CB&I
12005 Ford Road, Suite 600
Dallas, Texas 75234
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November 9, 2016

Mr. Dwight Russell, P.E.
Municipal Solid Waste Permits Section – MC 124
Texas Commission on Environmental Quality
12100 Park 35 Circle; Bldg. F
Austin, Texas 78753

Re: Pescadito Environmental Resource Center - Webb County
Municipal Solid Waste (MSW) Permit Application No. 2374
Technically Complete Permit Application Supplement Number 3
Tracking Nos. 20877533 and 20683791; CN603835489/RN106119639

Dear Mr. Russell;

CB&I Environmental and Infrastructure, Inc. (CB&I) is providing the attached information to supplement the referenced permit application which was declared technically complete on March 11, 2016. We are providing these changes based on your e-mail request dated October 11, 2016 and in an effort to make the application abundantly clear on the issues. As requested in your e-mail, each specific item of concern is cited below followed by our response:

1. Commenter, Webb County, submitted new information during the formal comment period of the August 11, 2016 public meeting. The new information indicates your application does not contain all of the applicable permits and approvals as required under 30 TAC §§330.63(c)(2)(D)(i) and (ii). Please provide documentation in the application that permits or approvals have been obtained in accordance with 30 TAC §§330.63(c)(2)(D)(i) and (ii).

RESPONSE:

Webb County's comments appear to have been misunderstood and/or misinterpreted. 30 TAC §330.63(c)(2)(D) applies specifically "for construction in a floodplain." RVWM has already applied for, and received, a CLOMR from FEMA to remove the area of the PERC facility from the 100-year floodplain [November 21, 2014]. Once the CLOMR improvements are constructed and approved by FEMA, the PERC facility will not be in the 100-year floodplain, i.e., no development will occur in the 100-year floodplain and the requirements of 30 TAC §330.63(c)(2)(D) are not applicable.

The information cited above has been added to Part III, Appendix III-C.1 - Facility Surface Water Drainage Report Narrative. A modified Cover Page, Table of Contents, revised Page 1 are provided for Part III, Appendix III-C.1.

Also, please see legal opinion included in Attachment A to the letter.

2. Drawing III G. 1-1 identifies several pipeline easements located in areas proposed for landfilling of waste. In accordance with 30 TAC §330.543(a), landfilling of waste may not occur within 25 feet of the centerline of any pipeline easement. Please provide either confirmation that the applicant has control over these easements or documentation from the easement holder(s) acknowledging that they will agree to move the easements to be in compliance with the rules prior to any solid waste unloading, storage, disposal, or processing operations beginning within 25 feet of the centerline of the easements.

RESPONSE:

The Application is clear in regards to easements at the site. Part II, Section 4.0 states "Easements are shown on Figure 4, Sheets 1 to 4, in Part I. These easements will be protected in accordance with TCEQ rules until such time as they may be voided or relocated outside the waste fill area." In accordance with the requirements of 30 TAC §330.543(a), no solid waste disposal will occur within 25 feet of the center line of any pipeline easement. No solid waste unloading, storage, disposal or processing operation shall occur within any easement that crosses the facility. Applicant has been in contact with the easement holder who has agreed to move the easements, and associated pipelines at the applicant's expense, to be in compliance with TCEQ rules related to easement protection prior to any solid waste unloading, storage, disposal or processing operation beginning in the area. Copies of such agreement(s) will be forwarded upon completion.

3. A portion of the facility perimeter drainage channels and the internal road are located outside of the permit boundary. As noted in the definition in 30 TAC §330.3(52), the facility includes the appurtenances of the landfill. Appurtenances include drainage structures, groundwater monitoring wells, landfill gas probes, gate or scale houses, etc. Drainage structures constructed outside of the permit boundary are also discussed in TCEQ Technical Guideline RG-417 (copy attached). If it is not practicable to locate the internal roads and perimeter drainage channels within the permit boundary, please provide an easement or similar instrument that addresses the use of the property between the north and south landfill units not included within the permit boundary.

RESPONSE:

A Surface Use Agreement has been prepared allowing use of the Yugo Ranch for : "access, security, preparation, construction, and maintenance of the Landfill and all necessary, reasonable, or convenient uses appurtenant to the Landfill, including the

construction, use and maintenance of any roads, drainage structures, groundwater monitoring wells, landfill gas probes, gate or scale houses, and any other necessary appurtenant uses."

A modified Cover Page, Table of Contents and new Figure 5 of Part I are provided,

4. The surface water drainage report should be revised to demonstrate that the proposed facility will not adversely alter the existing drainage patterns of the watershed that will be affected in accordance with 30 TAC §330.305(a). The design storm for this demonstration is the 25-year, 24-hour storm. TCEQ Regulatory Guideline RG-417 provides guidance on preparing this demonstration. It is requested that your response to this comment address the procedures presented in RG-417.

RESPONSE:

Further demonstration that construction of the facility will have no adverse effect on drainage patterns in the watershed has been provided as Objective 5 in Part III, AppendixIII-C.1 - Facility Surface Water Drainage Report Narrative. Objective 5 was inserted to "Run the post-CLOMR, pre-development HydroCAD model and the post-development HydroCAD model described in Objective #3 for the 25-year, 24-hour storm to determine the discharge rates and volumes associated with the 25-year, 24-hour storm. Demonstrate that the existing drainage patterns are not adversely altered, to any significant degree, by the development of the facility by comparing drainage at the permit boundary. This is additional demonstration that the existing drainage patterns are not adversely altered to that observed in Objective 4 above for the 100-year, 24-hour storm event."

To accomplish Objective 5, additional modeling was performed for the 25-year, 24-hour storm event at discharge points along the permit boundary. The results demonstrate that "existing or permitted drainage patterns" will not be "adversely altered" at the permit boundary by the development of the Pescadito Environmental Resource Center.

A modified Cover Page, Table of Contents, revised Pages 1, 7, 8, 10, 11, 21 and 23 along with new pages 24 to 38 are provided for Part III, Appendix III-C.1.

Additionally, Figures III.C-2.3, 4 and 5 have been modified to more accurately depict modeled conditions and new Figures III.C-2.18 and 19 have been included as illustration. A modified Cover Page, Table of Contents are also provided for Part III, Appendix III-C.2

The number of culverts have been modified to more exactly match flows at discharge Points A and B, which required some revised HydroCAD Output files for the South Detention Basin (SDB) Discharge. A modified Cover Page and Table of Contents, along with the cover and pages 81, 82 and 86 of III-C.4-3(D)(I), cover and pages 821, 82 and 86 of III-C.4-3(D)(II) and cover and pages 5 and 6 of III-C.4-3(E)(I) are provided for Part III, Appendix III-C.4. Page 81 of II-C.4-3(D)(I)and (II) did not change but are being included since those sections were copied on both sides of the paper. This modification also required minor changes in Part III, Appendix III-C.3 Facility Surface Water Drainage Analysis. In particular, Problem Statement 10 Detention Basin Sizing

has been modified. A modified Cover Page and Table of Contents, along with Problem Statement 10 are provided for Part III, Appendix III-C.3.

5. The profile drawings of the proposed detention pond indicate that the detention pond will be excavated several feet below natural grade. It is our understanding that the pond is intended to completely drain and not retain any significant amount of collected runoff. Please provide a detail drawing of each discharge structure that depicts how the below grade portion of the pond will be drained by the proposed box culverts. If conveyance structures outside of the permit boundary will be required for the stormwater to be delivered to the natural drainage ways, please provide a discussion and drawing(s) to document these structures. Please provide an easement or similar instrument that will allow for inspection and maintenance of stormwater conveyance structures constructed outside of the permit boundary.

RESPONSE:

Modified drawings III.C.11 and 12 are provided to better illustrate the drainage from the South Detention Basin. The culverts from the basin discharge into the floodplain on the permitted property and no easements are required.. New Figures III-C.2-16 and 17 are provided for additional detail. A modified Cover Page and Table of Contents, along with the figures listed above, are provided for Part III, Appendix III-C.2.

In addition to the modifications listed above, the following is provided to further clarify modifications submitted in October.

Part III, Appendix III-B.1 General Facility Design Figures

Figure III-B.1-5, Liquid Solidification Basin Plan and Details has been modified to more clearly reflect the drainage around the units. A modified Cover Page, Table of Contents and Figure III.B.1-5 are provided for Part III, Appendix III-B.1.

Part III, Appendix III-D.6 Leachate and Contaminated Water Plan

Page 5 has been further modified to reflect the requirement that the maximum level of leachate in the sumps is at the top elevation of the sump. A modified Cover Page, Table of Contents and Page 5 are provided for Part III, Appendix III-D.6.

Part III, Appendix III-F.1 Groundwater Monitoring Plan Figures

Figure III-F.1-1, Groundwater Monitoring System Plan has been modified to clearly reflect that groundwater monitoring wells must be installed around the evaporation pond prior to its use. A modified Cover Page, Table of Contents and Figure III.F.1-1 are provided for Part III, Appendix III-F.1.

Our submittal is formatted as follows:

- Attachment A contains a new signature page from the Part 1 form, revised pages 1 and 5 of the Master Table of Contents and Legal Opinion regarding Item 1.
- Attachment B contains the original version of the changed pages.
- Attachment C contains a redline/strikeout version of the changed pages.
- Attachment D contains three (3) copies of the original changed pages found in Attachment B for TCEQ use only.

The information provided in this submittal is also being sent to the Laredo Public Library and uploaded to the web site at www.pescaditoerc.com. We trust this information is clear and complete; however, should you need additional information, please let us know.

Sincerely,
CB&I Environmental and Infrastructure, Inc.
TBPE Firm F-5650

Michael W. Oden, P.E.
Project Manager

Attachments

A – Part 1 Form Signature Page, Revised pages of the Master Table of Contents and Legal Opinion
B – Original Replacement pages
C – Redline/Strikeout version of changed pages
D – Three copies of changed pages (TCEQ only)

CC: Mr. Carlos Y. Benavides III
Mr. William W. Thompson
Mr. Geoffrey S. Connor
Mr. Earl Lott
Mr. Chance Goodin
Mr. Anthony Tatu

Attachment A

to November 2016 Supplement Letter (MSW 2374)

Part I Form Signature Page and

Master Table of Contents - Revised Pages 1 and 5 of 26

Legal Opinion

Signature Page

I, Cypress under III Manager,
(Site Operator (Permittee/Registrant)'s Authorized Signatory) (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: Carlos Y. Benavides III Date: 11-8-2016

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

~~I, _____, hereby designate _____~~
~~(Print or Type Operator Name) (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 Carlos Y. Benavides III
On this 8th day of November, 2016
My commission expires on the 11th day of March, 2018

Norma V. Valdez
Notary Public in and for
Webb County, Texas
(Note: Application Must Bear Signature & Seal of Notary Public)

NOTARY PUBLIC STATE OF TEXAS
NORMA V VALDEZ
My Commission Expires
March 11, 2018

VOLUME 1 of 5

PART I

PART I Figures

Figure 1	General Location Map
Figure 2	Detailed Location Map
Figure 3	Land Ownership Map
Figure 4	Boundary Survey (Sheets 1 to 4 of 4)
Figure 5	Surface Use Agreement

PART I Attachments

Attachment A	Legal Description
Attachment B	Certificate of Incorporation
Attachment C	Payment Demonstration

This document is released for the purpose of permitting only under the authority of Michael W. Oden, P.E. #67165. It is not to be used for bidding or construction. Texas Registered Engineering Firm F-5650.

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PART I

PART I Figures

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Figure 2	Detailed Location Map
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This document is released for the purpose of permitting only under the authority of Michael W. Oden, P.E. #67165. It is not to be used for bidding or construction. Texas Registered Engineering Firm F-5650.

VOLUME 2 of 5

GEOFFREY S. CONNOR

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November 9, 2016

Dwight C. Russell, P.E.
Engineer V, Municipal Solid Waste Section
TCEQ Waste Permits Division MC 124
P.O. Box 13087
Austin, Texas 78711

Re: Rancho Viejo Waste Management, LLC, Laredo, Webb County, Texas; Application No. 2374; Proposed Permit No. 2374; Customer Reference No. CN603835489; Regulated Entity No. RN106119639; Municipal Solid Waste Type I Landfill.

Dear Mr. Russell:

This letter responds to item 1 on the NOD list sent to Applicant on October 11, 2016. The inquiry is whether the Applicant has satisfied 30 TAC Sections 330.63(c)(2)(D)(i) and (ii). These provisions apply "for construction in a floodplain, submit **where applicable**" and provides options for satisfaction of the requirement. In this case, Applicant has chosen to remove the site from the floodplain by performing certain engineering work which has been reviewed and approved by FEMA.

To secure FEMA's approval for the CLOMR, Applicant first submitted its engineering plans and maps to the Webb County flood plain administrator, Rhonda Tiffin, for her review and approval. She certified her approval of the CLOMR Application to FEMA on November 14, 2011, stating in pertinent part that "we find the completed or proposed project meets or is designated to meet all of the community floodplain management requirements" and that "all necessary Federal, State and local permits have been, or in the case of a conditional LOMR, will be obtained." See attached Overview and Concurrence Form.

FEMA approved the CLOMR on November 21, 2014 thus satisfying TAC Sections 330.63(c)(2)(D)(i) and (ii). In turn, the TCEQ in reliance on that and other matters issued its letter of technical completeness along with a draft permit on March 11, 2016.

The provisions raised by the TCEQ are not applicable under the rule because the project area has been removed from the floodplain as a matter of law by FEMA's approved CLOMR. FEMA continues to stand by its determination and has advised Applicant that it will put same in writing soon. Additionally, Webb County has already stated that all local permits are satisfied.

The geology and the geography of the proposed site has not changed since the earlier actions by Webb County and FEMA. The only thing that has changed is local politics, which is not a subject for a state regulatory proceeding. Instead, such disputes must be resolved by the courts, and to that end, Applicant filed suit in Webb County District Court against the floodplain

administrator on October 18, 2016. In the action, Applicant points out the FEMA's issuance of the CLOMR on November 21, 2014 means that Webb County no longer has jurisdiction to regulate development on the project site. Applicant intends to move aggressively to resolve that lawsuit through obtaining a final judgment as quickly as possible. (See attached Original Petition)

In sum, Webb County certified in 2011 that all local requirements were satisfied. Moreover, even if a county permit were required to build in the floodplain, FEMA's granting the CLOMR Application means as a matter of law that the project site is not in a flood plain. The CLOMR/LOMR process determines whether a particular site is removed from the 100 year floodplain as a result of engineering analysis and work that establishes construction of the proposed facility will not adversely impact the 100 year flood event.

FEMA has advised Applicant that it has no intention whatsoever of revoking the CLOMR which it approved almost two years ago on November 21, 2014. It is clear that Webb County's attempt to revoke the CLOMR is based upon false, deliberately misleading and unfounded information provided by protestants to Applicant's permit application. FEMA has indicated that unless Webb County submits its own new CLOMR application with full engineering documentation, and can successfully undergo FEMA technical review and Applicant's technical challenge, the original CLOMR stands as issued.

TCEQ is not required to attempt to resolve local political infighting. TCEQ has a duty to proceed when all conditions have been met and to not allow protesting parties, through local politics, to thwart the regulatory process. It would be a travesty and grossly inappropriate to the Applicant to allow Webb County to certify approval and then, after years of additional time and money, to withdraw the approval to satisfy a protesting party. Specifically, the Webb County flood plain administrator works for County Commissioner John Galo. Galo is married to Applicant's cousin, Anna-Gloria Benavides Galo. Mrs. Galo is a protesting party, and the organizer of groups formed earlier this year to contest the application. Since his election as a County Commissioner in 2012, Galo has put pressure on the Webb County Floodplain Administrator to take steps to try to stop Applicant's project from moving forward. The agency does not have jurisdiction to resolve personal or family disputes, but it does have a duty to see that the integrity of the regulatory process is respected, and is allowed to proceed without improper manipulation.

Additionally, TCEQ should be aware that as an additional move against the Applicant, the Webb County Commissioners Court is now seeking to enact an ex post facto ordinance to restrict the placement of Applicant's proposed landfill. Whereas, the current permit application is exempt from a proposed new ordinance, if the TCEQ returns the application then Webb County will argue that any new filing will be subject to, and prohibited by the proposed new ordinance. It would be manifestly unjust at this point to return an Application in response to a local political maneuver with the knowledge that doing so will adversely affect an applicant that has fully complied with all the requirement of FEMA, Webb County and TCEQ.

Applicant urges TCEQ to allow this permit to proceed to SOAH which is the proper venue for determining if a permit should issue. This does not prejudice Webb County or the Application opponents because the court will hear and decide whether they may require a local development permit at this stage. In short, sending this matter to SOAH with these provisions treats all parties fairly and allows the state regulatory process to continue on the one hand, while the courts deal with local issues on the other. Allowing the permit to go to SOAH while the local issues are addressed in court fairly balances the interests of all parties and allows all relevant

issues to be heard in a timely manner by the right decision makers. SOAH and TCEQ will decide the state regulatory issues, and the courts will determine if Webb County has acted properly in withdrawing its prior approval of the CLOMR while also seeking to impose ex post facto regulations over construction of the landfill by county siting ordinance.

Sincerely,

Geoffrey S. Connor
Attorney at Law

GSC:slm

cc: Anthony Tatu

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a: (check one)

☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway, or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72).

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
481059	Webb County	TX	48479C	1275C	04/02/08

2. a Flooding Source: Unnamed Tributaries of San Juanito Creek

b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH) ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Pescadito Environmental Resource Center

4. FEMA Zone designations affected: A (Choices A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision: Proposed modifications to basin

a. The basis for this revision request is (check all that apply)

☒ Physical Change	☐ Improved Methodology/Data	☐ Regulatory Floodway Revision	☐ Base Map Changes
☐ Coastal Analysis	☒ Hydraulic Analysis	☒ Hydrologic Analysis	☐ Corrections
☒ Weir-Dam Changes	☐ Levee Certification	☐ Alluvial Fan Analysis	☐ Natural Changes
☒ New Topographic Data	☐ Other (attach Description)		

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures:	☒ Channelization	☐ Levee/Floodwall	☒ Bridge/Culvert
	☒ Dam	☒ Fill	☐ Other (Attach Description)

6. ☒ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes, Fee Amount: $6,050

☐ No, Attach Explanation

Please see the DHS-FEMA website at http://fema.gov/plan/prevent/fhm/frm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States code, Section 1001.

Name Carlos Y. Benavides, III	Company Rancho Viejo Waste Management, LLC	
Mailing Address 1116 Calle del Norte Laredo, TX 78041	Daytime Telephone No. (956) 523-1400	FAX No. (956) 523-1401
	EMAIL ADDRESS ccltollroad@aim.com	
Signature of Requester (Required)		Date 11/14/2011

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For conditional LOMR request, the applicant has documented Endangered Species Act (ESA) compliance to DHS/FEMA prior to DHS/FEMA's review of the Conditional LOMR application. For LOMR request, I acknowledge that compliance with sections 9 and 10 of the ESA has been achieved independently of DHS/FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44 CFR 65.2(c), and that we have available upon request by DHS/FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title Rhonda Tiffin, Director of Planning	Community Name Webb County	
Mailing Address 1110 Washington St., Suite 302 Laredo, TX 78040	Daytime Telephone No. (956) 523-4100	FAX No. (956) 523-5008
	EMAIL ADDRESS rhonda@webbcountytx.gov	
Community Official's signature (required)		Date 11/14/2011

CERTIFICATION BY REGISTRATION PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms instruction. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name	License No.	Expiration Date
Richard K. Frithiof, P.E., C.F.M.	55186	12/31/2011
Company Name	**Telephone No.**	**Fax No.**
TRC Environmental Corp.	(512) 684-3346	(512) 343-1083
Signature	**E-mail Address**	**Date**
Richard K. Frithiof	rfrithiof@trcsolutions.com	11/1/2011

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form name and (Number)	Required if.....
☒ Riverine Hydrology & Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (optional)

Filed
10/18/2016 9:35:08 AM
Esther Degollado
District Clerk
Webb District
Diana Vela
2016CVQ002694D1

CAUSE NO. _____

Rancho Viejo Waste Management, LLC	§	**IN THE DISTRICT COURT OF**
Plaintiff,	§	
	§	
v.	§	**WEBB COUNTY, TEXAS**
	§	
Rhonda M. Tiffin, Webb County Planning Director and Floodplain Administrator, in her official capacity,	§	
Defendant.	§	**_____ JUDICIAL DISTRICT**

PLAINTIFF'S ORIGINAL PETITION AND SUIT FOR INJUNCTIVE RELIEF

Now Comes Plaintiff Rancho Viejo Waste Management, LLC (hereinafter "RVWM" or "Plaintiff") and files this its Original Petition and Suit for Injunctive Relief against Rhonda M. Tiffin, Webb County Planning Director and Floodplain Administrator, in her official capacity (hereinafter "Tiffin" or "Defendant") and would show the Court as follows:

I.
Discovery Control Plan

1. Discovery should be conducted in accordance with a Level 3 discovery control plan under TEX. R. CIV. P. 190.3 to be entered by the Court for this particular case.

II.
Parties

2. Plaintiff RVWM is a limited liability company organized under the laws of the State of Texas and doing business in Webb County, Texas.

3. Defendant Tiffin is an employee of Webb County, Texas, who resides in Webb County, Texas and may be served with process at 1110 Washington Street, Laredo, Texas. Because Plaintiff is bringing *ultra vires* claims against Tiffin for actions she has taken without legal authority, Plaintiff's claims against her are brought against her official capacity.

4. This Court has jurisdiction over this case because the relief sought, namely declaratory and injunctive relief, is within the jurisdiction of this Court as granted by the Constitution and laws of the State of Texas.

5. Venue is proper in Webb County, Texas, because Defendant resides in Webb County, Texas, and the causes of actions substantially accrued in Webb County, Texas.

III.
Factual Background

6. RVWM owns real property in Webb County Texas. Portions of the real property owned by Plaintiff in Webb County, Texas lie within an area designated by the Federal Emergency Management Agency ("FEMA") as within the 100-year floodplain. Portions of Plaintiff's land that are within the 100-year floodplain are where Plaintiff intends to build a municipal solid waste facility ("MSW").

7. After FEMA designated portions of Plaintiff's real property in Webb County as being within the FEMA 100-year floodplain, Plaintiff commenced the process of modifying that designation and seeking to have FEMA revise its 100-year floodplain map to exclude sections of Plaintiff's real property where the MSW was to be located. Plaintiff applied for a Conditional Letter of Map Revision ("CLOMR") which, upon completion of construction of the MSW, would remove portions of Plaintiff's real property from the 100-year floodplain.

8. Plaintiff submitted detailed engineering analysis to support its CLOMR Application. Defendant, as Webb County's Floodplain Administrator, reviewed and approved Plaintiff's CLOMR Application. After reviewing and analyzing Plaintiff's CLOMR Application, FEMA granted Plaintiff's CLOMR Application.

9. FEMA's approval of Plaintiff's CLOMR Application and issuance of a CLOMR constitutes a final determination by the controlling regulatory entity that the portion of the 1110-

acre tract on which RVWM is seeking to build a MSW facility will not as a matter of law, be located in FEMA's 100-year floodplain upon construction of the facility in accordance with the CLOMR.

10. RVWM had previously filed an application with the Texas Commission on Environmental Quality ("TCEQ") for a municipal solid waste permit for a MSW facility which was to be built on portions of real property located in Webb County that were initially designated by FEMA as being located within the 100-year floodplain. However, as a result of FEMA granting Plaintiff's modification and issuing the CLOMR, the entire 1110-acre tract for which RVWM seeks a MSW permit will not be located in the 100-year floodplain upon construction of the modification authorized by the CLOMR.

11. There are restrictions and limitations on the development of real property located within the 100-year floodplain. Counties, such as Webb County, acting through their floodplain administrators, have some regulatory control over the development of real property within the 100-year floodplain. However, FEMA's issuance of the CLOMR means that Defendant has no authority to regulate development on RVWM's real property or to regulate the construction of the MSW based on FEMA's authority to regulate development on real property located within the 100-year floodplain because construction of the MSW in accordance with the CLOMR removes the property from the 100-year floodplain.

12. Defendant is an employee of Webb County, Texas holding the position of Planning Director and Floodplain Administrator.

13. Defendant is also a Certified Floodplain Administrator, meaning she has received education and training regarding the process or authority of FEMA to designate areas as located within the 100-year floodplain, as well as FEMA's exclusive authority to remove portions of real

property from the 100-year floodplain by granting a CLOMR. Thus, Defendant is well aware that FEMA has the exclusive authority to grant a CLOMR. Defendant is also fully aware that, once FEMA granted the CLOMR for Plaintiff's MSW, Defendant had no authority to: (1) assert that FEMA erred in granting the CLOMR; and/or (2) regulate construction of Plaintiff's MSW based on the fact that it is located within the 100-year floodplain.

14. Defendant has taken actions without legal or statutory authority in her capacity as the Webb County Planning Director and Floodplain Administrator. Specifically, Defendant contacted TCEQ and stated that FEMA was in error by granting Plaintiff's CLOMR and that she will not approve construction of Plaintiff's MSW because it is within the 100-year floodplain. Defendant's actions seek to usurp the power and authority granted FEMA and, thus, her actions are unlawful and constitute *ultra vires* actions. RVWM is entitled to declaratory and injunctive relief to stop Defendant's illegal actions that unquestionably exceed, not only the authority of her position, but also the powers delegated to Webb County by FEMA.

15. While Defendant does not have any authority to overrule FEMA's granting the CLOMR Application, Webb County, for whom Defendant acts as its Planning Director and Floodplain Administrator, may assert that it is seeking to prohibit Plaintiff's construction of the MSW under powers vested in it by the Constitution or laws of the State of Texas. However, assuming Webb County has the authority to prohibit construction of the MSW, that action would constitute the taking of Plaintiff's property for which Webb County, Texas would be liable for the resulting diminution in the value of Plaintiff's real property, an amount well in excess of $50,000,000.00.

IV.
First Cause of Action: Declaratory Judgment

16. Plaintiff re-alleges all preceding paragraphs of this Petition as though fully set forth herein.

17. Plaintiff seeks a declaration under the Uniform Declaratory Judgments Act regarding its rights and, further, seeks a declaration that Defendant's actions and statements regarding Defendant's MSW are *ultra vires*. Specifically, Plaintiff seeks a declaratory judgment determining the following:

a. FEMA granting the CLOMR means that, as a matter of law, upon construction of the MSW and other mitigation elements in accordance with the CLOMR, RVWM's real property covered by the CLOMR will not be located within the 100-year floodplain;

b. Defendant does not have any lawful authority to assert or claim that RVWM's real property which is covered by the CLOMR is within the 100-year floodplain; and

c. Defendant does not have any lawful authority to assert that she will not grant the approvals necessary for construction of RVWM's MSW facility based on it being located within the 100-year floodplain.

V.
Second Cause of Action: Application for TRO, Temporary and Permanent Injunctive Relief

18. Plaintiff re-alleges all preceding paragraphs of this Petition as though fully set forth herein.

19. Unless Defendant is restrained by this Court from taking actions for which she has no lawful authority, Plaintiff will suffer substantial and irreparable injury. Plaintiff has no

adequate remedy at law for such injuries, as Defendant's training and certification establish that she knows she has no lawful authority to continue to claim that Plaintiff's property on which the MSW facility is to be located is located within the 100-year floodplain and/or that she has the authority to regulate the construction of Plaintiff's MSW facility based on it being within the 100-year floodplain.

20. Plaintiff seeks injunctive relief from this Court pursuant to equitable and statutory principles, Rules 680-693 of the Texas Rules of Civil Procedure. As shown above, Plaintiff has a probable right of recovery in this action. In addition, unless enjoined by this Court, Plaintiff will suffer imminent and irreparable harm as a proximate result of Defendant's conduct. Plaintiff has no adequate remedy at law.

21. Based upon the foregoing, Plaintiff will suffer immediate and irreparable harm with no adequate remedy at law if the Court does not issue a temporary restraining order, temporary injunction, and permanent injunction, enjoining Defendant as follows:

a. from taking any actions in her capacity as Webb County Planning Director and Floodplain Administrator asserting or exercising her authority to assert that the real property owned by RVWM and covered by the CLOMR is within the 100-year floodplain; and

b. from taking any actions in her capacity as Webb County Planning Director and Floodplain Administrator asserting or exercising her authority to seek to prevent construction of RVWM's MSW facility based on it being located within the 100-year floodplain.

22. A temporary restraining order and temporary injunction are necessary to preserve the status quo of the parties until the trial of this cause. Accordingly, Plaintiff seeks temporary and permanent injunctive relief as set forth above.

23. If the foregoing actions are not restrained and enjoined, Plaintiff will suffer probable injury in the form of imminent and irreparable harm.

24. The threatened loss to Plaintiff, if Defendant is not temporarily restrained, greatly outweighs any harm to Defendant by the imposition of this temporary restraining order or by an injunction.

25. The injunctive relief sought herein will promote equity and justice and is not adverse to the public interest.

26. Plaintiff has no adequate remedy at law if Defendant is not prohibited from the conduct outlined above.

VI.
Third Cause of Action: Claim For Attorney's Fees Against Defendant

27. Plaintiff re-alleges all preceding paragraphs of this Petition as though fully set forth herein.

28. As a result of Defendant's conduct as described above, Plaintiff has been required to retain the undersigned attorneys in connection with this matter. Plaintiff has agreed to pay the attorneys a reasonable fee for their services. Accordingly, Plaintiff respectfully requests that the Court award Plaintiff its reasonable attorneys' fees and other costs incurred pursuant to Texas Declaratory Judgment Act, Chapter 37 of the Texas Civil Practices and Remedies Code.

VII.
Prayer

WHEREFORE, PREMISES CONSIDERED, Plaintiff prays that Defendant be cited to appear, that the Court grant Plaintiff's request for injunctive relief and that, upon final trial, grant Plaintiff's declaratory relief as requested, award Plaintiff all costs, expenses, and attorneys' fees incurred, and further award Plaintiff such other relief to which it is justly entitled.

Respectfully submitted,

EDWARDS LAW
1101 East Eleventh Street
Austin, Texas 78702
Tel. (512) 623-7727
Fax. (512) 623-7729

By /s/ Jeff Edwards
JEFF EDWARDS
State Bar No. 24014406
jeff@edwards-law.com
SCOTT MEDLOCK
State Bar No. 24044783
scott@edwards-law.com

By: /s/ Edward Maddox
Edward F. Maddox
Texas Bar No. 24013081
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Texas Bar No. 2405369
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Laredo, Texas 78040
Tel. 956.791.3003
Fax. 956.791.3010
edward@benmadlaw.com
adriana@benmadlaw.com

Attorneys For Plaintiff Rancho Viejo Waste Management, LLC

Attachment B

to November 2016 Supplement Letter (MSW 2374)

Original Replacement Pages

Changed Pages

Part I

PART I

APPLICATION FOR PERMIT
TYPE I MUNICIPAL SOLID WASTE FACILITY

MSW PERMIT NO. 2374

PESCADITO ENVIRONMENTAL RESOURCE CENTER
SOLID WASTE MANAGEMENT AND DISPOSAL FACILITY

RANCHO VIEJO WASTE MANAGEMENT, LLC
LAREDO, WEBB COUNTY, TEXAS

Originally Prepared By:
TRC Environmental Corporation
TBPE Firm Registration No. 3775

March 28, 2011; Revised May 20, 2011; Revised September 14, 2011; Revised December 14, 2011

Part I was signed by James F. Neyens, P.E. on December 14, 2011 for all changes through that date

Revised on June 12, 2014
April 20, 2015
September 2015
Technically Complete March 11, 2016
Modified November 2016 By:

CB&I Environmental and Infrastructure, Inc.
TBPE Firm Registration No. F-5650

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Part I

Figures

Attachments

4.0 PROPERTY OWNER INFORMATION [330.59 (d)]

4.1 Legal Description

The legal description of the PERC site is a tract of land containing 952.89 acres, more or less, out of and being a part of a 12,193.84 acre tract as described and depicted as Tract 2 on a Survey Plat by John E. Foster, R.P.L.S. on a Stipulation Conforming Surface Ownership, Agreed Boundary Line and Roadway Access instrument, as recorded in Volume 704, Pages 827 – 852, of the Plat Records of Webb County, Texas.

The 952.89 acre tract is situated in Webb County, Texas and is a part of Survey 373, Abstract 1718; Survey 111, Abstract 1616; and Survey 1654, Abstract 3104. The boundary metes and bounds description of the property and a drawing of the property description are shown on Figure 4 titled Boundary Survey (Sheets 1 of 4 and 2 of 4) and Legal Description (Sheets 3 of 4 and 4 of 4). This legal description is also provided in Attachment A. The record information for the 952.89 acre tract is Volume 3071 Pages 426-432, Official Public Records, Webb County Texas as part of a larger 1,109.48 acre tract.

The 952.89 acre tract is not platted.

4.2 Property Owner Affidavit

The signed property owner affidavit for this application is provided on Page 9 of the Part I Application Form (Form TCEQ – 0650) contained in this permit application.

4.3 Surface Use Agreement – Survey 2366

See Figure 5 for a Surface Use Agreement that allows use of the property associated with Survey 2366 (the wedge between the north and south landfill units) for landfill operations.

FIGURES

Surface Use Agreement

Rancho Viejo Cattle Company, Ltd. (RVCC) and Rancho Viejo Waste Management, LLC (RVWM) (collectively Grantor) grant this Surface Use Agreement as follows:

Grantee: RVWM and its successors and assigns as owner of the Land Benefited described below.

Land Benefited: This agreement shall constitute a real covenant running with the land for the benefit of the 952.89 acre Landfill Tract depicted in Exhibit A and its use as a MSW landfill under pending Permit No. 2374.

Land Affected: The property commonly known as the Yugo Ranch, more particularly described as 12,193.84 acres, Tract 2, Recorded at Vol. 704, pgs. 827-852 of the Real Property Records of Webb County, Texas, a copy of which is attached as Exhibit B.

Term: for ten (10) years and so long thereafter as any of the following conditions are met: (1) the owner of the Landfill Tracts has pending or is actively seeking an MSW permit; (2) the Landfill Tract is used as a landfill; (3) the Landfill Tract is subject to an MSW permit; or (4) the Landfill Tract is subject to any regulation or order of the TCEQ or any applicable agency in relation to an MSW Permit.

Rights granted: Use and possession of the surface of the Yugo Ranch is granted for access, security, preparation, construction, and maintenance of the Landfill and all necessary, reasonable, or convenient uses appurtenant to the Landfill, including the construction, use and maintenance of any roads, drainage structures, groundwater monitoring wells, landfill gas probes, gate or scale houses, and any other necessary appurtenant uses.

Designation of Use. Grantee shall determine the use and location of the appurtenant use, subject to Grantor's approval, which will not be unreasonably withheld.

Nonexclusive Use: The rights granted by Grantor to Grantee are nonexclusive, and Grantor reserves the right to use all access roads and all surface and subsurface uses of the Lands and the right to grant successive easements therein or across on such terms and conditions as Grantor deems necessary or advisable, except that successive easements shall not interfere with or obstruct Grantee's use or damage roads or rights-of-way constructed by Grantee or materially increase Grantees cost to maintain the property used.

Compensation. Any usage of the surface pursuant to this agreement shall be agreed to by the parties at the time. Absent such subsequent agreement, Grantor shall be entitled to the following compensation, at Grantor's election: (1) The prevailing rate for actual damages for such surface use in the general vicinity of the property in Webb County, Texas; or (2) the fair market value (no less than $1500 per acre) of the land used and occupied on a cleared acreage basis.

Indemnity. Grantee agrees to indemnify, hold harmless, and defend Grantor and the premises from all costs, losses, damages, liabilities, expenses, penalties, and fines whatsoever that may arise from or be claimed against Grantor or the premises by any person or persons for any injury to person or property or damage of whatever kind or character arising from the use or occupancy of the premises by Grantee; from any neglect or fault of Grantee or the agents and the employees of Grantee in using and occupying the premises; or from any failure by Grantee to comply and conform with all laws, statutes, ordinances, and regulations of any governmental body or subdivision now or hereafter in force. If any lawsuit or proceeding shall be brought against Grantor or the premises on account of any alleged violations or failure to comply and conform or on account of any damage, omission, neglect, or use of the premises by Grantee, the agents and employees of Grantee, or any other person on the premises, Grantee agrees that Grantee or any other person on the premises will defend it, pay whatever judgments may be recovered against Grantor or against the premises on account of it, and pay for all costs, expenses, and attorneys' fees in connection with it, including on appeal.

Venue. This Agreement is fully performable in Webb County, Texas, and the parties agree that venue is proper and mandatory for any dispute about this agreement in the District Courts of Webb County, Texas.

Merger. It is understood that this Agreement expresses the entire agreement of the Parties and no agreements or representations of any kind are made by any party in connection herewith, except those expressly herein set out.

Unenforceability. In the event any one or more of the provisions of this Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision hereof, and this Lease shall be construed as if such invalid, illegal or unenforceable provision was not included in this instrument.

Nonassignability. This Agreement shall not be assigned by Grantee to any other entity either in whole or in part, unless Grantor consents in writing to such assignment.

Binding Effect. This Agreement is binding upon the successors and assigns of the parties.

Additional Documents. The parties will execute any additional documents necessary to make this agreement fully effective and shall act in utmost good faith and reasonable diligence to accomplish the purposes of this agreement.

Dated: Nov 8th, 2016.

Grantor: Rancho Viejo Cattle Company, Ltd. by and through its general partner, Benavides Management LLC

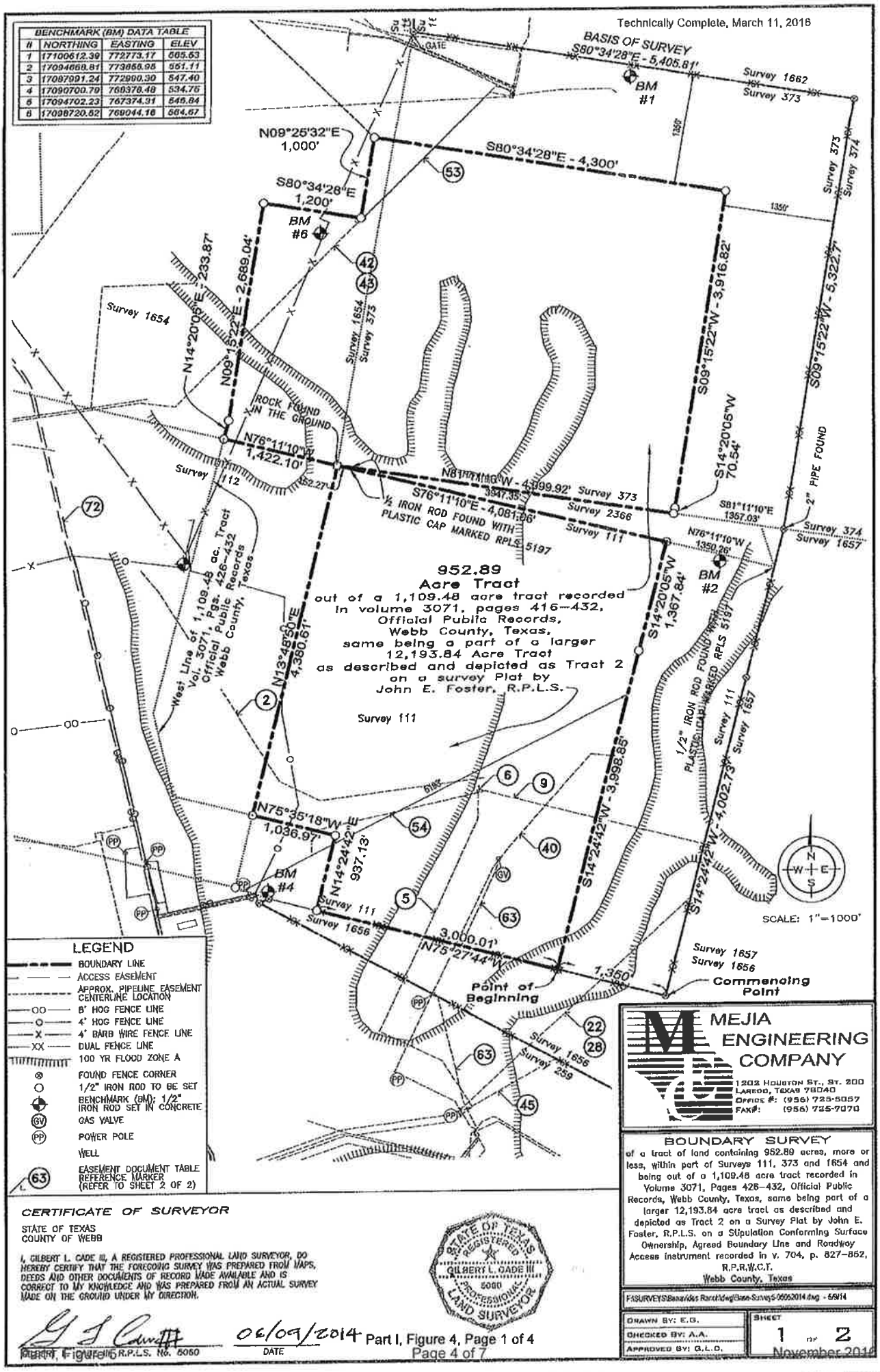
by: Linda Cristina B Alexander

Linda Cristina Benavides Alexander, Manager

Grantee: Rancho Viejo Waste Management, LLC

by: C Y Benavides III

Carlos Y. Benavides, III, Manager



CERTIFICATE OF SURVEYOR

STATE OF TEXAS
COUNTY OF WEBB

I, GILBERT L. CADE III, A REGISTERED PROFESSIONAL LAND SURVEYOR, DO HEREBY CERTIFY THAT THE FOREGOING SURVEY WAS PREPARED FROM MAPS, DEEDS AND OTHER DOCUMENTS OF RECORD MADE AVAILABLE AND IS CORRECT TO MY KNOWLEDGE AND WAS PREPARED FROM AN ACTUAL SURVEY MADE ON THE GROUND UNDER MY DIRECTION.

STATE OF TEXAS
REGISTERED
GILBERT L. CADE III
5060
PROFESSIONAL
LAND SURVEYOR

Gilbert L. Cade III, R.P.L.S. No. 5060

06/09/2014
DATE

MEJIA ENGINEERING COMPANY
1202 Houston St., St. 200
Laredo, Texas 78040
Office #: (956) 725-5057
Fax #: (956) 725-7070

BOUNDARY SURVEY

of a tract of land containing 952.89 acres, more or less, within part of Surveys 111, 373 and 1654 and being out of a 1,109.48 acre tract recorded in Volume 3071, Pages 426–432, Official Public Records, Webb County, Texas, same being part of a larger 12,193.84 acre tract as described and depicted as Tract 2 on a Survey Plat by John E. Foster, R.P.L.S. on a Stipulation Conforming Surface Ownership, Agreed Boundary Line and Roadway Access instrument recorded in v. 704, p. 827–852, R.P.R.W.C.T.
Webb County, Texas

F:\SURVEYS\Bexar\Abs Ranch\dwg\Base-Survey\5-20052014.dwg - 5/9/14

DRAWN BY: E.G.	SHEET 1 OF 2
CHECKED BY: A.A.	
APPROVED BY: G.L.C.	

November 2014

Part I, Figure 4, Page 1 of 4

Easement Document Table (Provided by Others)	
(2)	30' Right of Way Easement, Carlos Y Benavides Sr to United Texas Transmission Co, v. 696, p. 328-334, May 21, 1982
(5)	30' Right of Way Easement, Carlos Y Benavides Sr to United Texas Transmission Co, v. 696, p. 140-144, May 26, 1982
(6)	Surface Site Easements and a 12' Access Road Easement, Carlos Y Benavides Sr to United Texas Transmission Co, v. 696, p. 145-156, May 26, 1982
(9)	30' Easement and Right of Way Agreement, Carlos Y Benavides Sr to United Texas Transmission Co, v. 1039, p. 345-347, Nov 21, 1985
(22)	30' Easement and Right of Way Agreement, Carlos Y Benavides Sr to Kash Gathering Systems Inc, v. 1220, p. 374-382, Feb 23, 1987
(28)	Cathodic Protection Facility Easement, Carlos Y Benavides Sr to Kash Gathering Systems Inc, v. 1438, p. 47-49, Aug 08, 1990
(40)	50' Right of Way Easement, Rancho Viejo Cattle Co to Conoco Inc, v. 348, p. 798-804, Sep 20, 1995
(42)	50' Right of Way Easement, Rancho Viejo Cattle Co to Conoco Inc, v. 357, p. 460-465, Oct 26, 1995
(43)	50' Right of Way Easement, Rancho Viejo Cattle Co to Conoco Inc, v. 362, p. 96-101, Mar 19, 1996
(45)	30' Right of Way, Carlos Y Benavides Jr to Chevron USA Inc, v. 421, p. 530-534, Jul 08, 1996
(53)	50' Right of Way Easement, Rancho Viejo Cattle Co to Conoco Inc, v. 485, p. 812-816, Mar 14, 1997
(54)	50' Right of Way Easement, Rancho Viejo Cattle Co to Conoco Inc, v. 517, p. 32-36, Jun 03, 1997
(63)	50' Right of Way Easement, Rancho Viejo Cattle Co to Conoco-Phillips Co, v. 2343, p. 271-277, Apr 24, 2007
(72)	40' Road Easement, v. 704, p. 848-852, O.P.R.W.C.T.; MAY OR MAY NOT BE ALL EASEMENT DOCUMENTS THAT AFFECTS THIS TRACT

SURVEY NOTES

1. BASIS OF BEARING; BOUNDARY DATA ON STATE PLANE NAD 83, NAVD 88 4205 TEXAS SOUTH

2. BY GRAPHICAL PLOTTING ONLY, PARTS OF THIS TRACT ARE LOCATED WITHIN ZONE A AS DEFINED BY THE FEMA FLOOD INSURANCE RATE MAP, COMMUNITY PANEL 48479C 1275C WITH AN EFFECTIVE DATE OF APRIL 2, 2008.

3. THIS SURVEY WAS DONE WITHOUT THE BENEFIT OF TITLE COMPANY RESEARCH. THERE MAY BE EASEMENTS OF RECORD NOT SHOWN ON THIS SURVEY OF WHICH THE SURVEYOR IS UNAWARE OF AND AS SUCH ASSUMES NO LIABILITY HEREIN.

4. USGS BENCHMARK REFERENCE CONTROL DATA: NO. 526, N 17081242.78, E 758021.71, ELEV. 526.28

MEJIA ENGINEERING COMPANY
1202 Houston St., St. 200
Laredo, Texas 78040
Office #: (956) 725-5057
Fax #: (956) 725-7070

BOUNDARY SURVEY

of a tract of land containing 952.89 acres, more or less, within part of Surveys 111, 373 and 1654 and being out of a 1,109.48 acre tract recorded in Volume 3071, Pages 426-432, Official Public Records, Webb County, Texas, same being part of a larger 12,193.84 acre tract as described and depicted as Tract 2 on a Survey Plat by John E. Foster, R.P.L.S. on a Stipulation Conforming Surface Ownership, Agreed Boundary Line and Roadway Access Instrument recorded in v. 704, p. 827-852, R.P.R.W.C.T.
Webb County, Texas

F:\SURVEYS\Benavides Ranch\New\Base-Survey\5-06060814.dwg - 8/15/2011

DRAWN BY: E.G.	SHEET 2 OF 2
CHECKED BY: A.A.	
APPROVED BY: G.L.C.	November 2016

CERTIFICATE OF SURVEYOR

STATE OF TEXAS
COUNTY OF WEBB

I, GILBERT L. CADE III, A REGISTERED PROFESSIONAL LAND SURVEYOR, DO HEREBY CERTIFY THAT THE FOREGOING SURVEY WAS PREPARED FROM MAPS, DEEDS AND OTHER DOCUMENTS OF RECORD MADE AVAILABLE AND IS CORRECT TO MY KNOWLEDGE AND WAS PREPARED FROM AN ACTUAL SURVEY MADE ON THE GROUND UNDER MY DIRECTION.

STATE OF TEXAS
REGISTERED
GILBERT L. CADE III
6060
PROFESSIONAL
LAND SURVEYOR

GILBERT L. CADE III, R.P.L.S. No. 5060

06/09/2014
DATE

Field Notes for Tract 2

Being 12,193.0423 acres of land, more or less, out of and being a part of the original 16,256 acre Peacadito Ranch, consisting of pastures El Yugo and Rancho Viejo, said 12,193.0423 acres also out of and being a part of a 5,000 acre tract as per deed from Carlos Y. Benavides to A.N.B. Cattle Co. and Rancho Viejo Cattle Co., described in further detail and recorded on Dec-20-1909 in V. 1399, P. 262-73, Real Property Records of Webb County, Texas; said 12,193.0423 acres of land, more or less, consisting of the above mentioned pastures, being more particularly described by metes and bounds as follows:

BEGINNING at an existing fence post being the most Easterly Southeast corner of Survey 1926, Abstract 992, Manuel Collado, Original Grantee, said fence post also being the Southwest corner of Survey 1649, an exterior corner hereof, for the POINT OF BEGINNING of said 12,193.0423 acre tract;

(1) THENCE, North 89°32'57" East, a distance of 8240.01 feet, along the existing outer boundary fence line of the aforementioned group of pastures, to a fence post being the Northeast corner of Survey 1653;

THENCE, continuing along said boundary fence line, the following;

				to Survey corner	
(2)	South 00°04'51" East	5261.12 feet	BN	373	
	South 89°34'28" East	5409.81 feet	NR	373	
	South 09°15'22" West	5322.70 feet	SE	373	
(5)	South 34°20'05" West	1056.80 feet	deflection right		
	South 14°24'42" West	4002.73 feet	SE	111	
	North 75°27'44" West	4945.86 feet	NE	2240	
	South 68°26'01" West	126.31 feet	NW	259	
	South 61°25'40" East	5391.19 feet	NE	259	
(10)	South 29°01'12" West	6258.58 feet	SE	259	
	North 61°24'22" West	2861.25 feet	interior corner		
	South 00°26'38" East	4086.21 feet	deflection right		
	South 00°25'17" East	4265.49 feet	SE	1641	
	South 89°35'16" West	2060.30 feet	RxR North Line		
(15)	South 89°28'13" West	133.65 feet	RxR South Line		
	South 89°25'03" West	2769.21 feet	exterior corner		
	North 00°26'57" West	856.55 feet	NE	572	
	South 89°36'11" West	2280.73 feet	SW	1641	
	North 01°00'19" West	697.82 feet	SE	2078	
(20)	South 89°30'44" West	1568.35 feet	SW	2078	
	South 11°07'35" West	1370.47 feet	SE	11	
	North 73°47'52" West	3023.46 feet	deflection right		
	North 09°30'05" East	51.92 feet	deflection left		
	North 79°34'51" West	1571.16 feet	SW	11	
(25)	North 10°27'45" East	655.75 feet	interior corner		
	South 89°43'57" West	619.88 feet	SW	2076	
	South 00°41'55" East	479.38 feet	SE	1616	
	South 89°39'46" West	2652.89 feet	RxR South Line		
	South 89°28'41" West	193.07 feet	RxR North Line		
(30)	South 09°36'51" West	2036.11 feet	SW hereof		
	North 00°25'17" West	3999.43 feet	deflection right		
	North 00°24'37" West	4677.26 feet	deflection left		
	North 00°25'09" West	4590.68 feet	westerly corner		

704 841

EXHIBIT 2

Witness my hand and seal of office on

JUL 15 2013

Part I, Figure 5 Page 6 of 7 November 2016

THENCE, along the division line for the Yugo Ranch, same being a fence line, the following;

	North 79°30'40" East	2976.91 feet			
(38)	North 04°24'54" East	758.51 feet			
	North 26°06'56" East	208.66 feet	SW	120	
	North 03°32'17" East	5292.02 feet	GR	120	
	North 07°07'43" West	5279.31 feet	NB	120	
	North 37°08'03" East	5636.76 feet			
(40)	North 28°11'25" West	3796.70 feet			

THENCE, continuing along the division line for the Yugo Ranch, same being the southerly fence line of the Ranch Headquarters, the following;

North 53°40'13" East	77.33 feet	
North 00°58'37" East	934.57 feet	
North 66°13'37" East	64.86 feet	
South 09°32'05" East	98.30 feet	
(45) North 04°27'55" East	61.00 feet	
South 85°32'05" East	91.00 feet	
South 73°50'57" East	1177.49 feet	
North 71°09'04" East	373.63 feet	
(49) North 26°30'34" West	574.02 feet	

(50) THENCE, North 42°48'28" East, a distance of 1781.08 feet, along said division fence line, to the POINT OF BEGINNING, and containing 12,193.0423 acres of land, more or less.

Note: 1) Basis of Bearings taken from the North American Datum 1927 (NAD 27), with Global Positioning System (GPS), utilizing USGS Monument "Casa", for the N-S-E.

STATE OF TEXAS
COUNTY OF WEBB

I, John E. Foster, a Registered Professional Land Surveyor, do hereby certify that the foregoing fieldnotes are true and correct to my best knowledge and belief and was prepared from an actual survey made on the ground on 27 March thru 06 April, 1996 and 20 July thru 10 August, 1997, under my direction and from office records available.

WITNESS MY HAND AND SEAL THIS 10th DAY OF AUGUST, 1997.

John E. Foster, R.P.L.S. #1136
P.E. #15051

STATE OF TEXAS
REGISTERED
JOHN E. FOSTER
1136
PROFESSIONAL
LAND SURVEYOR

D:\OFFICE\WPWIN\WPDOCS\YUGO-1.FC

704 842

I, Margo Ramirez Reyna, County Clerk, Webb County, do hereby certify that this is a true and correct copy of the same appears of record in my office.
Witness my hand and seal of office on
JUL 15 2013
Margo Ramirez Reyna
Webb County Clerk
Deputy County Clerk

Changed Pages

Part III, Appendix III-B.1

General Facility Design Figures

Part III
Attachment III-B
Appendix III-B.1

GENERAL FACILITY DESIGN FIGURES

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Revised September 2015
Revised November 2015
Technically Complete March 11, 2016
Modified October 2016
Modified November 2016

11-8-2016

STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED PROFESSIONAL ENGINEER

This document is released for the purpose of permitting only under the authority of Michael W. Oden, P.E. #67165. It is not to be used for bidding or construction. Texas Registered Engineering Firm F-5650

Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:
CB&I Environmental and Infrastructure, Inc.

CBI

12005 Ford Rd, Suite 600
Dallas, TX 75234

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11-8-2016

STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED
PROFESSIONAL ENGINEER

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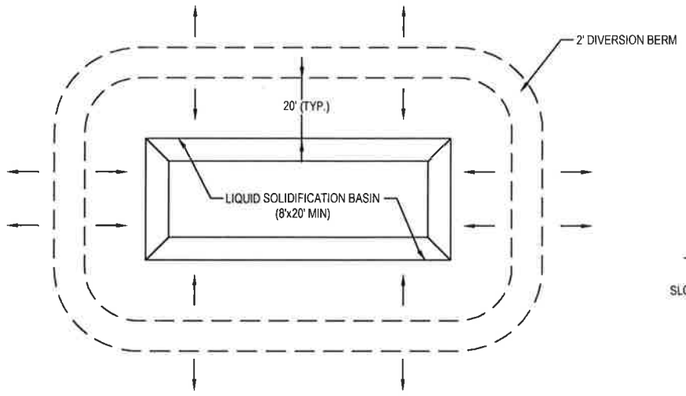


1 / B.1-5 TEMPORARY LIQUID SOLIDIFICATION BASIN PLAN VIEW

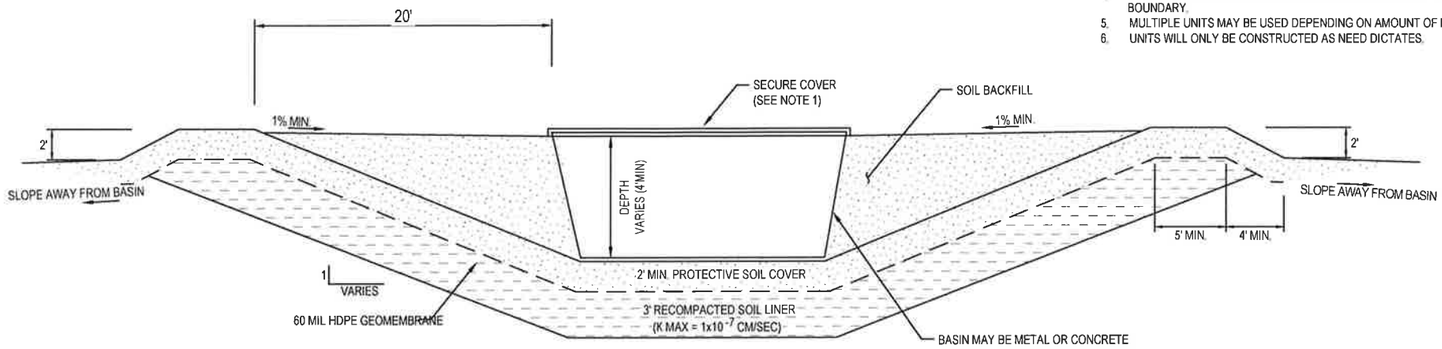
NOT TO SCALE

NOTE:

1. STORMWATER TO BE DIRECTED AWAY FROM DIVERSION BERM
2. THIS PLAN IS CONCEPTUAL. ACTUAL DIMENSIONS OF THE BASIN WILL VARY.

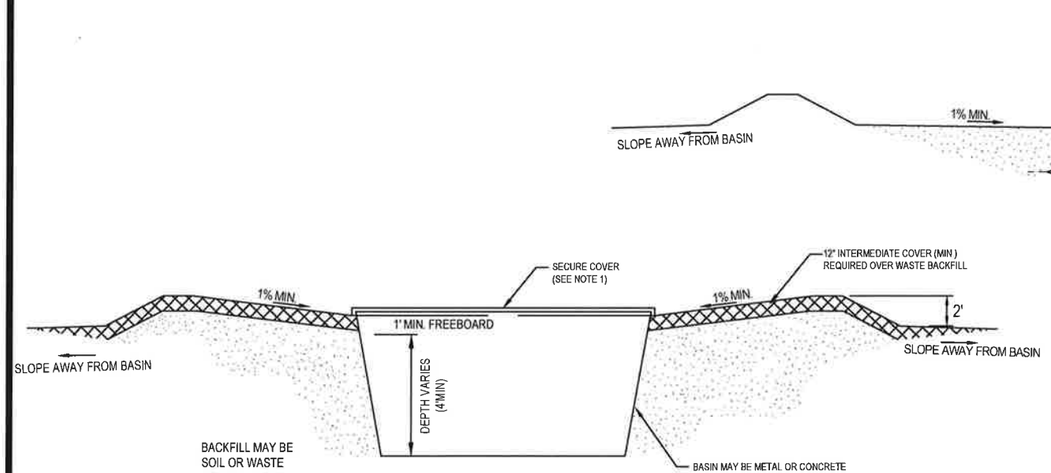
NOTE:

1. A SECURE COVER WILL BE PLACED OVER THE TEMPORARY CONTAINER ANY TIME PROCESSED OR UNPROCESSED WASTE REMAINS IN THE CONTAINER OVERNIGHT
2. THIS SECTION IS CONCEPTUAL, ACTUAL DIMENSIONS OF THE BASIN WILL VARY. THE BASIN SHALL BE AT A MINIMUM: 8 FEET WIDE, 20 FEET LONG, AND 5 FEET DEEP (4 FEET PLUS 1 FOOT FREEBOARD). THE NUMBER OF BASINS WILL VARY DEPENDING ON WASTE RECEIPTS.
3. 2' OR 3' RECOMPACTED SOIL LINER AND 60 MIL HDPE GEOCOMPOSITE LINER AND 2' SOIL PROTECTIVE COVER TO BE CONSTRUCTED IN ACCORDANCE WITH APPENDIX III-D.7 (LINER QUALITY CONTROL PLAN)
4. THIS BASIN CONFIGURATION AND CONSTRUCTION WILL BE UTILIZED OUTSIDE OF EXISTING WASTE BUT WITHIN PERMIT BOUNDARY.
5. MULTIPLE UNITS MAY BE USED DEPENDING ON AMOUNT OF INCOMING WASTE.
6. UNITS WILL ONLY BE CONSTRUCTED AS NEED DICTATES.



3 / B.1-5 TYPICAL CROSS SECTION TEMPORARY BASIN LOCATED OUTSIDE OF WASTE CELL

NOT TO SCALE

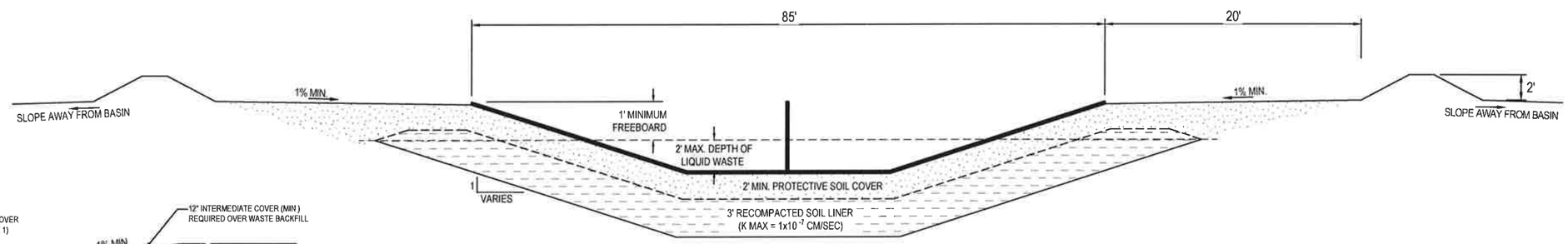


4 / B.1-5 TYPICAL CROSS SECTION TEMPORARY BASIN LOCATED OVER LINED CELL

NOT TO SCALE

NOTE:

1. A SECURE COVER WILL BE PLACED OVER THE TEMPORARY CONTAINER ANY TIME PROCESSED OR UNPROCESSED WASTE REMAINS IN THE CONTAINER OVERNIGHT
2. THIS SECTION IS CONCEPTUAL, ACTUAL DIMENSIONS OF THE BASIN WILL VARY. THE NUMBER OF BASINS WILL VARY DEPENDING ON WASTE RECEIPTS.
3. THIS BASIN CONFIGURATION MAY ONLY BE PLACED IN EXISTING WASTE OVER THE EXISTING COMPOSITE LINED CELLS



4 / B.1-5 TYPICAL CROSS SECTION PERMANENT LIQUID SOLIDIFICATION BASIN

NOT TO SCALE

NOTE:

1. PERMANENT BASIN MAY BE CONSTRUCTED IN PHASES AS WASTE RECEIPTS DICTATE.

REV. NO.	DATE	DESCRIPTION
3	11/2016	REVISED SLOPES AT BASINS
2	10/2016	REVISED LIQUID SOLIDIFICATION BASIN DETAILS
1	9/2015	NOD 1

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED
PROFESSIONAL ENGINEER

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11-8-2016

PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

LIQUID SOLIDIFICATION BASIN PLAN AND DETAILS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015
DRAWING NO.
III
B.1-5
5 OF 6 SHEETS

Changed Pages

Part III, Appendix III-C.1

Facility Surface Water Drainage Report Narrative

Part III
Attachment III-C
Appendix III-C.1

FACILITY SURFACE WATER DRAINAGE REPORT NARRATIVE

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Supplement April 2015
Revised September 2015
Revised November 2015
Technically Complete March 11, 2016
Modified November 2016

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Prepared for:
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1116 Calle del Norte
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Prepared by:
CB&I Environmental and Infrastructure, Inc.

12005 Ford Rd, Suite 600
Dallas, TX 75234

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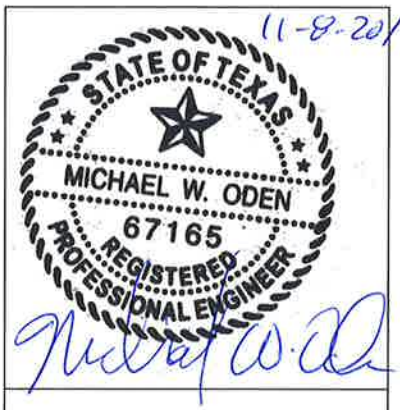
Attachments



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1.0 INTRODUCTION

This Facility Surface Water Drainage Report (FSWDR) for the Pescadito Environmental Resource Center (PERC) has been designed to collect, route, and detain stormwater runoff from the facility in an environmentally sound manner. The Plan for the landfill contains design features that follow best management practices that meet or exceed the regulations applicable to stormwater management outlined in Title 30 of the Texas Administrative Code (30 TAC), Section 330, Municipal Solid Waste. Specifically, Sections 330.63(c), 330.303, 330.305, and 330.307 are addressed.

Specific regulations of note include:

- ❑ Section 330.63(c) – Facility Surface Water Drainage Report
  - *"The owner or operator of a municipal solid waste (MSW) facility shall include a statement that the facility design complies with the requirements of 330.303 of this title (relating to Surface Water Drainage for Municipal Solid Waste Facilities). Additionally, applications for landfill and compost units shall include a surface water drainage report to satisfy the requirements of Subchapter G of this chapter (relating to Surface Water Drainage)."*
  - *30 TAC §330.63(c)(2)(D) applies specifically "for construction in a floodplain." RVWM has already applied for, and received, a CLOMR from FEMA to remove the area of the PERC facility from the 100-year floodplain [November 21, 2014]. Once the CLOMR improvements are constructed and approved by FEMA, the PERC facility will not be in the 100-year floodplain, i.e., no development will occur in the 100-year floodplain and the requirements of 30 TAC §330.63(c)(2)(D) are not applicable.*
- ❑ Section 330.303 – Surface Water Drainage for Municipal Solid Waste Facilities
  - *"(a) A facility must be constructed, maintained, and operated to manage run-on and runoff during the peak discharge of a 25-year rainfall event*
  - *(b) Surface water drainage in and around a facility shall be controlled to minimize surface water running onto, into, and off the treatment area"*
- ❑ Section 330.305 – Additional Surface Water Drainage Requirements for Landfills
  - *"(a) Existing or permitted drainage patterns must not be adversely altered.*
  - *(b) The owner or operator shall design, construct, and maintain a run-on control system capable of preventing flow onto the active portion of the landfill during the peak discharge from at least a 25-year rainfall event.*
  - *(c) The owner or operator shall design, construct, and maintain a runoff management system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.*

3.0 OBJECTIVES OF MODELING

Based on the above discussion, this Facility Surface Water Drainage Report approaches stormwater modeling with the following objectives:

1. Demonstrate that the HydroCAD software produces similar discharge rates and volumes as the HEC-HMS models presented in the CLOMR. This step is completed to ensure an "apples-to-apples" comparison between software models.
2. Develop a detailed stormwater model that reflects the post-development design of the landfill. Model every stormwater management component to ensure that they are adequately sized and can convey stormwater at rates that will not cause erosion (e.g. less than five feet per second) for the 100-year, 24-hour storm. The 100-year storm is selected based on the need to demonstrate that the CLOMR is maintained. It is noted that the CLOMR modeled 100-year storms to accurately delineate the 100-year floodplain. It is also noted that Texas regulations require sizing the facility stormwater management components for the smaller 25-year 24-hour storm.
3. Update the intermediate conditions model (which was based on general landfill hydrology assumptions) with the detailed landfill design described in Objective 2. This model is a hybrid:
    a. Areas inside of the landfill's stormwater management footprint will use the detailed stormwater modeling based on CB&I's design.
    b. Areas outside of the landfill's stormwater management footprint that will be modified from the existing conditions that are modeled as described within the CLOMR.
    c. The purpose of this hybrid model is to verify that the results are substantially similar to the intermediate conditions described in the CLOMR for the 100-year storm to ensure that the CLOMR conclusions are maintained.
4. Run the pre-development HydroCAD model and the post-development HydroCAD model described in Goal #3 for the 100-year 24-hour storm to determine the discharge rates. Demonstrate that the post-development design maintains similar discharge rates and volumes to pre-development conditions, indicating that the landfill development will not produce adverse effects to area stormwater management.
5. Run the post-CLOMR, pre-development HydroCAD model and the post-development HydroCAD model described in Objective #3 for the 25-year, 24-hour storm to determine the discharge rates and volumes associated with the 25-year, 24-hour storm. Demonstrate that the

existing drainage patterns are not adversely altered, to any significant degree, by the development of the facility by comparing drainage at the permit boundary. This is additional demonstration that the existing drainage patterns are not adversely altered to that observed in Objective 4 above for the 100-year, 24-hour storm event.

By developing a detailed stormwater model for the proposed facility, CB&I is able to demonstrate that all stormwater features used to convey stormwater within the facility are adequately sized. Additionally, by demonstrating that discharge rates and Drainage Area locations for the facility are consistent with those developed within the CLOMR, the results of the CLOMR and its approach can be maintained.

updated with the detailed landfill design for the purpose of comparison to existing conditions and for validation of the CLOMR results.

Table 1
Peak Discharge Rate – 100-Year, 24-Hour Model Comparison

Model Run	HEC-HMS – CLOMR (cfs)	HydroCAD – Recreated (cfs)	Percent Difference
Pre-development Conditions			
DA1	7860.9	7900.0	0.50%
DA2	1676.8	1687.6	0.64%
DA3	3823.2	3835.91	0.33%
DA4	3824.2	3819.7	-0.12%
Junction-2	6905.7	6761.72	-2.1%
Burrito Tank	7714.2	7720.42	0.08%
Reach 1	7714.2	7720.42	0.08%
Junction-1 (Downstream Discharge Point)	14567.6	14540.47	-0.19%
Intermediate Conditions			
DA1	6852.4	6885.92	0.49%
DA2	2082.6	2084.3	0.08%
DA3	4690.7	4709.99	0.41%
DA4	3824.2	3819.9	-0.11%
DA5	468.5	471.92	0.73%
DA6	378.5	380.18	0.44%
DA7	1015.7	1024.75	0.89%
West Detention Basin	5980.8	5960.38	-0.34%
NW Detention Basin	0	0	0.00%
NE Detention Basin	0	0	0.00%
Reach 1	5980.8	5960.38	-0.34%
Junction-1 (Downstream Discharge Point)	14096.1	14083.77	-0.09%

Table 2 Peak Discharge Volume – 100-Year, 24-Hour Model Comparison			
Model Run	**HEC-HMS – CLOMR (af)**	**HydroCAD – Recreated (af)**	**Percent Difference**
Pre-development Conditions			
DA1	3272.6	3272.9	0.01%
DA2	364.6	363.7	-0.25%
DA3	1263.3	1262.4	-0.07%
DA4	1832	1830.9	-0.06%
Junction-2	3095.3	3093.3	-0.06%
Burrito Tank	3272.6	3272.9	0.01%
Reach 1	3272.6	3272.9	0.01%
Junction-1 (Downstream Discharge Point)	6732.5	6729.8	-0.04%
Intermediate Conditions			
DA1	2520.7	2522.4	0.07%
DA2	557.5	557	-0.09%
DA3	1547.6	1547.6	0.00%
DA4	1832	1830.9	-0.06%
DA5	78.6	78.8	0.25%
DA6	51.8	51.7	-0.19%
DA7	163	162.9	-0.06%
West Detention Basin	2599.3	2601.2	0.07%
Reach 1	2599.3	2601.2	0.07%
NW Detention Basin	0	0	0.00%
NE Detention Basin	0	0	0.00%
Junction-1 (Downstream Discharge Point)	6536.4	6536.6	0.00%

Note: Peak Discharge Volume results for Pre-Development conditions were not provided in the CLOMR text. HEC-HMS results shown in Table 2 were obtained from the digital HEC-HMS model files provided with the CLOMR submission.

6.0 OBJECTIVE 3

Update the Intermediate Conditions (post-CLOMR) Model to include detailed landfill design. Verify that the updated results are substantially similar to the intermediate conditions described in the CLOMR for the 100-year storm to ensure that the CLOMR conclusions are maintained.

In order to ensure that the determinations made in the CLOMR were maintained, the proposed stormwater model including the detailed stormwater management system was compared to the proposed stormwater model from the CLOMR for the 100-year, 24-hour event.

This model is a hybrid:

A. Areas inside of the landfill's stormwater management footprint will use the detailed stormwater modeling based on CB&I's design.
B. Areas outside of the landfill's stormwater management footprint that will be modified from existing conditions are modeled as described within the CLOMR.

Because some of the drainage areas in the CLOMR proposed model were modified by the detailed proposed model, the two models were compared at the "Junction 1-Downstream Discharge Point" for the 100-year, 24-hour storm event to demonstrate that the design of the stormwater management system does not significantly or negatively impact the downstream discharge values determined in the CLOMR. The Junction 1-Downstream Discharge Point is shown on Drawings 1 and 3 of Appendix III-C.2. The stormwater model output files are provided in Appendix III-C.4. Table 5 below summarizes the comparison of the two models.

Table 5
100-Year, 24-Hour Storm Event Model Comparison

Model Run	Intermediate (post-CLOMR)	Post Development	Percent Difference
Peak Discharge Rate (cfs)			
Junction-1 (Downstream Discharge Point)	14,083.77	13,907.57	-1.25%
Peak Discharge Volume (af)			
Junction-1 (Downstream Discharge Point)	6,536.62	6,682.68	2.2%

7.0 OBJECTIVE 4

Run the pre-development HydroCAD model and the post-development HydroCAD model described in Objective #3 for the 100-year storm to determine the discharge rates associated with the 100-year storms. Demonstrate that post-development design maintains similar discharge rates and volumes to pre-development conditions, indicating that the landfill development will not produce adverse effects to area stormwater management.

In order to demonstrate compliance with 30 TAC, Section 330, Subchapter G, the proposed stormwater model including the detailed stormwater management system was compared to the existing conditions stormwater model. The two models were compared at the "Junction 1-Downstream Discharge Point" to demonstrate that the design of the stormwater management system does not significantly or negatively impact the existing downstream discharge values. Table 6 below summarizes the comparison of the two models.

Table 6
100-Year, 24-Hour Storm Event Model Comparison

Model Run	Pre-Development (pre-CLOMR)	Post-Development	Percent Difference
Peak Discharge Rate			
Junction-1 (Downstream Discharge Point)	14,540.47	13,907.57	-4.4%
Peak Discharge Volume			
Junction-1 (Downstream Discharge Point)	6,729.82	6,682.68	-0.7%

Based on the fact that the post-development conditions will discharge water downstream at flow rates and volumes that are within 5 percent of existing conditions demonstrates that the proposed landfill will not adversely affect drainage conditions. Therefore, Objective 4 is achieved.

Note that, unlike many MSW landfill applications, PERC had a detailed 100-year hydraulic and hydrologic baseline model available for the entire watershed in which the facility is proposed to be located. The detailed model was the result of the separate CLOMR process to remove the facility area from the 100-year floodplain. That model was independently verified by FEMA and its technical contractors and memorialized by the November 21, 2014 CLOMR approval. Availability of the watershed model provided an excellent opportunity to show that the PERC

facility could be developed without significantly or adversely altering existing, pre-facility-development (post-CLOMR) drainage patterns and conditions. Further, modeling/designing to 100-year (24-hour) conditions is more protective of human health and the environment than the 25-year (24-hour) storm event required by the Chapter 330 regulations.

8.0 OBJECTIVE 5

Run the post-CLOMR, pre-development HydroCAD model and the post-development HydroCAD model described in Objective #3 for the 25-year, 24-hour storm to determine the discharge rates and volumes associated with the 25-year, 24-hour storm. Demonstrate that the existing drainage patterns are not adversely altered, to any significant degree, by the development of the facility by comparing drainage at the permit boundary. This is additional demonstration that the existing drainage patterns are not adversely altered to that observed in Objective 4 above for the 100-year, 24-hour storm event.

Current Title 30 TAC §330.305(a) states "Existing or permitted drainage patterns must not be adversely altered." For the PERC facility, this demonstration was accomplished by comparing the Post-CLOMR Intermediate (permitted) and the Post-Development (proposed) conditions at the facility. However, the 25-year, 24-hour storm or rainfall event is to be used for this comparison for Objective 5.

Although outdated and currently under revision, TCEQ recommends that procedures in Regulatory Guidance 417 (RG-417; June 2006) - Guidelines for Preparing a Surface Water Drainage Plan for a Municipal Solid Waste Facility be used in the demonstration. RG-417 discusses the following elements that can be used for the evaluation:

- receiving streams or channels,
- downstream flooding potential,
- adjacent and downstream properties, and
- downstream water rights and uses.

Analysis

RG-417 discusses both "specific discharge points" and/or "overland (sheet) flow" at the permit boundary as the location for the comparison. Stormwater run on to the PERC facility is almost exclusively sheet flow, or overland flow as a result of the broad, salt-flat nature of the site. Runoff occurs along the south permit boundary almost exclusively as shallow concentrated flow and/or sheet flow. Further, most of the discharge enters the 100-year and 25-year floodplains

prior to exiting the permit boundary. "Specific discharge points" are usually associated with "channels" defined by "bed and banks." With the exception of the extreme southeast corner of the permit boundary, identifiable channels are not present at the permit boundary. The absence of channels was confirmed by the U.S. Army Corps of Engineers and U.S. EPA in their finding that there are no Jurisdictional Waters on site (Part II, Attachment A).

However, three locations along the southern permit boundary have been identified as "discharge points" for the comparison. Refer to Figures III-C.2-18 and III-C.2-19 in Appendix III-C.2 for the location of these "discharge points" and associated drainage areas for the pre-development (Post-CLOMR, existing or permitted) and post landfill development conditions (proposed), respectively.

Objective 4 above demonstrates that the pre-development (Post-CLOMR) and post-development conditions have similar discharge rates and volumes for the 100-year, 24-hour rainfall for the watershed in which the facility is located. The following analysis provides further demonstration for the 25-year, 24-hour rainfall event at the permit boundary. Three locations have been identified for analysis and have been designated as points A, B and C. See Figures III-C.2-18 and 19 in Part III, Appendix III-C.2

Point A is located at the southeast corner of the permit boundary. Flow at this location for the Post-CLOMR, pre-landfill (existing or permitted) condition consists of sheet, or overland flow associated with a portion Drainage Area 3 which has been identified as DA3A. Part of the flow is within a channel that is known as "Trib 1 of San Juanito Creek Trib" (See Figure 1 in CLOMR Application – III-C.1-A). This tributary crosses the permit boundary at Point A and proceeds onto adjacent property owned by JEV Family LTD before re-entering property owned by RVCC. Note that Point A is within the 100-year and 25-year floodplains. [The 25-year, 24-hour floodplain has very similar characteristics to the 100-year, 24-hour floodplain shown throughout the application except that it is one (1) to two (2) feet lower in elevation.]

Point B is located approximately in the middle of the site, near the west end of the South Detention Basin. Flow at this location for the Post-CLOMR, pre-landfill (existing or permitted) condition consists of sheet, or overland flow associated with a portion of Drainage Area 2 which has been designated as DA2B. Flow in subcatchment DA2B is primarily from the western

portion of the facility where drainage tends to flow to Burrito Tank and over the spillway on the east of the tank and proceeds across the south permit boundary onto adjacent property owned by JEV Family LTD before re-entering property owned by RVCC. Note that Point B is within the 100-year and 25-year floodplains.

Point C is located at the most southerly southwest corner of the site. Flow at this location for the Post-CLOMR, pre-landfill (existing or permitted) condition consists of sheet, or overland flow associated with another portion of Drainage Area 2 and has been designated as DA2C. Flow in subcatchment DA2C is from offsite and onsite from an area south and east of the west detention basin. Note that discharge from Point C enters the 100-year and 25-year floodplains shortly after leaving the permit boundary while on property owned by RVCC.

For the post-landfill (proposed) condition, discharges from Points A, B and C are as follow:

- Discharge at **Point A** continues to consist of sheet, or overland flow associated with a portion Drainage Area 3. This area has been identified as DA3A-Post. Part of the flow is still within the tributary that crosses the permit boundary at Point A. For this condition, point A also receives discharge from the South Detention Basin – East, or Secondary, Outlet. Flow leaves the east culverts at less than 5 feet per second (fps) and is considered non-erodible. It then enters a long flat swale where the velocity will drop below 2 fps and enters the 100-year and 25-year floodplain before leaving the permit boundary (see Figure III-C.2-17).
- Discharge at **Point B** is from the South Detention Basin – West, or Primary, Outlet. Flow leaves the west culverts at around 8.7 fps. Downstream of the culvert exit, the drainage swale will be lined with rip-rap to lower the velocity. This, coupled with the low slope of the swale, will drop the velocity below 2 fps. The discharge will enter the 100-year and 25-year floodplain before leaving the permit boundary (see Figure III-C.2-16).
- Discharge at **Point C** continues to consist of sheet, or overland flow associated with another portion of Drainage Area 2 and has been designated as DA2C-Post. Subcatchment DA2C-Post extends to the north end of the facility, below DA6. Note that discharge from Point C enters the 100-year and 25-year floodplain shortly after leaving the permit boundary while on property owned by RVCC.
- Note that the discharge from Points A, B and C enter inside the fork of the two main stems of the modeled watershed. See Figures III-C.2-18 and 19.

Results

As part of the CLOMR application, the entire watershed that contains the proposed facility has been modeled; providing a unique opportunity to ensure that regional drainage patterns are not affected. As noted in Table 5 above in confirming that Objective 3 was met, the stormwater models of the Intermediate (Post-CLOMR) and Post Development conditions were compared for the 100-year, 24-hour storm event and confirmed that the two conditions were substantially similar.

For Objective 5, Table 7 below compares stormwater model results for the 25-year, 24-hour storm event at three discharge points along the permit boundary (southern limits of the facility). The results demonstrate that "existing or permitted drainage patterns" will not be "adversely altered" at the permit boundary by the development of the Pescadito Environmental Resource Center. HydroCAD output files for models evaluated are presented at the end of this section.

Table 7
25-Year, 24-Hour Storm Event Model Comparison

Point of Comparison	Intermediate (post-CLOMR)		Post Development		% difference
	Model Run	Value	Model Run	Value	
Peak Discharge Rate (cubic feet per second)					
A	DA3A	3,302.61	DA3A-Post	2,910.45	-
	-	-	SDBE	134.47	-
	Total	3,302.61	**Total** [1]	3,044.92	-8.5
B	DA2B	380.02	SDBW	350.64	7.7
C	DA2C	87.57	DA2C-Post	63.44	-23.6
Peak Discharge Volume (acre feet)					
A	DA3A	961.635	DA3A-Post	847.446	-
	-	-	SDBE	32.816	-
	Total	961.635	**Total**	880.262	-9.2
B	DA2B	172.542	SDBW	386.511	124.0 [2]
C	DA2C	25.492	DA2C-Post	48.675	90.9 [3]

[1] – For convenience the values from DA3A-Post and SDBE are added. In reality, the peak flows do not occur at the same time, rather one hour different. This assumption is conservative in respect to the comparison.

[2] – The increase in volume associated with Point B is attenuated in that the flow is over a much longer duration due to the South Detention Basin

[3] - The increase in volume associated with Point C is attenuated in that the peak flow has decreased and the flow period is extended from 13 to 18 hours in length.

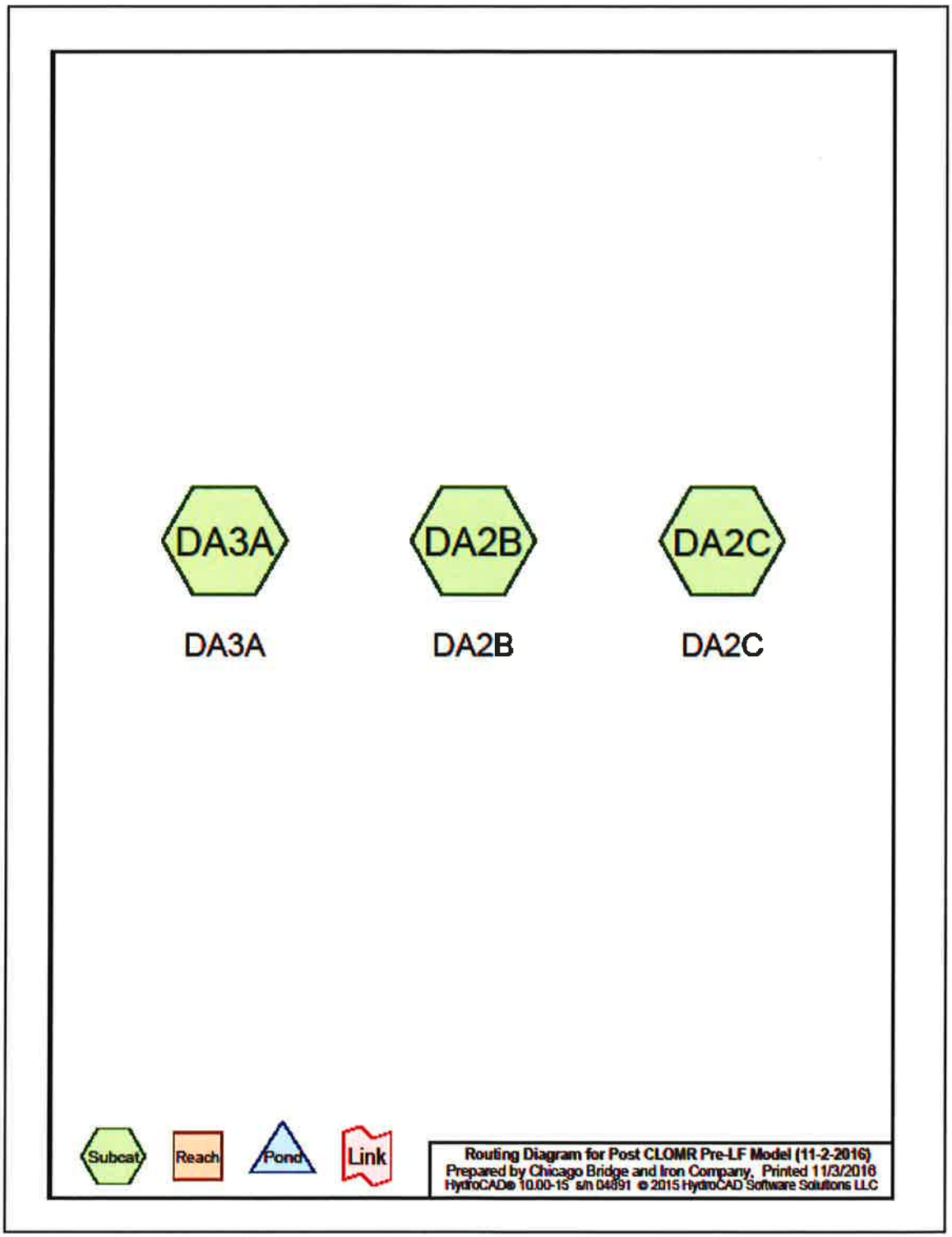
Velocities associated with flow from the South Detention Basin have been discussed above as being less than 2 fps for the 25-year, 24-hour rainfall event prior to leaving the permit boundary.

Based on the analysis presented above, Objective 5 has been met in that the development of the facility will have no adverse impact to:

- receiving streams or channels,
- downstream flooding potential,
- adjacent and downstream properties, or
- downstream water rights and uses.

Please refer to the CLOMR provided in Attachment A of Part III, Appendix III-C.1 for additional information and discussion regarding existing an

Model Diagram for Post-CLOMR (permitted) conditions



Results for Subcatchment DA2B

Post CLOMR Pre-LF Model (11-2-2016) *Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"*
Prepared by Chicago Bridge and Iron Company Printed 11/3/2016
HydroCAD® 10.00-15 s/n 04891 © 2015 HydroCAD Software Solutions LLC Page 1

Summary for Subcatchment DA2B: DA2B

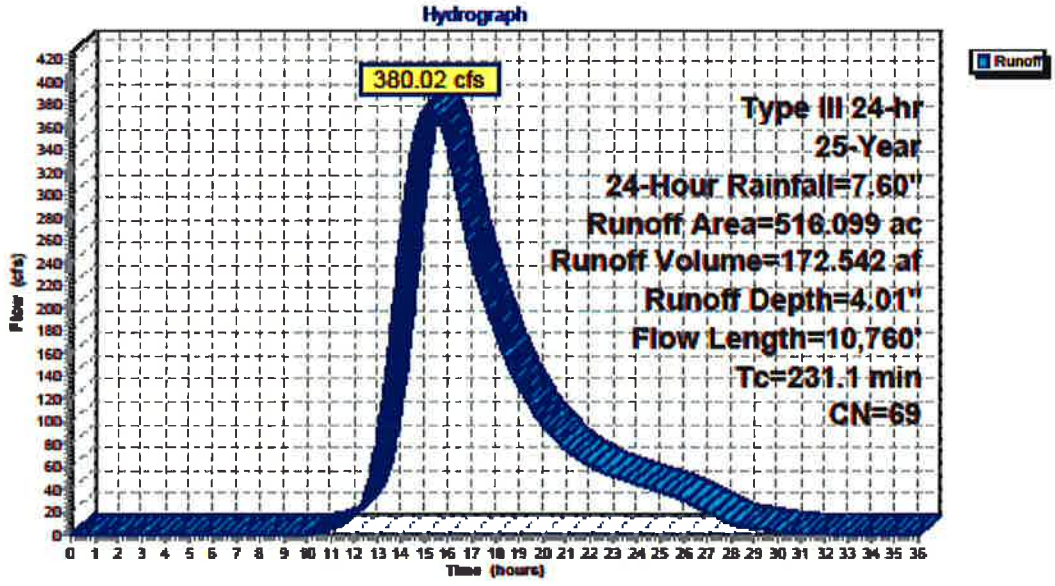
Runoff = 380.02 cfs @ 15.15 hrs, Volume= 172.542 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

Area (ac)	CN	Description
* 516.099	69	
516.099		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	300	0.0100	0.17		Sheet Flow, Grass: Short n= 0.150 P2= 3.75"
202.3	10,460	0.0033	0.86		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
231.1	10,760	Total			

Subcatchment DA2B: DA2B



Results for Subcatchment DA2C

Summary for Subcatchment DA2C: DA2C

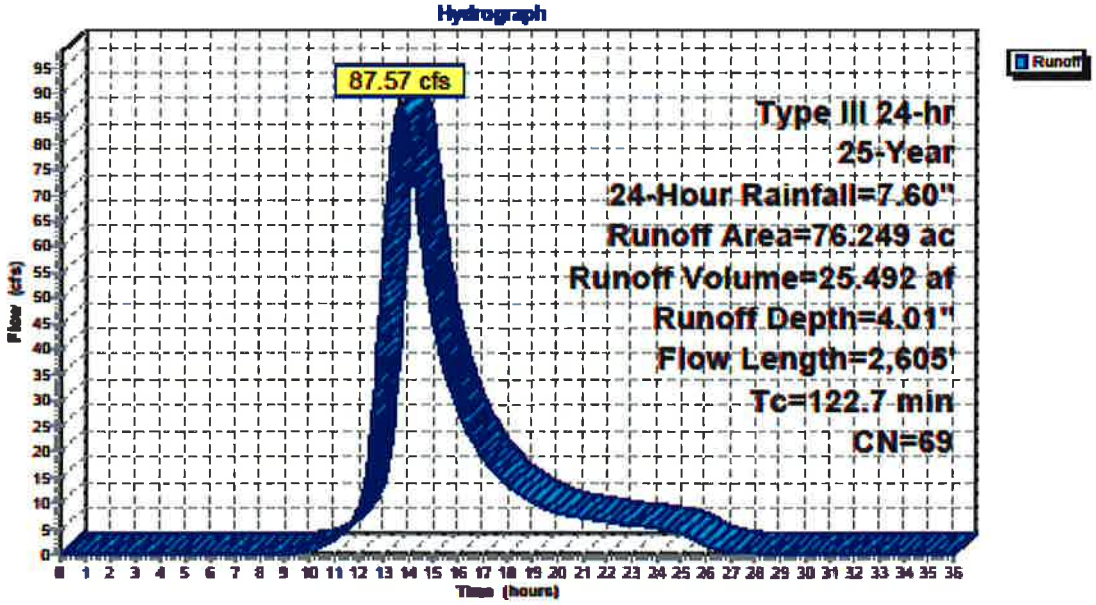
Runoff = 87.57 cfs @ 13.64 hrs, Volume= 25.492 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

Area (ac)	CN	Description
* 76.249	69	
76.249		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	300	0.0030	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.75"
76.1	2,305	0.0052	0.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
122.7	2,605	Total			

Subcatchment DA2C: DA2C



Results for Subcatchment DA3A

Summary for Subcatchment DA3A: DA3A

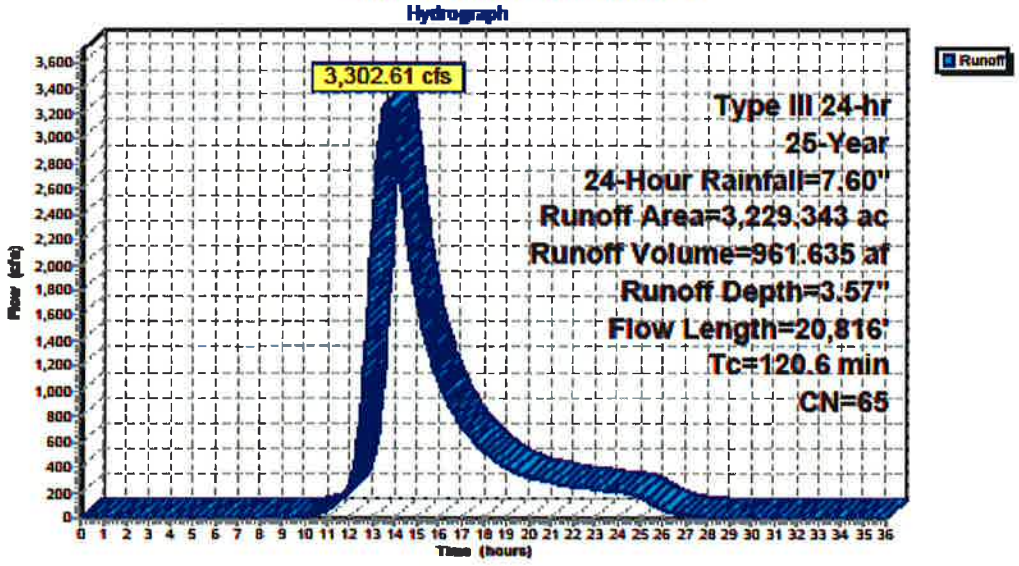
Runoff = 3,302.61 cfs @ 13.66 hrs, Volume= 961.635 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

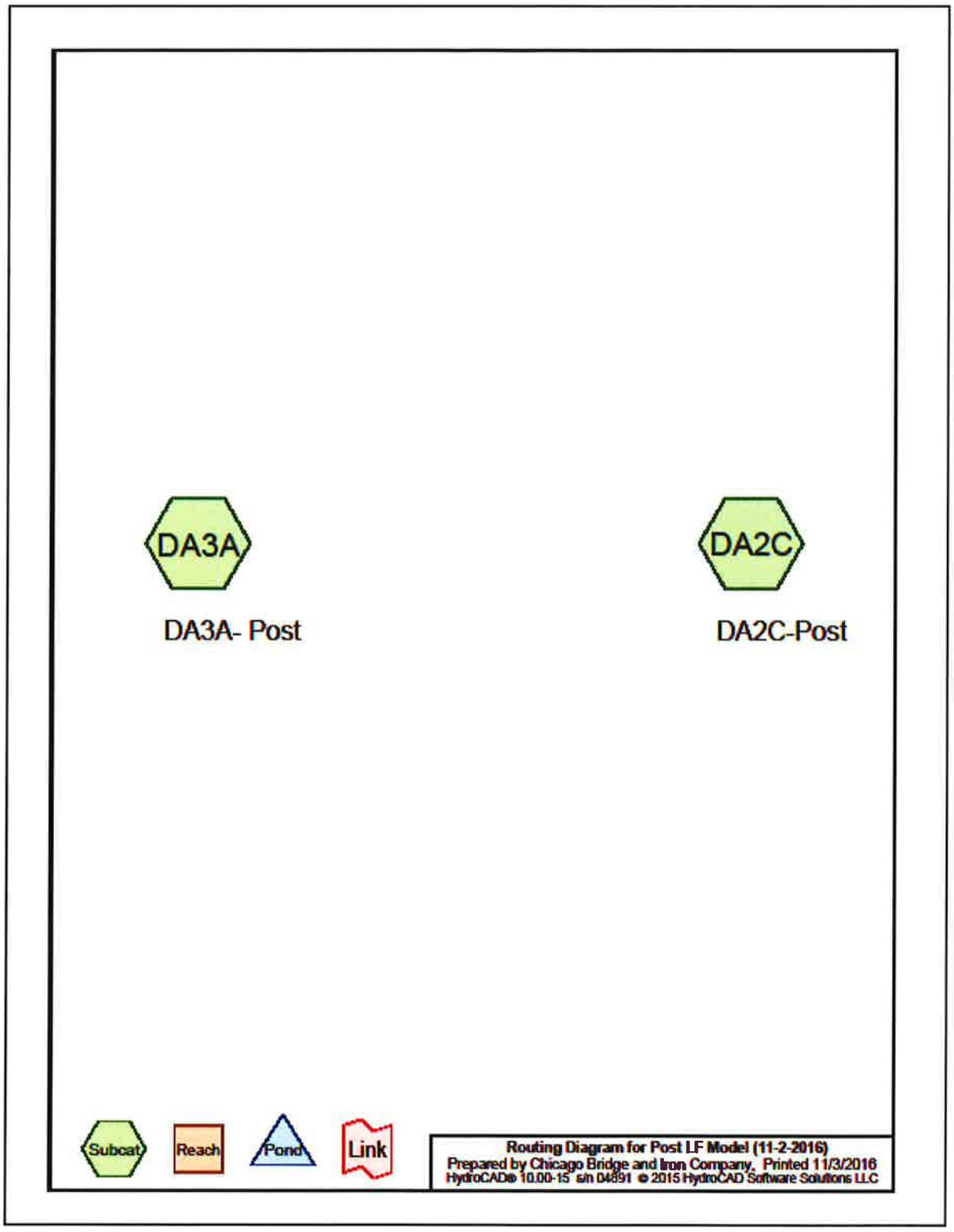
Area (ac)	CN	Description
* 3,229.343	65	
3,229.343		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	300	0.0200	0.42		Sheet Flow, From CLOMR n= 0.070 P2= 3.75"
6.4	1,000	0.0250	2.59		Shallow Concentrated Flow, From CLOMR Kv= 16.4 fps
102.4	19,516	0.0042	3.18	50.82	Channel Flow, From CLOMR Area= 16.0 sf Perim= 12.9' r= 1.24' n= 0.035
120.6	20,816	Total			

Subcatchment DA3A: DA3A



Model Diagram for Off Site Flows Post Landfill



Results for Subcatchment DA2C-Post

Summary for Subcatchment DA2C: DA2C-Post

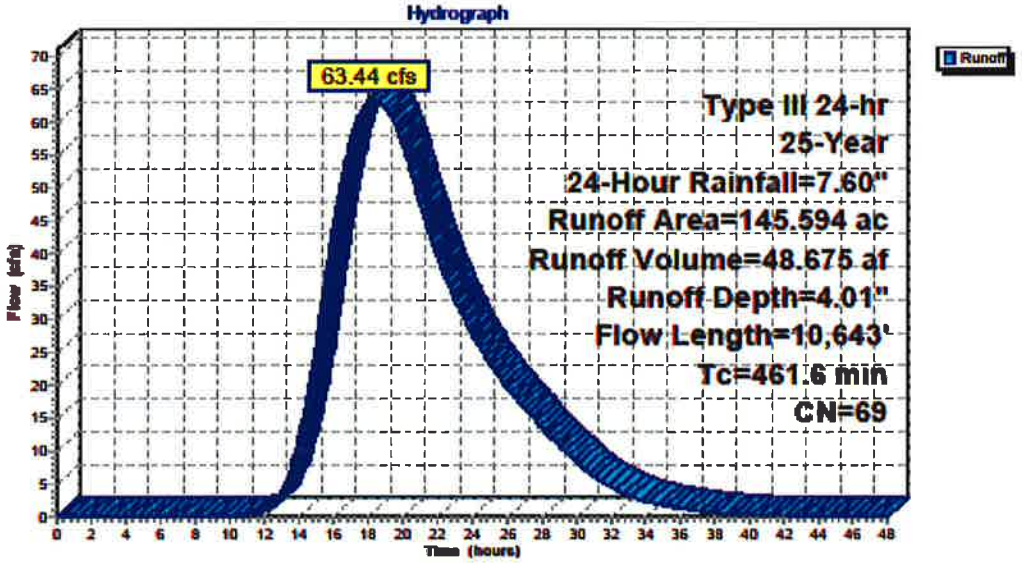
Runoff = 63.44 cfs @ 17.96 hrs, Volume= 48.675 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

Area (ac)	CN	Description
* 145.594	69	
145.594		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.3	300	0.0125	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.75"
435.3	10,343	0.0032	0.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
461.6	10,643	Total			

Subcatchment DA2C: DA2C



Results for Subcatchment DA3A-Post

Summary for Subcatchment DA3A: DA3A-Post

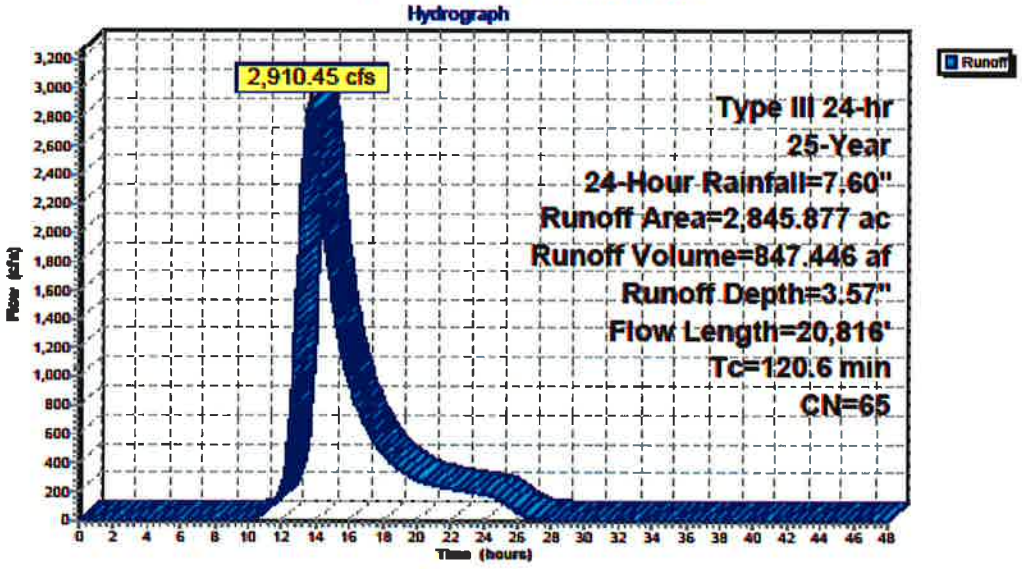
Runoff = 2,910.45 cfs @ 13.66 hrs, Volume= 847.446 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

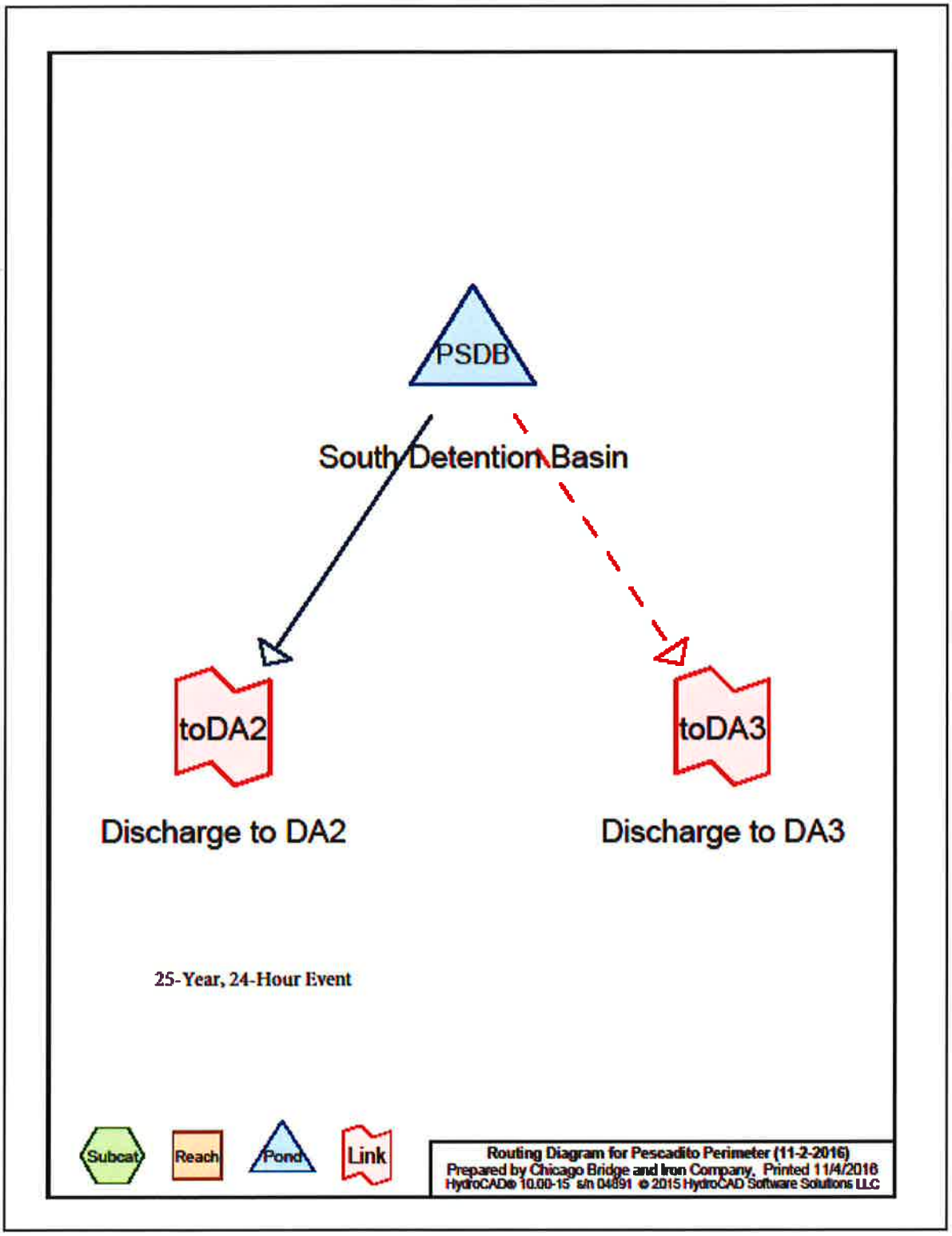
Area (ac)	CN	Description
* 2,845.877	65	
2,845.877		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	300	0.0200	0.42		Sheet Flow, From CLOMR n= 0.070 P2= 3.75"
6.4	1,000	0.0250	2.59		Shallow Concentrated Flow, From CLOMR Kv= 16.4 fps
102.4	19,516	0.0042	3.18	50.82	Channel Flow, From CLOMR Area= 16.0 sf Perim= 12.9' r= 1.24' n= 0.035
120.6	20,816	Total			

Subcatchment DA3A: DA3A



Model Diagram for South Detention Basin



Results for South Detention Basin

Summary for Pond PSDB: South Detention Basin

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth = 6.70" for 25-Year, 24-Hour event
Inflow = 1,612.96 cfs @ 12.80 hrs, Volume= 452.020 af
Outflow = 485.11 cfs @ 14.67 hrs, Volume= 419.327 af, Atten= 70%, Lag= 112.4 min
Primary = 350.64 cfs @ 14.67 hrs, Volume= 386.511 af
Secondary = 134.47 cfs @ 14.67 hrs, Volume= 32.816 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 538.28' @ 14.67 hrs Surf.Area= 1,983,123 sf Storage= 10,096,980 cf

Plug-Flow detention time= 369.4 min calculated for 419.211 af (93% of inflow)
Center-of-Mass det. time= 329.0 min (1,176.9 - 847.9)

Volume	Invert	Avail.Storage	Storage Description
#1	533.00'	13,552,994 cf	Custom Stage Data (Prismatic)Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
533.00	1,843,612	0	0
540.00	2,028,672	13,552,994	13,552,994

Device	Routing	Invert	Outlet Devices
#1	Primary	533.00'	48.0" W x 24.0" H Box Culvert X 5.00 L= 80.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 533.00' / 532.84' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf
#2	Secondary	536.50'	48.0" W x 24.0" H Box Culvert X 6.00 L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 536.50' / 536.40' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf

Primary OutFlow Max=350.65 cfs @ 14.67 hrs HW=538.28' TW=532.99' (Fixed TW Elev= 532.99')
↑1=Culvert (Inlet Controls 350.65 cfs @ 8.77 fps)

Secondary OutFlow Max=134.45 cfs @ 14.67 hrs HW=538.28' TW=537.51' (Fixed TW Elev= 537.51')
↑2=Culvert (Barrel Controls 134.45 cfs @ 4.20 fps)

Primary Ouflow is from the West Culverts
Secondary Ouflow is from the East Culverts

Changed Pages

Part III, Appendix III-C.2

Facility Surface Water Drainage Drawings

Part III
Attachment III-C
Appendix III-C.2

FACILITY SURFACE WATER DRAINAGE DRAWINGS

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Supplement April 2015
Revised September 2015
Revised August 2016
Technically Complete March 11, 2016
Modified November 2016

Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:
CB&I Environmental and Infrastructure, Inc.
12005 Ford Rd, Suite 600
Dallas, TX 75234

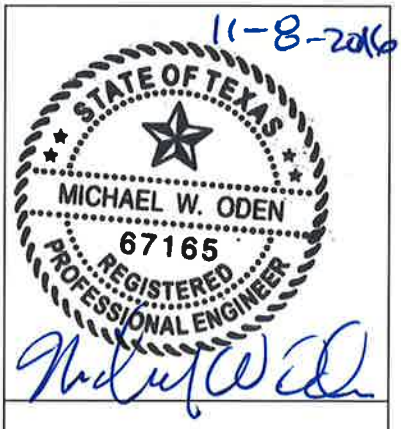


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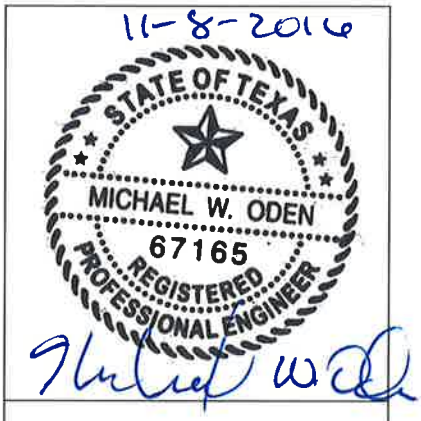
Table of Contents



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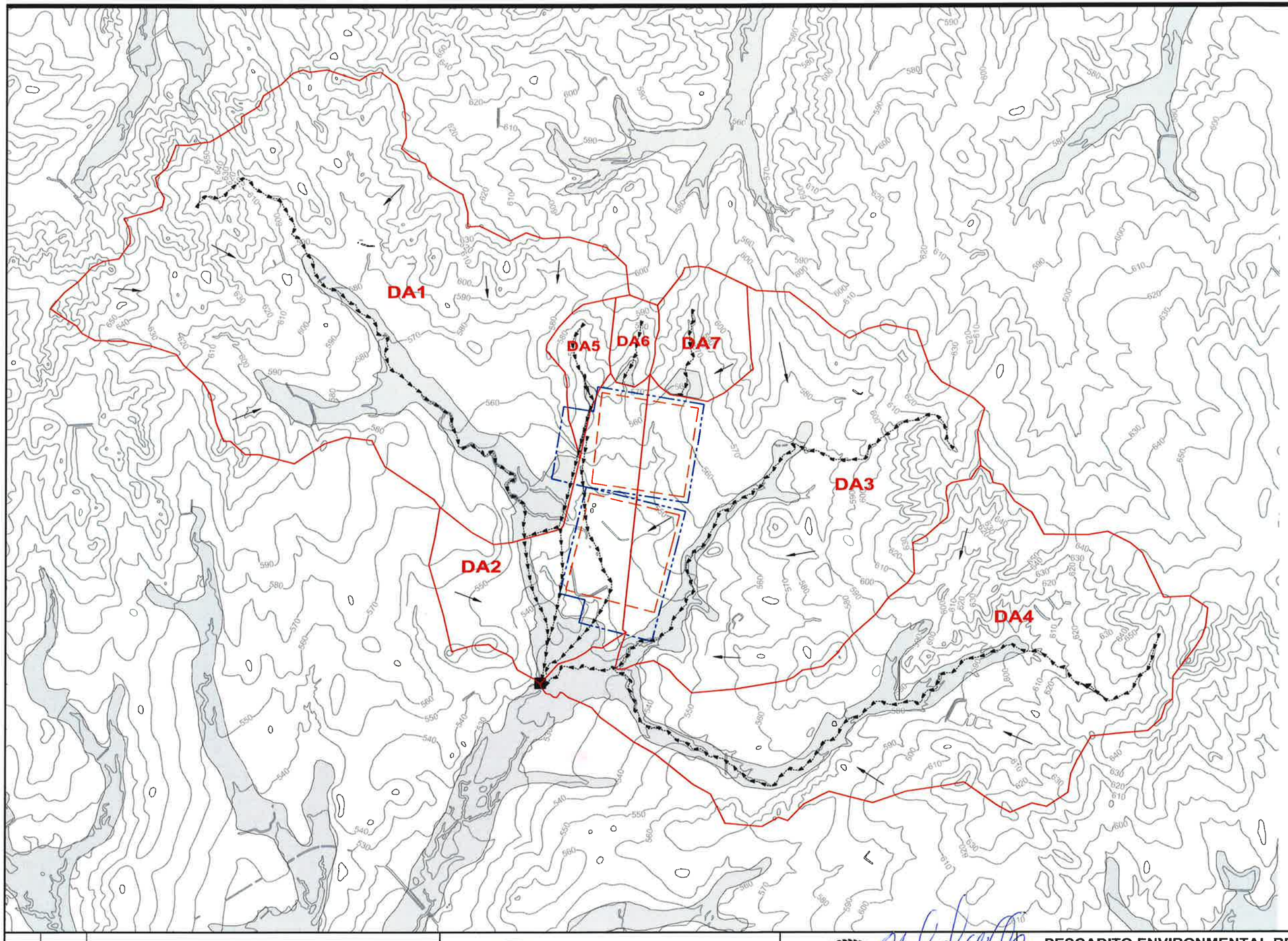

N

2000' 0 2000'
GRAPHIC SCALE

LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- INTERMEDIATE CONDITION SUBCATCHMENT BOUNDARIES
- STORMWATER FLOW PATH
- STORMWATER FLOW DIRECTION
- JUNCTION 1 (SEE NOTE 5)
- CLOMR 100-YEAR FLOODPLAIN

NOTES

1. CONTOURS ADAPTED FROM TEXAS NATURAL RESOURCE INFORMATION SYSTEM "TEXAS ELEVATION FRAMEWORK (HYPSOGRAPHY)" QUADRANGLES.
2. BOUNDARY AND IMPROVEMENT SURVEY DEVELOPED BY MEJIA ENGINEERING COMPANY ON AUGUST 15, 2011 AND JUNE 9, 2014.
3. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
4. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
5. JUNCTION 1 REPRESENTS THE MOST DOWNSTREAM ELEMENT WITHIN THE STORMWATER MODELS AND IS THE MAIN POINT OF COMPARISON BETWEEN MODELS.
6. "DRAINAGE AREAS" (DA) ARE TAKEN FROM THE CONDITIONAL LETTER OF MAP REVISION, PREPARED BY CB&I ENVIRONMENTAL AND INFRASTRUCTURE, INC. APPROVED NOVEMBER 21, 2014.

REV. NO.	DATE	DESCRIPTION
2	11/2016	ADJUSTED FLOW PATHS
1	9/2015	NOD 1

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED
PROFESSIONAL ENGINEER

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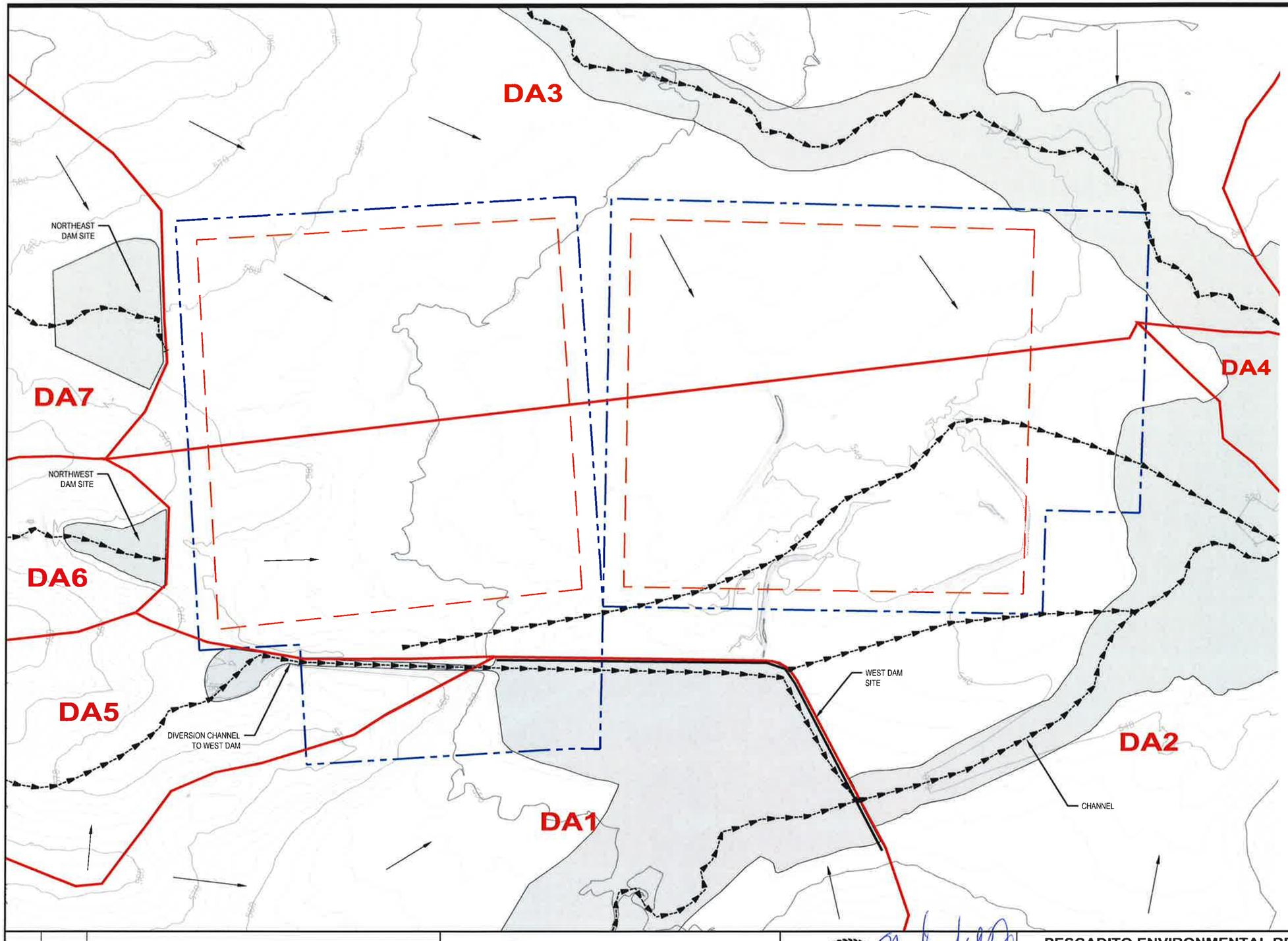
11-8-2016

PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
INTERMEDIATE DEVELOPMENT CONDITIONS - REGIONAL OVERVIEW

PROJ. NO.:	148866
DESIGNED BY:	-
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015
DRAWING NO.
III
C.2-3
3 OF 19 SHEETS



N

500' 0 500'
GRAPHIC SCALE

LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- INTERMEDIATE CONDITIONS SUBCATCHMENT BOUNDARIES
- STORMWATER FLOW PATH
- STORMWATER FLOW DIRECTION
- CLOMR 100-YEAR FLOODPLAIN

NOTES

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY DALLAS AERIAL SURVEYS ON FEBRUARY 15, 2010 (MODIFIED TO INCLUDE CLOMR IMPROVEMENTS.
2. BOUNDARY AND IMPROVEMENT SURVEY DEVELOPED BY MEJIA ENGINEERING COMPANY ON AUGUST 15, 2011 AND JUNE 9, 2014.
3. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
4. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
5. "DRAINAGE AREAS" (DA) ARE TAKEN FROM THE CONDITIONAL LETTER OF MAP REVISION, PREPARED BY CB&I ENVIRONMENTAL AND INFRASTRUCTURE, INC. APPROVED NOVEMBER 21, 2014.

REV. NO.	DATE	DESCRIPTION
2	11/2016	ADJUSTED FLOW PATHS
1	9/2015	NOD 1

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WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
INTERMEDIATE DEVELOPMENT CONDITIONS
FACILITY AND IMMEDIATE SURROUNDINGS

PROJ. NO.:	148866
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APPROVED BY:	MWO

DATE: APRIL 2015

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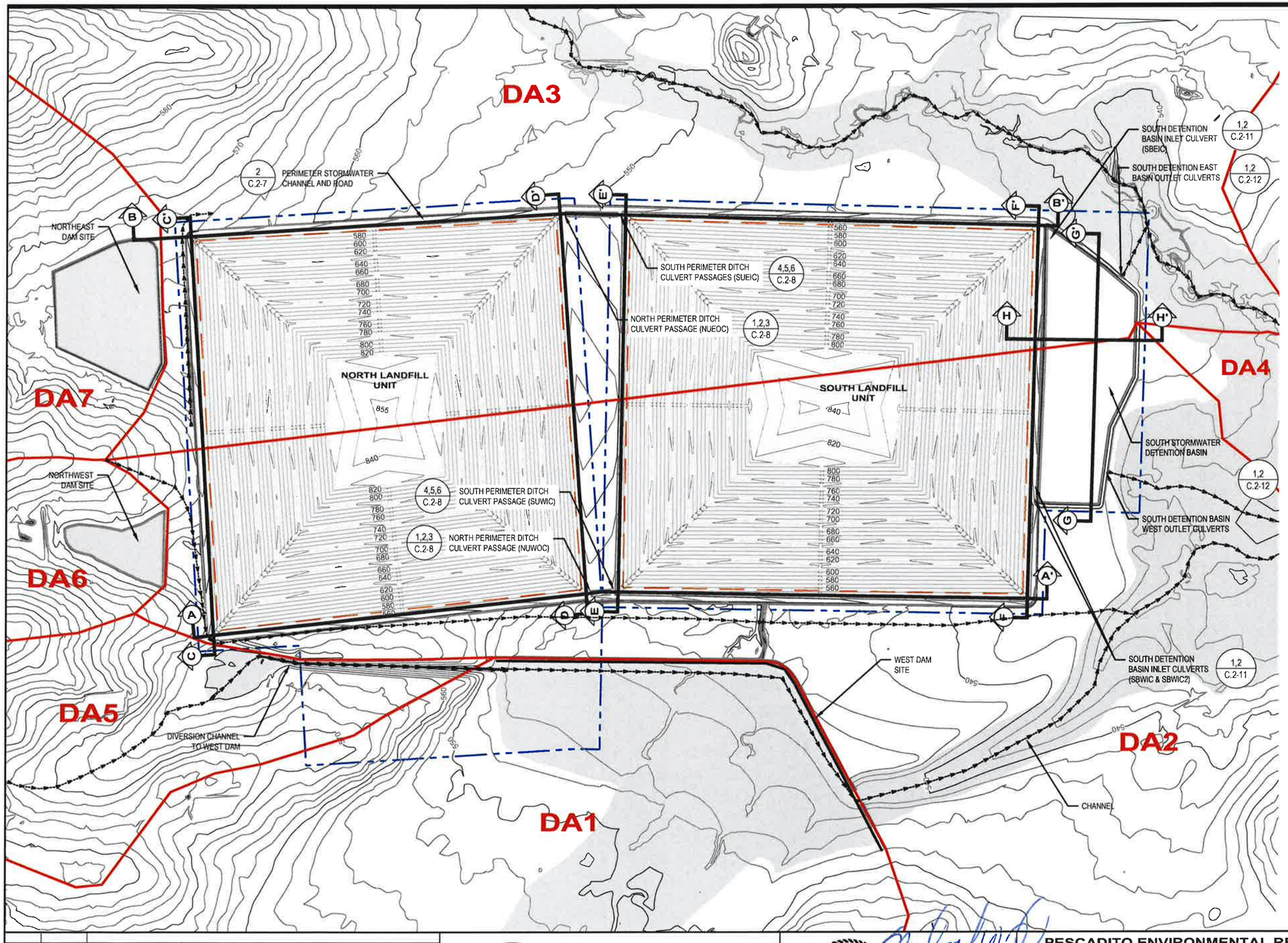
III
C.2-4
4 OF 19 SHEETS



LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- CLOMR 100-YEAR FLOODPLAIN
- PERIMETER CHANNEL AND DETENTION BASIN PROFILE LOCATIONS
- STORMWATER FLOW

NOTES

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY DALLAS AERIAL SURVEYS ON FEBRUARY 15, 2010 (MODIFIED TO INCLUDE CLOMR IMPROVMENTS).
2. BOUNDARY AND IMPROVEMENT SURVEY DEVELOPED BY MEJIA ENGINEERING COMPANY ON AUGUST 15, 2011 AND JUNE 9, 2014.
3. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
4. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
5. PROFILES A-H ARE LOCATED ON DRAWINGS 9-11 OF APPENDIX III-C.2.
6. DRAINAGE AREAS FOR POST-DEVELOPMENT CONDITIONS ARE UNCHANGED FROM INTERMEDIATE CONDITIONS SHOWN IN DRAWINGS 3 & 4 OF APPENDIX III-C.2.

REV. NO.	DATE	DESCRIPTION
1	11/2016	REVISED SOUTH DETENTION BASIN OUTLETS & SITE FLOW PATHS

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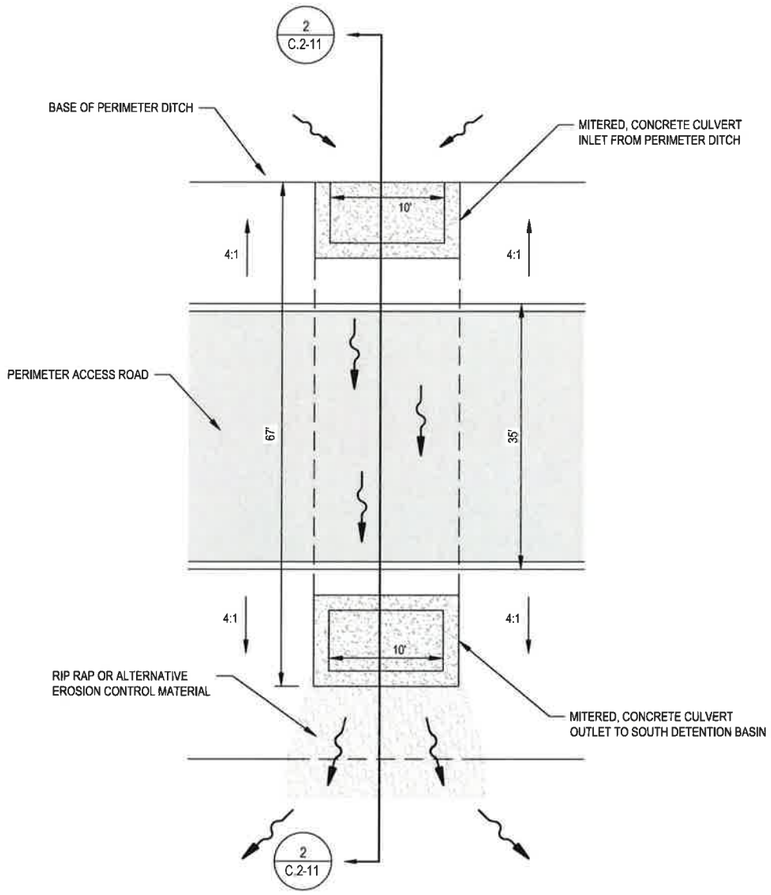
WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
POST-DEVELOPMENT CONDITIONS
FACILITY AND IMMEDIATE SURROUNDINGS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

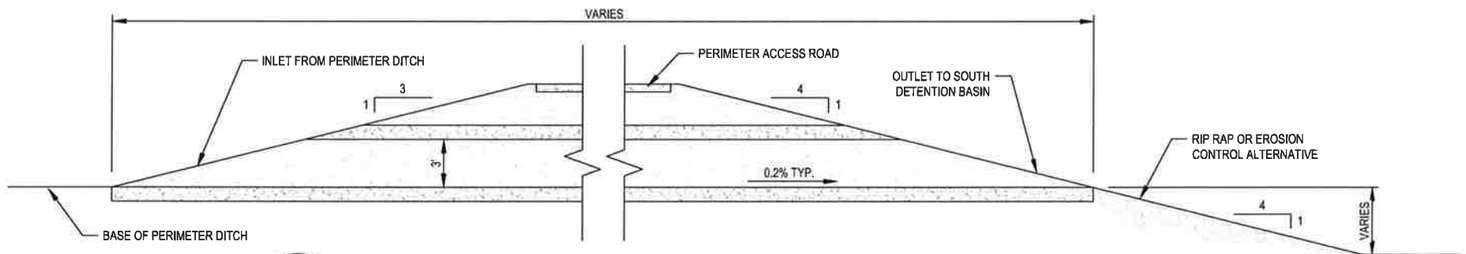
DATE: APRIL 2015

DRAWING NO.
III
C.2-5
5 OF 19 SHEETS



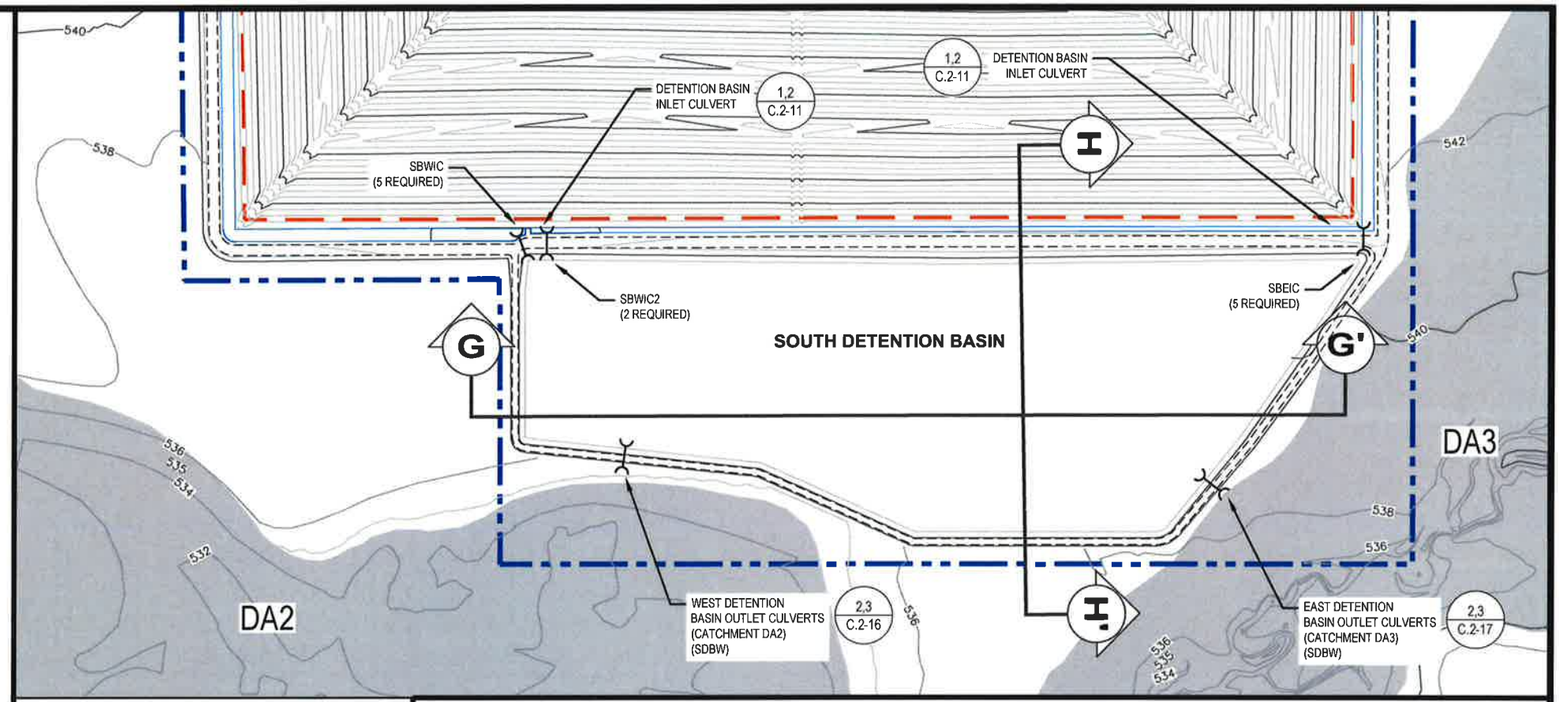
1 C.2-11 **TYPICAL DETENTION BASIN CULVERT PASSAGE - PLAN VIEW**

(SBWIC, SBWIC2, SBEIC)
NOT TO SCALE



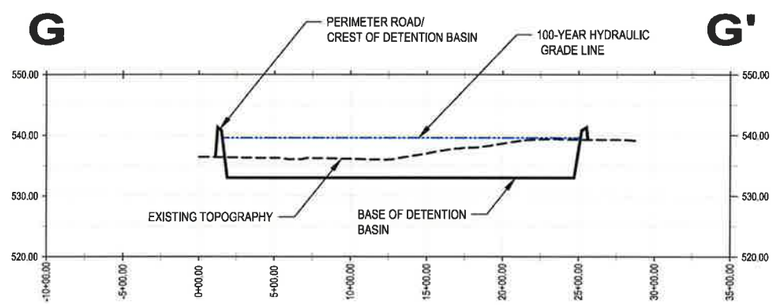
2 C.2-11 **DETENTION BASIN INLET CULVERT PASSAGE - SECTION VIEW**

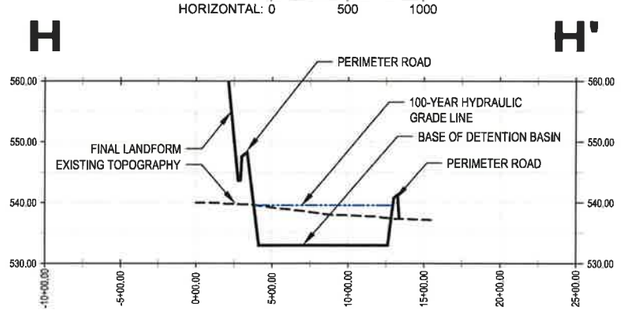
NOT TO SCALE



LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- PERIMETER ROAD
- PERIMETER STORMWATER DITCH
- MITERED CONCRETE CULVERT
- CLOMR100-YEAR FLOODPLAIN





REV. NO.	DATE	DESCRIPTION
4	11/2016	REVISED SOUTH DETENTION BASIN OUTLETS

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WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
DETENTION BASIN PLAN, PROFILE, AND DETAILS

PROJ. NO.:	148886
DESIGNED BY:	-
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015
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III
C.2-11
11 OF 19 SHEETS

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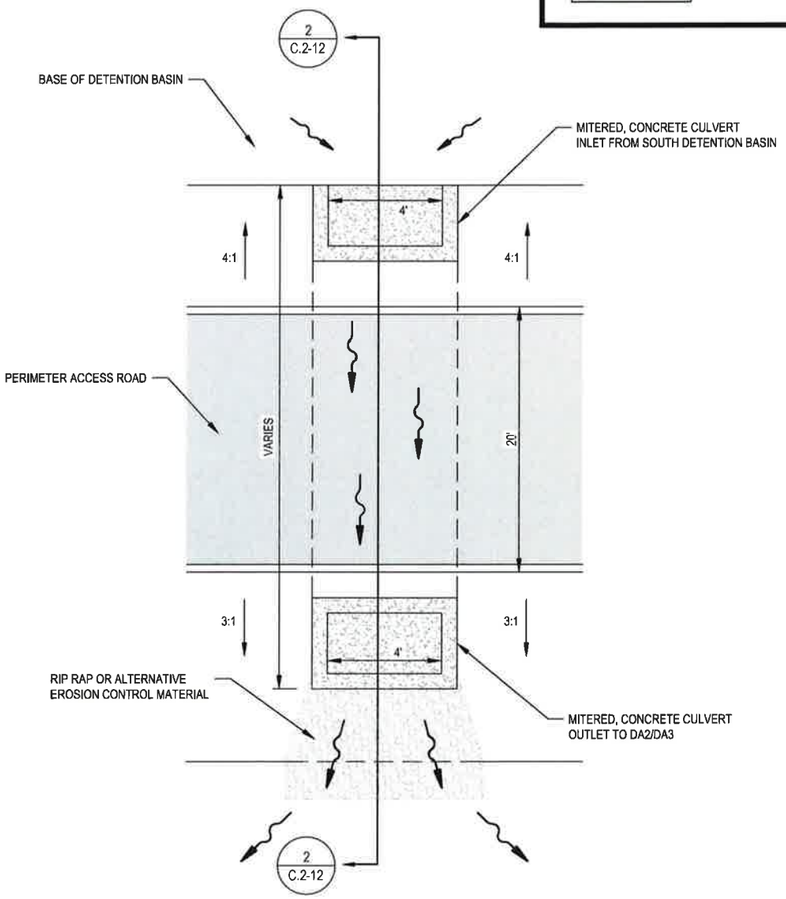
LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- PERIMETER ROAD
- PERIMETER STORMWATER DITCH
- MITERED CONCRETE CULVERT
- CLOMR100-YEAR FLOODPLAIN



1 / C.2-12 TYPICAL DETENTION BASIN OUTLET CULVERT PASSAGE - PLAN VIEW

(SDBE & SDBW)
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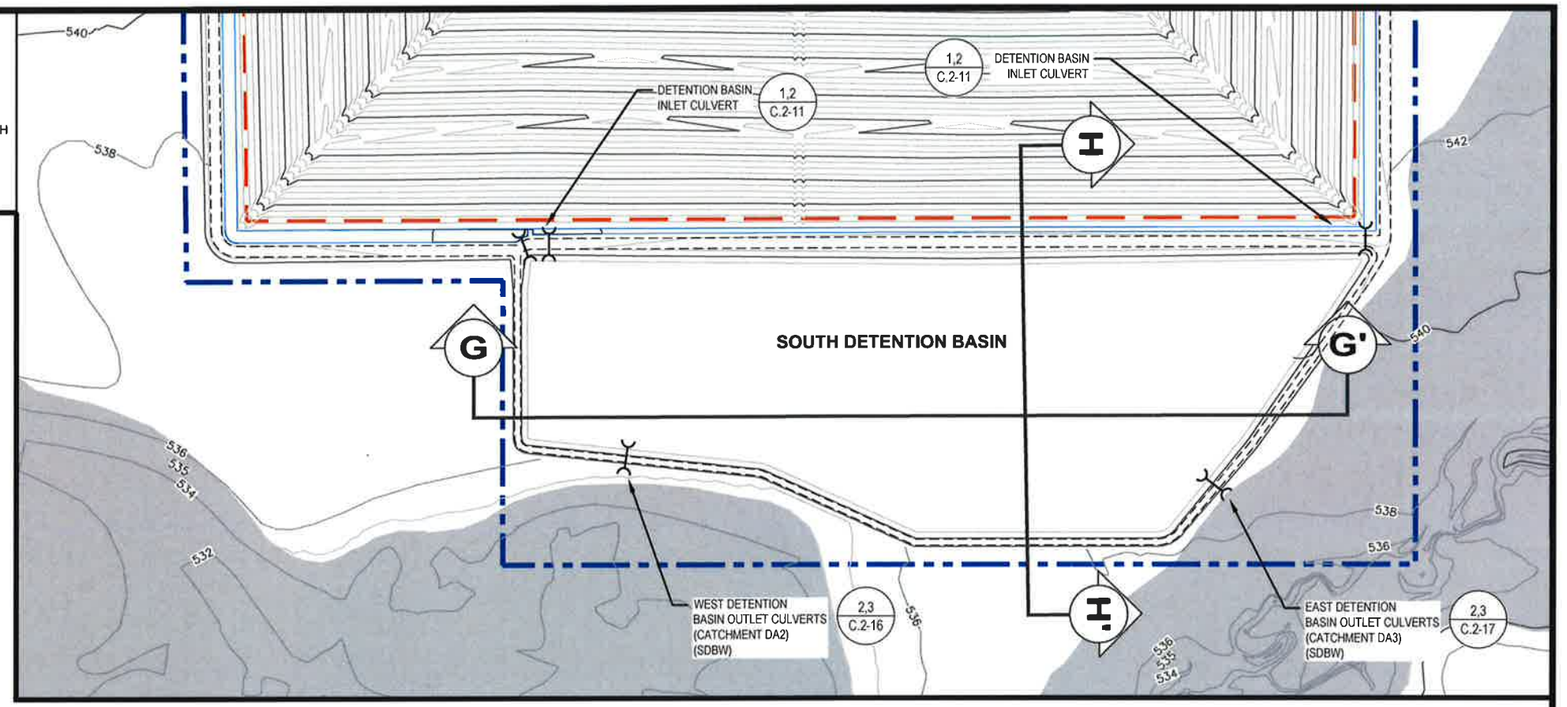

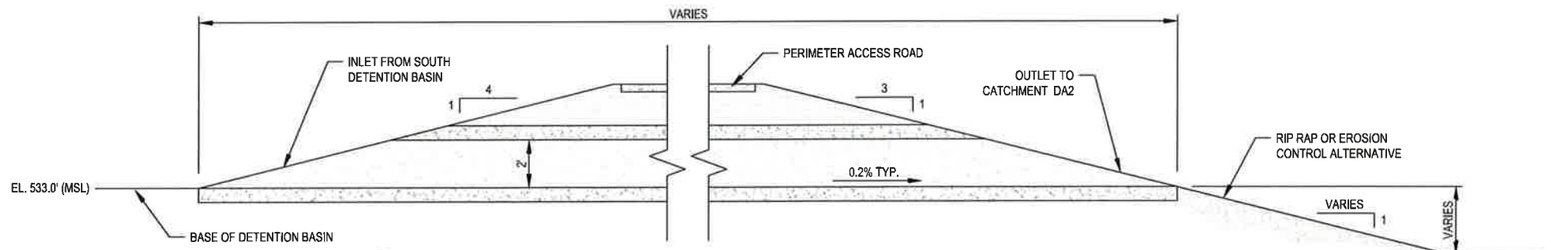

2 / C.2-12 DETENTION BASIN WEST OUTLET CULVERT PASSAGE - SECTION VIEW

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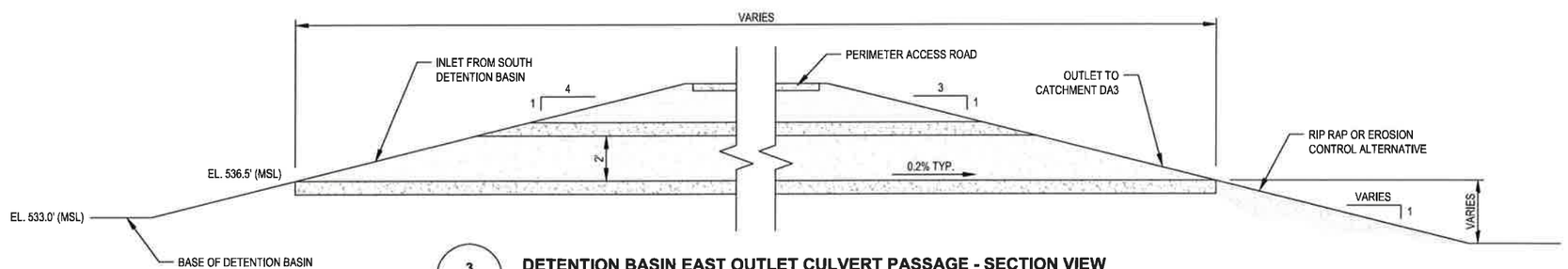

3 / C.2-12 DETENTION BASIN EAST OUTLET CULVERT PASSAGE - SECTION VIEW

NOT TO SCALE

REV. NO.	DATE	DESCRIPTION
4	11/2016	REVISED CULVERT DETAILS

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WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
DETENTION BASIN PLAN, PROFILE, AND DETAILS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015
DRAWING NO.
III
C.2-12
12 OF 19 SHEETS

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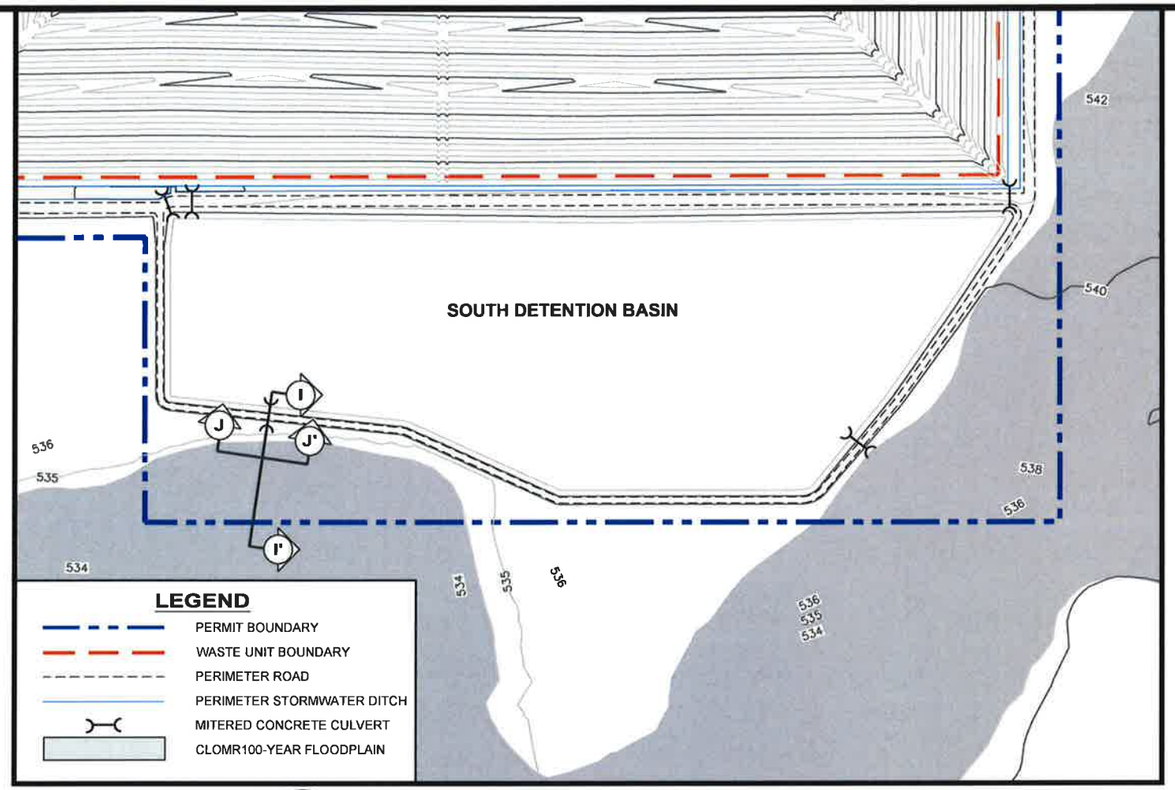
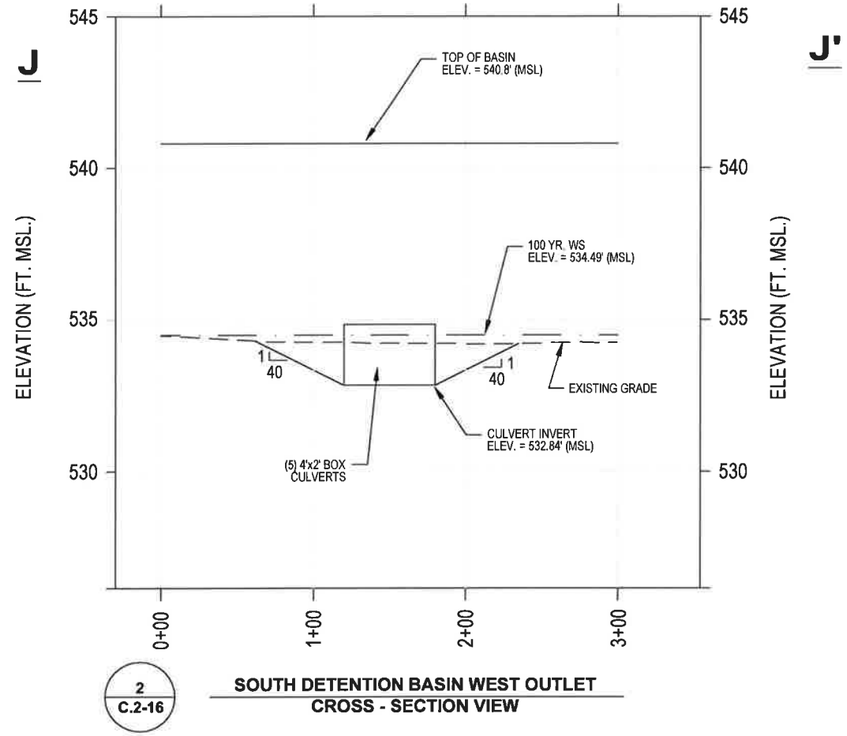
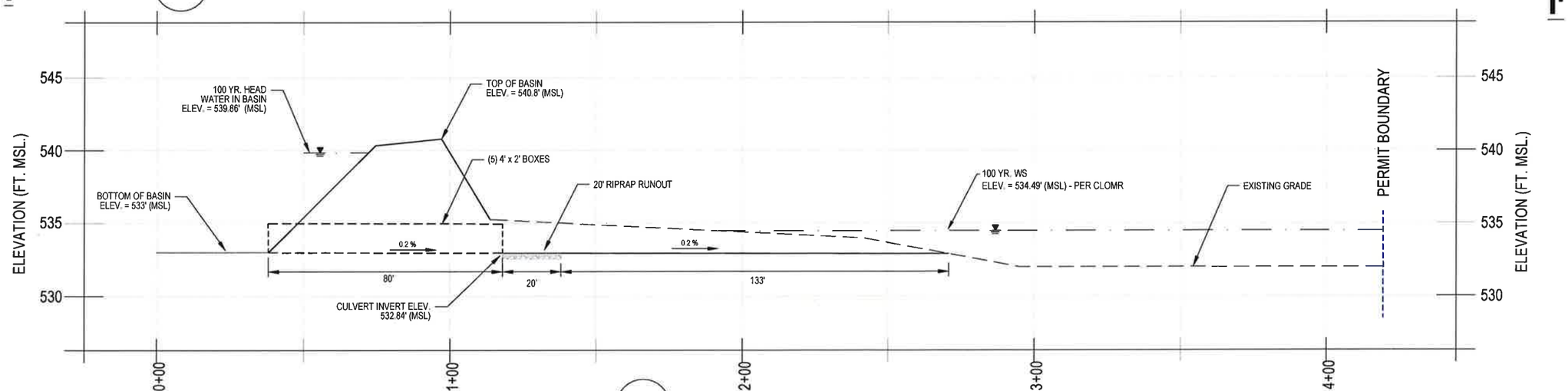


1 C.2-16 **SOUTH DETENTION BASIN WEST OUTLET - PLAN VIEW**

SCALE: 1" = 500'



2 C.2-16 **SOUTH DETENTION BASIN WEST OUTLET CROSS - SECTION VIEW**



3 C.2-16 **SOUTH DETENTION BASIN WEST OUTLET PROFILE VIEW**

REV. NO.	DATE	DESCRIPTION

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED
PROFESSIONAL ENGINEER

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11-8-2016

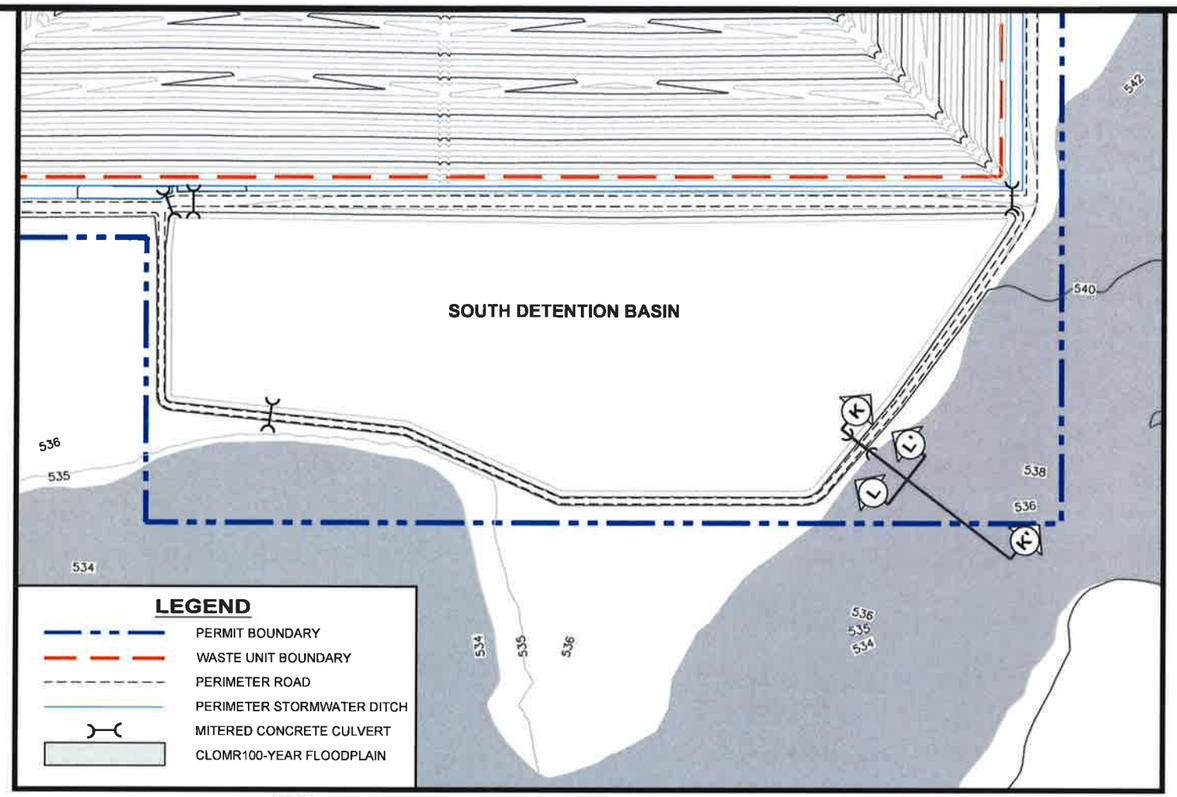
PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
SOUTH DETENTION BASIN WEST OUTLET PLAN, PROFILE, AND DETAILS

PROJ. NO.:	148866
DESIGNED BY:	-
DRAWN BY:	NV
CHECKED BY:	RDS
APPROVED BY:	MWO

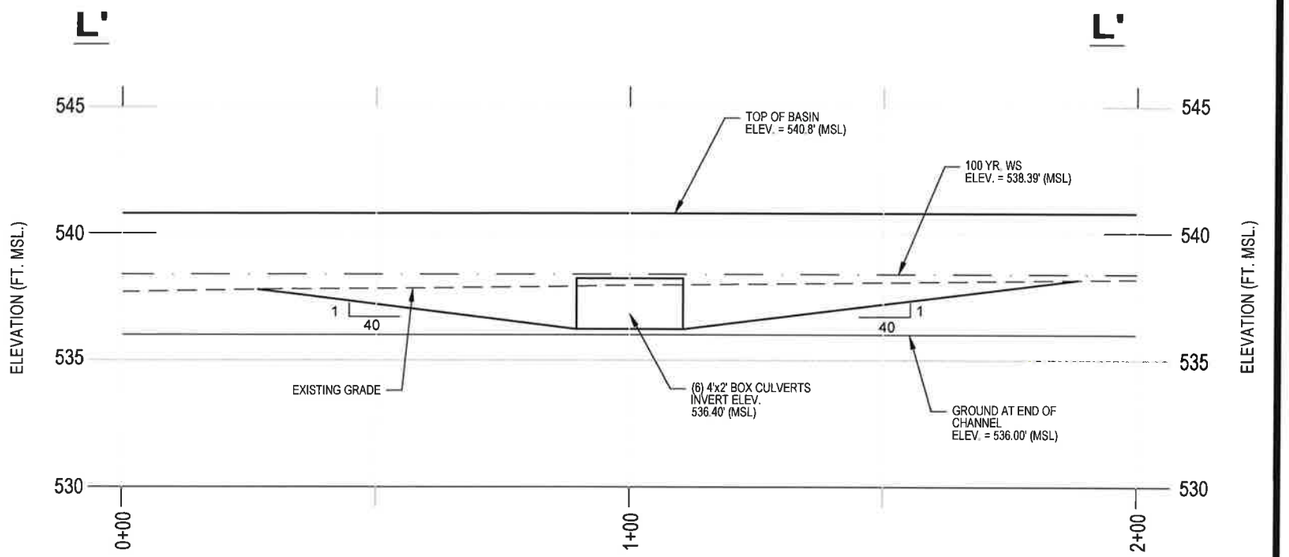
DATE: NOVEMBER 2016

DRAWING NO.
III
C.2-16
16 OF 19 SHEETS

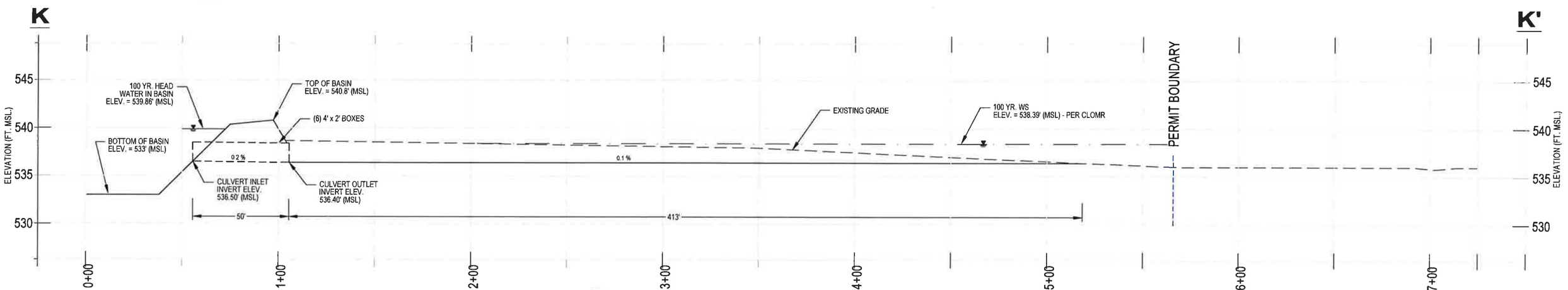


1 / C.2-17 **SOUTH DETENTION BASIN EAST OUTLET - PLAN VIEW**

SCALE: 1" = 500'



2 / C.2-17 **SOUTH DETENTION BASIN EAST OUTLET CROSS - SECTION VIEW**



3 / C.2-17 **SOUTH DETENTION BASIN EAST OUTLET PROFILE VIEW**

REV. NO.	DATE	DESCRIPTION

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SOUTH DETENTION BASIN EAST OUTLET PLAN, PROFILE, AND DETAILS

PROJ. NO.:	148866
DESIGNED BY:	–
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APPROVED BY:	MWO

DATE: NOVEMBER 2016

DRAWING NO.

III
C.2-17

17 OF 19 SHEETS

TO NUECES RIVER

TO NUECES RIVER

TO NUECES RIVER

DA1

DA2

DA3

DA4

DA5

DA6

DA7

A

B

C

JEV FAMILY LTD.

TO RIO GRANDE RIVER

TO RIO GRANDE RIVER

25-YEAR, 24-HOUR FLOWS

Q_A = 3,302.6 CFS
Q_B = 380.0 CFS
Q_C = 87.6 CFS

N

2000' 0 2000'
GRAPHIC SCALE

LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- PERMITTED CONDITION SUBCATCHMENT BOUNDARIES
- SUBCATCHMENT DIVIDE
- RANCHO VIEJO CATTLE COMPANY LTD. BOUNDARY
- TIME OF CONCENTRATION FLOW PATH
- STORMWATER FLOW DIRECTION
- JUNCTION 1 (SEE NOTE 5)
- CLOMR 100-YEAR FLOODPLAIN
- DA3A SUBCATCHMENT
- DA2B SUBCATCHMENT
- DA2C SUBCATCHMENT

NOTES

1. CONTOURS ADAPTED FROM TEXAS NATURAL RESOURCE INFORMATION SYSTEM "TEXAS ELEVATION FRAMEWORK (HYPSOGRAPHY)" QUADRANGLES.
2. BOUNDARY AND IMPROVEMENT SURVEY DEVELOPED BY MEJIA ENGINEERING COMPANY ON AUGUST 15, 2011 AND JUNE 9, 2014.
3. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
4. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
5. JUNCTION 1 REPRESENTS THE MOST DOWNSTREAM ELEMENT WITHIN THE STORMWATER MODELS AND IS THE MAIN POINT OF COMPARISON BETWEEN MODELS.
6. "DRAINAGE AREAS" (DA) ARE TAKEN FROM THE CONDITIONAL LETTER OF MAP REVISION, PREPARED BY CB&I ENVIRONMENTAL AND INFRASTRUCTURE, INC. APPROVED NOVEMBER 21, 2014.

REV. NO.	DATE	DESCRIPTION

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

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11-8-2016

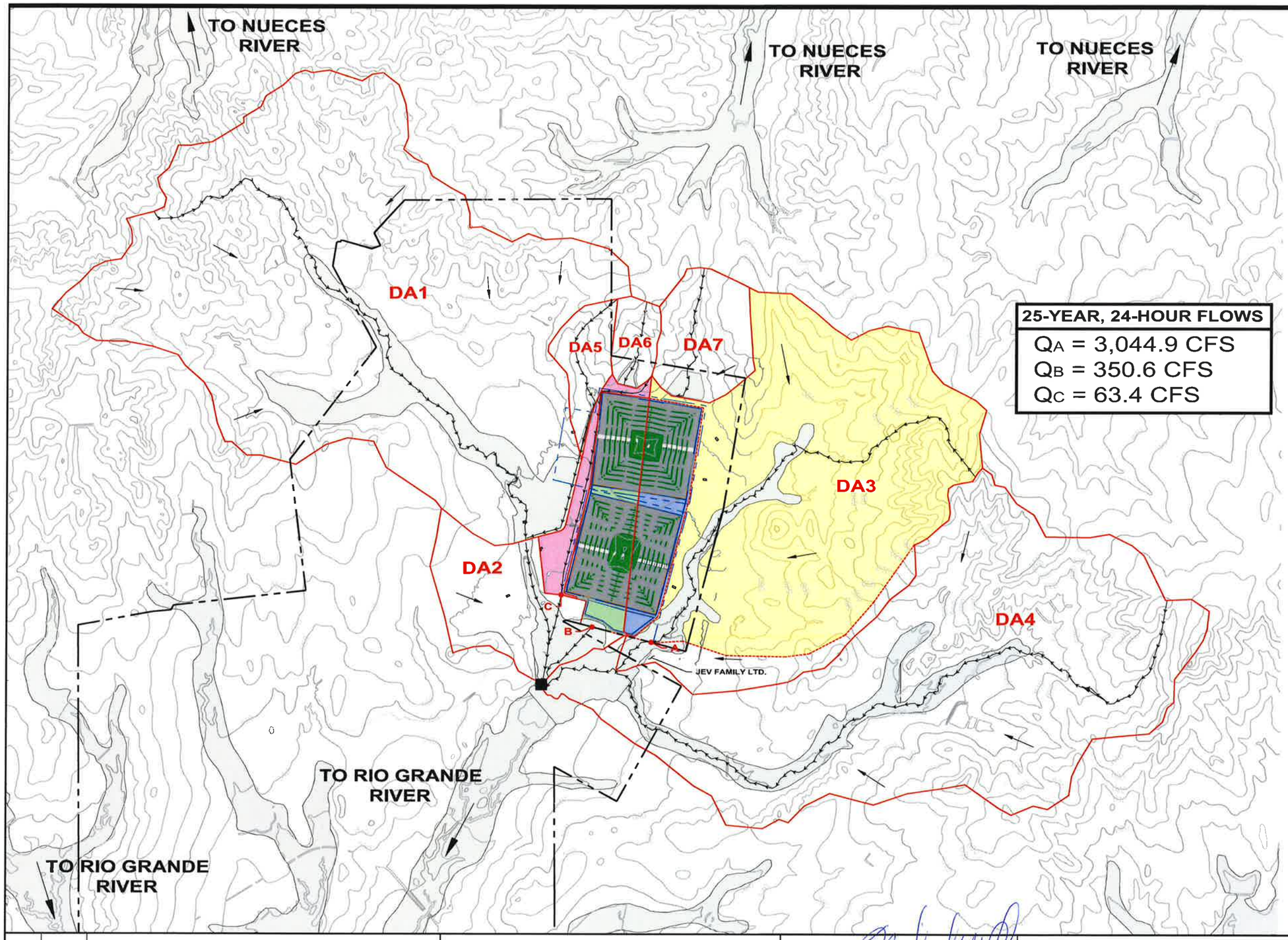
PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
PERMITTED CONDITIONS
SURFACE WATER DRAINAGE ANALYSIS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	SJL
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: NOVEMBER 2016

DRAWING NO.
III
C.2-18



25-YEAR, 24-HOUR FLOWS

Q_A = 3,044.9 CFS
Q_B = 350.6 CFS
Q_C = 63.4 CFS

N

2000' 0 2000'
GRAPHIC SCALE

LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- PROPOSED CONDITION SUBCATCHMENT BOUNDARIES
- SUBCATCHMENT DIVIDE
- RANCHO VIEJO CATTLE COMPANY LTD. BOUNDARY
- TIME OF CONCENTRATION FLOW PATH
- STORMWATER FLOW DIRECTION
- JUNCTION 1 (SEE NOTE 5)
- CLOMR 100-YEAR FLOODPLAIN
- DA3A-POST SUBCATCHMENT
- SDBE SUBCATCHMENT
- SDBW SUBCATCHMENT
- DA2C-POST SUBCATCHMENT

NOTES

1. CONTOURS ADAPTED FROM TEXAS NATURAL RESOURCE INFORMATION SYSTEM "TEXAS ELEVATION FRAMEWORK (HYPSOGRAPHY)" QUADRANGLES.
2. BOUNDARY AND IMPROVEMENT SURVEY DEVELOPED BY MEJIA ENGINEERING COMPANY ON AUGUST 15, 2011 AND JUNE 9, 2014.
3. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
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6. "DRAINAGE AREAS" (DA) ARE TAKEN FROM THE CONDITIONAL LETTER OF MAP REVISION, PREPARED BY CB&I ENVIRONMENTAL AND INFRASTRUCTURE, INC. APPROVED NOVEMBER 21, 2014.

REV. NO.	DATE	DESCRIPTION
1	9/2015	NOD 1

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

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WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
PROPOSED CONDITIONS
SURFACE WATER DRAINAGE ANALYSIS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	SJL
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: NOVEMBER 2016

DRAWING NO.
III
C.2-19
19 OF 19 SHEETS

Changed Pages

Part III, Appendix III-C.3

Facility Surface Water Drainage Analysis

Part III
Attachment III-C
Appendix III-C.3

FACILITY SURFACE WATER DRAINAGE ANALYSIS

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Supplement April 2015
Technically Complete March 11, 2016
Modified November 2016

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Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:
CB&I Environmental and Infrastructure, Inc.

CBI

12005 Ford Rd, Suite 600
Dallas, TX 75234

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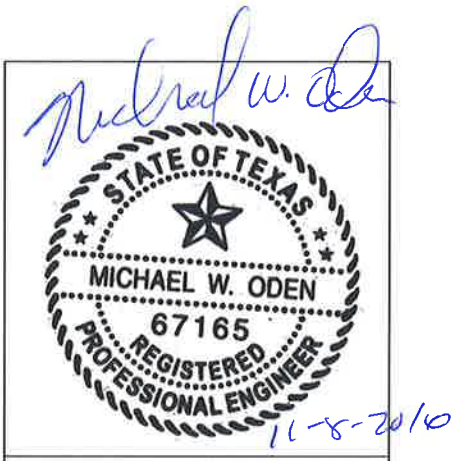
Attachments



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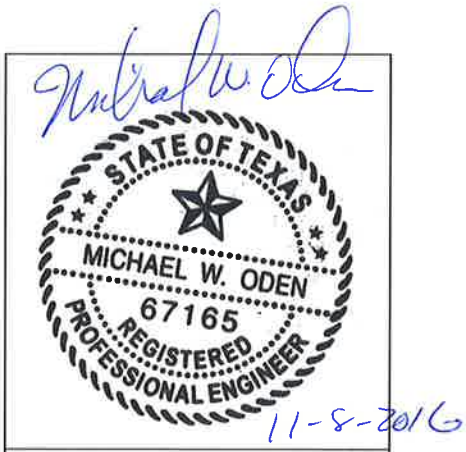
ATTACHMENT III-C

APPENDIX III-C.3

FACILITY SURFACE WATER DRAINAGE ANALYSIS

10. DETENTION BASIN SIZING (III-C.3-10)

Submitted March 2015
Supplement April 2015
Technically Complete March 11, 2016
Modified November 2016



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CBI

Client:	**Rancho Viejo Waste Management, LLC**		
Project:	**Pescadito Environmental Resource Center**		
Project #:	**148866**		
Calculated By:	**MTE**	**Date:**	**4/13/15**
Checked By:	**RDS**	**Date:**	**4/15/15**

TITLE: DETENTION BASIN SIZING

Problem Statement

Determine whether the detention basin that detains stormwater for the proposed PERC is adequately sized. The basin shall be considered to be adequately sized if the following conditions are met, based on best management practices:

1. The release rate from the detention basin for the 100-year, 24-hour storm results in an overall site discharge that is substantially similar to the overall discharge calculated in the CLOMR.

2. One foot of freeboard exists between the 100-year, 24-hour storm event peak elevation and the crest elevation of the detention basin.

Given

- ❑ Mannings Coefficient HydroCAD default value of 0.012 for concrete culverts

- ❑ The south detention basin will have two discharge points, located approximately at the southwest and southeast corners of the basin. The discharge point at the southeast end of the detention basin will consist of 6 - 24" x 48" box culverts at invert elevation 536.5 ft NGVD. The discharge point at the southwest end of the detention basin will consist of 5 - 24" x 48" box culverts at invert elevation 533 ft NGVD. The culvert discharge areas will be reinforced with rip-rap or an erosion control alternative to prevent erosion and scour. The basin outlet design may be changed at the owner/operator's discretion, as long as the new design is equivalent.

- ❑ The size, outlet structures, and model results for the proposed stormwater detention basin is provided in Table C.3-10. Design values were calculated using AutoCAD Civil 3D 2014.

- ❑ Drawings 5 and 6 of Appendix III-C.2 show the location of the south detention basin.

Calculations

HydroCAD was used to model the peak storage volume of the detention basin. The storage volume considers both the inflow (which generally includes stormwater collection from the landfill and surrounding area), elevation-storage relationships of the detention basin, and outflow from the basin discharge structures.

Client:	**Rancho Viejo Waste Management, LLC**		
Project:	**Pescadito Environmental Resource Center**		
Project #:	**148866**		
Calculated By:	**MTE**	**Date:**	**4/13/15**
Checked By:	**RDS**	**Date:**	**4/15/15**

TITLE: DETENTION BASIN SIZING

AutoCAD Civil 3D 2014 was used to determine the design dimensions and volumes for the detention basin. Please refer to Appendix III-C.4 for the HydroCAD output files.

Results

Based on the HydroCAD model for the Pescadito Environmental Resource Center, the proposed detention basin is adequately sized. Table C.3-10 summarizes the results of the HydroCAD calculations. The discharge rate comparison (Criteria #1 above) is discussed in Appendix III-C.1.

TABLE C.3-10 Detention Basin Design Summary Pescadito Environmental Resource Center			
Detention Basin General Design	Capture Area	acres	809.84
	Basin Sideslopes	H:V	4:1
	Normal Water Level	ft MSL	533
	Crest Elevation	ft MSL	540.8
Outlet Structures (Southwest)	Culvert Height	in	24
	Culvert Width	in	48
	Number of Outlet Culverts	Quantity	~~5~~
	Outlet Structure Elevation	ft MSL	533
	Maximum Discharge Rate 25-year, 24-hour Storm	cfs	350.65
	Maximum Discharge Rate 100-year, 24-hour Storm	cfs	391.24
Outlet Structures (Southeast)	Culvert Height	in	24
	Culvert Width	in	48
	Number of Outlet Culverts	Quantity	6
	Outlet Structure Elevation	ft MSL	536.5
	Maximum Discharge Rate 25-year, 24-hour Storm	cfs	134.45
	Maximum Discharge Rate 100-year, 24-hour Storm	cfs	246.67
Modeling Results	Maximum Discharge Rate 25-year, 24-hour Storm	cfs	485.1
	Maximum Discharge Rate 100-year, 24-hour Storm	cfs	637.91
	Peak Water Elevation 25-year, 24-hour Storm	ft MSL	538.28
	Peak Water Elevation 100-year, 24-hour Storm	ft MSL	539.86

Changed Pages

Part III, Appendix III-C.4

HydroCAD Model Output Files

Part III
Attachment III-C
Appendix III-C.4

HYDROCAD MODEL OUTPUTS

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
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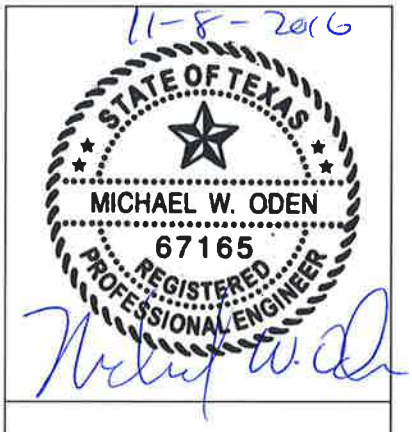

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ATTACHMENT III-C

APPENDIX III-C.4

HYDROCAD MODEL OUTPUT FILES

3. PROPOSED CONDITIONS (POST-DEVELOPMENT)

A. MODEL DIAGRAMS

B. LANDFILL WATERSHED A (TYPICAL OF WATERSHEDS C, E, G, J, K, M, & O)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

C. LANDFILL WATERSHED B (TYPICAL OF WATERSHEDS D, F, J, L, N, & P)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

D. LANDFILL PERIMETER DITCH, CULVERT, & BASIN SYSTEM

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

E. REGIONAL STORMWATER CONDITIONS

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

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Inlet Invert= 0.00', Outlet Invert= -0.21'

Summary for Reach SUWIC: South Unit West Inlet Culvert

Inflow Area = 174.503 ac, 0.00% Impervious, Inflow Depth = 8.54" for 100-Year, 24-Hour event
Inflow = 685.13 cfs @ 12.43 hrs, Volume= 124.166 af
Outflow = 685.01 cfs @ 12.43 hrs, Volume= 124.166 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.90 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 0.4 min

Peak Storage= 4,843 cf @ 12.43 hrs
Average Depth at Peak Storage= 2.31'
Bank-Full Depth= 4.00' Flow Area= 120.0 sf, Capacity= 1,103.63 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
180.0" W x 48.0" H Box Pipe
n= 0.012
Length= 70.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.21'

Summary for Reach WMC: West Middle Channel

Inflow Area = 174.503 ac, 0.00% Impervious, Inflow Depth = 8.54" for 100-Year, 24-Hour event
Inflow = 685.61 cfs @ 12.41 hrs, Volume= 124.166 af
Outflow = 685.13 cfs @ 12.43 hrs, Volume= 124.166 af, Atten= 0%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.93 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 2.3 min

Peak Storage= 25,723 cf @ 12.42 hrs
Average Depth at Peak Storage= 3.05'
Bank-Full Depth= 4.00' Flow Area= 196.0 sf, Capacity= 1,124.79 cfs

35.00' x 4.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 4.0 '/' Top Width= 63.00'
Length= 185.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.56'

Summary for Pond PSDB: South Detention Basin

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth = 8.58" for 100-Year, 24-Hour event
Inflow = 2,275.01 cfs @ 12.71 hrs, Volume= 579.178 af
Outflow = 637.91 cfs @ 14.52 hrs, Volume= 515.320 af, Atten= 72%, Lag= 109.1 min
Primary = 391.24 cfs @ 14.52 hrs, Volume= 433.829 af
Secondary = 246.67 cfs @ 14.52 hrs, Volume= 81.490 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 539.86' @ 14.52 hrs Surf.Area= 2,024,870 sf Storage= 13,261,519 cf

Plug-Flow detention time= 372.5 min calculated for 515.320 af (89% of inflow)
Center-of-Mass det. time= 316.4 min (1,153.0 - 836.6)

Volume	Invert	Avail.Storage	Storage Description
#1	533.00'	13,552,994 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
533.00	1,843,612	0	0
540.00	2,028,672	13,552,994	13,552,994

Device	Routing	Invert	Outlet Devices
#1	Primary	533.00'	**48.0" W x 24.0" H Box Culvert X 5.00** L= 80.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 533.00' / 532.84' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf
#2	Secondary	536.50'	**48.0" W x 24.0" H Box Culvert X 6.00** L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 536.50' / 536.40' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf

Primary OutFlow Max=391.24 cfs @ 14.52 hrs HW=539.86' TW=534.49' (Fixed TW Elev= 534.49')
↑—**1=Culvert** (Inlet Controls 391.24 cfs @ 9.78 fps)

Secondary OutFlow Max=246.67 cfs @ 14.52 hrs HW=539.86' TW=538.39' (Fixed TW Elev= 538.39')
↑—**2=Culvert** (Inlet Controls 246.67 cfs @ 5.14 fps)

Summary for Link P: Watershed P

Inflow Area = 46.766 ac, 0.00% Impervious, Inflow Depth = 8.53" for 100-Year, 24-Hour event
Inflow = 349.50 cfs @ 12.12 hrs, Volume= 33.246 af
Primary = 349.50 cfs @ 12.12 hrs, Volume= 33.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

100-Year, 24-Hour Outflow Imported from T:\Projects\2013\Pescadito Landfill\Design\Stormwater (Plan B)\Text an

Summary for Link toDA2: Discharge to DA2

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth > 6.43" for 100-Year, 24-Hour event
Inflow = 391.24 cfs @ 14.52 hrs, Volume= 433.829 af
Primary = 391.24 cfs @ 14.52 hrs, Volume= 433.829 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link toDA3: Discharge to DA3

Inflow = 246.67 cfs @ 14.52 hrs, Volume= 81.490 af
Primary = 246.67 cfs @ 14.52 hrs, Volume= 81.490 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

ATTACHMENT III-C

APPENDIX III-C.4

HYDROCAD MODEL OUTPUT FILES

3. PROPOSED CONDITIONS (POST-DEVELOPMENT)

A. MODEL DIAGRAMS

B. LANDFILL WATERSHED A (TYPICAL OF WATERSHEDS C, E, G, J, K, M, & O)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

C. LANDFILL WATERSHED B (TYPICAL OF WATERSHEDS D, F, J, L, N, & P)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

D. LANDFILL PERIMETER DITCH, CULVERT, & BASIN SYSTEM

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

E. REGIONAL STORMWATER CONDITIONS

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

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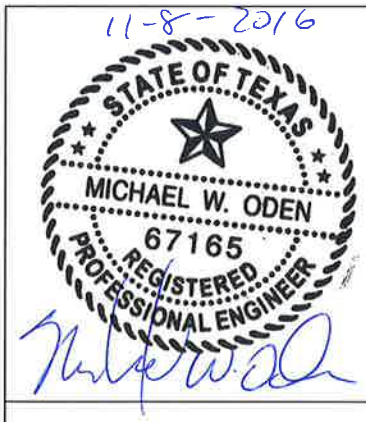
11-8-2016



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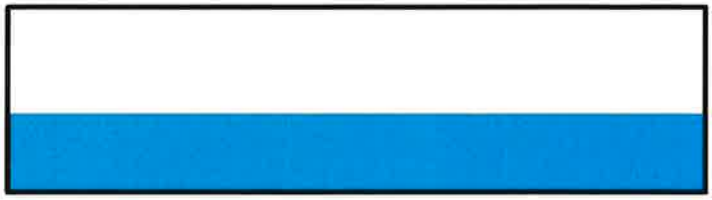
Inlet Invert= 0.00', Outlet Invert= -0.21'



Summary for Reach SUWIC: South Unit West Inlet Culvert

Inflow Area = 174.503 ac, 0.00% Impervious, Inflow Depth = 6.66" for 25-Year, 24-Hour event
Inflow = 504.57 cfs @ 12.54 hrs, Volume= 96.780 af
Outflow = 504.49 cfs @ 12.54 hrs, Volume= 96.780 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.92 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.39 fps, Avg. Travel Time= 0.5 min

Peak Storage= 3,961 cf @ 12.54 hrs
Average Depth at Peak Storage= 1.89'
Bank-Full Depth= 4.00' Flow Area= 120.0 sf, Capacity= 1,103.63 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
180.0" W x 48.0" H Box Pipe
n= 0.012
Length= 70.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.21'

Summary for Reach WMC: West Middle Channel

Inflow Area = 174.503 ac, 0.00% Impervious, Inflow Depth = 6.66" for 25-Year, 24-Hour event
Inflow = 504.91 cfs @ 12.52 hrs, Volume= 96.780 af
Outflow = 504.57 cfs @ 12.54 hrs, Volume= 96.780 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.47 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 2.5 min

Peak Storage= 20,877 cf @ 12.53 hrs
Average Depth at Peak Storage= 2.57'
Bank-Full Depth= 4.00' Flow Area= 196.0 sf, Capacity= 1,124.79 cfs

35.00' x 4.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 4.0 '/' Top Width= 63.00'
Length= 185.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.56'

Summary for Pond PSDB: South Detention Basin

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth = 6.70" for 25-Year, 24-Hour event
Inflow = 1,612.96 cfs @ 12.80 hrs, Volume= 452.020 af
Outflow = 485.11 cfs @ 14.67 hrs, Volume= 419.327 af, Atten= 70%, Lag= 112.4 min
Primary = 350.64 cfs @ 14.67 hrs, Volume= 386.511 af
Secondary = 134.47 cfs @ 14.67 hrs, Volume= 32.816 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 538.28' @ 14.67 hrs Surf.Area= 1,983,123 sf Storage= 10,096,980 cf

Plug-Flow detention time= 369.4 min calculated for 419.211 af (93% of inflow)
Center-of-Mass det. time= 329.0 min (1,176.9 - 847.9)

Volume	Invert	Avail.Storage	Storage Description
#1	533.00'	13,552,994 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
533.00	1,843,612	0	0
540.00	2,028,672	13,552,994	13,552,994

Device	Routing	Invert	Outlet Devices
#1	Primary	533.00'	**48.0" W x 24.0" H Box Culvert X 5.00** L= 80.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 533.00' / 532.84' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf
#2	Secondary	536.50'	**48.0" W x 24.0" H Box Culvert X 6.00** L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 536.50' / 536.40' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf

Primary OutFlow Max=350.65 cfs @ 14.67 hrs HW=538.28' TW=532.99' (Fixed TW Elev= 532.99')
↑—**1=Culvert** (Inlet Controls 350.65 cfs @ 8.77 fps)

Secondary OutFlow Max=134.45 cfs @ 14.67 hrs HW=538.28' TW=537.51' (Fixed TW Elev= 537.51')
↑—**2=Culvert** (Barrel Controls 134.45 cfs @ 4.20 fps)

Summary for Link P: Watershed P

Inflow Area = 46.766 ac, 0.00% Impervious, Inflow Depth = 6.65" for 25-Year, 24-Hour event
Inflow = 236.48 cfs @ 12.15 hrs, Volume= 25.907 af
Primary = 236.48 cfs @ 12.15 hrs, Volume= 25.907 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

25-Year, 24-Hour Outflow Imported from T:\Projects\2013\Pescadito Landfill\Design\Stormwater (Plan B)\Text and

Summary for Link toDA2: Discharge to DA2

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth > 5.73" for 25-Year, 24-Hour event
Inflow = 350.64 cfs @ 14.67 hrs, Volume= 386.511 af
Primary = 350.64 cfs @ 14.67 hrs, Volume= 386.511 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link toDA3: Discharge to DA3

Inflow = 134.47 cfs @ 14.67 hrs, Volume= 32.816 af
Primary = 134.47 cfs @ 14.67 hrs, Volume= 32.816 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

ATTACHMENT III-C

APPENDIX III-C.4

HYDROCAD MODEL OUTPUT FILES

3. PROPOSED CONDITIONS (POST-DEVELOPMENT)

A. MODEL DIAGRAMS

B. LANDFILL WATERSHED A (TYPICAL OF WATERSHEDS C, E, G, J, K, M, & O)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

C. LANDFILL WATERSHED B (TYPICAL OF WATERSHEDS D, F, J, L, N, & P)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

D. LANDFILL PERIMETER DITCH, CULVERT, & BASIN SYSTEM

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

E. REGIONAL STORMWATER CONDITIONS

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

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Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=556.00' (Free Discharge)
↑—**1=556562** (Controls 0.00 cfs)

Summary for Pond BT: West Detention Basin

Inflow Area = 5,437.747 ac, 0.00% Impervious, Inflow Depth = 5.74" for 100-Year, 24-Hour event
Inflow = 6,977.36 cfs @ 14.39 hrs, Volume= 2,601.214 af
Outflow = 5,960.38 cfs @ 15.04 hrs, Volume= 2,601.214 af, Atten= 15%, Lag= 39.1 min
Primary = 5,960.38 cfs @ 15.04 hrs, Volume= 2,601.214 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 547.57' @ 15.04 hrs Surf.Area= 118.164 ac Storage= 348.911 af

Plug-Flow detention time= 34.9 min calculated for 2,600.492 af (100% of inflow)
Center-of-Mass det. time= 34.9 min (1,004.3 - 969.4)

Volume	Invert	Avail.Storage	Storage Description
#1	542.00'	401.600 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
542.00	14.400	0.000	0.000
544.00	37.000	51.400	51.400
546.00	94.200	131.200	182.600
548.00	124.800	219.000	401.600

Device	Routing	Invert	Outlet Devices
#1	Primary	542.00'	**Special & User-Defined** Elev. (feet) 542.00 544.00 546.00 548.00 Disch. (cfs) 0.000 1,273.000 3,600.000 6,614.000

Primary OutFlow Max=5,960.38 cfs @ 15.04 hrs HW=547.57' (Free Discharge)
↑—**1=Special & User-Defined** (Custom Controls 5,960.38 cfs)

Summary for Link J1: Junction-1

Inflow Area = 14,125.662 ac, 0.35% Impervious, Inflow Depth > 5.68" for 100-Year, 24-Hour event
Inflow = 13,907.57 cfs @ 14.67 hrs, Volume= 6,682.682 af
Primary = 13,907.57 cfs @ 14.67 hrs, Volume= 6,682.682 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link JDA2: Junction DA2

Inflow Area = 1,559.638 ac, 3.14% Impervious, Inflow Depth > 6.05" for 100-Year, 24-Hour event
Inflow = 1,697.95 cfs @ 13.53 hrs, Volume= 786.873 af
Primary = 1,697.95 cfs @ 13.53 hrs, Volume= 786.873 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link JDA3: Junction DA3

Inflow Area = 3,149.669 ac, 0.00% Impervious, Inflow Depth = 5.58" for 100-Year, 24-Hour event
Inflow = 4,443.92 cfs @ 13.94 hrs, Volume= 1,463.795 af
Primary = 4,443.92 cfs @ 13.94 hrs, Volume= 1,463.795 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link Junction-2: Junction-2

Inflow Area = 7,128.277 ac, 0.00% Impervious, Inflow Depth = 5.55" for 100-Year, 24-Hour event
Inflow = 7,340.64 cfs @ 14.40 hrs, Volume= 3,294.722 af
Primary = 7,340.64 cfs @ 14.40 hrs, Volume= 3,294.722 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link SDBE: South Detention Basin East

Inflow = 246.67 cfs @ 14.52 hrs, Volume= 81.490 af
Primary = 246.67 cfs @ 14.52 hrs, Volume= 81.490 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

100-Year, 24-Hour Primary Outflow Imported from Pescadito Perimeter~Link toDA3.hce

Summary for Link SDBW: South Detention Basin West

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth > 6.43" for 100-Year, 24-Hour event
Inflow = 391.24 cfs @ 14.52 hrs, Volume= 433.829 af
Primary = 391.24 cfs @ 14.52 hrs, Volume= 433.829 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

100-Year, 24-Hour Primary Outflow Imported from Pescadito Perimeter~Link toDA2.hce

Changed Pages

Part III, Appendix III-D.6

Leachate and Contaminated Water Plan

Part III
Attachment III-D
Appendix III - D.6

LEACHATE AND CONTAMINATED WATER PLAN

Pescadito Environmental Resource Center
MSW-2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Revised September 2015
Technically Complete March 11, 2016
Modified October 2016
Modified November 2016

Prepared for:

Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:

CB&I Environmental and Infrastructure, Inc.

12005 Ford Rd, Suite 600
Dallas, TX 75234

11-8-2016
STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED PROFESSIONAL ENGINEER

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ATTACHMENTS

Attachment A to Appendix III-D.6: Contaminated Water/Leachate Collection System Design Analysis

1. Loads on the Leachate Collection System
2. Ring Deflection of Leachate Pipe
3. Structural Capacity of the Leachate Collection System
4. Compressed Thickness and Hydraulic Conductivity of the Geonet
5. Help Model Analysis
6. Leachate Collection System Flow Rates
7. Geotextile Permittivity
8. Leachate Collection System Design
9. Leachate Tank Size

Attachment B to Appendix D.6: HELP Model Outputs

1. Summary Table of HELP Model Runs
2. Open Conditions
   a. Leachate Collection System Scenario A
   b. Leachate Collection System Scenario B
   c. Leachate Collection System Scenario C
   d. Leachate Collection System Scenario D
3. Intermediate Conditions
4. Closed Conditions
5. Introduced Contaminated Water Analysis
   a. Open Conditions – 20 Foot Waste Column
   b. Intermediate Conditions – 50 Foot Waste Column
   c. Intermediate Conditions – 100 Foot Waste Column

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3.4 Leachate Pump and Riser System

Extraction of leachate from the collection sumps will be accomplished by submersible pumps, which can be operated either manually or automatically. Leachate levels in the collection sumps, will be monitored to maintain a head buildup of no greater than the lowest point of the landfill floor adjacent to the sump in each cell.

Sump riser pipes will be located directly up the sideslopes from the sumps at the disposal area perimeter. Risers will be 18-inch diameter HDPE pipe and provide a means for lowering submersible pumps down the 3:1 sideslope incline into the collection sumps. The lower portion of the riser within the sump is perforated (1/2-inch diameter holes), which will allow leachate to flow to the pumps.

The depth of leachate on the liner will be measured using electronic transducers mounted on the leachate pump. Leachate pumps will be sized appropriately to ensure that leachate levels can be maintained at a depth no greater than the lowest point of the landfill floor adjacent to the sump in each cell, without short-cycling. Pumps will be automatically controlled using liquid level sensors installed at appropriate elevations to activate the pump when the leachate level reaches the lowest point of the landfill floor adjacent to the sump, and deactivate the pump when the leachate level is six inches, or less above the bottom of the sump.

3.5 Conveyance

Leachate will be transferred to storage tanks or disposal locations by tanker truck or pipeline. Leachate may be withdrawn from the collection sumps or lines, or storage tanks/ponds into tanker trucks. Spill containment for truck hose connection and loading will be provided by a portable trough or similar spill containment. Protection will be provided at hose connection locations. Contaminated water will be transported to an authorized and permitted facility, or to the on-site evaporation pond, for treatment and disposal.

3.6 Leachate Storage

Leachate will be stored on-site in two on-site leachate storage tanks or evaporation pond prior to transport to a permitted treatment facility. The leachate storage facility will have adequate secondary containment in the event of a tank failure. Secondary containment will be sized to

Changed Pages

Part III, Appendix III-F.1

Groundwater Monitoring Plan Figures

Part III
Attachment III-F
Appendix III-F.1

GROUNDWATER MONITORING PLAN FIGURES

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
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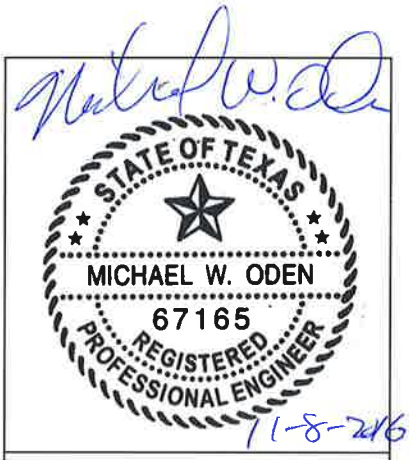

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Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:
CB&I Environmental and Infrastructure, Inc.

12005 Ford Rd, Suite 600
Dallas, TX 75234

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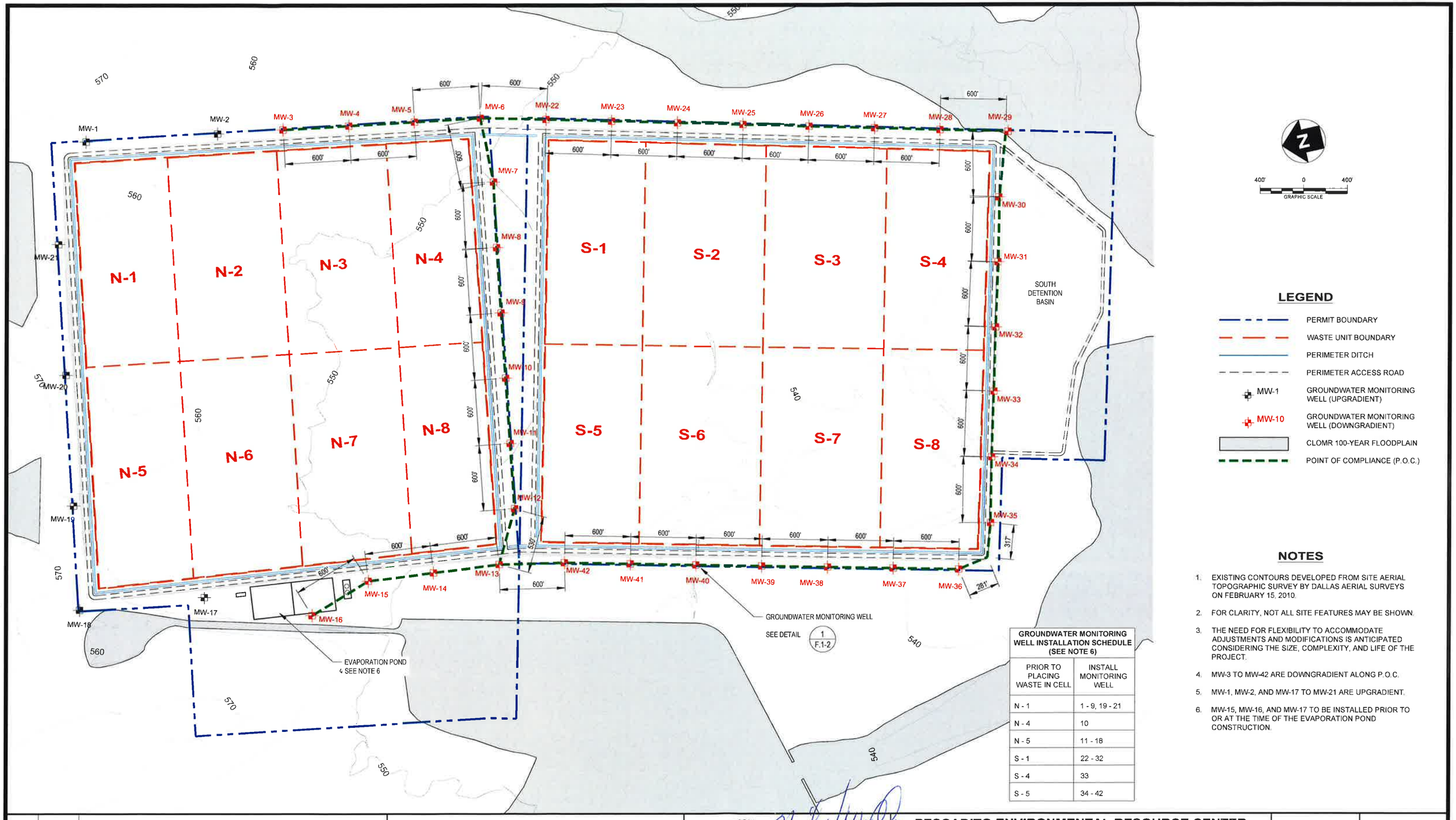

GROUNDWATER MONITORING WELL INSTALLATION SCHEDULE (SEE NOTE 6)

PRIOR TO PLACING WASTE IN CELL	INSTALL MONITORING WELL
N - 1	1 - 9, 19 - 21
N - 4	10
N - 5	11 - 18
S - 1	22 - 32
S - 4	33
S - 5	34 - 42

NOTES

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY DALLAS AERIAL SURVEYS ON FEBRUARY 15, 2010.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
4. MW-3 TO MW-42 ARE DOWNGRADIENT ALONG P.O.C.
5. MW-1, MW-2, AND MW-17 TO MW-21 ARE UPGRADIENT.
6. MW-15, MW-16, AND MW-17 TO BE INSTALLED PRIOR TO OR AT THE TIME OF THE EVAPORATION POND CONSTRUCTION.

REV. NO.	DATE	DESCRIPTION
4	11/2016	REVISED SCHEDULE FOR MW-15, MW-16 & MW-17
3	10/2016	REVISED WELL LAYOUT / ADDED INSTALLATION SCHEDULE
2	11/2015	NOD 2
1	9/2015	NOD 1

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED
PROFESSIONAL ENGINEER

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11-8-2016

PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

GROUNDWATER MONITORING SYSTEM PLAN

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO
DATE:	APRIL 2015
DRAWING NO.	III F.1-1
	1 OF 2 SHEETS

Attachment C

to November 2016 Supplement Letter (MSW 2374)

Redline Version of Changed Pages

Redline / Strikeout Version

Part I

PART I

APPLICATION FOR PERMIT
TYPE I MUNICIPAL SOLID WASTE FACILITY

MSW PERMIT NO. 2374

PESCADITO ENVIRONMENTAL RESOURCE CENTER
SOLID WASTE MANAGEMENT AND DISPOSAL FACILITY

RANCHO VIEJO WASTE MANAGEMENT, LLC
LAREDO, WEBB COUNTY, TEXAS

Originally Prepared By:

TRC Environmental Corporation

TBPE Firm Registration No. 3775

March 28, 2011; Revised May 20, 2011; Revised September 14, 2011; Revised December 14, 2011

Part I was signed by James F. Neyens, P.E. on December 14, 2011 for all changes through that date

Revised on June 12, 2014
April 20, 2015
September 2015
Technically Complete March 11, 2016
Modified November 2016 By:

CB&I Environmental and Infrastructure, Inc.

TBPE Firm Registration No. F-5650

Table of Contents

Page

Part I

Figures

Attachments

4.0 PROPERTY OWNER INFORMATION [330.59 (d)]

4.1 Legal Description

The legal description of the PERC site is a tract of land containing 952.89 acres, more or less, out of and being a part of a 12,193.84 acre tract as described and depicted as Tract 2 on a Survey Plat by John E. Foster, R.P.L.S. on a Stipulation Conforming Surface Ownership, Agreed Boundary Line and Roadway Access instrument, as recorded in Volume 704, Pages 827 – 852, of the Plat Records of Webb County, Texas.

The 952.89 acre tract is situated in Webb County, Texas and is a part of Survey 373, Abstract 1718; Survey 111, Abstract 1616; and Survey 1654, Abstract 3104. The boundary metes and bounds description of the property and a drawing of the property description are shown on Figure 4 titled Boundary Survey (Sheets 1 of 4 and 2 of 4) and Legal Description (Sheets 3 of 4 and 4 of 4). This legal description is also provided in Attachment A. The record information for the 952.89 acre tract is Volume 3071 Pages 426-432, Official Public Records, Webb County Texas as part of a larger 1,109.48 acre tract.

The 952.89 acre tract is not platted.

4.2 Property Owner Affidavit

The signed property owner affidavit for this application is provided on Page 9 of the Part I Application Form (Form TCEQ – 0650) contained in this permit application.

4.3 Surface Use Agreement – Survey 2366

See Figure 5 for a Surface Use Agreement that allows use of the property associated with Survey 2366 (the wedge between the north and south landfill units) for landfill operations.

Redline / Strikeout Version

Part III, Appendix III-B.1

General Facility Design Figures

Part III
Attachment III-B
Appendix III-B.1

GENERAL FACILITY DESIGN FIGURES

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

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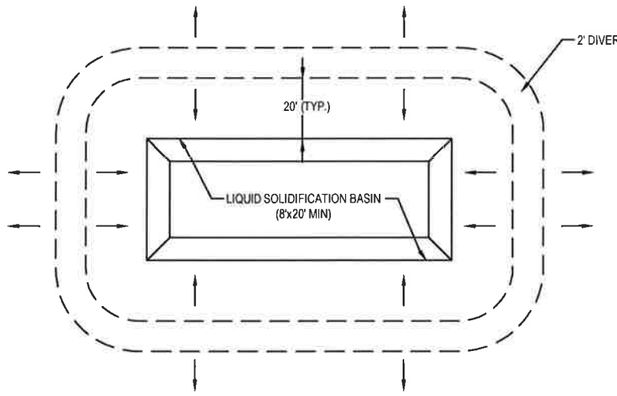
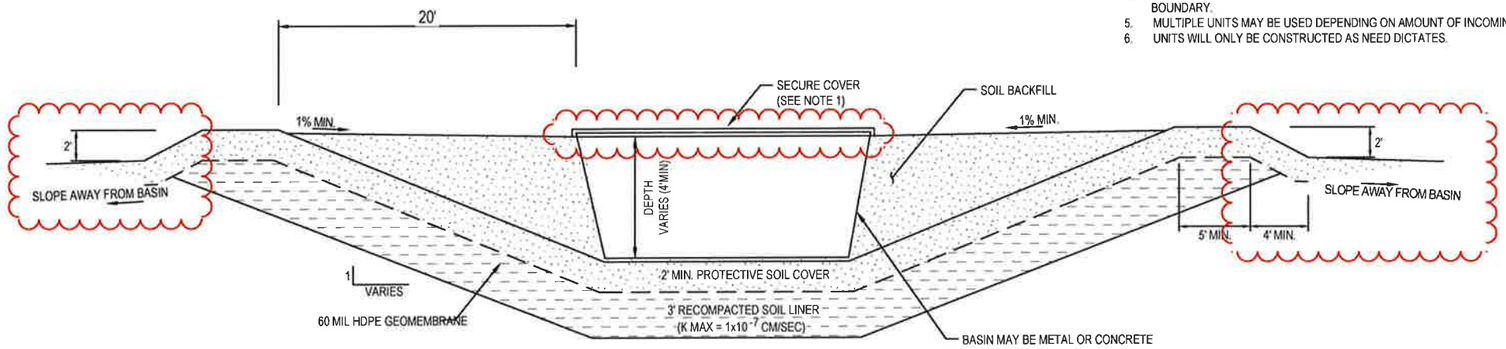


1 B.1-5 **TEMPORARY LIQUID SOLIDIFICATION BASIN PLAN VIEW**

NOT TO SCALE

NOTE:

1. STORMWATER TO BE DIRECTED AWAY FROM DIVERSION BERM
2. THIS PLAN IS CONCEPTUAL. ACTUAL DIMENSIONS OF THE BASIN WILL VARY.

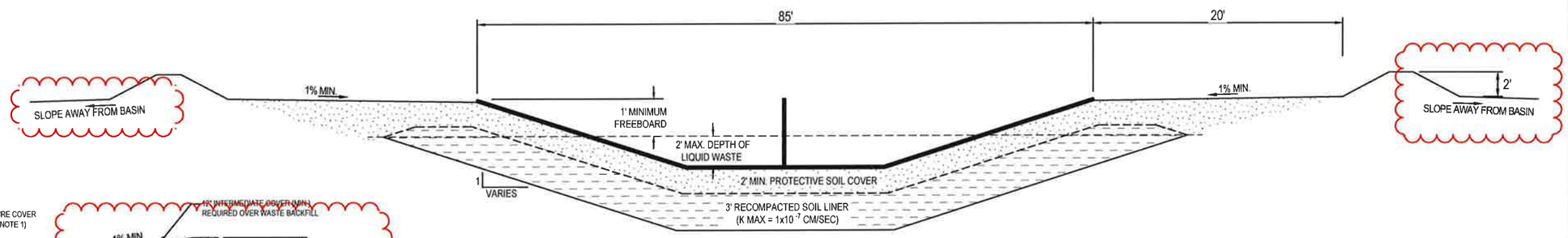


3 B.1-5 **TYPICAL CROSS SECTION TEMPORARY BASIN LOCATED OUTSIDE OF WASTE CELL**

NOT TO SCALE

NOTE:

1. A SECURE COVER WILL BE PLACED OVER THE TEMPORARY CONTAINER ANY TIME PROCESSED OR UNPROCESSED WASTE REMAINS IN THE CONTAINER OVERNIGHT
2. THIS SECTION IS CONCEPTUAL, ACTUAL DIMENSIONS OF THE BASIN WILL VARY. THE BASIN SHALL BE AT A MINIMUM: 8 FEET WIDE, 20 FEET LONG, AND 5 FEET DEEP (4 FEET PLUS 1 FOOT FREEBOARD). THE NUMBER OF BASINS WILL VARY DEPENDING ON WASTE RECEIPTS.
3. 2' OR 3' RECOMPACTED SOIL LINER AND 60 MIL HDPE GEOCOMPOSITE LINER AND 2' SOIL PROTECTIVE COVER TO BE CONSTRUCTED IN ACCORDANCE WITH APPENDIX III-D.7 (LINER QUALITY CONTROL PLAN)
4. THIS BASIN CONFIGURATION AND CONSTRUCTION WILL BE UTILIZED OUTSIDE OF EXISTING WASTE BUT WITHIN PERMIT BOUNDARY.
5. MULTIPLE UNITS MAY BE USED DEPENDING ON AMOUNT OF INCOMING WASTE.
6. UNITS WILL ONLY BE CONSTRUCTED AS NEED DICTATES.

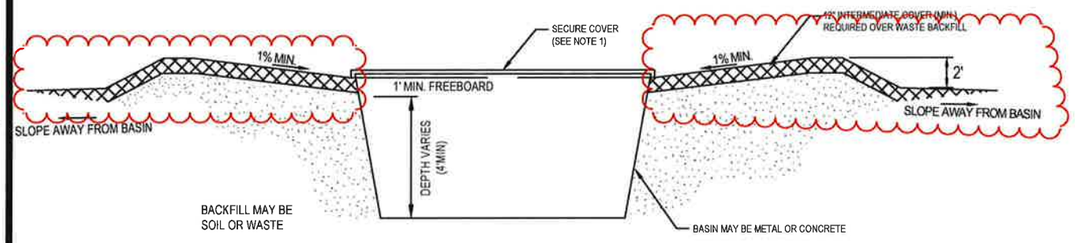


4 B.1-5 **TYPICAL CROSS SECTION PERMANENT LIQUID SOLIDIFICATION BASIN**

NOT TO SCALE

NOTE:

1. PERMANENT BASIN MAY BE CONSTRUCTED IN PHASES AS WASTE RECEIPTS DICTATE.



4 B.1-5 **TYPICAL CROSS SECTION TEMPORARY BASIN LOCATED OVER LINED CELL**

NOT TO SCALE

NOTE:

1. A SECURE COVER WILL BE PLACED OVER THE TEMPORARY CONTAINER ANY TIME PROCESSED OR UNPROCESSED WASTE REMAINS IN THE CONTAINER OVERNIGHT
2. THIS SECTION IS CONCEPTUAL, ACTUAL DIMENSIONS OF THE BASIN WILL VARY. THE NUMBER OF BASINS WILL VARY DEPENDING ON WASTE RECEIPTS.
3. THIS BASIN CONFIGURATION MAY ONLY BE PLACED IN EXISTING WASTE OVER THE EXISTING COMPOSITE LINED CELLS

REV. NO.	DATE	DESCRIPTION
3	11/2016	REVISED SLOPES AT BASINS
2	10/2016	REVISED LIQUID SOLIDIFICATION BASIN DETAILS
1	9/2015	NOD 1

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

STATE OF TEXAS
MICHAEL W. ODEN
67165
REGISTERED
PROFESSIONAL ENGINEER

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF PERMITTING UNDER THE AUTHORITY OF MICHAEL W. ODEN, P.E. 67165.

PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

LIQUID SOLIDIFICATION BASIN PLAN AND DETAILS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015

DRAWING NO.
III
B.1-5

5 OF 6 SHEETS

Redline / Strikeout Version

Part III, Appendix III-C.1

Facility Surface Water Drainage Report Narrative

Part III
Attachment III-C
Appendix III-C.1

FACILITY SURFACE WATER DRAINAGE REPORT NARRATIVE

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Supplement April 2015
Revised September 2015
Revised November 2015
Technically Complete March 11, 2016
Modified November 2016

Prepared for:
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Table of Contents

Attachments

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1.0 INTRODUCTION

This Facility Surface Water Drainage Report (FSWDR) for the Pescadito Environmental Resource Center (PERC) has been designed to collect, route, and detain stormwater runoff from the facility in an environmentally sound manner. The Plan for the landfill contains design features that follow best management practices that meet or exceed the regulations applicable to stormwater management outlined in Title 30 of the Texas Administrative Code (30 TAC), Section 330, Municipal Solid Waste. Specifically, Sections 330.63(c), 330.303, 330.305, and 330.307 are addressed.

Specific regulations of note include:

- ❑ Section 330.63(c) – Facility Surface Water Drainage Report
  - ▪ *"The owner or operator of a municipal solid waste (MSW) facility shall include a statement that the facility design complies with the requirements of 330.303 of this title (relating to Surface Water Drainage for Municipal Solid Waste Facilities). Additionally, applications for landfill and compost units shall include a surface water drainage report to satisfy the requirements of Subchapter G of this chapter (relating to Surface Water Drainage)."*
  - ▪ *30 TAC §330.63(c)(2)(D) applies specifically "for construction in a floodplain." RVWM has already applied for, and received, a CLOMR from FEMA to remove the area of the PERC facility from the 100-year floodplain [November 21, 2014]. Once the CLOMR improvements are constructed and approved by FEMA, the PERC facility will not be in the 100-year floodplain, i.e., no development will occur in the 100-year floodplain and the requirements of 30 TAC §330.63(c)(2)(D) are not applicable.*
- ❑ Section 330.303 – Surface Water Drainage for Municipal Solid Waste Facilities
  - ▪ *"(a) A facility must be constructed, maintained, and operated to manage run-on and runoff during the peak discharge of a 25-year rainfall event*
  - ▪ *(b) Surface water drainage in and around a facility shall be controlled to minimize surface water running onto, into, and off the treatment area"*
- ❑ Section 330.305 – Additional Surface Water Drainage Requirements for Landfills
  - ▪ *"(a) Existing or permitted drainage patterns must not be adversely altered.*
  - ▪ *(b) The owner or operator shall design, construct, and maintain a run-on control system capable of preventing flow onto the active portion of the landfill during the peak discharge from at least a 25-year rainfall event.*
  - ▪ *(c) The owner or operator shall design, construct, and maintain a runoff management system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.*

3.0 OBJECTIVES OF MODELING

Based on the above discussion, this Facility Surface Water Drainage Report approaches stormwater modeling with the following objectives:

1. Demonstrate that the HydroCAD software produces similar discharge rates and volumes as the HEC-HMS models presented in the CLOMR. This step is completed to ensure an "apples-to-apples" comparison between software models.
2. Develop a detailed stormwater model that reflects the post-development design of the landfill. Model every stormwater management component to ensure that they are adequately sized and can convey stormwater at rates that will not cause erosion (e.g. less than five feet per second) for the 100-year, 24-hour storm. The 100-year storm is selected based on the need to demonstrate that the CLOMR is maintained. It is noted that the CLOMR modeled 100-year storms to accurately delineate the 100-year floodplain. It is also noted that Texas regulations require sizing the facility stormwater management components for the smaller 25-year 24-hour storm.
3. Update the intermediate conditions model (which was based on general landfill hydrology assumptions) with the detailed landfill design described in Objective 2. This model is a hybrid:
    a. Areas inside of the landfill's stormwater management footprint will use the detailed stormwater modeling based on CB&I's design.
    b. Areas outside of the landfill's stormwater management footprint that will be modified from the existing conditions that are modeled as described within the CLOMR.
    c. The purpose of this hybrid model is to verify that the results are substantially similar to the intermediate conditions described in the CLOMR for the 100-year storm to ensure that the CLOMR conclusions are maintained.
4. Run the pre-development HydroCAD model and the post-development HydroCAD model described in Goal #3 for the 100~~25~~-year 24-hour storm to determine the discharge rates. Demonstrate that the post-development design maintains similar discharge rates and volumes to pre-development conditions, indicating that the landfill development will not produce adverse effects to area stormwater management.

~~4.~~5. Run the post-CLOMR, pre-development HydroCAD model and the post-development HydroCAD model described in Objective #3 for the 25-year, 24-hour storm to determine the discharge rates and volumes associated with the 25-year, 24-hour storm. Demonstrate that the

existing drainage patterns are not adversely altered, to any significant degree, by the development of the facility by comparing drainage at the permit boundary. This is additional demonstration that the existing drainage patterns are not adversely altered to that observed in Objective 4 above for the 100-year, 24-hour storm event.

By developing a detailed stormwater model for the proposed facility, CB&I is able to demonstrate that all stormwater features used to convey stormwater within the facility are adequately sized. Additionally, by demonstrating that discharge rates and Drainage Area locations for the facility are consistent with those developed within the CLOMR, the results of the CLOMR and its approach can be maintained.

updated with the detailed landfill design for the purpose of comparison to existing conditions and for validation of the CLOMR results.

Table 1
Peak Discharge Rate – 100-Year, 24-Hour Model Comparison

Model Run	HEC-HMS – CLOMR (cfs)	HydroCAD – Recreated (cfs)	Percent Difference
Pre-development Conditions			
DA1	7860.9	7900~~890~~.0	0.50~~37~~%
DA2	1676.8	1687.6	0.64%
DA3	3823.2	3835.91	0.33%
DA4	3824.2	3819.7	-0.12%
Junction-2	6905.7	6761.72~~926.7~~	-2.1~~0.30~~%
Burrito Tank	7714.2	7720.42	0.08%
Reach 1	7714.2~~3272.6~~	7720.42~~3272.8~~	0.08~~1~~%
Junction-1 (Downstream Discharge Point)	14567.6	14540.47	-0.19%
Intermediate Conditions			
DA1	6852.4	6885.92	0.49%
DA2	2082.6	2084.3	0.08%
DA3	4690.7	4709.99	0.41%
DA4	3824.2	3819.9	-0.11%
DA5	468.5	471.92	0.73%
DA6	378.5	380.18	0.44%
DA7	1015.7	1024.75	0.89%
West Detention Basin	5980.8	5960.38	-0.34%
NW Detention Basin	0	0	0.00%
NE Detention Basin	0	0	0.00%
Reach 1	5980.8	5960.38	-0.34%
Junction-1 (Downstream Discharge Point)	14096.1	14083.77	-0.09%

Table 2 Peak Discharge Volume – 100~~25~~-Year, 24-Hour Model Comparison			
Model Run	**HEC-HMS – CLOMR (af~~efs~~)**	**HydroCAD – Recreated (af~~efs~~)**	**Percent Difference**
Pre-development Conditions			
DA1	3272.6	3272.9	0.01%
DA2	364.6	363.7	-0.25%
DA3	1263.3	1262.4	-0.07%
DA4	1832	1830.9	-0.06%
Junction-2	3095.3	3093.3	-0.06%
Burrito Tank	3272.6	3272.9	0.01%
Reach 1	3272.6	3272.9	0.01%
Junction-1 (Downstream Discharge Point)	6732.5	6729.8	-0.04%
Intermediate Conditions			
DA1	2520.7	2522.4	0.07%
DA2	557.5	557	-0.09%
DA3	1547.6	1547.6	0.00%
DA4	1832	1830.9	-0.06%
DA5	78.6	78.8	0.25%
DA6	51.8	51.7	-0.19%
DA7	163	162.9	-0.06%
West Detention Basin	2599.3	2601.2	0.07%
Reach 1	2599.3	2601.2	0.07%
NW Detention Basin	0	0	0.00%
NE Detention Basin	0	0	0.00%
Junction-1 (Downstream Discharge Point)	6536.4	6536.6	0.00%

Note: Peak Discharge Volume~~25 year storm event~~ results for Pre-Development conditions were not provided in the CLOMR text. HEC-HMS results shown in Table 2 were obtained from the digital HEC-HMS model files provided with the CLOMR submission.

6.0 OBJECTIVE 3

Update the Intermediate Conditions (post-CLOMR) Model to include detailed landfill design. Verify that the updated results are substantially similar to the intermediate conditions described in the CLOMR for the 100-year storm to ensure that the CLOMR conclusions are maintained.

In order to ensure that the determinations made in the CLOMR were maintained, the proposed stormwater model including the detailed stormwater management system was compared to the proposed stormwater model from the CLOMR for the 100-year, 24-hour event.

This model is a hybrid:

A. Areas inside of the landfill's stormwater management footprint will use the detailed stormwater modeling based on CB&I's design.
B. Areas outside of the landfill's stormwater management footprint that will be modified from existing conditions are modeled as described within the CLOMR.

Because some of the drainage areas in the CLOMR proposed model were modified by the detailed proposed model, the two models were compared at the "Junction 1-Downstream Discharge Point" for the 100-year, 24-hour storm event to demonstrate that the design of the stormwater management system does not significantly or negatively impact the downstream discharge values determined in the CLOMR. The Junction 1-Downstream Discharge Point is shown on Drawings 1 and 3 of Appendix III-C.2. The stormwater model output files are provided in Appendix III-C.4. Table 5 below summarizes the comparison of the two models.

Table 5
100-Year, 24-Hour Storm Event Model Comparison

Model Run	Intermediate (post-CLOMR)	Post Development	Percent Difference
Peak Discharge Rate (cfs)			
Junction-1 (Downstream Discharge Point)	14,083.77	13,907.57~~14,070.88~~	-1.25~~0.1~~%
Peak Discharge Volume (af)			
Junction-1 (Downstream Discharge Point)	6,536.62	6,682.68~~6,734.90~~	2.2~~3.0~~%

7.0 OBJECTIVE 4

Run the pre-development HydroCAD model and the post-development HydroCAD model described in Objective #3 for the 100-year storm to determine the discharge rates associated with the 100-year storms. Demonstrate that post-development design maintains similar discharge rates and volumes to pre-development conditions, indicating that the landfill development will not produce adverse effects to area stormwater management.

In order to demonstrate compliance with 30 TAC, Section 330, Subchapter G, the proposed stormwater model including the detailed stormwater management system was compared to the existing conditions stormwater model. The two models were compared at the "Junction 1-Downstream Discharge Point" to demonstrate that the design of the stormwater management system does not significantly or negatively impact the existing downstream discharge values. Table 6 below summarizes the comparison of the two models.

Table 6
100-Year, 24-Hour Storm Event Model Comparison

Model Run	Pre-Development (pre-CLOMR)	Post-Development	Percent Difference
Peak Discharge Rate			
Junction-1 (Downstream Discharge Point)	14,540.47	13,907.57~~14,070.88~~	-4.4~~3.3~~%
Peak Discharge Volume			
Junction-1 (Downstream Discharge Point)	6,729.82	6,682.68~~6,734.90~~	-0.7~~1~~%

Based on the fact that the post-development conditions will discharge water downstream at flow rates and volumes that are within 5 percent of existing conditions demonstrates that the proposed landfill will not adversely affect drainage conditions. Therefore, Objective 4 is achieved.

Note that, unlike many MSW landfill applications, PERC had a detailed 100-year hydraulic and hydrologic baseline model available for the entire watershed in which the facility is proposed to be located. The detailed model was the result of the separate CLOMR process to remove the facility area from the 100-year floodplain. That model was independently verified by FEMA and its technical contractors and memorialized by the November 21, 2014 CLOMR approval. Availability of the watershed model provided an excellent opportunity to show that the PERC

facility could be developed without significantly or adversely altering existing, pre-facility-development (post-CLOMR) drainage patterns and conditions. Further, modeling/designing to 100-year (24-hour) conditions is more protective of human health and the environment than the 25-year (24-hour) storm event required by the Chapter 330 regulations.

8.0 OBJECTIVE 5

Run the post-CLOMR, pre-development HydroCAD model and the post-development HydroCAD model described in Objective #3 for the 25-year, 24-hour storm to determine the discharge rates and volumes associated with the 25-year, 24-hour storm. Demonstrate that the existing drainage patterns are not adversely altered, to any significant degree, by the development of the facility by comparing drainage at the permit boundary. This is additional demonstration that the existing drainage patterns are not adversely altered to that observed in Objective 4 above for the 100-year, 24-hour storm event.

Current Title 30 TAC §330.305(a) states "Existing or permitted drainage patterns must not be adversely altered." For the PERC facility, this demonstration was accomplished by comparing the Post-CLOMR Intermediate (permitted) and the Post-Development (proposed) conditions at the facility. However, the 25-year, 24-hour storm or rainfall event is to be used for this comparison for Objective 5.

Although outdated and currently under revision, TCEQ recommends that procedures in Regulatory Guidance 417 (RG-417; June 2006) - Guidelines for Preparing a Surface Water Drainage Plan for a Municipal Solid Waste Facility be used in the demonstration. RG-417 discusses the following elements that can be used for the evaluation:

- receiving streams or channels,
- downstream flooding potential,
- adjacent and downstream properties, and
- downstream water rights and uses.

Analysis

RG-417 discusses both "specific discharge points" and/or "overland (sheet) flow" at the permit boundary as the location for the comparison. Stormwater run on to the PERC facility is almost exclusively sheet flow, or overland flow as a result of the broad, salt-flat nature of the site. Runoff occurs along the south permit boundary almost exclusively as shallow concentrated flow and/or sheet flow. Further, most of the discharge enters the 100-year and 25-year floodplains

prior to exiting the permit boundary. "Specific discharge points" are usually associated with "channels" defined by "bed and banks." With the exception of the extreme southeast corner of the permit boundary, identifiable channels are not present at the permit boundary. The absence of channels was confirmed by the U.S. Army Corps of Engineers and U.S. EPA in their finding that there are no Jurisdictional Waters on site (Part II, Attachment A).

However, three locations along the southern permit boundary have been identified as "discharge points" for the comparison. Refer to Figures III-C.2-18 and III-C.2-19 in Appendix III-C.2 for the location of these "discharge points" and associated drainage areas for the pre-development (Post-CLOMR, existing or permitted) and post landfill development conditions (proposed), respectively.

Objective 4 above demonstrates that the pre-development (Post-CLOMR) and post-development conditions have similar discharge rates and volumes for the 100-year, 24-hour rainfall for the watershed in which the facility is located. The following analysis provides further demonstration for the 25-year, 24-hour rainfall event at the permit boundary. Three locations have been identified for analysis and have been designated as points A, B and C. See Figures III-C.2-18 and 19 in Part III, Appendix III-C.2

Point A is located at the southeast corner of the permit boundary. Flow at this location for the Post-CLOMR, pre-landfill (existing or permitted) condition consists of sheet, or overland flow associated with a portion Drainage Area 3 which has been identified as DA3A. Part of the flow is within a channel that is known as "Trib 1 of San Juanito Creek Trib" (See Figure 1 in CLOMR Application – III-C.1-A). This tributary crosses the permit boundary at Point A and proceeds onto adjacent property owned by JEV Family LTD before re-entering property owned by RVCC. Note that Point A is within the 100-year and 25-year floodplains. [The 25-year, 24-hour floodplain has very similar characteristics to the 100-year, 24-hour floodplain shown throughout the application except that it is one (1) to two (2) feet lower in elevation.]

Point B is located approximately in the middle of the site, near the west end of the South Detention Basin. Flow at this location for the Post-CLOMR, pre-landfill (existing or permitted) condition consists of sheet, or overland flow associated with a portion of Drainage Area 2 which has been designated as DA2B. Flow in subcatchment DA2B is primarily from the western

portion of the facility where drainage tends to flow to Burrito Tank and over the spillway on the east of the tank and proceeds across the south permit boundary onto adjacent property owned by JEV Family LTD before re-entering property owned by RVCC. Note that Point B is within the 100-year and 25-year floodplains.

Point C is located at the most southerly southwest corner of the site. Flow at this location for the Post-CLOMR, pre-landfill (existing or permitted) condition consists of sheet, or overland flow associated with another portion of Drainage Area 2 and has been designated as DA2C. Flow in subcatchment DA2C is from offsite and onsite from an area south and east of the west detention basin. Note that discharge from Point C enters the 100-year and 25-year floodplains shortly after leaving the permit boundary while on property owned by RVCC.

For the post-landfill (proposed) condition, discharges from Points A, B and C are as follow:

- Discharge at **Point A** continues to consist of sheet, or overland flow associated with a portion Drainage Area 3. This area has been identified as DA3A-Post. Part of the flow is still within the tributary that crosses the permit boundary at Point A. For this condition, point A also receives discharge from the South Detention Basin – East, or Secondary, Outlet. Flow leaves the east culverts at less than 5 feet per second (fps) and is considered non-erodible. It then enters a long flat swale where the velocity will drop below 2 fps and enters the 100-year and 25-year floodplain before leaving the permit boundary (see Figure III-C.2-17).
- Discharge at **Point B** is from the South Detention Basin – West, or Primary, Outlet. Flow leaves the west culverts at around 8.7 fps. Downstream of the culvert exit, the drainage swale will be lined with rip-rap to lower the velocity. This, coupled with the low slope of the swale, will drop the velocity below 2 fps. The discharge will enter the 100-year and 25-year floodplain before leaving the permit boundary (see Figure III-C.2-16).
- Discharge at **Point C** continues to consist of sheet, or overland flow associated with another portion of Drainage Area 2 and has been designated as DA2C-Post. Subcatchment DA2C-Post extends to the north end of the facility, below DA6. Note that discharge from Point C enters the 100-year and 25-year floodplain shortly after leaving the permit boundary while on property owned by RVCC.
- Note that the discharge from Points A, B and C enter inside the fork of the two main stems of the modeled watershed. See Figures III-C.2-18 and 19.

Results

As part of the CLOMR application, the entire watershed that contains the proposed facility has been modeled; providing a unique opportunity to ensure that regional drainage patterns are not affected. As noted in Table 5 above in confirming that Objective 3 was met, the stormwater models of the Intermediate (Post-CLOMR) and Post Development conditions were compared for the 100-year, 24-hour storm event and confirmed that the two conditions were substantially similar.

For Objective 5, Table 7 below compares stormwater model results for the 25-year, 24-hour storm event at three discharge points along the permit boundary (southern limits of the facility). The results demonstrate that "existing or permitted drainage patterns" will not be "adversely altered" at the permit boundary by the development of the Pescadito Environmental Resource Center. HydroCAD output files for models evaluated are presented at the end of this section.

Table 7
25-Year, 24-Hour Storm Event Model Comparison

Point of Comparison	Intermediate (post-CLOMR)		Post Development		% difference
	Model Run	Value	Model Run	Value	
Peak Discharge Rate (cubic feet per second)					
A	DA3A	3,302.61	DA3A-Post	2,910.45	-
	-	-	SDBE	134.47	-
	Total	3,302.61	**Total** [1]	3,044.92	-8.5
B	DA2B	380.02	SDBW	350.64	7.7
C	DA2C	87.57	DA2C-Post	63.44	-23.6
Peak Discharge Volume (acre feet)					
A	DA3A	961.635	DA3A-Post	847.446	-
	-	-	SDBE	32.816	-
	Total	961.635	**Total**	880.262	-9.2
B	DA2B	172.542	SDBW	386.511	124.0 [2]
C	DA2C	25.492	DA2C-Post	48.675	90.9 [3]

[1] – For convenience the values from DA3A-Post and SDBE are added. In reality, the peak flows do not occur at the same time, rather one hour different. This assumption is conservative in respect to the comparison.

[2] – The increase in volume associated with Point B is attenuated in that the flow is over a much longer duration due to the South Detention Basin

[3] - The increase in volume associated with Point C is attenuated in that the peak flow has decreased and the flow period is extended from 13 to 18 hours in length.

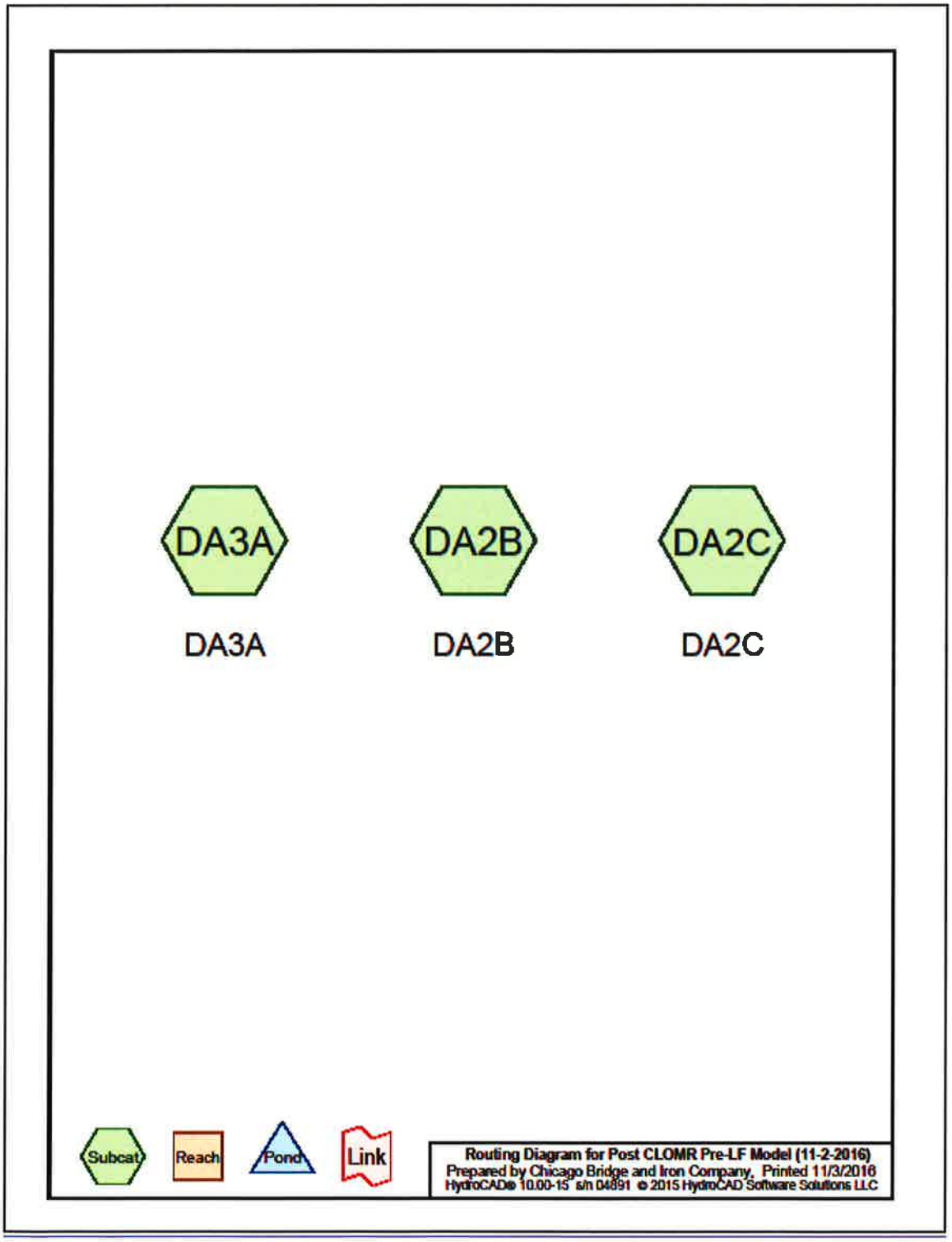
Velocities associated with flow from the South Detention Basin have been discussed above as being less than 2 fps for the 25-year, 24-hour rainfall event prior to leaving the permit boundary.

Based on the analysis presented above, Objective 5 has been met in that the development of the facility will have no adverse impact to:

- receiving streams or channels,
- downstream flooding potential,
- adjacent and downstream properties, or
- downstream water rights and uses.

Please refer to the CLOMR provided in Attachment A of Part III, Appendix III-C.1 for additional information and discussion regarding existing an

Model Diagram for Post-CLOMR (permitted) conditions



Results for Subcatchment DA2B

Summary for Subcatchment DA2B: DA2B

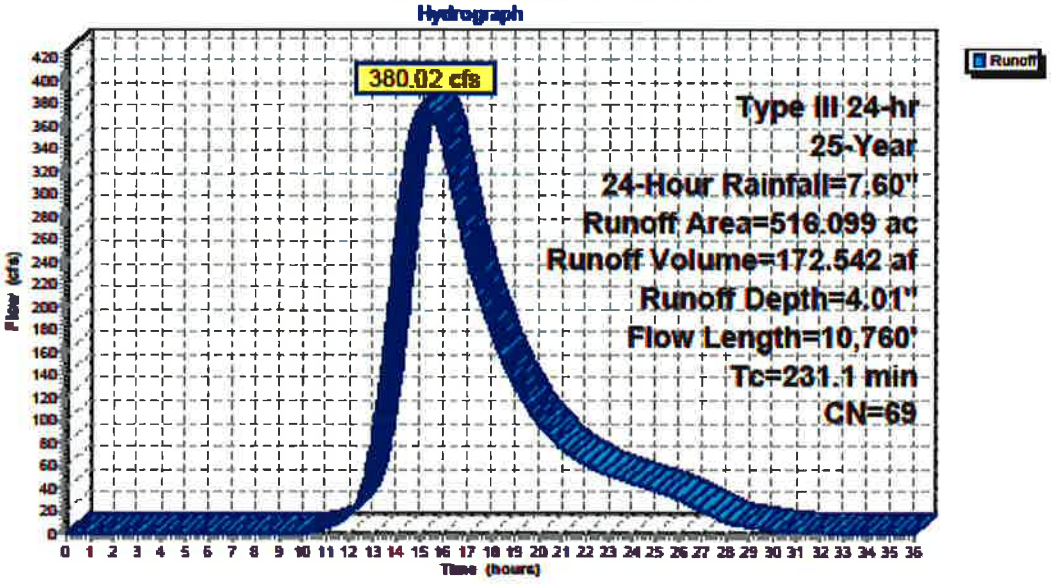
Runoff = 380.02 cfs @ 15.15 hrs, Volume= 172.542 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

Area (ac)	CN	Description
* 516.099	69	
516.099		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	300	0.0100	0.17		Sheet Flow, Grass: Short n= 0.150 P2= 3.75"
202.3	10,460	0.0033	0.86		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
231.1	10,760	Total			

Subcatchment DA2B: DA2B



Results for Subcatchment DA2C

Summary for Subcatchment DA2C: DA2C

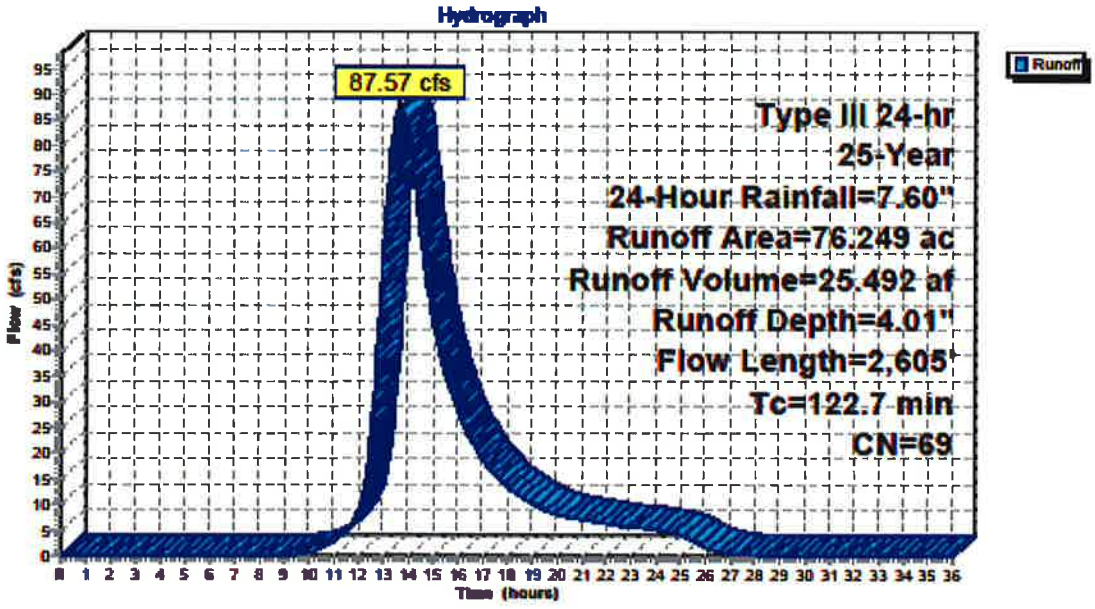
Runoff = 87.57 cfs @ 13.64 hrs, Volume= 25.492 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

	Area (ac)	CN	Description
*	76.249	69	
	76.249		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.6	300	0.0030	0.11		Sheet Flow, Grass: Short n= 0.150 P2= 3.75"
76.1	2,305	0.0052	0.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
122.7	2,605	Total			

Subcatchment DA2C: DA2C



Results for Subcatchment DA3A

Summary for Subcatchment DA3A: DA3A

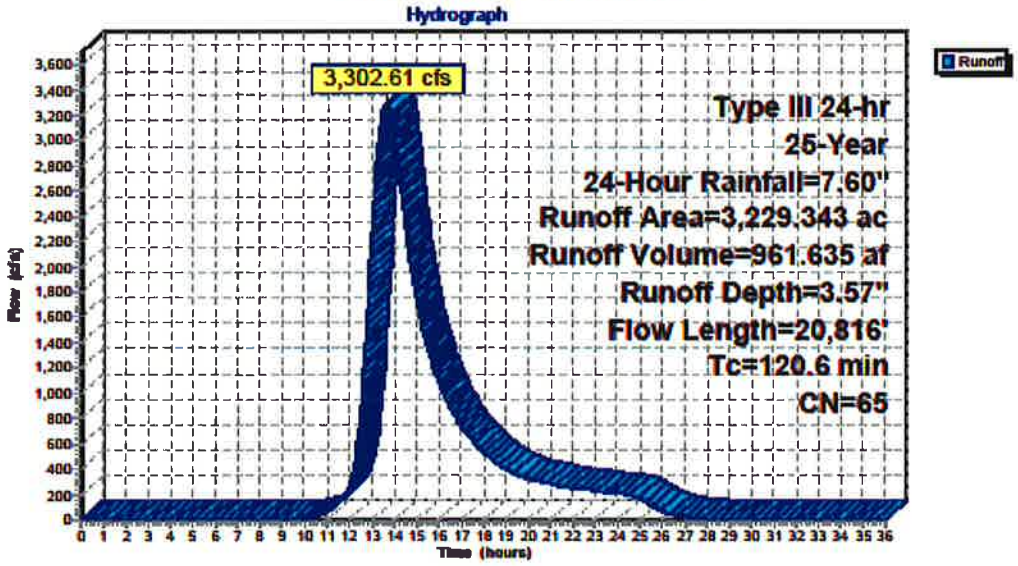
Runoff = 3,302.61 cfs @ 13.66 hrs, Volume= 961.635 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

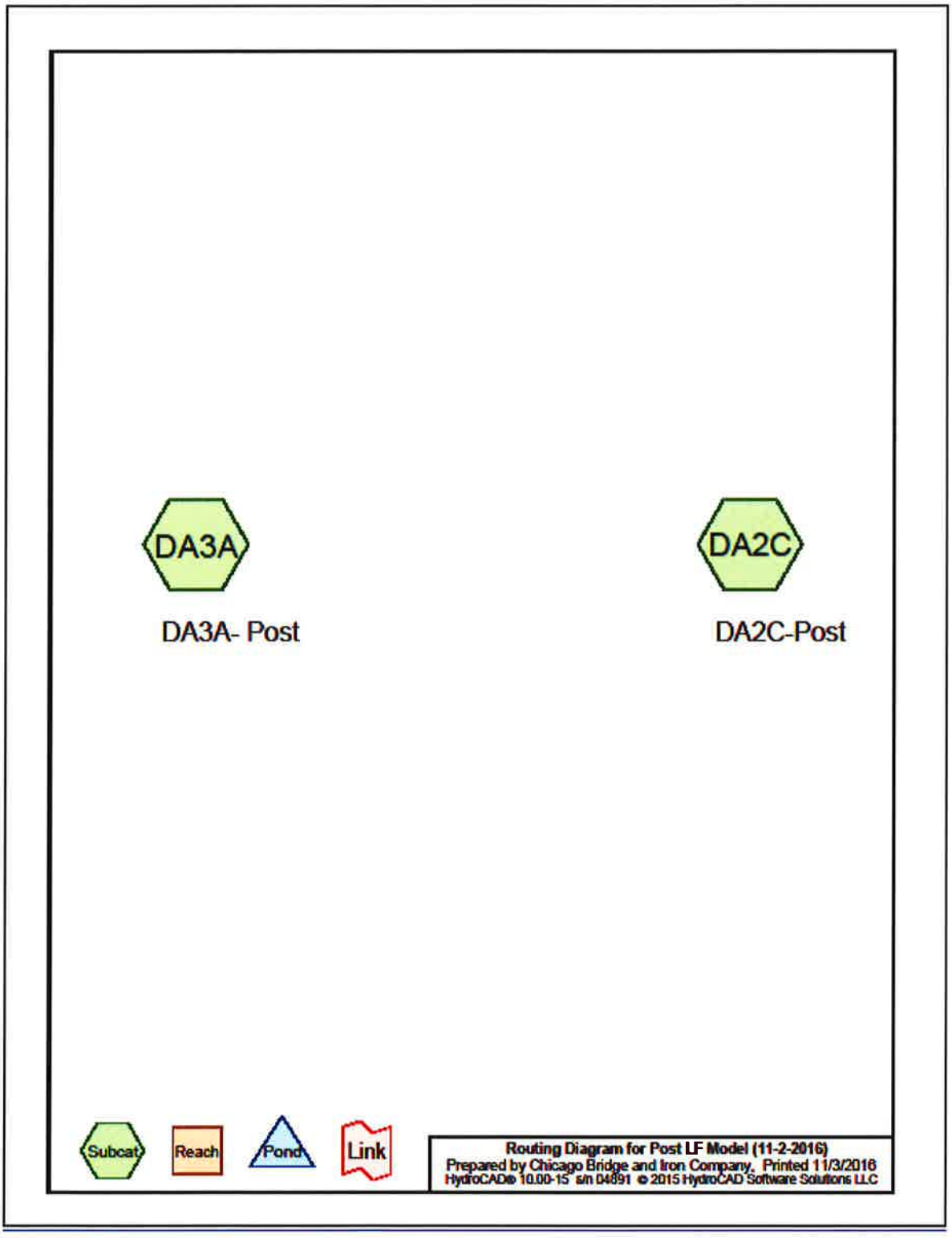
Area (ac)	CN	Description
* 3,229.343	65	
3,229.343		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	300	0.0200	0.42		Sheet Flow, From CLOMR n= 0.070 P2= 3.75"
6.4	1,000	0.0250	2.59		Shallow Concentrated Flow, From CLOMR Kv= 16.4 fps
102.4	19,516	0.0042	3.18	50.82	Channel Flow, From CLOMR Area= 16.0 sf Perim= 12.9' r= 1.24' n= 0.035
120.6	20,816	Total			

Subcatchment DA3A: DA3A



Model Diagram for Off Site Flows Post Landfill



Results for Subcatchment DA2C-Post

Summary for Subcatchment DA2C: DA2C-Post

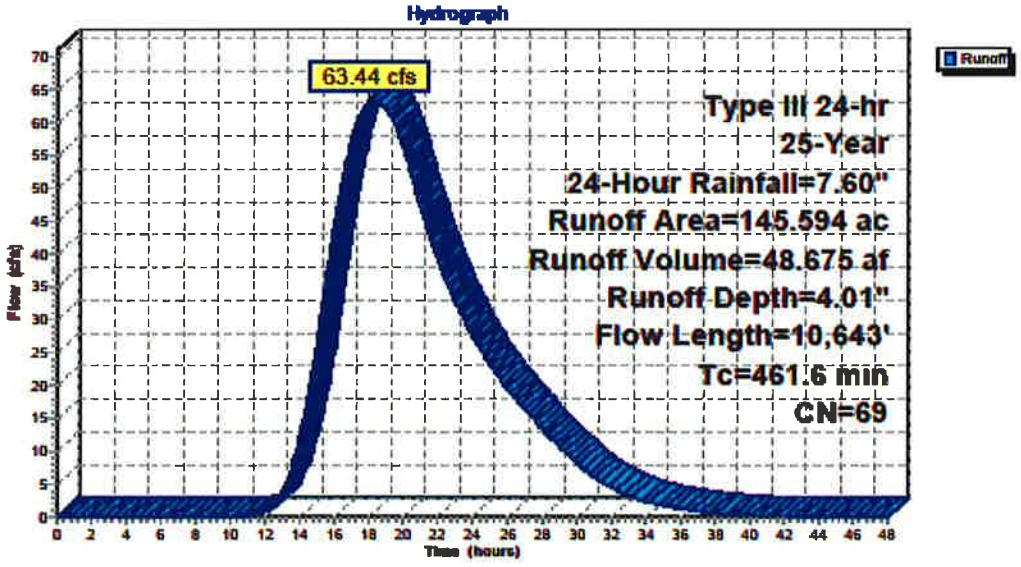
Runoff = 63.44 cfs @ 17.96 hrs, Volume= 48.675 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

	Area (ac)	CN	Description
*	145.594	69	
	145.594		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.3	300	0.0125	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.75"
435.3	10,343	0.0032	0.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
461.6	10,643	Total			

Subcatchment DA2C: DA2C



Results for Subcatchment DA3A-Post

Summary for Subcatchment DA3A: DA3A-Post

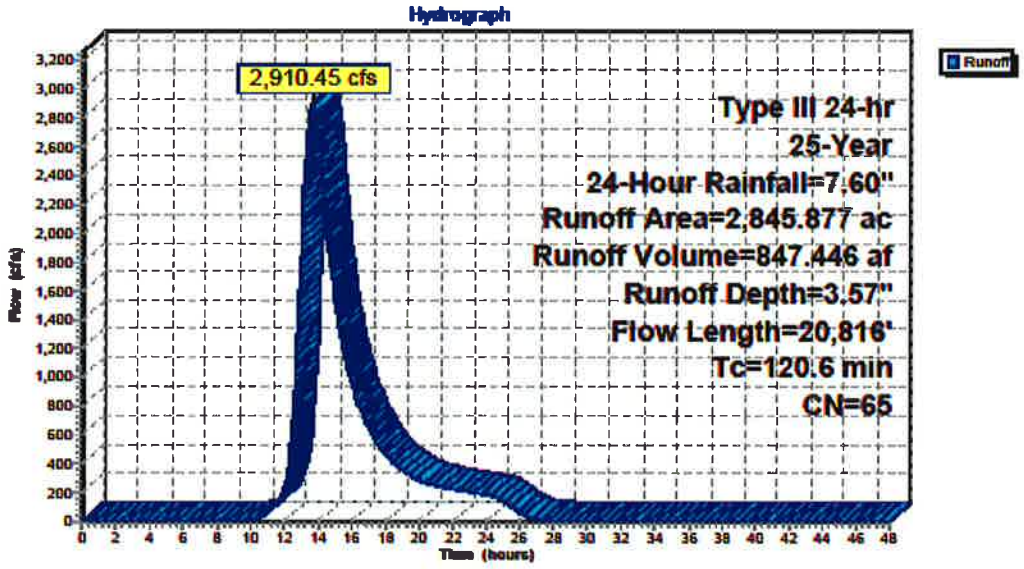
Runoff = 2,910.45 cfs @ 13.66 hrs, Volume= 847.446 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year, 24-Hour Rainfall=7.60"

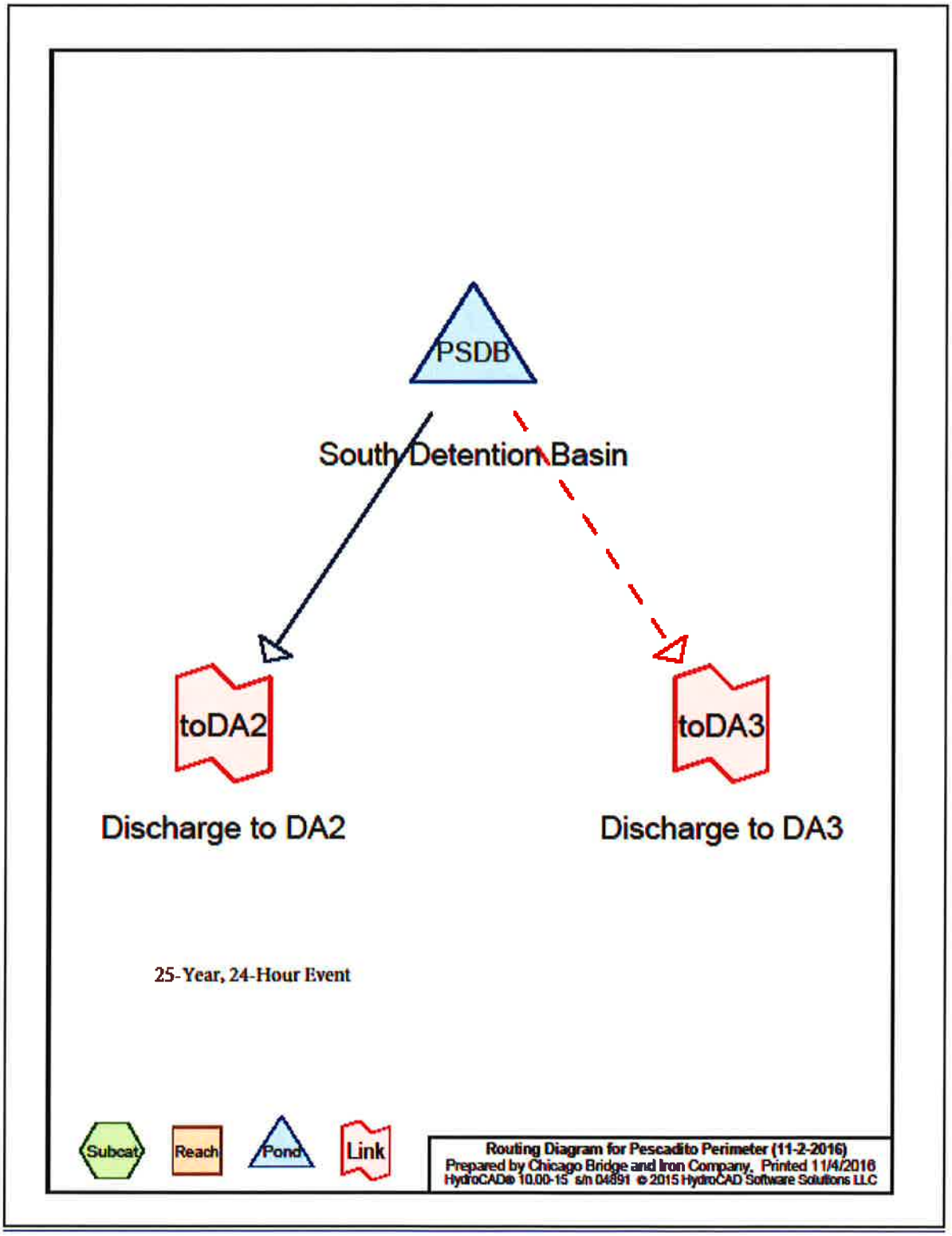
Area (ac)	CN	Description
* 2,845.877	65	
2,845.877		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	300	0.0200	0.42		Sheet Flow, From CLOMR n= 0.070 P2= 3.75"
6.4	1,000	0.0250	2.59		Shallow Concentrated Flow, From CLOMR Kv= 16.4 fps
102.4	19,516	0.0042	3.18	50.82	Channel Flow, From CLOMR Area= 16.0 sf Perim= 12.9' r= 1.24' n= 0.035
120.6	20,816	Total			

Subcatchment DA3A: DA3A



Model Diagram for South Detention Basin



Results for South Detention Basin

Summary for Pond PSDB: South Detention Basin

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth = 6.70" for 25-Year, 24-Hour event
Inflow = 1,612.96 cfs @ 12.80 hrs, Volume= 452.020 af
Outflow = 485.11 cfs @ 14.67 hrs, Volume= 419.327 af, Atten= 70%, Lag= 112.4 min
Primary = 350.64 cfs @ 14.67 hrs, Volume= 386.511 af
Secondary = 134.47 cfs @ 14.67 hrs, Volume= 32.816 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 538.28' @ 14.67 hrs Surf.Area= 1,983,123 sf Storage= 10,096,980 cf

Plug-Flow detention time= 369.4 min calculated for 419.211 af (93% of inflow)
Center-of-Mass det. time= 329.0 min (1,176.9 - 847.9)

Volume	Invert	Avail.Storage	Storage Description
#1	533.00'	13,552,994 cf	Custom Stage Data (Prismatic)Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
533.00	1,843,612	0	0
540.00	2,028,672	13,552,994	13,552,994

Device	Routing	Invert	Outlet Devices
#1	Primary	533.00'	48.0" W x 24.0" H Box Culvert X 5.00 L= 80.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 533.00' / 532.84' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf
#2	Secondary	536.50'	48.0" W x 24.0" H Box Culvert X 6.00 L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 536.50' / 536.40' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf

Primary OutFlow Max=350.65 cfs @ 14.67 hrs HW=538.28' TW=532.99' (Fixed TW Elev= 532.99')
↑1=Culvert (Inlet Controls 350.65 cfs @ 8.77 fps)

Secondary OutFlow Max=134.45 cfs @ 14.67 hrs HW=538.28' TW=537.51' (Fixed TW Elev= 537.51')
↑2=Culvert (Barrel Controls 134.45 cfs @ 4.20 fps)

Primary Ouflow is from the West Culverts
Secondary Ouflow is from the East Culverts

Redline / Strikeout Version

Part III, Appendix III-C.2

Facility Surface Water Drainage Drawings

Part III
Attachment III-C
Appendix III-C.2

FACILITY SURFACE WATER DRAINAGE DRAWINGS

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Supplement April 2015
Revised September 2015
Revised August 2016
Technically Complete March 11, 2016
Modified November 2016

Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:
CB&I Environmental and Infrastructure, Inc.
12005 Ford Rd, Suite 600
Dallas, TX 75234

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Table of Contents

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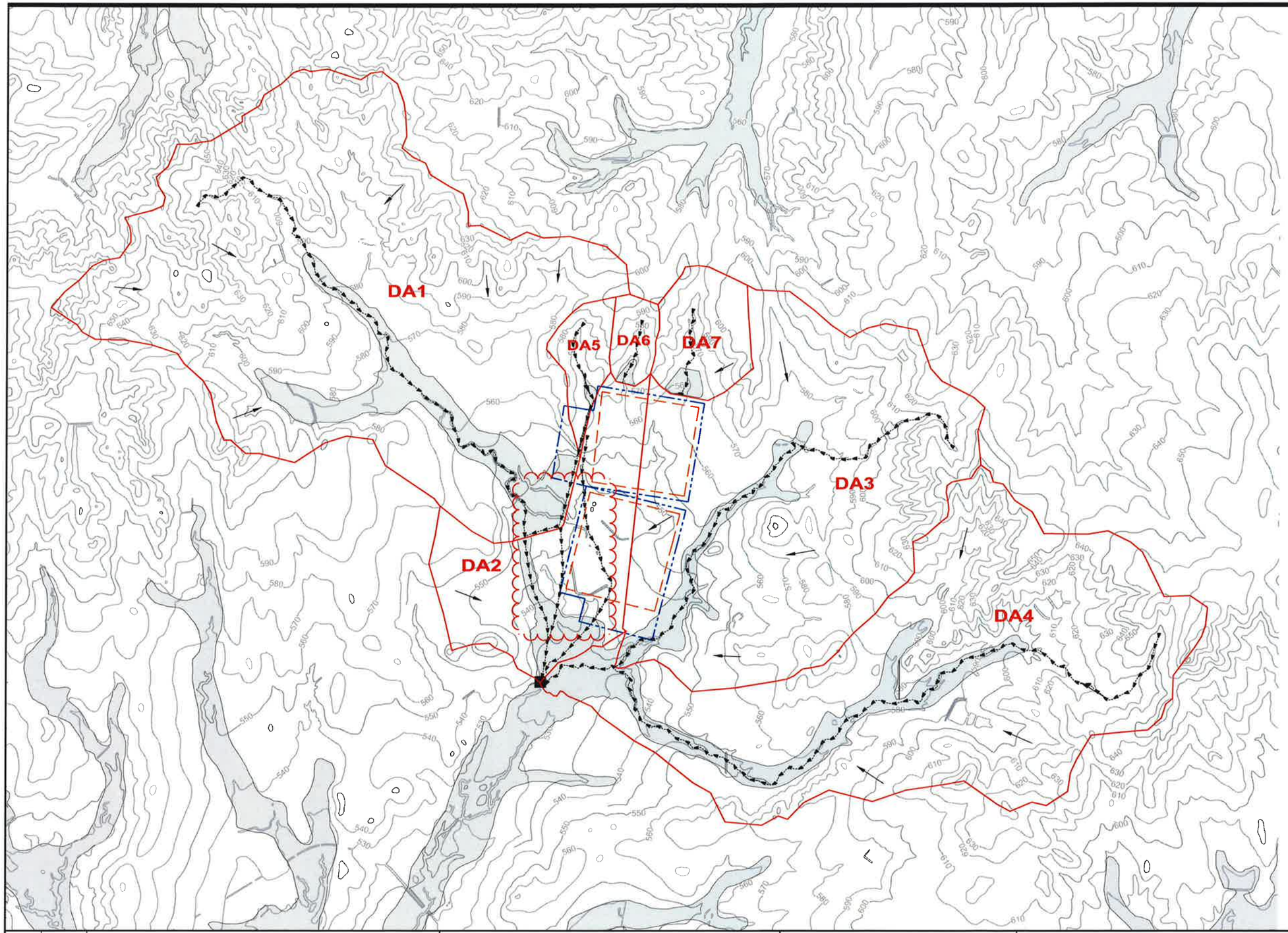

N

2000' 0 2000'
GRAPHIC SCALE

LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- INTERMEDIATE CONDITION SUBCATCHMENT BOUNDARIES
- STORMWATER FLOW PATH
- STORMWATER FLOW DIRECTION
- JUNCTION 1 (SEE NOTE 5)
- CLOMR 100-YEAR FLOODPLAIN

NOTES

1. CONTOURS ADAPTED FROM TEXAS NATURAL RESOURCE INFORMATION SYSTEM "TEXAS ELEVATION FRAMEWORK (HYPSOGRAPHY)" QUADRANGLES.
2. BOUNDARY AND IMPROVEMENT SURVEY DEVELOPED BY MEJIA ENGINEERING COMPANY ON AUGUST 15, 2011 AND JUNE 9, 2014.
3. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
4. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
5. JUNCTION 1 REPRESENTS THE MOST DOWNSTREAM ELEMENT WITHIN THE STORMWATER MODELS AND IS THE MAIN POINT OF COMPARISON BETWEEN MODELS.
6. "DRAINAGE AREAS" (DA) ARE TAKEN FROM THE CONDITIONAL LETTER OF MAP REVISION, PREPARED BY CB&I ENVIRONMENTAL AND INFRASTRUCTURE, INC. APPROVED NOVEMBER 21, 2014.

REV. NO.	DATE	DESCRIPTION
2	11/2016	ADJUSTED FLOW PATHS
1	9/2015	NOD 1

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

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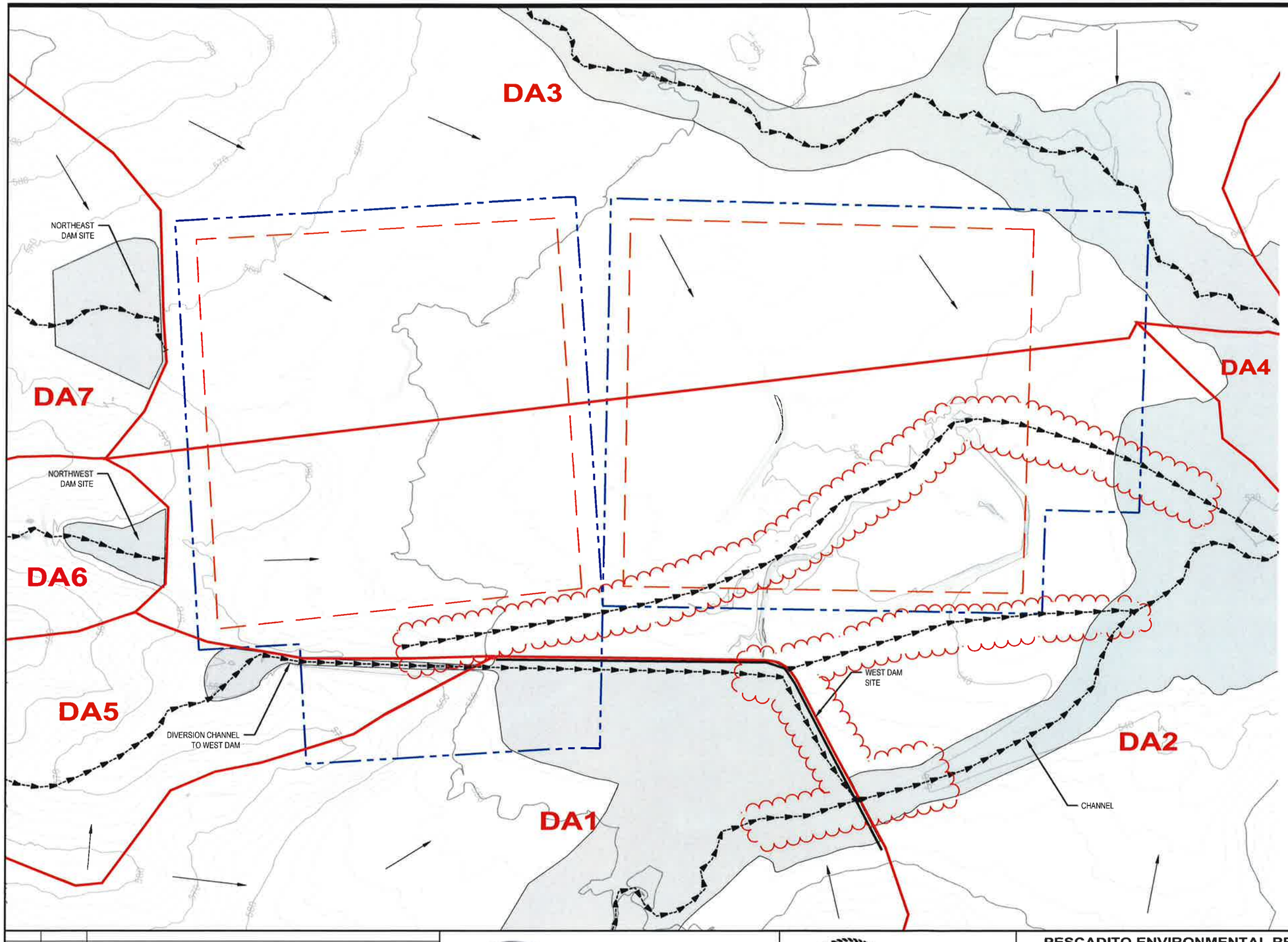
PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
INTERMEDIATE DEVELOPMENT CONDITIONS - REGIONAL OVERVIEW

PROJ. NO.:	148868
DESIGNED BY:	-
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015
DRAWING NO.
III
C.2-3
3 OF 19 SHEETS



N

500' 0 500'
GRAPHIC SCALE

LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- INTERMEDIATE CONDITIONS SUBCATCHMENT BOUNDARIES
- STORMWATER FLOW PATH
- STORMWATER FLOW DIRECTION
- CLOMR 100-YEAR FLOODPLAIN

NOTES

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY DALLAS AERIAL SURVEYS ON FEBRUARY 15, 2010 (MODIFIED TO INCLUDE CLOMR IMPROVEMENTS.
2. BOUNDARY AND IMPROVEMENT SURVEY DEVELOPED BY MEJIA ENGINEERING COMPANY ON AUGUST 15, 2011 AND JUNE 9, 2014.
3. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
4. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
5. "DRAINAGE AREAS" (DA) ARE TAKEN FROM THE CONDITIONAL LETTER OF MAP REVISION, PREPARED BY CB&I ENVIRONMENTAL AND INFRASTRUCTURE, INC. APPROVED NOVEMBER 21, 2014.

REV. NO.	DATE	DESCRIPTION
2	11/2016	ADJUSTED FLOW PATHS
~~1~~	~~9/2015~~	NOD 1

CB&I Environmental & Infrastructure, Inc.
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STATE OF TEXAS
MICHAEL W. ODEN
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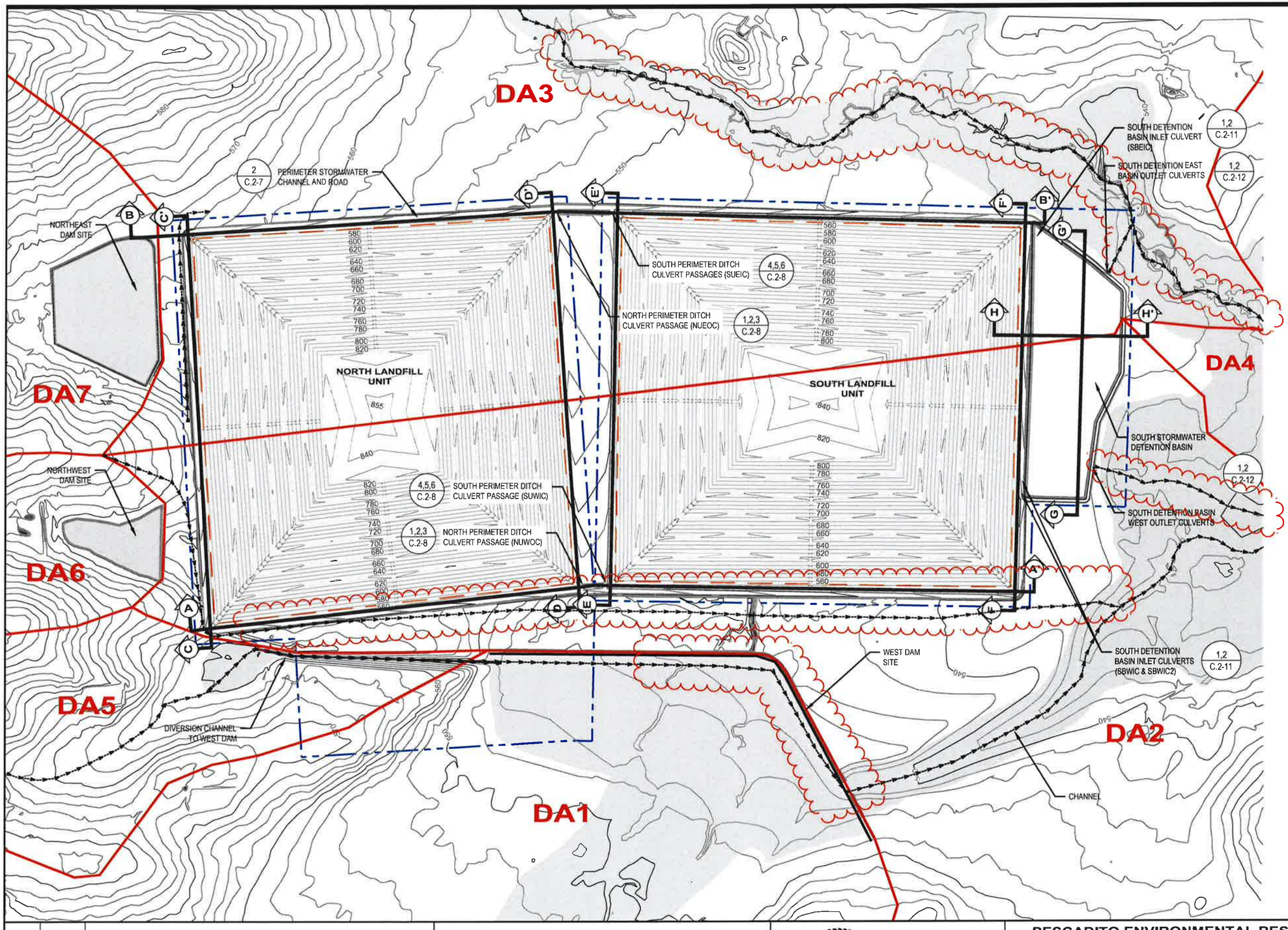
WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
INTERMEDIATE DEVELOPMENT CONDITIONS
FACILITY AND IMMEDIATE SURROUNDINGS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015

DRAWING NO.
III
C.2-4
4 OF 19 SHEETS



N

500' 0 500'
GRAPHIC SCALE

LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- CLOMR 100-YEAR FLOODPLAIN
- PERIMETER CHANNEL AND DETENTION BASIN PROFILE LOCATIONS
- STORMWATER FLOW

NOTES

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY DALLAS AERIAL SURVEYS ON FEBRUARY 15, 2010 (MODIFIED TO INCLUDE CLOMR IMPROVMENTS).
2. BOUNDARY AND IMPROVEMENT SURVEY DEVELOPED BY MEJIA ENGINEERING COMPANY ON AUGUST 15, 2011 AND JUNE 9, 2014.
3. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
4. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
5. PROFILES A-H ARE LOCATED ON DRAWINGS 9-11 OF APPENDIX III-C.2.
6. DRAINAGE AREAS FOR POST-DEVELOPMENT CONDITIONS ARE UNCHANGED FROM INTERMEDIATE CONDITIONS SHOWN IN DRAWINGS 3 & 4 OF APPENDIX III-C.2.

REV. NO.	DATE	DESCRIPTION
1	11/2016	REVISED SOUTH DETENTION BASIN OUTLETS & SITE FLOW PATHS

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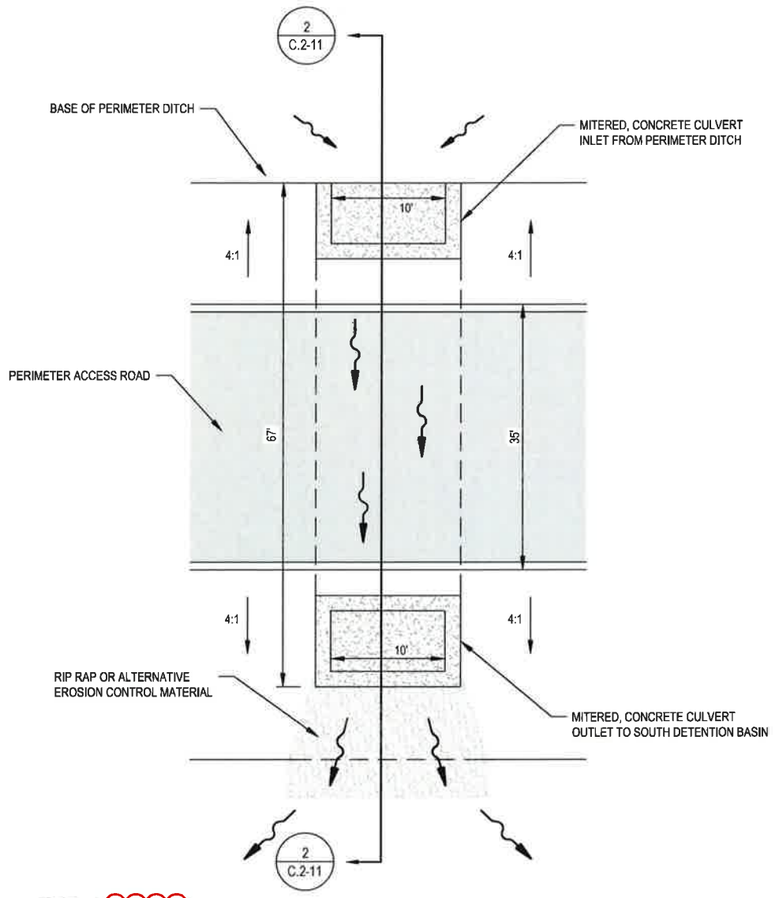
WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
POST-DEVELOPMENT CONDITIONS
FACILITY AND IMMEDIATE SURROUNDINGS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

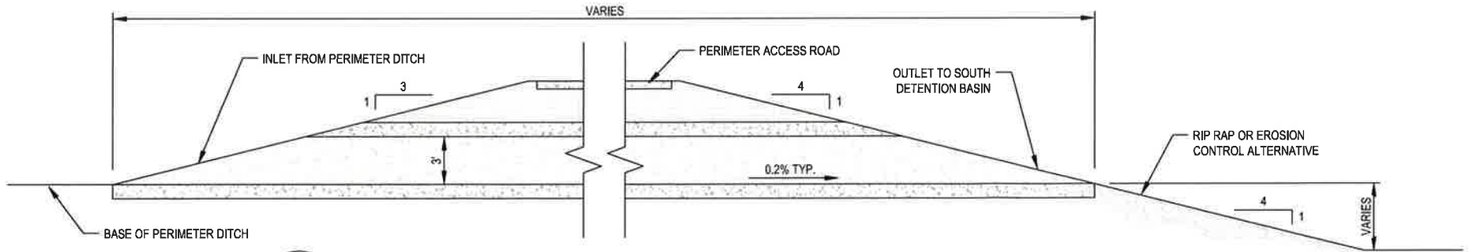
DATE: APRIL 2015

DRAWING NO.
III
C.2-5
5 OF 19 SHEETS



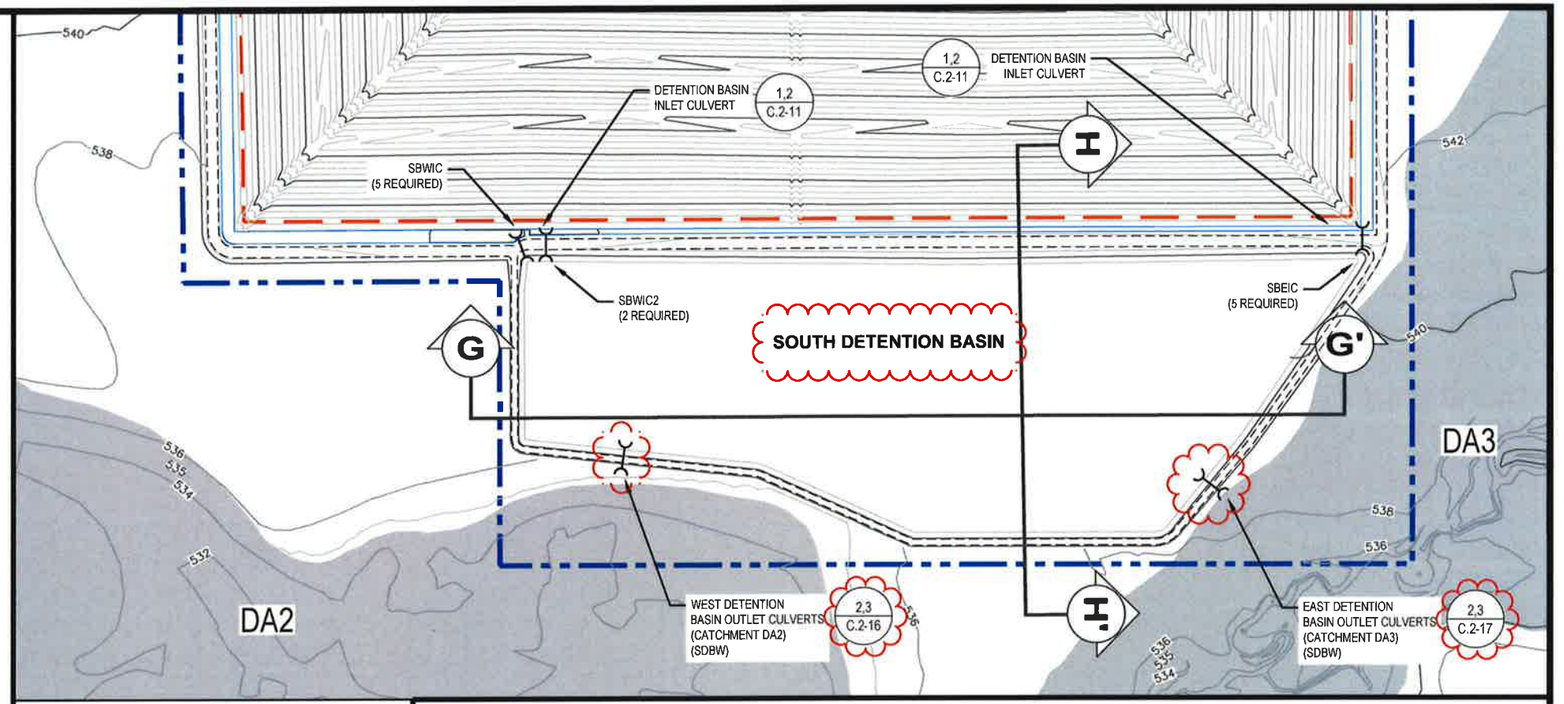
1 C.2-11 **TYPICAL DETENTION BASIN CULVERT PASSAGE - PLAN VIEW**

(SBWIC, SBWIC2, SBEIC)
NOT TO SCALE



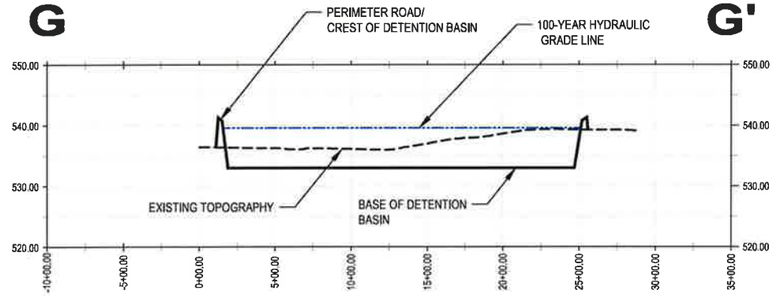
2 C.2-11 **DETENTION BASIN INLET CULVERT PASSAGE - SECTION VIEW**

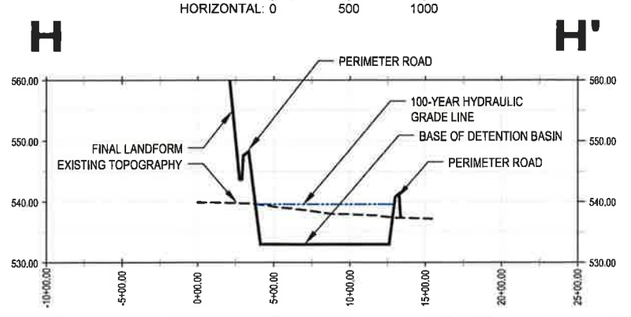
NOT TO SCALE



LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- PERIMETER ROAD
- PERIMETER STORMWATER DITCH
- MITERED CONCRETE CULVERT
- CLOMR100-YEAR FLOODPLAIN





REV. NO.	DATE	DESCRIPTION
4	11/2016	REVISED SOUTH DETENTION BASIN OUTLETS

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WEBB COUNTY, TEXAS
MSW 2374

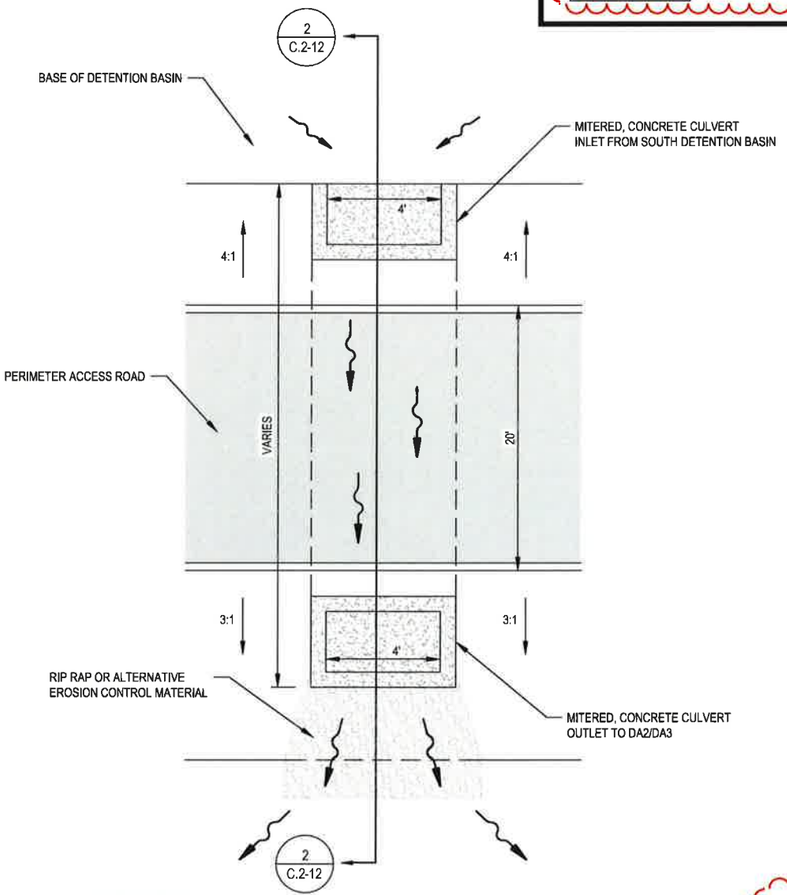
FACILITY SURFACE WATER DRAINAGE REPORT
DETENTION BASIN PLAN, PROFILE, AND DETAILS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015
DRAWING NO.
III
C.2-11
11 OF 19 SHEETS

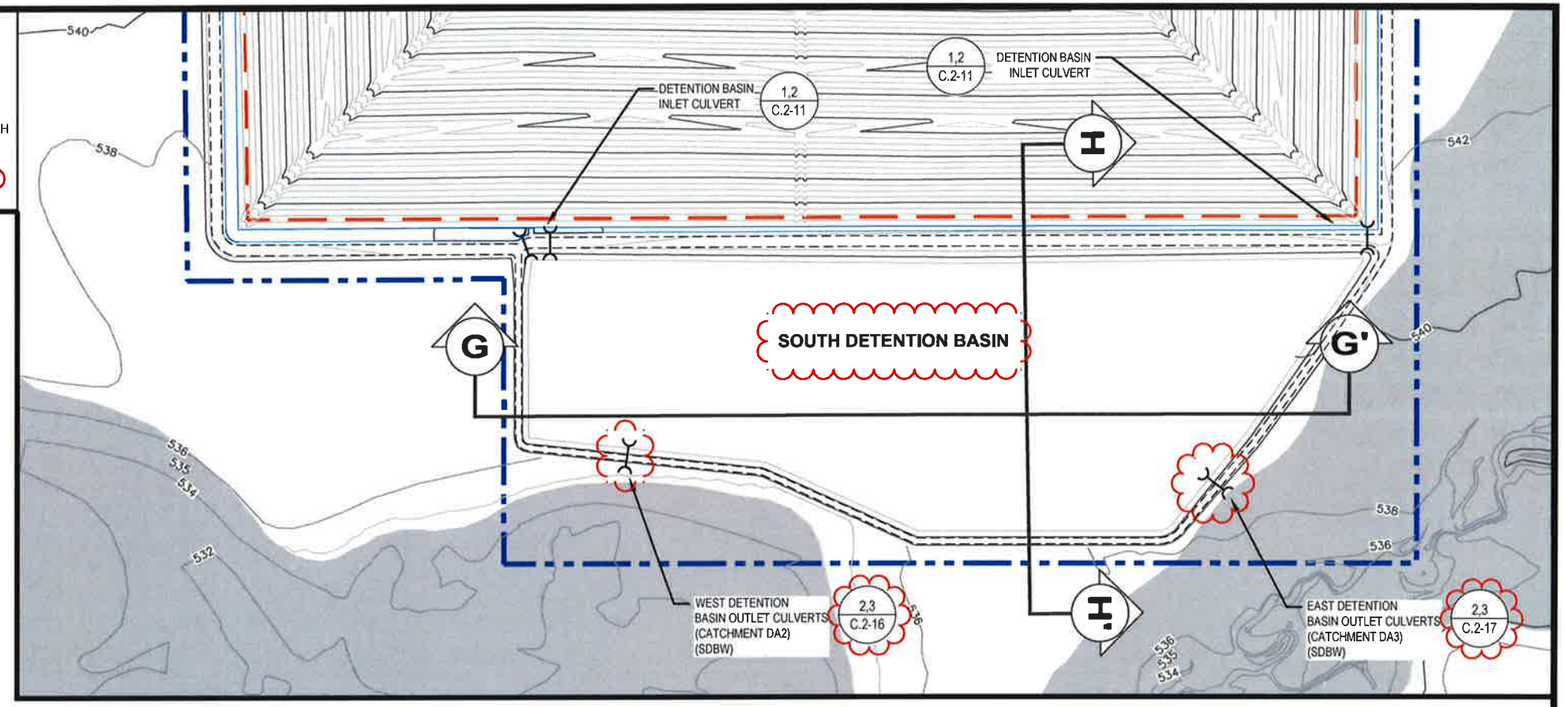
LEGEND

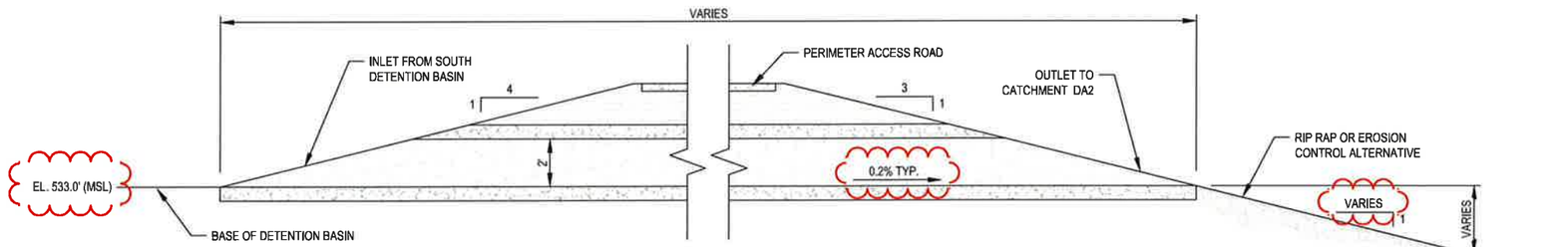
- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- PERIMETER ROAD
- PERIMETER STORMWATER DITCH
- MITERED CONCRETE CULVERT
- CLOMR100-YEAR FLOODPLAIN



1 / C.2-12 TYPICAL DETENTION BASIN OUTLET CULVERT PASSAGE - PLAN VIEW

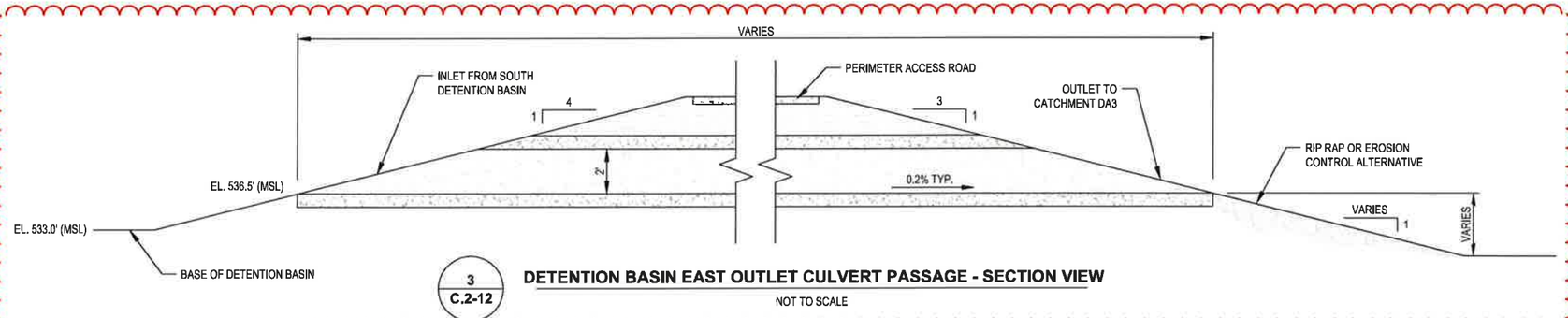
(SDBE & SDBW)
NOT TO SCALE





2 / C.2-12 DETENTION BASIN WEST OUTLET CULVERT PASSAGE - SECTION VIEW

NOT TO SCALE



3 / C.2-12 DETENTION BASIN EAST OUTLET CULVERT PASSAGE - SECTION VIEW

NOT TO SCALE

REV. NO.	DATE	DESCRIPTION
4	11/2016	REVISED CULVERT DETAILS

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PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

FACILITY SURFACE WATER DRAINAGE REPORT
DETENTION BASIN PLAN, PROFILE, AND DETAILS

PROJ. NO.:	148866
DESIGNED BY:	–
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO

DATE: APRIL 2015

DRAWING NO.
III
C.2-12
12 OF 19 SHEETS

Redline / Strikeout Version

Part III, Appendix III-C.3

Facility Surface Water Drainage Analysis

Part III
Attachment III-C
Appendix III-C.3

FACILITY SURFACE WATER DRAINAGE ANALYSIS

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Supplement April 2015
Technically Complete March 11, 2016
Modified November 2016

Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:
CB&I Environmental and Infrastructure, Inc.

12005 Ford Rd, Suite 600
Dallas, TX 75234

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Attachments

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ATTACHMENT III-C

APPENDIX III-C.3

FACILITY SURFACE WATER DRAINAGE ANALYSIS

10. DETENTION BASIN SIZING (III-C.3-10)

Submitted March 2015
Supplement April 2015
Technically Complete March 11, 2016
Modified November 2016

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CBI

Client:	**Rancho Viejo Waste Management, LLC**
Project:	**Pescadito Environmental Resource Center**
Project #:	**148866**
Calculated By:	**MTE** **Date: 4/13/15**
Checked By:	**RDS** **Date: 4/15/15**

TITLE: DETENTION BASIN SIZING

Problem Statement

Determine whether the detention basin that detains stormwater for the proposed PERC is adequately sized. The basin shall be considered to be adequately sized if the following conditions are met, based on best management practices:

1. The release rate from the detention basin for the 100-year, 24-hour storm results in an overall site discharge that is substantially similar to the overall discharge calculated in the CLOMR.

2. One foot of freeboard exists between the 100-year, 24-hour storm event peak elevation and the crest elevation of the detention basin.

Given

- ❑ Mannings Coefficient HydroCAD default value of 0.012 for concrete culverts

- ❑ The south detention basin will have two discharge points, located approximately at the southwest and southeast corners of the basin. The discharge point at the southeast~~west~~ end of the detention basin will consist of 6~~4~~ - 24" x 48" box culverts at invert elevation 536.5 ft NGVD. The discharge point at the southwest~~east~~ end of the detention basin will consist of 5~~10~~ - 24" x 48" box culverts at invert elevation 533 ft NGVD. The culvert discharge areas will be reinforced with rip-rap or an erosion control alternative to prevent erosion and scour. The basin outlet design may be changed at the owner/operator's discretion, as long as the new design is equivalent.

- ❑ The size, outlet structures, and model results for the proposed stormwater detention basin is provided in Table C.3-10. Design values were calculated using AutoCAD Civil 3D 2014.

- ❑ Drawings 5 and 6 of Appendix III-C.2 show the location of the south detention basin.

Calculations

HydroCAD was used to model the peak storage volume of the detention basin. The storage volume considers both the inflow (which generally includes stormwater collection from the landfill and surrounding area), elevation-storage relationships of the detention basin, and outflow from the basin discharge structures.

Client:	**Rancho Viejo Waste Management, LLC**		
Project:	**Pescadito Environmental Resource Center**		
Project #:	**148866**		
Calculated By:	**MTE**	**Date:**	**4/13/15**
Checked By:	**RDS**	**Date:**	**4/15/15**

TITLE: DETENTION BASIN SIZING

AutoCAD Civil 3D 2014 was used to determine the design dimensions and volumes for the detention basin. Please refer to Appendix III-C.4 for the HydroCAD output files.

Results

Based on the HydroCAD model for the Pescadito Environmental Resource Center, the proposed detention basin is adequately sized. Table C.3-10 summarizes the results of the HydroCAD calculations. The discharge rate comparison (Criteria #1 above) is discussed in Appendix III-C.1.

TABLE C.3-10 Detention Basin Design Summary Pescadito Environmental Resource Center			
Detention Basin General Design	Capture Area	acres	809.84
	Basin Sideslopes	H:V	4:1
	Normal Water Level	ft MSL	533
	Crest Elevation	ft MSL	540.8
Outlet Structures (Southwest)	Culvert Height	in	24
	Culvert Width	in	48
	Number of Outlet Culverts	Quantity	~~10~~ 5
	Outlet Structure Elevation	ft MSL	533
	Maximum Discharge Rate 25-year, 24-hour Storm	cfs	~~614.13~~ 350.65
	Maximum Discharge Rate 100-year, 24-hour Storm	cfs	~~717.41~~ 391.24
Outlet Structures (Southeast)	Culvert Height	in	24
	Culvert Width	in	48
	Number of Outlet Culverts	Quantity	~~4~~ 6
	Outlet Structure Elevation	ft MSL	536.5
	Maximum Discharge Rate 25-year, 24-hour Storm	cfs	~~27.42~~ 134.45
	Maximum Discharge Rate 100-year, 24-hour Storm	cfs	~~104.59~~ 246.67
Modeling Results	Maximum Discharge Rate 25-year, 24-hour Storm	cfs	~~641.55~~ 485.10
	Maximum Discharge Rate 100-year, 24-hour Storm	cfs	~~822~~ 637.91
	Peak Water Elevation 25-year, 24-hour Storm	ft MSL	~~537.29~~ 538.28
	Peak Water Elevation 100-year, 24-hour Storm	ft MSL	~~538.47~~ 539.86

Redline / Strikeout Version

Part III, Appendix III-C.4

HydroCAD Model Output Files

Part III
Attachment III-C
Appendix III-C.4

HYDROCAD MODEL OUTPUTS

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Supplement April 2015
Technically Complete March 11, 2016
Modified November 2016

Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:
CB&I Environmental and Infrastructure, Inc.

CBI

12005 Ford Rd, Suite 600
Dallas, TX 75234

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HYDROCAD MODEL OUTPUT FILES

3. PROPOSED CONDITIONS (POST-DEVELOPMENT)

A. MODEL DIAGRAMS

B. LANDFILL WATERSHED A (TYPICAL OF WATERSHEDS C, E, G, J, K, M, & O)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

C. LANDFILL WATERSHED B (TYPICAL OF WATERSHEDS D, F, J, L, N, & P)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

D. LANDFILL PERIMETER DITCH, CULVERT, & BASIN SYSTEM

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

E. REGIONAL STORMWATER CONDITIONS

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

Submitted March 2015
Supplement April 2015
Technically Complete March 11, 2016
Modified November 2016

35.00' x 4.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 4.0 '/' Top Width= 63.00'
Length= 185.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.56'

‡

Summary for Pond PSDB: South Detention Basin

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth = 8.58" for 100-Year, 24-Hour event
Inflow = 2,275.01 cfs @ 12.71 hrs, Volume= 579.178 af
Outflow = 822.00 cfs @ 14.01 hrs, Volume= 567.540 af, Atten= 64%, Lag= 78.4 min
Primary = 717.41 cfs @ 14.01 hrs, Volume= 544.112 af
Secondary = 104.59 cfs @ 14.01 hrs, Volume= 23.428 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 538.47' @ 14.01 hrs Surf.Area= 1,988,335 sf Storage= 10,488,455 cf

Plug-Flow detention time= 223.2 min calculated for 567.540 af (98% of inflow)
Center-of-Mass det. time= 209.5 min (1,046.1 - 836.6)

Volume	Invert	Avail.Storage	Storage Description
#1	533.00'	13,552,994 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
533.00	1,843,612	0	0
540.00	2,028,672	13,552,994	13,552,994

Device	Routing	Invert	Outlet Devices
#1	Primary	533.00'	**48.0" W x 24.0" H Box Culvert X 10.00** L= 80.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 533.00' / 532.84' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf
#2	Secondary	536.50'	**48.0" W x 24.0" H Box Culvert X 4.00** L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 536.50' / 536.40' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf

Primary OutFlow Max=717.42 cfs @ 14.01 hrs HW=538.47' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 717.42 cfs @ 8.97 fps)

Secondary OutFlow Max=104.58 cfs @ 14.01 hrs HW=538.47' (Free Discharge)
↑—**2=Culvert** (Barrel Controls 104.58 cfs @ 4.41 fps)

Summary for Link P: Watershed P

Inflow Area = 46.766 ac, 0.00% Impervious, Inflow Depth = 8.53" for 100-Year, 24-Hour event
Inflow = 349.50 cfs @ 12.12 hrs, Volume= 33.246 af
Primary = 349.50 cfs @ 12.12 hrs, Volume= 33.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

100-Year, 24-Hour Outflow Imported from T:\Projects\2013\Pescadito Landfill\Design\Stormwater (Plan B)\Text a

Summary for Link toDA2: Discharge to DA2

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth > 8.06" for 100-Year, 24-Hour event
Inflow = 717.41 cfs @ 14.01 hrs, Volume= 544.112 af
Primary = 717.41 cfs @ 14.01 hrs, Volume= 544.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link toDA3: Discharge to DA3

Inflow = 104.59 cfs @ 14.01 hrs, Volume= 23.428 af
Primary = 104.59 cfs @ 14.01 hrs, Volume= 23.428 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

ATTACHMENT III-C

APPENDIX III-C.4

HYDROCAD MODEL OUTPUT FILES

3. PROPOSED CONDITIONS (POST-DEVELOPMENT)

A. MODEL DIAGRAMS

B. LANDFILL WATERSHED A (TYPICAL OF WATERSHEDS C, E, G, J, K, M, & O)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

C. LANDFILL WATERSHED B (TYPICAL OF WATERSHEDS D, F, J, L, N, & P)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

D. LANDFILL PERIMETER DITCH, CULVERT, & BASIN SYSTEM

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

E. REGIONAL STORMWATER CONDITIONS

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

Submitted March 2015
Supplement April 2015
Technically Complete March 11, 2016
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35.00' x 4.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 4.0 '/' Top Width= 63.00'
Length= 185.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.56'

‡

Summary for Pond PSDB: South Detention Basin

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth = 6.70" for 25-Year, 24-Hour event
Inflow = 1,612.96 cfs @ 12.80 hrs, Volume= 452.020 af
Outflow = 641.55 cfs @ 14.23 hrs, Volume= 441.111 af, Atten= 60%, Lag= 85.7 min
Primary = 614.13 cfs @ 14.23 hrs, Volume= 437.023 af
Secondary = 27.42 cfs @ 14.23 hrs, Volume= 4.088 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 537.29' @ 14.23 hrs Surf.Area= 1,957,046 sf Storage= 8,153,736 cf

Plug-Flow detention time= 227.2 min calculated for 440.988 af (98% of inflow)
Center-of-Mass det. time= 211.2 min (1,059.2 - 847.9)

Volume	Invert	Avail.Storage	Storage Description
#1	533.00'	13,552,994 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
533.00	1,843,612	0	0
540.00	2,028,672	13,552,994	13,552,994

Device	Routing	Invert	Outlet Devices
#1	Primary	533.00'	**48.0" W x 24.0" H Box Culvert X 10.00** L= 80.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 533.00' / 532.84' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf
#2	Secondary	536.50'	**48.0" W x 24.0" H Box Culvert X 4.00** L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 536.50' / 536.40' S= 0.0020 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 8.00 sf

Primary OutFlow Max=614.14 cfs @ 14.23 hrs HW=537.29' (Free Discharge)
└**1=Culvert** (Inlet Controls 614.14 cfs @ 7.68 fps)

Secondary OutFlow Max=27.41 cfs @ 14.23 hrs HW=537.29' (Free Discharge)
└**2=Culvert** (Barrel Controls 27.41 cfs @ 2.89 fps)

Summary for Link P: Watershed P

Inflow Area = 46.766 ac, 0.00% Impervious, Inflow Depth = 6.65" for 25-Year, 24-Hour event
Inflow = 236.48 cfs @ 12.15 hrs, Volume= 25.907 af
Primary = 236.48 cfs @ 12.15 hrs, Volume= 25.907 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

25-Year, 24-Hour Outflow Imported from T:\Projects\2013\Pescadito Landfill\Design\Stormwater (Plan B)\Text anc

Summary for Link toDA2: Discharge to DA2

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth > 6.48" for 25-Year, 24-Hour event
Inflow = 614.13 cfs @ 14.23 hrs, Volume= 437.023 af
Primary = 614.13 cfs @ 14.23 hrs, Volume= 437.023 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link toDA3: Discharge to DA3

Inflow = 27.42 cfs @ 14.23 hrs, Volume= 4.088 af
Primary = 27.42 cfs @ 14.23 hrs, Volume= 4.088 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

ATTACHMENT III-C

APPENDIX III-C.4

HYDROCAD MODEL OUTPUT FILES

3. PROPOSED CONDITIONS (POST-DEVELOPMENT)

A. MODEL DIAGRAMS

B. LANDFILL WATERSHED A (TYPICAL OF WATERSHEDS C, E, G, J, K, M, & O)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

C. LANDFILL WATERSHED B (TYPICAL OF WATERSHEDS D, F, J, L, N, & P)

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

D. LANDFILL PERIMETER DITCH, CULVERT, & BASIN SYSTEM

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

II. 25-YEAR, 24 HOUR (NON-ADJUSTED – 7.6 INCHES)

E. REGIONAL STORMWATER CONDITIONS

I. 100-YEAR, 24 HOUR (ADJUSTED RAINFALL – 9.5 INCHES)

Submitted March 2015
Supplement April 2015
Technically Complete March 11, 2016
Modified November 2016

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=556.00' (Free Discharge)
└**1=556562** (Controls 0.00 cfs)

Summary for Pond BT: West Detention Basin

Inflow Area = 5,437.747 ac, 0.00% Impervious, Inflow Depth = 5.74" for 100-Year, 24-Hour event
Inflow = 6,977.36 cfs @ 14.39 hrs, Volume= 2,601.214 af
Outflow = 5,960.38 cfs @ 15.04 hrs, Volume= 2,601.214 af, Atten= 15%, Lag= 39.1 min
Primary = 5,960.38 cfs @ 15.04 hrs, Volume= 2,601.214 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 547.57' @ 15.04 hrs Surf.Area= 118.164 ac Storage= 348.911 af

Plug-Flow detention time= 34.9 min calculated for 2,600.492 af (100% of inflow)
Center-of-Mass det. time= 34.9 min (1,004.3 - 969.4)

Volume	Invert	Avail.Storage	Storage Description
#1	542.00'	401.600 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
542.00	14.400	0.000	0.000
544.00	37.000	51.400	51.400
546.00	94.200	131.200	182.600
548.00	124.800	219.000	401.600

Device	Routing	Invert	Outlet Devices
#1	Primary	542.00'	**Special & User-Defined** Elev. (feet) 542.00 544.00 546.00 548.00 Disch. (cfs) 0.000 1,273.000 3,600.000 6,614.000

Primary OutFlow Max=5,960.38 cfs @ 15.04 hrs HW=547.57' (Free Discharge)
└**1=Special & User-Defined** (Custom Controls 5,960.38 cfs)

Summary for Link J1: Junction-1

Inflow Area = 14,125.662 ac, 0.35% Impervious, Inflow Depth > 5.72" for 100-Year, 24-Hour event
Inflow = 14,070.88 cfs @ 14.67 hrs, Volume= 6,734.902 af
Primary = 14,070.88 cfs @ 14.67 hrs, Volume= 6,734.902 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link JDA2: Junction DA2

Inflow Area = 1,559.638 ac, 3.14% Impervious, Inflow Depth > 6.90" for 100-Year, 24-Hour event
Inflow = 2,028.14 cfs @ 13.53 hrs, Volume= 897.156 af
Primary = 2,028.14 cfs @ 13.53 hrs, Volume= 897.156 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link JDA3: Junction DA3

Inflow Area = 3,149.669 ac, 0.00% Impervious, Inflow Depth = 5.36" for 100-Year, 24-Hour event
Inflow = 4,311.24 cfs @ 13.94 hrs, Volume= 1,405.732 af
Primary = 4,311.24 cfs @ 13.94 hrs, Volume= 1,405.732 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link Junction-2: Junction-2

Inflow Area = 7,128.277 ac, 0.00% Impervious, Inflow Depth = 5.45" for 100-Year, 24-Hour event
Inflow = 7,194.96 cfs @ 14.40 hrs, Volume= 3,236.659 af
Primary = 7,194.96 cfs @ 14.40 hrs, Volume= 3,236.659 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link SDBE: South Detention Basin East

Inflow = 104.59 cfs @ 14.01 hrs, Volume= 23.428 af
Primary = 104.59 cfs @ 14.01 hrs, Volume= 23.428 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

100-Year, 24-Hour Primary Outflow Imported from Pescadito Perimeter~Link toDA3.hce

Summary for Link SDBW: South Detention Basin West

Inflow Area = 809.838 ac, 6.05% Impervious, Inflow Depth > 8.06" for 100-Year, 24-Hour event
Inflow = 717.41 cfs @ 14.01 hrs, Volume= 544.112 af
Primary = 717.41 cfs @ 14.01 hrs, Volume= 544.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

100-Year, 24-Hour Primary Outflow Imported from Pescadito Perimeter~Link toDA2.hce

Redline / Strikeout Version

Part III, Appendix III-D.6

Leachate and Contaminated Water Plan

Part III
Attachment III-D
Appendix III - D.6

LEACHATE AND CONTAMINATED WATER PLAN

Pescadito Environmental Resource Center
MSW-2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Revised September 2015
Technically Complete March 11, 2016
Modified October 2016
Modified November 2016

Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

Prepared by:
CB&I Environmental and Infrastructure, Inc.
12005 Ford Rd, Suite 600
Dallas, TX 75234

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ATTACHMENTS

Attachment A to Appendix III-D.6: Contaminated Water/Leachate Collection System Design Analysis

1. Loads on the Leachate Collection System
2. Ring Deflection of Leachate Pipe
3. Structural Capacity of the Leachate Collection System
4. Compressed Thickness and Hydraulic Conductivity of the Geonet
5. Help Model Analysis
6. Leachate Collection System Flow Rates
7. Geotextile Permittivity
8. Leachate Collection System Design
9. Leachate Tank Size

Attachment B to Appendix D.6: HELP Model Outputs

3.4 Leachate Pump and Riser System

Extraction of leachate from the collection sumps will be accomplished by submersible pumps, which can be operated either manually or automatically. Leachate levels in the collection sumps, will be monitored to maintain a head buildup of no greater than the lowest point of the landfill floor adjacent to the sump in each cell.

Sump riser pipes will be located directly up the sideslopes from the sumps at the disposal area perimeter. Risers will be 18-inch diameter HDPE pipe and provide a means for lowering submersible pumps down the 3:1 sideslope incline into the collection sumps. The lower portion of the riser within the sump is perforated (1/2-inch diameter holes), which will allow leachate to flow to the pumps.

The depth of leachate on the liner will be measured using electronic transducers mounted on the leachate pump. Leachate pumps will be sized appropriately to ensure that leachate levels can be maintained at a depth no greater than the lowest point of the landfill floor adjacent to the sump in each cell, without short-cycling. Pumps will be automatically controlled using liquid level sensors installed at appropriate elevations to activate the pump when the leachate level reaches the lowest point of the landfill floor adjacent to~~is ten inches above the top of~~ the sump, and deactivate the pump when the leachate level is six inches, or less above the bottom of the sump.

3.5 Conveyance

Leachate will be transferred to storage tanks or disposal locations by tanker truck or pipeline. Leachate may be withdrawn from the collection sumps or lines, or storage tanks/ponds into tanker trucks. Spill containment for truck hose connection and loading will be provided by a portable trough or similar spill containment. Protection will be provided at hose connection locations. Contaminated water will be transported to an authorized and permitted facility, or to the on-site evaporation pond, for treatment and disposal.

3.6 Leachate Storage

Leachate will be stored on-site in two on-site leachate storage tanks or evaporation pond prior to transport to a permitted treatment facility. The leachate storage facility will have adequate secondary containment in the event of a tank failure. Secondary containment will be sized to

Redline / Strikeout Version

Part III, Appendix III-F.1

Groundwater Monitoring Plan Figures

Part III
Attachment III-F
Appendix III-F.1

GROUNDWATER MONITORING PLAN FIGURES

Pescadito Environmental Resource Center
MSW No. 2374
Webb County, Texas

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015
Revised September 2015
Revised November 2015
Revised January 2016
Technically Complete March 11, 2016
Modified October 2016
Modified November 2016

Prepared for:
Rancho Viejo Waste Management, LLC
1116 Calle del Norte
Laredo, TX 78041

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Prepared by:
CB&I Environmental and Infrastructure, Inc.

CBI

12005 Ford Rd, Suite 600
Dallas, TX 75234

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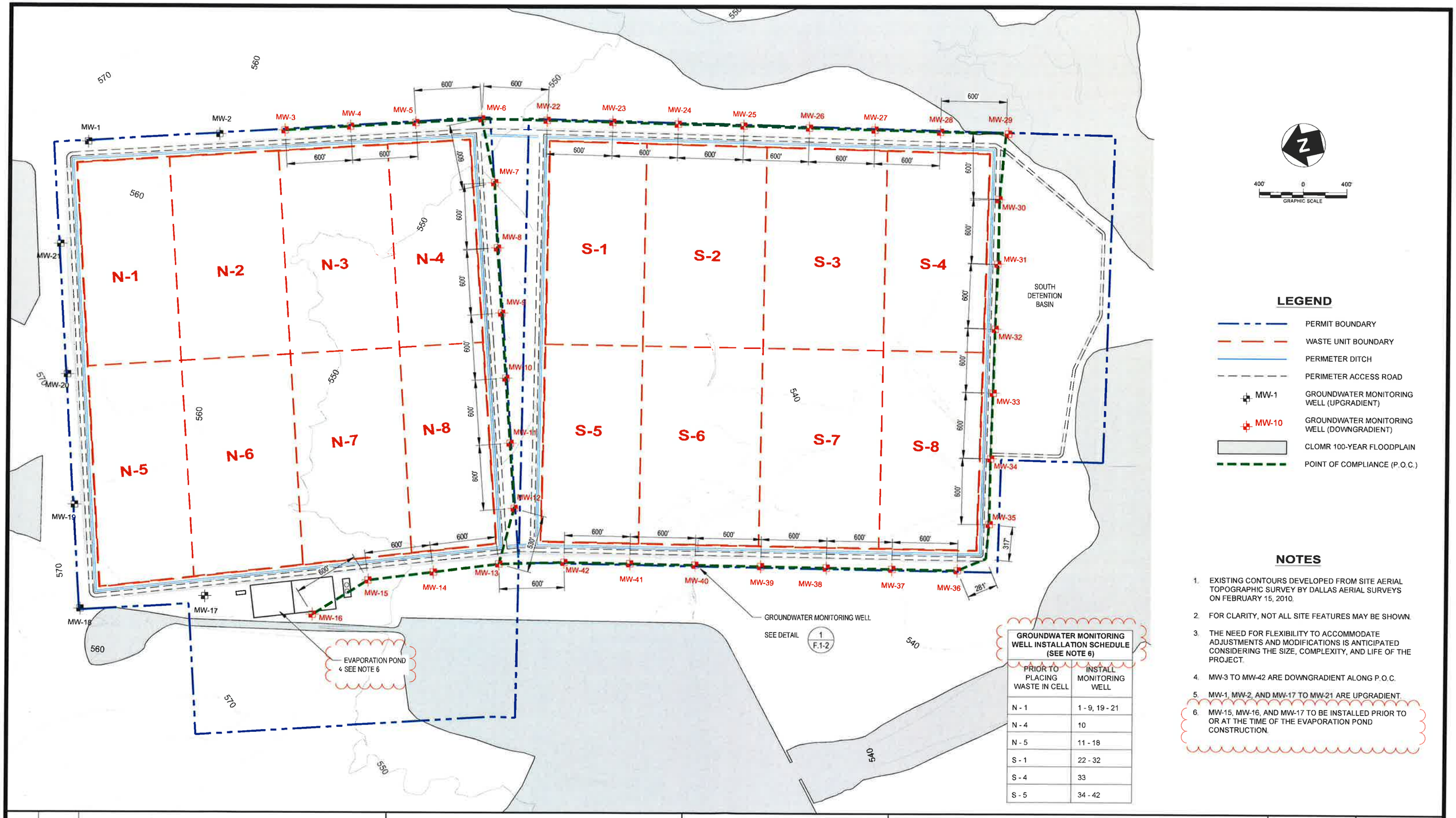

LEGEND

- PERMIT BOUNDARY
- WASTE UNIT BOUNDARY
- PERIMETER DITCH
- PERIMETER ACCESS ROAD
- MW-1 — GROUNDWATER MONITORING WELL (UPGRADIENT)
- MW-10 — GROUNDWATER MONITORING WELL (DOWNGRADIENT)
- CLOMR 100-YEAR FLOODPLAIN
- POINT OF COMPLIANCE (P.O.C.)

GROUNDWATER MONITORING WELL INSTALLATION SCHEDULE (SEE NOTE 6)

PRIOR TO PLACING WASTE IN CELL	INSTALL MONITORING WELL
N - 1	1 - 9, 19 - 21
N - 4	10
N - 5	11 - 18
S - 1	22 - 32
S - 4	33
S - 5	34 - 42

NOTES

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY DALLAS AERIAL SURVEYS ON FEBRUARY 15, 2010.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. THE NEED FOR FLEXIBILITY TO ACCOMMODATE ADJUSTMENTS AND MODIFICATIONS IS ANTICIPATED CONSIDERING THE SIZE, COMPLEXITY, AND LIFE OF THE PROJECT.
4. MW-3 TO MW-42 ARE DOWNGRADIENT ALONG P.O.C.
5. MW-1, MW-2, AND MW-17 TO MW-21 ARE UPGRADIENT.
6. MW-15, MW-16, AND MW-17 TO BE INSTALLED PRIOR TO OR AT THE TIME OF THE EVAPORATION POND CONSTRUCTION.

REV. NO.	DATE	DESCRIPTION
4	11/2016	REVISED SCHEDULE FOR MW-15, MW-16 & MW-17
3	10/2016	REVISED WELL LAYOUT / ADDED INSTALLATION SCHEDULE
2	11/2015	NOD 2
1	9/2015	NOD 1

CB&I Environmental & Infrastructure, Inc.
TBPE FIRM F-5650

STATE OF TEXAS — MICHAEL W. ODEN — 67165 — REGISTERED PROFESSIONAL ENGINEER

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF PERMITTING UNDER THE AUTHORITY OF MICHAEL W. ODEN, P.E. 67165.

PESCADITO ENVIRONMENTAL RESOURCE CENTER
WEBB COUNTY, TEXAS
MSW 2374

GROUNDWATER MONITORING SYSTEM PLAN

PROJ. NO.:	148866
DESIGNED BY:	-
DRAWN BY:	MTE
CHECKED BY:	RDS
APPROVED BY:	MWO
DATE:	APRIL 2015
DRAWING NO.	III F.1-1
	1 OF 2 SHEETS

Attachment D

to November 2016 Supplement Letter (MSW 2374)

Three copies of Changed Pages (TCEQ Only)