 2127.


WALTER O. BAUMY, JR., P.E.
Chief, Engineering Division

Encl
No

CF: CEMVN-ED-F (Bivona)

CEMVN-OD-SW


11-6398
March 23, 2011

MEMORANDUM FOR C/Engineering Div

SUBJECT: MVN 2011-0563 WB

1. Submitting application by Kenneth Bernhard for an electrical line bore, beneath the Atchafalaya River in Butte LaRose area in St. Martin Parish, Louisiana.
2. Please respond within 10 working days of this memo. A lack of response will construed as a no comment.
3. If you need assistance call Darlene Herman at X2287.

Encls


Pete J. Serio
Chief, Regulatory Branch

March 16, 2011

MEMORANDUM FOR: Mike Lowe

SUBJECT: Review of Permit Application for need of Engineering Division Review.

1. The attached permit application is forwarded for your determination as to need for an Engineering Division Review. Please forward your response within 2 days of the date of this memorandum.
2. Information relative to this application is as follows:

APPLICANT: Kenneth Bernhard

APPLICATION No.: MVN 2011-0563 WB

PROJECT MANAGER: Darlene Herman X2287


Pete J. Serio
Chief, Regulatory Branch

2 Encls

1. Appl. form
2. Set of dwgs.


CEMVN-OD-G 1st end

DATE: 3/18/2011

FOR: Chief, Regulatory Branch

Reference permit application forwarded for determination as to need for a Engineering Division Review.

- a. Forward application to Engineering Division review. Review time may be charged to J2KG9K
- b. The impacts are minor. Engineering review is not required. See "other" for conditions or additional comments (if any).
- c. Other. See enclosed comments.


OPERATIONS MANAGER.

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants
730 E. Kaliste Saloom Road
Lafayette, LA 70508

(337) 234-5124

(337) 235-3632 (FAX)

March 4, 2011

MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

Re: Kenneth Bernhard, Proposed Electrical Line Bore, Atchafalaya River, Butte La Rose Area, St. Martin Parish, Louisiana

Dear Mr. Duke,

Mr. Kenneth Bernhard proposes to directionally drill a utility crossing across the Atchafalaya River near Butte La Rose, Louisiana, for the purpose of providing electricity to his property which is located on the left descending bank of the river. It is anticipated that an 8-inch diameter hole would be directionally drilled across the river and three 2-inch pipes would be run in that hole. The bore entry point would be located on Mr. Bernhard's property. The bore exit point would be located in the batture at a site approximately 332-feet from the centerline of the Atchafalaya River Protection levee and approximately 114-feet from the bank of the river. A stability control line survey was conducted at the project site by Eustis Engineering, and a report of their findings is included with this application. In accordance with those findings, the bore exit point would be located approximately 117-feet riverward of the levee stability control line.

In accordance with the burial requirements outlined in the New Orleans District, Corps of Engineers' May 31, 2010 Public Notice, the proposed utility line crossing would be bored a minimum of 15-feet below the mudline of the Atchafalaya River. A minimum distance of 20-feet would be maintained between the bore and the levee stability control line. Approval for the installation of these proposed pipelines is requested under Nationwide Permit No. 12 from your agency.

We believe that the proposed project site falls within an area in which the Corps of Engineers has a real estate interest. U.S. Government Easement No. DACW29-9-11-66 was granted to Mr. Bernhard by your agency for the purpose of constructing and maintaining the camp site, boat dock and walkway which this proposed utility line will serve. The applicant hereby respectfully requests that the utility line that is proposed in this application be included for coverage in the aforementioned Real Estate Consent.

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants

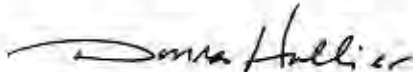
MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
Page Two
March 4, 2011

If additional information is required, please advise. I may be reached at 337/735-3882. Thank you for your consideration of this application.

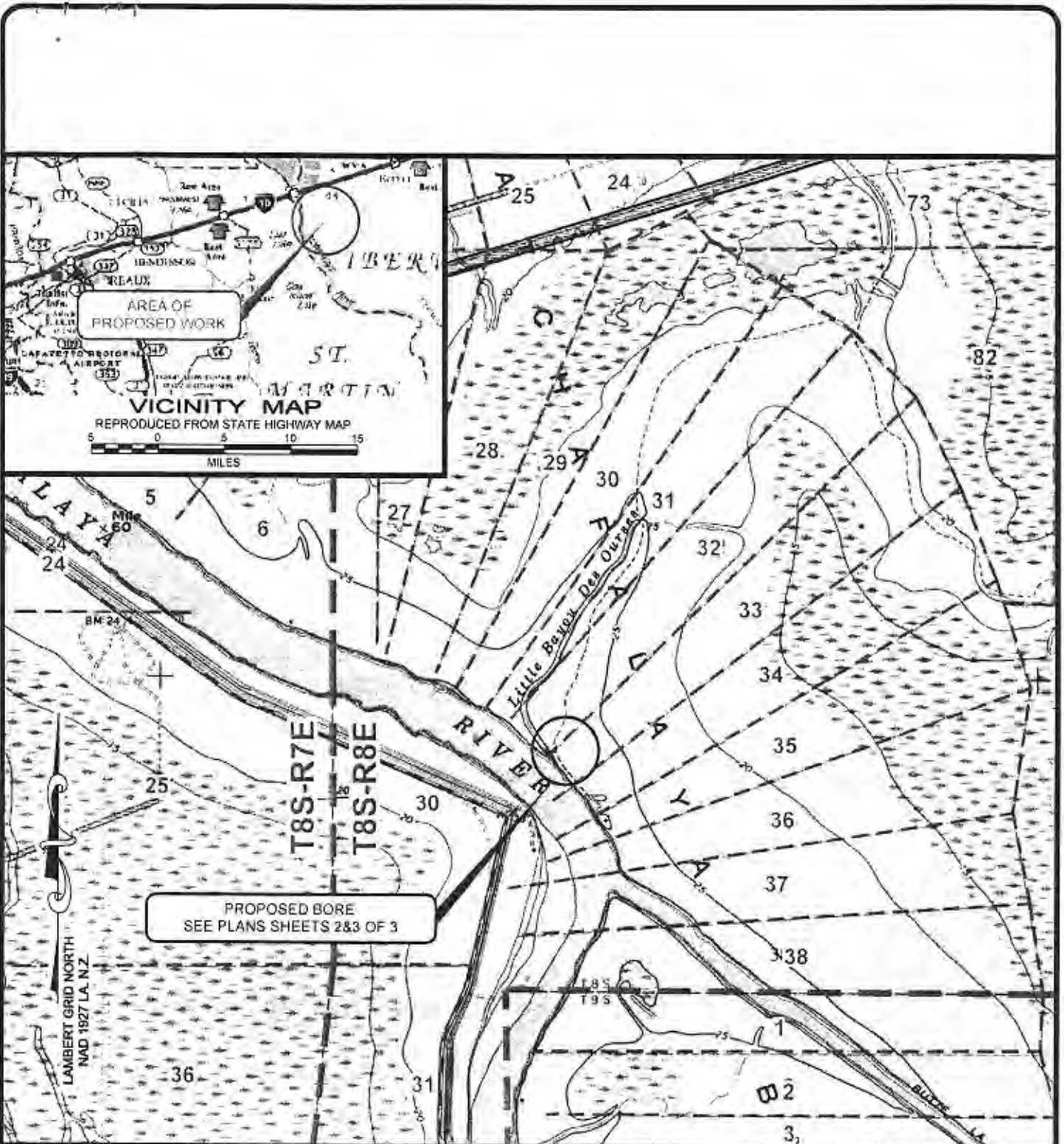
Sincerely,

TIM MORTON & ASSOCIATES, INC.



Donna Hollier, CPS
Agent for Kenneth Bernhard

dh
Attachments



LOCATION MAP

REPRODUCED FROM USGS BUTTE LA ROSE QUADRANGLE

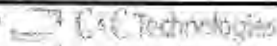


KENNETH BERNHARD

200 Llainsfair Drive
Lafayette, LA 70503

**PROPOSED BORE
BUTTE LA ROSE AREA
ST. MARTIN PARISH, LOUISIANA**

PREPARED BY



JOB NO. 100776

DWG. REP

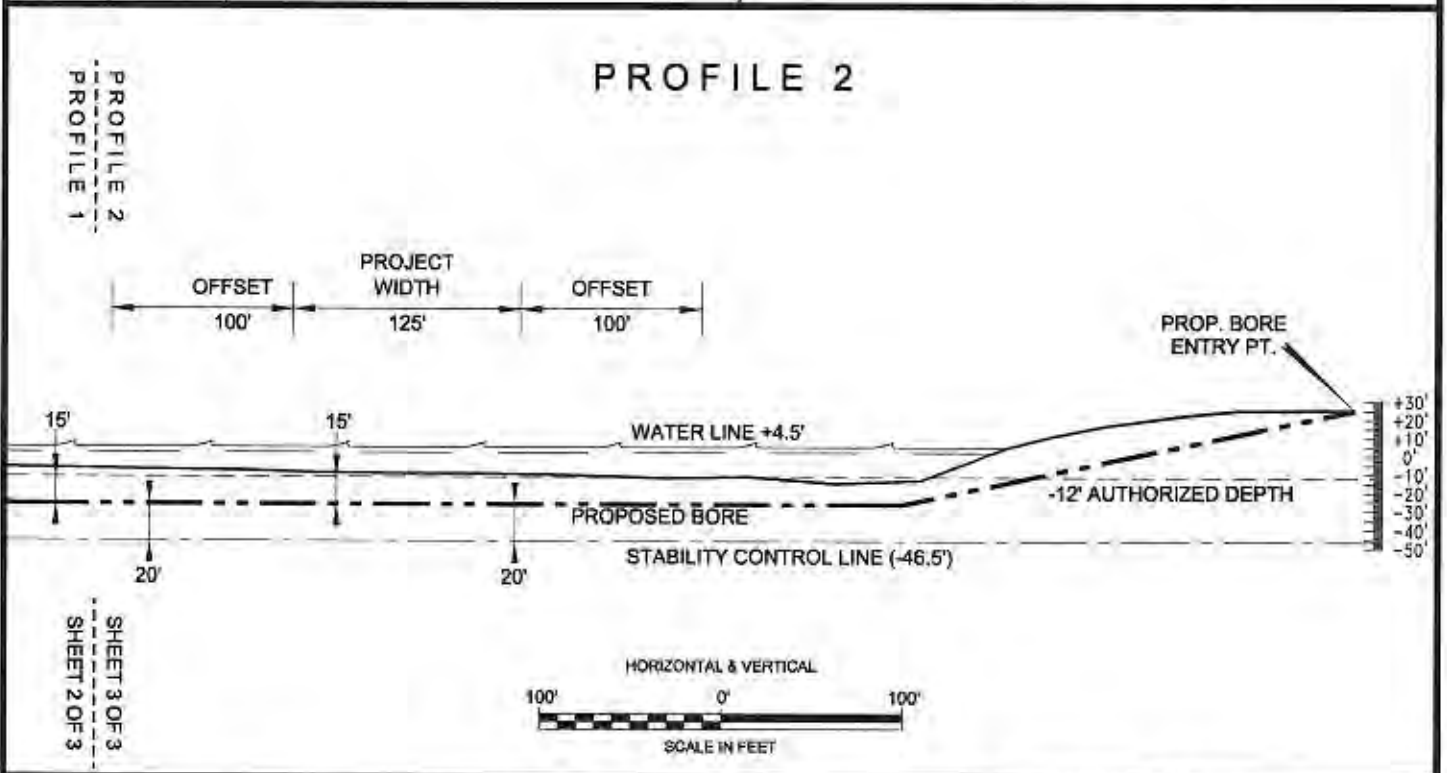
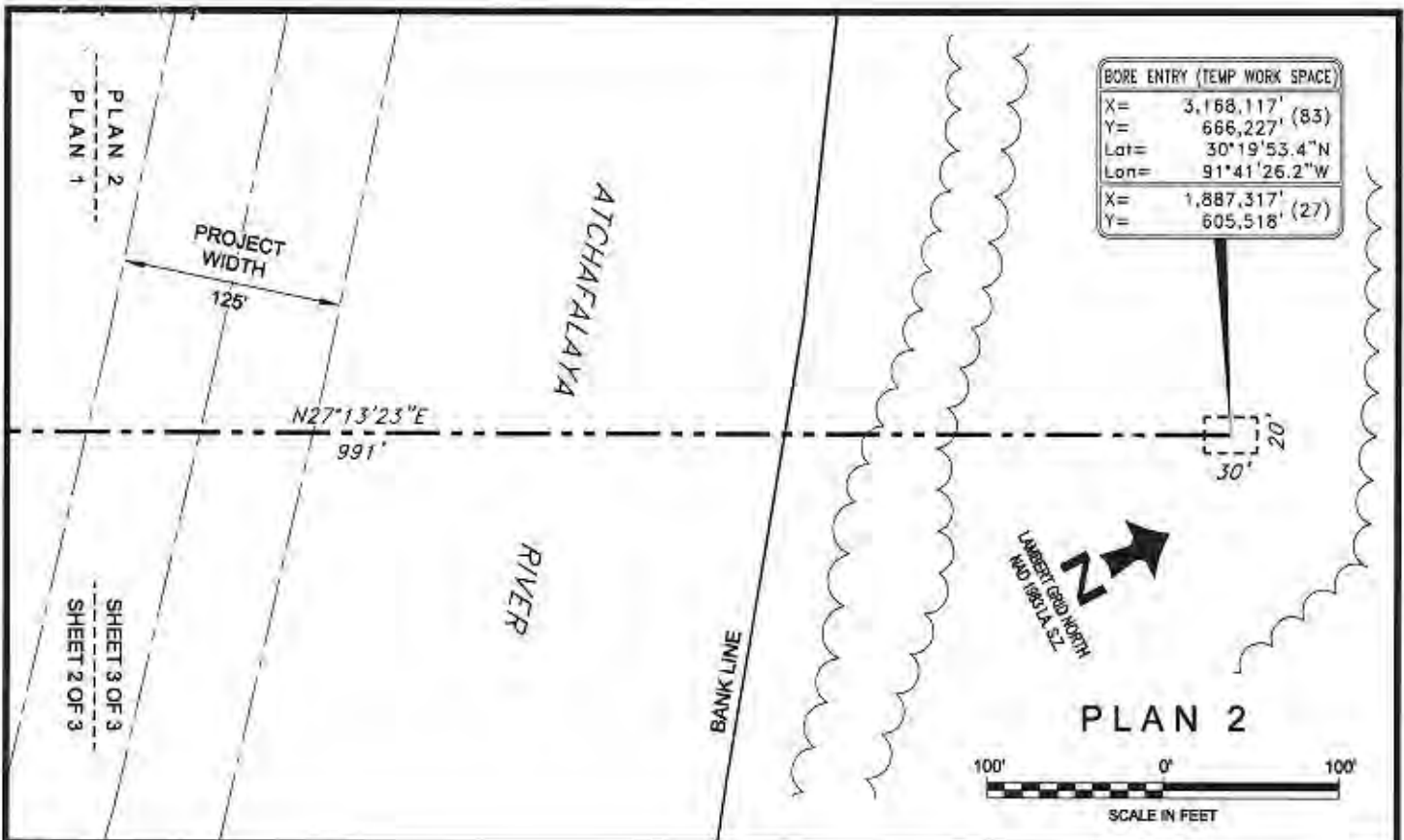
CHK: HEK

REVISED:

DATE: 3/15/2011

FILENAME: L:\08S08E\100776\C100776.DWG

SHEET 1 OF 3



KENNETH BERNHARD 200 Llainsfair Drive Lafayette, LA 70503		PROPOSED BORE BUTTE LA ROSE ST. MARTIN PARISH, LOUISIANA	
PREPARED BY C&C Technologies SURVEY SERVICES 730 E. KAUSTE SALOOM ROAD, LAFAYETTE, LA (337) 281-2860 LA REGISTRATION NUMBER: 330	JOB NO. 100776 DWG: REP CHK: HEK	REVISED:	DATE: 3/15/2011
FILENAME: L:\08S08E\100776\100778A.DWG		SHEET 3 OF 3	



EUSTIS ENGINEERING SERVICES, L.L.C.

202 PARK WEST DRIVE
SCOTT, LOUISIANA 70583
PN 337-268-9755 | FN 337-268-9756
EMAIL: INFO@EUSTISENG.COM | SITE: WWW.EUSTISENG.COM

26 January 2011

Bernhard Mechanical Contractors, Inc.
Post Office Box 62690
Lafayette, Louisiana 70596-2690

Attention Mr. Kenneth Bernhard

Gentlemen:

Geotechnical Investigation
Bernhard Mechanical Contractors, Inc.
Horizontal Directional Drill Crossing
Atchafalaya River
Butte La Rose, Louisiana
Eustis Engineering Project No. L0125

Transmitted are three copies (two bound and one unbound) of our report covering a geotechnical investigation for the subject project. An electronic copy of this report has been sent to you.

Thank you for asking us to perform these services.

Yours very truly,

EUSTIS ENGINEERING SERVICES, L.L.C.

SHAUN R. SIMON, P.E.

SRS:brp/kdl



GEOTECHNICAL INVESTIGATION
BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA
EUSTIS ENGINEERING PROJECT NO. L0125

FOR
BERNHARD MECHANICAL CONTRACTORS, INC.
LAFAYETTE, LOUISIANA

26 JANUARY 2011



EUSTIS ENGINEERING SERVICES, L.L.C.

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GEOTECHNICAL INVESTIGATION
BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA
EUSTIS ENGINEERING PROJECT NO. L0125

FOR
BERNHARD MECHANICAL CONTRACTORS, INC.
LAFAYETTE, LOUISIANA

By
Eustis Engineering Services, L.L.C.
Scott, Louisiana

26 JANUARY 2011

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	1
SCOPE	2
SOIL BORINGS	2
LABORATORY TESTS	4
DESCRIPTION OF SUBSOIL CONDITIONS	4
Stratigraphy	4
Ground Water	5
ENGINEERING ANALYSES	5
Furnished Information	5
Stability Analyses	5
Levee Reconstruction	6
ADDITIONAL GEOTECHNICAL SERVICES	7
FIGURES 1 THROUGH 4	
APPENDICES I AND II	

GEOTECHNICAL INVESTIGATION
BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA
EUSTIS ENGINEERING PROJECT NO. L0125

INTRODUCTION

1. This report contains the results of a geotechnical investigation performed for the proposed horizontal directional drill crossing of the Atchafalaya River for utilities to be installed. The project site is in the vicinity of levee Station 2845+00 near Butte La Rose, Louisiana. The work was performed in general accordance with the scope outlined in Eustis Engineering Services, L.L.C.'s proposal dated 12 October 2010, which was accepted on 29 November 2010 by Mr. Kenneth Bernhard.
2. This report has been prepared in accordance with generally accepted geotechnical engineering practice for the exclusive use of Bernhard Mechanical Contractors, Inc., and their designated representatives for specific application to the subject site. In the event of any changes in the nature, design, or location of the proposed horizontal directional drill crossing, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified and verified in writing. Should these data be used by anyone other than Bernhard Mechanical Contractors and their designated representatives, they should contact Eustis Engineering for interpretation of data and to secure any other information pertinent to this project.
3. Recommendations and conclusions contained in this report are to some degree subjective having partial basis in engineering judgement and experience particular

to the design engineer. For this reason, the report in its entirety should not be included in the contract plans and specifications. However, the results of the soil borings and laboratory tests contained in Appendix I of this report may be included in the plans and specifications.

4. Further note, the analyses and recommendations contained in this report are based, in part, on data obtained from the soil borings. The individual boring logs are considered representative of subsurface conditions at their respective locations on the dates completed. No warranty is given that the logs are representative of subsurface conditions at other locations or times. The nature and extent of variations in subsurface conditions between and away from the boring locations may not become evident until construction. If such variations then appear, it will be necessary to reevaluate the recommendations contained in this report.

SCOPE

5. The investigation included the drilling of soil test borings to evaluate subsoil conditions and stratification, and to obtain samples of the various substrata. Soil mechanics laboratory tests, performed on samples obtained from the borings, were used to evaluate the physical properties of the subsoils. Engineering analyses, based on the soil borings and laboratory tests were made to determine recommendations regarding site preparation, drainage, placement and compaction of fill, slope stability, and construction recommendations.

SOIL BORINGS

6. Three undisturbed borings were made at the site (in the vicinity of the U.S. Army Corps of Engineer's levee baseline Station 2845+00) on 7 and 8 December 2010. Prior to drilling, permission was received from the Atchafalaya Basin Levee District including letters of no objection from the USACE and State of Louisiana, Office of

Coastal Protection and Restoration. Boring 1 was made to a depth of 100 feet at the levee centerline. Boring 2 was made to a depth of 60 feet at the flood side toe of the levee. Boring 3 was made on the river's bank to a depth of 60 feet. The approximate locations of the borings are shown on Figure 1. The GPS coordinates of the actual locations are provided on the boring logs in Appendix I. Ground surface elevations at the boring locations were furnished by C & C Technologies, Inc.

7. Detailed descriptive logs of the borings and laboratory tests are shown in both tabular and graphical form in Appendix I. Upon completion of drilling the borings, the holes were backfilled in accordance with current regulatory requirements and as stipulated by the permit.
8. The undisturbed soil borings were made with a truck mounted rotary type drill rig. Undisturbed samples of cohesive or semi-cohesive subsoils were obtained at close intervals or changes in stratum using a 3-in. diameter thinwall Shelby tube sampler. The samples were immediately extruded from the sampler, inspected, and visually classified by Eustis Engineering's soil technician. Pocket penetrometer tests were performed on the soil samples to give a general indication of their shear strength or consistency. The results of these tests are shown on the boring logs in Appendix I under the column heading "PP." Representative samples were then promptly placed in moisture proof containers and sealed for preservation of their natural moisture content.
9. Cohesionless and semi-cohesive soils were obtained during the performance of in situ Standard Penetration Tests. This test consists of driving a 2-in. diameter splitspoon sampler 1 foot into the soil after first seating the sampler 6 inches. A 140-lb weight dropped 30 inches is used to advance the sampler. The number of blows required to drive the sampler through the final 1-ft increment is indicative of the relative density or approximate consistency of the subsoils tested. The results

of the Standard Penetration Tests are shown on the boring logs in Appendix I under the column heading "SPT." Representative samples were placed in moisture proof containers for preservation of their natural moisture content.

LABORATORY TESTS

10. Soil mechanics laboratory tests, consisting of natural water content, unit weight, unconfined compression shear (UC), and one-point unconsolidated undrained triaxial compression shear (OB), were performed on undisturbed samples obtained from the borings. In addition, Atterberg liquid and plastic limits tests were performed on selected representative samples to aid in classification of the subsoils and to give an indication of their relative compressibility. The results of the laboratory tests are summarized on the boring logs in Appendix I.

DESCRIPTION OF SUBSOIL CONDITIONS

Stratigraphy

11. Our interpretation of the stratigraphy at the boring locations is shown on the logs in Appendix I. Reference to the boring logs shows the Atchafalaya River guide levee comprises loose to dense brown and tan silty sand to el 21.5 (NAVD 88 Datum). Beneath the levee deposits and beginning at the ground surface in Boring 3, deposits of very soft to stiff gray, brown, tan, and dark gray clay, sandy clay, organic clay, and loose brown sandy silt extend to depths ranging from el 0 to el -9. These deposits are interspersed by loose to medium dense tan, brown, and gray sand and silty sand in Boring 1 between el 19.5 and el 17.5 and in Borings 2 and 3 between el 15.5 and el 13.5. Deposits of very loose to dense gray sand, silty sand, and clayey sand extend from el 0 to el -21 in Borings 1 and 2 and to the termination of Boring 3 at el -34.5. Continuing in Borings 1 and 2, deposits of soft to stiff gray clay and sandy clay were encountered to the termination of the borings.

Ground Water

12. In order to determine the ground water conditions at the time of the field investigation, observations were made in Boring 2. The boring was drilled without the addition of water to a depth of 15 feet. Free water was not encountered in the boring. After a period of 15 hours, the hole was observed to be dry to the 15-ft depth.
13. The depth to ground water will vary with climatic conditions, drainage improvements, water levels in the nearby Atchafalaya River, and other factors. The depth to ground water should be determined by those persons responsible for construction immediately prior to beginning work.

ENGINEERING ANALYSES

Furnished Information

14. We understand a horizontal directional drill will be required to provide utilities from the west bank of the Atchafalaya River to the east bank. The USACE has requested a stability control line be established for the project. The USACE has furnished a low water level of el 1.7 in the Atchafalaya River. Topographic and hydrographic surveys of the site dated 9 December 2010 were performed by C & C Technologies.

Stability Analyses

15. Design Methodology. Soil parameters utilized in our analyses are shown on Figure 2. A cross-section was furnished by C & C Technologies and is dated 9 December 2010. Stability analyses were performed using the USACE's Stability with UPLIFT program which uses the LMVD Method of Planes. The input and output runs for the

stability analyses are included as Appendix II. A minimum factor of safety equal to 1.3 was assumed for this method of analysis.

16. Levee Stability - Existing Conditions. Slope stability analyses were performed to evaluate the stability of the levee at low water conditions. These analyses assumed a low water level (LWL) in the Atchafalaya River at el 1.7 and are based on current survey data. The results of these analyses, shown on Figure 3, indicate a minimum factor of safety of 1.86 for the existing levee conditions.
17. Stability Control Line. Analyses have been performed to establish a stability control line for the proposed horizontal directional drill. The results of our analyses are shown on Figure 4 and indicate a minimum factor of safety of 1.31 assuming a 1 vertical on 5 horizontal degraded bank from el 26 to el -46.5. The horizontal directional drill should be conducted in accordance with the permit.

Levee Reconstruction

18. After the project is complete, it will be necessary to reconstruct and reshape the batture area to its existing cross-section should damage occur. It may be necessary to import cohesive (Unified Soil Classification CH/CL) material. Cohesive fill should have an organic content no greater than 9% as determined by ASTM D 2974, Method C, a maximum Atterberg liquid limit of 75, and a plasticity index no less than 10. The fill should have less than 35% sand retained on the No. 200 sieve by ASTM D 1140. The exposed surface should be scarified before fill is placed. The cohesive fill should be placed in 8 to 10-in. lifts and compacted near optimum moisture to at least 95% of its maximum dry density determined by ASTM D 698. Reconstruction should also meet all permit requirements.
19. Quality Control. Density tests should be performed on each lift of the compacted fill to determine if the contractor has achieved the recommended density. All

clearing, filling, and compaction operations should be accomplished only during periods of dry weather. The contractor should exercise caution during and after inclement weather to ensure subsoil support is not degraded by construction operations.

ADDITIONAL GEOTECHNICAL SERVICES

20. To provide continuity between the investigation, design, and construction phases, Eustis Engineering should be retained to provide additional services during completion of the project. These services may include consultation during design and construction, reviewing geotechnical aspects of plans and specifications, providing inspection of excavations, reviewing site drainage plans and construction sequences proposed by the contractor, testing and approval of proposed fill, and any other soils and materials testing services. Eustis Engineering offers a complete range of materials testing services which will provide quality control during construction and conformance to design specifications.

21. In summary, Eustis Engineering should be retained to monitor all geotechnical related work performed by the contractor. If construction problems arise, Eustis Engineering should be notified to participate in the development of solutions. This participation permits the geotechnical engineer to evaluate the effects of unanticipated conditions and propose solutions on the geotechnical design assumptions particular to the project. The design geotechnical engineer may also be able to judge how site specific soil and ground water conditions will affect the success of a proposed construction alternative.

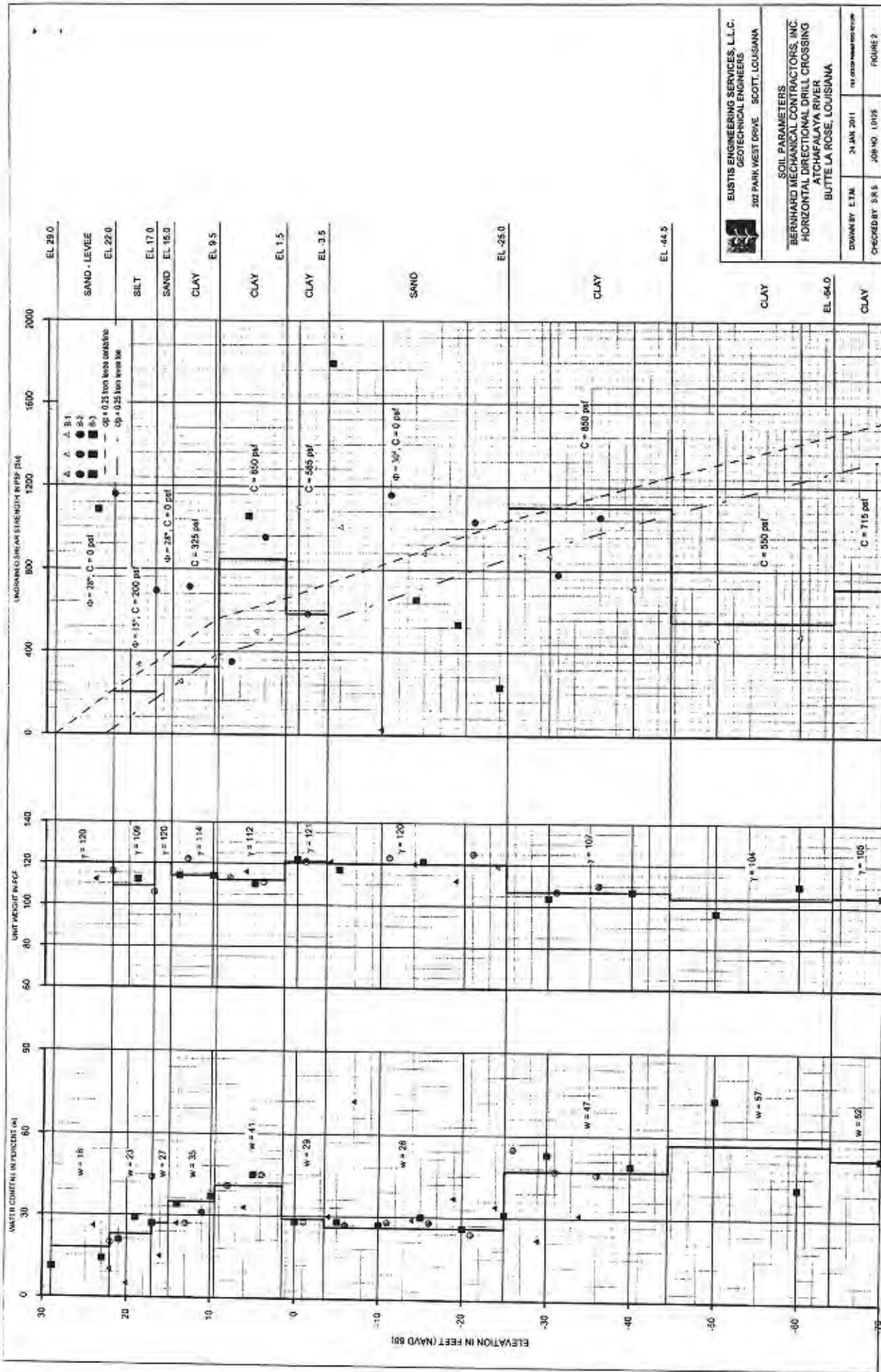


EUSTIS ENGINEERING SERVICES, L.L.C.
GEOTECHNICAL ENGINEERS
202 PARK WEST DRIVE SCOTT, LOUISIANA

LOCATION OF BORINGS
BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA

DRAWN BY: E.T.M. 24-JAN-2011 FILE NUMBER: GNF
CHECKED BY: S.R.S. JOB NO.: LD25 FIGURE: 1

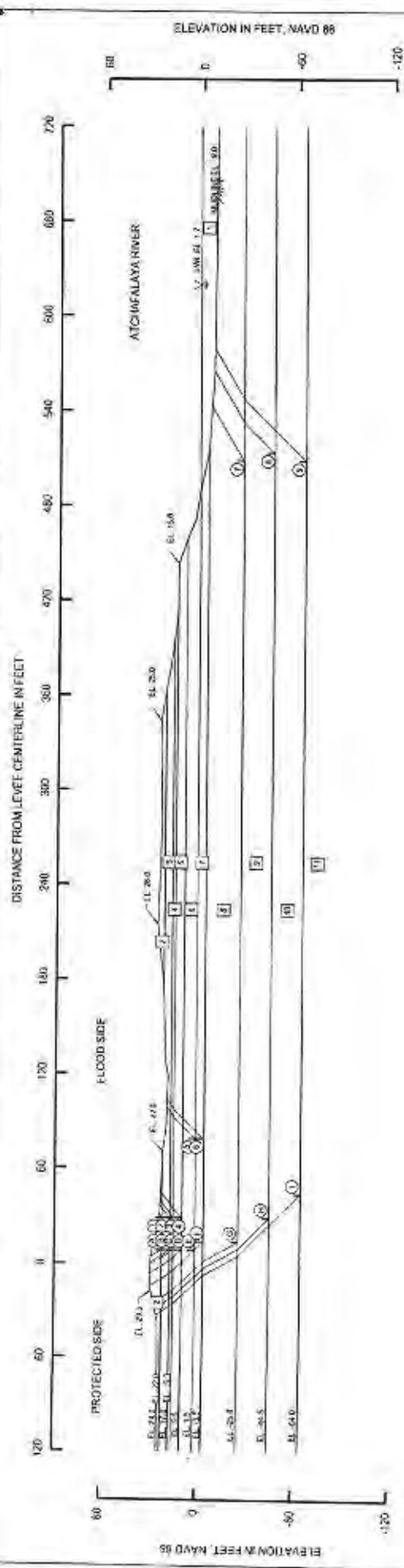
Ⓞ DENOTES UNDISTURBED SOIL BORINGS DRILLED 7 AND 8 DECEMBER 2010.
NOT TO SCALE



EUSTIS ENGINEERING SERVICES, L.L.C.
 GEOTECHNICAL ENGINEERS
 202 PARK WEST DRIVE SCOTT, LOUISIANA

SOIL PARAMETERS
 BERNHARD MECHANICAL CONTRACTORS, INC.
 HORIZONTAL DIRECTIONAL DRILL CROSSING
 ATCHAFALAYA RIVER
 BUTTE LA ROSE, LOUISIANA

DRAWN BY: L.T.M. 24 JAN. 2011
 CHECKED BY: S.R.S. JOB NO. 10158
 FIGURE 2



- NOTES:
1. SLOPE STABILITY ANALYSES PERFORMED BY LWD METHOD OF PLANES.
 2. FACTOR OF SAFETY COMPUTED AS RATIO OF RESISTING TO DRIVING FORCES.
 3. LEVEE CROSS-SECTION AND RIVER BANK CONFIGURATION BASED ON SURVEY DATED 9 DECEMBER 2010 BY C & C TECHNOLOGIES.

FAILURE SURFACE	SUMMATION OF FORCES IN KIPLS.F.		FACTOR OF SAFETY
	RESISTING	DRIVING	
(A)	7.23	2.50	2.89
(B)	19.66	6.95	3.30
(C)	21.57	7.39	2.92
(D)	21.69	11.60	1.87
(E)	86.36	24.89	3.47
(F)	94.97	29.56	3.21
(G)	525.49	131.85	3.98
(H)	434.88	193.51	2.25
(I)	494.81	250.04	1.96

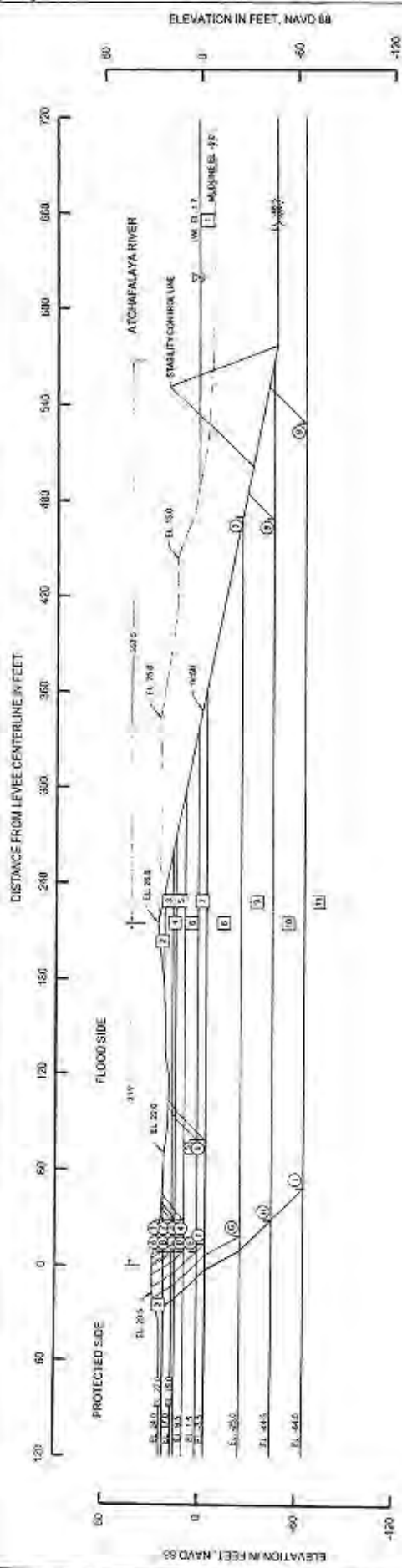
SOIL NO.	DESCRIPTION	FRICTION ANGLE IN DEGREES	UNIT WEIGHT IN PCF	COHESION IN PSF	
				AVG.	BASE
1	WATER	0	62.4	0	0
2	SAND	28	120	0	0
3	SILT	15	109	200	200
4	SAND	28	120	0	0
5	CLAY	0	114	325	325
6	CLAY	0	112	850	850
7	CLAY	0	123	585	585
8	SAND	30	120	0	0
9	CLAY	0	107	850	850
10	CLAY	0	104	550	550
11	CLAY	0	106	715	715

EUSTIS ENGINEERING SERVICES, L.L.C.
 GEOTECHNICAL ENGINEERS
 5007 L. OGDEN
 SUITE 100
 BUTTE LA ROSE, LOUISIANA

SLOPE STABILITY ANALYSES FLOOD SIDE OF LEVEE
 EXISTING CONDITIONS
 BERNHARD MECHANICAL CONTRACTORS, INC.
 HORIZONTAL DIRECTIONAL DRILL CROSSING
 ATCHAFALAYA RIVER
 BUTTE LA ROSE, LOUISIANA

DRAWN BY: J.L.S. PLOT DATE: 25 JAN 11 COMP FILE: 20100203
 CHECKED BY: S.R.S. JOB NO: 10126

FIGURE 3



NOTES:

1. SLOPE STABILITY ANALYSES PERFORMED BY LMVD METHOD OF PLANES.
2. FACTOR OF SAFETY COMPUTED AS RATIO OF RESISTING TO DRIVING FORCES.
3. LEVEE CROSS SECTION AND RIVER BANK CONFIGURATION BASED ON SURVEY DATED 9 DECEMBER 2010 BY C & C TECHNOLOGIES.

FAILURE SURFACE	SUMMATION OF FORCES IN KIPLS F.		FACTOR OF SAFETY
	RESISTING	DRIVING	
(A) ①	7.23	2.50	2.88
(B) ②	19.65	5.95	3.30
(C) ③	21.57	7.38	2.92
(D) ④	21.66	11.50	1.87
(E) ⑤	86.35	24.88	3.47
(F) ⑥	94.97	29.58	3.21
(G) ⑦	407.49	143.17	2.85
(H) ⑧	367.93	223.53	1.67
(I) ⑨	425.30	325.78	1.31

SOIL NO.	DESCRIPTION	FRICTION ANGLE IN DEGREES	UNIT WEIGHT IN PCF	COHESION IN PSF	
				AVS.	BASE
1	WATER	0	62.4	0	0
2	SAND	28	120	0	0
3	SILT	15	103	200	200
4	SAND	28	120	0	0
5	CLAY	0	114	325	325
6	CLAY	0	112	550	550
7	CLAY	0	121	535	535
8	SAND	30	120	0	0
9	CLAY	0	107	850	850
10	CLAY	0	104	550	550
11	CLAY	0	105	715	715

EUSTIS ENGINEERING SERVICES, L.L.C.
30 WEST HARRISON
SCOTT, LOUISIANA











SLOPE STABILITY ANALYSES FLOOD SIDE OF LEVEE
STABILITY CONTROL LINE

BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA

DRAWN BY: J.L.S.	SCALE: AS SHOWN
CHECKED BY: S.R.S.	DATE: 25 FEB 11
JOB NO.: 10125	FIGURE 4



LEGEND AND NOTES FOR
LOG OF BORING AND TEST RESULTS

PP	Pocket penetrometer resistance in tons per square foot					
SPT	Standard Penetration Test: Number of blows of a 140-lb. hammer dropped 30 inches required to drive 2-in. O.D., 1.4-in. I.D. sampler a distance of 1 foot into the soil after first seating it 6 inches					
SPLR	Type of Sampling	 Shelby	 SPT	 Auger	 No sample	
SYMBOL	Clay	Silt	Sand	Peat/Humus	Shells	Stone/Gravel
						
	Predominant type shown heavy; Modifying type shown light					
USC	Unified Soil Classification					
DENSITY	Unit weight in pounds per cubic foot					

SHEAR TESTS

TYPE

UC	Unconfined compression shear
DB	Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
UU	Unconsolidated undrained triaxial compression shear
CU	Consolidated undrained triaxial compression shear
DS	Direct shear
ϕ	Angle of internal friction in degrees
c	Cohesion in pounds per square foot

ATTERBERG LIMITS

LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index

OTHER TESTS

CON	Consolidation
PD	Particle size distribution (sieve and/or hydrometer)
k	Coefficient of permeability in centimeters per second
SP	Swelling pressure in pounds per square foot

Other laboratory test results reported on separate figures

GENERAL NOTES

- (1) If a ground water depth is shown on the boring log, these observations were made at the time of drilling and were measured below the existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal fluctuations and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction immediately prior to beginning work.
- (2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.



BUTTE LA ROSE, LOUISIANA

Ground Elev.: 29.2 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125 Date Drilled: 12/07/10 Boring: 1 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI	
0					Loose brown & tan silty sand w/gravel	SM	1	0-2	11									
					w/clay pockets		2	2-4										
		4					3	4.5-6	14									
	0.25	8			Soft gray & tan sandy clay w/decayed wood	CL	4	6.5-8	21									
					Loose gray fine sand w/clay pockets	SP	5	8-10	29				UC	-	335			
	0.25				Soft gray & tan sandy clay w/roots	CL	6	10-12	27									
					Soft gray & brown sandy clay w/roots & wood	CL	7	13-15	34				UC	-	255			
	0.00						8	16-19	37				UC	-	370			
	0.75				Soft gray w/silty sand pockets	CH	9	23-24	45				UC	-	500			
	1.25				Stiff gray & tan clay w/silty sand pockets	CH	10	28-29	28				UC	-	1100			
	0.00				Dense gray clayey sand w/clay pockets	SC	11	33-34	28				OB	0	1005	25	16	8
	0.00				Medium dense gray silty sand w/clay pockets	SM	12	38-39	27									
	0.00						13	43-44	30				OB	0	880			
	0.00						14	48-49	26									

Comments: Latitude: 30°19'41.8"N Longitude: 91°41'33.3"W



LOG OF BORING AND TEST RESULTS

BERNHARD MECHANICAL CONTRACTORS, INC.
 HORIZONTAL DIRECTIONAL DRILL CROSSING
 ATCHAFALAYA RIVER
 BUTTE LA ROSE, LOUISIANA

EUSTIS ENGINEERING SERVICES, L.L.C.

Refer to "Legends & Notes"

Boring: 1

Date Drilled: 12/07/10

Gr. Water Depth: See Text Job No.: L0125

Scale In Feet	PP	SPT	S P L R	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests		Atterberg Limits			Other Tests
									Dry	Wet	Type	φ	C	LL	PL	
-50				Soft gray sandy clay	CL	15	53-54	31								
60	1.75			Medium stiff gray clay w/decayed wood & roots	CH	16	58-59	53	88	104	UC	--	870			
70	1.00			w/shell fragments & silty sand pockets		17	63-64									
	1.75					18	68-69	49	72	107	UC	--	715			
	1.50			Soft gray clay w/trace of organic matter & decayed wood	CH	19	73-74									
80	1.00					20	76-79	73	56	97	UC	--	465			
	0.75					21	83-84									
	0.50			w/silty sand pockets		22	88-89	41	78	110	UC	--	485			
90	1.00					23	93-94									
100	2.25			Medium stiff gray clay w/silt pockets & lenses	CH	24	98-99	52	69	105	UC	--	715			

Comments: Latitude: 30°19'41.8"N Longitude: 91°41'33.3"W



(Sheet 1 of 2)

LOG OF BORING AND TEST RESULTS

BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA

EUSTIS ENGINEERING SERVICES, L.L.C.

Refer to "Legends & Notes"

Boring: 2

Date Drilled: 12/07-08/10

Job No.: L0125

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	Ø	C	LL	PL	PI	
0							1	0-2	20	97	116	OB	0	1160				
	1.00				Dense brown & tan silty sand w/clay pockets & roots	SM	2	2-4										
	1.00				Medium stiff gray & brown clay w/silty sand pockets & decayed wood	CH	3	4-6	44	74	106	UC	-	695				
	0.75				Soft gray sandy clay	CL	4	6-8	36			OB	0	715	28	15	13	
	0.00				Medium dense brown silty sand w/clay pockets	SM	5	8-10	27	96	122	OB	0					
10	0.00				Very soft gray sandy clay	CL	6	10-12	31									
	0.00				Soft brown & gray sandy clay w/trace of decayed wood	CL	7	13-15	41	80	113	OB	0	350				
	0.00				Medium stiff gray clay w/silty sand pockets	CH	8	18-19	45	76	111	UC	-	955				
20	1.75				Medium stiff gray & tan sandy clay	CL	9	23-24	28	95	121	UC	-	585				
	0.75				Medium dense gray silty sand	SM	10	28-29	27									
30							11	33-34	28	97	123	OB	0	1160	NP	NP		
40							12	38-39	28									
							13	43-44	24	100	125	OB	0	1030				
50							14	48-49	55									
					Stiff gray clay w/decayed wood & fine sand pockets	CH												

Ground Elev.: 23.2 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125

Comments: Latitude: 30°19'42.2"N Longitude: 91°41'33.1"W



LOG OF BORING AND TEST RESULTS

BERNHARD MECHANICAL CONTRACTORS, INC.
 HORIZONTAL DIRECTIONAL DRILL CROSSING
 ATCHAFALAYA RIVER
 BUTTE LA ROSE, LOUISIANA

EUSTIS ENGINEERING SERVICES, L.L.C.

Ground Elev.: 23.2 Datum: NAVD 88 Gr. Water Depth: See Text Job No.: L0125 Date Drilled: 12/07-08/10 Boring: 2 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI	
50																		
1.25					Medium stiff gray clay w/decayed wood, roots, & fine sand pockets	CH	15	53-54	47	73	107	UC	-	780				
2.25					Stiff gray clay w/fine sand pockets	CH	16	58-59	46	75	110	UC	-	1055				
60																		
70																		
80																		
90																		
100																		

Comments: Latitude: 30°19'42.2"N Longitude: 91°41'33.1"W

LOG OF BORING AND TEST RESULTS
 BERNHARD MECHANICAL CONTRACTORS, INC.
 HORIZONTAL DIRECTIONAL DRILL CROSSING
 ATCHAFALAYA RIVER



BUTTE LA ROSE, LOUISIANA

Refer to "Legends & Notes"

Boring: 3

Date Drilled: 12/08/10

Job No.: L0125

Gr. Water Depth: See Text

Datum: NAVD 88

Ground Elev.: 25.5

Scale in Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI	
0	1.75				Stiff brown & tan sandy clay w/roots, organic matter, & decayed wood	CL	1	0-2	26	89	112	UC	-	1085				
	0.00	3			Loose brown sandy silt w/clay pockets	ML	2	2-4	10									
					Loose brown sandy silt		3	4.5-6	5									
		6					4	6-8										
					Loose gray & tan silty sand	SM	5	8.5-10	15									
	0.00				Soft gray sandy clay w/organic matter	CL	6	10-12	27									
	1.25				Stiff gray clay w/roots & silt pockets	CH	7	13-15	31									
	1.50						8	16-18	33	87	116	UC	-	1055				
	2.00				Stiff reddish-brown clay w/silt pockets	CH	9	23-24										
	0.50				Stiff gray clay w/silty sand pockets & lenses, decayed wood, & roots	CH	10	28-29	30	93	121	UC	-	1790				
					Medium stiff dark gray organic clay w/wood & roots	OH	11	32-33	72									
					Medium dense gray silty sand w/clay pockets & lenses	SM	12	33-34	207									
							13	38-39	29	93	120	OB	0	655				
	0.00				Loose gray clayey sand w/decayed wood & trace of organic matter	SC	14	43-44	37									
					Medium dense gray clayey sand w/wood & roots	SC	15	48-49	34	84	112	OB	0	535				

Comments: Latitude: 30°19'44.8"N Longitude: 91°41'31.9"W



BUTTE LA ROSE, LOUISIANA

Refer to "Legends & Notes"

Boring: 3

Date Drilled: 12/08/10

Job No.: L0125

See Text

Gr. Water Depth:

NAVD 88

Datum: 25.5

Ground Elev.:

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Other Tests
										Dry	Wet	Type	ø	C	LL	PL	PI	
50					Very loose gray fine sand	SP	16	53-54	22	97	119	OB	0	230				
60		13			Medium dense gray silty sand w/wood	SM	17	58.5-60	31									
70																		
80																		
90																		
100																		

Comments: Latitude: 30°19'44.8"N Longitude: 91°41'31.9"W

BERNHARD MECHANICAL CONTRACTORS, INC.
HORIZONTAL DIRECTIONAL DRILL CROSSING
ATCHAFALAYA RIVER
BUTTE LA ROSE, LOUISIANA
EUSTIS ENGINEERING PROJECT NO. L0125

SUMMARY OF COMPUTER RUNS FOR UPLIFT ANALYSES

FIGURE NUMBER INDICATED ON REPORT DATED 26 JANUARY 2011	DESCRIPTION OF ANALYSIS	FILENAME
3	Flood Side of Levee - Existing Conditions	s11a.txt
4	Flood Side of Levee - Stability Control Line	s113.txt

511a.000

**** STABILITY WITH UPLIFT ****

EE L0125- BERNHARD- Existing slope stability
 Floodside - water at 1.7
 12 PROFILES
 1 VERTICALS
 UPLIFT WITH 1 PIEZOMETRIC GRADE LINES

* * STRATUM 2 ACT, WEDGE LOC. 90165.0 EL. 22.0 PASS.WEDGE LOC. 180.0 EL. 22.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	22.0	240.	0.	128.	264.	128.
100.0	22.0	240.	0.	128.	264.	128.
120.0	22.0	300.	0.	160.	280.	160.
131.0	22.0	600.	0.	319.	361.	319.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 136.3						
139.0	22.0	840.	0.	447.	425.	425.
150.0	22.0	900.	0.	479.	441.	441.
150.0	22.0	900.	0.	479.	441.	441.
162.0	22.0	840.	0.	446.	425.	425.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 164.7						
174.0	22.0	480.	0.	255.	329.	255.
189.0	22.0	180.	0.	96.	248.	96.
227.0	22.0	0.	0.	0.	200.	0.
243.0	22.0	-125.	0.	0.	999999.	0.
275.0	22.0	-187.	0.	0.	999999.	0.
286.0	22.0	-62.	0.	0.	999999.	0.
331.0	22.0	0.	0.	0.	200.	0.
STRATUM 2 STARTS FAILURE POSSIBLE FROM DIST. 331.0						
371.0	22.0	480.	0.	255.	329.	255.
436.0	22.0	240.	0.	128.	264.	128.
500.0	22.0	360.	0.	191.	296.	191.
520.0	22.0	0.	0.	0.	200.	0.
537.0	22.0	-187.	0.	0.	999999.	0.
552.0	22.0	-312.	0.	0.	999999.	0.
569.0	22.0	-437.	0.	0.	999999.	0.
600.0	22.0	-437.	0.	0.	999999.	0.
616.0	22.0	-780.	0.	0.	999999.	0.
628.0	22.0	-1092.	0.	0.	999999.	0.
646.0	22.0	-1267.	0.	0.	999999.	0.
STRATUM 2 STARTS FAILURE POSSIBLE FROM DIST. 646.0						
647.0	22.0	-1267.	0.	0.	999999.	0.
660.0	22.0	-1267.	0.	0.	999999.	0.
672.0	22.0	-1267.	0.	0.	999999.	0.
722.0	22.0	-1267.	0.	0.	999999.	0.
915.0	22.0	-1267.	0.	0.	999999.	0.
1000.0	22.0	-1267.	0.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 22.0 DP 422. RP 748.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	22.0	2720.	1738.	0.	4282.	2.95

CRIT. ACTIVE LOC 165.0 EL 22.0 DA 2720. RA 1738.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	22.0	1070.	1894.	0.	1794.	3.29
175.0	22.0	690.	1221.	0.	3192.	3.03
180.0	22.0	422.	748.	0.	4282.	2.95
185.0	22.0	220.	390.	0.	5105.	2.89
190.0	22.0	120.	212.	0.	5668.	2.93

					sigma _{cut}	
195.0	22.0	90.	159.	0.	6102.	3.04
200.0	22.0	64.	113.	0.	6473.	3.13
205.0	22.0	42.	75.	0.	6782.	3.21
210.0	22.0	25.	45.	0.	7027.	3.27
215.0	22.0	13.	22.	0.	7210.	3.31

* * STRATUM 3 ACT. WEDGE LOC. 90165.0 EL. 17.0 PASS. WEDGE LOC. 180.0 EL. 17.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	17.0	785.	0.	410.	417.	410.
100.0	17.0	785.	0.	410.	417.	410.
120.0	17.0	845.	0.	426.	449.	426.
131.0	17.0	1145.	0.	507.	609.	507.
139.0	17.0	1385.	0.	571.	736.	571.
150.0	17.0	1445.	0.	587.	768.	587.
150.0	17.0	1445.	0.	587.	768.	587.
162.0	17.0	1385.	0.	571.	736.	571.
174.0	17.0	1025.	0.	475.	545.	475.
SHEAR STRENGTHS ARE EQUAL			403.2 AT DIST.	187.3		
189.0	17.0	725.	0.	394.	385.	385.
227.0	17.0	545.	0.	346.	290.	290.
243.0	17.0	327.	0.	288.	174.	174.
275.0	17.0	218.	0.	258.	116.	116.
286.0	17.0	436.	0.	317.	232.	232.
331.0	17.0	545.	0.	346.	290.	290.
SHEAR STRENGTHS ARE EQUAL			403.2 AT DIST.	348.8		
371.0	17.0	1025.	0.	475.	545.	475.
436.0	17.0	785.	0.	410.	417.	410.
500.0	17.0	905.	0.	442.	481.	442.
SHEAR STRENGTHS ARE EQUAL			403.2 AT DIST.	508.1		
520.0	17.0	545.	0.	346.	290.	290.
537.0	17.0	218.	0.	258.	116.	116.
552.0	17.0	0.	0.	200.	0.	0.
569.0	17.0	-125.	0.	200.	999999.	200.
600.0	17.0	-125.	0.	200.	999999.	200.
616.0	17.0	-468.	0.	200.	999999.	200.
628.0	17.0	-780.	0.	200.	999999.	200.
646.0	17.0	-955.	0.	200.	999999.	200.
STRATUM 3 STARTS FAILURE POSSIBLE FROM DIST.			646.0			
647.0	17.0	-955.	0.	200.	999999.	200.
660.0	17.0	-955.	0.	200.	999999.	200.
672.0	17.0	-955.	0.	200.	999999.	200.
722.0	17.0	-955.	0.	200.	999999.	200.
915.0	17.0	-955.	0.	200.	999999.	200.
1000.0	17.0	-955.	0.	200.	999999.	200.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 17.0 DP 3008. RP 4892.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	17.0	8431.	5695.	0.	7348.	3.31

CRIT. ACTIVE LOC 165.0 EL 17.0 DA 8431. RA 5695.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	17.0	4499.	6393.	0.	2634.	3.74
175.0	17.0	3690.	5563.	0.	5069.	3.44
180.0	17.0	3008.	4892.	0.	7348.	3.31
185.0	17.0	2484.	4459.	0.	9493.	3.30
190.0	17.0	2243.	4260.	0.	11490.	3.47
195.0	17.0	2100.	4134.	0.	13373.	3.66
200.0	17.0	1961.	4015.	0.	15194.	3.85
205.0	17.0	1827.	3904.	0.	16951.	4.02
210.0	17.0	1697.	3802.	0.	18645.	4.18
215.0	17.0	1572.	3706.	0.	20276.	4.33

* * STRATUM 4 ACT. WEDGE LOC. 90165.0 EL. 15.0 PASS.WEDGE LOC. 180.0 EL. 15.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	15.0	1025.	0.	545.	325.	325.
100.0	15.0	1025.	0.	545.	325.	325.
120.0	15.0	1085.	0.	577.	325.	325.
131.0	15.0	1385.	0.	737.	325.	325.
139.0	15.0	1625.	0.	864.	325.	325.
150.0	15.0	1685.	0.	896.	325.	325.
150.0	15.0	1685.	0.	896.	325.	325.
162.0	15.0	1625.	0.	864.	325.	325.
174.0	15.0	1265.	0.	673.	325.	325.
189.0	15.0	965.	0.	513.	325.	325.
227.0	15.0	785.	0.	417.	325.	325.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	239.8		
243.0	15.0	567.	0.	301.	325.	301.
275.0	15.0	458.	0.	244.	325.	244.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	282.7		
286.0	15.0	676.	0.	359.	325.	325.
331.0	15.0	785.	0.	417.	325.	325.
371.0	15.0	1265.	0.	673.	325.	325.
436.0	15.0	1025.	0.	545.	325.	325.
500.0	15.0	1145.	0.	609.	325.	325.
520.0	15.0	785.	0.	417.	325.	325.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	529.0		
537.0	15.0	458.	0.	243.	325.	243.
552.0	15.0	240.	0.	128.	325.	128.
569.0	15.0	0.	0.	0.	325.	0.
600.0	15.0	0.	0.	0.	325.	0.
616.0	15.0	-343.	0.	0.	999999.	0.
628.0	15.0	-655.	0.	0.	999999.	0.
646.0	15.0	-830.	0.	0.	999999.	0.
STRATUM 4 STARTS FAILURE POSSIBLE FROM DIST.			646.0			
647.0	15.0	-830.	0.	0.	999999.	0.
660.0	15.0	-830.	0.	0.	999999.	0.
672.0	15.0	-830.	0.	0.	999999.	0.
722.0	15.0	-830.	0.	0.	999999.	0.
915.0	15.0	-830.	0.	0.	999999.	0.
1000.0	15.0	-830.	0.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 15.0 DP 4612. RP 8082.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	15.0	11464.	7605.	0.	4875.	3.00

CRIT. ACTIVE LOC 165.0 EL 15.0 DA 11464. RA 7605.

DIS.	EL.	DP	RP	DB	RB	FS
170.0	15.0	6364.	10115.	0.	1625.	3.79
175.0	15.0	5412.	8967.	0.	3250.	3.27
180.0	15.0	4612.	8082.	0.	4875.	3.00
185.0	15.0	4077.	7462.	0.	6500.	2.92
190.0	15.0	3812.	7121.	0.	8125.	2.99
195.0	15.0	3624.	6916.	0.	9750.	3.10
200.0	15.0	3441.	6719.	0.	11375.	3.20
205.0	15.0	3262.	6530.	0.	13000.	3.31
210.0	15.0	3088.	6348.	0.	14625.	3.41
215.0	15.0	2918.	6174.	0.	16250.	3.51

* * STRATUM 5 ACT. WEDGE LOC. 120.0 EL. 9.5 PASS.WEDGE LOC. 180.0 EL. 9.5

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ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	9.5	1652.	0.	325.	850.	325.
100.0	9.5	1652.	0.	325.	850.	325.
120.0	9.5	1712.	0.	325.	850.	325.
131.0	9.5	2012.	0.	325.	850.	325.
139.0	9.5	2252.	0.	325.	850.	325.
150.0	9.5	2312.	0.	325.	850.	325.
150.0	9.5	2312.	0.	325.	850.	325.
162.0	9.5	2252.	0.	325.	850.	325.
174.0	9.5	1892.	0.	325.	850.	325.
189.0	9.5	1592.	0.	325.	850.	325.
227.0	9.5	1412.	0.	325.	850.	325.
243.0	9.5	1194.	0.	325.	850.	325.
275.0	9.5	1085.	0.	325.	850.	325.
286.0	9.5	1303.	0.	325.	850.	325.
331.0	9.5	1412.	0.	325.	850.	325.
371.0	9.5	1892.	0.	325.	850.	325.
436.0	9.5	1652.	0.	325.	850.	325.
500.0	9.5	1772.	0.	325.	850.	325.
520.0	9.5	1412.	0.	325.	850.	325.
537.0	9.5	1085.	0.	325.	850.	325.
552.0	9.5	867.	0.	325.	850.	325.
569.0	9.5	627.	0.	325.	850.	325.
600.0	9.5	627.	0.	325.	850.	325.
616.0	9.5	0.	0.	325.	850.	325.
628.0	9.5	-312.	0.	325.	999999.	325.
646.0	9.5	-487.	0.	325.	999999.	325.
STRATUM 5 STARTS FAILURE POSSIBLE FROM DIST. 646.0						
647.0	9.5	-487.	0.	325.	999999.	325.
660.0	9.5	-487.	0.	325.	999999.	325.
672.0	9.5	-487.	0.	325.	999999.	325.
722.0	9.5	-487.	0.	325.	999999.	325.
915.0	9.5	-487.	0.	325.	999999.	325.
1000.0	9.5	-487.	0.	325.	999999.	325.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 9.5 DP 11759. RP 10986.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	9.5	12571.	7633.	0.	19500.	46.94
125.0	9.5	13097.	7705.	0.	17875.	27.34
130.0	9.5	14346.	7970.	0.	16250.	13.61
135.0	9.5	16355.	8606.	0.	14625.	7.45
140.0	9.5	18633.	9387.	0.	13000.	4.85
145.0	9.5	20724.	10299.	0.	11375.	3.64
150.0	9.5	22237.	11066.	0.	9750.	3.04
155.0	9.5	22878.	11432.	0.	8125.	2.75
160.0	9.5	22971.	11565.	0.	6500.	2.59
165.0	9.5	22575.	11500.	0.	4875.	2.53
170.0	9.5	21344.	11226.	0.	3250.	2.66
175.0	9.5	19273.	10574.	0.	1625.	3.09
180.0	9.5	16635.	9474.	0.	0.	4.20
185.0	9.5	14457.	8578.	0.	-1625.	6.65
190.0	9.5	12785.	7969.	0.	-3250.	15.31

CRIT. ACTIVE LOC. 165.0 EL. 9.5 DA 22575. RA 11500.

DIS.	EL.	DP	RP	DB	RB	FS
170.0	9.5	14223.	12442.	0.	1625.	3.06
175.0	9.5	12813.	11585.	0.	3250.	2.70
180.0	9.5	11759.	10986.	0.	4875.	2.53
185.0	9.5	10979.	10675.	0.	6500.	2.47
190.0	9.5	10539.	10471.	0.	8125.	2.50
195.0	9.5	10226.	10275.	0.	9750.	2.55
200.0	9.5	9918.	10086.	0.	11375.	2.60
205.0	9.5	9614.	9905.	0.	13000.	2.65
210.0	9.5	9314.	9732.	0.	14625.	2.70

215.0 9.5 8988. 9357. 0. slla.out
16250. 2.73

* * STRATUM 6 ACT. WEDGE LOC. 120.0 EL. 1.5 PASS.WEDGE LOC. 230.0 EL. 1.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
0	1.5	2548.	500.	850.	585.	585.
100.0	1.5	2548.	500.	850.	585.	585.
120.0	1.5	2608.	500.	850.	585.	585.
131.0	1.5	2908.	500.	850.	585.	585.
139.0	1.5	3148.	500.	850.	585.	585.
150.0	1.5	3208.	500.	850.	585.	585.
150.0	1.5	3208.	500.	850.	585.	585.
162.0	1.5	3148.	500.	850.	585.	585.
174.0	1.5	2788.	500.	850.	585.	585.
189.0	1.5	2488.	500.	850.	585.	585.
227.0	1.5	2308.	500.	850.	585.	585.
243.0	1.5	2090.	500.	850.	585.	585.
275.0	1.5	1981.	500.	850.	585.	585.
286.0	1.5	2199.	500.	850.	585.	585.
331.0	1.5	2308.	500.	850.	585.	585.
371.0	1.5	2788.	500.	850.	585.	585.
436.0	1.5	2548.	500.	850.	585.	585.
500.0	1.5	2668.	500.	850.	585.	585.
520.0	1.5	2308.	500.	850.	585.	585.
537.0	1.5	1981.	500.	850.	585.	585.
552.0	1.5	1763.	500.	850.	585.	585.
569.0	1.5	1523.	500.	850.	585.	585.
600.0	1.5	1523.	500.	850.	585.	585.
616.0	1.5	896.	500.	850.	585.	585.
628.0	1.5	336.	187.	850.	585.	585.
646.0	1.5	22.	12.	850.	585.	585.
647.0	1.5	12.	13.	850.	585.	585.
FAILURE SURFACE IN STRATA 6 EL. 1.5 DIST. 647.0 STRENGTH 850.0						
660.0	1.5	12.	13.	850.	999999.	850.
672.0	1.5	12.	13.	850.	999999.	850.
722.0	1.5	12.	13.	850.	999999.	850.
915.0	1.5	12.	13.	850.	999999.	850.
1000.0	1.5	12.	13.	850.	999999.	850.

ASSUMED CRIT. PASSIVE LOC. 230.0 EL. 1.5 DP 20442. RP 20477.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	1.5	29405.	21120.	0.	64350.	11.82
125.0	1.5	30047.	21190.	0.	61425.	10.73
130.0	1.5	31299.	21262.	0.	58500.	9.23
135.0	1.5	33198.	21363.	0.	55575.	7.64
140.0	1.5	35952.	21787.	0.	52650.	6.12
145.0	1.5	38881.	22503.	0.	49725.	5.03
150.0	1.5	41420.	23335.	0.	46800.	4.32
155.0	1.5	43399.	24235.	0.	43875.	3.86
160.0	1.5	44455.	24872.	0.	40950.	3.59
165.0	1.5	44483.	25106.	0.	38025.	3.48
170.0	1.5	43546.	25172.	0.	35100.	3.49
175.0	1.5	41617.	25019.	0.	32175.	3.67
180.0	1.5	39040.	24621.	0.	29250.	4.00
185.0	1.5	35805.	23746.	0.	26325.	4.59
190.0	1.5	32504.	22682.	0.	23400.	5.52

CRIT. ACTIVE LOC 165.0 EL 1.5 DA 44483. RA 25106.

DIST.	EL.	DP	RP	DB	RB	FS
205.0	1.5	24692.	23153.	0.	23400.	3.62
210.0	1.5	24104.	22635.	0.	26325.	3.63
215.0	1.5	23395.	21979.	0.	29250.	3.62

				s11a, out	
220.0	1.5	22522.	21291.	0.	32175.
225.0	1.5	21488.	20756.	0.	35100.
230.0	1.5	20442.	20477.	0.	38025.
235.0	1.5	19596.	20307.	0.	40950.
240.0	1.5	19009.	20139.	0.	43875.
245.0	1.5	18658.	19972.	0.	46800.
250.0	1.5	18357.	19807.	0.	49725.

* * STRATUM 7 ACT. WEDGE LOC. 120.0 EL. -3.5 PASS. WEDGE LOC. 230.0 EL. -3.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-3.5	3153.	813.	585.	1351.	585.
100.0	-3.5	3153.	813.	585.	1351.	585.
120.0	-3.5	3213.	813.	585.	1386.	585.
131.0	-3.5	3513.	813.	585.	1559.	585.
139.0	-3.5	3753.	813.	585.	1698.	585.
150.0	-3.5	3813.	813.	585.	1732.	585.
150.0	-3.5	3813.	813.	585.	1732.	585.
162.0	-3.5	3753.	813.	585.	1698.	585.
174.0	-3.5	3393.	813.	585.	1490.	585.
189.0	-3.5	3093.	813.	585.	1317.	585.
227.0	-3.5	2913.	813.	585.	1213.	585.
243.0	-3.5	2695.	813.	585.	1087.	585.
275.0	-3.5	2586.	813.	585.	1024.	585.
286.0	-3.5	2804.	813.	585.	1150.	585.
331.0	-3.5	2913.	813.	585.	1213.	585.
371.0	-3.5	3393.	813.	585.	1490.	585.
436.0	-3.5	3153.	813.	585.	1351.	585.
500.0	-3.5	3273.	813.	585.	1420.	585.
520.0	-3.5	2913.	813.	585.	1213.	585.
537.0	-3.5	2586.	813.	585.	1024.	585.
552.0	-3.5	2368.	813.	585.	898.	585.
569.0	-3.5	2128.	813.	585.	760.	585.
600.0	-3.5	2128.	813.	585.	759.	585.
SHEAR STRENGTHS ARE EQUAL			585.0 AT DIST.	607.7		
616.0	-3.5	1501.	813.	585.	397.	397.
628.0	-3.5	941.	500.	585.	255.	255.
646.0	-3.5	627.	325.	585.	175.	175.
647.0	-3.5	617.	325.	585.	169.	169.
660.0	-3.5	528.	325.	585.	117.	117.
672.0	-3.5	324.	325.	585.	0.	0.
FAILURE SURFACE IN STRATA			7 EL. -3.5 DIST.	672.0 STRENGTH	585.0	
722.0	-3.5	324.	325.	585.	999999.	585.
915.0	-3.5	324.	325.	585.	999999.	585.
1000.0	-3.5	324.	325.	585.	999999.	585.

ASSUMED CRIT. PASSIVE LOC. 230.0 EL. -3.5 DP 32273. RP 26157.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-3.5	43631.	26927.	0.	64350.	10.34
125.0	-3.5	44299.	26970.	0.	61425.	9.53
130.0	-3.5	45624.	27040.	0.	58500.	8.37
135.0	-3.5	47579.	27112.	0.	55575.	7.11
140.0	-3.5	50214.	27213.	0.	52650.	5.91
145.0	-3.5	53299.	27637.	0.	49725.	4.92
150.0	-3.5	56365.	28353.	0.	46800.	4.21
155.0	-3.5	58909.	29185.	0.	43875.	3.72
160.0	-3.5	60763.	30085.	0.	40950.	3.41
165.0	-3.5	61580.	30721.	0.	38025.	3.24
170.0	-3.5	60909.	30956.	0.	35100.	3.22
175.0	-3.5	59227.	31022.	0.	32175.	3.32
180.0	-3.5	56718.	30869.	0.	29250.	3.53
185.0	-3.5	53642.	30471.	0.	26325.	3.88
190.0	-3.5	49915.	29596.	0.	23400.	4.49
195.0	-3.5	46373.	28532.	0.	20475.	5.33

CRIT. ACTIVE LOC 170.0 EL -3.5 DA 0909. RA 30956. sila.out

DIS.	EL.	DP	RP	DB	RB	FS
205.0	-3.5	37617.	28485.	0.	20475.	3.43
210.0	-3.5	36790.	27829.	0.	23400.	3.41
215.0	-3.5	35799.	27141.	0.	26325.	3.36
220.0	-3.5	34646.	26606.	0.	29250.	3.31
225.0	-3.5	33442.	26327.	0.	32175.	3.26
230.0	-3.5	32273.	26157.	0.	35100.	3.22
235.0	-3.5	31345.	25989.	0.	38025.	3.21
240.0	-3.5	30675.	25822.	0.	40950.	3.23
245.0	-3.5	30242.	25657.	0.	43875.	3.28
250.0	-3.5	29858.	25494.	0.	46800.	3.33

* * STRATUM 8 ACT. WEDGE LOC. 120.0 EL. -25.0 PASS. WEDGE LOC. 660.0 EL. -25.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-25.0	5733.	2156.	2065.	850.	850.
100.0	-25.0	5733.	2156.	2065.	850.	850.
120.0	-25.0	5793.	2156.	2100.	850.	850.
131.0	-25.0	6093.	2156.	2273.	850.	850.
139.0	-25.0	6333.	2156.	2411.	850.	850.
150.0	-25.0	6393.	2156.	2446.	850.	850.
150.0	-25.0	6393.	2156.	2446.	850.	850.
162.0	-25.0	6333.	2156.	2411.	850.	850.
174.0	-25.0	5973.	2156.	2203.	850.	850.
189.0	-25.0	5673.	2156.	2030.	850.	850.
227.0	-25.0	5493.	2156.	1926.	850.	850.
243.0	-25.0	5275.	2156.	1801.	850.	850.
275.0	-25.0	5166.	2156.	1738.	850.	850.
286.0	-25.0	5384.	2156.	1864.	850.	850.
331.0	-25.0	5493.	2156.	1927.	850.	850.
371.0	-25.0	5973.	2156.	2204.	850.	850.
436.0	-25.0	5733.	2156.	2065.	850.	850.
500.0	-25.0	5853.	2156.	2134.	850.	850.
520.0	-25.0	5493.	2156.	1926.	850.	850.
537.0	-25.0	5166.	2156.	1738.	850.	850.
552.0	-25.0	4948.	2156.	1612.	850.	850.
569.0	-25.0	4708.	2156.	1473.	850.	850.
600.0	-25.0	4708.	2156.	1473.	850.	850.
616.0	-25.0	4081.	2156.	1111.	850.	850.
628.0	-25.0	3521.	1844.	968.	850.	850.
646.0	-25.0	3207.	1669.	888.	850.	850.
647.0	-25.0	3197.	1669.	883.	850.	850.
SHEAR STRENGTHS ARE EQUAL 850.0 AT DIST. 655.2						
660.0	-25.0	3108.	1669.	831.	850.	831.
672.0	-25.0	2904.	1669.	713.	850.	713.
722.0	-25.0	2732.	1669.	614.	850.	614.
915.0	-25.0	2588.	1669.	531.	850.	531.
1000.0	-25.0	2588.	1669.	530.	850.	530.

ASSUMED CRIT. PASSIVE LOC. 660.0 EL. -25.0 DP 35684. RP 26817.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-25.0	139529.	69924.	0.	458955.	5.35
125.0	-25.0	140529.	70490.	0.	454705.	5.27
130.0	-25.0	142657.	71756.	0.	450455.	5.13
135.0	-25.0	145899.	73674.	0.	446205.	4.96
140.0	-25.0	149983.	75779.	0.	441955.	4.76
145.0	-25.0	154076.	77484.	0.	437705.	4.58
150.0	-25.0	157796.	78500.	0.	433455.	4.41
155.0	-25.0	161117.	79003.	0.	429205.	4.27
160.0	-25.0	164185.	79552.	0.	424955.	4.13
165.0	-25.0	166330.	79869.	0.	420705.	4.04
170.0	-25.0	166812.	79620.	0.	416455.	3.99

DIST.	EL.	DP	RP	DB	RB	FS
175.0	-25.0	165409.	78549.	0.	399500.	3.99
180.0	-25.0	162495.	77003.	0.	403750.	4.04
185.0	-25.0	158792.	75490.	0.	408000.	4.11
190.0	-25.0	154494.	74010.	0.	399455.	4.21
195.0	-25.0	149996.	72632.	0.	395205.	4.33

CRIT. ACTIVE LOC 170.0 EL -25.0 DA 166812. RA 79620.

DIST.	EL.	DP	RP	DB	RB	FS
640.0	-25.0	39502.	33215.	0.	399500.	4.02
645.0	-25.0	38381.	32009.	0.	403750.	4.01
650.0	-25.0	37425.	30298.	0.	408000.	4.00
655.0	-25.0	36528.	28504.	0.	412250.	3.99
660.0	-25.0	35684.	26817.	0.	416455.	3.99
665.0	-25.0	34967.	25384.	0.	420488.	3.99
670.0	-25.0	34451.	24352.	0.	424276.	3.99
675.0	-25.0	34099.	23648.	0.	427854.	4.00
680.0	-25.0	33768.	22986.	0.	431366.	4.01
685.0	-25.0	33441.	22333.	0.	434829.	4.02

* * STRATUM 9 ACT. WEDGE LOC. 120.0 EL. -44.5 PASS. WEDGE LOC. 660.0 EL. -44.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-44.5	7820.	3375.	850.	550.	550.
100.0	-44.5	7820.	3375.	850.	550.	550.
120.0	-44.5	7880.	3375.	850.	550.	550.
131.0	-44.5	8180.	3375.	850.	550.	550.
139.0	-44.5	8420.	3375.	850.	550.	550.
150.0	-44.5	8479.	3375.	850.	550.	550.
150.0	-44.5	8479.	3375.	850.	550.	550.
162.0	-44.5	8419.	3375.	850.	550.	550.
174.0	-44.5	8059.	3375.	850.	550.	550.
189.0	-44.5	7759.	3375.	850.	550.	550.
227.0	-44.5	7579.	3375.	850.	550.	550.
243.0	-44.5	7361.	3375.	850.	550.	550.
275.0	-44.5	7253.	3375.	850.	550.	550.
286.0	-44.5	7471.	3375.	850.	550.	550.
331.0	-44.5	7580.	3375.	850.	550.	550.
371.0	-44.5	8059.	3375.	850.	550.	550.
436.0	-44.5	7820.	3375.	850.	550.	550.
500.0	-44.5	7939.	3375.	850.	550.	550.
520.0	-44.5	7579.	3375.	850.	550.	550.
537.0	-44.5	7252.	3375.	850.	550.	550.
552.0	-44.5	7034.	3375.	850.	550.	550.
569.0	-44.5	6795.	3375.	850.	550.	550.
600.0	-44.5	6794.	3375.	850.	550.	550.
616.0	-44.5	6167.	3375.	850.	550.	550.
628.0	-44.5	5607.	3062.	850.	550.	550.
646.0	-44.5	5294.	2887.	850.	550.	550.
647.0	-44.5	5284.	2888.	850.	550.	550.
660.0	-44.5	5195.	2888.	850.	550.	550.
672.0	-44.5	4991.	2888.	850.	550.	550.
722.0	-44.5	4818.	2888.	850.	550.	550.
915.0	-44.5	4674.	2888.	850.	550.	550.
1000.0	-44.5	4674.	2888.	850.	550.	550.

ASSUMED CRIT. PASSIVE LOC. 660.0 EL. -44.5 DP 111905. RP 56202.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-44.5	271286.	102479.	0.	297000.	2.86
125.0	-44.5	271960.	102531.	0.	294250.	2.83
130.0	-44.5	273372.	102670.	0.	291500.	2.79
135.0	-44.5	275533.	102879.	0.	288750.	2.74
140.0	-44.5	278435.	103099.	0.	286000.	2.67

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145.0	-44.5	281933.	103735.	0.	283250.	2.61
150.0	-44.5	286013.	105072.	0.	280500.	2.54
155.0	-44.5	290491.	107031.	0.	277750.	2.47
160.0	-44.5	294913.	109128.	0.	275000.	2.41
165.0	-44.5	298737.	110767.	0.	272250.	2.35
170.0	-44.5	301346.	111712.	0.	269500.	2.31
175.0	-44.5	302843.	112204.	0.	266750.	2.28
180.0	-44.5	303609.	112751.	0.	264000.	2.26
185.0	-44.5	303139.	113021.	0.	261250.	2.25
190.0	-44.5	301206.	112709.	0.	258500.	2.26
195.0	-44.5	297874.	111555.	0.	255750.	2.28
200.0	-44.5	293547.	109996.	0.	253000.	2.31
205.0	-44.5	288871.	108496.	0.	250250.	2.34
210.0	-44.5	283959.	107009.	0.	247500.	2.39

CRIT. ACTIVE LOC 185.0 EL -44.5 DA 303139. RA 113021.

DIS.	EL.	DP	RP	DB	RB	FS
640.0	-44.5	118300.	60131.	0.	250250.	2.29
645.0	-44.5	116593.	58660.	0.	253000.	2.28
650.0	-44.5	115024.	57587.	0.	255750.	2.27
655.0	-44.5	113429.	56865.	0.	258500.	2.26
660.0	-44.5	111905.	56202.	0.	261250.	2.25
665.0	-44.5	110598.	55548.	0.	264000.	2.25
670.0	-44.5	109634.	54904.	0.	266750.	2.25
675.0	-44.5	108967.	54298.	0.	269500.	2.25
680.0	-44.5	108366.	53769.	0.	272250.	2.25
685.0	-44.5	107804.	53320.	0.	275000.	2.26

* * STRATUM 10 ACT. WEDGE LOC. 140.0 EL. -64.0 PASS. WEDGE LOC. 660.0 EL. -64.0

ASSUMED FAILURE SURFACE DATA

QIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USER
0	-64.0	9848.	4594.	550.	715.	550.
100.0	-64.0	9848.	4594.	550.	715.	550.
120.0	-64.0	9908.	4594.	550.	715.	550.
131.0	-64.0	10208.	4594.	550.	715.	550.
139.0	-64.0	10448.	4594.	550.	715.	550.
150.0	-64.0	10507.	4594.	550.	715.	550.
150.0	-64.0	10507.	4594.	550.	715.	550.
162.0	-64.0	10447.	4594.	550.	715.	550.
174.0	-64.0	10087.	4594.	550.	715.	550.
189.0	-64.0	9787.	4594.	550.	715.	550.
227.0	-64.0	9607.	4594.	550.	715.	550.
243.0	-64.0	9389.	4594.	550.	715.	550.
275.0	-64.0	9281.	4594.	550.	715.	550.
286.0	-64.0	9499.	4594.	550.	715.	550.
331.0	-64.0	9608.	4594.	550.	715.	550.
371.0	-64.0	10087.	4594.	550.	715.	550.
436.0	-64.0	9848.	4594.	550.	715.	550.
500.0	-64.0	9967.	4594.	550.	715.	550.
520.0	-64.0	9607.	4594.	550.	715.	550.
537.0	-64.0	9280.	4594.	550.	715.	550.
552.0	-64.0	9062.	4594.	550.	715.	550.
569.0	-64.0	8823.	4594.	550.	715.	550.
600.0	-64.0	8822.	4594.	550.	715.	550.
616.0	-64.0	8195.	4594.	550.	715.	550.
628.0	-64.0	7635.	4281.	550.	715.	550.
646.0	-64.0	7322.	4106.	550.	715.	550.
647.0	-64.0	7312.	4106.	550.	715.	550.
660.0	-64.0	7223.	4106.	550.	715.	550.
672.0	-64.0	7019.	4106.	550.	715.	550.
722.0	-64.0	6846.	4106.	550.	715.	550.
915.0	-64.0	6702.	4106.	550.	715.	550.
1000.0	-64.0	6702.	4106.	550.	715.	550.

ASSUMED CRIT. PASSIVE LOC. 660.0 EL. -64.0 DP 226644. RP 75268.

ACTIVE WEDGE DATA

slia.out

DIST.	ELEV.	DA	RA	DB	RB	FS
140.0	-64.0	450292.	123930.	0.	286000.	2.17
145.0	-64.0	453427.	123991.	0.	283250.	2.13
150.0	-64.0	456752.	124139.	0.	280500.	2.09
155.0	-64.0	460123.	124351.	0.	277750.	2.04
160.0	-64.0	463382.	124581.	0.	275000.	2.01
165.0	-64.0	466703.	125288.	0.	272250.	1.97
170.0	-64.0	469767.	126694.	0.	269500.	1.94
175.0	-64.0	472460.	128689.	0.	266750.	1.91
180.0	-64.0	474605.	130771.	0.	264000.	1.90
185.0	-64.0	475854.	132344.	0.	261250.	1.88
190.0	-64.0	476092.	133213.	0.	258500.	1.87
195.0	-64.0	475766.	133705.	0.	255750.	1.87
200.0	-64.0	475137.	134248.	0.	253000.	1.86
205.0	-64.0	473604.	134466.	0.	250250.	1.86
210.0	-64.0	470971.	134085.	0.	247500.	1.87
215.0	-64.0	467056.	132858.	0.	244750.	1.88
220.0	-64.0	462202.	131291.	0.	242000.	1.90
225.0	-64.0	457047.	129804.	0.	239250.	1.93

CRIT. ACTIVE LOC 200.0 EL -64.0 DA 475137. RA 134248.

DIS.	EL.	DP	RP	DB	RB	FS
640.0	-64.0	234702.	77718.	0.	242000.	1.89
645.0	-64.0	232392.	77063.	0.	244750.	1.88
650.0	-64.0	230361.	76418.	0.	247500.	1.87
655.0	-64.0	228440.	75805.	0.	250250.	1.87
660.0	-64.0	226644.	75268.	0.	253000.	1.86
665.0	-64.0	225098.	74811.	0.	255750.	1.86
670.0	-64.0	223931.	74432.	0.	258500.	1.86
675.0	-64.0	223079.	74132.	0.	261250.	1.86
680.0	-64.0	222295.	73911.	0.	264000.	1.87
685.0	-64.0	221553.	73762.	0.	266750.	1.87

**** STABILITY WITH UPLIFT ****

EE L0125- BERNHARD- Stability Control Line
 Floodside - water at 1.7
 12 PROFILES
 1 VERTICALS
 UPLIFT WITH 1 PIEZOMETRIC GRADE LINES

* * STRATUM 2 ACT. WEDGE LOC. 90165.0 EL. 22.0 PASS.WEDGE LOC. 180.0 EL. 22.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	22.0	240.	0.	128.	264.	128.
100.0	22.0	240.	0.	128.	264.	128.
120.0	22.0	300.	0.	160.	280.	160.
131.0	22.0	600.	0.	319.	361.	319.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 136.3						
139.0	22.0	840.	0.	447.	425.	425.
150.0	22.0	900.	0.	479.	441.	441.
150.0	22.0	900.	0.	479.	441.	441.
162.0	22.0	840.	0.	446.	425.	425.
SHEAR STRENGTHS ARE EQUAL 403.2 AT DIST. 164.7						
174.0	22.0	480.	0.	255.	329.	255.
189.0	22.0	180.	0.	96.	248.	96.
227.0	22.0	0.	0.	0.	200.	0.
243.0	22.0	-125.	0.	0.	999999.	0.
275.0	22.0	-187.	0.	0.	999999.	0.
286.0	22.0	-62.	0.	0.	999999.	0.
297.5	22.0	-46.	0.	0.	999999.	0.
305.3	22.0	-36.	0.	0.	999999.	0.
331.0	22.0	0.	0.	0.	200.	0.
STRATUM 2 STARTS FAILURE POSSIBLE FROM DIST. 331.0						
371.0	22.0	480.	0.	255.	329.	255.
391.0	22.0	0.	0.	0.	200.	0.
416.0	22.0	-312.	0.	0.	999999.	0.
426.0	22.0	-437.	0.	0.	999999.	0.
453.5	22.0	-780.	0.	0.	999999.	0.
492.5	22.0	-1267.	0.	0.	999999.	0.
STRATUM 2 STARTS FAILURE POSSIBLE FROM DIST. 492.5						
493.5	22.0	-1267.	0.	0.	999999.	0.
518.5	22.0	-1267.	0.	0.	999999.	0.
626.0	22.0	-1267.	0.	0.	999999.	0.
723.5	22.0	-1267.	0.	0.	999999.	0.
733.5	22.0	-1267.	0.	0.	999999.	0.
1000.0	22.0	-1267.	0.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 22.0 DP 422. RP 748.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	22.0	2720.	1738.	0.	4282.	2.95

CRIT. ACTIVE LOC 165.0 EL 22.0 DA 2720. RA 1738.

DIS.	EL.	DP	RP	DB	RB	FS
170.0	22.0	1070.	1894.	0.	1794.	3.29
175.0	22.0	690.	1221.	0.	3192.	3.03
180.0	22.0	422.	748.	0.	4282.	2.95
185.0	22.0	220.	390.	0.	5105.	2.89
190.0	22.0	120.	212.	0.	5668.	2.93
195.0	22.0	90.	159.	0.	6102.	3.04
200.0	22.0	64.	113.	0.	6473.	3.13
205.0	22.0	42.	75.	0.	6782.	3.21

210.0 22.0 25. 45. 0. s113.out 3.27
 215.0 22.0 13. 22. 0. 7027. 3.31
 0. 7210.

* * STRATUM 3 ACT. WEDGE LOC. 90165.0 EL. 17.0 PASS.WEDGE LOC. 180.0 EL. 17.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	17.0	785.	0.	410.	417.	410.
100.0	17.0	785.	0.	410.	417.	410.
120.0	17.0	845.	0.	426.	449.	426.
131.0	17.0	1145.	0.	507.	609.	507.
139.0	17.0	1385.	0.	571.	736.	571.
150.0	17.0	1445.	0.	587.	768.	587.
150.0	17.0	1445.	0.	587.	768.	587.
162.0	17.0	1385.	0.	571.	736.	571.
174.0	17.0	1025.	0.	475.	545.	475.
SHEAR STRENGTHS ARE EQUAL			403.2 AT DIST.	187.3		
189.0	17.0	725.	0.	394.	385.	385.
227.0	17.0	545.	0.	346.	290.	290.
243.0	17.0	327.	0.	288.	174.	174.
275.0	17.0	218.	0.	258.	116.	116.
286.0	17.0	436.	0.	317.	232.	232.
297.5	17.0	464.	0.	324.	247.	247.
305.3	17.0	483.	0.	329.	257.	257.
331.0	17.0	545.	0.	346.	290.	290.
SHEAR STRENGTHS ARE EQUAL			403.2 AT DIST.	348.8		
371.0	17.0	1025.	0.	475.	545.	475.
391.0	17.0	545.	0.	346.	290.	290.
416.0	17.0	0.	0.	200.	0.	0.
426.0	17.0	-125.	0.	200.	999999.	200.
453.5	17.0	-468.	0.	200.	999999.	200.
492.5	17.0	-955.	0.	200.	999999.	200.
STRATUM 3 STARTS FAILURE POSSIBLE FROM DIST.			492.5			
493.5	17.0	-955.	0.	200.	999999.	200.
518.5	17.0	-955.	0.	200.	999999.	200.
626.0	17.0	-955.	0.	200.	999999.	200.
723.5	17.0	-955.	0.	200.	999999.	200.
733.5	17.0	-955.	0.	200.	999999.	200.
1000.0	17.0	-955.	0.	200.	999999.	200.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 17.0 DP 3008. RP 4892.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	17.0	8431.	5695.	0.	7348.	3.31

CRIT. ACTIVE LOC 165.0 EL 17.0 DA 8431. RA 5695.

DIST.	EL.	DP	RP	DB	RB	FS
170.0	17.0	4499.	6393.	0.	2634.	3.74
175.0	17.0	3690.	5563.	0.	5069.	3.44
180.0	17.0	3008.	4892.	0.	7348.	3.31
185.0	17.0	2484.	4459.	0.	9493.	3.30
190.0	17.0	2243.	4260.	0.	11490.	3.47
195.0	17.0	2100.	4134.	0.	13373.	3.66
200.0	17.0	1961.	4015.	0.	15194.	3.85
205.0	17.0	1827.	3904.	0.	16951.	4.02
210.0	17.0	1697.	3802.	0.	18645.	4.18
215.0	17.0	1572.	3706.	0.	20276.	4.33

* * STRATUM 4 ACT. WEDGE LOC. 90165.0 EL. 15.0 PASS.WEDGE LOC. 180.0 EL. 15.0

ASSUMED FAILURE SURFACE DATA

s113.out

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	15.0	1025.	0.	545.	325.	325.
100.0	15.0	1025.	0.	545.	325.	325.
120.0	15.0	1085.	0.	577.	325.	325.
131.0	15.0	1385.	0.	737.	325.	325.
139.0	15.0	1625.	0.	864.	325.	325.
150.0	15.0	1685.	0.	896.	325.	325.
150.0	15.0	1685.	0.	896.	325.	325.
162.0	15.0	1625.	0.	864.	325.	325.
174.0	15.0	1265.	0.	673.	325.	325.
189.0	15.0	965.	0.	513.	325.	325.
227.0	15.0	785.	0.	417.	325.	325.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	239.8		
243.0	15.0	567.	0.	301.	325.	301.
275.0	15.0	458.	0.	244.	325.	244.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	282.7		
286.0	15.0	676.	0.	359.	325.	325.
297.5	15.0	704.	0.	374.	325.	325.
305.3	15.0	723.	0.	384.	325.	325.
331.0	15.0	785.	0.	417.	325.	325.
371.0	15.0	1265.	0.	672.	325.	325.
391.0	15.0	785.	0.	417.	325.	325.
SHEAR STRENGTHS ARE EQUAL			325.0 AT DIST.	399.0		
416.0	15.0	240.	0.	127.	325.	127.
426.0	15.0	0.	0.	0.	325.	0.
453.5	15.0	-343.	0.	0.	999999.	0.
492.5	15.0	-830.	0.	0.	999999.	0.
STRATUM 4 STARTS FAILURE POSSIBLE FROM DIST.			492.5			
493.5	15.0	-830.	0.	0.	999999.	0.
518.5	15.0	-830.	0.	0.	999999.	0.
626.0	15.0	-830.	0.	0.	999999.	0.
723.5	15.0	-830.	0.	0.	999999.	0.
733.5	15.0	-830.	0.	0.	999999.	0.
1000.0	15.0	-830.	0.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 15.0 DP 4612. RP 8082.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
165.0	15.0	11464.	7605.	0.	4875.	3.00

CRIT. ACTIVE LOC 165.0 EL 15.0 DA 11464. RA 7605.

DIS.	EL.	DP	RP	DB	RB	FS
170.0	15.0	6364.	10115.	0.	1625.	3.79
175.0	15.0	5412.	8967.	0.	3250.	3.27
180.0	15.0	4612.	8082.	0.	4875.	3.00
185.0	15.0	4077.	7462.	0.	6500.	2.92
190.0	15.0	3812.	7121.	0.	8125.	2.99
195.0	15.0	3624.	6916.	0.	9750.	3.10
200.0	15.0	3441.	6719.	0.	11375.	3.20
205.0	15.0	3262.	6530.	0.	13000.	3.31
210.0	15.0	3088.	6348.	0.	14625.	3.41
215.0	15.0	2918.	6174.	0.	16250.	3.51

* * STRATUM 5 ACT. WEDGE LOC. 120.0 EL. 9.5 PASS.WEDGE LOC, 180.0 EL. 9.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	9.5	1652.	0.	325.	850.	325.
100.0	9.5	1652.	0.	325.	850.	325.
120.0	9.5	1712.	0.	325.	850.	325.
131.0	9.5	2012.	0.	325.	850.	325.
139.0	9.5	2252.	0.	325.	850.	325.

					s113.out	
150.0	9.5	2312.	0.	325.	850.	325.
150.0	9.5	2312.	0.	325.	850.	325.
162.0	9.5	2252.	0.	325.	850.	325.
174.0	9.5	1892.	0.	325.	850.	325.
189.0	9.5	1592.	0.	325.	850.	325.
227.0	9.5	1412.	0.	325.	850.	325.
243.0	9.5	1194.	0.	325.	850.	325.
275.0	9.5	1085.	0.	325.	850.	325.
286.0	9.5	1303.	0.	325.	850.	325.
297.5	9.5	1331.	0.	325.	850.	325.
305.3	9.5	1350.	0.	325.	850.	325.
331.0	9.5	1412.	0.	325.	850.	325.
371.0	9.5	1892.	0.	325.	850.	325.
391.0	9.5	1412.	0.	325.	850.	325.
416.0	9.5	867.	0.	325.	850.	325.
426.0	9.5	627.	0.	325.	850.	325.
453.5	9.5	0.	0.	325.	850.	325.
492.5	9.5	-487.	0.	325.	999999.	325.
STRATUM 5	STARTS	FAILURE	POSSIBLE	FROM	DIST.	492.5
493.5	9.5	-487.	0.	325.	999999.	325.
518.5	9.5	-487.	0.	325.	999999.	325.
626.0	9.5	-487.	0.	325.	999999.	325.
723.5	9.5	-487.	0.	325.	999999.	325.
733.5	9.5	-487.	0.	325.	999999.	325.
1000.0	9.5	-487.	0.	325.	999999.	325.

ASSUMED CRIT. PASSIVE LOC. 180.0 EL. 9.5 DP 11759. RP 10986.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	9.5	12571.	7633.	0.	19500.	46.94
125.0	9.5	13097.	7705.	0.	17875.	27.34
130.0	9.5	14346.	7970.	0.	16250.	13.61
135.0	9.5	16355.	8606.	0.	14625.	7.45
140.0	9.5	18633.	9387.	0.	13000.	4.85
145.0	9.5	20724.	10299.	0.	11375.	3.64
150.0	9.5	22237.	11066.	0.	9750.	3.04
155.0	9.5	22878.	11432.	0.	8125.	2.75
160.0	9.5	22971.	11565.	0.	6500.	2.59
165.0	9.5	22575.	11500.	0.	4875.	2.53
170.0	9.5	21344.	11226.	0.	3250.	2.66
175.0	9.5	19273.	10574.	0.	1625.	3.09
180.0	9.5	16635.	9474.	0.	0.	4.20
185.0	9.5	14457.	8578.	0.	-1625.	6.65
190.0	9.5	12785.	7969.	0.	-3250.	15.31

CRIT. ACTIVE LOC 165.0 EL 9.5 DA 22575. RA 11500.

DIS.	EL.	DP	RP	DB	RB	FS
170.0	9.5	14223.	12442.	0.	1625.	3.06
175.0	9.5	12813.	11585.	0.	3250.	2.70
180.0	9.5	11759.	10986.	0.	4875.	2.53
185.0	9.5	10979.	10675.	0.	6500.	2.47
190.0	9.5	10539.	10471.	0.	8125.	2.50
195.0	9.5	10226.	10275.	0.	9750.	2.55
200.0	9.5	9918.	10086.	0.	11375.	2.60
205.0	9.5	9614.	9905.	0.	13000.	2.65
210.0	9.5	9314.	9732.	0.	14625.	2.70
215.0	9.5	8988.	9357.	0.	16250.	2.73

* * STRATUM 6 ACT. WEDGE LOC. 120.0 EL. 1.5 PASS. WEDGE LOC. 230.0 EL. 1.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
100.0	1.5	2548.	500.	850.	585.	585.
100.0	1.5	2548.	500.	850.	585.	585.

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	1.5	2608.	500.	850.	585.	585.
131.0	1.5	2908.	500.	850.	585.	585.
139.0	1.5	3148.	500.	850.	585.	585.
150.0	1.5	3208.	500.	850.	585.	585.
150.0	1.5	3208.	500.	850.	585.	585.
162.0	1.5	3148.	500.	850.	585.	585.
174.0	1.5	2788.	500.	850.	585.	585.
189.0	1.5	2488.	500.	850.	585.	585.
227.0	1.5	2308.	500.	850.	585.	585.
243.0	1.5	2090.	500.	850.	585.	585.
275.0	1.5	1981.	500.	850.	585.	585.
286.0	1.5	2199.	500.	850.	585.	585.
297.5	1.5	2227.	500.	850.	585.	585.
305.3	1.5	2246.	12.	850.	585.	585.
331.0	1.5	2308.	13.	850.	585.	585.
371.0	1.5	2788.	13.	850.	585.	585.
391.0	1.5	2308.	13.	850.	585.	585.
416.0	1.5	1763.	13.	850.	585.	585.
426.0	1.5	1523.	13.	850.	585.	585.
453.5	1.5	896.	13.	850.	585.	585.
492.5	1.5	22.	13.	850.	585.	585.
493.5	1.5	12.	13.	850.	585.	585.
FAILURE SURFACE IN STRATA 6 EL. 1.5 DIST. 493.5 STRENGTH 850.0						
518.5	1.5	12.	13.	850.	999999.	850.
626.0	1.5	12.	13.	850.	999999.	850.
723.5	1.5	12.	13.	850.	999999.	850.
733.5	1.5	12.	13.	850.	999999.	850.
1000.0	1.5	12.	13.	850.	999999.	850.

ASSUMED CRIT. PASSIVE LOC. 230.0 EL. 1.5 DP 20442. RP 20477.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	1.5	29405.	21120.	0.	64350.	11.82
125.0	1.5	30047.	21190.	0.	61425.	10.73
130.0	1.5	31299.	21262.	0.	58500.	9.23
135.0	1.5	33198.	21363.	0.	55575.	7.64
140.0	1.5	35952.	21787.	0.	52650.	6.12
145.0	1.5	38881.	22503.	0.	49725.	5.03
150.0	1.5	41420.	23335.	0.	46800.	4.32
155.0	1.5	43399.	24235.	0.	43875.	3.86
160.0	1.5	44455.	24872.	0.	40950.	3.59
165.0	1.5	44483.	25106.	0.	38025.	3.48
170.0	1.5	43546.	25172.	0.	35100.	3.49
175.0	1.5	41617.	25019.	0.	32175.	3.67
180.0	1.5	39040.	24621.	0.	29250.	4.00
185.0	1.5	35805.	23746.	0.	26325.	4.59
190.0	1.5	32504.	22682.	0.	23400.	5.52

CRIT. ACTIVE LOC 165.0 EL 1.5 DA 44483. RA 25106.

DIST.	EL.	DP	RP	DB	RB	FS
205.0	1.5	24692.	23153.	0.	23400.	3.62
210.0	1.5	24104.	22635.	0.	26325.	3.63
215.0	1.5	23395.	21979.	0.	29250.	3.62
220.0	1.5	22522.	21291.	0.	32175.	3.58
225.0	1.5	21488.	20756.	0.	35100.	3.52
230.0	1.5	20442.	20477.	0.	38025.	3.48
235.0	1.5	19596.	20307.	0.	40950.	3.47
240.0	1.5	19009.	20139.	0.	43875.	3.50
245.0	1.5	18658.	19972.	0.	46800.	3.56
250.0	1.5	18357.	19807.	0.	49725.	3.62

* * STRATUM 7 ACT. WEDGE LOC. 120.0 EL. -3.5 PASS. WEDGE LOC. 230.0 EL. -3.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
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s113.out

.0	-3.5	3153.	813.	585.	1351.	585.
100.0	-3.5	3153.	813.	585.	1351.	585.
120.0	-3.5	3213.	813.	585.	1386.	585.
131.0	-3.5	3513.	813.	585.	1559.	585.
139.0	-3.5	3753.	813.	585.	1698.	585.
150.0	-3.5	3813.	813.	585.	1732.	585.
150.0	-3.5	3813.	813.	585.	1732.	585.
162.0	-3.5	3753.	813.	585.	1698.	585.
174.0	-3.5	3393.	813.	585.	1490.	585.
189.0	-3.5	3093.	813.	585.	1317.	585.
227.0	-3.5	2913.	813.	585.	1213.	585.
243.0	-3.5	2695.	813.	585.	1087.	585.
275.0	-3.5	2586.	813.	585.	1024.	585.
286.0	-3.5	2804.	813.	585.	1150.	585.
297.5	-3.5	2832.	813.	585.	1166.	585.
305.3	-3.5	2851.	325.	585.	1458.	585.
331.0	-3.5	2913.	325.	585.	1494.	585.
371.0	-3.5	3393.	325.	585.	1771.	585.
391.0	-3.5	2913.	325.	585.	1494.	585.
416.0	-3.5	2368.	325.	585.	1179.	585.
426.0	-3.5	2128.	325.	585.	1041.	585.
453.5	-3.5	1501.	325.	585.	679.	585.
SHEAR STRENGTHS ARE EQUAL				585.0 AT DIST.	460.8	
492.5	-3.5	627.	325.	585.	175.	175.
493.5	-3.5	617.	325.	585.	169.	169.
518.5	-3.5	324.	325.	585.	0.	0.
FAILURE SURFACE IN STRATA				7 EL. -3.5	DIST. 518.6	STRENGTH 585.0
626.0	-3.5	324.	325.	585.	999999.	585.
723.5	-3.5	324.	325.	585.	999999.	585.
733.5	-3.5	324.	325.	585.	999999.	585.
1000.0	-3.5	324.	325.	585.	999999.	585.

ASSUMED CRIT. PASSIVE LOC. 230.0 EL. -3.5 DP 32273. RP 26157.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-3.5	43631.	26927.	0.	64350.	10.34
125.0	-3.5	44299.	26970.	0.	61425.	9.53
130.0	-3.5	45624.	27040.	0.	58500.	8.37
135.0	-3.5	47579.	27112.	0.	55575.	7.11
140.0	-3.5	50214.	27213.	0.	52650.	5.91
145.0	-3.5	53299.	27637.	0.	49725.	4.92
150.0	-3.5	56365.	28353.	0.	46800.	4.21
155.0	-3.5	58909.	29185.	0.	43875.	3.72
160.0	-3.5	60763.	30085.	0.	40950.	3.41
165.0	-3.5	61580.	30721.	0.	38025.	3.24
170.0	-3.5	60909.	30956.	0.	35100.	3.22
175.0	-3.5	59227.	31022.	0.	32175.	3.32
180.0	-3.5	56718.	30869.	0.	29250.	3.53
185.0	-3.5	53642.	30471.	0.	26325.	3.88
190.0	-3.5	49915.	29596.	0.	23400.	4.49
195.0	-3.5	46373.	28532.	0.	20475.	5.33

CRIT. ACTIVE LOC 170.0 EL. -3.5 DA 60909. RA 30956.

DIST.	EL.	DP	RP	DB	RB	FS
205.0	-3.5	37617.	28485.	0.	20475.	3.43
210.0	-3.5	36790.	27829.	0.	23400.	3.41
215.0	-3.5	35799.	27141.	0.	26325.	3.36
220.0	-3.5	34646.	26606.	0.	29250.	3.31
225.0	-3.5	33442.	26327.	0.	32175.	3.26
230.0	-3.5	32273.	26157.	0.	35100.	3.22
235.0	-3.5	31345.	25989.	0.	38025.	3.21
240.0	-3.5	30675.	25822.	0.	40950.	3.23
245.0	-3.5	30242.	25657.	0.	43875.	3.28
250.0	-3.5	29858.	25494.	0.	46800.	3.33

* * STRATUM 8 ACT. WEDGE LOC. 120.0 EL. -25.0 PASS WEDGE LOC. 620.0 EL. -25.0

s113.out

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	URLIFT	STR 1	STR 2	STR USED
.0	-25.0	5733.	2156.	2065.	850.	850.
100.0	-25.0	5733.	2156.	2065.	850.	850.
120.0	-25.0	5793.	2156.	2100.	850.	850.
131.0	-25.0	6093.	2156.	2273.	850.	850.
139.0	-25.0	6333.	2156.	2411.	850.	850.
150.0	-25.0	6393.	2156.	2446.	850.	850.
150.0	-25.0	6393.	2156.	2446.	850.	850.
162.0	-25.0	6333.	2156.	2411.	850.	850.
174.0	-25.0	5973.	2156.	2203.	850.	850.
189.0	-25.0	5673.	2156.	2030.	850.	850.
227.0	-25.0	5493.	2156.	1926.	850.	850.
243.0	-25.0	5275.	2156.	1801.	850.	850.
275.0	-25.0	5166.	2156.	1738.	850.	850.
286.0	-25.0	5384.	2156.	1864.	850.	850.
297.5	-25.0	5412.	2156.	1880.	850.	850.
305.3	-25.0	5431.	1669.	2172.	850.	850.
331.0	-25.0	5493.	1669.	2208.	850.	850.
371.0	-25.0	5973.	1669.	2485.	850.	850.
391.0	-25.0	5493.	1669.	2208.	850.	850.
416.0	-25.0	4948.	1669.	1893.	850.	850.
426.0	-25.0	4708.	1669.	1755.	850.	850.
453.5	-25.0	4081.	1669.	1393.	850.	850.
492.5	-25.0	3207.	1669.	888.	850.	850.
493.5	-25.0	3197.	1669.	883.	850.	850.
SHEAR STRENGTHS ARE EQUAL 850.0 AT DIST. 498.3						
518.5	-25.0	2904.	1669.	713.	850.	713.
626.0	-25.0	1666.	1669.	0.	850.	0.
723.5	-25.0	1666.	1669.	0.	999999.	0.
733.5	-25.0	1666.	1669.	0.	999999.	0.
1000.0	-25.0	1666.	1669.	0.	999999.	0.

ASSUMED CRIT. PASSIVE LOC. 620.0 EL. -25.0 DP 22272. RP 57.

ACTIVE WEDGE DATA

DIST	ELEV.	DA	RA	DB	RB	FS
120.0	-25.0	139529.	69924.	0.	375571.	3.80
125.0	-25.0	140529.	70490.	0.	371321.	3.74
130.0	-25.0	142657.	71756.	0.	367071.	3.65
135.0	-25.0	145899.	73674.	0.	362821.	3.53
140.0	-25.0	149983.	75779.	0.	358571.	3.40
145.0	-25.0	154076.	77484.	0.	354321.	3.28
150.0	-25.0	157796.	78500.	0.	350071.	3.16
155.0	-25.0	161117.	79003.	0.	345821.	3.06
160.0	-25.0	164185.	79552.	0.	341571.	2.97
165.0	-25.0	166330.	79869.	0.	337321.	2.90
170.0	-25.0	166812.	79620.	0.	333071.	2.86
175.0	-25.0	165409.	78549.	0.	328821.	2.85
180.0	-25.0	162495.	77003.	0.	324571.	2.86
185.0	-25.0	158792.	75490.	0.	320321.	2.90
190.0	-25.0	154494.	74010.	0.	316071.	2.95
195.0	-25.0	149996.	72632.	0.	311821.	3.01
200.0	-25.0	145574.	71335.	0.	307571.	3.07

CRIT. ACTIVE LOC 175.0 EL -25.0 DA 165409. RA 78549.

DIST.	EL.	DP	RP	DB	RB	FS
600.0	-25.0	22820.	1137.	0.	326698.	2.85
605.0	-25.0	22618.	738.	0.	327478.	2.85
610.0	-25.0	22460.	425.	0.	328091.	2.85
615.0	-25.0	22345.	198.	0.	328539.	2.85
620.0	-25.0	22272.	57.	0.	328821.	2.85
625.0	-25.0	22242.	1.	0.	328937.	2.85
626.0	-25.0	22242.	0.	0.	328941.	2.85

s113.out

STRATUM 9 ACT. WEDGE LOC. 120.0 EL. -44.5 PASS.WEDGE LOC. 620.0 EL. -44.5

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-44.5	7820.	3375.	850.	550.	550.
100.0	-44.5	7820.	3375.	850.	550.	550.
120.0	-44.5	7880.	3375.	850.	550.	550.
131.0	-44.5	8180.	3375.	850.	550.	550.
139.0	-44.5	8420.	3375.	850.	550.	550.
150.0	-44.5	8479.	3375.	850.	550.	550.
150.0	-44.5	8479.	3375.	850.	550.	550.
162.0	-44.5	8419.	3375.	850.	550.	550.
174.0	-44.5	8059.	3375.	850.	550.	550.
189.0	-44.5	7759.	3375.	850.	550.	550.
227.0	-44.5	7579.	3375.	850.	550.	550.
243.0	-44.5	7361.	3375.	850.	550.	550.
275.0	-44.5	7253.	3375.	850.	550.	550.
286.0	-44.5	7471.	3375.	850.	550.	550.
297.5	-44.5	7498.	3375.	850.	550.	550.
305.3	-44.5	7517.	2887.	850.	550.	550.
331.0	-44.5	7580.	2888.	850.	550.	550.
371.0	-44.5	8059.	2888.	850.	550.	550.
391.0	-44.5	7579.	2888.	850.	550.	550.
416.0	-44.5	7034.	2888.	850.	550.	550.
426.0	-44.5	6794.	2888.	850.	550.	550.
453.5	-44.5	6167.	2888.	850.	550.	550.
492.5	-44.5	5294.	2888.	850.	550.	550.
493.5	-44.5	5284.	2888.	850.	550.	550.
518.5	-44.5	4991.	2888.	850.	550.	550.
626.0	-44.5	3753.	2888.	850.	550.	550.
723.5	-44.5	2883.	2888.	850.	550.	550.
FAILURE SURFACE IN STRATA	9	EL. -44.5	DIST. 723.5	STRENGTH	850.0	
733.5	-44.5	2883.	2888.	850.	999999.	850.
1000.0	-44.5	2883.	2888.	850.	999999.	850.

ASSUMED CRIT. PASSIVE LOC. 620.0 EL. -44.5 DP 74601. RP 29323.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	FS
120.0	-44.5	271286.	102479.	0.	275000.	2.07
125.0	-44.5	271960.	102531.	0.	272250.	2.05
130.0	-44.5	273372.	102670.	0.	269500.	2.02
135.0	-44.5	275533.	102879.	0.	266750.	1.99
140.0	-44.5	278435.	103099.	0.	264000.	1.94
145.0	-44.5	281933.	103735.	0.	261250.	1.90
150.0	-44.5	286013.	105072.	0.	258500.	1.86
155.0	-44.5	290491.	107031.	0.	255750.	1.82
160.0	-44.5	294913.	109128.	0.	253000.	1.78
165.0	-44.5	298737.	110767.	0.	250250.	1.74
170.0	-44.5	301346.	111712.	0.	247500.	1.71
175.0	-44.5	302843.	112204.	0.	244750.	1.69
180.0	-44.5	303609.	112751.	0.	242000.	1.68
185.0	-44.5	303139.	113021.	0.	239250.	1.67
190.0	-44.5	301206.	112709.	0.	236500.	1.67
195.0	-44.5	297874.	111555.	0.	233750.	1.68
200.0	-44.5	293547.	109996.	0.	231000.	1.69
205.0	-44.5	288871.	108496.	0.	228250.	1.71
210.0	-44.5	283959.	107009.	0.	225500.	1.73

CRIT. ACTIVE LOC 185.0 EL. -44.5 OA 303139. RA 113021.

DIS.	EL.	DP	RP	DB	RB	FS
600.0	-44.5	78757.	33215.	0.	228250.	1.67
605.0	-44.5	77600.	33150.	0.	231000.	1.67
610.0	-44.5	76500.	32156.	0.	233750.	1.67
615.0	-44.5	75499.	30739.	0.	236500.	1.67
620.0	-44.5	74601.	29323.	0.	239250.	1.67

				slip out	
625.0	-44.5	73805.	27906.	0.	242000.
630.0	-44.5	73090.	26489.	0.	244750.
635.0	-44.5	72414.	25073.	0.	247500.
640.0	-44.5	71775.	23656.	0.	250250.
645.0	-44.5	71172.	22240.	0.	253000.

* * STRATUM 10 ACT. WEDGE LOC. 140.0 EL. -64.0 PASS.WEDGE LOC. 690.0 EL. -64.0

ASSUMED FAILURE SURFACE DATA

DIST.	ELEV.	WT.	UPLIFT	STR 1	STR 2	STR USED
.0	-64.0	9848.	4594.	550.	715.	550.
100.0	-64.0	9848.	4594.	550.	715.	550.
120.0	-64.0	9908.	4594.	550.	715.	550.
131.0	-64.0	10208.	4594.	550.	715.	550.
139.0	-64.0	10448.	4594.	550.	715.	550.
150.0	-64.0	10507.	4594.	550.	715.	550.
150.0	-64.0	10507.	4594.	550.	715.	550.
162.0	-64.0	10447.	4594.	550.	715.	550.
174.0	-64.0	10087.	4594.	550.	715.	550.
189.0	-64.0	9787.	4594.	550.	715.	550.
227.0	-64.0	9607.	4594.	550.	715.	550.
243.0	-64.0	9389.	4594.	550.	715.	550.
275.0	-64.0	9281.	4594.	550.	715.	550.
286.0	-64.0	9499.	4594.	550.	715.	550.
297.5	-64.0	9526.	4594.	550.	715.	550.
305.3	-64.0	9545.	4106.	550.	715.	550.
331.0	-64.0	9608.	4106.	550.	715.	550.
371.0	-64.0	10087.	4106.	550.	715.	550.
391.0	-64.0	9607.	4106.	550.	715.	550.
416.0	-64.0	9062.	4106.	550.	715.	550.
426.0	-64.0	8822.	4106.	550.	715.	550.
453.5	-64.0	8195.	4106.	550.	715.	550.
492.5	-64.0	7322.	4106.	550.	715.	550.
493.5	-64.0	7312.	4106.	550.	715.	550.
518.5	-64.0	7019.	4106.	550.	715.	550.
626.0	-64.0	5781.	4106.	550.	715.	550.
723.5	-64.0	4911.	4106.	550.	715.	550.
733.5	-64.0	4828.	4106.	550.	715.	550.
1000.0	-64.0	4828.	4106.	550.	715.	550.

ASSUMED CRIT. PASSIVE LOC. 690.0 EL. -64.0 DP 146856. RP 25415.

ACTIVE WEDGE DATA

DIST.	ELEV.	DA	RA	DB	RB	F5
140.0	-64.0	450292.	123930.	0.	302500.	1.49
145.0	-64.0	453427.	123991.	0.	299750.	1.47
150.0	-64.0	456752.	124139.	0.	297000.	1.44
155.0	-64.0	460123.	124351.	0.	294250.	1.42
160.0	-64.0	463382.	124581.	0.	291500.	1.39
165.0	-64.0	466703.	125288.	0.	288750.	1.37
170.0	-64.0	469767.	126694.	0.	286000.	1.36
175.0	-64.0	472460.	128689.	0.	283250.	1.34
180.0	-64.0	474605.	130771.	0.	280500.	1.33
185.0	-64.0	475854.	132344.	0.	277750.	1.32
190.0	-64.0	476092.	133213.	0.	275000.	1.32
195.0	-64.0	475766.	133705.	0.	272250.	1.31
200.0	-64.0	475137.	134248.	0.	269500.	1.31
205.0	-64.0	473604.	134466.	0.	266750.	1.31
210.0	-64.0	470971.	134085.	0.	264000.	1.31
215.0	-64.0	467056.	132858.	0.	261250.	1.31
220.0	-64.0	462202.	131291.	0.	258500.	1.32
225.0	-64.0	457047.	129804.	0.	255750.	1.32
230.0	-64.0	451605.	128311.	0.	253000.	1.33

CRIT. ACTIVE LOC 205.0 EL -64.0 DA 473604. RA 134466.

DIST.	EL.	DP	RP	DB	RB	F5
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665.0	-64.0	152188.	32498.	0.	253000.	1.31
670.0	-64.0	151048.	31082.	0.	255750.	1.31
675.0	-64.0	149944.	29665.	0.	258500.	1.31
680.0	-64.0	148877.	28249.	0.	261250.	1.31
685.0	-64.0	147848.	26832.	0.	264000.	1.31
690.0	-64.0	146856.	25415.	0.	266750.	1.31
695.0	-64.0	145900.	23999.	0.	269500.	1.31
700.0	-64.0	144982.	22582.	0.	272250.	1.31
705.0	-64.0	144102.	21265.	0.	275000.	1.31
710.0	-64.0	143267.	20349.	0.	277750.	1.31

CEMVN-OD-D

17 May 2011

MEMORANDUM FOR C/Reg Branch (ATTN: Darlene Herman)

SUBJECT: Permit application by Kenneth Bernhard
MVN 2011-0563 WB

1. There is no adverse comment for the subject permit request.
2. Point of contact is Anh Nguyen, extension 2153.

Anh Thuan Nguyen

FOR Michael Lowe
Operations Manager

Encl

May 3, 2011

MEMORANDUM FOR: Mike Lowe

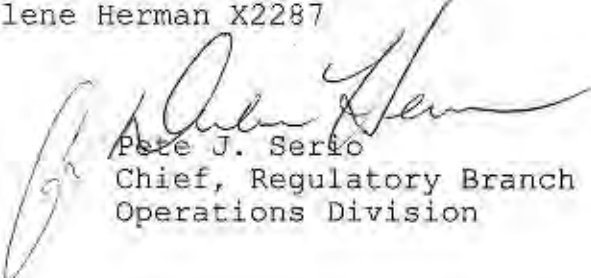
SUBJECT: Letter of no objection from Engineering Division

1. As per your request, the attached permit application has been reviewed by Engineering Division and is being returned back to you for further review. Also, attached is a letter of no objection from Engineering Division.
2. Information relative to this application is as follows:

APPLICANT: Kenneth Bernhard

APPLICATION No: MVN 2011-0563 WB

PROJECT MANAGER: Darlene Herman X2287



Pete J. Serio
Chief, Regulatory Branch
Operations Division

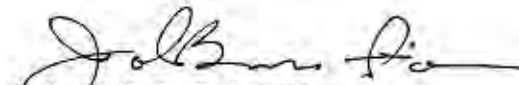
- 3 Encl.
1. Appl. form
 2. Set of dwgs.
 3. Engr Comments

21 April 2011

MEMORANDUM FOR: Chief/CEMVN-OD-SW

SUBJECT: Review of Permit MVN-2011-0563-WB to install an electrical line by boring with a directional drill beneath the Atchafalaya River at approximate Mile 60 by Kenneth Bernhard near Butte La Rose, St. Martin Parish, Louisiana (Mailtrax #11-6397)

1. Reference CEMVN-OD-SW memorandum dated 23 March 2011 requesting review of the subject permit.
2. Engineering Division has reviewed the subject permit request. We have no adverse comments regarding the subject permit request provided the following changes and/or additions are made an integral part of the letter of no objection. Written verification of these provisions should be requested and the agreements made part of our files. Accomplishment of the above negates the necessity of further review of the permit request by us.
 - a. No drilling or excavation will be performed when river stage on the Carrollton gage is elevation +11.0 or higher.
3. Point of contact for this permit review is Jason Binet, telephone extension 2127.


WALTER O. BAOMY, JR., P.E.
Chief, Engineering Division

Encl
Nc

CF: CEMVN-ED-F (Bivona)

CEMVN-OD-SW

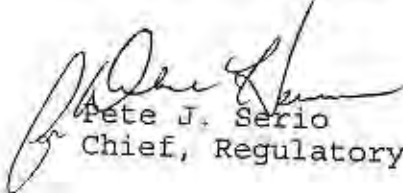
11-6398
March 23, 2011

MEMORANDUM FOR C/Engineering Div

SUBJECT: MVN 2011-0563 WB

1. Submitting application by Kenneth Bernhard for an electrical line bore, beneath the Atchafalaya River in Butte LaRose area in St. Martin Parish, Louisiana.
2. Please respond within 10 working days of this memo. A lack of response will construed as a no comment.
3. If you need assistance call Darlene Herman at X2287.

Encls



Pete J. Serio

Chief, Regulatory Branch

March 16, 2011

MEMORANDUM FOR: Mike Lowe

SUBJECT: Review of Permit Application for need of Engineering Division Review.

1. The attached permit application is forwarded for your determination as to need for an Engineering Division Review. Please forward your response within 2 days of the date of this memorandum.
2. Information relative to this application is as follows:

APPLICANT: Kenneth Bernhard

APPLICATION No.: MVN 2011-0563 WB

PROJECT MANAGER: Darlene Herman X2287


 Pete J. Serio
 Chief, Regulatory Branch

- 2 Encls
1. Appl. form
 2. Set of dwgs.


CEMVN-OD-G 1st end

DATE: 3/18/2011

FOR: Chief, Regulatory Branch

Reference permit application forwarded for determination as to need for a Engineering Division Review.

- a. Forward application to Engineering Division review. Review time may be charged to J2KG9K
- b. The impacts are minor. Engineering review is not required. See "other" for conditions or additional comments (if any).
- c. Other. See enclosed comments.


 OPERATIONS MANAGER.

Tim Morton & Associates, Inc.

Regulatory & Environmental Consultants

730 E. Kaliste Saloom Road

Lafayette, LA 70508

(337) 234-5124

(337) 235-3632 (FAX)

March 4, 2011

MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

Re: Kenneth Bernhard, Proposed Electrical Line Bore, Atchafalaya River, Butte La Rose Area, St. Martin Parish, Louisiana

Dear Mr. Duke,

Mr. Kenneth Bernhard proposes to directionally drill a utility crossing across the Atchafalaya River near Butte La Rose, Louisiana, for the purpose of providing electricity to his property which is located on the left descending bank of the river. It is anticipated that an 8-inch diameter hole would be directionally drilled across the river and three 2-inch pipes would be run in that hole. The bore entry point would be located on Mr. Bernhard's property. The bore exit point would be located in the batture at a site approximately 332-feet from the centerline of the Atchafalaya River Protection levee and approximately 114-feet from the bank of the river. A stability control line survey was conducted at the project site by Eustis Engineering, and a report of their findings is included with this application. In accordance with those findings, the bore exit point would be located approximately 117-feet riverward of the levee stability control line.

In accordance with the burial requirements outlined in the New Orleans District, Corps of Engineers' May 31, 2010 Public Notice, the proposed utility line crossing would be bored a minimum of 15-feet below the mudline of the Atchafalaya River. A minimum distance of 20-feet would be maintained between the bore and the levee stability control line. Approval for the installation of these proposed pipelines is requested under Nationwide Permit No. 12 from your agency.

We believe that the proposed project site falls within an area in which the Corps of Engineers has a real estate interest. U.S. Government Easement No. DACW29-9-11-66 was granted to Mr. Bernhard by your agency for the purpose of constructing and maintaining the camp site, boat dock and walkway which this proposed utility line will serve. The applicant hereby respectfully requests that the utility line that is proposed in this application be included for coverage in the aforementioned Real Estate Consent.

Tim Morton & Associates, Inc.
Regulatory & Environmental Consultants

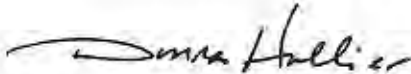
MAR 09 2011

Mr. Ronnie Duke
Chief, Western Evaluation Section
New Orleans District, Corps of Engineers
Page Two
March 4, 2011

If additional information is required, please advise. I may be reached at 337/735-3882. Thank you for your consideration of this application.

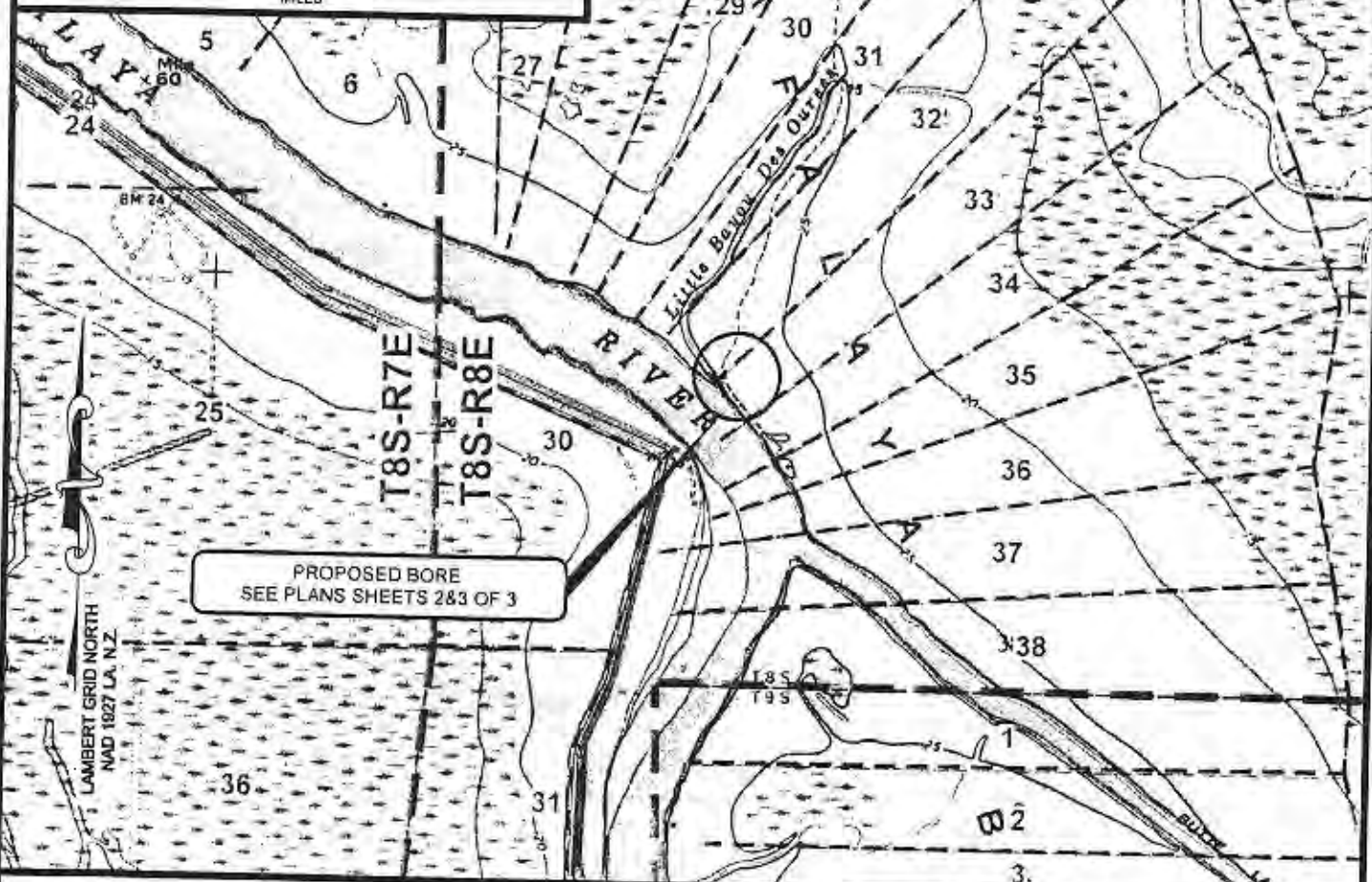
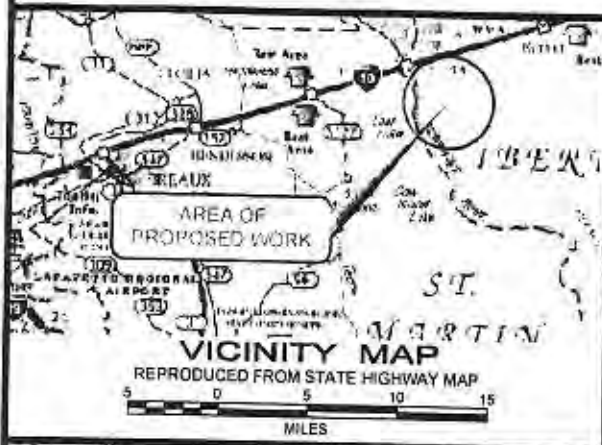
Sincerely,

TIM MORTON & ASSOCIATES, INC.



Donna Hollier, CPS
Agent for Kenneth Bernhard

dh
Attachments



LOCATION MAP

REPRODUCED FROM USGS BUTTE LA ROSE QUADRANGLE

KENNETH BERNHARD

200 Lainsfair Drive
Lafayette, LA 70503

PROPOSED BORE
BUTTE LA ROSE AREA

ST. MARTIN PARISH, LOUISIANA

PREPARED BY **GeoTechnologies**

JOB NO. 100776

DWG: REP

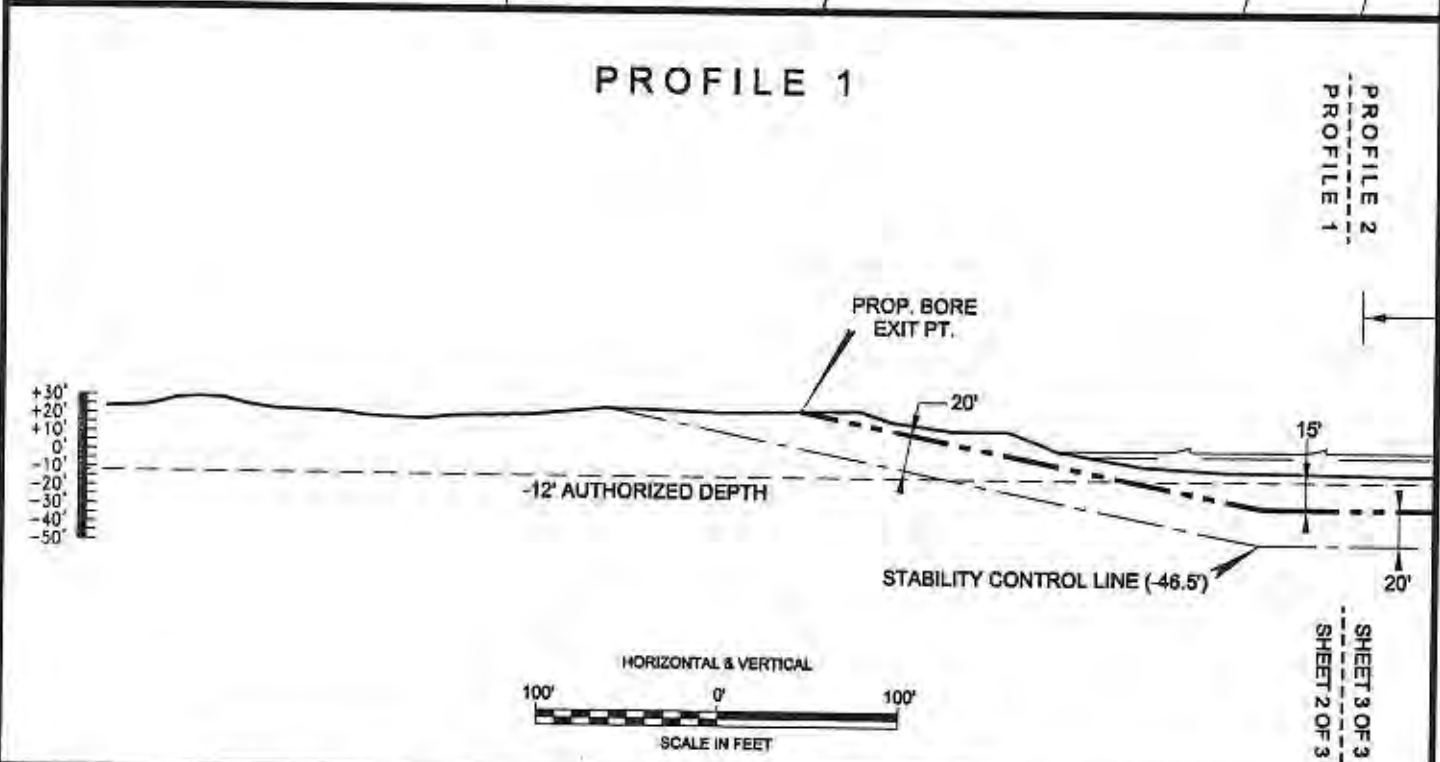
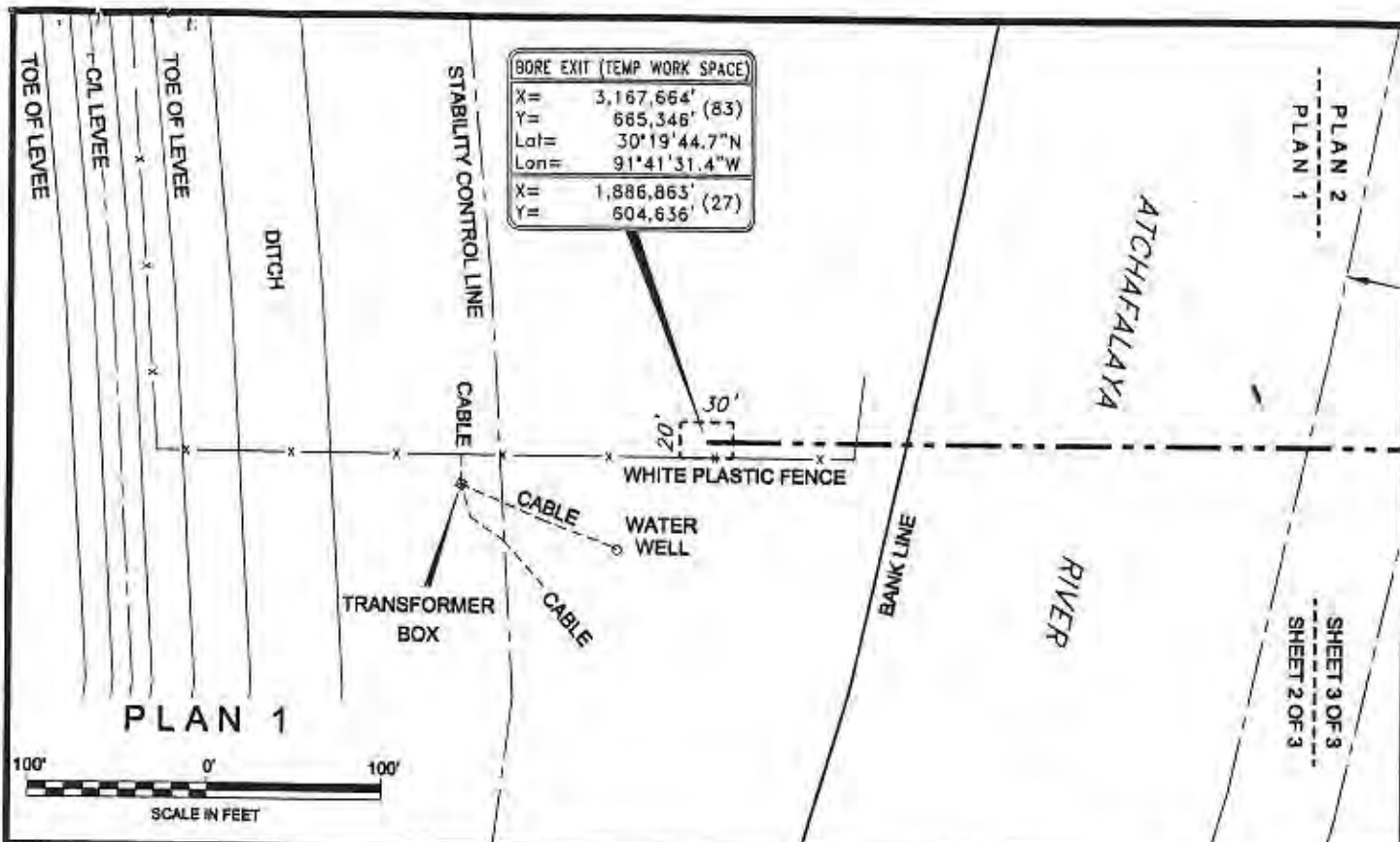
CHK: HEK

REVISED:

DATE: 3/15/2011

FILENAME: L:\08S08E\100776\100776.DWG

SHEET 1 OF 3



KENNETH BERNHARD

200 L'ainsfair Drive

Lafayette, LA 70503

PROPOSED BORE

BUTTE LA ROSE

ST. MARTIN PARISH, LOUISIANA

PREPARED BY **C&C Technologies**
SURVEY SERVICES
700 E. KALISTE BALOGH ROAD, LAFAYETTE, LA (337) 281-0000
LA REGISTRATION NUMBER: 330

JOB NO. 100776

DWG: REP

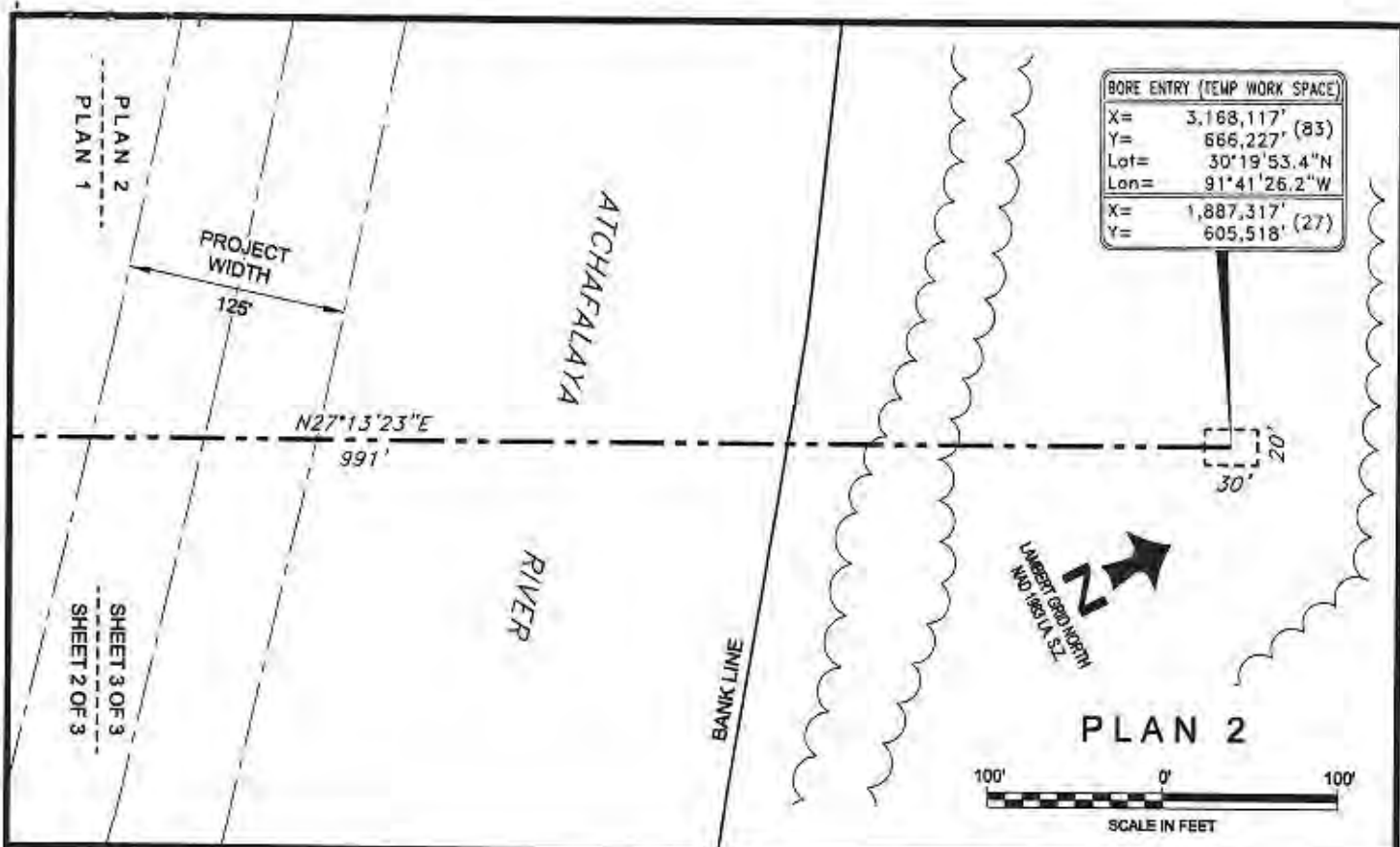
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REVISED:

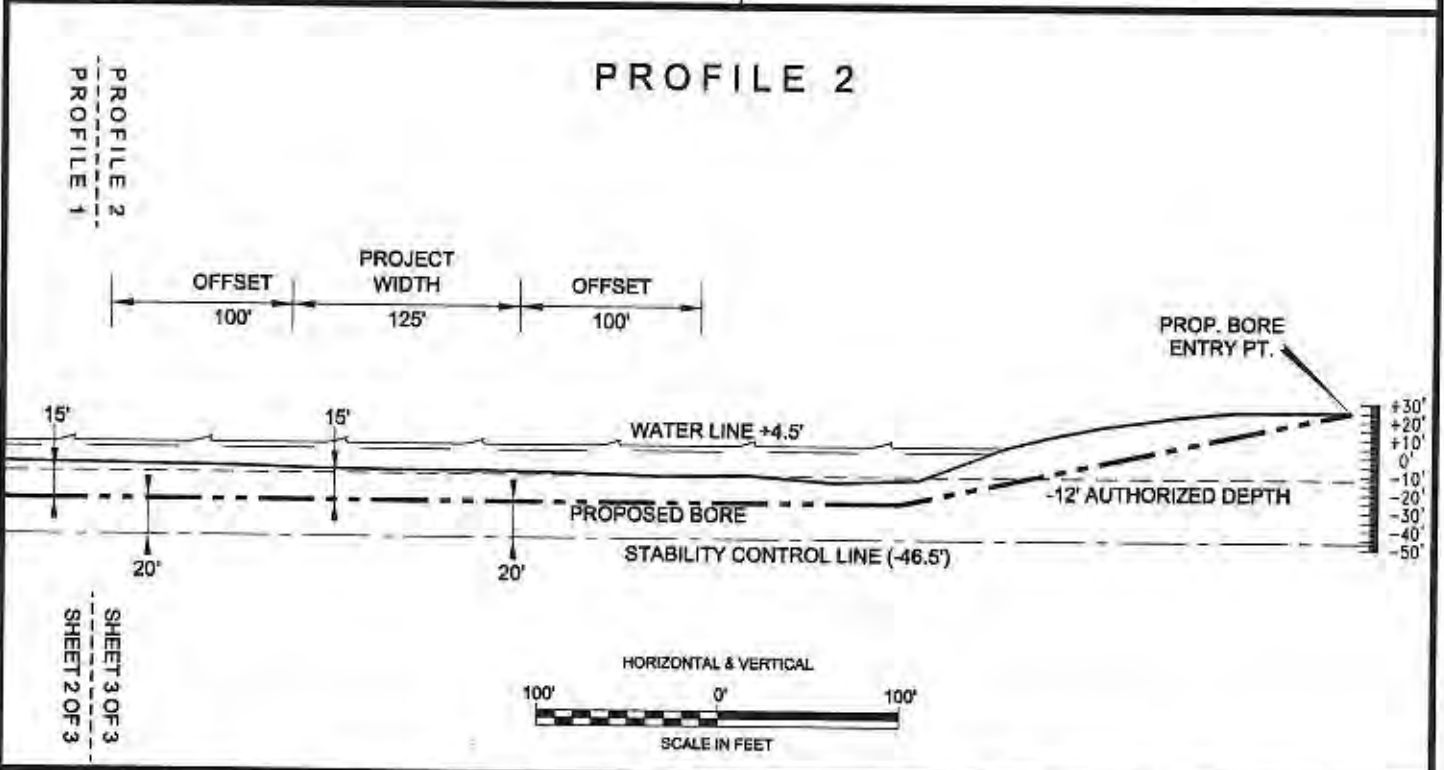
DATE: 3/15/2011

FILENAME: L:\08S08E\100776\C100776A.DWG

SHEET 2 OF 3



BORE ENTRY (TEMP WORK SPACE)	
X=	3,168,117' (83)
Y=	666,227' (83)
Lot=	30°19'53.4\"N
Lon=	91°41'26.2\"W
X=	1,887,317' (27)
Y=	605,518' (27)



KENNETH BERNHARD 200 Llainsfair Drive Lafayette, LA 70503		PROPOSED BORE BUTTE LA ROSE ST. MARTIN PARISH, LOUISIANA		
PREPARED BY C&C Technologies SURVEY SERVICES 730 E. KALISIE SALOOM ROAD, LAFAYETTE, LA (337) 281-0880 LA REGISTRATION NUMBER: 330	JOB NO. 100776	DWG. REP	CHK: HEK	REVISED:
FILENAME: L:\08S08E\100776\C100776A.DWG			DATE: 3/15/2011	
				SHEET 3 OF 3

CEMVN-OD-SW

March 16, 2011

MEMORANDUM FOR: Operations Division, Atchafalaya Floodway System

SUBJECT: The attached permit application is forwarded for your determination as to the need for a special use permit.

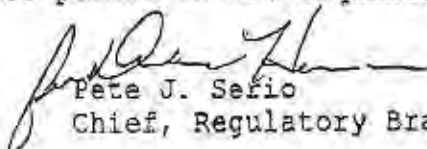
1. Information relative to this application is as follows:

APPLICANT: Kenneth Bernhard

APPLICATION No: MVN 2011-0563 WB

PROJECT MANAGER: Darlene Herman (862-2287)

2. Please advise us of your determination as soon as possible. Lack of reply within 5 days of this date will be construed as indicating that a special use permit is not required.


Pete J. Seffo
Chief, Regulatory Branch

Encl


CEMVN-OD-D 1st End

DATE:

FOR: Chief, Regulatory Branch

Reference permit application forwarded for determination as to need for a special use permit.

- a. A special use permit is not required.
- b. A special use permit is required.
- c. A Real Estate Easement Consent is not required.
- d. A Real Estate Easement Consent is required. contact RE about easement.
- 1. Applicant has contacted my office for application.
- 2. Applicant has **not** contacted my office for application.


Ranger, Operations Division
Stephen M Stone

111
MAR 18 2011
Liquit 62 BLKS

CEMVN-OD-SW

March 16, 2011

MEMORANDUM FOR: Chief, Real Estate Division,

SUBJECT: Review of Permit Application as to need for a
Real Estate Instrument

1. The attached permit application is forwarded for your determination as to the need for a real estate instrument.

APPLICANT: Kenneth Bernhard

APPLICATION No: MVN 2011-0563 WB

PROJECT MANAGER: Darlene Herman X2287

2. Please advise us of your determination as soon as possible. Lack of reply within 2 days of this date will be construed as indicating that Real Estate Division has no property interest at the proposed site and does not object to permit issuance.


Pete J. Serio
Chief, Regulatory Branch

Encl

CEMVN-RE-M 1st End

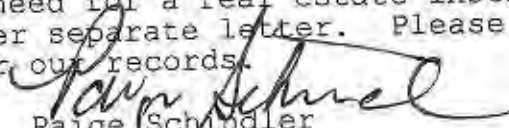
DATE 3/28/11

FOR: Chief, Regulatory Branch

Reference permit application forwarded for determination as to need for a real estate interest.

a. No real estate instrument will be required for this application, as no real estate interest under the jurisdiction of the New Orleans District is involved.

✓ b. A real estate instrument will be required for this application as it impacts real estate interests under the jurisdiction of the New Orleans District. If reviewed by other district elements result in project changes, these changes should be forwarded to Real Estate Division to be incorporated into the real estate instrument. Within the permit, please also advise the applicant of the need for a real estate instrument, which will be forwarded under separate letter. Please forward a final copy of the permit for our records.


Paige Schindler
Chief, Mangement, Disposal & Control Br.
Real Estate Division

2 Encls
wd

3/18
Map 89
at

CEMVN-OD-SW

Application: MVN 2011-0563 WB

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Memorandum Documenting Nationwide Permit/Regional General Permit Verification

Applicant: Kenneth Bernhard

Project Location: In St. Martin Parish, Louisiana Calcasieu Parish, Louisiana

Pre-Construction Notification Receipt Date: 3/10/2011 **Complete?** Yes No

Additional Information Requested Date: N/A

Pre-Construction Notification Complete Date: 3/10/2011

Waters of the US:

Authority: Section 10 Section 404 Section 103

Project Description: Install and maintain an electrical line across the Atchafalaya River in St. Martin Parish.

Type of Permit Requested: NWP12 RGP #

Pre-construction Notification Required: Yes No

Waiver required to begin work (see GC 27 (a)(2) as applied to appropriate NWP's): N/A

Yes No

Rationale:

Coordination with Agencies/Tribes Needed: Yes No Date:

Resolution:

Commenting Agencies:

US Fish and Wildlife Service

US Environmental Protection Agency

National Marine Fisheries Service

State Agency (list commenting state agencies)

State Historic Preservation Office

Other:

Substantive Issues Raised and Corps Resolution (Consideration of Comments): none

Compliance with Other Federal Laws (If specific law is not applicable write N/A):

a) Endangered Species Act: previously approved, N/A, see above

Name of species present:

Effects determination:

Date of Service(s) concurrence:

Basis for "no effect" determination:

Additional information (optional):

b) Magnuson-Stevens Act (Essential Fish Habitat): previously approved, N/A, see above

Name of species present:

Effects determination:

Date of Service(s) concurrence: Basis for "no effect" determination:

Additional information (optional):

c) Section 106 of the National Historic Preservation Act: previously approved, N/A, see above

Known site present: yes no

Survey required/conducted: yes no

Effects determination:

Rationale:

Date consultation complete (if necessary):

Additional information (optional):

d) Section 401 Water Quality Certification: has blanket authorization, see above

Individual certification required: yes no

Issued Waived Denied

e) Coastal Zone Management Act: CZM issues independently from Corps for PGP

Individual certification required: yes no

Issued Waived Denied

Additional information (optional):

f) Wild and Scenic Rivers Act: previously approved, see above

Project located on designated or "study" river: yes no

Managing Agency:

Date written determination provided that the project will not adversely affect the Wild and Scenic River designation or study status:

Additional information (optional):

g) Other

Special Conditions required (include rationale for each required condition/explanation for requiring no special conditions): yes no NWP conditions are attached

Compensatory Mitigation Determination: The applicant has avoided and minimized impacts to the maximum extent practicable.

- (1) Is compensatory mitigation required for unavoidable impacts to jurisdictional aquatic resources to reduce the individual and cumulative adverse environmental effects to a minimal level?