The CAREL CORPORATION

January 19, 2010
Project No. 09-12-28

Mr. Arthur Denny
MC 124
Municipal Solid Waste Permits Section
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, Texas 78711-3087

Re: Response to TCEQ Notice of Deficiency Letter Dated December 2, 2009, Camelot Landfill, Groundwater Monitoring System Revision Permit Modification; MSW Permit No. 1312A, Denton County, Texas; Tracking No. 11995256; RN101479038/CN601253628

Dear Mr. Denny:

This letter is written on behalf of the Camelot Landfill in response to a Texas Commission on Environmental Quality (TCEQ) letter dated December 2, 2009. The TCEQ's comment is provided below in italics, with our response immediately following.

Comment 1: *The request in Section 3.4.4 to decommission the six (6) existing point of compliance monitor wells (MW-, 4R, 10, 11, 12, 14, and 15A) which are all currently in Assessment Monitoring is denied. No monitor wells currently in assessment monitoring are to be decommissioned.*

Response: Attachment 5 has been modified to retain wells MW-4R, 10, 11, 12, 14, and 15A. However, the facility desires to designate wells MW-4R, MW-10, MW-11, and MW-12 as observation wells to monitor remedial progress. A revised point of compliance (POC) has been proposed for the Camelot Landfill. The revised point of compliance remains on property owned by the owner of the Camelot Landfill and also remains within the 500 feet requirements per 30 TAC §330.3(106) and 40 CFR §258.40(d). Additional wells south of MW-4R, MW-10, MW-11, and MW-12 have been proposed along the revised POC, each of which meets the 600 foot spacing requirement. As requested, MW-14 and MW-15A will be retained and located along the proposed POC.

Comment 2: *As previously requested, please identify all surface water bodies and features for the Camelot Landfill and how they impact the groundwater gradient and flow. This description should include, but is not limited to excavations and surface water bodies. Also include a description of when all of these features were created.*

136 Pecan Street, Keller, Texas 76248
Telephone: 817.337.0112 • Facsimile: 817.337.0041

Response: Plates 142 through 151 of Permit Attachment 5 have been revised to identify and label surface water bodies. Appendix F has been added to Permit Attachment 5. A discussion of the different categories of surface water bodies illustrated on Plates 142 through 151 and how they impact groundwater gradient and flow is provided in Appendix F.

Comment 3: *The MSW Permits Section also requests that the current and all future surface contour maps include all of the existing bodies of water within and 500 feet approximate to the property line.*

Response: Your request is noted. However, please note that some ground survey control is necessary for these topographic maps. Therefore, mapping adjacent properties may be problematic. Regardless, new topographic maps will attempt to include topography (including surface water bodies) within 500 feet of the property line.

Comment 4: *On an additional map, please enumerate each of the surface water bodies / features and provide an enumerated discussion of how all of the above mentioned site features may affect the facility groundwater flow rate and direction.*

Response: The contour maps provided as Plates 142 through 151 and descriptions provided in Appendix F of Permit Attachment 5 were interpreted and prepared based on landfill features.

Comment 5: *On another additional map, please provide the most likely pathway for pollutant migration in relation to the potential critical receptors (e.g., streams, off-site water wells).*

Response: The pathway for pollutant migration in relation to the potential critical receptors can be derived from Plates 142 through 151 of Permit Attachment 5. The pollution migration would be consistent with groundwater flow directions which are perpendicular to the groundwater contours.

Comment 6: *On a fourth map, describe the relationship between the landfill features (e.g., liner type, depth of excavation and sumps, storm water ponds, etc...) and the uppermost groundwater bearing zone.*

Response: The requested information is provided in Plates 142 through 151 and Appendix F of Permit Attachment 5.

Comment 7: *Does "contaminated" groundwater discharge into surface water bodies located in or adjacent to the Camelot Landfill?*

Response: Some groundwater is believed to discharge into surface water bodies located within the landfill boundaries and groundwater may discharge into off-site surface water bodies. No surface water sampling has been conducted at the facility. Information obtained from Nature and Extent investigations and subsequent groundwater monitoring events indicate no contaminated groundwater is believed to discharge into any surface water body. For example, investigative wells B-3, MW-10B, and MW-12B were installed and sampled to determine the extent of impact hydraulically downgradient of wells MW-11, MW-10, and MW-12. No volatile organic compounds were detected in the aforementioned investigative wells. Currently, no evidence is present to infer contaminant discharge in surface water bodies.

Comment 8: *Include a provision for the information previously requested and in Questions 2, 3, and 4 to be included and updated when requested, as a part of the facility GWSAP in the Hydrogeology – Section 3.5.1.*

Response: *Hydrogeology – Section 3.5.1* is located in Permit Attachment 5. A provision has been added to *Hydrogeology – Section 3.5.1* as requested. The facility GWSAP was not changed due to addition of the requested provision to Permit Attachment 5.

Comment 9: *Are the two monitor wells (MW-19 and MW-20) to be considered upgradient to the landfill? If so, then in order to be more protective and better serve the Camelot Landfill during future GWM events and future use of total metals analyses, we request that these wells be installed within 90 days of modification issuance.*

Response: MW-19 and MW-20 will be installed within 90 days of the approval of this modification. The permit documents have been modified to reflect this change, revised pages are attached.

Comment 10: *Please provide a new demonstration / proposal for how the facility's monitor well spacing will meet the 600ft requirement. In doing so, please include the following:*

- *a scale that is 600 feet,*
- *measurements of the actual distances between all monitor wells (both existing and proposed) for this facility, and*
- *all of the existing bodies of water within the property line and 500 feet of the facility property line.*

Response: Plate 141 has been modified to include the requested information from the first two bullets listed above. The topography illustrated on Plate 141 has also been updated with the most recent aerial photograph taken in

September 2009. Furthermore, existing bodies of water within 500 feet of the property line have been included on the northern, southern, and eastern portions of Plate 141. Illustration of surface water bodies within 500 feet west of the property line requires a new aerial survey and construction of a new topographic map, which is not available at this time. Further, as discussed in the response to Comment 3, topographic mapping of off-site properties may be problematic.

Comment 11: *What seep monitoring data has the Camelot Landfill acquired for areas down gradient of the landfill?*

Response: We are not aware of any seep monitoring data acquired from areas down-gradient of the landfill.

We trust this information meets your needs, please call Mr. Mark Meadows at (972) 434-2015 or us at (817) 337-0112 if you have any questions.

Sincerely,
THE CAREL CORPORATION

Steven Wimmer

Steven J. Wimmer
Remedial and Environmental Services Manager

Kevin T. Carel, P.G.
President

STATE OF TEXAS
KEVIN T. CAREL
GEOLOGY
#960
LICENSED
PROFESSIONAL GEOSCIENTIST

1.19.10

Att: TCEQ Part 1 Application Page 1 and Signature Page
Permit Attachment 5 - Underline/Strikeout Pages
Permit Attachment 5 - Clean/Replacement Pages

cc: TCEQ Region 4 Office
Mark Meadows – Camelot Landfill TX, LP
Mark Allendorf – Republic Services, Inc. (e-copy)
Larry Bressman – Camelot Landfill
Shane Davis – City of Farmer's Branch

TCEQ Part 1 Application Page 1 and Signature Page

Texas Commission on Environmental Quality

Permit or Registration Application for Municipal Solid Waste Facility

Part I

A. General Information

Facility Name:	Camelot Landfill			
Physical or Street Address (if available):	580 Huffines Blvd.			
(City) (County)(State)(Zip Code):	Lewisville	Denton	TX	75056
(Area Code) Telephone Number:	972-492-3888			
Charter Number:				

If the application is submitted on behalf of a corporation, provide the Charter Number as recorded with the Office of the Secretary of State for Texas.

Operator Name[1]:	Camelot Landfill TX, LP			
Mailing Address:	580 Huffines Blvd.			
(City) (County)(State)(Zip Code):	Lewisville	Denton	TX	75056
(Area Code) Telephone Number:	972-492-3888			
(Area Code) FAX Number:	972-492-4943			
Charter Number:				

If the permittee is the same as the operator, type "Same as Operator".

Permittee Name:	City of Farmers Branch			
Physical or Street Address (if available):	13000 Wm. Dodson Pkwy.			
(City) (County)(State)(Zip Code):	Frmrs Branch	Denton	TX	75234
(Area Code) Telephone Number:	972-919-2597			
Charter Number:				

If the application is submitted by a corporation or by a person residing out of state, the applicant must register an Agent in Service or Agent of Service with the Texas Secretary of State's office and provide a complete mailing address for the agent. The agent must be a Texas resident.

Agent Name:	CT Corporation System			
Mailing Address:	350 N. St. Paul Street			
(City) (County)(State)(Zip Code):	Dallas	Dallas	TX	75201
(Area Code) Telephone Number:	214-979-1172			
(Area Code) FAX Number:	214-754-0921			

Application Type:

☐	Permit	☐	Major Amendment	☐	Minor Amendment
☐	Registration	☒	Modification	☐	Temporary Authorization
		☒	w/Public Notice		
		☐	w/out Public Notice	☒	Notice of Deficiency Response

[1] The operator has the duty to submit an application if the facility is owned by one person and operated by another [30 TAC 305.43(b)]. The permit will specify the operator and the owner who is listed on this application [Section 361.087 Texas Health and Safety Code].

Signature Page

I, Mark Pavageaux (Operator), Director, Public Works Dept. (Title)

certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: Mark Pavageaux Date: 1-18-10

TO BE COMPLETED BY THE OPERATOR IF THE APPLICATION IS SIGNED BY AN AUTHORIZED REPRESENTATIVE FOR THE OPERATOR

I, _____ (Print or Type Operator Name), hereby designate _____ (Print or Type Representative Name)

as my representative and hereby authorize said representative to sign any application, submit additional information as may be requested by the Commission; and/or appear for me at any hearing or before the Texas Commission on Environmental Quality in conjunction with this request for a Texas Water Code or Texas Solid Waste Disposal Act permit. I further understand that I am responsible for the contents of this application, for oral statements given by my authorized representative in support of the application, and for compliance with the terms and conditions of any permit which might be issued based upon this application.

_____
Printed or Typed Name of Operator or Principal Executive Officer

_____
Signature

SUBSCRIBED AND SWORN to before me by the said Mark Pavageaux

On this 18th day of January, 2010

My commission expires on the 30th day of November, 2011

NAOMI DINGMAN-SMART
MY COMMISSION EXPIRES
November 30, 2011

Naomi Dingman-Smart
Notary Public in and for
Dallas County, Texas

(Note: Application Must Bear Signature & Seal of Notary Public)

Attachment 5
Underlined/Strikeout Replacement Pages

CAMELOT LANDFILL
DENTON COUNTY, TEXAS
TCEQ MSW Permit No. 1312-A

ATTACHMENT 5
GROUNDWATER CHARACTERIZATION REPORT

Prepared November 1995

~~**Revised June 2009**~~
Revised January 2010

Prepared for

Camelot Landfill TX, L.P.

and

The City of Farmers Branch, Texas

Prepared by

The CAREL CORPORATION

136 Pecan Street
Keller, Texas 76248
(817) 337-0112

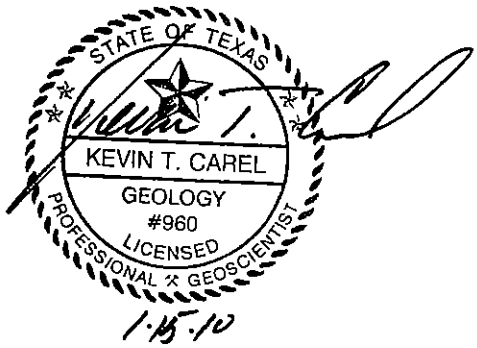
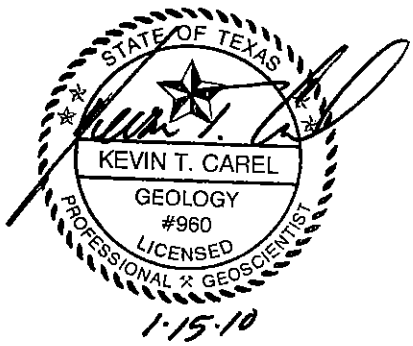


TABLE OF CONTENTS



TABLE

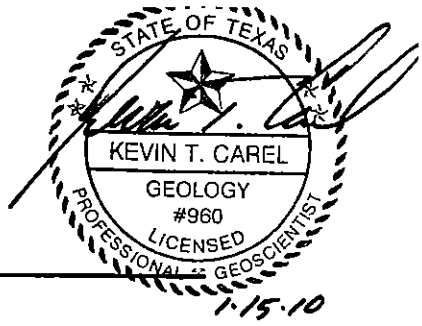


TABLE OF CONTENTS (CONTINUED)

ILLUSTRATIONS

APPENDICES

10. Location of off-site well and chemistry data, Plates 129 and 130.

11. Durov plot depicting the average character of groundwater from facility monitor wells, Plate 131.

12. Contour and distribution of selected groundwater quality constituents, Plates 132 through 140.

13. Groundwater Monitoring System Plan, Plate 141.

14. Groundwater gradient maps for December, 1999 through December, 2008, Plates 142 through 151.

APPENDIX

A. Boring Logs and Monitor Well Data Sheets completed on the Camelot Site, Plates A-1 through A-57

B. Detail of Monitor Well Construction

C. Aquifer Testing

D. Permeability Testing – Eagle Ford Shale

2.2 Methodology

Existing geotechnical data was augmented with additional field data to further characterize site geology and the ground water flow regime. The geotechnical data was used in conjunction with the Monitor Well Data Sheets to evaluate the geologic strata in which each well is constructed. Based on interpretation of all available boring logs, contour maps of the top of shale bedrock, sand and gravel thickness (isopach), and elevation contour maps were developed using the Golden Software contouring software program, **Surfer**™. Top of bore hole elevations are based on limited information contained in the original Permit Application.

Ground water gradient maps were prepared based on information obtained from the Ground Water Monitoring Reports for each sampling event and groundwater elevation data collected from temporary wells. These were compared with the contour and isopach maps in order to evaluate the influence of the geologic environment on ground water flow with changes in ground water level over time. The groundwater contour maps illustrated on Plates 29 through 50 were generated using the **Surfer**™ program. Newer groundwater contour maps (Plates 142 through 151) were hand contoured by a qualified groundwater scientist taking into consideration various site features, including surface water bodies, that may affect groundwater flow. Surface water bodies were identified and labeled on Plates 142 through 151. A discussion of the different categories of surface water bodies illustrated on Plates 142 through 151 and how they impact groundwater gradient and flow is provided in **Appendix F**. If requested in the future, the facility will provide the TCEQ with further information regarding surface water bodies and features located at the Camelot Landfill and how they impact the groundwater flow rate and direction.

Available SLER's and aerial photographs were reviewed in order to evaluate conditions under which the landfill has been constructed relative to possible influence on ground water quality and flow. Monitor well hydrographs were compared to precipitation records and stream gauging data to assess hydraulic communication and response time between the groundwater flow system, recharge events and the Elm Fork Trinity River.

In order to compare the results of recent ground water analyses with the historical data and to evaluate the data for possible adverse trends, all Ground Water Monitoring Reports have been incorporated into a computer database. The database allows graphing of the analyses for comparison and evaluation of possible trends. Water level elevation data from all Ground Water Monitoring Reports was also incorporated into the database to evaluate seasonal changes and possible influence on water quality.

Groundwater chemistry data for selected constituents were contoured. Average groundwater chemistry data were plotted to establish general trends among the facility monitor wells.

3.0 RESULTS

3.1 Location and Landfill Development

The Camelot landfill is located in the City of Lewisville, Texas and situated approximately 18 miles northwest of downtown Dallas, Texas (Plate 1). The existing permitted landfill footprint occupies approximately 82.1 acres of floodplain land adjacent to the Elm Fork Trinity River. The proposed expansion area includes an additional 158.1 acres. Plate 2 illustrates the landfill boundary and significant topographic and geographic features.

3.2 Landfill Construction

The Permit Application indicates that lateral protection against leachate migration is provided by in-situ sidewall liners of highly plastic clays, with constructed liners being

required in zones of permeable clayey sands, sands and gravels. Protection against vertical migration of leachate is provided by either the in-situ clays, or by excavation into the unweathered Eagle Ford Shale.

Historical records indicate that protection against leachate migration in Wet Weather Area 1 was provided by in-situ side and bottom clay liners. The remaining portion of the landfill has a constructed sidewall liner to isolate waste from the permeable sand and gravel. The bottom liner has consisted of unweathered shale. Aerial photographs illustrating the landfill construction sequence are included in the report **Illustrations** as Plates 3 through 8.

Excavation reportedly began at the southwest corner of Sector A in September/October, 1980. Filling was concurrently taking place in Wet Weather Area 1. As seen on Plate 3, by May, 1981, excavation had reached the unweathered shale and a sidewall liner had been constructed along the west edge, and a portion to the south edge of Sector A. No SLER was available in the Farmers Branch files for this liner section. Note that Wet Weather Area 1 was still in operation at this time.

By October, 1983, the sidewall liner had been extended to the east, along the south edge of Sector A, for a distance of approximately 500 linear feet (Plate 4). The first available SLER covers this section of liner. By May, 1084, the sidewall liner had been extended an additional 350 feet to the northeast. This section of liner is addressed in an SLER dated May 30, 1984. By October, 1985, the sidewall liner had been extended an additional 1,100 feet along the southeast and east edges of Sector A (Plate 5). As seen on

Plate 5, while the liner was being constructed, filling followed approximately 500 feet behind, and Wet Weather Area 2 was being excavated down to the unweathered shale. The last section of sidewall liner along the edge of Sector A is addressed in an SLER dated November 15, 1985.

As seen on Plates 6 and 7, excavation and filling of Sector A and Wet Weather Area 2 continued between 1985 and 1988. Note that by June, 1987, Wet Weather Area 1 was no longer in use. Although not addressed by an SLER, it is understood from the site operator that a sidewall liner was constructed along the entire northern boundary of Wet Weather Area 2.

By July, 1988, excavation had begun in the southeast corner of Sector B (Plate 7). By this time, filling in Sector A was near completion. An SLER dated November 15, 1988, addresses the first 160 linear feet of sidewall in Sector B. This section of liner was tied into the liner at the southwest corner of Sector A by a 300-linear foot liner, addressed in an SLER dated May 31, 1989. In an SLER dated October 17, 1990, an additional 400 linear feet of sidewall liner extending west from the original 160-foot section is addressed. Subsequently, an approximate 50,000-square foot section of in-situ bottom liner in Sector B was excavated and evaluated. This evaluation is addressed in an SLER dated September 23, 1991. Also at this time, excavation of Sector B continued for an additional 600 feet to the west.

As seen on Plate 8, by September, 1991, unweathered shale had been exposed in a large portion of Sector B, and excavation had commenced in the southwest portion of Sector C.

As of July, 1992, filling in the eastern portion of Sector B was almost complete and the southwest corner of Sector C had been excavated down to the top of unweathered shale. During construction and filling in Sector B, ground water flowing into the north side of Sector B has been collected in a trench and drained by gravity flow to a sump and pump. This has been done in order to avoid contact between the trash fill and the ground water.

3.3 Site Geology

In general, site geology consists of alluvial sands and clay soils overlying weathered and unweathered shale of the Cretaceous Eagle Ford Formation. Plate 9 illustrates the regional surface geology in the vicinity of the site. The alluvial deposits are associated with deposition within the floodplain of the ancestral Elm Fork Trinity River and its tributaries. Migration of the ancestral river channel resulted in deposition of channel sands and gravels immediately above the Eagle Ford Shale bedrock. These lag deposits were in turn overlain by sandy clays and clays, typical of overbank and floodplain deposition. Examination of excavation cuts and core samples reveal a classic fining upward sequence indicative of point bar and floodplain deposition.

The alluvial deposits typically consist of high plasticity clays with occasional sandy clay layers, grading with depth into moderate to low plasticity sandy clays, underlain by clayey sands, sands and gravel. These soils exhibit a sequence of fining-upward grain sizes and are interpreted as point bar, floodplain and near-channel (levee) deposits. A typical exposure of the alluvial sequence illustrated on Plate 10. The photograph illustrates the typical nature of the alluvial deposits, including the fining upward sequence and color of the material.

Results of limited laboratory tests indicate the hydraulic conductivity of the clay and sandy clay deposits range from $3.5x10^{-9}$ to $8.0x10^{-7}$ centimeters per second (cm/sec). Laboratory tests performed on the clayey sands, sands, and gravels (channel deposits) indicate hydraulic conductivity values of $1.0x10^{-5}$ to $8.0x10^{-6}$ cm/sec. (see Geotechnical Report, Attachment 11 of 1980 Application). Limited slug testing indicate hydraulic conductivity values of $1.0x10^{-4}$ cm/sec. **Appendix C** contains the data and solutions for the slug tests.

In its unweathered state, the Eagle Ford Formation typically consists of a dark gray, soft (rock classification), slightly fissile clay shale. The upper portions typically weather to form deposits jointed, highly plastic residual clay. In most areas, the upper weathered zone has been removed by erosional forces associated with stream action. Where present, the weathered shale is typically less than five feet thick. Drilling logs of water wells completed in the area indicate the depth of the Eagle Ford may range from 100 to 300 feet below ground. Boring DB-l, DB-2, and DB-3 were drilled to a depths of 60 to 80 feet below ground surface (BGS) and encountered shale from the alluvial/shale contact to the total depth of the hole. Work by Foster, 1965 indicates the Eagle Ford to be approximately 100 to 110 feet thick beneath the site.

Laboratory tests of vertical hydraulic and horizontal hydraulic conductivity were performed on samples of Eagle Ford Shale. The results indicate an average vertical hydraulic conductivity of $9.7x10^{-9}$ cm/sec. The average horizontal hydraulic conductivity is $7.1x10^{-9}$ cm/sec. **Appendix D** contains the laboratory report of hydraulic conductivity.

Based on interpretation of all available boring logs (see Plates A-1 through A-57), a structure contour map of the top of the Eagle Ford Shale was prepared and is included in the report **Illustrations** as Plate 11. The surface of the shale appears to have been modified by fluvial processes with a prominent channel feature situated along the north boundary near the northwest corner and along the west edge of the site. A bedrock terrace at approximate elevation 440 feet MSL occupies the central portion of the site. The surface of the shale slopes in all directions from the center, but the most pronounced slope is to the northwest and west. Based on its morphology, it is believed this feature represents the inside of a bedrock controlled meander bend.

A sand and gravel isopach map has been constructed based on all available boring logs and is included as Plate 12. The thickness of sand and gravel veneering the bedrock terrace is generally on the order of five to ten feet. Exceptions occur in the east and northeast portions of the site where the sand is very thin and in some locations absent. Where the bedrock slopes to the north and along portions of the north boundary of the study area, the sand thins and in some locations is absent. The sand and gravel thicken significantly in the buried channel northwest of the terrace, reaching a maximum thickness of about 18 feet near the northern boundary of the study area. Sand thicknesses around the remaining perimeter of the landfill range from four to eleven feet.

A structure contour map depicting the top surface of the sand overlying the shale is presented as Plate 13. The top of sand occurs at elevations of 440 to 453 feet over much of the bedrock terrace. Top of sand elevations in the vicinity of the northwestern channel are 20 feet to 30 lower than atop the bedrock terrace.

Plates 14 through 17 are geologic cross sections illustrating the bedrock surface, the distribution of alluvials, and the buried geomorphic features. Cross section A-A' is situated along the west edge of the site and oriented north-south. It depicts the deep channel in the northwest corner of the site, the elevated bedrock terrace, the alluvial sequence veneering the bedrock, the sloping bedrock toward the present river channel and groundwater elevations measured in August 1994. Also illustrated is the limits of landfill excavation. Cross Section B-B' is oriented west-east through the center of the site. It depicts the deep channel along a portion of the west side of the site, the steep slope between the deep channel and the bedrock terrace, and areas where sand is absent from the alluvial sequence. Cross section C-C' is oriented northwest to southeast. It illustrates the deep channel in the northwest corner of the site, the steep slope to the top of the terrace, the thinning and absent sand over that slope, the alluvial sequence characteristic of the terrace, the absence of sand in the central areas of the site, and the re-emergence of sand along the southeastern perimeter of the site.

The sand thickness map and cross sections B-B' and C-C' illustrate areas where sand is thin or absent. These include the eastern area of the bedrock terrace and along the north facing cut bank slope of the deep channel. Sand is thin at two general elevations along the cut bank. The elevation is interpreted to represent the crest of the slope, while the lower elevation corresponds to the steepest portion of the cutbank.

Given the depth of the north channel, the geologic data suggests the channel and cut bank were formed following the alluviation of the terrace surface. During and after cutbank