PROJECT REPORT

TO: ENVIRONMENTAL EVALUATION COMMITTEE **AGENDA DATE: February 14,2019**

FROM: PLANNING & DEVELOPMENT SERVICES DEPT. **AGENDA TIME 1:30 PM/No. 2**

PROJECT TYPE: All American Grain – GPA18-0001; ZC18-0002 SUPERVISOR DIST #4

LOCATION: 305 Yocum Road APN: 024-260-032-000

Calipatria, CA PARCEL SIZE: 89 +/- acres

GENERAL PLAN (existing) Urban GENERAL PLAN (proposed) N/A

ZONE (existing) A-2 ZONE (proposed) M-2

GENERAL PLAN FINDINGS ☒ CONSISTENT ☐ INCONSISTENT ☐ MAY BE/FINDINGS

PLANNING COMMISSION DECISION: HEARING DATE:

☐ APPROVED ☐ DENIED ☐ OTHER

PLANNING DIRECTORS DECISION: HEARING DATE:

☐ APPROVED ☐ DENIED ☐ OTHER

ENVIROMENTAL EVALUATION COMMITTEE DECISION: HEARING DATE: 02/14/19

INITIAL STUDY: 18-0007

☐ NEGATIVE DECLARATION ☐ MITIGATED NEG. DECLARATION ☐ EIR

DEPARTMENTAL REPORTS / APPROVALS:

PUBLIC WORKS	☐ NONE	☒ ATTACHED
AG / APCD	☐ NONE	☒ ATTACHED
E.H.S.	☐ NONE	☐ ATTACHED
FIRE / OES	☐ NONE	☐ ATTACHED
OTHER	Augustine Band of Cahuilla Indians, Colorado River Indian Tribes, Imperial Irrigation District	

REQUESTED ACTION:

SEE ATTACHED

Imperial County Planning & Development Services
(Jim Minnick, Director)
801 MAIN ST., EL CENTRO, CA.., 92243 760-482-4236
GM\DB\S:\APN\024\260\032\GPA 18-0001 project\EEC\GPA18-0001 - EECPROJREPT 021419.doc

Initial Study #18-0007

☐ NEGATIVE DECLARATION
☐ MITIGATED NEGATIVE DECLARATION

Initial Study & Environmental Analysis
For:

All American Grain Company, LLC

IS#18-0007
GPA # 18-0001 & ZC 18-0002

1907

Prepared By:

COUNTY OF IMPERIAL
Planning & Development Services Department
801 Main Street
El Centro, CA 92243
(442) 265-1736
www.icpds.com

February 2019

TABLE OF CONTENTS

SECTION 1
INTRODUCTION

A. PURPOSE

This document is a ☐ policy-level, ☒ project level Initial Study for the evaluation of potential environmental impacts resulting with the proposed Zone Change #18-0002 , General Plan Amendment # 18-0001 for Initial Study#18-0007. For purposes of this document, the abovementioned project will be called the "proposed application". as shown on Exhibit A & B.

B. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) REQUIREMENTS AND THE IMPERIAL COUNTY'S GUIDELINES FOR IMPLEMENTING CEQA

As defined by Section 15063 of the State California Environmental Quality Act (CEQA) Guidelines and Section 7 of the County's "CEQA Regulations Guidelines for the Implementation of CEQA, as amended", an **Initial Study** is prepared primarily to provide the Lead Agency with information to use as the basis for determining whether an Environmental Impact Report (EIR), Negative Declaration, or Mitigated Negative Declaration would be appropriate for providing the necessary environmental documentation and clearance for any proposed project.

☐ According to Section 15065, an **EIR** is deemed appropriate for a particular proposal if the following conditions occur:

- The proposal has the potential to substantially degrade quality of the environment.
- The proposal has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- The proposal has possible environmental effects that are individually limited but cumulatively considerable.
- The proposal could cause direct or indirect adverse effects on human beings.

☐ According to Section 15070(a), a **Negative Declaration** is deemed appropriate if the proposal would not result in any significant effect on the environment.

☐ According to Section 15070(b), a **Mitigated Negative Declaration** is deemed appropriate if it is determined that though a proposal could result in a significant effect, mitigation measures are available to reduce these significant effects to insignificant levels.

This Initial Study has determined that the proposed applications will not result in any potentially significant environmental impacts and therefore, a Mitigated Negative Declaration is deemed as the appropriate document to provide necessary environmental evaluations and clearance as identified hereinafter.

This Initial Study and Mitigated Negative Declaration are prepared in conformance with the California Environmental Quality Act of 1970, as amended (Public Resources Code, Section 21000 et. seq.); Section 15070 of the State & County of Imperial's Guidelines for Implementation of the California Environmental Quality Act of 1970, as amended (California Code of Regulations, Title 14, Chapter 3, Section 15000, et. seq.); applicable requirements of the County of Imperial; and the regulations, requirements, and procedures of any other responsible public agency or an agency with jurisdiction by law.

Pursuant to the County of Imperial Guidelines for Implementing CEQA as amended, depending on the project scope, the County of Imperial Board of Supervisors, Planning Commission and/or Planning Director is designated the Lead Agency, in accordance with Section 15050 of the CEQA Guidelines. The Lead Agency is the public agency which has the principal responsibility for approving the necessary environmental clearances and analyses for any project in the County.

C. INTENDED USES OF INITIAL STUDY AND NEGATIVE DECLARATION

This Initial Study and Negative Declaration are informational documents which are intended to inform County of Imperial decision makers, other responsible or interested agencies, and the general public of potential environmental effects of the proposed applications. The environmental review process has been established to enable public agencies to evaluate environmental consequences and to examine and implement methods of eliminating or reducing any potentially adverse impacts. While CEQA requires that consideration be given to avoiding environmental damage, the Lead Agency and other responsible public agencies must balance adverse environmental effects against other public objectives, including economic and social goals.

The Initial Study and Mitigated Negative Declaration, prepared for the project will be circulated for a period of 30 days (*30-days if submitted to the State Clearinghouse for a project of area-wide significance*) for public and agency review and comments. At the conclusion, if comments are received, the County Planning & Development Services Department will prepare a document entitled "Responses to Comments" which will be forwarded to any commenting entity and be made part of the record within 10-days of any project consideration.

D. CONTENTS OF INITIAL STUDY & NEGATIVE DECLARATION

This Initial Study is organized to facilitate a basic understanding of the existing setting and environmental implications of the proposed applications.

SECTION 1

I. INTRODUCTION presents an introduction to the entire report. This section discusses the environmental process, scope of environmental review, and incorporation by reference documents.

SECTION 2

II. ENVIRONMENTAL CHECKLIST FORM contains the County's Environmental Checklist Form. The checklist form presents results of the environmental evaluation for the proposed applications and those issue areas that would have either a significant impact, potentially significant impact, or no impact.

PROJECT SUMMARY, LOCATION AND EVIRONMENTAL SETTINGS describes the proposed project entitlements and required applications. A description of discretionary approvals and permits required for project implementation is also included. It also identifies the location of the project and a general description of the surrounding environmental settings.

ENVIRONMENTAL ANALYSIS evaluates each response provided in the environmental checklist form. Each response checked in the checklist form is discussed and supported with sufficient data and analysis as necessary. As appropriate, each response discussion describes and identifies specific impacts anticipated with project implementation.

SECTION 3

III. MANDATORY FINDINGS presents Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

IV. PERSONS AND ORGANIZATIONS CONSULTED identifies those persons consulted and involved in preparation of this Initial Study and Mitigated Negative Declaration.

V. REFERENCES lists bibliographical materials used in preparation of this document.

VI. MITIGATED NEGATIVE DECLARATION – COUNTY OF IMPERIAL

VII. FINDINGS

SECTION 4

VIII. RESPONSE TO COMMENTS (IF ANY)

IX. MITIGATION MONITORING & REPORTING PROGRAM (MMRP)

E. SCOPE OF ENVIRONMENTAL ANALYSIS

For evaluation of environmental impacts, each question from the Environmental Checklist Form is summarized and responses are provided according to the analysis undertaken as part of the Initial Study. Impacts and effects will be evaluated and quantified, when appropriate. To each question, there are four possible responses, including:

1. **No Impact:** A "No Impact" response is adequately supported if the impact simply does not apply to the proposed applications.

2. **Less Than Significant Impact:** The proposed applications will have the potential to impact the environment. These impacts, however, will be less than significant; no additional analysis is required.

3. **Less Than Significant With Mitigation Incorporated:** This applies where incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact".

4. **Potentially Significant Impact:** The proposed applications could have impacts that are considered significant. Additional analyses and possibly an EIR could be required to identify mitigation measures that could reduce these impacts to less than significant levels.

F. POLICY-LEVEL or PROJECT LEVEL ENVIRONMENTAL ANALYSIS

This Initial Study and Negative Declaration will be conducted under a ☐ policy-level, ☒ project level analysis. Regarding mitigation measures, it is not the intent of this document to "overlap" or restate conditions of approval that are commonly established for future known projects or the proposed applications. Additionally, those other standard requirements and regulations that any development must comply with, that are outside the County's jurisdiction, are also not considered mitigation measures and therefore, will not be identified in this document.

G. TIERED DOCUMENTS AND INCORPORATION BY REFERENCE

Information, findings, and conclusions contained in this document are based on incorporation by reference of tiered documentation, which are discussed in the following section.

1. Tiered Documents

As permitted in Section 15152(a) of the CEQA Guidelines, information and discussions from other documents can be included into this document. Tiering is defined as follows:

"Tiering refers to using the analysis of general matters contained in a broader EIR (such as the one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects;

incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project."

Tiering also allows this document to comply with Section 15152(b) of the CEQA Guidelines, which discourages redundant analyses, as follows:

"Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects including the general plans, zoning changes, and development projects. This approach can eliminate repetitive discussion of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review. Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration."

Further, Section 15152(d) of the CEQA Guidelines states:

"Where an EIR has been prepared and certified for a program, plan, policy, or ordinance consistent with the requirements of this section, any lead agency for a later project pursuant to or consistent with the program, plan, policy, or ordinance should limit the EIR or negative declaration on the later project to effects which:

(1) Were not examined as significant effects on the environment in the prior EIR; or

(2) Are susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means."

2. Incorporation By Reference

Incorporation by reference is a procedure for reducing the size of EIRs/MND and is most appropriate for including long, descriptive, or technical materials that provide general background information, but do not contribute directly to the specific analysis of the project itself. This procedure is particularly useful when an EIR or Negative Declaration relies on a broadly-drafted EIR for its evaluation of cumulative impacts of related projects (*Las Virgenes Homeowners Federation v. County of Los Angeles* [1986, 177 Ca.3d 300]). If an EIR or Negative Declaration relies on information from a supporting study that is available to the public, the EIR or Negative Declaration cannot be deemed unsupported by evidence or analysis (*San Francisco Ecology Center v. City and County of San Francisco* [1975, 48 Ca.3d 584, 595]). This document incorporates by reference appropriate information from the "Final Environmental Impact Report and Environmental Assessment for the "County of Imperial General Plan EIR" prepared by Brian F. Mooney Associates in 1993 and updates.

When an EIR or Negative Declaration incorporates a document by reference, the incorporation must comply with Section 15150 of the CEQA Guidelines as follows:

- The incorporated document must be available to the public or be a matter of public record (CEQA Guidelines Section 15150[a]). The General Plan EIR and updates are available, along with this document, at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 Ph. (442) 265-1736.
- This document must be available for inspection by the public at an office of the lead agency (CEQA Guidelines Section 15150[b]). These documents are available at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 Ph. (442) 265-1736.
- These documents must summarize the portion of the document being incorporated by reference or briefly describe information that cannot be summarized. Furthermore, these documents must describe the relationship between the incorporated information and the analysis in the tiered documents (CEQA

Guidelines Section 15150[c]). As discussed above, the tiered EIRs address the entire project site and provide background and inventory information and data which apply to the project site. Incorporated information and/or data will be cited in the appropriate sections.

- These documents must include the State identification number of the incorporated documents (CEQA Guidelines Section 15150[d]). The State Clearinghouse Number for the County of Imperial General Plan EIR is SCH #93011023.

- The material to be incorporated in this document will include general background information (CEQA Guidelines Section 15150[f]). This has been previously discussed in this document.

II. Environmental Checklist

1. **Project Title**: All American Grain General Plan Amendment #18-0001, Zone Change #18-0002, Initial Study # 18-0007
2. **Lead Agency**: Imperial County Planning & Development Services Department
3. **Contact person and phone number**: David Black, Planner IV, (442)265-1736, ext. 1746
4. **Address**: 801 Main Street, El Centro CA, 92243
5. **E-mail**: davidblack@co.imperial.ca.us
6. **Project location**: The project site is located south of the City of Calipatria, Imperial County, California at 204 East Albright Road and Yocum Road and is further identified as Assessor's Parcel Number 024-260-032-000. The entire APN 024-260-032 is currently situated on approximately 89 +/- acres of land located within the County of Imperial, about half a mile south of the City of Calipatria See Exhibit A.
7. **Project sponsor's name and address**: All American Grain, at 1065 State Street, El Centro, CA 92243
8. **General Plan designation**: Urban
9. **Current Zoning**: A-2-(General Agricultural)
10. **Description of project**: Applicant proposes a Zone Change (ZC) and General Plan Amendment (GPA) to the west half of APN: 024-260-032 in an effort to bring the parcel into conformance with applicable zoning & land use regulations. The Zone Change & General Plan Amendment will allow more acreage under the Medium Industrial use so that the applicant may establish a Container Yard and Rail Spur. The proposed Zone Change will change the current A-2 (General Agriculture) zone to M-2 (Medium Industrial) zone, while the General Plan Amendment will amend the Imperial County Land Use Element *Table 4: Compatibility Matrix1*, located on page 64 of the Land Use Element. The current land use designation for APN: 024-260-032 is Urban Area which allows for compatibility with M-2 zoning as stated within the contents of the Land Use Element, however, this is not reflected in *Table 4: Compatibility Matrix*. This General Plan Amendment is meant to correct *Table 4: Compatibility Matrix* so that it is compatible with the Land Use Element's contents.

11. **Surrounding land uses and setting**: The land uses located east of project site are zoned for industrial type of uses, a rail spur surrounds the project situs used for uploading shipment of Agriculture products including corn and grain. Highway 111 is directly west of project site and the Railroad is directly east of project site.
12. **Other public agencies whose approval is required** (e.g., permits, financing approval, or participation agreement.): A) Planning Commission B) Regional Water Quality Control Board
13. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so has consultation begun?**

    Native American Tribes and members of the Native American Heritage Commission (NAHC) have been invited to participate in the "Request for Review and Comment" as part of the Initial Study review process. Also, a tribal list was delivered from NAHC for us to contact so we did, but no comments related to significant impacts were received SB 18 and AB 52 consultation request to comment letters have been sent out. .

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics
☒ Biological Resources
☒ Greenhouse Gas Emissions
☐ Land Use / Planning
☐ Population / Housing
☒ Transportation/Traffic
☐ Mandatory Findings of Significance

☐ Agriculture and Forestry Resources
☒ Cultural Resources
☐ Hazards & Hazardous Materials
☐ Mineral Resources
☒ Public Services
☐ Tribal Cultural Resources

☐ Air Quality
☒ Geology /Soils
☒ Hydrology / Water Quality
☐ Noise
☐ Recreation
☐ Utilities/Service Systems

ENVIRONMENTAL EVALUATION COMMITTEE (EEC) DETERMINATION

After Review of the Initial Study, the Environmental Evaluation Committee has:

☐ Found that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ Found that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ Found that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ Found that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ Found that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DE MINIMIS IMPACT FINDING: ☐ Yes ☐ No

EEC VOTES	**YES**	**NO**	**ABSENT**
PUBLIC WORKS	☐	☐	☐
ENVIRONMENTAL HEALTH SVCS	☐	☐	☐
OFFICE EMERGENCY SERVICES	☐	☐	☐
APCD	☐	☐	☐
AG	☐	☐	☐
SHERIFF DEPARTMENT	☐	☐	☐
ICPDS	☐	☐	☐

Jim Minnick, Director of Planning/EEC Chairman

Date:

PROJECT SUMMARY

Project Location: The project site is located south of the City of Calipatria, Imperial County, California at 204 East Albright Road and Yocum Road and is further identified as Assessor's Parcel Number 024-260-032-000. The entire APN 024-260-032 is currently situated on approximately 89 +/- acres of land located within the County of Imperial, about half a mile south of the City of Calipatria See Exhibit A.

A.

Project Summary: Applicant proposes a Zone Change (ZC) and General Plan Amendment (GPA) to the west half of APN: 024-260-032 in an effort to bring the parcel into conformance with applicable zoning & land use regulations. The Zone Change & General Plan Amendment will allow more acreage under the Medium Industrial use so that the applicant may establish a Container Yard and Rail Spur. The proposed Zone Change will change the current A-2 (General Agriculture) zone to M-2 (Medium Industrial) zone, while the General Plan Amendment will amend the Imperial County Land Use Element *Table 4: Compatibility Matrix1*, located on page 64 of the Land Use Element. The current land use designation for APN: 024-260-032 is Urban Area which allows for compatibility with M-2 zoning as stated within the contents of the Land Use Element, however, this is not reflected in *Table 4: Compatibility Matrix*. This General Plan Amendment is meant to correct *Table 4: Compatibility Matrix* so that it is compatible with the Land Use Element's contents. All American Grain Company proposes the construction of a loading/distribution facility that will utilize train units for distribution purposes to the POLB, thus cutting down the amount of trucks needed for distribution. A second spur is proposed and a bridge or tunnel will be built to provide 24 hour access to the parcel inside of spur(s). The current operations of the facility act as a grain transfer and storage station for locally grown container agricultural commodities. These operations include the receiving of the agricultural commodities such as hay, and other types of locally grown refuge in storage containers, transported via trucks to the facility. Once these containers are received and stored for a short period of time, they are then reloaded on to unit trains for distribution outside of the Imperial Valley. Additionally, incorporated in the original operations of the facility was receiving corn via unit train cars that would then be distributed to various Feed mills in the Imperial Valley via truck that will continue.

The applicant wishes to add to the current use by relying more heavily on the unit train cars rather than trucks for distribution from the Imperial Valley. The method of receiving and transporting the hay from locally harvested fields to the storage facility will remain. However, once the hay containers are stored and are ready to be reloaded, individual unit train cars will be the *primary method* of distribution to the POLB. Ultimately, the applicant's goal is to become more efficient with the delivery of out-going hay products that leave the valley and reduce the amount of trip miles made by trucks. This addition of one-unit train of 105 well cars which is 210 containers will be needed to maximize the reduction of trip miles made by trucks.

Once operations are in-motion, the empty storage facility will utilize their inner circle railway as a systematic method of offloading containers from the train and then reloading the containers that were loaded at the source. When the train unit cars are loaded and ready for distribution, they will leave the inner circle railway on their way to the POLB utilizing the Union Pacific Rail Road.

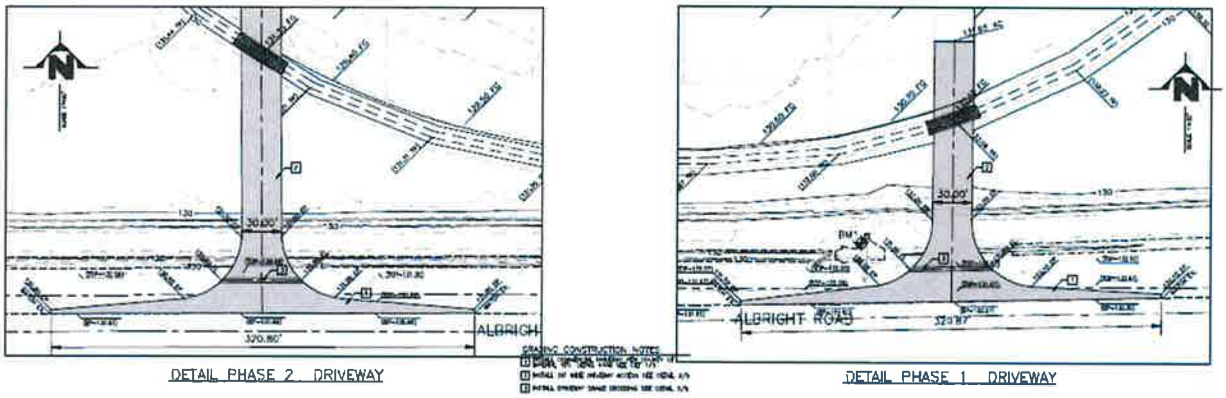
It is the intent of the applicant to construct this Container Yard in phases (see **Figure 5**). On the furthest east portion of the project, contains Phase 1, which is permitted by right to allow for a container yard. Phase 1 is unrelated to this Zone Change and General Plan Amendment for the reason stated previously. As of 8/06/2018 and 8/07/2018, the applicant has submitted with County of Imperial Building Department and Public Works Department for a grading permit for Phase 1. Once the Zone Change and General Plan Amendment have been approved, grading permits will be submitted for Phases 2 & 3.

C. **Environmental Setting**: The land uses located east of project site are zoned for industrial type of uses, a rail spur surrounds the project situs used for uploading shipment of Agriculture products including corn and grain. Highway 111 is directly west of project site and the Railroad is directly east of project site.

D. **Analysis**: The project site is zoned A-2- (General Agricultural) per Zoning Map #06 (Title 9, Section 92506.04). The approval of the proposed Zone Change to M-2 (Medium Industrial) would allow for the proposed use with the submittal and approval of a building permit since it is listed as a permitted use per Title 9, Division 5, Chapter 9, Section 90509.01. The proposed application is consistent with the Imperial County General Plan's designation, and the Imperial County's Land Use Ordinance. In addition, the adoption of the CEQA Initial Study for this project would be consistent with applicable County and State ordinances and regulations.

E. **General Plan Consistency**: The project site is designated as "Agriculture", according to the County's General Plan Land Use Map. The proposed project zone change and general plan amendment is not expected to conflict with the County's General Plan. The rezoning to M-2 Medium Industrial will be consistent with the eastern portion of parcel which is currently zone M-2.

Exhibit "A"
Vicinity Map



DETAIL PHASE 2 DRIVEWAY

DETAIL PHASE 1 DRIVEWAY

Exhibit "B"

Site Plan

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should

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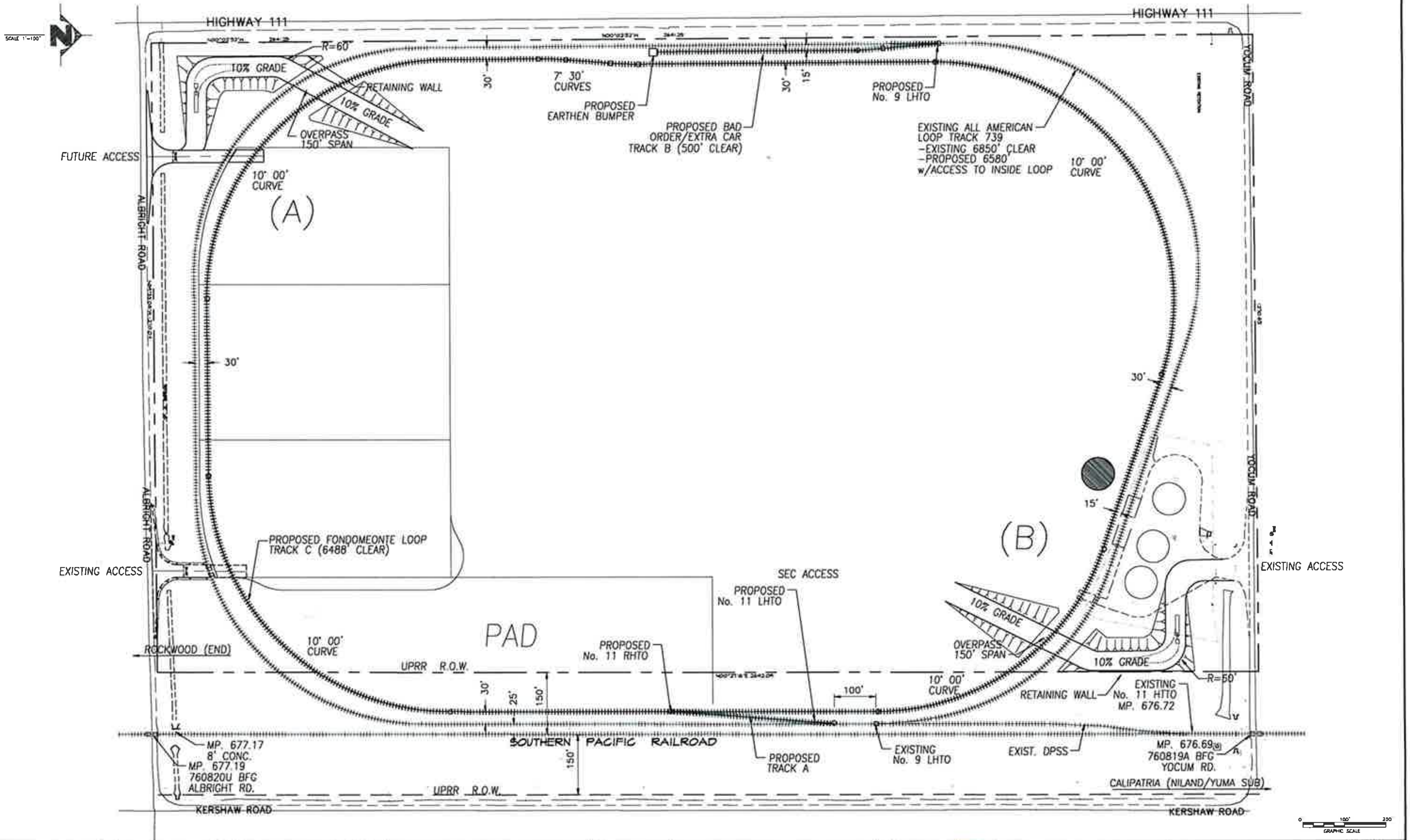

UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
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BEFORE YOU DIG

No.	REVISIONS	BY	DATE

SEAL

ENGINEER OF RECORD
PLANS PREPARED UNDER THE SUPERVISION OF
BY: ______ DATE: ______
CARLOS CORRALES
R.C.E. NO.: 55432

SEAL
No. 55432

LC ENGINEERING CONSULTANTS INC.
1065 State Street
El Centro CA 92243

DATE 1/15/19
BENCHMARK: -

SITE PLAN
FUTURE PROJECT SITE PLAN
FONDOMONTE/ALL AMERICAN GRAIN
CONTAINER YARD & SPUR LOADING
IMPERIAL COUNTY
FONDOMONTE/ALL AMERICAN GRAIN
W.O.

SHEET
2 OF
2 SHEETS
JOB NO.
C19002-00

be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.
   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) The significance criteria or threshold, if any, used to evaluate each question; and
   b) The mitigation measure identified, if any, to reduce the impact to less than significance

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**

I. ***AESTHETICS*** ***Would the project:***

a) Have a substantial adverse effect on a scenic vista or scenic highway?	☐	☐	☐	☒

a) The project is not located near a designated scenic vista and the project area around Highway 111 scenic highway as per the Imperial County Circulation & Scenic Highways Element[3] is not in a scenic designation area.

b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒

b) There are no historic buildings near or around this project site. The project site is mostly clear open field with little to no vegetation. No impact is projected.

c) Substantially degrade the existing visual character or quality of the site and its surrounding?	☐	☐	☒	☐

c) The project site is not within a designated scenic route within Imperial County's *Circulation/Scenic Highway Element.* There will be lighting on-site for the office and shall include the installation of power poles and light standards within the operation and parking area that may have an aesthetic impact on those traveling on Highway 111 from these new light sources, but the lighting shall be pointed downward to avoid glare onto the adjacent properties as well as to reduce nighttime glare. Project lighting is not considered to be a significant, adverse aesthetic impact. The construction and operation could temporarily alter the local view-shed with building materials placed on-site and trucks entering and leaving the site. With the implementation of landscaping and industrial development standards is expected to decrease visual impacts to less than significant

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

d) The project site is not within a designated scenic route within Imperial County's *Circulation/Scenic Highway Element.* There will be lighting on-site for the office and shall include the installation of power poles and light standards within the operation and parking area that may have an aesthetic impact on those traveling on Highway 111 from these new light sources, but the lighting shall be pointed downward to avoid glare onto the adjacent properties as well as to reduce nighttime glare. Project lighting is not considered to be a significant, adverse aesthetic impact. The construction and operation could temporarily alter the local view-shed with building materials placed on-site and trucks entering and leaving the site. With the implementation of landscaping and industrial development standards is expected to decrease visual impacts to less than significant

II. ***AGRICULTURE AND FOREST RESOURCES***

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. --Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒

a) The project area has not been farmed in over 10+ years and the current land use includes a rail spur surrounding a majority of the project site. This potential use for an industrial purpose and the de minimus amount of agriculture land being converted is not expected to be significant and would be anticipated due to the availability of the existing railroad spur on-site and the Union Pacific Railroad adjacent to the project site.

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
b) Conflict with existing zoning for agricultural use, or a Williamson Act Contract?	☐	☐	☐	☒

b) The current grain trucking and storage operation on the same parcel would appear to not be impacted by the proposed storage yard. The grain operation is along Yocum road and has its own separate entrance to parcel. The proposed project does not conflict with existing zoning for agricultural use and is not under a Williamson Act contract, according to the Williamson Act map created in 2012 by ICPDS for the Imperial County Board of Supervisors Order #10a; therefore, no impacts are expected.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒

c) The project site is mostly surrounded by open and flat lands used for agricultural purposes, and would not cause for any forest land to be converted into non-forest use. No impacts are expected to occur.

d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

d) There is no forest land in the area of the project location and no conversion to non-forest use would occur as a consequence of the approval of the proposed project; therefore, no impacts would occur.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

e) The portion of this property is currently Medium Industrial and the entire parcel is surrounded by a rail spur which would discourage any type of farming operation and limit any type of irrigation needed for farming. With the nearby railroad boarding property on the east side and Highway 111 on the westerly side of proposed property would be limited to any type of Agricultural use.

III. *AIR QUALITY*

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to the following determinations. Would the Project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☒	☐	☐

An Air Quality Study was prepared by Ultra-Systems dated November 2018 to identify the potential significant air quality effects on the environmental that could result from the short term (i.e. construction activities) and long term (i.e. implementation and operation) impacts of the project.

The proposed project is proposing to construct two paved driveways and up to three paved container storage pads to the site. The driveways will have two compositions, in the County right-of-way, will be comprised of hour inches of Caltrans Type B asphalt concrete over 12 inches of Class 2 aggregate base, and a minimum of 100 feet inside the property line, the driveway will consist of four inches of Caltrans Type B asphalt concrete over 14 inches of Class 2 aggregate base. Alternate option would include a bridge over one of the three driveways to enable the trucks to ingress and egress over the any blockage of train cars on the three entrances. Additionally, a second spur is being proposed on the project site which will enable additional train cars for on loading ag commodities In addition to complying with the ICAPCD's standard mitigation measures for construction, and with applicable District rules, the proponent shall implement mitigation measure
Construction phase Mitigation to include:

- **MM AQ-1 The operator shall limit vehicle speed to less than 15 miles per hour on any and all unpaved surfaces on the project site.**

Operational Phase Mitigation to include:

- **MM AQ-2 the proponent shall pay an in-lieu mitigation fee to be determined and administered by the ICAPCD. [1] In accordance with the ICAPCD *CEQA Air Quality Handbook*, the long-term operational impacts would be less than significant upon implementation of mitigation measure**

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? ☐ ☐ ☒ ☐

b) The USEPA issued a final ruling determining that the Imperial County "moderate" 8 hour ozone non-attainment area attained the 1997 8 hour NAAQS for ozone. This determination effectively suspended the requirement for the state to submit an attainment demonstration, an RFP plan, contingency measures and other planning requirements for so long as Imperial County remain as a "moderate" non-attainment area of the 1997 8-hour ozone NAAQS.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? ☐ ☐ ☒ ☐

c) Major stationary sources are required to implement Best Available Control Technology (BACT) to control PM10 emission (Rule 207) and they are required to comply with the 20% opacity (Rule 403). In addition stationary sources will be required to mitigate fugitive dust emissions from access roads, construction activities, handling and transferring of bulk materials, and track-out/carry out according to the requirements of Regulation VIII.

d) Expose sensitive receptors to substantial pollutants concentrations? ☐ ☐ ☒ ☐

d) Major stationary sources are required to implement Best Available Control Technology (BACT) to control PM10 emission (Rule 207) and they are required to comply with the 20% opacity (Rule 403). In addition stationary sources will be required to mitigate fugitive dust emissions from access roads, construction activities, handling and transferring of bulk materials, and track-out/carry out according to the requirements of Regulation VIII

e) Create objectionable odors affecting a substantial number of people? ☐ ☐ ☒ ☐

e) Rule 800 , 801 (Construction and Earthmoving Activities, 802(Bulk Material), 803 (Carry out and Tract out) 804 (open areas) and 805 (Paced and Unpaved Roads) are intended to reduce the amount of PM10 entrained in the ambient air as a result of emission generated by fugitive dust sources by requiring actions to prevent reduce or mitigate emission.

IV. *BIOLOGICAL RESOURCES* *Would the project:*

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? ☐ ☒ ☐ ☐

a) On 17 July, 2018 a biological habitat assessment was conducted by Maria Barrett and Jacob Calanno biologists, on the Project site. A 500 foot buffer area was also surveyed. Surveys were conducted to determine the presence absence nesting birds and of Western Burrowing Owl. No vegetation was found that would be considered endangered, threatened or species of concern. No vegetation onsite. No fauna was found that would be considered endangered or threatened. Three burrowing owls, CDFW species of concern, one occupied burrow, and one active burrow were found offsite on Imperial Irrigation District Right of Way Nectarine Lateral A.

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[1] #4Ultra-Systems Air Quality Study dated November 13, 2018
Barrett Biological surveys dates July 2018

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**

Mitigation Measures:

a. BUOW shelter in place using hay bales and remove shelter when project is complete under supervision of qualified biologist.

b. Worker BOUW training sessions

c. Monitoring when construction is within 250 feet (February – August); 160 feet (September – January) if determined necessary by qualified biologist.

d. If construction stared during Migratory Bird Nesting season (February – August) a nesting bird survey should be completed 3 days prior to start of construction.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒

b) The project site is surrounded by flat agricultural fields, railroad, and state highway and is not located within or near any riparian habitat or sensitive natural community; therefore, no impacts are expected to occur.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐

c) The proposed project site is mostly surrounded by agricultural flat lands, and is far from wetlands. Water may be used for its operations (i.e. dust suppression), but the amount of water to be used is not expected to be substantial and would be subject to APCD's rules and regulations.

d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐

d) The proposed project is not expected to impact the movement of resident or migratory fish, since the project site is not located near a body of water nor near a wildlife corridor. As previously mentioned, the project site is within the burrowing owl distribution

e) Conflict with any local policies or ordinance protecting biological resource, such as a tree preservation policy or ordinance?	☐	☐	☒	☐

e) There are no policies protecting biological resources that apply to the scope of work of the proposed project; therefore, less than significant impacts are expected.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

f) There are no Conservation Plans within the project area; therefore, no impacts are expected.

V. *CULTURAL RESOURCES* ***Would the project:***

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐

a) Mitigation Measure: The Imperial County Planning Department shall be notified immediately if any cultural resources (e.g., prehistoric or historic artifacts) or paleontological resources (e.g., fossils) are uncovered during construction. All construction must stop in vicinity of the find and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐

Mitigation Measure for Culture:

- **The Imperial County Planning Department shall be notified immediately if any cultural resources (e.g., prehistoric or historic artifacts) or paleontological resources (e.g., fossils) are uncovered during construction. All construction must stop in vicinity of the find and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action.**

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? ☐ ☒ ☐ ☐

c) Mitigation Measures:

- **The Imperial County Planning Department shall be notified immediately if any cultural resources (e.g., prehistoric or historic artifacts) or paleontological resources (e.g., fossils) are uncovered during construction. All construction must stop in vicinity of the find and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action.**
- **If any paleontological resources (fossils) are discovered during ground disturbing project activity, all work in the immediate vicinity must stop and the Imperial County Planning Department shall be immediately notified. A qualified paleontologist shall be retained to evaluate the finds and recommend appropriate mitigation measures for the inadvertently discovered paleontological resources.**
- **If avoidance is not feasible, a qualified professional archaeologist shall be on site during any excavations in excess of 4 feet who shall have the authority to stop construction if necessary and determine the appropriate protective measures if any. If subsurface deposits are found, an area equal to 200 feet around the area shall be halted from construction until appropriate removal or alternative solution of collective of artifacts is concluded. In the event that human remains are found, construction activities within 200 feet radius shall cease, the Imperial County Coroner notified and work not resume until the recommendations of an MLD (Most Likely Descendant) are implemented.**

d) Disturb any human remains, including those interred outside of dedicated cemeteries? ☐ ☐ ☒ ☐

d) There are no cemeteries within the vicinity of the project site. Compliance with the California Health and Safety Code §7050.5, CEQA §15064.5, and California Public Resources Code §5097.98 would bring any potential project impacts to less than significant levels.

VI. *GEOLOGY AND SOILS Would the project:*

a) Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving: ☐ ☐ ☒ ☐

a) The project site lies at an elevation of approximately 175 feet below sea level in the Imperial Valley region. The site is located in the Imperial Valley portion of the Salton Trough. The Salton Trough represents the northward extension of he Gulf of California.

1) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42? ☐ ☐ ☒ ☐

1) The project site is located in the seismically active Imperial Valley of southern California and is considered likely to be subjected to moderate to strong ground motion from earthquake in the region.

The proposed site structures should be designed in accordance with the California Building Code (CBC) for near source factors derived from a "design basis earthquake" (DBE).. This site identifies the predominant native subgrade soils to be clays that yield an R-Value strength of 5 when tested in accordance with test method CAL 301. Based on the Container Reach Lift/Stacker service loads an estimated R-value of 5 for the subgrade soil and assumed traffic index of 11.0. The report suggested Portland Cement Concrete (PCC)

pavement structural section for the Hay Loading Pad. Twelve (12) inches of moisture conditioned (minimum 4% above optimum) native clay soil compacted to a minimum of 90% of the maximum dry density determined by ASTM D 1557 shall support the pavement structural section. Unpaved Structural Section Maintenance Required: Requirement The container storage and loading areas may consist of 18 inches of aggregate base. The bottom 12 inches may consist of crushed concrete aggregate base and the top 6 inches should consist of crushed natural rock aggregate base. Please refer to the Landmark letter dated August 3, 2018 regarding Rail Loop Loading Pad Structural Section SEC of State Hwy 111 and Yocum Road LCI Report No. LE18146 for additional recommendations.

2) Strong Seismic ground shaking? ☐ ☐ ☒ ☐

2) Strong ground shaking during earthquakes along the Brawley Seismic Zone and the Imperial, Brawley, and Superstition Hill Faults. Guide lines shown on previous a)1 recommendation and recommendation outlined in Landmark letter dated August 3, 2018 regarding Rail Loop Loading Pad Structural Section SEC of State Hwy 111 and Yocum Road LCI Report No. LE18146 for impacts recommendations will keep impacts at a less than significant level. Developer will follow all recommendations in report.

3) Seismic-related ground failure, including liquefaction and seiche/tsunami? ☐ ☐ ☒ ☐

3) According to the Department of Conservation Regulatory Maps, the project site is not within the designated Tsunami areas; therefore, no impacts are expected. . Based on the Geotechnical Report dated July 2006 from Landmark Consultants, Inc. on page 13 of report "based on research from Ishihara (1985) and Youd and Garris (1995) ground rupture or sand boil formation is unlikely because of the thickness of the overlaying un-liquefiable soil.

4) Landslides? ☐ ☐ ☒ ☐

4) Also using the Department of Conservation Regulatory Maps, it was found that the site is not located within a landslide hazard zone; therefore, no impacts are expected. Based on the Geotechnical Report dated July 2006 from Landmark Consultants, Inc. on page 13 of report "based on research from Ishihara (1985) and Youd and Garris (1995) ground rupture or sand boil formation is unlikely because of the thickness of the overlaying un-liquefiable soil.

b) Result in substantial soil erosion or the loss of topsoil? ☐ ☐ ☒ ☐

b) Land has not been farmed in a number of years and is surrounded by rail spur and highways and railroad tracks. Loss of any top soil is projected to be minimal.

c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse? ☐ ☐ ☒ ☐

c) , it was found that the site is not located within a landslide hazard zone; therefore, no impacts are expected. Based on the Geotechnical Report dated July 2006 from Landmark Consultants, Inc. on page 13 of report "based on research from Ishihara (1985) and Youd and Garris (1995) ground rupture or sand boil formation is unlikely because of the thickness of the overlaying un-liquefiable soil.

d) Be located on expansive soil, as defined in the latest Uniform Building Code, creating substantial risk to life or property? ☐ ☐ ☒ ☐

d) , it was found that the site is not located within a landslide hazard zone; therefore, no impacts are expected. Based on the Geotechnical Report dated July 2006 from Landmark Consultants, Inc. on page 13 of report "based on research from Ishihara (1985) and Youd and Garris (1995) ground rupture or sand boil formation is unlikely because of the thickness of the overlaying un-liquefiable soil

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? ☐ ☐ ☒ ☐

e) The applicant will follow all **Above ground and permitted septic systems requirements and will follow all Environmental Health Services permitting and compliance requirements.**

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**

VII. *GREENHOUSE GAS EMISSION* ***Would the project:***

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☒	☐	☐

a) According to the Ultra Systems report regarding comparisons of criterial pollutant emissions from truck and train transport of agricultural products from All American Grain in Calipatria to Riverside County Line prepared, the project will cause emissions of GHG from mobile sources, Mitigation measure will reduce impacts to a less than significant level.

b) Conflict with an applicable plan or policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

b) There are no regional or local climate action plans, general or specific plan provisions to reduce GHG emissions in the study area, other than the regulations under AB 32, which has a target of reducing GHG emissions to 1990 levels by 2020[2]. The California Air Resources Board (CARB)'s AB 32 Scoping Plan was updated but it does not include an applicable threshold for GHG emissions for a project with these characteristics and duration.. Compliance with APCD and all applicable County's requirements and mitigations measures listed in the Ultra Systems Air Quality report dated November 13, 2018 will bring the impacts to less than significant.

Mitigation Measures for Construction Phase:

- **MM AQ-1 The operator shall limit vehicle speed to less than 15 miles per hour on any and all unpaved surfaces on the project site.**

Operational Phase Mitigation to include:

- **MM AQ-2: The proponent shall pay an in-lieu mitigation fee to be determined and administered by the ICAPCD.[3] In accordance with the ICAPCD *CEQA Air Quality Handbook*, the long-term operational impacts would be less than significant upon implementation of mitigation measure.**

VIII. *HAZARDS AND HAZARDOUS MATERIALS* ***Would the project:***

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒

a) The proposed project does not have the potential to create a significant hazard to the public or environment through the transportation, use or disposal of hazardous materials, since they are not part of the scope of work; therefore, no impacts are expected to occur.

b) Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒

b) As stated above, no hazardous materials are included in the proposed project; therefore, no impacts are expected.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

c) No impacts are expected. No schools are nearby.

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		Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
d)	Be located on a site, which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒

d) Government Code Section 65962.5 requires the Department of Toxic Substances Control (DTSC) to compile and update a list of hazardous waste and substances sites from the DTSC EnviroStor Database. After using the EnvironStor Database[4] for the project site, it was found that it was not included in the database; therefore, no impacts are expected to occur.

e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

e) According to Figure 1A of the 1996 Imperial County Airport Land Use Compatibility Plan (ALUC Plan), the project is not located within two miles of an airport, nor is it located within an airport land use plan. The nearest airport is the Calipatria Airport, and project area is located outside the Airport Compatibility Plan Area No impacts are expected to occur.

f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

f) In addition to the statement above, the proposed project is not within any known private airstrip; therefore, no impacts are expected to occur.

g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

g) The proposed project shall comply with all County requirements related to any applicable emergency plan to avoid impairing its implementation. The access points are from Yocum and Albright Roads. Access for emergencies will be provided by a proposed bridge or tunnel on either the Yocum or Albright Roads Showing compliance with County requirements regarding design of emergency points or access to be used by employees would bring potential impacts to less than significant levels.

h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

h) The project site is located within a Local Responsibility Area (LRA) Moderate Zone and a LRA Un zoned area according to the Fire Hazard Severity Zone Map.[5] Zones are classified based on a combination of how a fire will behave and the probability of flames and embers threatening buildings, as well of the likelihood of the area burning. Since no wildlands are surrounding the project vicinity, less than significant impacts are to be expected.

An Emergency Response Plan shall be prepared in coordination with local fire agencies and the County of Imperial. The Emergency Response Plan shall be updated annually in coordination with the Imperial County Fire Department and the Imperial County Office of Emergency Services. All impacts appear to be less than significant.

IX. *HYDROLOGY AND WATER QUALITY* ***Would the project:***

a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐

a) The proposed project includes water for dust mitigation purposes. The water would be obtained from the southeast end

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[4] EnviroStor Database http://www.envirostor.dtsc.ca.gov/public/map/?myaddress=Sacramento&tour=True

[5] ALUC Compatibility Map Figure 3C

of the property, since there is a field gate. . The applicant and property owner are subject to compliance with all local, state and federal laws. Compliance with all laws regarding water would bring potential impacts to less than significant levels. The water and access will be thru IID and any permits required.

		Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒

b) Groundwater use is not a part of the scope of work of this project, and there are no known groundwater or domestic wells near the project site area. All water needs will be thru permitting with IID.

		Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐

c) According to the Imperial County Public Works requirements, a grading/drainage plan is required to assure drainage patterns are designed to avoid alterations of streams or to negatively affect the surrounding water sources. Compliance with all County Building (ICPDS) and Public Works (PW) Departments' requirements on the project would appear to cause for the impacts to be less than significant.

		Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
)	Substantially alter the existing drainage patterns of the site or area, including through the of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☒	☐	☐

d) Mitigation Measure:

- **d) The project applicant is required to prepare a Storm Water Pollution and Prevention Plan (SWPPP) to be administered through all phases of grading and project construction. The SWPPP must incorporate Best Management Practices (BMPs) meeting technical standards of the General Construction permit to ensure that potential water quality impacts (including on-site and off-site erosion) during construction phases are minimized and that violations of water quality standards do not occur. The SWPPP must address spill prevention and include a countermeasure plan describing measures to ensure proper collection and disposal of all pollutants handled or produced on the site during construction, including sanitary wastes, cement, and petroleum products. BMPs included in the SWPPP must be consistent with the California Storm-water Best Management Practices Handbook for Construction. The SWPPP must be submitted to the Region 7 Regional Water Quality Control Board and to the County for review prior to the issuance of grading permits.**

		Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
e)	Create or contribute runoff water, which would exceed the capacity of existing or planned storm-water drainage systems or provide substantial additional sources of polluted runoff?	☐	☒	☐	☐

Mitigation Measure:

- **e) The project applicant is required to prepare a Storm Water Pollution and Prevention Plan (SWPPP) governing industrial operations to be administered so long as industrial activities are ongoing. The Industrial SWPPP must incorporate Best Management Practices (BMPs) meeting the technical standards of the General Industrial Permit to ensure that potential water quality impacts during the operational phase are minimized and that violations of water quality standards do not occur. The Industrial SWPPP will include permanent post-construction BMPs meeting the County's requirements under its program implementing the Small MS4 Permit. These post-construction BMPs will be included in the Industrial SWPPP and must be consistent with the California Stormwater Best Management Practices Handbook for Commercial and Industrial operations. The BMPs will include the implementation of three [3] detention basins, collectively sized to retain a 100-year frequency storm event from the project site. These detention basins will meet design standards imposed by the County and the Imperial Irrigation District, including draining within 72 hours following a storm event and having outlet structures no larger than 12 inches in diameter and containing a backflow prevention**

device. The Industrial SWPPP must be submitted to the Region 7 Regional Water Quality Control prior to the issuance of certificates of occupancy. As per Mitigation Measure in Pacific Ethanol EIR 2006.

		Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
f)	Otherwise substantially degrade water quality? **f) The property owner shall show compliance with all local, state and federal laws to prevent degradation of any water supply during the life of project.. Compliance with all laws against water quality degradation would bring any potential impacts to less than significant levels.**	☐	☐	☒	☐
g)	Place housing within a 100-year flood hazard area as mapped on a Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? **g) No housing is being proposed for this project and the project site is not within a Flood Hazard Boundary; therefore, no impacts are expected.**	☐	☐	☐	☒
h)	Place within a 100-year flood hazard area structures which would impede or redirect the flood flows? **h) The project site is approximately 3 miles east of the nearest 100-year flood hazard area (Zone A) of the FEMA Flood Insurance Rate Map Panel 625 of 1175[6], and is located on Zone C, which means it is an area of minimal flooding. No impacts are expected regarding redirection or impediment of flood flows.**	☐	☐	☐	☒
i)	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam? **i) In addition to the statement above, there are no dams or levees near the proposed site; therefore, the approval of the proposed project is not expected to cause impacts related to people or structures.**	☐	☐	☐	☒
j)	Inundation by seiche, tsunami, or mudflow? **j) According to the California Emergency Management Agency and the Department of Conservation, the project site is not within a Tsunami Inundation Area for Emergency Planning; therefore, no impacts are expected to occur.**	☐	☐	☐	☒

X. *LAND USE AND PLANNING* *Would the project:*

		PSI	PSUMI	LTSI	NI
a)	Physically divide an established community? **a) The project would not physically divide any established community since it is approximately 3 miles south of an established community in Calipatria; therefore, no impacts can be expected.**	☐	☐	☐	☒
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (include, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? **b) The proposed project does not conflict with any applicable land use plan, policy or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The proposed General Plan Amendment, Zone Change is consistent with the intent of the Imperial County General Plan's Land Use Element and its goals and objectives. If the proposed Zone Change is approved, the applicant would need to submit a building permit application per the County Land Use Ordinance Title 9 Division 5, Chapter 9 Section 90516.01 list of permitted uses; therefore, no impacts are expected.**	☐	☐	☒	☐
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan? **c) The project would not conflict with any habitat conservation plan or natural community conservation plan since there are none that apply to the area; for that reason, no impacts are expected to occur.**	☐	☐	☐	☒

XI. *MINERAL RESOURCES* *Would the project:*

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[6] Federal Emergency Management Area (FEMA) http://www.icpds.com/CMS

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒

a) The project site area is not located in or near any existing mineral resource areas as shown on the Imperial County Conservation and Open Space Element, Figure 8 "Existing Mineral Resources"[7]; therefore, no impacts are expected.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

b) As previously stated, the proposed project would not result in the loss of locally-important mineral resources as identified in the Imperial County General Plan Conservation and Open Space Element, Figure 8 "Existing Mineral Resources". No impacts are expected to occur.

XII. *NOISE* *Would the project result in:*

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐

a) The project site is within a "noise impact zone," as defined by the Imperial County General Plan Noise Element, because it meets all the following criteria:

- **.Within 1,100 feet of a state highway**
- **Within 750 feet of the centerline of any railroad; and**
- **Within 1,320 feet of existing farmland which is in an agricultural zone.**

The applicant owner per the Noise Study dated September 2018 has indicated that the project site will include the following improvements:

- **Two paved driveways**
- **Three paved container storage pads**
- **County road right of way will be comprised of four inches of Caltrans Type B asphalt concrete over 12 inches of Class 2 aggregate base.**
- **For a 100 feet inside property line, driveways will consist of four inches of Caltrans Type B asphalt concrete over 14 inches of Class 2 aggregate base.**
- **Container yard pavement will consist of six inches of Caltrans Class 2 aggregate base over 12 inches of crushed recycled concrete, over mesh, and over 12 inches of compacted native soil.**

Noise modeling done with Ultra-Systems report dated September 2018 indicated construction phase with no significant impacts. Operational phase shows no significant impacts with no mitigation needed.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐

b) The closest sensitive receivers in the project vicinity are residence to the northwest of project site. The distance between the nearest residence and the project site boundary is 271 feet. Noise Report done by Ultra-Systems showed no significant impacts from ground vibration.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

c) According to the Transportation Impact Analysis prepared, the proposed feedlot expansion would cause no significant impacts, and no permanent increase in noise levels are expected; therefore, less than significant impacts are expected to occur.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

d) As previously stated, compliance with the Imperial County General Plan, Land Use Ordinance, Noise Element and standard construction practices would ensure that the temporary noise levels associated with site

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Noise Study by UltraSytems dated September 2018

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
preparation and trucks remain less than significant.				
e) For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
e) The project site is not located within 2 miles of an airport; therefore, no impacts are expected.				
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) No known private airstrip is located near the vicinity of the project; therefore, no impact is expected.				
XIII. ***POPULATION AND HOUSING Would the project:***				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and business) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
a) The proposed project is consistent with the Imperial County's General Plan. According to the revised application received November 21, 2018, only five (5) employees are expected to be hired to operate the proposed cattle pen expansion project. Per the Transportation Impact Analysis, it is anticipated that the majority of new workers will be from the proximate local population centers of Calipatria, Brawley and El Centro. Less than significant impacts are expected since no substantial no population growth is expected to occur.				
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
b) Since no housing is being proposed as part of the project; no impacts are expected to occur.				
c) Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) The proposed project does not involve any housing and is not expected to displace substantial number of people; therefore, no impacts are expected.				
XIV. ***PUBLIC SERVICES***				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☒	☐
a) The project would not cause for the need of any provisions or cause for alterations involving governmental facilities. It would not substantially affect any type of public service, except an increase in traffic during the site preparation phase, and during operations, if this General Plan & Zone Change and building permit were to be approved. Less than significant impacts are to be expected.				
1) Fire Protection?	☐	☒	☐	☐
a1) The applicant and operator of the proposed container yard will be in compliance with Fire Protection and have a fire suppression system on site. The applicant is proposing a bridge or tunnel for 24 hour access across the existing rail spur on property Continual compliance with the Fire Department's rules and regulations would bring the proposed project's impacts to less than significant levels with Mitigations.				

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**

Mitigation

- **An Emergency Response Plan shall be prepared in coordination with local fire agencies and the County of Imperial. The Emergency Response Plan shall be updated annually in coordination with the Imperial County Fire Department and the Imperial County Office of Emergency Services would appear to bring impacts to a less than significant level.**
- **A Hazardous Materials Business Plan shall be prepared in accordance with Title 19, Division 2, Chapter 4, and Article 4 of California Code of Regulations. The Hazardous Material Inventory shall be updated annually to the Imperial County Fire Department and the Imperial County Office of Emergency Services**

	PSI	PSUMI	LTSI	NI
2) Police Protection?	☐	☐	☐	☒

a2) the property will be fenced and access will be monitored to and from site, no significant impact are expected to occur.

	PSI	PSUMI	LTSI	NI
3) Schools?	☐	☐	☐	☒

a3) The project site and proposed Industrial uses would not increase housing and allow for residential uses; therefore, no impacts are expected.

	PSI	PSUMI	LTSI	NI
4) Parks?	☐	☐	☐	☒

a4) The proposed project is not within a park or would cause for the need to alter one; therefore, no impacts are expected.

	PSI	PSUMI	LTSI	NI
5) Other Public Facilities?	☐	☐	☐	☒

a5) No other public facilities would be affected by the proposed project; therefore, no impacts are expected.

XV. *RECREATION*

	PSI	PSUMI	LTSI	NI
a) Would the project increase the use of the existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

a) Since the proposed site is not within any residential areas, parks or recreational facilities, no impacts are expected.

	PSI	PSUMI	LTSI	NI
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse effect on the environment?	☐	☐	☐	☒

b) No recreational facilities are being included in the scope of work or would cause for the need to construct or expand existing recreational facilities; therefore, no impacts are expected.

XVI. *TRANSPORTATION / TRAFFIC* *Would the project:*

	PSI	PSUMI	LTSI	NI
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☒	☐	☐

Mitigation Measures will reduce impacts for sections a, and the following b, c, d ,e, and f sections to a less than significant with the following mitigations:

- ***Yocum Road is classified as 4-Lane Major Collector requiring eighty four feet (84) of right of way, being forty two (42) feet from existing centerline. Forty feet (40') of right of way has been provided per Grant Deed Doc # Book 2249 pg. 1381, 2003. As directed by Imperial County Board of Supervisors per Minute Order #6 dated 11/22/1994 per the Imperial County Circulation Element Plan of the General Plan).***

- ***Albright Road is classified as 2-Lane Minor Collector requiring seventy feet (70) of right of way, being thirty five (35) feet from existing centerline. Seventeen feet and Six inches (17'-6') of right of way has been provided per Grant Deed Doc # Book 2249 pg. 1378, 2003. Sufficient right of way must be provided to meet this road classification. As directed by Imperial County Board of Supervisors per Minute Order #6 dated 11/22/1994 per the Imperial County Circulation Element Plan of the General Plan).***

- *The applicant shall furnish a Drainage and Grading Plan/Study to provide for property grading and drainage control, which shall also include prevention of sedimentation of damage to off-site properties. The Plan/Study shall be prepared per the Engineering Design Guidelines Manual for the Preparation and checking of Street Improvement, Drainage, and Grading Plans within Imperial County and submitted to the Department of Public Works for review and approval. The applicant shall implement the approved plan. Employment of the appropriate Best Management Practices (BMPs) shall be included on the plan.*

- The applicant for encroachment permits, grading plans, and/or improvement plans is responsible for researching, protecting and preserving survey monuments per the Professional Land Surveyor's Act (8771 (b)). This shall include a copy of the referenced survey map and tie card(s) (if applicable) for all monuments that may be impacted by the project whether it be on-site of off-site.

- *At time of development, if required, by Section 8762(b) of the Professional Land Surveyors Act, a record of survey shall be filed with the County Recorder of Imperial County.*

- Street improvements shall be required in conjunction with, but not limited to, any construction, grading, or related work, including the construction of structures, buildings, or major additions thereto, on property located adjacent to any county street or on property utilizing any county street for ingress and egress, except that such improvements may be deferred as described in Section 12.10.040 of this chapter for residential property (Per Imperial County Code of Ordinances, Chapter 12.10.020). The street improvements required shall be a commercial type driveway per Imperial County Standards and a secondary emergency access driveway as approved by this Department. The secondary emergency access driveway shall be constructed of asphalt concrete or as approved by this Department.
- *No building permit for any structure or building or major addition to a building or structure shall be issued until the improvements required by Section 12.10.010 of this chapter have been installed and/or bonded. In addition, no building permit shall be issued until there has been compliance with Chapter 12.12 of this title and the requirement that an encroachment permit be obtained (Per Imperial County Code of Ordinances, Chapter 12.10.030).*
- *Any activity and/or work within Imperial County right-of-way shall be completed under an encroachment permit issued by this Department (Per Imperial County Code of Ordinances, Chapter 12.12). Any activity and/or work may include, but not be limited to, the installation of temporary traffic control devices, construction of access driveways, etc.*
- *The applicant/owner of facility shall fund needed future construction and improvements for said turn lanes installations for right and/or left turn lanes into the facility.*

b) Conflict with an applicable congestion management program, including but not limited to level of service standard and travel demand measures, or other standards established by the county congestions/management agency for designated roads or highways? ☐ ☒ ☐ ☐

Mitigation:
b) Figure 7-1 of the transportation impact analysis indicates that 15% of the truck traffic will be using Yocum Road east of Kershaw Road (Brown Avenue). This section of Yocum Road is unpaved.- Unpaved Haul/Access Roads Requirements of Rule 805 of the Imperial County Air Pollution Control District limits any traffic on unpaved roads to generate visible dust emissions (VDE) to less than 20% opacity. If the applicant is unable to maintain the opacity level as required by Rule 805, the applicant shall mitigate the generation of dust due to project traffic along Yocum Road between Kershaw Road (Brown Avenue) and Blair Road and along Blair Road between Yocum Road and State Route 115 by one of the methods below:

- Asphalt Concrete Road Improvements: The road section shall be improved by installing two (2) 12-foot travel lanes consisting of 4 inches of asphalt concrete over 18 inches of Class 2 Base, including Class 2 base shoulder backing, as approved by the Director of Public Works. Any activities related to these road improvements shall be completed under an encroachment permit from this Department.

- **Road Surface Chemical Stabilization: The road surface shall be stabilized by applying chemical stabilization products as recommended by the product manufacturer to accommodate for two (2) 12-foot travel lanes and as approved by the Director of Public Works. Any activities related to this road stabilization shall be completed under an encroachment permit from this Department.**
- **Aggregate Base Road Improvements: The road section shall be improved by installing two (2) 12-foot travel lanes consisting of a minimum of 3" of Class 2 Base material, as recommended by a California Geotechnical Engineer, and as approved by the Director of Public Works. Any activities related to these road improvements shall be completed under an encroachment permit from this Department.**
- **Road Dust Mitigation Plan: The applicant shall prepare a Road Dust Mitigation Plan and submit it to this Department for review and approval. Any activities related to the implementation of the road dust mitigation plan shall be completed under an encroachment permit from this Department.**
- **Traffic Restriction: Any existing and/or proposed project traffic, truck or passenger vehicles, associated with the project site shall be restricted from using the road section. The transportation impact analysis shall be revised to indicate the revised traffic distribution and resubmitted to this Department for review and approval prior to the Zone Change Approval.**
- **All solid and hazardous waste shall be disposed of in approved solid waste disposal sites in accordance with existing County, State and Federal regulations (Per Imperial County Code of Ordinances, Chapter 8.72).**
- **All on-site traffic area shall be hard surfaced to provide all weather access for fire protection vehicles. The surfacing shall meet the Department of Public Works and Fire/OES Standards as well as those of the Air Pollution Control District (APCD) (Per Imperial County Code of ordinances, Chapter 12.10.020 A).**
- **The project shall submit a National Pollutant Discharge Elimination System (NPDES) permit and Notice of Intent (NOI) from the Regional Water Quality Control Board (RWQCB) prior county approval of onsite grading plan (40 CFR 122.28).**
- **A Transportation Permit shall be submitted to the local road agency(s) having jurisdiction over the haul route(s) for any hauls of heavy equipment and large vehicles which impose greater then legal loads on riding surfaces, including bridges. (Per Imperial County Code of Ordinances, Chapter 10.12.020).**

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? ☐ ☐ ☐ ☒

c) The proposed project would not affect air traffic patterns; therefore, no impacts are expected to occur.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? ☐ ☐ ☐ ☒

d) MITIGATION MEASURE:

- **As a part of the project's compliance with the mandatory regulation, the existing railroad crossing shall be re-evaluated to conform to the traffic control devices, systems, and practices described in the Manual on Uniform Traffic Control Devices (MUTCD), Federal, State, and local laws and regulations. The applicant shall also consult with Commission's Rail Crossings Engineering Section and Union Pacific Railroad (UPRR) and comply with the mandatory requirements established from the consultations for the inclusion of the trains required for the proposed project.**

e) Result in inadequate emergency access? ☐ ☐ ☒ ☐

e) .The applicant/owner of facility is proposing a access points on Yocum Road and access points on Albright road. A 24 hour access point will be built across and over the rail spur to insure emergency access at all times. The Fire Department will review the three sites and owner shall build in all requirements needed for Fire Department and OES approval.

f) Conflicts with adopted policies, plans, programs, regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities? ☐ ☐ ☒ ☐

f) Conformance with applicable agencies such as Imperial County Public Works and Caltrans would prevent any

conflict with adopted policies, plans or programs regarding public transit. Compliance with the above agencies' requirements regarding traffic and transportation would appear to cause a less than significant impact.

XVII. *TRIBAL CULTURAL RESOURCES*

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe, and that is:	☐	☐	☒	☐

a) The project site is not within the vicinity of any area that has been geographically defined as sacred or object of value to California Native American Tribe, according to the Imperial County General Plan Conservation and Open Space Element, Figure 6 "Known Areas of Native American Cultural Sensitivity".

Efforts of consultation with tribes and with Native American Heritage Commission were performed. An AB 52 & SB 18 consultation letters were mailed out to tribes. A letter received and dated January 8, 2019 from the Colorado River Indian Tribes indicated they had no specific comments on project. A letter from Augustine Band of Cahuilla Indians dated December 27, 2018 encouraging the County to contract with a monitor who is qualified in Native American culture resource identification and who is able to be present onsite full time during per construction and construction phase of the project. A Sacred Lands Search was requested and came back with negative results; Compliance with the above requirements would appear to reduce impacts to less than significant.

	PSI	PSUMI	LTSI	NI
1) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as define in Public Resources Code Section 5020.1(k), or	☐	☐	☒	☐

1) The proposed site does not appear to be eligible under Public Resources Code Section 21074 or 5020.1 (k). The Native American Heritage Commission was contacted regarding this project. Communication was sent out to tribes. The comments received during construction would appear to reduce impacts to a less than significant level.

	PSI	PSUMI	LTSI	NI
2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth is subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.	☐	☐	☒	☐

2) The proposed site does not appear to be eligible under Public Resources Code Section 21074 or 5020.1 (k). The Native American Heritage Commission was contacted regarding this project. Communication was sent out to tribes. The comments received during construction would appear to reduce impacts to a less than significant level.

XVIII. *UTILITIES AND SERVICE SYSTEMS* ***Would the project:***

	PSI	PSUMI	LTSI	NI
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board	☐	☐	☒	☐

a) The applicant shall provide a Grading/Drainage letter to Public Works Department and shall comply with all applicable agencies to ensure that wastewater and storm water are properly handled to avoid a negative environmental effect. Compliance with all applicable agencies would bring the project's impacts to less than significant levels

	PSI	PSUMI	LTSI	NI
b) Require or result in the construction of new water or water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental	☐	☐	☐	☒

		Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
	effects? **b) No new or expansion of water treatment facilities are required for this project since there will be no need to provide potable drinking water. According to the applicant, water is currently being taken from the canals for the existing feedlot and composting facility, is not metered, and is to be used for the dust mitigation of the proposed cattle pen expansion project. No impacts to water treatment facilities are expected to occur.**				
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? **c) The applicant shall provide a Grading/Drainage letter to Public Works Department and shall comply with all applicable agencies to ensure that wastewater and storm water are properly handled to avoid a negative environmental effect. Compliance with all applicable agencies would bring the project's impacts to less than significant levels.**	☐	☐	☒	☐
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? **d) Water will be supplied with Colorado water via IID for water supplies and impacts appear to be less than significant. Compliance will all agencies will bring impacts to less than significant levels.**	☐	☐	☒	☐
e)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? **An approved septic system will be designed for wastewater for facility. .Grading plans will be approved by Public Works. Impacts appear to be less than significant. Compliance will all agencies will bring impacts to less than significant levels.**	☐	☐	☒	☐
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? **f) The proposed General Plan & Zone Change would not produce a significant amount of solid waste, Compliance will all agencies will bring impacts to less than significant levels.**	☐	☐	☒	☐
g)	Comply with federal, state, and local statutes and regulations related to solid waste? **g) The proposed project shall comply with all federal, state and local statues and regulations. Compliance with said codes shall cause for impacts to be less than significant.**	☐	☐	☒	☐

Note: Authority cited: Sections 21083 and 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21093, 21094, 21095, and 21151, Public Resources Code; Sundstrom v. County of Mendocino,(1988) 202 Cal.App.3d 296; Leonoff v. Monterey Board of Supervisors, (1990) 222 Cal.App.3d 1337; Eureka Citizens for Responsible Govt. v. City of Eureka (2007) 147 Cal.App.4th 357; Protect the Historic Amador Waterways v. Amador Water Agency (2004) 116 Cal.App.4th at 1109; San Franciscans Upholding the Downtown Plan v. City and County of San Francisco (2002) 102 Cal.App.4th 656.

Revised 2009- CEQA
Revised 2011- ICPDS
Revised 2016 – ICPDS
Revised 2017 - ICPDS

SECTION 3
III. MANDATORY FINDINGS OF SIGNIFICANCE

The following are Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, eliminate tribal cultural resources or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☐	☐
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☐

IV. PERSONS AND ORGANIZATIONS CONSULTED

This section identifies those persons who prepared or contributed to preparation of this document. This section is prepared in accordance with Section 15129 of the CEQA Guidelines.

A. COUNTY OF IMPERIAL

- Jim Minnick, Director of Planning & Development Services
- Michael Abraham, AICP, Assistant Director of Planning & Development Services
- David Black, Planner IV
- Imperial County Air Pollution Control District
- Department of Public Works
- Fire Department
- Agriculture Commissioner
- Environmental Health Services
- Sheriff's Office

B. OTHER AGENCIES/ORGANIZATIONS

- Imperial Irrigation District (ID)
- Native American Heritage Commission
- California Highway Patrol (CHP)
- Regional Water Quality Control Board (RWQCB)

I.1.XVIII.1.1.1.1.1.1 Imperial Irrigation District

- California Department of Transportation, District 11

(Written or oral comments received on the checklist prior to circulation)

V. REFERENCES

1. See Applicant's Site Plan on Exhibit A & B of this Initial Study
2. Land Use Element Table 4 exhibit
3. Ultra-Systems Air Quality Study dated November 13, 2018
4. Barrett's Survey's July 2018
5. Conservation Element Open Space Element Figure 6
6. California Health & Safety Code 7050.5, CEQA 15064.5, California Resources Code 5097.98
7. Linscott Law & Greenspan Engineers Transportation Impact Analysis dated July, 2018
8. IC General Plan Conservation and Open Space Element Figure 1 http://www.icpds.com/CMS/Media/Conservation-&-Open-Space-Element-2016.pd
9. Imperial County General Plan Conservation and Open Space Element Fig 8 http://www.icpds.com/CMS/Media/Conservation-&-Open-Space-Element-2016.pdf
10. Geotechnical report Landmark dated August 2018
11. Geotechnical Report LandMark dated July 2006 for Pacific Ethanol EIR
12. ALUC Compatibility May 3C
13. Fault Activity Map of California (2010) http://maps.conservation.ca.gov/cgs/fam
14. EnviroStor Database http://www.envirostor.dtsc.ca.gov/public/map/?myaddress=Sacramento&tour=True
15. Federal Emergency Management Area (FEMA) http://www.icpds.com/CMS/Media/45-FEMA-1100.pdf
16. Imperial County Conservation and Open Space Element Figure 8 http://www.icpds.com/CMS/Media/Conservation-&-Open-Space-Element-2016.pdf
17. I.C. Public Works Comment Letter dated 1-25-19
18. Augustine Band of Cahuilla Indians
19. Colorado River Indians Tribes
20. IID comment letter dated 5-14-2018
21. APCD comment letter dated 12-26-18
22. Pacific Ethanol Mitigation Monitoring and Reporting Program

VI. NEGATIVE DECLARATION – County of Imperial

The following Negative Declaration is being circulated for public review in accordance with the California Environmental Quality Act Section 21091 and 21092 of the Public Resources Code.

Project Name: GPA # 18-0001 & ZC 18-0002 Initial Study #18-0007

Project Applicant: All American Grain Company LLC

Project Location: The project site is located south of the City of Calipatria, Imperial County, California at 204 East Albright Road and Yocum Road and is further identified as Assessor's Parcel Number 024-260-032-000. The entire APN 024-260-032 is currently situated on approximately 89 +/- acres of land located within the County of Imperial, about half a mile south of the City of Calipatria See Exhibit A.

Description of Project: Applicant proposes a Zone Change (ZC) and General Plan Amendment (GPA) to the west half of APN: 024-260-032 in an effort to bring the parcel into conformance with applicable zoning & land use regulations. The Zone Change & General Plan Amendment will allow more acreage under the Medium Industrial use so that the applicant may establish a Container Yard and Rail Spur. The proposed Zone Change will change the current A-2 (General Agriculture) zone to M-2 (Medium Industrial) zone, while the General Plan Amendment will amend the Imperial County Land Use Element *Table 4: Compatibility Matrix1*, located on page 64 of the Land Use Element. The current land use designation for APN: 024-260-032 is Urban Area which allows for compatibility with M-2 zoning as stated within the contents of the Land Use Element, however, this is not reflected in *Table 4: Compatibility Matrix*. This General Plan Amendment is meant to correct *Table 4: Compatibility Matrix* so that it is compatible with the Land Use Element's contents

VII. FINDINGS

This is to advise that the County of Imperial, acting as the lead agency, has conducted an Initial Study to determine if the project may have a significant effect on the environmental and is proposing this Negative Declaration based upon the following findings:

☐ The Initial Study shows that there is no substantial evidence that the project may have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

☐ The Initial Study identifies potentially significant effects but:

(1) Proposals made or agreed to by the applicant before this proposed Mitigated Negative Declaration was released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur.

(2) There is no substantial evidence before the agency that the project may have a significant effect on the environment.

(3) Mitigation measures are required to ensure all potentially significant impacts are reduced to levels of insignificance.

A NEGATIVE DECLARATION will be prepared.

If adopted, the Negative Declaration means that an Environmental Impact Report will not be required. Reasons to support this finding are included in the attached Initial Study. The project file and all related documents are available for review at the County of Imperial, Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 (442) 265-1736.

NOTICE

The public is invited to comment on the proposed Negative Declaration during the review period.

Date of Determination   Jim Minnick, Director of Planning & Development Services

The Applicant hereby acknowledges and accepts the results of the Environmental Evaluation Committee (EEC) and hereby agrees to implement all Mitigation Measures, if applicable, as outlined in the MMRP.

Applicant Signature   Date

SECTION 4

VIII. RESPONSE TO COMMENTS

(

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Attachment A.

Mitigation Monitoring & Reporting Program

MITIGATION, MONTORING AND REPORTING PROGRAM

MITIGATION MEASURES
PURSUANT TO THE ENVIRONMENTAL EVALUATION COMMITTEE
February 14, 2019
All American Grain
[GPA #18-0001 ZC #18-0002 TR #00991]

(APN 024-260-032-000)

(CEQA – Mitigated Negative Declaration)

Pursuant to the review and recommendations of the Imperial County Environmental Evaluation Committee (EEC) on February 14, 2019, the following Mitigation Measures are hereby proposed for the project:

MITIGATION MEASURE 1 AIR QUALITY (a)

Construction Phase:

- **MM AQ-1 The operator shall limit vehicle speed to less than 15 miles per hour on any and all unpaved surfaces on the project site.**

Operational Phase Mitigation to include:

MM AQ-2 the proponent shall pay an in-lieu mitigation fee to be determined and administered by the ICAPCD. [1] In accordance with the ICAPCD *CEQA Air Quality Handbook*, the long-term operational impacts would be less than significant upon implementation of mitigation measure

(Monitoring Agency: Imperial County Planning & Development Services Department & APCD; Timing: During Construction & Prior to permit approval)

MITIGATION MEASURE 2 BIOLOGICAL (a)

Mitigation Measures:
a. BUOW shelter in place using hay bales and remove shelter when project is complete under supervision of qualified biologist.
b. Worker BOUW training sessions
c. Monitoring when construction is within 250 feet (February – August); 160 feet (September – January) if determined necessary by qualified biologist.
d. If construction stared during Migratory Bird Nesting season (February – August) a nesting bird survey should be completed 3 days prior to start of construction.

(Monitoring Agency: Imperial County Planning & Development Services Department; Timing: Prior to construction)

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[1] #4Ultra-Systems Air Quality Study dated November 13, 2018
Barrett Biological surveys dates July 2018

MITIGATION MEASURE 3 CULTURAL & ARCHAEOLOGICAL (a)

Mitigation Measures:

- **The Imperial County Planning Department shall be notified immediately if any cultural resources (e.g., prehistoric or historic artifacts) or paleontological resources (e.g., fossils) are uncovered during construction. All construction must stop in vicinity of the find and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action.**

- **The Imperial County Planning Department shall be notified immediately if any cultural resources (e.g., prehistoric or historic artifacts) or paleontological resources (e.g., fossils) are uncovered during construction. All construction must stop in vicinity of the find and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action.**

- **If any paleontological resources (fossils) are discovered during ground disturbing project activity, all work in the immediate vicinity must stop and the Imperial County Planning Department shall be immediately notified. A qualified paleontologist shall be retained to evaluate the finds and recommend appropriate mitigation measures for the inadvertently discovered paleontological resources.**

- **If avoidance is not feasible, a qualified professional archaeologist shall be on site during any excavations in excess of 4 feet who shall have the authority to stop construction if necessary and determine the appropriate protective measures if any. If subsurface deposits are found, an area equal to 200 feet around the area shall be halted from construction until appropriate removal or alternative solution of collective of artifacts is concluded. In the event that human remains are found, construction activities within 200 feet radius shall cease, the Imperial County Coroner notified and work not resume until the recommendations of an MLD (Most Likely Descendant) are implemented.**

(Monitoring Agency: Imperial County Planning & Development Services Department; Timing: During Construction)

MITIGATION MEASURE 4 GREENHOUSE GAS EMISSION:

Mitigation Measures for Construction Phase:

Construction Phase:

- **MM AQ-1 The operator shall limit vehicle speed to less than 15 miles per hour on any and all unpaved surfaces on the project site.**

Operational:

- **MM AQ-2: The proponent shall pay an in-lieu mitigation fee to be determined and administered by the ICAPCD.[2] In accordance with the ICAPCD *CEQA Air Quality Handbook*, the long-term operational impacts would be less than significant upon implementation of mitigation measure**
- (Monitoring Agency: Imperial County Planning & Development Services Department & APCD; Timing: Prior to permit approval)

MITIGATION MEASURE 5 HYDROLOGY AND WATER QUALITY:

- The project applicant is required to prepare a Storm Water Pollution and Prevention Plan (SWPPP) to be administered through all phases of grading and project construction. The SWPPP must incorporate Best Management Practices (BMPs) meeting technical standards of the General Construction permit to ensure that potential water quality impacts (including on-site and off-site erosion) during construction phases are minimized and that violations of water quality standards do not occur. The SWPPP must address spill prevention and include a countermeasure plan describing measures to ensure proper collection and disposal of all pollutants handled or produced on the site during construction, including sanitary wastes, cement, and petroleum products. BMPs included in the SWPPP must be consistent with the California Storm-water Best Management Practices Handbook for Construction. The SWPPP must be submitted to the Region 7 Regional Water Quality Control Board and to the County for review prior to the issuance of grading permits.

- The project applicant is required to prepare a Storm Water Pollution and Prevention Plan (SWPPP) governing industrial operations to be administered so long as industrial activities are ongoing. The Industrial SWPPP must incorporate Best Management Practices (BMPs) meeting the technical standards of the General Industrial Permit to ensure that potential water quality impacts during the operational phase are minimized and that violations of water quality standards do not occur. The Industrial SWPPP will include permanent post-construction BMPs meeting the County's requirements under its program implementing the Small MS4 Permit. These post-construction BMPs will be included in the Industrial SWPPP and must be consistent with the California Storm-water Best Management Practices Handbook for Commercial and Industrial operations. The BMPs will include the implementation of three [3] detention basins, collectively sized to retain a 100-year frequency storm event from the project site. These detention basins will meet design standards imposed by the County and the Imperial Irrigation District, including draining within 72 hours following a storm event and having outlet structures no larger than 12 inches in diameter and containing a backflow prevention device. The Industrial SWPPP must be submitted to the Region 7 Regional Water Quality Control prior to the issuance of certificates of occupancy. As per Mitigation Measure in Pacific Ethanol EIR 2006.

(Monitoring Agency: Imperial County Planning & Development Services Department; Timing: Prior to permit approval)

MITIGATION MEASURE 6 PUBLIC SERVICES

- An Emergency Response Plan shall be prepared in coordination with local fire agencies and the County of Imperial. The Emergency Response Plan shall be updated annually in coordination with the Imperial County Fire Department and the Imperial County Office of Emergency Services would appear to bring impacts to a less than significant level.

- A Hazardous Materials Business Plan shall be prepared in accordance with Title 19, Division 2, Chapter 4, and Article 4 of California Code of Regulations. The Hazardous Material Inventory shall be updated annually to the Imperial County Fire Department and the Imperial County Office of Emergency Services.

(Monitoring Agency: Imperial County Planning & Development Services Department & Fire Department; Timing: Prior to permit approval)

MITIGATION MEASURE 7 TRANSPORTATION / TRAFFIC

- *Yocum Road is classified as 4-Lane Major Collector requiring eighty four feet (84) of right of way, being forty two (42) feet from existing centerline. Forty feet (40') of right of way has been provided per Grant Deed Doc # Book 2249 pg. 1381, 2003. As directed by Imperial County Board of Supervisors per Minute Order #6 dated 11/22/1994 per the Imperial County Circulation Element Plan of the General Plan).*

- *Albright Road is classified as 2-Lane Minor Collector requiring seventy feet (70) of right of way, being thirty five (35) feet from existing centerline. Seventeen feet and Six inches (17'-6') of right of way has been provided per Grant Deed Doc # Book 2249 pg. 1378, 2003. Sufficient right of way must be provided to meet this road classification. As directed by Imperial County Board of Supervisors per Minute Order #6 dated 11/22/1994 per the Imperial County Circulation Element Plan of the General Plan).*

- *The applicant shall furnish a Drainage and Grading Plan/Study to provide for property grading and drainage control, which shall also include prevention of sedimentation of damage to off-site properties. The Plan/Study shall be prepared per the Engineering Design Guidelines Manual for the Preparation and checking of Street Improvement, Drainage, and Grading Plans within Imperial County and submitted to the Department of Public Works for review and approval. The applicant shall implement the approved plan. Employment of the appropriate Best Management Practices (BMPs) shall be included on the plan.*

- The applicant for encroachment permits, grading plans, and/or improvement plans is responsible for researching, protecting and preserving survey monuments per the Professional Land Surveyor's Act (8771 (b)). This shall include a copy of the referenced survey map and tie card(s) (if applicable) for all monuments that may be impacted by the project whether it be on-site of off-site.

- *At time of development, if required, by Section 8762(b) of the Professional Land Surveyors Act, a record of survey shall be filed with the County Recorder of Imperial County.*

- Street improvements shall be required in conjunction with, but not limited to, any construction, grading, or related work, including the construction of structures, buildings, or major additions thereto, on property located adjacent to any county street or on property utilizing any county street for ingress and egress, except that such improvements may be deferred as described in Section 12.10.040 of this chapter for residential property (Per Imperial County Code of Ordinances, Chapter 12.10.020). The street improvements required shall be a commercial type driveway per Imperial County Standards and a secondary emergency access driveway as approved by this Department. The secondary emergency access driveway shall be constructed of asphalt concrete or as approved by this Department.
- *No building permit for any structure or building or major addition to a building or structure shall be issued until the improvements required by Section 12.10.010 of this chapter have been installed and/or bonded. In addition, no building permit shall be issued until there has been compliance with Chapter 12.12 of this title and the requirement that an encroachment permit be obtained (Per Imperial County Code of Ordinances, Chapter 12.10.030).*
- *Any activity and/or work within Imperial County right-of-way shall be completed under an encroachment permit issued by this Department (Per Imperial County Code of Ordinances, Chapter 12.12). Any activity and/or work may include, but not be limited to, the installation of temporary traffic control devices, construction of access driveways, etc.*
- The applicant/owner of facility shall fund needed future construction and improvements for said turn lanes installations for right and/or left turn lanes into the facility.

Figure 7-1 of the transportation impact analysis indicates that 15% of the truck traffic will be using Yocum Road east of Kershaw Road (Brown Avenue). This section of Yocum Road is unpaved.- Unpaved Haul/Access Roads Requirements of Rule 805 of the Imperial County Air Pollution Control District limits any traffic on unpaved roads to generate visible dust emissions (VDE) to less than 20% opacity. If the applicant is unable to maintain the opacity level as required by Rule 805, the applicant shall mitigate the generation of dust due to project traffic along Yocum Road between Kershaw Road (Brown Avenue) and Blair Road and along Blair Road between Yocum Road and State Route 115 by one of the methods

below:

- **Asphalt Concrete Road Improvements: The road section shall be improved by installing two (2) 12-foot travel lanes consisting of 4 inches of asphalt concrete over 18 inches of Class 2 Base, including Class 2 base shoulder backing, as approved by the Director of Public Works. Any activities related to these road improvements shall be completed under an encroachment permit from this Department.**
- **Road Surface Chemical Stabilization: The road surface shall be stabilized by applying chemical stabilization products as recommended by the product manufacturer to accommodate for two (2) 12- foot travel lanes and as approved by the Director of Public Works. Any activities related to this road stabilization shall be completed under an encroachment permit from this Department.**
- **Aggregate Base Road Improvements: The road section shall be improved by installing two (2) 12-foot travel lanes consisting of a minimum of 3" of Class 2 Base material, as recommended by a California Geotechnical Engineer, and as approved by the Director of Public Works. Any activities related to these road improvements shall be completed under an encroachment permit from this Department.**
- **Road Dust Mitigation Plan: The applicant shall prepare a Road Dust Mitigation Plan and submit it to this Department for review and approval. Any activities related to the implementation of the road dust mitigation plan shall be completed under an encroachment permit from this Department.**
- **Traffic Restriction: Any existing and/or proposed project traffic, truck or passenger vehicles, associated with the project site shall be restricted from using the road section. The transportation impact analysis shall be revised to indicate the revised traffic distribution and resubmitted to this Department for review and approval prior to the Zone Change Approval.**
- **All solid and hazardous waste shall be disposed of in approved solid waste disposal sites in accordance with existing County, State and Federal regulations (Per Imperial County Code of Ordinances, Chapter 8.72).**
- **All on-site traffic area shall be hard surfaced to provide all weather access for fire protection vehicles. The surfacing shall meet the Department of Public Works and Fire/OES Standards as well as those of the Air Pollution Control District (APCD) (Per Imperial County Code of ordinances, Chapter 12.10.020 A).**
- **The project shall submit a National Pollutant Discharge Elimination System (NPDES) permit and Notice of Intent (NOI) from the Regional Water Quality Control Board (RWQCB) prior county approval of onsite grading plan (40 CFR 122.28).**
- **A Transportation Permit shall be submitted to the local road agency(s) having jurisdiction over the haul route(s) for any hauls of heavy equipment and large vehicles which impose greater then legal loads on riding surfaces, including bridges. (Per Imperial County Code of Ordinances, Chapter 10.12.020).**
- **As a part of the project's compliance with the mandatory regulation, the existing railroad crossing shall be re-evaluated to conform to the traffic control devices, systems, and practices described in the Manual on Uniform Traffic Control Devices (MUTCD), Federal, State, and local laws and regulations. The applicant shall also consult with Commission's Rail Crossings Engineering Section and Union Pacific Railroad (UPRR) and comply with the mandatory requirements established from the consultations for the inclusion of the trains required for the proposed project.**

Monitoring Agency: Imperial County Planning & Development Services Department & Public Works Department; Timing: Prior to permit approval

S:\APN\024\260\032\gpa18-0001\EEC\mmrp

Attachment B.

Revised Project Description (1-23-2019)

DUBOSE DESIGN GROUP

email@dubosedesigngroup.com
dubosedesigngroup.com

PLANNING • CIVIL ENGINEERING • LAND SURVEYING • PROJECT MANAGEMENT

1/23/2019

All American Grain Company- Zone Change & GPA

Applicant: All-American Grain Company, LLC

Engineer: LC Engineering Consultant, Inc. (License No. 55432)

Planning: DuBose Design Group, Inc.

Contractor: Andy Hoyt General Engineering, Inc. (License No. 578349)

Location: The site is located just south of the City of Calipatria, Imperial County, California. The approximate site address is Albright Road and Highway 111, Calipatria, California. Latitude and longitude are 33°06'28" and 115°30'43", respectively.

Property Size: 89 +/- acres

Project Size: 42 +/- acres

APN: 024-260-032

Proposed Development:

All-American Grain, LLC (applicant) proposes a Zone Change (ZC) and General Plan Amendment (GPA) to the west half of APN: 024-260-032 in an effort to bring the parcel into conformance with applicable zoning & land use regulations. The Zone Change & General Plan Amendment will allow more acreage under the Medium Industrial use so that the applicant may establish a container yard, an additional inner rail-spur and a bridge allowing for alternative access. The proposed Zone

Figure 1. Property Site

Change will change the current A-2 (General Agriculture) zone to M-2 (Medium Industrial) zone, while the General Plan Amendment will amend the Imperial County Land Use Element *Table 4: Compatibility Matrix*[1], located on page 64 of the Land Use Element. The current land use designation for APN: 024-260-032 is Urban Area which allows for compatibility with M-2 zoning as stated within the contents of the Land Use Element, however, this is not reflected in *Table 4: Compatibility Matrix*. This General Plan Amendment is meant to correct *Table 4: Compatibility Matrix* so that it is compatible with the Land Use Element's contents.

Project Summary:

The Project Site

The entire APN 024-260-032 is currently situated on approximately 89 +/- acres of land located within the County of Imperial, about half a mile south of the City of Calipatria (please see **Figure 1**). The property is currently divided into two separate zoning distinctions but with one land use designations (reference **Appendix A**). In 2008, the property underwent a Zone Change and General Plan Amendment, in which approximately 47 +/- acres changed from A-2 to M-2 zoning while the entire parcel changed from Agriculture to Urban Area land use. Currently, most of the eastern portion of the property is zoned M-2 while the entire western portion and small portions of the northeastern side of the property are zoned A-2 as indicated above.

Project Development

The applicant proposes to construct a container yard that will act as storage area for loading and unloading containers and will be primarily situated on the southernmost portion of APN 024-260-032 (please see **Figure 5**). A proposed inner rail-spur located within the existing rail-spur would be construct for organizational purposes and due to regulations set forth by Union Pacific Rail-Road. The existing facility accommodates two trains per week, including one (1) train loaded with corn that unloads at the existing All-American Grain facility and (1) unit train that ships agricultural products to the Port of Long Beach. Because the applicant proposes to accommodate one (1) more unit train, scheduling conflicts will likely occur between the corn train and unit trains. This proposed inner rail-spur will allow the unit trains to cycle around the proposed inner rail-spur while the corn train utilizes the outer rail-spur, simultaneously. Additionally, through careful

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[1] Imperial County Land Use Element

consideration the applicant may decide to construct a bridge that will be located at either Option A or Option B (please see **Appendix B**). In an effort to maximize efficiency, access to the container yard will be provided to loaded trucks and emergency vehicles by the proposed bridge once either the inner and/or outer rail-spur is completely occupied.

Need for Project

As of now, operations for agricultural exporters rely heavily on trucks for distribution purposes. As discussed below, containers are loaded with agricultural commodities and are driven via truck to the Port of Long Beach (POLB) for distribution. As the amount of containers being transported to POLB increases so does the level of complexity. As noted on the POLB's website, exports for the month of April from the POLB have increased by 22% as compared to last year. This level of increase places an even higher strain on nearby infrastructure, truck drivers/haulers and port authorities. The increased number of trucks to the POLB creates congestion on major highways to the Port, congestion at the port terminal and makes meeting appointment times at the terminal difficult to achieve. Additionally, the availability of logistic truck drivers has fallen, other labor markets such as construction are drawing these drivers away. To solve these issues, All American Grain Company proposes the construction of a loading/distribution facility that will utilize train units for distribution purposes to the POLB, thus cutting down the amount of trucks needed for distribution.

Project Use

The current operations of the facility act as a grain transfer and storage station for locally grown containered agricultural commodities. These operations include the receiving of the agricultural commodities such as hay, and other types of locally grown rufage in storage containers, transported via trucks to the facility. Once these containers are received and stored for a short period of time, they are then reloaded on to unit trains for distribution outside of the Imperial Valley. Additionally, incorporated in the original operations of the facility was receiving corn via unit train cars that would then be distributed to various Feed mills in the Imperial Valley via truck that will continue.

The applicant wishes to add to the current use by relying more heavily on the unit train cars rather than trucks for distribution from the Imperial Valley by adding an additional one (1) unit train. The method of receiving and transporting the hay from locally harvested fields to the storage facility will remain. However, once the hay containers are stored and are ready to be reloaded, individual unit train cars will be the *primary method* of distribution to the POLB. Ultimately, the applicant's goal is to become more efficient with the delivery of out-going hay products that leave the valley and reduce the amount of trip miles made by trucks. This addition of one-unit train of 105 well cars which is 210 containers will be needed to maximize the reduction of trip miles made by trucks. Once operations are in-motion, the empty storage facility will utilize their inner circle railway as a systematic method of offloading containers from the train and then reloading the containers that were loaded at the source. When the train unit cars are loaded and ready for distribution, they will leave the inner circle railway on their way to the POLB utilizing the Union Pacific Rail Road.

Project Circulation

In order to gain access to the project site, the applicant requires the construction of two (2) driveways for purposes of ingress and egress. The driveway closest to the intersection of HWY 111 and E. Albright Rd will be utilized as the point of egress while the further east driveway will be utilized as the point of ingress. These access points will be located on the southern boundary of the site where E. Albright intersects HWY 111 (see **Figure 2**). The distance between the entrance to the facility and the turn-off from Hwy 111 will provide enough space if numerous trucks show up all at once. As discussed earlier, the applicant desires to have the ability to construct a bridge that will allow access to the storage container yard when both the existing and proposed additional rail spur are fully occupied.

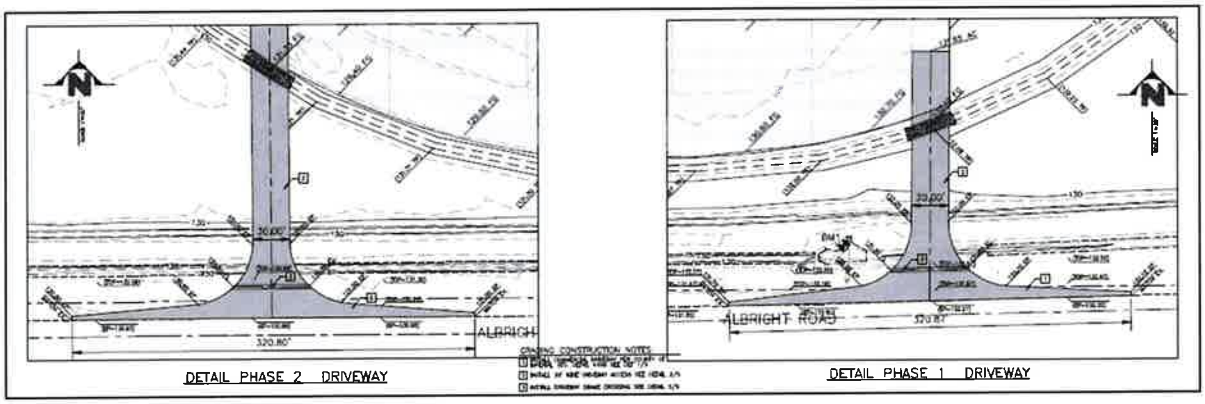

Figure 2. Driveways

Construction Activities

In order to support the additional loading and unloading zones and to stay compliant with County of Imperial Planning Department, County of Imperial Fire Department and APCD, the proposed container yard will install "all weather surface" pavement to the standards of both the County of Imperial and the Air Pollution Control District. The container yard will accommodate containers that will be stacked 4 high over a space of 8 ft by 40 ft (the container on the ground level). There will be 840 containers within the loading area at the peak on one day. The stacks of containers will not exceed the height of the nearby silos. Individual containers will weight approximately 60,000 lbs when filled. Once stacked in fours the total approximate weight of the stack will be 240,000 lbs (a soils recommendation will be provided from a geotechnical expert). With this being said, the load bearing capacity for the surface must withstand this total amount of weight. For descriptions of the pavement section for both the Container Yard and the All-Weather Access Driveways please see **Figure 3** and **Figure 4**. The unloading and loading of the containers will occur two days per week, during these days the train will be on site for 10-12 hours for purposes of unloading and loading.

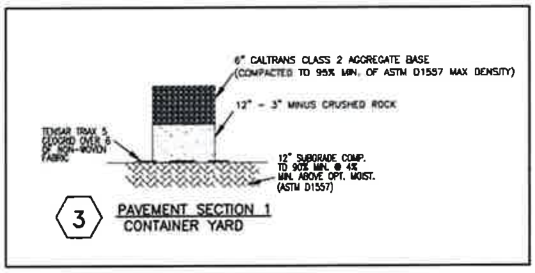

Figure 3. Container Yard

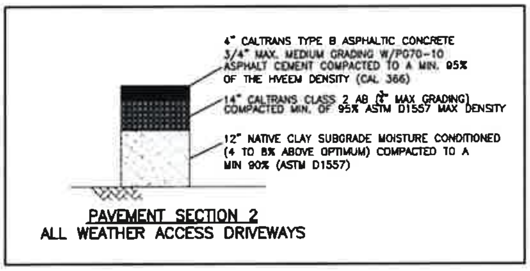

Figure 4. Access Driveways

Project Operation

As previously stated, the operation of the facility will act as a grain transfer and storage station for locally grown agricultural commodities. These commodities will be harvested throughout the Imperial Valley, loaded into empty containers and shipped via truck to the container yard. Upon arrival, the loaded containers will be stored at the container yard for a short period of time until the unit train arrives. Once the unit train has arrived, it will move into position for both unloading and loading. The train will move forward for every 10 railcars that are unloaded and loaded. The containers themselves are then unloaded and loaded via RS46 Series Hyster container loaders.

When the facility is completely operational, there will be a maximum of four (4) container loaders at the site.

Project Phasing

It is the intent of the applicant to construct this container yard in phases (see **Figure 5**). On the furthest east portion of the project, contains Phase 1, which is permitted by right to allow for a container yard. Phase 1 is unrelated to this Zone Change and General Plan Amendment for the reason stated previously. As of 8/06/2018 and 8/07/2018, the applicant has submitted with County of Imperial Building Department and Public Works Department for a grading permit for Phase 1. Once the Zone Change and General Plan Amendment have been approved, grading permits will be submitted for Phases 2 & 3.

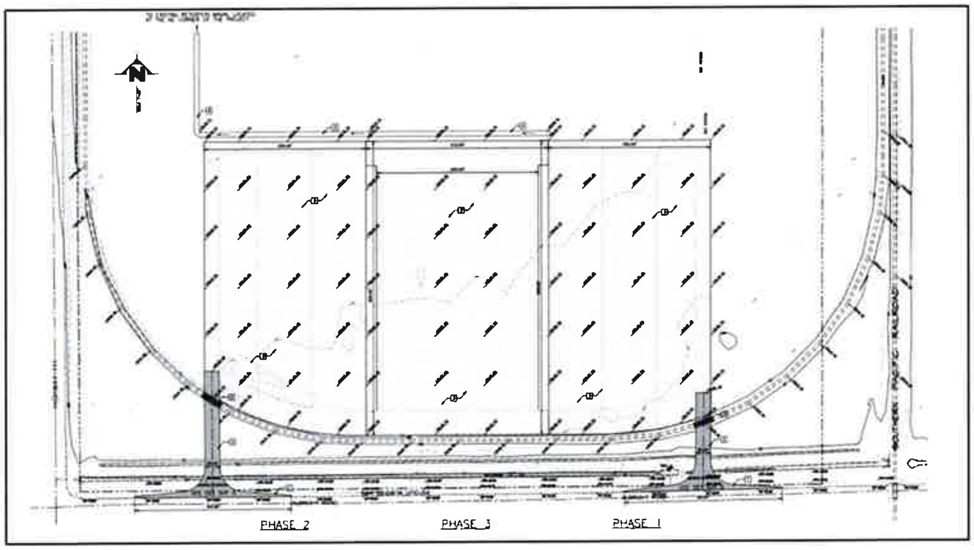

Figure 5. Project Phasing

Environmental Consideration

It is understood by the applicant that this proposed alteration to the current use will trigger additional environmental studies. With consultation from the County of Imperial, it has been determined that environmental studies will include: (1) Air Study, (2) Noise Study, (3) Traffic Study and (4) Biological.

Air Study

As instructed by the Imperial County Planning and Development Services, an Air Quality Study was performed by UltraSystems, Inc. analyzing the air quality including Greenhouse Gas Emissions generated by the proposed project. As further discussed in the Air Quality and Greenhouse Gas Emissions Report, sources of air pollution include locomotive emissions, container loader emissions, hauling truck emissions, and employee commuter emissions. These sources of emissions would emit pollutants of concern include ROG, CO, NOx, PM10 and PM2.5. As the report indicates, the long-term project operational emissions would not exceed applicable thresholds for ROG, PM10 or CO but they would exceed the Tier 2 threshold for NOx. However, as discussed in the attached Memo to the Air Quality Study, APCD requested that UltraSystems perform a comparison of criteria pollutants emissions from truck and train transport of Agricultural products from All American Grain in Calipatria to Riverside County Line. Ultimately, the amount of NOx decreases a substantial amount due to reliance on trains rather than trucks.

Noise Study

As instructed by the Imperial County Planning and Development Services, a Noise Study was prepared by UltraSystems, Inc. analyzing the noise levels generated by the proposed project. As further discussed in the Noise Study Report, noise sources include container loaders, trucks, trains, landscape and building maintenance. Offsite noise would be attributed to project-induced traffic. Although the project would generate some noise, UltraSystems found that there would be no significant short- or long-term noise impacts due to the project so no mitigation measures are necessary.

Traffic Study

As instructed by the Imperial County Planning and Development Services, a Traffic Study was prepared by Linscott Law & Greenspan (LLG) to analyze the traffic impacts caused by the proposed project. Based on information obtained from the applicant, LLG predicts the Total Project would generate a maximum of 20 Average Daily Traffic (ADT) by passenger vehicles. It would also generate 360 ADT by trucks, with 15 inbound and 15 outbound trips during the AM and PM peak hours. As previously discussed, the project would have driveways dedicated for both entrances and exits for vehicles (**Figure 2**).

Biological Study

As instructed by the Imperial County Planning and Development Services, a Biological Study was conducted by Barrett's Biological Surveys. They performed a biological habitat assessment of the lower portion where the project site would be located. As further described in the Biological Report, there were no vegetation that was found that would be considered endangered, threatened or species of concern. Additionally, there were no fauna found that would be considered endangered or threatened, however, three burrowing owls, one occupied burrow and one active burrow were found offsite on Imperial Irrigation District Right-of-Way. Mitigation measures were given for those instances.

DUBOSE DESIGN GROUP

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PLANNING • CIVIL ENGINEERING • LAND SURVEYING • PROJECT MANAGEMENT

Appendix A


Current Property Zoning
Yocum Rd
A-2 (General Agriculture)
111
M-2 (Medium Industrial)
Kershaw Rd
uegger Rd
E Albright Rd
Albright Rd
Google Earth
© 2018 Google
N
1000 ft


Proposed Property Zoning
M-2 (Medium Industrial)
M-2 (Medium Industrial)
Kershaw Rd
Google Earth
© 2018 Google
N
1000 ft

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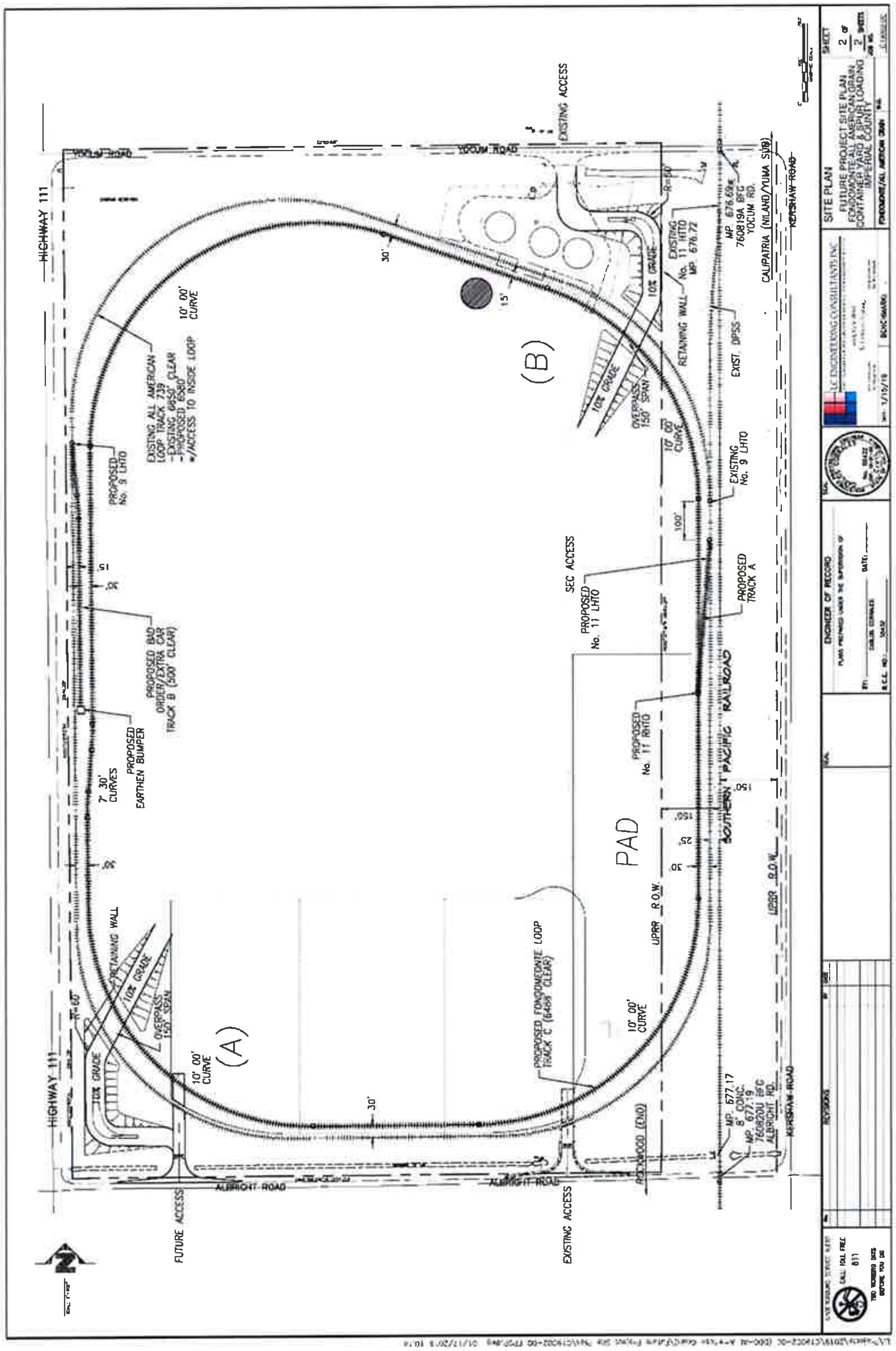
PLANNING • CIVIL ENGINEERING • LAND SURVEYING • PROJECT MANAGEMENT

Appendix B


SITE PLAN
FUTURE PROJECT SITE PLAN
FONDOMONTE/ALL AMERICAN GRAIN
CONTAINER YARD & SPUR LOADING
IMPERIAL COUNTY
SHEET 2 OF 2 SHEETS
LC ENGINEERING CONSULTANTS INC
ENGINEER OF RECORD
HIGHWAY 111
YOCUM ROAD
EXISTING ACCESS
KERSHAW ROAD
ALBRIGHT ROAD
FUTURE ACCESS
ROCKWOOD (END)
EXISTING ALL AMERICAN LOOP TRACK 739
-EXISTING 6650' CLEAR
-PROPOSED 6580'
-W/ACCESS TO INSIDE LOOP
10' 00' CURVE
7' 30' CURVES
PROPOSED No. 9 LHTO
PROPOSED BAD ORDER/EXTRA CAR TRACK B (500' CLEAR)
PROPOSED EARTHEN BUMPER
RETAINING WALL
10% GRADE
OVERPASS 150' SPAN
R=60'
(A)
(B)
PAD
PROPOSED FONDOMONTE LOOP TRACK C (6498' CLEAR)
UPRR R.O.W.
SOUTHERN PACIFIC RAILROAD
PROPOSED No. 11 RHTO
PROPOSED No. 11 LHTO
SEC ACCESS
PROPOSED TRACK A
EXISTING No. 9 LHTO
EXISTING No. 11 HTTO MP 676.72
EXIST. DPSS
CALIPATRIA (NILAND/YUMA SUB)
MP 676.69± 760819A BFC YOCUM RD.
MP 677.17 8" CONC.
MP 677.19 760820U BFG ALBRIGHT RD.
30'
15'
100'
150'
25'
CALL TOLL FREE 811
TWO WORKING DAYS BEFORE YOU DIG
REVISIONS

Attachment C.

Request for Agency Comments Package

Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

December 7, 2018
REQUEST FOR REVIEW
AND COMMENTS

The attached project and materials are being sent to you for your review and as an early notification that the following project is being requested and being processed by the County's Planning & Development Services Department. Please review the proposed project based on your agency/department area of interest, expertise, and/or jurisdiction.

To: County Agencies

- ☒ County Executive Office- Andy Horne
- ☒ Public Works – John Gay/ Carlos Yee
- ☒ APCD – Monica Soucier/Matt Desert
- ☒ IC Fire/OES Office – Robert Malek/ Andrew Loper
- ☐ IC Sheriff's Office – Thomas Garcia
- ☒ EHS Office – Jeff Lamoure/Jorge Perez
- ☒ AG Commissioner- Carlos Ortiz/ Sandra Mendivil
- ☐ Heber Union Elementary School District- Juan Cruz
- ☐ Board of Supervisors – Luis Plancarte Dist. #2

State Agencies/Other

- ☒ Caltrans District 11- Jacob Armstrong/Beth Landrum
- ☒ CA Public Utilities Commission
- ☒ CA RWQC Board – Nadim-Shukry Zeywar
- ☐ BLM- Tom Zale/ Carrie Sahagun
- ☒ Southern California Gas CO-Justin Freeman
- ☒ State Historic Preservation Office- Julianne Polanco
- ☒ CA Dept. Conservation – John Lowrie
- ☒ CHP (Imperial Office) - Arturo Proctor, Capt.
- ☐ Native American Heritage Comm.-Katy Sanchez/Frank Lienert

Cities/Other

- ☒ City of Calipatria-Romualdo Medina
- ☒ Golden State Water CO-Perry Dahlstrom
- ☒ Dept of Fish & Wildlife-Magdalena Rodriguez
- ☒ City of Brawley- Gordon Gaste
- ☒ Carlsbad Fish & Wildlife Office
- ☒ Naval Air Facility-Marybeth Dreusike
- ☒ IID Env. Compliance. - Don Vargas
- ☒ Southern CA Water CO-Sunil Pillai
- ☒ Southern CA Edison-Erlinda Martinez

Project Contact: David Black, Planner IV – (442) 265-1736 ext. 1746 or davidblack@co.imperial.ca.us

Project ID: General Plan Amendment (GPA) #18-0001 & Zone Change (ZC) #18-0002 & Conditional Use Permit (CUP) #07-0023 (Recirculation)

Project Location: APN: 024-260-032-001
ADDRESS: 305 E. Yocum Road, Calipatria, CA

Project Description: Applicant wishes to rezone portion of the aforementioned property in hopes of creating more uniform zoning area. Applicant wishes to clean up the inconsistent zoning of their single property cause by a prior zone change.

Applicants: All American Grain Company LLC/ Mark Brandt, Secretary

Your written comments, recommendations, or conditions are requested by the deadline below so that they can be reviewed for appropriateness by the Director of Planning & Development Services and incorporated as part of project consideration. Please submit your response to the Case Planner. Jim Minnick, Director, Thank You!

Comments due by: December 27, 2018 at 5:00 p.m.

EEC/PC: TBD

COMMENTS: *(attach a separate sheet if necessary)* (if no comments, please state below and mail, fax, or e-mail this sheet to Case Planner)

Name: ______________________ Signature: ______________________ Title: ______________________

Date: ____________ Telephone No.: ____________________ E-mail: ______________________

DB\LA\S:\APN\024\260\032\GPA18-0001 & ZC18-0002 Request for Review and Comments 12.06.18.docx

Project Site-Prior to Zone Change

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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11/26/2018

All American Grain Company- Proposed Container Yard

Client: All American Grain Company, LLC

Engineer: LC Engineering Consultant, Inc. (License No. 55432)

Planning: DuBose Design Group, Inc.

Contractor: Andy Hoyt General Engineering, Inc. (License No. 578349)

Location: The site is located just south of the City of Calipatria, Imperial County, California. The approximate site address is Albright Road and Highway 111, Calipatria, California. Latitude and longitude are 33°06'28'' and 115°30'43'', respectively.

Property Size:	89 +/- acres
Project Size:	42 +/- acres
APN:	024-260-032

Proposed Development:

Applicant proposes a Zone Change (ZC) and General Plan Amendment (GPA) to the west half of APN: 024-260-032 in an effort to bring the parcel into conformance with applicable zoning & land use regulations. The Zone Change & General Plan Amendment will allow more acreage under the Medium Industrial use so that the applicant may establish a Container Yard and Rail Spur. The proposed Zone Change will change the current A-2 (General Agriculture) zone to M-2 (Medium Industrial)

Figure 1. Property Site

zone, while the General Plan Amendment will amend the Imperial County Land Use Element *Table 4: Compatibility Matrix*[1], located on page 64 of the Land Use Element. The current land use designation for APN: 024-260-032 is Urban Area which allows for compatibility with M-2 zoning as stated within the contents of the Land Use Element, however, this is not reflected in *Table 4: Compatibility Matrix*. This General Plan Amendment is meant to correct *Table 4: Compatibility Matrix* so that it is compatible with the Land Use Element's contents.

Project Summary:

The Project Site

The entire APN 024-260-032 is currently situated on approximately 89 +/- acres of land located within the County of Imperial, about half a mile south of the City of Calipatria (please see **Figure 1**). The property is currently divided into two separate zoning distinctions but with one land use designations (reference **Appendix A**).

In 2008, the property underwent a Zone Change and General Plan Amendment, in which approximately 47 +/- acres changed from A-2 to M-2 zoning while the entire parcel changed from Agriculture to Urban Area land use. Currently, most of the eastern portion of the property is zoned M-2 while the entire western portion and small portions of the northeastern side of the property are zoned A-2 as indicated above. The Container Yard will be primarily situated on the southernmost portion of APN 024-260-032 (please see **Figure 5**).

Need for Project

As of now, operations for agricultural exporters rely heavily on trucks for distribution purposes. As discussed below, containers are loaded with agricultural commodities and are driven via truck to the Port of Long Beach (POLB) for distribution. As the amount of containers being transported to POLB increases so does the level of complexity. As noted on the POLB's website, exports for the month of April from the POLB have increased by 22% as compared to last year. This level of increase places an even higher strain on nearby infrastructure, truck drivers/haulers and port authorities. The increased number of trucks to the POLB creates congestion on major highways to the Port, congestion at the port terminal and makes meeting appointment times at the terminal difficult to achieve. Additionally, the availability of logistic truck drivers has fallen, other labor

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[1] Imperial County Land Use Element

markets such as construction are drawing these drivers away. To solve these issues, All American Grain Company proposes the construction of a loading/distribution facility that will utilize train units for distribution purposes to the POLB, thus cutting down the amount of trucks needed for distribution.

Project Use

The current operations of the facility act as a grain transfer and storage station for locally grown containered agricultural commodities. These operations include the receiving of the agricultural commodities such as hay, and other types of locally grown rufage in storage containers, transported via trucks to the facility. Once these containers are received and stored for a short period of time, they are then reloaded on to unit trains for distribution outside of the Imperial Valley. Additionally, incorporated in the original operations of the facility was receiving corn via unit train cars that would then be distributed to various Feed mills in the Imperial Valley via truck that will continue.

The applicant wishes to add to the current use by relying more heavily on the unit train cars rather than trucks for distribution from the Imperial Valley. The method of receiving and transporting the hay from locally harvested fields to the storage facility will remain. However, once the hay containers are stored and are ready to be reloaded, individual unit train cars will be the *primary method* of distribution to the POLB. Ultimately, the applicant's goal is to become more efficient with the delivery of out-going hay products that leave the valley and reduce the amount of trip miles made by trucks. This addition of one-unit train of 105 well cars which is 210 containers will be needed to maximize the reduction of trip miles made by trucks. Once operations are in-motion, the empty storage facility will utilize their inner circle railway as a systematic method of offloading containers from the train and then reloading the containers that were loaded at the source. When the train unit cars are loaded and ready for distribution, they will leave the inner circle railway on their way to the POLB utilizing the Union Pacific Rail Road.

Project Circulation

In order to gain access to the project site, the applicant requires the construction of two (2) driveways for purposes of ingress and egress. The driveway closest to the intersection of HWY 111 and E. Albright Rd will be utilized as the point of egress while the further east driveway will be utilized as the point of ingress. These access points will be located on the southern boundary of the site where E. Albright intersects HWY 111 (see **Figure 2**). The distance between the entrance

to the facility and the turn-off from Hwy 111 will provide enough space if numerous trucks show up all at once. Additionally, the exit location will be located at the south/west corner of the property, allowing the option to either turn right or left depending on logistical reasons.

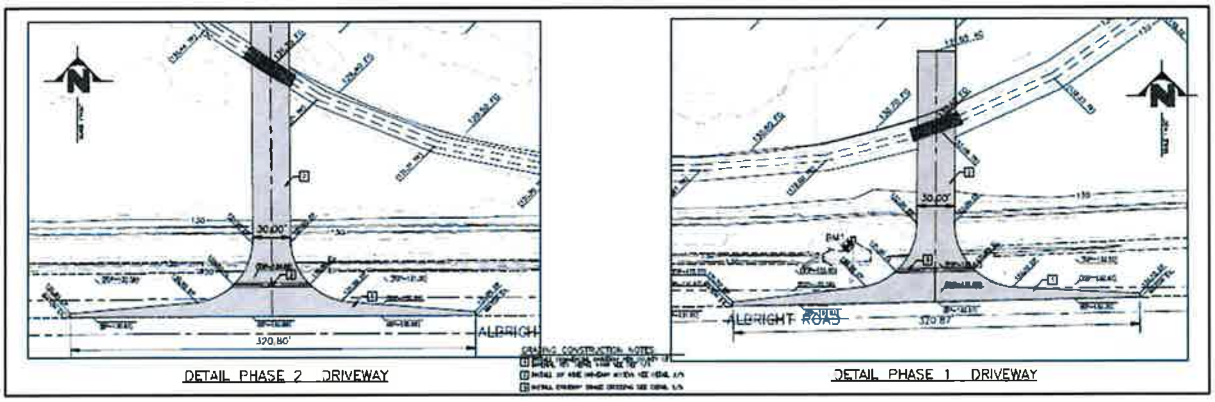

Figure 2. Driveways

Construction Activities

In order to support the additional loading and unloading zones and to stay compliant with County of Imperial Planning Department, County of Imperial Fire Department and APCD, the proposed container yard will install "all weather surface" pavement to the standards of both the County of Imperial and the Air Pollution Control District. The Container Yard and Spur Loading zone will accommodate containers that will be stacked 4 high over a space of 8 ft by 40 ft (the container on the ground level). There will be 840 containers within the loading area at the peak on one day. The stacks of containers will not exceed the height of the nearby silos. Individual containers will weight approximately 60,000 lbs when filled. Once stacked in fours the total approximate weight of the stack will be 240,000 lbs (a soils recommendation will be provided from a geotechnical expert). With this being said, the load bearing capacity for the surface must withstand this total amount of weight. For descriptions of the pavement section for both the Container Yard and the All-Weather Access Driveways please see **Figure 3** and **Figure 4**. The unloading and loading of the containers will occur two days per week, during these days the train will be on site for 10-12 hours for purposes of unloading and loading.

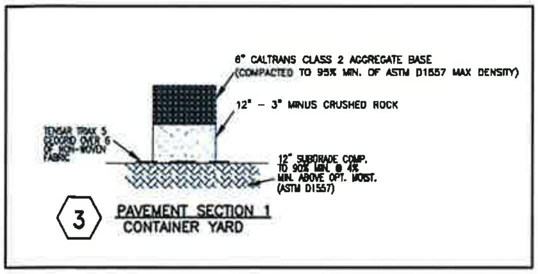

Figure 3. Container Yard

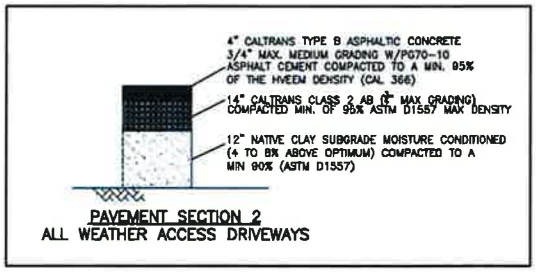

Figure 4. Access Driveways

Project Operation

As previously stated, the operation of the facility will act as a grain transfer and storage station for locally grown agricultural commodities. These commodities will be harvested throughout the Imperial Valley, loaded into empty containers and shipped via truck to the Container Yard. Upon arrival, the loaded containers will be stored at the Container Yard for a short period of time until the unit train arrives. Once the unit train has arrived, it will move into position for both unloading and loading. The train will move forward for every 10 railcars that are unloaded and loaded. The containers themselves are then unloaded and loaded via RS46 Series Hyster container loaders. When the facility is completely operational, there will be a maximum of four (4) container loaders at the site.

Project Phasing

It is the intent of the applicant to construct this Container Yard in phases (see **Figure 5**). On the furthest east portion of the project, contains Phase 1, which is permitted by right to allow for a container yard. Phase 1 is unrelated to this Zone Change and General Plan Amendment for the reason stated previously. As of 8/06/2018 and 8/07/2018, the applicant has submitted with County of Imperial Building Department and Public Works Department for a grading permit for Phase 1. Once the Zone Change and General Plan Amendment have been approved, grading permits will be submitted for Phases 2 & 3.

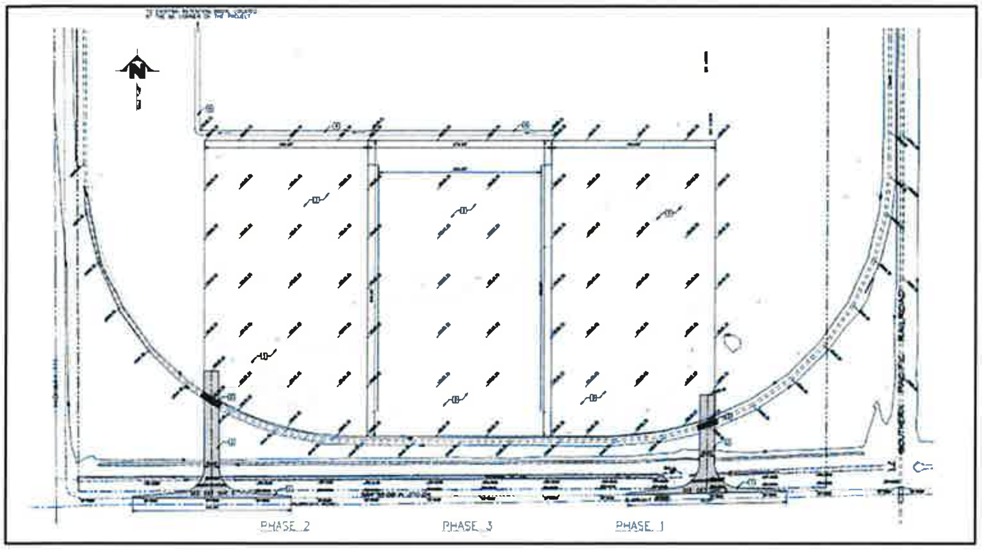

Figure 5. Project Phasing

Environmental Consideration

It is understood by the applicant that this proposed alteration to the current use will trigger additional environmental studies. With consultation from the County of Imperial, it has been determined that environmental studies will include: (1) Air Study, (2) Noise Study, (3) Traffic Study and (4) Biological.

Air Study

As instructed by the Imperial County Planning and Development Services, an Air Quality Study was performed by UltraSystems, Inc. analyzing the air quality including Greenhouse Gas Emissions generated by the proposed project. As further discussed in the Air Quality and Greenhouse Gas Emissions Report, sources of air pollution include locomotive emissions, container loader emissions, hauling truck emissions, and employee commuter emissions. These sources of emissions would emit pollutants of concern include ROG, CO, NOx, PM10 and PM2.5. As the report indicates, the long-term project operational emissions would not exceed applicable thresholds for ROG, PM10 or CO but they would exceed the Tier 2 threshold for NOx. However, as discussed in the attached Memo to the Air Quality Study, APCD requested that UltraSystems perform a comparison of criteria pollutants emissions from truck and train transport of Agricultural products from All American Grain in Calipatria to Riverside County Line. Ultimately, the amount of NOx decreases a substantial amount due to reliance on trains rather than trucks.

Noise Study

As instructed by the Imperial County Planning and Development Services, a Noise Study was prepared by UltraSystems, Inc. analyzing the noise levels generated by the proposed project. As further discussed in the Noise Study Report, noise sources include container loaders, trucks, trains, landscape and building maintenance. Offsite noise would be attributed to project-induced traffic. Although the project would generate some noise, UltraSystems found that there would be no significant short- or long-term noise impacts due to the project so no mitigation measures are necessary.

Traffic Study

As instructed by the Imperial County Planning and Development Services, a Traffic Study was prepared by Linscott Law & Greenspan (LLG) to analyze the traffic impacts caused by the proposed project. Based on information obtained from the applicant, LLG predicts the Total Project would generate a maximum of 20 Average Daily Traffic (ADT) by passenger vehicles. It would also generate 360 ADT by trucks, with 15 inbound and 15 outbound trips during the AM and PM peak hours. As previously discussed, the project would have driveways dedicated for both entrances and exits for vehicles (**Figure 2**).

Biological Study

As instructed by the Imperial County Planning and Development Services, a Biological Study was conducted by Barrett's Biological Surveys. They performed a biological habitat assessment of the lower portion where the project site would be located. As further described in the Biological Report, there were no vegetation that was found that would be considered endangered, threatened or species of concern. Additionally, there were no fauna found that would be considered endangered or threatened, however, three burrowing owls, one occupied burrow and one active burrow were found offsite on Imperial Irrigation District Right-of-Way. Mitigation measures were given for those instances.

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Appendix A

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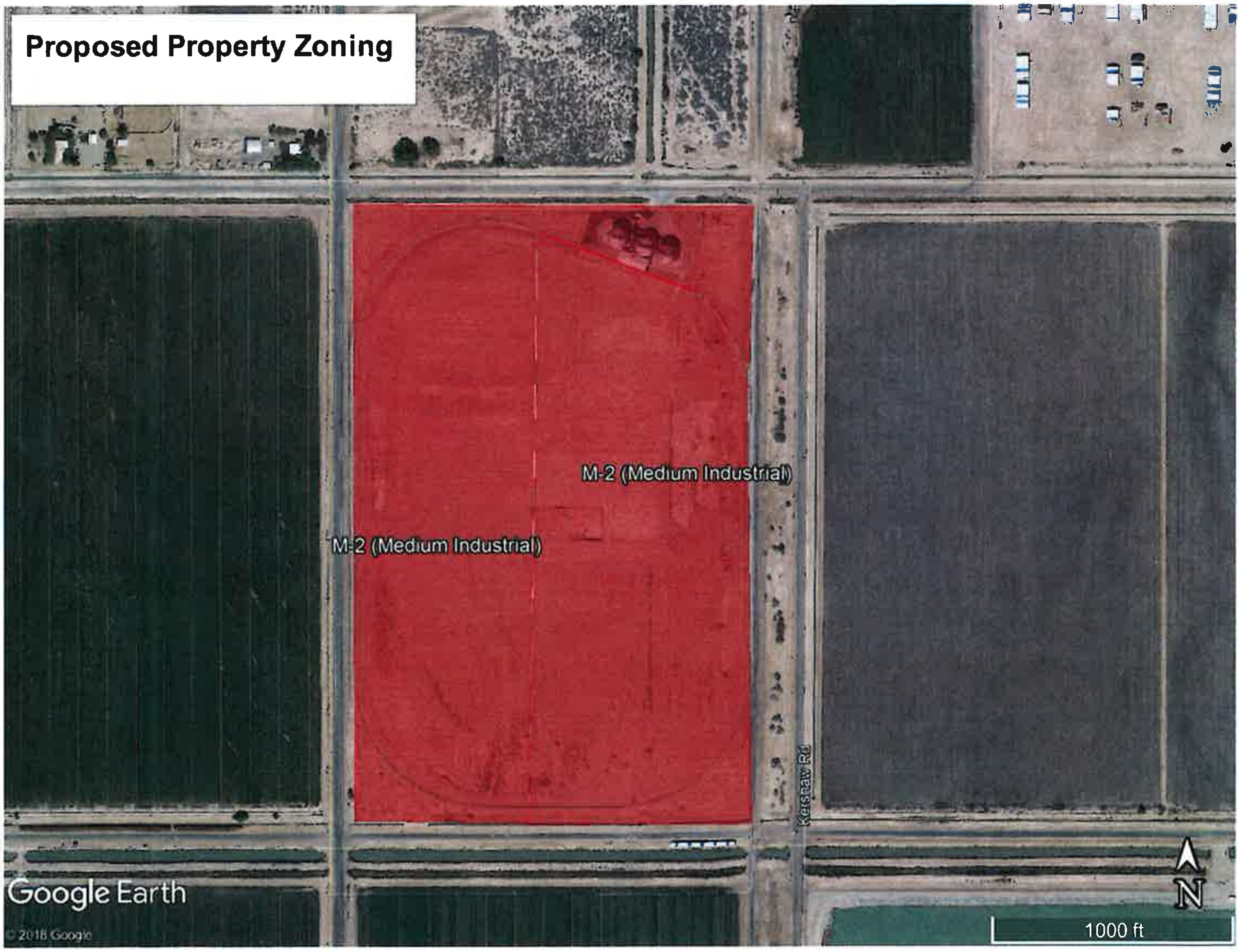
Proposed Property Zoning
M-2 (Medium Industrial)
M-2 (Medium Industrial)
Kershaw Rd
Google Earth
© 2018 Google
N
1000 ft

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11/26/2018

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Client: All American Grain Company, LLC

Engineer: LC Engineering Consultant, Inc. (License No. 55432)

Planning: DuBose Design Group, Inc.

Contractor: Andy Hoyt General Engineering, Inc. (License No. 578349)

Location: The site is located just south of the City of Calipatria, Imperial County, California. The approximate site address is Albright Road and Highway 111, Calipatria, California. Latitude and longitude are 33°06'28'' and 115°30'43'', respectively.

Property Size:	89 +/- acres
Project Size:	42 +/- acres
APN:	024-260-032

Proposed Development:

Applicant proposes a Zone Change (ZC) and General Plan Amendment (GPA) to the west half of APN: 024-260-032 in an effort to bring the parcel into conformance with applicable zoning & land use regulations. The Zone Change & General Plan Amendment will allow more acreage under the Medium Industrial use so that the applicant may establish a Container Yard and Rail Spur. The proposed Zone Change will change the current A-2 (General Agriculture) zone to M-2 (Medium Industrial)

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zone, while the General Plan Amendment will amend the Imperial County Land Use Element *Table 4: Compatibility Matrix*[1], located on page 64 of the Land Use Element. The current land use designation for APN: 024-260-032 is Urban Area which allows for compatibility with M-2 zoning as stated within the contents of the Land Use Element, however, this is not reflected in *Table 4: Compatibility Matrix*. This General Plan Amendment is meant to correct *Table 4: Compatibility Matrix* so that it is compatible with the Land Use Element's contents.

Project Summary:

The Project Site

The entire APN 024-260-032 is currently situated on approximately 89 +/- acres of land located within the County of Imperial, about half a mile south of the City of Calipatria (please see **Figure 1**). The property is currently divided into two separate zoning distinctions but with one land use designations (reference **Appendix A**).

In 2008, the property underwent a Zone Change and General Plan Amendment, in which approximately 47 +/- acres changed from A-2 to M-2 zoning while the entire parcel changed from Agriculture to Urban Area land use. Currently, most of the eastern portion of the property is zoned M-2 while the entire western portion and small portions of the northeastern side of the property are zoned A-2 as indicated above. The Container Yard will be primarily situated on the southernmost portion of APN 024-260-032 (please see **Figure 5**).

Need for Project

As of now, operations for agricultural exporters rely heavily on trucks for distribution purposes. As discussed below, containers are loaded with agricultural commodities and are driven via truck to the Port of Long Beach (POLB) for distribution. As the amount of containers being transported to POLB increases so does the level of complexity. As noted on the POLB's website, exports for the month of April from the POLB have increased by 22% as compared to last year. This level of increase places an even higher strain on nearby infrastructure, truck drivers/haulers and port authorities. The increased number of trucks to the POLB creates congestion on major highways to the Port, congestion at the port terminal and makes meeting appointment times at the terminal difficult to achieve. Additionally, the availability of logistic truck drivers has fallen, other labor

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Project Use

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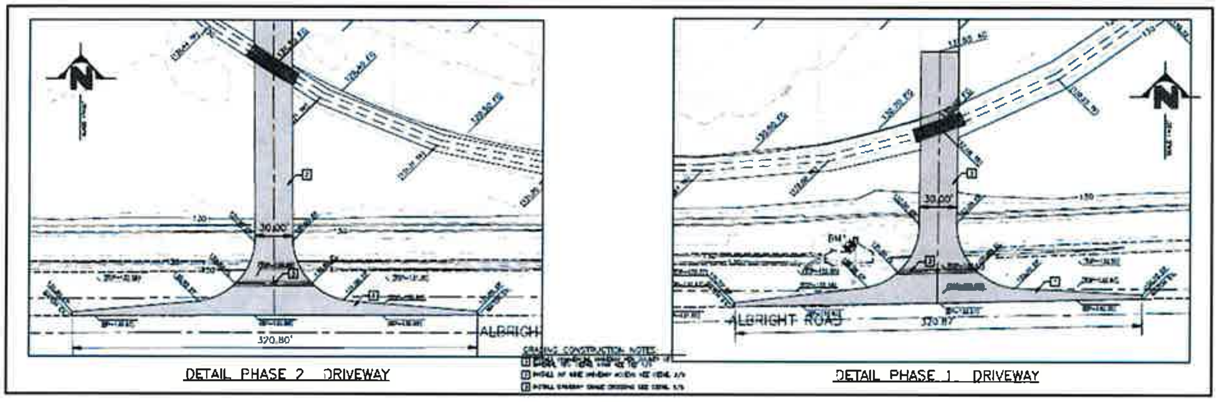

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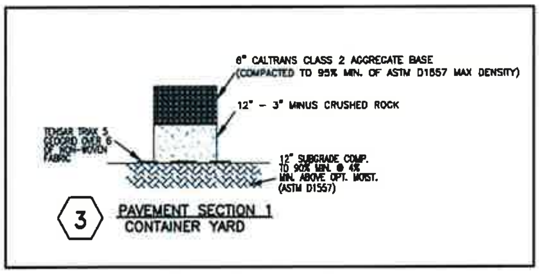
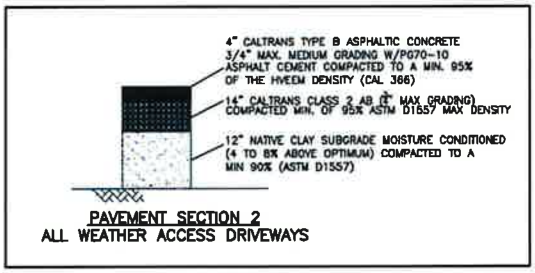


Figure 3. Container Yard



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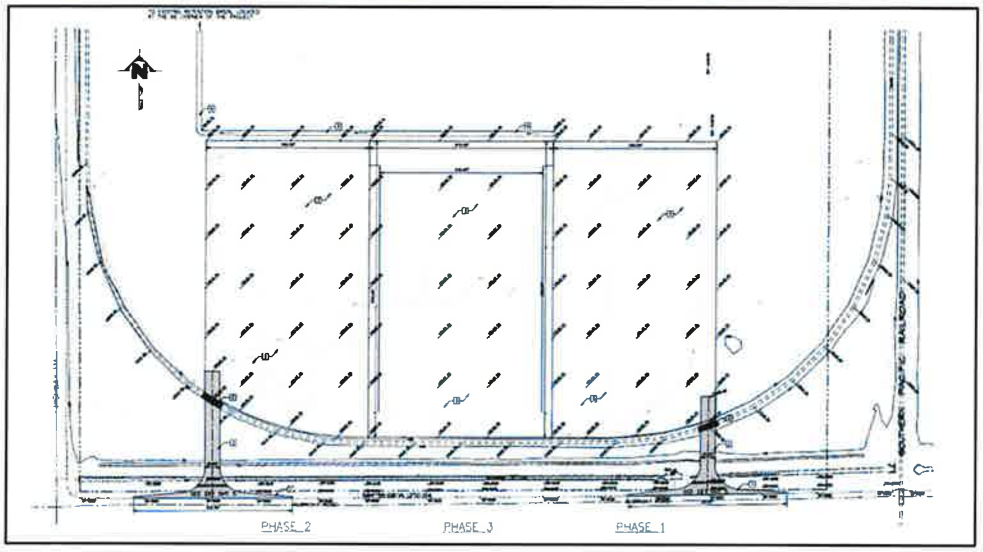

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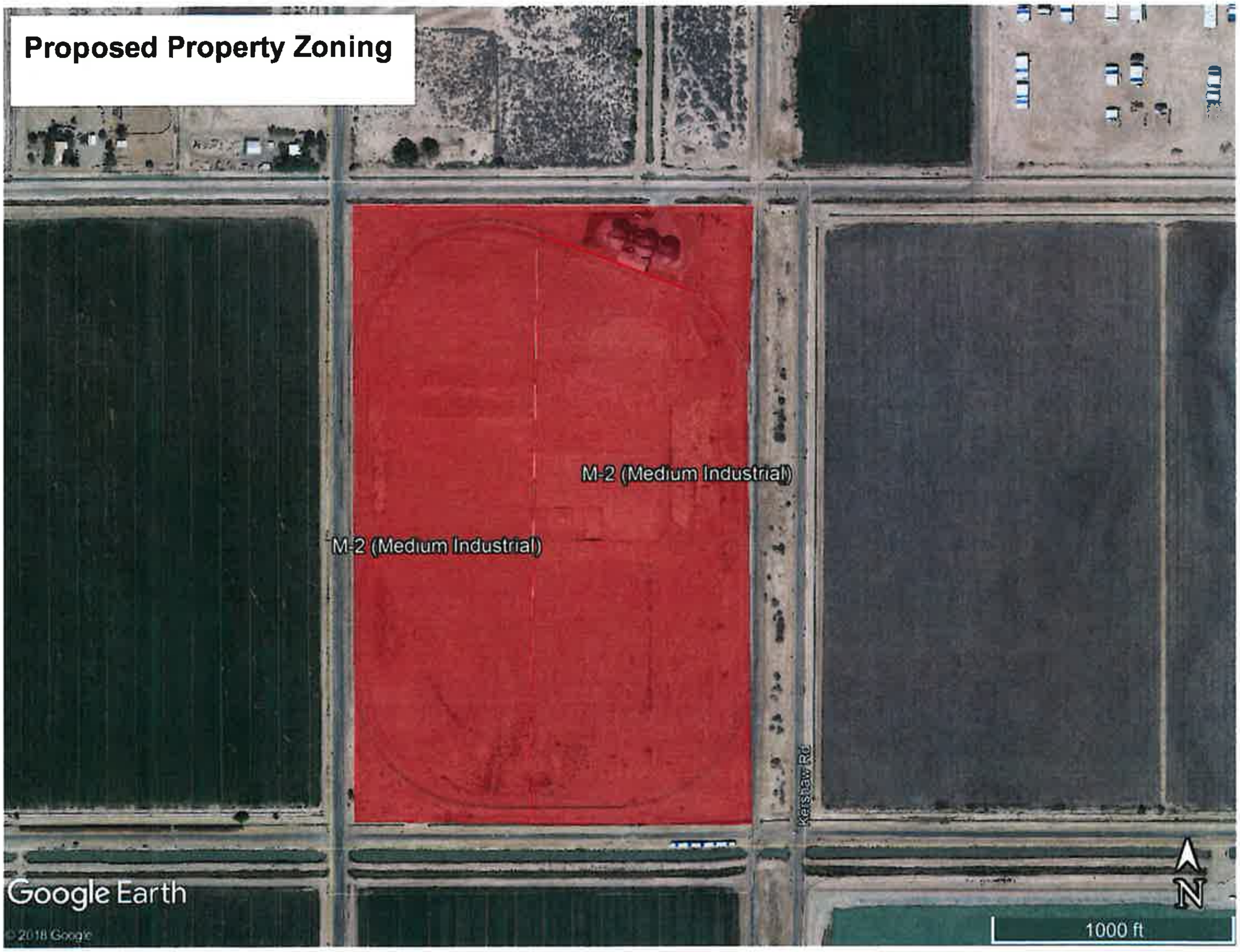
Appendix A

Current Property Zoning


Proposed Property Zoning
M-2 (Medium Industrial)
M-2 (Medium Industrial)
Kershaw Rd
Google Earth
© 2018 Google
N
1000 ft

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Property Size: 89 +/- acres

Project Size: 42 +/- acres

APN: 024-260-032

Proposed Development:

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Project Use

The current operations of the facility act as a grain transfer and storage station for locally grown containered agricultural commodities. These operations include the receiving of the agricultural commodities such as hay, and other types of locally grown rufage in storage containers, transported via trucks to the facility. Once these containers are received and stored for a short period of time, they are then reloaded on to unit trains for distribution outside of the Imperial Valley. Additionally, incorporated in the original operations of the facility was receiving corn via unit train cars that would then be distributed to various Feed mills in the Imperial Valley via truck that will continue.

The applicant wishes to add to the current use by relying more heavily on the unit train cars rather than trucks for distribution from the Imperial Valley. The method of receiving and transporting the hay from locally harvested fields to the storage facility will remain. However, once the hay containers are stored and are ready to be reloaded, individual unit train cars will be the *primary method* of distribution to the POLB. Ultimately, the applicant's goal is to become more efficient with the delivery of out-going hay products that leave the valley and reduce the amount of trip miles made by trucks. This addition of one-unit train of 105 well cars which is 210 containers will be needed to maximize the reduction of trip miles made by trucks. Once operations are in-motion, the empty storage facility will utilize their inner circle railway as a systematic method of offloading containers from the train and then reloading the containers that were loaded at the source. When the train unit cars are loaded and ready for distribution, they will leave the inner circle railway on their way to the POLB utilizing the Union Pacific Rail Road.

Project Circulation

In order to gain access to the project site, the applicant requires the construction of two (2) driveways for purposes of ingress and egress. The driveway closest to the intersection of HWY 111 and E. Albright Rd will be utilized as the point of egress while the further east driveway will be utilized as the point of ingress. These access points will be located on the southern boundary of the site where E. Albright intersects HWY 111 (see **Figure 2**). The distance between the entrance

to the facility and the turn-off from Hwy 111 will provide enough space if numerous trucks show up all at once. Additionally, the exit location will be located at the south/west corner of the property, allowing the option to either turn right or left depending on logistical reasons.

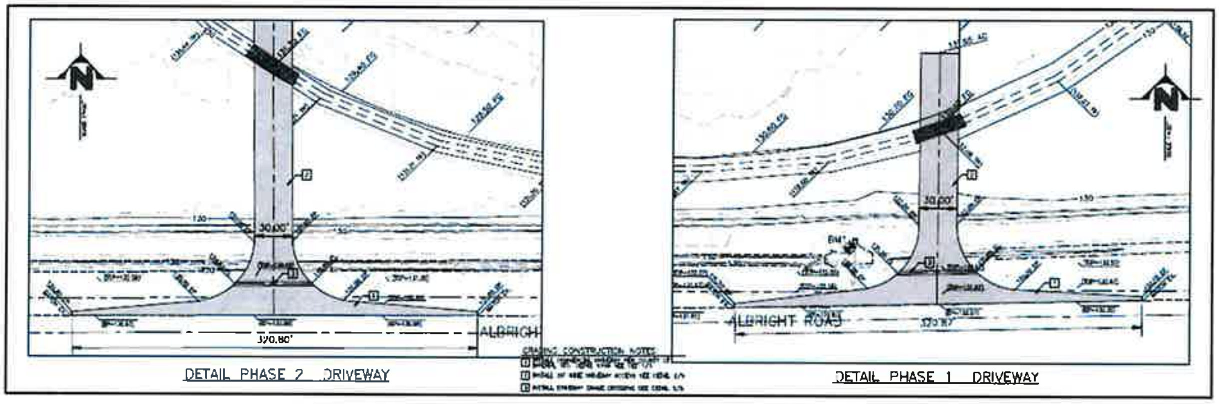

Figure 2. Driveways

Construction Activities

In order to support the additional loading and unloading zones and to stay compliant with County of Imperial Planning Department, County of Imperial Fire Department and APCD, the proposed container yard will install "all weather surface" pavement to the standards of both the County of Imperial and the Air Pollution Control District. The Container Yard and Spur Loading zone will accommodate containers that will be stacked 4 high over a space of 8 ft by 40 ft (the container on the ground level). There will be 840 containers within the loading area at the peak on one day. The stacks of containers will not exceed the height of the nearby silos. Individual containers will weight approximately 60,000 lbs when filled. Once stacked in fours the total approximate weight of the stack will be 240,000 lbs (a soils recommendation will be provided from a geotechnical expert). With this being said, the load bearing capacity for the surface must withstand this total amount of weight. For descriptions of the pavement section for both the Container Yard and the All-Weather Access Driveways please see **Figure 3** and **Figure 4**. The unloading and loading of the containers will occur two days per week, during these days the train will be on site for 10-12 hours for purposes of unloading and loading.

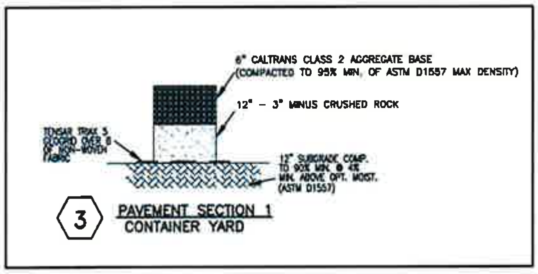

Figure 3. Container Yard

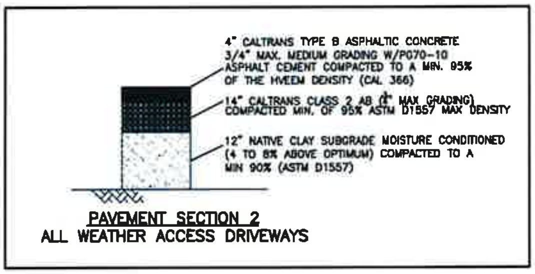

Figure 4. Access Driveways

Project Operation

As previously stated, the operation of the facility will act as a grain transfer and storage station for locally grown agricultural commodities. These commodities will be harvested throughout the Imperial Valley, loaded into empty containers and shipped via truck to the Container Yard. Upon arrival, the loaded containers will be stored at the Container Yard for a short period of time until the unit train arrives. Once the unit train has arrived, it will move into position for both unloading and loading. The train will move forward for every 10 railcars that are unloaded and loaded. The containers themselves are then unloaded and loaded via RS46 Series Hyster container loaders. When the facility is completely operational, there will be a maximum of four (4) container loaders at the site.

Project Phasing

It is the intent of the applicant to construct this Container Yard in phases (see **Figure 5**). On the furthest east portion of the project, contains Phase 1, which is permitted by right to allow for a container yard. Phase 1 is unrelated to this Zone Change and General Plan Amendment for the reason stated previously. As of 8/06/2018 and 8/07/2018, the applicant has submitted with County of Imperial Building Department and Public Works Department for a grading permit for Phase 1. Once the Zone Change and General Plan Amendment have been approved, grading permits will be submitted for Phases 2 & 3.

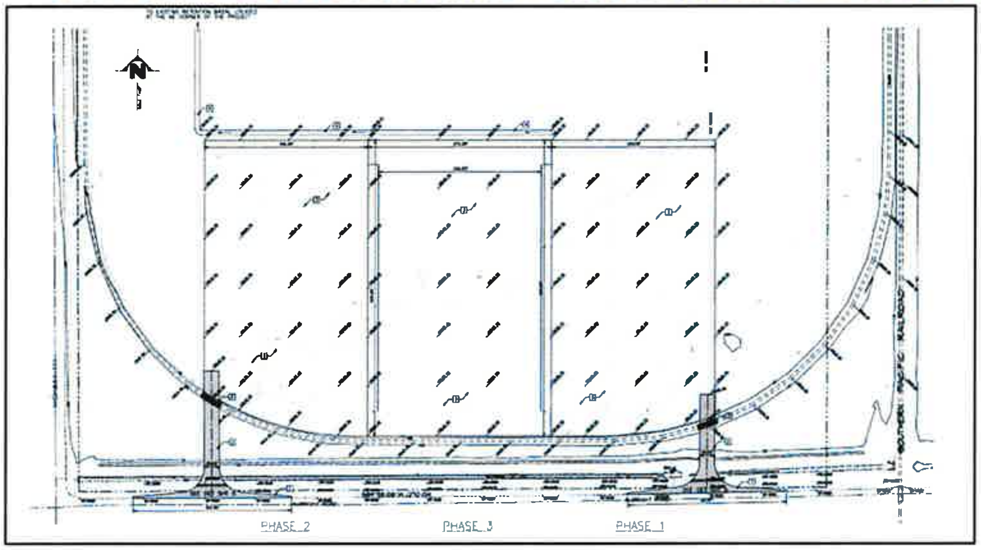

Figure 5. Project Phasing

Environmental Consideration

It is understood by the applicant that this proposed alteration to the current use will trigger additional environmental studies. With consultation from the County of Imperial, it has been determined that environmental studies will include: (1) Air Study, (2) Noise Study, (3) Traffic Study and (4) Biological.

Air Study

As instructed by the Imperial County Planning and Development Services, an Air Quality Study was performed by UltraSystems, Inc. analyzing the air quality including Greenhouse Gas Emissions generated by the proposed project. As further discussed in the Air Quality and Greenhouse Gas Emissions Report, sources of air pollution include locomotive emissions, container loader emissions, hauling truck emissions, and employee commuter emissions. These sources of emissions would emit pollutants of concern include ROG, CO, NOx, PM10 and PM2.5. As the report indicates, the long-term project operational emissions would not exceed applicable thresholds for ROG, PM10 or CO but they would exceed the Tier 2 threshold for NOx. However, as discussed in the attached Memo to the Air Quality Study, APCD requested that UltraSystems perform a comparison of criteria pollutants emissions from truck and train transport of Agricultural products from All American Grain in Calipatria to Riverside County Line. Ultimately, the amount of NOx decreases a substantial amount due to reliance on trains rather than trucks.

Noise Study

As instructed by the Imperial County Planning and Development Services, a Noise Study was prepared by UltraSystems, Inc. analyzing the noise levels generated by the proposed project. As further discussed in the Noise Study Report, noise sources include container loaders, trucks, trains, landscape and building maintenance. Offsite noise would be attributed to project-induced traffic. Although the project would generate some noise, UltraSystems found that there would be no significant short- or long-term noise impacts due to the project so no mitigation measures are necessary.

Traffic Study

As instructed by the Imperial County Planning and Development Services, a Traffic Study was prepared by Linscott Law & Greenspan (LLG) to analyze the traffic impacts caused by the proposed project. Based on information obtained from the applicant, LLG predicts the Total Project would generate a maximum of 20 Average Daily Traffic (ADT) by passenger vehicles. It would also generate 360 ADT by trucks, with 15 inbound and 15 outbound trips during the AM and PM peak hours. As previously discussed, the project would have driveways dedicated for both entrances and exits for vehicles (**Figure 2**).

Biological Study

As instructed by the Imperial County Planning and Development Services, a Biological Study was conducted by Barrett's Biological Surveys. They performed a biological habitat assessment of the lower portion where the project site would be located. As further described in the Biological Report, there were no vegetation that was found that would be considered endangered, threatened or species of concern. Additionally, there were no fauna found that would be considered endangered or threatened, however, three burrowing owls, one occupied burrow and one active burrow were found offsite on Imperial Irrigation District Right-of-Way. Mitigation measures were given for those instances.

DUBOSE
DESIGN
GROUP

email@dubosedesigngroup.com
dubosedesigngroup.com

PLANNING • CIVIL ENGINEERING • LAND SURVEYING • PROJECT MANAGEMENT

Appendix A

DUBOSE
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email@dubosedesigngroup.com
dubosedesigngroup.com

PLANNING • CIVIL ENGINEERING • LAND SURVEYING • PROJECT MANAGEMENT

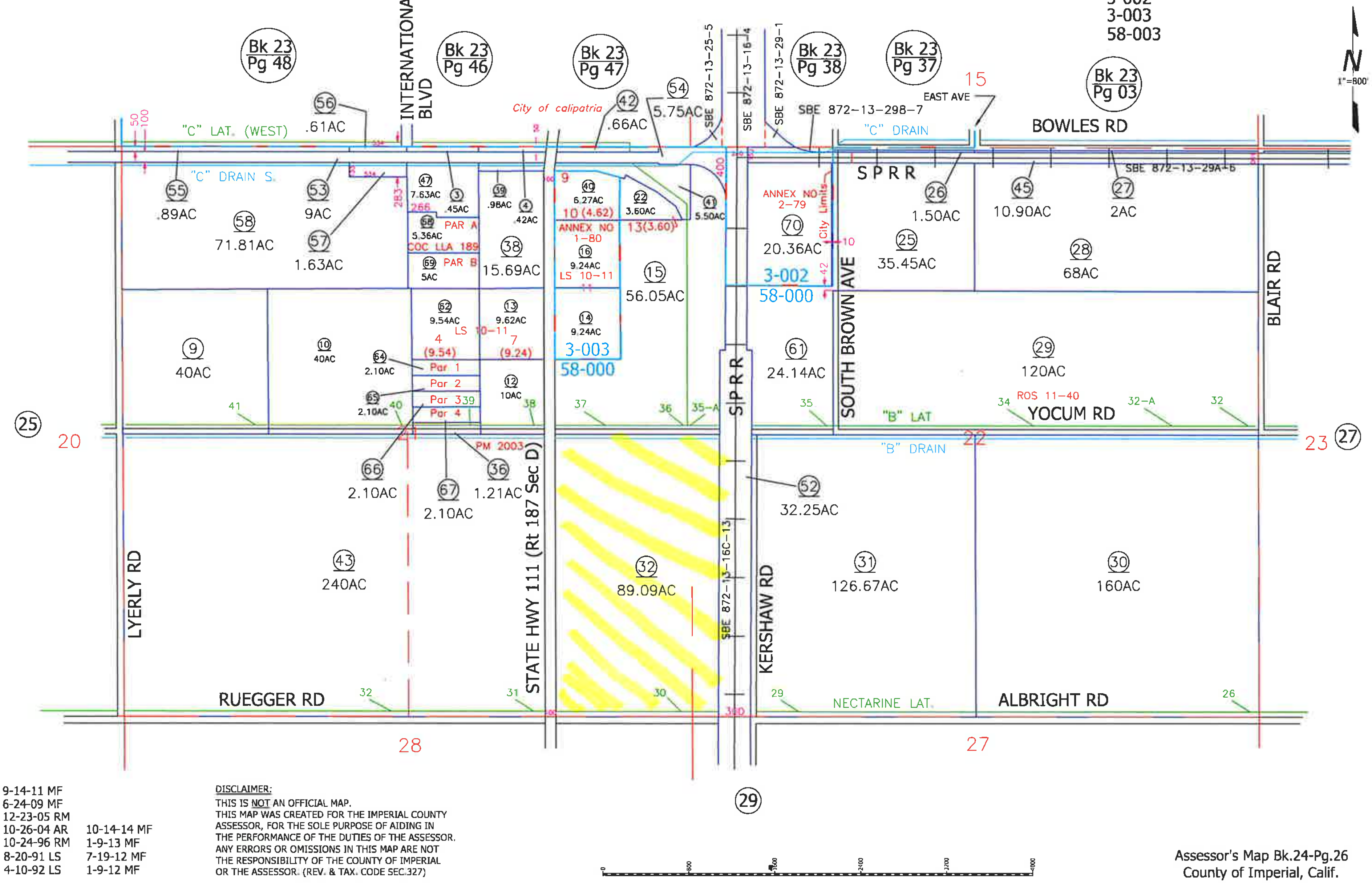
Current Property Zoning

Proposed Property Zoning

SEC. 21, 22, T.12S., R.14E.

Tax Area Code
3-002
3-003
58-003

24-26



9-14-11 MF
6-24-09 MF
12-23-05 RM
10-26-04 AR
10-24-96 RM
8-20-91 LS
4-10-92 LS
10-14-14 MF
1-9-13 MF
7-19-12 MF
1-9-12 MF

DISCLAIMER:
THIS IS NOT AN OFFICIAL MAP.
THIS MAP WAS CREATED FOR THE IMPERIAL COUNTY ASSESSOR, FOR THE SOLE PURPOSE OF AIDING IN THE PERFORMANCE OF THE DUTIES OF THE ASSESSOR. ANY ERRORS OR OMISSIONS IN THIS MAP ARE NOT THE RESPONSIBILITY OF THE COUNTY OF IMPERIAL OR THE ASSESSOR. (REV. & TAX. CODE SEC.327)

Assessor's Map Bk.24-Pg.26
County of Imperial, Calif.

ALL AMERICAN CONTAINER YARD PROPOSAL

Agenda

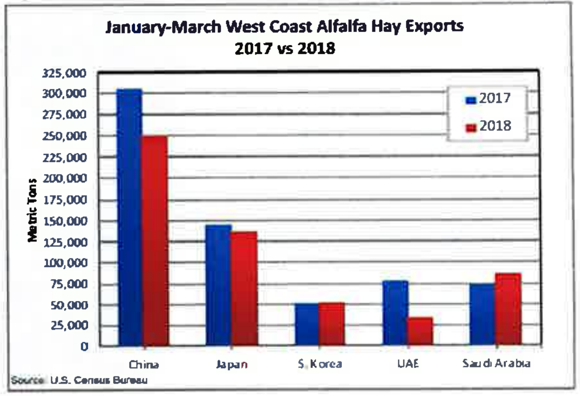
1. Logistics Overview
2. Site Location in relation to other exporters
3. Site Zoning
4. Proposed site layout
5. Next Steps

Californian Logistics Overview

- **Capacity reduction of over 30% in the trucking fleet driven by ELOGs**
  - Independent haulers have withdrawn from the market
  - Large haulers who were prepared for the ELOGs are not prepared for the increase in volume due to independent withdrawal
  - In Service Hours being strictly inforced

- **Availability of truck drivers has fallen**
  - Other labor markets such as construction are drawing drivers away from logistics
    - Home every night
    - Earning potential similar or better in construction

- **Port of Los Angeles/Long Beach**
  - Congestion on the major highways to the port
  - Congestion at the port terminal
  - Pier passes on day and night shift moving forward
  - Appointment times at the terminals



January-March West Coast Alfalfa Hay Exports
2017 vs 2018

Source: U.S. Census Bureau

- **Calipatria Container Yard**
  - Eliminate the requirement for exporters to transport containers too and from the port
  - Eliminate the need to increase truck fleets to transport the same volume
  - Continue to make the Imperial Valley forage competitive with the Pacific Northwest for exporters
  - Substantial reduction of air emissions from diesel consumption
  - Proposal is for 1 additional unit train of 105 well cars which is 210 containers

Sample of Exporters in Imperial

Boarder Valley

El Toro

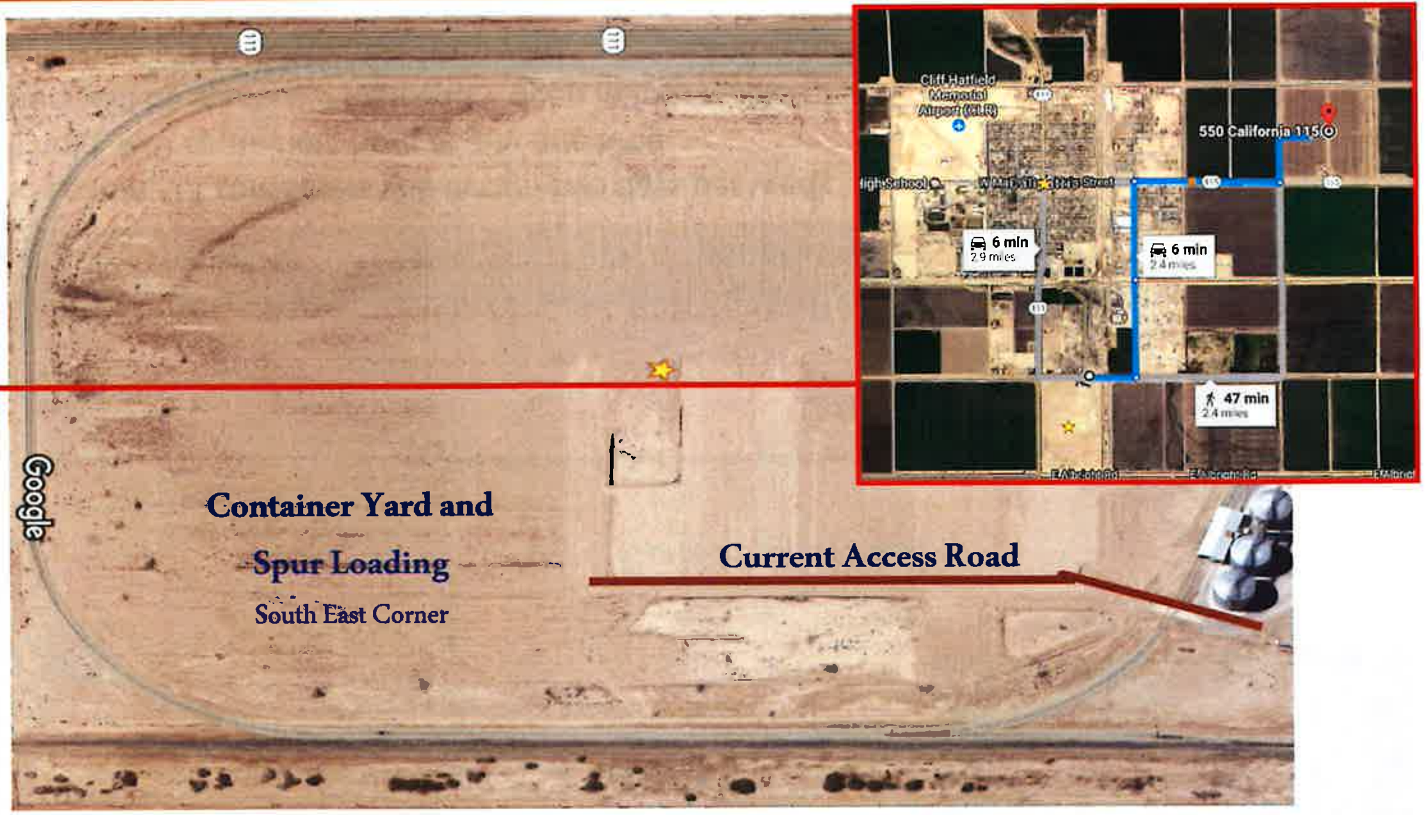
Triple I

- All within 35 miles of Calipatria, 45 minutes or less
- All can access the site via the 111 or 115 using
  - Albright
  - Kershaw
  - Yocum

Current Site Layout and Operation

Zone A2 Agricultural

Zone M2 Light Industrial



- Unloading and Loading of containers will occurs one day per week
  - We will hold 210 containers here at any one time as buffer
- 5 days per week transfers of containers from yard to press and return
  - All American will use the facility approx one day a week for unloading grain
- Train will be on site for 10-12 hours unloading and loading

Draft Site Layout

- Unloading and Loading of containers will occurs two days per week
  - We will hold 420 containers here at any one time
  - Containers will be stacked 3 high and 7 deep in four stacks of 105
- 6 days per week transfers of containers from yard to press and return
  - 70 trucks per day will be accessing the site
- Train will be on site for 10-12 hours unloading and loading

NEXT STEPS

THANK YOU

Attachment D.

Agency Comments

150 SOUTH NINTH STREET
EL CENTRO, CA 92243-2850

TELEPHONE: (442) 265-1800
FAX: (442) 265-1799

AIR POLLUTION CONTROL DISTRICT

December 26, 2018

Jim Minnick
Planning & Development Services Director
801 Main Street
El Centro, CA 92243

SUBJECT: Request for GPA 18-0001 and ZC 18-0002 and CUP 07-0023 (Recirculation) for the purpose of establishing a Container Yard and Rail Spur.

Dear Mr. Minnick,

The Imperial County Air Pollution Control District ("Air District") would like to thank you for the opportunity to review the request by All American Grain Company, LLC for a proposed General Plan Amendment (GPA) 18-0001, Zone Change (ZC) 18-0002, and Conditional Use Permit (CUP) 07-0023. The GPA and ZC to the west half of APN 024-260-032 would ultimately allow for the establishment of a Container Yard and Rail Spur at 305 E. Yocum Road in Calipatria, California.

Due to ongoing conversations with the Enforcement and Engineering & Permitting Divisions of the Air District, the applicant is aware that compliance with Regulation VIII Rules is a requirement. Any changes to the details of the proposal can be addressed in future conversations between the two parties. Other than that, the Air District has No Comment.

As a reminder, Air District Rules and Regulations can be found on our website at www.co.imperial.ca.us/AirPollution under the "Planning" tab. The ICAPCD office can be reached at (442) 265-1800.

Sincerely,
Curtis Blondell

Curtis Blondell
Environmental Coordinator

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DEC 26 2018
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

AUGUSTINE BAND OF CAHUILLA INDIANS
PO Box 846 84-481 Avenue 54 Coachella CA 92236
Telephone: (760) 398-4722
Fax (760) 369-7161
Tribal Chairperson: Amanda Vance
Tribal Vice-Chairperson: William Vance
Tribal Secretary: Victoria Martin

December 27, 2018

Daivd Black
Imperial County Planning & Development Services
801 Main St. El Centro, CA 92243

Re: **Project Notification Pursuant to Senate Bill 18 for the All American Grain Project in Imperial County, California**

Dear Mr. Black-

Thank you for the opportunity to offer input concerning the development of the above-identified project. We appreciate your sensitivity to the cultural resources that may be impacted by your project, and the importance of these cultural resources to the Native American peoples that have occupied the land surrounding the area of your project for thousands of years. Unfortunately, increased development and lack of sensitivity to cultural resources has resulted in many significant cultural resources being destroyed or substantially altered and impacted. Your invitation to consult on this project is greatly appreciated.

At this time we are unaware of specific cultural resources that may be affected by the proposed project. We encourage you to contact other Native American Tribes and individuals within the immediate vicinity of the project site that may have specific information concerning cultural resources that may be located in the area. We also encourage you to contract with a monitor who is qualified in Native American cultural resources identification and who is able to be present on-site full-time during the pre-construction and construction phase of the project. Please notify us immediately should you discover any cultural resources during the development of this project.

Very truly yours,

Victoria Martin
Tribal Secretary

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DEC 31 2018
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

COLORADO RIVER INDIAN TRIBES

Tribal Historic Preservation Office

26600 Mohave Road
Parker, Arizona 85344
Telephone: (928)-669-5822 Fax: (928) 669-5843

Imperial County Planning
801 Main St.
El Centro, CA 92243

Date: January 8, 2019

RE: All-American Grain – General Plan Amendment, GPA 18-0001/ zone change ZC 18-0002, APN #024-260-032-000.

Dear: Jim Minnick, Director

The Colorado River Indian Tribes' Tribal Historic Preservation Office ("CRIT THPO") has received your letter dated December 14, 2018, regarding the All-American Grain – General Plan Amendment, GPA 18-0001/ zone change ZC 18-0002 APN #024-260-032-000.

As a preliminary matter, the Colorado River Indian Tribes are a federally recognized Indian tribe comprised of over 4,200 members belonging to the Mohave, Chemehuevi, Hopi and Navajo Tribes. The almost 300,000-acre Colorado River Indian Reservation sits astride the Colorado River between Blythe, California and Parker, Arizona. The ancestral homelands of the Tribe's members, however, extend far beyond the Reservation boundaries. Significant portions of public and private lands in California, Arizona and Nevada were occupied by the ancestors of the Colorado River Indian Tribes' Mohave and Chemehuevi members since time immemorial. These landscapes remain imbued with substantial cultural, spiritual and religious significance for the Tribes' current members and future generations. For this reason, we have a strong interest in ensuring that potential cultural resource impacts are adequately considered and mitigated.

In addition, we respond as follows, The Colorado River Indian Tribes do not have any specific comment on the proposed project and instead defer to the comments of other affiliated tribes. Thank you for your consideration. Please contact the undersigned if you have any questions or concerns.

Sincerely,

COLORADO RIVER INDIAN TRIBES
TRIBAL HISTORIC PRESERVATION OFFICE

/s/ Bryan Etsitty, Acting-Director
26600 Mohave Road
Parker, AZ 85344
Phone: (928) 669-5822
E-mail: betsitty@crit-nsn.gov

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Public Works works for the Public

ICDPW

COUNTY OF IMPERIAL

DEPARTMENT OF PUBLIC WORKS

155 S. 11th Street
El Centro, CA
92243

Tel: (442) 265-1818
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January 24, 2019

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IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Mr. Jim Minnick, Director
Planning & Development Services Department
801 Main Street
El Centro, CA 92243

Attention: David Black, Planner IV

SUBJECT: ZC 18-0002 / GPA 18-0001 – All American Grain Company, LLC
Located on 306 E. Yocum Road, Calipatria, CA
APN 024-260-032-000

Dear Mr. Minnick:

This letter is in response to your submittal received by this department on April 25, 2018 for the above mentioned project. The applicant proposes to rezone a portion of the aforementioned property in hopes of creating a more uniform zoning area and clean-up the inconsistent zoning of their single property caused by prior zone change.

Department staff has reviewed the package information and the following comments are provided for the applicant use:

1. Yocum Road is classified as 4-Lane Major Collector requiring eighty four feet (84) of right of way, being forty two (42) feet from existing centerline. Forty feet (40') of right of way has been provided per Grant Deed Doc # Book 2249 pg. 1381, 2003. As directed by Imperial County Board of Supervisors per Minute Order #6 dated 11/22/1994 per the Imperial County Circulation Element Plan of the General Plan).

2. Albright Road is classified as 2-Lane Minor Collector requiring seventy feet (70) of right of way, being thirty five (35) feet from existing centerline. Seventeen feet and Six inches (17'-6') of right of way has been provided per Grant Deed Doc # Book 2249 pg. 1378, 2003. Sufficient right of way must be provided to meet this road classification. As directed by Imperial County Board of Supervisors per Minute Order #6 dated 11/22/1994 per the Imperial County Circulation Element Plan of the General Plan).

3. The applicant shall furnish a Drainage and Grading Plan/Study to provide for property grading and drainage control, which shall also include prevention of sedimentation of damage to off-site properties. The Plan/Study shall be prepared per the Engineering Design Guidelines Manual for the Preparation and checking of Street Improvement, Drainage, and Grading Plans within Imperial County and submitted to the Department of Public Works for review and approval. The applicant shall implement the approved plan. Employment of the appropriate Best Management Practices (BMPs) shall be included on the plan.

4. The applicant for encroachment permits, grading plans, and/or improvement plans is responsible for researching, protecting and preserving survey monuments per the Professional Land Surveyor's Act (8771 (b)). This shall include a copy of the referenced survey map and tie card(s) (if applicable) for all monuments that may be impacted by the project whether it be on-site of off-site.

5. At time of development, if required, by Section 8762(b) of the Professional Land Surveyors Act, a record of survey shall be filed with the County Recorder of Imperial County.

6. Street improvements shall be required in conjunction with, but not limited to, any construction, grading, or related work, including the construction of structures, buildings, or major additions thereto, on property located adjacent to any county street or on property utilizing any county street for ingress and egress, except that such improvements may be deferred as described in Section 12.10.040 of this chapter for residential property (Per Imperial County Code of Ordinances, Chapter 12.10.020). The street improvements required shall be a commercial type driveway per Imperial County Standards and a secondary emergency access driveway as approved by this Department. The secondary emergency access driveway shall be constructed of asphalt concrete or as approved by this Department.

7. No building permit for any structure or building or major addition to a building or structure shall be issued until the improvements required by Section 12.10.010 of this chapter have been installed and/or bonded. In addition, no building permit shall be issued until there has been compliance with Chapter 12.12 of this title and the requirement that an encroachment permit be obtained (Per Imperial County Code of Ordinances, Chapter 12.10.030).

8. Any activity and/or work within Imperial County right-of-way shall be completed under an encroachment permit issued by this Department (Per Imperial County Code of Ordinances, Chapter 12.12). Any activity and/or work may include, but not be limited to, the installation of temporary traffic control devices, construction of access driveways, etc.

9. The applicant shall update the transportation impact analysis at one (1) year and five (5) years from the date of the Zone Change Approval and/or as directed by the Road Commissioner. The updates of the transportation impact analysis shall include:

    a. Current traffic volume data along County Roads (within 1 year of the date of the transportation impact report update) at the following locations:

        i. Albright Road between State Route 111 and Kershaw Road
        ii. Albright Road between Kershaw Road and State Route 115
        iii. Yocum Road between State Route 111 and Kershaw Road
        iv. Yocum Road between Kershaw Road (west) and Kershaw Road (Brown Road)
        v. Yocum Road between Kershaw Road (Brown Avenue) and Blair Road
        vi. Yocum Road between Blair Road and State Route 115

- vii. Blair Road between Yocum Road and State Route 115
- viii. Kershaw Road between Albright Road and Yocum Road
- ix. Kershaw Road (Brown Avenue) between Yocum Road and Calipatria City Limits

b. If the transportation impact analysis to be completed within five (5) years of the Zone Change Approval warrants the installation for right and/or left turn lanes into the facility, the applicant shall fund the construction for said turn lanes.

10. Figure 7-1 of the transportation impact analysis indicates that 15% of the truck traffic will be using Yocum Road east of Kershaw Road (Brown Avenue). This section of Yocum Road is unpaved.

    a. Section E - Unpaved Haul/Access Roads Requirements of Rule 805 of the Imperial County Air Pollution Control District limits any traffic on unpaved roads to generate visible dust emissions (VDE) to less than 20% opacity. If the applicant is unable to maintain the opacity level as required by Rule 805, the applicant shall mitigate the generation of dust due to project traffic along Yocum Road between Kershaw Road (Brown Avenue) and Blair Road and along Blair Road between Yocum Road and State Route 115 by one of the methods below:

        - i. Asphalt Concrete Road Improvements: The road section shall be improved by installing two (2) 12-foot travel lanes consisting of 4 inches of asphalt concrete over 18 inches of Class 2 Base, including Class 2 base shoulder backing, as approved by the Director of Public Works. Any activities related to these road improvements shall be completed under an encroachment permit from this Department.
        - ii. Road Surface Chemical Stabilization: The road surface shall be stabilized by applying chemical stabilization products as recommended by the product manufacturer to accommodate for two (2) 12-foot travel lanes and as approved by the Director of Public Works. Any activities related to this road stabilization shall be completed under an encroachment permit from this Department.
        - iii. Aggregate Base Road Improvements: The road section shall be improved by installing two (2) 12-foot travel lanes consisting of a minimum of 3" of Class 2 Base material, as recommended by a California Geotechnical Engineer, and as approved by the Director of Public Works. Any activities related to these road improvements shall be completed under an encroachment permit from this Department.
        - iv. Road Dust Mitigation Plan: The applicant shall prepare a Road Dust Mitigation Plan and submit it to this Department for review and approval. Any activities related to the implementation of the road dust mitigation plan shall be completed under an encroachment permit from this Department.
        - v. Traffic Restriction: Any existing and/or proposed project traffic, truck or passenger vehicles, associated with the project site shall be restricted from

using the road section. The transportation impact analysis shall be revised to indicate the revised traffic distribution and resubmitted to this Department for review and approval prior to the Zone Change Approval.

INFORMATIVE:

The following items are for informational purposes only. The applicant is responsible to determine if the enclosed items affect the subject project.

- All solid and hazardous waste shall be disposed of in approved solid waste disposal sites in accordance with existing County, State and Federal regulations (Per Imperial County Code of Ordinances, Chapter 8.72).
- All on-site traffic area shall be hard surfaced to provide all weather access for fire protection vehicles. The surfacing shall meet the Department of Public Works and Fire/OES Standards as well as those of the Air Pollution Control District (APCD) (Per Imperial County Code of ordinances, Chapter 12.10.020 A).
- The project may require a National Pollutant Discharge Elimination System (NPDES) permit and Notice of Intent (NOI) from the Regional Water Quality Control Board (RWQCB) prior county approval of onsite grading plan (40 CFR 122.28).
- A Transportation Permit may be required from road agency(s) having jurisdiction over the haul route(s) for any hauls of heavy equipment and large vehicles which impose greater then legal loads on riding surfaces, including bridges. (Per Imperial County Code of Ordinances, Chapter 10.12.020).
- As this project proceeds through the planning and the approval process, additional comments and/or requirements may apply as more information is received.

Should you have any questions, please do not hesitate to contact this office. Thank you for the opportunity to review and comment on this project.

Respectfully,

John Gay

John A. Gay, PE
Director of Public Works

FO/cv

IID

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May 14, 2018

Mr. David Black
Planner IV
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: All American Grain Company, LLC GPA No. 18-0001 and ZC No. 18-0002

Dear Mr. Black:

On April 25, 2018, the Imperial Irrigation District received from the Imperial County Planning & Development Services Department, a request for agency comments on General Plan Amendment no. 18-0001 and Zone Change no. 18-000. The applicant, All American Grain Company, LLC; is proposing to rezone a portion of property to correct the inconsistent zoning created by a prior zone change. The property is located at 306 E. Yocum Road, Calipatria, CA.

The Imperial Irrigation District has assessed the information and has the following comments:

1. IID water facilities that may be impacted include the Nectarine Lateral A along the parcel's southern boundary and the B Drain along the parcel's northern boundary. An existing ethanol plant entrance/drain crossing is located along the parcel's northern boundary. No new construction is proposed with the General Plan amendment or zone change. However, IID Water Department should be consulted prior to the installation of any facilities adjacent to IID's facilities. For further information, IID Water Engineering Services can be contacted at (760) 339-9265.

2. In addition, If future impacts to IID water facilities should result, the IID Water Department must be informed regarding encroachments, drainage and water service.

3. Any construction or operation on IID property or within its existing and proposed right of way or easements including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities; will require an encroachment permit, or encroachment agreement (depending on the circumstances). A copy of the IID encroachment permit application and instructions for its completion are available at http://www.iid.com/departments/real-estate. The IID Real Estate Section should be contacted at (760) 339-9239 for additional information regarding encroachment permits or agreements. No foundations or buildings will be allowed within IID's right of way.

4. In addition to IID's recorded easements, IID claims, at a minimum, a prescriptive right of way to the toe of slope of all existing canals and drains. Where space is limited and depending upon the specifics of adjacent modifications, the IID may claim additional secondary easements/prescriptive rights of ways to ensure operation and maintenance of IID's facilities can be maintained and are not impacted and if impacted mitigated. Thus, IID should be consulted prior to the installation of any facilities adjacent to IID's facilities. Certain conditions may be placed on adjacent facilities to mitigate or avoid impacts to IID's facilities.

5. Any new, relocated, modified or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, etc.) need to be included as part of the project's CEQA and/or NEPA documentation, environmental impact analysis and mitigation. Failure to do so will result in postponement of any construction and/or modification of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully analyzed. **Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent.**

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

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Michael P. Kemp – Superintendent, Regulatory & Environmental Compliance
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Randy Gray – ROW Agent, Real Estate
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Attachment E.

Studies & Memo's to Studies

ALL AMERICAN GRAIN
BIOLOGICAL HABITAT ASSESSMENT
Zone Change and General Plan Amendment

JULY, 2018

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CONTENTS

I. PROJECT DESCRIPTION

Applicant wishes to propose a Zone Change and General Plan Amendment to the half of 024-260-032 in order expand more acreage under the M-2 zone (Medium Industrial) and under the Industrial land use, approximately 42 acres of 89 acres. The current zone of the western portion is A-2 (Agriculture), please see **Figure 1** below. The added acreage under the M-2 zoning/land use will allow the applicant more available space to establish a Container Yard and Rail Spur for loading and distribution purposes.

The intent of the applicant is to propose a Zone Change and General Plan Amendment that would conform to the General Plan and zoning regulations/policies of the County of Imperial. The entire property is divided up into two zoning & land use distinctions, Zoning: A-2, M-2 and Land Use: Agriculture, Industrial. The applicant wishes to address the non-conforming portion of the property and bring it into conformance by changing its zoning from A-2 to M-2 and its land use from Agriculture to Industrial. This request is consistent with the City of Calipatria's General Plan and future zoning regulations if area is annexed in the future.

The entire APN 024-260-032 is currently situated on approximately 89 +/- acres of land located within the County of Imperial, about half a mile south of the City of Calipatria. The property is currently divided into two separate zoning distinctions and two separate land use designations (**Figure 1**). In 2008, the property underwent a Zone Change and General Plan Amendment, in which approximately 47 +/- acres changed from A-2 to M-2 zoning and from Agriculture to Industrial land use, while the rest of the property kept its prior A- 2 zoning. Most of the eastern portion of the property is zoned M-2 while the entire western portion and small portions of the northeastern side of the property are zoned A-2 as indicated above.

As of now, operations for Agricultural Exporters rely heavily on trucks for distribution purposes. As discussed below, containers are loaded with agricultural commodities and are driven via truck to the Port of Long Beach (POLB) for distribution. As the amount of containers being transported to POLB increases so does the level of complexity. As noted on the Port of Long Beach's website, exports for the month of April from the POLB have increased by 22% as compared to last year. This level of increase places an even higher strain on nearby infrastructure, truck drivers/haulers and port authorities. The increased number of trucks to the POLB creates congestion on major highways to the Port, congestion at the port terminal and makes meeting appointment times at the terminal difficult to achieve. Additionally, the availability of logistic truck drivers has fallen, other labor markets such as construction are drawing these drivers away. To solve these issues, All American Grain Company proposes the construction of a loading/distribution facility that will utilize train units for distribution purposes to the POLB, thus cutting down the amount of trucks needed for distribution.

The current operations of the facility act as a grain transfer and storage station for locally grown contained agricultural commodities. These operations include the receiving of the agricultural commodities such as hay, and other types of locally grown ruffage in storage containers, transported via trucks to the facility. Once these containers are received and stored for a short period of time, they are then reloaded on to unit trains for distribution outside of the Imperial Valley. Additionally, incorporated in the original operations of the facility was receiving corn via unit train cars that would then be distributed to various Feed mills in the Imperial Valley via truck that will continue.

The applicant wishes to add to the current use by relying more heavily on the unit train cars rather than trucks for distribution from the Imperial Valley. The method of receiving and transporting the hay from locally harvested fields to the storage facility will remain. However, once the hay containers are stored and are ready to be reloaded, individual unit train cars will be the primary method of distribution to the Port of Long Beach. Ultimately, the applicant's goal is to more efficiently deliver out-going hay products that leave the valley via truck to these unit trains, and reducing the amount of trip miles made by trucks. This addition of one additional unit train of 105 well cars which is 210 containers will be needed to maximize the reduction of trip miles made by trucks. Once operations are in-motion, the empty storage facility will utilize their inner circle railway as a systematic method of off-loading containers from the train and then reloading the containers that were loaded at the source. Access to the container yard will come off of E. Albright Rd., at the south/east corner of the property. The distance between the entrance to the facility and the turn-off from Hwy 111 will provide enough space if numerous trucks arrive concurrently. Additionally, the exit location will be located at the southwest corner of the property, allowing the option to either turn right or left depending on logistical reasons. When the train unit cars are loaded and ready for distribution, they will leave the inner circle railway on their way to the Port of Long Beach utilizing the Union Pacific Railroad.

In order to support the additional loading and unloading zones and to stay compliant with County of Imperial Planning Department, County of Imperial Fire Department and APCD, the proposed container yard will install "all weather surface" pavement to the standards of both the County of Imperial and the Air Pollution Control District. The Container Yard and Spur Loading zone will accommodate containers that will be stacked 4 high over a space of 8 ft by 40 ft (the container on the ground level). There will be 840 containers within the loading area at the peak on one day. The stacks of containers will not exceed the height of the nearby silos. Individual containers will weigh approximately 60,000 lbs when filled. Once stacked in fours the total approximate weight of the stack will be 240,000 lbs (a soils recommendation will be provided from a geotechnical expert). With this being said, the load bearing capacity for the surface must withstand this total amount of weight. The unloading and loading of the containers will occur two days per week, during these days the train will be on site for 10-12 hours for purposes of unloading and loading.

Figure 1. Project Site

II. BIOLOGICAL REQUIREMENTS

Barrett's Biological Surveys has conducted biological assessment field survey of the area that conforms with California Department of Fish and Wildlife guidelines. The results of the survey are provided in this report.

III. BIOLOGICAL HABITAT ASSESSMENT SURVEY

On 17 July, 2018, a biological habitat assessment was conducted by Marie Barrett and Jacob Calanno biologists, on the Project site. A 500 foot buffer area was also surveyed. The project is located on the southern most portion of APN 024-260-032; bordered on the north by the northern portion of APN 024-260-032, on the south by Imperial Irrigation District (IID) Nectarine Lateral A, Albright Road and Vail Supply Canal; on the east by the Union Pacific railroad, Kershaw Road, agricultural fields; on the west Highway 111 and agricultural fields.

Table 1: Field Survey

Date	Surveyors	Hours/Surveyor	Total hours/day	Conditions
7/17/18	Marie Barrett Jacob Calanno	630-830 2.0 hrs	4.0	89-96°F/100% cloud cover/0-4 mph
		Total hours in field	4.0	

IV. BIOLOGICAL OBSERVATIONS

Surveys were conducted to determine the presence/absence nesting birds and of Western Burrowing Owl, *Athene cunicularia hypugaea,* using procedures found in *Staff Report on Burrowing Owl Mitigation, California Department of Fish and Game (Wildlife),2012.*

Table 2 Ruderal vegetation found around the project site:

Common name	Scientific name	Cal-IPC Rating*
Alkali mallow	*Malvella leprosa*	
Arrowweed	*Pluchea sericea*	
Quail bush	*Atriplex lentiformis*	
Bermuda	*Cynodon dactylon*	
Watergrass	*Echinochloa sp.*	
Saltgrass	*Distichlis spicata*	
Alkali heliotrope	*Heliotropium curassavicum*	
Saltcedar	*Tamarix sp.*	Ca Noxious Weed Cal-IPC rating: High

No vegetation was found that would be considered endangered, threatened or species of concern. No vegetation onsite.

Table 3 Animals/Invertebrates were observed in vicinity:

Common name	Scientific name
Burrowing owl	*Athene cunicularia*
Cattle egret	*Bubulcus ibis*
Cliff swallow	*Petrochelidon pyrrhonota*
Grackle	*Quiscalus mexicanus*
Mourning dove	*Zenaida macroura*
Redwinged blackbird	*Agelaius phoeniceus*
White faced ibis	*Plegadis chihi*
White-throated swift	*Aeronautes saxatalis*
White winged dove	*Zenaida asiatica*
Western meadowlark	*Sturnella neglecta*
Alfalfa butterfly	*Colias eurytheme*
Common bee	*Aphis spp.*
Velvet ant	*Dasymutilla occidentalis*
Ants	*various*
Crickets	*Gryllus*
Dragonfly	*various*
Gopher mound	*Thomomys bottae*
Canine tracks	*various*
Jackrabbit	*Lepus californicus*

No fauna was found that would be considered endangered or threatened

Three burrowing owls, a CDFW species of concern, one occupied burrow and one active burrow were found offsite on Imperial Irrigation District Right Of Way (IIDROW), Nectarine Lateral A. The table below lists the locations BUOW or burrows were observed and appropriate avoidance, minimization and mitigation techniques.

Table 4: BUOW Burrow Locations

Location WGS 84 EPE 11-13 ft	**Biological Resource**	**Minimization/Mitigation**
1. 33°6'14.8"/115°30'45.5"	Occupied burrow 2 adult BUOWs/1 juvenile	**Offsite: Shelter in place with haybales if construction within 250 ft (February-August) or 160 feet (Sept-January)**
2. 33°6'14.6"/115°30'47.4"	Active burrow	**Observe and shelter if necessary**

Burrowing owls, a CDFW species of concern, occupied and active burrows were found; they could be within 160-250 foot buffer zone of construction activities.

This survey was conducted during the prime nesting season for BUOW; BUOW were observed. Habitat on site was determined not suitable for BUOW foraging or burrowing.

V. AVOIDANCE, MINIMIZATION AND MITIGATION ACTIVITIES DURING CONSTRUCTION

Activities, under the supervision of a biologist, include the following:

- BUOW shelter in place (using hay bales) and remove shelters when project is complete under supervision of qualified biologist
- Worker BUOW training sessions
- Monitoring when construction is within 250 feet (February-August); 160 feet (September-January) if determined necessary by qualified biologist
- If construction started during Migratory Bird Nesting season (February-August) a nesting bird survey should be completed 3 days prior to start of construction

APPENDIX A
SENSITIVE BOTANICAL AND ZOOLOGICAL SPECIES (CNDDB/CNPS)
Iris Quadrangle (Nine Quad Search) 7/13/2018

BOTANICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Peirson's milk-vetch *Astragalus magdalenae var. peirsonii*	T/E/1B	Silvery, short-lived perennial plant that is somewhat broom like in appearance. A member of the pea and bean family, it can grow to 2.5 feet tall and is notable among milkvetches for its greatly reduced leaves. Peirson´s milkvetch produces attractive, small purple flowers, generally in March or April, with 10 to 17 flowers per stalk. It yields inflated fruit similar to yellow-green pea pods with triangular beaks.	Desert dune habitats. In California, known from sand dunes in the Algodones Dunes system of Imperial County. Was known historically from Borrego Valley in San Diego County and at a site southwest of the Salton Sea in Imperial County	L None observed. No dune habitat

BOTANICAL SPECIES	STATUS¹	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Algodones Dunes Sunflower *Helianthus niveus ssp. tephrodes (A.* Gray) Heiser	CNDDB Ranks: G4T2, S1.2; CNPS: 1B.2; Cal: Endangered	The Algodones Dunes sunflower produces clusters of large, bright yellow daisy-like flower heads	Sandy desert areas, creosote bush scrub, Algodones Dunes, Imperial Co.	L No habitat
Slender Cottonheads *Nemacaulis denudata var. gracilis*	CNDDB Ranks: G4T1, S1; CNPS: 2.2	Plants ascending to erect, 0.4-2.5(-4) × 0.4-2 dm. Leaf-blades usually linear or narrowly spatulate, 1-7 × 0.1-0.6 cm. Inflorescences with slender, light brown branches; glomerules distinctly pedunculate, 2-4 mm across. Peduncles 0.5-3 mm. Involucral bracts 2-4 × 0.5-1 mm, light brown to yellowish-green in the tawny tomentum. Flowers 5(-12), usually obscured by the tomentum, 0.5-1.2 mm; outer perianth lobes linear to oblong.	Coastal Strand, Creosote Bush Scrub. Dunes.	L No Habitat

BOTANICAL SPECIES	STATUS¹	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Giant Spanish Needle *Palafoxia arida var. gigantea*	CNDDB Ranks: G5T3, S2; CNPS: 1B.3	An attractive pink-flowered member of the sunflower, or aster family. It is an annual or short-lived perennial species with dark green, linear shaped leaves. Heads of pink disk flowers appear in both the spring and fall, with sufficient rainfall.	Found throughout much of the Sonoran and Mojave deserts.	L No habitat
Mecca-aster *Xylorhiza cognata*	CNPS: 1B.2	Woody stemmed thorny leaves with purple flowers.	Arid canyons to 750', northern Sonora Desert, Mecca Hills, Riverside Co.	L No habitat
Glandular ditaxis *Ditaxis claryana*	CNPS: 2.2	Staminate flower: sepals 5, edges abutting in bud; petals 5; stamens 5–15, generally in 2 sets, some > others, filaments fused into a column, staminodes 0–3 at column tip	Sandy soils, Creosote Bush Scrub	L No habitat

BOTANICAL SPECIES	STATUS¹	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Munz's Cholla *Opuntia munzii*	CNDDB Ranks: G3, S1.2; CNPS: 1B.3	Shrub to tree-like, 6.4 - 12.8 feet (2-4 meters) tall, almost as wide. Main trunk 4-6 inches (10-15cm) thick. Stem succulent. Lower branches rather bare. Tubercles (small, wart-like projections) strongly raised, 3/8 - 5/8 inches (10-16mm) long, 2/8 inch (5-6mm) wide. Areoles (area bearing spines) with short, tan bristles, and 10-12 yellowish, somewhat equal spines, 3/8 - 5/8 inches (1-2cm) long. Flowers few. Petals yellowish-green, 5/8 - 6/8 inches (1.5-2cm) long. Fruit is dry. Seeds are somewhat rounded, 1/8 inch (3mm).	Dry, gravelly or sandy places. Creosote bush scrub. Elevation 480 - 1,920 feet (150-600 meters).	L No habitat

BOTANICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Harwood's milk-vetch *Astragalus insularis var. harwoodii*	CNDDB Ranks: G5T3, S2.2?; CNPS: 2.2	Long leaves with purplish flowers	Creosote Bush Scrub. Dunes	L No habitat
Slender-spined All-thorn *Koeberlinia spinosa ssp. tenuispina*	CNPS: 2.2	Flower: sepals 1–2 mm, ovate, entire, greenish white; petals 3–4 mm, 0.5–1 mm wide, short-clawed with an obovate or oblanceolate limb, white; stamens 2.8–4 mm, anthers 0.8–1 mm; ovary 1–1.2 mm, stalk 0.3–0.5 mm, style 1–1.5 mm	Creosote Bush Scrub. Occurs in wetlands in another region, but occurs almost always under natural conditions in non wetlands in California	L No habitat
Sand Evening-primrose *Camissonia arenaria*	CNPS: 2.2	The flowers generally open at dawn, and may be yellow, white, or lavender, often with darker shades at the base. They are usually cup-shaped, thus the common name.	Creosote Bush Scrub	L No habitat

BOTANICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Wiggins' croton *Croton wigginsii*	CNDDB Ranks:G2G3, S1.2; CNPS: 2.2 Cal:Rare	This spreading shrub approaches a meter in height. Its sparse foliage is made up of long oval-shaped leaves covered in a coating of white hairs.	This small gray-green shrub is native to the deserts of northern Mexico and into California and Arizona where it is an inhabitant of sand dunes.	L No habitat
Abrams's Spurge *Chamaesyce abramisiana*	CNPS list: 2	Annual herbaceous blooms Sept/Nov. Common spurge in area has large purple spot and is prostrate; Abram's is not as colorful.	Sonoran Desert Shrub	L No habitat; no spurges found.
Sand Food *Pholisma sonorae*	State: S1.2 (threatened); CNPS list:1B.2	Parasite on species such as *Erigonus, /tiquilia, ambrosia, pluchea.* White to brown color. Corolla pink to purple.	Sonoran Desert Dunes; loose deep sand	L No deep loose sand available, no habitat; none observed

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Birds				
Yuma clapper rail *Rallus longirostris yumanensis*	Fed:Endangered Ca: Threatened	A chickenlike marsh bird with a long, slightly drooping bill and an often upturned tail. Light brownish with dark streaks above. Rust-colored breast; bold, vertical gray and white bars on the flanks; white undertail coverts	Lives in freshwater and brackish marshes. Prefers dense cattails, bulrushes, and other aquatic vegetation. Nests in riverine wetlands near upland, in shallow sites dominated by mature vegetation, often in the base of a shrub. Prefers denser cover in winter than in summer. Very shy.	L None observed or heard; Cattails not found in dense stands; no suitable habitat on site or in adjacent drains.
Gull-billed Tern *Gelochelidon nilotica*	Species of concern	This is a fairly large and powerful tern. The short thick gull-like bill, broad wings, long legs and robust body are distinctive. The summer adult has grey upperparts, white under parts, a black cap, strong black bill and black legs.	This species breeds in colonies on lakes, marshes and coasts. It nests in a ground scrape and lays two to five eggs.	L No suitable habitat

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Caspian Tern *Hydroprogne caspia, formerly Sterna caspia*	CNDDB Rank: G5, S4	It is the world's largest tern with a length of 48–56 cm, a wingspan of 127–140 cm and a weight of 574–782g. Adult birds have black legs, and a long thick red-orange bill with a small black tip. They have a white head with a black cap and white neck, belly and tail. The upper wings and back are pale grey; the underwings are pale with dark primary feathers.	Their breeding habitat is large lakes and ocean coasts in North America (including the Great Lakes), and locally in Europe (mainly around the Baltic Sea and Black Sea), Asia, Africa, and Australasia (Australia and New Zealand). North American birds migrate to southern coasts, the West Indies and northernmost South America. European and Asian birds spend the non-breeding season in the Old World tropics. African and Australasian birds are resident or disperse over short distances.	L No suitable habitat

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Merlin *Falco columbarius*	CNDDB Rank: G5, S3	The Merlin is 24–33 cm (9.5–13 in) long with a 50–67 cm (20–26 in) wingspan. adult males may weigh 150-210 grams (5.3-7.4 oz), and females 190-255 grams (6.7-9 oz). The male Merlin has a blue-grey back, ranging from almost black to silver-grey in different subspecies. Its under parts are buff- to orange-tinted and more or less heavily streaked with black to reddish brown. The female and immature are brownish-grey to dark brown above, and whitish buff spotted with brown below.	Merlins inhabit fairly open country, such as willow or birch scrub, shrubland, but also taiga forest, parks, grassland such as steppe and prairies, or moorland. They are not very habitat-specific and can be found from sea level to the treeline. In general, they prefer a mix of low and medium-height vegetation with some trees, and avoid dense forests as well as treeless arid regions. During migration however, they will utilize almost any habitat.	L No habitat; no trees

ZOOLOGICAL SPECIES	STATUS¹	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Yellow-breasted Chat *Icteria virens*	CNDDB Rank: G5, S3; CNPS: SC	Yellow-breasted Chats are noticeably larger than all other warblers, reaching a length of 7.5 in (19 cm) and a wingspan of 9.75 in (24.8 cm). These birds have olive upperparts with white bellies and yellow throats and breasts; they also have long tails, thick heavy bills, large white eye-rings, and dark legs.	The breeding habitats of this species are dense, brushy areas and hedgerows. The nests of these birds are cup-shaped, and are placed in thick shrubs. These birds eat insects and berries, and will forage in dense vegetation, occasionally gripping food with their feet.	L No dense vegetation available
Ferruginous Hawk *Buteo regalis*	CNDDB Rank: G4, S3S4	Adults have long broad wings and a broad gray, rusty or white tail. The legs are feathered to the talons	The countryside is open, level, or rolling prairies; foothills or middle elevation plateaus largely devoid of trees; and cultivated shelterbelts or riparian corridors.	L May occasionally hunt in area
Gray-Headed Junco *Junco hyemalis caniceps*	CNDDB Rank: G5T5; S1	Adults generally have gray heads, necks, and breasts, gray or brown backs and wings, and a white belly, but show a confusing amount of variation in plumage details. The white outer tail feathers flash distinctively in flight and while hopping on the ground. The bill is usually pale pinkish.	It breeds in the southern Rocky Mountains from Colorado to central Arizona and New Mexico, and winters into northern Mexico.	L May pass through on migration

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Black-tailed Gnatcatcher *Polioptila melanura*	CNDDB Rank: G5; S2	Reaches about 4.5 to 5 inches in length, much of it taken up by a long black tail lined with white outer feathers. The body is blue-gray, with white underparts.	Ranges throughout the Sonoran and Chihuahuan Deserts of the southwestern United States and northern Mexico. It is nonmigratory and found in arid desert areas year-round.	L No desert habitat
Burrowing Owl *Athene cunicularia*	CDFG: SC Species of Concern	Small raptors that nest in burrows that have been borrowed from other species in open grassland areas. Have adapted well in Imperial County using canals/drains/ditches to establish burrows and foraging for insects in agricultural fields	Open, dry annual or perennial grasslands; deserts & scrublands	H Owls/burrow found off site. Survey results included in this report

ZOOLOGICAL SPECIES	STATUS¹	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Yellow Warbler *Dendroica petechia brewsteri*	CNDDB Rank: G5T3, S2; CDFG: SC	A Family of seed-eating, small to moderately large passerine birds that have strong, stubby beaks, which in some species can be quite large. They have a bouncing flight, alternating flapping with gliding on closed wings. Most sing well.	Yellow warblers in southern California breed in lowland and foothill riparian woodlands dominated by cottonwoods, alders, or willows and other small trees and shrubs typical of low, open-canopy riparian woodland (Garrett and Dunn 1981). During migration, they occur in lowland and foothill woodland habitats such as desert oases, riparian woodlands, oak woodlands, mixed deciduous-coniferous woodlands, suburban and urban gardens and parks, groves of exotic trees, farmyard windbreaks, and orchards (Small 1994).	L Sparse thickets
Crissal Thrasher *Toxostoma crissale*	CDFG Species of Concern	A large thrasher found in the Southwestern United. The bird grows to 32 cm (12.5 inches), and has a deeply curved bill. It can be found near water in dense underbrush, and in the low desert near canyon chaparral; seldom flies in the open.	Dense vegetation along streams/washes in mesquite/willows/arrowweed	L None observed; scarce habitat

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Black Skimmer *Rynchops niger*	Fed: - CDFG: SC	A medium-sized to large waterbird with long red and black bill. Black back and cap.Underparts white with very short red legs.	Fairly common summer resident at the Salton Sea. Forages on small fishes and crustaceans in calm, shallow water. Roosts on sandy beaches or gravel bars	L No suitable habitat
Short-eared owl *Asio flammeus*	CDFG: SC	Medium sized with light and dark brown mottled upperparts with dark-streaked, pale buff underparts. The head has large, round, pale buff facial disk with fine, brown tinges, black around eyes, and small ear tufts. Eyes are yellow and bill is black. Flight is erratic with flopping wing beats. Hunts day or night.	Found in fresh and saltwater swamplands, lowland meadows and irrigated alfalfa fields. Requires tall grass or cattail patches for nesting and cover. Nests on dry ground in depression concealed in vegetation.	L Irrigated alfalfa could provide hunting area. No nesting areas

ZOOLOGICAL SPECIES	**STATUS[1]**	**DESCRIPTION OF SPECIES**	**HABITAT**	**OBSERVATION/ SITE POTENTIAL**
California Black Rail *Laterallus jamaicensis coturniculus*	CDFG: Threatened	The smallest of all rails, the black rail is slate-colored, with a black bill, red eyes and a white-speckled back. The legs are moderately long and the toes are unwebbed. The sexes are similar.	Most commonly occurs in tidal emergent wetlands dominated by pickleweed or in brackish marshes with bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass and in immediate vicinity of tidal sloughs. Typically occurs in the high wetland zones near upper limit of tidal flooding, not in low wetland areas with considerable annual or daily fluctuations in water levels. Nests are concealed in dense vegetation, often pickleweed, near upper limits of tidal flooding	L None observed; no habitat on site
Sonoran desert toad *Incillius alvarius*	CDFG: SC	Smooth, typically olive-green/brown skin, cranial crests, and prominent, elongated glands on both sides of the back of the head and on the hind legs. Young toads have small dark, orange-tipped spots on the back. Larger tadpoles are gray or brown with a rounded tail tip, and grow to about 2.25".	Sonoran Desert scrub, semi-desert grasslands. May be found many miles from water, particularly during the summer monsoons. Most Sonoran Desert toads are found at night during the monsoon season, but they may emerge a month or more before the summer rains begin, particularly in areas of permanent water. Can be found in rodent burrows or underground retreats.	L None observed. No habitat present on site.

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Leopard frog *Lithobates yavapaiensis*	Species of concern	Tan,gray-brown or light gray-green to green above; yellow below. Vague upper lip stripe, tuberculate skin. Dark network on rear of thighs; yellow groin color often extends onto rear of belly and underside of legs. Male will exhibit a swollen and darkened thumb base.	Find in desert grassland and in woodlands. Uses permanent water sources, stays near water. Breed Feb-April. Bullfrogs are predators	L No water sources on site; not expected on site.
Carlson's dune Beetle *Anomala carlsoni*	CNDDB Ranks: G2, S2;	Length 7.6 mm, width of prothorax 2.7 mm. Head dorsally pale red-brown, eyes black.	Sandy dune area	L No habitat
Hardy's dune Beetle *Anomala hardyorum*	CNDDB Ranks: G2, S2;	Members of this species have a light tan coloration with males ranging from 0.28 to 0.39 in (7 to 10 mm) in length, and females from 0.28 to 0.35 in (7 to 9 mm)	The species has most often been found on north- or east-facing dune slip faces. All known collections are from the Algodones Dunes in Imperial County, California	L No habitat

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
A mellitid bee *Melitta californica*	CNDDB Rank: SNR	They are typically moderate-sized bees (8–15 mm), which are commonly oligolectic	Restricted to Africa and the northern temperate zone.	L Honey bee only bee observed
Flat-tailed horned lizard *Phrynosoma mcallii*	CNDDB Rank: G3; S2 CDFG: SC	A small (up to 87 mm or 3.4" from snout to vent), exceptionally flat and wide lizard with a long (for a horned lizard) broad, flat tail and a dark stripe running down the middle of the back.	Occupy a small range in the Sonoran Desert of southwestern California, southwestern Arizona, and extreme northern Mexico.	L No habitat
American Badger *Taxidea taxus*	CDFG: Species of Concern	Burrowing animals that feed on ground squirrels, rabbits, gophers and other small animals. Prefer grasslands, agricultural areas.	Found in drier open areas with friable soils	L None seen; no burrows observed with badger characteristics observed. Not expected because of farming activities
Nelson's Bighorn sheep *Ovis canadensis nelsoni*	CNDDB Ranks: G4T4, S3	Sheep have short hair which is light gray to grayish brown, except around their stomachs and rump, where it is creamy white. Their tails are about four inches long.	Occupy a variety of plant communities, ranging from mixed-grass hillsides, shrubs. Avoids dense vegetation	L None observed; no habitat

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Desert Pupfish *Cyprinodon macularius*	CNDDB Rank: G1; S1 Federal: Endangered; Cal: Endangered	The body of the desert pupfish is thickened and markedly compressed laterally in adult males. The mouth is superior, highly protractile, armed with tricuspid teeth. The scales bear spine-like projections. The dorsal profile of the fish is smoothly rounded.	The pupfish occupies shallow waters of springs, small streams, and marshes.	L No drains located near Salton Sea near site
Razorback Sucker *Xyrauchen texanus*	Fed/CA: Endangered	One of the largest suckers in North America can grow to up to 13 pounds and lengths exceeding 3 feet. The razorback is brownish-green with a yellow to white-colored belly and has an abrupt, bony hump on its back shaped like an upside-down boat keel	Colorado River	L No habitat

ZOOLOGICAL SPECIES	STATUS¹	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Pocketed free-tailed bat *Nyctinomops femorosaccus*	CNDDB Rank: G4, S2S3; CDFG: SC	A small fold, or "pocket" in the wing membrane of the free-tailed bat, near its knee, gives this bat its common name. Pocketed free-tailed bats have large ears and long wings, and fly rapidly, generally pursuing insects on the wing. They eat many kinds of insects, but seem to prefer small moths.	It occurs in the arid lowlands of the desert Southwest, and primarily roosts in crevices in rugged cliffs, slopes, and tall rocky outcrops.	L No habitat
Western Mastiff Bat *Eumops perotis californicus*	CNDDB Rank: G5T4, S3; CDFG: SC	Eumops perotis can be distinguished from all other North American molossid (free-tail) species based on size. With a forearm of 73-83 mm, it is North America's largest species.	In California, the E. perotis is most frequently encountered in broad open areas. Generally, this bat is found in a variety of habitats, from dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, montane meadows, and agricultural areas.	L No habitat
Western Yellow bat *Lasiurus xanthinus*	CDFG SC:	Consumes small to medium-sized, night flying insects. Yellow color/short ears.	Roosts in leafy vegetation the deserts of the southwestern United States. Roosts among the dead fronds of palm trees and cottonwoods	L Not expected; no palms or cottonwood trees found on site.

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Pallid Bat *Antrozous pallidus*	Species of concern	Pallid bats have larger eyes than most other species of bats in North America and have pale, long, and wide ears; their fur is generally lightly colored. They have on average a total length of 92 to 135 mm (3.6 to 5.3 in).	They primarily sleep in rock crevices and buildings. Pallid bats are skilled at climbing and crawling.	L No habitat
California Leaf-nosed Bat *Macrotus californicus*	Species of concern	The California leaf-nosed bat weighs between 12 and 20 grams, has a wingspan of over 30 centimeters and a body length of over 6 centimeters, and is brown in color. As its name implies, it has a triangular fleshy growth of skin, called a noseleaf, protruding above the nose.	Its natural habitat is hot deserts.	L No habitat

ZOOLOGICAL SPECIES	STATUS[1]	DESCRIPTION OF SPECIES	HABITAT	OBSERVATION/ SITE POTENTIAL
Desert tortoise *Gopherus agassizii*	Fed/Cal: Threathened	A herbivore that may attain a length of 9 to 15 inches in upper shell (carapace) length. The tortoise is able to live where ground temperature may exceed 140 degrees F because of its ability to dig underground burrows and escape the heat. At least 95% of its life is spent in burrows. Their shells are high-domed, and greenish-tan to dark brown in color. Desert tortoises can grow from 4–6"in height and weigh 8–15 lb (4–7 kg) when fully grown. The front limbs have heavy, claw-like scales and are flattened for digging. Back legs are more stumpy and elephantine	Dry, flat, and gravelly or sandy ground in desert shrub communities where annual and perennial grasses are abundant. Frequent habitats with a mix of shrubs, forbs, and grasses	L Habitat not favorable

Special Status Species that Occur in Imperial County (USFWS)

Common Name ***Scientific Name***	**Status[1] Federal/CDFG / CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Plants				
Peirson's milk-vetch *Astragalus magdalenae var. peirsonii*	T/E/1B	Silvery, short-lived perennial plant that is somewhat broom like in appearance. A member of the pea and bean family, it can grow to 2.5 feet tall and is notable among milkvetches for its greatly reduced leaves. Peirson´s milkvetch produces attractive, small purple flowers, generally in March or April, with 10 to 17 flowers per stalk. It yields inflated fruit similar to yellow-green pea pods with triangular beaks.	Desert dune habitats. In California, known from sand dunes in the Algodones Dunes system of Imperial County. Was known historically from Borrego Valley in San Diego County and at a site southwest of the Salton Sea in Imperial County	L No dune habitat

Common Name *Scientific Name*	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Birds				
California brown pelican *Pelecanus occidentalis* No longer endangered	E/E/-	Large size and brown color. Adults weigh approximately 9 pounds, and have a wingspan of over 6 feet. They have long, dark bills with big pouches for catching and holding fish. Pelicans breed in nesting colonies on islands without mammal predators. Roosting and loafing sites provide important resting habitat for breeding and non-breeding birds.	Open water, estuaries, beaches; roosts on various structures, such as pilings, boat docks, breakwaters, and mudflats	L None observed. No open water

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Southwestern willow flycatcher *Empidonax traillii extimus*	E/-/-	Small; usually a little less than 6 inches in length, including tail. Conspicuous light-colored wingbars. Lacks the conspicuous pale eye-ring of many similar *Empidonax* species. Overall, body brownish-olive to gray-green above. Throat whitish, breast pale olive, and belly yellowish. Bill relatively large; lower mandible completely pale. The breeding range of extimus includes Arizona and adjacent states.	At low elevations, breeds principally in dense willow, cottonwood, and tamarisk thickets and in woodlands, along streams and rivers. Migrants may occur more widely. Prefers riparian willow/cottonwood but will use salt cedar thickets	L No habitat

Common Name *Scientific Name*	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Yuma clapper rail *Rallus longirostris yumanensis*	E/T/-	A chickenlike marsh bird with a long, slightly drooping bill and an often upturned tail. Light brownish with dark streaks above. Rust-colored breast; bold, vertical gray and white bars on the flanks; white undertail coverts. Very shy.	Lives in freshwater and brackish marshes. Prefers dense cattails, bulrushes, and other aquatic vegetation. Nests in riverine wetlands near upland, in shallow sites dominated by mature vegetation, often in the base of a shrub. Prefers denser cover in winter than in summer..	L None observed or heard; no suitable habitat; not immediately adjacent to Salton Sea.
Yellow-billed cuckoo *Coccyzus americanus*	C/E/-	Medium-sized cuckoo with gray-brown upperparts and white underparts. Eye-rings are pale yellow. Bill is mostly yellow. Wings are gray-brown with rufous primaries. Tail is long and has white-spotted black edges. Sexes are similar.	Found in forest and open woodlands, especially in areas with dense undergrowth, such as parks, riparian woodlands, and thickets	L None observed; no habitat on site. Thickets are not.
Bald eagle *Haliaeetus leucocephalus*	T, PD/E/-	The distinctive white head and tail feathers Beak and eyes yellow. Bald Eagles are about 29 to 42 inches long, can weigh 7 to 15 pounds, and have a wing span of 6 to 8 feet.	Found on shores, lake margins, and near large rivers Winters at lakes, reservoirs, river systems, and some rangelands and coastal wetlands (breeding range is mainly in mountainous habitats near reservoirs, lakes and rivers)	L None observed; no habitat

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Least tern *Sterna antillarum*	E/E/-	Small tern. During breeding, black cap ending at white forehead. Short white eyestripe. Bill yellow with black tip. Back light gray. Underside white. Black leading edge to wing. In nonbreeding plumage has black eyestripe extending to back of head, white top of head, and black bill. Size: 21-23 cm (8-9 in) Wingspan: 48-53 cm (19-21 in) Weight: 30-45 g (1.06-1.59 ounces)	Shallow areas of estuaries, lagoons, and at the joining points between rivers and estuaries	L None observed; no habitat
Least Bell's Vireo *Vireo bellii pusillus*	E/E/-	Drab gray to green above and white to yellow below. It has a faint white eyering and two pale wingbars; has pale whitish cheeks and forehead and greenish wings and tail. longer tail and subtle wingbars.	Formerly a common and widespread summer resident below about 2,000 feet in western Sierra Nevada. Also was common in coastal southern California, from Santa Barbara County south, below about 4,000 feet east of the Sierra Nevada. Prefers thickets of willow, and other low shrubs afford nesting and roosting cover	L None observed; no habitat on site. Thickets are not present .

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Mountain plover *Charadrius montanus*	FPT/SC/-	Medium-sized plover with pale brown upperparts, white underparts, and brown sides. Head has brown cap, white face, and dark eyestripe. Upperwings are brown with black edges and white bars; underwings are white. Tail is brown-black with white edges. Sexes are similar.	Avoids high and dense cover. Uses open grass plains, plowed fields with little vegetation, and open sagebrush areas. Likes to follow livestock grazing or burned off fields.	L Fields, if planted to Bermuda or alfalfa, in vicinity could support mt. plover
Black rail *Laterallus jamaicensis coturniculus*	-/T/-	The smallest of all rails, the black rail is slate-colored, with a black bill, red eyes and a white-speckled back. The legs are moderately long and the toes are unwebbed. The sexes are similar.	Most commonly occurs in tidal emergent wetlands dominated by pickleweed or in brackish marshes with bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass and in immediate vicinity of tidal sloughs. Typically occurs in the high wetland zones near upper limit of tidal flooding, not in low wetland areas with considerable annual or daily fluctuations in water levels. Nests are concealed in dense vegetation, often pickleweed, near upper limits of tidal flooding	L None observed; no habitat

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Raptors				
Peregrine Falcon *Falco peregrinus*	D/E/-	Large, powerful falcon; pointed winged falcon silhouette. Strong shallow wingbeats may dive at speeds up to 100 mph. Dark with dark hooded effect. Blue gray below with narrow bars Long-winged, long tailed hawk. Habitually flies low over open fields and marshes watching and listening for prey such as rodents and birds. (I observed Harrier with a white faced ibis as prey). Perches low or on ground. Low slow flight. Nests in reeds. Grey with black wingtips.	Most often found along coastlines or marshy habitats. Nest in cliffs and have been known to nest in tall buildings	L None observed; rare visitors to area outside of the Salton Sea. No waterfowl for prey or cliffs/tall buildings for nesting

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Northern Harrier *Circus cyaneus*	-/SC/-	Blue gray above pale reddish below; small size. Tip of tail squared off. Nesting occurs in dense tree stands which are cool, moist, well shaded and usually near water. Hunt in openings at the edges of woodlands and also brushy pastures.	Marshes, open fields. Nests in reeds	L No rodent, rabbit populations present for prey.
Sharp-shinned Hawk *Accipiter striatus*	-/SC/-	Gray and white with black on shoulders and under bend of wing. Graceful flyer. Adults have bright red eyes. Medium size hawk; about 15 inches long and about 12 ounces. Males pale with rufous shoulders and thigh feathers. White tail washed with rufous. Wide head wings in shallow v when soaring.	Sharp-shinned hawks may appear in woodland habitats during winter and migration periods and are often common in southern California in the coastal lowlands and desert areas; winters in woodlands and other habitats except alpine, open prairie and bare desert	L No rodent, rabbit populations present for prey.

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
White tailed Kite *Elanus leucurus*	/E/		Found in open country; like to perch on treetop. May be seen hovering prior to attack of a rodent.	L No rodent, rabbit populations present for prey.
Ferruginous hawk *Buteo regalis*	/SC/		Found in arid to semiarid regions, as well as grasslands and agricultural areas in southwestern Canada, western United States, and northern Mexico.	L No rodent, rabbit populations present for prey.
Mammals				
Bighorn sheep *Ovis canadensis*	E/E/-	Sheep have short hair which is light gray to grayish brown, except around their stomachs and rump, where it is creamy white. Their tails are about four inches long. Full-grown rams weigh between 180 and 240 pounds,	Desert Bighorn sheep occupy a variety of plant communities, ranging from mixed-grass hillsides, shrubs. Avoids dense vegetation	L None observed; no habitat

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Jaguar *Panthera onca*	-/-/-	Typically yellow-brown with black spots, called rosettes, but they can also be black with black spots. They are nocturnal and have a keen sense of smell and hearing. Excellent swimmers, tree climbers, and move easily on the ground.	Occurs in tropical rainforests, arid scrub, and wet grasslands. Prefers dense forests or swamps with a ready supply of water	L None observed; no habitat

Common Name *Scientific Name*	Status[1] Federal/CDFG /CNPS	DESCRIPTION OF SPECIES	Habitat	Suitability Of Habitat In Survey Area
Reptiles and Amphibians				
Desert tortoise *Gopherus agassizii*	T/T/-	A herbivore that may attain a length of 9 to 15 inches in upper shell (carapace) length. The tortoise is able to live where ground temperature may exceed 140 degrees F because of its ability to dig underground burrows and escape the heat. At least 95% of its life is spent in burrows. Their shells are high-domed, and greenish-tan to dark brown in color. Desert tortoises can grow from 4–6"in height and weigh 8–15 lb (4–7 kg) when fully grown. The front limbs have heavy, claw-like scales and are flattened for digging. Back legs are more stumpy and elephantine	Dry, flat, and gravelly or sandy ground in desert shrub communities where annual and perennial grasses are abundant. Frequent habitats with a mix of shrubs, forbs, and grasses	L None observed; habitat not favorable

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Flat-tailed horn lizard *Phrynosoma mcallii*	PT/-/-	Closely related to Desert horned lizard (scat indistinquishable); only found in Imperial, Riverside County,Ca and Yuma area, Az. Small round lizard with distinquishing round spots on back. Diet of ants; needs sandy soil, shade bushes to survive.	Desert washes/sandy areas with vegetative cover. Diet of ants	L No habitat; none observed
Fish				
Desert pupfish *Cyprinodon macularius*	E/E/-	Small, silvery-colored fish with 6 to 9 dark bands on its sides. Grows to a full average length of only 2.5 inches; develop quickly, sometimes reaching full maturity within 2 to 3 months. Although their average life span is 6 to 9 months, some survive more than one year. Pupfish have a short, scaled head with an upturned mouth.	Springs, seeps, and slow-moving streams in Salton Sink basin and backwaters and sloughs of the Colorado River	L None observed; no habitat; drains not adjacent to Salton Sea

Common Name ***Scientific Name***	**Status[1] Federal/CDFG /CNPS**	**DESCRIPTION OF SPECIES**	**Habitat**	**Suitability Of Habitat In Survey Area**
Razorback Sucker *Xyrauchen texanus*	Fed/CA: Endangered	One of the largest suckers in North America can grow to up to 13 pounds and lengths exceeding 3 feet. The razorback is brownish-green with a yellow to white-colored belly and has an abrupt, bony hump on its back shaped like an upside-down boat keel	Colorado River	L None observed; no habitat

USFWS Birds of Conservation Concern

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	National Rating
Bald Eagle	*Haliaeetus leucocephalus*	Nests on tall trees or on cliffs in forested areas near large bodies of water. Winters in coastal areas, along large rivers, and large unfrozen lakes.	Low Not expected. No tall trees; not observed in area	X	X
Swainson's Hawk	*Buteo swainsoni*	Breeds in open country such as grassland, shrubland, and agricultural areas. Usually migrates in large flocks often with Broad-winged Hawks. Winters in open grasslands and agricultural areas of Southern America.	M May migrate through. Not observed in area		X
Peregrine Falcon	*Falco peregrinus*	Inhabits open wetlands near cliffs for nesting. Also uses large cities and nests on buildings.	M No open wetlands or nesting area; could hunt in vicinity	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	Common Name
Black Rail	*Laterallus jamaicensis*	Nests in high portions of salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation.	Low No salt or freshwater marshes; no vegetation	X	X
Snowy Plover	*Chardrius alexandrinus*	Barren to sparsely vegetated sand beaches, dry salt flats in lagoons, dredge spoils deposited on beach or dune habitat, levees and flats at salt-evaporation ponds, river bars, along alkaline or sailne lakes, reservoirs, and ponds.	Low No habitat; not observed	X	X
Mountain Plover	*Charadrius montanus*	Breeds on open plains at moderate elevations. Winters in short-grass plains and fields, plowed fields, and sandy deserts.	Low Could be found in vicinity on site if adjacent fields are planted to alfalfa or bermuda	X	X
Black Oystercatcher	*Haematopus bachmani*	Rocky seacoasts and islands, less commonly sandy beaches.	Low No habitat; not observed	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	Common Name
Solitary Sandpiper	*Tringa solitaria*	Breeds in taiga, nesting in trees in deserted songbird nests. In migration and winter found along freshwater ponds, stream edges, temporary ponds, flooded ditches and fields, more commonly in wooded regions, less frequently on mudflats and open marshes.	Low No habitat; not observed		X
Lesser Yellowlegs	*Tringa flavipes*	Breeds in open boreal forest with scattered shallow wetlands. Winters in wide variety of shallow fresh and saltwater habitats.	Low No habitat; not observed		X
Upland Sandpiper	*Bartramia longicauda*	Native prairie and other dry grasslands, including airports and some croplands.	Low No habitat; not observed		X
Whimbrel	*Numenius phaeopus*	Breeds in various tundra habitat, from wet lowlands to dry heath. In migration, frequents various coastal and inland habitats, including fields and beaches. Winters in tidal flats and shorelines, occasionally visiting inland habitats.	L Could use adjacent fields for foraging if planted to alfalfa or bermuda	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	Common Name
Long-billed Curlew	*Numenius americanus*	Nests in wet and dry uplands. In migration and winter found on wetlands, grain fields, lake and river shores, marshes, and beaches.	Low Could use adjacent fields for foraging if planted to alfalfa or bermuda	X	X
Short-billed Dowitcher	*Limnodromus griseus*	Breeds in muskegs of taiga to timberline, and barely into subarctic tundra. Winters on coastal mud flats and brackish lagoons. In migration prefers saltwater tidal flats, beaches, and salt marshes. Also found in freshwater mud flats and flooded agricultural fields.	Low Could use adjacent fields for foraging if planted to alfalfa or bermuda	X	X
Aleutian Tern	*Sterna aleutica*	Nest on flat vegetated islands on or near the coast. Vegetation includes dwarf-shrub tundra, grass and sedgemeadows, and coastal marsh. Migration and winter habitat not known, probably pelagic.	Low No habitat; not observed		X
Least Tern	*Sterna antillarum*	Seacoasts, beaches, bays, estuaries, lagoons, lakes and rivers, breeding on sandy or gravelly beaches and banks of rivers or lakes, rarely on flat rooftops of buildings.	Low No habitat; not observed		X

Common Name	**Species Name**	**Habitat**	**Potential Onsite**	**Region 8 Imperial County**	**Common Name**
Gull-billed Turn	*Sterna nilotica*	Breeds on gravelly or sandy beaches. Inters in salt marshes, estuaries, lagoons and plowed fields, along rivers, around lakes and in freshwater marshes.	Low No habitat; not observed		X
Black Skimmer	*Rynchops niger*	Breeds in large colonies on sandbars and beaches. Forages in shallow bays, inlets, and estuaries.	Low No habitat; not observed	X	X
Yellow-billed Cuckoo	*Coccyzus americanus*	Open woodlands with clearings, orchards, dense scrubby vegetation, mainly cottonwood, willow, and adler, often along water.	Low No habitat; not observed	X	X
Black Swift	*Cypseloides niger*	Nests on steep ledges on cliffs or canyons. Migrates and winters over coastal lowlands.	Low No habitat; no swifts observed in area	X	X
Costa's Hummingbird	*Calypte costae*	Primarily low deserts and arid brushy foothills, but also chaparral and coastal sage scrub closer to the coast. Often visits ornamental plantings and feeders in desert communities. In migration and winter frequents a wider variety of habitats, occasionally ranging into pine-oak woodlands.	Low No habitat; not observed – no feeders or nectar sources in area	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	Common Name
Calliope Hummingbird	*Stellula calliope*	Open montane forest, mountain meadows, and thickets of willow and alder. In migration and winter also in chaparral, oak and pine-oak woodlands, deserts, and gardens.	Low No habitat; not observed	X	X
Rufous Hummingbird	*Selasphorus rufus*	Breeds in a variety of forested habitats where flowers are found. Frequents montane meadows and just about anywhere else with flowers or feeders during migration. Winters primarily in pine and pine-oak forests in Mexico, but most birds wintering farther north are attracted either to flowers or feeders in gardens.	Low No habitat; not observed – no feeders or nectar in area.		X
Allen's Hummingbird	*Selasphorus sasin*	Breeds in coastal sage scrub, chaparral, and riparian corridors within coastal forests. In Mexico winters in forest edge and scrub clearings with flowers. The resident population on the mainland of southern California is largely restricted to suburban neighborhoods where feeders and flowers are plentiful.	Low No habitat; not observed. No feeders or nectar in area	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	Common Name
Lewis's Woodpecker	*Melanerpes lewis*	Breeds in open arid conifer, oak, and riparian woodlands: rare in coastal areas. Winters in breeding habitat, and oak savannas, orchards, and even in towns.	Low No habitat; not observed	X	X
Olive-sided Flycatcher	*Contopus cooperi*	Montane and northern coniferous forests, at forest edges and openings such as meadows, and at ponds and bags. Winters at forest edges and clearings where tall trees or snags are present.	Low No habitat; not observed	X	X
Willow Flycatcher	*Empidonax trailii*	Breeds in moist, shrubby areas, often with standing or running water. Winters in shrubby clearings and early successional growth.	Low No habitat; not observed	X	X
Loggerhead Shrike	*Lanius ludovicianus*	Open or brushy areas.	Low No habitat; not observed. No thickets or thorny trees available. Could pass through fields	X	X
Bell's Vireo	*Vireo bellii*	Dense, low, shrubby vegetation generally early successional stages in riparian areas, brushy fields, young second-growth forest or woodland, scrub oak, coastal chaparral, and mesquite brushlands, often near water in arid regions.	Low No habitat; not observed. No thickets available. Could pass through fields	X	X

Common Name	Species Name	Habitat	Potential Onsite	Region 8 Imperial County	Common Name
Black-chinned Sparrow	*Spizella atrogularis*	Arid brushland, commonly in tall and fairly dense sagebrush, and dry chaparral. Often in rocky, rugged country from sea level to around 8,900 ft (2700m).	Low No habitat; not observed	X	X
Tricolored Blackbird	*Agelaius tricolor*	Breeds in marsh vegetation, particulalry cattails, near grain fields, riparian scrublnd, and forests, but always near water. Dairies and feedlots also commonly used for foraging. Urban and suburban areas occasinoally utilized, particularly park lawns. Cultivated lands also suitable for foraging. Large night-time roosts form during nonbreeding season in cattail marshes near foraging grounds.	Low No habitat; not observed	X	X
Lawrence's Goldfinch	*Carduelis lawrencei*	Prefers dry interior foothills, mountain valleys, open woodlands, chaparral, and weedy fields. Often found near isolated water sources such as springs and cattle troughs.	Low No habitat; not observed	X	X

CNPS Species or Community Level
G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

State Ranking	
The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.	The R-E-D Code contains information on Rarity, Endangerment, and Distribution, ranked as a 1, 2, or 3 for each value (as below). This code was originally known as the R-E-V-D Code (through the 3rd edition 1980), and the V (Vigor) was removed in the 4th edition (1984).
S1 = Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres	**R - Rarity**
S1.1 = very threatened	1 – Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time
S1.2 = threatened	2 – Distributed in a limited number of occurrences, occasionally more if each occurrence is small
S1.3 = no current threats known	3 – Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported
S2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres	**E - Endangerment**
S2.1 = very threatened	1 – Not very endangered in California
S2.2 = threatened	2 – Fairly endangered in California
S2.3 = no current threats known	3 – Seriously endangered in California
S3 = 21-80 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres	**D - Distribution**
S3.1 = very threatened	1 – More or less widespread outside California
S3.2 = threatened	2 – Rare outside California
S3.3 = no current threats known	3 – Endemic to California
S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.	
S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.	

Sources: CDFG/CNDDB 2018, California Wildlife 2016; CNPS 2018; USFWS, 2016	
State/CDFG:	**[1]Status: Federal:**
E = Listed as an endangered species; or previously known as "rare, fully protected"	E = Listed as an endangered species
T = Listed as a threatened species	T = Listed as a threatened species
SC = species of special concern (designation intended for use as a management tool and for information; species of special concern have no legal status (www.dfg.ca.gov/wildlife/species/ssc/birds.html))	C = Candidate for listing
CNPS (California Native Plant Society):	D = Delisted
1B = Rare, threatened, or endangered in California or elsewhere	PD = Proposed for delisting/PT = Proposed for threatened status
2= Plants rare, threatened, or endangered in Ca, but more common elsewhere	
3=Plants about which more information is needed	
Habitat Suitability Codes: H = Habitat is of high suitability for this species M = Habitat is of moderate suitability for this species L = Habitat is of low suitability for this species	

PHOTOGRAPHS

1. Southwest corner of site looking north; SR 111 and ag fields to left

2. Agriculture field south of site; Albright Road and Vail Supply Canal; cattle egrets white face ibis in field

3. Northern boundary of site looking south; bare ground – no vegetation on site

4. All American Grain facility to north of site

5. Container facility on site; southeast corner

6. Union Pacific railroad tracks at east boundary of site looking east; Blair Road and agricultural field in background

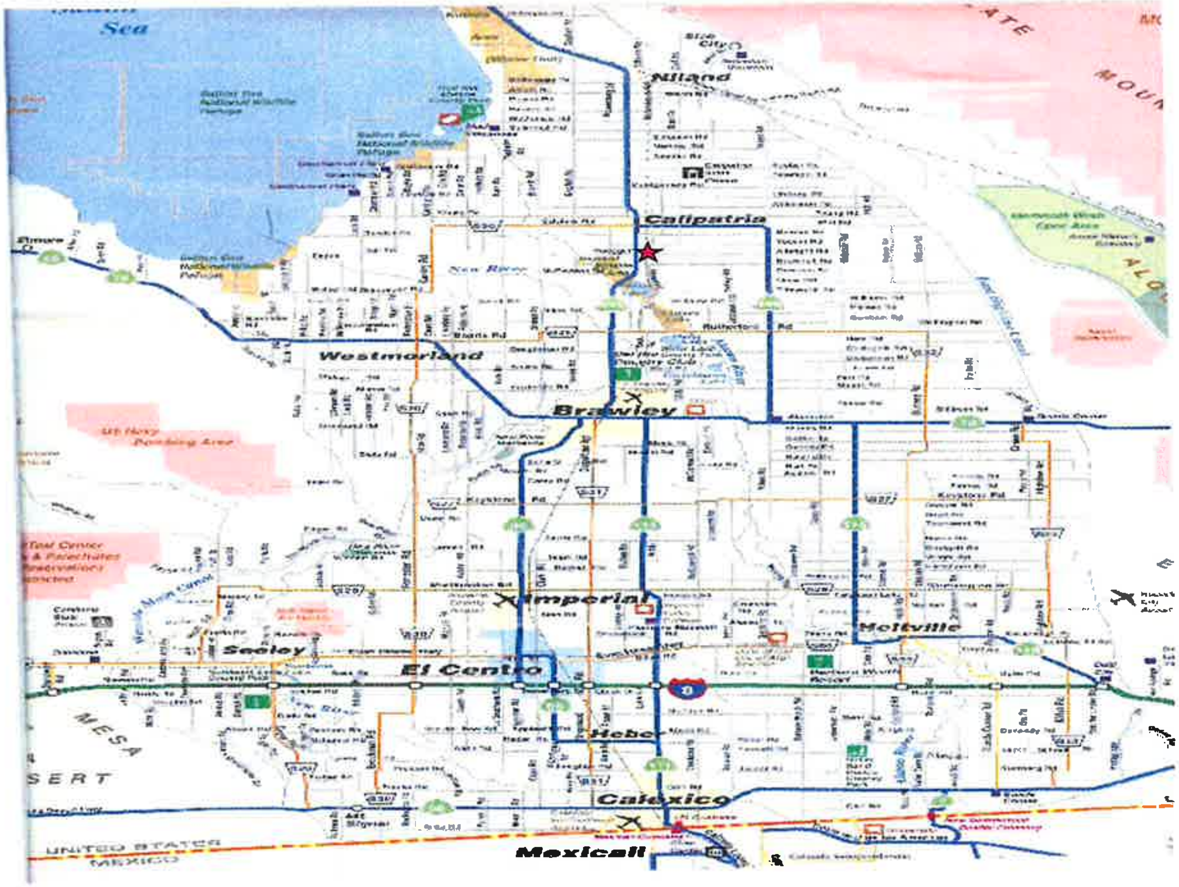
7. Nectarine Lateral A adjacent to south end of property looking west; site to right

8. Adult with juvenile in burrow along Nectarine Lateral A canal offsite to the south of site

9. Active burrow along Nectarine Lateral A canal offsite to the south of site

PROJECT STATEWIDE LOCATION

PROJECT REGIONAL LOCATION




ALL AMERICAN GRAIN
Biological Resources Map
Yocum Rd
Blair Rd
All American Grain Facility
Bermuda
Agricultural fields
Site
Bare ground/no vegetation
Lyerly Rd
Kershaw Rd
Nectarine Lateral A
Vail Supply Canal
Ruegger Rd
2
1
Bermuda
111
Reservoir
N
1000 ft
Google earth

MARIE S. BARRETT

2035 Forrester Road, El Centro, CA 92243 (760) 352 4159 mariebarrett@roadrunner.com

LICENSES/CERTIFICATES

Flat Tailed Horn Lizard Surveyor CDFG/BLM
Burrowing Owl Surveyor (CDFG/USFWS)
USFW Desert Tortoise Egg Handling Desert Tortoise Council Survey Techniques Workshop Certificate
BCI Bat Conservation and Management Workshop (Acoustic) Certificate
Southwestern Willow Flycatcher Workshop Kernville, CA 2010
California Pest Control Advisor #70373 California Pest Control Operator #103123
CA Scientific Collection Permit 126/USFWS Salvage Permit MB52633B-1

CAREER HISTORY

Barrett's Biological Surveys, El Centro, California ***BIOLOGIST* 3/95 -present**

Helped established protocol and perform Vegetative Baseline Studies and Biological Surveys for Mining Reclamation Plans in Imperial County. Have performed numerous (over 20,000 acres) surveys involving varied wildlife including burrowing owl, nesting birds and plant species and writing reports and biological assessments. Certified to perform Flat Tailed Horned Lizard Surveys; completed Desert Tortoise workshops; approved to handle desert tortoise (American Girl Mine/BLM project, 1/2013). Work closely with governmental agencies such as such as Bureau of Land Management, State Office of Mining Reclamation, California Department of Fish and Game. Written over ten Environmental Assessments for BLM, El Centro office. Over 150 days spent in field monitoring/surveying for FTHL; 98 days in field monitoring/surveying for desert tortoise and 32,000 acres surveyed for burrowing owl and nesting birds; 2 IID Burrowing owl surveys with AECOM (2011/12- 226 hrs). Wrote Imperial Irrigation District Artificial Burrow Installation Manual (2009). Over 25 active burrowing owl burrows passively relocated and 50 artificial burrows installed. Volunteered for desert tortoise work (20 hrs) with Dr. Jeff Lovich. Coachella Valley Projects: Torres-Martinez (Desert Cahuilla Composting Facility Biological Resource Technical Report/Surveys 60 acres, SR 86/Ave 84, 2013; Augustine Tribe (Solar Farm Biological Resource Technical Report/Surveys 10 acres, La Quinta,CA, 2010); Benitez Family Trust Therapeutic Community, Dillon and Cabazon Roads, 10 acres,2008); Chandri Group (Dairy Queen Chill/Grill Project, 1.5 acres, Date Palm Drive/I-10, La Quinta, CA, 2014). Blythe 8Minutenergy Mt. Signal Solar 5000 acres Preconstruction surveys/construction monitoring and BUOW Post construction monitoring; Biological report. 2010-2017

Black Mt. MetTower Installation: desert tortoise survey and monitoring approved by BLM, El Centro office

Salton City Burrtec Landfill FTHL monitoring/clearance 2010-2014 (42.5 hrs); Superior Redi Mix: FTHL surveys, Oat Pit Environmental Assessment for BLM, El Centro, 2009-14. (20 hours) SDG&E La Rosite Pole Replacement FTHL Monitoring 2012-2013(410 hrs); Imperial County Department of Public Works, FTHL surveys for Coyote Mine Environmental Assessment, BLM, El Centro, 2008. (10 hours) All American Aggregates, FTHL surveys, Boyd Road Mine Environmental Assessment, BLM El Centro, 2007. (9.5 hours) All American Aggregates, FTHL surveys, Wheeler Road Mine Environmental Assessment, BLM, El Centro, 2006. (8.5 hours); ValRock, FTHL surveys, Ocotillo ByPass Road Environmental Assessment, County of Imperial/BLM, El Centro, 2004. (7 hours). USFWS Authorized desert tortoise biologist: American Girl Mine and Mesquite Mine.

Citizens' Congressional Task Force on the New River, Brawley, Ca ***PROGRAM COORDINATOR* 1/98 - present**

Assisted with design, construction, planting and monitoring of four constructed wetlands in Imperial County. Responsible for coordinating activities relating to student and public outreach education to promote the water quality opportunities of wetlands ponding systems on the New River.

Imperial Valley College, Imperial, California ***ENVIRONMENTAL MANAGEMENT PROJECT COORDINATOR* 9/95-12/99**

Responsible for establishing an Environmental Technology curriculum, presenting public forums, short courses and certificate courses in hazardous materials and safety areas. In conjunction with Division Chairman, established a budget for 96-98 program and obtained funding of $131,000 based on 95-96 program performance. Established short courses that trained over 700 people in hazardous materials safety programs. Compiled a survey of employers, which provided direction for the program.

VOLUNTEER ORGANIZATIONS

CALIFORNIA NATIVE PLANT SOCIETY: Imperial Valley Coordinator, 2006-2016.

SALTON SEA INTERNATIONAL BIRD FESTIVAL: Coordinator: 2001-2010. Organize bird festival in the Imperial Valley that attracts over 300 birders.

COLORDO RIVER WATER QUALITY CONTROL BOARD: Board member Dec 05-Sept 06.

FRIENDS OF SONNY BONO NATIONAL WILDLIFE REFUGE: Board Chairman, May 2015- 16

EDUCATION

University of Arizona, Tucson, Arizona
Masters of Science Degree – AGRICULTURAL EDUCATION
Thesis: Survey and training protocol for documenting burrowing owls and habitat in Imperial County, California
California State Polytechnic College, Kellogg-Voorhis Campus, Pomona, California
Bachelor of Science Degree.- AGRICULTURAL BIOLOGY
Imperial Valley College, Imperial, California *Associate of Science Degree. AGRICULTURE*

Jacob Calanno
Post Office Box 458
Niland, California 92257
760-550-4214

SPECIALTIES: Biological Surveys and Monitoring, Mechanical Process Applications, Field operations.

EDUCATION: Imperial Valley College, Imperial, Ca. - Municipal Water and Waste Water Treatment; Licensing pending.

COMPUTER SKILLS: Basic computer skills, Lab View for Engineers.

CERTIFIED SPECIALIZED TRAINING:
Environmental Review & Compliance for Natural Gas Facilities Seminar- June 5-7, 2012
Desert tortoise Surveying, Monitoring and Handling Techniques Certificate Nov. 5-6, 2012
Flat Tail Horn Lizard Training- June 20, 2012
40 Hour Hazwoper Feb. 8, 2013
CALIFORNIA OSHA TITLE-2011
Confine Space Training, 2005
Lockout/Tagout , 2005
Respirator Training, 2005
Operators Safety Training, 2005
Foreman Field Crew Supervisory and Operations Training, 2005

SUMMARY: Biological surveyor and Monitor/ Field Operations Crew Foreman/Operations Technician

For the past 6 years I have been specifically working on biological surveys and monitoring including burrowing owl, flat tail horned lizard, desert tortoise and migratory birds. I have 15 years' experience in the environmental remediation industry. My area of expertise is in remedial mechanical applications, equipment operations and maintenance programs.

Training and hands on experience working in the field with endangered species; Desert Tortoise and the Flat Tail Horned Lizard, followed compliance policy and procedure when encountering endangered species. This training was received while working on specific projects such as:

WORK EXPERIENCE:

2012-18 Barrett's Biological Surveys
Project Salton City Burrtec Landfill: 320 acre clearance and provided FTHL training to construction crew(42 hrs)
Project AECOM/IID Burrowing Owl habitat surveys June, 2015
Project Imperial County Public Works Desert Tortoise/MBTA monitoring: 195.7 hours at Walters Camp, near Palo Verde, CA
Project Mesquite Mine: 30 acre desert tortoise clearance; fence installation monitoring (25 hrs)
Project Oat Mine: FTHL monitoring (186 hrs)
Project CalTrans: FTHL monitoring (50 hrs)
Project: Arms and Dudes Film Project FTHL/MBTA monitoring (181 hours)
Project Niland Wastewater Project BUOW/Biological surveys (5 days)

Project: Hell's Kitchen MBTA Nesting Bird/Burrowing Owl Surveys (5 days)
BLM, El Centro, CA office: Volunteer Bat Surveys with Pat Brown (20 hours)
CDFW, Avian Carcass Collection Volunteer (5 hours)

2005 to 2010 Volper, LLC, Burbank, Ca.
Provided field supervision of construction
Responsibilities include plan and coordinate field construction and activities, field reports and tracking hours.
Manager/Grower

2003 to 2005 Cape Environmental, Irvine, California
Field Operations Supervisor/Sr. Operations Technician
Provided technical equipment applications support on various environmental remediation projects.
Responsibilities included; construction, planning and field supervision for the installation, operation and maintenance of ground water remediation equipment.

2000 to 2003 Foster Wheeler Environmental, San Diego, California
Field Operation Supervisor/Sr. Operations Technician
Provided technical equipment applications support on various environmental remediation projects.
Responsibilities included; construction, planning and field supervision for the installation, operation and maintenance of ground water remediation equipment.

REFERENCES:

Mr. Fredrick Rivera	Marie Barrett	Ed Cooney
IR Manager,	2035 Forrester Rd	Engineering Technician
Naval Air Facility - El Centro	El Centro, CA 92243	FEAD/PW Bldg.504 NAF El Centro, CA 92243
760-339-2226	760 427 7006	760-339-2469

LANDMARK
Geo-Engineers and Geologists

780 N. 4th Street
El Centro, CA 92243
(760) 370-3000
(760) 337-8900 fax

77-948 Wildcat Drive
Palm Desert, CA 92211
(760) 360-0665
(760) 360-0521 fax

August 3, 2018

Mr. Mark Brandt
All American Grain
305 E. Yocum Road
Calipatria, CA 92233

Rail Loop Loading Pad Structural Sections
SEC of State Hwy 111 and Yocum Road
Calipatria, California
LCI Report No. LE18146
(Refer LCI Report No. LE06217)

Dear Mr. Brandt:

Landmark Consultants, Inc. conducted a geotechnical investigation at the Unit – Train Rail Loop in 2006 for proposed industrial development. Currently, the interior of the rail loop is being used to load shipping containers loaded with compressed hay bales onto rail cars. Pavement structural sections are being provided for design of the Hay Loading Pad and Container Storage Areas. It is our understanding that the Container Reach Lift/Stacker is a Hyster Model RS45-31 CH which has an axle load of 127,000 pounds (front axle-dual wheels at 145 psi). The container reach lift/stacker service weights for unloaded and loaded conditions were provided by the hay loading company. In the storage areas, containers will be stacked up to four (4) high. Each loaded container weights about 60,000 lbs with a total weight of 240,000 lbs for a stack of four (4) containers over an area of 8'x 40' (320 sf) resulting in a uniform load of 750 psf. The equipment loads are approximately equivalent to a Traffic Index of 11.0 (Caltrans pavement design method).

Landmark's geotechnical investigation conducted in June 2006 at this site identifies the predominant native subgrade soils to be clays that yield an R-Value strength of 5 when tested in accordance with test method CAL 301. Based on the Container Reach Lift/Stacker service loads, an estimated R-value of 5 for the subgrade soil and assumed traffic index of 11.0, the following table provides our suggested Portland Cement Concrete (PCC) pavement structural section for the Hay Loading Pad.

Rigid Pavement Structural Section

Traffic Index	**Rigid (PCC) Pavements**	
	Concrete Thickness (in.)	**Aggregate Base Thickness (in.)**
11.0	11.0	15.0

Twelve (12) inches of moisture conditioned (minimum 4% above optimum) native clay soil compacted to a minimum of 90% of the maximum dry density determined by ASTM D1557 shall support the pavement structural section. After compaction of the subgrade soil, a layer of 6 oz. non-woven geotextile fabric conforming to AASHTO M288 Class 2 Specification and a layer of Tensar TriAx 160 (or Greenbook Type S2 bi-axial geogrid) geogrid reinforcing shall be placed directly above the compacted subgrade surface.

Aggregate base shall conform to Caltrans Class 2 (¾ in. maximum), compacted to a minimum of 95% of ASTM D1557 maximum dry density. Portland cement concrete for pavements should have Type V cement, a minimum compressive strength of 5,000 psi at 28 days, and a maximum water-cement ratio of 0.40 (600 psi flexural strength).

Unpaved Structural Section (Maintenance Required):

The container storage and loading areas may consist of 18 inches of aggregate base. The bottom 12 inches may consist of crushed concrete aggregate base and the top 6 inches should consist of crushed natural rock aggregate base. Recycled and crushed aggregate bases shall conform to Caltrans Class 2 (¾ in. maximum), compacted to a minimum of 95% of ASTM D1557 maximum dry density. The aggregate base layers shall be placed on 12 inches of moisture conditioned (minimum 4% above optimum) native clay soil compacted to a minimum of 90% of the maximum dry density determined by ASTM D1557. After compaction of the subgrade soil, a layer of 6 oz. non-woven geotextile fabric conforming to AASHTO M288 Class 2 Specification and a layer of Tensar TriAx 160 (or Greenbook Type S2 bi-axial geogrid) geogrid reinforcing shall be placed directly above the compacted subgrade surface before the aggregate base is laid.

The unpaved aggregate base section shall be wetted regularly to minimize dust generation and maintain the surface of the aggregate base without raveling. Areas of the surface found to yield or rut under lift hoist wheel loads should be repaired with stiffer material such as cement treated base.

The opportunity to provide professional services for project design for the rail car loading pad is appreciated. Please contact our office with any questions or comments.

Respectfully Submitted,
Landmark Consultants, Inc.

Julian R. Avalos, PE
Senior Engineer

JULIAN R AVALOS
No. 73339
EXPIRES 12-31-18
CIVIL

Jeffrey O. Lyon, PE
President

JEFFREY O. LYON
No. 31921
EXPIRES 12-31-08 18
CIVIL

Geotechnical Report

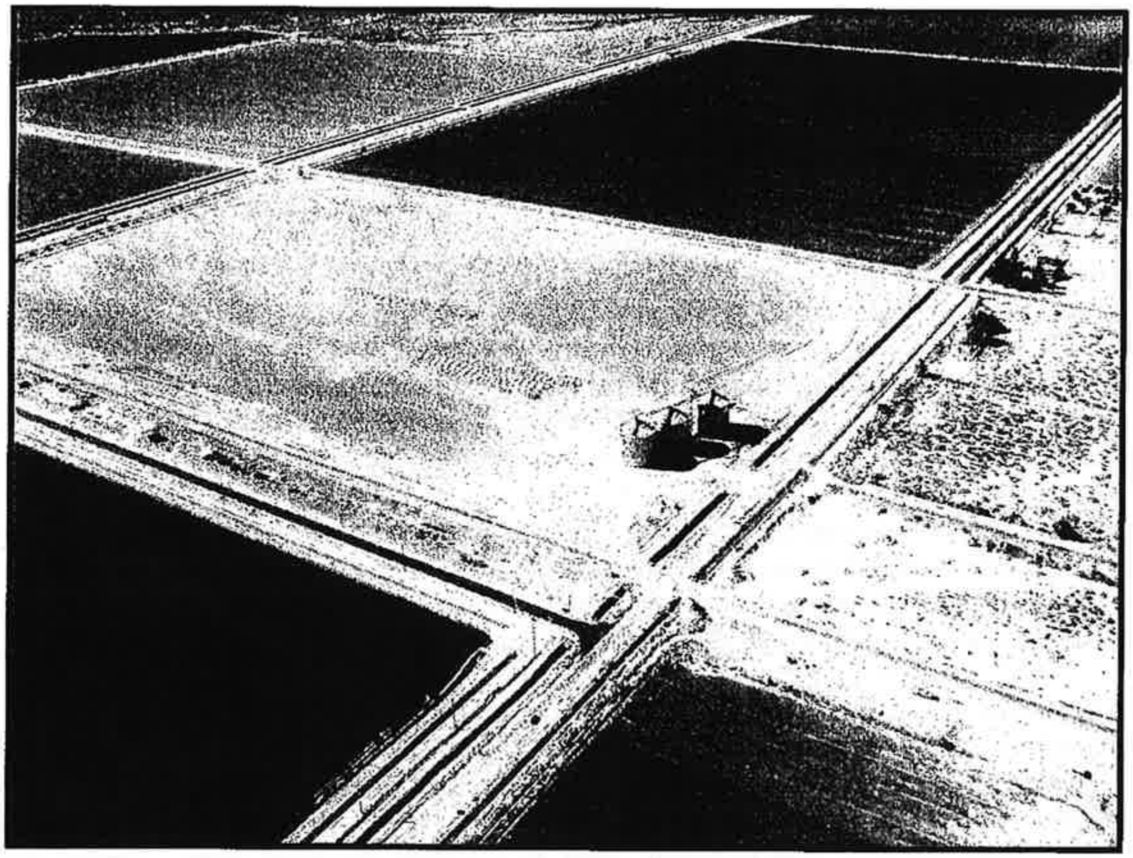
Pacific Ethanol Plant

SEC State Hwy 111 and Yocum Road

Calipatria, California

Prepared for:

TKDA
1500 Piper Jaffray Plaza
444 Cedar Street
St. Paul, MN 55101-2140



Prepared by:

LANDMARK
Geo-Engineers and Geologists

Landmark Consultants, Inc.
780 N. 4th Street
El Centro, CA 92243
(760) 370-3000

July 2006

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July 13, 2006

Mr. Brent Paulsen
TKDA
1500 Piper Jaffray Plaza
444 Cedar Street
St. Paul, MN 55101-2140

Geotechnical Investigation
Pacific Ethanol Plant
SEC State Hwy 111 and Yocum Road
Calipatria, California
LCI Report No. LE06217

Dear Mr. Paulsen:

This geotechnical report is provided for design and construction of the proposed Pacific Ethanol Plant located at the southeast corner of State Hwy 111 and Yocum Road within the All American Grain Facility's unit train rail loop south of Calipatria, California. Our geotechnical investigation was conducted in response to your request for our services. The enclosed report describes our soil engineering investigation and presents our professional opinions regarding geotechnical conditions at the site to be considered in the design and construction of the project.

This summary presents ***selected*** elements of our findings and recommendations only. It ***does not*** present crucial details needed for the proper application of our findings and recommendations. Our findings, recommendations, and application options are related ***only through reading the full report***, and are best evaluated with the active participation of the engineer of record who developed them.

The findings of this study indicate that the site is, in general, predominantly underlain by clays of moderate to high expansion potential that will require foundations and slabs-on-grade designed to resist expansive soil heave (CBC Section 1815 and 1816). The California Building Code (CBC) design method requires grade-beam stiffening of floor slabs at a maximum spacing of 18 feet on center, grade-beam stiffened post-tensioned slabs or flat-plate structural slabs. Design and construction of site improvements (concrete flatwork, curbs, patios, etc.) should include provisions to mitigate clay soil movement. Additionally, the weak clay subgrade soil requires thickened structural sections for pavements.

In order to reduce settlement in some structures to generally accepted limits, existing soft, compressible clays may be strengthened by soil improvement (soil mixing, stone colums, geopiers, etc.) or by placement of a deep foundation system like driven piles or drilled piers. These options are discussed in the report.

The soil is highly corrosive to metals and contains sufficient sulfates and chlorides to require special concrete mixes (4,500 psi strength with 0.45 maximum water cement ratio and Type V cement) and protection of embedded steel components when concrete is placed in contact with native soil.

Evaluation of liquefaction potential at the site indicates that 1 to 5 foot thick, isolated, interbedded layers of silt and silty sand at a depth between 16 to 50 feet may liquefy under seismically induced groundshaking, potentially resulting in an estimated 1 to 2¾ inches of deep seated settlement. There is a 16-foot layer of non-liquefiable clay soils above any potentially liquefiable soil; therefore, it is unlikely that there will be rapid deformation or punching bearing failures of the surface soils should liquefaction occur.

We did not encounter soil conditions that would preclude implementation of the proposed project provided the recommendations contained in this report are implemented in the design and construction of this project.

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. If you have any questions or comments regarding our findings, please call our office at (760) 360-0665.

Respectfully Submitted,
Landmark Consultants, Inc.

Steven K. Williams, CEG
Senior Engineering Geologist

STEVEN K. WILLIAMS
CERTIFIED ENGINEERING GEOLOGIST
CEG 2261

Julian R. Avalos
Staff Engineer

Jeffrey O. Lyon, PE
President

JEFFREY O. LYON
No. 31921
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CIVIL

Distribution:
Client (4)

TABLE OF CONTENTS

Section 1
INTRODUCTION

1.1 Project Description

This report presents the findings of our geotechnical investigation for the proposed Pacific Ethanol Plant located at the southeast corner of State Hwy 111 and Yocum Road within the All American Grain Company's unit train rail loop south of Calipatria, California (See Vicinity Map, Plate A-1). The proposed development will consist of several buildings for offices, storage, control rooms, fermentation, main processing and distillation processes. Also, the proposed plant will have steel storage tanks, cooling towers, silos, hoppers, storage yards and associated internal roadways. A parallel rail loop is planned for splitting of the unit train rail cars to allow at grade plant access during train unloading. A site plan for the proposed development was provided by the client at the time that this report was prepared.

The structures (buildings) are planned to consist of slabs-on-grade foundations with masonry and steel-frame or panelized tilt-up concrete construction. Footing loads at exterior bearing walls are estimated at 1 to 5 kips per lineal foot. Column loads are estimated to range from 5 to 100 kips. Expected plant components, cooling towers, hoppers and silos columns loads range from 5 to 300 kips. The dimensions for the proposed steel storage tanks were not provided at the time that this report was prepared. The estimated loads imposed at ground surface by the loaded tanks are expected to range from 2,000 to 3,000 pounds per square foot.

If structural loads exceed those stated above, we should be notified so we may evaluate their impact on foundation settlement and bearing capacity. Site development will include foundation support pad preparation, underground utility installation, roadway and concrete flatwork placement.

1.2 Purpose and Scope of Work

The purpose of this geotechnical study was to investigate the upper 50 feet of subsurface soil at selected locations within the site for evaluation of physical/engineering properties. From the subsequent field and laboratory data, professional opinions were developed and are provided in this report regarding geotechnical conditions at this site and the effect on design and construction.

The scope of our services consisted of the following:

- Field exploration and in-situ testing of the site soils at selected locations and depths.
- Laboratory testing for physical and/or chemical properties of selected samples.
- Review of the available literature and publications pertaining to local geology, faulting, and seismicity.
- Engineering analysis and evaluation of the data collected.
- Preparation of this report presenting our findings, professional opinions, and recommendations for the geotechnical aspects of project design and construction.

This report addresses the following geotechnical issues:

- Subsurface soil and groundwater conditions
- Site geology, regional faulting and seismicity, near source factors, and site seismic accelerations
- Liquefaction potential and its mitigation
- Expansive soil and methods of mitigation
- Aggressive soil conditions to metals and concrete

Professional opinions with regard to the above issues are presented for the following:

- Site grading and earthwork
- Building pad and foundation subgrade preparation
- Allowable soil bearing pressures and expected settlements
- Concrete slabs-on-grade
- Lateral earth pressures
- Excavation conditions and buried utility installations
- Mitigation of the potential effects of salt concentrations in native soil to concrete mixes and steel reinforcement
- Seismic design parameters
- Pavement structural sections
- Rail bed subgrade/subbase requirements

Our scope of work for this report did not include an evaluation of the site for the presence of environmentally hazardous materials or conditions.

1.3 Authorization

Mr. Richard N. Sobiech, president of TKDA provided authorization by written agreement to proceed with our work on June 12, 2006. We conducted our work according to our written proposal dated June 8, 2006.

Section 2
METHODS OF INVESTIGATION

2.1 Field Exploration

Subsurface exploration was performed on June 14, 2006 using Holguin, Fahan, & Associates, Inc. of Cypress, California to advance seven (7) electric cone penetrometer (CPT) soundings to an approximate depth of 50 feet below existing ground surface. The soundings were made at the locations shown on the Site and Exploration Plan (Plate A-2). The approximate sounding locations were established in the field and plotted on the site map by sighting to discernable site features.

CPT soundings provide a continuous profile of the soil stratigraphy with readings every 2.5cm (1 inch) in depth. Direct sampling for visual and physical confirmation of soil properties has been used by our firm to establish direct correlations with CPT exploration in this geographical region.

The CPT exploration was conducted by hydraulically advancing an instrumented Hogentogler 10cm^2 conical probe into the ground at a rate of 2cm per second using a 23-ton truck as a reaction mass. An electronic data acquisition system recorded a nearly continuous log of the resistance of the soil against the cone tip (Qc) and soil friction against the cone sleeve (Fs) as the probe was advanced. Empirical relationships (Robertson and Campanella, 1989) were then applied to the data to give a continuous profile of the soil stratigraphy. Interpretation of CPT data provides correlations for SPT blow count, phi (ϕ) angle (soil friction angle), undrained shear strength (S_u) of clays and over-consolidation ratio (OCR). These correlations may then be used to evaluate vertical and lateral soil bearing capacities and consolidation characteristics of the subsurface soil.

Additional subsurface exploration was performed on June 14 and 15, 2006 using 2R Drilling of Ontario, California to advance seven (25) borings to depths of 5 to 41.5 feet below existing ground surface. The borings were advanced with a truck-mounted, CME 55 drill rig using 8-inch diameter, hollow-stem, continuous-flight augers. The approximate boring locations were established in the field and plotted on the site map by sighting to discernable site features. The boring locations are shown on the Site and Exploration Plan (Plate A-2).

A staff engineer observed the drilling operations and maintained a log of the soil encountered and sampling depths, visually classified the soil encountered during drilling in accordance with the Unified Soil Classification System, and obtained drive tube and bulk samples of the subsurface materials at selected intervals. Relatively undisturbed soil samples were retrieved using a 2-inch outside diameter (OD) split-spoon sampler or a 3-inch OD Modified California Split-Barrel (ring) sampler. The samples were obtained by driving the sampler ahead of the auger tip at selected depths. The drill rig was equipped with a 140-pound CME automatic hammer for conducting Standard Penetration Tests (SPT). The number of blows required to drive the samplers 12 inches into the soil is recorded on the boring logs as "blows per foot". Blow counts reported on the boring logs represent the field blow counts. No corrections have been applied for effects of overburden pressure, automatic hammer drive energy, drill rod lengths, liners, and sampler diameter. Pocket penetrometer readings were also obtained to evaluate the stiffness of cohesive soils retrieved from sampler barrels.

After logging and sampling the soil, the exploratory borings were backfilled with the excavated material. The backfill was loosely placed and was not compacted to the requirements specified for engineered fill.

The subsurface borings logs and interpretive logs of the CPT soundings are presented on Plates B-1 through B-32 in Appendix B. A key to the interpretation of CPT soundings and the borings logs are presented on Plates B-33 and B-34, respectively. The stratification lines shown on the subsurface logs represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth.

2.2 Laboratory Testing

Laboratory tests were conducted on selected bulk soil samples obtained from a hand auger boring made adjacent to the CPT location to aid in classification and evaluation of selected engineering properties of the near surface soils. The tests were conducted in general conformance to the procedures of the American Society for Testing and Materials (ASTM) or other standardized methods as referenced below. The laboratory testing program consisted of the following tests:

- Plasticity Index (ASTM D4318) – used for soil classification, settlement estimates and expansive soil design criteria.
- Amount of Soil Particles Finer than No. 200 Sieve (ASTM D1140) – used determine the fines content of the soil.
- Unconfined Compression (ASTM D2166) – used for soil strength estimates.
- Unit Dry Densities (ASTM D2937) and Moisture Contents (ASTM D2216) – used for insitu soil parameters.
- Expansion Index (Swell) Test (UBC 18-2 and ASTM D4829) – used for evaluating relative expansion classification.
- Chemical Analyses (soluble sulfates & chlorides, pH, and resistivity) (Caltrans Methods) – used for concrete mix evaluations and corrosion protection requirements.

The laboratory test results are presented on the subsurface logs in Appendix B and on Plates C-1 through C-6 in Appendix C.

Engineering parameters of soil strength, compressibility and relative density utilized for developing design criteria provided within this report were either extrapolated from correlations with the subsurface CPT data or from data obtained from the field and laboratory testing program.

Section 3
DISCUSSION

3.1 Site Conditions

The project site is located within the central area of the elevated rail (about 3 feet above grade) for the All American Grain Company's unit train rail loop. The site area is relatively flat-lying (sloping northwesterly) and consists of approximately 90-acres of vacant land. The site was previously agricultural use land which has been fallow for about 5 years. Yocum Road, Albright Road, Kershaw Road and State Highway 111, all paved roadways, are located along the north, south, east and west sides of the site. Adjacent properties are flat-lying and are approximately at the same elevation with this site. Vacant land is located to the north and agriculture fields are located to the south, east and west sides of the proposed project property.

An existing office building, rail car unloading building/tunnel and three steel grain silos are located outside the rail loop at the northeast corner of the property. A unit train (100 rail cars) railroad track is located along the perimeter of the proposed project site. Several piles of soil and soil-cement mixture from construction of the grain silos are located within the north side of the project site

The project site lies at an elevation of approximately 175 feet below mean sea level (El. 825 local datum) in the Imperial Valley region of the California low desert. The surrounding properties lie on terrain which is flat (planar), part of a large agricultural valley, which was previously an ancient lake bed covered with fresh water to an elevation of 43± feet above MSL. Annual rainfall in this arid region is less than 3 inches per year with four months of average summertime temperatures above 100 °F. Winter temperatures are mild, seldom reaching freezing.

3.2 Geologic Setting

The project site is located in the Imperial Valley portion of the Salton Trough physiographic province. The Salton Trough is a geologic structural depression resulting from large scale regional faulting. The trough is bounded on the northeast by the San Andreas Fault and Chocolate Mountains and the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments since the Miocene Epoch.

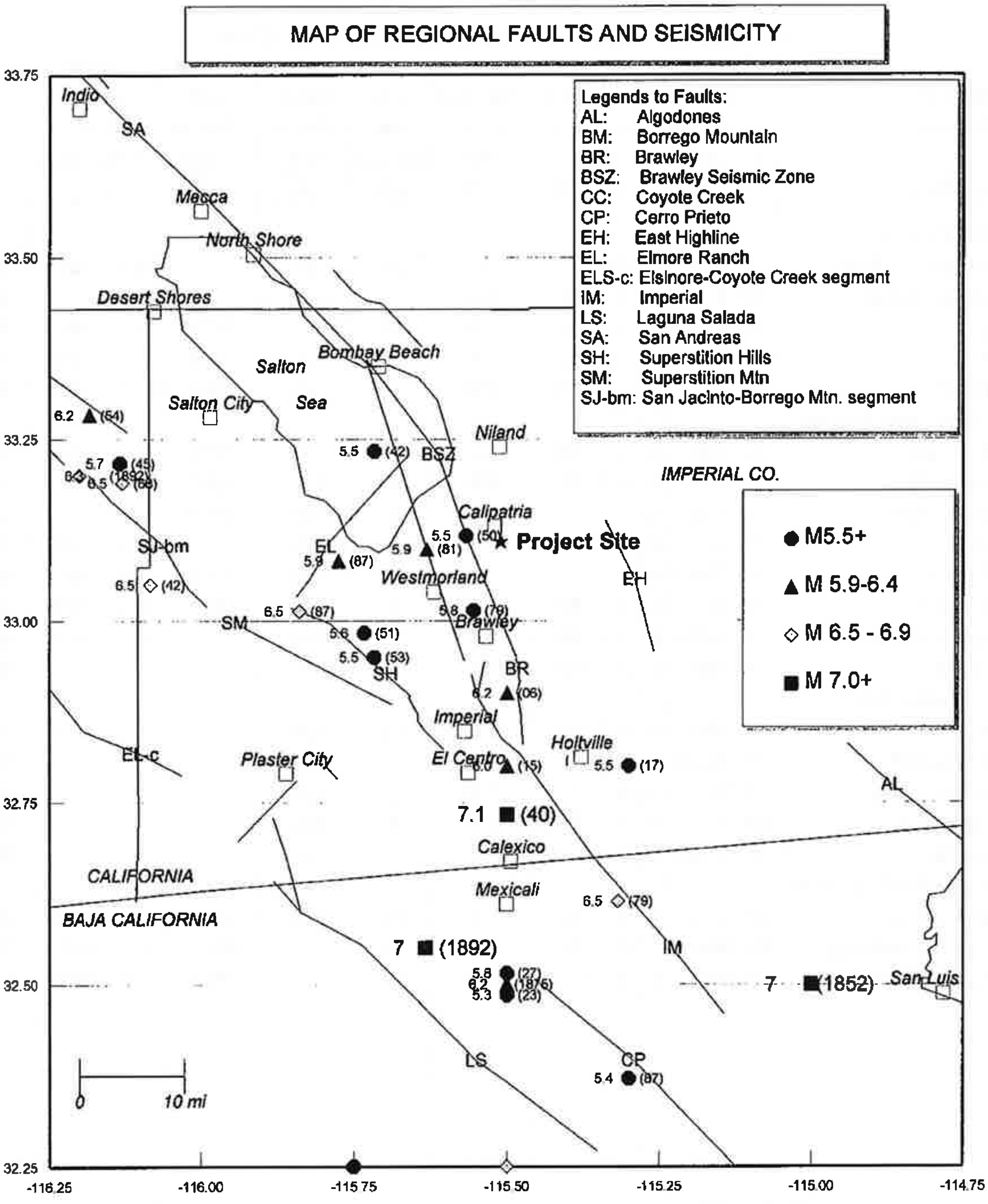
Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity. Figure 1 shows the location of the site in relation to regional faults and physiographic features.

The Imperial Valley is directly underlain by lacustrine deposits, which consist of interbedded lenticular and tabular silt, sand, and clay. The Late Pleistocene to Holocene lake deposits are probably less than 100 feet thick and derived from periodic flooding of the Colorado River which intermittently formed a fresh water lake (Lake Cahuilla). Older deposits consist of Miocene to Pleistocene non-marine and marine sediments deposited during intrusions of the Gulf of California. Basement rock consisting of Mesozoic granite and Paleozoic metamorphic rocks are estimated to exist at depths between 15,000 - 20,000 feet.

3.3 Seismicity and Faulting

Faulting and Seismic Sources: We have performed a computer-aided search of known faults or seismic zones that lie within a 62 mile (100 kilometers) radius of the project site as shown on Figure 1 and Table 1. The search identifies known faults within this distance and computes deterministic ground accelerations at the site based on the maximum credible earthquake expected on each of the faults and the distance from the fault to the site. The Maximum Magnitude Earthquake (Mmax) listed was taken from published geologic information available for each fault (CDMG OFR 96-08 and Jennings, 1994).

Seismic Risk: The project site is located in the seismically active Imperial Valley of southern California and is considered likely to be subjected to moderate to strong ground motion from earthquakes in the region. The proposed site structures should be designed in accordance with the California Building Code (CBC) for near source factors derived from a "Design Basis Earthquake" (DBE). The DBE is defined as the motion having a 10 percent probability of being exceeded in 50 years.



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Faults and Seismic Zones from Jennings (1994), Earthquakes modified from Ellsworth (1990) catalog.

Figure 1. Map of Regional Faults and Seismicity

Table 1
FAULT PARAMETERS & DETERMINISTIC ESTIMATES OF PEAK GROUND ACCELERATION (PGA)

Fault Name or Seismic Zone	Distance (mi) & Direction from Site	Fault Type		Fault Length (km)	Maximum Magnitude Mmax (Mw)	Avg Slip Rate (mm/yr)	Avg Return Period (yrs)	Date of Last Rupture (year)	Largest Historic Event >5.5M	(year)	Est. Site PGA (g)
Reference Notes: (1)		(2)	(3)	(2)	(4)	(3)	(3)	(3)	(5)		(6)
Imperial Valley Faults											
Brawley Seismic Zone	2.8 WSW	B	B	42	**6.4**	25	24		5.9	1981	**0.37**
East Highline Canal	10 E	C	C	22	**6.3**	1	774				**0.17**
Brawley	11 S	B	B	14	**7.0**	20	---	1979	5.8	1979	**0.24**
Imperial	11 S	A	B	62	**7.0**	20	79	1979	7.0	1940	**0.23**
Cerro Prieto	42 S	A	B	116	**7.2**	34	50	1980	7.1	1934	**0.10**
San Jacinto Fault System											
- Elmore Ranch	12 NW	B	A	29	**6.6**	1	225	1987	5.9	1987	**0.18**
- Superstition Hills	17 SW	B	A	22	**6.6**	4	250	1987	6.5	1987	**0.14**
- Superstition Mtn.	19 SW	B	A	23	**6.6**	5	500	1440 +/-			**0.13**
- Borrego Mtn	28 W	B	A	29	**6.6**	4	175		6.5	1942	**0.10**
- Anza Segment	37 WNW	A	A	90	**7.2**	12	250	1918	6.8	1918	**0.11**
- Coyote Creek	42 W	B	A	40	**6.8**	4	175	1968	6.5	1968	**0.08**
- Hot Spgs-Buck Ridge	50 WNW	B	A	70	**6.5**	2	354		6.3	1937	**0.06**
- Whole Zone	19 SW	A	A	245	**7.5**	---	---				**0.21**
Elsinore Fault System											
- Laguna Salada	34 SW	B	B	67	**7.0**	3.5	336		7.0	1891	**0.10**
- Coyote Segment	37 WSW	B	A	38	**6.8**	4	625				**0.09**
- Earthquake Valley	52 W	B	A	20	**6.5**	2	351				**0.06**
- Julian Segment	54 W	A	A	75	**7.1**	5	340				**0.08**
- Whole Zone	37 WSW	A	A	250	**7.5**	---	---				**0.13**
San Andreas Fault System											
- Coachella Valley	21 NW	A	A	95	**7.4**	25	220	1690+/-	6.5	1948	**0.19**
- San Gorgonio-Banning	63 NW	A	A	98	**7.4**	10	---	1690+/-	6.2	1986	**0.08**
- Whole S. Calif. Zone	21 NW	A	A	440	**7.9**	---	---	1857	7.8	1857	**0.24**

Notes:

1. Jennings (1994) and CDMG (1996)
2. CDMG (1996), where Type A faults -- slip rate >5 mm/yr and well constrained paleoseismic data
   Type B faults -- all other faults.
3. WGCEP (1995)
4. CDMG (1996) based on Wells & Coppersmith (1994)
5. Ellsworth Catalog in USGS PP 1515 (1990) and USBR (1976), Mw = moment magnitude,
6. The deterministic estimates of the Site PGA are based on the attenuation relationship of:
   Boore, Joyner, Fumal (1997)

Seismic Hazards.

▸ **Groundshaking.** The primary seismic hazard at the project site is the potential for strong groundshaking during earthquakes along the Brawley Seismic Zone and the Imperial, Brawley, and Superstition Hills Faults. A further discussion of groundshaking follows in Section 3.4.

▸ **Surface Rupture.** The project site does not lie within a State of California, Alquist-Priolo Earthquake Fault Zone. Surface fault rupture is considered to be unlikely at the project site because of the well-delineated fault lines through the Imperial Valley as shown on USGS and CGS maps. However, because of the high tectonic activity and deep alluvium of the region, we cannot preclude the potential for surface rupture on undiscovered or new faults that may underlie the site.

▸ **Liquefaction.** Liquefaction is a potential design consideration because of underlying saturated sandy substrata. The potential for liquefaction at the site is discussed in more detail in Section 3.7.

Other Secondary Hazards.

▸ **Landsliding.** The hazard of landsliding is unlikely due to the regional planar topography. No ancient landslides are shown on geologic maps of the region and no indications of landslides were observed during our site investigation.

▸ **Volcanic hazards.** The site is not located in proximity to any known volcanically active area and the risk of volcanic hazards is considered very low.

▸ **Tsunamis, sieches, and flooding.** The site does not lie near any large bodies of water, so the threat of tsunami, sieches, or other seismically-induced flooding is unlikely.

▸ **Expansive soil.** In general, much of the near surface soils in the Imperial Valley consist of silty clays and clays which are moderate to highly expansive. The expansive soil conditions are discussed in more detail in Section 3.5.

3.4 Site Acceleration and UBC Seismic Coefficients

Site Acceleration: Deterministic horizontal peak ground accelerations (PGA) from maximum probable earthquakes on regional faults have been estimated and are included in Table 1. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Accelerations also are dependent upon attenuation by rock and soil deposits, direction of rupture and type of fault; therefore, ground motions may vary considerably in the same general area.

We have used the computer program FRISKSP (Blake, 2000) to provide a probabilistic estimate of the site PGA using the attenuation relationship of Boore, Joyner, and Fumal NEHRP D 250 (1997). The PGA estimate for the project site having a 10% probability of being exceeded in 50 years (return period of 475 years) is **0.79g.**

CBC Seismic Response Coefficients: The CBC seismic response coefficients are calculated from the near-source factors for Seismic Zone 4. The near-source factors are based on the distance from the fault and the seismic source type. The following table lists seismic and site coefficients (near source factors) determined by Chapter 16 of the 2001 CBC. ***This site lies approximately 4.5 km from a Type B fault and overlies S_D (stiff) soil.***

CBC Seismic Coefficients for Chapter 16 Seismic Provisions

CBC Code Edition	Soil Profile Type	Seismic Source Type	Distance to Critical Source	Near Source Factors		Seismic Coefficients	
				Na	Nv	Ca	Cv
2001	S_D (stiff soil)	B	4.5 km	1.05	1.27	0.46	0.81
Ref. Table	16-J	16-U	---	16-S	16-T	16-Q	16-R

3.5 Subsurface Soil

Subsurface soils encountered during the field exploration conducted on June 14 and 15, 2006 consist of dominantly stiff to very stiff clay and silty clay to a depth of 16 to 17 feet. Medium dense to dense silty sands and sands extend from 16 feet to 34 feet. Interbedded layers of stiff to very stiff silty clays/clays and clayey silts/silts extend from 32 to 50 feet, the maximum depth of exploration. The subsurface logs (Plates B-1 through B-32) depict the stratigraphic relationships of the various soil types.

The native surface clays exhibit high swell potential (Expansion Index, EI = 120) when tested according to Uniform Building Code Standard 18-2 methods and moderate to high swell potential (Expansion Index, EI = 70 to 130) when correlated to Plasticity Index tests (ASTM D4318) performed on the native clays. The clay is expansive when wetted and can shrink with moisture loss (drying). Development of building foundations, concrete flatwork, and asphaltic concrete pavements should include provisions for mitigating potential swelling forces and reduction in soil strength, which can occur from saturation of the soil. Causes for soil saturation include landscape irrigation, broken utility lines, or capillary rise in moisture upon sealing the ground surface to evaporation. Moisture losses can occur with lack of landscape watering, close proximity of structures to downslopes and root system moisture extraction from deep rooted shrubs and trees placed near the foundations.

Typical measures used for commercial/industrial projects to remediate expansive soil include:

- moisture conditioning subgrade soils to a minimum of 5% above optimum moisture (ASTM D1557) for the full range in depth of surface soils.
- capping silt/clay soil with a non-expansive sand layer of sufficient thickness to reduce the effects of soil shrink/swell,
- treatment of silt/clay with lime to mitigate the shrink/swell forces of the clay soils when sulfate content of the soils is generally less than 7,500 ppm,
- design of foundations that are resistant to shrink/swell forces of silt/clay soil.

3.6 Groundwater

Two (2) inch diameter piezometers were installed in Borings B-12 and B-15 to a depth of 20 feet at the project site. Groundwater was encountered in the piezometers at a depth of 8.4 and 9.5 feet on June 21, 2006, 7 days after placement of the piezometers. However, since the first 16 feet of native soils are clays we are not expected to encounter groundwater within this layer. We expect an increase in the groundwater level only if the sand layer encountered between 16 to 34 feet is penetrated. There is uncertainty in the accuracy of short-term water level measurements, particularly in fine-grained soil. Groundwater levels may fluctuate with precipitation, irrigation of adjacent properties, drainage, and site grading. The referenced groundwater level should not be interpreted to represent an accurate or permanent condition.

3.7 Liquefaction

Liquefaction occurs when granular soil below the water table is subjected to vibratory motions, such as produced by earthquakes. With strong ground shaking, an increase in pore water pressure develops as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations.

Four conditions are generally required for liquefaction to occur:

(1) the soil must be saturated (relatively shallow groundwater);
(2) the soil must be loosely packed (low to medium relative density);
(3) the soil must be relatively cohesionless (not clayey); and
(4) groundshaking of sufficient intensity must occur to function as a trigger mechanism.

All of these conditions exist to some degree at this site.

Methods of Analysis: Liquefaction potential at the project site was evaluated using the 1997 NCEER Liquefaction Workshop methods which utilize direct SPT blow counts or CPT cone readings from site exploration and earthquake magnitude/PGA estimates from the seismic hazard analysis. The resistance to liquefaction is plotted on a chart of cyclic shear stress ratio (CSR) versus a corrected blow count $N_{1(60)}$ or Qc_{1N}. ***A ground acceleration of 0.79g was used in the analysis with an 8.4-foot groundwater depth.***

Liquefaction induced settlements have been estimated using the 1987 Tokimatsu and Seed method. Fines content of liquefiable sands and silt increase the liquefaction resistance in that more cycles of ground motions are required to fully develop pore pressures. The CPT tip pressures (Qc) were adjusted to an equivalent clean sand pressure (Q_{C1Ncs}). The adjusted tip pressures were converted to equivalent clean sand blow counts ($N_{1(60)cs}$) prior to calculating settlements. A computed factor of safety less than 1.0 indicates a liquefiable condition.

The soil encountered at the points of exploration included saturated silts and silty sands that could liquefy during a CBC Design Basis Earthquake (7M – 0.79g) for a 10% risk in 50 years. Liquefaction can occur within isolated sandy and silty layers (1 to 5 feet thick) between depths of 16 to 50 feet. The likely triggering mechanism for liquefaction appears to be strong groundshaking associated with the rupture of the Imperial Fault and the Superstition Hills Fault.

SUMMARY OF LIQUEFACTION ANALYSES

Boring Location	Depth To First Liquefiable Zone (ft)	Potential Induced Settlement (in)
CPT-1	17	2½
CPT-2	17	2½
CPT-3	17	2¼
CPT-4	16	2¾
CPT-5	17	1¼
CPT-6	17	2
CPT-7	17	1¾
B-10	17.5	2
B-11	25	2½
B-12	20	1
B-13	25	1
B-14	17.5	1
B-15	25	2¾
B-17	20	2¾

<u>Liquefaction Effects:</u> Based on empirical relationships, total induced settlements are estimated to be about 1 to 2¾ inches should liquefaction occur. The minimum differential settlement could be estimated to be on the order of one-half of the total settlement be used in the design. Based on research from Ishihara (1985) and Youd and Garris (1995) ground rupture or sand boil formation is unlikely because of the thickness of the overlying unliquefiable soil.

Because of the depth of the liquefiable layer, wide area subsidence from soil overburden would be the expected effect of liquefaction rather than bearing capacity failure of the proposed structures. The relatively high fines content (>30%) within the potentially liquefiable layer will probably reduce pore water movement significantly, thereby stalling development of a "quick" soil condition.

Since the potentially liquefiable sandy soil are overlain by 16 feet of non-liquefying soil which resist groundwater movement, it is unlikely that the light structure loads planned are sufficient to result in liquefaction induced settlement greater than the surrounding land mass.

Mitigation: Means to mitigate liquefaction movement include either ground improvement techniques or a deep foundation system, rigid mat foundations and grade-beam reinforced foundations that can withstand some differential movement or tilting, but may not protect fracturing of buried utilities.

If the differential settlement caused by liquefaction is considered excessive for plant equipment tolerances, the designer may consider the following ground improvements or foundation designs to mitigate the liquefaction induced settlement.

1) Soil mixing to 20 feet (soil-cement)
2) Geopiers or stone columns to 20 feet
3) Deep foundations that are founded into non-liquefying soils;
4) Foundations that use grade-beam footings to tie floor slabs and isolated columns to continuous footings (conventional or post-tensioned).
5) Structural flat-plate mats, either conventionally reinforced or tied with post-tensioned tendons.

These alternatives reduce the potential effects of liquefaction-induced settlements by making the structures more able to withstand differential settlement. The structural engineer is directed to CDMG Special Publication 117 for design on liquefiable sites.

Section 4
RECOMMENDATIONS

4.1 Site Preparation

Clearing and Grubbing: All surface improvements, debris or vegetation including grass, trees, and weeds on the site at the time of construction should be removed from the construction area. Root balls should be completely excavated. Organic strippings should be hauled from the site and not used as fill. **Any trash, construction debris, and buried obstructions such as subsurface tile drainage pipelines exposed during rough grading should be traced to the limits of the foreign material by the grading contractor and removed under our supervision.** Any excavations resulting from site clearing should be dish-shaped to the lowest depth of disturbance and backfilled under the observation of the geotechnical engineer's representative.

Building Pad Preparation: After removal the existing piles of soil and soil-cement mixture, the existing surface soil within building pad areas should be removed to 36 inches below the building pad elevation or existing grade (whichever is lower) extending five feet beyond all exterior wall/column lines (including adjacent concreted areas). Exposed subgrade should be scarified to a depth of 8 inches, uniformly moisture conditioned to 5 to 10% above optimum moisture content and recompacted to 85 to 90% of the maximum density determined in accordance with ASTM D1557 methods. Prior to over-excavation of the surface soil, deep moisture penetration may be achieved by bordering the site and applying multiple floodings to allow water to permeate to a minimum depth of 3.5 feet (20% minimum moisture content) below existing natural surface.

The native soil is suitable for use as engineered fill provided it is free from concentrations of organic matter or other deleterious material. The fill soil should be uniformly moisture conditioned by discing and watering to the limits specified above, placed in maximum 8-inch lifts (loose), and compacted to the limits specified above. Clay soil should not be compacted greater than 90% relative compaction because highly compacted soil will result in increased swelling.

If foundation designs are to be utilized which do not include provisions for expansive soil, an engineered building support pad consisting of 3.0 feet of granular soil or lime treated soil, placed in maximum 8-inch lifts (loose), compacted to a minimum of 90% of ASTM D1557 maximum density at 2% below to 4% above optimum moisture, should be placed below the bottom of the slab. Lime content in soil (if used) shall be established by the Eads-Grim Method with a resulting maximum Expansion Index of 15 after lime addition.

Imported fill soil (for foundations designed for expansive soil conditions) should have a Plasticity Index less than 25 and sulfates (SO_4) less than 2,000 ppm. For foundations designed for expansive soil conditions, non-expansive, granular soil meeting the USCS classifications of SM, SP-SM, or SW-SM with a maximum rock size of 3 inches and 5 to 35% passing the No. 200 sieve shall be used. The geotechnical engineer should approve imported fill soil sources before hauling material to the site. Imported granular fill should be placed in lifts no greater than 8 inches in loose thickness and compacted to a minimum of 90% of ASTM D1557 maximum dry density at optimum moisture ±2%.

In areas other than the building pad which are to receive area concrete slabs, the ground surface should be presaturated to a minimum depth of 36 inches and then scarified to 8 inches, moisture conditioned to a minimum of 5% over optimum, and recompacted to 83-87% of ASTM D1557 maximum density just prior to concrete placement.

Trench Backfill: Trench backfill should conform to San Diego Regional Standard Drawing S-4, using either Type A, B or C backfill.

Type A backfill for HDPE pipe consists of a 4 to 6 inch bed of ¾-inch crushed rock below the pipe and pipezone backfill (to 12" above top of pipe) that consists of crusher fines (sand). Sewer pipes (SDR-35), water mains, and stormdrain pipes of other that HDPE pipe may use crusher fines for bedding. The crusher fines shall be compaction to a minimum of 90% of ASTM D1557 maximum density. Pipe deflection should be checked to not exceed 2% of pipe diameter. Native clay/silt soils may be used to backfill the remainder of the trench. Clays shall be compacted to a minimum of 85% of ASTM D1557 maximum density and silts shall be compacted to a minimum of 87% of ASTM D1557 maximum density, except that the top 12 inches of the trench shall be compacted to at least 90% of ASTM D1557 maximum density.

Type B backfill for HDPE pipe requires 6 inches of ¾-inch crushed rock as bedding and to springline of the pipe. Thereafter, sand/cement slurry (3 sack cement factor) should be used to 12 inches above the top of the pipe. Native clay and silt soils may be used in the remainder of the trench backfill as specified above.

Type C backfill for HDPE pipe shall consist of a geotextile filter fabric encapsulating ¾-inch crushed rock. The crushed rock thickness shall be 6 inches below and to the sides of the pipe and shall extend to 12 inches above the top of the pipe. The filter fabric shall cover the trench bottom, sidewalls and over the top of the crushed rock. Native clay and silt soils may be used in the remainder of the trench backfill as specified above. **Type C backfill must be used in wet soils and below groundwater for all buried utility pipelines unless dewatered to at least 12 inches below the trench bottom prior to excavation. Type A backfill may be used in the case of a dewatered trench condition.**

On-site soil free of debris, vegetation, and other deleterious matter may be suitable for use as utility trench backfill above pipezone, but may be difficult to uniformly maintain at specified moistures and compact to the specified densities. Native backfill should only be placed and compacted after encapsulating buried pipes with suitable bedding and pipe envelope material.

Imported granular material is acceptable for backfill of utility trenches. Granular trench backfill used in building pad areas should be plugged with a solid (no clods or voids) 2-foot width of native clay soils at each end of the building foundation to prevent landscape water migration into the trench below the building.

Backfill soil within paved areas should be placed in layers not more that 6 inches in thickness and mechanically compacted to a minimum of 87% of the ASTM D1557 maximum dry density except for the top 12 inches of the trench which shall be compacted to at least 90%.

Moisture Control and Drainage: The moisture condition of the building pad should be maintained during trenching and utility installation until concrete is placed or should be rewetted before initiating delayed construction. If soil drying is noted, a 2 to 3 inch depth of water may be used in the bottom of footings to restore footing subgrade moisture and reduce potential edge lift.

Adequate site drainage is essential to future performance of the project. Infiltration of excess irrigation water and stormwaters can adversely affect the performance of the subsurface soil at the site. Positive drainage should be maintained away from all structures to prevent ponding and subsequent saturation of the native clay soil. If landscape irrigation is allowed next to the building, drip irrigation systems or lined planter boxes should be used. The subgrade soil should be maintained in a moist, but not saturated state, and not allowed to dry out. Drainage should be maintained without ponding.

Observation and Density Testing: All site preparation and fill placement should be continuously observed and tested by a representative of a qualified geotechnical engineering firm. Full-time observation services during the excavation and scarification process is necessary to detect undesirable materials or conditions and soft areas that may be encountered in the construction area. The geotechnical firm that provides observation and testing during construction shall assume the responsibility of "*geotechnical engineer of record*" and, as such, shall perform additional tests and investigation as necessary to satisfy themselves as to the site conditions and the recommendations for site development.

Auxiliary Structures Foundation Preparation: Auxiliary structures such as free standing or retaining walls should have the existing soil beneath the structure foundation prepared in the manner recommended for the building pad except the preparation needed only to extend 18 inches below and beyond the footing.

4.2 Spread Foundations and Settlements

Shallow spread footings and continuous wall footings are suitable to support the structures associates with the building for offices, warehouses, cooling towers, etc. Footings shall be founded on a layer of properly prepared and compacted soil as described in Section 4.1. The foundations may be designed using an allowable soil bearing pressure of 1,500 psf for compacted native clay soil and 2,000 psf when foundations are supported on imported sands (extending a minimum of 1.0 feet below footings). The allowable soil pressure may be increased by 20% for each foot of embedment depth in excess of 18 inches and by one-third for short term loads induced by winds or seismic events. The maximum allowable soil pressure at increased embedment depths shall not exceed 3,000 psf.

As an alternative to shallow spread foundations, flat plate structural mats or grade-beam reinforced foundations may be used to mitigate liquefaction related movement.

<u>Flat Plate Structural Mats</u>: Flat plate structural mats may be used to mitigate expansive soils at the project site. The structural mat shall have a double mat of steel (minimum No. 4's @ 16" O.C. each way – top and bottom) and a minimum thickness of 12 inches. Mat edges shall have a minimum edge footing of 12 inches width and 18 inches depth (below the building pad surface). Mats may be designed by UBC Section 1815 (Div. III) methods using an Effective Plasticity Index of 28.

Structural mats may be designed for a modulus of subgrade reaction (Ks) of 100 pci when placed on compacted clay or a subgrade modulus of 300 pci when placed on 3.0 feet of granular fill. Mats shall overlay 2 inches of sand and a 10-mil polyethylene vapor retarder. The building support pad shall be moisture conditioned and recompacted as specified in Section 4.1 of this report.

<u>Grade-beam Reinforced Foundations</u>: Specific soil data for structures with grade-beam reinforced foundations placed on the native clays (without removal of the surface clay or a minimum of 3.0 feet of underlying granular fill) are presented below in accordance with the design method given in CBC Chapter 18 (2001) - Division III, Section 1815:

- Weighted Plasticity Index (PI) = 35
- Slope Coefficient (C_s) = 1.0
- Strength Coefficient (C_o) = 0.8
- Climatic Rating (C_w) = 15
- Effective PI = 28
- 1-C Value = 0.14
- Maximum Grade-beam Spacing = 18 feet

Post-tensioned Slabs: If post-tensioned slabs are considered for this project, the following soil criteria shall be used in the Post Tensioning Institute (PTI) designs:

Edge Moisture Variation Distance, e_m	Center Lift: 5.3 ft. Edge Lift: 2.6 ft.
Depth to Constant Suction:	5.0 ft.
Constant Suction (pF):	3.6
Differential Swell, y_m	Center Lift: 3.12 in. Edge Lift: 0.55 in.
Moisture Velocity	0.6 inches/month
Estimated Differential Settlement (swell):	1.0 in.
Bearing Capacity:	1,500 psf
Maximum Slab Deflection	1.0 in

Clamping devices and end anchors for post-tensioned tendons are susceptible to corrosion from aggressive soil and landscape water conditions. Therefore, a minimum concrete cover of 3.0 inches, a PVC end cap and epoxy coatings should be specified for the tendon ends with a positive bonding agent used with polymer modified cementitious material to patch the recessed anchor cup. A complete encapsulation system intended for corrosive environments is a suggested protection method for post-tensioning cables and anchoring/clamping devices.

All exterior foundations should be embedded a minimum of 18 inches below the building support pad or lowest adjacent final grade, whichever is deeper. Interior footings (bearing) should be a minimum of 12 inches deep. Continuous wall footings should have a minimum width of 12 inches. Spread footings should have a minimum width of 24 inches and should not be structurally isolated.

Recommended concrete reinforcement and sizing for all footings should be provided by the structural engineer.

Resistance to horizontal loads will be developed by passive earth pressure on the sides of footings and frictional resistance developed along the bases of footings and concrete slabs. Passive resistance to lateral earth pressure may be calculated using an equivalent fluid pressure of 250 pcf (300 pcf for sands) to resist lateral loadings. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.25 (0.35 for sands) may also be used at the base of the footings to resist lateral loading.

Foundation movement under the estimated static (non-seismic) loadings and static site conditions are estimated to not exceed 1.0 inch with differential movement of about two-thirds of total movement for the loading assumptions stated above when the subgrade preparation guidelines given above are followed. Seismically induced liquefaction settlement may be on the order of 1 to 2¾ inches.

Settlement estimates developed for spread footings embedded a minimum of 2.0 feet into native soils and loaded to 2,000 psf follow:

Size of Footing (ft.)		
2 x 2	**5 x 5**	**10 x 10**
0.30 in	0.70 in	1.20 in

4.3 Slabs-On-Grade

Concrete slabs and flatwork placed over native clay soil should be designed in accordance with Chapter 18, Division III of the 2001 CBC (using an Effective Plasticity Index of 28) and shall be a minimum of 5 inches thick due to expansive soil conditions. Concrete floor slabs shall be monolithically placed with the foundations unless placed on 3.0 feet of granular fill or lime treated soil. The concrete slabs should be underlain by a minimum of 4 inches of clean sand (Sand Equivalent SE>30) or aggregate base or may be placed directly on the 3.0-foot thick granular fill pad (if used) that has been moistened to approximately optimum moisture just before the concrete placement. A 10-mil polyethylene vapor retarder, properly lapped and sealed with a 2-inch sand cover and extended a minimum of 12 inches into the footing, should be placed as a capillary break to inhibit moisture migration into the slab section. Concrete slabs may be placed directly over a 15-mil vapor retarder if desired (Stego-Wrap or equivalent).

Concrete slab and flatwork reinforcement should consist of chaired rebar slab reinforcement (minimum of No. 3 bars at 18-inch centers, both horizontal directions) placed at slab mid-height to resist potential swell forces and cracking. Slab thickness and steel reinforcement are minimums only and should be verified by the structural engineer/designer knowing the actual project loadings. All steel components of the foundation system should be protected from corrosion by maintaining a 3-inch minimum concrete cover of densely consolidated concrete at footings (by use of a vibrator).

The construction joint between the foundation and any mowstrips/sidewalks placed adjacent to foundations should be sealed with a polyurethane based non-hardening sealant to prevent moisture migration between the joint. Epoxy coated embedded steel components or permanent waterproofing membranes placed at the exterior footing sidewall may also be used to mitigate the corrosion potential of concrete placed in contact with native soil.

Control joints should be provided in all concrete slabs-on-grade at a maximum spacing (in feet) of 2 to 3 times the slab thickness (in inches) as recommended by American Concrete Institute (ACI) guidelines. All joints should form approximately square patterns to reduce randomly oriented contraction cracks. Contraction joints in the slabs should be tooled at the time of the pour or sawcut (¼ of slab depth) within 6 to 8 hours of concrete placement.

Construction (cold) joints in foundations and area flatwork should either be thickened butt-joints with dowels or a thickened keyed-joint designed to resist vertical deflection at the joint. All joints in flatwork should be sealed to prevent moisture, vermin, or foreign material intrusion. Precautions should be taken to prevent curling of slabs in this arid desert region (refer to ACI guidelines).

All independent flatwork (sidewalks, housekeeping slabs) should be placed on a minimum of 2 inches of concrete sand or aggregate base, dowelled to the perimeter foundations where adjacent to the building and sloped 2% or more away from the building. A minimum of 24 inches of moisture conditioned (20% moisture content) and 8 inches of compacted subgrade (83 to 87%) and a 10-mil (minimum) polyethylene separation sheet should underlie the flatwork. All flatwork should be jointed in square patterns and at irregularities in shape at a maximum spacing of 10 feet or the least width of the sidewalk.

4.4 Deep Foundations

In order to reduce settlement to accepted limits, existing soft, compressible ground may be improved by soil improvement (soil mixing with cement, stone columns, geopiers, etc) or by placement a deep foundation system like drilled piers.

A. Soil-Cement Mixing

A technique to improve soft and compressible ground condition is through mixing of the subsurface soil with cement. Soil-cement mixing is accomplished by augering 36 to 48-inch diameter holes to a depth of about 20 feet below ground surface and mixing the soil with cement creating a soil-cement column. The deep soil mixing serves to reduce settlement by replacing the compressible clay soils below the structures with very stiff soil-cement columns, creating a stiffer composite soil matrix.

Soil-cement design should be provided by a licensed specialty contractor. Specialty contractor should also provide allowable soil bearing capacity and associated settlement.

B. Stone Columns

Stone columns consisting of gravel stones that are placed in underground columns by a vibro-replacement method are effective in mitigating the settlement hazard related to highly compressible soil layers. They have been used frequently in Southern California.

For preliminary design purposes, the stone columns should be extended to a dense, non-compressible layer, spaced on approximately 6-foot on centers, and have an effective diameter of approximately 30-36 inches. The vibro-replacement method densifies the soil around the column. Settlement potential of the soil is greatly reduced by densification, drainage, and increased stiffness of the soil within the treated area. The stone columns should extend to a depth determined by engineering design based on settlement risks, but should, as a minimum, be founded at depths greater than 20 feet.

A 24-inch thick aggregate base layer should overlie the stone column treated area beneath the foundation to act as a drainage layer and to spread transmitted loads to the stone columns.

The above data for stone columns is presented as preliminary information only. A specialty contractor should be consulted for the actual design and construction of stone columns. Specialty contract should also provide allowable soil bearing capacity and associated settlement.

All of the stone column installation operations should be conducted under the observation of the geotechnical engineer's representative.

C. Geopiers

Another technique to improve soft and compressible ground condition is through placement of geopiers. Geopiers are constructed by augering 30 to 36-inch diameter holes to depths of about 8 to 20 feet below the base of the footings and backfilling the holes with thin lifts of compacted aggregates. Compaction densifies the aggregate and increases lateral stress in the soil matrix. The system serves to reduce settlement by replacing the compressible clay soils below the structures with very stiff aggregate piers, creating a stiffer composite soil matrix.

Geopier design should be provided by a licensed specialty contractor. Specialty contractor should also provide allowable soil bearing capacity and associated settlement. One demonstration pier should be installed with the contractor's standard procedures and then load –tested to determine the soil modulus. The load testing setup and procedures should be selected by the geopier contractor and submitted for review to the project geotechnical engineer. The demonstration pier should be installed at the foundation grade level.

All of the Geopier element installation operations should be conducted under the observation of the geotechnical engineer's representative.

D. Drilled Piers

Recommendations for 24 and 48 inch diameter cast-in place drilled piers are provided below.

Vertical Capacity: Vertical capacity for 24 and 48 inch diameter shafts are presented in Figure 2. Capacities for other shaft sizes can be determined in direct proportion to shaft diameters. End bearing and skin friction parameters have been used to determine the allowable shaft capacity. The allowable capacities include a factor of safety of 2.0. The allowable vertical compression capacities may be increased by 33 percent to accommodate temporary loads such as from wind or seismic forces. The allowable vertical shaft capacities are based on the supporting capacity of the soil. The structural capacity of the piers should be verified by the structural engineer.

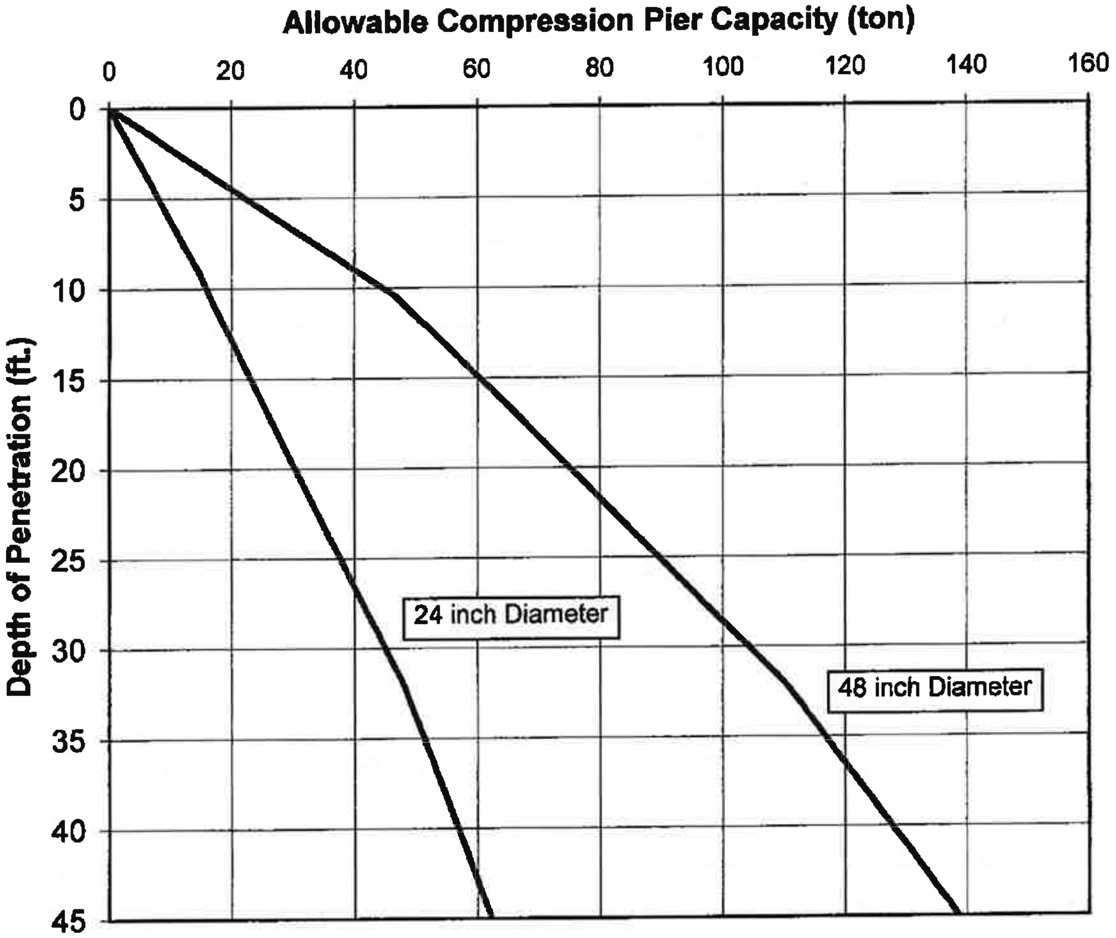
Lateral Capacity: The allowable lateral capacity for 24 and 48 inch diameter shafts are given in the table shown below. The allowable horizontal deflection at the shaft head has been assumed to be one-half inch (0.50 inch).

Lateral Pier Capacities

Shaft Diameter (in.)	24		48	
Head Condition	Free	Fixed	Free	Fixed
Allowable Head Deflection (in.)	0.5	0.5	0.5	0.5
Length (ft.)	**15**	**15**	**15**	**15**
Lateral Capacity (kips)	21.5	50.5	33.0	145
Maximum Moment (foot-kips)	73.5	328	108	1366
@Depth from Pier Head (ft.)	6	0	6	0
Length (ft.)	**25**	**25**	**25**	**25**
Lateral Capacity (kips)	29	61	76	205
Maximum Moment (foot-kips)	127.5	352	507	2192
@Depth from Pier Head (ft.)	8.4	0	12.5	0
Length (ft.)	**35**	**35**	**35**	**35**
Lateral Capacity (kips)	30.5	63	91	222
Maximum Moment (foot-kips)	132.5	355.5	716	2208
@Depth from Pier Head (ft.)	8.6	0	12.8	0

Uplift Capacity: Pier capacity in tension should be taken as 50% of the compression capacity.

Installation: The drilled pier shall be placed in conformance to ACI 336 guidelines. Excavation for piers should be inspected by the geotechnical consultant. The bottom of the excavation for piers should be reasonably free of loose or slough material. A tremie pipe should be used to pour concrete from the bottom up and to ensure less than five feet of free fall. The drilled piers should be cased if groundwater is encountered due the presence of saturated medium dense to very dense sandy soils at a depth below 16 feet.



Notes:

1. Compression load capacity are based on skin friction and end-bearing capacity. The structural capacity of the piers should be checked.
2. The indicated capacities are for sustained (dead plus live) vertical compression load, and include a factor of safety of at least 2.0.
3. For temporary wind or seismic load, the above values may be increased by one-third.
4. For sustained tension loads, use 50% of compression capacities plus dead load of the drilled pier.
5. Capacities of other pier sizes are in direct proportion to the pile diameter.

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Drilled Pier Compression Capacity Chart
Pacific Ethanol Plant
Calipatria, CA

Figure
2

4.5 Tank Foundations and Settlements

Site Preparation and Grading: The existing soils underlying the steel tanks should be removed to a depth of 36 inches below ground surface extending to a minimum of 5 feet beyond the perimeter of the tanks. The native soil at the subexcavation and footing excavation level should be compacted to 85 - 90 % of ASTM D1557 maximum density for a minimum depth of 8 inches. The area should then be brought to finish grade with engineered fill consisting of the following components:

- 24 inches of crushed aggregate base
- 8 inches of crushed rock
- 4 inches of oiled sand

As a minimum, a steel ring should be placed to contain the crushed rock subgrade below the tank. The rock fill should be placed to the top of the ring wall. The fill may be crowned about 2.5 inches to allow for differential movement between the tank perimeter and center.

The engineered fill should be placed in 8-inch maximum loose lifts and compacted to a minimum 90% of ASTM D1557 maximum density within 2% of optimum moisture. The crushed rock tank underlayment should meet the gradation requirements of ASTM C33, size 57 (1" x No. 4 rock). The proposed source of engineered fill and rock should be submitted to the geotechnical engineer for review and testing to verify conformance to these requirements.

Tank Foundations: Flexible steel tanks, which can withstand large settlements, generally require minimal foundations, allowing settlement to occur and using flexible connections to inlet/outlet piping. The tanks should have a perimeter ring wall foundation which supports the tank wall and roof.

The interior footings and the ringwall may be proportioned for a net load of 1,500 to 2,000 psf for dead load of roof weight (plus sustained live load) excluding the weight of the ethanol. This soil pressure can be increased by one third for transient and seismic loads. The minimum depth of the ring wall footing should be 18 inches below the finished ground surface. The minimum footing width should be 12 inches.

Estimated Tank Settlements: The subsurface clays are saturated and overconsolidated in their natural state. Imposed foundations loads can consolidate the soils by reducing the void ratio through pore water expulsion. The amount of vertical settlement that occurs as a result of soil compression varies with applied loads, foundation shape and width.

Moderately loaded structures, such as the flexible steel tanks which can withstand large settlements, will generally require minimal foundations, allowing settlement to occur and using flexible connections to inlet/outlet utility lines. The silts and clays will consolidate fairly slowly because of their low permeability. Flexible connections such a "Flex-Tend" expansion joints should be used to connect exterior piping with the tank. The tank should be preloaded and monitored for settlement prior to making piping connections. It may be necessary to readjust piping connections after the loading sequence.

Estimated settlements were calculated using the consolidation and field data test data for the silt and clay strata and Schmertman's analysis for the granular strata using the CPT engineering properties correlations. The soils to a depth of the diameter of the tanks (50 to 100 feet) may be significantly stressed so as to contribute to the overall settlement. The estimated settlements for different tanks heights and diameters are provided in the table below:

Estimated Center Settlements

Height, ft	**Diameter, ft**		
	50	75	100
20	3.50	4.30	4.90
24	3.70	4.50	5.10
28	3.90	4.80	5.40
32	4.10	5.00	5.60
36	4.30	5.40	6.30

The estimated settlements for the tanks are approximately 3.50 to 6.30 inches in the center of the tanks and about 1.90 to 3.10 inches at the edge of the tanks (depends on tank dimensions). Since the settlement is deep seated, little is gained by further excavation and replacement of compacted granular fill to reduce settlements.

4.6 Concrete Mixes and Corrosivity

Selected chemical analyses for corrosivity were conducted on bulk samples of the near surface soil from the project site (Plates C-9 and C-10). The native soils were found to have low to severe levels of sulfate ion concentration (928 to 6,094 ppm). Sulfate ions in high concentrations can attack the cementitious material in concrete, causing weakening of the cement matrix and eventual deterioration by raveling. The California Building Code recommends that increased quantities of Type II Portland Cement be used at a low water/cement ratio when concrete is subjected to moderate sulfate concentrations. Type V Portland Cement and/or Type II/V cement with 25% flyash replacement is recommended when the concrete is subjected to soil with severe sulfate concentration.

A minimum of 6.25 sacks per cubic yard of concrete (4,500 psi) of Type V Portland Cement with a maximum water/cement ratio of 0.45 (by weight) should be used for concrete placed in contact with native soil on this project (sitework including sidewalks, driveways, and foundations). Admixtures may be required to allow placement of this low water/cement ratio concrete.

The native soil has a very severe level of chloride ion concentration (2,920 to 4,060 ppm). Chloride ions can cause corrosion of reinforcing steel, anchor bolts and other buried metallic conduits. Resistivity determinations on the soil indicate very severe potential for metal loss because of electrochemical corrosion processes. Mitigation of the corrosion of steel can be achieved by using steel pipes coated with epoxy corrosion inhibitors, asphaltic and epoxy coatings, cathodic protection or by encapsulating the portion of the pipe lying above groundwater with a minimum of 3 inches of densely consolidated concrete. ***No metallic pipes or conduits should be placed below foundations.***

Foundation designs shall provide a minimum concrete cover of three (3) inches around steel reinforcing or embedded components (anchor bolts, etc.) exposed to native soil or landscape water (to 18 inches above grade). If the 3-inch concrete edge distance cannot be achieved, all embedded steel components (anchor bolts, etc.) shall be epoxy dipped for corrosion protection or a corrosion inhibitor and a permanent waterproofing membrane shall be placed along the exterior face of the exterior footings. Additionally, the concrete should be thoroughly vibrated at footings during placement to decrease the permeability of the concrete.

4.7 Excavations

All site excavations should conform to CalOSHA requirements for Type B soil. The contractor is solely responsible for the safety of workers entering trenches. Temporary excavations with depths of 4 feet or less may be cut nearly vertical for short duration. Excavations deeper than 4 feet will require shoring or slope inclinations in conformance to CAL/OSHA regulations for Type B soil. Surcharge loads of stockpiled soil or construction materials should be set back from the top of the slope a minimum distance equal to the height of the slope. All permanent slopes should not be steeper than 3:1 to reduce wind and rain erosion. Protected slopes with ground cover may be as steep as 2:1. However, maintenance with motorized equipment may not be possible at this inclination.

4.8 Lateral Earth Pressures

Earth retaining structures, such as retaining walls, should be designed to resist the soil pressure imposed by the retained soil mass. Walls with granular drained backfill may be designed for an assumed static earth pressure equivalent to that exerted by a fluid weighing 55 pcf for unrestrained (active) conditions (able to rotate 0.1% of wall height), and 70 pcf for restrained (at-rest) conditions. These values should be verified at the actual wall locations during construction.

When applicable (walls retaining more than 6 feet of earth) seismic earth pressure on walls may be assumed to exert a uniform pressure distribution of 7.5H psf against the back of the wall, where H is the height of the backfill. The total seismic load is assumed to act as a point load at 0.6H above the base of the wall.

Surcharge loads should be considered if loads are applied within a zone between the face of the wall and a plane projected behind the wall 45 degrees upward from the base of the wall. The increase in lateral earth pressure acting uniformly against the back of the wall should be taken as 50% of the surcharge load within this zone. Areas of the retaining wall subjected to traffic loads should be designed for a uniform surcharge load equivalent to two feet of native soil.

Walls should be provided with backdrains to reduce the potential for the buildup of hydrostatic pressure. The drainage system should consist of a composite HDPE drainage panel or a 2-foot wide zone of free draining crushed rock placed adjacent to the wall and extending 2/3 the height of the wall. The gravel should be completely enclosed in an approved filter fabric to separate the gravel and backfill soil. A perforated pipe should be placed perforations down at the base of the permeable material at least six inches below finished floor elevations. The pipe should be sloped to drain to an appropriate outlet that is protected against erosion. Walls should be properly waterproofed. The project geotechnical engineer should approve any alternative drain system.

4.9 Seismic Design

This site is located in the seismically active southern California area and the site structures are subject to strong ground shaking due to potential fault movements along the San Andreas Fault. Engineered design and earthquake-resistant construction are the common solutions to increase safety and development of seismic areas. Designs should comply with the latest edition of the CBC for Seismic Zone 4 using the seismic coefficients given in Section 3.4 of this report. ***This site lies approximately 4.5 km from a Type B fault and overlies*** S_D ***(stiff) soil.***

4.10 Pavements

Pavements should be designed according to CALTRANS or other acceptable methods. Traffic indices were not provided by the project engineer or owner; therefore, we have provided structural sections for several traffic indices for comparative evaluation. The public agency or design engineer should decide the appropriate traffic index for the site. Maintenance of proper drainage is necessary to prolong the service life of the pavements. Based on the current State of California CALTRANS method, an estimated R-value of 5 for the subgrade soil and assumed traffic indices, the following table provides our estimates for asphaltic concrete (AC) pavement sections.

RECOMMENDED PAVEMENTS SECTIONS

R-Value of Subgrade Soil - 5 (estimated) Design Method - CALTRANS 1990

Traffic Index (assumed)	Flexible Pavements		(*) Flexible Pavements		Rigid (PCC) Pavements	
	Asphaltic Concrete Thickness (in.)	Aggregate Base Thickness (in.)	Asphaltic Concrete Thickness (in.)	Aggregate Base Thickness (in.)	Concrete Thickness (in.)	Aggregate Base Thickness (in.)
4.0	3.0	8.0	3.0	4.0	5.0	6.0
5.0	3.0	9.0	3.0	4.0	5.5	6.0
6.0	3.0	14.0	3.0	6.0	6.0	6.0
6.5	4.0	14.0	4.0	8.0	7.0	8.0
8.0	4.0	18.0	4.0	11.0	8.0	11.0
10.0	4.5	26.0	4.5	16.0	9.0	13.0
11.0	5.5	28.0	5.5	20.0	10.0	15.0

(*) Pavement structural section when used in conjunction with 9 inches of lime-treated subgrade soil (3-4% quicklime by weight) with minimum R-Value = 60 (Other pavements sections can be provided for varying depths of lime treatment).

Notes:

1) Asphaltic concrete shall be Caltrans, Type B, ¾ inch maximum (½ inch maximum for parking areas), medium grading, compacted to a minimum of 95% of the 75-blow Marshall density (ASTM D1559).
2) Aggregate base shall conform to Caltrans Class 2 (¾ in. maximum), compacted to a minimum of 95% of ASTM D1557 maximum dry density.
3) Place pavements on 12 inches of moisture conditioned (minimum 4% above optimum if clays) native clay soil compacted to a minimum of 90% (95% if sand subgrade) of the maximum dry density determined by ASTM D1557.
4) Portland cement concrete for pavements should have Type V cement, a minimum compressive strength of 4,500 psi at 28 days, and a maximum water-cement ratio of 0.45.
5) Typical Street Classifications (Imperial County)

Cul-de-Sacs:	TI = 5.0
Local Streets:	TI = 6.0
Minor Collectors:	TI = 6.5
Major Collectors:	TI = 8.0
Minor Arterial:	TI = 10.0
Primary Arterial:	TI = 11.0

4.11 Railroad Spur Line Subgrade Preparation:

Option No. 1:

The site preparation for the railroad spur line will consist of the removal of 1.5 feet of native soil (17.33 feet wide) along the spur route. The exposed subgrade soil will be scarified and compacted to a minimum of 90% of ASTM D1557 maximum density at a minimum of 4% above optimum moisture and a geotextile fabric placed over the subgrade as specified below.

Option No. 2:

If it is desired that an "above grade" ballast and sub-ballast be used, the surface 1.5 feet of native soil shall be removed to a width of 23.33 feet and recompacted to at least 90% (ASTM D1557) at a minimum of 4% above optimum moisture. A geotextile stabilization/separation fabric such as Mirafi "Geolon HP 370" or equivalent should be placed over the prepared native clay subgrade prior to placing sub-ballast.

An 18-inch layer of Caltrans Class 2 Aggregate Base (1½ inch grading) material shall be placed as sub-ballast and compacted in 6-inch lifts over the geotextile fabric. If placed above grade, the sub-ballast should be 23.33 feet wide and extend upward with 2:1 outer slopes to a top width of 17.33 feet wide. If no geotextile is used, an additional 6 inches of class 2 aggregate base should be used. The Class 2 base shall be moisture conditioned (± 2% of optimum moisture) and compacted to a minimum of 95% of ASTM D1557 maximum density.

After sub-ballast placement, a minimum of 8 inches of railroad ballast shall be placed below the railroad ties. The ballast shall be sloped no steeper than 3:1 giving a 13.33-foot wide surface to support the rail ties.

Section 5
LIMITATIONS AND ADDITIONAL SERVICES

5.1 Limitations

The recommendations and conclusions within this report are based on current information regarding the proposed Pacific Ethanol Plant located at the southeast corner of State Hwy 111 and Yocum Road south of Calipatria, California. The conclusions and recommendations of this report are invalid if:

- Structural loads change from those stated or the structures are relocated.
- The Additional Services section of this report is not followed.
- This report is used for adjacent or other property.
- Changes of grade or groundwater occur between the issuance of this report and construction other than those anticipated in this report.
- Any other change that materially alters the project from that proposed at the time this report was prepared.

Findings and recommendations in this report are based on selected points of field exploration, geologic literature, laboratory testing, and our understanding of the proposed project. Our analysis of data and recommendations presented herein are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil conditions can exist between and beyond the exploration points or groundwater elevations may change. If detected, these conditions may require additional studies, consultation, and possible design revisions.

This report contains information that may be useful in the preparation of contract specifications. However, the report is not worded is such a manner that we recommend its use as a construction specification document without proper modification. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

This report was prepared according to the generally accepted *geotechnical engineering standards of practice* that existed in Imperial County at the time the report was prepared. No express or implied warranties are made in connection with our services. This report should be considered invalid for periods after two years from the report date without a review of the validity of the findings and recommendations by our firm, because of potential changes in the Geotechnical Engineering Standards of Practice.

The client has responsibility to see that all parties to the project including, designer, contractor, and subcontractor are made aware of this entire report. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

5.2 Additional Services

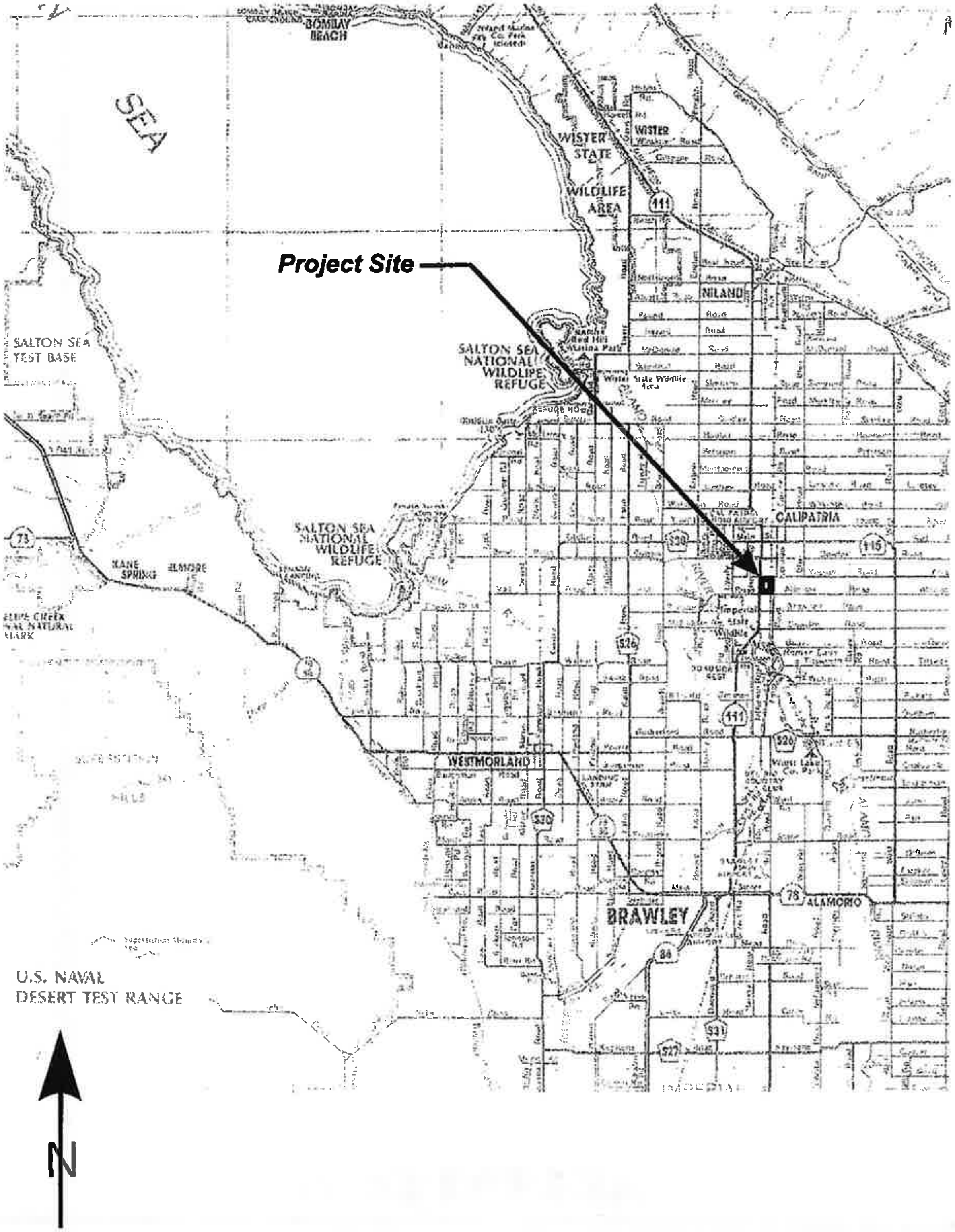
We recommend that Landmark Consultants, Inc. be retained as the geotechnical consultant to provide the tests and observations services during construction. If Landmark Consultants does not provide such services then *the geotechnical engineering firm providing such tests and observations shall become the geotechnical engineer of record and assume responsibility for the project.*

The recommendations presented in this report are based on the assumption that:

- Consultation during development of design and construction documents to check that the geotechnical recommendations are appropriate for the proposed project and that the geotechnical recommendations are properly interpreted and incorporated into the documents.
- Landmark Consultants will have the opportunity to review and comment on the plans and specifications for the project prior to the issuance of such for bidding.
- Continuous observation, inspection, and testing by the geotechnical consultant of record during site clearing, grading, excavation, placement of fills, building pad and subgrade preparation, and backfilling of utility trenches.
- Observation of foundation excavations and reinforcing steel before concrete placement.
- Other consultation as necessary during design and construction.

We emphasize our review of the project plans and specifications to check for compatibility with our recommendations and conclusions. Additional information concerning the scope and cost of these services can be obtained from our office.

APPENDIX A



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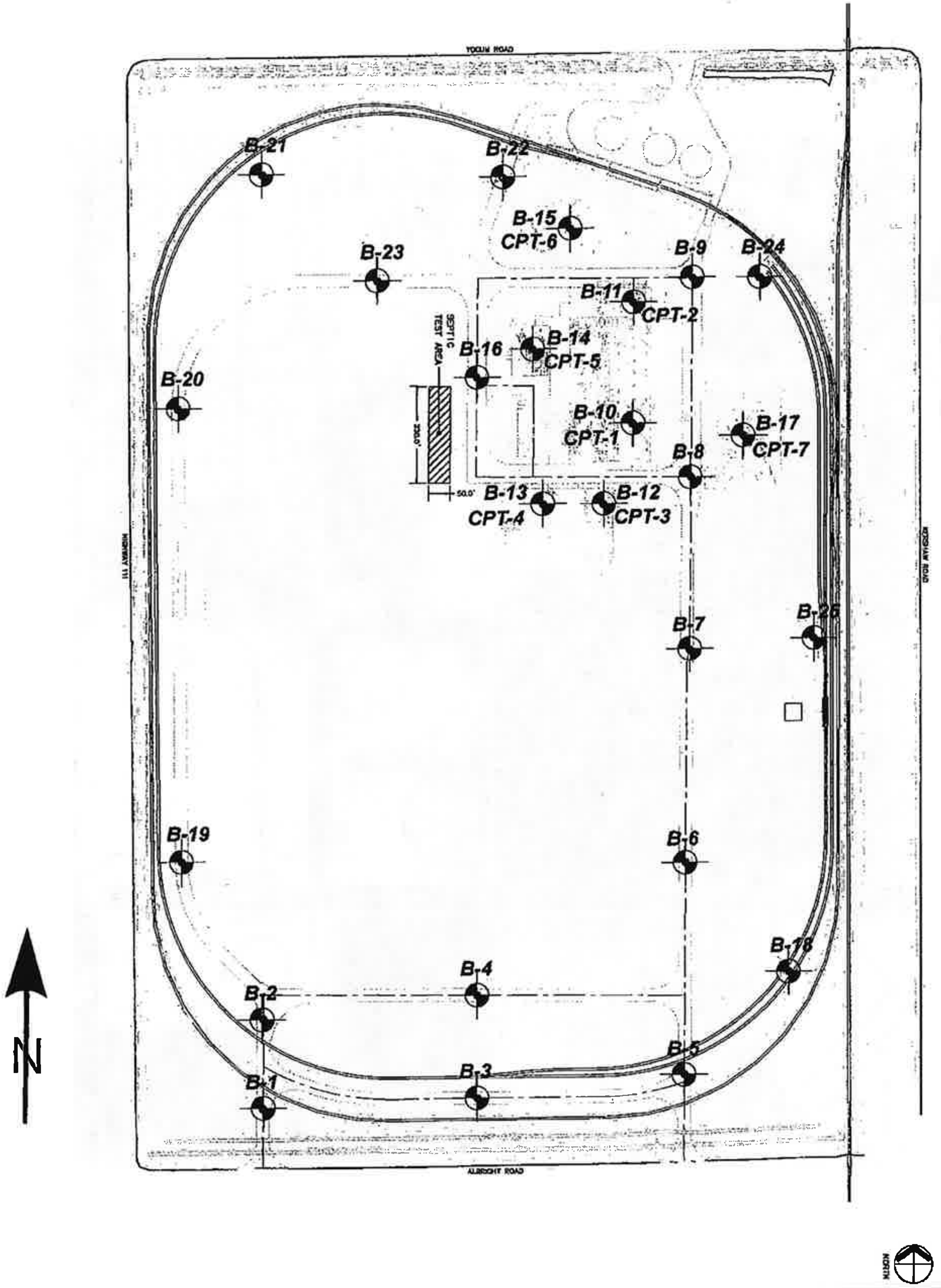
Vicinity Map

Plate
A-1



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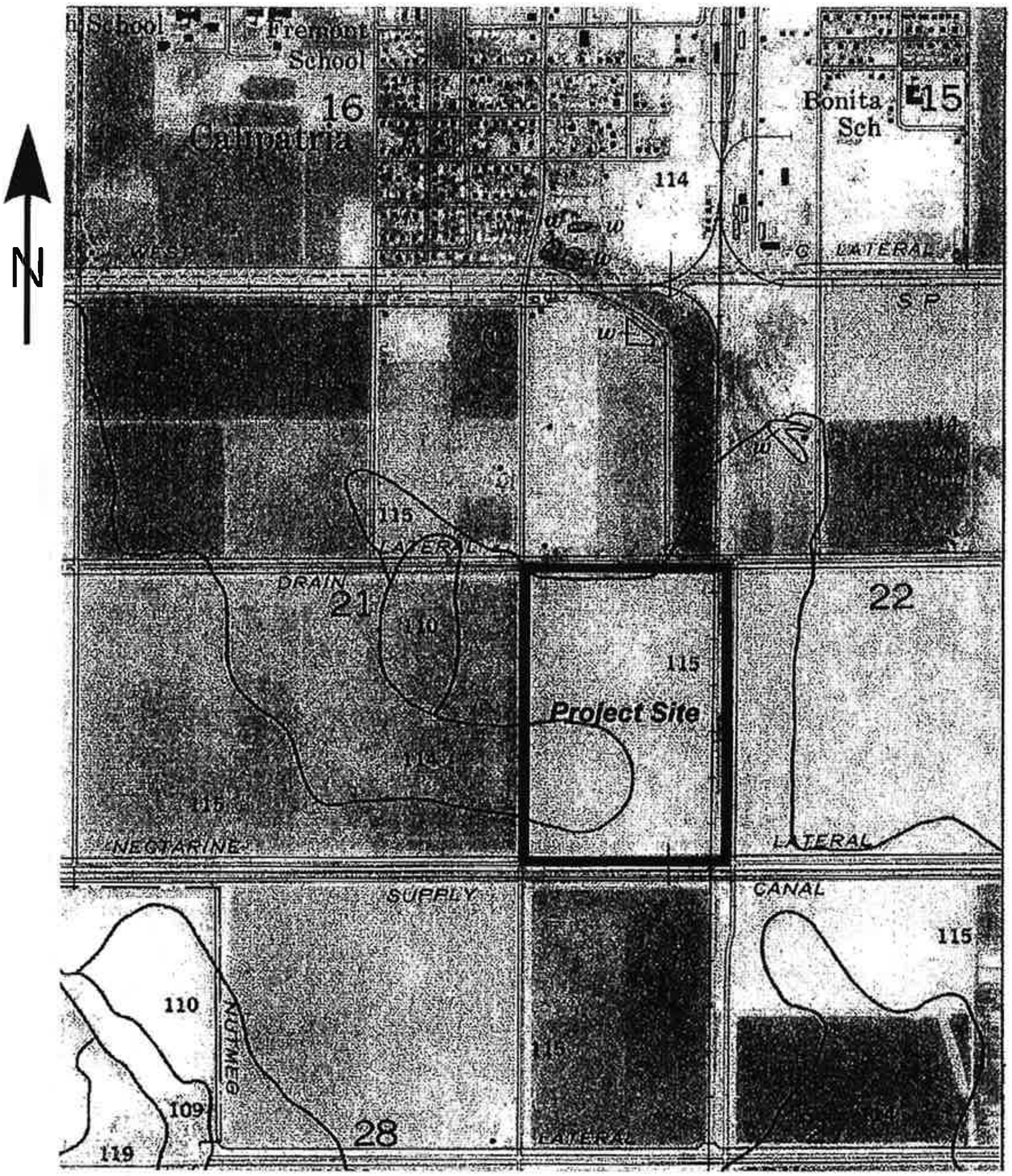
Site and Exploration Plan

Plate
A-2



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Soil Survey Map

Plate A-3

Soil Survey of

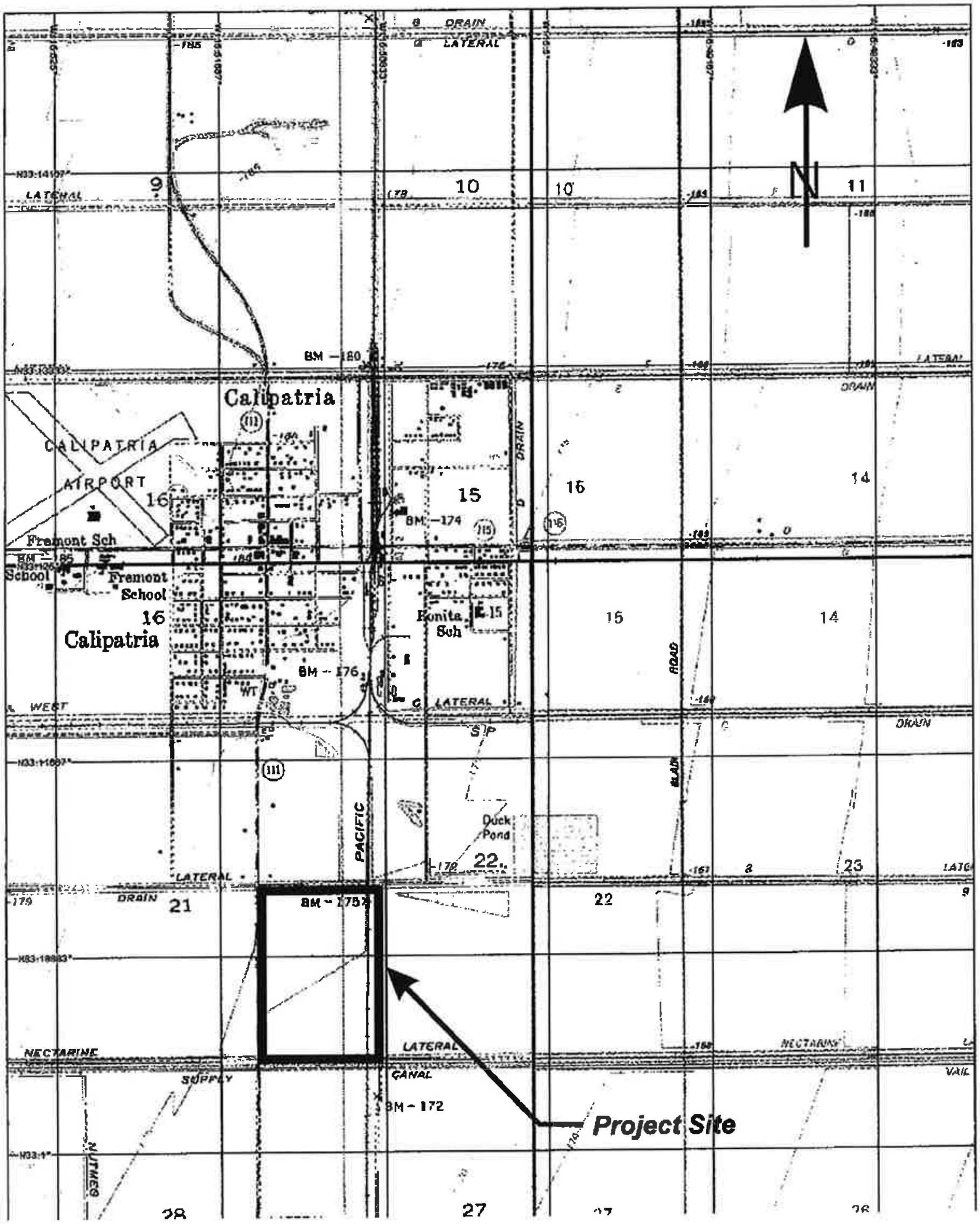
IMPERIAL COUNTY
CALIFORNIA
IMPERIAL VALLEY AREA

United States Department of Agriculture Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station
and
Imperial Irrigation District

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
111*: Holtville----------	0-10	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	10-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
Imperial----------	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
112---------------- Imperial	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
113---------------- Imperial	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay, clay, silty clay loam.	CH	A-7	0	100	100	100	85-95	50-70	25-45
114---------------- Imperial	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
115*: Imperial----------	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar-----------	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
116*: Imperial----------	0-13	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	13-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar-----------	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
117, 118----------- Indio	0-12	Loam-------------	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
119*: Indio--------------	0-12	Loam-------------	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Vint---------------	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	25-35	---	NP
	10-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
120*--------------- Laveen	0-12	Loam-------------	ML, CL-ML	A-4	0	100	95-100	75-85	55-65	20-30	NP-10
	12-60	Loam, very fine sandy loam.	ML, CL-ML	A-4	0	95-100	85-95	70-80	55-65	15-25	NP-10

See footnote at end of table.



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Topographic Map

Plate A-4

APPENDIX B

CLIENT: TKDA

PROJECT: Pacific Ethanol Plant, Calipatria, California

LOCATION: See Site and Boring Location Plan

CONE PENETROMETER: HOLGUIN, FAHAN & ASSC. Truck Mounted Electric Cone with 23 ton reaction weight

DATE: 06/14/06

LOG OF CONE SOUNDING DATA CPT-1

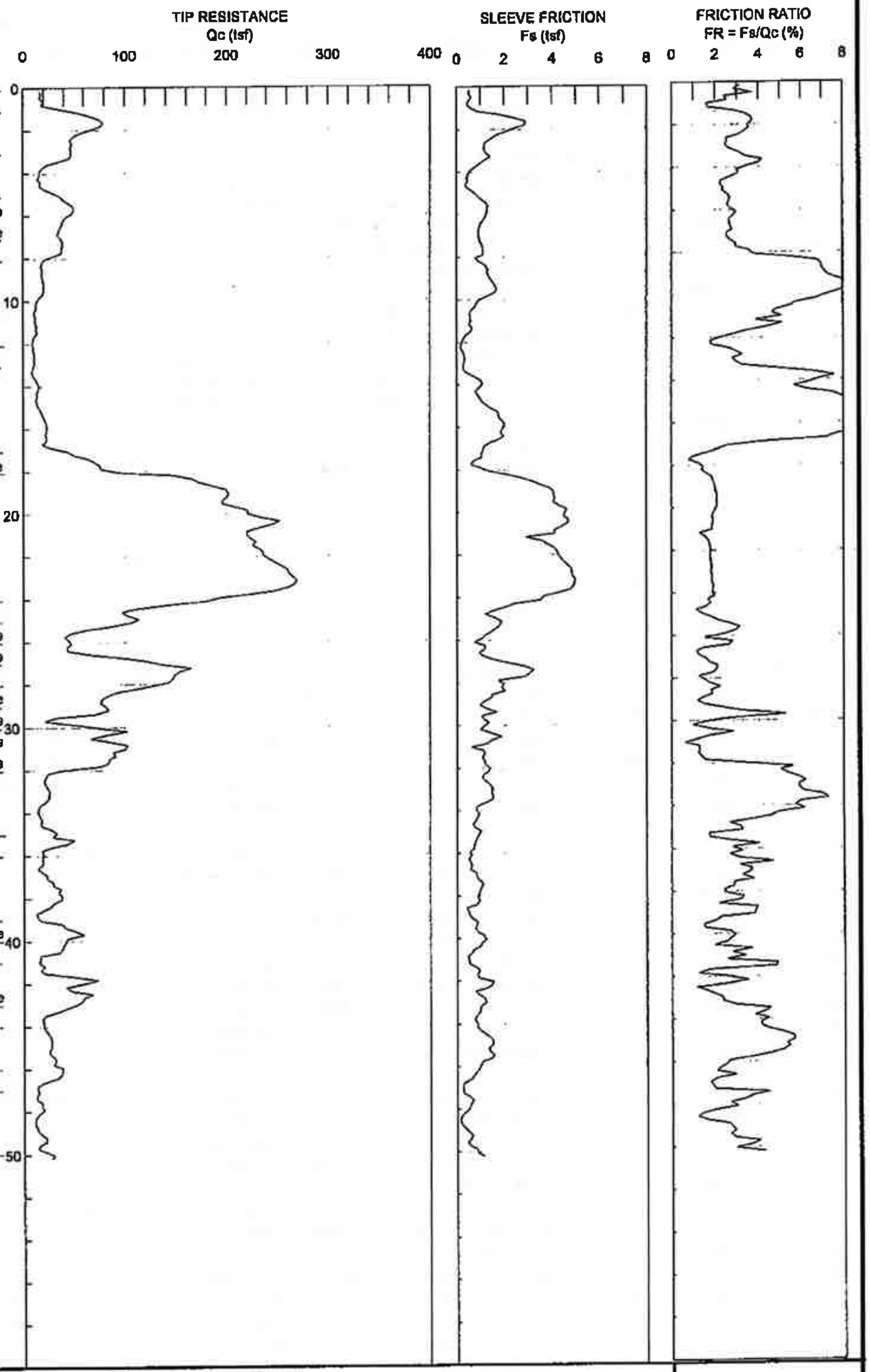
DEPTH (FEET)

INTERPRETED SOIL PROFILE
From Robertson & Campanella (1989)

GROUND EL. +/-

Clayey Silt to Silty Clay	ML/CL	very stiff
Sandy Silt to Clayey Silt	ML	very dense
Sandy Silt to Clayey Silt	" "	dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Sandy Silt to Clayey Silt	" "	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Clay	CL/CH	very stiff
Clay	" "	very stiff
Clay	" "	stiff
Silty Clay to Clay	CL	stiff
Clayey Silt to Silty Clay	ML/CL	stiff
Clay	CL/CH	stiff
Clay	" "	stiff
Clay	" "	very stiff
Clay	" "	very stiff
Silty Sand to Sandy Silt	SM/ML	medium dense
Sand to Silty Sand	SP/SM	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	dense
Sandy Silt to Clayey Silt	ML	medium dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Sand to Silty Sand	SP/SM	dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Sandy Silt to Clayey Silt	ML	medium dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Clay	CL/CH	very stiff
Clay	" "	very stiff
Silty Clay to Clay	CL	very stiff
Sandy Silt to Clayey Silt	ML	loose
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Sandy Silt to Clayey Silt	ML	loose
Sandy Silt to Clayey Silt	" "	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Clay	CL/CH	very stiff
Silty Clay to Clay	CL	very stiff
Sandy Silt to Clayey Silt	ML	loose
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	stiff
Clayey Silt to Silty Clay	" "	very stiff

End of Sounding @ 50.0 ft.



Project No:
LE06217

LANDMARK
Geo-Engineers and Geologists
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Plate
B-1

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-1

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
0.15	0.5	16.66	3.24	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	2.00		75			0.98	>10
0.30	1.0	23.82	2.18	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	7	2.00	45.0	55	75	39		
0.45	1.5	63.59	2.62	6	6	Sandy Silt to Clayey Silt	ML	very dense	115	3.5	18	2.00	120.2	40	97	42		
0.60	2.0	74.29	3.65	6	6	Sandy Silt to Clayey Silt	ML	very dense	115	3.5	21	2.00	140.4	45	97	42		
0.75	2.5	50.38	3.32	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	20	2.00		50			2.96	>10
0.93	3.0	46.80	2.49	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	13	2.00	88.5	45	76	39		
1.08	3.5	42.46	3.04	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	12	2.00	80.3	50	71	38		
1.23	4.0	19.18	3.89	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	2.00		80			1.12	>10
1.38	4.5	15.86	2.92	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	2.00		75			0.92	>10
1.53	5.0	22.65	2.28	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	6	1.95	41.7	60	47	35		
1.68	5.5	42.69	2.56	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	12	1.86	74.8	45	64	37		
1.83	6.0	46.06	2.73	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	1.77	77.2	45	65	37		
1.98	6.5	37.92	2.72	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	11	1.70	61.0	50	58	36		
2.13	7.0	35.19	2.67	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	10	1.64	54.5	50	55	36		
2.28	7.5	38.53	2.71	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	11	1.58	57.6	50	56	36		
2.45	8.0	29.98	3.42	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.53		60			1.74	>10
2.60	8.5	18.32	6.35	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.48		95			1.05	>10
2.75	9.0	19.01	7.12	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.43		100			1.09	>10
2.90	9.5	20.09	8.03	3	3	Clay	CL/CH	very stiff	125	1.3	16	1.41		100			1.15	>10
3.05	10.0	15.99	7.68	3	3	Clay	CL/CH	stiff	125	1.3	13	1.39		100			0.91	>10
3.20	10.5	11.99	6.01	3	3	Clay	CL/CH	stiff	125	1.3	10	1.37		100			0.67	8.41
3.35	11.0	11.77	4.86	3	3	Clay	CL/CH	stiff	125	1.3	9	1.35		100			0.66	7.70
3.50	11.5	13.16	4.46	3	3	Clay	CL/CH	stiff	125	1.3	11	1.34		100			0.74	9.00
3.65	12.0	10.00	2.91	4	4	Silty Clay to Clay	CL	stiff	125	1.8	6	1.32		100			0.55	6.88
3.80	12.5	10.37	2.08	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	4	1.30		95			0.57	>10
3.95	13.0	10.88	3.00	4	4	Silty Clay to Clay	CL	stiff	125	1.8	6	1.29		100			0.60	7.41
4.13	13.5	9.30	3.75	3	3	Clay	CL/CH	stiff	125	1.3	7	1.27		100			0.51	4.18
4.28	14.0	13.52	7.02	3	3	Clay	CL/CH	stiff	125	1.3	11	1.26		100			0.76	7.56
4.43	14.5	14.28	6.09	3	3	Clay	CL/CH	stiff	125	1.3	11	1.24		100			0.80	8.00
4.58	15.0	13.62	7.94	3	3	Clay	CL/CH	stiff	125	1.3	11	1.23		100			0.76	7.00
4.73	15.5	18.37	8.96	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.22		100			1.04	>10
4.88	16.0	22.68	8.49	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.20		100			1.29	>10
5.03	16.5	22.52	8.18	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.19		100			1.28	>10
5.18	17.0	30.47	4.59	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	17	1.18		85			1.75	>10
5.33	17.5	61.26	1.58	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	14	1.17	67.5	40	61	37		
5.48	18.0	82.45	1.17	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	15	1.16	90.1	30	69	38		
5.65	18.5	162.54	1.63	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	30	1.15	176.2	20	89	40		
5.80	19.0	196.33	1.96	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	36	1.14	211.1	25	95	41		
5.95	19.5	197.73	2.08	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	44	1.13	210.9	25	95	41		
6.10	20.0	217.17	2.07	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	48	1.12	229.9	25	97	42		
6.25	20.5	244.40	1.89	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	44	1.11	256.7	20	100	42		
6.40	21.0	224.42	1.87	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	41	1.10	233.9	20	98	42		
6.55	21.5	226.45	1.51	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	41	1.09	234.3	20	98	42		
6.70	22.0	235.49	1.78	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	43	1.09	241.8	20	99	42		
6.85	22.5	249.33	1.80	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	45	1.08	254.2	20	100	42		
7.00	23.0	262.66	1.84	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	48	1.07	265.9	20	101	42		
7.18	23.5	266.20	1.86	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	48	1.06	267.5	20	102	42		
7.33	24.0	221.65	1.90	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	40	1.06	221.4	25	96	41		
7.48	24.5	144.29	1.83	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	26	1.05	143.0	30	83	40		
7.63	25.0	104.57	1.39	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	19	1.04	103.0	30	73	38		
7.78	25.5	64.87	2.18	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	19	1.03	63.0	45	67	37		
7.93	26.0	44.01	2.80	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	1.03	42.8	65	47	35		
8.08	26.5	49.89	2.12	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	14	1.02	48.1	55	51	35		
8.23	27.0	118.22	1.35	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	21	1.01	113.4	30	76	39		
8.38	27.5	155.57	1.97	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	35	1.01	148.2	30	84	40		
8.53	28.0	139.07	1.57	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	25	1.00	131.7	30	81	39		
8.68	28.5	93.69	1.94	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	21	1.00	88.2	40	69	38		
8.85	29.0	78.12	1.53	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	17	0.99	73.1	40	63	37		
9.00	29.5	62.31	2.36	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	18	0.98	57.9	55	56	36		
9.15	30.0	46.96	3.25	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	19	0.98		70			2.70	>10

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-1

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
9.30	30.5	83.80	1.83	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	19	0.97	76.9	45	65	37		
9.45	31.0	96.01	1.20	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	17	0.97	87.6	30	69	38		
9.60	31.5	87.76	1.27	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	16	0.96	79.7	35	66	37		
9.75	32.0	65.93	2.20	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	15	0.95	59.5	55	57	36		
9.90	32.5	21.94	5.35	3	3	Clay	CL/CH	very stiff	125	1.3	18	0.95		100			1.22	6.54
10.05	33.0	23.36	5.99	3	3	Clay	CL/CH	very stiff	125	1.3	19	0.94		100			1.30	7.13
10.20	33.5	23.88	6.34	3	3	Clay	CL/CH	very stiff	125	1.3	19	0.94		100			1.33	7.27
10.38	34.0	14.81	6.32	3	3	Clay	CL/CH	stiff	125	1.3	12	0.93		100			0.80	3.35
10.53	34.5	16.88	5.20	3	3	Clay	CL/CH	stiff	125	1.3	14	0.92		100			0.92	4.00
10.68	35.0	25.86	3.20	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	0.92		100			1.45	>10
10.83	35.5	40.41	2.26	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	12	0.91	34.9	70	41	34		
10.98	36.0	21.55	3.15	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	0.91		100			1.19	>10
11.13	36.5	17.23	3.41	4	4	Silty Clay to Clay	CL	stiff	125	1.8	10	0.90		100			0.94	4.89
11.28	37.0	21.11	3.47	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.6	8	0.90		100			1.16	9.59
11.43	37.5	31.26	3.28	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.89		95			1.76	>10
11.58	38.0	36.28	2.56	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	10	0.89	30.5	80	37	33		
11.73	38.5	24.69	2.87	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	0.88		100			1.37	>10
11.88	39.0	14.29	3.87	4	4	Silty Clay to Clay	CL	stiff	125	1.8	8	0.88		100			0.76	3.35
12.05	39.5	43.16	1.93	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	12	0.88	35.7	70	42	34		
12.20	40.0	48.03	2.37	6	6	Sandy Silt to Clayey Silt	ML	medium dense	116	3.5	14	0.87	39.5	70	45	34		
12.35	40.5	37.70	2.41	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	11	0.87	30.9	80	38	33		
12.50	41.0	15.91	3.27	4	4	Silty Clay to Clay	CL	stiff	125	1.8	9	0.86		100			0.85	3.74
12.65	41.5	18.86	4.08	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	0.86		100			1.02	4.78
12.80	42.0	60.05	1.87	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	13	0.85	48.4	60	51	35		
12.95	42.5	52.27	2.41	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	15	0.85	42.0	70	47	35		
13.10	43.0	56.51	1.99	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	13	0.85	45.2	65	49	35		
13.25	43.5	32.34	3.26	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.84		95			1.81	>10
13.40	44.0	18.87	4.17	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	0.84		100			1.02	4.37
13.58	44.5	23.43	4.23	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	13	0.83		100			1.29	6.21
13.73	45.0	26.61	5.48	3	3	Clay	CL/CH	very stiff	125	1.3	21	0.83		100			1.47	5.88
13.88	45.5	26.84	5.28	3	3	Clay	CL/CH	very stiff	125	1.3	21	0.83		100			1.49	5.76
14.03	46.0	32.74	3.61	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.82		100			1.83	>10
14.18	46.5	36.76	2.26	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	10	0.82	27.6	85	35	33		
14.33	47.0	15.33	2.17	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.81		100			0.81	3.91
14.48	47.5	14.26	3.40	4	4	Silty Clay to Clay	CL	stiff	125	1.8	8	0.81		100			0.74	2.65
14.63	48.0	17.29	3.03	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	0.81		100			0.92	4.57
14.78	48.5	10.95	1.56	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	4	0.80		100			0.55	2.27
14.93	49.0	14.40	2.33	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.80		100			0.75	3.35
15.10	49.5	19.76	2.83	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.80		100			1.06	5.42
15.25	50.0	21.77	3.57	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	0.79		100			1.18	6.32

CLIENT: TKDA

PROJECT: Pacific Ethanol Plant, Calipatria, California

LOCATION: See Site and Boring Location Plan

CONE PENETROMETER: HOLGUIN, FAHAN & ASSC. Truck Mounted Electric Cone with 23 ton reaction weight

DATE: 06/14/06

LOG OF CONE SOUNDING DATA CPT-2

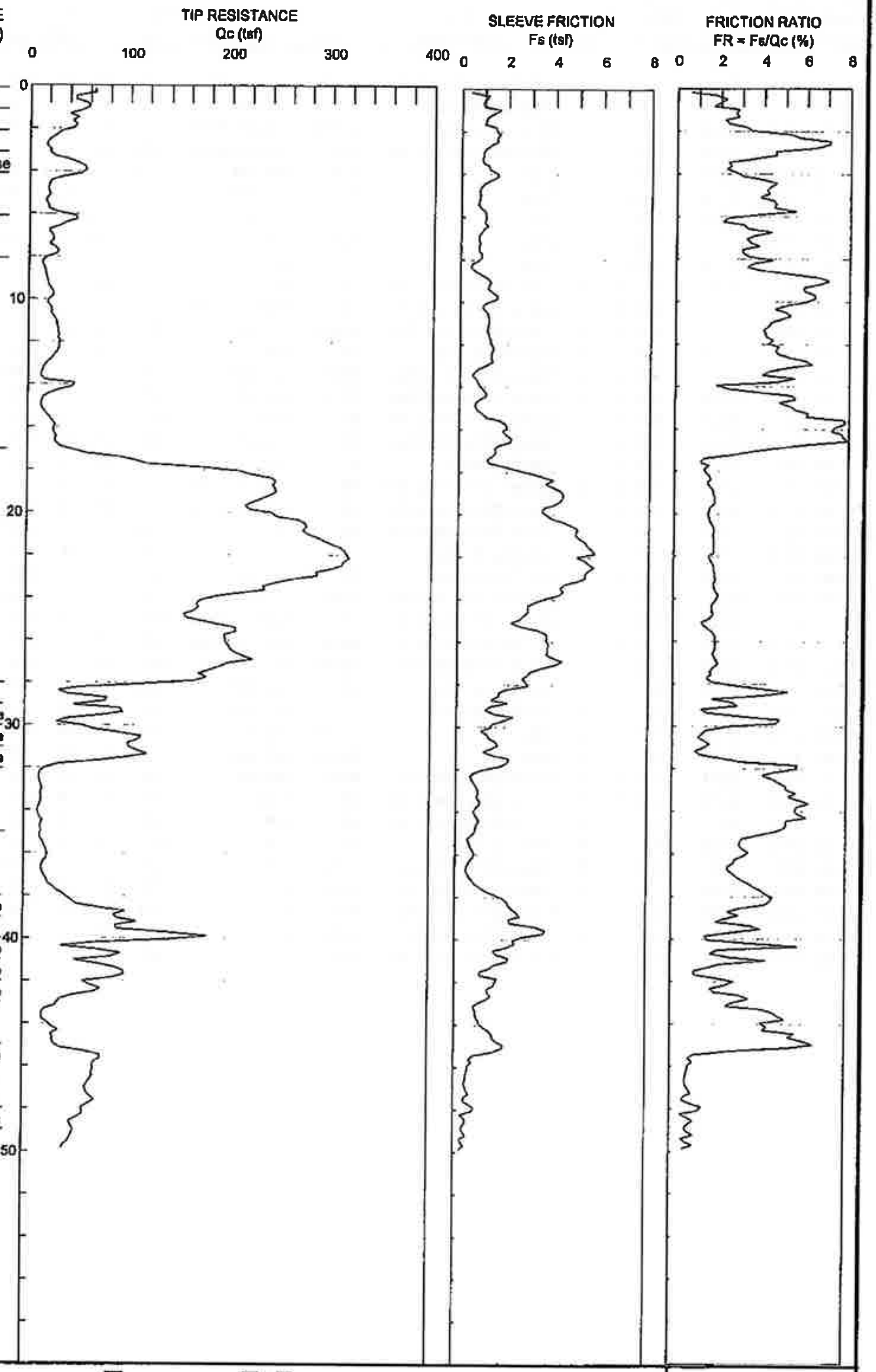
DEPTH (FEET)

INTERPRETED SOIL PROFILE
From Robertson & Campanella (1989)

GROUND EL. +/-

Silty Sand to Sandy Silt	SM/ML	very dense
Sandy Silt to Clayey Silt	ML	dense
Clay	CL/CH	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Silty Clay to Clay	CL	very stiff
Silty Clay to Clay	" "	very stiff
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clay	CL/CH	stiff
Clay	" "	very stiff
Clay	" "	very stiff
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	very stiff
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	very stiff
Clay	" "	very stiff
Clay	" "	very stiff
Sand to Silty Sand	SP/SM	dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	dense
Clayey Silt to Silty Clay	ML/CL	hard
Sandy Silt to Clayey Silt	ML	medium dense
Sand to Silty Sand	SP/SM	medium dense
Sandy Silt to Clayey Silt	ML	medium dense
Clay	CL/CH	stiff
Clay	" "	stiff
Clay	" "	stiff
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Silty Sand to Sandy Silt	SM/ML	dense
Sandy Silt to Clayey Silt	ML	medium dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Sandy Silt to Clayey Silt	ML	medium dense
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	very stiff
Silty Sand to Sandy Silt	SM/ML	medium dense
Sand to Silty Sand	SP/SM	medium dense
Sand to Silty Sand	" "	medium dense
Silty Sand to Sandy Silt	SM/ML	medium dense

End of Sounding @ 49.5 ft.



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-20-
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-50-

Project No:
LE06217

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Plate
B-2

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-2

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
0.15	0.5	58.03	1.53	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	13	2.00	109.7	30	118	45		
0.30	1.0	53.38	2.14	6	6	Sandy Silt to Clayey Silt	ML	very dense	115	3.5	15	2.00	100.9	40	100	42		
0.45	1.5	45.95	2.53	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	13	2.00	86.9	45	88	40		
0.60	2.0	43.65	2.97	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	12	2.00	82.5	50	81	39		
0.75	2.5	26.13	5.99	3	3	Clay	CL/CH	very stiff	125	1.3	21	2.00		80			1.53	>10
0.93	3.0	18.18	5.93	3	3	Clay	CL/CH	very stiff	125	1.3	15	2.00		95			1.06	>10
1.08	3.5	28.43	3.46	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	2.00		65			1.66	>10
1.23	4.0	52.63	2.47	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	15	2.00	99.5	40	75	38		
1.38	4.5	34.70	3.84	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	14	2.00		60			2.03	>10
1.53	5.0	19.06	4.21	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	1.94		80			1.10	>10
1.68	5.5	18.23	4.31	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.84		85			1.05	>10
1.83	6.0	30.83	3.86	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.75		65			1.79	>10
1.98	6.5	38.12	2.82	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	11	1.68	60.7	50	58	36		
2.13	7.0	21.78	3.70	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	12	1.62		75			1.26	>10
2.28	7.5	23.26	3.39	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	1.56		70			1.34	>10
2.45	8.0	24.40	3.57	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	1.51		70			1.41	>10
2.60	8.5	14.36	3.55	4	4	Silty Clay to Clay	CL	stiff	125	1.8	8	1.46		85			0.82	>10
2.75	9.0	17.36	6.28	3	3	Clay	CL/CH	stiff	125	1.3	14	1.42		100			0.99	>10
2.90	9.5	20.31	6.10	3	3	Clay	CL/CH	very stiff	125	1.3	16	1.40		95			1.16	>10
3.05	10.0	22.68	6.26	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.38		95			1.30	>10
3.20	10.5	21.23	4.88	3	3	Clay	CL/CH	very stiff	125	1.3	17	1.36		90			1.22	>10
3.35	11.0	25.34	4.83	3	3	Clay	CL/CH	very stiff	125	1.3	20	1.34		80			1.46	>10
3.50	11.5	28.60	4.12	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	16	1.32		75			1.65	>10
3.65	12.0	30.24	4.27	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	17	1.31		75			1.74	>10
3.80	12.5	29.41	4.67	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	17	1.29		80			1.69	>10
3.95	13.0	22.35	5.82	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.28		95			1.28	>10
4.13	13.5	14.74	4.45	3	3	Clay	CL/CH	stiff	125	1.3	12	1.26		100			0.83	8.86
4.28	14.0	25.21	3.99	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	14	1.25		80			1.44	>10
4.43	14.5	31.06	3.85	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.23		75			1.79	>10
4.58	15.0	13.87	5.20	3	3	Clay	CL/CH	stiff	125	1.3	11	1.22		100			0.77	7.00
4.73	15.5	16.54	5.88	3	3	Clay	CL/CH	stiff	125	1.3	13	1.21		100			0.93	9.39
4.88	16.0	24.89	7.55	3	3	Clay	CL/CH	very stiff	125	1.3	20	1.19		100			1.42	>10
5.03	16.5	27.12	7.80	3	3	Clay	CL/CH	very stiff	125	1.3	22	1.18		100			1.55	>10
5.18	17.0	34.57	4.77	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	20	1.17		80			1.99	>10
5.33	17.5	84.69	1.68	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	19	1.16	92.7	35	70	38		
5.48	18.0	168.47	1.45	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	31	1.15	182.9	20	90	41		
5.65	18.5	235.43	1.58	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	43	1.14	253.5	20	100	42		
5.80	19.0	244.48	1.72	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	44	1.13	261.1	20	101	42		
5.95	19.5	230.95	1.84	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	42	1.12	244.7	20	99	42		
6.10	20.0	225.98	1.60	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	41	1.11	237.6	20	98	42		
6.25	20.5	263.01	1.66	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	48	1.10	274.4	20	102	42		
6.40	21.0	275.73	1.61	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	50	1.10	285.6	20	103	42		
6.55	21.5	293.91	1.81	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	53	1.09	302.1	20	105	43		
6.70	22.0	313.93	1.74	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	57	1.08	320.4	15	107	43		
6.85	22.5	314.95	1.75	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	57	1.07	319.1	15	107	43		
7.00	23.0	292.15	1.85	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	53	1.06	293.9	20	104	43		
7.18	23.5	247.91	1.85	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	45	1.06	247.7	20	99	42		
7.33	24.0	210.60	1.96	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	38	1.05	209.0	25	94	41		
7.48	24.5	170.57	1.79	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	31	1.04	168.1	25	88	40		
7.63	25.0	160.42	1.73	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	29	1.04	157.0	25	86	40		
7.78	25.5	191.25	1.44	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	35	1.03	186.0	20	91	41		
7.93	26.0	200.32	1.87	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	36	1.02	193.5	25	92	41		
8.08	26.5	201.99	1.88	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	37	1.02	193.9	25	92	41		
8.23	27.0	213.36	1.96	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	39	1.01	203.5	25	93	41		
8.38	27.5	181.69	1.75	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	33	1.00	172.2	25	89	40		
8.53	28.0	154.44	1.94	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	34	1.00	145.5	30	84	40		
8.68	28.5	43.10	4.46	4	4	Silty Clay to Clay	CL	hard	125	1.8	25	0.99		85			2.47	>10
8.85	29.0	69.55	2.47	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	20	0.98	64.6	55	60	36		
9.00	29.5	88.77	2.02	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	20	0.98	82.0	45	67	37		
9.15	30.0	43.36	4.04	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	17	0.97		80			2.48	>10

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California　Project No: LE06217　Date: 06/14/06

CONE SOUNDING: CPT-2

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Nk: 17.0

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Phi (deg.)	Su (tsf)	OCR
9.30	30.5	92.69	1.37	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	17	0.97	84.8	35	68	37		
9.45	31.0	105.63	1.54	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	19	0.96	95.8	35	71	38		
9.60	31.5	111.61	1.50	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	20	0.95	100.7	35	73	38		
9.75	32.0	41.23	4.83	4	4	Silty Clay to Clay	CL	hard	125	1.8	24	0.95		90			2.36	>10
9.90	32.5	16.11	4.45	3	3	Clay	CL/CH	stiff	125	1.3	12	0.94		100			0.82	3.58
10.05	33.0	16.74	5.11	3	3	Clay	CL/CH	stiff	125	1.3	13	0.94		100			0.91	4.09
10.20	33.5	16.61	5.61	3	3	Clay	CL/CH	stiff	125	1.3	13	0.93		100			0.91	3.91
10.38	34.0	14.83	5.89	3	3	Clay	CL/CH	stiff	125	1.3	12	0.92		100			0.80	3.28
10.53	34.5	15.93	5.74	3	3	Clay	CL/CH	stiff	125	1.3	13	0.92		100			0.86	3.58
10.68	35.0	16.67	5.06	3	3	Clay	CL/CH	stiff	125	1.3	13	0.91		100			0.91	3.74
10.83	35.5	16.77	3.45	4	4	Silty Clay to Clay	CL	stiff	125	1.8	10	0.91		100			0.91	4.78
10.98	36.0	21.48	3.27	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	0.90		100			1.19	>10
11.13	36.5	20.70	2.89	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.90		100			1.14	9.00
11.28	37.0	19.37	2.75	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.89		100			1.06	7.86
11.43	37.5	25.53	3.52	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	0.89		100			1.42	>10
11.58	38.0	38.21	4.35	4	4	Silty Clay to Clay	CL	hard	125	1.8	22	0.88		95			2.17	>10
11.73	38.5	59.17	3.97	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	24	0.88		75			3.40	>10
11.88	39.0	94.67	2.67	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	27	0.87	78.1	55	65	37		
12.05	39.5	98.75	3.24	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	28	0.87	81.1	55	66	37		
12.20	40.0	155.54	1.96	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	35	0.87	127.2	35	80	39		
12.35	40.5	60.95	3.84	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	24	0.86		75			3.50	>10
12.50	41.0	77.81	2.92	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	22	0.86	63.0	60	59	36		
12.65	41.5	87.99	1.66	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	20	0.85	70.9	45	62	37		
12.80	42.0	83.17	1.98	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	18	0.85	66.7	50	61	36		
12.95	42.5	71.01	2.10	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	16	0.85	56.7	55	56	36		
13.10	43.0	40.61	3.18	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	16	0.84		85			2.30	>10
13.25	43.5	24.36	3.78	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	14	0.84		100			1.34	6.65
13.40	44.0	21.61	4.74	3	3	Clay	CL/CH	very stiff	125	1.3	17	0.83		100			1.18	4.18
13.58	44.5	30.68	4.75	3	3	Clay	CL/CH	very stiff	125	1.3	25	0.83		100			1.71	7.27
13.73	45.0	30.22	5.99	3	3	Clay	CL/CH	very stiff	125	1.3	24	0.82		100			1.69	7.00
13.88	45.5	57.65	3.05	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	16	0.82	44.7	75	49	35		
14.03	46.0	72.54	0.91	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	13	0.82	56.0	40	56	36		
14.18	46.5	69.32	0.79	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	13	0.81	53.3	40	54	36		
14.33	47.0	64.18	0.77	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	12	0.81	49.2	45	52	35		
14.48	47.5	67.84	0.74	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	12	0.81	51.8	40	53	35		
14.63	48.0	61.59	1.25	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	14	0.80	46.8	55	50	35		
14.78	48.5	53.24	0.81	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	10	0.80	40.3	50	46	34		
14.93	49.0	49.46	0.79	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	11	0.80	37.3	50	43	34		
15.10	49.5	46.85	0.80	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	10	0.79	35.2	55	42	34		

CLIENT: TKDA

PROJECT: Pacific Ethanol Plant, Calipatria, California

LOCATION: See Site and Boring Location Plan

CONE PENETROMETER: HOLGUIN, FAHAN & ASSC. Truck Mounted Electric Cone with 23 ton reaction weight

DATE: 06/14/06

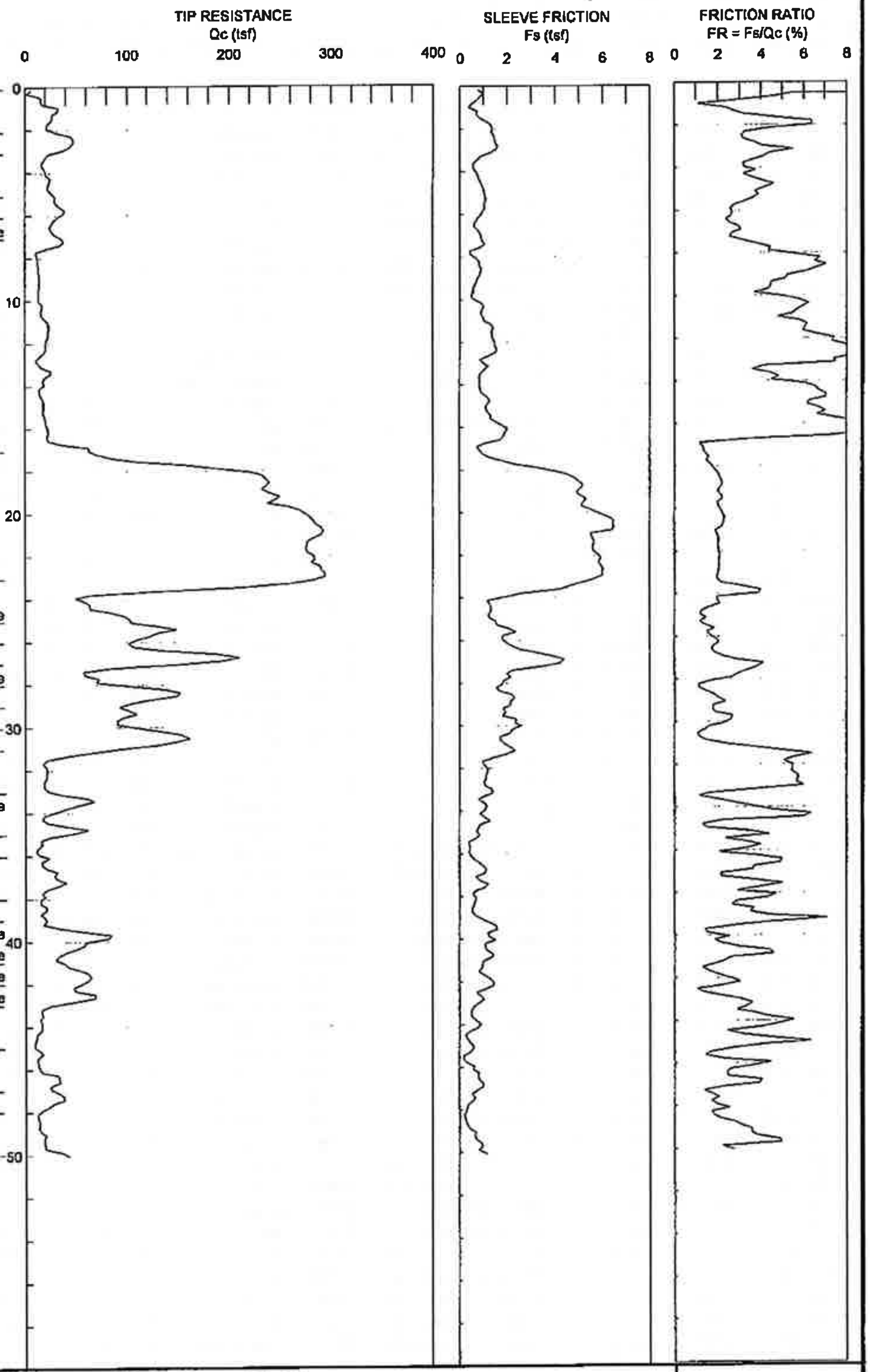
LOG OF CONE SOUNDING DATA CPT-3

INTERPRETED SOIL PROFILE
From Robertson & Campanella (1989)

GROUND EL. +/-

Clay	CL/CH	stiff
Silty Clay to Clay	CL	very stiff
Clayey Silt to Silty Clay	ML/CL	hard
Silty Clay to Clay	CL	very stiff
Silty Clay to Clay	" "	very stiff
Clayey Silt to Silty Clay	ML/CL	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	very stiff
Clay	" "	stiff
Clay	" "	very stiff
Clay	" "	stiff
Clay	" "	very stiff
Clay	" "	hard
Sand to Silty Sand	SP/SM	dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Silty Sand to Sandy Silt	SM/ML	dense
Silty Sand to Sandy Silt	" "	medium dense
Sand to Silty Sand	SP/SM	dense
Silty Sand to Sandy Silt	SM/ML	dense
Sandy Silt to Clayey Silt	ML	medium dense
Sand to Silty Sand	SP/SM	dense
Silty Sand to Sandy Silt	SM/ML	dense
Sand to Silty Sand	SP/SM	dense
Clay	CL/CH	very stiff
Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Silty Clay to Clay	CL	stiff
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Silty Clay to Clay	CL	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Sandy Silt to Clayey Silt	" "	medium dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Sandy Silt to Clayey Silt	ML	medium dense
Silty Clay to Clay	CL	stiff
Clay	CL/CH	stiff
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	loose
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	very stiff

End of Sounding @ 49.5 ft.



Project No:
LE06217

LANDMARK
Geo Engineers and Geologists
a DBE/MBE/SBE Company

Plate
B-3

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-3

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
0.15	0.5	7.21	36.79	1	1	Organic Material	OL/OH	firm	120	1.0	7	2.00		100			0.42	>10
0.30	1.0	21.58	2.84	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	2.00		65			1.27	>10
0.45	1.5	28.06	2.72	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	2.00		55			1.65	>10
0.60	2.0	21.98	5.82	3	3	Clay	CL/CH	very stiff	125	1.3	18	2.00		85			1.29	>10
0.75	2.5	40.78	3.57	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	16	2.00		55			2.39	>10
0.93	3.0	43.09	3.61	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	17	2.00		55			2.53	>10
1.08	3.5	20.21	4.68	3	3	Clay	CL/CH	very stiff	125	1.3	16	2.00		80			1.18	>10
1.23	4.0	17.75	3.31	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	7	2.00		75			1.03	>10
1.38	4.5	22.73	3.50	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	2.00		70			1.32	>10
1.53	5.0	23.20	4.28	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	13	1.92		75			1.35	>10
1.68	5.5	30.11	3.59	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.82		65			1.75	>10
1.83	6.0	36.01	2.61	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	10	1.74	59.3	50	57	36		
1.98	6.5	25.88	2.49	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	7	1.68	41.0	60	46	34		
2.13	7.0	29.68	2.87	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.61		60			1.72	>10
2.28	7.5	31.12	3.15	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.56		60			1.80	>10
2.45	8.0	11.04	4.82	3	3	Clay	CL/CH	stiff	125	1.3	9	1.51		100			0.62	>10
2.60	8.5	12.62	6.76	3	3	Clay	CL/CH	stiff	125	1.3	10	1.46		100			0.71	>10
2.75	9.0	13.80	5.97	3	3	Clay	CL/CH	stiff	125	1.3	11	1.41		100			0.78	>10
2.90	9.5	13.29	4.70	3	3	Clay	CL/CH	stiff	125	1.3	11	1.39		100			0.75	>10
3.05	10.0	12.85	4.34	3	3	Clay	CL/CH	stiff	125	1.3	10	1.37		100			0.72	9.59
3.20	10.5	16.33	5.99	3	3	Clay	CL/CH	stiff	125	1.3	13	1.35		100			0.93	>10
3.35	11.0	18.63	5.31	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.34		95			1.06	>10
3.50	11.5	22.80	6.00	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.32		95			1.31	>10
3.65	12.0	21.23	6.69	3	3	Clay	CL/CH	very stiff	125	1.3	17	1.30		100			1.21	>10
3.80	12.5	19.23	7.96	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.29		100			1.09	>10
3.95	13.0	12.30	8.33	3	3	Clay	CL/CH	stiff	125	1.3	10	1.27		100			0.69	6.65
4.13	13.5	21.90	6.08	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.26		95			1.25	>10
4.28	14.0	18.21	4.58	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.24		100			1.03	>10
4.43	14.5	14.17	6.44	3	3	Clay	CL/CH	stiff	125	1.3	11	1.23		100			0.79	7.56
4.58	15.0	17.67	6.78	3	3	Clay	CL/CH	stiff	125	1.3	14	1.21		100			1.00	>10
4.73	15.5	18.12	6.63	3	3	Clay	CL/CH	very stiff	125	1.3	14	1.20		100			1.02	>10
4.88	16.0	21.00	7.90	3	3	Clay	CL/CH	very stiff	125	1.3	17	1.19		100			1.19	>10
5.03	16.5	22.15	8.20	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.18		100			1.26	>10
5.18	17.0	53.30	1.90	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	12	1.17	58.7	45	57	36		
5.33	17.5	89.34	1.47	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	20	1.16	97.6	30	72	38		
5.48	18.0	189.45	1.64	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	34	1.15	205.3	20	94	41		
5.65	18.5	236.21	2.02	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	43	1.14	253.9	20	100	42		
5.80	19.0	236.30	2.14	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	43	1.13	252.0	25	100	42		
5.95	19.5	244.30	2.12	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	44	1.12	258.5	20	101	42		
6.10	20.0	267.18	2.03	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	49	1.11	280.5	20	103	42		
6.25	20.5	282.55	2.24	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	51	1.10	294.4	20	104	43		
6.40	21.0	291.44	2.10	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	53	1.09	301.4	20	105	43		
6.55	21.5	279.32	2.00	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	51	1.09	286.7	20	104	43		
6.70	22.0	278.52	2.03	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	51	1.08	283.9	20	103	42		
6.85	22.5	285.41	2.06	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	52	1.07	288.8	20	104	43		
7.00	23.0	293.16	2.05	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	53	1.06	294.5	20	104	43		
7.18	23.5	253.37	2.03	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	46	1.06	252.8	25	100	42		
7.33	24.0	82.48	3.68	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	33	1.05		55			4.79	>10
7.48	24.5	62.75	2.01	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	14	1.04	61.7	50	58	36		
7.63	25.0	94.67	1.36	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	17	1.03	92.5	30	70	38		
7.78	25.5	128.37	1.35	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	23	1.03	124.6	25	79	39		
7.93	26.0	119.98	1.67	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	27	1.02	115.7	30	77	39		
8.08	26.5	134.07	1.87	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	30	1.01	128.5	30	80	39		
8.23	27.0	184.32	2.31	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	41	1.01	175.5	30	89	40		
8.38	27.5	67.02	3.78	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	27	1.00		65			3.88	>10
8.53	28.0	81.94	2.45	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	23	0.99	77.0	50	65	37		
8.68	28.5	146.69	1.24	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	27	0.99	137.0	25	82	39		
8.85	29.0	107.14	2.08	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	24	0.98	99.5	40	72	38		
9.00	29.5	103.05	1.81	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	23	0.98	95.1	40	71	38		
9.15	30.0	97.07	2.54	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	22	0.97	89.1	45	69	38		

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California   Project No: LE06217   Date: 06/14/06

CONE SOUNDING: CPT-3

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
9.30	30.5	149.65	1.37	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	27	0.97	136.7	25	82	39		
9.45	31.0	124.15	1.65	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	23	0.96	112.6	35	76	39		
9.60	31.5	42.79	4.96	4	4	Silty Clay to Clay	CL	hard	125	1.8	24	0.95		90			2.45	>10
9.75	32.0	20.11	5.35	3	3	Clay	CL/CH	very stiff	125	1.3	16	0.95		100			1.11	5.65
9.90	32.5	20.58	5.54	3	3	Clay	CL/CH	very stiff	125	1.3	16	0.94		100			1.14	5.76
10.05	33.0	20.25	5.78	3	3	Clay	CL/CH	very stiff	125	1.3	16	0.93		100			1.12	5.53
10.20	33.5	55.90	2.19	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	16	0.93	49.1	60	51	35		
10.38	34.0	40.27	2.89	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	12	0.92	35.2	80	42	34		
10.53	34.5	19.09	5.63	3	3	Clay	CL/CH	very stiff	125	1.3	15	0.92		100			1.05	4.68
10.68	35.0	50.35	1.66	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	11	0.91	43.5	55	48	35		
10.83	35.5	19.02	3.41	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.91		100			1.04	8.14
10.98	36.0	12.20	3.52	4	4	Silty Clay to Clay	CL	stiff	125	1.8	7	0.90		100			0.64	2.91
11.13	36.5	19.42	3.93	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	0.90		100			1.06	5.88
11.28	37.0	30.70	3.14	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	0.89		95			1.73	>10
11.43	37.5	31.27	3.65	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.89		100			1.76	>10
11.58	38.0	17.15	3.83	4	4	Silty Clay to Clay	CL	stiff	125	1.8	10	0.88		100			0.93	4.47
11.73	38.5	18.69	3.27	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.88		100			1.03	7.00
11.88	39.0	18.42	3.86	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	0.87		100			1.00	4.89
12.05	39.5	36.20	4.79	4	4	Silty Clay to Clay	CL	hard	125	1.8	21	0.87		100			2.05	>10
12.20	40.0	75.52	1.81	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	17	0.86	61.7	50	58	36		
12.35	40.5	49.85	2.31	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	14	0.86	40.5	70	46	34		
12.50	41.0	33.55	3.87	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.86		100			1.89	>10
12.65	41.5	53.00	1.78	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	12	0.85	42.7	60	47	35		
12.80	42.0	61.06	2.07	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	14	0.85	49.0	60	51	35		
12.95	42.5	55.68	2.09	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	16	0.84	44.4	65	49	35		
13.10	43.0	47.89	2.18	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	14	0.84	38.1	70	44	34		
13.25	43.5	16.74	3.29	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	0.84		100			0.90	4.89
13.40	44.0	15.67	4.54	3	3	Clay	CL/CH	stiff	125	1.3	13	0.83		100			0.83	2.65
13.58	44.5	12.82	3.78	4	4	Silty Clay to Clay	CL	stiff	125	1.8	7	0.83		100			0.66	2.41
13.73	45.0	9.41	4.64	3	3	Clay	CL/CH	firm	125	1.3	8	0.82		100			0.46	1.20
13.88	45.5	14.60	2.84	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.82		100			0.77	3.66
14.03	46.0	12.82	2.73	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	5	0.82		100			0.66	3.07
14.18	46.5	27.16	2.85	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	0.81		100			1.50	>10
14.33	47.0	29.14	3.17	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	0.81		100			1.62	>10
14.48	47.5	34.66	1.71	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	10	0.81	26.6	80	33	33		
14.63	48.0	16.85	2.06	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.6	7	0.80		100			0.89	4.28
14.78	48.5	13.07	1.86	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	5	0.80		100			0.67	2.91
14.93	49.0	16.11	3.13	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.80		100			0.85	3.91
15.10	49.5	18.69	4.11	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	0.79		100			1.00	3.66
15.25	50.0	33.12	3.29	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.79		100			1.85	>10

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, California
LOCATION: See Site and Boring Location Plan

CONE PENETROMETER: HOLGUIN, FAHAN & ASSC. Truck Mounted Electric Cone with 23 ton reaction weight
DATE: 06/14/06

LOG OF CONE SOUNDING DATA CPT-4

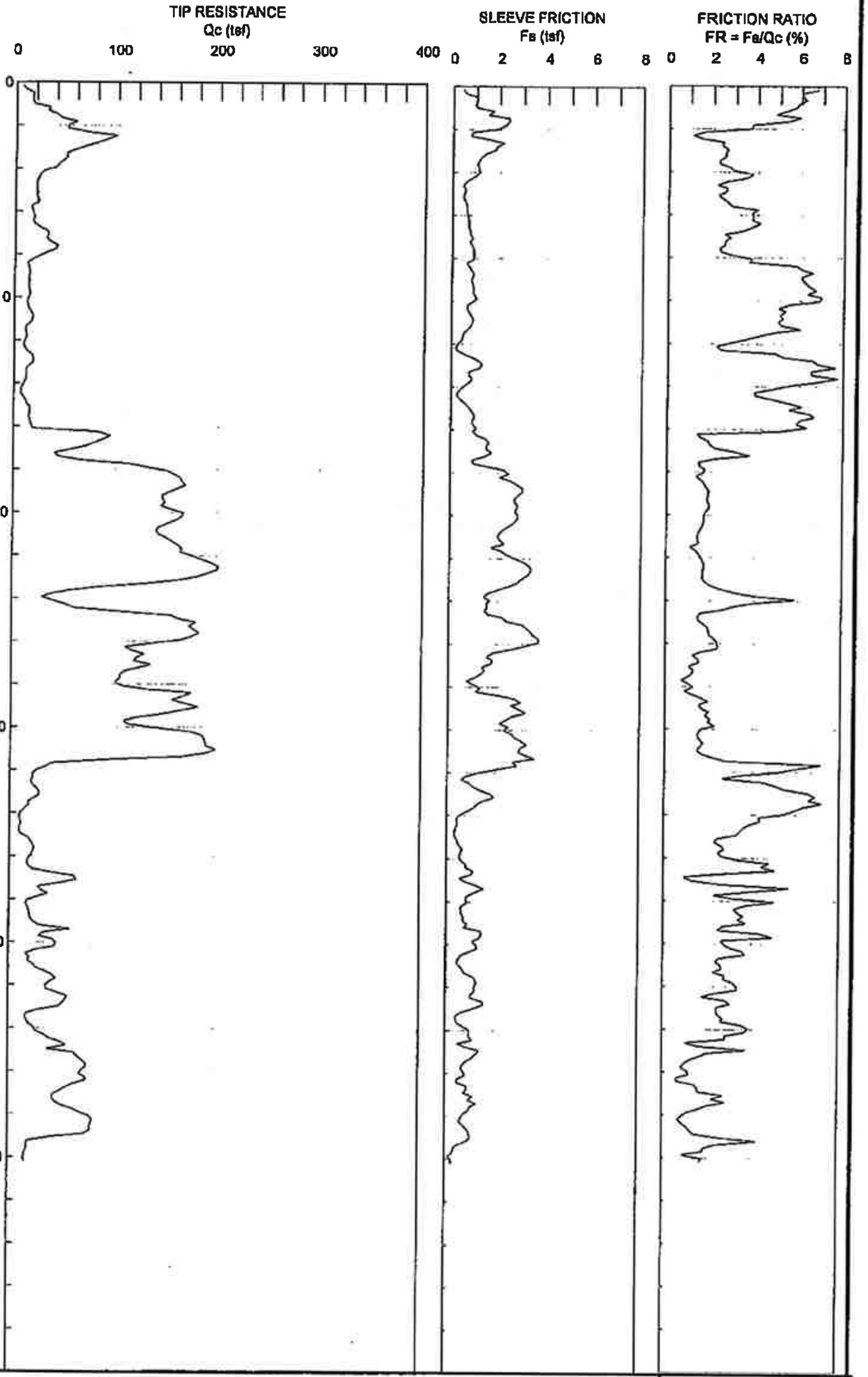
DEPTH (FEET)

INTERPRETED SOIL PROFILE
From Robertson & Campanella (1989)

GROUND EL. +/-

Clay	CL/CH	stiff
Silty Clay to Clay	CL	hard
Silty Sand to Sandy Silt	SM/ML	very dense
Sandy Silt to Clayey Silt	ML	dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Clay	CL/CH	stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	firm
Clay	" "	stiff
Silty Sand to Sandy Silt	SM/ML	medium dense
Silty Sand to Sandy Silt	" "	dense
Sand to Silty Sand	SP/SM	dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	very dense
Sandy Silt to Clayey Silt	ML	medium dense
Silty Sand to Sandy Silt	SM/ML	dense
Sand to Silty Sand	SP/SM	dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	dense
Silty Sand to Sandy Silt	SM/ML	dense
Sand to Silty Sand	SP/SM	dense
Clayey Silt to Silty Clay	ML/CL	hard
Clay	CL/CH	very stiff
Clay	" "	very stiff
Clay	" "	firm
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	hard
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	loose
Sandy Silt to Clayey Silt	" "	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Sandy Silt to Clayey Silt	ML	loose
Silty Sand to Sandy Silt	SM/ML	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Clayey Silt to Silty Clay	ML/CL	stiff

End of Sounding @ 50.0 ft.



Project No:
LE06217

LANDMARK
Geo-Engineers and Geologists
a DBE/MBE/SBE Company

Plate
B-4

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California   Project No: LE06217   Date: 06/14/06

CONE SOUNDING: CPT-4

Est. GWT (ft): 9.0   Phi Correlation: 0   0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
0.15	0.5	10.70	6.25	3	3	Clay	CL/CH	stiff	125	1.3	9	2.00		100			0.63	>10
0.30	1.0	16.48	5.92	3	3	Clay	CL/CH	stiff	125	1.3	13	2.00		95			0.97	>10
0.46	1.5	34.46	5.33	3	3	Clay	CL/CH	hard	125	1.3	28	2.00		70			2.02	>10
0.60	2.0	51.32	4.26	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	21	2.00		55			3.01	>10
0.75	2.5	72.65	1.44	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	16	2.00	137.3	25	91	41		
0.93	3.0	78.77	2.45	6	6	Sandy Silt to Clayey Silt	ML	very dense	115	3.5	23	2.00	148.9	35	91	41		
1.08	3.5	52.00	2.42	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	15	2.00	98.3	40	76	39		
1.23	4.0	42.43	2.61	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	12	2.00	80.2	45	68	38		
1.38	4.5	24.34	3.28	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	2.00		65			1.42	>10
1.53	5.0	20.57	2.42	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	1.93		65			1.19	>10
1.68	5.5	21.41	2.50	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	1.84		65			1.24	>10
1.83	6.0	16.67	3.83	4	4	Silty Clay to Clay	CL	stiff	125	1.8	10	1.75		80			0.96	>10
1.98	6.5	18.52	3.87	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	1.68		80			1.07	>10
2.13	7.0	28.79	2.88	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.61		60			1.67	>10
2.28	7.5	34.98	2.43	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	10	1.56	51.5	50	53	35		
2.45	8.0	32.43	2.98	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	1.51		55			1.88	>10
2.60	8.5	14.68	5.15	3	3	Clay	CL/CH	stiff	125	1.3	12	1.46		95			0.83	>10
2.75	9.0	14.25	6.23	3	3	Clay	CL/CH	stiff	125	1.3	11	1.42		100			0.81	>10
2.90	9.5	14.02	6.46	3	3	Clay	CL/CH	stiff	125	1.3	11	1.40		100			0.79	>10
3.05	10.0	14.67	6.71	3	3	Clay	CL/CH	stiff	125	1.3	12	1.38		100			0.83	>10
3.20	10.5	13.13	5.26	3	3	Clay	CL/CH	stiff	125	1.3	11	1.36		100			0.74	9.59
3.35	11.0	17.42	5.07	3	3	Clay	CL/CH	stiff	125	1.3	14	1.34		95			0.99	>10
3.50	11.5	12.60	5.27	3	3	Clay	CL/CH	stiff	125	1.3	10	1.32		100			0.71	8.00
3.65	12.0	11.29	3.45	4	4	Silty Clay to Clay	CL	stiff	125	1.8	6	1.31		100			0.63	8.27
3.80	12.5	10.38	3.13	4	4	Silty Clay to Clay	CL	stiff	125	1.8	6	1.29		100			0.57	6.76
3.95	13.0	18.33	6.21	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.27		100			1.04	>10
4.13	13.5	13.01	6.88	3	3	Clay	CL/CH	stiff	125	1.3	10	1.26		100			0.73	7.00
4.28	14.0	10.97	6.69	3	3	Clay	CL/CH	stiff	125	1.3	9	1.24		100			0.61	5.10
4.43	14.5	7.03	4.23	3	3	Clay	CL/CH	firm	125	1.3	6	1.23		100			0.37	2.57
4.58	15.0	10.75	5.40	3	3	Clay	CL/CH	stiff	125	1.3	9	1.22		100			0.59	4.57
4.73	15.5	15.34	6.18	3	3	Clay	CL/CH	stiff	125	1.3	12	1.20		100			0.86	8.14
4.88	16.0	16.65	5.82	3	3	Clay	CL/CH	stiff	125	1.3	13	1.19		100			0.94	9.00
5.03	16.5	87.73	1.59	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	19	1.18	97.8	30	72	38		
5.18	17.0	69.05	2.39	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	20	1.17	76.3	45	65	37		
5.33	17.5	49.71	2.44	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	14	1.16	54.5	55	55	36		
5.48	18.0	131.66	1.62	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	24	1.15	143.1	25	83	40		
5.65	18.5	161.80	1.53	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	29	1.14	174.5	20	89	40		
5.80	19.0	160.67	1.86	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	36	1.13	171.9	25	88	40		
5.95	19.5	146.79	1.87	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	33	1.12	155.8	25	86	40		
6.10	20.0	155.54	1.80	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	28	1.11	163.8	25	87	40		
6.25	20.5	158.09	1.67	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	29	1.11	165.2	25	87	40		
6.40	21.0	141.49	1.48	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	26	1.10	146.7	25	84	40		
6.55	21.5	155.62	1.32	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	28	1.09	160.2	20	86	40		
6.70	22.0	168.09	1.45	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	31	1.08	171.8	20	88	40		
6.85	22.5	193.29	1.68	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	35	1.07	196.1	20	92	41		
7.00	23.0	191.63	1.67	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	35	1.07	193.1	25	92	41		
7.18	23.5	126.37	2.04	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	28	1.06	126.4	35	79	39		
7.33	24.0	40.05	4.29	4	4	Silty Clay to Clay	CL	hard	125	1.8	23	1.05		60			2.30	>10
7.48	24.5	51.21	3.17	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	15	1.04	50.5	65	52	35		
7.63	25.0	141.36	1.50	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	26	1.04	138.4	25	82	39		
7.78	25.5	176.84	1.84	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	32	1.03	172.0	25	88	40		
7.93	26.0	174.71	2.11	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	39	1.02	168.8	30	88	40		
8.08	26.5	123.47	1.87	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	27	1.02	118.5	35	77	39		
8.23	27.0	125.79	1.35	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	23	1.01	120.0	25	78	39		
8.38	27.5	112.66	1.18	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	20	1.00	106.8	25	74	38		
8.53	28.0	104.74	1.02	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	19	1.00	98.7	25	72	38		
8.68	28.5	159.12	1.24	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	29	0.99	149.0	25	84	40		
8.85	29.0	169.92	1.70	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	31	0.98	158.1	25	86	40		
9.00	29.5	145.06	1.93	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	32	0.98	134.2	30	81	39		
9.15	30.0	121.51	1.95	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	27	0.97	111.7	35	76	39		

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-4

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
9.30	30.5	183.81	1.54	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	33	0.97	168.0	25	88	40		
9.45	31.0	193.72	1.60	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	35	0.96	176.1	25	89	40		
9.60	31.5	153.10	2.19	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	34	0.96	138.4	35	82	39		
9.75	32.0	33.45	6.14	3	3	Clay	CL/CH	very stiff	125	1.3	27	0.95		100			1.90	>10
9.90	32.5	21.77	3.52	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	0.94		100			1.21	>10
10.05	33.0	24.99	5.68	3	3	Clay	CL/CH	very stiff	125	1.3	20	0.94		100			1.40	8.00
10.20	33.5	23.13	6.87	3	3	Clay	CL/CH	very stiff	125	1.3	19	0.93		100			1.29	6.76
10.38	34.0	14.20	5.90	3	3	Clay	CL/CH	stiff	125	1.3	11	0.93		100			0.76	3.14
10.53	34.5	9.89	4.18	3	3	Clay	CL/CH	stiff	125	1.3	8	0.92		100			0.51	1.77
10.68	35.0	9.60	3.43	4	4	Silty Clay to Clay	CL	firm	125	1.8	5	0.91		100			0.49	2.13
10.83	35.5	20.16	2.42	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.91		100			1.11	9.00
10.98	36.0	22.64	2.58	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	0.90		100			1.26	>10
11.13	36.5	19.13	4.39	3	3	Clay	CL/CH	very stiff	125	1.3	15	0.90		100			1.05	4.37
11.28	37.0	56.40	1.55	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	13	0.89	47.7	55	51	35		
11.43	37.5	35.94	4.07	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	14	0.89		95			2.04	>10
11.58	38.0	27.02	3.49	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	0.88		100			1.51	>10
11.73	38.5	18.17	3.43	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	0.88		100			0.99	6.65
11.88	39.0	21.55	3.58	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	0.88		100			1.19	8.85
12.05	39.5	40.54	3.16	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	16	0.87		85			2.30	>10
12.20	40.0	39.15	3.44	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	16	0.87		90			2.22	>10
12.35	40.5	28.86	3.42	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	0.86		100			1.61	>10
12.50	41.0	20.62	2.49	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.86		100			1.13	7.56
12.65	41.5	34.58	2.55	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	10	0.85	27.9	85	35	33		
12.80	42.0	40.43	3.08	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	16	0.85		85			2.29	>10
12.95	42.5	46.78	2.47	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	0.85	37.4	75	43	34		
13.10	43.0	51.82	2.75	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	15	0.84	41.2	75	46	34		
13.25	43.5	20.67	2.53	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.84		100			1.13	7.00
13.40	44.0	21.05	3.33	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.83		100			1.15	7.13
13.58	44.5	33.62	3.14	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.83		95			1.88	>10
13.73	45.0	48.05	2.13	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	14	0.83	37.5	70	44	34		
13.88	45.5	67.16	1.64	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	15	0.82	52.2	55	53	35		
14.03	46.0	74.08	0.98	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	13	0.82	57.4	40	56	36		
14.18	46.5	73.12	0.85	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	13	0.82	56.4	40	56	36		
14.33	47.0	52.37	1.84	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	12	0.81	40.2	65	46	34		
14.48	47.5	46.95	2.36	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	0.81	35.9	75	42	34		
14.63	48.0	70.37	1.19	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	16	0.81	53.6	50	54	36		
14.78	48.5	80.85	0.92	8	8	Sand to Silty Sand	SP/SM	medium dense	115	5.5	15	0.80	61.4	40	58	36		
14.93	49.0	65.23	1.72	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	14	0.80	49.3	60	52	35		
15.10	49.5	18.98	2.85	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.80		100			1.02	5.10
15.25	50.0	16.09	1.52	6	6	Sandy Silt to Clayey Silt	ML	very loose	115	3.5	5	0.79	12.1	100	10	29		

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, California
LOCATION: See Site and Boring Location Plan

CONE PENETROMETER: HOLGUIN, FAHAN & ASSC. Truck Mounted Electric Cone with 23 ton reaction weight
DATE: 06/14/06

LOG OF CONE SOUNDING DATA CPT-5

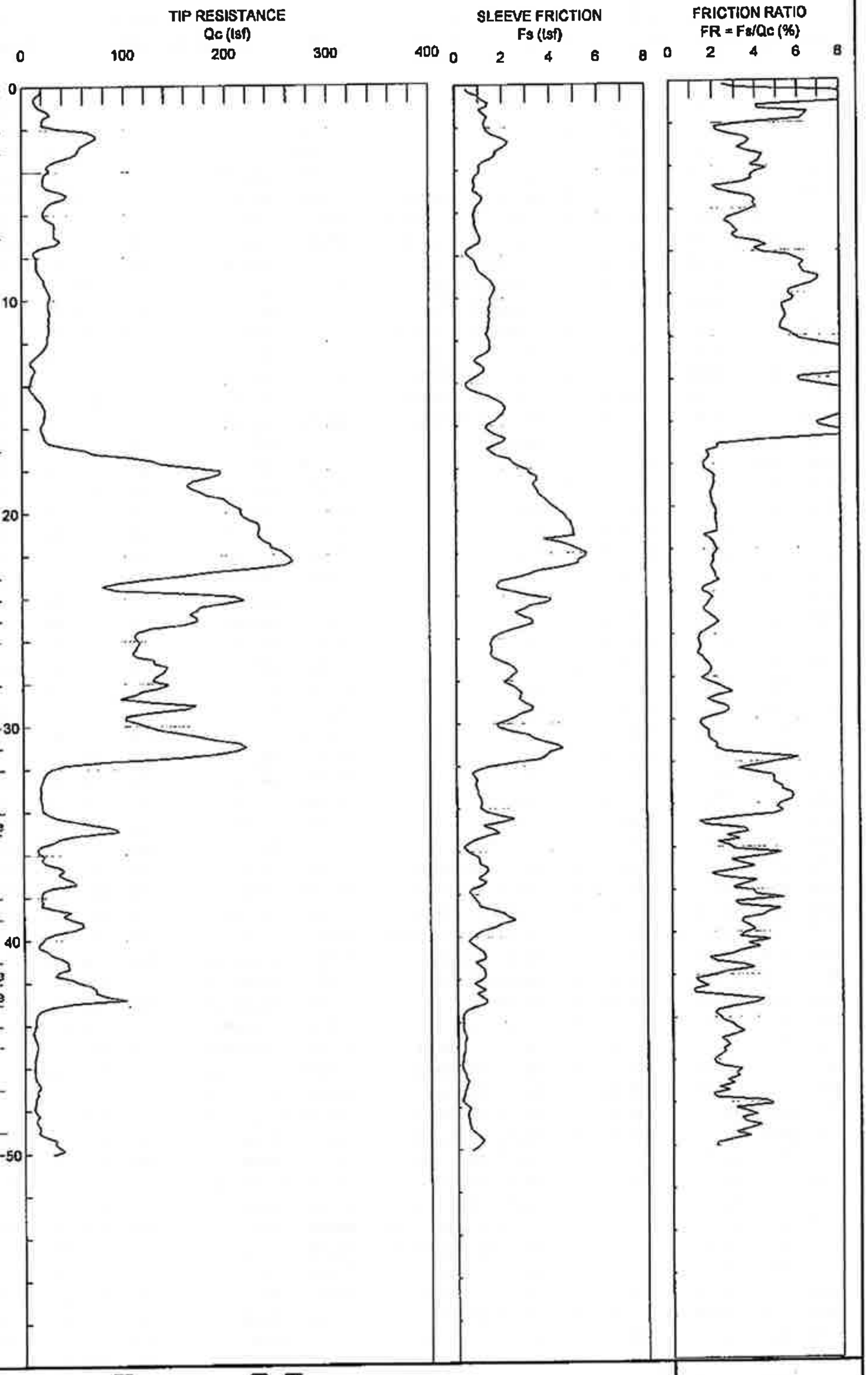
DEPTH (FEET)

INTERPRETED SOIL PROFILE
From Robertson & Campanella (1989)

GROUND EL. +/-

Clay	CL/CH	stiff
Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	dense
Clayey Silt to Silty Clay	ML/CL	hard
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	very stiff
Clay	" "	very stiff
Sand to Silty Sand	SP/SM	dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Silty Sand to Sandy Silt	SM/ML	dense
Sand to Silty Sand	SP/SM	dense
Silty Sand to Sandy Silt	SM/ML	dense
Sand to Silty Sand	SP/SM	dense
Sand to Silty Sand	" "	dense
Silty Sand to Sandy Silt	SM/ML	dense
Silty Sand to Sandy Silt	" "	dense
Sand to Silty Sand	SP/SM	dense
Sandy Silt to Clayey Silt	ML	dense
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	stiff
Sandy Silt to Clayey Silt	ML	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Silty Clay to Clay	CL	very stiff
Clayey Silt to Silty Clay	ML/CL	hard
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Clayey Silt to Silty Clay	ML/CL	stiff
Silty Clay to Clay	CL	stiff
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	stiff
Silty Clay to Clay	CL	stiff
Silty Clay to Clay	" "	stiff
Clayey Silt to Silty Clay	ML/CL	very stiff

End of Sounding @ 50.0 ft.



Project No:
LE06217

LANDMARK
Geo-Engineers and Geologists
a DBE/MBE/SBE Company

Plate
B-5

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-5

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
0.15	0.5	16.67	4.39	3	3	Clay	CL/CH	stiff	125	1.3	13	2.00		85			0.98	>10
0.30	1.0	14.01	9.32	3	3	Clay	CL/CH	stiff	125	1.3	11	2.00		100			0.82	>10
0.45	1.5	24.92	4.90	3	3	Clay	CL/CH	very stiff	125	1.3	20	2.00		75			1.46	>10
0.60	2.0	25.58	5.34	3	3	Clay	CL/CH	very stiff	125	1.3	20	2.00		80			1.50	>10
0.75	2.5	69.44	2.31	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	15	2.00	131.3	35	90	41		
0.93	3.0	59.67	3.57	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	24	2.00		45			3.50	>10
1.08	3.5	45.88	3.68	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	18	2.00		55			2.69	>10
1.23	4.0	26.61	4.04	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	15	2.00		70			1.55	>10
1.38	4.5	21.72	4.08	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	12	2.00		75			1.26	>10
1.53	5.0	27.99	3.06	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	1.91		60			1.63	>10
1.68	5.5	35.27	3.20	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	14	1.81		55			2.06	>10
1.83	6.0	21.74	3.85	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	12	1.73		75			1.26	>10
1.98	6.5	29.86	2.81	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.66		55			1.73	>10
2.13	7.0	32.22	2.99	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	1.60		55			1.87	>10
2.28	7.5	29.93	3.34	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	1.55		60			1.73	>10
2.45	8.0	12.47	4.28	3	3	Clay	CL/CH	stiff	125	1.3	10	1.50		95			0.71	>10
2.60	8.5	14.69	5.95	3	3	Clay	CL/CH	stiff	125	1.3	12	1.45		100			0.83	>10
2.75	9.0	18.90	6.19	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.41		95			1.08	>10
2.90	9.5	23.60	6.87	3	3	Clay	CL/CH	very stiff	125	1.3	19	1.39		95			1.36	>10
3.05	10.0	27.30	5.76	3	3	Clay	CL/CH	very stiff	125	1.3	22	1.37		85			1.57	>10
3.20	10.5	26.44	5.59	3	3	Clay	CL/CH	very stiff	125	1.3	21	1.35		85			1.52	>10
3.35	11.0	27.23	5.36	3	3	Clay	CL/CH	very stiff	125	1.3	22	1.33		85			1.57	>10
3.50	11.5	26.95	5.27	3	3	Clay	CL/CH	very stiff	125	1.3	22	1.31		85			1.55	>10
3.65	12.0	25.39	5.51	3	3	Clay	CL/CH	very stiff	125	1.3	20	1.30		90			1.46	>10
3.80	12.5	21.30	6.93	3	3	Clay	CL/CH	very stiff	125	1.3	17	1.28		100			1.21	>10
3.95	13.0	10.50	9.41	3	3	Clay	CL/CH	stiff	126	1.3	8	1.27		100			0.58	5.10
4.13	13.5	11.66	10.01	3	3	Clay	CL/CH	stiff	125	1.3	9	1.25		100			0.65	5.76
4.28	14.0	8.83	8.09	3	3	Clay	CL/CH	firm	125	1.3	7	1.24		100			0.48	3.58
4.43	14.5	9.50	6.96	3	3	Clay	CL/CH	stiff	125	1.3	8	1.22		100			0.52	3.91
4.58	15.0	18.05	9.50	3	3	Clay	CL/CH	very stiff	125	1.3	14	1.21		100			1.02	>10
4.73	15.5	22.62	9.06	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.20		100			1.29	>10
4.88	16.0	20.21	7.64	3	3	Clay	CL/CH	very stiff	125	1.3	16	1.18		100			1.14	>10
5.03	16.5	21.70	8.05	3	3	Clay	CL/CH	very stiff	125	1.3	17	1.17		100			1.23	>10
5.18	17.0	43.48	4.58	4	4	Silty Clay to Clay	CL	hard	126	1.8	25	1.16		75			2.51	>10
5.33	17.5	101.07	1.88	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	22	1.15	109.8	30	75	39		
5.48	18.0	167.37	1.62	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	30	1.14	180.4	20	90	41		
5.65	18.5	181.29	1.84	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	33	1.13	193.8	25	92	41		
5.80	19.0	167.57	2.00	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	37	1.12	177.8	25	89	41		
5.95	19.5	194.18	1.89	8	8	Sand to Silty Sand	SP/SM	very dense	116	5.5	35	1.11	204.4	25	94	41		
6.10	20.0	212.54	1.97	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	39	1.11	222.0	25	96	41		
6.25	20.5	223.71	2.09	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	41	1.10	231.9	25	97	42		
6.40	21.0	232.41	2.11	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	42	1.09	239.2	25	98	42		
6.55	21.5	237.87	1.85	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	43	1.08	243.0	20	99	42		
6.70	22.0	252.82	2.05	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	46	1.07	256.4	20	100	42		
6.85	22.5	262.47	2.00	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	48	1.07	264.3	20	101	42		
7.00	23.0	191.07	1.93	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	35	1.06	191.1	25	92	41		
7.18	23.5	97.56	2.11	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	22	1.05	96.9	40	72	38		
7.33	24.0	154.66	1.61	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	28	1.04	152.6	25	85	40		
7.48	24.5	197.10	1.85	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	36	1.04	193.1	25	92	41		
7.63	25.0	169.19	1.60	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	31	1.03	164.7	25	87	40		
7.78	25.5	151.94	2.04	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	34	1.02	146.9	30	84	40		
7.93	26.0	111.70	1.71	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	25	1.02	107.3	35	75	38		
8.08	26.5	111.71	1.33	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	20	1.01	106.6	30	74	38		
8.23	27.0	123.71	1.34	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	22	1.00	117.4	30	77	39		
8.38	27.5	139.76	1.73	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	25	1.00	131.8	30	81	39		
8.53	28.0	134.01	1.65	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	24	0.99	125.6	30	79	39		
8.68	28.5	120.76	2.15	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	27	0.99	112.5	35	76	39		
8.85	29.0	129.60	2.23	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	29	0.98	120.0	36	78	39		
9.00	29.5	129.19	2.40	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	29	0.97	118.9	40	78	39		
9.15	30.0	112.01	1.90	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	25	0.97	102.5	35	73	38		

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-5

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
9.30	30.5	154.59	1.52	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	28	0.98	140.6	25	83	40		
9.45	31.0	207.45	1.79	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	38	0.96	187.6	25	91	41		
9.60	31.5	185.55	2.21	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	41	0.95	166.9	30	88	40		
9.75	32.0	50.80	5.03	4	4	Silty Clay to Clay	CL	hard	125	1.8	29	0.95		85			2.92	>10
9.90	32.5	21.28	3.67	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	12	0.94		100			1.18	8.00
10.05	33.0	17.47	4.77	3	3	Clay	CL/CH	stiff	125	1.3	14	0.93		100			0.96	4.28
10.20	33.5	17.42	5.33	3	3	Clay	CL/CH	stiff	125	1.3	14	0.93		100			0.95	4.18
10.38	34.0	18.97	5.47	3	3	Clay	CL/CH	very stiff	125	1.3	15	0.92		100			1.04	4.68
10.53	34.5	36.13	4.99	3	3	Clay	CL/CH	hard	125	1.3	29	0.92		100			2.05	>10
10.68	35.0	83.19	1.90	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	18	0.91	71.6	45	63	37		
10.83	35.5	39.06	3.16	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	16	0.91		85			2.22	>10
10.98	36.0	15.25	2.66	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.90		100			0.82	5.42
11.13	36.5	23.97	3.77	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	14	0.90		100			1.33	8.27
11.28	37.0	38.01	3.32	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	15	0.89		85			2.16	>10
11.43	37.5	42.50	2.72	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	12	0.89	35.6	75	42	34		
11.58	38.0	17.85	3.33	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	0.88		100			0.97	6.54
11.73	38.5	22.70	4.04	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	13	0.88		100			1.25	7.00
11.88	39.0	43.94	4.24	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	18	0.87		90			2.50	>10
12.05	39.5	55.00	3.60	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	22	0.87		75			3.15	>10
12.20	40.0	23.38	3.65	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	0.86		100			1.29	>10
12.35	40.5	17.73	3.76	4	4	Silty Clay to Clay	CL	stiff	125	1.8	10	0.86		100			0.96	4.28
12.50	41.0	35.19	3.37	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	14	0.85		95			1.98	>10
12.65	41.5	41.04	2.34	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	12	0.85	33.0	75	40	34		
12.80	42.0	43.42	2.79	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	12	0.85	34.7	80	41	34		
12.95	42.5	69.17	1.35	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	15	0.84	55.1	50	55	36		
13.10	43.0	76.28	1.56	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	17	0.84	60.5	50	58	36		
13.25	43.5	18.75	3.69	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	0.83		100			1.01	4.28
13.40	44.0	11.24	2.09	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	4	0.83		100			0.57	2.57
13.58	44.5	9.47	2.71	4	4	Silty Clay to Clay	CL	firm	125	1.8	5	0.83		100			0.47	1.50
13.73	45.0	11.77	2.84	4	4	Silty Clay to Clay	CL	stiff	125	1.8	7	0.82		100			0.60	2.06
13.88	45.5	11.81	2.50	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	5	0.82		100			0.60	2.73
14.03	46.0	10.11	2.19	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	4	0.81		100			0.50	2.06
14.18	46.5	10.26	2.49	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	4	0.81		100			0.51	2.13
14.33	47.0	13.67	2.87	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	5	0.81		100			0.71	3.21
14.48	47.5	11.74	2.21	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	5	0.80		100			0.59	2.49
14.63	48.0	10.25	3.71	3	3	Clay	CL/CH	stiff	125	1.3	8	0.80		100			0.51	1.25
14.78	48.5	12.75	3.46	4	4	Silty Clay to Clay	CL	stiff	125	1.8	7	0.80		100			0.65	2.13
14.93	49.0	14.71	3.60	4	4	Silty Clay to Clay	CL	stiff	125	1.8	8	0.79		100			0.77	2.57
15.10	49.5	27.48	3.38	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	0.79		100			1.52	9.59
15.25	50.0	33.65	2.31	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	10	0.79	25.0	80	32	32		

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, California
LOCATION: See Site and Boring Location Plan

CONE PENETROMETER: HOLGUIN, FAHAN & ASSC. Truck Mounted Electric Cone with 23 ton reaction weight
DATE: 06/14/06

LOG OF CONE SOUNDING DATA CPT-6

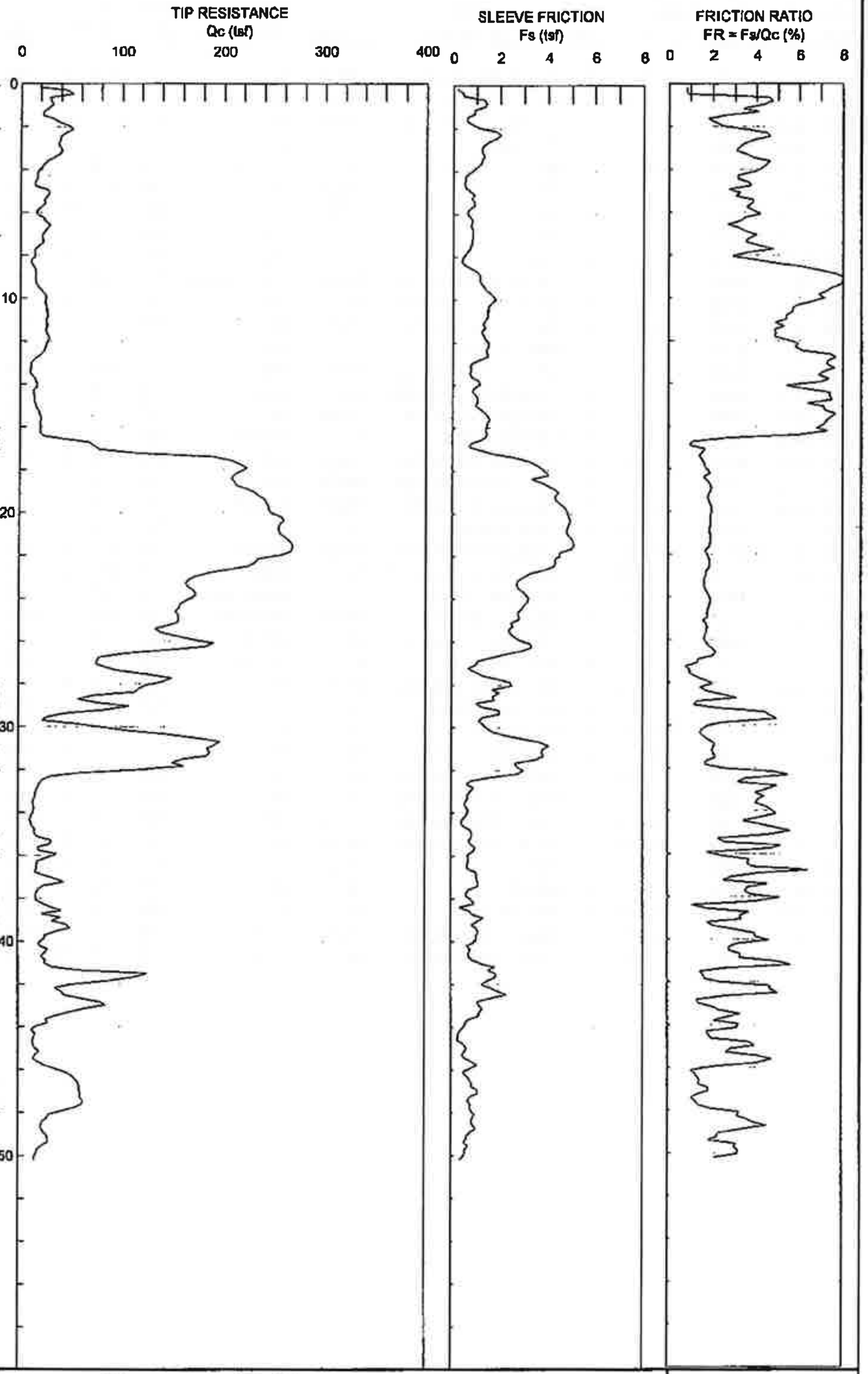
DEPTH (FEET)

INTERPRETED SOIL PROFILE
From Robertson & Campanella (1989)

GROUND EL. +/-

Sandy Silt to Clayey Silt	ML	very dense
Sandy Silt to Clayey Silt	" "	dense
Clayey Silt to Silty Clay	ML/CL	hard
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Sand to Silty Sand	SP/SM	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Clayey Silt to Silty Clay	ML/CL	hard
Sand to Silty Sand	SP/SM	dense
Silty Sand to Sandy Silt	SM/ML	dense
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	stiff
Clay	" "	stiff
Clayey Silt to Silty Clay	ML/CL	very stiff
Silty Clay to Clay	CL	very stiff
Silty Clay to Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	loose
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Sandy Silt to Clayey Silt	" "	medium dense
Sandy Silt to Clayey Silt	" "	loose
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	very stiff
Silty Sand to Sandy Silt	SM/ML	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff

End of Sounding @ 50.0 ft.



Project No:
LE06217

LANDMARK
Geo-Engineers and Geologists
a DBE/MBE/SBE Company

Plate
B-6

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-6

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Nk: 17.0

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Phi (deg.)	Su (tsf)	OCR
0.15	0.5	38.41	0.86	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	9	2.00	72.6	30	106	43		
0.30	1.0	30.24	4.53	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	17	2.00		70			1.78	>10
0.45	1.5	23.84	3.35	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	2.00		65			1.40	>10
0.60	2.0	39.25	2.08	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	11	2.00	74.2	45	77	39		
0.75	2.5	44.87	4.20	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	18	2.00		55			2.63	>10
0.93	3.0	38.25	3.50	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	15	2.00		55			2.24	>10
1.08	3.5	37.04	3.46	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	15	2.00		55			2.17	>10
1.23	4.0	23.16	4.44	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	13	2.00		75			1.35	>10
1.38	4.5	16.58	3.37	4	4	Silty Clay to Clay	CL	stiff	125	1.8	9	2.00		80			0.96	>10
1.53	5.0	18.32	3.35	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	7	1.92		75			1.06	>10
1.68	5.5	25.60	3.47	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	1.83		65			1.49	>10
1.83	6.0	17.53	3.85	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	10	1.75		80			1.01	>10
1.98	6.5	25.72	3.12	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	1.67		65			1.49	>10
2.13	7.0	23.97	3.55	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	1.61		70			1.39	>10
2.28	7.5	20.88	3.73	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	12	1.55		75			1.20	>10
2.45	8.0	14.24	3.74	4	4	Silty Clay to Clay	CL	stiff	125	1.8	8	1.50		85			0.81	>10
2.60	8.5	11.37	4.89	3	3	Clay	CL/CH	stiff	125	1.3	9	1.45		100			0.64	9.39
2.75	9.0	15.04	7.49	3	3	Clay	CL/CH	stiff	125	1.3	12	1.41		100			0.85	>10
2.90	9.5	16.78	7.86	3	3	Clay	CL/CH	stiff	125	1.3	13	1.39		100			0.95	>10
3.05	10.0	24.36	7.09	3	3	Clay	CL/CH	very stiff	125	1.3	19	1.37		95			1.40	>10
3.20	10.5	25.78	6.04	3	3	Clay	CL/CH	very stiff	125	1.3	21	1.35		90			1.48	>10
3.35	11.0	26.61	5.48	3	3	Clay	CL/CH	very stiff	125	1.3	21	1.33		85			1.53	>10
3.50	11.5	26.13	4.99	3	3	Clay	CL/CH	very stiff	125	1.3	21	1.32		85			1.50	>10
3.65	12.0	27.91	5.08	3	3	Clay	CL/CH	very stiff	125	1.3	22	1.30		85			1.60	>10
3.80	12.5	25.23	5.94	3	3	Clay	CL/CH	very stiff	125	1.3	20	1.28		90			1.45	>10
3.95	13.0	15.54	7.46	3	3	Clay	CL/CH	stiff	125	1.3	12	1.27		100			0.88	>10
4.13	13.5	10.21	7.35	3	3	Clay	CL/CH	stiff	125	1.3	8	1.25		100			0.56	4.68
4.28	14.0	14.68	7.07	3	3	Clay	CL/CH	stiff	125	1.3	12	1.24		100			0.82	8.27
4.43	14.5	14.55	6.38	3	3	Clay	CL/CH	stiff	125	1.3	12	1.23		100			0.81	7.85
4.58	15.0	14.58	7.11	3	3	Clay	CL/CH	stiff	125	1.3	12	1.21		100			0.82	7.56
4.73	15.5	18.57	7.32	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.20		100			1.05	>10
4.88	16.0	20.94	7.17	3	3	Clay	CL/CH	very stiff	125	1.3	17	1.19		100			1.19	>10
5.03	16.5	29.69	5.28	3	3	Clay	CL/CH	very stiff	125	1.3	24	1.17		90			1.70	>10
5.18	17.0	74.17	1.25	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	16	1.16	81.6	30	66	37		
5.33	17.5	172.05	1.52	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	31	1.15	187.7	20	91	41		
5.48	18.0	218.92	1.71	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	40	1.14	236.9	20	98	42		
5.65	18.5	209.93	1.76	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	38	1.14	225.3	20	96	42		
5.80	19.0	221.86	1.92	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	40	1.13	236.2	20	98	42		
5.95	19.5	239.18	1.84	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	43	1.12	252.7	20	100	42		
6.10	20.0	245.50	1.95	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	45	1.11	257.4	20	100	42		
6.25	20.5	257.54	1.91	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	47	1.10	268.0	20	102	42		
6.40	21.0	255.16	1.89	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	46	1.09	263.5	20	101	42		
6.55	21.5	265.22	1.91	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	48	1.08	271.9	20	102	42		
6.70	22.0	263.42	1.77	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	48	1.08	268.1	20	102	42		
6.85	22.5	230.11	1.88	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	42	1.07	232.5	20	97	42		
7.00	23.0	189.30	1.77	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	34	1.06	189.9	25	91	41		
7.18	23.5	165.39	1.66	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	30	1.05	164.8	25	87	40		
7.33	24.0	172.48	1.78	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	31	1.05	170.7	25	88	40		
7.48	24.5	159.33	1.90	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	35	1.04	156.6	30	86	40		
7.63	25.0	155.49	1.81	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	28	1.03	151.8	30	85	40		
7.78	25.5	145.38	1.71	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	26	1.03	141.0	30	83	40		
7.93	26.0	154.82	1.71	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	28	1.02	149.2	25	84	40		
8.08	26.5	155.61	1.93	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	35	1.01	149.0	30	84	40		
8.23	27.0	77.50	1.60	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	17	1.01	73.7	40	63	37		
8.38	27.5	104.94	0.94	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	19	1.00	99.2	25	72	38		
8.53	28.0	138.71	1.67	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	25	0.99	130.3	30	80	39		
8.68	28.5	102.24	1.86	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	23	0.99	95.5	40	71	38		
8.85	29.0	81.25	1.88	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	18	0.98	75.4	45	64	37		
9.00	29.5	52.96	3.80	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	21	0.98		75			3.05	>10
9.15	30.0	53.40	3.09	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	15	0.97	49.0	65	51	35		

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California   Project No: LE06217   Date: 06/14/06

CONE SOUNDING: CPT-6

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
9.30	30.5	144.23	1.57	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	26	0.96	131.5	30	81	39		
9.45	31.0	191.44	2.01	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	43	0.96	173.5	30	89	40		
9.60	31.5	178.03	2.08	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	40	0.95	160.5	30	86	40		
9.75	32.0	143.95	1.99	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	32	0.95	129.0	35	80	39		
9.90	32.5	37.45	4.62	4	4	Silty Clay to Clay	CL	hard	125	1.8	21	0.94		95			2.13	>10
10.05	33.0	18.83	4.23	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	0.94		100			1.04	6.32
10.20	33.5	15.53	4.18	3	3	Clay	CL/CH	stiff	125	1.3	12	0.93		100			0.84	3.58
10.38	34.0	14.72	4.44	3	3	Clay	CL/CH	stiff	125	1.3	12	0.92		100			0.79	3.28
10.53	34.5	11.83	4.21	3	3	Clay	CL/CH	stiff	125	1.3	9	0.92		100			0.62	2.34
10.68	35.0	14.90	4.90	3	3	Clay	CL/CH	stiff	125	1.3	12	0.91		100			0.80	3.21
10.83	35.5	27.75	3.11	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	0.91		95			1.56	>10
10.98	36.0	26.11	3.88	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	15	0.90		100			1.46	>10
11.13	36.5	21.29	3.39	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	0.90		100			1.18	9.79
11.28	37.0	26.25	4.51	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	15	0.89		100			1.47	9.79
11.43	37.5	30.12	3.57	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	12	0.89		100			1.69	>10
11.58	38.0	17.54	4.14	4	4	Silty Clay to Clay	CL	stiff	125	1.8	10	0.88		100			0.95	4.68
11.73	38.5	32.82	2.32	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	9	0.88	27.2	85	34	33		
11.88	39.0	33.09	3.47	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.87		95			1.87	>10
12.05	39.5	45.55	2.33	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	0.87	37.4	70	43	34		
12.20	40.0	24.69	4.21	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	14	0.86		100			1.37	7.70
12.35	40.5	25.75	2.91	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	0.86		100			1.43	>10
12.50	41.0	25.41	3.84	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	0.86		100			1.41	>10
12.65	41.5	73.19	3.26	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	21	0.85	58.9	65	57	36		
12.80	42.0	86.48	1.91	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	19	0.85	69.3	50	62	37		
12.95	42.5	41.92	4.81	4	4	Silty Clay to Clay	CL	hard	125	1.8	24	0.84		100			2.38	>10
13.10	43.0	76.14	1.80	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	17	0.84	60.4	50	58	36		
13.25	43.5	50.42	2.57	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	14	0.84	39.8	75	45	34		
13.40	44.0	24.72	2.65	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	0.83		100			1.36	9.59
13.58	44.5	15.21	2.27	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.83		100			0.80	4.00
13.73	45.0	15.15	3.23	4	4	Silty Clay to Clay	CL	stiff	125	1.8	9	0.82		100			0.80	3.07
13.88	45.5	17.83	3.22	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	0.82		100			0.96	5.10
14.03	46.0	27.82	3.65	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	0.82		100			1.54	>10
14.18	46.5	52.79	1.24	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	12	0.81	40.6	55	46	34		
14.33	47.0	60.52	1.65	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	13	0.81	46.3	60	50	35		
14.48	47.5	62.92	1.24	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	14	0.81	48.0	50	51	35		
14.63	48.0	44.02	2.21	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	0.80	33.4	80	40	34		
14.78	48.5	25.54	3.56	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	0.80		100			1.40	8.70
14.93	49.0	25.94	3.36	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	0.80		100			1.43	8.85
15.10	49.5	27.58	2.40	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	8	0.79	20.7	100	26	32		
15.25	50.0	18.11	3.13	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	0.79		100			0.97	4.57

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, California
LOCATION: See Site and Boring Location Plan

CONE PENETROMETER: HOLGUIN, FAHAN & ASSC. Truck Mounted Electric Cone with 23 ton reaction weight
DATE: 06/14/06

LOG OF CONE SOUNDING DATA CPT-7

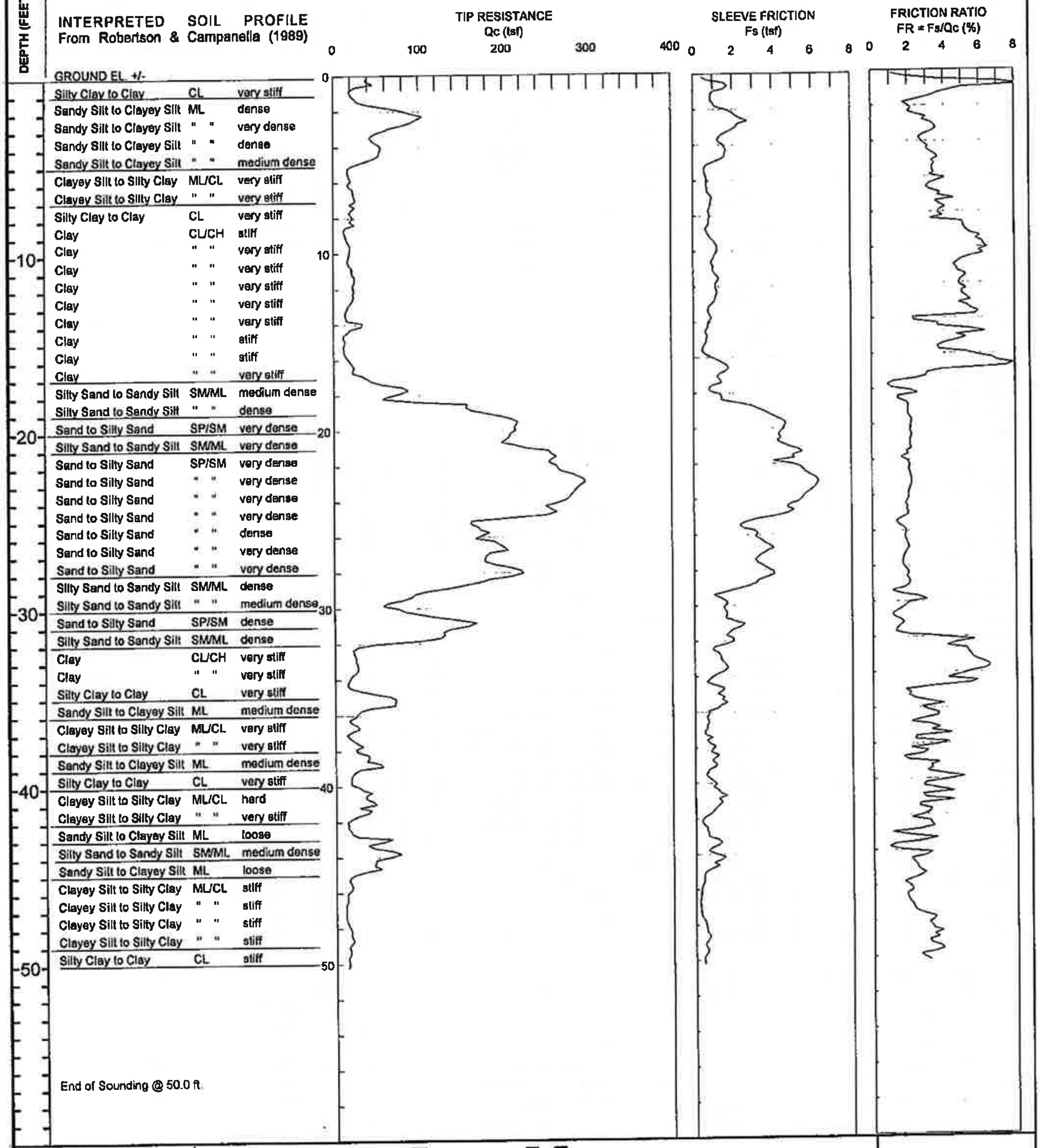
DEPTH (FEET)

INTERPRETED SOIL PROFILE
From Robertson & Campanella (1989)

GROUND EL. +/-

Silty Clay to Clay	CL	very stiff
Sandy Silt to Clayey Silt	ML	dense
Sandy Silt to Clayey Silt	" "	very dense
Sandy Silt to Clayey Silt	" "	dense
Sandy Silt to Clayey Silt	" "	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Silty Clay to Clay	CL	very stiff
Clay	CL/CH	stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	very stiff
Clay	" "	stiff
Clay	" "	stiff
Clay	" "	very stiff
Silty Sand to Sandy Silt	SM/ML	medium dense
Silty Sand to Sandy Silt	" "	dense
Sand to Silty Sand	SP/SM	very dense
Silty Sand to Sandy Silt	SM/ML	very dense
Sand to Silty Sand	SP/SM	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	dense
Sand to Silty Sand	" "	very dense
Sand to Silty Sand	" "	very dense
Silty Sand to Sandy Silt	SM/ML	dense
Silty Sand to Sandy Silt	" "	medium dense
Sand to Silty Sand	SP/SM	dense
Silty Sand to Sandy Silt	SM/ML	dense
Clay	CL/CH	very stiff
Clay	" "	very stiff
Silty Clay to Clay	CL	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Clayey Silt to Silty Clay	ML/CL	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Silty Clay to Clay	CL	very stiff
Clayey Silt to Silty Clay	ML/CL	hard
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	loose
Silty Sand to Sandy Silt	SM/ML	medium dense
Sandy Silt to Clayey Silt	ML	loose
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	stiff
Clayey Silt to Silty Clay	" "	stiff
Clayey Silt to Silty Clay	" "	stiff
Silty Clay to Clay	CL	stiff

End of Sounding @ 50.0 ft.



Project No:
LE06217

LANDMARK
Geo-Engineers and Geologists
a DBE/MBE/SBE Company

Plate
B-7

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-7

Est. GWT (ft): 9.0 Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
0.15	0.5	40.95	2.12	6	6	Sandy Silt to Clayey Silt	ML	very dense	115	3.5	12	2.00	77.4	45	108	43		
0.30	1.0	21.30	6.74	3	3	Clay	CL/CH	very stiff	125	1.3	17	2.00		90			1.25	>10
0.45	1.5	25.22	3.65	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	2.00		70			1.48	>10
0.60	2.0	61.19	2.07	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	14	2.00	115.7	35	91	41		
0.75	2.5	97.82	2.20	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	22	2.00	184.9	30	101	42		
0.93	3.0	80.03	3.03	6	6	Sandy Silt to Clayey Silt	ML	very dense	115	3.5	23	2.00	151.3	40	92	41		
1.08	3.5	48.59	3.45	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	19	2.00		50			2.85	>10
1.23	4.0	49.63	2.71	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	14	2.00	93.8	45	73	38		
1.38	4.5	54.50	2.99	6	6	Sandy Silt to Clayey Silt	ML	dense	115	3.5	16	2.00	103.0	45	74	38		
1.53	5.0	39.79	3.50	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	16	1.95		55			2.32	>10
1.68	5.5	17.92	3.38	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	7	1.85		75			1.04	>10
1.83	6.0	18.93	3.59	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	1.77		75			1.09	>10
1.98	6.5	21.44	3.27	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	1.69		70			1.24	>10
2.13	7.0	24.51	3.58	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	10	1.63		70			1.42	>10
2.28	7.5	21.66	3.97	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	12	1.57		75			1.25	>10
2.45	8.0	20.82	3.84	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	12	1.51		75			1.20	>10
2.60	8.5	19.36	4.07	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	11	1.46		80			1.11	>10
2.75	9.0	13.17	5.17	3	3	Clay	CL/CH	stiff	125	1.3	11	1.42		100			0.74	>10
2.90	9.5	16.99	5.80	3	3	Clay	CL/CH	stiff	125	1.3	14	1.40		100			0.97	>10
3.05	10.0	19.06	6.29	3	3	Clay	CL/CH	very stiff	125	1.3	15	1.38		100			1.09	>10
3.20	10.5	17.31	5.91	3	3	Clay	CL/CH	stiff	125	1.3	14	1.36		100			0.98	>10
3.35	11.0	20.31	4.77	3	3	Clay	CL/CH	very stiff	125	1.3	16	1.34		90			1.16	>10
3.50	11.5	23.44	4.91	3	3	Clay	CL/CH	very stiff	125	1.3	19	1.33		85			1.34	>10
3.65	12.0	23.17	4.98	3	3	Clay	CL/CH	very stiff	125	1.3	19	1.31		90			1.33	>10
3.80	12.5	23.30	5.05	3	3	Clay	CL/CH	very stiff	125	1.3	19	1.29		90			1.33	>10
3.95	13.0	19.59	5.27	3	3	Clay	CL/CH	very stiff	125	1.3	16	1.28		100			1.11	>10
4.13	13.5	14.54	5.23	3	3	Clay	CL/CH	stiff	125	1.3	12	1.26		100			0.82	8.70
4.28	14.0	21.57	4.84	3	3	Clay	CL/CH	very stiff	125	1.3	17	1.25		90			1.23	>10
4.43	14.5	22.80	3.21	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	9	1.23		80			1.31	>10
4.58	15.0	12.01	5.50	3	3	Clay	CL/CH	stiff	125	1.3	10	1.22		100			0.66	5.65
4.73	15.5	11.99	4.61	3	3	Clay	CL/CH	stiff	125	1.3	10	1.21		100			0.66	5.42
4.88	16.0	15.33	4.61	3	3	Clay	CL/CH	stiff	125	1.3	12	1.19		100			0.86	7.85
5.03	16.5	22.61	7.20	3	3	Clay	CL/CH	very stiff	125	1.3	18	1.18		100			1.29	>10
5.18	17.0	31.70	4.80	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	18	1.17		85			1.82	>10
5.33	17.5	61.63	2.19	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	18	1.16	67.5	45	61	37		
5.48	18.0	76.96	1.36	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	17	1.15	83.6	30	67	37		
5.65	18.5	104.21	1.78	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	23	1.14	112.3	30	76	39		
5.80	19.0	166.60	1.96	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	37	1.13	178.1	25	90	41		
5.95	19.5	208.95	2.01	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	38	1.12	221.6	25	96	41		
6.10	20.0	214.85	2.14	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	48	1.11	226.1	25	97	42		
6.25	20.5	206.81	2.11	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	46	1.10	216.0	25	95	41		
6.40	21.0	213.85	2.11	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	48	1.10	221.6	25	96	41		
6.55	21.5	257.94	2.05	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	47	1.09	266.3	20	101	42		
6.70	22.0	258.04	1.83	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	47	1.08	263.5	20	101	42		
6.85	22.5	271.92	2.04	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	49	1.07	275.7	20	102	42		
7.00	23.0	293.80	2.10	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	53	1.07	295.8	20	105	43		
7.18	23.5	287.42	2.14	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	52	1.06	287.3	20	104	43		
7.33	24.0	277.82	2.02	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	51	1.05	275.8	20	102	42		
7.48	24.5	256.97	1.93	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	47	1.04	253.4	20	100	42		
7.63	25.0	240.65	1.94	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	44	1.04	235.7	25	98	42		
7.78	25.5	164.71	1.64	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	30	1.03	160.3	25	86	40		
7.93	26.0	177.07	1.65	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	32	1.02	171.2	25	88	40		
8.08	26.5	188.32	1.84	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	34	1.02	180.9	25	90	41		
8.23	27.0	189.99	1.96	7	7	Silty Sand to Sandy Silt	SM/ML	very dense	115	4.5	42	1.01	181.3	25	90	41		
8.38	27.5	182.69	1.75	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	33	1.00	173.3	25	89	40		
8.53	28.0	217.50	1.71	8	8	Sand to Silty Sand	SP/SM	very dense	115	5.5	40	1.00	205.0	25	94	41		
8.68	28.5	188.91	1.94	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	34	0.99	177.0	30	89	41		
8.85	29.0	133.68	2.02	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	30	0.99	124.5	35	79	39		
9.00	29.5	88.39	1.46	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	20	0.98	81.8	35	67	37		
9.15	30.0	64.81	2.50	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	19	0.97	59.6	55	57	36		

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Pacific Ethanol Plant, Calipatria, California Project No: LE06217 Date: 06/14/06

CONE SOUNDING: CPT-7

Est. GWT (ft): 9.0

Phi Correlation: 0 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth meters	Base Depth feet	Avg Tip Qc, tsf	Avg Friction Ratio, %		1 Soil Type	Soil Classification	USC	Density or Consistency	Est. Density (pcf)	Qc to N	SPT N(60)	Cn or Cq	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	Nk: Phi (deg.)	17.0 Su (tsf)	OCR
9.30	30.5	102.38	1.59	7	7	Silty Sand to Sandy Silt	SM/ML	dense	115	4.5	23	0.97	93.6	35	71	38		
9.45	31.0	158.13	1.30	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	29	0.96	143.8	25	83	40		
9.60	31.5	132.18	1.53	8	8	Sand to Silty Sand	SP/SM	dense	115	5.5	24	0.96	119.5	30	78	39		
9.75	32.0	92.49	2.42	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	21	0.95	83.2	45	67	37		
9.90	32.5	23.67	4.79	3	3	Clay	CL/CH	very stiff	125	1.3	19	0.95		100			1.32	7.41
10.05	33.0	24.31	5.32	3	3	Clay	CL/CH	very stiff	125	1.3	19	0.94		100			1.36	7.56
10.20	33.5	26.53	5.91	3	3	Clay	CL/CH	very stiff	125	1.3	21	0.93		100			1.49	8.70
10.38	34.0	20.46	6.05	3	3	Clay	CL/CH	very stiff	125	1.3	16	0.93		100			1.13	5.42
10.53	34.5	15.66	4.92	3	3	Clay	CL/CH	stiff	125	1.3	13	0.92		100			0.85	3.50
10.68	35.0	45.13	3.48	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	18	0.92		80			2.58	>10
10.83	35.5	70.85	2.13	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	16	0.91	61.0	55	58	36		
10.98	36.0	32.61	3.22	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	13	0.91		90			1.84	>10
11.13	36.5	21.10	3.21	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.90		100			1.16	9.59
11.28	37.0	20.52	2.96	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.90		100			1.13	8.85
11.43	37.5	20.48	3.29	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.89		100			1.13	8.70
11.58	38.0	27.20	3.35	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	11	0.89		100			1.52	>10
11.73	38.5	38.32	2.59	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	11	0.88	31.9	80	39	33		
11.88	39.0	45.38	2.40	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	0.88	37.6	70	44	34		
12.05	39.5	20.00	3.12	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.87		100			1.09	7.70
12.20	40.0	21.21	4.34	4	4	Silty Clay to Clay	CL	very stiff	125	1.8	12	0.87		100			1.16	6.10
12.35	40.5	36.43	3.05	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	15	0.86		90			2.06	>10
12.50	41.0	42.35	3.32	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	17	0.86		85			2.41	>10
12.65	41.5	35.92	3.18	5	5	Clayey Silt to Silty Clay	ML/CL	hard	120	2.5	14	0.86		90			2.03	>10
12.80	42.0	19.39	2.98	5	5	Clayey Silt to Silty Clay	ML/CL	very stiff	120	2.5	8	0.85		100			1.05	6.65
12.95	42.5	15.69	2.79	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.85		100			0.84	4.57
13.10	43.0	36.70	2.29	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	10	0.84	29.2	80	36	33		
13.25	43.5	45.63	2.73	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	0.84	36.2	80	42	34		
13.40	44.0	69.49	1.20	7	7	Silty Sand to Sandy Silt	SM/ML	medium dense	115	4.5	15	0.84	54.9	45	55	36		
13.58	44.5	46.27	2.68	6	6	Sandy Silt to Clayey Silt	ML	medium dense	115	3.5	13	0.83	38.4	80	43	34		
13.73	45.0	37.39	2.31	6	6	Sandy Silt to Clayey Silt	ML	loose	115	3.5	11	0.83	29.3	85	36	33		
13.88	45.5	16.23	2.62	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.82		100			0.86	4.47
14.03	46.0	17.24	1.90	6	6	Sandy Silt to Clayey Silt	ML	very loose	115	3.5	5	0.82	13.4	100	13	30		
14.18	46.5	12.61	2.01	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	5	0.82		100			0.66	3.07
14.33	47.0	11.30	1.99	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	5	0.81		100			0.57	2.49
14.48	47.5	11.74	2.43	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	5	0.81		100			0.60	2.57
14.63	48.0	15.21	3.22	4	4	Silty Clay to Clay	CL	stiff	125	1.8	9	0.81		100			0.80	2.91
14.78	48.5	17.87	3.41	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	0.80		100			0.95	4.78
14.93	49.0	17.16	3.29	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	7	0.80		100			0.91	4.37
15.10	49.5	16.09	3.54	4	4	Silty Clay to Clay	CL	stiff	125	1.8	9	0.80		100			0.85	3.07
15.25	50.0	14.41	2.92	5	5	Clayey Silt to Silty Clay	ML/CL	stiff	120	2.5	6	0.79		100			0.75	3.28

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-1

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨	●			Moist to very moist						
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
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Plate
B-8

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-2

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨	●			Moist to very moist						
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
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Plate
B-9

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-3

SHEET 1 OF 1

DESCRIPTION OF MATERIAL

SURFACE ELEV. +/-

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist High plasticity						
	▨	●							56	35	
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
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Plate
B-10

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-4

SHEET 1 OF 1

DESCRIPTION OF MATERIAL

SURFACE ELEV. +/-

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-5

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
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Plate
B-12

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-6

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
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Plate
B-13

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-7

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
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CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-8

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

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Plate
B-15

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-9

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

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Plate
B-16

CLIENT: TKDA

PROJECT: Pacific Ethanol Plant, Calipatria, CA

LOCATION: See Site and Exploration Plan

METHOD OF DRILLING: CME 55 w/autohammer

DATE OBSERVED 06/14/06

LOGGED BY: J.R. Avalos

LOG OF BORING B-10

SHEET 1 OF 1

DEPTH	CLASSIFICATION	SAMPLE TYPE	BLOWS/FOOT **	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	UNCONFINED COMPRESSION (TSF)	LIQUID LIMIT	PLASTICITY INDEX	PASSING #200
	▨	●			SILTY CLAY (CL): Light brown, dry, medium plasticity Cracks about 1 to 2 inches wide and 1 to 3 feet deep				41	23	
	▨	⧄	31	3.00	SILTY CLAY/CLAY (CL-CH): Brown, moist, very stiff consistency and medium to high plasticity						
	▨	◩	16	3.00	Very moist						
	▨	◩	17	2.50		23.8	97.4				
	▨	⧄	13		SILTY SAND (SM): Brown, saturated, medium dense, fine grained sand						26
	▨	⧄	17								
	▨	⧄	17								39
	▨	⧄	9		CLAY (CH): Olive brown, very moist, stiff consistency and high plasticity				66	46	
	▨	⧄	8								
					End of Boring at 39.0 ft						

5

10

15

20

25

30

35

40

** Blows not corrected for overburden pressure, sampler size or increase drive energy for automatic hammers.

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Plate
B-17

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF DRILLING: CME 55 w/autohammer
DATE OBSERVED 06/14/06
LOGGED BY: J.R. Avalos

LOG OF BORING B-11

SHEET 1 OF 1

SURFACE ELEV. +/-

DEPTH	CLASSIFICATION	SAMPLE TYPE	BLOWS/FOOT **	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	UNCONFINED COMPRESSION (TSF)	LIQUID LIMIT	PLASTICITY INDEX	PASSING #200
	▨				CLAY (CH): Light brown, dry, high plasticity Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
		●							55	21	
5		◪	23	1.00	Brown, moist, stiff consistency						
10		◪	24	2.50	Very moist	28.0	95.9				
15		⧄	31	2.50	Very stiff consistency				51	15	
20	▥	⧄	29		SILT SAND (SM): Brown, saturated, medium dense, fine grained sand						
25		⧄	18								18
30		⧄	12								
35	▨	⧄	22		CLAYEY SILT (ML): Brown, saturated, medium dense, medium plasticity, some fine grained sand				30	18	
40		⧄	17								
					End of Boring at 41.5 ft ** Blows not corrected for overburden pressure, sampler size or increase drive energy for automatic hammers.						

Project No:
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Plate
B-18

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF DRILLING: CME 55 w/autohammer
DATE OBSERVED 06/14/06
LOGGED BY: J.R. Avalos

LOG OF BORING B-12

SHEET 1 OF 1

DEPTH	CLASSIFICATION	SAMPLE TYPE	BLOWS/FOOT **	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	UNCONFINED COMPRESSION (TSF)	LIQUID LIMIT	PLASTICITY INDEX	PASSING #200
					SURFACE ELEV. +/-						
	▩				SILTY CLAY (CL): Light brown, dry, medium plasticity Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
	▩	●							46	29	
5	▩	⧄	10	2.00	Brown, moist, stiff consistency				36	16	
10	▨	◩	35	3.00	CLAY (CH): Brown, moist, very stiff consistency and high plasticity	19.5	104.6				
15	▨	◩	19	3.00	Very moist	25.4	97.3				
20	▤	⧄	21		SILTY SAND (SM): Brown, saturated, medium dense, fine grained sand						41
25	▤	⧄	32		Dense						
30	▤	⧄	21		Medium dense						39
35	▥	⧄	16		SANDY SILT (ML): Brown, saturated, medium dense, with fine grained sand				29	---	
40					End of Boring at 37.5 ft Groundwater Encountered at 8.4 feet (06-21-06) ** Blows not corrected for overburden pressure, sampler size or increase drive energy for automatic hammers.						

Project No:
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Plate
B-19

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF DRILLING: CME 55 w/autohammer
DATE OBSERVED 06/14/06
LOGGED BY: J.R. Avalos

LOG OF BORING B-13

SHEET 1 OF 1

DEPTH	CLASSIFICATION	SAMPLE TYPE	BLOWS/FOOT **	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	UNCONFINED COMPRESSION (TSF)	LIQUID LIMIT	PLASTICITY INDEX	PASSING #200
					SILTY CLAY (CL): Light brown, dry, medium plasticity Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
		●							41	22	
5		◩	21	3.00	Brown, very moist, very stiff consistency	23.3	89.6				
10		◩	38	2.50	CLAY (CH): Reddish brown, very moist, very stiff consistency and high plasticity	21.1	103.5				
15		⧄	29	3.00							
20		⧄	29		SILTY SAND (SM): Brown, saturated, medium dense, fine grained sand						
25		⧄	19		SANDY SILT/SILTY SAND (ML/SM): Brown, saturated, medium dense and fine grained sand						52
30		⧄	31		Dense						
35		⧄	10		SILTY CLAY (CL): Brown, very moist, stiff consistency and low to medium plasticity						
					End of Boring at 37.5 ft						
40											

** Blows not corrected for overburden pressure, sampler size or increase drive energy for automatic hammers.

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Plate
B-20

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF DRILLING: CME 55 w/autohammer
DATE OBSERVED 06/14/06
LOGGED BY: J.R. Avalos

LOG OF BORING B-14

SHEET 1 OF 1

DESCRIPTION OF MATERIAL

DEPTH	CLASSIFICATION	SAMPLE TYPE	BLOWS/FOOT **	POCKET PEN. (TSF)	SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	UNCONFINED COMPRESSION (TSF)	LIQUID LIMIT	PLASTICITY INDEX	PASSING #200
	▨	●			CLAY (CH): Light brown, dry, high plasticity Cracks about 1 to 2 inches wide and 1 to 3 feet deep				58	42	
	▨	◩	32	4.00	Moist, very stiff	12.0	108.4				
5	▨										
	▨	◩	22	2.00	Very moist	21.5	112.6				
10	▨										
	▨	◩	13	2.50	Stiff						
15	▨										
	▦	⧄	13		SILTY SAND (SM): Brown, saturated, medium dense, fine grained sand						
20	▦										
	▦	⧄	22								23
25	▦										
	▦	⧄	25								32
30	▦										
	▨	⧄	11	3.00	CLAY (CH): Brown, very moist, stiff consistency and high plasticity				60	38	
35	▨										
	▨	⧄	6	2.50							
					End of Boring at 39.0 ft						
40											
					** Blows not corrected for overburden pressure, sampler size or increase drive energy for automatic hammers.						

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Plate
B-21

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF DRILLING: CME 55 w/autohammer
DATE OBSERVED 06/14/06
LOGGED BY: J.R. Avalos

LOG OF BORING B-15

SHEET 1 OF 1

DESCRIPTION OF MATERIAL

SURFACE ELEV. +/-

DEPTH	CLASSIFICATION	SAMPLE TYPE	BLOWS/FOOT **	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	UNCONFINED COMPRESSION (TSF)	LIQUID LIMIT	PLASTICITY INDEX	PASSING #200
	▨				CLAY (CH): Light brown, dry, high plasticity Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
	▨	●							53	34	
5	▨	⧅	7	0.75	Brown, moist, medium stiff consistency						
10	▨	◪	19	2.50	Reddish brown, very moist, stiff consistency	26.4	81.6				
15	▨	◪	>50	2.75	hard	25.2	95.8				
20	░	⧅	32		SILTY SAND (SM): Brown, saturated, dense, fine grained sand						
25	░	⧅	14		Medium dense						22
30	░	⧅	13								
35	▥	⧅	10		SILT/CLAYEY SILT (ML): Brown, saturated, medium dense, some fine grained sand						
40	▥	⧅	18						26	---	

End of Boring at 41.5 ft
Groundwater Encountered at 9.5 feet (06-21-06)
** Blows not corrected for overburden pressure, sampler size or increase drive energy for automatic hammers.

Project No:
LE06217

LANDMARK
Geo-Engineers and Geologists
a DBE/MBE/SBE Company

Plate
B-22

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-16

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨	●			Moist to very moist High plasticity				58	39	
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

LANDMARK
Geo-Engineers and Geologists
a DBE/MBE/SBE Company

Plate
B-23

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF DRILLING: CME 55 w/autohammer
DATE OBSERVED 06/14/06
LOGGED BY: J.R. Avalos

LOG OF BORING B-17

SHEET 1 OF 1

DEPTH	CLASSIFICATION	SAMPLE TYPE	BLOWS/FOOT **	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	UNCONFINED COMPRESSION (TSF)	LIQUID LIMIT	PLASTICITY INDEX	PASSING #200
					SURFACE ELEV. +/-						
					SILTY CLAY (CL): Light brown, dry, medium plasticity Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
		●							35	19	
5		◩	12	3.00	Brown, moist, stiff consistency	28.2	93.5				
10		◩	33	3.50	CLAY (CH): Reddish brown, very moist, very stiff consistency and high plasticity						
15		◩	30	4.00		30.0	95.8				
20		⧄	16		SILTY SAND (SM): Brown, saturated, medium dense, fine grained sand						21
25		⧄	23								
30		⧄	11								38
35		⧄	10		SILT/CLAYEY SILT (ML): Brown, saturated, medium dense, some fine grained sand				30	---	
40		⧄	9								
					End of Boring at 41.5 ft ** Blows not corrected for overburden pressure, sampler size or increase drive energy for automatic hammers.						

Project No:
LE06217

LANDMARK
Geo-Engineers and Geologists
a DBE/MBE/SBE Company

Plate
B-24

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-18

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨	●			Moist to very moist						
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

LANDMARK
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a DBE/MBE/SBE Company

Plate
B-25

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-19

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5	▨										
					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-20

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

LANDMARK
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a DBE/MBE/SBE Company

Plate
B-27

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-21

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
1	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

LANDMARK
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Plate
B-28

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-22

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨	●			Moist to very moist						
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

LANDMARK
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Plate
B-29

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-23

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

LANDMARK
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Plate
B-30

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-24

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
	▨				SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep						
1	▨										
2	▨				Moist to very moist						
	▨	●									
3	▨										
4	▨										
5					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						
6											
7											
8											
9											
10											
11											

Project No:
LE06217

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Plate
B-31

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
LOCATION: See Site and Exploration Plan

METHOD OF EXCAVATION Mec. Auger
DATE OBSERVED 06/14/06
LOGGED BY J.R. Avalos

LOG OF BORING B-25

SHEET 1 OF 1

DEPTH (FEET)	CLASSIFICATION	SAMPLE TYPE	BLOWS/ FOOT	POCKET PEN. (TSF)	DESCRIPTION OF MATERIAL SURFACE ELEV. +/-	MOISTURE CONTENT (%)	DRY UNIT WT. (PCF)	RELATIVE COMPACTION (%)	LIQUID LIMIT	PLASTICITY INDEX	PASSING # 200
1 2 3 4 5	▨	●			SILTY CLAY/CLAY(CL-CH): Light brown, very stiff, dry, medium to high plasticity. Cracks about 1 to 2 inches wide and 1 to 3 feet deep Moist to very moist						
6 7 8 9 10 11					End of Exploration @ 5.0 ft. No groundwater encountered @ time of exploration.						

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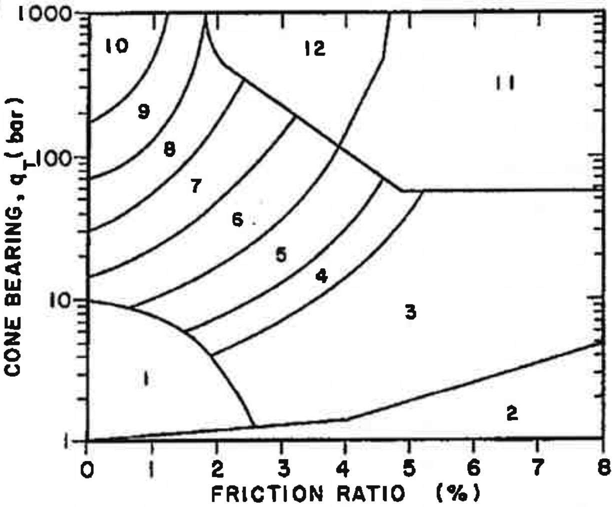
Simplified Soil Classification Chart

After Robertson & Campanella (1989)



Geotechnical Parameters from CPT Data:

Equivalent SPT N(60) blow count = Qc/(Qc/N Ratio)

N1(60) = Cn*N(60) Normalized SPT blow count

Cn = 1/(p'o)^0.5 < 1.6 max. from Liao & Whitman (1986)

p'o = effective overburden pressure (tsf) using unit densities
given below and estimated groundwater table.

Dr = Relative density (%) from Jamiolkowski et. al. (1986) relationship
= -98 +68*log(Qc/p'o^0.5) where Qc, p'o in tonne/sqm

Note: 1 tonne/sqm = 0.1024 tsf, 1 bar =1.0443 tsf

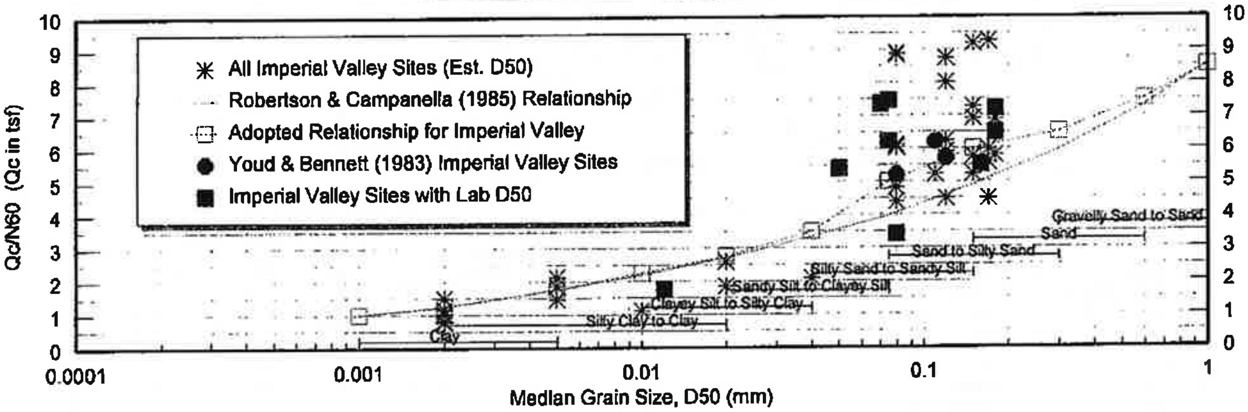
Phi = Friction Angle estimated from either:

1. Roberton & Campanella (1983) chart:
   Phi = 5.3 + 24*(log(Qc/p'o))+3(log(Qc/p'o))^2
2. Peck, Hansen & Thornburn (1974) N-Phi Correlation
3. Schmertman (1978) chart [Phi = 28+0.14*Dr for fine uniform sands]

Su = undrained shear strength (tsf)
= (Qc-p'o)/Nk where Nk varies from 10 to 22, 17 for OC clays

OCR = Overconsolidation Ratio estimated from Schmertman (1978)
chart using Su/p'o ratio and estimated normal consolidated Su/p'o

Variation of Qc/N Ratio with Grain Size



Note: Assumed Properties and Adopted Qc/N Ratio based on correlations from Imperial Valley, California soils

Table of Soil Types and Assumed Properties

Zone	Soil Classification	UCS	Density (pcf)	R&C Qc/N	Adopted Qc/N	Est. PI	Fines (%)	D50 (mm)
1	Sensitive fine grained	ML	120	2	2	NP-15	65-100	0.020
2	Organic Material	OL/OH	120	1	1	--	--	--
3	Clay	CL/CH	125	1	1.25	25-40+	90-100	0.002
4	Silty Clay to Clay	CL	125	1.5	2	15-40	90-100	0.010
5	Clayey Silt to Silty Clay	ML/CL	120	2	2.75	5-25	90-100	0.020
6	Sandy Silt to Clayey Silt	ML	115	2.5	3.5	NP-10	65-100	0.040
7	Silty Sand to Sandy Silt	SM/ML	115	3	5	NP	35-75	0.075
8	Sand to Silty Sand	SP/SM	115	4	6	NP	5-35	0.150
9	Sand	SP	110	5	6.5	NP	0-5	0.300
10	Gravelly Sand to Sand	SW	115	6	7.5	NP	0-5	0.600
11	Overconsolidated Soil	--	120	1	1	NP	90-100	0.010
12	Sand to Clayey Sand	SP/SC	115	2	2	NP-5	--	--

Su (tsf)	Consistency
0-0.13	very soft
0.13-.25	soft
0.25-0.5	firm
0.5-1.0	stiff
1.0-2.0	very stiff
>2.0	hard

Dr (%)	Relative Density
0-15	very loose
15-35	loose
35-65	medium dense
65-85	dense
>85	very dense

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Project No: LE06217

Key to CPT Interpretation of Logs

Plate
B-33

DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS		SECONDARY DIVISIONS
Coarse grained soils More than half of material is larger than No. 200 sieve	**Gravels** More than half of coarse fraction is larger than No. 4 sieve	Clean gravels (less than 5% fines)	▨	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			▨	GP	Poorly graded gravels, or gravel-sand mixtures, little or no fines
		Gravel with fines	▨	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			▨	GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	Sands More than half of coarse fraction is smaller than No. 4 sieve	Clean sands (less than 5% fines)	▨	SW	Well graded sands, gravelly sands, little or no fines
			▨	SP	Poorly graded sands or gravelly sands, little or no fines
		Sands with fines	▨	SM	Silty sands, sand-silt mixtures, non-plastic fines
			▨	SC	Clayey sands, sand-clay mixtures, plastic fines
Fine grained soils More than half of material is smaller than No. 200 sieve	**Silts and clays** Liquid limit is less than 50%		▨	ML	Inorganic silts, clayey silts with slight plasticity
			▨	CL	Inorganic clays of low to medium plasticity, gravely, sandy, or lean clays
			▨	OL	Organic silts and organic clays of low plasticity
	Silts and clays Liquid limit is more than 50%		▨	MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts
			▨	CH	Inorganic clays of high plasticity, fat clays
			▨	OH	Organic clays of medium to high plasticity, organic silts
Highly organic soils			▨	PT	Peat and other highly organic soils

GRAIN SIZES

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

200 4 10 4 3/4" 3" 12"

US Standard Series Sieve Clear Square Openings

Sands, Gravels, etc.	Blows/ft. *
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

Clays & Plastic Silts	Strength **	Blows/ft. *
Very Soft	0-0.25	0-2
Soft	0.25-0.5	2-4
Firm	0.5-1.0	4-8
Stiff	1.0-2.0	8-16
Very Stiff	2.0-4.0	16-32
Hard	Over 4.0	Over 32

* Number of blows of 140 lb. hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 in. I.D.) split spoon (ASTM D1586).

** Unconfined compressive strength in tons/s.f. as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D1586), Pocket Penetrometer, Torvane, or visual observation.

Type of Samples:

▮ Ring Sample ⧄ Standard Penetration Test ⌶ Shelby Tube ● Bulk (Bag) Sample

Drilling Notes:

1. Sampling and Blow Counts
   Ring Sampler - Number of blows per foot of a 140 lb. hammer falling 30 inches.
   Standard Penetration Test - Number of blows per foot.
   Shelby Tube - Three (3) inch nominal diameter tube hydraulically pushed.
2. P. P. = Pocket Penetrometer (tons/s.f.).
3. NR = No recovery.
4. GWT ▼ = Ground Water Table observed @ specified time.

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Key to Logs

Plate B-34

APPENDIX C

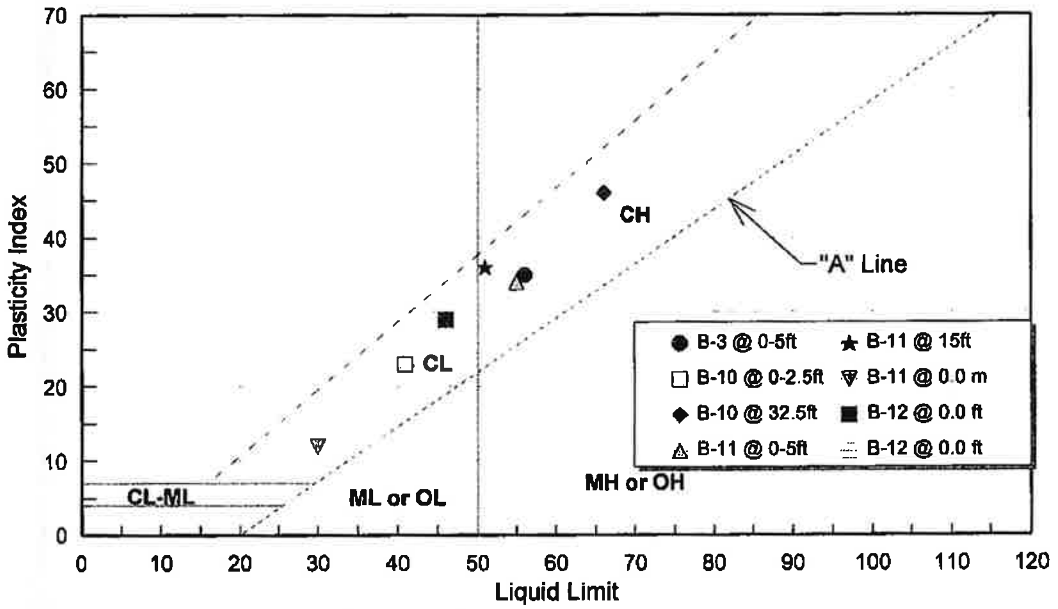
LANDMARK CONSULTANTS, INC.

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
JOB NO: LE06217
DATE: 06/24/06

ATTERBERG LIMITS (ASTM D4318)

Sample Location	Sample Depth (ft)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	USCS Classif-ation
B-3	0-5	56	21	35	CH
B-10	0-2.5	41	18	23	CL
B-10	32.5	66	20	46	CH
B-11	0-5	55	21	34	CH
B-11	15	51	15	36	CH
B-11	35	30	18	12	CL
B-12	0-5	46	17	29	CL
B-12	5	36	20	16	CL

PLASTICITY CHART



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Project No: LE06217

Atterberg Limits
Test Results

Plate
C-1

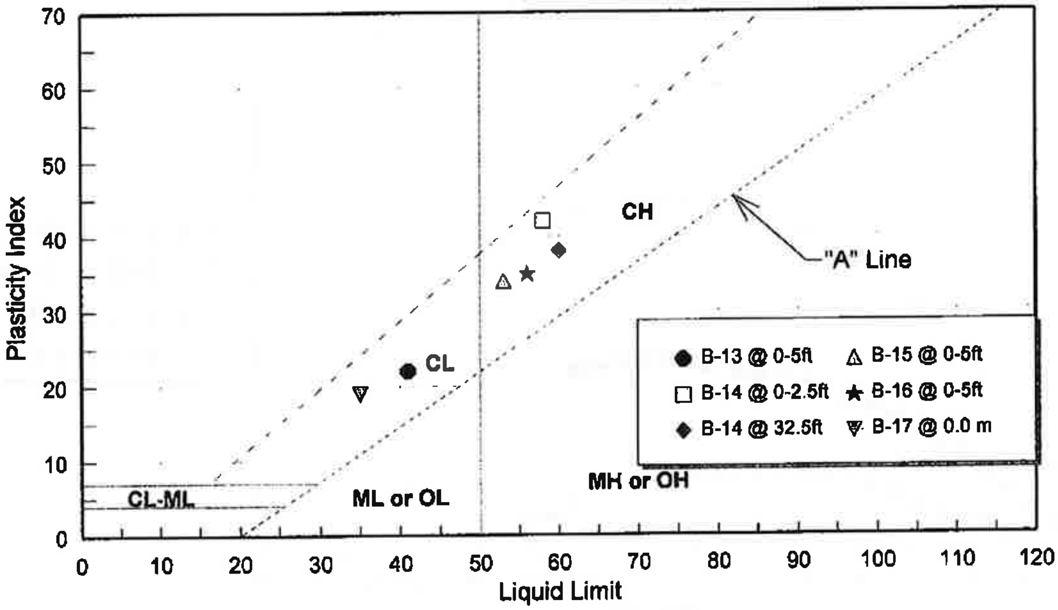
LANDMARK CONSULTANTS, INC.

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
JOB NO: LE06217
DATE: 06/24/06

ATTERBERG LIMITS (ASTM D4318)

Sample Location	Sample Depth (ft)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	USCS Classif-ation
B-13	0-5	41	19	22	CL
B-14	0-2.5	58	16	42	CH
B-14	32.5	60	22	38	CH
B-15	0-5	53	19	34	CH
B-16	0-5	56	21	35	CH
B-17	0-5	35	16	19	CL

PLASTICITY CHART



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Project No: LE06217

Atterberg Limits
Test Results

Plate
C-2

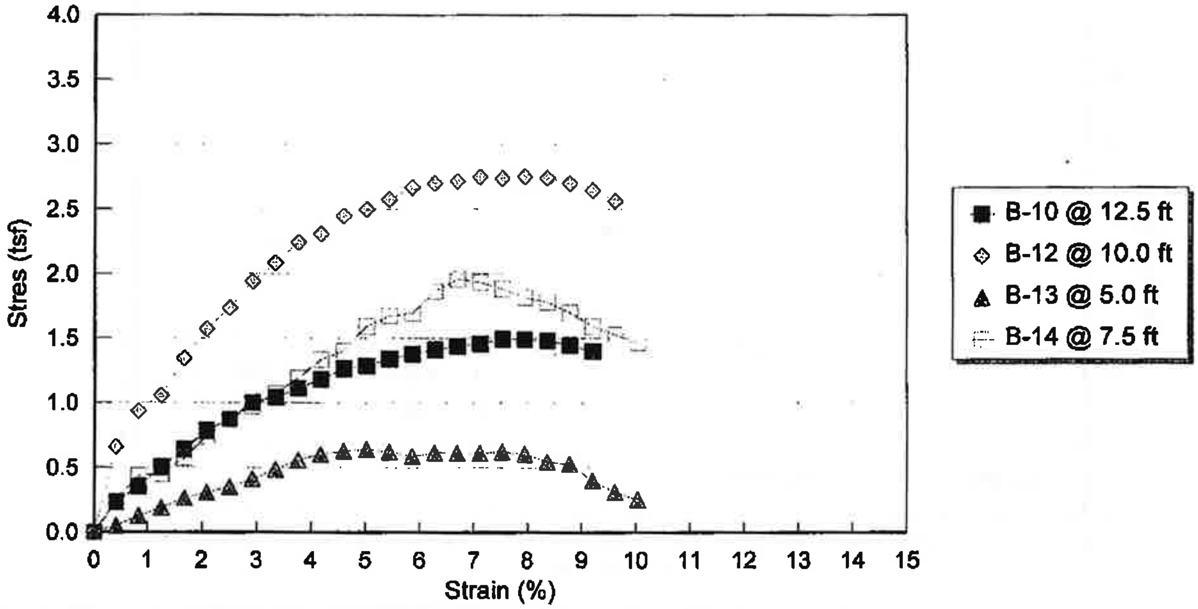
LANDMARK GEOTECHNICAL

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
JOB NO: LE06217
DATE: 06/20/06

UNCONFINED COMPRESSION TEST (ASTM D2166)

Boring No.	Sample Depth (ft)	Natural Moisture Content (%)	Unit Dry Weight (pcf)	Maximum Compressive Strength (tsf)	Cohesion (tsf)	Failure Strain (%)
B-10	12.5	23.8	97.4	1.50	0.75	7.5
B-12	10.0	19.5	104.6	2.75	1.37	7.9
B-13	5.0	23.3	89.6	0.64	0.32	5.0
B-14	7.5	21.5	112.6	1.96	0.98	6.7

STRESS-STRAIN PLOT



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Project No: **LE06217**

Unconfined Compression Test Results

Plate C-3

LANDMARK CONSULTANTS, INC.

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
JOB NO: LE06217
DATE: 07/06/06

EXPANSION INDEX TEST (UBC 29-2 & ASTM D4829)

Sample Location & Depth (ft)	Initial Moisture (%)	Compacted Dry Density (pcf)	Final Moisture (%)	Volumetric Swell (%)	Expansion Index (EI)	Expansive Potential
B-11 0-5 ft.	11.6	104.1	29.6	12.0	**120**	High

UBC CLASSIFICATION

0-20	Very Low
20-50	Low
50-90	Medium
90-130	High
130+	Very High

Note: * The measured EI have been adjusted to the estimated EI at 50% saturation in accordance with Section 10.1.2 of ASTM D4829.

LANDMARK
Geo-Engineers and Geologists

Project No: LE06217

Expansion Index Test Results

Plate C-4

LANDMARK CONSULTANTS, INC.

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
JOB NO: LE06217
DATE: 06/30/06

CHEMICAL ANALYSES

Boring:	B-10	B-11	B-12	B-13	B-14	CalTrans
Sample Depth, ft:	0-2.5	0-5	0-5	0-5	0-2.5	Method
pH:	9.2	9.2	9.2	9.2	9.3	643
Electrical Conductivity (mmhos):	3.3	3.4	2.9	2.7	3.1	424
Resistivity (ohm-cm):	220	180	250	190	170	643
Chloride (Cl), ppm:	2,920	4,060	3,100	3,640	3,880	422
Sulfate (SO4), ppm:	6,094	6,077	4,625	3,348	928	417

General Guidelines for Soil Corrosivity

Material Affected	Chemical Agent	Amount in Soil (ppm)	Degree of Corrosivity
Concrete	Soluble Sulfates	0 -1,000	Low
		1,000 - 2,000	Moderate
		2,000 - 20,000	Severe
		> 20,000	Very Severe
Normal Grade Steel	Soluble Chlorides	0 - 200	Low
		200 - 700	Moderate
		700 - 1,500	Severe
		> 1,500	Very Severe
Normal Grade Steel	Resistivity	1-1,000	Very Severe
		1,000-2,000	Severe
		2,000-10,000	Moderate
		> 10,000	Low

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a DBE/MBE/SBE Company

Project No: LE06217

Selected Chemical Analyses Results

Plate C-5

LANDMARK CONSULTANTS, INC.

CLIENT: TKDA
PROJECT: Pacific Ethanol Plant, Calipatria, CA
JOB NO: LE06217
DATE: 06/30/06

CHEMICAL ANALYSES

Boring:	B-15	B-17	**CalTrans Method**
Sample Depth, ft:	0-5	0-5	
pH:	9.2	9.3	**643**
Electrical Conductivity (mmhos):	3.2	1.8	**424**
Resistivity (ohm-cm):	230	240	**643**
Chloride (Cl), ppm:	3,700	3,040	**422**
Sulfate (SO4), ppm:	5,501	1,975	**417**

General Guidelines for Soil Corrosivity

Material Affected	Chemical Agent	Amount in Soil (ppm)	Degree of Corrosivity
Concrete	Soluble Sulfates	0 -1,000	Low
		1,000 - 2,000	Moderate
		2,000 - 20,000	Severe
		> 20,000	Very Severe
Normal Grade Steel	Soluble Chlorides	0 - 200	Low
		200 - 700	Moderate
		700 - 1,500	Severe
		> 1,500	Very Severe
Normal Grade Steel	Resistivity	1-1,000	Very Severe
		1,000-2,000	Severe
		2,000-10,000	Moderate
		> 10,000	Low

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Geo-Engineers and Geologists
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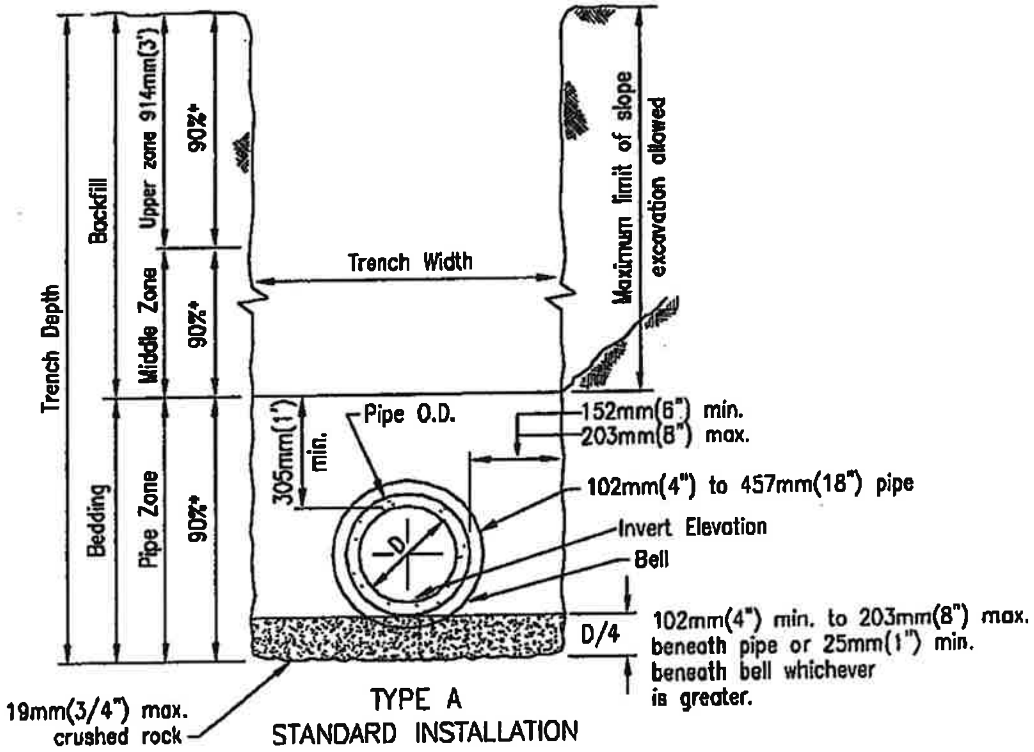
Project No: LE06217

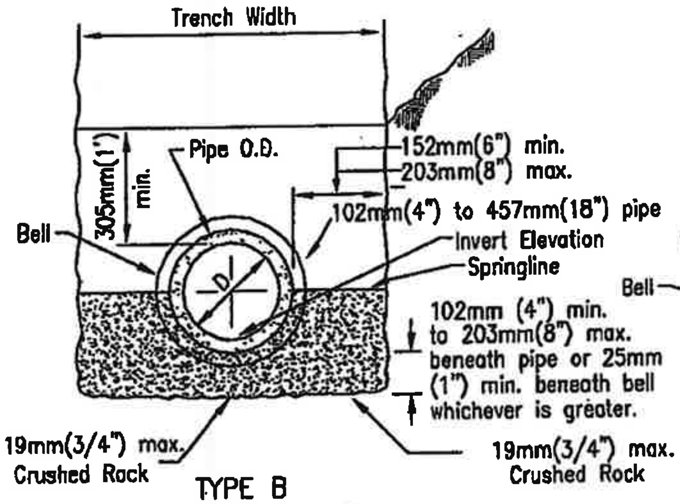
Selected Chemical Analyses Results

Plate C-6

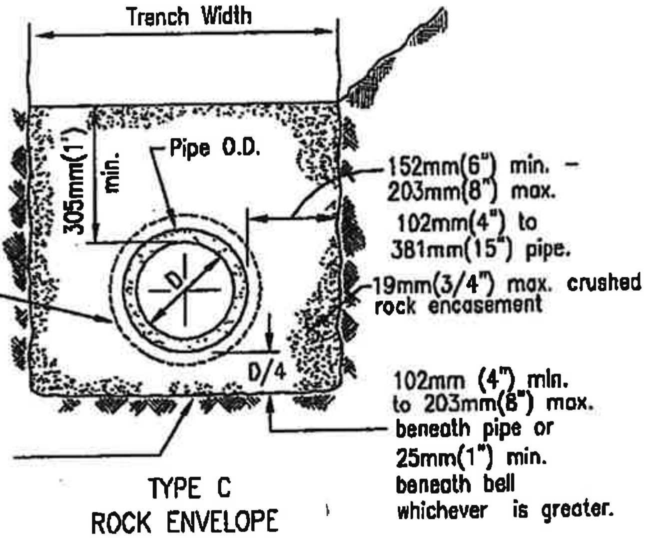
APPENDIX D



TYPE A
STANDARD INSTALLATION



TYPE B
ROCK TO SPRINGLINE



TYPE C
ROCK ENVELOPE

NOTES

1. For trenching in improved streets, see Standard Drawings G-24 or G-25 for trench resurfacing.
2. (*) indicates minimum relative compaction.
3. Minimum depth of cover from the top of pipe to finish grade for all sanitary sewer installations shall be 914mm(3') For cover less than 914mm(3'), see Standard Drawing S-7 for concrete encasement.
4. See Type A installation for details not shown for Types B and C.

Revision	By	Approved	Date
ORIGINAL		A.Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

PIPE BEDDING AND TRENCH BACKFILL FOR SEWERS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

3/01/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **S-4**

APPENDIX E

REFERENCES

Arango I., 1996, Magnitude Scaling Factors for Soil Liquefaction Evaluations: ASCE Geotechnical Journal, Vol. 122, No. 11.

Blake, T. F., 2000, FRISKSP - A computer program for the probabilistic estimation of seismic hazard using faults as earthquake sources.

Boore, D. M., Joyner, W. B., and Fumal, T. E., 1997, Empirical Near-Source Attenuation Relationships for Horizontal and Vertical Components of Peak Ground Acceleration, Peak Ground Velocity, and Pseudo-Absolute Acceleration Response Spectra: Seismological Research Letters, Vol. 68, No. 1, p. 154-179.

Bray, J. D., Sancio, R. B., Riemer, M. F. and Durgunoglu, T., (2004) Liquefaction Susceptibility of Fine-Grained Soils: Proc. 11th Inter. Conf. in Soil Dynamics and Earthquake Engineering and 3rd Inter. Conf. on Earthquake Geotechnical Engineering., Doolin, Kammerer, Nogami, Seed, and Towhata, Eds., Berkeley, CA, Jan. 7-9, V.1, pp. 655-662.

California Division of Mines and Geology (CDMG), 1996, California Fault Parameters: available at http://www.consrv.ca.gov/dmg/shezp/fltindex.html.

California Division of Mines and Geology (CDMG), 1962, Geologic Map of California – San Diego-El Centro Sheet: California Division of Mines and Geology, Scale 1:250,000.

Cao, T., Bryant, W. A., Rowshandel, B., Branum, D., and Wills, C. J., 2003, The revised 2002 California probabilistic seismic hazards maps: California Geological Survey: http://www.conservation.ca.gov/cgs/rghm/psha.

Cetin, K. O., Seed, R. B., Der Kiureghian, A., Tokimatsu, K., Harder, L. F., Jr., Kayen, R. E., and Moss, R. E. S., 2004, Standard penetration test-based probabilistic and deterministic assessment of seismic soil liquefaction potential: ASCE JGGE, Vol., 130, No. 12, p. 1314-1340.

Ishihara, K. (1985), Stability of natural deposits during earthquakes, Proc. 11th Int. Conf. On Soil Mech. And Found. Engrg., Vol. 1, A. A. Balkema, Rotterdam, The Netherlands, 321-376.

Jennings, C. W., 1994, Fault activity map of California and Adjacent Areas: California Division of Mines and Geology, DMG Geologic Map No. 6.

Morton, P. K., 1977, Geology and mineral resources of Imperial County, California: California Division of Mines and Geology, County Report No. 7, 104 p.

Robertson, P. K. and Wride, C. E., 1996, Cyclic Liquefaction and its Evaluation based on the SPT and CPT, Proceeding of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils, NCEER Technical Report 97-0022, p. 41-88.

Seed, H. B., Idriss, I. M., and Arango I., 1983, Evaluation of liquefaction potential using field performance data: ASCE Geotechnical Journal, Vol. 109, No. 3.

Seed, H. B., et al, 1985, Influence of SPT Procedures in Soil Liquefaction Resistance Evaluations: ASCE Geotechnical Journal, Vol. 113, No. 8.

Seed, R. B., Cetin, K. O., Moss, R. E. S., Kammerer, A. M., Wu, J., Pestana, J. M. Riemer, M. F., Sancio, R. B., Bray, J. D., Kayen, R. E., and Faris, A, 2003, Recent advances in soil liquefaction engineering: a unified and consistent framework: University of California, Earthquake Engineering Research Center Report 2003-06, 71 p.

Sylvester, A. G., 1979, Earthquake damage in Imperial Valley, California May 18, 1940, as reported by T. A. Clark: BSSA, v. 69, no. 2, p. 547-568.

Tokimatsu, K. and Seed H. B., 1987, Evaluation of settlements in sands due to earthquake shaking: ASCE Geotechnical Journal, v. 113, no. 8.

U.S. Geological Survey (USGS), 1982, The Imperial Valley California Earthquake of October 15, 1979: Professional Paper 1254, 451 p.

U.S. Geological Survey (USGS), 1996, National Seismic Hazard Maps: available at http://gldage.cr.usgs.gov

Working Group on California Earthquake Probabilities (WGCEP), 1992, Future seismic hazards in southern California, Phase I Report: California Division of Mines and Geology.

Working Group on California Earthquake Probabilities (WGCEP), 1995, Seismic hazards in southern California, Probable Earthquakes, 1994-2014, Phase II Report: Southern California Earthquake Center.

Youd, T. Leslie and Garris, C. T., 1995, Liquefaction induced ground surface disruption: ASCE JGGE, Vol. 121, No. 11.

Youd, T. L., Hansen, C. M., and Bartlett, S. F., 1995, Revised Multilinear Regression Equations of Prediction of Lateral Spread Displacement: Journal of Geotechnical and Geoenvironmental Engineering, Vol. 128, No. 12, p. 1007-1017.

Youd, T. L. et. al., 2001, Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils: JGGE, Vol. 127, No. 10, p. 817-833.

LINSCOTT
LAW &
GREENSPAN
engineers

TRANSPORTATION IMPACT ANALYSIS

ALL AMERICAN GRAIN

County of Imperial, California
July 3, 2018

LLG Ref. 3-18-2924

Prepared by:
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ALL AMERICAN GRAIN

County of Imperial, California
July 3, 2018

1.0 INTRODUCTION

The following traffic impact analysis has been prepared to determine the potential impacts to the local circulation system due to truck and employee traffic related to the proposed All American Grain project in the County of Imperial, California. This report includes the following sections:

- Project Description
- Existing Conditions
- Analysis Approach and Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Trip Generation / Distribution / Assignment
- Near-Term / Roadway Capacity Analysis
- Project Access discussion
- Conclusions and Recommendations

2.0 PROJECT DESCRIPTION

All American Grain Company, LLC (the "Applicant") is seeking a Zone change and General Plan Amendment to the west half of parcel #024-260-032 in order to expand more acreage under the M-2 zone (Medium Industrial) and under the Industrial land use. The expanded acreage will allow the applicant more available space to establish a Container Yard and Rail Spur for loading and distribution.

2.1 Project Location

The Project site is located in the unincorporated area of Imperial County. The project site is bound by SR 111, Yocum Road, Kershaw Road and Albright Road. The site is located just south of the City of Calipatria.

Figure 2–1 depicts the project vicinity. ***Figure 2–2*** shows a more detailed project area map. ***Figure 2–3*** shows the site layout.

2.2 Project Description

The applicant wishes to add to the current use by relying more heavily on the unit train cars rather than trucks for distribution from the Imperial Valley. The method of receiving and transporting the hay from locally harvested fields to the storage facility will remain via trucks. However, once the hay containers are stored and are ready to be reloaded, individual unit train cars will be the primary method of distribution to the Port of Long Beach. Ultimately, the applicant's goal is to become more efficient with the delivery of out-going hay products that leave the valley via truck to these unit trains, and reducing the amount of trip miles made by trucks. This addition of one additional unit train of 105 well cars which is 210 containers will be needed to maximize the reduction of trip miles made by trucks. Once operations are in-motion, the empty storage facility will utilize their inner circle railway as a systematic method of off-loading containers from the train and then reloading the containers that were loaded at the source. Access to the container yard will come off of E. Albright Rd., at the south/east corner of the property. The distance between the entrance to the facility and the turn-off from Hwy 111 will provide enough space if numerous trucks show up all at once. Additionally, the exit location will be located at the south/west corner of the property, allowing the option to either turn right or left depending on logistical reasons. When the train unit cars are loaded and ready for distribution, they will leave the inner circle railway on their way to the Port of Long Beach utilizing the Union Pacific Rail Road.

The current operations of the facility act as a grain transfer and storage station for locally grown containered agricultural commodities. These operations include the receiving of the agricultural commodities such as hay, and other types of locally grown rufage in storage containers, transported via trucks to the facility. Once these containers are received and stored for a short period of time, they are then reloaded on to unit trains for distribution outside of the Imperial Valley. Additionally, incorporated in the original operations of the facility was receiving corn via unit train cars that would then be distributed to various Feed mills in the Imperial Valley via truck that will continue.

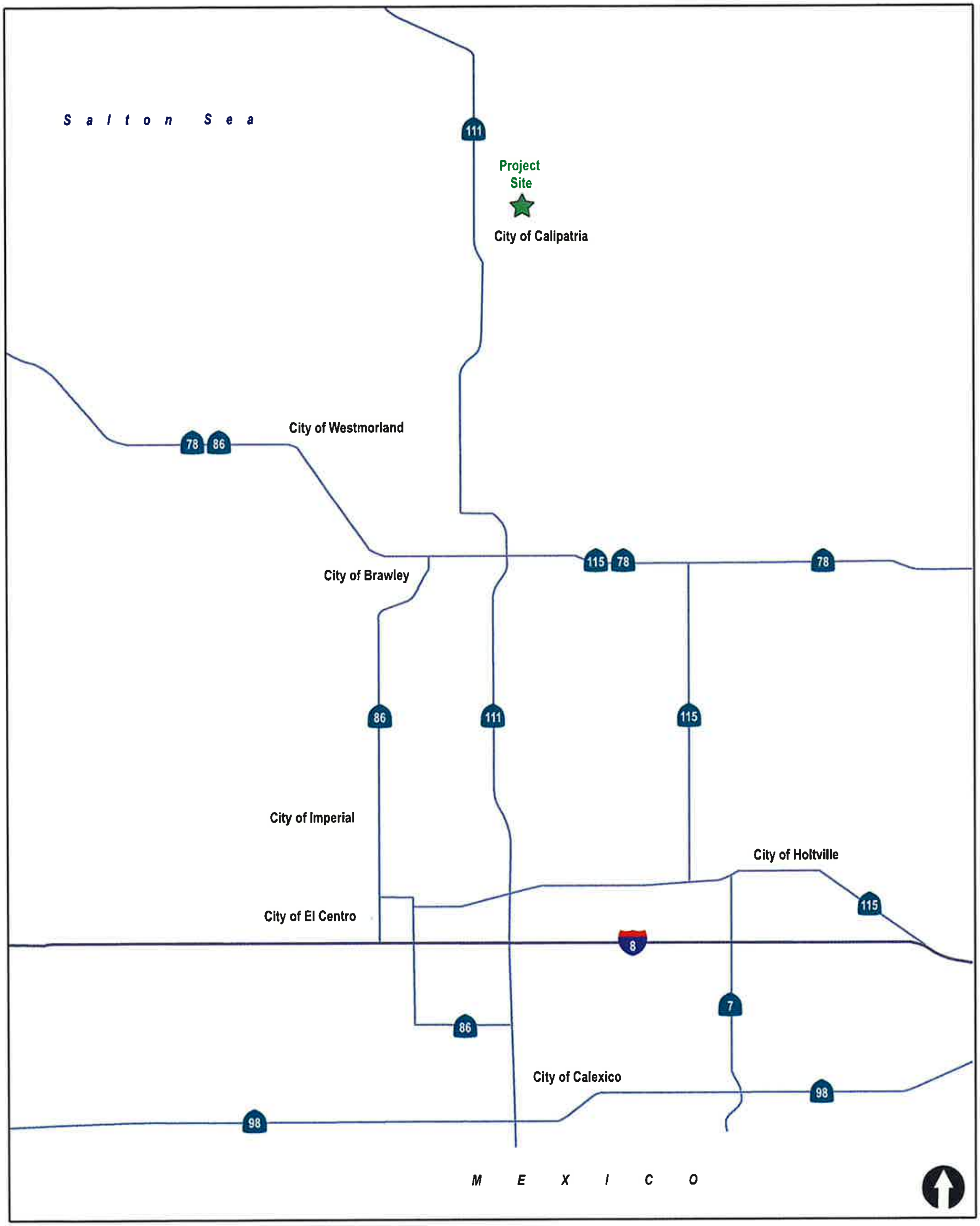

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Figure 2-1

Vicinity Map

ALL-AMERICAN GRAIN PROJECT

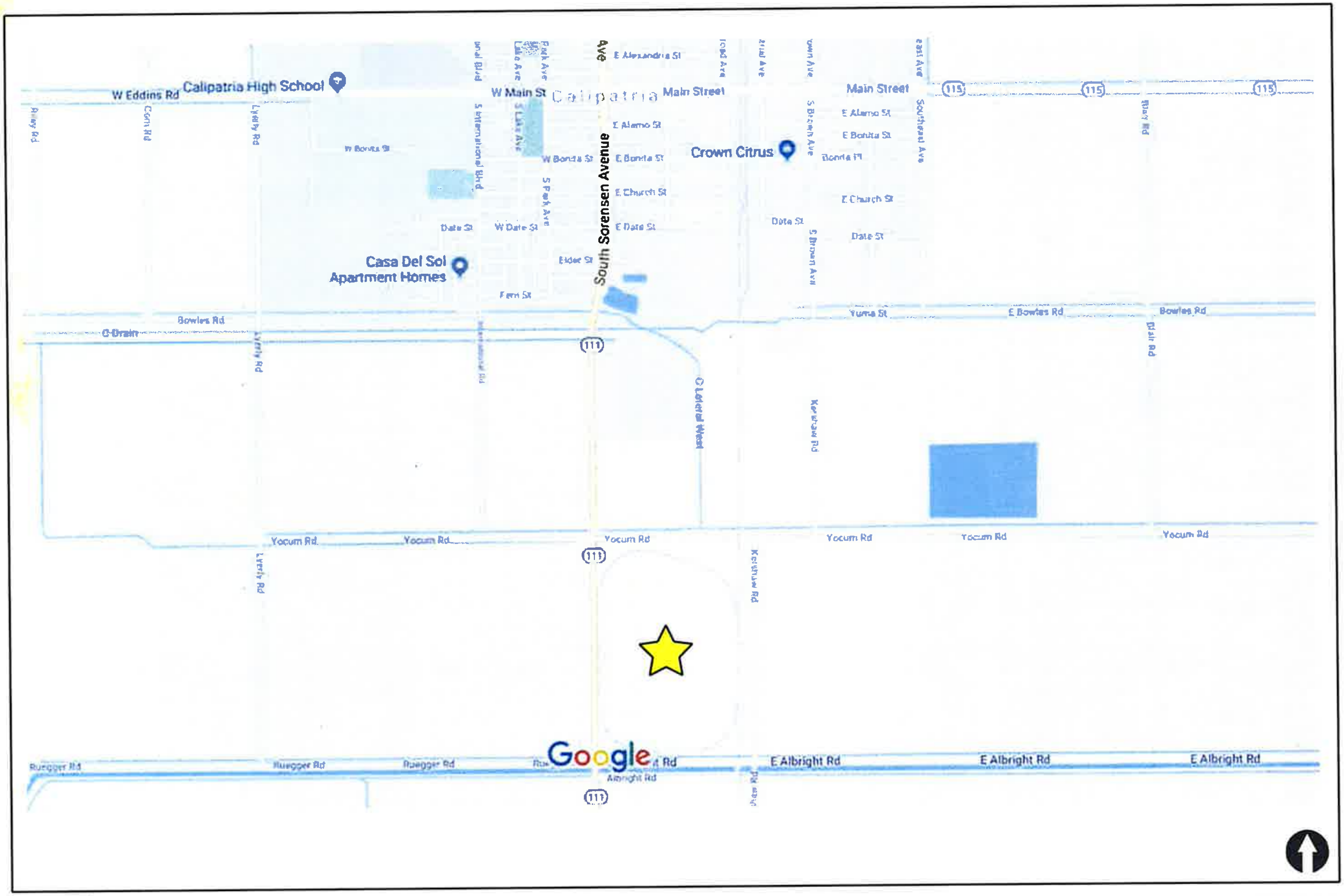

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Figure 2-2

Project Area Map

ALL-AMERICAN GRAIN PROJECT

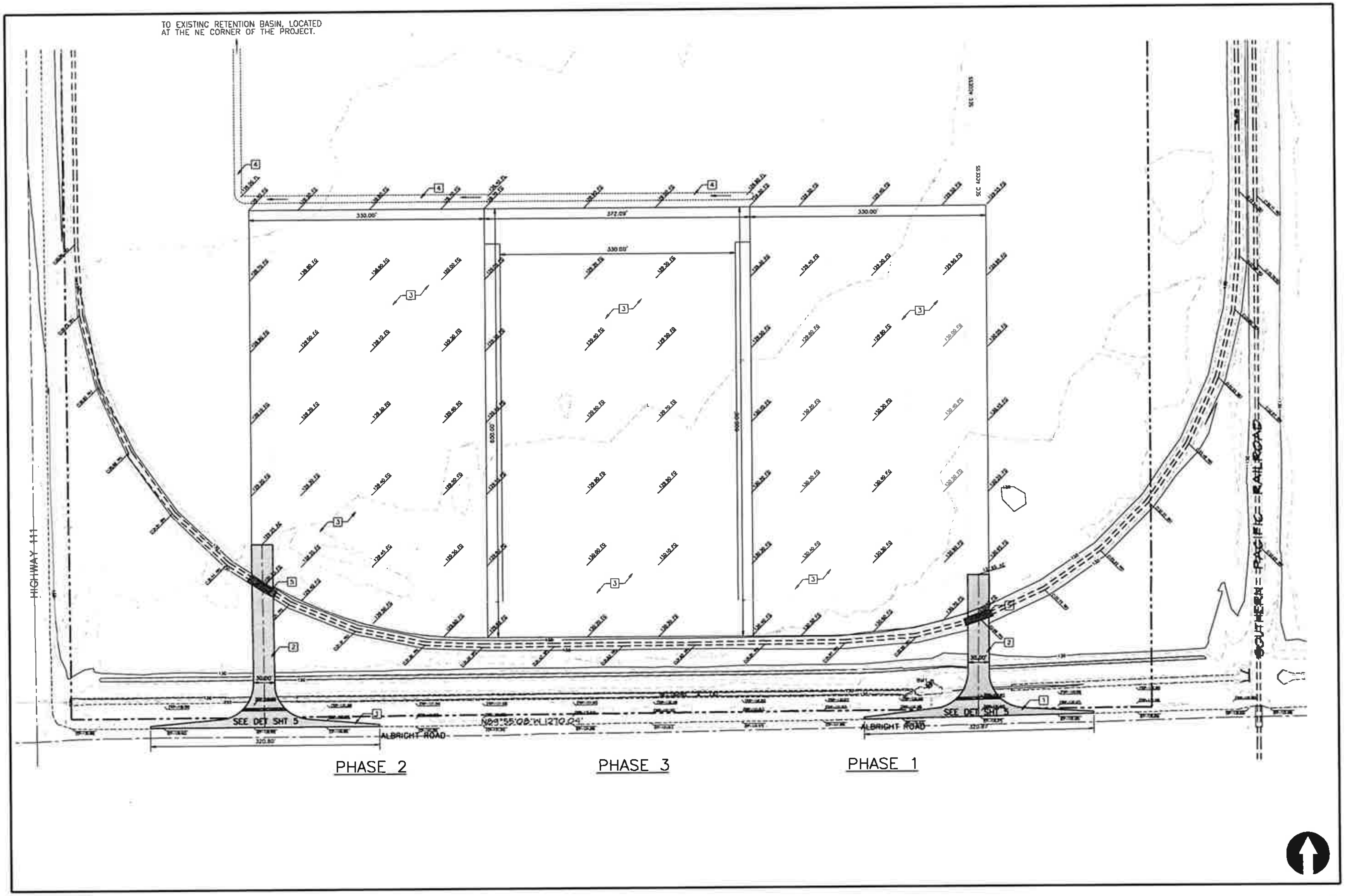

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Figure 2-3

Site Layout

ALL-AMERICAN GRAIN PROJECT

3.0 EXISTING CONDITIONS

3.1 Existing Street Network

Following is a brief description of the street segments within the project area. ***Figure 3–1*** illustrates the existing conditions, including the lane geometry, for the key intersections in the study area.

State Route 111 (SR-111) is classified as a State Highway in the Imperial County Circulation Element. SR 111 is a north-south facility located adjacent to and west of the project site. In the vicinity of the project, SR-111 is a two-lane undivided roadway with a posted speed limit of 40 mph. No bike lanes or bus stops are provided and curbside parking is prohibited. It should be noted that SR-111 is constructed as a four-lane undivided roadway for a small portion between SR-115 and Yocum Road.

Main Street (SR- 115) is classified as a State Highway in the Imperial County Circulation Element. Main Street is an East-West facility located north of the project site and within the central business district of the City of Calipatria. No bike lanes or bus stops are provided.

Yocum Road is classified as a minor collector in the Imperial County Circulation Element. Yocum Road is an East-West facility located adjacent to the project site. In the vicinity of the project, Yocum Road is a two lane undivided roadway. No bike lanes or bus stops are provided.

Albright Road is classified as a minor collector in the Imperial County Circulation Element. Albright Road is an East-West facility located adjacent to the project site. In the vicinity of the project, Albright Road is a two lane undivided roadway. No bike lanes or bus stops are provided.

Rutherford Road is an East-West facility classified as a Major Collector Street in the Imperial County Circulation Element. In the vicinity of the project, Rutherford Road is a two lane undivided roadway. No bike lanes or bus stops are provided.

Kershaw Road is an unclassified local road. Kershaw Road is a North-South facility located adjacent to the project site. In the vicinity of the project, Kershaw Road is a two lane undivided roadway. No bike lanes or bus stops are provided.

3.2 Existing Traffic Volumes

Daily traffic (ADT) volumes on study area segments along SR-111 and SR-115 were obtained from the Caltrans Traffic Census Program for Year 2016, the latest available as of the date of this report. To be conservative, a 10% growth was applied to update the counts to Year 2018 conditions. AM and PM peak hour intersection turning movement volume counts at study area intersections were commissioned by LLG Engineers on June 5th,2018. ***Table 3–1*** summarizes the segment ADT volumes on all the study area segments.

Figure 3–2 depicts the existing traffic volumes on both an ADT and peak hour basis. ***Appendix A*** contains the manual intersection count sheets and latest Caltrans traffic volumes.

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	Source	2016 ADT [a]
SR-111		
SR-115 to Yocum Road	Caltrans	6,100
Albright Road to Rutherford Road	Caltrans	6,800
SR-115		
East of Kershaw Road	Caltrans	3,700

Footnotes:

[a] Average Daily Traffic Volume.

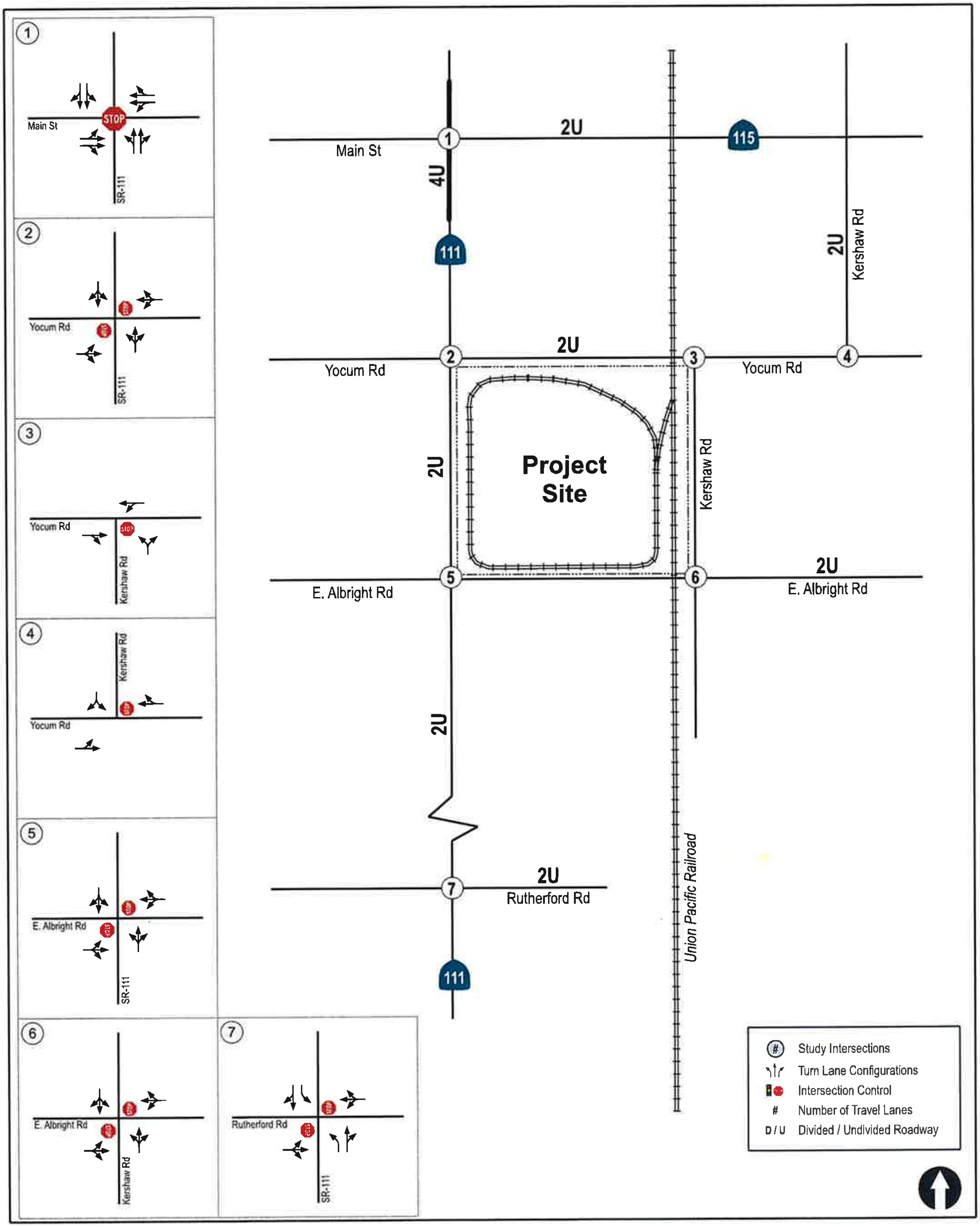

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Figure 3-1

Existing Conditions Diagram

ALL-AMERICAN GRAIN PROJECT

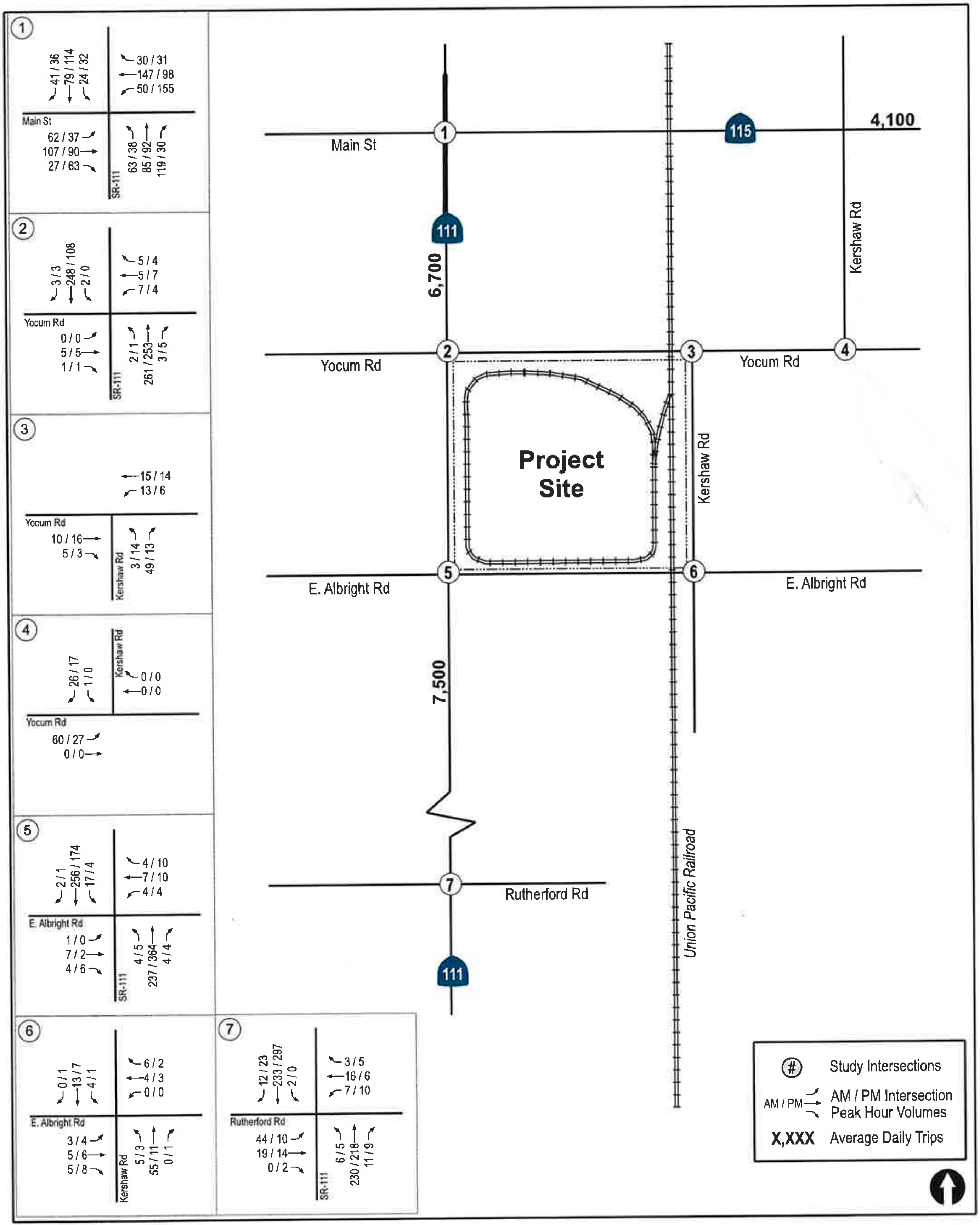

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Figure 3-2

Existing Traffic Volumes

ALL AMERICAN GRAIN PROJECT

4.0 ANALYSIS APPROACH AND METHODOLOGY

Based on the anticipated distribution/assignment of project traffic, the intersections included in the study area are listed below.

Intersections

1. SR-111/ Main Street
2. SR-111/ Yocum Road
3. Kershaw Road/ Yocum Road (West Side)
4. Kershaw Road/ Yocum Road (East Side)
5. SR-111/ Albright Road
6. Kershaw Road/ Albright Road
7. SR-111/ Rutherford Road

Segments

SR-111: SR-115 to Yocum Road;
SR-111: Albright Road to Rutherford Road; and
SR-115: East of Kershaw Road.

This report takes into account the effects of the heavy vehicle traffic associated with the project since this type of traffic is more impactful to the local circulation system than passenger cars.

Cumulative project traffic and a growth factor was also analyzed.

- *Existing*
- *Existing + Project*
- *Existing + Project + Cumulative*

The operations of the project area intersections and segments are characterized using the concept of "Level of Service" (LOS). LOS is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A through F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

Table 4–1 summaries the description for each level of service.

Table 4-2 summarizes the delay in seconds per vehicle associated with each level of service.

4.1 Unsignalized Intersections

All study area intersections are unsignalized, and level of service is determined by the computed or measured control delay and is defined for each minor movement. Level of service is not defined for the intersection as a whole.

Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits.

LOS F may also appear in the form of side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

Appendix B contains the peak hour intersection worksheets.

TABLE 4–1
INTERSECTION LEVEL OF SERVICE DESCRIPTIONS

Level of Service	Description
A	Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.
F	Considered to be unacceptable to most drivers. This condition often occurs with over saturation i.e. when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume-to-capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

TABLE 4–2
INTERSECTION LOS & DELAY RANGES

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	≥ 80.1	≥ 50.1

Source: 2010 Highway Capacity Manual

4.2 Street Segments

Street segments were analyzed based upon the comparison of ADT to the County of Imperial *Roadway Classifications, Levels of Service (LOS) and Average Daily Traffic (ADT)* table (see ***Table 4–3*** below). *Table 4–3* provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. Segment analysis is a comparison of ADT volumes and an approximate daily capacity on the subject roadway.

TABLE 4–3
IMPERIAL COUNTY STANDARD STREET CLASSIFICATION AVERAGE DAILY VEHICLE TRIPS

Road		**Level of Service W/ADT***				
Class	**X-Section**	**A**	**B**	**C**	**D**	**E**
Expressway	128 / 210	30,000	42,000	60,000	70,000	80,000
Prime Arterial	106 / 136	22,200	37,000	44,600	50,000	57,000
Minor Arterial	82 / 102	14,800	24,700	29,600	33,400	37,000
Major Collector (Collector)	64 / 84	13,700	22,800	27,400	30,800	34,200
Minor Collector (Local Collector)	40 / 70	1,900	4,100	7,100	10,900	16,200
Residential Street	40 / 60	*	*	< 1,500	*	*
Residential Cul-de-Sac / Loop Street	40/60	*	*	< 1,500	*	*
Industrial Collector	76 / 96	5,000	10,000	14,000	17,000	20,000
Industrial Local Street	44 / 64	2,500	5,000	7,000	8,500	10,000

* Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

5.0 SIGNIFICANCE CRITERIA

The County of Imperial does not have published significance criteria. However, the County General Plan does state that the LOS goal for intersections and roadway segments is to operate at LOS C or better. Therefore, if an intersection or segment degrades from LOS C or better to LOS D or worse with the addition of project traffic, the impact is considered significant. If the location operates at LOS D or worse with and without project traffic, the impact is considered significant if the project causes the intersection delta to increase by more than two (2) seconds, or the volume to capacity (V/C) ratio to increase by more than 0.02.

A project is considered to have a significant impact if the new project traffic decreases the operations of surrounding roadways by a defined threshold. The defined thresholds for roadway segments and intersections are defined in ***Table 5–1*** below. If the project exceeds the thresholds in ***Table 5–1,*** then the project may be considered to have a significant project impact. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated.

TABLE 5–1
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

Level of Service with Project [a]	Allowable Increase Due to Project Impacts [b]					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
D, E & F *(or ramp meter delays above 15 minutes)*	0.01	1	0.02	1	2	2[c]

Footnotes:

a. All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis (using Table 4-3 or a similar LOS chart for each jurisdiction). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

b. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are deemed to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), or if the project adds a significant amount of peak hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating significant impact changes.

c. The allowable increase in delay at a ramp meter with more than 15 minutes of delay and freeway LOS E is 2 minutes and at LOS F is 1 minute.

General Notes:

1. V/C = Volume to Capacity Ratio
2. Speed = Arterial speed measured in miles per hour
3. Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
4. LOS = Level of Service

6.0 ANALYSIS OF EXISTING CONDITIONS

6.1 Peak Hour Intersection Levels of Service

The project study area is located in a rural setting and all intersections are unsignalized. As seen in ***Table 6–1,*** all study area intersections are calculated to currently operate at LOS C or better during both the AM and PM peak hours.

Appendix B contains the peak hour intersection analysis worksheets.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
1. SR 111 / Main St.	AWSC	AM PM	10.7 11.1	B B
2. SR 111 / Yocum Rd.	TWSC	AM PM	11.9 11.4	B B
3. Kershaw Rd / Yocum Rd (West Side).	TWSC	AM PM	8.6 8.7	A A
4. Kershaw Rd / Yocum Rd (East Side).	TWSC	AM PM	0.0 0.1	A A
5. SR 111 / Albright Rd.	TWSC	AM PM	13.3 13.2	B B
6. Kershaw Rd / Albright Rd.	TWSC	AM PM	9.1 8.8	A A
7. Kershaw Rd / Albright Rd.	TWSC	AM PM	15.3 14.5	C B

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. AWSC – All Way Stop Controlled intersection; TWSC – Two-Way Stop Controlled intersection (Minor street turn delay is reported).

UNSIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 < 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
> 50.1	F

6.2 Daily Street Segment Levels of Service

As described above, the project study area is located in a rural setting and all segments are two-lane facilities. As seen in ***Table 6–2***, all study area segments are calculated to currently operate at LOS D or better.

TABLE 6–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
SR-111				
SR-115 to Yocum Road	16,200	6,700	C	0.414
Albright Road to Rutherford Road	16,200	7,500	D	0.463
SR-115				
East of Kershaw Road	16,200	4,100	B	0.253

Footnotes:

a. Roadway capacity corresponding to Level of Service E from Imperial County Standard Street Classification, Average Daily Vehicle Trips table.
b. Average Daily Traffic volumes
c. Volume / Capacity ratio.
d. Level of Service

7.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

7.1 Trip Generation

Project traffic generation is based on site-specific trip generating characteristics provided by the applicant. The Project would expand operations at the current project site along the southern portion of the project. Based on discussions with the applicant, it is expected that 90 additional trucks per day would ingress and egress the site per day, seven days a week. These trucks would be standard day cab Freightliner type haul trucks and would be loading and unloading grains.

In addition to trucks, the applicant will have 5 new full-time employees at the site to run operations. New worker/miscellaneous trips are expected to arrive/depart during the AM/PM peak hours. Also, in order to account for the vendor/visitor trips, an additional 10 trips per day was assumed.

Based on the information obtained from the applicant, the Total Project would generate a maximum of 20 ADT by passenger vehicles. It would also generate 360 ADT by trucks, with 15 inbound and 15 outbound trips during the AM and PM peak hours. A passenger car equivalence factor (PCE) of 2.0 is applied to these trips for the purposes of the analysis to account for the reduced performance characteristics (stopping, starting, maneuvering, etc.) of heavy vehicles in the traffic flow. ***Table 7–1*** is a summary of the Project traffic generated.

TABLE 7–1
TRIP GENERATION

Use	Quantity	PCE*	Daily Trips		AM Peak Hour		PM Peak Hour	
			Rate	ADT[a]	Volume		Volume	
					In	Out	In	Out
Heavy Veh (trucks)[b]	90	2.0	2.0 / vehicle	360	15	15	15	15
Employees	5	1.0	2.0 / vehicle	10	5	0	0	5
Light Veh (Vendors/Visitors)[c]	5	1.0	2.0 / vehicle	10	2	2	2	2
Subtotal				***380***	***22***	***17***	***17***	***22***

Footnotes:

a. ADT – Average daily traffic.

b. Heavy vehicle traffic includes trucks carrying full loads.

c. Trucks assumed to arrive/leave the site evenly throughout the day's work shift (6AM – 5PM).

d. 100% of employee trips are anticipated to enter and 100% to exit the site during the peak periods.

e. Light vehicle traffic includes vehicles used by vendors and miscellaneous visitors such as small service vehicles for fuel, supplies, and miscellaneous trips.

* PCE Factor of 2.0 for level terrain based on HCM 2010.

7.2 Trip Distribution

Regional trip distribution for construction truck traffic was based on current and forecasted travel patterns. Based on these discussions, 65% of truck traffic would come from the east principally utilizing SR-115. The remaining truck traffic would come from the south utilizing SR-111. ***Figure 7–1*** shows the distribution of truck traffic in the study area.

It is anticipated that the majority of new workers will be from the proximate local population centers of Calipatria, Brawley, and El Centro. ***Figure 7–2*** shows the distribution of employee passenger car traffic along with any miscellaneous trips associated with the project. The majority of employee traffic (62%) is anticipated to be to/from south of the site, from the local labor pool utilizing SR-111 as the primary route to work. The remaining employee trips (38%) would originate north of the project site.

7.3 Trip Assignment

The Project trip generation values shown in ***Table 7–1*** were multiplied by the related truck and employee distribution percentages shown on *Figures 7–1* and *7–2*, respectively. The Project truck traffic assignment is shown on ***Figure 7–3*** and ***Figure 7–4*** shows the Project employee and miscellaneous traffic assignment. ***Figure 7–5*** depicts the Total Project traffic assignment. ***Figure 7–6*** depicts the Existing + Total Project traffic assignment.

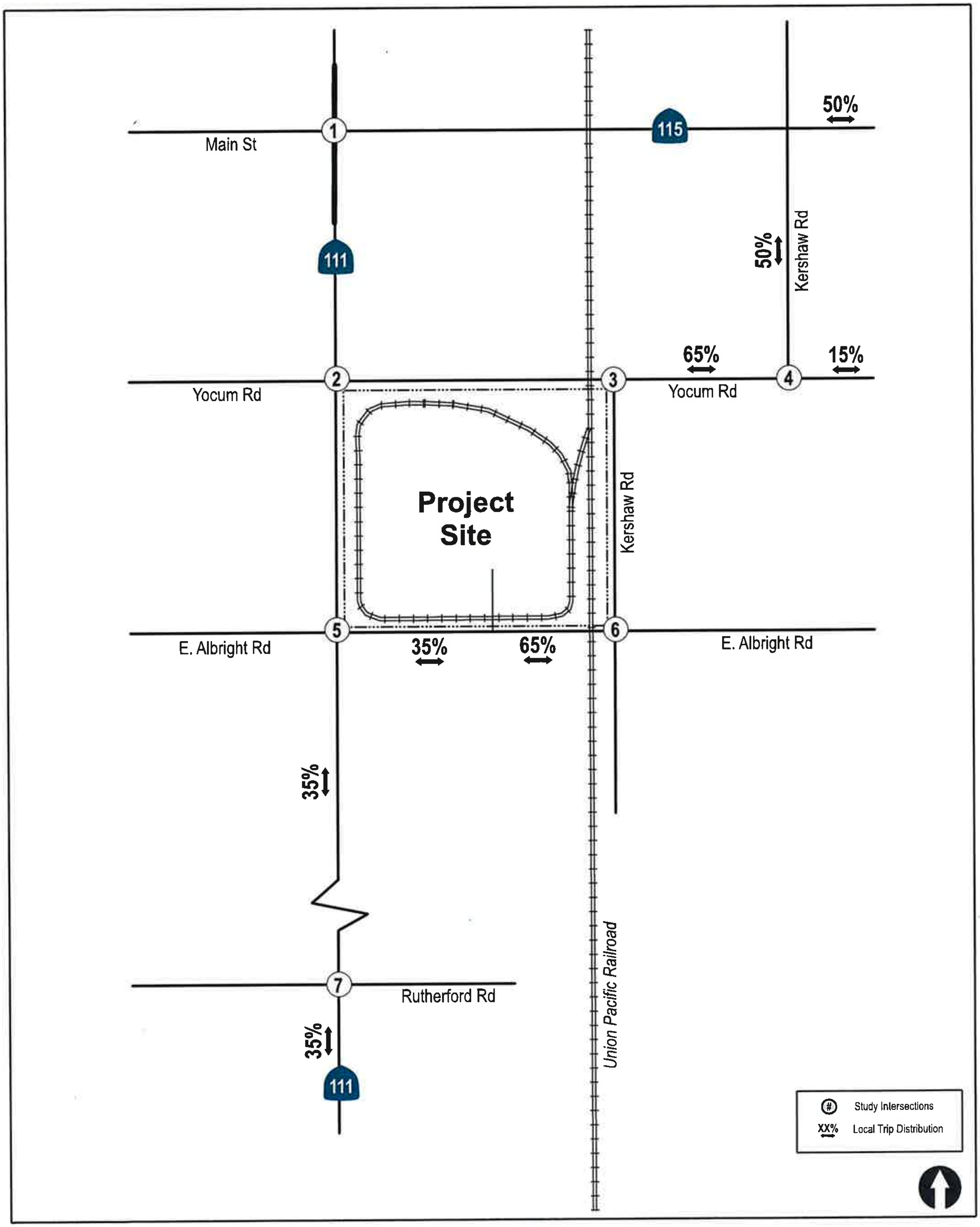

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Figure 7-1

Truck Project Traffic Distribution

ALL AMERICAN GRAIN PROJECT

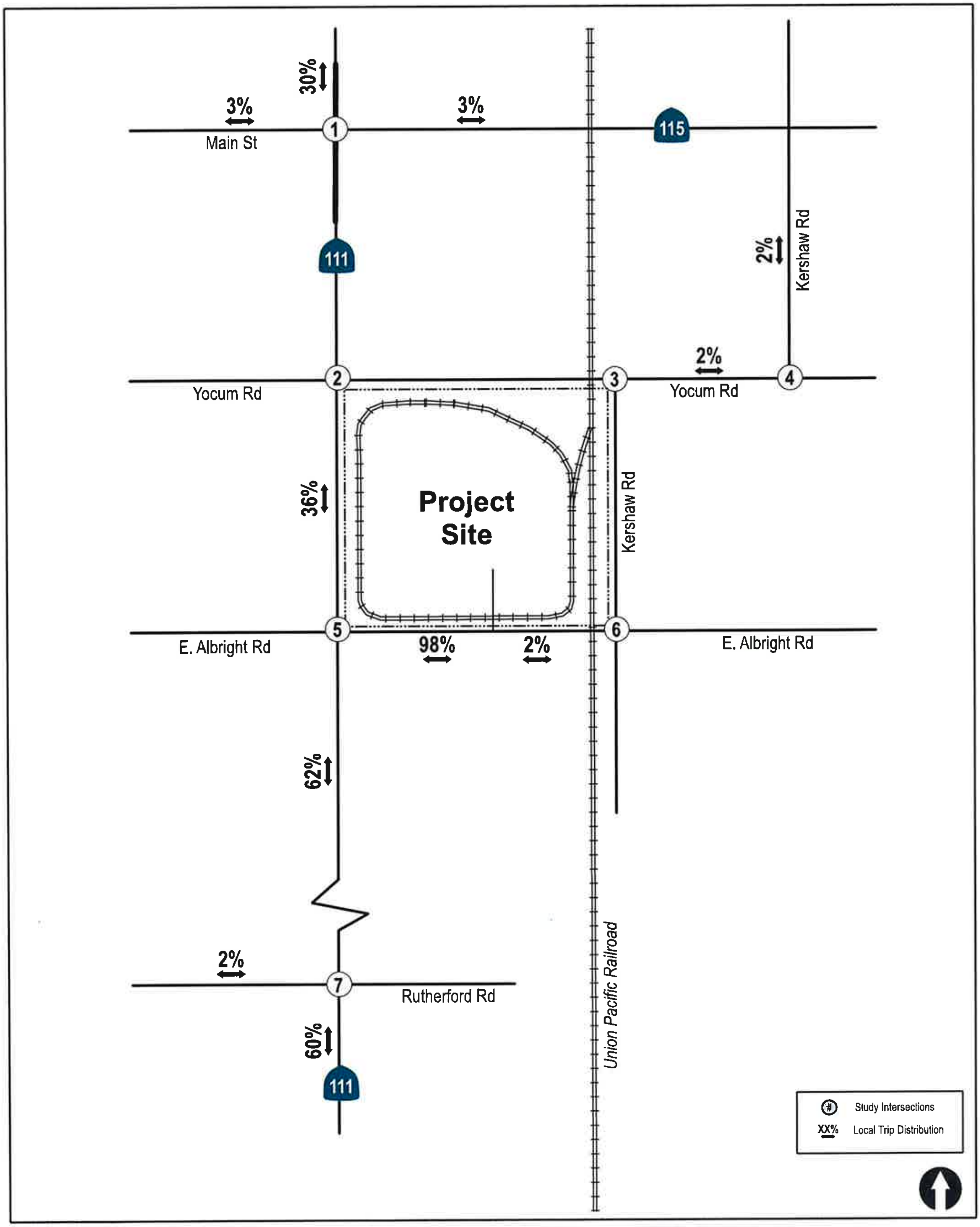

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Figure 7-2

Employee & Visitors Project Traffic Distribution

ALL AMERICAN GRAIN PROJECT

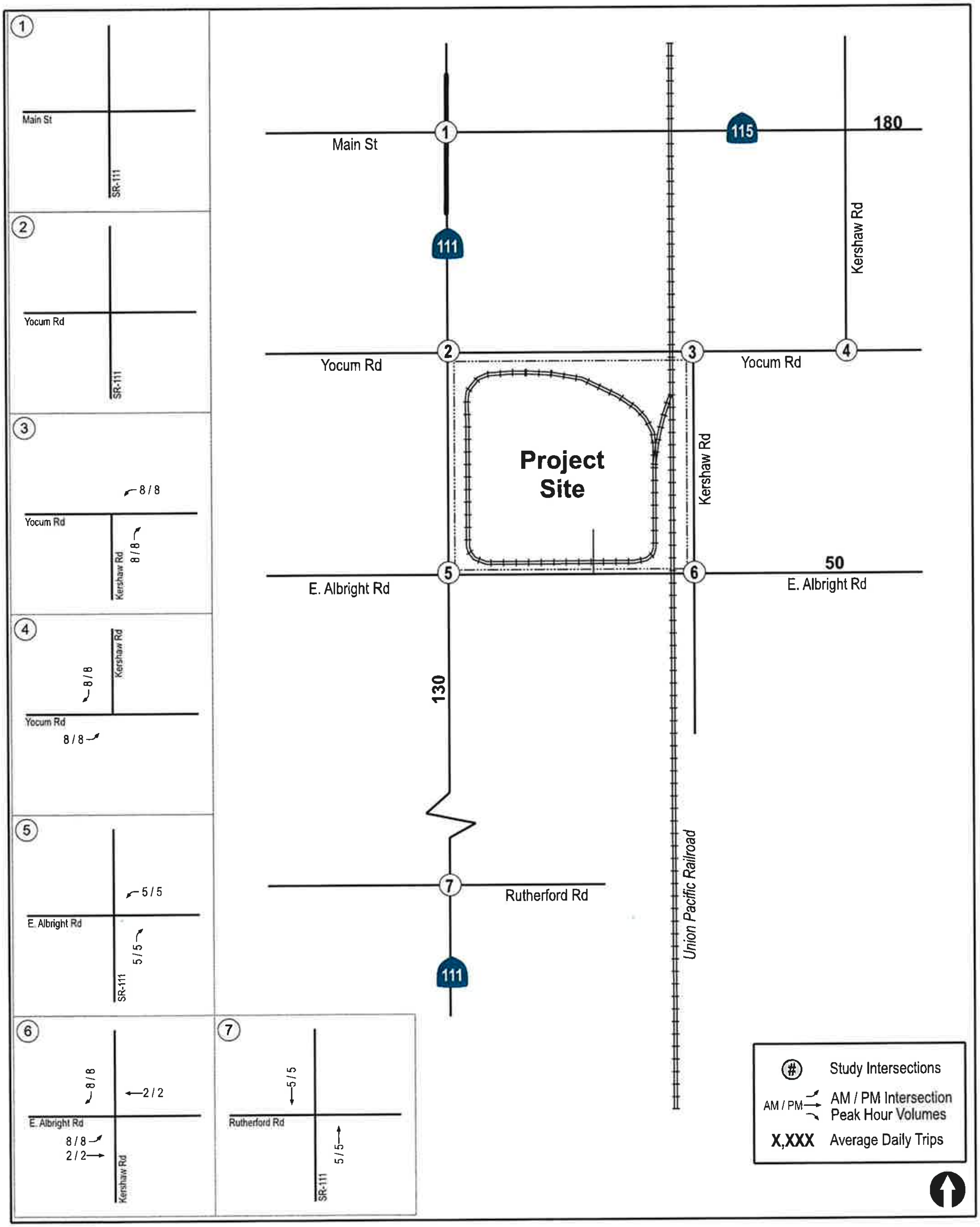

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Figure 7-3

Truck Project Traffic Volumes

ALL AMERICAN GRAIN PROJECT

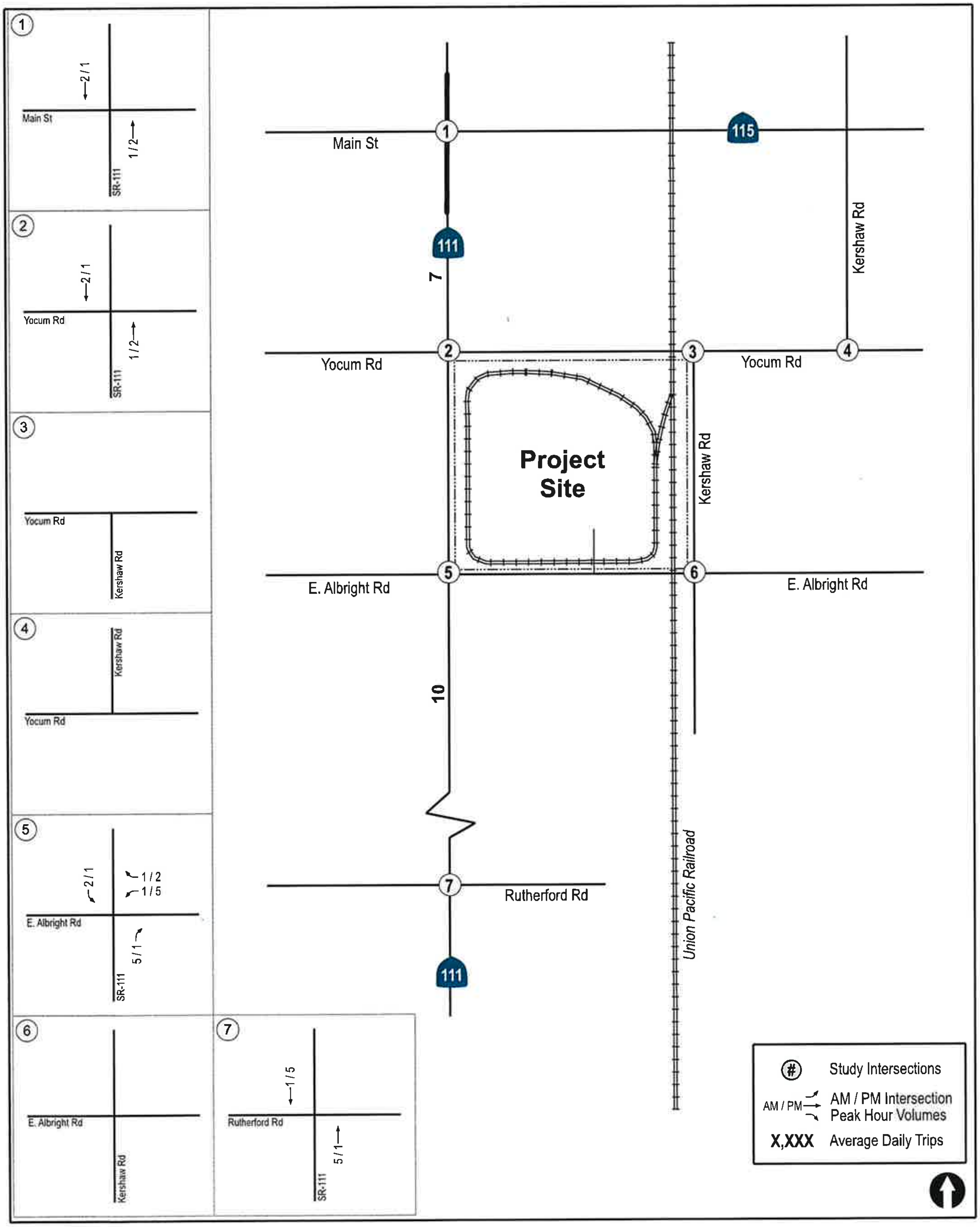

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Figure 7-4

Employee & Visitors Project Traffic Volumes

All American Grain Project

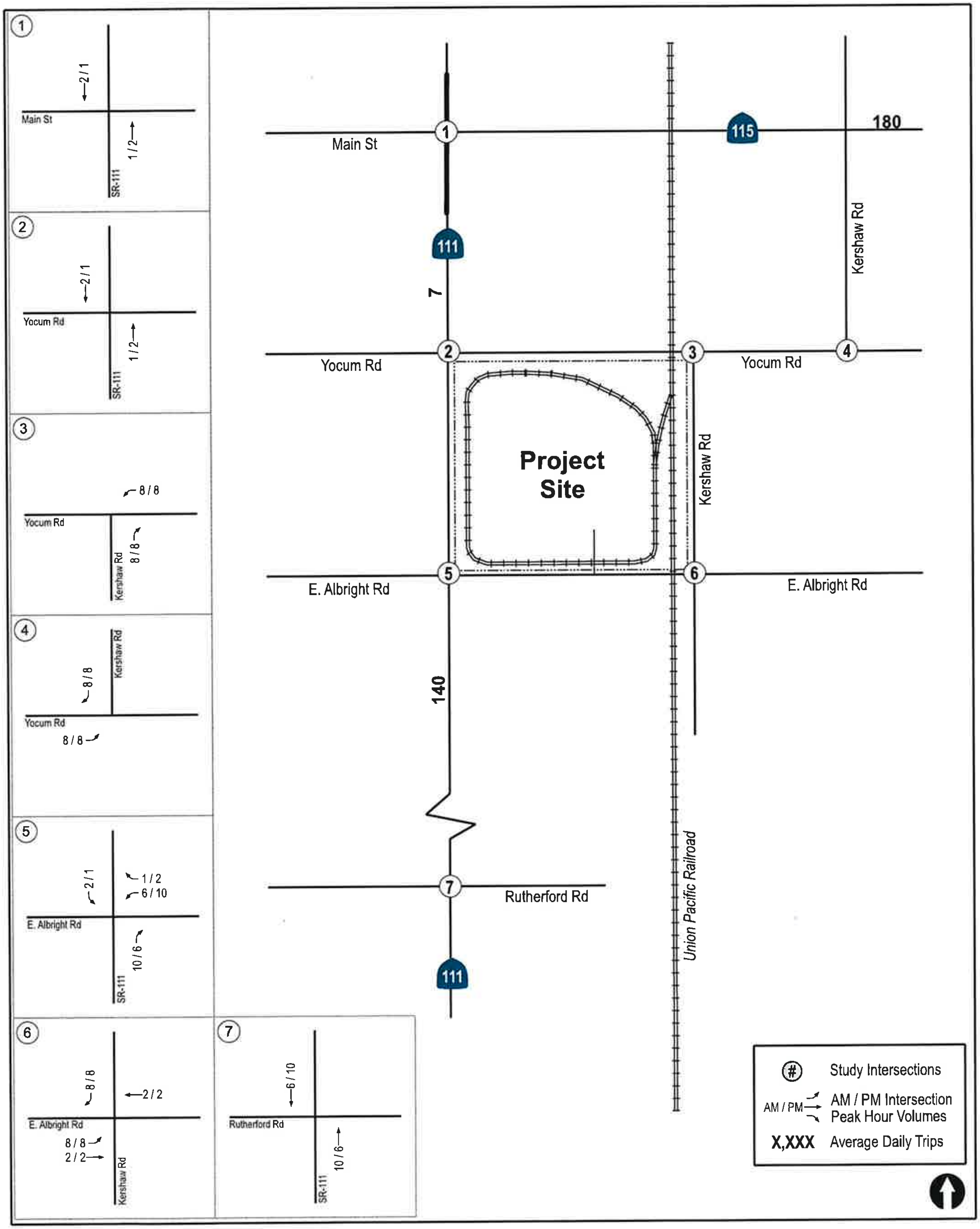

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Figure 7-5

Total Project Traffic Volumes

ALL-AMERICAN GRAIN PROJECT

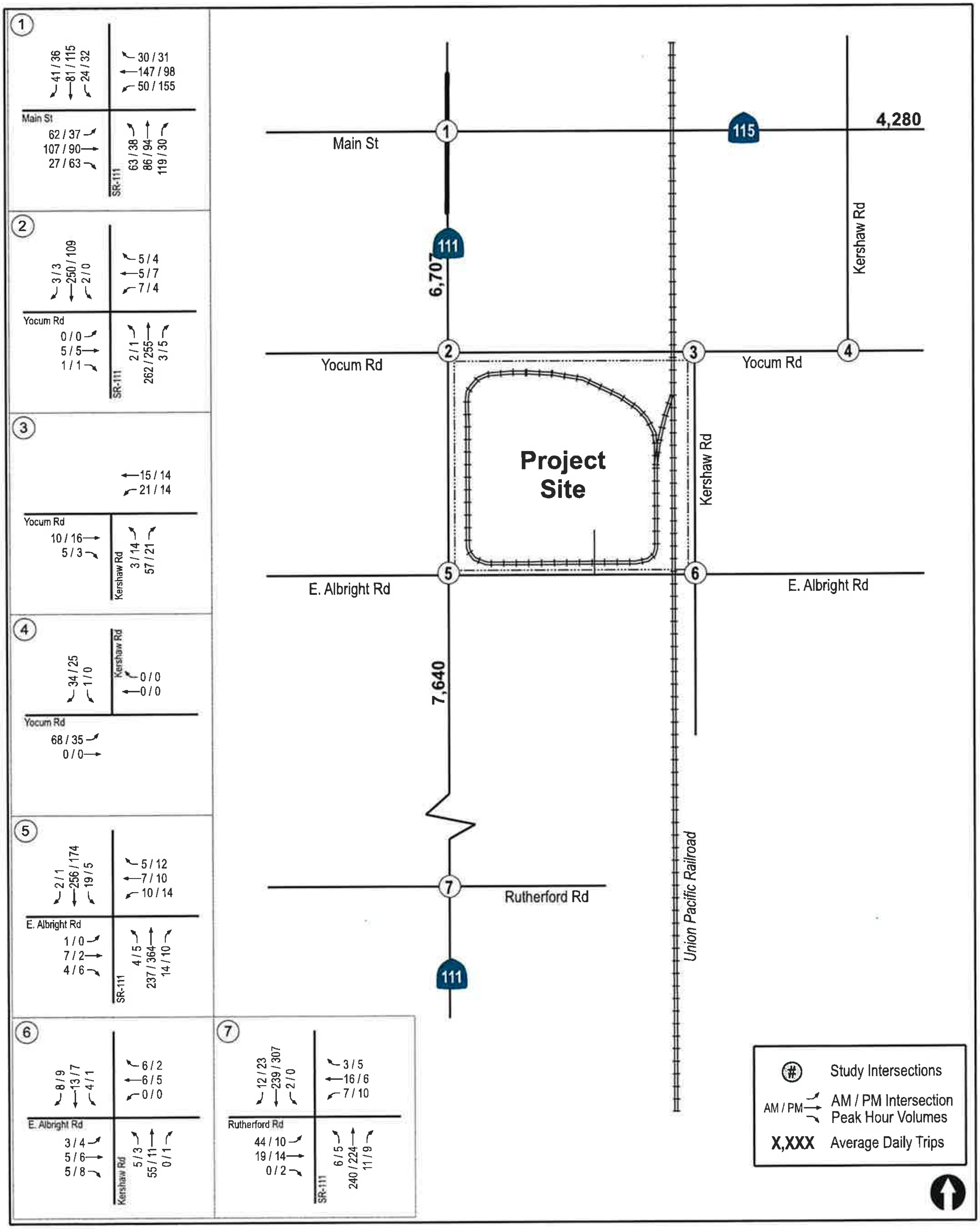

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Figure 7-6

Existing + Total Project Traffic Volumes

ALL-AMERICAN GRAIN PROJECT

8.0 CUMULATIVE PROJECTS AND ANALYSIS RESULTS

There is one planned project in the area adjacent to the project site that may add traffic to the roadways surrounding the project site. The following is a brief description of this cumulative project.

8.1 Description of Projects

1. **Circle K Convenience Store & Fuel Station** is to be located on the southwest corner of the SR-111/S Main Street intersection.

In addition to this project, a 10% growth factor was applied to all existing 2018 traffic volumes throughout the study area. This 10% growth would conservatively represent the amount of traffic that may utilize the street system in the project vicinity proposed from future development projects planned in Imperial County.

Figure 8–1 depicts the Existing + Total Project + Cumulative traffic assignment.

8.2 Existing + Project Analysis

8.2.1 *Intersection Operations*

Table 8–1 summarizes the intersection operations throughout the project study area with the addition of project traffic. ***Table 8–1*** shows that all of the intersections in the study area are calculated to operate at LOS C or better during the AM and PM peak hours.

8.2.2 *Segment Analysis*

Table 8–2 summarizes the street segment operations throughout the project study area with the addition of project traffic. ***Table 8–2*** shows that all of the street segments in the study area are forecasted to operate at LOS D or better.

8.3 Existing + Project + Cumulative Analysis

8.3.1 *Intersection Analysis*

Table 8–1 summarizes the intersection operations throughout the project study area with the addition of cumulative traffic. ***Table 8–1*** shows that all of the intersections in the study area are calculated to continue to operate at LOS C or better during the AM and PM peak hours.

8.3.2 *Segment Analysis*

Table 8–2 summarizes the street segment operations throughout the project study area with the addition of cumulative traffic. ***Table 8–2*** shows that all of the street segments in the study area are forecasted to continue to operate at LOS D or better.

TABLE 8–1
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing + Project		Existing + Project + Cumulative		Significant?
			Delay [a]	LOS [b]	Delay	LOS	
1. SR-111 / Main Street	AWSC[c]	AM	10.7	B	11.6	B	No
		PM	11.1	B	12.1	B	No
2. SR-111 / Yocum Road	TWSC	AM	13.0	B	14.0	B	No
		PM	11.4	B	11.6	B	No
3. Kershaw Road (W) / Yocum Road	TWSC	AM	8.6	A	8.7	A	No
		PM	8.7	A	8.8	A	No
4. Kershaw Road (E) / Yocum Road	TWSC	AM	0.1	A	0.1	A	No
		PM	0.1	A	0.1	A	No
5. SR-111 / Albright Road	TWSC	AM	13.8	B	14.9	B	No
		PM	14.0	B	14.9	B	No
6. Albright Road / Kershaw Road (E)	TWSC	AM	9.2	A	9.2	A	No
		PM	9.0	A	9.0	A	No
7. SR-111 / Rutherford Road	TWSC	AM	15.7	C	17.2	C	No
		PM	14.7	B	15.8	C	No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. AWSC – All Way Stop Controlled intersection;
d. TWSC – Two-Way Stop Controlled intersection (Minor street turn delay is reported); WB=Westbound; SB=Southbound.

UNSIGNALIZED	
Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

TABLE 8–2
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Existing Capacity (LOS E)[a]	Existing + Project			Existing + Project + Cumulative		
		ADT[b]	LOS[c]	V/C[d]	ADT	LOS	V/C
SR-111							
SR-115 to Yocum Road	16,200	6,707	C	0.414	6,740	C	0.416
Albright Road to Rutherford Road	16,200	7,640	D	0.472	8,390	D	0.518
SR-115							
East of Kershaw Road	16,200	4,280	C	0.264	4,350	C	0.269

Footnotes:

a. Roadway capacity corresponding to Level of Service E from Imperial County Standard Street Classification, Average Daily Vehicle Trips table.
b. Average Daily Traffic volumes
c. Level of Service
d. Volume / Capacity ratio.
e. Increase in V/C due to cumulative traffic.

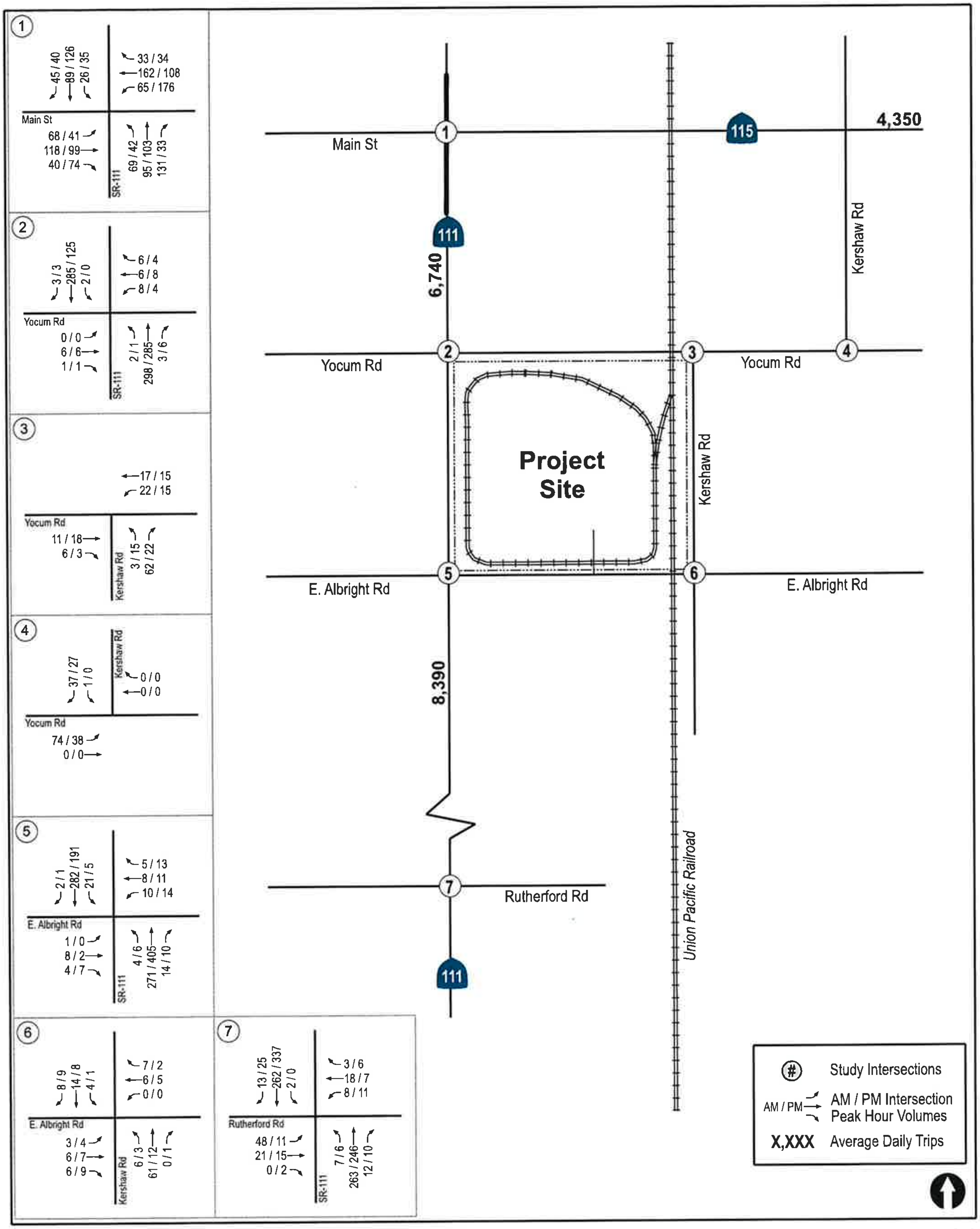

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Figure 8-1

Existing + Total Project + Cumulative Traffic Volumes

ALL-AMERICAN GRAIN PROJECT

9.0 PROJECT ACCESS

The Project will utilize the existing site access driveway along the southeast portion of the site. Based on the location of the driveway, the relatively low amount of project trips, and the very low traffic volumes along Albright Road, the driveway should perform adequately.

10.0 CONCLUSIONS & RECOMMENDATIONS

The capacity analyses performed for the key roadway segments and unsignalized intersections indicate that ***no significant impacts would occur*** during the daily operations of the project.

Inbound Trucks accessing the site should be scheduled such that several trucks do not arrive at the site at the same time.

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TECHNICAL APPENDICES

ALL AMERICAN GRAIN

County of Imperial, California
July 6, 2018

LLG Ref. 3-18-2924

**Linscott, Law &
Greenspan, Engineers**
4542 Ruffner Street
Suite 100
San Diego, CA 92111
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www.llgengineers.com

APPENDIX A

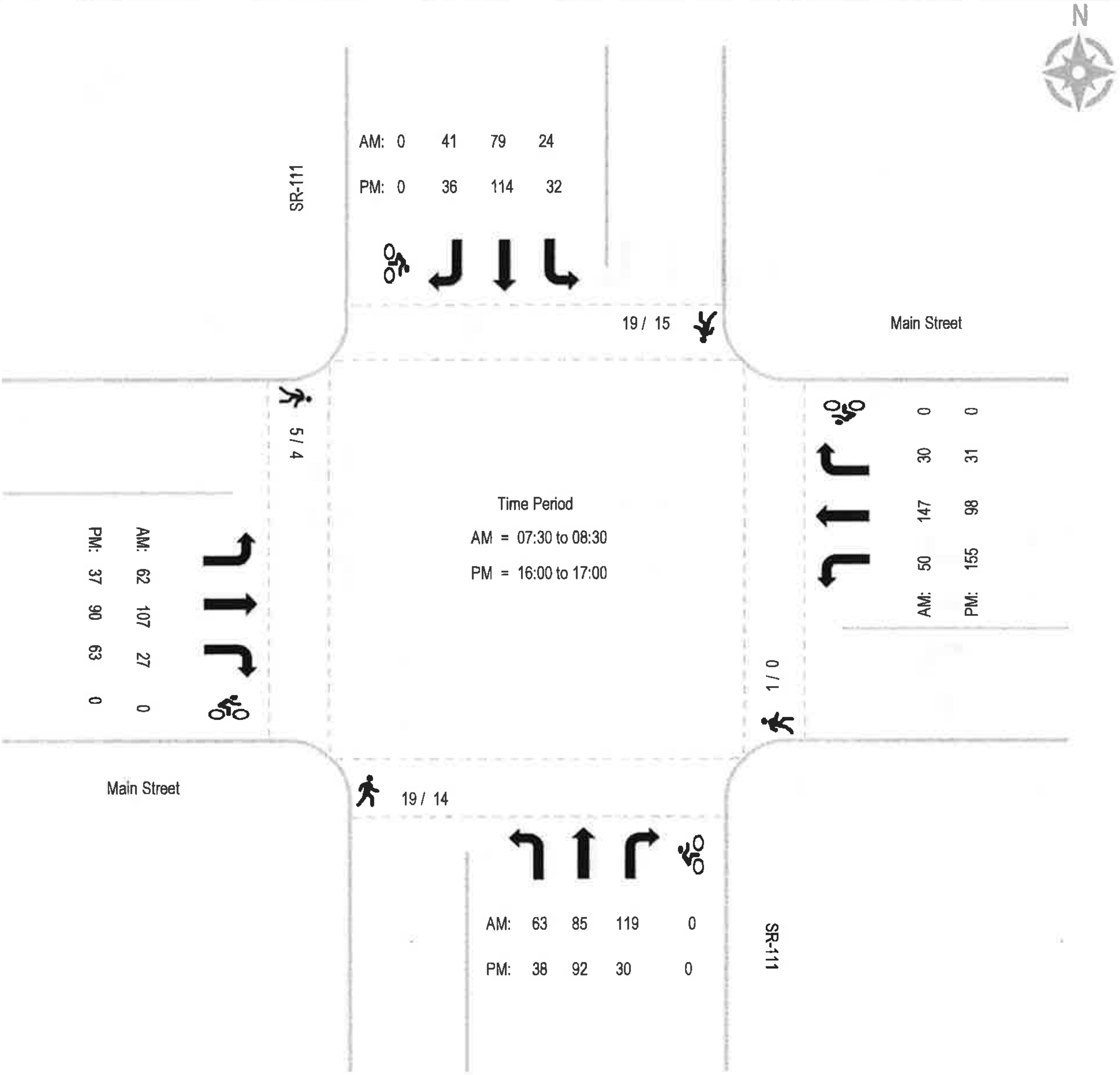
INTERSECTION AND SEGMENT MANUAL COUNT SHEETS

Intersection Turning Movement - Peak Hour Summary

Linscott Law & Greenspan engineers

Location: #01
Intersection: SR-111 & Main Street
Date of Count: Tuesday, June 05, 2018

File Name: ITM-18-073-01
Project: LLG Ref. 3-18-2924
Calipatria



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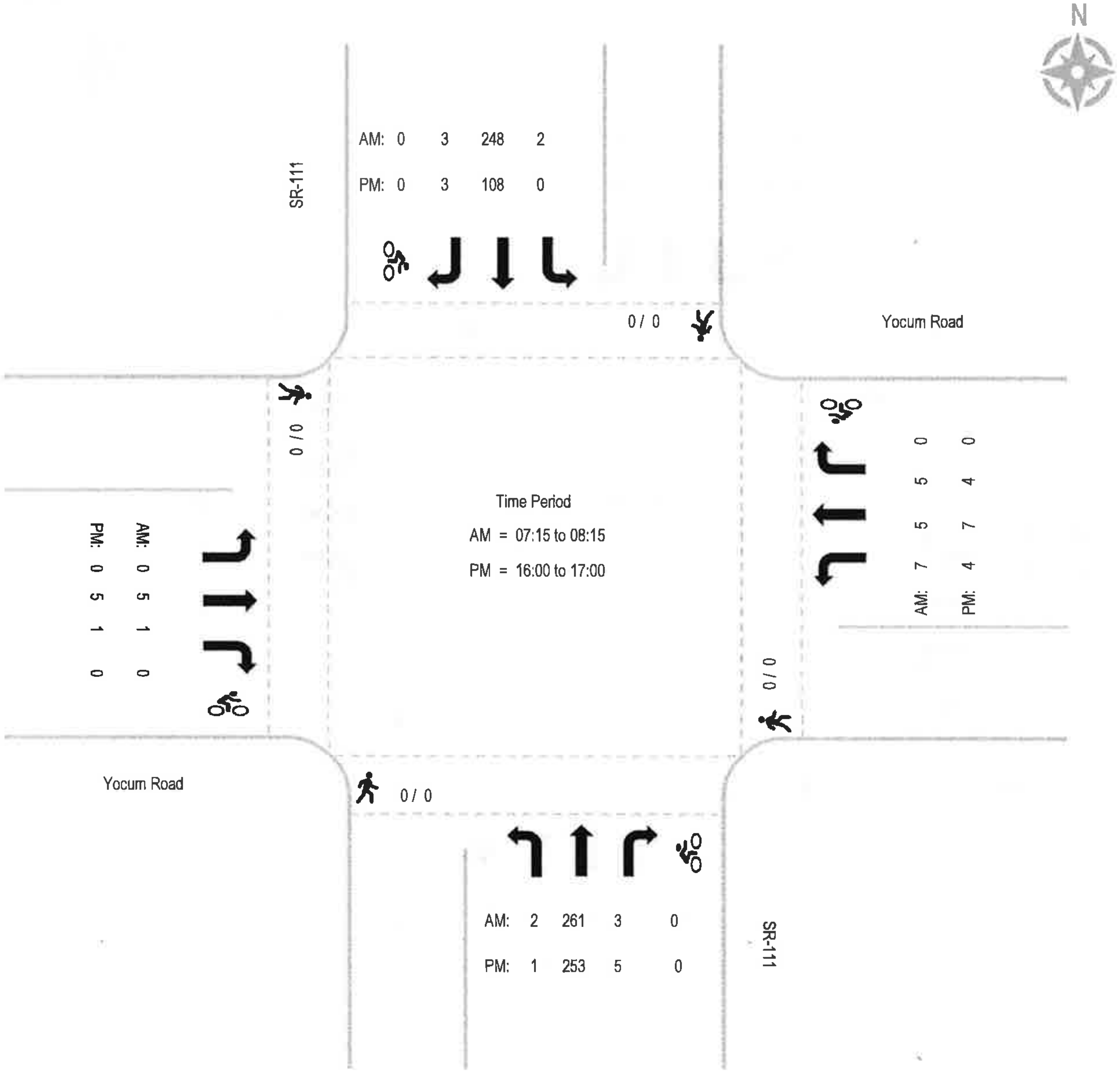
Intersection Turning Movement - Peak Hour Summary

Linscott Law & Greenspan engineers

Location: #02
Intersection: SR-111 & Yuocum Road
Date of Count: Tuesday, June 05, 2018

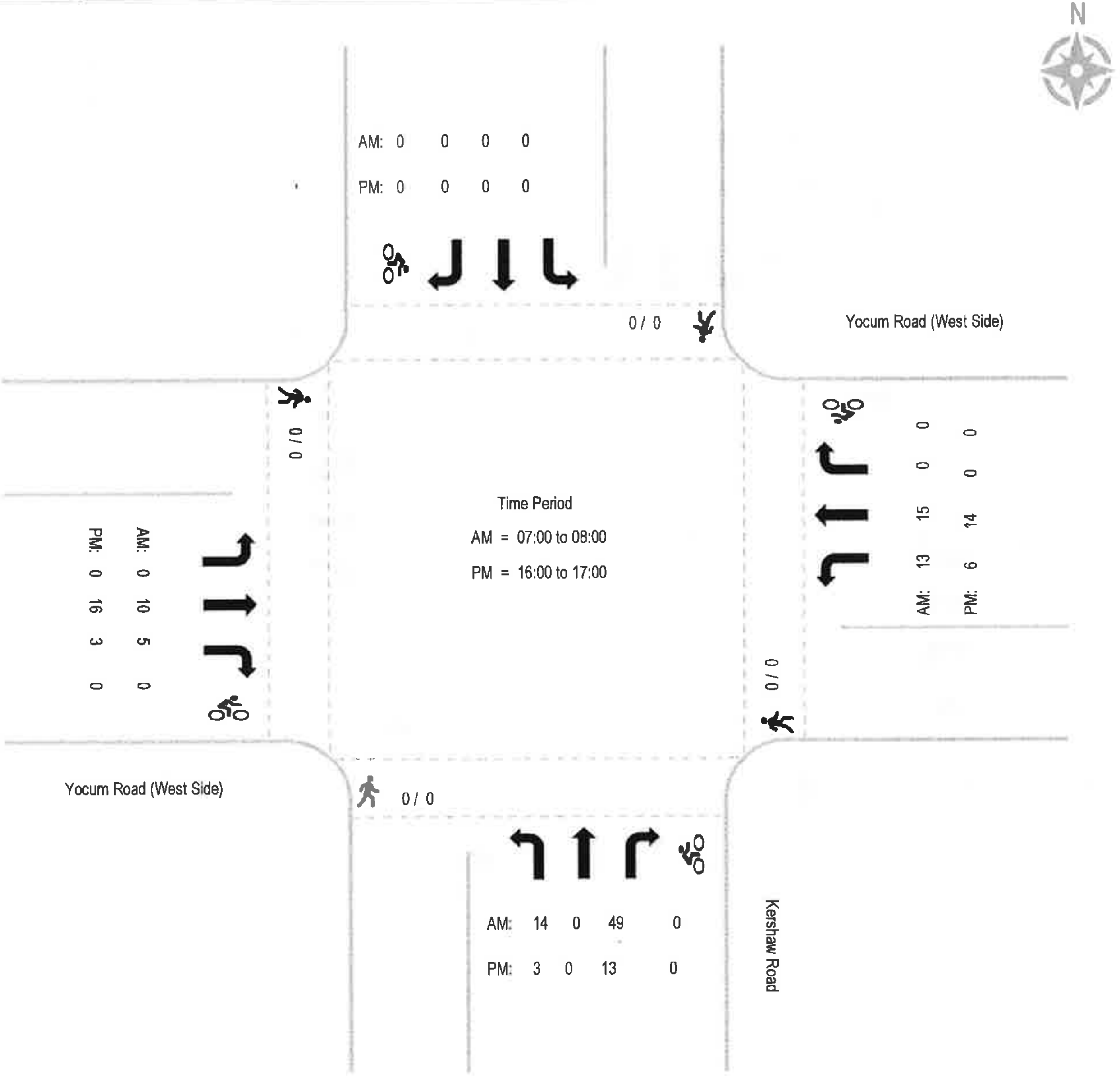
File Name: ITM-18-073-02
Project: LLG Ref. 3-18-2924
Calipatria



Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers

Location:	#05	File Name:	ITM-18-073-05
Intersection:	Kershaw Road & Yocum Road (West Side)	Project:	LLG Ref. 3-18-2924
Date of Count:	Tuesday, June 05, 2018		Calipatria



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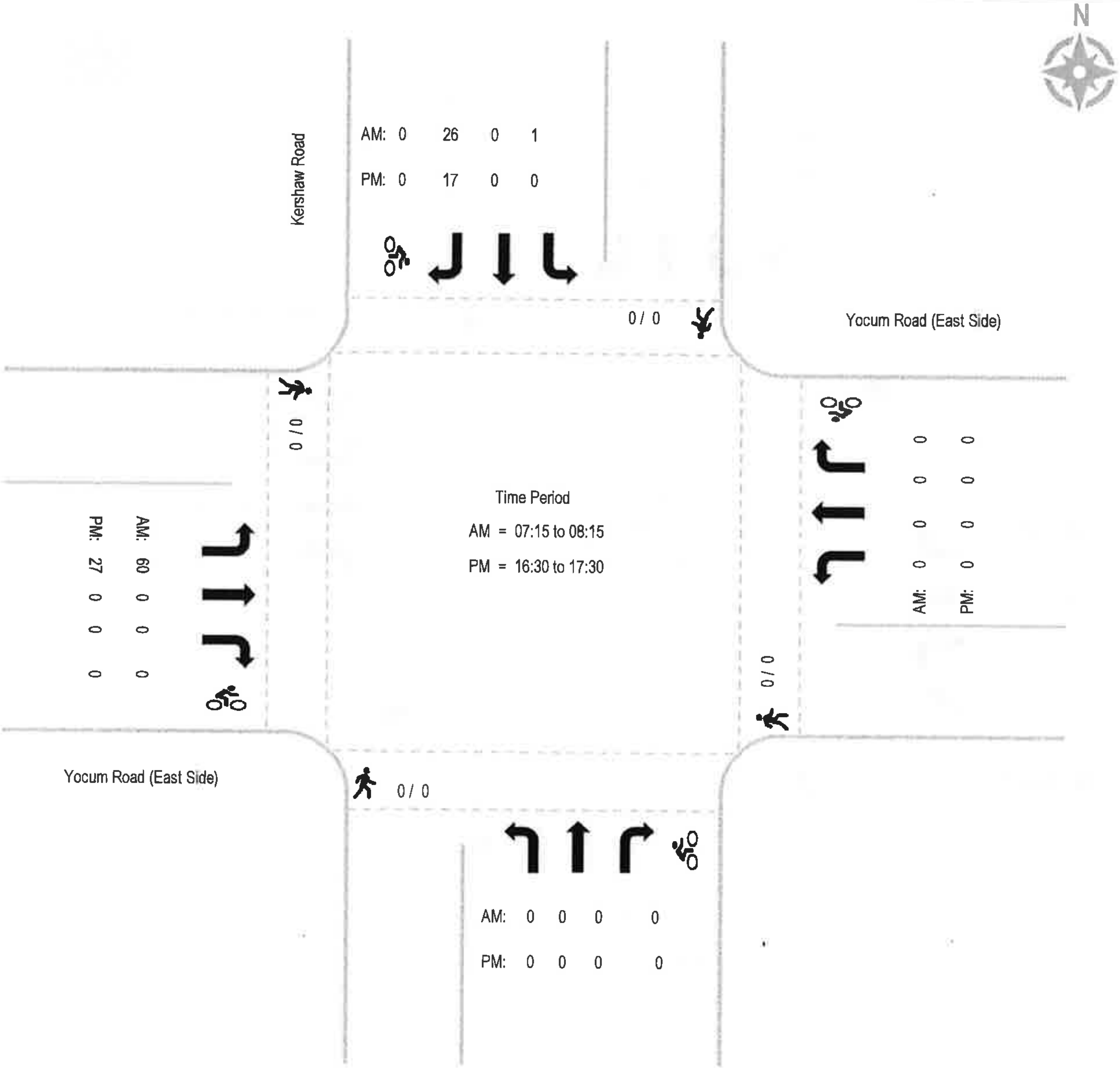
Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers

Location:	#06	File Name:	ITM-18-073-06
Intersection:	Kershaw Road & Yocum Road (East Side)	Project:	LLG Ref. 3-18-2924
Date of Count:	Tuesday, June 05, 2018		Calipatria



Intersection Turning Movement - Peak Hour Summary

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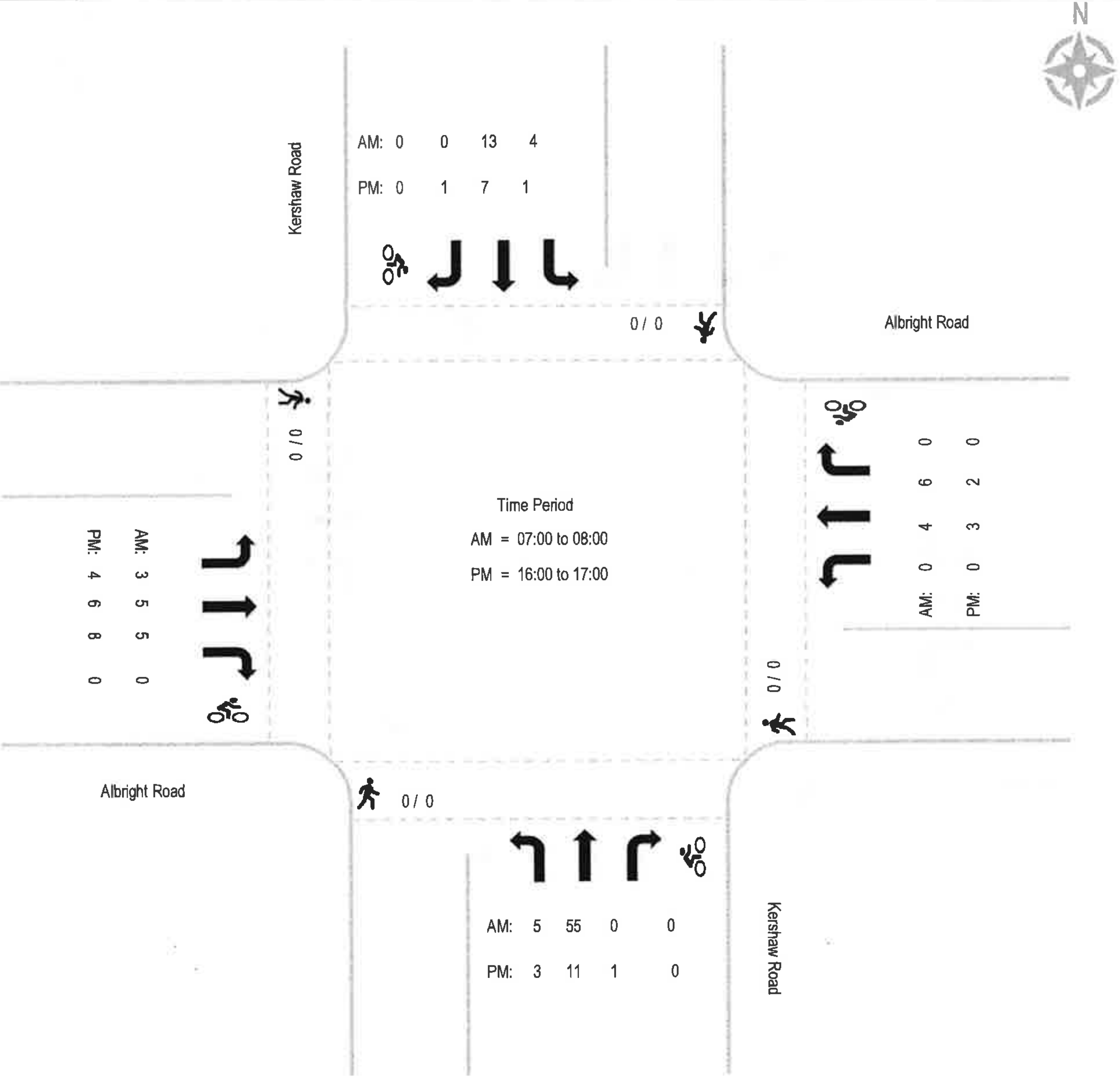
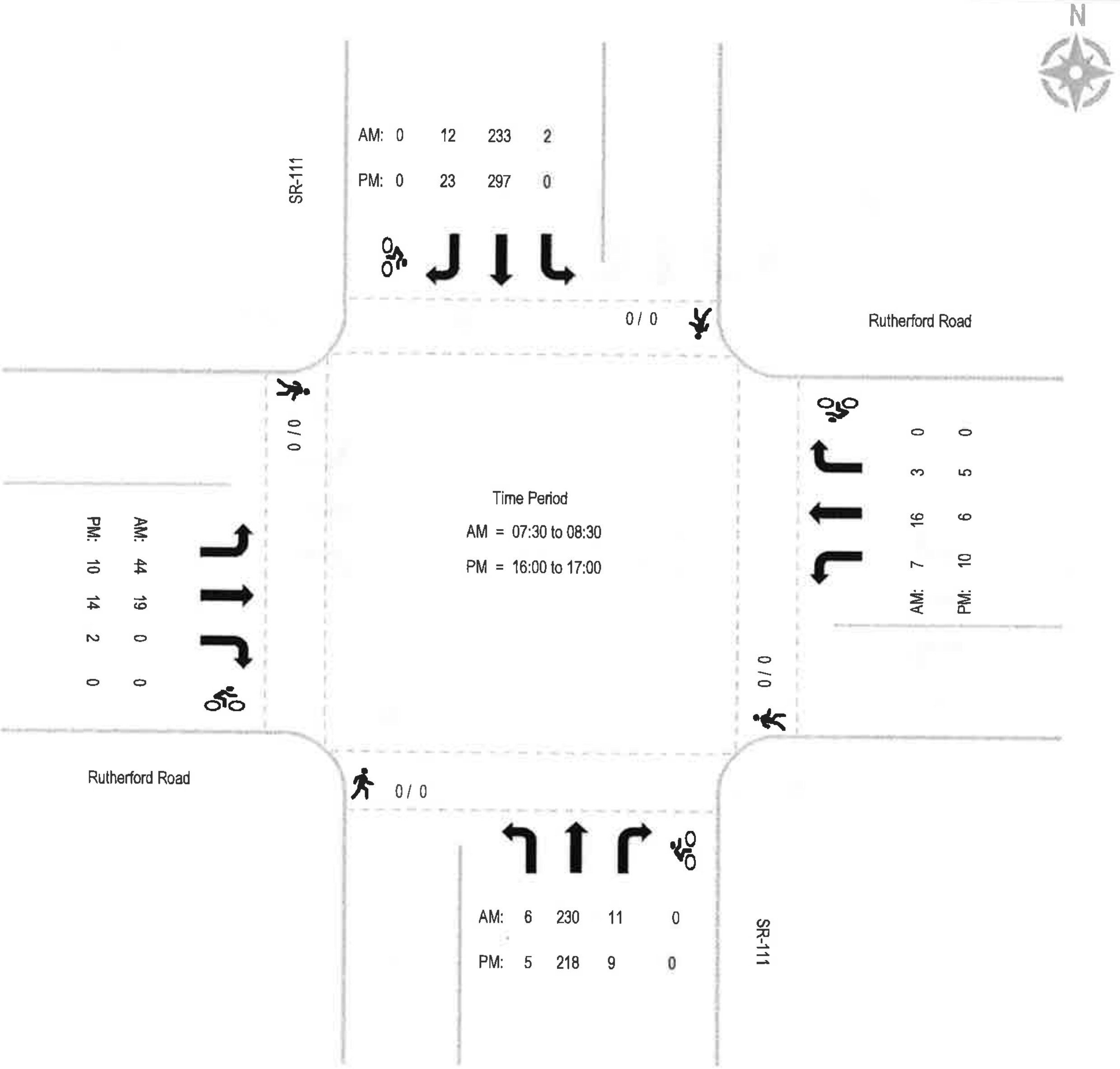
Location:	#07	File Name:	ITM-18-073-07
Intersection:	Kershaw Road & Albright Road	Project:	LLG Ref. 3-18-2924
Date of Count:	Tuesday, June 05, 2018		Calipatria



Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers

Location:	#04	File Name:	ITM-18-073-04
Intersection:	SR-111 & Rutherford Road	Project:	LLG Ref. 3-18-2924
Date of Count:	Tuesday, June 05, 2018		Calipatria



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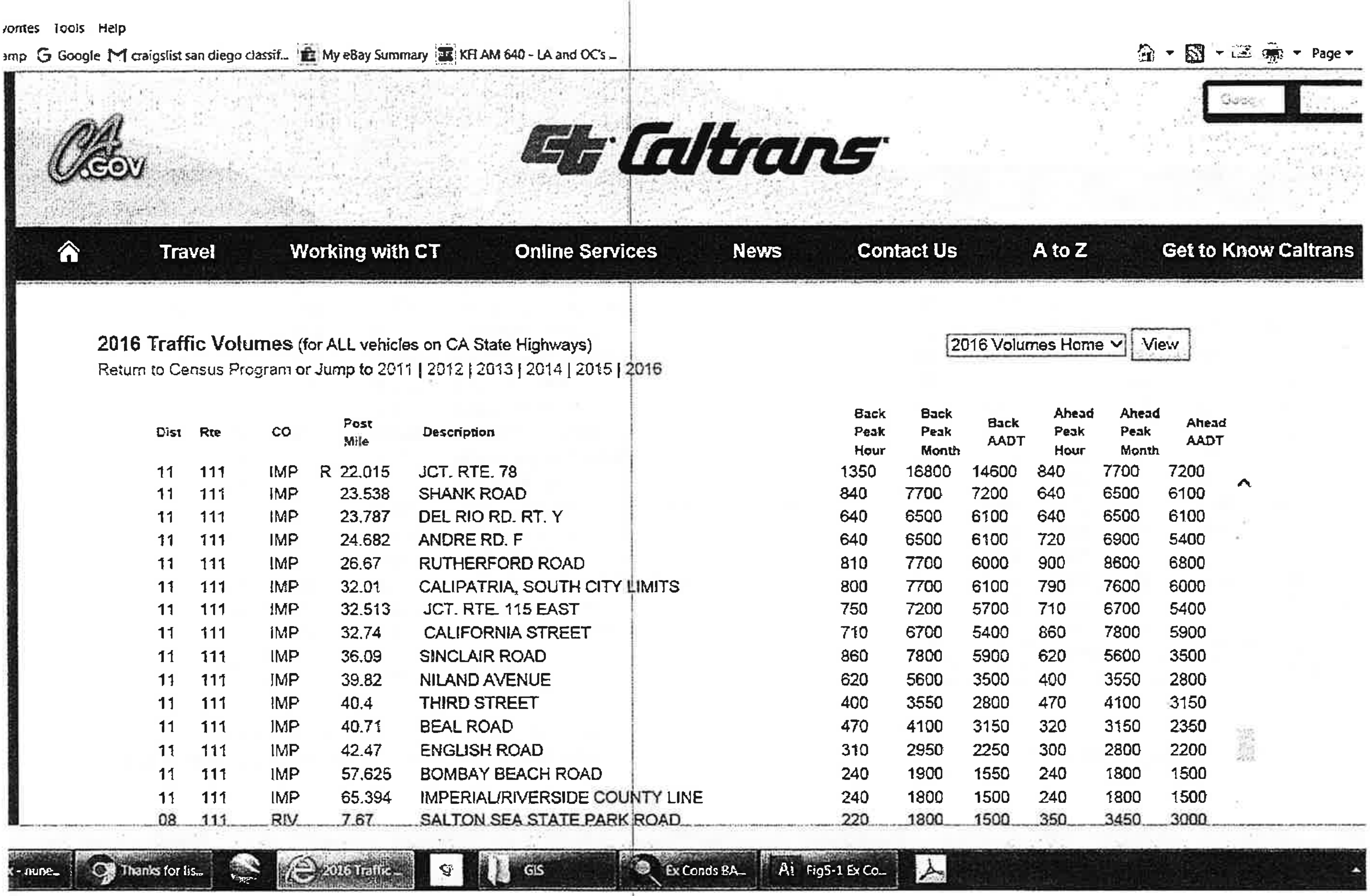
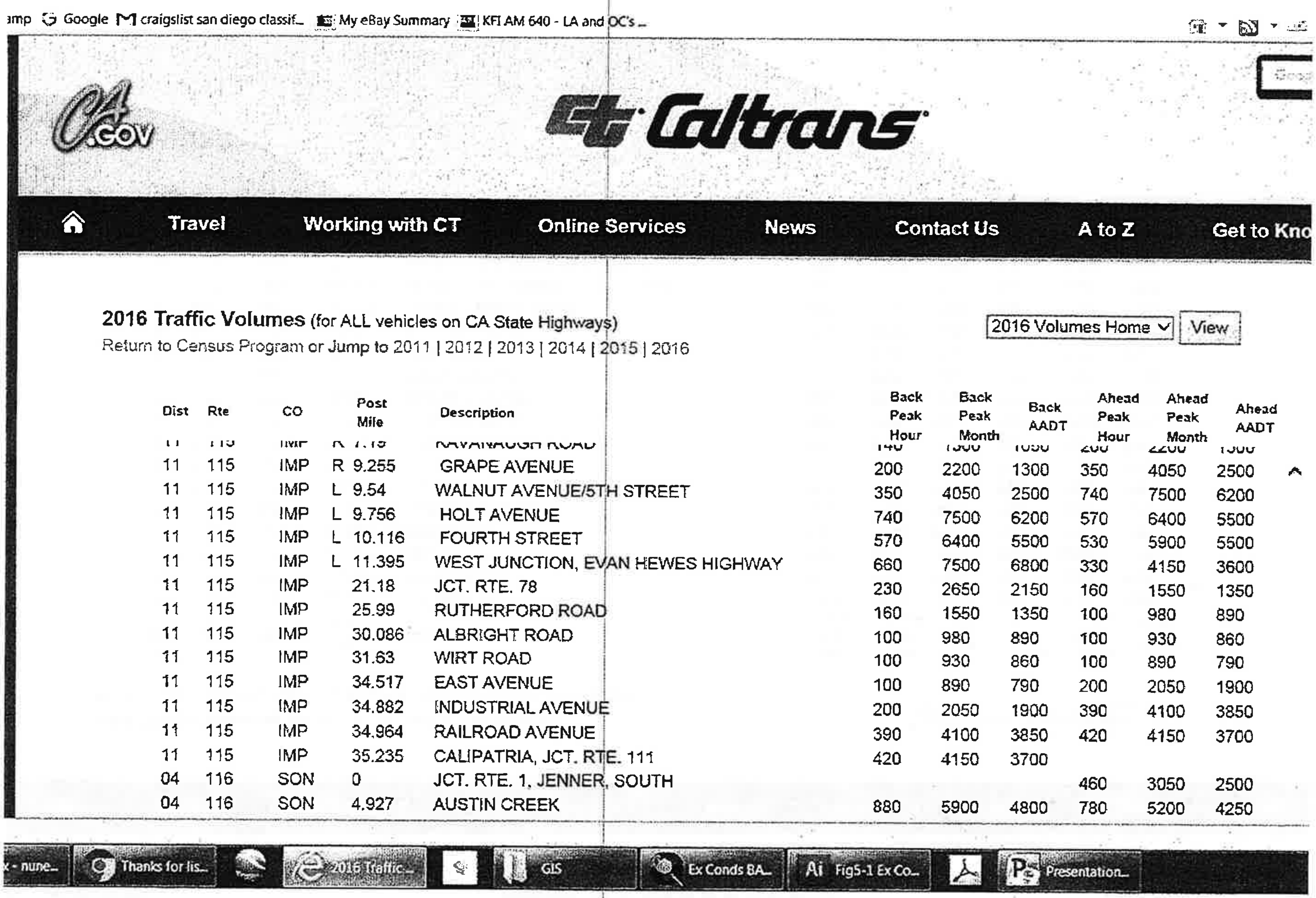


2016 Traffic Volumes (for ALL vehicles on CA State Highways)

Return to Census Program or Jump to 2011 | 2012 | 2013 | 2014 | 2015 | 2016

Dist	Rte	CO	Post Mile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
11	111	IMP	R 22.015	JCT. RTE. 78	1350	16800	14600	840	7700	7200
11	111	IMP	23.538	SHANK ROAD	840	7700	7200	640	6500	6100
11	111	IMP	23.787	DEL RIO RD. RT. Y	640	6500	6100	640	6500	6100
11	111	IMP	24.682	ANDRE RD. F	640	6500	6100	720	6900	5400
11	111	IMP	26.67	RUTHERFORD ROAD	810	7700	6000	900	8600	6800
11	111	IMP	32.01	CALIPATRIA, SOUTH CITY LIMITS	800	7700	6100	790	7600	6000
11	111	IMP	32.513	JCT. RTE. 115 EAST	750	7200	5700	710	6700	5400
11	111	IMP	32.74	CALIFORNIA STREET	710	6700	5400	860	7800	5900
11	111	IMP	36.09	SINCLAIR ROAD	860	7800	5900	620	5600	3500
11	111	IMP	39.82	NILAND AVENUE	620	5600	3500	400	3550	2800
11	111	IMP	40.4	THIRD STREET	400	3550	2800	470	4100	3150
11	111	IMP	40.71	BEAL ROAD	470	4100	3150	320	3150	2350
11	111	IMP	42.47	ENGLISH ROAD	310	2950	2250	300	2800	2200
11	111	IMP	57.625	BOMBAY BEACH ROAD	240	1900	1550	240	1800	1500
11	111	IMP	65.394	IMPERIAL/RIVERSIDE COUNTY LINE	240	1800	1500	240	1800	1500
08	111	RIV	7.67	SALTON SEA STATE PARK ROAD	220	1800	1500	350	3450	3000



2016 Traffic Volumes (for ALL vehicles on CA State Highways)

Return to Census Program or Jump to 2011 | 2012 | 2013 | 2014 | 2015 | 2016

Dist	Rte	CO	Post Mile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
11	115	IMP	R 9.255	GRAPE AVENUE	200	2200	1300	350	4050	2500
11	115	IMP	L 9.54	WALNUT AVENUE/5TH STREET	350	4050	2500	740	7500	6200
11	115	IMP	L 9.756	HOLT AVENUE	740	7500	6200	570	6400	5500
11	115	IMP	L 10.116	FOURTH STREET	570	6400	5500	530	5900	5500
11	115	IMP	L 11.395	WEST JUNCTION, EVAN HEWES HIGHWAY	660	7500	6800	330	4150	3600
11	115	IMP	21.18	JCT. RTE. 78	230	2650	2150	160	1550	1350
11	115	IMP	25.99	RUTHERFORD ROAD	160	1550	1350	100	980	890
11	115	IMP	30.086	ALBRIGHT ROAD	100	980	890	100	930	860
11	115	IMP	31.63	WIRT ROAD	100	930	860	100	890	790
11	115	IMP	34.517	EAST AVENUE	100	890	790	200	2050	1900
11	115	IMP	34.882	INDUSTRIAL AVENUE	200	2050	1900	390	4100	3850
11	115	IMP	34.964	RAILROAD AVENUE	390	4100	3850	420	4150	3700
11	115	IMP	35.235	CALIPATRIA, JCT. RTE. 111	420	4150	3700			
04	116	SON	0	JCT. RTE. 1, JENNER, SOUTH				460	3050	2500
04	116	SON	4.927	AUSTIN CREEK	880	5900	4800	780	5200	4250

APPENDIX B

INTERSECTION ANALYSIS WORKSHEETS

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	62	107	27	0	50	147	30	0	63	85	119
Future Vol, veh/h	0	62	107	27	0	50	147	30	0	63	85	119
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	70	122	31	0	57	167	34	0	72	97	135
Number of Lanes	0	0	2	0	0	0	2	0	0	0	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	10.8	10.8	10.9
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	60%	0%	54%	0%	40%	0%	38%	0%
Vol Thru, %	40%	26%	46%	66%	60%	71%	62%	49%
Vol Right, %	0%	74%	0%	34%	0%	29%	0%	51%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	106	162	116	81	124	104	64	81
LT Vol	63	0	62	0	50	0	24	0
Through Vol	43	43	54	54	74	74	40	40
RT Vol	0	119	0	27	0	30	0	41
Lane Flow Rate	120	184	131	91	140	118	72	91
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.217	0.29	0.239	0.154	0.251	0.197	0.132	0.154
Departure Headway (Hd)	6.507	5.682	6.552	6.041	6.433	6.022	6.609	6.054
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	551	631	547	592	557	595	541	590
Service Time	4.255	3.43	4.303	3.792	4.183	3.772	4.365	3.811
HCM Lane V/C Ratio	0.218	0.292	0.239	0.154	0.251	0.198	0.133	0.154
HCM Control Delay	11.1	10.8	11.4	9.9	11.3	10.3	10.4	9.9
HCM Lane LOS	B	B	B	A	B	B	B	A
HCM 95th-tile Q	0.8	1.2	0.9	0.5	1	0.7	0.5	0.5

2: SR-111 & Yocum Rd

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	5	1	7	5	5	2	261	3	2	248	3
Future Vol, veh/h	0	5	1	7	5	5	2	261	3	2	248	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	1	8	6	6	2	297	3	2	282	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	444	593	143	451	593	150	285	0	0	300	0	0
Stage 1	288	288	-	303	303	-	-	-	-	-	-	-
Stage 2	156	305	-	148	290	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	497	417	879	492	417	870	1274	-	-	1258	-	-
Stage 1	695	672	-	681	662	-	-	-	-	-	-	-
Stage 2	831	661	-	840	671	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	487	415	879	485	415	870	1274	-	-	1258	-	-
Mov Cap-2 Maneuver	487	415	-	485	415	-	-	-	-	-	-	-
Stage 1	694	671	-	680	661	-	-	-	-	-	-	-
Stage 2	817	660	-	830	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	11.9	0.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1274	-	-	415	489	464	637	1258	-	-
HCM Lane V/C Ratio	0.002	-	-	0.007	0.008	0.023	0.013	0.002	-	-
HCM Control Delay (s)	7.8	0	-	13.7	12.4	12.9	10.7	7.9	0	-
HCM Lane LOS	A	A	-	B	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	10	5	13	15	3	49
Future Vol, veh/h	10	5	13	15	3	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	6	15	17	3	56

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	17	0	61	14
Stage 1	-	-	-	-	14	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1600	-	945	1066
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1600	-	936	1066
Mov Cap-2 Maneuver	-	-	-	-	936	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	966	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1058	-	-	1600	-
HCM Lane V/C Ratio	0.056	-	-	0.009	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	60	0	0	0	1	26
Future Vol, veh/h	60	0	0	0	1	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	0	0	0	1	30

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	30	0	168	0	0	-
Stage 1	-	-	136	-	-	-
Stage 2	-	-	32	-	-	-
Critical Hdwy	-	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	-	-	725	-	-	-
Stage 1	-	-	784	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	-	-	0	-	-	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s		0	
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	-	-
HCM Lane LOS	-	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	1	7	4	4	7	4	4	237	4	17	256	2
Future Vol, veh/h	1	7	4	4	7	4	4	237	4	17	256	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	8	5	5	8	5	5	269	5	19	291	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	618	614	292	618	613	272	293	0	0	274	0	0
Stage 1	331	331	-	281	281	-	-	-	-	-	-	-
Stage 2	287	283	-	337	332	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	402	407	747	402	408	767	1269	-	-	1289	-	-
Stage 1	682	645	-	726	678	-	-	-	-	-	-	-
Stage 2	720	677	-	677	644	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	387	398	747	387	399	767	1269	-	-	1289	-	-
Mov Cap-2 Maneuver	387	398	-	387	399	-	-	-	-	-	-	-
Stage 1	679	633	-	722	675	-	-	-	-	-	-	-
Stage 2	704	674	-	652	632	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	13.3	0.1	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1269	-	-	470	453	1289	-	-
HCM Lane V/C Ratio	0.004	-	-	0.029	0.038	0.015	-	-
HCM Control Delay (s)	7.8	0	-	12.9	13.3	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	3	5	5	0	4	6	5	55	0	4	13	0
Future Vol, veh/h	3	5	5	0	4	6	5	55	0	4	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	6	6	0	5	7	6	63	0	5	15	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	104	98	15	104	98	63	15	0	0	63	0	0
Stage 1	24	24	-	74	74	-	-	-	-	-	-	-
Stage 2	80	74	-	30	24	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	876	792	1065	876	792	1002	1603	-	-	1540	-	-
Stage 1	994	875	-	935	833	-	-	-	-	-	-	-
Stage 2	929	833	-	987	875	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	862	786	1065	862	786	1002	1603	-	-	1540	-	-
Mov Cap-2 Maneuver	862	786	-	862	786	-	-	-	-	-	-	-
Stage 1	990	872	-	931	830	-	-	-	-	-	-	-
Stage 2	914	830	-	972	872	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	9	0.6	1.7
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1603	-	-	894	903	1540	-	-
HCM Lane V/C Ratio	0.004	-	-	0.017	0.013	0.003	-	-
HCM Control Delay (s)	7.3	0	-	9.1	9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	44	19	0	7	16	3	6	230	11	2	233	12
Future Vol, veh/h	44	19	0	7	16	3	6	230	11	2	233	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	600	-	-	230	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	22	0	8	18	3	7	261	13	2	265	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	568	564	272	568	564	268	278	0	0	274	0	0
Stage 1	276	276	-	281	281	-	-	-	-	-	-	-
Stage 2	292	288	-	287	283	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	434	435	767	434	435	771	1285	-	-	1289	-	-
Stage 1	730	682	-	726	678	-	-	-	-	-	-	-
Stage 2	716	674	-	720	677	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	416	432	767	415	432	771	1285	-	-	1289	-	-
Mov Cap-2 Maneuver	416	432	-	415	432	-	-	-	-	-	-	-
Stage 1	726	681	-	722	674	-	-	-	-	-	-	-
Stage 2	690	670	-	696	676	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.3	13.6	0.2	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1285	-	-	421	450	1289	-	-
HCM Lane V/C Ratio	0.005	-	-	0.17	0.066	0.002	-	-
HCM Control Delay (s)	7.8	-	-	15.3	13.6	7.8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	0	-	-

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	37	90	63	0	155	98	31	0	38	92	30
Future Vol, veh/h	0	37	90	63	0	155	98	31	0	38	92	30
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	42	102	72	0	176	111	35	0	43	105	34
Number of Lanes	0	0	2	0	0	0	2	0	0	0	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	10.2	12.4	10.5
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	45%	0%	45%	0%	76%	0%	36%	0%
Vol Thru, %	55%	61%	55%	42%	24%	61%	64%	61%
Vol Right, %	0%	39%	0%	58%	0%	39%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	84	76	82	108	204	80	89	93
LT Vol	38	0	37	0	155	0	32	0
Through Vol	46	46	45	45	49	49	57	57
RT Vol	0	30	0	63	0	31	0	36
Lane Flow Rate	95	86	93	123	232	91	101	106
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.177	0.148	0.167	0.198	0.413	0.145	0.185	0.18
Departure Headway (Hd)	6.662	6.151	6.44	5.797	6.416	5.757	6.574	6.116
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	537	582	556	617	561	622	545	585
Service Time	4.414	3.903	4.191	3.548	4.163	3.503	4.325	3.867
HCM Lane V/C Ratio	0.177	0.148	0.167	0.199	0.414	0.146	0.185	0.181
HCM Control Delay	10.9	10	10.5	10	13.6	9.5	10.8	10.2
HCM Lane LOS	B	A	B	A	B	A	B	B
HCM 95th-tile Q	0.6	0.5	0.6	0.7	2	0.5	0.7	0.7

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	5	1	4	7	4	1	253	5	0	108	3
Future Vol, veh/h	0	5	1	4	7	4	1	253	5	0	108	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	1	5	8	5	1	288	6	0	123	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	274	419	63	357	419	147	126	0	0	293	0	0
Stage 1	124	124	-	293	293	-	-	-	-	-	-	-
Stage 2	150	295	-	64	126	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	657	524	988	574	524	873	1458	-	-	1265	-	-
Stage 1	867	792	-	691	669	-	-	-	-	-	-	-
Stage 2	837	668	-	939	791	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	646	523	988	568	523	873	1458	-	-	1265	-	-
Mov Cap-2 Maneuver	646	523	-	568	523	-	-	-	-	-	-	-
Stage 1	866	792	-	690	668	-	-	-	-	-	-	-
Stage 2	822	667	-	931	791	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.1	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1458	-	-	523	604	546	665	1265	-	-
HCM Lane V/C Ratio	0.001	-	-	0.005	0.007	0.016	0.013	-	-	-
HCM Control Delay (s)	7.5	0	-	11.9	11	11.7	10.5	0	-	-
HCM Lane LOS	A	A	-	B	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	0	0	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	16	3	6	14	14	13
Future Vol, veh/h	16	3	6	14	14	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	3	7	16	16	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	22	0	50	20
Stage 1	-	-	-	-	20	-
Stage 2	-	-	-	-	30	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1593	-	959	1058
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	993	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1593	-	955	1058
Mov Cap-2 Maneuver	-	-	-	-	955	-
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	989	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1002	-	-	1593	-
HCM Lane V/C Ratio	0.031	-	-	0.004	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	27	0	0	0	0	17
Future Vol, veh/h	27	0	0	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	0	0	0	0	19

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	19	0	80	0	0	-
Stage 1	-	-	61	-	-	-
Stage 2	-	-	19	-	-	-
Critical Hdwy	-	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	-	-	810	-	-	-
Stage 1	-	-	844	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	-	-	0	-	-	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s		0	0
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	2	6	4	10	10	5	364	4	4	174	1
Future Vol, veh/h	0	2	6	4	10	10	5	364	4	4	174	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	7	5	11	11	6	414	5	5	198	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	646	637	198	639	635	416	199	0	0	418	0	0
Stage 1	207	207	-	427	427	-	-	-	-	-	-	-
Stage 2	439	430	-	212	208	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	385	395	843	389	396	637	1373	-	-	1141	-	-
Stage 1	795	731	-	606	585	-	-	-	-	-	-	-
Stage 2	597	583	-	790	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	367	391	843	381	392	637	1373	-	-	1141	-	-
Mov Cap-2 Maneuver	367	391	-	381	392	-	-	-	-	-	-	-
Stage 1	790	727	-	602	581	-	-	-	-	-	-	-
Stage 2	571	580	-	777	726	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	13.2	0.1	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1373	-	-	654	464	1141	-	-
HCM Lane V/C Ratio	0.004	-	-	0.014	0.059	0.004	-	-
HCM Control Delay (s)	7.6	0	-	10.6	13.2	8.2	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	4	6	8	0	3	2	3	11	1	1	7	1
Future Vol, veh/h	4	6	8	0	3	2	3	11	1	1	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	7	9	0	3	2	3	13	1	1	8	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	34	31	9	39	31	13	9	0	0	14	0	0
Stage 1	11	11	-	20	20	-	-	-	-	-	-	-
Stage 2	23	20	-	19	11	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	973	862	1073	966	862	1067	1611	-	-	1604	-	-
Stage 1	1010	886	-	999	879	-	-	-	-	-	-	-
Stage 2	995	879	-	1000	886	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	966	859	1073	950	859	1067	1611	-	-	1604	-	-
Mov Cap-2 Maneuver	966	859	-	950	859	-	-	-	-	-	-	-
Stage 1	1008	885	-	997	877	-	-	-	-	-	-	-
Stage 2	987	877	-	983	885	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	8.9	1.4	0.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1611	-	-	969	932	1604	-	-
HCM Lane V/C Ratio	0.002	-	-	0.021	0.006	0.001	-	-
HCM Control Delay (s)	7.2	0	-	8.8	8.9	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	14	2	10	6	5	5	218	9	0	297	23
Future Vol, veh/h	10	14	2	10	6	5	5	218	9	0	297	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	600	-	-	230	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	16	2	11	7	6	6	248	10	0	338	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	621	620	351	624	628	253	364	0	0	258	0	0
Stage 1	351	351	-	264	264	-	-	-	-	-	-	-
Stage 2	270	269	-	360	364	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	400	404	692	398	400	786	1195	-	-	1307	-	-
Stage 1	666	632	-	741	690	-	-	-	-	-	-	-
Stage 2	736	687	-	658	624	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	390	402	692	383	398	786	1195	-	-	1307	-	-
Mov Cap-2 Maneuver	390	402	-	383	398	-	-	-	-	-	-	-
Stage 1	663	632	-	737	687	-	-	-	-	-	-	-
Stage 2	720	684	-	639	624	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.5	13.6	0.2	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1195	-	-	410	442	1307	-	-
HCM Lane V/C Ratio	0.005	-	-	0.072	0.054	-	-	-
HCM Control Delay (s)	8	-	-	14.5	13.6	0	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-	-

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	62	107	27	0	50	147	30	0	63	86	119
Future Vol, veh/h	0	62	107	27	0	50	147	30	0	63	86	119
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	70	122	31	0	57	167	34	0	72	98	135
Number of Lanes	0	0	2	0	0	0	2	0	0	0	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	10.8	10.9	10.9
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	59%	0%	54%	0%	40%	0%	37%	0%
Vol Thru, %	41%	27%	46%	66%	60%	71%	63%	50%
Vol Right, %	0%	73%	0%	34%	0%	29%	0%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	106	162	116	81	124	104	65	82
LT Vol	63	0	62	0	50	0	24	0
Through Vol	43	43	54	54	74	74	41	41
RT Vol	0	119	0	27	0	30	0	41
Lane Flow Rate	120	184	131	91	140	118	73	93
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.218	0.291	0.239	0.154	0.251	0.197	0.135	0.156
Departure Headway (Hd)	6.51	5.687	6.562	6.051	6.443	6.032	6.608	6.061
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	550	630	546	591	556	594	542	590
Service Time	4.259	3.436	4.315	3.804	4.195	3.784	4.364	3.817
HCM Lane V/C Ratio	0.218	0.292	0.24	0.154	0.252	0.199	0.135	0.158
HCM Control Delay	11.1	10.8	11.4	9.9	11.4	10.3	10.4	9.9
HCM Lane LOS	B	B	B	A	B	B	B	A
HCM 95th-tile Q	0.8	1.2	0.9	0.5	1	0.7	0.5	0.5

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	5	1	7	5	5	2	262	3	2	250	3
Future Vol, veh/h	0	5	1	7	5	5	2	262	3	2	250	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	1	8	6	6	2	298	3	2	284	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	446	596	144	453	596	151	288	0	0	301	0	0
Stage 1	290	290	-	304	304	-	-	-	-	-	-	-
Stage 2	156	306	-	149	292	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	496	415	877	490	415	868	1271	-	-	1257	-	-
Stage 1	694	671	-	681	662	-	-	-	-	-	-	-
Stage 2	831	660	-	838	670	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	486	413	877	483	413	868	1271	-	-	1257	-	-
Mov Cap-2 Maneuver	486	413	-	483	413	-	-	-	-	-	-	-
Stage 1	693	670	-	680	661	-	-	-	-	-	-	-
Stage 2	817	659	-	828	669	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	12	0.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1271	-	-	413	487	462	635	1257	-	-
HCM Lane V/C Ratio	0.002	-	-	0.007	0.008	0.023	0.013	0.002	-	-
HCM Control Delay (s)	7.8	0	-	13.8	12.5	13	10.7	7.9	0	-
HCM Lane LOS	A	A	-	B	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	10	5	21	15	3	57
Future Vol, veh/h	10	5	21	15	3	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	6	24	17	3	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	17	0	79	14
Stage 1	-	-	-	-	14	-
Stage 2	-	-	-	-	65	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1600	-	924	1066
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	958	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1600	-	910	1066
Mov Cap-2 Maneuver	-	-	-	-	910	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	944	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.2	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1057	-	-	1600	-
HCM Lane V/C Ratio	0.065	-	-	0.015	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	68	0	0	0	1	34
Future Vol, veh/h	68	0	0	0	1	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	0	0	0	1	39

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	39	0	196	0	0	-
Stage 1	-	-	155	-	-	-
Stage 2	-	-	41	-	-	-
Critical Hdwy	-	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	-	-	699	-	-	-
Stage 1	-	-	769	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	-	-	0	-	-	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s		0	
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	-	-
HCM Lane LOS	-	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	1	7	4	10	7	5	4	237	14	19	256	2
Future Vol, veh/h	1	7	4	10	7	5	4	237	14	19	256	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	8	5	11	8	6	5	269	16	22	291	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	628	629	292	627	622	277	293	0	0	285	0	0
Stage 1	335	335	-	286	286	-	-	-	-	-	-	-
Stage 2	293	294	-	341	336	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	395	399	747	396	403	762	1269	-	-	1277	-	-
Stage 1	679	643	-	721	675	-	-	-	-	-	-	-
Stage 2	715	670	-	674	642	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	378	389	747	380	393	762	1269	-	-	1277	-	-
Mov Cap-2 Maneuver	378	389	-	380	393	-	-	-	-	-	-	-
Stage 1	676	629	-	717	672	-	-	-	-	-	-	-
Stage 2	698	667	-	648	629	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	13.8	0.1	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1269	-	-	462	434	1277	-	-
HCM Lane V/C Ratio	0.004	-	-	0.03	0.058	0.017	-	-
HCM Control Delay (s)	7.8	0	-	13	13.8	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.1	-	-

6: Albright Rd & Kershaw Rd

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	3	5	5	0	6	6	5	55	0	4	13	8
Future Vol, veh/h	3	5	5	0	6	6	5	55	0	4	13	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	6	6	0	7	7	6	63	0	5	15	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	109	102	19	108	107	63	24	0	0	63	0	0
Stage 1	28	28	-	74	74	-	-	-	-	-	-	-
Stage 2	81	74	-	34	33	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	870	788	1059	871	783	1002	1591	-	-	1540	-	-
Stage 1	989	872	-	935	833	-	-	-	-	-	-	-
Stage 2	927	833	-	982	868	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	854	782	1059	857	778	1002	1591	-	-	1540	-	-
Mov Cap-2 Maneuver	854	782	-	857	778	-	-	-	-	-	-	-
Stage 1	985	869	-	931	830	-	-	-	-	-	-	-
Stage 2	909	830	-	967	865	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	9.2	0.6	1.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1591	-	-	889	876	1540	-	-
HCM Lane V/C Ratio	0.004	-	-	0.017	0.016	0.003	-	-
HCM Control Delay (s)	7.3	0	-	9.1	9.2	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	44	19	0	7	16	3	6	240	11	2	239	12
Future Vol, veh/h	44	19	0	7	16	3	6	240	11	2	239	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	600	-	-	230	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	22	0	8	18	3	7	273	13	2	272	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	586	582	278	587	583	279	285	0	0	285	0	0
Stage 1	283	283	-	293	293	-	-	-	-	-	-	-
Stage 2	303	299	-	294	290	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	422	425	761	421	424	760	1277	-	-	1277	-	-
Stage 1	724	677	-	715	670	-	-	-	-	-	-	-
Stage 2	706	666	-	714	672	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	404	422	761	402	421	760	1277	-	-	1277	-	-
Mov Cap-2 Maneuver	404	422	-	402	421	-	-	-	-	-	-	-
Stage 1	720	676	-	711	666	-	-	-	-	-	-	-
Stage 2	680	662	-	690	671	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.7	13.8	0.2	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1277	-	-	409	438	1277	-	-
HCM Lane V/C Ratio	0.005	-	-	0.175	0.067	0.002	-	-
HCM Control Delay (s)	7.8	-	-	15.7	13.8	7.8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	0	-	-

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	37	90	63	0	155	98	31	0	38	94	30
Future Vol, veh/h	0	37	90	63	0	155	98	31	0	38	94	30
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	42	102	72	0	176	111	35	0	43	107	34
Number of Lanes	0	0	2	0	0	0	2	0	0	0	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	10.2	12.5	10.5
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	45%	0%	45%	0%	76%	0%	36%	0%
Vol Thru, %	55%	61%	55%	42%	24%	61%	64%	61%
Vol Right, %	0%	39%	0%	58%	0%	39%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	85	77	82	108	204	80	90	94
LT Vol	38	0	37	0	155	0	32	0
Through Vol	47	47	45	45	49	49	58	58
RT Vol	0	30	0	63	0	31	0	36
Lane Flow Rate	97	88	93	123	232	91	102	106
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.179	0.15	0.167	0.198	0.414	0.146	0.186	0.181
Departure Headway (Hd)	6.661	6.157	6.451	5.808	6.427	5.767	6.577	6.122
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	537	581	555	616	559	621	544	584
Service Time	4.416	3.912	4.204	3.56	4.173	3.514	4.331	3.876
HCM Lane V/C Ratio	0.181	0.151	0.168	0.2	0.415	0.147	0.188	0.182
HCM Control Delay	10.9	10	10.5	10	13.7	9.5	10.8	10.2
HCM Lane LOS	B	A	B	A	B	A	B	B
HCM 95th-tile Q	0.6	0.5	0.6	0.7	2	0.5	0.7	0.7

2: SR-111 & Yocum Rd

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	5	1	4	7	4	1	255	5	0	109	3
Future Vol, veh/h	0	5	1	4	7	4	1	255	5	0	109	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	1	5	8	5	1	290	6	0	124	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	277	424	64	360	422	148	127	0	0	295	0	0
Stage 1	126	126	-	295	295	-	-	-	-	-	-	-
Stage 2	151	298	-	65	127	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	654	520	987	571	522	872	1457	-	-	1263	-	-
Stage 1	865	791	-	689	668	-	-	-	-	-	-	-
Stage 2	836	666	-	938	790	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	643	519	987	565	521	872	1457	-	-	1263	-	-
Mov Cap-2 Maneuver	643	519	-	565	521	-	-	-	-	-	-	-
Stage 1	864	791	-	688	667	-	-	-	-	-	-	-
Stage 2	821	665	-	930	790	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.1	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1457	-	-	519	600	544	663	1263	-	-
HCM Lane V/C Ratio	0.001	-	-	0.005	0.007	0.016	0.013	-	-	-
HCM Control Delay (s)	7.5	0	-	12	11	11.7	10.5	0	-	-
HCM Lane LOS	A	A	-	B	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	0	0	-	-

3: Kershaw Rd & Yocum Rd

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	16	3	14	14	14	21
Future Vol, veh/h	16	3	14	14	14	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	3	16	16	16	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	22	0	68	20
Stage 1	-	-	-	-	20	-
Stage 2	-	-	-	-	48	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1593	-	937	1058
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	974	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1593	-	928	1058
Mov Cap-2 Maneuver	-	-	-	-	928	-
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	964	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1002	-	-	1593	-
HCM Lane V/C Ratio	0.04	-	-	0.01	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	35	0	0	0	0	25
Future Vol, veh/h	35	0	0	0	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	0	0	0	0	28

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	28	0	108	0	0	-
Stage 1	-	-	80	-	-	-
Stage 2	-	-	28	-	-	-
Critical Hdwy	-	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	-	-	782	-	-	-
Stage 1	-	-	828	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	-	-	0	-	-	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s		0	0
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	2	6	14	10	12	5	364	10	5	174	1
Future Vol, veh/h	0	2	6	14	10	12	5	364	10	5	174	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	7	16	11	14	6	414	11	6	198	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	653	646	198	645	641	419	199	0	0	425	0	0
Stage 1	210	210	-	431	431	-	-	-	-	-	-	-
Stage 2	443	436	-	214	210	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	380	390	843	385	393	634	1373	-	-	1134	-	-
Stage 1	792	728	-	603	583	-	-	-	-	-	-	-
Stage 2	594	580	-	788	728	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	360	385	843	377	388	634	1373	-	-	1134	-	-
Mov Cap-2 Maneuver	360	385	-	377	388	-	-	-	-	-	-	-
Stage 1	787	724	-	599	580	-	-	-	-	-	-	-
Stage 2	566	577	-	774	724	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	14	0.1	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1373	-	-	650	440	1134	-	-
HCM Lane V/C Ratio	0.004	-	-	0.014	0.093	0.005	-	-
HCM Control Delay (s)	7.6	0	-	10.6	14	8.2	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

6: Albright Rd & Kershaw Rd

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	4	6	8	0	5	2	3	11	1	1	7	9
Future Vol, veh/h	4	6	8	0	5	2	3	11	1	1	7	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	7	9	0	6	2	3	13	1	1	8	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	39	35	13	43	40	13	18	0	0	14	0	0
Stage 1	15	15	-	20	20	-	-	-	-	-	-	-
Stage 2	24	20	-	23	20	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	966	857	1067	960	852	1067	1599	-	-	1604	-	-
Stage 1	1005	883	-	999	879	-	-	-	-	-	-	-
Stage 2	994	879	-	995	879	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	957	854	1067	944	849	1067	1599	-	-	1604	-	-
Mov Cap-2 Maneuver	957	854	-	944	849	-	-	-	-	-	-	-
Stage 1	1003	882	-	997	877	-	-	-	-	-	-	-
Stage 2	983	877	-	978	878	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	9	1.5	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1599	-	-	962	902	1604	-	-
HCM Lane V/C Ratio	0.002	-	-	0.021	0.009	0.001	-	-
HCM Control Delay (s)	7.3	0	-	8.8	9	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	14	2	10	6	5	5	224	9	0	307	23
Future Vol, veh/h	10	14	2	10	6	5	5	224	9	0	307	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	600	-	-	230	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	16	2	11	7	6	6	255	10	0	349	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	639	638	362	642	646	260	375	0	0	265	0	0
Stage 1	362	362	-	271	271	-	-	-	-	-	-	-
Stage 2	277	276	-	371	375	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	389	394	683	387	390	779	1183	-	-	1299	-	-
Stage 1	657	625	-	735	685	-	-	-	-	-	-	-
Stage 2	729	682	-	649	617	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	380	392	683	372	388	779	1183	-	-	1299	-	-
Mov Cap-2 Maneuver	380	392	-	372	388	-	-	-	-	-	-	-
Stage 1	654	625	-	731	682	-	-	-	-	-	-	-
Stage 2	713	679	-	630	617	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	13.8	0.2	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1183	-	-	400	431	1299	-	-
HCM Lane V/C Ratio	0.005	-	-	0.074	0.055	-	-	-
HCM Control Delay (s)	8.1	-	-	14.7	13.8	0	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-	-

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	68	118	40	0	65	162	33	0	69	95	131
Future Vol, veh/h	0	68	118	40	0	65	162	33	0	69	95	131
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	77	134	45	0	74	184	38	0	78	108	149
Number of Lanes	0	0	2	0	0	0	2	0	0	0	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	11.5	11.8	11.8
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	59%	0%	54%	0%	45%	0%	37%	0%
Vol Thru, %	41%	27%	46%	60%	55%	71%	63%	50%
Vol Right, %	0%	73%	0%	40%	0%	29%	0%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	117	179	127	99	146	114	71	90
LT Vol	69	0	68	0	65	0	26	0
Through Vol	48	48	59	59	81	81	45	45
RT Vol	0	131	0	40	0	33	0	45
Lane Flow Rate	132	203	144	112	166	130	80	102
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.25	0.336	0.274	0.196	0.31	0.226	0.154	0.18
Departure Headway (Hd)	6.791	5.968	6.828	6.268	6.718	6.285	6.93	6.383
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	527	598	524	569	533	569	515	558
Service Time	4.561	3.737	4.599	4.038	4.487	4.055	4.71	4.163
HCM Lane V/C Ratio	0.25	0.339	0.275	0.197	0.311	0.228	0.155	0.183
HCM Control Delay	11.8	11.8	12.2	10.6	12.5	10.9	11	10.6
HCM Lane LOS	B	B	B	B	B	B	B	B
HCM 95th-tile Q	1	1.5	1.1	0.7	1.3	0.9	0.5	0.7

2: SR-111 & Yocum Rd

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	6	1	8	6	6	2	298	3	2	285	3
Future Vol, veh/h	0	6	1	8	6	6	2	298	3	2	285	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	1	9	7	7	2	339	3	2	324	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	507	677	164	515	677	171	327	0	0	342	0	0
Stage 1	330	330	-	345	345	-	-	-	-	-	-	-
Stage 2	177	347	-	170	332	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	449	373	852	443	373	843	1229	-	-	1214	-	-
Stage 1	657	644	-	644	635	-	-	-	-	-	-	-
Stage 2	808	633	-	815	643	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	438	372	852	435	372	843	1229	-	-	1214	-	-
Mov Cap-2 Maneuver	438	372	-	435	372	-	-	-	-	-	-	-
Stage 1	656	643	-	643	634	-	-	-	-	-	-	-
Stage 2	791	632	-	804	642	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	12.7	0.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1229	-	-	372	433	416	593	1214	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.01	0.03	0.017	0.002	-	-
HCM Control Delay (s)	7.9	0	-	14.8	13.4	13.9	11.2	8	0	-
HCM Lane LOS	A	A	-	B	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	11	6	22	17	3	62
Future Vol, veh/h	11	6	22	17	3	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	7	25	19	3	70

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	19	0	85	16
Stage 1	-	-	-	-	16	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1597	-	916	1063
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1597	-	901	1063
Mov Cap-2 Maneuver	-	-	-	-	901	-
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	939	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.1	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1054	-	-	1597	-
HCM Lane V/C Ratio	0.07	-	-	0.016	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	74	0	0	0	1	37
Future Vol, veh/h	74	0	0	0	1	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	84	0	0	0	1	42

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	42	0	212	0	0	-
Stage 1	-	-	168	-	-	-
Stage 2	-	-	44	-	-	-
Critical Hdwy	-	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	-	-	685	-	-	-
Stage 1	-	-	759	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	-	-	0	-	-	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s		0	
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	-	-
HCM Lane LOS	-	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	1	8	4	10	8	5	4	271	14	21	282	2
Future Vol, veh/h	1	8	4	10	8	5	4	271	14	21	282	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	9	5	11	9	6	5	308	16	24	320	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	701	702	322	701	695	316	323	0	0	324	0	0
Stage 1	369	369	-	325	325	-	-	-	-	-	-	-
Stage 2	332	333	-	376	370	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	353	362	719	353	366	724	1237	-	-	1236	-	-
Stage 1	651	621	-	687	649	-	-	-	-	-	-	-
Stage 2	681	644	-	645	620	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	336	352	719	336	355	724	1237	-	-	1236	-	-
Mov Cap-2 Maneuver	336	352	-	336	355	-	-	-	-	-	-	-
Stage 1	648	606	-	684	646	-	-	-	-	-	-	-
Stage 2	663	641	-	616	605	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	14.9	0.1	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1237	-	-	416	388	1236	-	-
HCM Lane V/C Ratio	0.004	-	-	0.036	0.067	0.019	-	-
HCM Control Delay (s)	7.9	0	-	14	14.9	8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.1	-	-

6: Albright Rd & Kershaw Rd

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	3	6	6	0	6	7	6	61	0	4	14	8
Future Vol, veh/h	3	6	6	0	6	7	6	61	0	4	14	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	7	7	0	7	8	7	69	0	5	16	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	120	113	20	119	117	69	25	0	0	69	0	0
Stage 1	30	30	-	83	83	-	-	-	-	-	-	-
Stage 2	90	83	-	36	34	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	855	777	1058	857	773	994	1589	-	-	1532	-	-
Stage 1	987	870	-	925	826	-	-	-	-	-	-	-
Stage 2	917	826	-	980	867	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	837	771	1058	841	767	994	1589	-	-	1532	-	-
Mov Cap-2 Maneuver	837	771	-	841	767	-	-	-	-	-	-	-
Stage 1	982	867	-	920	822	-	-	-	-	-	-	-
Stage 2	898	822	-	963	864	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	9.2	0.7	1.1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1589	-	-	880	875	1532	-	-
HCM Lane V/C Ratio	0.004	-	-	0.019	0.017	0.003	-	-
HCM Control Delay (s)	7.3	0	-	9.2	9.2	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	48	21	0	8	18	3	7	263	12	2	262	13
Future Vol, veh/h	48	21	0	8	18	3	7	263	12	2	262	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	600	-	-	230	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	55	24	0	9	20	3	8	299	14	2	298	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	644	638	305	644	639	306	313	0	0	313	0	0
Stage 1	310	310	-	322	322	-	-	-	-	-	-	-
Stage 2	334	328	-	322	317	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	386	394	735	386	394	734	1247	-	-	1247	-	-
Stage 1	700	659	-	690	651	-	-	-	-	-	-	-
Stage 2	680	647	-	690	654	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	367	391	735	366	391	734	1247	-	-	1247	-	-
Mov Cap-2 Maneuver	367	391	-	366	391	-	-	-	-	-	-	-
Stage 1	696	658	-	686	647	-	-	-	-	-	-	-
Stage 2	651	643	-	664	653	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	14.7	0.2	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1247	-	-	374	403	1247	-	-
HCM Lane V/C Ratio	0.006	-	-	0.21	0.082	0.002	-	-
HCM Control Delay (s)	7.9	-	-	17.2	14.7	7.9	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.3	0	-	-

1: SR-111 & Main St

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	41	99	74	0	176	108	34	0	42	103	33
Future Vol, veh/h	0	41	99	74	0	176	108	34	0	42	103	33
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	47	113	84	0	200	123	39	0	48	117	38
Number of Lanes	0	0	2	0	0	0	2	0	0	0	2	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	10.9	14	11.1
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	45%	0%	45%	0%	77%	0%	36%	0%
Vol Thru, %	55%	61%	55%	40%	23%	61%	64%	61%
Vol Right, %	0%	39%	0%	60%	0%	39%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	85	91	124	230	88	98	103
LT Vol	42	0	41	0	176	0	35	0
Through Vol	52	52	50	50	54	54	63	63
RT Vol	0	33	0	74	0	34	0	40
Lane Flow Rate	106	96	103	140	261	100	111	117
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.205	0.172	0.191	0.235	0.482	0.166	0.212	0.208
Departure Headway (Hd)	6.94	6.433	6.697	6.04	6.642	5.98	6.848	6.389
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	515	555	534	591	541	597	522	559
Service Time	4.713	4.205	4.469	3.811	4.406	3.743	4.619	4.16
HCM Lane V/C Ratio	0.206	0.173	0.193	0.237	0.482	0.168	0.213	0.209
HCM Control Delay	11.5	10.6	11.1	10.7	15.5	9.9	11.5	10.8
HCM Lane LOS	B	B	B	B	C	A	B	B
HCM 95th-tile Q	0.8	0.6	0.7	0.9	2.6	0.6	0.8	0.8

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	6	1	4	8	4	1	285	6	0	125	3
Future Vol, veh/h	0	6	1	4	8	4	1	285	6	0	125	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	1	5	9	5	1	324	7	0	142	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	313	477	73	404	475	165	145	0	0	331	0	0
Stage 1	144	144	-	330	330	-	-	-	-	-	-	-
Stage 2	169	333	-	74	145	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	616	486	974	531	487	850	1435	-	-	1225	-	-
Stage 1	844	777	-	657	644	-	-	-	-	-	-	-
Stage 2	816	642	-	927	776	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	604	486	974	524	487	850	1435	-	-	1225	-	-
Mov Cap-2 Maneuver	604	486	-	524	487	-	-	-	-	-	-	-
Stage 1	843	777	-	656	643	-	-	-	-	-	-	-
Stage 2	799	641	-	918	776	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.9	11.6	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1435	-	-	486	556	505	619	1225	-	-
HCM Lane V/C Ratio	0.001	-	-	0.007	0.008	0.018	0.015	-	-	-
HCM Control Delay (s)	7.5	0	-	12.5	11.5	12.3	10.9	0	-	-
HCM Lane LOS	A	A	-	B	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	18	3	15	15	15	22
Future Vol, veh/h	18	3	15	15	15	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	3	17	17	17	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	24	0	73	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	51	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1591	-	931	1055
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	971	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1591	-	921	1055
Mov Cap-2 Maneuver	-	-	-	-	921	-
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	960	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	996	-	-	1591	-
HCM Lane V/C Ratio	0.042	-	-	0.011	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Existing + Project + Cumulative PM
4: Yocum Rd & Kershaw Rd

All-American Grain
7/5/2018

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	38	0	0	0	0	27
Future Vol, veh/h	38	0	0	0	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	0	0	0	0	31

Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	31	0	117	0	0	-
Stage 1	-	-	86	-	-	-
Stage 2	-	-	31	-	-	-
Critical Hdwy	-	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	-	-	773	-	-	-
Stage 1	-	-	824	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	-	-	0	-	-	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s		0	0
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBLn1	SBL	SBR
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	-	-

5: SR-111 & Albright Rd

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	2	7	14	11	13	6	405	10	5	191	1
Future Vol, veh/h	0	2	7	14	11	13	6	405	10	5	191	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	8	16	13	15	7	460	11	6	217	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	722	714	218	714	710	466	218	0	0	472	0	0
Stage 1	229	229	-	480	480	-	-	-	-	-	-	-
Stage 2	493	485	-	234	230	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	342	357	822	346	359	597	1352	-	-	1090	-	-
Stage 1	774	715	-	567	554	-	-	-	-	-	-	-
Stage 2	558	552	-	769	714	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	321	352	822	338	354	597	1352	-	-	1090	-	-
Mov Cap-2 Maneuver	321	352	-	338	354	-	-	-	-	-	-	-
Stage 1	769	711	-	563	550	-	-	-	-	-	-	-
Stage 2	528	548	-	755	710	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.8	15	0.1	0.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1352	-	-	634	403	1090	-	-
HCM Lane V/C Ratio	0.005	-	-	0.016	0.107	0.005	-	-
HCM Control Delay (s)	7.7	0	-	10.8	15	8.3	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0	-	-

6: Albright Rd & Kershaw Rd

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	4	7	9	0	5	2	3	12	1	1	8	9
Future Vol, veh/h	4	7	9	0	5	2	3	12	1	1	8	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	8	10	0	6	2	3	14	1	1	9	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	41	38	14	47	43	14	19	0	0	15	0	0
Stage 1	16	16	-	21	21	-	-	-	-	-	-	-
Stage 2	25	22	-	26	22	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	963	854	1066	954	849	1066	1597	-	-	1603	-	-
Stage 1	1004	882	-	998	878	-	-	-	-	-	-	-
Stage 2	993	877	-	992	877	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	954	851	1066	936	846	1066	1597	-	-	1603	-	-
Mov Cap-2 Maneuver	954	851	-	936	846	-	-	-	-	-	-	-
Stage 1	1002	881	-	996	876	-	-	-	-	-	-	-
Stage 2	982	875	-	973	876	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	9	1.4	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1597	-	-	959	899	1603	-	-
HCM Lane V/C Ratio	0.002	-	-	0.024	0.009	0.001	-	-
HCM Control Delay (s)	7.3	0	-	8.8	9	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	11	15	2	11	7	6	6	246	10	0	337	25
Future Vol, veh/h	11	15	2	11	7	6	6	246	10	0	337	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	600	-	-	230	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	17	2	13	8	7	7	280	11	0	383	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	703	702	397	706	710	285	411	0	0	291	0	0
Stage 1	397	397	-	299	299	-	-	-	-	-	-	-
Stage 2	306	305	-	407	411	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	352	362	652	351	359	754	1148	-	-	1271	-	-
Stage 1	629	603	-	710	666	-	-	-	-	-	-	-
Stage 2	704	662	-	621	595	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	341	360	652	336	357	754	1148	-	-	1271	-	-
Mov Cap-2 Maneuver	341	360	-	336	357	-	-	-	-	-	-	-
Stage 1	625	603	-	706	662	-	-	-	-	-	-	-
Stage 2	685	658	-	601	595	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.8	14.7	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1148	-	-	364	398	1271	-	-
HCM Lane V/C Ratio	0.006	-	-	0.087	0.069	-	-	-
HCM Control Delay (s)	8.2	-	-	15.8	14.7	0	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

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MEMO

TO: Matthew Harmon

FROM: Michael Rogozen

COPY TO: Tom DuBose

DATE: Thursday, January 31, 2019

CONTRACT #: UltraSystems Project No. 6084

RE: Noise Analysis of Bridge and New Onsite Railroad Track at All American Grain

---

1.0 INTRODUCTION

On September 11, 2018, UltraSystems submitted to you "Noise Study Report for All American Grain Container Storage and Transfer Facility," for a proposed facility near Calipatria, California. After the report was submitted, two new elements were proposed for the project:

- A new rail spur, to be built inside the existing one
- A bridge over both rail spurs to allow access to the interior of the facility from surrounding roadways when one or both of the rail spurs is occupied by a unit train.

This memorandum is a supplement to the aforementioned noise study. It covers only the proposed rail spur and bridge although, where necessary, information from the previous report has been included.

2.0 PROJECT DESCRIPTION

Attachment 1 shows the revised new site plan, including the proposed inner rail spur and two alternative locations for the new bridge.

2.1 Inner Rail Spur

The new rail spur will be approximately 8,100 feet long, within a 15-foot right-of-way. It will roughly parallel the existing spur, with a minimum separation distance of 30 feet. Trains will enter from the existing spur from the Southern Pacific Railroad main line (on the east side of the project site), travel briefly on the outer spur, and then enter the inner spur. The new spur will be used primarily for unit trains that ship agricultural products to the Port of Long Beach.

Track construction will precede construction of the bridge and will take four to five months. The construction starting date is estimated to be September 2019.

The addition of the rail spur will not result in an increase in the activity levels of trucks and trains over what was described in the November 2018 report.

2.2 Bridge

The overpass portion of the bridge will be 90 feet long and 30 feet wide. The remainder of the bridge structure (on either side of the overpass) will total 1000 feet long and be 40 to 45 feet wide. The maximum height of the bridge roadway surface will be 35 feet above the ground. The maximum number of trucks crossing the bridge per day will be 10.

3.0 SCOPE OF THE NOISE EVALUATION

After reviewing the September 11, 2018 submittal, UltraSystems determined that the same level of noise impact analysis that was used therein is not necessary for the rail and bridge addition, for the following reasons.

- Construction noise impacts for the original project were very minor, even for the nearest sensitive receiver. The maximum exposure from construction activities would be 46.8 dBA $L_{eq,}$ and the maximum increase in exposure would be 0.02 dBA L_{eq}. This increase in exposure would not be detectable by people.
- The construction equipment used for the new construction is in many respects different from the usual, inasmuch as it is specialized for rail construction. Nevertheless, there is nothing about the equipment that suggests that noise or vibration levels would be significantly higher than those of the equipment types analyzed in the September 11, 2018 report.
- The addition of the new rail spur and the bridge is not expected to increase onroad traffic in the vicinity of the facility. The September 11, 2018 report concluded that the noise impacts of the project before the new rail spur and bridge were under consideration was less than significant. No change to this conclusion is supportable.

Furthermore, although the likelihood of having more than one active train at the site at one time raises the possibility of increased noise generation, the train on the outer spur would effectively block transmission of noise from the train on the inner spur.

One possible noise issue that would be new to the project would be an increase in noise exposure from trucks passing over the new bridge. Three reasons for such an increase would be:

- At the bridge elevation, trains, other equipment onsite would not block noise transmission from the trucks.
- With the noise source high above the ground surface, there would be less ground absorption.
- Since trucks would have to accelerate to go up onto the overpass, and decelerate going down, they would be noisier.

It was decided therefore to do a screening study of noise exposures from trucks crossing the rail spur on the future bridge. The northeastern bridge option was examined because it was closer to the nearest sensitive receiver than is the southwestern option.

4.0 TRUCK NOISE ANALYSIS

For the bridge traffic noise analysis, we used a vehicle "pass-by" method published by the Federal Transit Administration."[1] The method is based upon a metric called the sound exposure level (SEL), which is defined as the cumulative noise exposure from a single noise event, normalized to one second.[2] For a situation where noise sources pass by a point infrequently and intermittently, the one-hour equivalent noise level (L_{eq}) is calculated by the following formula:[3]

$$L_{eq} = SEL_{ref} + 10\log(V) + 25\log(S/50) - 35.6$$

where

SEL_{ref} = Reference SEL at 50 feet

V = Average number of vehicles per hour

S = Average vehicle speed (miles per hour)

Note that the coefficient of (S/50) depends upon the type of vehicle. Since the cited FTA publication does not discuss heavy duty diesel trucks in defining this calculation, we used the recommended coefficient for buses.

The FTA publication does not include a reference SEL for heavy duty trucks. For that parameter, we use a measured value of 87 dB at 50 feet, as reported by Bollard Acoustical Consultants, Inc.[4] Assuming ten trucks per day, and an eight-hour workday, V would be 1.25. An average vehicle speed of 15 miles per hour on the bridge was assumed. The resulting L_{eq} at 50 feet is:

$$\begin{aligned} L_{eq} &= 87 + 10\log(1.25) + 25\log(15/50) - 35.6 \\ &= 44.5 \text{ dBA} \end{aligned}$$

This value applies within 50 feet of the sensitive receiver. The distance from the proposed bridge location to the nearest sensitive receiver's property line is about 1,600 feet. For a moving point source, the effect of attenuation with distance is 10 log(1600/50) = 15.1 dBA. Therefore, at the sensitive receiver, the maximum hourly average exposure to bridge traffic noise would be 29.4 dBA L_{eq}. The increase in total noise (ambient plus bridge traffic) would be only 0.0004 dBA, which would not be noticeable to humans.

---

1 Transit Noise and Vibration Impact Assessment. U.S. Department of Transportation, Federal Transit Administration. FTA Report No. 0123. September 2018. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf, p. 80.

2 Ibid., p. 208.

3 Ibid., p. 80.

4 Environmental Noise Assessment. Home Depot Project, Thousand Oaks, California. Prepared by Bollard Acoustical Consultants, Inc., Auburn, CA for Lars Anderson & Associates, Inc., Fresno, CA. January 21, 2008.

5.0 DISCUSSION

Adding the new rail spur and the bridge to the project would not result in significant noise impacts during project construction or operation. No mitigation measures would be needed.

NOISE STUDY REPORT
FOR
ALL AMERICAN GRAIN CONTAINER STORAGE AND TRANSFER FACILITY

Prepared for:

DuBose Design Group
1065 State Street
El Centro, California 92243

Prepared By:

UltraSystems

UltraSystems Environmental
16431 Scientific Way
Irvine, California 92618-4355

Job No. 6084

September 2018

This noise analysis was prepared in accordance with § 15063(d)(3) and Appendix G of the *State CEQA Guidelines* to determine the potential significant noise effects on the physical environment that could result from the implementation of the project.

NOISE STUDY REPORT
FOR
ALL AMERICAN GRAIN CONTAINER STORAGE AND TRANSFER FACILITY

Calipatria, California

September 2018

Prepared by: ______________________ Date: SEPTEMBER 11, 2018
UltraSystems Environmental Inc.

Reviewed by: ______________________ Date: 09-11-2018
UltraSystems Environmental Inc.

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ATTACHMENT

1.0 INTRODUCTION

All American Grain Company, the applicant, operates a grain transfer and storage facility for locally grown agricultural commodities shipped in containers on an 89-acre site at the northeast corner of East Albright Road and State Highway 111, south of Calipatria, California, in Imperial County. A railroad track circles the site within the boundaries, and is connected through a siding to a Union Pacific Railroad main line. As part of the project, portions of the interior surface of the lot, which is unpaved, will be paved. Containers will be trucked to the site from local farms and stored in the paved area. They will then be transferred by four mobile loaders to unit trains waiting on the interior track for shipment to the Port of Long Beach and other destinations. The regional location of the development is shown in **Figure 1.0-1**. The site and surrounding properties are shown in **Figure 1.0-2**.

Because the site is in a "noise impact zone" as defined by the Noise Element of the Imperial County General Plan, the County requires that an acoustical analysis be performed. This report satisfies the acoustical analysis requirement. It includes a discussion of the fundamentals of sound; an examination of federal, state, and local noise guidelines and policies; a review of existing conditions; an evaluation of potential noise impacts associated with the project; and the mitigation for all identified significant or potentially significant impacts.

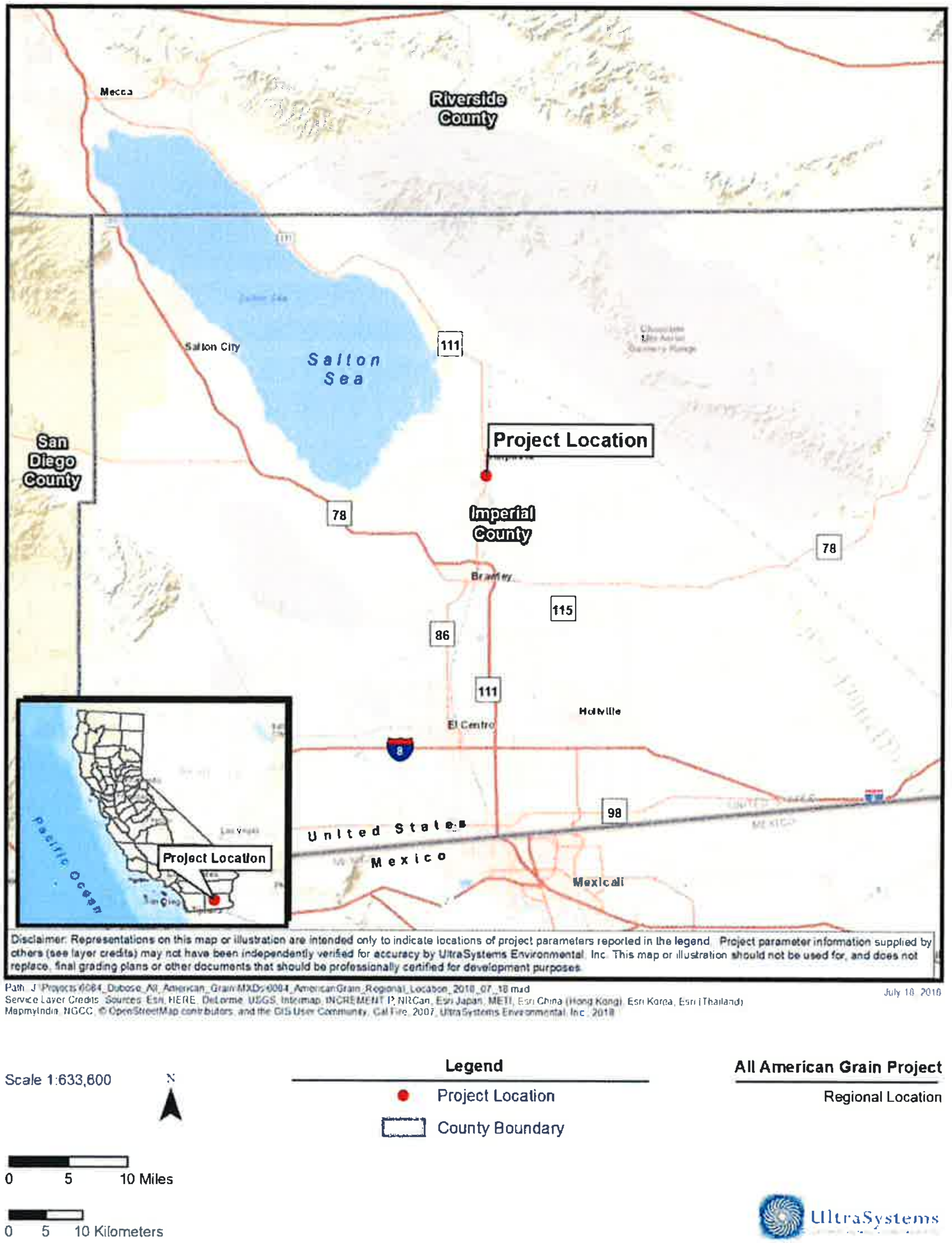
2.0 BACKGROUND INFORMATION

2.1 Characteristics of Sound

Sound is a pressure wave transmitted through the air. It is described in terms of loudness or amplitude (measured in decibels), frequency or pitch (measured in hertz [Hz] or cycles per second), and duration (measured in seconds or minutes). The decibel (dB) scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Because the human ear is not equally sensitive to all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against upper and lower frequencies in a manner approximating the sensitivity of the human ear. The scale is based on a reference pressure level of 20 micropascals (corresponding to zero dBA). The scale ranges from zero (for the average least perceptible sound) to about 130 (for the average human pain level).

The normal range of conversation is between 34 and 66 dBA. Between 70 and 90 dBA, sound is distracting and presents an obstacle to conversation, thinking, or learning. Above 90 dBA, sound can cause permanent hearing loss. Examples of various sound levels in different environments are shown in **Table 2.1-1** (Typical Sound Levels).

Figure 1.0-1
REGIONAL LOCATION MAP



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July 18, 2018

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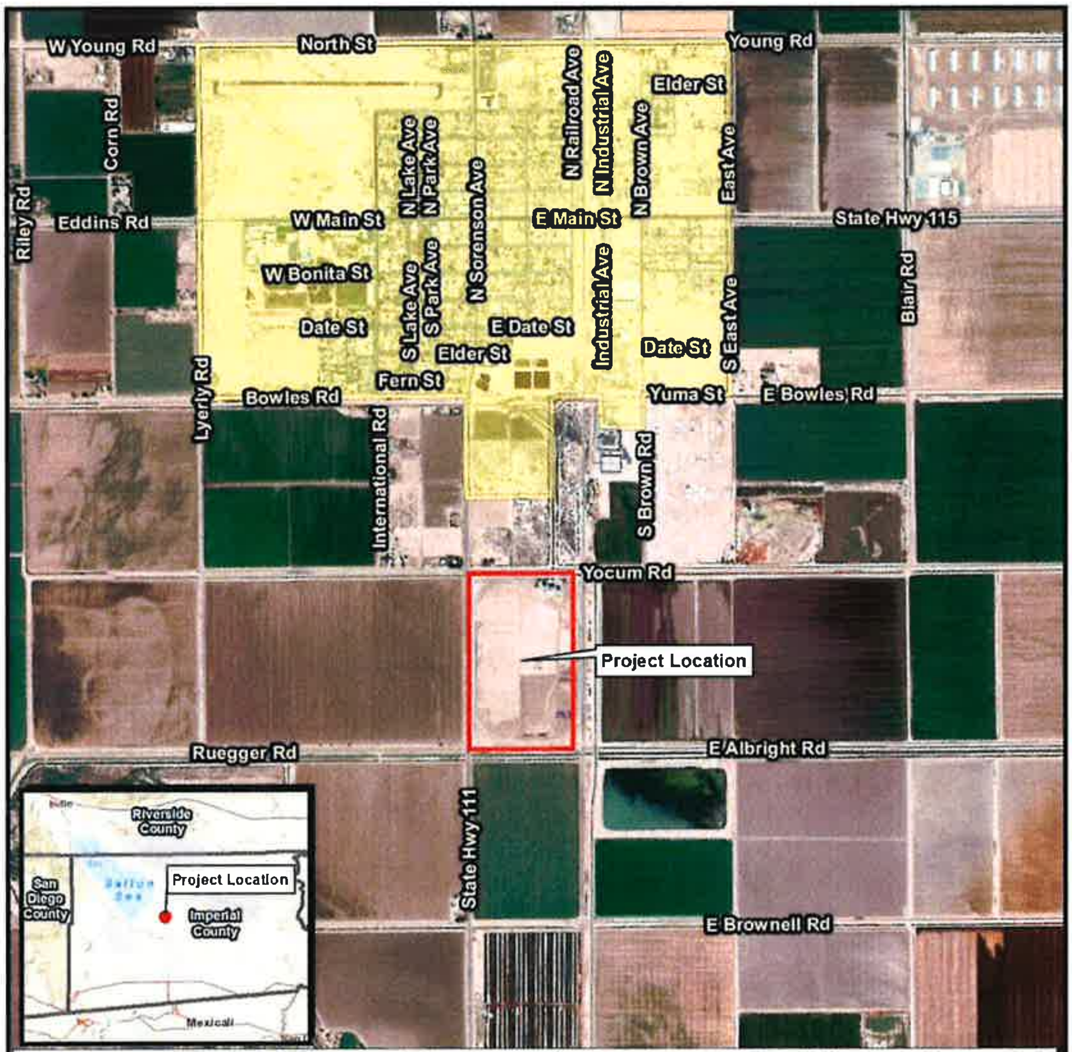
Figure 1.0-2
VICINITY MAP



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Scale 1:24,000

N

0 1,000 2,000 Feet

0 300 600 Meters

Legend

🟥 Project Boundary
🟨 City of Calpatria

All American Grain Project

Project Vicinity

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Table 2.1-1
TYPICAL SOUND LEVELS

Common Sounds	A-Weighted Sound Level in Decibels	Subjective Impression
Oxygen Torch	120	Pain Threshold
Rock Band	110	
Pile Driver at 50 feet	100	Very Loud
Ambulance Siren at 100 feet	90	
Garbage disposal	80	
Vacuum Cleaner at 10 feet	70	Moderately Loud
Air Conditioner at 100 feet	60	
Quiet Urban Daytime	50	
Quiet Urban Nighttime	40	Quiet
Bedroom at Night	30	
Recording Studio	20	Just Audible
	10	Threshold of Hearing
	0	

Sources: Aviation Planning Associates. 1978. Calculations of Maximum A-weighted Sound Levels (dBA) Resulting from Civil Aircraft Operations.

2.2 Noise Measurement Scales

Several rating scales have been developed to analyze adverse effects of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise on people depends largely upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Those that are applicable to this analysis are as follows:

- L_{eq}, the equivalent noise level, is an average of sound level over a defined time period (such as 1 minute, 15 minutes, 1 hour or 24 hours). Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure.

- L_{90} is a noise level that is exceeded 90 percent of the time at a given location; it is often used as a measure of "background" noise.

- CNEL, the Community Noise Equivalent Level, is a 24-hour average L_{eq} with a 5-dBA "penalty" added to noise during the hours of 7:00 p.m. to 10:00 p.m., and a 10-dBA penalty added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime.[1] The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.

L_{dn}, the day-night average noise, is a 24-hour average L_{eq} with an additional 10-dBA "penalty" added to noise that occurs between 10 p.m. and 7 a.m. The L_{dn} metric yields similar values (within 1 dBA) as does the CNEL metric. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment.

---

[1] The evening weighting in the CNEL calculation is actually 4.77, but the Imperial County Noise Abatement and Control Ordinance defines it as 5.

A noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway.

When evaluating environmental community noise levels, a 3-dBA increase over 24 hours is barely perceptible to most people. A 5-dBA increase is readily noticeable and is considered a potentially significant impact. A 10-dBA increase is perceived as a doubling of loudness and is a clearly significant impact.[2]

2.3 Noise Attenuation

The noise level from a particular source generally declines as the distance to the receiver increases. Other factors such as the weather and reflecting or shielding also intensify or reduce the noise level at any given location. Typically, a single row of buildings between the receiver and the noise source reduces the noise level by about 5 dBA. Exterior noise levels can normally be reduced by 15 dBA inside buildings constructed with no special noise insulation.[3] The U.S. Environmental Protection Agency (USEPA) estimates that residences in "warm" climates provide at least 12 dBA of exterior-to-interior noise attenuation with windows open and 24 dBA with windows closed.[4]

Noise from traffic on roads depends on the volume and speed of traffic and the distance from the traffic. A commonly used rule of thumb for traffic noise is that for every doubling of distance from the road, atmospheric spreading over "hard" or "soft" sites reduces the noise level by about 3 or 4.5 dBA, respectively. For a stationary source, the noise is reduced by at least 6 dBA for each doubling of distance. Further, because of the logarithmic nature of the decibel scale, a doubling of traffic on any given roadway or doubling a stationary source would cause a noise increase of approximately 3 dBA.

2.4 Noise Sensitive Receivers

This noise analysis focuses primarily upon project impacts on sensitive noise receivers located near the project site or along roadways that would carry project-generated traffic. Such noise-sensitive land uses in the project area are single-family and multifamily residences, churches, and schools.

3.0 PROJECT DESCRIPTION

3.1 Current Operations

At present,[5] the facility receives one unit train[6] per week. The train typically consists of two General Motors SD70M diesel locomotives and 105 well cars, which are freight cars that carry one or two stacked containers each. In the evening before the train's arrival, trucks enter the site from Yocum

---

[2] U.S. Environmental Protection Agency (US EPA), 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. March.

[3] U.S. Department of Housing and Urban Development (HUD), 1985. Noise Guidebook.

[4] U.S. Environmental Protection Agency, Protective Noise Levels. Condensed Version of EPA Levels Document, Office of Noise Abatement and Control, Washington, DC, EPA-550/9-79-100 (November 1978).

[5] The project would not include or affect an existing silo operation in the northeast corner of the property. Therefore, that operation will not be discussed.

[6] A unit train is a type of freight train in which all the cars contain the same type of load (e.g., coal, chemicals, grain).

Road on the northeast and deliver containers of hay or alfalfa. The containers are stored on unpaved ground. Containers are transferred between trucks, trains and storage by Hyster RE 46-33CH container loaders with Tier 4 (final), 350-HP engines.

The next morning, the train arrives at about 6 a.m. Over the next six hours, empty containers are offloaded and placed in temporary storage. After ten cars are unloaded, the train moves so that ten new well cars are in position for unloading. When unloading is complete, the container loaders begin transferring the hay- or alfalfa-loaded containers from a storage area to the well cars. Loading takes about two hours. Meanwhile, trucks then take on the empty containers and depart the site via Yocum Road. (Other entry and exit points are available, but they are often blocked by trains on the site's inner track.)

All the time that the train is stationary, its diesel-electric engines are idling. During each repositioning of the train, the train moves at three to four miles per hour. After loading is finished, the train leaves the site and rejoins the Union Pacific main line, which is immediately east of the facility.

3.2 Future Operations

The project consists of adding a second train each week that is dedicated to exporting containers of local agricultural products to the Port of Long Beach. Operations will be similar to the current ones. However, container-laden trucks will come east from SR-111 onto East Albright Road, and enter the facility through a new entrance on the southeast. Trucks with empty or no containers will exit the site at the southwest corner. About 80 to 100 trucks will visit the site each day.

3.3 Construction Activities and Schedule

Construction will consist of adding two paved driveways and up to three paved container storage pads to the site. **Table 3.3-1** quantifies the extent of proposed construction. The driveways will have two compositions. Where they are in the County road right-of-way, they will be comprised of four inches of Caltrans Type B asphalt concrete over 12 inches of Class 2 aggregate base. For a minimum of 100 feet inside the property line, the driveway will consist of four inches of Caltrans Type B asphalt concrete over 14 inches of Class 2 aggregate base. The container yard pavement will consist of six inches of Caltrans Class 2 aggregate base over 12 inches of crushed recycled concrete, over a mesh, and over 12 inches of compacted native soil. The native soil will be obtained from the project site.

Table 3.3-1
CONSTRUCTION CHARACTERISTICS

Site Element	Value		
	Phase 1	Phase 2	Phase 3
Grading Area	606,316 ft^2		
Access Driveway Paving	9,171 ft^2	10,840 ft^2	None
Container Yard Paving	195,080 ft^2	189,020 ft^2	202,205 ft^2

Table 3.3-2 shows the overall construction schedule and the main activities in each of three phases. For the purpose of the analysis in this report, it is assumed that Phase 1 will begin August 27, 2018 and that Phase 3 will be completed on August 2, 2020. As will be discussed in

Section 5.1, the noise impact analysis focused on Phase 1, which is anticipated to include the most noise generation.

Table 3.3-2
OVERALL CONSTRUCTION SCHEDULE

Phase	To be Constructed	Start Date	End Date
1	Eastern container storage yard Drainage channel Eastern access driveway	August 27, 2018	October 19, 2018
2	Western container storage yard Western access driveway	May 27, 2019	July 19, 2019
3	Middle container storage yard	June 10, 2020	August 2, 2020

3.4 Existing Sensitive Land Uses

The area surrounding the site is designated for agricultural land uses. Five rural residences surrounded by agricultural land are located to the northwest across SR 111 and Yocum Road. The owner of the residence immediately across the intersection from the site expressed concern about noise, among other issues at a project scoping meeting for an ethanol plant that had previously been proposed for the site.[7]

3.5 Existing Noise Environment

The principal noise sources in the area surrounding the project are transportation sources (aircraft, rail lines, and motor vehicles) and off-road agricultural equipment. The nearest airport is the Calipatria Municipal Airport, whose runway is about 1.4 miles northeast of the northeast corner of the project. According to the *Airport Land Use Compatibility Plan, Imperial County Airports*,[8] the project site is outside the future noise impact area of that airport. However, crop-dusting airplanes could be a noise source near the project. A Union Pacific Railroad branch line runs along the eastern boundary of the Site; a spur from this line connects with a "racetrack" rail line on the Site property. Current operations on the Union Pacific branch line are about four trains per day.[9] Limited existing highway noise data are available for SR 111, which borders the Site on the west. In the general area of Calipatria, the distances from the roadway to the 70-, 65- and 60-dBA CNEL contours are 100, 210, and 980 feet, respectively.[10] That means that the western half of the Site is currently exposed to noise levels exceeding 60 dBA CNEL. It also means that the nearest sensitive receiver is currently exposed to more than 70 dBA CNEL.

The project site is within a "noise impact zone," as defined by the *Imperial County General Plan, Noise Element*, because it meets all the following criteria:

- Within 1,100 feet of a state highway;
- Within 750 feet of the centerline of any railroad; and
- Within 1,320 feet of existing farmland which is in an agricultural zone.

---

[7] Email from Christina Keller, Pacific Municipal Consultants, San Diego, California to Michael Rogozen, UltraSystems Environmental, Irvine, California (September 15, 2006).

[8] Cited in Imperial County General Plan, Noise Element. County of Imperial Planning and Development Services, El Centro, CA. Approved October 6, 2015. http://www.icpds.com/CMS/Media/Noise-Element-2015.pdf, p. 32. Accessed August 30, 2018.

[9] Ibid., p. 6.

[10] Ibid., p. 9.

3.6 Ambient Noise Measurements

On Wednesday, July 18, 2018, UltraSystems made sound level measurements on the project site and at the nearest sensitive receiver (a house on the northwest corner of SR 111 and Yocum Road). The purpose of the measurements was to obtain information on "existing conditions," which include current container storage, truck operations, and rail operations. Because the project would include similar operations, the sampling data were also used to estimate future exposures. (See **Section 5.2.1**.)

Figure 3.4-1 shows the noise sampling locations and **Table 3.4-1** describes the sampling points and activities onsite and offsite during each measurement. Measurement results are summarized in **Table 3.4-2**. Some of the measurement results may appear counterintuitive; for example, the exposure at the residence was higher in the absence of onsite activity than it was when the trains, trucks and container loaders were active onsite. A reasonable explanation for this is that noise levels anywhere on or near the project site are influenced mainly by traffic on SR-111. The train acted as a noise barrier, thus insulating the residence from exposure to noise generated onsite, leaving the highway traffic as the only variable noise source.

Figure 3.4-1
AMBIENT NOISE MEASUREMENT LOCATIONS

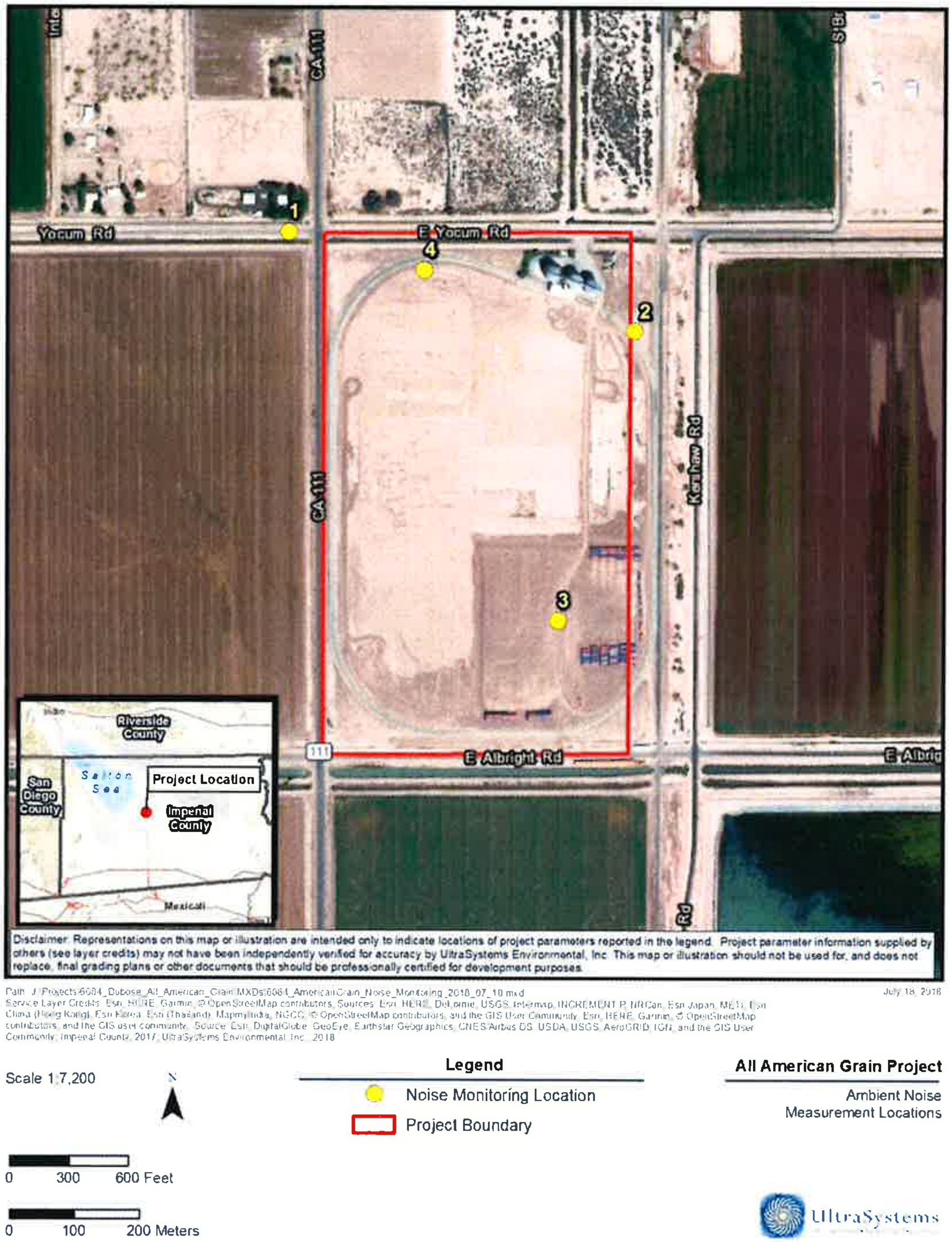

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Table 3.4-1
CHARACTERISTICS OF AMBIENT NOISE MEASUREMENT LOCATIONS AT ALL AMERICAN GRAIN

Point[a]	Identification	Latitude and Longitude	Purpose	Data Set	Time Interval	Comments
1	Residence at northwest corner of R-111 and East Yocum Road	33.63124 N 115.73334 W	Measure exposure during operations	S007	0840-0851	No onsite activity; main noise sources are highway truck traffic and agricultural machinery
				S008	0856-0911	Onsite activity; brief train movement; trucks entering site
2	Onsite, outside the track, near silos	33.110133 N 115.50955 W	Measure locomotive noise	S009	1002-1005	Locomotive idling at 50 feet
			Measure train noise	S010	1005-1007	Train moving counterclockwise at 50 feet
3	Onsite, inside the track, in southeast corner of site, near container storage	33.10580 N 115.51084 W	Measure noise from container loading and unloading	S011	1030-1045	Container loaders loading and unloading containers, 100 – 300 feet away
			Measure noise in absence of container loading and unloading	S012	1100-1106	No container movements
4	Onsite, inside the track, in northwest corner of site	33.11069 N 115.51302 W	Measure locomotive noise	S013	1123-1138	Locomotive idling at 50 feet
			Measure train noise	S014	1218-1224	Train moving counterclockwise

[a] Locations shown in **Figure 3.4-1**.

Table 3.4-2
AMBIENT NOISE MEASUREMENT RESULTS

Data Set	Description	Measured Sound Level (dBA)		
		L_{eq}	L_{max}	L_{90}
S007	Residential exposure, no site activity	70.1	92.7	52.4
S008	Residential exposure, onsite truck, train and loader activity[a]	65.8	86.6	52.2
S009	Onsite, locomotive idling @ 50 feet	80.9	98.3	67.2
S010	Onsite, train moving @ 50 feet	77.4	86.1	70.6
S011	Container loading and unloading @ 100 – 300 feet	63.4	78.0	53.8
S012	Onsite, no container activity	65.9	79.8	53.8
S013	Onsite, locomotive idling @ 50 feet	69.8	89.7	63.7
S014	Onsite, train moving @ 50 feet	78.9	96.5	69.6

[a]Sound path to residence blocked by onsite train.

4.0 APPLICABLE REGULATIONS

To limit population exposure to noise levels that are physically and/or psychologically damaging or intrusive, the federal government, the State of California, various county governments, and most municipalities in the state have established noise policies, standards, and ordinances.

4.1 Federal

The U.S. Department of Housing and Urban Development (HUD) has set a goal of 45 dBA L_{dn} as a desirable maximum interior standard for residential units developed under HUD funding. While HUD does not specify acceptable exterior noise levels, standard construction of residential dwellings constructed under Title 24 of the California Code of Regulations typically provide 20 dBA of acoustical attenuation with the windows closed and 10 dBA with the windows open. Based on this assumption, the exterior L_{dn} or CNEL should not exceed 65 dBA under normal conditions.

4.2 State of California

The California Department of Health Care Services (DHCS)[11] Office of Noise Control[12] studied the correlation of noise levels and their effects on various land uses. The most current guidelines are contained in the "General Plan Guidelines" issued by the Governor's Office of Planning and Research

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[11] Formerly called the California Department of Health Services (DHS).

[12] The Office of Noise Control no longer exists.

in 2017.[13] These guidelines establish four categories for judging the severity of noise intrusion on specified land uses:

- Normally Acceptable: Is generally acceptable, with no mitigation necessary.
- Conditionally Acceptable: May require some mitigation, as established through a noise study.
- Normally Unacceptable: Requires substantial mitigation.
- Clearly unacceptable: Probably cannot be mitigated to a less-than-significant level.

The types of land uses addressed by the State standards and the acceptable noise categories for each are presented in **Table 4.2-1.** There is some overlap between categories, which indicates that some judgment is required in determining the applicability of the numbers in some situations. Note that Imperial County has modified this table for the purpose of implementing the noise element of its general plan. The Imperial County version of the table is presented in **Section 4.3.1**.

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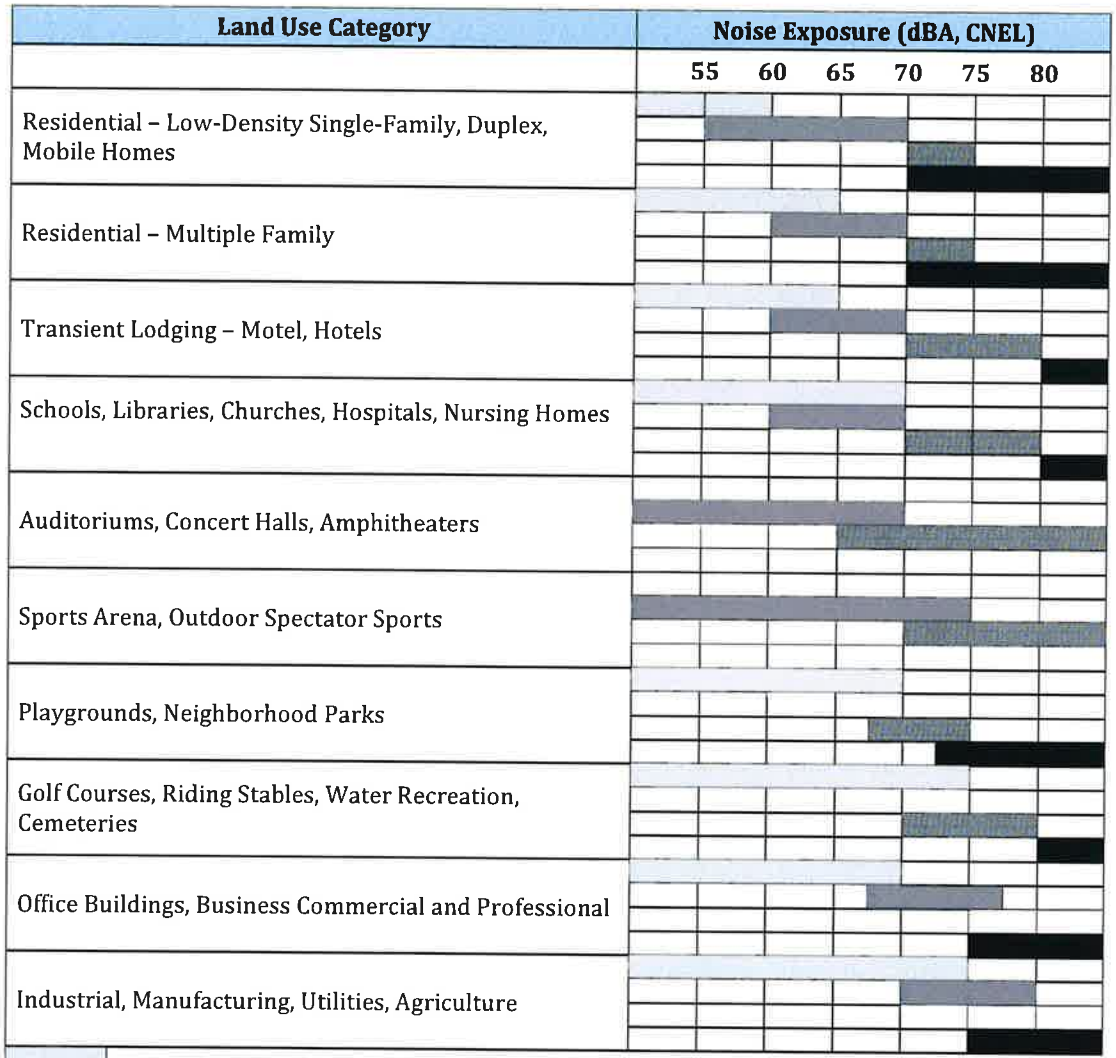
[13] State of California General Plan Guidelines. Appendix D. Guidelines for the Preparation and Content of the Noise Element of the General Plan. Office of Planning and Research, Sacramento, CA. 2017. http://opr.ca.gov/docs/OPR_Appendix_D_final.pdf. Accessed August 23, 2018.

Table 4.2-1
LAND USE COMPATIBILITY FOR COMMUNITY NOISE SOURCES



░ **Normally Acceptable**: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

▒ **Conditionally Acceptable**: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditionally will normally suffice.

▓ **Normally Unacceptable**: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

■ **Clearly Unacceptable**: New construction or development should generally not be undertaken.

Source: State of California, *General Plan Guidelines*, Governor's Office of Planning and Research, 2017.

4.3 Local Standards

The primary regulatory documents that establish noise standards in the county are the Imperial County General Plan, Noise Element[14] and the Imperial Noise Abatement and Control Ordinance.[15] Relevant standards from both documents are discussed below by type of standard (e.g., for construction noise or operation noise). Note that the Imperial County General Plan and the Noise Abatement and Control Ordinance apply only to unincorporated area in the county.

4.3.1 Imperial County General Plan, Noise Element

Definition of Sensitive Receptors

As defined in the Imperial General Plan, Noise Element, "sensitive noise receptors" are, in general, "areas of habitation where the intrusion of noise has the potential to adversely impact the occupancy, use or employment of the environment."[16] Sensitive receptors include, but are not limited to, residences, schools, hospitals, parks and office buildings. Sensitive receptors may also be non-human species, such as riparian birds.

Construction Noise

The Imperial County General Plan limits sound levels from construction activities during specific hours of the day and night through a set of construction noise standards, presented below in **Table 4.3-1**. The standards apply to the noise measured at the nearest sensitive receptor.

Table 4.3-1
COUNTY OF IMPERIAL CONSTRUCTION NOISE STANDARDS

Construction Duration	Sound Level (dB L_{eq})	Averaging Period	Hours of Operation Restriction
Short-Term (days or weeks)	75	8 hours	7:00 a.m. – 7:00 p.m. Monday to Friday 9:00 a.m. – 5:00 p.m. Saturday No commercial construction operation is permitted on Sundays and holidays
Extended Periods	75	1 hour	7:00 a.m. – 7:00 p.m. Monday to Friday 9:00 a.m. – 5:00 p.m. Saturday No commercial construction operation is permitted on Sundays and holidays

Source: County of Imperial, General Plan, Noise Element, 2015, p. 21.

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[14] Imperial County General Plan, Noise Element. County of Imperial Planning and Development Services, El Centro, CA. Approved October 6, 2015. http://www.icpds.com/CMS/Media/Noise-Element-2015.pdf. Accessed August 30, 2018.

[15] Title 9, Land Use Ordinance for the County of Imperial, Division 7: Noise Abatement and Control (Last amended April 18, 2017). http://www.icpds.com/CMS/Media/TITLE9Div7_2015.pdf. Accessed August 30, 2018.

[16] Imperial County General Plan, Noise Element, p. 15.

Operational Noise

The Imperial County General Plan, Noise Element includes Property Line Noise Limits, which are listed in **Table 4.3-2**, and apply to noise generation from one property to an adjacent property. The standards imply the existence of a sensitive receptor on the adjacent, or receiving, property. In the absence of a sensitive receptor, an exception or variance to the standard may be appropriate. An analysis is required for any project that has the potential to generate noise in excess of the Property Line Noise Limits. Note that when the ambient noise level equals or exceeds a property line standard, the increase of the existing or proposed noise shall not exceed 3 dB L_{eq}.

Table 4.3-2
COUNTY OF IMPERIAL OPERATIONAL NOISE STANDARDS

Land Use Zone	Hours	Noise Limit One-hour Average Sound Level (dBA)
Residential	7:00 a.m. – 10:00 p.m.	50
	10:00 p.m. – 7:00 a.m.	45
Multi-residential	7:00 a.m. – 10:00 p.m.	55
	10:00 p.m. – 7:00 a.m.	50
Commercial	7:00 a.m. – 10:00 p.m.	60
	10:00 p.m. – 7:00 a.m.	55
Light Industrial/Industrial Park	Anytime	70
General Industrial	Anytime	75

Source: County of Imperial, General Plan, Noise Element, 2015, p. 21.

As was discussed in **Section 3.5**, the project site is located in a "noise impact zone," as defined by the Imperial County General Plan, Noise Element. An acoustical analysis is therefore required to "demonstrate project compliance with land use compatibility requirements and other applicable environmental noise standards."[17] The Imperial County-specific land use compatibility guidelines are shown in **Table 4.3-3.**

4.3.2 Imperial County Noise Ordinance

The Imperial County Noise Abatement and Control Ordinance includes property line noise limits that are essentially the same as those listed in **Table 4.3-2.**[18] No other Noise Abatement and Control Ordinance provisions are relevant to the propose project.

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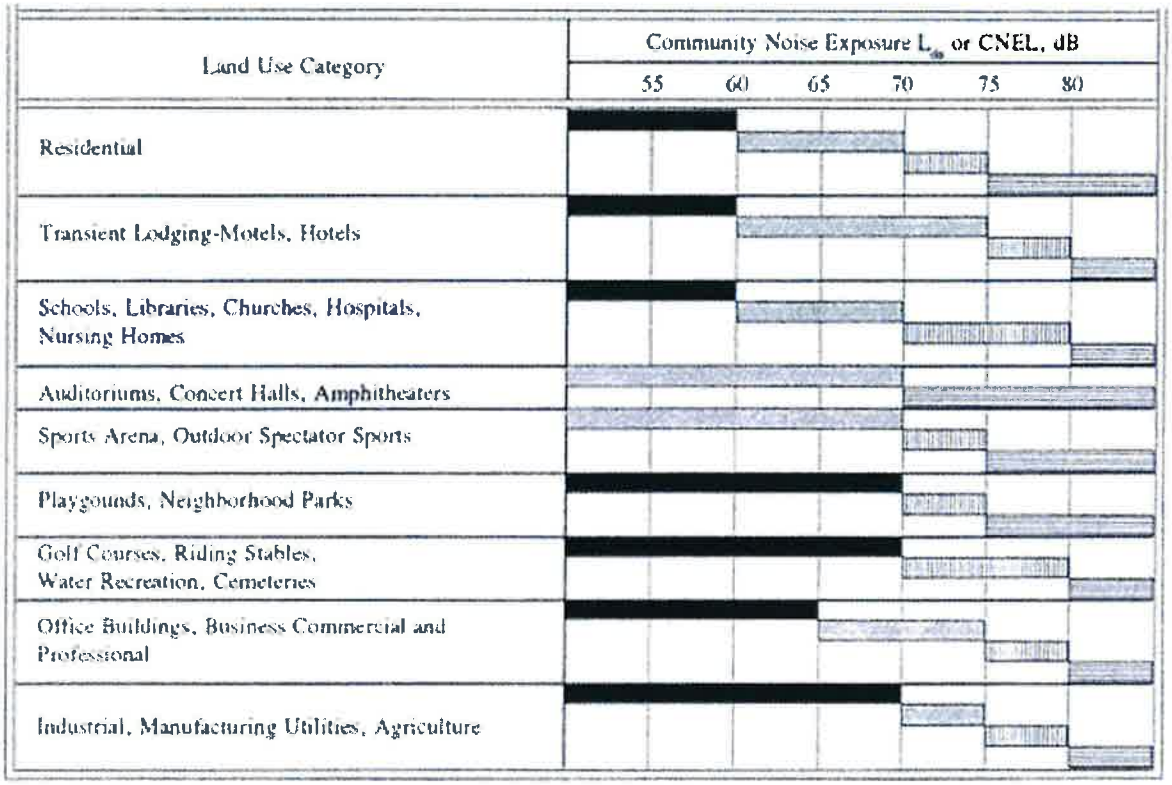
[17] Imperial County General Plan, Noise Element, p. 16.

[18] County of Imperial Codified Ordinances, Title 9, Division 7: Noise Abatement and Control, § 90702.00(A).

Table 4.3-3
IMPERIAL COUNTY NOISE/LAND USE COMPATIBILITY GUIDELINES



Interpretation (For Land Use Planning Purposes)

■ Normally Acceptable

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

▨ Conditionally Acceptable

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

▥ Normally Unacceptable

New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

▤ Clearly Unacceptable

New construction or development clearly should not be undertaken.

Source: County of Imperial, General Plan, Noise Element, 2015, p. 18.

4.3.3 Imperial County Right-to-Farm Ordinance

In recognition of the role of agriculture in the county, Imperial County has adopted a right-to-farm ordinance.[19] A "right-to-farm" ordinance creates a legal presumption that ongoing, standard farming practices are not a nuisance to adjoining residences. It requires a disclosure to land owners near agricultural land operations, or areas zoned for agricultural purposes. The disclosure advises persons that discomfort and inconvenience from machinery resulting from conforming and accepted agricultural operations are normal and necessary aspects of living in the agricultural areas of the county.

4.4 Thresholds of Significance

There are two criteria for judging noise impacts. First, noise levels generated by the project must comply with all relevant federal, state, and local standards and regulations. Noise impacts on the surrounding community are limited by local noise ordinances, which are implemented through investigations in response to nuisance complaints. It is assumed that all existing regulations for the construction and operation of the project would be enforced. In addition, the project should not produce noise levels that are incompatible with adjacent noise sensitive land uses as defined in the General Plan.

The second measure of impact used in this analysis is the significant increase in noise levels above existing ambient noise levels as a result of the introduction of a new noise source. An increase in noise level due to a new noise source has a potential to adversely impact people.

Based on the applicable noise regulations stated above, the project would have a significant noise impact if it would:

- Conflict with applicable noise restrictions or standards imposed by regulatory agencies.
- Result in future (operational) noise levels within the "normally acceptable" ranges shown in **Table 4.3-3**, but would also result in an increase of 5 dBA CNEL or greater.
- Result in future (operational) noise levels greater than the "normally acceptable" ranges shown in **Table 4.3-3**, and result in an increase of 3 dBA CNEL or greater.
- Result in a substantial temporary or periodic increase in ambient noise levels above levels existing without the project at sensitive receiver locations.

5.0 PROJECT IMPACTS

Noise impacts associated with land use development projects include short-term and long-term impacts. Construction activities, especially heavy equipment operation, would create noise increases on and adjacent to the construction site.

Long-term noise impacts include project-generated onsite and offsite operational noise sources. Onsite (stationary) noise sources would include operation of container loaders, trucks and trains; and landscape and building maintenance. Offsite noise would be attributable to project-induced

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[19] County of Imperial Codified Ordinances, Division 2, Title 6: Right to Farm, § 62950-62955.

traffic, which would cause an incremental increase in noise levels within and near the project vicinity.

This section also evaluates potential groundborne vibration that would be generated from the construction or operation of the project.

5.1 Short-Term Noise Impacts

Noise generated during construction of the project could generate noise levels in excess of standards adopted in local ordinances. Noise impacts from construction activities occurring within the project site would be a function of the noise generated by construction equipment, the equipment location, and the timing and duration of the noise-generating activities.

As discussed in **Section 3.3**, construction will comprise three phases. The construction noise impact analysis considered only Phase 1, because (1) it has the highest concentration of simultaneous noise-generating activities and (2) as will become evident below, construction noise impacts are so low that it is not necessary to do a detailed analysis for all three phases. The types and numbers of pieces of equipment to be deployed during Phase 1 were determined as part of the air quality and greenhouse gas emissions analysis for this project.[20] Phase 1 was divided into five construction stages. Equipment characteristic for the subphases are shown in **Table 5.1-1**.

Table 5.1-1
PHASE 1 CONSTRUCTION EQUIPMENT CHARACTERISTICS

Construction Stage	Equipment Type	Horse-power	No. of Pieces	Utilization Factor	dBA @ 50 Feet
CP1 – Subgrade Preparation for Access Driveway	Excavators	81	1	0.4	80
	Graders	187	1	0.4	85
	Rollers	80	1	0.2	85
	Rubber-Tired Dozers	247	1	0.4	85
CP2 – Subgrade Preparation for Container Storage	Excavators	81	1	0.4	80
	Graders	187	2	0.4	85
	Rollers	80	1	0.2	85
	Rubber-Tired Dozers	247	2	0.4	85
CP3 – Crushed Rock for Container Storage Yard	Graders	187	2	0.4	85
	Rollers	80	2	0.2	85
	Rubber-Tired Loader[a]	97	2	0.4	84
CP4 – Class II Aggregate Base – Container Yard and Access Driveway	Graders	187	2	0.4	85
	Rollers	80	2	0.2	85
	Rubber-Tired Loader[a]	97	2	0.4	84

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[20] Air Quality and Greenhouse Gas Emissions Report for All American Grain Container Storage and Transfer Facility, Calipatria, California. Prepared by UltraSystems Environmental Inc. for DuBose Design Group, El Centro, CA. September 2018.

Construction Stage	Equipment Type	Horse-power	No. of Pieces	Utilization Factor	dBA @ 50 Feet
CP5 – Paving – Access Driveway	Pavers	130	1	0.5	85
	Rollers	90	1	0.2	85
	Tractors/Loaders/ Backhoes	97	1	0.4	84

Source: RCM, unless otherwise noted.
[a]Noise emissions characteristics assumed same as for tractors/loaders/backhoes.

One sensitive receiver[21]—the closest residence—was analyzed. The estimated composite hourly L_{eq} values at this receiver from the source of construction activities on the container storage area and on the new access driveways were calculated using the noise source values from **Table 5.1-1** and methods suggested by the Federal Transit Administration (FTA).[22] Results are presented in **Table 5.1-2**. The first column of the table accounts for the fact that some construction stages will be simultaneous for parts of the project. The maximum exposure from construction activities would be 46.8 dBA L_{eq}, and the maximum increase in exposure would be 0.02 dBA L_{eq}. This exposure would not be detectable by people.

Based on the project construction schedule, no pile driving or blasting would be required for construction of the project.

Please note that these estimated construction noise levels represent a conservative (worst-case) scenario, in which the loudest type of construction equipment would be operating on the same schedule and in the same area on the construction site. These worst-case values would not be continuous, nor would they be typical of noise levels throughout the construction period.

Table 5.1-2
ESTIMATED CONSTRUCTION NOISE LEVELS

Construction Stage	Noise Exposure, dBA L_{eq}				
	From Container Storage Area	From Driveway Area	Ambient	New Total	Increase
CP1 + CP2	43.4	39.9	70.1	70.113	0.013
CP2	43.4	0	70.1	70.109	0.009
CP3	43.7	0	70.1	70.11	0.010
CP4	43.7	42.0	70.1	70.116	0.016
CP4 + CP5	43.7	44.0	70.1	70.12	0.020

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[21] UltraSystems' convention is to use "receiver" for noise impacts and "receptor" for air quality impacts, except when referencing laws and regulations that use "receptor;" the two terms should be considered interchangeable here.

[22] U.S. Department of Transportation (USDOT). 1995. Federal Transit Administration (FTA): Transit Noise and Vibration Impact Assessment. April.

5.2 Long-Term Noise Impacts

5.2.1 Onsite Sources

As discussed in **Section 3.5**, the sensitive receiver evaluated for this report already is exposed to more than 70 dBA CNEL from SR-111 traffic. The ambient sampling performed for this study found 70.1 dBA L_{eq} with no activity on the project site and 65.8 dBA L_{eq} with the exact same type of activity that will occur under the project. For a worst case (the greatest increase in exposure, measured as CNEL) assume that all of the 65.8 dBA L_{eq} was from the project (i.e. none from SR-111), and that the current daily average exposure is 70 dBA CNEL. The new CNEL value (ambient plus project contribution) would be 71.2 dBA, and the increase would be only 1.2 dBA CNEL. That value would not be detected by the average person. The increase in noise due to the project would be less than significant.

5.2.2 Roadway Noise

The principal noise source in the project area is traffic on local roadways. A noise impact would occur if the project contributes to a permanent increase in ambient noise levels affecting sensitive receivers along roadways that would carry project-generated traffic. Using unit trains instead of trucks to transport agricultural products to the Port of Long Beach will reduce daily onroad traffic in the project area, thereby reducing traffic-related noise impacts. In the worst case, traffic would remain at about 80 to 100 trucks per day. The traffic study for the project[23] estimates about 6,700 to 7,500 annual average daily trips on SR-111 near the project site. The maximum increase due to the project would be about 1.5%. Given the logarithmic nature of the decibel, traffic volume needs to be doubled in order for the noise level to increase by 3 dBA,[24] the minimum level perceived by the average human ear. A doubling is equivalent to a 100% increase. Therefore, the onroad noise impact would be less than significant.

5.2.3 Train Noise

The project will generate up to three additional train trips per week along the Union Pacific branch line that runs along the site's eastern boundary. Because the noise exposure would be of short duration and would occur only three times per week, the impact is less than significant.

5.3 Vibration Impacts

Vibration is sound radiated through the ground. Groundborne noise is the rumbling sound caused by the vibration of building interior surfaces. The ground motion caused by vibration is measured as peak particle velocity (PPV) in inches per second and is referenced as vibration decibels (VdB). Typical outdoor sources of perceptible groundborne vibration are construction equipment and traffic on rough roads.

The American National Standards Institute (ANSI) indicates that vibration levels in critical care areas, such as hospital surgical rooms and laboratories, should not exceed 0.2 inch per second of PPV.[25] The FTA also uses a PPV of 0.2 inch per second as vibration damage threshold for fragile

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[23] Report is in preparation; data from Linscott, Law and Greenspan Engineers, June 18, 2018.

[24] Technical Noise Supplement. Prepared by ICF Jones & Stokes, Sacramento, California for California Department of Transportation, Division of Environmental Analysis, Sacramento, California. November 2009.

[25] American National Standards Institute (ANSI). 1983. "Guide to the Evaluation of Human Exposure to Vibration in Buildings," ANSI S.329-1983.

buildings and a PPV of 0.12 inch per second for extremely fragile historic buildings. The FTA criterion for ground-borne vibration that may cause human annoyance is 80 VdB for operational sources.[26]

5.3.1 Construction Impact

It is expected that groundborne vibration from project construction activities would cause only intermittent, localized intrusion. The project's construction activities most likely to cause vibration impacts are:

- **Heavy Construction Equipment:** Although all heavy, mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to buildings, the vibration is usually short-term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as large bulldozers would operate close enough to any residences to cause vibration impact.

- **Trucks:** Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes almost always eliminates the problem.

The FTA has published standard vibration levels for construction equipment operations.[27] The calculated vibration levels expressed in VdB and PPV for construction equipment at distances of 50 and 100 feet are listed in **Table 5.3-1**.

Table 5.3-1
VIBRATION LEVELS OF CONSTRUCTION EQUIPMENT

Equipment	PPV at 50 ft (in/sec)	Vibration Decibels at 50 ft (VdB)	PPV at 271 ft (in/sec)	Vibration Decibels at 271 ft (VdB)
Large Bulldozer	0.0315	81	0.0025	66
Loaded Truck	0.0269	80	0.0021	65
Small Bulldozer	0.0011	52	0.00008	37
Vibratory Roller	0.0742	88	0.0059	73

The closest sensitive receivers in the project vicinity are residences to the northwest of project site. The distance between the nearest residence and the project site boundary is 271 feet. As shown in **Table 5.3-1**, vibration level of construction equipment at a distance of 271 feet is less than the FTA damage threshold of 0.12 inch per second PPV for fragile historic buildings. In addition, since it is not expected that heavy equipment such as large bulldozers would operate close enough to any residences, the construction would not generate groundborne vibrations that cause human annoyance. Therefore, there would be no impact from groundborne vibration or groundborne noise as a result of project construction.

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[26] Federal Transit Administration. 1995. Transit Noise and Vibration Impact Assessment (April).
[27] Federal Transit Administration, Transit Noise and Vibration Impact Assessment, April 1995.

5.3.2 Operational Impact

Operation of the project would not involve significant sources of groundborne vibration or groundborne noise. Thus, operation of the project would result in no impact.

6.0 MITIGATION MEASURES

As no significant short- or long-term noise impacts due to the project would occur, no mitigation measures are necessary. ✓

7.0 IMPACTS AFTER MITIGATION

As no significant short- or long-term noise impacts are expected for the project, no mitigation measures are necessary.

ATTACHMENT 1

AMBIENT NOISE MEASUREMENT DATA

UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part A

Date: 7/18/18 Day of Week: wednesday Time: 8:40 Project Number: 6084

Monitoring Segment / Area: 01 Monitoring Site Address: ______

Measurement Taken By: Mohamed of UltraSystems Environmental

Approximate Wind Speed: 6.6 mph [km/hr] Approximate Wind Direction: From the E — W

Approximate distance of sound level meter from receptor location: ______

Approximate distance of sound level meter from construction site: ______
(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential ☐ Institutional ☑ Comm./Ind. ☐ Recreational

Sound Level Meter: Make and Model: Quest SoundPro DL-1-1/3 Serial Number: BLH080004

Meter Setting: ☑ A-Weighted Sound Level (SLOW) ☐ A-Weighted Sound Level (FAST)

Measurement Start Time: 8:40 Measurement End Time: 8:55

Total Measurement Time: 15 min Session File Name (e.g., S012): S007

Check the measurement purpose:

☐ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results

Measurement Type	Measured Levels (dB)	
Calibration	Pre: 114.1	Post: 114.1
L_{eq} (h)	Slow: 70.2	Fast: 70.1
L_{max}	Slow: 92.7	Fast: 94.3
L_{90}	Slow: 55.1	Fast: 55.1

SEL: 99.7 dB

Field Notes:

1. train stopped — traffic on the 111 HWY
2. on road tracks — farming equipment used next lot
3. No loading or unloading.

Noise Monitor's Signature: Mohamed Date: 7/18/18

UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part B

Date: 7/18/18 Day of Week: wednsday Time: 8:40 Project Number: 6084

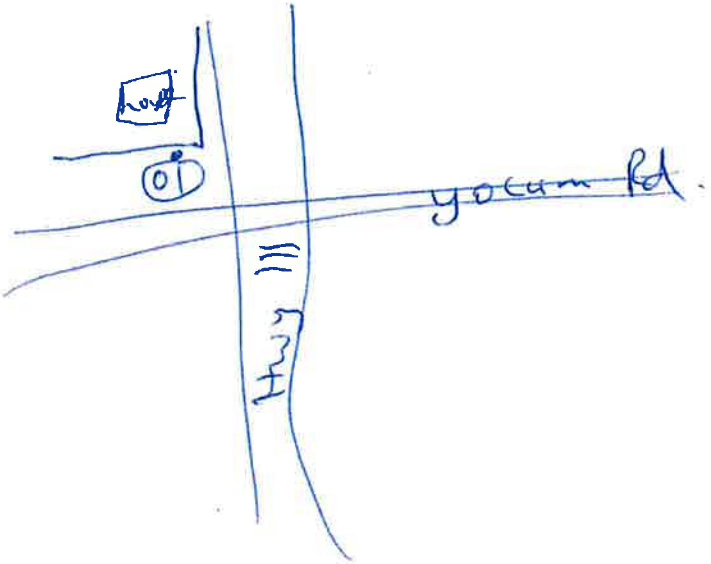
Monitoring Segment / Area: 01 Monitoring Site Address: ____________

Site Map

Plan View

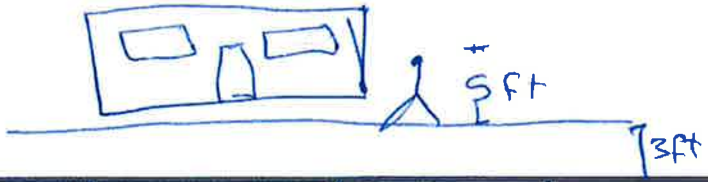
North Arrow
(fill-in)

(Indicate site location, receptor location, meter location, distance in feet to landmarks, roadways, travel lane directions, geographical objects: trees, water, buildings, signs, store names, hydrants, power & telephone lines, manholes, etc.)



Elevation View

(Indicate terrain, roadway, height and location of receptor, meter, walls, barriers, buildings, etc.)



Latitude: 33.63124	**Longitude:** 117.73334	**Elevation:** -179ft

Noise Monitor's Signature: ____________ Date: 7/18/18

Session Report

7/20/2018

Information Panel

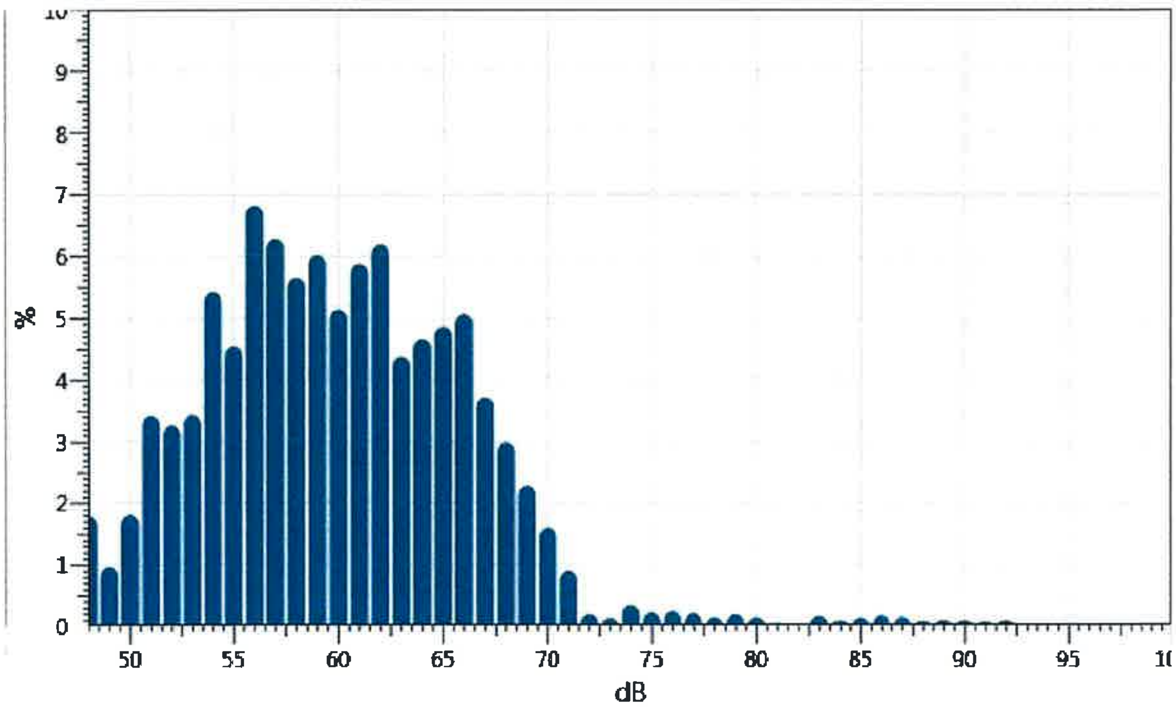
Name	S007_BLH080004_19072018_165022
Start Time	7/18/2018 8:40:21 AM
Stop Time	7/18/2018 8:55:21 AM
Device Name	BLH080004
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	70.1 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	FAST			

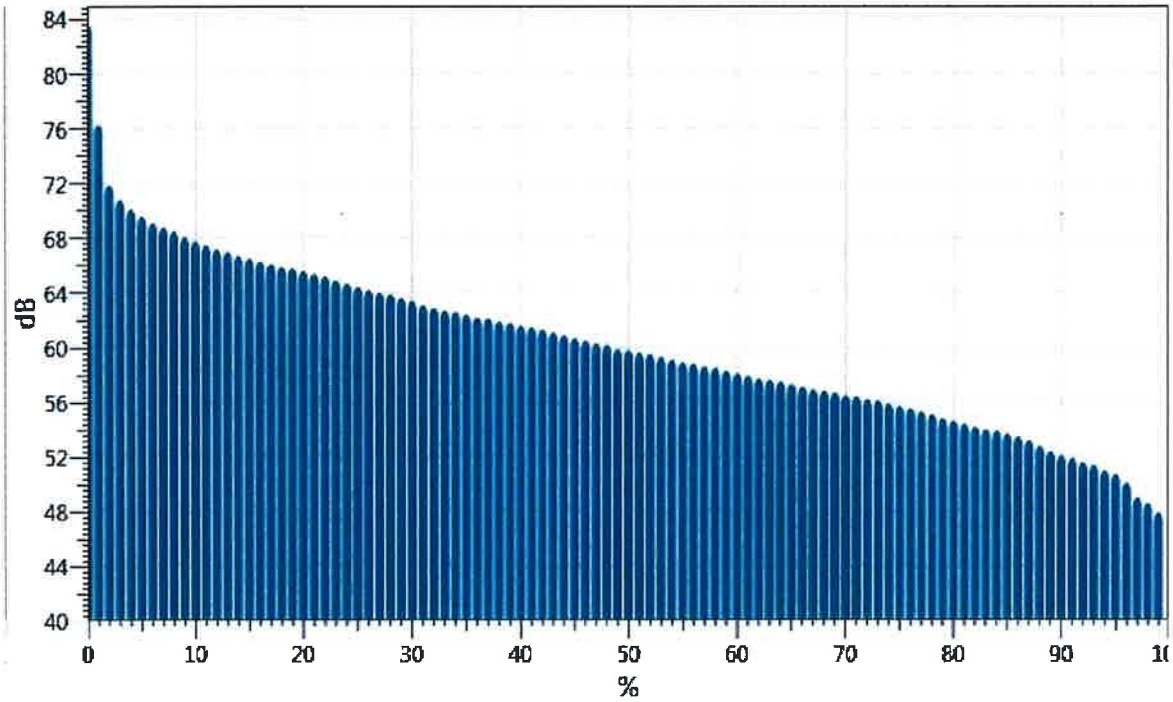
Statistics Chart

S007_BLH080004_19072018_165022: Statistics Chart



Exceedance Chart

S007_BLH080004_19072018_165022: Exceedance Chart



Statistics Table

dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
48:	0.06	0.05	0.02	0.14	0.20	0.21	0.17	0.40	0.39	0.16	1.79
49:	0.17	0.14	0.10	0.10	0.07	0.04	0.08	0.06	0.09	0.12	0.96
50:	0.07	0.11	0.10	0.12	0.16	0.16	0.16	0.23	0.33	0.38	1.81
51:	0.35	0.26	0.12	0.21	0.35	0.35	0.45	0.46	0.41	0.46	3.42
52:	0.42	0.39	0.36	0.27	0.24	0.35	0.33	0.29	0.30	0.30	3.26
53:	0.25	0.23	0.21	0.21	0.33	0.31	0.44	0.51	0.46	0.48	3.43
54:	0.81	0.79	0.40	0.55	0.61	0.46	0.48	0.46	0.43	0.42	5.42
55:	0.39	0.31	0.61	0.40	0.37	0.36	0.49	0.52	0.54	0.55	4.54
56:	0.58	0.69	0.64	0.60	0.62	0.87	0.65	0.72	0.82	0.65	6.82
57:	0.59	0.81	0.42	0.46	0.50	0.70	0.80	0.60	0.69	0.72	6.28
58:	0.64	0.48	0.53	0.42	0.48	0.52	0.59	0.62	0.74	0.64	5.65
59:	0.69	0.64	0.55	0.58	0.56	0.49	0.65	0.63	0.59	0.64	6.02
60:	0.62	0.60	0.38	0.50	0.65	0.54	0.43	0.51	0.47	0.45	5.13
61:	0.53	0.55	0.52	0.61	0.67	0.55	0.59	0.66	0.59	0.61	5.88
62:	0.60	0.79	0.70	0.64	0.60	0.60	0.54	0.64	0.53	0.54	6.19
63:	0.59	0.52	0.38	0.52	0.39	0.35	0.39	0.39	0.40	0.44	4.37
64:	0.54	0.55	0.56	0.48	0.51	0.44	0.40	0.36	0.44	0.37	4.66
65:	0.38	0.45	0.42	0.43	0.56	0.59	0.49	0.43	0.58	0.51	4.85
66:	0.55	0.57	0.42	0.60	0.48	0.55	0.55	0.46	0.45	0.43	5.06
67:	0.46	0.47	0.41	0.34	0.45	0.33	0.36	0.34	0.29	0.26	3.71
68:	0.25	0.29	0.30	0.27	0.32	0.30	0.26	0.38	0.28	0.32	2.98
69:	0.27	0.35	0.20	0.19	0.26	0.24	0.22	0.22	0.15	0.19	2.28
70:	0.21	0.16	0.14	0.15	0.16	0.14	0.18	0.17	0.17	0.12	1.59
71:	0.13	0.15	0.09	0.07	0.04	0.05	0.07	0.08	0.14	0.08	0.90
72:	0.03	0.02	0.02	0.01	0.02	0.02	0.03	0.02	0.01	0.01	0.19
73:	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.13
74:	0.02	0.02	0.03	0.02	0.03	0.04	0.06	0.04	0.04	0.05	0.34
75:	0.02	0.03	0.03	0.01	0.01	0.01	0.03	0.02	0.04	0.02	0.22
76:	0.03	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.24
77:	0.03	0.03	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.21
78:	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.14
79:	0.03	0.03	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.19
80:	0.01	0.01	0.02	0.01	0.04	0.02	0.01	0.01	0.01	0.01	0.14
81:	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.05
82:	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.04

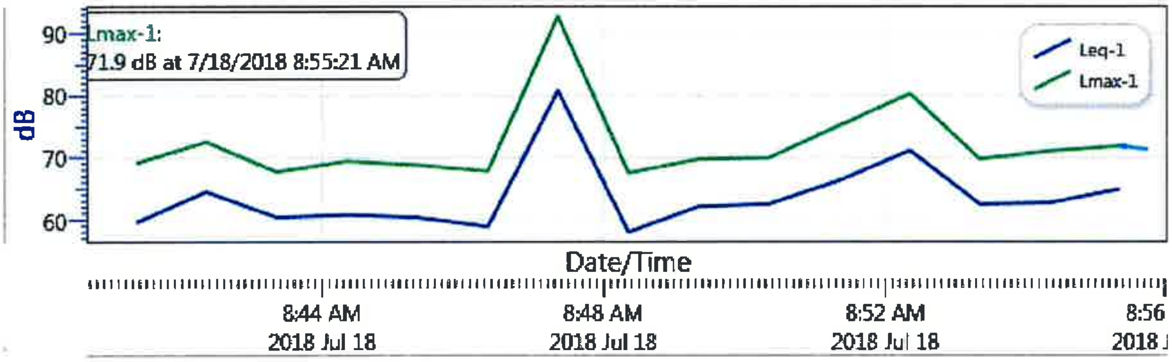
83:	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.04	0.04	0.04	0.16
84:	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.02	0.02	0.01	0.09
85:	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.13
86:	0.02	0.05	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.17
87:	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.14
88:	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
89:	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
90:	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
91:	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.07
92:	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.09

Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		83.7	76.3	71.9	70.8	70.1	69.6	69.1	68.8	68.5
10%:	68.1	67.8	67.5	67.2	67.0	66.7	66.5	66.3	66.1	65.9
20%:	65.8	65.6	65.4	65.2	64.9	64.7	64.4	64.2	64.0	63.9
30%:	63.6	63.4	63.1	62.9	62.7	62.6	62.4	62.2	62.1	61.9
40%:	61.8	61.6	61.5	61.3	61.1	60.9	60.7	60.5	60.3	60.2
50%:	59.9	59.8	59.6	59.5	59.3	59.1	58.9	58.8	58.6	58.5
60%:	58.3	58.1	57.9	57.7	57.6	57.5	57.3	57.1	56.9	56.8
70%:	56.7	56.5	56.4	56.2	56.1	55.9	55.7	55.5	55.3	55.1
80%:	54.8	54.6	54.4	54.2	54.0	53.9	53.7	53.5	53.2	52.8
90%:	52.4	52.1	51.9	51.6	51.4	51.0	50.7	50.1	49.0	48.6
100%:	47.9									

Logged Data Chart

S007_BLH080004_19072018_165022: Logged Data Chart



UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part A

Date: 7/18/18 Day of Week: wed-s Time: 8:56 Project Number: 6084

Monitoring Segment / Area: 01 Monitoring Site Address: ________

Measurement Taken By: Mohamed of UltraSystems Environmental

Approximate Wind Speed: 5.7 mph [km/hr] Approximate Wind Direction: From the W

Approximate distance of sound level meter from receptor location: ________

Approximate distance of sound level meter from construction site: ________
(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential ☑ Institutional ☐ Comm./Ind. ☐ Recreational

Sound Level Meter: Make and Model: Quest SoundPro DL-1-1/3 Serial Number: BLH080004

Meter Setting: ☑ A-Weighted Sound Level (SLOW) ☐ A-Weighted Sound Level (FAST)

Measurement Start Time: 8:56 Measurement End Time: 9:11

Total Measurement Time: 15 min Session File Name (e.g., S012): S008

Check the measurement purpose:

☑ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results

Measurement Type	Measured Levels (dB)
Calibration	Pre: 114.1 Post: 114.2
L_{eq} (h)	Slow: 65.8 Fast: 65.8
L_{max}	Slow: 86.6 Fast: 89.0
L_{90}	Slow: 50.8 Fast: 50.7

SEL: 95.4 dB

Field Notes:

1. on Road traffic and trucks. train started moving for a bit
2. at 9:00 then stopped – heavy trucks going onsite
3.

Noise Monitor's Signature: Mohamed Date: 7/18/18

UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part B

Date: 7/18/18 Day of Week: wednsday Time: 8:56 Project Number: 6084

Monitoring Segment / Area: 01 Monitoring Site Address: ____________

Site Map

Plan View North Arrow (fill-In)	(Indicate site location, receptor location, meter location, distance in feet to landmarks, roadways, travel lane directions, geographical objects: trees, water, buildings, signs, store names, hydrants, power & telephone lines, manholes, etc.)
Elevation View	(Indicate terrain, roadway, height and location of receptor, meter, walls, barriers, buildings, etc.)

Latitude: 33.63124°	**Longitude:** 117.73334	**Elevation:** -179 ft

Noise Monitor's Signature: ____________ Date: 7/18/18

Session Report

7/20/2018

Information Panel

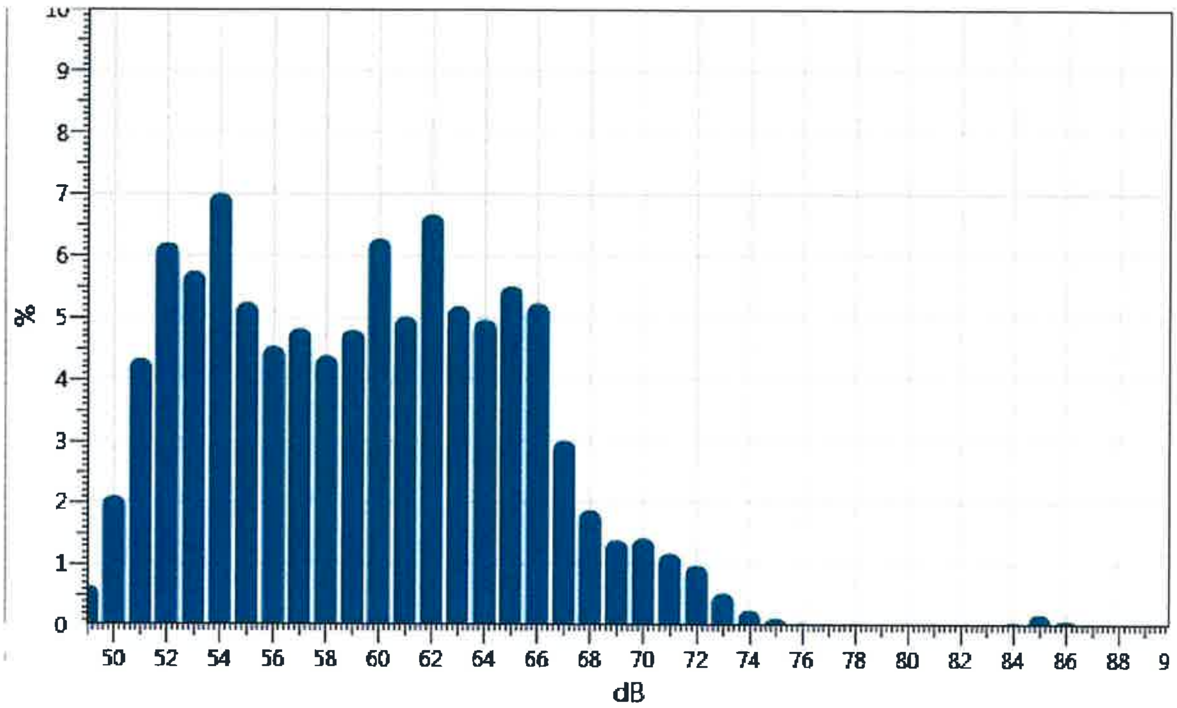
Name	S008_BLH080004_19072018_165026
Start Time	7/18/2018 8:57:08 AM
Stop Time	7/18/2018 9:12:08 AM
Device Name	BLH080004
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	65.8 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	FAST			

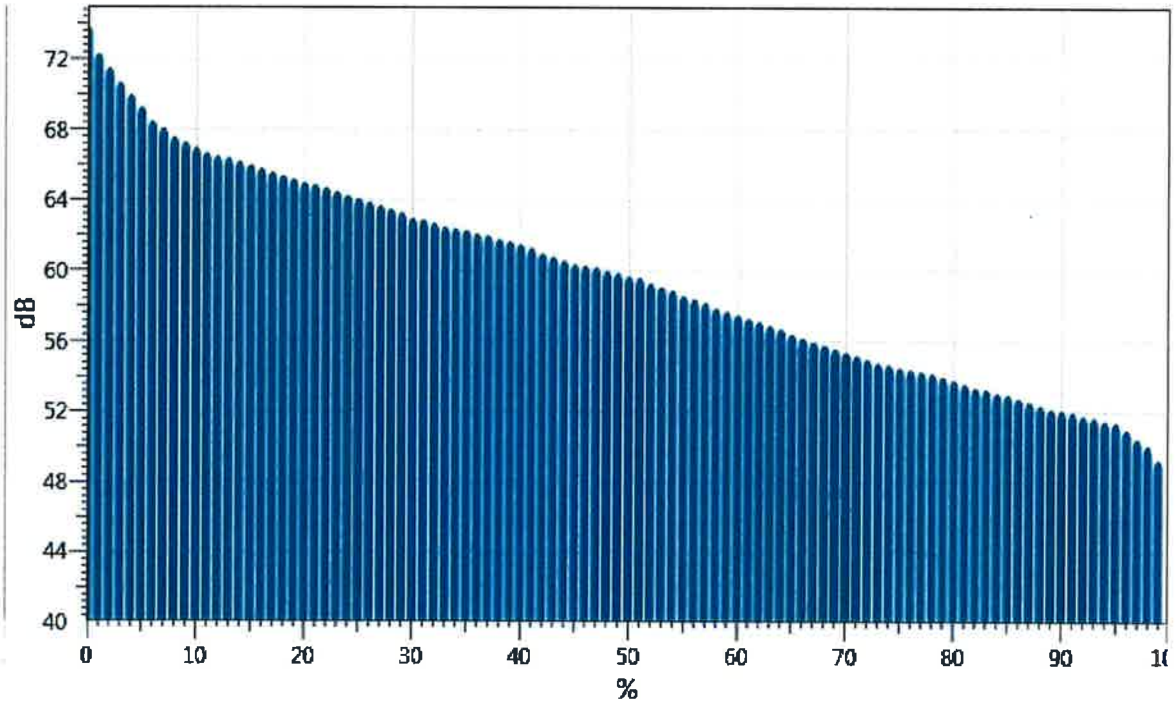
Statistics Chart

S008_BLH080004_19072018_165026: Statistics Chart



Exceedance Chart

S008_BLH080004_19072018_165026: Exceedance Chart



Statistics Table

dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
49:	0.00	0.00	0.00	0.00	0.05	0.14	0.04	0.10	0.19	0.12	0.65
50:	0.14	0.17	0.25	0.23	0.21	0.19	0.24	0.21	0.20	0.26	2.10
51:	0.23	0.29	0.13	0.19	0.29	0.45	0.78	0.54	0.60	0.83	4.33
52:	0.69	0.87	0.88	0.61	0.59	0.55	0.59	0.48	0.47	0.46	6.20
53:	0.52	0.76	0.69	0.58	0.53	0.69	0.59	0.48	0.46	0.44	5.74
54:	0.53	0.79	0.60	0.81	0.83	0.74	0.74	0.70	0.70	0.57	7.01
55:	0.54	0.70	0.63	0.45	0.41	0.50	0.52	0.38	0.55	0.56	5.24
56:	0.49	0.55	0.57	0.60	0.43	0.31	0.34	0.34	0.44	0.45	4.52
57:	0.55	0.63	0.47	0.55	0.44	0.50	0.46	0.41	0.42	0.37	4.82
58:	0.42	0.38	0.44	0.53	0.48	0.60	0.44	0.36	0.37	0.36	4.37
59:	0.46	0.42	0.36	0.43	0.47	0.46	0.41	0.44	0.61	0.73	4.79
60:	0.85	0.78	0.60	0.73	0.65	0.68	0.53	0.52	0.50	0.43	6.27
61:	0.49	0.49	0.40	0.34	0.38	0.51	0.53	0.53	0.61	0.72	5.01
62:	0.68	0.67	0.76	0.72	0.78	0.71	0.62	0.52	0.54	0.66	6.66
63:	0.66	0.65	0.39	0.51	0.51	0.50	0.43	0.51	0.56	0.45	5.18
64:	0.48	0.49	0.47	0.48	0.59	0.58	0.49	0.46	0.48	0.43	4.96
65:	0.62	0.61	0.48	0.54	0.48	0.45	0.60	0.60	0.60	0.53	5.51
66:	0.54	0.53	0.38	0.55	0.55	0.56	0.55	0.60	0.52	0.44	5.23
67:	0.38	0.31	0.35	0.35	0.32	0.25	0.25	0.25	0.29	0.25	3.01
68:	0.21	0.19	0.20	0.25	0.24	0.22	0.15	0.13	0.14	0.14	1.87
69:	0.14	0.14	0.11	0.12	0.18	0.13	0.15	0.15	0.15	0.14	1.39
70:	0.14	0.13	0.15	0.16	0.17	0.13	0.09	0.11	0.16	0.17	1.42
71:	0.11	0.09	0.09	0.10	0.11	0.12	0.12	0.15	0.13	0.15	1.18
72:	0.15	0.15	0.11	0.09	0.11	0.11	0.06	0.08	0.06	0.06	0.98
73:	0.09	0.08	0.05	0.07	0.09	0.03	0.02	0.03	0.04	0.04	0.53
74:	0.04	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.25
75:	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.13
76:	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.05
77:	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.04
78:	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.04
79:	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04
80:	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04
81:	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.04
82:	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.03
83:	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.04

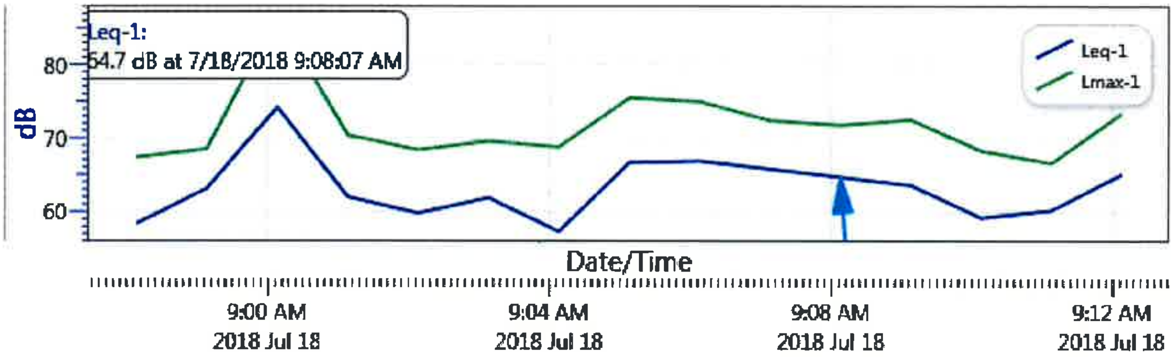
84:	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.05
85:	0.03	0.02	0.01	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.19
86:	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.00	0.00	0.00	0.09

Exceedance Table

	0%	**1%**	**2%**	**3%**	**4%**	**5%**	**6%**	**%7**	**%8**	**%9**
0%:		73.9	72.3	71.5	70.7	70.0	69.3	68.5	68.1	67.6
10%:	67.3	67.0	66.7	66.5	66.4	66.2	66.0	65.8	65.6	65.4
20%:	65.2	65.0	64.9	64.7	64.5	64.3	64.1	63.9	63.7	63.5
30%:	63.3	63.0	62.9	62.7	62.5	62.4	62.3	62.1	62.0	61.8
40%:	61.7	61.5	61.3	61.0	60.8	60.6	60.4	60.3	60.2	60.0
50%:	59.9	59.7	59.6	59.3	59.1	58.9	58.6	58.4	58.2	57.9
60%:	57.7	57.5	57.3	57.1	56.9	56.7	56.4	56.2	56.0	55.8
70%:	55.6	55.4	55.2	55.0	54.8	54.7	54.5	54.4	54.3	54.2
80%:	54.0	53.8	53.6	53.4	53.3	53.1	53.0	52.8	52.6	52.4
90%:	52.2	52.1	52.0	51.8	51.7	51.5	51.4	51.0	50.5	50.1
100%:	49.3									

Logged Data Chart

S008_BLH080004_19072018_165026: Logged Data Chart



UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part A

Date: 7/18/18 Day of Week: wednsday Time: 10:02 Project Number: 6084

Monitoring Segment / Area: 02 Monitoring Site Address: ________

Measurement Taken By: Moland of UltraSystems Environmental

Approximate Wind Speed: ____mph [km/hr] Approximate Wind Direction: From the ______

Approximate distance of sound level meter from receptor location: ________

Approximate distance of sound level meter from construction site: ________
(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential ☐ Institutional ☑ Comm./Ind. ☐ Recreational

Sound Level Meter: Make and Model: Quest SoundPro DL-1-1/3 Serial Number: BLH080004

Meter Setting: ☑ A-Weighted Sound Level (SLOW) ☐ A-Weighted Sound Level (FAST)

Measurement Start Time: 10:02 Measurement End Time: 10:05

Total Measurement Time: min 2:31 Session File Name (e.g., S012): S009

Check the measurement purpose:

☐ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results

Measurement Type	Measured Levels (dB)
Calibration	Pre: 114.3 Post: 114.3
$L_{eq\,(h)}$	Slow: 81.0 Fast: 80.9
L_{max}	Slow: 98.3 Fast: 100.7
L_{90}	Slow: 58.2 Fast: 66.2

SEL: 102.8 dB

Field Notes:

1. train Idling @ 50ft
2. ________
3. ________

Noise Monitor's Signature: ________ Date: 7/18/18.

UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part B

Date: 7/18/18 Day of Week: wednesday Time: 10:02 Project Number: 6084

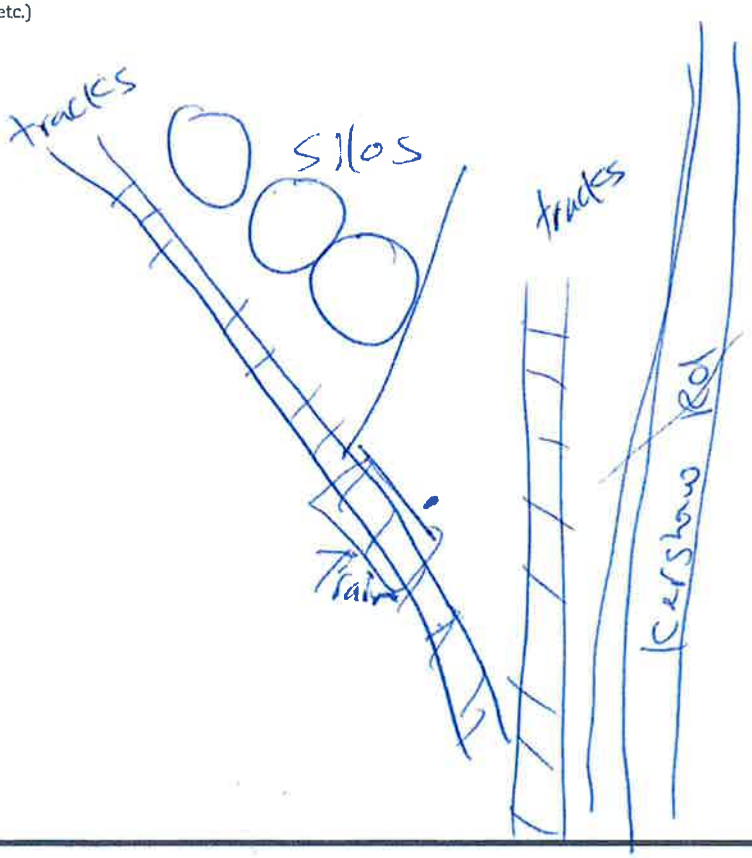
Monitoring Segment / Area: 02 Monitoring Site Address:

Site Map

Plan View

North Arrow (fill-in)

(Indicate site location, receptor location, meter location, distance in feet to landmarks, roadways, travel lane directions, geographical objects: trees, water, buildings, signs, store names, hydrants, power & telephone lines, manholes, etc.)



Elevation View

(Indicate terrain, roadway, height and location of receptor, meter, walls, barriers, buildings, etc.)

Latitude: 33.100135

Longitude: 115.50955

Elevation: -68 ft

Noise Monitor's Signature:

Date: 7/18/18

Session Report

7/20/2018

Information Panel

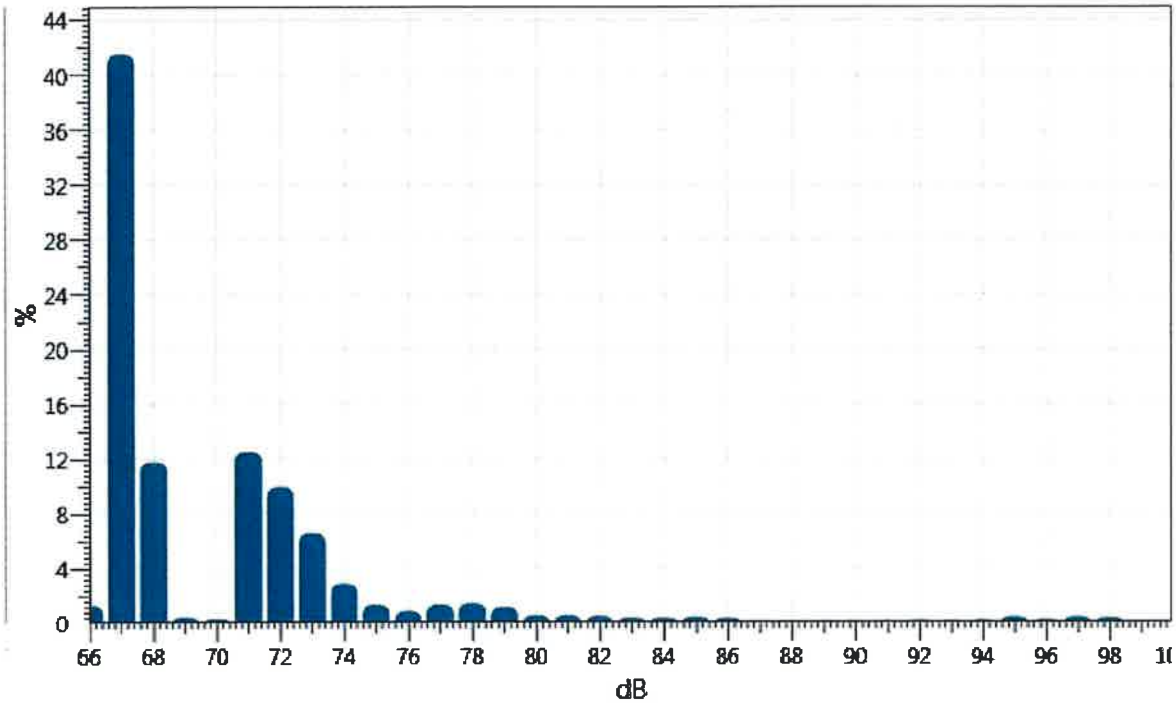
Name	S009_BLH080004_19072018_165030
Start Time	7/18/2018 10:02:32 AM
Stop Time	7/18/2018 10:05:03 AM
Device Name	BLH080004
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	80.9 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	FAST			

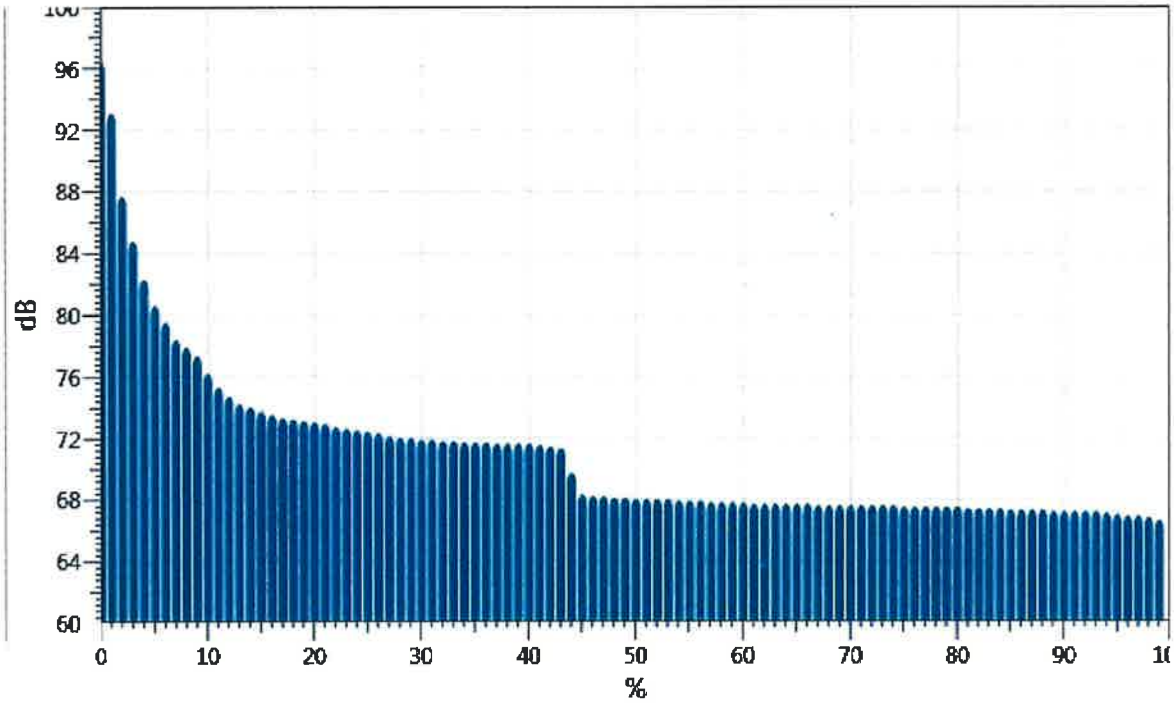
Statistics Chart

S009_BLH080004_19072018_165030: Statistics Chart



Exceedance Chart

S009_BLH080004_19072018_165030: Exceedance Chart



Statistics Table

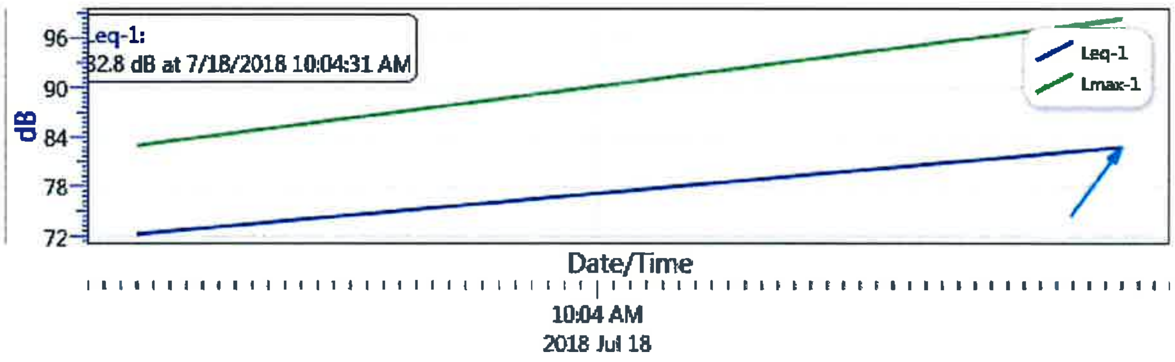
dB:	**0.0**	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**%**
66:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.57	0.67	1.31
67:	1.83	0.92	1.37	5.16	3.88	4.23	5.68	8.08	6.35	4.01	41.53
68:	2.93	3.69	2.18	2.21	0.34	0.12	0.08	0.11	0.06	0.04	11.79
69:	0.07	0.05	0.04	0.03	0.06	0.04	0.04	0.03	0.05	0.03	0.46
70:	0.04	0.02	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.31
71:	0.03	0.03	0.03	0.09	0.89	0.70	1.43	4.22	2.60	2.49	12.52
72:	1.79	1.36	1.21	0.52	1.08	0.99	0.87	0.94	0.55	0.64	9.94
73:	0.87	1.05	0.84	0.73	0.76	0.64	0.59	0.43	0.32	0.35	6.58
74:	0.42	0.37	0.49	0.41	0.26	0.25	0.19	0.16	0.17	0.18	2.89
75:	0.17	0.17	0.17	0.16	0.18	0.09	0.10	0.14	0.11	0.07	1.36
76:	0.09	0.11	0.09	0.08	0.07	0.08	0.08	0.10	0.08	0.08	0.89
77:	0.08	0.14	0.09	0.08	0.07	0.08	0.23	0.21	0.19	0.20	1.38
78:	0.33	0.31	0.23	0.09	0.08	0.08	0.08	0.09	0.08	0.07	1.46
79:	0.08	0.08	0.09	0.07	0.09	0.12	0.17	0.14	0.19	0.13	1.18
80:	0.04	0.06	0.05	0.06	0.05	0.04	0.06	0.05	0.07	0.07	0.57
81:	0.06	0.06	0.06	0.04	0.06	0.07	0.04	0.05	0.06	0.06	0.58
82:	0.03	0.06	0.07	0.04	0.06	0.04	0.05	0.05	0.06	0.05	0.53
83:	0.06	0.03	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.04	0.39
84:	0.04	0.05	0.04	0.02	0.04	0.03	0.04	0.03	0.04	0.04	0.38
85:	0.03	0.04	0.05	0.04	0.04	0.05	0.04	0.04	0.06	0.06	0.47
86:	0.08	0.13	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.36
87:	0.02	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.03	0.18
88:	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.03	0.01	0.02	0.17
89:	0.01	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.17
90:	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.19
91:	0.01	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.18
92:	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.22
93:	0.03	0.01	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.21
94:	0.02	0.02	0.01	0.03	0.01	0.03	0.01	0.01	0.03	0.05	0.23
95:	0.04	0.04	0.04	0.05	0.04	0.04	0.06	0.03	0.05	0.07	0.48
96:	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.01	0.03	0.02	0.25
97:	0.03	0.02	0.03	0.02	0.03	0.05	0.08	0.06	0.08	0.07	0.49
98:	0.10	0.06	0.09	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.40

Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		96.4	93.1	87.7	84.8	82.3	80.6	79.5	78.4	77.9
10%:	77.3	76.2	75.3	74.7	74.2	74.0	73.7	73.5	73.3	73.2
20%:	73.1	73.0	72.9	72.7	72.6	72.5	72.4	72.3	72.1	72.0
30%:	72.0	71.9	71.9	71.8	71.8	71.7	71.7	71.7	71.6	71.6
40%:	71.6	71.6	71.5	71.4	71.3	69.7	68.3	68.2	68.2	68.1
50%:	68.1	68.0	68.0	68.0	68.0	67.9	67.9	67.9	67.8	67.8
60%:	67.8	67.8	67.7	67.7	67.7	67.7	67.7	67.7	67.6	67.6
70%:	67.6	67.6	67.6	67.6	67.6	67.6	67.5	67.5	67.5	67.5
80%:	67.5	67.5	67.4	67.4	67.4	67.4	67.3	67.3	67.3	67.3
90%:	67.2	67.2	67.2	67.2	67.2	67.1	67.0	66.9	66.9	66.8
100%:	66.6									

Logged Data Chart

S009_BLH080004_19072018_165030: Logged Data Chart



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Noise Measurement Report Form – Part A

Date: 7/18/18 Day of Week: wednsday Time: 10:04 Project Number: 6084

Monitoring Segment / Area: 02 Monitoring Site Address: ______

Measurement Taken By: Mohamad of UltraSystems Environmental

Approximate Wind Speed: 5.6 mph [km/hr] Approximate Wind Direction: From the ______

Approximate distance of sound level meter from receptor location: ______

Approximate distance of sound level meter from construction site: ______
(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential ☐ Institutional ☑ Comm./Ind. ☐ Recreational

Sound Level Meter: Make and Model: Quest SoundPro DL-1-1/3 Serial Number: BLH080004

Meter Setting: ☑ A-Weighted Sound Level (SLOW) ☐ A-Weighted Sound Level (FAST)

Measurement Start Time: 10:04 Measurement End Time: 10:06

Total Measurement Time: 2:29 Session File Name (e.g., S012): S0[illegible]0

Check the measurement purpose:

☑ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results

Measurement Type	Measured Levels (dB)	
Calibration	Pre: 114.3	Post: 114.3
Leq (h)	Slow: 77.4	Fast: 77.4
Lmax	Slow: 86.1	Fast: 91.4
L90	Slow: 54.6	Fast: 54.5

Field Notes:

1. train moving @ 50 ft
2. ______
3. ______

Noise Monitor's Signature: ______ Date: 7/18/18

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Noise Measurement Report Form – Part B

Date: 7/18/18 Day of Week: wednsday Time: 10:04 Project Number: 6084

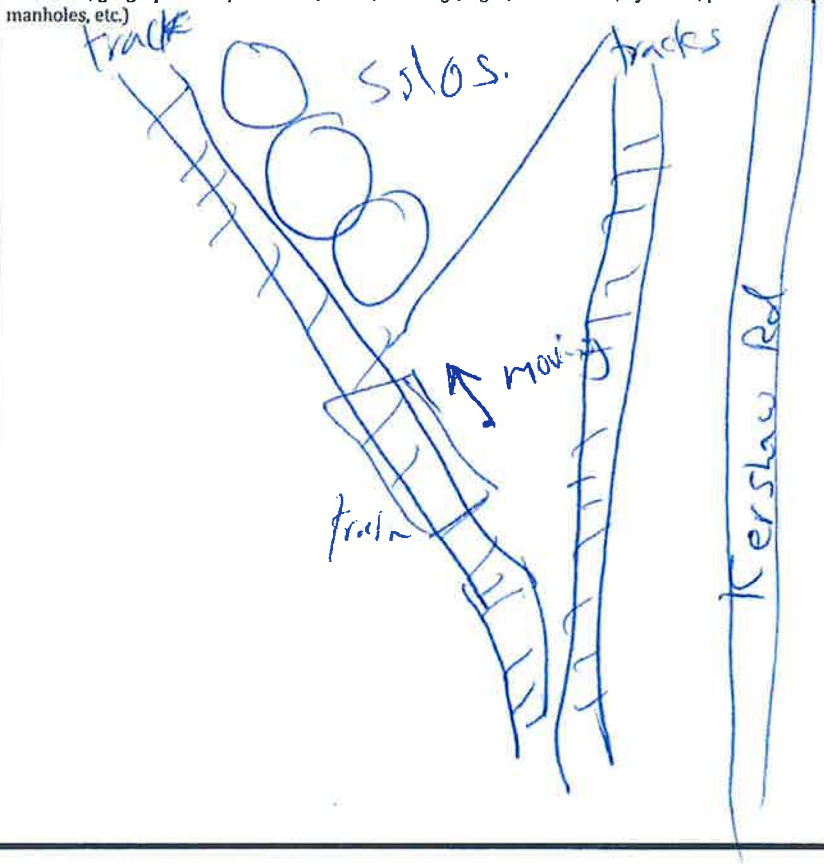
Monitoring Segment / Area: 02 Monitoring Site Address:

Site Map

Plan View

North Arrow (fill-in)

(Indicate site location, receptor location, meter location, distance in feet to landmarks, roadways, travel lane directions, geographical objects: trees, water, buildings, signs, store names, hydrants, power & telephone lines, manholes, etc.)



Elevation View

(Indicate terrain, roadway, height and location of receptor, meter, walls, barriers, buildings, etc.)

Latitude: 33.110133

Longitude: 115.50955

Elevation: -68ft

Noise Monitor's Signature: Mohamed

Date: 7/18/18

Session Report

7/20/2018

Information Panel

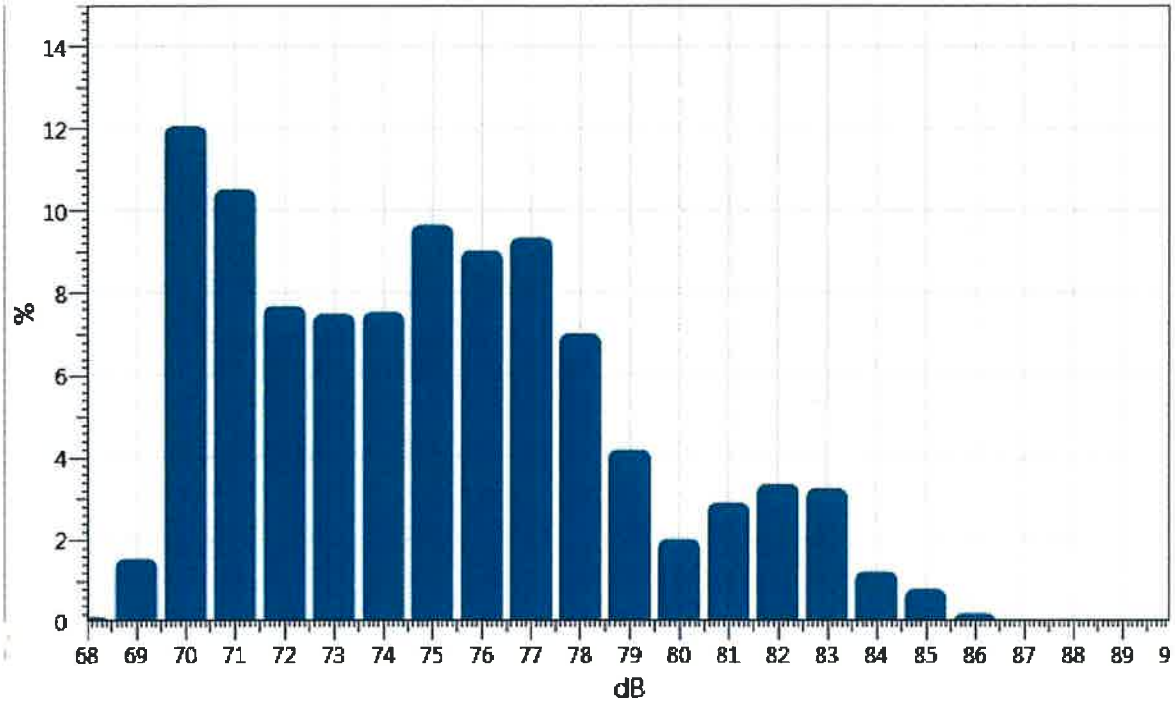
Name	S010_BLH080004_19072018_165034
Start Time	7/18/2018 10:05:09 AM
Stop Time	7/18/2018 10:07:38 AM
Device Name	BLH080004
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	77.4 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	FAST			

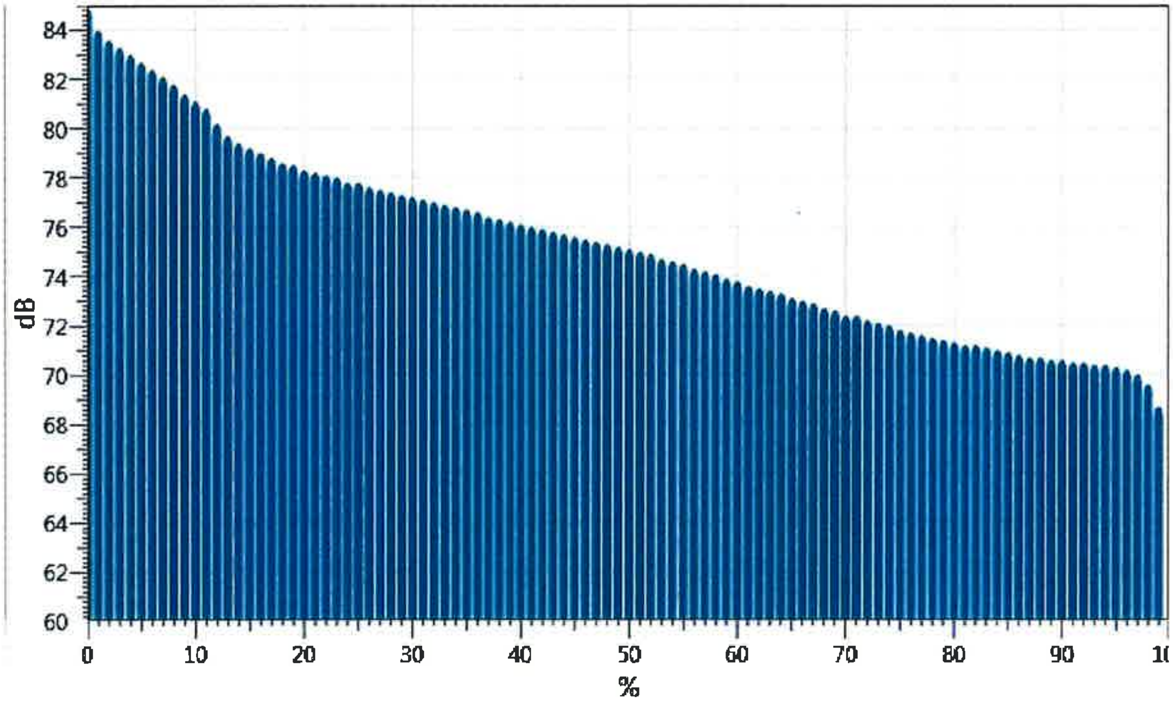
Statistics Chart

S010_BLH080004_19072018_165034: Statistics Chart



Exceedance Chart

S010_BLH080004_19072018_165034: Exceedance Chart



Statistics Table

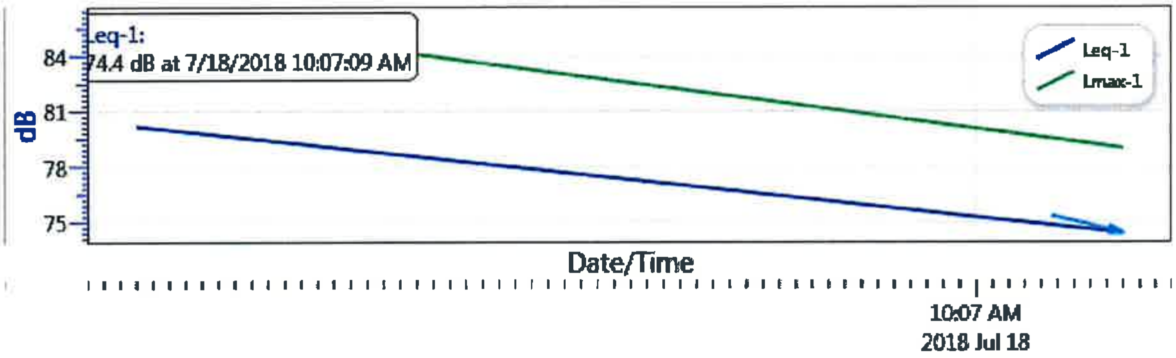
dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
68:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.13
69:	0.07	0.09	0.09	0.06	0.08	0.13	0.21	0.23	0.26	0.30	1.54
70:	0.30	0.41	0.39	0.73	1.28	1.75	1.99	2.40	1.48	1.33	12.07
71:	1.10	0.96	1.06	1.27	1.50	1.30	0.86	0.92	0.89	0.66	10.53
72:	0.72	0.88	0.84	0.49	0.78	1.05	0.79	0.66	0.77	0.71	7.69
73:	0.95	0.66	0.61	0.70	0.77	0.90	0.78	0.68	0.67	0.78	7.50
74:	0.70	0.64	0.74	0.74	0.77	0.67	0.70	0.78	0.91	0.88	7.54
75:	0.84	0.93	1.09	0.69	0.95	1.11	1.18	1.12	0.85	0.88	9.66
76:	0.80	0.85	0.79	0.95	1.09	0.89	0.85	1.01	0.98	0.83	9.03
77:	0.79	1.05	1.10	0.79	1.08	1.00	0.79	0.78	0.87	1.12	9.35
78:	0.90	0.89	0.78	0.57	1.01	0.79	0.65	0.51	0.48	0.44	7.02
79:	0.66	0.62	0.41	0.44	0.55	0.46	0.25	0.29	0.30	0.21	4.19
80:	0.20	0.17	0.27	0.27	0.19	0.08	0.12	0.20	0.25	0.26	2.01
81:	0.23	0.33	0.34	0.34	0.39	0.27	0.22	0.24	0.24	0.31	2.90
82:	0.25	0.28	0.31	0.35	0.34	0.47	0.47	0.35	0.26	0.27	3.36
83:	0.25	0.27	0.35	0.28	0.38	0.36	0.45	0.27	0.39	0.25	3.25
84:	0.20	0.17	0.21	0.08	0.18	0.15	0.05	0.06	0.06	0.06	1.23
85:	0.06	0.08	0.06	0.07	0.08	0.07	0.09	0.13	0.05	0.08	0.80
86:	0.12	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21

Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		84.9	84.0	83.6	83.3	83.0	82.7	82.4	82.1	81.8
10%:	81.4	81.1	80.8	80.2	79.7	79.4	79.2	79.0	78.8	78.6
20%:	78.5	78.3	78.2	78.1	78.0	77.8	77.8	77.6	77.5	77.4
30%:	77.3	77.2	77.1	77.0	76.9	76.8	76.7	76.6	76.4	76.3
40%:	76.2	76.1	76.0	75.9	75.8	75.7	75.6	75.5	75.4	75.3
50%:	75.2	75.1	75.0	74.9	74.7	74.6	74.5	74.3	74.2	74.1
60%:	73.9	73.8	73.6	73.5	73.4	73.3	73.1	73.0	72.9	72.7
70%:	72.6	72.4	72.4	72.2	72.1	72.0	71.8	71.7	71.6	71.5
80%:	71.4	71.3	71.2	71.2	71.1	71.0	70.9	70.8	70.7	70.7
90%:	70.6	70.6	70.5	70.5	70.4	70.4	70.3	70.2	70.0	69.6
100%:	68.7									

Logged Data Chart

S010_BLH080004_19072018_165034: Logged Data Chart



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Noise Measurement Report Form – Part A

Date: 7/18/18 Day of Week: wednesday Time: 10:30 Project Number: 6084

Monitoring Segment / Area: 03 Monitoring Site Address: ________

Measurement Taken By: Mohamed. of UltraSystems Environmental

Approximate Wind Speed: 5-7 mph [km/hr] Approximate Wind Direction: From the E-W

Approximate distance of sound level meter from receptor location: ________

Approximate distance of sound level meter from construction site: ________
(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential ☐ Institutional ☑ Comm./Ind. ☐ Recreational

Sound Level Meter: Make and Model: Quest SoundPro DL-1-1/3 Serial Number: BLH080004

Meter Setting: ☑ A-Weighted Sound Level (SLOW) ☐ A-Weighted Sound Level (FAST)

Measurement Start Time: 10:30 Measurement End Time: 10:45

Total Measurement Time: 15min Session File Name (e.g., S012): S001

Check the measurement purpose:

☑ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results

Measurement Type	Measured Levels (dB)
Calibration	Pre: 114.0 Post: 114.0
L_{eq} (h)	Slow: 63.4 Fast: 63.2
L_{max}	Slow: 78.0 Fast: 81.0
L_{90}	Slow: 48.4 Fast: 48.2

SEL 93.0 dB

Field Notes:

1. loading and unloading activities
2. machines are 100 — 300 ft
3. ________

Noise Monitor's Signature: ________ Date: 7/18/18.

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Noise Measurement Report Form – Part B

Date: 7/18/18 Day of Week: wednsday Time: 10:30 Project Number: 6084

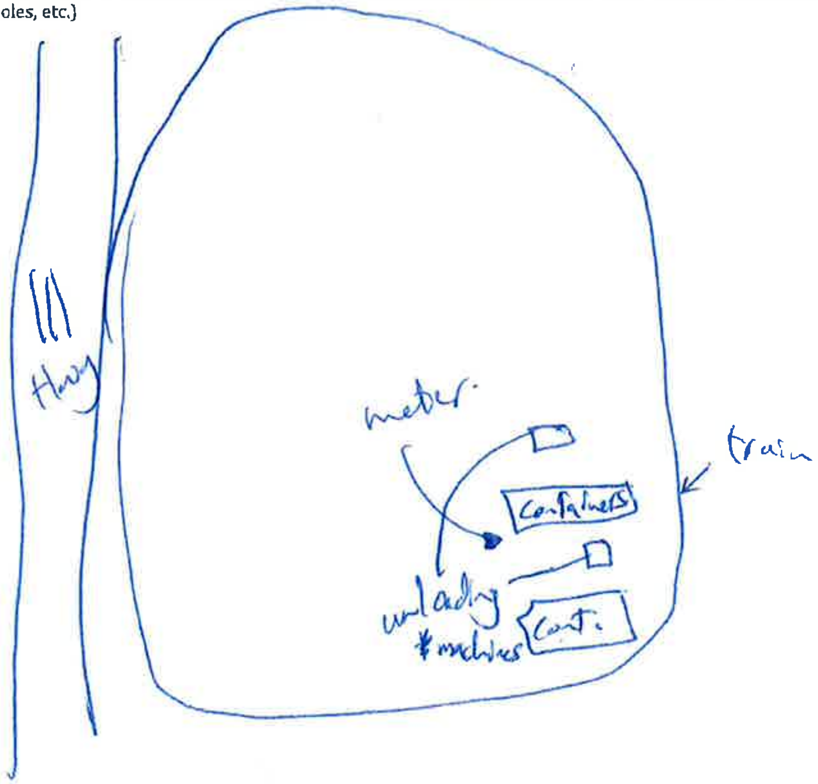
Monitoring Segment / Area: 03 Monitoring Site Address: ______

Site Map

Plan View

North Arrow (fill-in)

(Indicate site location, receptor location, meter location, distance in feet to landmarks, roadways, travel lane directions, geographical objects: trees, water, buildings, signs, store names, hydrants, power & telephone lines, manholes, etc.)



Elevation View

(Indicate terrain, roadway, height and location of receptor, meter, walls, barriers, buildings, etc.)

Latitude: 33.10580	**Longitude:** 115.51084	**Elevation:** -186

Noise Monitor's Signature: ______ Date: 7/18/18

Session Report

7/20/2018

Information Panel

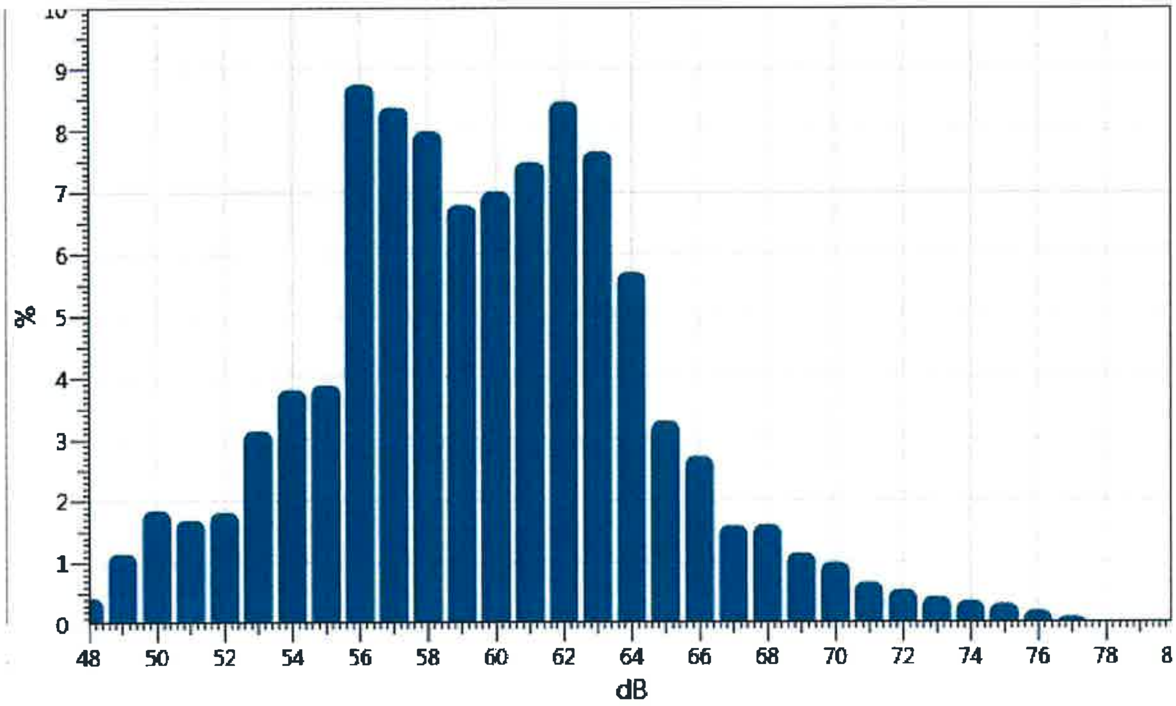
Name	S011_BLH080004_19072018_165038
Start Time	7/18/2018 10:31:27 AM
Stop Time	7/18/2018 10:46:27 AM
Device Name	BLH080004
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	63.4 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	FAST			

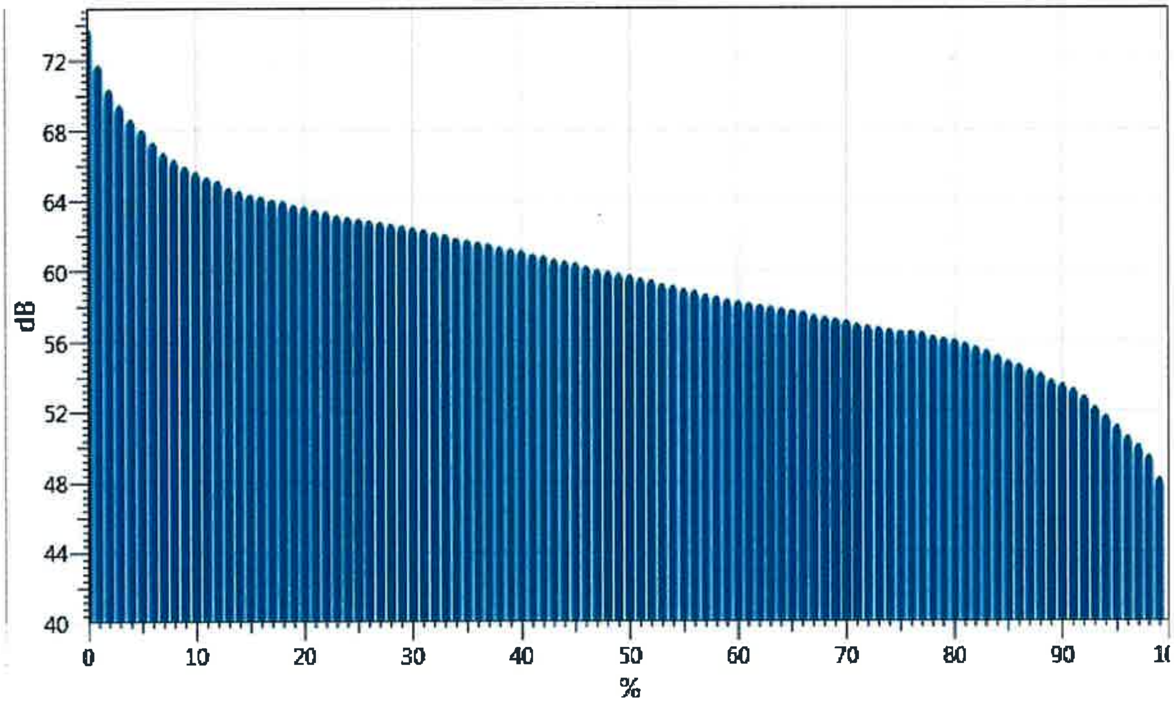
Statistics Chart

S011_BLH080004_19072018_165038: Statistics Chart



Exceedance Chart

S011_BLH080004_19072018_165038: Exceedance Chart



Statistics Table

dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
48:	0.00	0.00	0.00	0.02	0.03	0.09	0.07	0.08	0.05	0.08	0.42
49:	0.06	0.04	0.14	0.07	0.08	0.14	0.16	0.16	0.12	0.16	1.14
50:	0.15	0.18	0.18	0.13	0.18	0.29	0.19	0.19	0.21	0.14	1.84
51:	0.18	0.19	0.14	0.18	0.22	0.19	0.13	0.14	0.13	0.19	1.69
52:	0.19	0.21	0.21	0.20	0.14	0.20	0.19	0.15	0.13	0.19	1.81
53:	0.20	0.23	0.34	0.25	0.24	0.36	0.44	0.39	0.34	0.35	3.14
54:	0.29	0.30	0.25	0.41	0.46	0.46	0.42	0.36	0.41	0.46	3.80
55:	0.35	0.33	0.39	0.36	0.39	0.34	0.33	0.46	0.44	0.50	3.88
56:	0.56	0.71	0.71	0.71	0.77	0.81	1.00	1.19	1.24	1.06	8.76
57:	0.89	0.87	0.42	0.85	0.87	0.78	0.86	0.91	0.87	1.06	8.39
58:	0.97	0.95	0.92	0.90	0.83	0.65	0.77	0.65	0.68	0.66	7.99
59:	0.68	0.69	0.72	0.65	0.70	0.55	0.65	0.77	0.73	0.65	6.80
60:	0.85	0.92	0.59	0.73	0.62	0.64	0.66	0.65	0.74	0.64	7.02
61:	0.65	0.84	0.68	0.68	0.82	0.76	0.71	0.71	0.79	0.86	7.49
62:	0.91	0.77	0.63	0.68	0.74	0.81	0.89	0.95	1.04	1.05	8.48
63:	1.01	0.96	0.63	0.95	0.75	0.60	0.72	0.67	0.79	0.59	7.67
64:	0.69	0.62	0.57	0.61	0.62	0.73	0.53	0.46	0.40	0.48	5.71
65:	0.33	0.30	0.35	0.38	0.32	0.37	0.36	0.29	0.29	0.30	3.29
66:	0.32	0.41	0.30	0.28	0.25	0.27	0.24	0.22	0.22	0.20	2.72
67:	0.19	0.19	0.17	0.15	0.18	0.15	0.16	0.14	0.13	0.15	1.59
68:	0.15	0.16	0.16	0.18	0.17	0.14	0.18	0.16	0.17	0.14	1.61
69:	0.12	0.12	0.10	0.10	0.13	0.13	0.12	0.08	0.10	0.14	1.14
70:	0.15	0.10	0.11	0.13	0.09	0.09	0.09	0.09	0.08	0.07	0.99
71:	0.07	0.07	0.06	0.06	0.08	0.07	0.09	0.05	0.06	0.06	0.67
72:	0.06	0.07	0.06	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.54
73:	0.04	0.05	0.05	0.04	0.05	0.05	0.05	0.03	0.03	0.04	0.43
74:	0.03	0.03	0.05	0.04	0.05	0.03	0.03	0.03	0.03	0.03	0.36
75:	0.03	0.06	0.05	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.32
76:	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.21
77:	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.11
78:	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

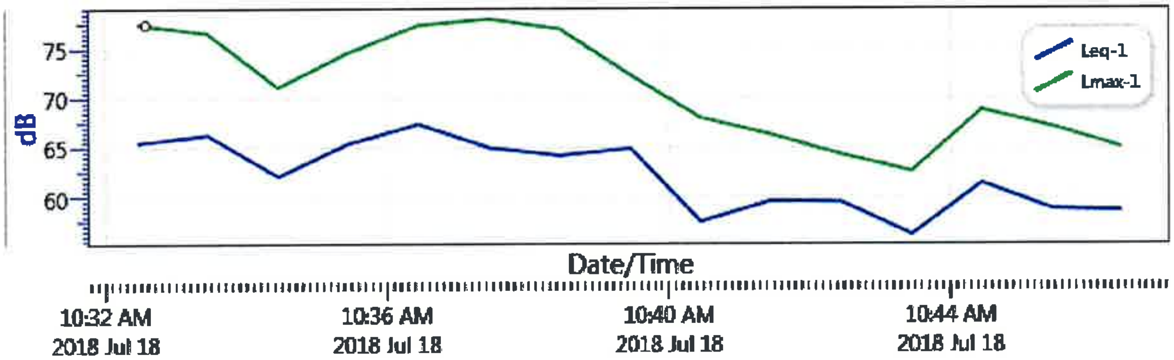
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9

0%:		73.9	71.8	70.4	69.5	68.7	68.1	67.4	66.8	66.4
10%:	66.0	65.7	65.4	65.2	64.8	64.6	64.4	64.3	64.1	64.0
20%:	63.8	63.7	63.5	63.4	63.2	63.1	63.0	62.9	62.8	62.7
30%:	62.6	62.5	62.4	62.2	62.1	61.9	61.8	61.7	61.6	61.4
40%:	61.3	61.2	61.0	60.9	60.7	60.6	60.5	60.3	60.1	60.0
50%:	59.9	59.8	59.6	59.5	59.3	59.2	59.0	58.9	58.7	58.6
60%:	58.4	58.3	58.2	58.1	58.0	57.9	57.8	57.7	57.5	57.4
70%:	57.3	57.2	57.0	56.9	56.8	56.7	56.6	56.6	56.5	56.3
80%:	56.2	56.1	55.9	55.7	55.5	55.2	54.9	54.7	54.4	54.2
90%:	53.8	53.6	53.3	52.9	52.3	51.8	51.2	50.6	50.1	49.5
100%:	48.2									

Logged Data Chart

S011_BLH080004_19072018_165038: Logged Data Chart



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Noise Measurement Report Form – Part A

Date: 7/18/18 Day of Week: Wednsday Time: 10:00 Project Number: 6084

Monitoring Segment / Area: 03 Monitoring Site Address: ________

Measurement Taken By: Mohamed of UltraSystems Environmental

Approximate Wind Speed: 5.7 mph [km/hr] Approximate Wind Direction: From the E-W

Approximate distance of sound level meter from receptor location: ________

Approximate distance of sound level meter from construction site: ________
(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential ☐ Institutional ☑ Comm./Ind. ☐ Recreational

Sound Level Meter: Make and Model: Quest SoundPro DL-1-1/3 Serial Number: BLH080004

Meter Setting: ☑ A-Weighted Sound Level (SLOW) ☐ A-Weighted Sound Level (FAST)

Measurement Start Time: 11:00 Measurement End Time: 11:06

Total Measurement Time: 6:34 Session File Name (e.g., S012): S012

Check the measurement purpose:

☐ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results

Measurement Type	Measured Levels (dB)
Calibration	Pre: 114.3 Post: 114.1
L_{eq} (h)	Slow: 65.9 Fast: 65.9
L_{max}	Slow: 79.8 Fast: 81.2
L_{90}	Slow: 47.3 Fast: 47.2

SEL : 91.9 dB.

Field Notes:

1. loading and unloading stopped.
2.
3.

Noise Monitor's Signature: ________ Date: 7/18/18

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Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part B

Date: 7/18/18 Day of Week: wednesday Time: 1100 Project Number: 6084

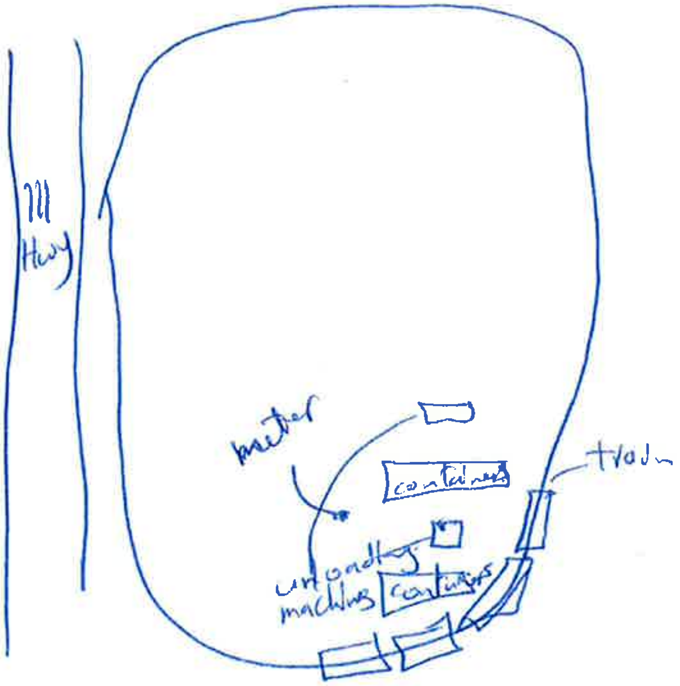
Monitoring Segment / Area: 23 Monitoring Site Address: ____

Site Map

Plan View

North Arrow (fill-in)

(Indicate site location, receptor location, meter location, distance in feet to landmarks, roadways, travel lane directions, geographical objects: trees, water, buildings, signs, store names, hydrants, power & telephone lines, manholes, etc.)



Elevation View

(Indicate terrain, roadway, height and location of receptor, meter, walls, barriers, buildings, etc.)

Latitude: 33.10580

Longitude: 115.51084.

Elevation: -186

Noise Monitor's Signature: ____ Date: 7/18/18.

Session Report

7/20/2018

Information Panel

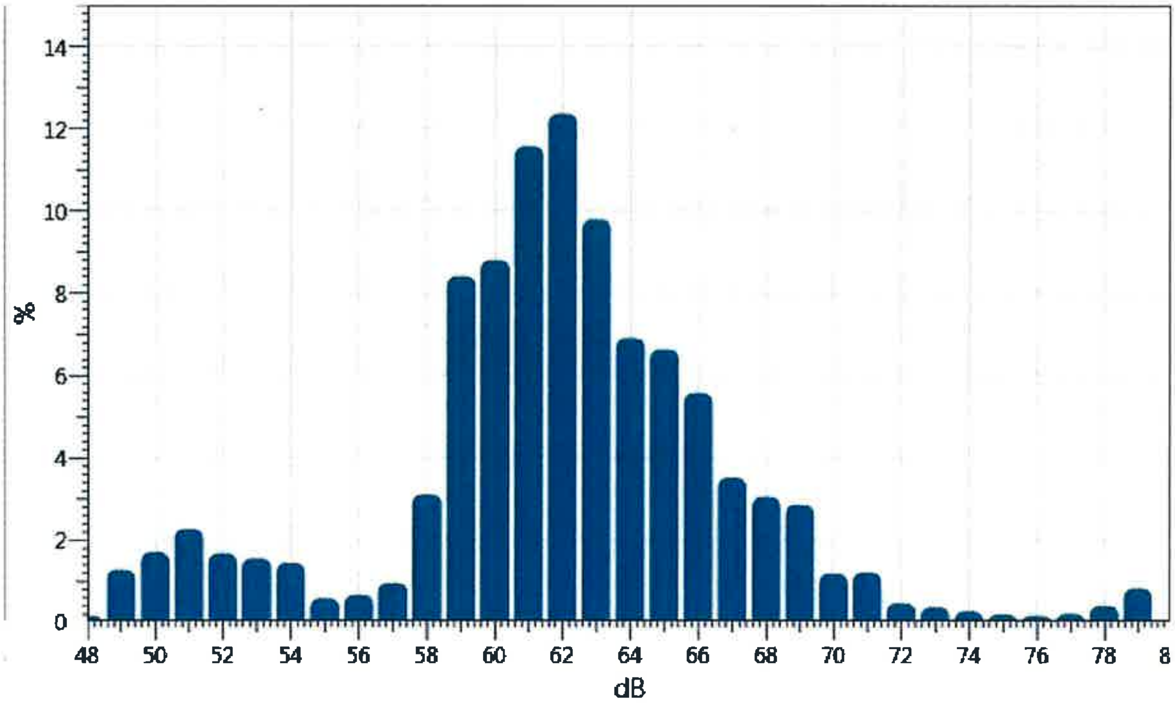
Name	S012_BLH080004_19072018_165043
Start Time	7/18/2018 11:00:23 AM
Stop Time	7/18/2018 11:06:57 AM
Device Name	BLH080004
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	65.9 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	FAST			

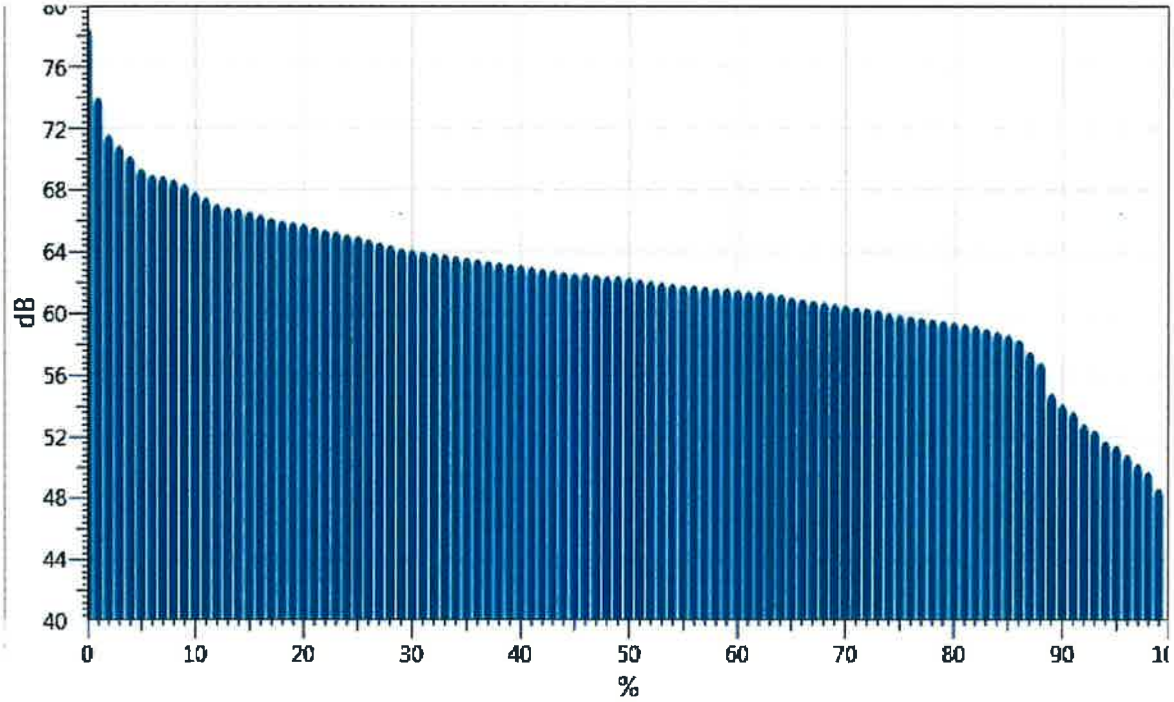
Statistics Chart

S012_BLH080004_19072018_165043: Statistics Chart



Exceedance Chart

S012_BLH080004_19072018_165043: Exceedance Chart



Statistics Table

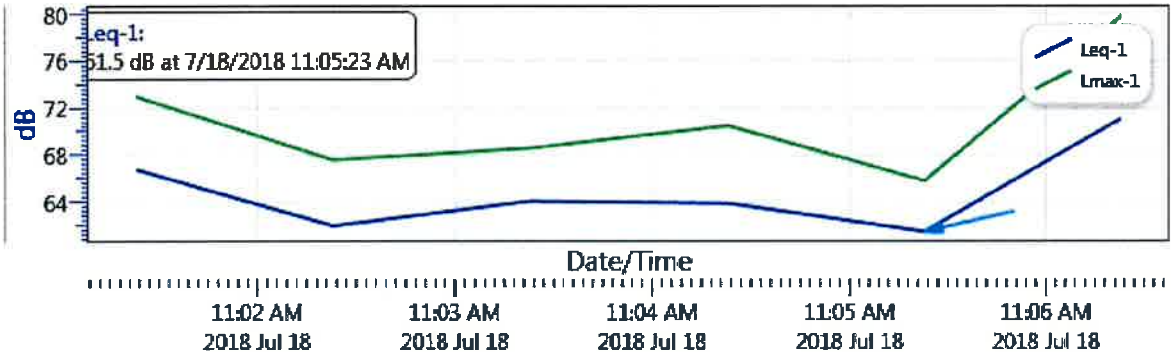
dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
48:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.06	0.15
49:	0.02	0.14	0.06	0.05	0.11	0.12	0.16	0.14	0.30	0.16	1.27
50:	0.13	0.15	0.19	0.20	0.17	0.23	0.18	0.13	0.14	0.16	1.69
51:	0.16	0.19	0.07	0.11	0.23	0.23	0.18	0.44	0.35	0.31	2.26
52:	0.16	0.09	0.08	0.12	0.11	0.17	0.16	0.43	0.26	0.10	1.67
53:	0.06	0.06	0.11	0.12	0.12	0.19	0.25	0.21	0.21	0.22	1.55
54:	0.20	0.18	0.09	0.14	0.13	0.18	0.15	0.15	0.10	0.11	1.43
55:	0.11	0.09	0.09	0.05	0.04	0.04	0.04	0.04	0.04	0.03	0.57
56:	0.03	0.05	0.04	0.03	0.03	0.03	0.03	0.04	0.09	0.30	0.65
57:	0.20	0.12	0.10	0.08	0.12	0.10	0.06	0.04	0.04	0.07	0.95
58:	0.05	0.05	0.24	0.24	0.47	0.23	0.25	0.31	0.33	0.95	3.11
59:	0.48	0.53	0.60	0.60	0.91	1.18	1.29	1.05	0.88	0.89	8.41
60:	0.90	1.02	0.37	0.70	0.75	0.77	1.04	0.99	1.15	1.12	8.80
61:	1.06	0.79	0.58	0.81	1.00	1.40	1.59	1.69	1.49	1.16	11.58
62:	1.05	1.02	1.34	1.04	1.28	1.30	1.50	1.52	1.40	0.91	12.37
63:	1.27	1.18	0.80	0.82	1.05	1.04	0.86	0.78	0.85	1.15	9.80
64:	1.00	1.10	1.13	0.73	0.57	0.42	0.51	0.48	0.48	0.50	6.91
65:	0.51	0.71	0.65	0.81	0.59	0.68	0.54	0.63	0.62	0.90	6.63
66:	0.76	0.74	0.38	0.52	0.57	0.56	0.44	0.54	0.41	0.65	5.57
67:	0.76	0.61	0.43	0.20	0.25	0.27	0.35	0.25	0.15	0.23	3.51
68:	0.24	0.18	0.14	0.20	0.23	0.25	0.42	0.42	0.39	0.56	3.04
69:	0.53	0.57	0.39	0.33	0.24	0.16	0.11	0.23	0.17	0.13	2.85
70:	0.08	0.08	0.08	0.10	0.11	0.09	0.07	0.07	0.22	0.28	1.17
71:	0.45	0.28	0.14	0.05	0.05	0.05	0.05	0.05	0.04	0.05	1.20
72:	0.06	0.08	0.06	0.03	0.05	0.04	0.04	0.04	0.04	0.04	0.46
73:	0.03	0.04	0.02	0.03	0.03	0.05	0.04	0.04	0.04	0.04	0.36
74:	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.27
75:	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.19
76:	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.16
77:	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.21
78:	0.03	0.02	0.03	0.02	0.03	0.03	0.03	0.06	0.07	0.09	0.40
79:	0.04	0.06	0.08	0.14	0.19	0.09	0.08	0.09	0.06	0.00	0.82

Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		78.6	74.0	71.6	70.9	70.2	69.4	69.0	68.9	68.7
10%:	68.4	67.9	67.5	67.1	66.9	66.8	66.6	66.4	66.2	66.0
20%:	65.9	65.8	65.6	65.4	65.3	65.1	65.0	64.8	64.6	64.4
30%:	64.2	64.1	64.0	63.9	63.8	63.7	63.6	63.5	63.4	63.3
40%:	63.2	63.1	63.0	62.9	62.8	62.7	62.6	62.6	62.5	62.4
50%:	62.4	62.3	62.2	62.1	62.0	61.9	61.8	61.8	61.7	61.6
60%:	61.6	61.5	61.4	61.4	61.3	61.2	61.0	60.9	60.8	60.7
70%:	60.6	60.5	60.4	60.3	60.2	60.0	59.9	59.8	59.7	59.6
80%:	59.5	59.4	59.3	59.2	59.0	58.8	58.6	58.3	57.5	56.8
90%:	54.8	54.1	53.6	52.8	52.4	51.7	51.4	50.8	50.2	49.7
100%:	48.6									

Logged Data Chart

S012_BLH080004_19072018_165043: Logged Data Chart



UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part A

Date: 7/18/18 Day of Week: wednesday Time: 11:22 Project Number: 6084

Monitoring Segment / Area: 04 Monitoring Site Address: ________

Measurement Taken By: Mohamed of UltraSystems Environmental

Approximate Wind Speed: ____mph [km/hr] Approximate Wind Direction: From the ________

Approximate distance of sound level meter from receptor location: ________

Approximate distance of sound level meter from construction site: ________
(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential ☐ Institutional ☑ Comm./Ind. ☐ Recreational

Sound Level Meter: Make and Model: Quest SoundPro DL-1-1/3 Serial Number: BLH080004

Meter Setting: ☑ A-Weighted Sound Level (SLOW) ☐ A-Weighted Sound Level (FAST)

Measurement Start Time: 11:22 Measurement End Time: ________

Total Measurement Time: 15 min Session File Name (e.g., S012): S013

Check the measurement purpose:

☑ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results

Measurement Type	Measured Levels (dB)	
Calibration	Pre: 114.1	Post: 114.2
Leq (h)	Slow: 69.9	Fast: 69.8
Lmax	Slow: 89.7	Fast: 96.3
L90	Slow: 54.8	Fast: 54.8

SEL : 55.4 dB

Field Notes:

1. Locomotive Idling @ 50 ft away.
2.
3.

Noise Monitor's Signature: ________ Date: 7/18/18

UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part B

Date: 7/18/18 Day of Week: wednesday Time: 11:22 Project Number: 6084

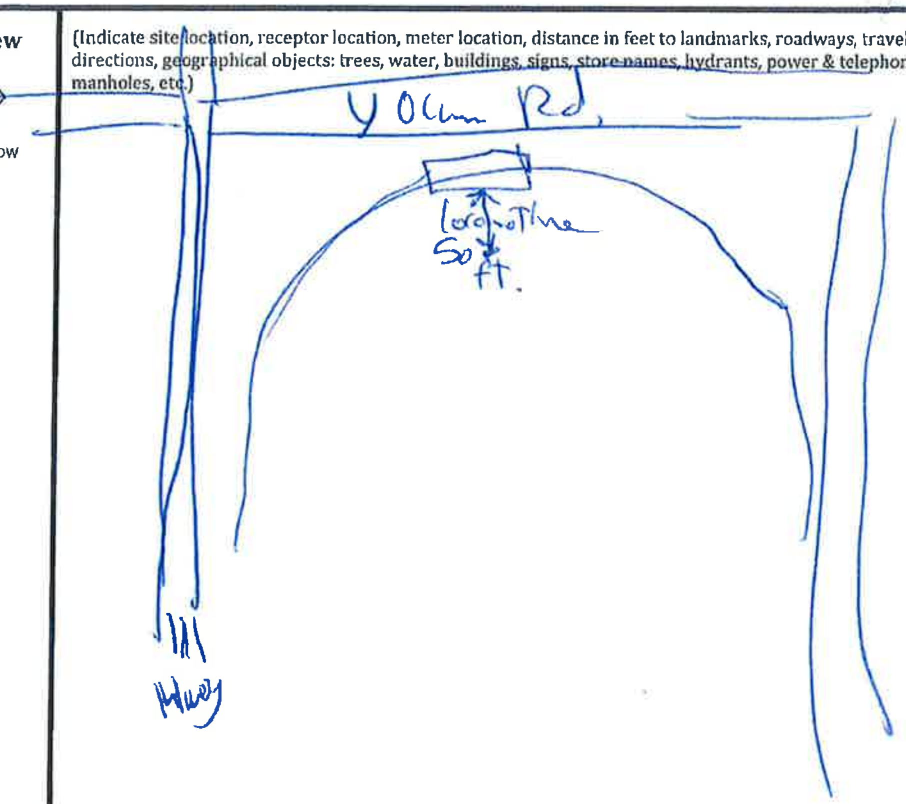
Monitoring Segment / Area: 04 Monitoring Site Address:

Site Map

Plan View

North Arrow (fill-in)

(Indicate site location, receptor location, meter location, distance in feet to landmarks, roadways, travel lane directions, geographical objects: trees, water, buildings, signs, store names, hydrants, power & telephone lines, manholes, etc.)



Elevation View

(Indicate terrain, roadway, height and location of receptor, meter, walls, barriers, buildings, etc.)

Latitude: 33.11069

Longitude: 115.51302'

Elevation: -187 ft

Noise Monitor's Signature: Mohamed

Date: 7/18/18

Session Report

7/20/2018

Information Panel

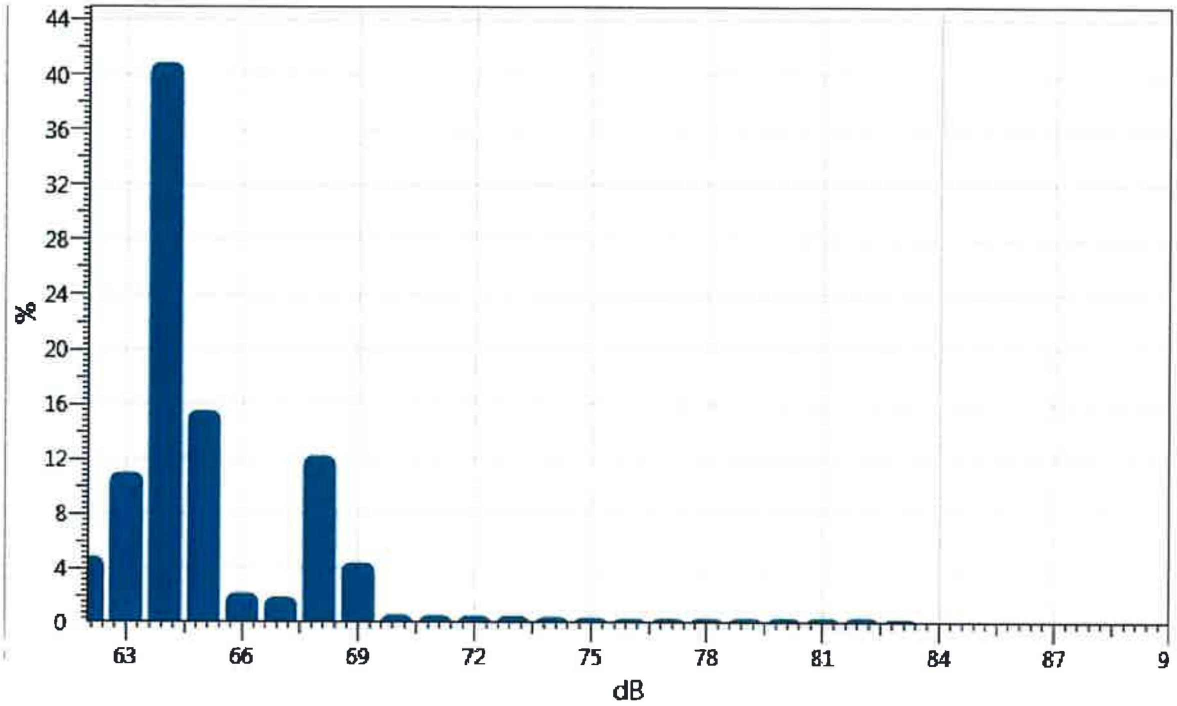
Name	S013_BLH080004_19072018_165047
Start Time	7/18/2018 11:23:03 AM
Stop Time	7/18/2018 11:38:03 AM
Device Name	BLH080004
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	69.8 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	FAST			

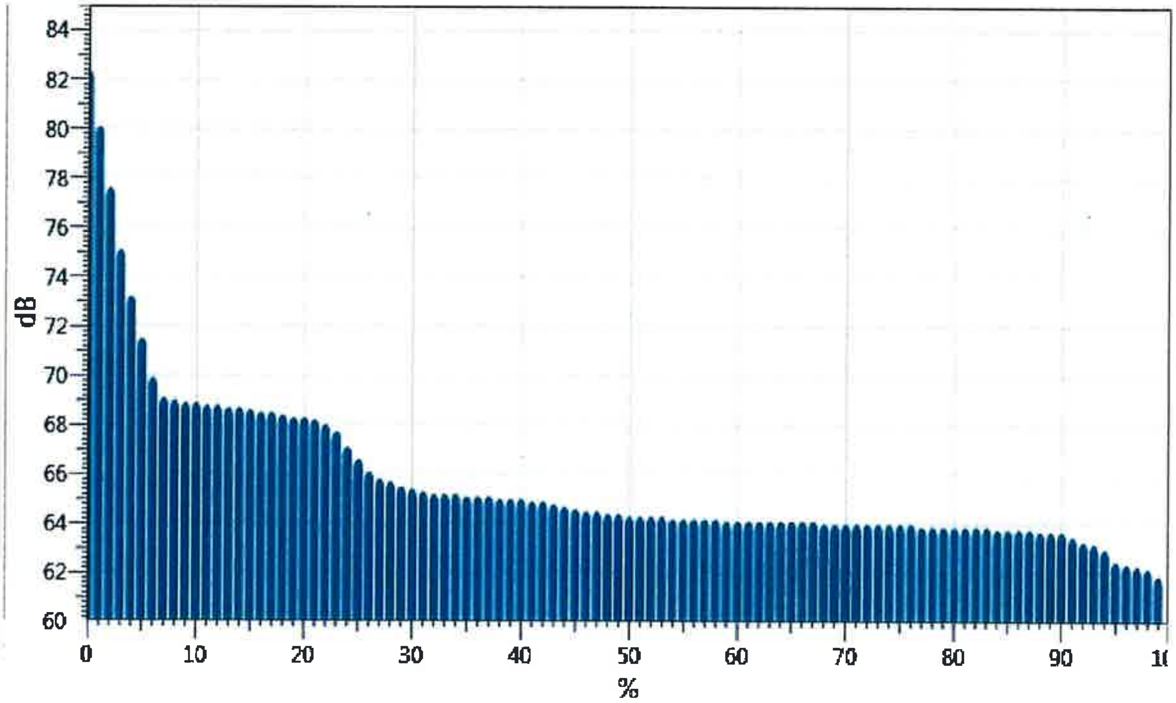
Statistics Chart

S013_BLH080004_19072018_165047: Statistics Chart



Exceedance Chart

S013_BLH080004_19072018_165047: Exceedance Chart



Statistics Table

dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
62:	0.02	0.20	0.43	0.57	0.91	1.36	0.72	0.29	0.20	0.15	4.86
63:	0.07	0.18	0.28	0.83	1.00	0.73	0.15	0.56	2.34	4.84	10.99
64:	6.52	8.76	8.96	5.80	3.33	2.16	1.83	1.35	1.23	0.93	40.86
65:	1.53	3.01	3.22	2.59	1.55	1.03	0.74	0.38	0.68	0.78	15.49
66:	0.44	0.29	0.19	0.17	0.21	0.16	0.19	0.15	0.20	0.19	2.21
67:	0.19	0.19	0.22	0.15	0.18	0.22	0.23	0.14	0.15	0.22	1.89
68:	0.40	0.55	0.74	0.82	1.20	1.53	1.64	1.69	1.99	1.64	12.21
69:	1.99	1.19	0.37	0.34	0.16	0.10	0.07	0.07	0.07	0.09	4.43
70:	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.64
71:	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.62
72:	0.07	0.06	0.06	0.04	0.06	0.05	0.06	0.06	0.05	0.06	0.58
73:	0.05	0.06	0.05	0.06	0.06	0.04	0.06	0.06	0.05	0.07	0.57
74:	0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.50
75:	0.05	0.05	0.06	0.03	0.04	0.05	0.06	0.03	0.04	0.03	0.45
76:	0.03	0.04	0.03	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.38
77:	0.04	0.04	0.04	0.04	0.05	0.04	0.03	0.04	0.03	0.04	0.39
78:	0.04	0.04	0.04	0.03	0.03	0.04	0.05	0.04	0.04	0.04	0.40
79:	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.41
80:	0.05	0.04	0.05	0.06	0.03	0.04	0.04	0.03	0.04	0.05	0.43
81:	0.04	0.05	0.05	0.03	0.04	0.04	0.04	0.05	0.04	0.04	0.43
82:	0.06	0.05	0.06	0.05	0.03	0.04	0.04	0.05	0.06	0.04	0.46
83:	0.04	0.05	0.02	0.03	0.02	0.03	0.03	0.04	0.03	0.03	0.33
84:	0.02	0.03	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.16
85:	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
86:	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
87:	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.06
88:	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
89:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03

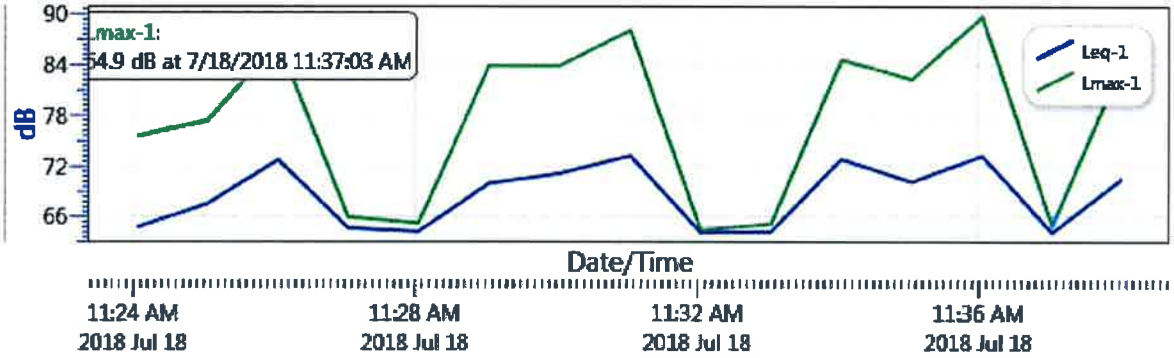
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		82.4	80.1	77.6	75.1	73.2	71.5	69.9	69.1	69.0
10%:	68.9	68.9	68.8	68.8	68.7	68.7	68.6	68.5	68.5	68.4
20%:	68.3	68.3	68.2	68.0	67.7	67.1	66.6	66.1	65.8	65.7

30%:	65.5	65.4	65.3	65.2	65.2	65.2	65.1	65.1	65.1	65.0
40%:	65.0	65.0	64.9	64.9	64.8	64.7	64.6	64.5	64.5	64.4
50%:	64.4	64.3	64.3	64.3	64.3	64.2	64.2	64.2	64.2	64.2
60%:	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.0
70%:	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	63.9	63.9
80%:	63.9	63.9	63.9	63.9	63.9	63.8	63.8	63.8	63.8	63.7
90%:	63.7	63.7	63.5	63.3	63.2	63.0	62.5	62.4	62.3	62.2
100%:	61.9									

Logged Data Chart

S013_BLH080004_19072018_165047: Logged Data Chart



UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part A

Date: 7/18/18 Day of Week: wednsday Time: 12:18 Project Number: 6084.

Monitoring Segment / Area: OS-moving Monitoring Site Address: ______

Measurement Taken By: ______ of UltraSystems Environmental

Approximate Wind Speed: ____mph [km/hr] Approximate Wind Direction: From the ______

Approximate distance of sound level meter from receptor location: ______

Approximate distance of sound level meter from construction site: ______
(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential ☐ Institutional ☐ Comm./Ind. ☐ Recreational

Sound Level Meter: Make and Model: Quest SoundPro DL-1-1/3 Serial Number: BLH080004

Meter Setting: ☐ A-Weighted Sound Level (SLOW) ☐ A-Weighted Sound Level (FAST)

Measurement Start Time: 12:18. Measurement End Time: 12:24

Total Measurement Time: 6:44 min Session File Name (e.g., S012): S013

Check the measurement purpose:

☐ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results

Measurement Type	Measured Levels (dB)	
Calibration	Pre: 114.2	Post: 114.1
L_{eq} (h)	Slow: 78.9	Fast: 787
L_{max}	Slow: 96.5	Fast: 99.8
L_{90}	Slow: 60.4	Fast: 60.4

SEL 105.0

Field Notes:

1. train moving. 6:44 min ~ 5 min
2.
3.

Noise Monitor's Signature: Mohamed Date: 7/18/18

UltraSystems

16431 Scientific Way
Irvine, CA 92618
949.788.4900

Noise Measurement Report Form – Part B

Date: 7/18/18 Day of Week: wednsday Time: 12:18 Project Number: 6084.

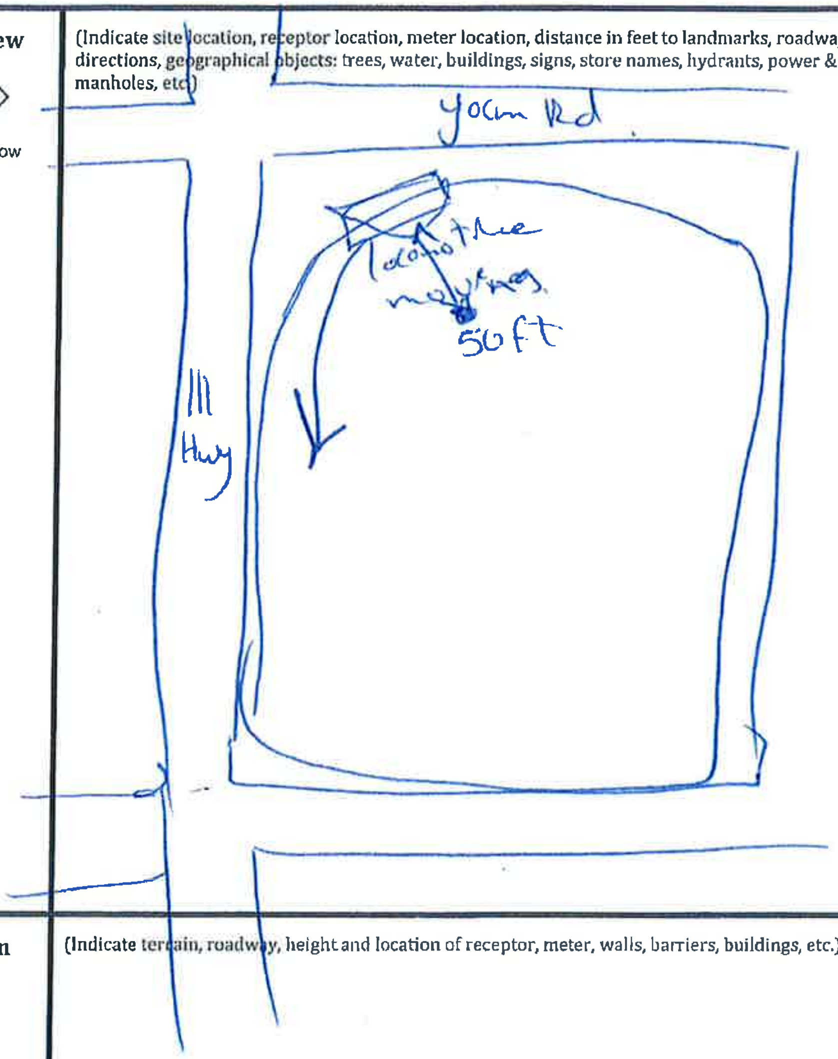
Monitoring Segment / Area: 05 Monitoring Site Address: ____________

Site Map

Plan View

North Arrow (fill-in)

(Indicate site location, receptor location, meter location, distance in feet to landmarks, roadways, travel lane directions, geographical objects: trees, water, buildings, signs, store names, hydrants, power & telephone lines, manholes, etc.)



Elevation View

(Indicate terrain, roadway, height and location of receptor, meter, walls, barriers, buildings, etc.)

Latitude:	**Longitude:**	**Elevation:**

Noise Monitor's Signature: Mohamed Date: 7/18/18

Session Report

7/20/2018

Information Panel

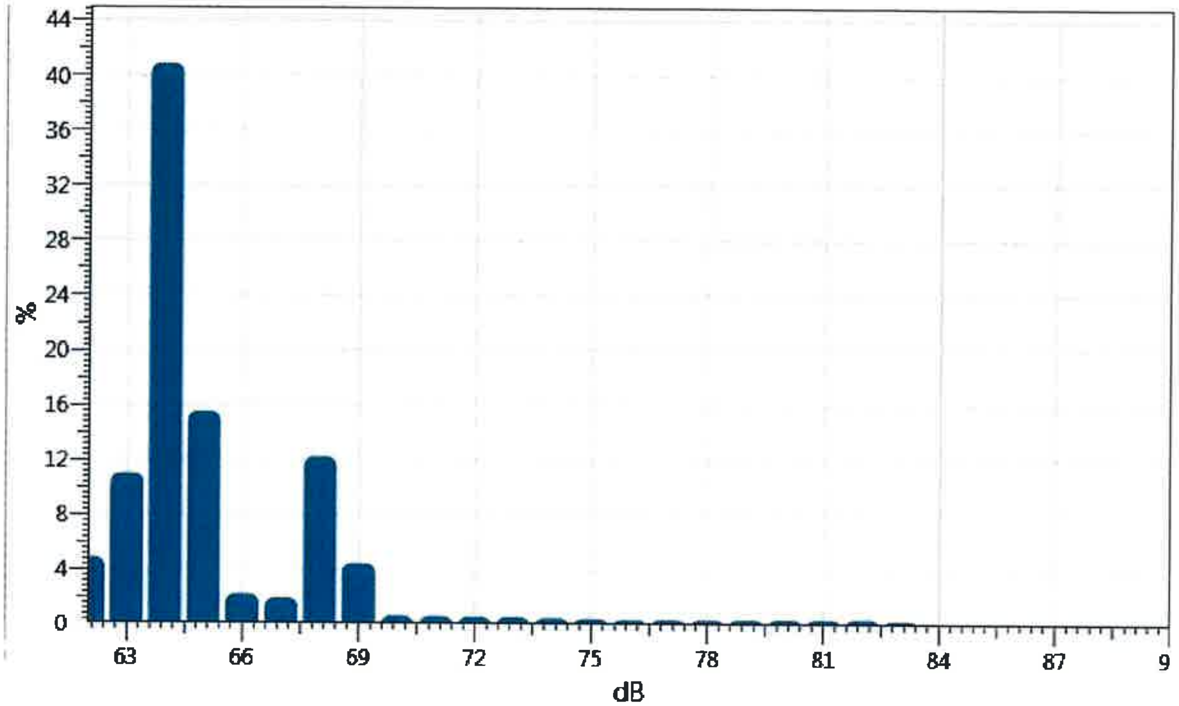
Name	S013_BLH080004_19072018_165047
Start Time	7/18/2018 11:23:03 AM
Stop Time	7/18/2018 11:38:03 AM
Device Name	BLH080004
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	69.8 dB			
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	FAST			

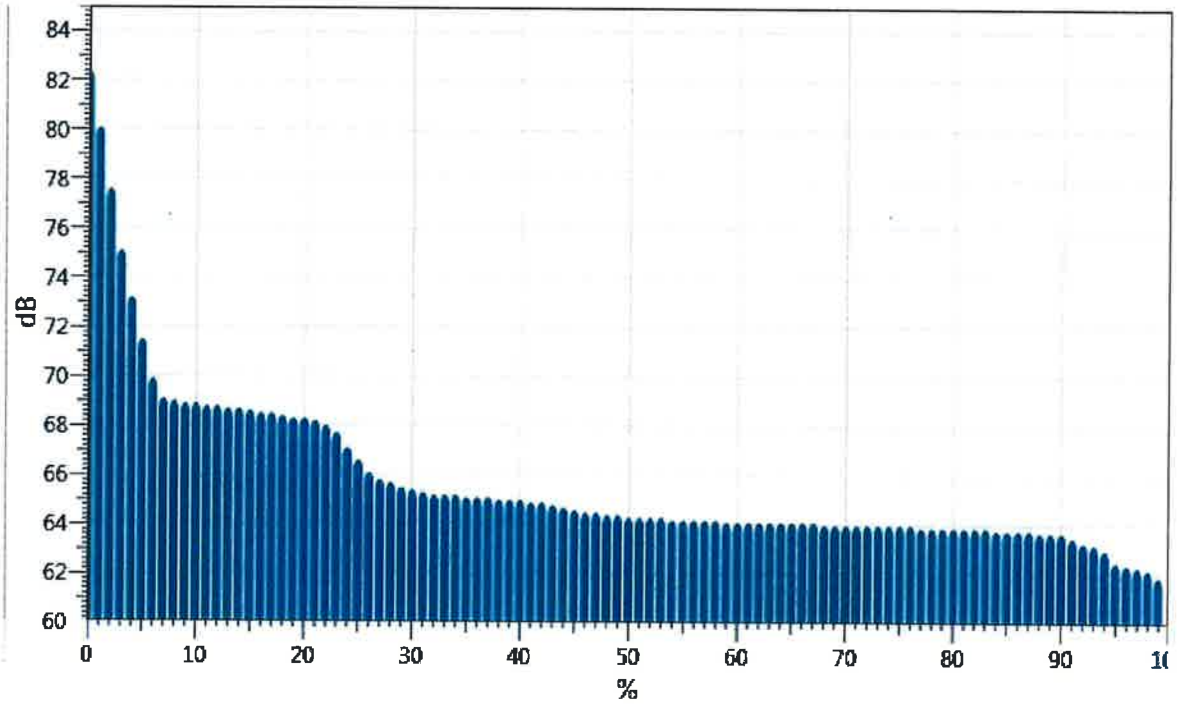
Statistics Chart

S013_BLH080004_19072018_165047: Statistics Chart



Exceedance Chart

S013_BLH080004_19072018_165047: Exceedance Chart



Statistics Table

dB:	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
62:	0.02	0.20	0.43	0.57	0.91	1.36	0.72	0.29	0.20	0.15	4.86
63:	0.07	0.18	0.28	0.83	1.00	0.73	0.15	0.56	2.34	4.84	10.99
64:	6.52	8.76	8.96	5.80	3.33	2.16	1.83	1.35	1.23	0.93	40.86
65:	1.53	3.01	3.22	2.59	1.55	1.03	0.74	0.38	0.68	0.78	15.49
66:	0.44	0.29	0.19	0.17	0.21	0.16	0.19	0.15	0.20	0.19	2.21
67:	0.19	0.19	0.22	0.15	0.18	0.22	0.23	0.14	0.15	0.22	1.89
68:	0.40	0.55	0.74	0.82	1.20	1.53	1.64	1.69	1.99	1.64	12.21
69:	1.99	1.19	0.37	0.34	0.16	0.10	0.07	0.07	0.07	0.09	4.43
70:	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.64
71:	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.62
72:	0.07	0.06	0.06	0.04	0.06	0.05	0.06	0.06	0.05	0.06	0.58
73:	0.05	0.06	0.05	0.06	0.06	0.04	0.06	0.06	0.05	0.07	0.57
74:	0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.50
75:	0.05	0.05	0.06	0.03	0.04	0.05	0.06	0.03	0.04	0.03	0.45
76:	0.03	0.04	0.03	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.38
77:	0.04	0.04	0.04	0.04	0.05	0.04	0.03	0.04	0.03	0.04	0.39
78:	0.04	0.04	0.04	0.03	0.03	0.04	0.05	0.04	0.04	0.04	0.40
79:	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.41
80:	0.05	0.04	0.05	0.06	0.03	0.04	0.04	0.03	0.04	0.05	0.43
81:	0.04	0.05	0.05	0.03	0.04	0.04	0.04	0.05	0.04	0.04	0.43
82:	0.06	0.05	0.06	0.05	0.03	0.04	0.04	0.05	0.06	0.04	0.46
83:	0.04	0.05	0.02	0.03	0.02	0.03	0.03	0.04	0.03	0.03	0.33
84:	0.02	0.03	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.16
85:	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
86:	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09
87:	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.06
88:	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
89:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03

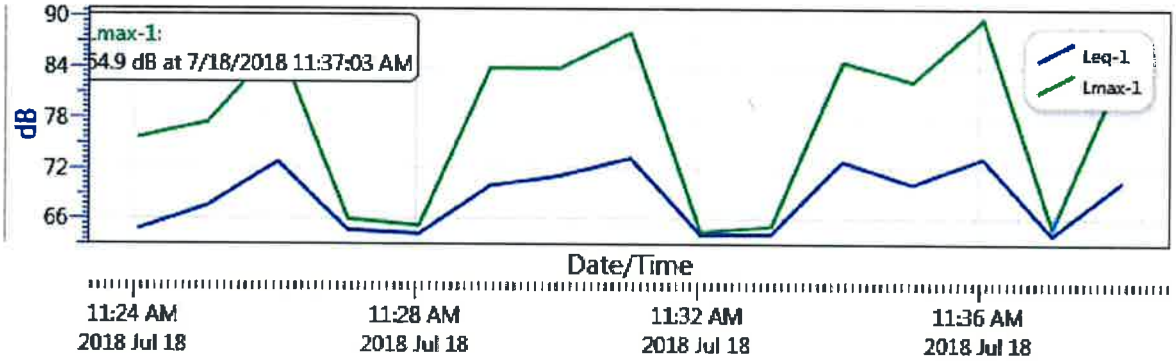
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	%7	%8	%9
0%:		82.4	80.1	77.6	75.1	73.2	71.5	69.9	69.1	69.0
10%:	68.9	68.9	68.8	68.8	68.7	68.7	68.6	68.5	68.5	68.4
20%:	68.3	68.3	68.2	68.0	67.7	67.1	66.6	66.1	65.8	65.7

30%:	65.5	65.4	65.3	65.2	65.2	65.2	65.1	65.1	65.1	65.0
40%:	65.0	65.0	64.9	64.9	64.8	64.7	64.6	64.5	64.5	64.4
50%:	64.4	64.3	64.3	64.3	64.3	64.2	64.2	64.2	64.2	64.2
60%:	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.1	64.0
70%:	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	63.9	63.9
80%:	63.9	63.9	63.9	63.9	63.9	63.8	63.8	63.8	63.8	63.7
90%:	63.7	63.7	63.5	63.3	63.2	63.0	62.5	62.4	62.3	62.2
100%:	61.9									

Logged Data Chart

S013_BLH080004_19072018_165047: Logged Data Chart



UltraSystems
environmental • management • planning

MEMO

TO: Matthew Harmon

FROM: Michael Rogozen

COPY TO: Tom DuBose

DATE: Thursday, January 31, 2019

CONTRACT #: UltraSystems Project No. 6084

RE: Air Quality and Greenhouse Gas Emission Analysis of Bridge and New Onsite Railroad Track at All American Grain

---

1.0 INTRODUCTION

On November 20, 2018, UltraSystems submitted to you a report, Air Quality and Greenhouse Gas Emissions Study for All American Grain Container Storage and Transfer Facility, for a proposed facility near Calipatria, California. After the report was submitted, two new elements were proposed for the project:

- A new rail spur, to be built inside the existing one.
- A bridge over both rail spurs to allow access to the interior of the facility from surrounding roadways when one or both of the rail spurs is occupied by a train.

This memorandum is a supplement to the aforementioned air quality and greenhouse gas (GHG) emissions study. It covers only the proposed rail spur and bridge although, where necessary, information from the previous report has been included.

2.0 PROJECT DESCRIPTION

Attachment 1 shows the revised new site plan, including the proposed inner rail spur and two alternative locations for the new bridge.

2.1 Inner Rail Spur

The new rail spur will be approximately 8,100 feet long, within a 15-foot right-of-way. It will roughly parallel the existing spur, with a minimum separation distance of 30 feet. Trains will enter from the existing spur from the Southern Pacific Railroad main line (on the east side of the project site), travel briefly on the outer spur, and then enter the inner spur. The new spur will be used primarily for unit trains that ship agricultural products to the Port of Long Beach.

Track construction will precede construction of the bridge and will take four to five months. The construction starting date is estimated to be September 2019.

The addition of the rail spur will not result in an increase in the activity levels of trucks and trains over what was described in the November 2018 report.

2.1 Bridge

The overpass portion of the bridge will be 90 feet long and 30 feet wide. The remainder of the bridge structure (on either side of the overpass) will total 1000 feet long and be 40 to 45 feet wide. The maximum height of the bridge roadway surface will be 35 feet above the ground. The maximum number of trucks crossing the bridge per day will be 10.

3.0 EMISSION CALCULATION METHODS

3.1 Rail Spur

The Rail Line construction did not fit the common CalEEMod Model,[1] so emissions were estimated using methods and formulas included in the CalEEMod Guidelines to address the unique aspects of railway construction. Although railway construction appears very straightforward, it requires more advanced technology and uses more sophisticated equipment. A new line consists of two tracks: the permanent one and a temporary track that is used to supply material for the former. Unique equipment, including a track laying machine, track lifting machine, tamping machine, ballast grader, and dynamic track stabilizers, is used. Details of calculations are provided in **Attachment 2**. Two rail spur construction phases were assumed: (1) site preparation and grading and (2) rail line construction.

3.2 Bridge

Emissions from the overpass/bridge construction activity were estimated using the latest version of the Sacramento Metropolitan Air Quality Management District's Roadway Construction Emissions Model.[2] The Roadway Model is recommended for linear construction projects such as new roadway, road widening, roadway overpass, levee, or pipelines. Model defaults for the Bridge/Overpass Construction project type were used, except for the addition of hauling of asphalt from Salton City.

4.0 EMISSIONS ESTIMATES

4.1 Rail Spur

4.1.1 Construction Emissions

Table 1 and **Table 2** summarize the criteria pollutant and greenhouse gas emissions estimates, respectively, by construction phase, for the new rail spur.

---

[1] California Emissions Estimator Model®, Version 2016.3.2. California Air Pollution Control Officers Association. November 2017.

[2] Roadway Construction Emissions Model. Sacramento Metropolitan Air Quality Management District. May 2018.

Table 1
RAIL SPUR CONSTRUCTION EMISSIONS OF CRITERIA POLLUTANTS

Activity	Location	Maximum Daily Emissions (lb/day)				
		ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Grading & Site Preparation	Offroad	0.9	6.6	9.1	0.5	0.5
	Onroad	0.022	0.683	0.09	0.001	0.018
	Total	**0.92**	**7.28**	**9.19**	**0.50**	**0.52**
Rail Line Construction	Offroad	3.4	20.0	41.1	1.6	1.5
	Onroad	1.52	6.58	21.71	1.03	0.44
	Total	**4.92**	**26.58**	**62.81**	**2.63**	**1.94**
ICAPCD Significance Threshold		**75**	**550**	**100**	**150**	**N/A**

These rail spur construction emissions are generally lower than the *mitigated* construction emissions estimated for the first three phases of the project in the November 2018 report. They are also below the ICAPCD's significance thresholds for all the pollutants. Therefore, they are less than significant.

Table 2
RAIL SPUR CONSTRUCTION EMISSIONS OF GREENHOUSE GASES

Activity	Location	GHG Emissions (tonnes)			
		CO_2	CH_4	N_2O	CO_2e
Grading & Site Preparation	Offroad	8.6	0.003	N/A	8.7
	Onroad	1.15	0.0001	0.0001	1.19
	Total	**9.75**	**0.003**	**0.0001**	**9.89**
Rail Line Construction	Offroad	174.5	0.056		176.0
	Onroad	111.61	0.0552	0.0511	128.25
	Total	**286.11**	**0.1112**	**0.0511**	**304.25**
Project GHG Emissions		**296**	**0.11**	**0.051**	**314**

4.1.2 Operational Emissions

4.1.2.1 Criteria Pollutant Emissions

The new rail spur will not increase the amount of truck or rail traffic associated with the site. Therefore, there is no change in the significance of criteria pollutant emissions.

4.1.2.2 Greenhouse Gas Emissions

As discussed in the November 2018 report, total construction GHG emissions are amortized over 30 years and added to operational GHG emissions. Operational GHG emissions would not change. The amortized GHG emissions from the rail spur construction are **10.5 tonnes per year**.

4.2 Bridge

4.2.1 Construction Emissions

Table 3 and **Table 4** summarize the criteria pollutant and greenhouse gas emissions estimates, respectively, by construction phase, for the bridge.

Table 3
BRIDGE CONSTRUCTION EMISSIONS OF CRITERIA POLLUTANTS

Activity	Maximum Daily Emissions (lb/day)[a]				
	ROG	CO	NO$_x$	PM$_{10}$	PM$_{2.5}$
Grubbing/Land Clearing	0.66	12.99	1.84	20.10	4.24
Grading/Excavation	6.05	86.39	32.79	21.54	5.52
Drainage/Utilities/Subgrade	3.95	59.38	15.51	20.92	5.01
Paving	1.14	14.84	18.99	0.85	0.57
Maximum	**6.05**	**86.39**	**32.79**	**21.54**	**5.52**
ICAPCD Significance Threshold	**75**	**550**	**100**	**150**	**N/A**

[a] Sum of emissions from offroad construction and onroad worker commuting and material hauling.

Daily emissions are below the ICAPCD's significance thresholds for all the pollutants. Therefore, they are less than significant.

Table 4
BRIDGE CONSTRUCTION EMISSIONS OF GREENHOUSE GASES

Activity	GHG Emissions (tonnes)			
	CO$_2$	CH$_4$	N$_2$O	CO$_2$e
Grubbing/Land Clearing	5.87	0.0020	0.00013	5.94
Grading/Excavation	256.41	0.077	0.0030	259.25
Drainage/Utilities/Subgrade	173.97	0.045	0.0021	175.73
Paving	140.90	0.0094	0.017	146.30
Project GHG Emissions	**577.15**	**0.13**	**0.022**	**587**

[a] Sum of emissions from offroad construction and onroad worker commuting and material hauling.

4.2.2 Operational Emissions

4.2.2.1 Criteria Pollutant Emissions

The new bridge will not increase the amount of truck or rail traffic associated with the site. Therefore, there is no change in the significance of criteria pollutant emissions.

4.2.2.2 Greenhouse Gas Emissions

As discussed in the November 2018 report, total construction GHG emissions are amortized over 30 years and added to operational GHG emissions. Operational GHG emissions would not change. The amortized GHG emissions from the bridge construction are **19.6 tonnes per year**.

5.0 DISCUSSION

Because the rail spur and the bridge would be built in separate phases, which will not overlap any other phases of project construction, their criteria pollutant emissions are not cumulative. Therefore, criteria pollutant emissions would be less than significant throughout construction and for the life of the project.

On the other hand, GHG emissions are cumulative, given their long lives in the atmosphere. The November 20, 2018 report estimated annual GHG emissions of 1,338 tonnes (including annualized emissions from construction). The rail spur and bridge additions to the project would contribute annualized emissions of 10.5 and 19.6 tonnes per year, respectively. Cumulative emissions would therefore be **1,368 tonnes per year**.

Total annual GHG emissions would remain below an interim threshold that the South Coast Air Quality Management District (SCAQMD) has recommended for various type of development projects.[3] The SCAQMD proposes that if a residential or commercial project generates GHG emissions below 3,000 tonnes CO_2e annually, it could be concluded that the Project's GHG contribution is not "cumulatively considerable" and is therefore less than significant under CEQA. The project's GHG contribution would be determined to be not "cumulatively considerable" and therefore would be less than significant under CEQA.

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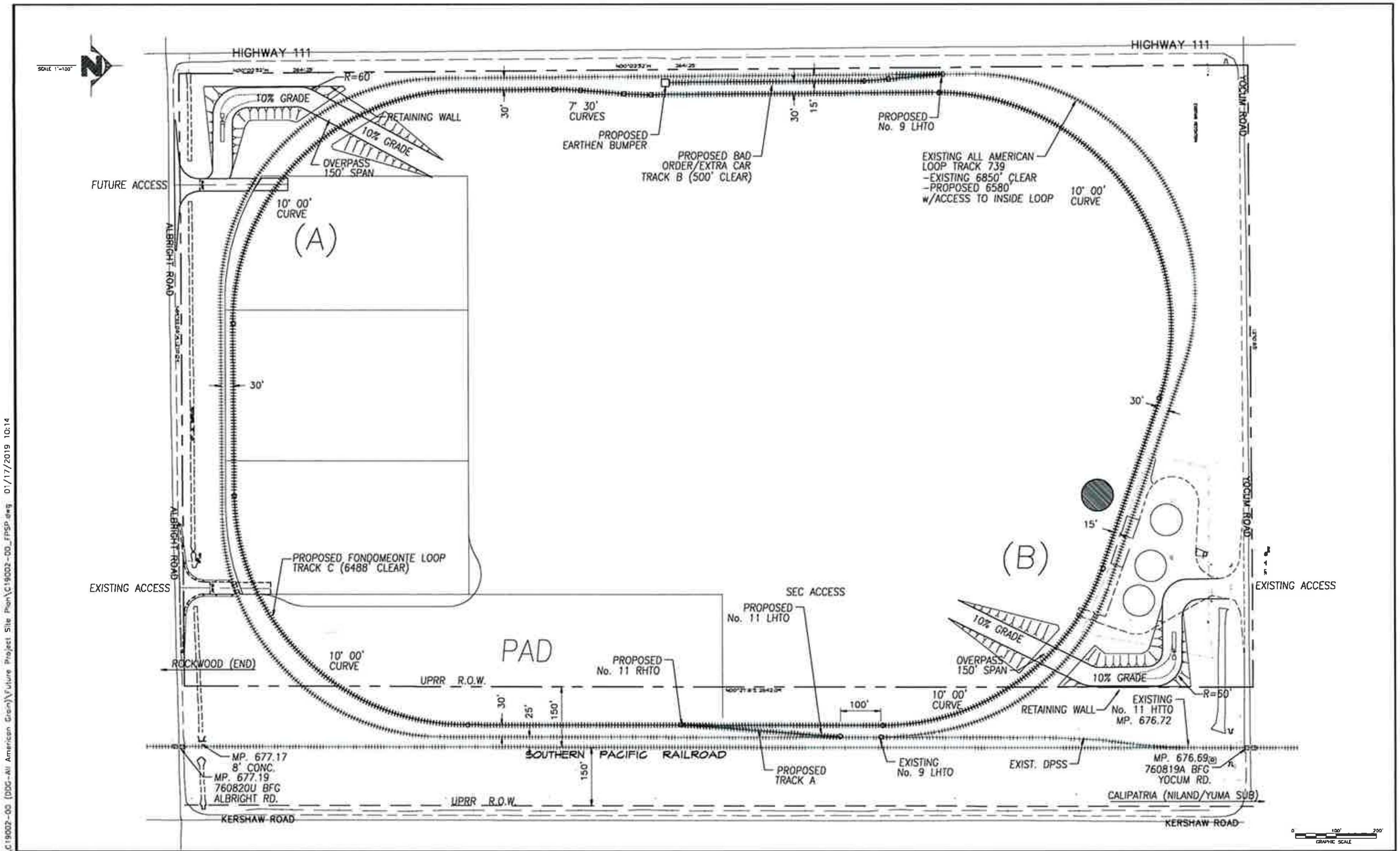
[3] Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans. South Coast Air Quality Management District Board. Adopted December 5, 2008.



UNDERGROUND SERVICE ALERT
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TWO WORKING DAYS
BEFORE YOU DIG

No.	REVISIONS	BY	DATE

SEAL

ENGINEER OF RECORD
PLANS PREPARED UNDER THE SUPERVISION OF
BY: CARLOS CORRALES DATE:
R.C.E. NO.: 55432

SEAL
CARLOS CORRALES
No. 55432

LC ENGINEERING CONSULTANTS INC.
1065 State Street
El Centro CA 92243

DATE 1/15/19
BENCHMARK: -

SITE PLAN

FUTURE PROJECT SITE PLAN
FONDOMONTE/ALL AMERICAN GRAIN
CONTAINER YARD & SPUR LOADING
IMPERIAL COUNTY

FONDOMONTE/ALL AMERICAN GRAIN
W.O.

SHEET 2 OF 2 SHEETS
JOB NO. C19002-00

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ATTACHMENT 2
EMISSION CALCULATION DETAILS

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> AAG - Overpass Const Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.66	12.99	1.84	20.10	0.10	20.00	4.24	0.08	4.16	0.02	2,132.94	0.58	0.05	2,161.19
Grading/Excavation	6.05	86.39	32.79	21.54	1.54	20.00	5.52	1.36	4.16	0.16	15,540.00	4.69	0.18	15,711.89
Drainage/Utilities/Sub-Grade	3.95	59.38	15.51	20.92	0.92	20.00	5.01	0.85	4.16	0.11	10,543.54	2.74	0.13	10,650.43
Paving	1.14	14.84	18.99	0.85	0.85	0.00	0.57	0.57	0.00	0.08	8,539.64	0.57	1.05	8,866.48
Maximum (pounds/day)	6.05	86.39	32.79	21.54	1.54	20.00	5.52	1.36	4.16	0.16	15,540.00	4.69	1.05	15,711.89
Total (tons/construction project)	0.19	2.69	1.12	0.77	0.05	0.72	0.19	0.05	0.15	0.01	577.15	0.13	0.02	587.22

Notes Project Start Year -> 2020
Project Length (months) -> 5
Total Project Area (acres) -> 6
Maximum Area Disturbed/Day (acres) -> 2
Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	210	40
Grading/Excavation	0	0	0	0	1,176	40
Drainage/Utilities/Sub-Grade	0	0	0	0	756	40
Paving	0	593	0	1,602	336	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> AAG - Overpass Const Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.00	0.04	0.01	0.06	0.00	0.06	0.01	0.00	0.01	0.00	5.87	0.00	0.00	5.39
Grading/Excavation	0.10	1.43	0.54	0.36	0.03	0.33	0.09	0.02	0.07	0.00	256.41	0.08	0.00	235.19
Drainage/Utilities/Sub-Grade	0.07	0.98	0.26	0.35	0.02	0.33	0.08	0.01	0.07	0.00	173.97	0.05	0.00	159.42
Paving	0.02	0.24	0.31	0.01	0.01	0.00	0.01	0.01	0.00	0.00	140.90	0.01	0.02	132.72
Maximum (tons/phase)	0.10	1.43	0.54	0.36	0.03	0.33	0.09	0.02	0.07	0.00	256.41	0.08	0.02	235.19
Total (tons/construction project)	0.19	2.69	1.12	0.77	0.05	0.72	0.19	0.05	0.15	0.01	577.15	0.13	0.02	532.72

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Rail Line Construction Employee Commute

Construction Employee Vehicle Activity

Activity	Total Work Days	Trips per day	Round Trip (mi)	VMT per day	Total VMT (mi)
Grading & Site Preparation	22	4	43	172	3,737
Rail Line Construction	76	15	43	645	49,047
			Totals	***645***	***49,047***

Construction Employee Criteria Emissions

Activity	Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Grading & Site Preparation	0.022	0.683	0.090	0.001	0.018
Rail Line Construction	0.083	2.559	0.339	0.002	0.066
Maximum Pounds per Day	***0.08***	***2.56***	***0.34***	***0.00***	***0.07***

Construction Employee GHG Emissions

Activity	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
Grading & Site Preparation	1.15	0.0001	0.0001	1.19
Rail Line Construction	15.11	0.0015	0.0017	15.65
Totals	***15.1***	***0.001***	***0.002***	***15.7***

Rail Line Off-road Equipment Emissions

Grading & Site Preparation

Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Grader	187	0.41	22	8	1	174	0.77	4.90	7.48	0.42	0.38	6.37	0.0021	6.42
Tractors/Loaders/Backhoes	97	0.37	22	6	1	130	0.16	1.71	1.58	0.10	0.09	2.22	0.0007	2.24
Grading Totals							**0.9**	**6.6**	**9.1**	**0.5**	**0.5**	**8.6**	**0.003**	**8.7**

Rail Line Construction

Equipment Type	Equivalent Offroad Category	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
		BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Track Laying Machine [1]	skid steer loaders	247	0.37	76	6	1	456	0.65	4.31	6.73	0.36	0.33	19.79	0.0064	19.95
Track Lifting Machine[2]	crane	142	0.29	76	6	1	456	0.39	2.27	3.48	0.25	0.23	8.83	0.0029	8.90
Railroad Crane	crane	241	0.29	76	6	1	456	0.36	1.66	4.22	0.17	0.16	15.08	0.0049	15.20
Ballast Wagon[3]	off hiway tractor	561	0.44	76	4	1	304	0.39	2.44	3.73	0.14	0.13	35.42	0.0115	35.71
Tamping machine	off hiway truck	758	0.38	76	4	1	304	0.77	3.48	12.18	0.32	0.29	41.17	0.0133	41.50
Ballast grader	grader	295	0.41	76	4	1	304	0.38	1.43	4.99	0.16	0.15	17.49	0.0057	17.63
Dynamic track stabilizers	other const	475	0.42	76	4	1	304	0.39	2.87	4.64	0.17	0.15	28.84	0.0093	29.07
Railroad excavator	excavator	121	0.38	76	6	1	456	0.11	1.50	1.11	0.05	0.05	7.93	0.0026	7.99
Construction Totals								**3.4**	**20.0**	**41.1**	**1.6**	**1.5**	**174.5**	**0.056**	**176.0**
Rail Line Criteria Maximum Daily / GHG Totals								**3.4**	**20.0**	**41.1**	**1.6**	**1.5**	**183.1**	**0.059**	**184.6**

[1] *Machine is towed by front-end loader*

[2] *Powered by Caterpillar C4.4 diesel engine*

[3] *Towed by small diesel locomotive*

Note: *For rail line construction equipment, bhp obtained from manufacturers' websites, emission & load fcators were from most appropriate CalEEMod OFFROAD equipment type for calendar year 2020.*

Hauling Truck Activity

Hauling Truck Activity

Project Phase	**Days per Phase**	**Trips/day**	**Round Trip (mi)**	**VMT per day**	**Total VMT (mi)**
Ballast for Rail Line Construction	76	26	45	1,170	89,000
				Ballast Truck Totals	***89,000***

Trip mileage for ballast is based on product from Hiway 111 & Frink Rd (44.5 miles 1-way)

Hauling Truck Criteria Emissions

Project Phase	**Pounds per Day**				
	ROG	**CO**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Ballast for Rail Line Construction	1.444	4.020	21.369	1.025	0.367
Max Daily	***1.44***	***4.02***	***21.37***	***1.03***	***0.37***

Hauling Truck GHG Emissions

Project Phase	**Total Tonnes**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Ballast for Rail Line Construction	96.54	0.05373	0.04943	112.61
Totals	***96.5***	***0.0537***	***0.0494***	***112.6***

Emissions Summary for Overpass/Bridge

Category	**Criteria Emissions (lbs/d)**					**GHG Emissions (MT)**			
	ROG	**CO**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Grubbing/Land Clearing	0.66	12.99	1.84	20.10	4.24	5.39	0.00	0.00	5.87
Grading/Excavation	6.05	86.39	32.79	21.54	5.52	235.19	0.08	0.00	256.41
Drainage/Utilities/Sub-Grade	3.95	59.38	15.51	20.92	5.01	159.42	0.05	0.00	173.97
Paving	1.06	14.05	13.28	0.64	0.48	79.32	0.01	0.01	84.75
Critera Max Daily/GHG Total	***6.1***	***86.4***	***32.8***	***21.5***	***5.5***	***479.3***	***0.14***	***0.01***	***521.0***

Data from Road Construction Model, Version 9.0.0

2020 Offroad Emission Factors

Equipment Type	BHP	Load Factor	Emission Factor (g/bhp-hr)						
			ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Excavator	158	0.38	0.231	3.086	2.278	0.110	0.102	472.3	0.153
Grader	187	0.41	0.567	3.621	5.530	0.309	0.284	478.0	0.155
Tractors/Loaders/Backhoes	97	0.37	0.331	3.601	3.326	0.210	0.193	475.2	0.154
Track Laying Machine	247	0.37	0.537	3.562	5.570	0.298	0.274	474.6	0.153
Track Lifting Machine	142	0.29	0.723	4.171	6.381	0.453	0.417	469.9	0.152
Railroad Crane	241	0.38	0.384	1.790	4.563	0.188	0.173	472.9	0.153
Ballast Wagon	561	0.44	0.181	1.122	1.715	0.063	0.058	471.8	0.153
Tamping machine	758	0.39	0.303	1.372	4.794	0.125	0.115	469.9	0.152
Ballast grader	295	0.41	0.352	1.342	4.678	0.150	0.138	475.3	0.154
Dynamic track stabilizers	475	0.42	0.224	1.634	2.637	0.096	0.088	475.2	0.154
Railroad excavator	121	0.38	0.231	3.086	2.278	0.110	0.102	472.3	0.153

From: CalEEMod Users Guide - Appendix D (October 2017)

Equipment List & Number of Workers for Rail Line

Construction Activity

Grading & Site Preparation	**Off-road Equipment**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Preparation of site	Grader	1	2	2.5	1.5	4
	Excavator	1				
Constructing Rail Line	**Off-road Equipment**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Laying of temporary track (rails & ties) used to transport the equipment; using temporary track to discharge the rails and ties for the main track onto the formation; laying of ties and rails on permanent track; laying ballast, tamping, and dynamic stabalization to complete rail leveling; final finishing with ballast grading.	Track Laying Machine	1	8	10	5	15
	Track Lifting Machine	1				
	Railroad Crane	1				
	Ballast Wagon	1				
	Tamping machine	1				
	Ballast grader	1				
	Dynamic track stabilizers	1				
	Railroad excavator	1				

Data Asssumptions

Bridge / Overpass		
90	feet	overpass
1,000		rest of bridge
1,200	tons	asphalt
315		concrete
1,090	feet	Total distance
0.21	mi	
800	feet	area disturbed
300		
240,000	ft^2	
5.51	acres	
20.7	mi	1-way asphalt
44.5	mi	1-way concrete & ballast

Rail Line		
8,100	feet	length of inner rail line
1.53	miles	
15	feet	width of rail area
121,500	ft^2	area of project
2.79	acres	
24,000	cy	base material
1	mo	grading & site prep
21.7	wd	
3.5	mo	rail construction
76.0	wd	
2,000	total trucks	
26	trucks per day	

ON-SITE IMPROVEMENT PLANS FOR
ALL AMERICAN GRAIN - PHASE 1
CONTAINER YARD AND SPUR LOADING IMPROVEMENTS
PORTION OF SECTION 22, T.12 S., R.14 E., S.B.M.

GRADING PLAN GENERAL NOTES:

1. APPROVAL OF THIS GRADING PLAN DOES NOT CONSTITUTE APPROVAL OF VERTICAL OR HORIZONTAL ALIGNMENT OF ANY PRIVATE ROAD SHOWN HEREON FOR COUNTY ROAD PURPOSES.

2. FINAL APPROVAL OF THESE GRADING PLANS SUBJECT TO FINAL APPROVAL OF THE ASSOCIATED IMPROVEMENT PLANS WHERE APPLICABLE. FINAL CURB GRADE ELEVATIONS MAY REQUIRE CHANGES IN THESE PLANS.

3. IMPORT MATERIAL SHALL BE OBTAINED FROM A LEGAL SITE.

4. THE CONTRACTOR SHALL BE RESPONSIBLE TO SECURE AN ENCROACHMENT PERMIT FROM THE COUNTY OF IMPERIAL DEPARTMENT OF PUBLIC WORKS FOR ANY EXCAVATION OR CONSTRUCTION WITHIN COUNTY ROAD RIGHT-OF-WAY.
FOR INSPECTIONS, 48 HOUR MINIMUM NOTICE IS REQUIRED. (442) 265-1818. ADDITIONALLY, UNDERGROUND SERVICE ALER (USA) MUST BE CALLED TWO WORKING DAYS BEFORE THE CONTRACTOR MAY EXCAVATE. THEIR CONTACT NUMBER 811 (formerly (800) 422-4133). ALL WORK AND MATERIALS ARE SUBJECT TO THE INSPECTION AND APPROVAL OF THE COUNTY DEPARTMENT OF PUBLIC WORKS.

5. THE CONTRACTOR SHALL VERIFY THE EXISTENCE AND LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK. NOTICE OF PROPOSED WORK SHALL BE GIVEN TO THE FOLLOWING AGENCIES:

GAS:	TELEPHONE NO. (909) 335-7716/(760) 332-6100
IID POWER:	TELEPHONE NO. (760) 482-3408
IID WATER:	TELEPHONE NO. (760) 339-9280
AT&T:	TELEPHONE NO. (760) 337-3325 OR (760) 337-3358
SPECTRUM:	TELEPHONE NO. (760) 336-4822
SEWER AGENCY	TELEPHONE NO. (442) 265-1818
WATER AGENCY	TELEPHONE NO. (442) 265-1818
CITY OF CALIPATRIA	TELEPHONE NO. (760) 348-4141

6. A SOILS REPORT MAY BE REQUIRED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT AND/OR GRADING PLAN APPROVAL.

7. APPROVAL OF THESE PLANS BY THE DIRECTOR OF PUBLIC WORKS DOES NOT AUTHORIZE ANY WORK OR GRADING TO BE PERFORMED UNTIL THE PROPERTY OWNER'S PERMISSION HAS BEEN OBTAINED AND VALID GRADING PERMIT HAS BEEN ISSUED BY THE COUNTY PLANNING & DEVELOPMENT SERVICES DEPARTMENT.

8. THE DIRECTOR OF PUBLIC WORKS' APPROVAL OF THESE PLANS DOES NOT CONSTITUTE COUNTY BUILDING OFFICIAL APPROVAL OF ANY FOUNDATION FOR STRUCTURES TO BE PLACED ON THE ITEMS COVERED BY THESE PLANS, INCLUDING ANY ONSITE OR PERIMETER SCREEN OR RETAINING WALLS.

9. ALL MAJOR SLOPES SHALL BE ROUNDED INTO EXISTING TERRAIN TO PRODUCE A CONTOURED TRANSITION FROM CUT OR FILL FACES TO NATURAL GROUND AND ABUTTING CUT OR FILL SURFACES.

10. NOTWITHSTANDING THE MINIMUM STANDARDS SET FORTH IN THE GRADING ORDINANCE AND NOTWITHSTANDING THE APPROVAL OF THESE GRADING PLANS, THE PERMITTEE IS RESPONSIBLE FOR THE PREVENTION OF DAMAGE TO ADJACENT PROPERTY. NO PERSON SHALL EXCAVATE ON LAND SO CLOSE TO THE PROPERTY LINE AS TO ENDANGER ANY SUCH PROPERTY FROM SETTLING, CRACKING, EROSION SILTING, SCOUR OR OTHER DAMAGE, WHICH MIGHT RESULT FROM THE GRADING DESCRIBED ON THE PLAN. THE COUNTY WILL HOLD THE PERMITTEE RESPONSIBLE FOR CORRECTION OF NONDEDICATED IMPROVEMENTS WHICH DAMAGE ADJACENT PROPERTY.

11. SPECIAL CONDITION: IF ANY ARCHEOLOGICAL RESOURCES ARE DISCOVERED ON THE SITE OF THIS GRADING OPERATION, SUCH OPERATION WILL CEASE IMMEDIATELY AND THE PERMITTEE WILL NOTIFY THE DIRECTOR OF THE PLANNING & DEVELOPMENT SERVICES DEPARTMENT AND THE DISCOVERY. GRADING OPERATION WILL NOT RECOMMENCE UNTIL THE PERMITTEE HAS RECEIVED WRITTEN AUTHORITY FROM THE DIRECTOR OF PLANNING & DEVELOPMENT SERVICES TO DO SO.

12. THE CONSTRUCTION OF ONE PCC STANDARD DRIVEWAY PER LOT, LOCATION TO BE DETERMINED IN THE FIELD BY ENGINEER OF WORK AND APPROVED BY COUNTY PUBLIC WORKS INSPECTOR. PCC SURFACING OF DRIVEWAY TO EXTEND FROM CURB TO PROPERTY LINE.

13. ALL GRADING SHALL CONFORM TO THE UNIFORM BUILDING CODE APPENDIX CHAP. 33, AS AMENDED BY TITLE 9 LAND USE ORDINANCE.

14. ALL PROPERTY CORNERS SHALL BE CLEARLY DELINEATED IN THE FIELD PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION AND/OR GRADING.

15. DURING ROUGH GRADING OPERATIONS AND PRIOR TO THE CONSTRUCTION OF ANY PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHALL BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO CONTIGUOUS PROPERTIES.

16. DUST SHALL BE CONTROLLED BY THE CONTRACTOR IN ACCORDANCE WITH ALL IMPERIAL COUNTY AIR POLLUTION CONTROL DISTRICT (APCD) FUGITIVE DUST CONTROL RULES AND REGULATIONS AND SHALL COMPLY WITH THEIR PERMITTING REQUIREMENTS, IF APPLICABLE.

17. NO FILL SHALL BE PLACED ON EXISTING GROUND UNTIL THE EXISTING GROUND HAS BEEN CLEARED OF WEEDS, DEBRIS, TOPSOIL AND OTHER DELETERIOUS MATERIAL.

18. THE MAXIMUM ALLOWABLE CUT AND FILL SLOPES ARE 2:1, UNLESS A SLOPE STABILITY ANALYSIS AUTHORIZES A STEEPER SLOPE AND HAS BEEN APPROVED.

19. A 6' WIDE BY 1' HIGH BERM, OR EQUIVALENT, SHALL BE CONSTRUCTED ALONG THE TOP OF ALL FILL SLOPES OVER 5' IN VERTICAL HEIGHT. ALL SLOPES LESS THAN OR EQUAL TO 5' SHALL HAVE A BERM TO PREVENT DRAINAGE FROM ERODING SAME.

20. A BROW DITCH DESIGNED TO HANDLE THE FLOWS (Q) FROM A 100-YR. STORM EVENT SHALL BE CONSTRUCTED ALONG THE TOP OF ALL CUT SLOPES.

21. NO OBSTRUCTION OF FLOOD PLAINS OR NATURAL WATER COURSES WILL BE PERMITTED.

22. ALL EXISTING DRAINAGE COURSES ON THE PROJECT SITE MUST CONTINUE TO FUNCTION DURING STORM CONDITIONS. PROTECTIVE MEASURES AND TEMPORARY DRAINAGE PROVISIONS MUST BE USED TO PROTECT CONTIGUOUS PROPERTIES DURING GRADING OPERATIONS.

23. THE FINISHED GRADE SHALL BE SLOPED AWAY FROM ALL EXTERIOR BUILDING WALLS AT NOT LESS THAN 4% (1/2" PER FOOT) FOR A MINIMUM OF 3 FEET, UNLESS A SOIL REPORT PROVIDES ALTERNATE RECOMMENDATIONS.

24. A QUALIFIED AND REGISTERED PROFESSIONAL ENGINEER SHALL SUBMIT A WRITTEN CERTIFICATION TO THE PUBLIC WORKS DEPARTMENT THAT THE FINAL GRADING HAS BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS FOR ALL GRADING DESIGNATED AS "ENGINEERED GRADING". AS-BUILT PLANS SHALL BE PROVIDED PRIOR TO FINAL ACCEPTANCE.

25. THE CONTRACTOR SHALL NOTIFY THE PUBLIC WORKS DEPARTMENT AT LEAST 48 HOURS IN ADVANCE OF REQUESTING A FINISH LOT GRADE AND DRAINAGE INSPECTION. THIS INSPECTION MUST BE APPROVED PRIOR TO THE BUILDING PERMIT FINAL INSPECTION BY PUBLIC WORKS FOR EACH LOT.

26. THE CONTRACTOR SHALL NOTIFY "UNDERGROUND SERVICE ALERT" AT 811 (formerly (800) 422-4133) A MINIMUM OF TWO DAYS PRIOR TO THE COMMENCEMENT OF ANY DIGGING OR EXCAVATION.

LEGAL DESCRIPTION:

THE EAST HALF OF THE SOUTHEAST QUARTER OF SECTION 21 AND THE WEST HALF OF THE SOUTHWEST QUARTER OF SECTION 22, TOWNSHIP 12 SOUTH, RANGE 14 EAST, S.B.M. IN AN UNINCORPORATED AREA OF THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEROF.

EXCEPTING THEREFROM THAT PORTION OF THE SOUTHWEST QUARTER OF SAID SECTION 22 LYING EASTERLY OF THE WESTERLY LINE OF THE SOUTHERN PACIFIC RAILROAD RIGHT OF WAY 300 FEET IN WIDTH AS SHOWN ON THE MAP OF THE TOWNSITE OF BERNICE, ACCORDING TO MAP THEREOF No. 117 ON FILE IN THE OFFICE OF THE COUNTY RECORDER OF IMPERIAL COUNTY.

OWNER:

SUPERIOR LAND AND CATTLE CO. AND
WILLIAM BRANDT AND SUSAN L BRANDT
CALIFORNIA

DEVELOPER:

PACIFIC ETHANOL BRAWLEY, LLC
ATTN: PAUL KOEHLER
5711, N. WEST AVENUE
FRESNO, CA 93711
OFFICE: 559-435-1771
FAX: 559-435-1478

ASSESSORS PARCEL NUMBERS:

APN: 024-280-52-01

FLOOD ZONE:

ZONE "C" - AREA OF MINIMAL FLOODING ACCORDING TO FEMA FLOOD INSURANCE RATE MAP COMMUNITY PANEL NO 060065- 425-B AND DATED 3-15-1984.

LAND USE DATA:

INDUSTRIAL PER IMPERIAL COUNTY LAND USE MAP / GENERAL PLAN (PHASE 1)

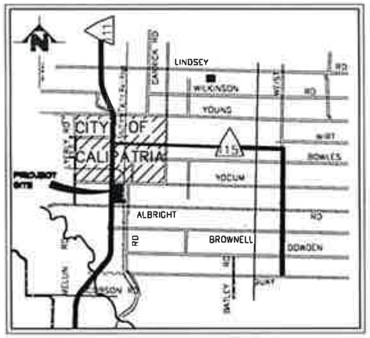
GEOTECHNICAL REPORT:

PREPARED BY: LANDMARK CONSULTANTS, INC.
DATED: AUGUST 3, 2018
REPORT No.: LCI REPORT No. 8146

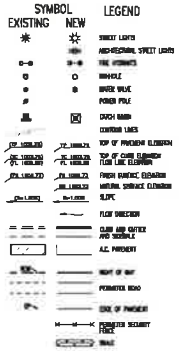
BENCHMARK:

BM1
BRASS CAP SOUTH UPSTREAM
WINGWALL OF CHECK 30 NECTARINE
A LAT, NORTH OF ALBRIGHT ROAD
EL.=132.89

BM2
CHIP "+" ON SOUTH UPSTREAM
WINGWALL OF CHECK 36 B LAT.
EL.=131.21



VICINITY MAP



SHEET INDEX

QUANTITIES

ITEM	UNIT	QUANTITY
PHASE 1		
SITE SURFACING (195,080 SF)		
6" CLASS II AG BASE	TON	6,830
12" CRUSHED CONCRETE AGG BASE	TON	13,656
12" SUBGRADE PREP	CYD	7,225
ACCESS DRIVEWAY (9,171 SF)		
4" ASPHALT CONCRETE	TON	229
12" CLASS II AG. BASE	TON	642
12" SUBGRADE PREP	CYD	340
PHASE 2		
SITE SURFACING (189,020 SF)		
6" CLASS II AG BASE	TON	8,616
12" CRUSHED CONCRETE AGG BASE	TON	13,231
12" SUBGRADE PREP	CYD	7,000
ACCESS DRIVEWAY (10,840 SF)		
4" ASPHALT CONCRETE	TON	268
12" CLASS II AG. BASE	TON	759
12" SUBGRADE PREP	CYD	401
PHASE 3		
SITE SURFACING (202,205 SF)		
6" CLASS II AG BASE	TON	7,077
12" CRUSHED CONCRETE AGG BASE	TON	14,154
12" SUBGRADE PREP	CYD	7,488

ENGINEERING NOTES:

1. NOTHING CONTAINED IN THE CONTRACT DOCUMENTS SHALL CREATE, NOR SHALL BE CONSTRUED TO CREATE, ANY CONTRACTUAL RELATIONSHIP BETWEEN THE ENGINEER AND THE CONTRACTOR OR ANY SUBCONTRACTOR.

2. ANY VARIATIONS FROM THESE PLANS SHALL BE PROPOSED ON CONSTRUCTION FIELD PRINTS AND TRANSMITTED TO THE ENGINEER.

3. THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING UTILITIES ON THE SITE. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS, SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

4. EXISTING SURFACE FEATURES AND FENCING SHALL BE REPLACED IN KIND IF DAMAGED BY THE CONTRACTOR DURING CONSTRUCTION.

5. ANY INSPECTION BY THE COUNTY OR THE ENGINEER SHALL NOT, IN ANY WAY, RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM THE WORK IN COMPLIANCE WITH APPLICABLE CODES AND AGENCY REQUIREMENTS.

6. CONTRACTOR TO LOCATE ALL EXISTING PROPERTY MONUMENTS PRIOR TO CONSTRUCTION. ANY MONUMENTS DISTURBED DURING THE CONSTRUCTION OF THIS PROJECT SHALL BE REPLACED BY A REGISTERED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.

7. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH COUNTY OF IMPERIAL REQUIREMENTS.

8. PRIOR TO FINAL APPROVAL AND ACCEPTANCE OF THE WORK THE DEVELOPER/CONTRACTOR WILL BE REQUIRED TO CLEAN AND REPAIR ADJACENT THE (PUBLIC) ROADWAYS USED OR DAMAGED DURING THE COURSE OF CONSTRUCTION.

9. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL STORM DRAIN PIPES AND DRAINAGE FACILITIES FROM DAMAGE DURING ALL STAGES OF CONSTRUCTION. THE DEPTH OF COVER ON THE STORM DRAINAGE PIPE IS DESIGNED FOR FINAL GRADE. THEREFORE, EXTRA CARE SUCH AS BERMING OVER PIPES, FLAGGING OR SIGNAGE SHOULD BE USED DURING CONSTRUCTION TO MAINTAIN COVER OR PROTECT THE PIPES.

10. THE ENGINEER MAKES NO REPRESENTATION OR GUARANTEE REGARDING EARTHWORK QUANTITIES OR THAT THE EARTHWORK FOR THIS PROJECT WILL BALANCE DUE TO THE VARYING FIELD CONDITIONS, CHANGING SOIL TYPES, ALLOWABLE CONSTRUCTION TOLERANCES AND CONSTRUCTION METHODS THAT ARE BEYOND THE CONTROL OF THE ENGINEER. PRIOR TO BIDDING THE WORK THE CONTRACTOR SHALL THOROUGHLY SATISFY HIMSELF AS TO THE ACTUAL CONDITIONS AND EARTHWORK QUANTITIES, IF ANY. NO CLAIM SHALL BE MADE AGAINST THE OWNER/DEVELOPER OR ENGINEER FOR ANY EXCESS OR DEFICIENCY THEREIN, ACTUAL OR RELATIVE.

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF THE WORK OF THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION OF 6703 OF THE BUSINESS AND PROFESSIONS CODE AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF THE PROJECT DRAWINGS AND SPECIFICATIONS BY THE COUNTY OF IMPERIAL IS CONFINED TO REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITY FOR PROJECT DESIGN

CARLOS CORRALES
LC ENGINEERING CONSULTANTS INC.
1065 STATE STREET
EL CENTRO, CALIFORNIA 92243
(760)353-8110

CARLOS CORRALES No. 55432 EXP. 12-31-19

BY: ______________________
CARLOS CORRALES
R.C.E. No. 55432

DATE: ______________________
EXPIRATION DATE: 12/31/19

WORK TO BE DONE

THE GRADING/IMPROVEMENTS CONSIST OF WORK TO BE DONE IN ACCORDANCE TO:
1) COUNTY OF IMPERIAL REGIONAL STANDARD DRAWINGS.
2) STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK).
3) COUNTY OF IMPERIAL GRADING AND EXCAVATION ORDINANCE.
4) FOR NEW SIGNAL DESIGN AND INSTALLATIONS.
5) STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) STANDARD PLANS.
6) STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) STANDARD SPECIFICATIONS.
7) STATE OF CALIFORNIA MUTCD 2014 SUPPLEMENT.
8) IMPERIAL IRRIGATION DEPARTMENT WATER DISTRICT STANDARD DRAWINGS AND SPECIFICATIONS.
9) GEOTECHNICAL REPORT.

UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
811
TWO WORKING DAYS
BEFORE YOU DIG

No.	REVISIONS	BY	DATE
1	PER PLAN CHECK PER LETTER DATED AUG 29 2018	STAFF	9/10/18
2	PER PLAN CHECK PER LETTER DATED OCT 19 2018	STAFF	10/26/18

COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT
APPROVED FOR CONSTRUCTION BY:
BY: ______________________ DATE: ____________
JOHN A. GAY, P.E.
DIRECTOR OF PUBLIC WORKS
R.C.E. NO.: 62028

SEAL
JOHN GAY R.C.E. 62028 EXP. 9-30-19

ENGINEER OF RECORD
PLANS PREPARED UNDER THE SUPERVISION OF
BY: ______________________ DATE: ____________
CARLOS CORRALES
R.C.E. NO.: 55432

SEAL
CARLOS CORRALES No. 55432 EXP. 12-31-19

LC ENGINEERING CONSULTANTS INC.
1065 State Street
El Centro CA 92243

DATE 11/05/18
BENCHMARK: SEE SHEET NO. 1

TITLE SHEET
ALL AMERICAN GRAIN
CONTAINER YARD & SPUR LOADING
IMPERIAL COUNTY
ALL AMERICAN GRAIN
W.O.

SHEET 1 OF 5 SHEETS
JOB NO. C18046-00

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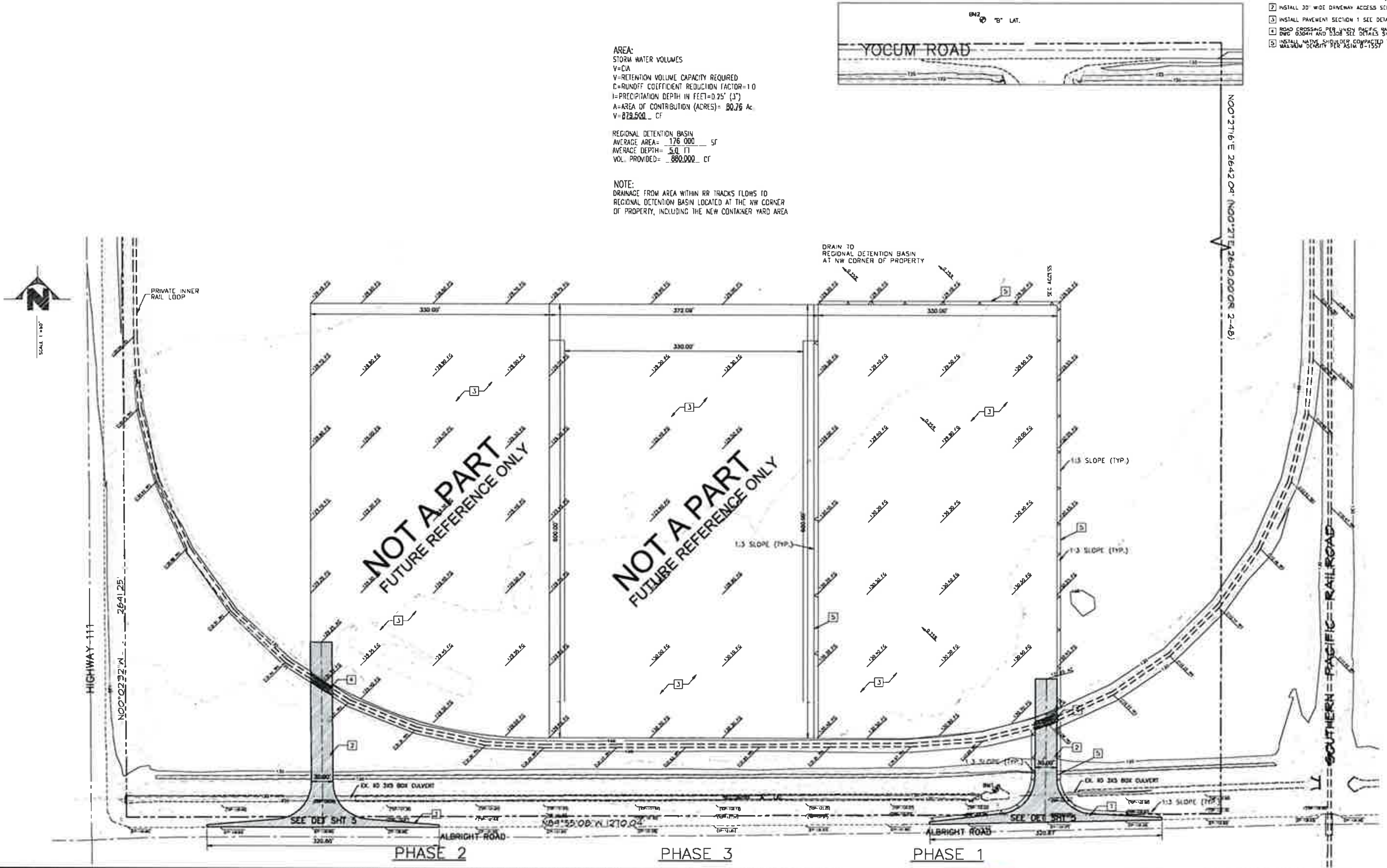
GRADING CONSTRUCTION NOTES:

1. INSTALL COMMERCIAL DRIVEWAY PER COUNTY OF IMPERIAL STD DETAIL 410B SEE DET 5/5
2. INSTALL 30' WIDE DRIVEWAY ACCESS SEE DETAIL 5/5
3. INSTALL PAVEMENT SECTION 1 SEE DETAIL 5/5
4. ROAD CROSSING PER UNION PACIFIC RAILROAD STANDARD DWG 0304H AND 0308 SEE DETAILS SHEET 4
5. INSTALL NATIVE SHOULDER COMPACTED TO 90% OF MAXIMUM DENSITY PER ASTM D-1557

AREA:
STORM WATER VOLUMES
V=CIA
V=RETENTION VOLUME CAPACITY REQUIRED
C=RUNOFF COEFFICIENT REDUCTION FACTOR=1.0
I=PRECIPITATION DEPTH IN FEET=0.25' (3")
A=AREA OF CONTRIBUTION (ACRES)= 80.76 Ac
V= 879,500 CF

REGIONAL DETENTION BASIN
AVERAGE AREA= 176,000 SF
AVERAGE DEPTH= 5.0 FT
VOL. PROVIDED= 880,000 CF

NOTE:
DRAINAGE FROM AREA WITHIN RR TRACKS FLOWS TO REGIONAL DETENTION BASIN LOCATED AT THE NW CORNER OF PROPERTY, INCLUDING THE NEW CONTAINER YARD AREA



UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

No.	REVISIONS	BY	DATE
1	PER PLAN CHECK PER LETTER DATED AUG 29 2018	STAFF	9/10/18
2	PER PLAN CHECK PER LETTER DATED OCT 19 2018	STAFF	10/26/18

COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT
APPROVED FOR CONSTRUCTION BY:
BY: ______________ DATE: ______
JOHN A. GAY, P.E.
DIRECTOR OF PUBLIC WORKS
R.C.E. NO.: 62028

SEAL
R.C.E. 62028
EXP. 9-30-19

ENGINEER OF RECORD
PLANS PREPARED UNDER THE SUPERVISION OF
BY: ______________ DATE: ______
CARLOS CORRALES
R.C.E. NO.: 55432

SEAL
CARLOS CORRALES
No. 55432
EXP. 12-31-19

LC ENGINEERING CONSULTANTS INC.
1015 State Street
El Centro CA 92243

DATE 11/05/18
BENCHMARK: SEE SHEET NO. 1

GRADING PLAN

ALL AMERICAN GRAIN
CONTAINER YARD & SPUR LOADING
IMPERIAL COUNTY

ALL AMERICAN GRAIN
W.O.

SHEET 2 OF 5 SHEETS
JOB NO. C18046-00

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STORM WATER POLLUTION CONTROL CONSTRUCTION NOTES:

1 - INSTALL SILT FENCE FOR PERIMETER CONTROL DURING MASS GRADING AND UTILITIES INSTALLATION
SEE SE-1 FOR INSTALLATION INSTRUCTIONS

2 - INSTALL SANDBAG BARRIER FOR PERIMETRAL CONTROL ACROSS CONCENTRATED FLOW PATHS, AT DRAINAGE INLETS AND AROUND TEMPORARY STOCKPILES AND SPOILS
SEE SE-8 FOR INSTALLATION INSTRUCTIONS

3 - STABILIZED CONSTRUCTION ENTRANCE/EXIT
SEE TC-1 FOR INSTALLATION INSTRUCTIONS

4 - STREET SWEEPING AND VACUUMING TO BE PERFORMED ON EXISTING STREETS AND ROADS, AND ON NEW STREETS ONCE CONSTRUCTED SEE SE-7 FOR IMPLEMENTATION INSTRUCTIONS

5 - APPLY HYDRAULICH MULCH FOR TEMPORARY EROSION CONTROL TO RETENTION BASINS ONCE THEY ARE GRADED AND AREAS TO BE LANDSCAPED SEE EC-3 FOR INSTALLATION INSTRUCTIONS

6 - APPLY PERMANENT SEEDING AND PLANTING TO FINISHED AREAS THAT WERE DESIGNATED FOR PERMANENT VEGETATION
SEE EC-4 FOR INSTALLATION INSTRUCTIONS

7.- APPLY SOIL BINDER IN AREAS WITHOUT CONSTRUCTION ACTIVITIES OF 21 DAYS OR MORE, AND TO STOCKPILES SEE EC-5 FOR INSTALLATION INSTRUCTIONS

8 - INSTALL STORM DRAIN INLET PROTECTION ON DROP INLET STRUCTURES AND CATCH BASINS APPROXIMATE LOCATIONS ARE SHOWN ON THE DRAWINGS SEE SE-10 FOR INSTALLATION INSTRUCTIONS

9 - APPLY WIND EROSION CONTROL THROUGHOUT THE CONSTRUCTION SITE SEE WE-1 FOR IMPLEMENTATION INSTRUCTIONS

10 - COMBINED VEHICLE CLEANING, FUELING AND MAINTENANCE STORAGE AREA SEE NS-8, NS-9, AND NS-10 FOR INSTALLATION INSTRUCTIONS

11 - INSTALL CONCRETE WASTE MANAGEMENT CONTROL SEE WM-8 FOR INSTALLATION INSTRUCTIONS

12 - PAVING AND GRINDING OPERATIONS SEE NS-3.

GENERAL WATER POLLUTION CONTROL NOTES:

1 - THE INFORMATION IN THESE DRAWINGS ARE ACCURATE FOR WATER POLLUTION CONTROL PURPOSES ONLY

2 - THE INFORMATION ON THIS PLAN IS INTENDED TO BE USED AS A GUIDELINE FOR THE CONTRACTOR AND SUBCONTRACTORS TO INSTALL WATER POLLUTION CONTROL DEVICES AT GENERAL LOCATIONS THROUGHOUT THE SITE THESE DRAWINGS ARE TO BE USED IN CONJUNCTION WITH THE NARRATIVE SECTION OF THE STORM WATER POLLUTION PREVENTION PLAN

3 - FIELD CONDITION MAY NECESSITATE MODIFICATIONS TO THESE DRAWINGS

4 - PERMANENT EROSION CONTROL WILL BE INSTALLED AS AREAS ARE DETERMINED TO BE SUBSTANTIALLY COMPLETE.

5.- ALL DRAINAGE INLETS RECEIVING RUNOFF FROM DISTURBED AREAS WILL BE PROTECTED WITH A SEDIMENT TRAP INLET PROTECTION

6 - ALL NECESARY WORK FOR EROSION CONTROL MEASURES SHALL BE DONE ACCORDING THE STATE OF CALIFORNIA CONSTRUCTION SITE BMP FIELD MANUAL AND TROUBLESHOOTING GUIDE AS ADOPTED JANUARY 2003 OR THE LATEST EDITION THEREOF, AND CALIFORNIA STORMWATER QUALITY ASSOCIATION CONSTRUCTION HANDBOOK AS ADOPTED JANUARY 2003 OR THE LATEST EDITION THEREOF.

7.- NO WATER POLLUTION CONTROL DEVICES SHALL BE PLACED IN CITY, COUNTY, OR IID RIGHT OF WAY OR EASEMENTS PRIOR TO APPROVED ENCROACHMENT PERMITS FOR EACH AGENCY.

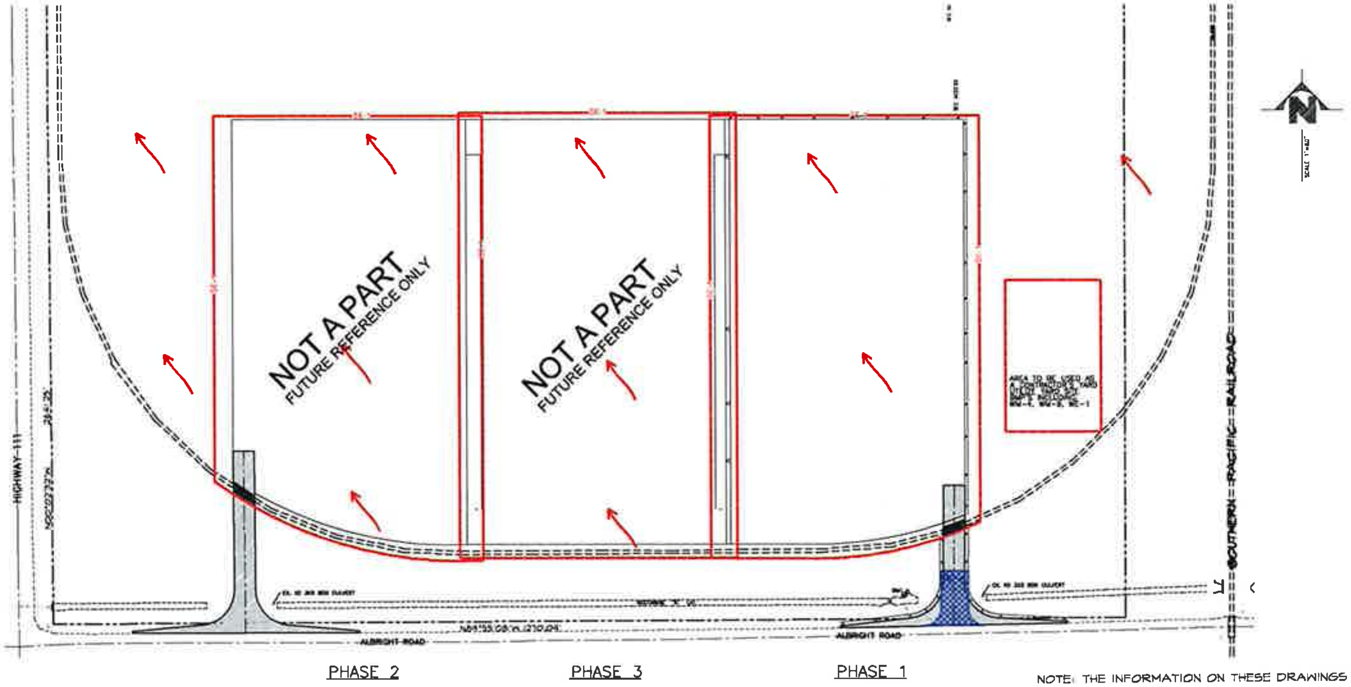
8.- CONTRACTORS SHALL PROVIDE ADEQUATE DUST SUPPRESSION TO MEET ALL CITY OF CALIPATRIA/COUNTY OF IMPERIAL AIR POLLUTION CONTROL DISTRICT REQUIREMENTS

LEGEND:

—SE-1—	SE-1 - SILT FENCE
SE-10 ☐	SE-10.- STORM DRAIN INLET PROTECTION (ON ADJACENT AREAS, EXISTING ROADS AND AS SHOWN)
EC-3 ▨	EC-3 - HYDRAULIC MULCH
- - SE-5 - -	SE-5 - FIBER ROLLS
TC-1 ■	TC-1 - STABILIZED CONSTRUCTION ENTRANCE/EXIT
—SE-7—	SE-7 - STREET SWEEPING AND VACUUMING (ON EXISTING ROADS AND ON NEW STREETS ONCE CONSTRUCTED)
—SE-8—	SE-8 - SANDBAG BARRIER (ACROSS UNPAVED DITCHES AND STREAMS AND AS SHOWN)
EC-5	EC-5 - SOIL BINDERS
→	NATURAL FLOW PATH
→	PROJECT SURFACE FLOW DIRECTION
—EC-9—	EC-9 - EARTH DIKES AND DRAINAGE SWALES
—	LIQUID WASTE MANAGEMENT

SITE BMP'S

- WM-1 MATERIAL DELIVERY AND STORAGE
- WM-2 MATERIAL USE
- WM-3 STOCKPILE MANAGEMENT
- WM-4 SPILL PREVENTION AND CONTROL
- WM-5 SOLID WASTE MANAGEMENT
- WM-6 HAZARDOUS WASTE MANAGEMENT
- WM-8A CONCRETE WASTE MANAGEMENT (ABOVE GRADE CWO)
- WM-8C CONCRETE WASTE MANAGEMENT (PREFAB CWO)
- WM-9 SANITARY/SEPTIC WASTE MANAGEMENT
- WM-10 LIQUID WASTE MANAGEMENT
- NS-1 WATER CONSERVATION PRACTICES
- NS-3 PAVING AND GRINDING OPERATIONS
- NS-6 ILLICIT CONNECTION/DISCHARGE
- NS-7 POTABLE WATER/IRRIGATION
- NS-8 VEHICLE AND EQUIPMENT CLEANING
- NS-9 VEHICLE AND EQUIPMENT FUELING
- NS-12 CONCRETE CURING
- NS-13 CONCRETE FINISHING
- EC-1 SCHEDULING
- EC-2 PRESERVATION OF EXISTING VEGETATION
- EC-3 HYDRAULIC MULCH
- EC-4 HYDROSEEDING
- EC-5 SOIL BINDERS
- EC-7 GEOTEXTILES-MATS-PLASTIC COVERS
- EC-8 WOOD MULCH
- EC-9 EARTH DIKES AND DRAINAGE SWALES
- EC-10 VELOCITY DISSIPATION DEVICES
- TC-2 STABILIZED CONSTRUCCTION ROADWAY
- WE-1 WIND EROSION CONTROL
- SE-1 SILT FENCE
- SE-3 TEMPORARY SEDIMENT TRAPS
- SE-4 CHECK DAMS
- SE-5 FIBER ROLLS
- SE-6 GRAVEL BAG BERM
- SE-7 STREET SWEEPING AND VACUUMING
- SE-10 STORM DRAIN INLET PROTECTION
- SE-12 TEMPORART SILT DIKE
- TC-1 STABILIZED CONSTRUCTION ENTRANCE/EXIT
- TC-2 STABILIZED CONSTRUCTION ROADWAY



NOTE: THE INFORMATION ON THESE DRAWINGS IS ACCURATE FOR WATER POLLUTION CONTROL PURPOSES ONLY

UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

No.	REVISIONS	BY	DATE
1	PER PLAN CHECK PER LETTER DATED AUG 29 2018	STAFF	9/10/18
2	PER PLAN CHECK PER LETTER DATED OCT 19 2018	STAFF	10/26/18

COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT
APPROVED FOR CONSTRUCTION BY:
BY: ______ DATE: ______
JOHN A. GAY, P.E.
DIRECTOR OF PUBLIC WORKS
R.C.E. NO.: 62028

SEAL
R.C.E. 62028

ENGINEER OF RECORD
PLANS PREPARED UNDER THE SUPERVISION OF
BY: ______ DATE: ______
CARLOS CORRALES
R.C.E. NO.: 55432

SEAL
CARLOS CORRALES
No. 55432

LC ENGINEERING CONSULTANTS INC.
1065 State Street
El Centro CA 92243
DATE 11/05/18
BENCHMARK: SEE SHEET NO. 1

EROSION CONTROL PLAN
ALL AMERICAN GRAIN
CONTAINER YARD & SPUR LOADING
IMPERIAL COUNTY
ALL AMERICAN GRAIN
W.O.

SHEET 3 OF 5 SHEETS
JOB NO. C18046-00

L:\Projects\2018\C18046-00 (DDG-All American Grain)\Engineering\Grading Plan\C18046-00_WSTR.dwg 12/10/2018 13:32

1. GENERAL REQUIREMENTS FOR MATERIALS AND CONSTRUCTION

1.01 STANDARD SPECIFICATIONS – WHEN IN THIS SECTION 1 OF THESE SPECIAL PROVISIONS THE TERM STANDARD SPECIFICATIONS IS USED, IT SHALL BE INTERPRETED TO MEAN THOSE STANDARD SPECIFICATION 2010 EDITION ISSUED BY THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION (CALTRANS), AVAILABLE FROM THE PUBLIC DISTRIBUTION UNIT OF SAID AGENCY, 1900 ROYAL OAKS DRIVE, SACRAMENTO, CA 95818, TELEPHONE (916) 445-3520.

1.02 WORK TO BE DONE – ALL THE IMPROVEMENTS SHOWN OR CALLED FOR IN THESE DRAWINGS SHALL BE CONSTRUCTED BY CONTRACTOR COMPLETE IN EVERY RESPECT AND READY FOR USE. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SUPPLIES, SERVICES, SUPERVISION AND INCIDENTALS THERETO REQUIRED FOR SAID COMPLETION. WHERE THE PLANS, SPECIFICATIONS OR DETAILS DO NOT PROVIDE ALL OF THE INFORMATION REQUIRED TO COMPLETE THE WORK, THE CONTRACTOR SHALL, NEVERTHELESS, WITHOUT ADDITIONAL COMPENSATION AND SUBJECT TO THE ENGINEER'S APPROVAL, PROVIDE THAT LABOR, MATERIAL AND EQUIPMENT REQUIRED TO COMPLETE THE WORK ACCORDING TO GENERALLY ACCEPTED STANDARDS OF THE TRADE INVOLVED.

1.03 SUBMITTALS AND MIX DESIGNS – CONTRACTOR SHALL SUBMIT TO THE ENGINEER NO LESS THAT 10 DAYS PRIOR TO ORDERING HIS MATERIALS OR EQUIPMENT, 3 SETS OF DESCRIPTIONS OF ALL PRODUCTS THAT HE PROPOSES TO INCORPORATE INTO THE PROJECT. SAID DESCRIPTIONS SHALL INCLUDE SUFFICIENT INFORMATION TO SHOW THAT EACH PRODUCT COMPLIES WITH EVERY PROVISION OF THESE CONTRACT DOCUMENTS WHICH IS APPLICABLE THERETO. SHOULD THERE BE ANY DEVIATION WHATSOEVER, THE CONTRACTOR SHALL POINT THAT DEVIATION OUT IN HIS LETTER OF TRANSMITTAL REQUIRED FOR EACH PRODUCT. SAID LETTER SHALL OTHERWISE INDICATE THAT THE CONTRACTOR HAS REVIEWED THE PRODUCT INFORMATION AND THAT THE PRODUCT PROPOSED CONFORMS FULLY WITH THE CONTRACT DOCUMENTS. PRODUCT INFORMATION INCLUDES, BUT IS NOT LIMITED TO: MANUFACTURER'S SPECIFICATIONS FOR PRODUCT; PRODUCT TESTING RESULTS FROM AN INDEPENDENT TESTING FIRM; SHOP DRAWINGS, DIAGRAMS AND DETAILS; OR, A MIX DESIGN BY A REGISTERED CIVIL ENGINEER. THE ENGINEER WILL DETERMINE THOSE ITEMS FOR WHICH SUBMITTALS WILL BE REQUIRED. SUBMITTALS WILL AT LEAST BE REQUIRED FOR THE FOLLOWING:

A. AGGREGATE BASE (TEST RESULTS);
B. PORTLAND CEMENT CONCRETE (MIX DESIGNS);
C. ASPHALT CONCRETE (MIX DESIGN);
D. PAINT FOR PAVEMENT STRIPES & MARKINGS (SPECIFICATIONS);
E. WATER AND STORM DRAIN PIPE (SPECIFICATIONS);
F. PIPELINE FITTINGS, VALVES AND HYDRANTS (SPECIFICATIONS);
G. GRANULAR BEDDING AND PIPE ZONE BACKFILL (TEST RESULTS);
H. MANHOLE SECTIONS, FRAMES AND COVERS (SPECIFICATIONS);
I. WATER SERVICE FITTINGS AND VALVES (SPECIFICATIONS);
J. COATING SYSTEMS (SPECIFICATIONS);

1.04 INSPECTION, TESTING AND QUALITY CONTROL – THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING THAT ALL MATERIALS AND WORKMANSHIP INCORPORATED INTO THE PROJECT MEET OR EXCEED THE REQUIREMENTS OF THESE DRAWINGS. HE SHALL PROVIDE ALL INSPECTIONS AND PERFORM ALL TESTING REQUIRED FOR THAT ASSURANCE IN ACCORDANCE WITH SECTION 6-3.02 OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE, ARRANGE AND PAY FOR ALL TESTING SPECIFICALLY CALLED FOR IN THESE DRAWINGS. MATERIAL OR WORKMANSHIP FOUND NOT IN CONFORMANCE WITH THESE DRAWINGS SHALL BE REMOVED FROM PROJECT. NO MATERIAL OF WORKMANSHIP SHALL BE COVERED OR OTHERWISE CONCEALED UNTIL SUCH HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER.

1.05 EARTH IMPORT, EXPORT AND DISPOSAL – ALL EARTH REQUIRED TO COMPLETE THE WORK CALLED FOR IN THESE DRAWINGS SHALL BE OBTAINED FROM THE SITE OF WORK. ALL SURPLUS EARTH GENERATED BY SAID WORK SHALL BE DISPOSED OF ON THE SITE OF WORK OUTSIDE OF BUT CONTIGUOUS TO THE CONSTRUCTED IMPROVEMENT AS DIRECTED BY THE ENGINEER. AS BEST HE CAN, THE CONTRACTOR SHALL KEEP SURPLUS EARTH CLOSE TO THAT LOCATION WHERE IT WAS EXCAVATED. ALSO, CONTRACTOR SHALL BARROW EARTH CLOSE TO THAT LOCATION WHERE IT IS REQUIRED. IN NO CASE SHALL SURPLUS EARTH OR BARROWED EARTH BE TRANSPORTED ACROSS HIGHWAY 98-7, MAGGIO ROAD OR MENVIELLE ROAD. SURPLUS EARTH EXCAVATED FROM THE PROJECT SITE SHALL BE PLACED IN NEAT, ORDERLY WINDROWS APPROXIMATELY 10 FEET WIDE AND 3 FEET HIGH, ADJACENT TO BUT OUTSIDE OF THE ROADWAY EXCAVATION OR EMBANKMENT.

1.06 CONFLICTS – WHERE IN THESE DRAWINGS CONFLICTS OCCUR BETWEEN REQUIREMENTS AND PROVISIONS APPLICABLE TO QUALITY OF MATERIALS OR WORKMANSHIP, THE MOST STRINGENT REQUIREMENT OR PROVISION SHALL CONTROL. WHERE STRINGENCY IS NOT INVOLVED, THEN THE ORDER OF PRECEDENCE SHALL BE AS FOLLOWS, WITH THAT DOCUMENT LISTED FIRST BEING OF THE HIGHEST PRIORITY.

A. IMPERIAL COUNTY CODES AND REGULATIONS
B. MANUFACTURER'S WRITTEN RECOMMENDATIONS
C. SPECIAL PROVISIONS
D. PLANS AND TYPICAL DETAILS
E. REFERENCED STANDARD SPECIFICATIONS

1.07 OR EQUAL PRODUCTS – WHERE IN THESE DRAWINGS CERTAIN MANUFACTURERS ARE CALLED OUT ALONG WITH A PRODUCT OR MODEL NUMBER, THE CONTRACTOR SHALL HAVE THE OPTION OF USING THE PRODUCTS OF ANOTHER MANUFACTURER PROVIDED THE ENGINEER DETERMINES THAT THE PROPOSED OTHER PRODUCT IS EQUAL TO OR BETTER THAN THAT OF THE MANUFACTURER CALLED OUT AND CONFORMS FULLY TO THESE CONTRACT DOCUMENTS. THE DETERMINATION OF THE ENGINEER IS FINAL; THEREFORE, IF THE CONTRACTOR WANTS TO INCLUDE IN HIS BID PRICES THE LOWER PRICE OF ANOTHER PRODUCT, HE IS ADVISED TO OBTAIN APPROVAL OF THE OTHER PRODUCT PRIOR TO SUBMITTING HIS BID. THE CONTRACTOR SHALL ALLOW NO LESS THAN TEN (10) CALENDAR DAYS FOR ENGINEER TO MAKE HIS DETERMINATION BASED ON THE CONTRACTOR'S SUBMITTAL OF FULL DETAILS ABOUT THE PRODUCT. DETAILS INSUFFICIENT TO SHOW CONFORMANCE TO THESE CONTRACT DOCUMENTS AND EQUIVALENCY MAY BE CAUSE FOR ENGINEER'S DISAPPROVAL.

1.08 PRODUCT UNIFORMITY – PRODUCTS INCORPORATED INTO THE WORK AND IMPROVEMENTS CALLED FOR IN THESE DRAWINGS SHALL BE THOSE THAT ARE THE MANUFACTURER'S CURRENT LINE OF PRODUCTS. ALL UNITS OF EACH OF THE FOLLOWING PRODUCTS SHALL BE OF THE SAME MANUFACTURER THROUGHOUT THE PROJECT:

A. MANHOLE FRAMES AND COVERS (SEWER AND STORM DRAIN);
B. WATER PIPE (C-900 AND C-905 POLYVINYL CHLORIDE);
C. WATER PIPE GATE VALVES;
D. WATER PIPE BUTTERFLY VALVES;
E. FIRE HYDRANTS;
F. WATER SERVICE SADDLES;
G. WATER SERVICE VALVES AND CORPORATION STOPS,
H. WATER PIPE AIR RELEASE DEVICES.

1.09 AS-BUILT RECORDS AND DRAWINGS – THE CONTRACTOR SHALL, AS A CONDITION TO ACHIEVING SUBSTANTIAL COMPLETION OF THE PROJECT, PROVIDE NO LESS THAN ONE (1) COMPLETE SETS OF AS-BUILT DRAWING PRINTS. AS-BUILT DRAWINGS SHALL INCLUDE NO LESS THAN A RECORD OF THE EXACT LOCATION OF ALL WATER AND SEWER SERVICES AND THE ENDS OF ALL PIPE PROVIDED FOR FUTURE CONNECTIONS.

1.10 SITE SAFETY AND TRAFFIC CONTROL – THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE SAFETY OF ALL PERSONS, INCLUDING EMPLOYEES, PROPERTY OCCUPYING OR TRAVERSING HIS AREAS OF WORK, DAY AND NIGHT, DURING BOTH WORKING AND NON-WORKING HOURS; AND, SHALL PROVIDE ALL BARRICADES, SHORING, DEWATERING, SIGNS, LIGHTING AND OTHER DEVICES REQUIRED THEREFORE IN ACCORDANCE TO CAL OSHA, SECTION 1604, 1539-1543 AND OTHER SECTIONS AS REQUIRED BY THE ENGINEER. THE CONTRACTOR SHALL ALSO PROVIDE A PLAN FOR, AND FURNISH AND INSTALL THE SIGNS, FLAGMEN, LIGHTS AND OTHER DEVICES NECESSARY TO, CONTROL TRAFFIC THROUGH THE PROJECT WORK SITE, TO PROTECT HIS EMPLOYEES AND TO PROTECT VEHICULAR AND PEDESTRIAN TRAFFIC PASSING THROUGH OR NEAR HIS AREAS OF WORK. TRAFFIC CONTROL WITHIN TRAVELWAYS SHALL CONFORM TO THE "MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE WORK ZONES" AVAILABLE FROM CALTRANS, CENTRAL PUBLICATION DISTRIBUTION, 6002 FOLSOM BLVD., SACRAMENTO, CA 95819.

1.11 PERMITS – THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS REQUIRED FOR THE WORK TO CONSTRUCT THE IMPROVEMENTS CALLED FOR IN THESE CONTRACT DOCUMENTS AND SHALL DELIVER NO LESS THAN ONE (1) COPY OF EACH TO THE ENGINEER BEFORE COMMENCING ANY WORK GOVERNED BY THE PERMITS. HE SHALL ALSO ARRANGE AND PAY FOR ALL INSPECTIONS AND TESTING REQUIRED BY SAID PERMITS. PERMITS REQUIRED OF THE CONTRACTOR INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

A. EXCAVATION PERMIT FROM THE STATE OF CALIFORNIA, DIVISION OF INDUSTRIAL SAFETY, FOR TRENCH EXCAVATIONS EXCEEDING 5 FOOT DEEP;

B. ENCROACHMENT PERMIT FROM THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION (CALTRANS), FOR WORKING WITHIN HIGHWAY RIGHTS-OF-WAY.

C. CONSTRUCTION ACTIVITY STORM WATER PERMIT FROM THE STATE OF CALIFORNIA, WATER RESOURCES CONTROL BOARD, TO CONTROL POLLUTION CAUSED BY WORK SITE DRAINAGE.

D. ENCROACHMENT PERMIT FROM THE IMPERIAL COUNTY DEPARTMENT OF PUBLIC WORKS, FOR WORKING WITHIN COUNTY ROAD RIGHTS-OF-WAY.

1.12 SOILS REPORT – IN ORDER TO PREPARE THESE DRAWINGS, JEFFREY O. LYON WAS RETAINED TO PERFORM A GEOTECHNICAL INVESTIGATION OVER THE PROJECT SITE AREA AND TO PREPARE A REPORT OF THEIR FINDINGS AND MAKE RECOMMENDATIONS RELATIVE THERETO. THE REPORT IS ENTITLED "REPORT OF PAVEMENT STRUCTURAL SECTIONS, ALL AMERICAN GRAIN CONTAINER YARD AND SPUR LOADING IMPROVEMENTS", IMPERIAL COUNTY, STATE OF CALIFORNIA, PREPARED BY LANDMARK CONSULTANTS, INC., LCI REPORT NO. [illegible], DATED JUNE 24, 2018. BIDDERS AND THE CONTRACTOR MAY REVIEW THAT REPORT AT THE OFFICES OF THE IMPERIAL COUNTY, DEPARTMENT OF PUBLIC WORKS, 155 SOUTH 11TH ST. EL CENTRO, CA 92243 OR, PURCHASE A COPY OF SAME FROM THE CONSULTANTS, 780 NORTH 4TH STREET, EL CENTRO, CA 92243. THE REPORT CONTAINS INFORMATION THAT WILL BE USEFUL TO BIDDERS ESTIMATING THE COST OF CONSTRUCTING THE IMPROVEMENTS CALLED FOR IN THESE DRAWINGS; HOWEVER, NEITHER THE COUNTY NOR THE ENGINEER WARRANTS OR GUARANTEES THE ACCURACY THEREOF. THE BIDDERS SHALL RETAIN THE SERVICES OF THEIR OWN GEOTECHNICAL ENGINEERS TO OBTAIN THAT INFORMATION ABOUT THE PROJECT SITE SOILS THAT IS CRUCIAL TO ESTIMATING THE COST OF THE WORK AND PREPARING THEIR BIDS.

1.13 CONSTRUCTION SURVEYING AND STAKING – THE CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION SURVEYING AND STAKING REQUIRED FOR COMPLETION OF THE WORK CALLED FOR IN THESE DRAWINGS. COPIES OF THE SURVEYOR'S NOTES AND CUT SHEETS SHALL BE PROVIDED TO THE ENGINEER. NO LESS THAN TWO BENCH MARKS SHALL BE REFERENCED FOR ALL SEGMENTS OF THE WORK. THE CENTERLINE OF ROADWAYS SHALL BE STAKED BEFORE COMMENCEMENT OF CONTRACTOR'S WORK. SAID CENTERLINES SHALL BE MAINTAINED DURING THE COURSE OF THE WORK.

2. ROADWAY AND DRAINAGE SYSTEMS SPECIFICATIONS

2.01 EARTHWORK AND GRADING – ALL EARTHWORK AND GRADING REQUIRED TO BRING THE PROJECT ROADWAYS, DITCHES AND EMBANKMENTS TO THE LINES AND GRADES SHOWN OR CALLED FOR IN THESE DRAWINGS SHALL CONFORM TO THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS, THOSE OTHER SECTIONS THEREIN REFERENCED AND THESE SPECIAL PROVISIONS.

A. DUST CONTROL: 10-1.01 THRU 10-1.04.

B. CLEARING AND GRUBBING: 16-1.01 THRU 16-1.06.

C. WATERING: 17-1.01 THRU 17-1.04.

D. EARTHWORK: 19-1.01 THRU 19-7.05, WITH THE FOLLOWING EXCEPTIONS. SUBGRADE FOR AGGREGATE BASE SHALL BE COMPACTED TO A RELATIVE COMPACTION OF NO LESS THAN 95 PERCENT; THE RELATIVE COMPACTION OF EMBANKMENT MATERIAL SHALL BE NO LESS THAN 90 PERCENT.

E. FINISHING ROADWAY: 22-1.01 THRU 22-1.03.

F. COMPACTION TESTING: TESTING OF EMBANKMENT CONSTRUCTION FOR DENSITY SHALL BE NO LESS OFTEN THAN ONCE IN THE GROUND SURFACE AND ONCE FOR EACH 8 INCHES OF DEPTH AND 3000 SQ. FT. OF SURFACE AREA. FAILING TESTS SHALL BE RETESTED AFTER RECOMPACTION. RETESTING SHALL INCLUDE TWO (2) ADDITIONAL TESTS, ONE EACH LOCATED 50 FT. BOTH WAYS FROM THE FAILING TEST LOCATION, MEASURED IN THE DIRECTION OF EQUIPMENT TRAVEL, UNTIL ALL TESTING SHOWS CONFORMING DENSITIES.

WHERE EMBANKMENTS ARE CONSTRUCTED UPON EXISTING GROUND SURFACE, THE EXISTING EARTH SURFACE SHALL BE BLADED TO A DEPTH OF NO LESS THAN 2 INCHES TO REMOVE NATIVE WEED COVER, WETTED AND THEN COMPACTED TO A DEPTH OF NO LESS THAN 12 INCHES TO A DENSITY OF NO LESS THAN 90 PERCENT. WHERE UNSTABLE AREAS ARE INDICATED BY SOIL PUMPING UNDER EQUIPMENT LOADS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE WHETHER OR NOT STABILIZATION WILL BE REQUIRED.

THE EXISTING NATIVE SOILS INCLUDE SOME CLAY THAT WHEN ENCOUNTERED WHICH MAY REQUIRE SPECIAL TREATMENT WHEN OCCURRING WITHIN THE LIMITS OF THE PAVED ROADWAYS. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY WHEN SUCH A SOIL IS ENCOUNTERED.

2.02 DRAINAGE SYSTEM FACILITIES – CONSTRUCTION OF DRAINAGE FACILITIES, EXCEPT FOR DITCHES WHICH ARE COVERED UNDER SECTION 7.03, EARTHWORK AND GRADING, SHOWN OR CALLED FOR IN THESE DRAWINGS, SHALL CONFORM TO THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS, THOSE OTHER SECTIONS THEREIN REFERENCED AND THESE SPECIAL PROVISIONS.

A. PLASTIC PIPE: 64-1.01 THRU 64-1.08. PLASTIC PIPE SHALL BE RIBBED POLYVINYL CHLORIDE DRAIN PIPE WITH GASKETED, BELL AND SPIGOT JOINTS (PERMA-LOC OR AN APPROVED EQUAL. THIS PIPE MUST COMPLY WITH CURRENT COUNTY STANDARDS OF SCHEDULE 40 PVC THICKNESS SDR VALUES) PROVIDING THE SAME FLEXIBILITY AND WATERTIGHTNESS CALLED FOR IN SECTIONS 65-1.08 AND 65-1.08 FOR REINFORCED CONCRETE SIPHON AND PRESSURE PIPE.

B. REINFORCED CONCRETE PIPE: 65-1.01 THRU 65-1.10. ALL JOINTS SHALL BE RUBBER GASKETED AND ALL PIPE SHALL BE INSTALLED TO MEET THE FLEXIBILITY AND WATERTIGHTNESS REQUIREMENTS SET OUT FOR SIPHON AND PRESSURE PIPE.

C. MISCELLANEOUS FACILITIES: 51-1.01 THRU 51-1.23; 53-1.01 THRU 53-1.08; AND, 70-1.01 THRU 70-1.04, WITH THE FOLLOWING EXCEPTIONS. PAYMENT FOR ALL EARTHWORK, FORMWORK, CONCRETE, REINFORCING AND MISCELLANEOUS IRON AND STEEL REQUIRED TO CONSTRUCT INLETS, JUNCTION BOXES AND SIMILAR STRUCTURES, SHALL BE CONSIDERED INCLUDED IN THE PRICES PAID FOR EACH SUCH STRUCTURE; AND, ALL CONCRETE INCORPORATED INTO SUCH STRUCTURES SHALL CONTAIN NO LESS THAN 5.5 SACKS OF TYPE V PORTLAND CEMENT PER CUBIC YARD, SHALL CONTAIN 4% (1% OF ENTRAINED AIR, SHALL REACH A 28 DAY COMPRESSIVE STRENGTH OF NO LESS THAN 4000 PSI AND SHALL HAVE A WATER CEMENT RATIO NOT EXCEEDING 0.50 BY WEIGHT.

D. PIPE BEDDING AND BACKFILL: GRANULAR MATERIAL FOR PIPE BEDDING AND PIPE ZONE BACKFILL TO NO LESS THAN 12 INCHES ABOVE TOP OF PIPE, SHALL CONSIST OF 3/4" MAXIMUM, CLASS 2 AGGREGATE BASE CONFORMING TO SECTION 26-1.02 OF THE STANDARD SPECIFICATIONS, COMPACTED TO A RELATIVE DENSITY OF NO LESS THAN 95% OF MAXIMUM. THE REQUIREMENT FOR A MINIMUM R-VALUE WILL BE WAIVED WHEN THE MATERIAL HAS A SAND EQUIVALENT OF NO LESS THAN 35.

E. COMPACTION TESTING: TESTING OF TRENCH BACKFILL FOR DENSITY SHALL BE NO LESS OFTEN THAN ONCE IN THE PIPE ZONE AND ONCE FOR EACH 9 INCHES OF DEPTH AT SPACINGS NOT TO EXCEED 150 FT. FAILING TESTINGS SHALL BE RETESTED AFTER RECOMPACTION. RETESTING SHALL INCLUDE TWO ADDITIONAL TESTS, ONE EACH LOCATED 50 FT. BOTH WAYS FROM THE FAILED TEST LOCATION UNTIL ALL TESTS SHOW CONFORMING DENSITIES.

2.03 CURBS, GUTTERS AND SIDEWALKS – CURBS, GUTTERS, RAMPS AND WALKS CALLED FOR BY THESE DRAWINGS SHALL CONFORM TO THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS, THOSE OTHER SECTIONS THEREIN REFERENCE AND THESE SPECIAL PROVISIONS.

A. CONCRETE CURBS AND SIDEWALKS. 73-1.01 THRU 73-1.08, WITH THE FOLLOWING EXCEPTIONS AND MODIFICATIONS. ALL CONCRETE SHALL CONTAIN NO LESS THAN 6-1/2 SACKS OF TYPE V, PORTLAND CEMENT PER CUBIC YARD, SHALL CONTAIN 4% (1% OF ENTRAINED AIR, SHALL REACH A 28-DAY COMPRESSIVE STRENGTH OF NO LESS THAN 4500 PSI, SHALL HAVE A WATER-CEMENT RATIO NOT EXCEEDING 0.45 BY WEIGHT AND SHALL BE TRANSIT-MIXED. NO SLIP-FORMED OR EXTRUDED CURBING WILL BE ALLOWED.

B. SEALED JOINTS: 51-1.12F.

C. CONCRETE TESTING: THE ENGINEER WILL CHECK SLUMP, COLLECT LOAD TICKETS AND OBSERVE THE GENERAL CONDITION OF ALL CONCRETE BEING PLACED. THE CONTRACTOR SHALL PROVIDE TESTING TO DETERMINE THE AMOUNT OF ENTRAINED AIR AND SAMPLING REQUIRED FOR TESTING COMPRESSIVE STRENGTH AT 7-DAYS AND 28-DAYS AND HAVING AT LEAST ONE (1) SPARE SAMPLE.

2.04 PAVING BASE AND SURFACING – AGGREGATE BASE AND ASPHALT CONCRETE INCORPORATED INTO THE STREET AND ROADWAY PAVING CALLED FOR IN THESE DRAWINGS SHALL CONFORM TO THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS, THOSE OTHER SECTIONS THEREIN REFERENCED AND THESE SPECIAL PROVISIONS.

A. AGGREGATE BASE: 26-1.01 THRU 26-1.07. AGGREGATE BASE SHALL BE 1-1/2 MAXIMUM, CLASS 2 MATERIAL. NO RECYCLED MATERIALS WILL BE ALLOWED.

B. ASPHALT CONCRETE: 39-1.01 THRU 39-8.03. ASPHALT CONCRETE SHALL BE 3/4" MAXIMUM (MEDIUM), TYPE "B", PLANT MIXED MATERIAL, CONTAINING NO LESS THAN 4.8 PERCENT BY WEIGHT OF AR 4000 PAVING ASPHALT BINDER AND SHALL BE COMPACTED IN PLACE TO A DENSITY OF NO LESS THAN 140 POUNDS PER CUBIC FOOT.

C. COMPACTION TESTING: SUBGRADE FOR AGGREGATE BASE, AGGREGATE BASE AND ASPHALT SHALL BE TESTED FOR DENSITY NO LESS OFTEN THAN ONCE FOR EACH 3000 SQ. FT. OF SURFACE AREA. FAILING TESTS SHALL BE RETESTED AFTER RE-COMPACTION. RETESTING SHALL INCLUDE TWO ADDITIONAL TESTS, ONE EACH LOCATED 50 FT. BOTH WAYS FROM THE FAILING TEST LOCATION UNTIL ALL TESTING SHOWS CONFORMING DENSITIES.

2.05 TRAFFIC CONTROL FACILITIES – TRAFFIC CONTROL FACILITIES, INCLUDING BUT NOT LIMITED TO SIGNS, STRIPING, MARKING, MARKERS AND RAILINGS, SHOWN OR CALLED FOR IN THESE DRAWINGS TO BE PERMANENTLY INSTALLED AS A PART OF THE COMPLETED IMPROVEMENTS, SHALL CONFORM TO THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS, THOSE OTHER SECTIONS THEREIN REFERENCED AND THESE SPECIAL PROVISIONS.

A. MARKERS AND DELINEATORS: 82-1.01 THRU 82-1.06. FLEXIBLE POST DELINEATORS SHALL BE EQUAL TO THOSE MANUFACTURED BY SAFE-HIT CORPORATION AS A FLATTENED TOP GUIDE POST WITH 3"x 8" REFLECTIVE STRIP IN WHITE OR YELLOW AS DIRECTED BY THE ENGINEER.

B. RAILINGS AND BARRIERS: 83-1.01 THRU 83-2.04.

C. TRAFFIC STRIPES AND PAVEMENT MARKINGS: 84-1.01 THRU 84-3.07. TRAFFIC STRIPES AND PAVEMENT MARKINGS SHALL BE PAINTED.

D. PAVEMENT MARKERS: 85-1.01 THRU 85-1.08.

E. ROADSIDE SIGNS: 56-2.01 THRU 56-2.08. STREET NAME SIGN SIZES, COLORS AND DESIGNS SHALL BE AS IS STANDARD WITH THE COUNTY OF IMPERIAL.

3. GENERAL REQUIREMENTS FOR DRAINAGE IMPROVEMENTS

1 ALL DRAINAGE DESIGN AND REQUIREMENTS ARE RECOMMENDED TO BE IN ACCORDANCE WITH THE IMPERIAL IRRIGATION DISTRICT (IID) "DRAFT" HYDROLOGY MANUAL OR OTHER RECOGNIZED SOURCE WITH APPROVAL BY THE COUNTY ENGINEER AND BASED ON FULL DEVELOPMENT OF UPSTREAM TRIBUTARY BASINS. ANOTHER SOURCE IS THE CALTRANS I-D-F CURVES FOR THE IMPERIAL VALLEY.

2 PUBLIC DRAINAGE FACILITIES SHALL BE DESIGNED TO CARRY THE TEN-YEAR SIX-HOUR STORM UNDERGROUND, THE 25-YEAR STORM BETWEEN THE TOP OF CURBS PROVIDED TWO 12' MINIMUM WIDTH DRY LANES EXIST AND THE 100-YEAR FREQUENCY STORM BETWEEN THE RIGHT OF WAY LINES WITH AT LEAST ONE 12' MINIMUM DRY LANE OPEN TO TRAFFIC. ALL CULVERTS SHALL BE DESIGNED TO ACCOMMODATE THE FLOW FROM A 100-YEAR FREQUENCY STORM.

3 PERMANENT DRAINAGE FACILITIES AND RIGHT OF WAY, INCLUDING ACCESS, SHALL BE PROVIDED FROM DEVELOPMENT TO POINT OF SATISFACTORY DISPOSAL.

4 RETENTION VOLUME ON RETENTION OR DETENTION BASINS SHOULD HAVE A TOTAL VOLUME CAPACITY FOR A THREE (3) INCH MINIMUM PRECIPITATION COVERING THE ENTIRE SITE WITH NO C REDUCTION FACTORS. VOLUME CAN BE CONSIDERED BY A COMBINATION OF BASIN SIZE AND VOLUME CONSIDERED WITHIN PARKING AND/OR LANDSCAPING AREAS.

THERE IS NO GUARANTEE THAT A DETENTION BASIN OUTLETTING TO AN IID FACILITY OR OTHER STORM DRAIN SYSTEM WILL NOT BACK UP SHOULD THE FACILITY BE FULL AND UNABLE TO ACCEPT THE PROJECT RUNOFF. THIS PROVIDES THE SAFETY FACTOR FROM FLOODING BY ENSURING EACH DEVELOPMENT CAN HANDLE A MINIMUM 3-INCH PRECIPITATION OVER THE PROJECT SITE.

5 RETENTION BASINS SHOULD EMPTY WITHIN 72 HOURS AND NO SOONER THAN 24 HOURS IN ORDER TO PROVIDE MOSQUITO ABATEMENT. DRAINING, EVAPORATION OR INFILTRATION, OR ANY COMBINATION THEREOF CAN ACCOMPLISH THIS. IF THIS IS NOT POSSIBLE THEN THE OWNER SHOULD BE MADE AWARE OF A POTENTIAL NEED TO ADDRESS MOSQUITO ABATEMENT TO THE SATISFACTION OF THE ENVIRONMENTAL HEALTH SERVICES (EHS) DEPARTMENT. ADDITIONALLY, IF IT IS NOT POSSIBLE TO EMPTY THE BASIN WITHIN 72 HOURS, THE BASIN SHOULD BE DESIGNED FOR 5 INCHES, NOT 3 INCHES AS MENTIONED IN ITEM #4 ABOVE. THIS WOULD ALLOW FOR A SATURATION CONDITION OF THE SOIL DUE TO A 5" STORM TRACK. EHS MUST REVIEW AND APPROVE ALL RETENTION BASIN DESIGNS PRIOR TO COUNTY PUBLIC WORKS APPROVAL. NUISANCE WATER MUST NOT BE ALLOWED TO ACCUMULATE IN RETENTION BASINS. EHS MAY REQUIRE A NUISANCE WATER ABATEMENT PLAN IF THIS OCCURS.

6. THE MINIMUM FINISH FLOOR ELEVATION SHALL BE 12" ABOVE TOP OF FRONTING STREET CURB UNLESS PROPERTY IS BELOW STREET LEVEL AND/OR 8" ABOVE THE 100-YEAR FREQUENCY STORM EVENT OR STORM TRACK. A LOCAL ENGINEERING PRACTICE IS TO USE A 5" PRECIPITATION EVENT AS A STORM TRACK IN THE ABSENCE OF DETAILED FLOOD INFORMATION.

THE 100-YEAR FREQUENCY STORM WOULD BE REQUIRED FOR DETENTION CALCULATIONS.

7 FINISH PAD ELEVATIONS SHOULD BE INDICATED ON THE PLANS, WHICH ARE AT OR ABOVE THE 100-YEAR FREQUENCY FLOOD ELEVATION IDENTIFIED BY THE ENGINEER FOR THE PARCEL. FINISH FLOOR ELEVATIONS SHOULD BE SET AT LEAST 8 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION.

8. THE DEVELOPER SHALL SUBMIT A DRAINAGE STUDY AND SPECIFICATIONS FOR IMPROVEMENTS OF ALL DRAINAGE EASEMENTS, CULVERTS, DRAINAGE STRUCTURES, AND DRAINAGE CHANNELS TO THE DEPARTMENT OF PUBLIC WORKS FOR APPROVAL. UNLESS SPECIFICALLY WAIVED HEREIN, REQUIRED PLANS AND SPECIFICATIONS SHALL PROVIDE A DRAINAGE SYSTEM CAPABLE OF HANDLING AND DISPOSING OF ALL SURFACE WATERS ORIGINATING WITHIN THE SUBDIVISION AND ALL SURFACE WATERS THAT MAY FLOW ONTO THE SUBDIVISION FROM ADJACENT LANDS. SAID DRAINAGE SYSTEM SHALL INCLUDE ANY EASEMENTS AND

STRUCTURES REQUIRED BY THE DEPARTMENT OF PUBLIC WORKS OR THE AFFECTED UTILITY AGENCY TO PROPERLY HANDLE THE DRAINAGE ON-SITE AND OFF-SITE. THE REPORT SHOULD DETAIL ANY VEGETATION AND TRASH/DEBRIS REMOVAL AS WELL AS ADDRESS ANY STANDING WATER.

9 HYDROLOGY AND HYDRAULIC CALCULATIONS FOR DETERMINING THE STORM SYSTEM DESIGN SHALL BE PROVIDED TO THE SATISFACTION OF THE DIRECTOR, DEPARTMENT OF PUBLIC WORKS. WHEN APPROPRIATE, WATER SURFACE PROFILES AND ADEQUATE FIELD SURVEY CROSS-SECTION DATA MAY ALSO BE REQUIRED.

10 AN APPROVED OR SCREENED OIL/WATER SEPARATOR OR EQUIVALENT IS REQUIRED PRIOR TO PERMITTING ONSITE LOT DRAINAGE FROM ENTERING ANY STREET RIGHT OF WAY OR PUBLIC STORM DRAIN SYSTEM FOR ALL INDUSTRIAL/COMMERCIAL OR MULTI RESIDENTIAL USES. A MAXIMUM 8" DRAIN LATERAL CAN BE USED TO TIE INTO EXISTING ADJACENT STREET CURB INLETS WITH SOME EXCEPTIONS. APPROVAL FROM THE DIRECTOR OF PUBLIC WORKS IS REQUIRED.

11 THE COUNTY IS IMPLEMENTING A STORM WATER QUALITY PROGRAM AS REQUIRED BY THE STATE WATER RESOURCES CONTROL BOARD, WHICH MAY MODIFY OR ADD TO THE REQUIREMENTS AND GUIDELINES PRESENTED ELSEWHERE IN THIS DOCUMENT.
THIS CAN INCLUDE ONGOING MONITORING OF WATER QUALITY OF STORM DRAIN RUNOFF, IMPLEMENTATION OF BEST MANAGEMENT PRACTICES (BMPS) TO REDUCE STORM WATER QUALITY IMPACTS DOWNSTREAM OR ALONG ADJACENT PROPERTIES. ATTENTION IS DIRECTED TO THE NEED TO REDUCE ANY POTENTIAL OF VECTORS, MOSQUITOS OR STANDING WATER.

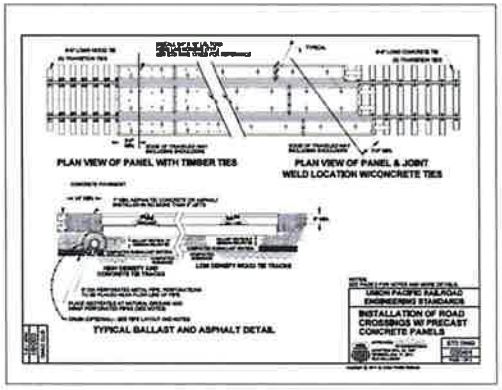
12 A DRAINAGE REPORT IS REQUIRED FOR ALL DEVELOPMENTS IN THE COUNTY. IT SHALL INCLUDE A PROJECT DESCRIPTION, PROJECT SETTING INCLUDING DISCUSSIONS OF EXISTING AND PROPOSED CONDITIONS, ANY DRAINAGE ISSUES RELATED TO THE SITE, SUMMARY OF THE FINDINGS OR CONCLUSIONS, OFFSITE HYDROLOGY, ONSITE HYDROLOGY, HYDRAULIC CALCULATIONS AND A HYDROLOGY MAP.

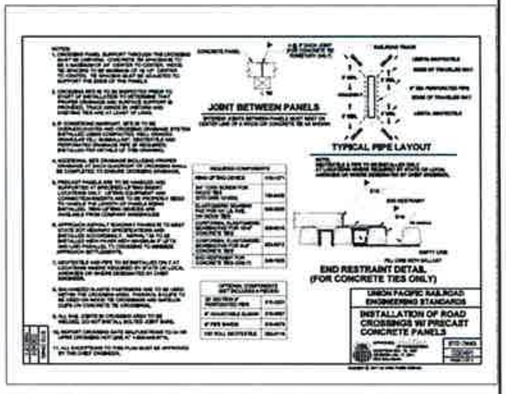
13 SPECIFIC TO SMALL PARCEL MAP DEVELOPMENTS:

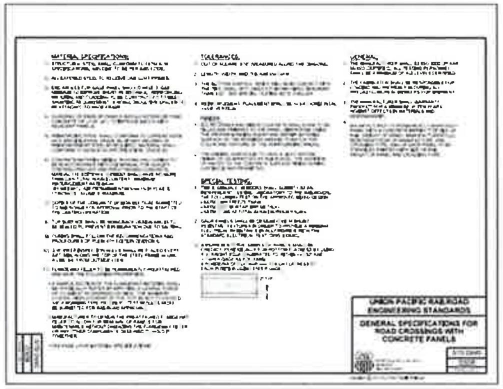
A. FOR INDIVIDUAL LOTS, SUFFICIENT STORAGE VOLUME MUST BE AVAILABLE ON A PORTION OF THE PROPOSED PARCEL TO ACCOMMODATE A THREE (3) INCH PRECIPITATION MINIMUM COVERING THE ENTIRE AREA. THE RESULTING STORAGE VOLUME SHOULD BE ACCOMMODATED IN A SINGLE RETENTION BASIN. HOWEVER, THIS OFFICE WILL CONSIDER A COMBINATION OF RETENTION BASINS AND ON-LOT STORAGE.
B. REMAINING PORTIONS OF THE PARCEL OR AGRICULTURAL PARCELS THAT ARE NOT BEING DEVELOPED SHOULD ALSO PROVIDE FOR ONSITE RETENTION OR ASSURANCES THAT THE RESULTING STORM RUNOFF WILL NOT IMPACT ADJACENT PARCELS.
C. FINISH PAD ELEVATIONS SHOULD BE INDICATED ON THE PLANS, WHICH ARE AT OR ABOVE THE 100-YEAR FREQUENCY FLOOD ELEVATION IDENTIFIED BY THE ENGINEER FOR THE PARCEL. FINISH FLOOR ELEVATIONS SHOULD BE SET AT LEAST 8 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION.
D. ONSITE DRIVEWAYS SHOULD BE DESIGNED AND CONSTRUCTED SUCH THAT THEY ARE AT LEAST 3 INCHES ABOVE THE 100-YEAR FREQUENCY FLOOD ELEVATION IDENTIFIED FOR THE PARCEL.
E. SEPTIC SYSTEM MANHOLE ACCESS, WATER SYSTEMS AND OTHER ASSOCIATED ELECTRICAL APPURTENANCES SHOULD ALSO HAVE FINISH ELEVATIONS INDICATED ON THE PLANS THAT ARE AT LEAST 8" ABOVE THE 100 YEAR FREQUENCY FLOOD ELEVATION IDENTIFIED FOR THE PARCEL.
F. RETENTION BASINS SHOULD EMPTY WITHIN 72 HOURS IN ORDER TO PROVIDE MOSQUITO ABATEMENT. THIS CAN BE ACCOMPLISHED BY EITHER DRAINING, EVAPORATION OR INFILTRATION, OR ANY COMBINATION THEREOF. IF THIS IS NOT POSSIBLE, THEN THE OWNER SHOULD BE MADE AWARE OF A POTENTIAL NEED TO ADDRESS MOSQUITO ABATEMENT TO THE SATISFACTION OF THE ENVIRONMENTAL HEALTH SERVICES DEPARTMENT. ADDITIONALLY, IF IT IS NOT POSSIBLE TO EMPTY THE BASIN WITHIN 72 HOURS, THE BASIN SHOULD BE DESIGNED FOR 5 INCHES, NOT 3 INCHES AS MENTIONED IN ITEM #4 ABOVE. THIS WOULD ALLOW FOR A SATURATION CONDITION OF THE SOIL DUE TO A 5" STORM TRACK.

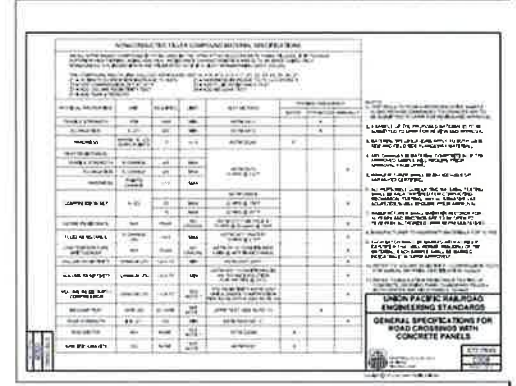
DETENTION BASIN DESIGN AND MAINTENANCE GUIDELINE NOTE:

THE IMPERIAL COUNTY DIVISION OF ENVIRONMENTAL HEALTH SERVICES VECTOR CONTROL PROGRAM IS RESPONSIBLE FOR VECTOR AND MOSQUITO CONTROL THROUGH A VARIETY OF MEANS. POORLY DESIGNED AND ILL-MAINTAINED DETENTION BASINS ARE CAPABLE OF BREEDING LARGE NUMBERS OF VECTORS OR MOSQUITOES AND OFFER EXCELLENT HARBORAGE FOR ADULT MOSQUITOES FROM OTHER SOURCES. BECAUSE DETENTION BASINS ARE OFTEN SITUATED IN RESIDENTIAL NEIGHBORHOODS AND OTHER POPULATED AREAS, THEY PRESENT A SIGNIFICANT HEALTH RISK AND POSE A CHALLENGING PESTICIDE APPLICATION SITUATION. THE CALIFORNIA HEALTH AND SAFETY CODES PROVIDE FOR PUBLIC NUISANCE ABATEMENT AND PREVENTION. EHS HAS GUIDELINES AVAILABLE AND THEY WILL REVIEW ALL STORM RETENTION BASIN SYSTEMS PRIOR TO PUBLIC WORKS APPROVAL.









UNDERGROUND SERVICE ALERT
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1	PER PLAN CHECK PER LETTER DATED AUG 29 2018	STAFF	9/10/18
2	PER PLAN CHECK PER LETTER DATED OCT 19 2018	STAFF	10/26/18

COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT
APPROVED FOR CONSTRUCTION BY:
BY: ______________ DATE: ______
JOHN A. GAY, P.E.
DIRECTOR OF PUBLIC WORKS
R.C.E. NO.: 82028

SEAL
JOHN GAY
R.C.E. 82028

ENGINEER OF RECORD
PLANS PREPARED UNDER THE SUPERVISION OF
BY: ______________ DATE: ______
CARLOS CORRALES
R.C.E. NO.: 55432

SEAL
CARLOS CORRALES
No. 55432

LC ENGINEERING CONSULTANTS INC.
1063 State Street
El Centro CA 92243

DATE 11/05/18
BENCHMARK: SEE SHEET NO. 1

SPECIFICATIONS
ALL AMERICAN GRAIN
CONTAINER YARD & SPUR LOADING
IMPERIAL COUNTY
ALL AMERICAN GRAIN
W.O.

SHEET 4 OF 5 SHEETS
JOB NO. C18046-00

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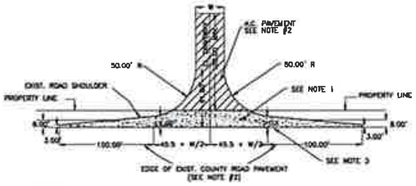
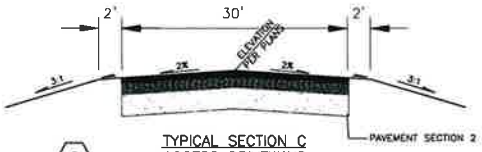


NOTES:

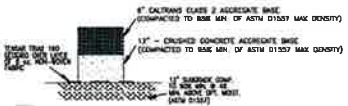
1. DRIVEWAY IN COUNTY ROAD RIGHT OF WAY SHALL BE 4" ASPHALT CONCRETE OVER 12" OF CLASS 2 AGGREGATE BASE MINIMUM SEE COUNTY STANDARD DRAWINGS 440
2. DRIVEWAY ONSITE SHALL BE PAVED A MINIMUM OF 100 FEET INSIDE THE PROPERTY LINE. THE 4" ASPHALT CONCRETE OVER 14" CLASS 2 AGGREGATE BASE SECTION IS RECOMMENDED
3. SAWCUT AND REMOVE EXISTING PAVEMENT 12" MINIMUM
4. ROAD BORROW PIT DRAINAGE SHALL BE ACCOMODATED VIA 12" MIN. PIPE SIPHON, DIP SECTION OR CONCRETE GUTTER AS DIRECTED BY COUNTY PUBLIC WORKS DIRECTOR.
5. THIS DETAIL IS A MINIMUM PROJECT CONDITIONS OF APPROVAL OR ENCROACHMENT PERMIT MAY REQUIRED MORE SUBSTANTIAL IMPROVEMENTS SUCH AS TURN LANES, CURB, GUTTER AND SIDEWALK

① DETAIL OF COMMERCIAL DRIVEWAY TO COUNTY RURAL ROAD CONNECTION

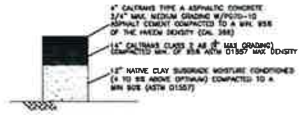
MODIFIED COUNTY OF IMPERIAL STD. DET # 4108



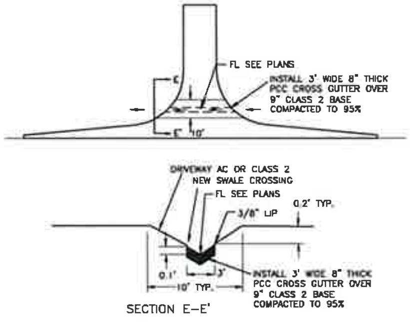
② TYPICAL SECTION C ACCESS DRIVEWAYS



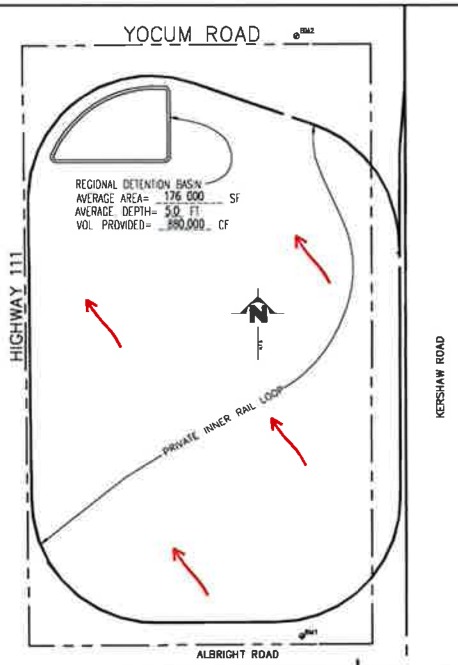
③ PAVEMENT SECTION 1 CONTAINER YARD

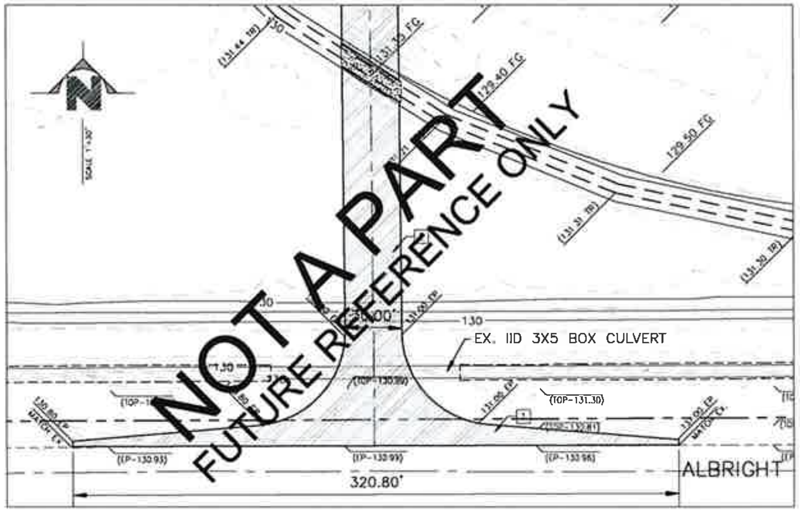


PAVEMENT SECTION 2 ALL WEATHER ACCESS DRIVEWAYS



⑤ DRIVEWAY SWALE CROSSING

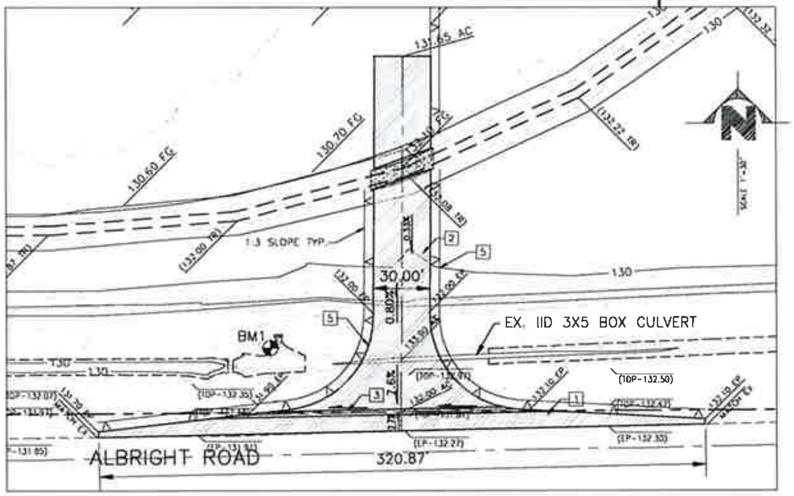




DETAIL PHASE 2 DRIVEWAY

GRADING CONSTRUCTION NOTES:

- [1] INSTALL COMMERCIAL DRIVEWAY PER COUNTY OF IMPERIAL STD. DETAIL 4108 SEE DET 5/5
- [2] INSTALL 30' WIDE DRIVEWAY ACCESS SEE DETAIL 5/5
- [3] INSTALL DRIVEWAY SWALE CROSSING SEE DETAIL 5/5
- [5] INSTALL NATIVE SHOULDER COMPACTED TO 80% OF MAXIMUM DENSITY PER ASTM D-1557



DETAIL PHASE 1 DRIVEWAY

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2	PER PLAN CHECK PER LETTER DATED OCT 19 2018	STAFF	10/26/18

COUNTY OF IMPERIAL PUBLIC WORKS DEPARTMENT
APPROVED FOR CONSTRUCTION BY:
BY: ______________ DATE: ________
JOHN A. GAY, P.E.
DIRECTOR OF PUBLIC WORKS
R.C.E. NO.: 62028

SEAL
R.C.E. 62028
EXP. 9-30-19

ENGINEER OF RECORD
PLANS PREPARED UNDER THE SUPERVISION OF
BY: ______________ DATE: ________
CARLOS CORRALES
R.C.E. NO.: 55432

SEAL
CARLOS CORRALES
No. 55432
EXP. 12-31-19

LC ENGINEERING CONSULTANTS INC.
1065 State Street
El Centro CA 92243

DATE 11/05/18
BENCHMARK: SEE SHEET NO. 1

DETAIL SHEET
ALL AMERICAN GRAIN CONTAINER YARD & SPUR LOADING IMPERIAL COUNTY
ALL AMERICAN GRAIN
W.O.

SHEET 5 OF 5 SHEETS
JOB NO. C18046-00

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UltraSystems
environmental•management•planning

MEMO

TO: Matthew Harmon

FROM: Michael Rogozen

COPY TO:

DATE: Tuesday, November 13, 2018

CONTRACT #: UltraSystems Project No. 6084

RE: Comparison of Criteria Pollutant Emissions from Truck and Train Transport of Agricultural Products from All American Grain in Calipatria to Riverside County Line

1.0 INTRODUCTION

The Imperial County Air Pollution Control District (ICAPCD) has asked All American Grain to compare criteria air pollutant emissions from truck transport of agricultural commodities from its Calipatria facility to Riverside County with those from use of trains for the same mass of transport.[1] This memorandum presents the results of that analysis.

2.0 METHODS

2.1 Definition of Travel Scenario

Per instructions by the ICAPCD, calculations were to be based upon the distance from the Calipatria facility to the southern boundary of Riverside County. It was assumed that trucks would follow State Route 111 (SR-111), which borders the facility on the west, to the county line, which is north of Bombay Beach, CA. The Union Pacific main line follows approximately the same route. The one-way distance from Calipatria to Riverside County is 35 miles for both trucks and trains.

According to All American Grain,[2] 247 truckloads are required to transport the same mass of agricultural produce as the 210 containers on one unit train. Other assumptions are presented in **Tables 1** and **2**. More information on the analysis and results is in **Attachment 1**.

---

[1] Email from Matthew Harmon, DuBose Design Group, El Centro, CA to Michael Rogozen, UltraSystems Environmental Inc., Irvine, CA. October 9, 2011.

[2] Email from Padraig Lawlor, All American Grain, Calipatria, CA to Matthew Harmon, DuBose Design Group, El Centro, CA and Michael Rogozen, UltraSystems Environmental Inc., Irvine, CA. October 27, 2018.

Table 1
TRUCKING ASSUMPTIONS

Parameter	Value
Number of trucks per day	247
Containers per truck	1
Engine type (per EMFAC2014)	T6 In-State Small
One-way travel distance	35 miles
Trips per day	2

The "T6 In-State Small" truck category consists of heavy-duty diesel trucks of the size and capacity to haul containers, as defined in the California Air Resources Board's (ARB's) EMFAC2014 mobile source emission factor database.[3] This analysis used a subset of the truck category consisting of all such trucks in Imperial County in 2018.

Table 2
UNIT TRAIN ASSUMPTIONS

Parameter	Value
Number of trains per day	1
Number of locomotives per train	2
Locomotive type	Diesel-electric
Number of well cars per train	105
Containers per well car	2
Travel distance	35 miles
Travel time	0.583 hour

Use of GM SD70M locomotives was assumed, although newer, "cleaner" locomotives are in active service, and many older locomotives have been retrofitted with emission controls.

2.2 Emission Calculation Methods

2.2.1 Trucks

Criteria pollutant emission factors for trucks were obtained from the ARB's EMFAC2014 Web Database for Imperial County for calendar year 2018. These are listed in **Table 3**.

Table 3
2018 TRUCK EMISSION FACTORS

Pollutant	Emission Factor (grams/mile)
Reactive organic gases (ROG)	0.1776
Carbon monoxide (CO)	0.6561
Nitrogen oxides (NO_x)	3.7393
Respirable particulate matter (PM_{10})	0.3107
Fine particulate matter ($PM_{2.5}$)	0.2199

---

[3] EMFAC2014 (v1.0.7) Web Database. California Air Resources Board. (https://www.arb.ca.gov/emfac/2014/). Accessed September 2018.

Truck miles traveled per day were multiplied by the emission factors in **Table 3** to obtain daily emission values.

2.2.2 Locomotives

Emission factors for locomotives were derived from a U.S. Environmental Protection Agency (USEPA) regulatory support document for locomotive emission standards.[4] Train emissions for one day were calculated for both container loading at the Calipatria facility and for main line travel to the Riverside County line. It was assumed that trains would spend five hours per day at the All American Grain facility (with two locomotive engines running), alternating between idling and "notch 1"[5] for moving slowly to a new position on the facility's internal "racetrack."[6] For the line haul phase of the trip, the emission factors represent a time-weighted average over all the notches except idling. Locomotive emission factors used in the analysis are shown in **Table 4**.

Table 4
LOCOMOTIVE EMISSION FACTORS

Pollutant	Emission Factor (pounds per hour)			
	Loading			Line Haul
	Idle	Notch 1	Composite	
Reactive organic gases (ROG)	0.205	0.041	0.129	1.128
Carbon monoxide (CO)	0.310	0.058	0.235	3.058
Nitrogen oxides (NO_x)	1.434	0.377	1.117	24.267
Respirable particulate matter (PM_{10})	0.042	0.007	0.031	0.618
Fine particulate matter ($PM_{2.5}$)	0.038	0.006	0.029	0.569

3.0 RESULTS

Table 5 summarizes the results of the emissions calculations. The values in the rightmost column are emissions that will be avoided by shipping commodities by train rather than by truck.

Table 5
CALCULATION RESULTS

Pollutant	Emissions for Travel from Project to Riverside County (pounds per day)		
	Truck	Train	Train - Truck
ROG	6.8	3.4	-3.4
CO	25.0	5.8	-19.2
NO_x	142.4	38.9	-103.5
PM_{10}	11.8	1.0	-10.8
$PM_{2.5}$	8.4	0.9	-7.5

Using the unit trains results in a "savings" of 103.5 pounds per day of NO_x emissions.

---

[4] Locomotive Emissions Standards: Regulatory Support Document. United States Environmental Protection Agency, Office of Mobile Sources. April 1998.

[5] The lowest of eight fixed engine power settings.

[6] Assumed 70% of time at idle and 30% of time at notch 1.

ATTACHMENT 1
ALL AMERICAN GRAIN BENEFITS ANALYSIS

All American Grain Benefits Analysis

Truck Activity Data	**Project to Riverside Co**	**Comments**
# Trucks per Day	247	One-way trip lengths estimated using Google Earth's Path Ruler on Hwy 111 and train tracks north to Riverside Co
Round Trip Length	70	
VMT per day	17,273	

Pollutant	**2018 Truck Emission Factors (g/m)**	**Comments**
ROG	0.1776	Emission factors represent EMFAC T6 - In-state Small category
CO	0.6561	
NO_X	3.7393	
PM_{10}	0.3107	
$PM_{2.5}$	0.2199	

Pollutant	**Project to Riverside Co Emissions (lbs/day)**		
	Replaced Truck Emissions	**Locomotive Emissions**	**Locomotive Minus Truck Emissions**
ROG	6.8	3.4	-3.4
CO	25.0	5.8	-19.2
NO_X	142.4	38.9	-103.5
PM_{10}	11.8	1.0	-10.8
$PM_{2.5}$	8.4	0.9	-7.4

Note: Number of trucks per day represents the number of trucks, that can only carry 20 metric ton containers, the train would be replacing with 210 containers carrying 23.5 metric tons per container.

AIR QUALITY AND GREENHOUSE GAS EMISSIONS STUDY
FOR
ALL AMERICAN GRAIN CONTAINER STORAGE AND TRANSFER FACILITY

Prepared for:

DuBose Design Group
1065 State Street
El Centro, California 92243

Prepared By:

UltraSystems

UltraSystems Environmental
16431 Scientific Way
Irvine, California 92618-4355

Job No. 6084

November 2018

This analysis was prepared in accordance with § 15063(d)(3) and Appendix G of the State CEQA Guidelines to determine the potential significant air quality effects on the physical environment that could result from the implementation of the project.

Report Preparers:

Name & Title: MICHAEL ROGOZEN, Senior Principal Engineer

Signature: __________ Date: November 20, 2018

Name & Title: JOE O'BANNON, Staff Engineer

Signature: __________ Date: November 20, 2018

TABLE OF CONTENTS

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LIST OF FIGURES

ATTACHMENTS

1.0 INTRODUCTION

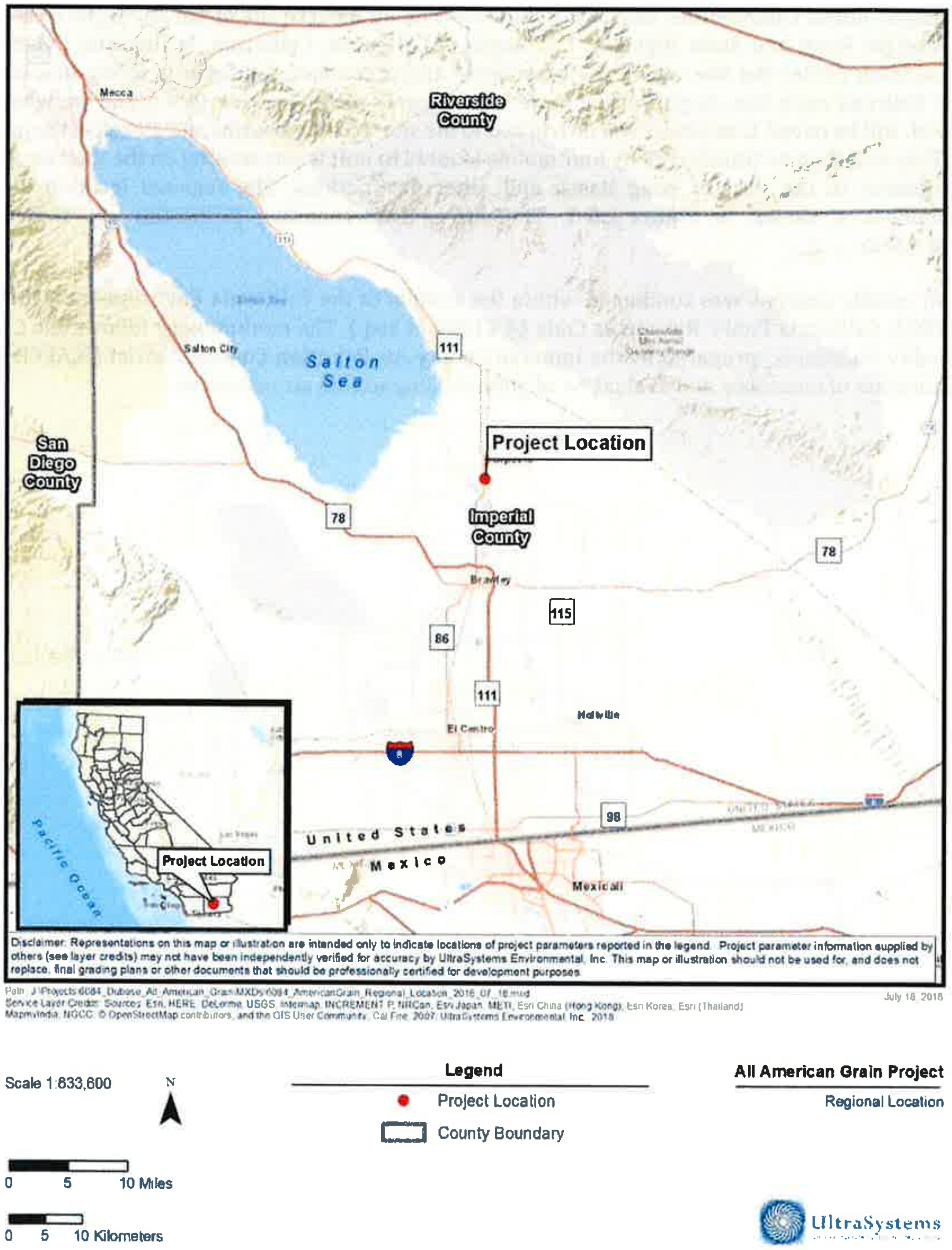
All American Grain Company, the applicant, operates a grain transfer and storage facility for locally grown agricultural commodities shipped in containers on an 89-acre site at the northeast corner of East Albright Road and State Highway 111, south of Calipatria, California, in Imperial County. A railroad track circles the site within the boundaries and is connected through a siding to a Union Pacific Railroad main line. As part of the project, portions of the interior surface of the lot, which is unpaved, will be paved. Containers will be trucked to the site from local farms and stored in the paved area. They will then be transferred by four mobile loaders to unit trains waiting on the interior track for shipment to the Port of Long Beach and other destinations. The regional location of the development is shown in **Figure 1.0-1**. The site and surrounding properties are shown in **Figure 1.0-2**.

This air quality analysis was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code §§ 21000 et seq.). The methodology follows the CEQA Air Quality Handbook[1] prepared by the Imperial County Air Pollution Control District (ICAPCD) for quantification of emissions and evaluation of potential impacts on air resources.

---

[1] CEQA Air Quality Handbook: Guidelines for the Implementation of the California Air Quality Act of 1970 as amended. Imperial County Air Pollution Control District. Final - December 12, 2017.

Figure 1.0-1
REGIONAL LOCATION MAP

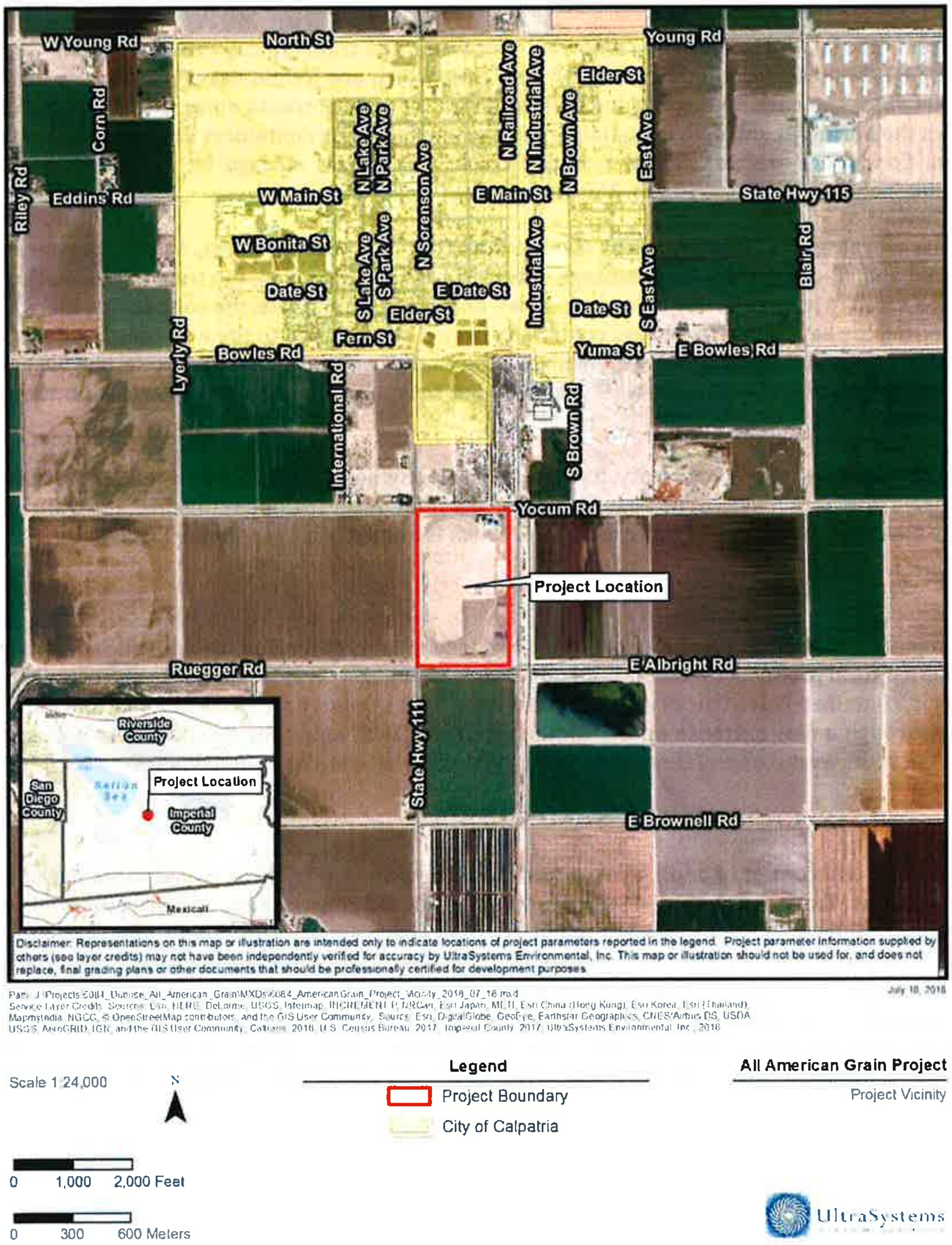


Disclaimer: Representations on this map or illustration are intended only to indicate locations of project parameters reported in the legend. Project parameter information supplied by others (see layer credits) may not have been independently verified for accuracy by UltraSystems Environmental, Inc. This map or illustration should not be used for, and does not replace, final grading plans or other documents that should be professionally certified for development purposes.

Path: J:\Projects\6084_Dubose_All_American_Grain\MXDs\6084_AmericanGrain_Regional_Location_2016_07_18.mxd
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community, Cal Fire 2007, UltraSystems Environmental Inc. 2018

July 18, 2018

Figure 1.0-2
VICINITY MAP



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July 18, 2018

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UltraSystems

2.0 PROJECT DESCRIPTION

2.1 CURRENT OPERATIONS

At present,[2] the facility receives one unit train[3] per week. The train typically consists of two General Motors SD70M diesel locomotives and 105 well cars, which are freight cars that carry one or two stacked containers each. In the evening before the train's arrival, trucks enter the site from Yocum Road on the northeast and deliver containers of hay or alfalfa. The containers are stored on unpaved ground. Containers are transferred between trucks, trains and storage by Hyster RE 46-33CH container loaders with Tier 4 (final), 350-HP engines.

The next morning, the train arrives at about 6 a.m. Over the next six hours, empty containers are offloaded and placed in temporary storage. After ten cars are unloaded, the train moves so that ten new well cars are in position for unloading. When unloading is complete, the container loaders begin transferring the hay- or alfalfa-loaded containers from a storage area to the well cars. Loading takes about two hours. Meanwhile, trucks then take on the empty containers and depart the site via Yocum Road. (Other entry and exit points are available, but they are often blocked by trains on the site's inner track.)

All the time that the train is stationary, its diesel-electric engines are idling. During each repositioning of the train, the train moves at three to four miles per hour. After loading is finished, the train leaves the site and rejoins the Union Pacific main line, which is immediately east of the facility.

2.2 FUTURE OPERATIONS

The project consists of adding a second train each week that is dedicated to exporting containers of local agricultural products to the Port of Long Beach. Operations will be similar to the current ones. However, container-laden trucks will come east from SR-111 onto East Albright Road, and enter the facility through a new entrance on the southeast. Trucks with empty or no containers will exit the site at the southwest corner. About 80 to 100 trucks will visit the site each day.

2.3 CONSTRUCTION ACTIVITIES AND SCHEDULE

Construction will consist of adding two paved driveways and up to three paved container storage pads to the site. **Table 3.3-1** quantifies the extent of proposed construction. The driveways will have two compositions. Where they are in the County road right-of-way, they will be comprised of four inches of Caltrans Type B asphalt concrete over 12 inches of Class 2 aggregate base. For a minimum of 100 feet inside the property line, the driveway will consist of four inches of Caltrans Type B asphalt concrete over 14 inches of Class 2 aggregate base. The container yard pavement will consist of six inches of Caltrans Class 2 aggregate base over 12 inches of crushed recycled concrete, over a mesh, and over 12 inches of compacted native soil. The native soil will be obtained from the project site.

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[2] The project would not include or affect an existing silo operation in the northeast corner of the property. Therefore, that operation will not be discussed.

[3] A unit train is a type of freight train in which all the cars contain the same type of load (e.g., coal, chemicals, grain).

Table 3.3-1
CONSTRUCTION CHARACTERISTICS

Site Element	Value		
	Phase 1	Phase 2	Phase 3
Grading Area	606,316 ft^2		
Access Driveway Paving	9,171 ft^2	10,840 ft^2	None
Container Yard Paving	195,080 ft^2	189,020 ft^2	202,205 ft^2

Table 3.3-2 shows the overall construction schedule and the main activities in each of three phases. For the purpose of the analysis in this report, it is assumed that Phase 1 will begin August 27, 2018 and that Phase 3 will be completed on August 2, 2020.

Table 3.3-2
OVERALL CONSTRUCTION SCHEDULE

Phase	To be Constructed	Start Date	End Date
1	Eastern container storage yard Drainage channel Eastern access driveway	August 27, 2018	October 19, 2018
2	Western container storage yard Western access driveway	May 27, 2019	July 19, 2019
3	Middle container storage yard	June 10, 2020	August 2, 2020

2.4 EXISTING SENSITIVE LAND USES

The area surrounding the site is designated for agricultural land uses. Five rural residences surrounded by agricultural land are located to the northwest across SR 111 and Yocum Road.

3.0 EXISTING CONDITIONS

The project site is located in an unincorporated area of Imperial County; which is in the Salton Sea Air Basin (SSAB). The SSAB includes the Imperial Valley and the central part of Riverside County, including the Coachella Valley. The Imperial Valley is bordered by the Salton Sea to the north, the Anza-Borrego Desert State Park to the west, the Chocolate Mountains to the northeast, and the U.S./Mexican Border to the south. The proposed site is located approximately one-half mile south of the City of Calipatria.

3.1 REGIONAL CLIMATE/METEOROLOGY

Meteorology is the study of weather and climate. Weather refers to the state of the atmosphere at a given time and place regarding temperature, air pressure, humidity, cloudiness, and precipitation. The term "weather" refers to conditions over short periods; conditions over prolonged periods, generally at least 30 to 50 years, are referred to as climate. Climate, in a narrow sense, is usually defined as the "average weather," or more rigorously as the statistical description in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years. These quantities are most often surface variables such as temperature, precipitation, and wind.

Climatic conditions in Imperial County are governed by the large-scale sinking and warming of air in the semi-permanent tropical high-pressure center of the Pacific Ocean. The high-pressure ridge blocks out most mid-latitude storms except in winter when the high is weakest and farthest south. The coastal mountains prevent the intrusion of any cool, damp air found in California coastal environs. Because of the weakened storms and barrier, Imperial County experiences clear skies, extremely hot summers, mild winters, and little rainfall. The flat terrain of the valley and the strong temperature differentials created by intense solar heating, produce moderate winds and deep thermal convection.

The combination of subsiding air, protective mountains, and distance from the ocean all combine to limit precipitation severely. Rainfall is highly variable with precipitation from a single heavy storm sometimes exceeding the entire annual total during a later drought condition.

Imperial County enjoys a year-round climate characterized by a temperate fall, winter, and spring and a harsh summer. Humidity often combines with the valley's normal elevated temperatures to produce a moist, tropical atmosphere that frequently seems hotter than the thermometer suggests. The sun shines, on the average, more in the Imperial County that anywhere else in the United States.

3.1.1 Temperature and Precipitation

The nearest National Weather Service Cooperative Observer Program weather station to the project is the station in Brawley, located approximately 8.5 miles south-southwest of the project. At the Brawley[4] station, average recorded rainfall during the period of record (1910 to 2007) measured 2.65 inches, with 72 percent of precipitation occurring between October and March and 47 percent in just December, January, and February. Monthly average maximum temperatures at this station vary annually by 38.2 degrees Fahrenheit (ºF): 107.6°F at the hottest to 69.4ºF at the coldest and monthly average minimum temperatures vary by 36.9°F annually, i.e. from 38.9°F to 75.8 ºF. In fact, this station shows that the months of June, July, August, and September have monthly maximum temperatures greater than 100ºF.

3.1.2 Humidity

Humidity in Imperial County is typically low throughout the year, ranging from 28% in summer to 52 % in winter. The large daily oscillation of temperature produces a corresponding large variation in the relative humidity. Nocturnal humidity rises to 50-60% but drop to about 10% during the day. Summer weather patterns are dominated by intense heat-induced low-pressure areas that form over the interior desert.

3.1.3 Wind

The wind direction follows two general patterns. The first occurs from fall through spring, where prevailing winds are from the west and northwest. Most of these winds originate in the Los Angeles Basin. The second pattern consists of occasional periods of high winds. Wind speeds exceeding 31 miles per hour (mph) occur most frequently in April and May. On an annual basis, high winds,

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[4] Western U.S. Climate Historical Summaries. Western Regional Climate Center. http://www.wrcc.dri.edu/Climsum.html. Accessed July 2018.

those exceeding 31 mph, are observed 0.6 percent of the time, where speeds of less than 6.8 miles per hour account for more than one-half of the observed winds. Wind statistics indicate that prevailing winds are from the west-northwest through southwest; however, a secondary flow pattern from the southeast is also evident.

3.1.4 Inversions

Air pollutant concentrations are primarily determined by the amount of pollutant emissions in an area and the degree to which these pollutants are dispersed in the atmosphere. The stability of the atmosphere is one of the key factors affecting pollutant dispersion. Atmospheric stability regulates the amount of vertical and horizontal air exchange, or mixing, that can occur within a given air basin. Horizontal mixing is a result of winds, as discussed above, but vertical mixing also affects the degree of stability in the atmosphere. An interruption of vertical mixing is called an inversion.

In the atmosphere, air temperatures normally decrease as altitude increases. At varying distances above the earth's surface, however, a reversal of this gradient can occur. This condition, termed an inversion, is simply a warm layer of air above a layer of cooler air, and it has the effect of limiting the vertical dispersion of pollutants. The height of the inversion determines the size of the vertical mixing volume trapped below. Inversion strength or intensity is measured by the thickness of the layer and the difference in temperature between the base and the top of the inversion. The strength of the inversion determines how easily it can be broken by winds or solar heating.

Imperial County experiences surface inversions almost every day of the year. Due to strong surface heating, these inversions are usually broken allowing pollutants to disperse more easily. Weak, surface inversions are caused by radiational cooling of air in contact with the cold surface of the earth at night. In valleys and low-lying areas, this condition is intensified by the addition of chilly air flowing down slope from the hills and pooling on the valley floor.

The presence of the Pacific High-Pressure Cell can cause the air to warm to a temperature higher than the air below. This highly stable atmospheric condition, termed a subsidence inversion can act as a nearly impenetrable lid to the vertical mixing of pollutants. The strength of these inversions makes them difficult to disrupt. Consequently, they can persist for one or more days, causing air stagnation and the buildup of pollutants. Highest or worst-case ozone levels are often associated with the presence of this type of inversion.

3.2 REGULATORY SETTING

Federal, state, and local agencies have set ambient air quality standards for certain air pollutants through statutory requirements and have established regulations and various plans and policies to maintain and improve air quality, as described below.

3.2.1 Air Pollutants of Concern[5]

As required by the Federal Clean Air Act (FCAA), the U. S. Environmental Protection Agency (USEPA) has identified criteria pollutants and established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide, suspended particulate matter (PM), and lead. Suspended PM includes both PM with an aerodynamic diameter of 10 micrometers or less (respirable PM, or PM_{10})

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[5] This section discusses only criteria pollutants. Greenhouse gases are defined and discussed in **Section 5.**

and PM with an aerodynamic diameter of 2.5 micrometers or less (fine PM, or $PM_{2.5}$). The California Air Resources Board (ARB) has established separate standards for the state, i.e. the California Ambient Air Quality Standards (CAAQS). The ARB established CAAQS for all the federal pollutants and sulfates, hydrogen sulfide, and visibility-reducing particles.

For some of the pollutants, the identified air quality standards are expressed in more than one averaging time to address the typical exposures found in the environment. For example, CO is expressed as a one-hour averaging time and an eight-hour averaging time. Regulations have set NAAQS and CAAQS limits in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). **Table 3.2-1** summarizes the state and federal ambient air quality standards for all criteria pollutants. Criteria pollutants of concern in Imperial County are ozone and PM, since the standards for other criteria pollutants are either being met or are unclassified in the Basin, and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future.

Ozone (O_3) is not emitted directly to the atmosphere but is formed by photochemical reactions between reactive organic gases (ROG), or volatile organic compounds[6] (VOC), and oxides of nitrogen (NO_X) in the presence of sunlight. The long, hot, humid days of summer are particularly conducive to ozone formation; thus, ozone levels are of concern primarily during May through September. Ozone is a strong chemical oxidant that adversely impacts human health through effects on respiratory function. It can also damage forests and crops. Tropospheric[7] ozone is formed by a complex series of chemical reactions involving NO_X, the result of combustion processes and evaporative ROGs such as industrial solvents, toluene, xylene, and hexane as well as the various hydrocarbons that are evaporated from the gasoline used by motor vehicles or emitted through the tailpipe following combustion. Additionally, ROGs are emitted by natural sources such as trees and crops. Ozone formation is promoted by strong sunlight, warm temperatures, and winds. High concentrations tend to be a problem in the Imperial County only during the hot summer months when these conditions frequently occur.

Reactive Organic Gases (ROG) are defined as any compound of carbon, excluding CO, carbon dioxide (CO2), carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participate in atmospheric photochemical reactions. It should be noted that there are no State or national ambient air quality standard for ROG because ROGs are not classified as criteria pollutants. They are regulated, however, because a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROGs are also transformed into organic aerosols in the atmosphere, which contribute to higher PM10 and lower visibility.

Nitrogen Oxides (NO_x) serve as integral participants in the process of photochemical smog production. The two major forms of NO_x are nitric oxide (NO) and nitrogen dioxide (NO_2).[8] NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. NO_X is an ozone precursor. A precursor is a directly emitted air contaminant that, when released into the atmosphere, forms, causes to be formed, or contributes to

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[6] Emissions of organic gases are typically reported only as aggregate organics, either as Volatile Organic Compounds (VOC) or as Reactive Organic Gases (ROG). These terms are meant to reflect what specific compounds have been included or excluded from the aggregate estimate. Although EPA defines VOC to exclude both methane and ethane, and CARB defines ROG to exclude only methane, in practice it is assumed that VOC and ROG are essentially synonymous.

[7] The troposphere is the atmospheric layer closest to the Earth's surface. Ozone produced here is an air pollutant that is harmful to breathe, and it damages crops, trees and other vegetation.

[8] Another form of NOx, nitrous oxide (N2O), is a greenhouse gas and is discussed below.

the formation of a secondary air contaminant for which an Ambient Air Quality Standard (AAQS) has been adopted, or whose presence in the atmosphere will contribute to the violation of one or more AAQSs. When NO_X and ROG are released in the atmosphere, they can chemically react with one another in the presence of sunlight to form ozone.

Particulate Matter (PM) is a general term used to describe a complex group of airborne solid, liquid, or semi-volatile materials of various size and composition. Primary PM is emitted directly into the atmosphere from both human activities (including agricultural operations, industrial processes, construction and demolition activities, and entrainment of road dust into the air) and non-anthropogenic activities (such as windblown dust and ash resulting from forest fires). Secondary PM is formed in the atmosphere from predominantly gaseous combustion by-product precursors, such as sulfur oxides and NO_X, and ROGs. The overwhelming majority of airborne PM in Imperial County is primary PM. The major source of primary PM is fugitive windblown dust, with other contributions from entrained road dust, farming, and construction activities.

Particle size is a critical characteristic of PM that primarily determines the location of PM deposition along the respiratory system (and associated health effects) as well as the degradation of visibility through light scattering. In the United States, federal and state agencies have established two types of PM air quality standards as shown in **Table 3.2-1**. PM_{10} corresponds to the fraction of PM no greater than 10 microns in aerodynamic diameter and is commonly called respirable particulate matter, while $PM_{2.5}$ refers to the subset of PM_{10} of aerodynamic diameter smaller than 2.5 microns, which is commonly called fine particulate matter.

PM air pollution has undesirable and detrimental environmental effects. PM affects vegetation, both directly (e.g. deposition of nitrates and sulfates may cause direct foliar damage) and indirectly (e.g., coating of plants upon gravitational settling reduces light absorption). PM also accumulates to form regional haze, which reduces visibility due to scattering of light.

PM_{10} is respirable, with fine and ultrafine particles[9] reaching the alveoli deep in the lungs, and larger particles depositing principally in the nose and throat area. PM_{10} deposition in the lungs results in irritation that triggers a range of inflammation responses, such as mucus secretion and bronchoconstriction, and exacerbates pulmonary dysfunctions, such as asthma, emphysema, and chronic bronchitis. Sufficiently small particles ($PM_{2.5}$ and ultrafines) may penetrate the bloodstream and impact functions such as blood coagulation, cardiac autonomic control, and mobilization of inflammatory cells from the bone marrow. Individuals susceptible to higher health risks from exposure to PM_{10} airborne pollution include children, the elderly, smokers, and people of all ages with low pulmonary/cardiovascular function. For these individuals in particular, adverse health effects of PM_{10} pollution include coughing, wheezing, shortness of breath, phlegm, bronchitis, and aggravation of lung or heart disease, leading for example to increased risks of hospitalization and mortality from asthma attacks and heart attacks.

Pollutant Transport

As stated above, ozone is a "secondary" pollutant, formed in the atmosphere by reactions between NO_X and ROG. These reactions are driven by sunlight and proceed at varying rates. Transport is the movement of ozone or the pollutants that form ozone from one area (known as the upwind area) to

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[9] Ultrafine particles (UFPs) are nanoscale, less than 100 nanometers. Regulations do not currently exist for this size class of ambient air pollution particles, which are far smaller than the regulated PM10 and PM2.5 particle classes and are believed to have several more aggressive health implications than those classes of larger particulates.

another area (known as the downwind area). Pollutant transport is a very complex phenomenon. Sometimes transport is a straightforward matter of wind blowing from one area to another at ground level, carrying ozone with it, but usually it is not that simple. Transport is three-dimensional; it can take place at the surface, or high above the ground. Meteorologists use the terms "surface" and "aloft" to distinguish these two cases. Often, winds can blow in different directions at different heights above the ground. To complicate matters further, winds can shift during the day, pushing a polluted air mass first one way, then another. Finally, because ozone and ozone forming emissions from an upwind area can mix with locally generated ozone and locally generated emissions, it is often difficult to determine the origin of the emission causing high pollution levels. Political boundaries do not prevent transport of pollutants. Transport over distances of several hundred miles has often been documented in California.

The accurate determination of the impacts of transport requires detailed technical analyses in conjunction with modeling studies. The Imperial County Air Quality Management Plan[10] (AQMP) identifies how the transport of emissions and pollutants from Mexico and other areas (South Coast and San Diego) influences ozone violations within Imperial County. Although the Imperial County is currently in attainment of the 1997 8-hour ozone NAAQS, it is important to note that any future analysis of air emissions impacting Imperial County must take into consideration the influence of transport from three distinct sources, that of the South Coast Air Basin via the Coachella Valley to the north, the San Diego Air Basin to the west and the international city of Mexicali, Mexico to the south.

3.2.2 Applicable Regulations

3.2.2.1 Federal Regulations

The federal Clean Air Act (FCAA), passed in 1970, established the national air pollution control program. The basic elements of the CAA are the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, hazardous air pollutants standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

NAAQS are the maximum allowable concentrations of criteria pollutants, over specified averaging periods, to protect human health. The FCAA requires that the U.S. Environmental Protection Agency (USEPA) establish NAAQS and reassess, at least every five years, whether they are adequate to protect public health, based on current scientific evidence. The NAAQS are divided into primary and secondary standards; the former standards are set to protect human health within an adequate margin of safety, and the latter to protect environmental values, such as plant and animal life.

The USEPA has identified nonattainment and attainment areas for each NAAQS. Under amendments to the FCAA, EPA has designated air basins or portions thereof as attainment, nonattainment, or unclassifiable, based on whether the national standards have been achieved.

In addition, the FCAA uses a classification system to design clean-up requirements appropriate for the severity of the pollution and set realistic deadlines for reaching clean-up goals. If an air basin is not in federal attainment for a particular pollutant, the Basin is classified as a marginal, moderate, serious, severe, or extreme nonattainment area, based on the estimated time it would take to reach attainment. Nonattainment areas must take steps towards attainment by a specific timeline.

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[10] Final 2009 1997 8-Hour Modified Air Quality Management Plan. Imperial County Air Pollution Control District. July 13, 2010.

Table 3.3-1 shows the federal and state attainment designations and federal classifications for the Basin.

Data collected at permanent monitoring stations are used by the USEPA to classify regions as "attainment" or "nonattainment," depending on whether the regions met the requirements stated in the primary NAAQS. Nonattainment areas are subject to additional restrictions, as required by the USEPA.

The FCAA Amendments in 1990 substantially revised the planning provisions for those areas not currently meeting NAAQS. The Amendments identify specific emission reduction goals, require both a demonstration of reasonable further progress and attainment, and incorporate more stringent sanctions for failure to attain the NAAQS or to meet interim attainment milestones.

3.2.2.2 State Regulations

The State of California began to set California ambient air quality standards (CAAQS) in 1969 under the mandate of the Mulford-Carrell Act. There were no attainment deadlines for the CAAQS originally. However, the State Legislature passed the California Clean Air Act (CCAA) in 1988 to establish air quality goals, planning mechanisms, regulatory strategies, and standards of progress to promote their attainment. The ARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for ensuring implementation of the CCAA, responding to the FCAA, and for regulating emissions from motor vehicles and consumer products.

The CCAA requires attainment of CAAQS by the earliest practicable date. The state standards are generally more stringent than the corresponding federal standards. Attainment plans are required for air basins in violation of the State ozone, PM_{10}, CO, SO_2, or NO_2 standards. Responsibility for achieving state standards is placed on the ARB and local air pollution control districts. District plans for nonattainment areas must be designed to achieve a 5% annual reduction in emissions. Preparation of and adherence to attainment plans are the responsibility of the local air pollution districts or air quality management districts. **Table 3.2-1** illustrates NAAQS and CAAQS for criteria pollutants.[11]

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[11] Ambient Air Quality Standards. California Air Resources Board. https://www.arb.ca.gov/research/aaqs/aaqs2.pdf. May 4, 2016. Accessed July 2018.

Table 3.2-1
AMBIENT AIR QUALITY STANDARDS FOR CRITERIA AIR POLLUTANTS

Air Pollutant	Averaging Time	California Standard	National Standard
Ozone (O_3)	1 hour 8 hour	0.09 ppm 0.070 ppm	— 0.070 ppm *
Respirable particulate matter (PM_{10})	24-hour Mean	50 µg/m^3 20 µg/m^3	150 µg/m^3 —
Fine particulate matter ($PM_{2.5}$)	24-hour Mean	— 12 µg/m^3	35 µg/m^3 12.0 µg/m^3 **
Carbon monoxide (CO)	1 hour 8 hour	20 ppm 9.0 ppm	35 ppm 9 ppm
Nitrogen dioxide (NO_2)	1 hour Mean	0.18 ppm 0.030 ppm	100 ppb 0.053 ppm
Sulfur dioxide (SO_2)	1 hour 24 hour	0.25 ppm 0.04 ppm	75 ppb —
Lead	30-day Rolling 3-month	1.5 µg/m^3 —	— 0.15 µg/m^3
Sulfates	24 hour	25 µg/m^3	**No National Standards**
Hydrogen sulfide	1 hour	0.03 ppm	
Vinyl chloride	24 hour	0.01 ppm	
Visibility-reducing particles	8 hour	Extinction coefficient of 0.23 per kilometer, visibility of ten miles or more due to particles when relative humidity is less than 70%.	

* On October 1, 2015, the national 8-hour ozone standard was lowered from 0.075 to 0.070 ppm.
** On December 14, 2012, the national $PM_{2.5}$ standard was lowered from 15 µg/m^3 to 12.0 µg/m^3.

Abbreviations:

ppm = parts per million	ppb = parts per billion	30-day = 30-day average
µg/m^3 = micrograms per cubic meter	Mean = Annual Arithmetic Mean	

3.2.3 Air Quality Plans

3.2.3.1 Ozone Plan

On December 3, 2009, the USEPA issued a final ruling determining that the Imperial County "moderate" 8-hour ozone non-attainment area attained the 1997 8-hour NAAQS for ozone. The determination by the USEPA was based upon complete, quality-assured, and certified ambient air monitoring data for the years 2006 thru 2008. This determination effectively suspended the requirement for the state to submit an attainment demonstration, an RFP plan, contingency measures and other planning requirements for so long as Imperial County continues to attain the 1997 8-hour ozone NAAQS. However, this determination did not constitute a re-designation to attainment; therefore, the classification and designation status for Imperial County remain as a "moderate" non-attainment area of the 1997 8-hour ozone NAAQS. Imperial County was required to submit for EPA approval a 2009 8-Hour Ozone "Modified" Air Quality Management Plan (Modified AQMP), which was approved July 13, 2010.

The Modified AQMP serves as a comprehensive planning document intended to provide guidance to the ICAPCD, the County, and other local agencies on how to continue maintaining the 1997 8-hour ozone NAAQS. The Modified AQMP includes control measures consisting of three components: 1) the ICAPCD's Stationary Source Control Measures; 2) Regional Transportation Control Measures; and 3) the State Strategy. These measures primarily rely on the traditional command and control approach and provide the framework for ICAPCD rules that reduce ROG and NO_X emissions.

3.2.3.2 PM_{10} Plan

The ICAPCD District Board of Directors adopted the PM_{10} SIP for Imperial County on August 11, 2009.[12] The PM_{10} SIP meets USEPA requirements to demonstrate that the County will attain the PM_{10} standard as expeditiously as practicable. The PM_{10} SIP was required to address and meet the following elements, required under the FCAA of areas classified to be in serious nonattainment of the NAAQS:

- Best available emission inventories;
- A plan that enables attainment of the PM_{10} federal air quality standards;
- Annual reductions in PM_{10} or PM_{10} precursor emissions that are of not less than 5% from the date of SIP submission until attainment;
- Best available control measures and best available control technologies for significant sources and major stationary sources of PM_{10}, to be implemented no later than four years after reclassification of the area as serious;
- Transportation conformity and motor vehicle emission budgets in accord with the attainment plan;
- Reasonable further progress and quantitative milestones; and
- Contingency measures to be implemented (without the need for additional rulemaking actions) if the control measure regulations incorporated in the plan cannot be successfully implemented or fail to give the expected emission reductions.

The PM_{10} SIP updated the emission inventory to incorporate revised cattle emissions, revised windblown dust model results, revised Southern California Association of Governments (SCAG) activity data, and updated entrained and windblown unpaved road dust estimates. The adjustments made to the emission inventory fell in two categories: (i) adjustments to incorporate new methodology and updated information (e.g., throughputs, activity data, etc.), and (ii) adjustments to incorporate emission reductions arising from the implementation of new control measures.

Additionally, the PM_{10} SIP demonstrates that Imperial County attained the Federal PM_{10} NAAQS, but for international emissions from Mexico, based on 2006-2008 monitoring data. Attainment was due,

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[12] 2009 Imperial County State Implementation Plan for Particulate Matter Less Than 10 Microns in Aerodynamic Diameter. Imperial County Air Pollution Control District. July 10, 2009.

in part, to ICAPCD's November 2005 adoption and subsequent implementation of Regulation VIII fugitive dust rules; those rules were based on the related 2005 Best Available Control Measure (BACM) analysis.

Since the reclassification of Imperial County to serious nonattainment for PM_{10} occurred on August 2004, control of fugitive PM_{10} emissions from the significant source categories that meets BACM stringency identified in the PM_{10} SIP began in January 2006.

Major stationary sources are required to implement Best Available Control Technology (BACT) to control PM_{10} emissions (Rule 207) and they are required to comply with the 20% opacity (Rule 403). In addition, stationary sources will be required to mitigate fugitive dust emissions from access roads, construction activities, handling and transferring of bulk materials, and track-out/carry-out according to the requirements of Regulation VIII.

Because the Imperial County is shown in the PM_{10} SIP to have attained the 24-hour PM_{10} NAAQS but for international transport of Mexicali emissions in 2006-2008, reasonable further progress and milestone requirements are unnecessary, and specifically the 5% yearly emission reductions requirement does not apply to future years. As documented in the PM_{10} SIP, all remaining SIP requirements applicable to the 2009 Imperial County PM_{10} Plan have been successfully addressed.

3.2.3.3 $PM_{2.5}$ Plan

The ICAPCD District Board of Directors adopted the $PM_{2.5}$ SIP for Imperial County on December 2, 2014.[13] The $PM_{2.5}$ SIP fulfills the requirements of the CAA for those areas classified as "moderate" nonattainment for $PM_{2.5}$. It incorporates updated emission inventories, and analysis of Reasonable Available Control Measures (RACM), an assessment of Reasonable Further Progress (RFP), and a discussion of contingency measures. Analyses in the $PM_{2.5}$ SIP included assessing emission inventories from Imperial County and Mexicali; evaluating the composition and elemental makeup of samples collected on Calexico violation days; reviewing the meteorology associated with high concentration measurements; and performing directional analysis of the sources potentially impacting the Calexico $PM_{2.5}$ monitor. As is demonstrated in the $PM_{2.5}$ SIP, the primary reason for elevated $PM_{2.5}$ levels in Imperial County is transport from Mexico. Essentially, the $PM_{2.5}$ SIP demonstrated attainment of the 2006 $PM_{2.5}$ NAAQS "but for" transport of international emissions from Mexicali, Mexico.

3.2.4 Local Regulations

3.2.4.1 Air Quality

The ICAPCD also has the authority to adopt and enforce regulations dealing with controls for specific types of sources, emissions of hazardous air pollutants, and New Source Review. The ICAPCD Rules and Regulations are part of the SIP and are separately enforceable by the EPA. The following ICAPCD rules potentially apply to the Project.

Rules 800 (General Requirements for Control of Fine Particulate Matter), **801** (Construction and Earthmoving Activities), **802** (Bulk Materials, **803** (Carry-out and Track-out), **804** (Open Areas), and **805** (Paved and Unpaved Roads) are intended to reduce the amount of PM_{10} entrained in the ambient

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[13] Imperial County 2013 SIP for the 2006 24-hr PM2.5 Moderate Nonattainment Area. Imperial County Air Pollution Control District. December 2, 2014.

air as a result of emissions generated by anthropogenic fugitive dust sources by requiring actions to prevent, reduce, or mitigate PM_{10} emissions. These rules include opacity limits, control measure requirements, and dust control plan requirements that apply to activities at the Facility.

3.2.4.2 Right-to-Farm Ordinance

In recognition of the role of agriculture in the county, Imperial County has adopted a right-to-farm ordinance. A "right-to-farm" ordinance creates a legal presumption that ongoing, standard farming practices are not a nuisance to adjoining residences. It requires a disclosure to owners and purchasers of property near agricultural land operations, or areas zoned for agricultural purposes. The disclosure advises persons that discomfort and inconvenience from odors, fumes, dust, smoke, and chemicals resulting from conforming and accepted agricultural operations are normal and necessary aspects of living in the agricultural areas of the county.

3.3 REGIONAL AIR QUALITY

Table 3.3-1 shows the area designation status of Imperial County for each criteria pollutant for both the NAAQS and the CAAQS.

On April 30, 2004, Imperial County was classified as a "marginal" nonattainment area for 8-Hour Ozone NAAQS under the FCAA. On March 13, 2008, the USEPA found that Imperial County failed to meet attainment for the 8-Hour Ozone NAAQS by June 15, 2007 and was reclassified as "moderate" nonattainment. However, on November 17, 2009, EPA announced that Imperial County has met the 1997 federal 8-hour ozone standard—demonstrating improved air quality in the area. The announcement is based on three years of certified clean air monitoring data for the years 2006-2008.

In response to the opinion of the US Court of Appeals for the Ninth Circuit in Sierra Club v. United States Environmental Protection Agency, et al., in August 2004 the USEPA found that the Imperial Valley PM_{10} nonattainment area had failed to attain by the moderate area attainment date of December 31, 1994, and as a result reclassified under the FCAA the Imperial Valley from a moderate to a serious PM_{10} nonattainment area. Also, in August 2004, the USEPA proposed a rule to find that the Imperial area had failed to attain the annual and 24-hour PM_{10} standards by the serious area deadline of December 31, 2001. The USEPA finalized the rule on December 11, 2007, citing as the basis for the rule that six Imperial County monitoring stations were in violation of the 24-hour standard during 1999-2001. The USEPA's final rule action requires the State to submit to the OSEPA by December 11, 2008 (within one year of the rule's publication in the Federal Register) an air quality plan that demonstrates that the County will attain the PM_{10} standard as expeditiously as practicable.

Table 3.3-1
FEDERAL AND STATE ATTAINMENT STATUS FOR IMPERIAL COUNTY

Pollutant	State Designation	Federal Designation (Classification)
Ozone	Nonattainment	Attainment
Respirable PM (PM_{10})	Nonattainment	Nonattainment (Serious) *
Fine PM ($PM_{2.5}$)	Attainment***	Nonattainment **
Carbon Monoxide (CO)	Attainment	Unclassifiable/Attainment
Nitrogen Dioxide (NO_2)	Attainment	Unclassifiable/Attainment
Sulfur Dioxide	Attainment	Attainment
Sulfates	Attainment	**No Federal Standard**
Lead	Attainment	
Hydrogen Sulfide	Unclassified	
Visibility reducing Particles	Unclassified	

* *Designation for Imperial Valley Planning Area only, which is most of Imperial County save for a small stretch of land on the County's eastern end.*
** *Designation is only for the urban areas within Imperial County*
*** *Designation for the whole of Imperial County except the City of Calexico.*
Source: Area Designations and Maps – 2013. California Air Resources Board. September 2018.

On November 13, 2009, EPA published Air Quality Designations for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards[14] wherein Imperial County was listed as designated nonattainment for the 2006 24-hour $PM_{2.5}$ NAAQS. On April 10, 2014, the ARB Board gave final approval to the 2013 Amendments to Area Designations for CAAQSs. For the State $PM_{2.5}$ standard, effective July 1, 2014, the Calexico area was designated nonattainment, while the rest of the SSAB was designated attainment. The Project lies outside the Calexico nonattainment area.

3.4 LOCAL AIR QUALITY

Existing levels of ambient air concentrations and historical trends and projections in the project area are best documented by measurements made by the ICAPCD and CARB. Imperial County began its ambient air monitoring in 1976; however, monitoring of ozone began in 1986 at the El Centro monitoring station. Since that time, monitoring has been performed by the ICAPCD, ARB, and private industry. There are six monitoring sites in Imperial County from Niland to Calexico.

The nearest monitoring station to the project site is in Niland, approximately 7.3 miles north northwest of the site. The Niland station is located at 7711 English Road and only monitors ozone and PM_{10}. The nearest site that monitors $PM_{2.5}$ is in Brawley, approximately 8.8 miles south-southwest of the site. **Table 3.3-2** (Ambient Criteria Pollutant Concentration Data for Project

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[14] Air Quality Designations for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards. United States Environmental Protection Agency. Federal Register. Vol. 74, No. 218. November 13, 2009.

Vicinity) summarizes 2015 through 2017 published monitoring data from the CARB's Aerometric Data Analysis and Management System (ADAM) for the Project vicinity[15].

The monitoring data shows that the Niland Station never exceeded the state 1-hour ozone standard in the three years. The Niland Station only exceeded the National Standard and State Standard in 2015. State and National PM_{10} Standards were exceeded at the Niland Station for every year. It should be noted that for 2015 and 2016, the standards were only exceeded for one measured day each and may qualify for ARB Exceptional Event status. The National $PM_{2.5}$ Standard was exceeded in both 2016 and 2017.

Table 3.3-2
AMBIENT CRITERIA POLLUTANT CONCENTRATION DATA FOR PROJECT VICINITY

Air Pollutant	Standard/Exceedance	2015	2016	2017
Ozone (O_3) - Niland	Max. 1-hour Concentration (ppm)	0.091	0.079	0.072
	Max. 8-hour Concentration (ppm)	0.074	0.066	0.061
	# Days > Federal 8-hour Std. of 0.070 ppm	5	0	0
	# Days > California 1-hour Std. of 0.09 ppm	0	0	0
	# Days > California 8-hour Std. of 0.07 ppm	5	0	0
Respirable Particulate Matter (PM_{10}) - Niland	Max. 24-hour Concentration (μg/m³)	250.4	225.7	345.8
	#Days > Fed. 24-hour Std. of 150 μg/m³	1	1	4
	#Days > California 24-hour Std. of 50 μg/m³	17	14	ND
	Annual Average(μg/m³)	46.1	40.7	ND
Fine Particulate Matter ($PM_{2.5}$) - Brawley	Max. 24-hour Concentration (μg/m³)	29.5	57.9	46.1
	State Annual Average (μg/m³)	6.6	11.3	9.4
	#Days > Fed. 24-hour Std. of 35 μg/m³	0	2	1
	Federal Annual Average (μg/m³)	6.5	11.2	9.4

Source: California Air Resources Board, "iADAM Air Quality Data Statistics." Internet URL: http://www.arb.ca.gov/adam/ (September 2018)

ND There were insufficient (or no) data available to determine the value.

4.0 AIR QUALITY IMPACTS ANALYSIS

This analysis was prepared in accordance with the ICAPCD CEQA Air Quality Handbook and with Appendix G of the California Environmental Quality Act (CEQA) Guidelines. Air quality impacts are typically divided into short-term and long-term impacts. Short-term impacts are associated with construction activities, such as site grading, excavation and building construction of a project. Long-term impacts are associated with the operation of a project upon its completion.

4.1 CEQA IMPACT REVIEW CRITERIA

In accordance with *State CEQA Guidelines* Appendix G, implementation of the project would result in a potentially significant impact if it were to:

- Conflict with or obstruct implementation of the applicable air quality plan;

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[15] ADAM Air Quality Data Statistics. California Air Resources Board. http://www.arb.ca.gov/adam/welcome.html. Accessed September 2018.

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);

- Expose sensitive receptors to substantial pollutant concentrations; or

- Create objectionable odors affecting a substantial number of people.

Where available, the significance criteria established by the applicable air quality management district (AQMD) or air pollution control district (APCD) may be relied upon to make the significance determinations. As will be discussed in the next section, the ICAPCD has developed a CEQA Air Quality Handbook to provide a protocol for air quality analyses that are prepared under the requirements of CEQA.

4.2 IMPERIAL COUNTY APCD THRESHOLDS OF SIGNIFICANCE

Under the ICAPCD guidelines, an air quality evaluation must address the following:

- Comparison of calculated project emissions with ICAPCD emission thresholds.

- Consistency with the most recent Clean Air Plan for Imperial County.

- Comparison of predicted ambient pollutant concentrations resulting from the project to state and federal health standards, when applicable.

- The evaluation of special conditions that apply to certain projects.

4.2.1 Construction Impacts

As will be discussed in **Section 4.5.2**, this is a "Tier I" project. In general, projects whose *operational* emissions qualify them as Tier I do not need to quantify their construction emissions; instead they adopt the standard mitigation measures for construction (See **Section 5.0**). The CEQA Guidelines states the "approach of the CEQA analyses for construction particulate matter impacts should be qualitative as opposed to quantitative." Since this is an atypical development project, this analysis quantifies construction emissions. The quantification serves the purpose of determining which construction-related mitigation measures to prescribe. The ICAPCD's thresholds for significance are shown in **Table 4.2-1**.

Table 4.2-1
THRESHOLDS OF SIGNIFICANCE FOR CONSTRUCTION ACTIVITIES[16]

Pollutant	Threshold
PM_{10}	150 lbs/day
ROG	75 lbs/day
NO_x	100 lbs/day
CO	550 lbs/day

4.2.2 Operational Impacts

To evaluate long-term air quality impacts due to operation of a project, the ICAPCD recommends the significance criteria shown in **Table 4.2-2.**

Table 4.2-2
THRESHOLDS OF SIGNIFICANCE FOR PROJECT OPERATIONS[17]

Pollutant	Emissions (lbs/day)	
	Tier I	Tier II
Carbon Monoxide (CO)	< 550	≥ 550
Reactive Organic Gases (ROG)	< 137	≥ 137
Nitrogen Oxides (NO_X)	< 137	≥ 137
Sulfur Oxides (SO_X)	< 150	≥ 150
Particulate Matter (PM_{10})	< 150	≥ 150
Particulate Matter ($PM_{2.5}$)	< 550	≥ 550
Level of Significance	Less Than Significant	Significant Impact
Level of Analysis	Initial Study	Comprehensive Air Quality Report
Environmental Document	Negative Declaration	Mitigated Negative Declaration or Environmental Impact Report

4.3 CO "HOTSPOTS" THRESHOLDS

Exhaust emissions from motor vehicles can potentially cause a direct, localized hotspot impact at or near proposed developments or sensitive receptors. The optimum condition for the occurrence of a CO hotspot would be cool and calm weather at a congested major roadway intersection with sensitive receptors nearby, and where vehicles are idling or moving at a stop-and-go pace.

The significance of localized project impacts depends on whether project-related emissions result in a violation of state and/or federal CO standards. A significant impact would occur if the CO hotspot analysis of vehicular intersection emissions exposes sensitive receptors to concentrations that are in excess of the following thresholds:

- 20 parts per million (ppm) for 1-hour average, and/or
- 9 ppm for 8-hour average.

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[16] Imperial County Air Pollution Control District. 2017. CEQA Air Quality Handbook. November, p. 20.
[17] Imperial County Air Pollution Control District. 2017. CEQA Air Quality Handbook. November, p. 10.

The ICAPCD *CEQA Air Quality* Handbook does not specify criteria for significance when ambient CO levels already exceed a state or federal standard. For that case, we used the South Coast Air Quality Management District's specification that project impacts are considered significant if they increase 1-hour CO concentrations by 1.0 ppm or more or 8-hour CO concentrations by 0.45 ppm or more.[18]

4.4 METHODOLOGY

Regional and local emissions of criteria air pollutants and precursors, and GHGs during project construction and operations were assessed in accordance with the methodologies described below. ICAPCD suggests that the "approach of the CEQA analyses for construction PM_{10} impacts should be qualitative as opposed to quantitative"[19] but that any projects which are greater than the level of significance for construction may have a significant impact on local and, under certain circumstances, regional air quality. This analysis includes PM_{10} in the quantification.

Due to the type of project, it was determined that emissions from the construction activities related to the project could not be easily estimated using existing models, including the commonly used California Emissions Estimator Model (CalEEMod), as these models are designed for "typical" land development projects. Therefore, this analysis attempts to provide detailed analysis of impacts related to three container pads including off-road equipment used for preparing the subgrade by compacting 12 inches of native soil, application and compacting 12 inches of crushed recycled concrete, and application and compacting 12 inches of Caltrans Class II aggregate; and the construction of two asphalt driveways with two compositions. Construction emissions also included the use of on-road trucks to haul the aggregate and crushed recycled concrete.

Operational emissions were estimated for employees, container loaders, agricultural hauling trucks, and locomotives.

4.5 AIR QUALITY IMPACTS

4.5.1 Short-Term Impacts

Project construction activities will generate short-term air quality impacts. Construction emissions can be distinguished as either onsite or offsite. Onsite air pollutant emissions would consist principally of exhaust emissions from off-road heavy-duty construction equipment, as well as fugitive particulate matter from earthwork. Offsite emissions would result from workers commuting to and from the job site, as well as from trucks hauling aggregate and crushed recycled concrete.

Construction of the container yard portion of Phase 1 of the project would include grading, leveling, and compacting native soil to produce a depth of 12 inches of compacted soil; placement of a mesh; importing crushed recycled concrete; distributing, leveling, and compacting to a depth of 12 inches; and importing Class 2 aggregate, distributing, leveling, and compacting to a depth of 6 inches. Additionally Phase 1 would include construction of a driveway that comprised of four inches of Caltrans Type B asphalt concrete over 12 to 14 inches of Class 2 aggregate base. Phase 2 of the project would be constructed the same and begin 9 months later. Phase 3 of the project would begin 9 months later and would include all the aforementioned container yard construction, but no driveway would be constructed. The overall duration of each Phase is expected to be eight months. The estimated

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[18] South Coast Air Quality Management District. 1993. CEQA Air Quality Handbook. April.

[19] CEQA Air Quality Handbook: Guidelines for the Implementation of the California Air Quality Act of 1970, and amended. Imperial County Air Pollution Control District, November 2007.

unmitigated emissions are presented in **Table 4.5-1.** Calculation assumptions and results files are provided in **Appendix B.**

Table 4.5-1
MAXIMUM DAILY UNMITIGATED CONSTRUCTION EMISSIONS

Construction Activity	**Maximum Emissions (lbs/day)**			
	ROG	**CO**	**NO_x**	**PM_{10}**
Phase 1	6.1	29.9	69.1	335.9
Phase 2	5.7	28.9	62.7	329.1
Phase 3	3.2	16.9	37.7	328.1
ICAPCD Significance Thresholds[a]	*75*	*550*	*100*	*150*
Significant (Yes or No)	No	No	No	**Yes**

Source: OB-1 Air Analyses.

[a]The ICAPCD does not have a significance threshold for $PM_{2.5}$ during construction.

As seen in **Table 4.5-1**, the project is expected to generate unmitigated PM_{10} emissions that would exceed the ICAPCD threshold of 150 pounds per day. These emissions will be reduced in two ways. First, the ICAPCD requires that standard mitigation measures for construction equipment and fugitive PM_{10} control be implemented at all construction sites, as appropriate and feasible, regardless of the size of construction.[20] In addition, please note that implementation of required mitigation measures does not exempt the project from compliance with ICAPCD rules and regulations. The project proponent must comply with all the requirements of the ICAPCD's rules and regulations, specifically those of Regulation VIII. Regulation VIII applies to any activity or man-made condition capable of generating fugitive dust, and requires the use of reasonably available control measures to suppress fugitive dust emissions.

In addition, to ensure that construction would be less than significant, the applicant must follow mitigation measure **MM AQ-1**, which is presented in **Section 6.1.1**

Table 4.5-2 shows estimated construction emissions after implementation **MM AQ-1** and of standard mitigation measures for construction equipment and fugitive PM_{10} control. Emissions of all criteria pollutants would be below their respective thresholds for significance.

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[20] Imperial County Air Pollution Control District, CEQA Air Quality Handbook. (November 2007).

Table 4.5-1
MAXIMUM DAILY MITIGATED CONSTRUCTION EMISSIONS

Construction Activity	Maximum Emissions (lbs/day)			
	ROG	CO	NO_x	PM_{10}
Phase 1	6.1	29.9	69.1	146.2
Phase 2	5.7	28.9	62.7	143..1
Phase 3	3.2	16.9	37.7	142.0
ICAPCD Significance Thresholds[a]	*75*	*550*	*100*	*150*
Significant (Yes or No)	No	No	No	**No**

Source: OB-1 Air Analyses.

[a]The ICAPCD does not have a significance threshold for $PM_{2.5}$ during construction.

4.5.2 Long-Term Impacts

The project will generate long-term air quality impacts associated with the exhaust emissions from locomotive traffic, agricultural delivery of product from fields using trucks, onsite container loaders, and employee commuting. Emission factors for employee vehicles and agricultural product hauling trucks were obtained from the EMFAC2014 Web Database[21] for Imperial County in calendar years 2018, 2019, and 2020. Emission factors for the container loaders were based on Tier 4F Standards and from the CalEEMod User's Manual[22] Appendix D. Emission factors for locomotives were derived from a USEPA Regulatory Support Document[23] and locomotive fuel rates were derived from *Fuel Efficiency Improvement in Rail Freight Transportation*[24].

The estimated emissions for the worst-case Phase 1 year of 2018 are shown in **Table 4.5-3.** Detailed calculations are provided in **Attachment 1.**

Table 4.5-3
DAILY PROJECT OPERATIONAL EMISSIONS

Emissions Source	Pollutant (maximum lbs/day)				
	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Locomotive Emissions	3.41	5.83	38.92	1.02	0.94
Container Loader Emissions	4.32	80.25	9.26	0.46	0.43
Hauling Truck Emissions	6.78	18.87	100.28	4.81	1.72
Employee Commute Emissions	0.02	0.47	0.06	0.00	0.00
Total Operational Emissions	**14.5**	**105.4**	**148.5**	**6.3**	**3.1**
Thresholds for Tier II	*137*	*550*	*137*	*150*	*550*
Tier	**I**	**I**	**II**	**I**	**I**

Source: Calculated by OB-1 Air Analyses.

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[21] EMFAC2014 Web Database. California Air Resources Board. (https://www.arb.ca.gov/emfac/2014/). Accessed September 2018.

[22] CalEEMod User's Guide, Version 2016.3.2. California Air Pollution Control Officers Association. November 2017.

[23] Locomotive Emissions Standards: Regulatory Support Document. United States Environmental Protection Agency, Office of Mobile Sources. April 1998.

[24] "Fuel Efficiency Improvement in Rail Freight Transportation," J N Cetenich, FRA-ORD-76-136, December 1975. as presented in Railroad Costs blog http://www.alternatewars.com/BBOW/Logistics/RR_Costs.htm. Accessed September 2018.

As indicated in **Table 4.5-3**, the long-term project operational emissions would not exceed applicable thresholds for ROG, CO, PM_{10}, or $PM_{2.5}$. However, they would exceed the Tier II threshold for NO_X. Most of the NO_X emissions would be from locomotives and exhaust from hauling trucks. None of the ICAPCD-required standard and discretionary operational mitigation measures specified in the ICAPCD *CEQA Air Quality Handbook* are applicable for this project. The ICAPCD realizes that industrial development projects "are by nature much more complex" than typical commercial or residential projects, and has adopted Guidance Policy #5 to help lead agencies evaluate offsite mitigation to help reduce their impacts. Guidance Policy #5 is discussed in **Section 6.1.2** of this document.

4.5.3 Sensitive Receptors

Sensitive receptors are persons who would be more susceptible to air pollution than the general population, such as children, athletes, the elderly, and the chronically ill. Examples of land uses where substantial numbers of sensitive receptors are often found are schools, daycare centers, parks, recreational areas, medical facilities, nursing homes, and convalescent care facilities. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended times, resulting in sustained exposure to pollutants. The closest sensitive receptor currently is a rural residence immediately northwest of the proposed site. The nearest school is Calipatria High School, located at 601 West Main Street, Calipatria, about 1.2 miles north-northwest of the project.

4.5.4 Objectionable Odors

Construction activities for the project would generate airborne odors associated with the operation of construction vehicles (i.e., diesel exhaust) and asphalt paving operations. These emissions would occur during daytime hours only and would be isolated to the immediate vicinity of the construction site and activity. Therefore, they would not affect a substantial number of people. Operational emissions would include locomotive emissions, but the location of the project is remote and will not affect a substantial number of people.

4.5.5 Conformity with Air Quality Management Plan

The ICAPCD *CEQA Air Quality Handbook* calls for a consistency analysis with the regional clean air plans, namely ozone and PM_{10} attainment demonstration plans, for large residential and commercial developments that are required to develop an EIR. Projects that are projected to exceed ICAPCD thresholds of significance for its operations are considered large developments and are required to demonstrate consistency with regional air quality plans.

With the mitigation measure presented in **Section 6.1.2**, operational emissions from the project would be matched by emission reductions elsewhere in Imperial County. Therefore, analysis for conformity with regional air quality plans is not required for the project.

5.0 GREENHOUSE GAS EMISSIONS ANALYSIS

5.1 CLIMATE CHANGE AND GREENHOUSE GASES

If the earth had no atmosphere, almost all of the energy received from the sun would be re-radiated out into space. Our atmosphere helps retain a major portion of the solar radiation through "the greenhouse effect." Short-wavelength solar radiation passes through the atmosphere and is absorbed by the earth's surface. The earth re-radiates the heat up into the atmosphere, at a longer wavelength. GHG in the atmosphere absorb the longer-wavelength heat and then radiate it back downward. In general, as concentrations of GHG in the atmosphere increase, global temperatures increase.

For many centuries, atmospheric GHG concentrations were relatively stable. As combustion of fossil fuels for industrial activities and transportation increased, concentrations of CO_2 in the atmosphere increased dramatically. The result has been an observed increase in average global temperature. The current consensus among scientists is that continued increases in atmospheric GHG will not only raise the average global temperature but will also lead to changes in climate. While air temperatures will mainly rise, temperatures may decrease in some areas. Rainfall distribution and storm patterns will be affected. As polar ice melts, sea levels may rise, inundating coastal areas.

GHG is defined under the California Global Warming Solutions Act of 2006 (AB 32) as CO_2, CH_4, N_2O, hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulfur hexafluoride (SF_6). Associated with each GHG species is a "global warming potential" (GWP), which is defined as the ratio of degree of warming to the atmosphere that would result from the emission of one mass unit of a given GHG compared with one equivalent mass unit of CO_2 over a given period of time. By this definition, the GWP of CO_2 is always 1. The GWP of methane and N_2O are 25 and 298, respectively.[25] "Carbon dioxide equivalent" (CO_2e) emissions are calculated by weighting each GHG compound's emissions by its GWP and then summing the products.

Carbon dioxide (CO_2) is a clear, colorless, and odorless gas. Fossil fuel combustion is the main human-related source of CO_2 emissions; electricity generation and transportation are first and second in the amount of CO_2 emissions, respectively. Carbon dioxide is the basis of GWP, and thus has a GWP of 1.

Methane (CH_4) is a clear, colorless gas, and is the main component of natural gas. Anthropogenic sources of CH_4 are fossil fuel production, biomass burning, waste management, and mobile and stationary combustion of fossil fuel. Wetlands are responsible for the majority of the natural methane emissions.[26] As mentioned above, CH_4, within a 100-year period, is 25 times more effective in trapping heat than is CO_2.

Nitrous oxide (N_2O) is a colorless, clear gas, with a slightly sweet odor. N_2O has both natural and human-related sources, and is removed from the atmosphere mainly by photolysis, or breakdown by sunlight, in the stratosphere. The main human-related sources of N_2O in the United States are agricultural soil management (synthetic nitrogen fertilization), mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production.[27] Nitrous oxide is also produced from a wide range of biological sources in soil and water. Within a 100-year span, N_2O is 298 times more effective in trapping heat than is CO_2.[28]

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[25] Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. 2007.

[26] U.S. Environmental Protection Agency, "Methane." Climate Change Web Site. Internet URL: http://www.epa.gov/methane/. Updated April 1, 2011.

[27] U.S. Environmental Protection Agency, "Nitrous Oxide." Climate Change Web Site. Internet URL: http://www.epa.gov/nitrousoxide/. Updated June 22, 2010.

[28] Ibid.

5.1.1 Potential Environmental Effects

Worldwide, average temperatures are likely to increase by 3°F to 7°F by the end of the 21st century.[29] However, a global temperature increase does not directly translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependent on multiple variables, such as topography. One region of the Earth may experience increased temperature, increased incidents of drought, and similar warming effects, whereas another region may experience a relative cooling. According to the International Panel on Climate Change's (IPCC's) Working Group II Report,[30] climate change impacts on North America may include diminishing snowpack, increasing evaporation, exacerbated shoreline erosion, exacerbated inundation from sea level rising, increased risk and frequency of wildfire, increased risk of insect outbreaks, increased experiences of heat waves, and rearrangement of ecosystems, as species and ecosystem zones shift northward and to higher elevations.

5.1.2 California Implications

Even though climate change is a global problem and GHGs are global pollutants, the specific potential effects of climate change on California have been studied. The third assessment produced by the California Natural Resources Agency (CNRA)[31] explores local and statewide vulnerabilities to climate change, highlighting opportunities for taking concrete actions to reduce climate-change impacts. Projected changes for the remainder of this century in California include:

- **Temperatures** – By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century and springtime warming — a critical influence on snowmelt — will be particularly pronounced.

- **Rainfall** – Even though model projections continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability, improved climate models shift towards drier conditions by the mid-to-late 21st century in Central, and most notably, Southern California.

- **Wildfire** - Earlier snowmelt, higher temperatures, and longer dry periods over a longer fire season will directly increase wildfire risk. Indirectly, wildfire risk will also be influenced by potential climate-related changes in vegetation and ignition potential from lightning, with human activities continuing to be the biggest factor in ignition risk. Models are showing that estimated that property damage from wildfire risk could be as much as 35% lower if smart growth policies were adopted and followed than if there is no change in growth policies and patterns.

The third assessment by CNRA not only defines projected vulnerabilities to climatic changes but analyzes potential impacts from adaptation measures used to minimize harm and take advantage of beneficial opportunities that may arise from climate change.

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[29] Climate Change 2007: Impacts, Adaptation, and Vulnerability. Website http://www.ipcc.ch/ipccreports/ar4-wg2.htm. Accessed March 2013.

[30] Ibid.

[31] Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California. California Natural Resources Agency. July 2012 / CEC-500-2012-007.

The report highlights important new insights and data, using probabilistic and detailed climate projections and refined topographic, demographic, and land use information. The findings include:

- The state's electricity system is more vulnerable than was previously understood.
- The Sacramento-San Joaquin Delta is sinking, putting levees at growing risk.
- Wind and waves, in addition to faster rising seas, will worsen coastal flooding.
- Animals and plants need connected "migration corridors" to allow them to move to habitats that are more suitable to avoid serious impacts.
- Native freshwater fish are particularly threatened by climate change.
- Minority and low-income communities face the greatest risks from climate change.

5.2 REGULATORY BACKGROUND

5.2.1 Federal Climate Change Regulation

The federal government has been involved in climate change issues at least since 1978 when Congress passed the National Climate Program Act (92 Stat. 601), under authority of which the National Research Council prepared a report predicting that additional increases in atmospheric CO_2 would lead to non-negligible changes in climate. At the "Earth Summit" in 1992 in Rio de Janeiro, President George H.W. Bush signed the United Nations Framework Convention on Climate Change (UNFCCC), a nonbinding agreement among 154 nations to reduce atmospheric concentrations of carbon dioxide and other greenhouse gases. The treaty was ratified by the U.S. Senate. However, when the UNFCCC signatories met in 1997 in Kyoto, Japan, and adopted a protocol that assigned mandatory targets for industrialized nations to reduce greenhouse gas emissions, the U.S. Senate expressed its opposition to the treaty. The Kyoto Protocol was not submitted to the Senate for ratification.

The federal government is taking several common-sense steps to address the challenge of climate change. EPA collects several types of GHG emissions data. This data helps policy makers, businesses, and EPA track GHG emissions trends and identify opportunities for reducing emissions and increasing efficiency. USEPA has been collecting a national inventory of GHG emissions since 1990 and in 2009 established mandatory reporting of GHG emissions from large GHG emissions sources.

Current USEPA efforts based on historical website material reflecting the EPA website as it existed on January 19, 2017[32] include regulatory initiatives such as EPA's vehicle greenhouse gas rules and Clean Power Plan; partnering with the private sector through voluntary energy and climate programs; and reducing EPA's carbon footprint with the federal greenhouse gas requirements and EPA's Strategic Sustainability Performance Plan. However, the current administration is making an effort to repeal the Clean Power Plan, and reduce or eliminate related initiatives of the previous administration.

5.2.2 California Climate Change Regulation

Since 2005, through legislation, regulations, and executive orders, the State of California has actively pursued a goal of substantially reducing public and private sector GHG emissions in the state. The following are the major actions taken to date.

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[32] What EPA Is Doing about Climate Change, Environmental Protection Agency.

Executive Order S-3-05 (GHG Emissions Reductions). Executive Order #S-3-05, signed by Governor Arnold Schwarzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80% reduction in GHG emissions to below 1990 levels by 2050.

The California Global Warming Solutions Act of 2006 (AB 32). In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Global Warming Solutions Act of 2006 (Health and Safety Code § 38500 et seq.), into law. AB 32 was intended to effectively end the scientific debate in California over the existence and consequences of global warming. In general, AB 32 directs the California Air Resources Board (CARB) to do the following:

- On or before June 30, 2007, publicly make available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit.
- By January 1, 2008, determine the statewide levels of GHG emissions in 1990, and adopt a statewide GHG emissions limit that is equivalent to the 1990 level (an approximately 25% reduction in existing statewide GHG emissions).
- On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures.
- On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and non-monetary incentives that reduce GHG emissions from any sources or categories of sources as CARB finds necessary to achieve the statewide GHG emissions limit.
- Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.

On December 11, 2008, the CARB approved the *Climate Change Scoping Plan*[33] pursuant to AB 32. The Scoping Plan recommends a wide range of measures for reducing GHG emissions, including (but not limited to):

- Expanding and strengthening of existing energy efficiency programs.
- Achieving a statewide renewables energy mix of 33 percent.
- Developing a GHG emissions cap-and-trade program.
- Establishing targets for transportation-related GHG emissions for regions throughout the state, and pursuing policies and incentives to meet those targets.

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[33] California Air Resources Board, Climate Change Scoping Plan, a Framework for Change, Pursuant to AB32, the California Global Warming Solutions Act of 2006 (December 11, 2008).

- Implementing existing state laws and policies, including California's clean car standards, goods movement measures and the Low Carbon Fuel Standard.
- Targeted fees to fund the state's long-term commitment to administering AB 32.

Executive Order S-01-07 (Low Carbon Fuel Standard). Executive Order #S-01-07 (January 18, 2007) establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020 through establishment of a Low Carbon Fuel Standard. Carbon intensity is the amount of CO2e per unit of fuel energy emitted from each stage of producing, transporting and using the fuel in a motor vehicle. On April 23, 2009 the Air Resources Board adopted a regulation to implement the standard.

Senate Bill 97. Senate Bill 97 was signed by the governor on August 24, 2007. The bill required the Office of Planning and Research (OPR), by July 1, 2009, to prepare, develop and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. On April 13, 2009 OPR submitted to the Secretary for Natural Resources its proposed amendments to the State CEQA Guidelines for greenhouse gas emissions. The Resources Agency adopted those guidelines on December 30, 2009, and they became effective on March 18, 2010. The amendments treat GHG emissions as a separate category of impacts; i.e. they are not to be addressed as part of an analysis of air quality impacts.

Section 15064.4, which was added to the CEQA Guidelines, specifies how the significance of impacts from GHGs is to be determined. First, the lead agency should "make a good faith effort" to describe, calculate or estimate the amount of GHG emissions resulting from a project. After that, the lead agency should consider the following factors when assessing the impacts of the GHG emissions on the environment:

- The extent to which the project may increase or reduce GHG emissions, relative to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional or local plan for the reduction or mitigation of GHG emissions.

The Governor's Office of Planning and Research (OPR) asked the CARB to make recommendations for GHG-related thresholds of significance. On October 24, 2008, the CARB issued a preliminary draft staff proposal for *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act.*[34] After holding two public workshops and receiving comments on the proposal, CARB staff

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[34] California Air Resources Board. Preliminary Draft Staff Proposal. Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act. Planning and Technical Support Division, Sacramento, California (October 24, 2008).

decided not to proceed with threshold development.[35] Quantitative significance thresholds, if any, are to be set by local agencies.

Senate Bill 375. Senate Bill 375 requires coordination of land use and transportation planning to reduce GHG emissions from transportation sources. Regional transportation plans, which are developed by metropolitan transportation organizations such as the Southern California Association of Governments (SCAG), are to include "sustainable community strategies" to reduce GHG emissions.

Title 24. The Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6, of the *California Code of Regulations*) were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Compliance with Title 24 will result in decreases in GHG emissions. The California Energy Commission adopted the 2008 changes to the Building Energy Efficiency Standards on April 23, 2008 with an aim to promote the objectives listed below.[36]

- Provide California with an adequate, reasonably-priced and environmentally-sound supply of energy.

- Respond to Assembly Bill 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its greenhouse gas emissions to 1990 levels by 2020.

- Pursue California energy policy that energy efficiency is the resource of first choice for meeting California's energy needs.

- Act on the findings of California's Integrated Energy Policy Report (IEPR) that Standards are the most cost-effective means to achieve energy efficiency, expects the Building Energy Efficiency Standards to continue to be upgraded over time to reduce electricity and peak demand, and recognizes the role of the Standards in reducing energy related to meeting California's water needs and in reducing greenhouse gas emissions.

- Meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes.

- Meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards.

The provisions of Title 24, Part 6 apply to all buildings for which an application for a building permit or renewal of an existing permit is required by law. They regulate design and construction of the building envelope, space-conditioning and water-heating systems, indoor and outdoor lighting systems of buildings, and signs located either indoors or outdoors. Title 24, Part 6 specifies mandatory, prescriptive and performance measures, all designed to

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[35] Personal communication from Douglas Ito, California Air Resources Board, Sacramento, California, to Michael Rogozen, UltraSystems Environmental Inc., Irvine, California. March 29, 2010.

[36] "2008 Building Energy Efficiency Standards." California Energy Commission, Sacramento, California. (http://www.energy.ca.gov/title24/2008standards/index.html). These became effective January 1, 2010.

optimize energy use in buildings and decrease overall consumption of energy to construct and operate residential and nonresidential buildings.[37] Mandatory measures establish requirements for manufacturing, construction and installation of certain systems; equipment and building components that are installed in buildings.

Recent Developments: On May 22, 2014 the ARB approved the First Update to the Climate Change Scoping Plan Pursuant to AB 32.[38] The updated scoping plan evaluates the effectiveness of policies from the original scoping plan and adds recommendations for expanding and improving upon those programs including, but not limited to:

- Leveraging public money to fund technologies including medium and heavy duty Zero Emission Vehicles (ZEV).
- Expanding local, regional, and state transportation plan goals to improve transit efficiency.
- Supporting the High-Speed Rail Authority and Sustainable Freight Strategy.
- Extending Low Carbon Fuel Standards beyond 2020 with more aggressive goals.
- Developing accurate methods for estimating agricultural emissions so that greenhouse gas reduction techniques can be assessed.
- Eliminating disposal of organic matter and promote methane recovery at landfills.
- Instituting the Forest Carbon Plan to model and understand the carbon cycle of forestry.
- Implementing economic incentives for the destruction of short-lived climate pollutants.
- Allowing limited future allowances for Cap-and-Trade to reduce cost spikes.
- Setting interim goals to reach greenhouse gas emissions of 80% of 1990 levels by 2050.

5.2.3 Local Significance Thresholds

It is widely recognized that no single project could generate enough GHG emissions to change the global climate temperature noticeably. However, the combination of GHG emissions from past, present, and future projects could contribute substantially to global climate change. Thus, project specific GHG emissions should be evaluated in terms of whether they would result in a cumulatively significant impact on global climate change.

Since the County of Imperial has not established a threshold of significance for GHGs, the ICAPCD recommends that the project be evaluated based on strategies developed by the Climate Action Team (CAT) in a 2006 Report[39] that set the framework for the State's emission reduction strategies that

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[37] 2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, California Energy Commission, (December 2008).

[38] First Update to the Climate Change Scoping Plan. California Air Resources Board. (http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf). May 2014.

[39] Climate Action Team Report to Governor Schwarzenegger and the Legislature. California Environmental Protection Agency. March 2006.

could be implemented in California to reduce climate change emissions to ensure that the targets of AB 32 are met.

5.3 PROJECT GREENHOUSE GAS EMISSIONS INVENTORY

The project will cause both direct and indirect source emissions of GHG. Direct emission sources are those which produce onsite emissions through the combustion of fossil fuels. Typically, the two main direct emission sources will be use of internal combustion (IC) engines and space heating. Indirect GHG source emissions are those for which the project is responsible, but that occur offsite. For example, the solid waste that is distributed to landfills will decay and emit the GHGs CO_2 and CH_4. GHG are also emitted by combustion of fossil fuels to generate electricity used by the project. Production of the electricity used to convey water to the project and to treat wastewater generated by the project is also an indirect source.

Because of the persistence of GHG in the atmosphere, all the impacts addressed in this section are defined as long-term. Greenhouse gas emissions from construction are amortized over the next 30 years and added to operational emissions for the purpose of estimating annual emissions.

5.3.1 Direct Source Emissions

5.3.1.1 Construction Emissions

The same equipment characteristics and schedule information that were used for the air quality analysis described in **Section 4.5** were used in the GHG analysis. Estimated annual GHG emissions in 2018, 2019, and 2020 would be **94.3, 72.3,** and **74.0 metric tons (tonnes) CO_2e**, respectively. The total of these values would be **240.5 tonnes of CO_2e**. The annual average over 30 years would be **8.0 tonnes per year**.

5.3.1.2 Operational Emissions

The project will generate operational GHG emissions from employee commuting, locomotive activity, container loader activity, and on-road exhaust emissions from hauling trucks. As Phases 1 through 3 are implemented, estimated annual GHG emissions in 2018, 2019, and 2020 would increase by **443.5, 443.0,** and **443.3 metric tons (tonnes) CO_2e**, respectively. The total of these values, **1,338 tonnes of CO_2e,** would be the annual emission rate for subsequent years.

5.3.2 Total Unmitigated Greenhouse Gas Emissions

Table 5.3-1 (Unmitigated Annual GHG Emissions, 2018 and Beyond) gives a detailed breakdown of the results of the GHG emissions analysis.

Table 5.3-1
UNMITIGATED ANNUAL GHG EMISSIONS, 2018 AND BEYOND

(Emissions in tonnes)

Phase/Activity	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
2018 Phase 1 Increment	434.0	0.134	0.021	443.5
2019 Phase 2 Increment	433.5	0.134	0.021	443.0
2020 Phase 3 Increment	433.7	0.134	0.021	443.3
Cumulative Operational Totals	**1,301**	**0.402**	**0.063**	**1,330**
Amortized Construction				8.0
Project Totals				***1,338***

5.4 IMPACT ANALYSIS

UltraSystems used the following factors from § 15064.4(b) of the CEQA Guidelines to assess the significance of impacts from greenhouse gas emissions on the environment:[40]

- The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting.
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.

5.4.1 Increase in Greenhouse Gas Emissions

As seen in **Table 5.3-1** the project will generate about 1,338 tonnes per year of GHG emissions. How much of an increase in GHG emissions this represents is uncertain. In fact, the project has the potential to significantly reduce GHG emissions through the elimination of the need for trucks to deliver their product to the POLB. Because climate change is a global issue, it does not matter where the emissions occur. Whether there would be a net increase in mobile source GHG emissions is also uncertain.

5.4.2 Compliance with Greenhouse Gas Reduction Plans

There are currently no regional or local climate action plans or general or specific plan provisions to reduce GHG emissions in the study area. The only applicable plan is the set of regulations to be developed under AB 32, which has a target of reducing GHG emissions to 1990 levels by 2020. The potential significance of emissions from the project therefore depends upon the extent to which the project furthers or hinders implementation of AB 32.

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[40] CEQA Guidelines §§ 15064.4(b)(1) through 15064.4(b)(3).

The 1,338 tonnes per year of GHG emissions forecast for the project is below an interim threshold that the South Coast Air Quality Management District (SCAQMD) has recommended for various type of development projects.[41] The SCAQMD proposes that if a residential or commercial project generates GHG emissions below 3,000 tonnes CO_2e annually, it could be concluded that the Project's GHG contribution is not "cumulatively considerable" and is therefore less than significant under CEQA. The project's GHG contribution would be determined to be not "cumulatively considerable" and therefore would be less than significant under CEQA.

6.0 MITIGATION MEASURES

6.1 MITIGATION FOR AIR QUALITY IMPACTS

Mitigation for the project's operational emissions, as specified by the ICAPCD's *CEQA Air Quality Handbook* and Guidance Policy #5 is listed below.

6.1.1 Construction Phase

In addition to complying with the ICAPCD's standard mitigation measures for construction, and with applicable District rules, the proponent shall implement mitigation measure **MM AQ-1**:

MM AQ-1 The operator shall limit vehicle speed to less than 15 miles per hour on any and all unpaved surfaces on the project site.

6.1.2 Operational Phase

In lieu of a proponent proposing and administering offsite mitigation measures, as approved by the ICAPCD, to reduce emission levels below significance the ICAPCD adopted Guidance Policy #5[42] to provide for a proponent to pay in-lieu fees that are placed into an ICAPCD specified development account for appropriate tracking. Projects funded by the in-lieu fees must be emission reductions that are surplus; that adhere to a minimum cost-effectiveness level; not utilized for marketable emission credits; and have a minimum project life of ten years.

In accordance with the ICAPCD *CEQA Air Quality Handbook*, the long-term operational impacts would be less than significant upon implementation of mitigation measure **AQ-2**:

MM AQ-2 The proponent shall pay an in-lieu mitigation fee to be determined and administered by the ICAPCD.

6.2 MITIGATION FOR CLIMATE CHANGE IMPACTS

No mitigations necessary.

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[41] Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans. South Coast Air Quality Management District Board. Adopted December 5, 2008.

[42] Off-Site Mitigation / In-Lieu Fee. Imperial County Air Pollution Control District. March 30, 2007 (Revised March 4, 2009).

ATTACHMENTS

ATTACHMENT 1

EMISSION CALCULATION DETAILS

Operational Summary Emissions

Operational Criteria Emissions

Phase/Activity	Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Phase 1 - Locomotives	3.41	5.83	38.92	1.02	0.94
Phase 1 - Container Loaders	4.32	80.25	9.26	0.46	0.43
Phase 1 - Hauling Trucks	6.78	18.87	100.28	4.81	1.72
Phase 1 - Employees	0.02	0.47	0.06	0.00	0.00
Phase 1 - Totals	***14.5***	***105.4***	***148.5***	***6.3***	***3.1***
Phase 2 - Locomotives	3.41	5.83	38.92	1.02	0.94
Phase 2 - Container Loaders	4.32	80.25	9.26	0.46	0.43
Phase 2 - Hauling Trucks	5.85	16.43	86.65	4.14	1.72
Phase 2 - Employees	0.01	0.45	0.06	0.00	0.01
Phase 2 - Totals	***13.6***	***103.0***	***134.9***	***5.6***	***3.1***
Phase 3 - Locomotives	3.41	5.83	38.92	1.02	0.94
Phase 3 - Container Loaders	4.32	80.25	9.26	0.46	0.43
Phase 3 - Hauling Trucks	4.26	12.00	62.99	2.96	1.72
Phase 3 - Employees	0.01	0.43	0.06	0.00	0.01
Phase 3 - Totals	***12.0***	***98.5***	***111.2***	***4.4***	***3.1***

Note: Criteria emissions are for on-road activity within the ICAPCD jurisdiction only

Operational GHG

Phase/Activity	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
Phase 1 - Locomotives	32.66	0.0026	0.0008	32.97
Phase 1 - Container Loaders	353.77	0.1099	N/A	356.52
Phase 1 - Hauling Trucks	36.95	0.0203	0.0187	43.02
Phase 1 - Employees	10.60	0.0010	0.0011	10.96
Phase 1 - Totals	***434.0***	***0.134***	***0.021***	***443.5***
Phase 2 - Locomotives	32.66	0.0026	0.0008	32.97
Phase 2 - Container Loaders	353.77	0.1099	N/A	356.52
Phase 2 - Hauling Trucks	36.60	0.0203	0.0187	42.68
Phase 2 - Employees	10.49	0.0010	0.0011	10.86
Phase 2 - Totals	***433.5***	***0.134***	***0.021***	***443.0***
Phase 3 - Locomotives	32.66	0.0026	0.0008	32.97
Phase 3 - Container Loaders	353.77	0.1099	N/A	356.52
Phase 3 - Hauling Trucks	36.95	0.0203	0.0187	43.02
Phase 3 - Employees	10.36	0.0010	0.0012	10.73
Phase 3 - Totals	***433.7***	***0.134***	***0.021***	***443.3***
Project Totals	***1,301***	***0.401***	***0.062***	***1,330***

Note: GHG emissions include all on-road activity including beyond Imperial County.

Locomotive, Truck, & Loader Assumptions

Assumptions per Phase

1	train per week
2	locomotives per train
212	total 1-way mileage to/from POLB
35	1-way POLB mileage in Imperial Co
60	average speed of long haulers
210	trucks per trainload
13	average 1-way mileage in Imperial Valley
4	container loaders on-site per day

Locomotive Emission Factors

Locomotive Type	Weighted EmFac (lb/hr)			
	HC	CO	NO_X	PM
Line Hauler	0.932	3.058	24.267	0.618
Switcher - Idle	0.169	0.310	1.434	0.042
Switcher - Notch 1	0.034	0.058	0.377	0.007

Applying ARB correction factors

	RHC	$PM_{2.5}$
Line Hauler	1.128	0.569
Switcher - Idle	0.205	0.038
Switcher - Notch 1	0.041	0.006

Long Haul Activity

1	train per week
35	one way trip miles within Imperial County
0.58	hours of travel within Imperial County
212	one way trip miles to POLB
16.21	hours of travel to/from POLB

Switch Engine Activity

1	train per week
1	day to unload empty containers
1	day to load full containers
2	days train operates as a switcher
10	hours per day of activity

Locomotives would spend 70% of the time at idle and 30% at Notch1

Container Loader Activity

4	loaders active each day
2	days loading/stacking/unloading
10	hours per day of activity

Truck Mileage to POLB

212.5	via CA-91
225.8	via I-10
211.4	via CA 78
216.6	**Average**

Truck Mileage in Imperial

51	via CA-91 or I-10
40	via CA 78

Diesel GHG Emission Factors		
CO_2	10,206	g/gal
CH_4	0.80	
N_2O	0.26	

Source: EPA (2017) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015.

Container Loader

Hyster RE 46-33 CH container loaders with Tier 4 (final), 350-HP Cummins engine

Tier 4F Standards		
CO	2.6	g/bhp/hr
NMHC	0.14	
NO_X	0.30	
PM	0.015	
* CO_2	486.0	
* CH_4	0.151	

** From Appendix D CalEEMod Manual*

Locomotive Emissions

Locomotive Activity

Activity	# of Engines	Hours of Operation	
		Imperial	POLB
Long Haul	2	0.6	28.3
Switching	1	5	N/A

Criteria

Activity	Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Long Haul	2.63	3.57	28.31	0.72	0.66
Switching - Idle	0.72	2.17	10.04	0.29	0.27
Switching - Notch 1	0.06	0.09	0.57	0.01	0.01
Totals	***3.4***	***5.8***	***38.9***	***1.0***	***0.9***

GHG

Activity	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
Long Haul	30.01	0.0024	0.0008	30.29
Switching	2.65	0.0002	0.0001	2.68
Totals	***32.7***	***0.003***	***0.001***	***33.0***

Note: Locomotive activity and resultant criteria emissions are based on activity and 1-way trip lengths within the jurisdiction of ICAPCD. Resultant GHG emissions are based on the total hours travelled with round trip mileages.

Container Loader Emissions

Loader Activity

Make	Number	Horsepower	Hours of Operation	
			Daily	Annual
Hyster	4	350	10	520

Criteria

Make	Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Hyster	4.32	80.25	9.26	0.46	0.43

GHG

Make	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
Hyster	353.77	0.1099	N/A	356.52

Operational On-road Emissions

Truck Activity

Expanded Activity	# Vehicles per Day	Trip Length (one-way)	VMT per day	VMT per year
Ag Products to Project	210	13.1	5,493	1,718,384

PCE *735*

Light Duty Vehicle Activity

Expanded Activity	# Vehicles per Day	Trip Length (one-way)	VMT per day	VMT per year
Employees	5	21.5	108	33,632
		TOTAL	***108***	***33,632***

Criteria Emissions

Expanded Activity	Pounds per day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Phase 1 - Ag Products to Project	6.78	18.87	100.28	4.81	1.72
Phase 1 - Employees	0.02	0.47	0.06	0.00	0.00
Phase 2 - Ag Products to Project	5.85	16.43	86.65	4.14	1.72
Phase 2 - Employees	0.01	0.45	0.06	0.00	0.01
Phase 3 - Ag Products to Project	4.26	12.00	62.99	2.96	1.72
Phase 3 - Employees	0.01	0.43	0.06	0.00	0.01

GHG

Expanded Activity	Tonnes per Year			
	CO_2	CH_4	N_2O	CO_2e
Phase 1 - Ag Products to Project	36.95	0.0203	0.0187	43.0
Phase 1 - Employees	10.60	0.0010	0.0011	11.0
Phase 2 - Ag Products to Project	36.60	0.0203	0.0187	42.7
Phase 2 - Employees	10.49	0.0010	0.0011	10.9
Phase 3 - Ag Products to Project	36.95	0.0203	0.0187	43.0
Phase 3 - Employees	10.36	0.0010	0.0012	10.7
Totals	***142.0***	***0.064***	***0.059***	***161.3***

Note: On-road activity and resultant criteria emissions are based on activity within the jurisdiction of ICAPCD. Resultant GHG emissions are based on the total on-road mileage.

EMFAC2014 (v1.0.7) Emission Rates

EMFAC2011 Vehicle Categories
Imperial COUNTY

Calendar Year 2018

Vehicle Info			Emission Factor (grams/mile)											
Type	Fuel	VMT	ROG	CO	NO_x	PM_{10}			$PM_{2.5}$			CO_2	CH_4	N_2O
						Exhaust	TW+BW	Total	Exhaust	TW+BW	Total			
LDA	GAS	2,929,674	0.0747	2.0664	0.2845	0.0014	0.0448	0.0462	0.0013	0.0178	0.0191	288.6	0.0278	0.0294
LDA	DSL	26,370	0.0231	0.2121	0.1512	0.0156	0.0448	0.0603	0.0149	0.0178	0.0327	257.8	0.6037	0.5554
LDT1	GAS	216,975	0.0925	3.5431	0.3809	0.0033	0.0448	0.0481	0.0030	0.0178	0.0208	340.9	0.0315	0.0433
LDT1	DSL	285	0.1618	1.0545	1.2686	0.1273	0.0448	0.1721	0.1218	0.0178	0.1395	359.9	0.6037	0.5554
LDT2	GAS	991,299	0.0327	1.4479	0.1875	0.0016	0.0448	0.0463	0.0014	0.0178	0.0192	390.1	0.0315	0.0433
LDT2	DSL	1,512	0.0126	0.1077	0.0803	0.0060	0.0448	0.0507	0.0057	0.0178	0.0235	332.3	0.6037	0.5554
Weighted Average for Employees			***0.065***	***1.984***	***0.266***	***0.002***	***0.045***	***0.046***	***0.002***	***0.018***	***0.019***	***315.3***	***0.0289***	***0.0334***
T6 ag	DSL	2,518	0.5596	1.5580	8.2817	0.3974	0.1423	0.5397	0.3802	0.0589	0.4390	1,084.7	0.6037	0.5554

Calendar Year 2019

Vehicle Info			Emission Factor (grams/mile)											
Type	Fuel	VMT	ROG	CO	NO_x	PM_{10}			$PM_{2.5}$			CO_2	CH_4	N_2O
						Exhaust	TW+BW	Total	Exhaust	TW+BW	Total			
LDA	GAS	3,002,449	0.0699	1.9582	0.2686	0.0015	0.0448	0.0462	0.0014	0.0178	0.0191	280.0	0.0278	0.0294
LDA	DSL	28,824	0.0203	0.1952	0.1238	0.0134	0.0448	0.0582	0.0128	0.0178	0.0306	250.0	0.6037	0.5554
LDT1	GAS	213,148	0.0775	3.1270	0.3358	0.0031	0.0448	0.0478	0.0028	0.0178	0.0206	332.7	0.0315	0.0433
LDT1	DSL	260	0.1447	0.9784	1.1821	0.1145	0.0448	0.1592	0.1095	0.0178	0.1273	353.2	0.6037	0.5554
LDT2	GAS	1,003,681	0.0279	1.2919	0.1620	0.0016	0.0448	0.0463	0.0015	0.0178	0.0192	378.8	0.0315	0.0433
LDT2	DSL	1,650	0.0120	0.1032	0.0678	0.0055	0.0448	0.0502	0.0052	0.0178	0.0230	324.9	0.6037	0.5554
Weighted Average for Employees			***0.061***	***1.884***	***0.251***	***0.002***	***0.046***	***0.047***	***0.002***	***0.018***	***0.020***	***311.9***	***0.0294***	***0.0341***
T6 ag	DSL	2,518	0.4834	1.3572	7.1556	0.3419	0.1423	0.4842	0.3271	0.0589	0.3860	1,088.4	0.6037	0.5554

Calendar Year 2020

Vehicle Info			Emission Factor (grams/mile)											
Type	**Fuel**	**VMT**	**ROG**	**CO**	**NO_x**	**PM_{10}**			**$PM_{2.5}$**			**CO_2**	**CH_4**	**N_2O**
						Exhaust	**TW+BW**	**Total**	**Exhaust**	**TW+BW**	**Total**			
LDA	GAS	3,064,802	0.0662	1.8682	0.2552	0.0015	0.0448	0.0462	0.0014	0.0178	0.0191	271.8	0.0278	0.0294
LDA	DSL	31,086	0.0181	0.1827	0.1036	0.0118	0.0448	0.0565	0.0113	0.0178	0.0290	243.1	0.6037	0.5554
LDT1	GAS	210,289	0.0657	2.7613	0.2975	0.0029	0.0448	0.0476	0.0026	0.0178	0.0204	324.3	0.0315	0.0433
LDT1	DSL	242	0.1376	0.9296	1.1150	0.1088	0.0448	0.1536	0.1041	0.0178	0.1218	347.3	0.6037	0.5554
LDT2	GAS	1,017,315	0.0244	1.1662	0.1418	0.0016	0.0448	0.0463	0.0014	0.0178	0.0192	367.8	0.0315	0.0433
LDT2	DSL	1,775	0.0114	0.0993	0.0579	0.0050	0.0448	0.0498	0.0048	0.0178	0.0226	317.9	0.6037	0.5554
Weighted Average for Employees			***0.058***	***1.800***	***0.238***	***0.002***	***0.046***	***0.048***	***0.002***	***0.018***	***0.020***	***308.1***	***0.0299***	***0.0346***
T6 ag	DSL	2,518	0.3515	0.9913	5.2023	0.2447	0.1423	0.3870	0.2341	0.0589	0.2930	1,098.6	0.6037	0.5554

Notes: - Criteria and CO_2 factors come from 2014 EMFAC2014 (v1.0.7) and represent Estimated Annual Emission Rates for Imperial County

- CH_4 and N_2O factors come from Local Government Operations Protocol: For the quantification and reporting of greenhouse gas emissions inventories. Version 1.1. California Air Resources Board, California Climate Action Registry, ICLEI - Local Governments for Sustainability, and The Climate Registry. May 2010

General Assumptions

Local Travel Distances

Source of Ag Products	1-way mileage
Imperial Valley	13.1

Notes - Imperial Valley mileage calculated by taking an average of the maximum mileage in each of the major and secondary cardinal directions

Employees

Source		1-way mileage
50%	Brawley	15
50%	El Centro	28
	Average 1-way Mileage	***21.5***

Fuel Rate for Locomotives

Long Haul

Notch	Fuel Rate (gal/hr)	Average % in Mode	Fuel Rate Portion (gal/hr)
DB	25	38.0%	9.50
Idle	5.5	12.5%	0.69
1	7.5	6.5%	0.49
2	25	6.5%	1.63
3	41	5.2%	2.13
4	57	4.4%	2.51
5	79	3.8%	3.00
6	108	3.9%	4.21
7	146	3.0%	4.38
8	168	16.2%	27.22
		Weighted gal/hr	**55.8**

Switcher

Notch	Fuel Rate (gal/hr)	Average % in Mode	Fuel Rate Portion (gal/hr)
DB	25	0.0%	0.00
Idle	5.5	59.8%	3.29
1	7.5	12.4%	0.93
2	25	12.3%	3.08
3	41	5.8%	2.38
4	57	3.6%	2.05
5	79	3.6%	2.84
6	108	1.5%	1.62
7	146	0.2%	0.29
8	168	0.8%	1.34
		Weighted gal/hr	**17.8**

* *"Fuel Efficiency Improvement in Rail Freight Transportation," J N Cetenich, FRA-ORD-76-136, Dec, 1975. as presented in Railroad Costs blog http://www.alternatewars.com/BBOW/Logistics/RR_Costs.htm*

Emission Factors - Line Haul Locomotives

Notch-Specific In-Use Horsepower and Horsepower-Based Emission Factors

Notch	Power in Notch (bhp)	Emission Factor (g/bhp-hr)			
		HC	CO	NO_x	PM
DB	70	6.89	9.90	50.49	2.82
Idle	14	14.71	27.86	85.35	4.67
1	164	1.06	1.47	12.88	0.45
2	372	0.47	0.95	11.27	0.37
3	764	0.36	0.93	10.81	0.37
4	1,118	0.27	1.15	11.20	0.26
5	1,568	0.25	1.41	11.34	0.22
6	2,093	0.24	1.57	11.16	0.23
7	2,818	0.25	1.46	11.03	0.20
8	3,336	0.25	1.22	10.65	0.21

Hourly Notch Specific Emission Rates

Notch	Emissions (lb/hr)				
	HC	CO	NO_x	PM	SO_2
DB	1.062	1.525	7.779	0.435	0.02
Idle	0.456	0.863	2.645	0.145	0.00
1	0.381	0.532	4.655	0.163	0.04
2	0.386	0.777	9.248	0.305	0.09
3	0.606	1.560	18.204	0.620	0.18
4	0.677	2.825	27.606	0.640	0.26
5	0.858	4.875	39.197	0.744	0.37
6	1.099	7.227	51.500	1.072	0.49
7	1.528	9.072	68.523	1.239	0.66
8	1.826	8.943	78.345	1.575	0.78

Time-in-Notch and Weighted Average Emission Rates

Notch	Average % In Mode	Emissions While in Mode (lb/hr)				
		HC	CO	NO_X	PM	SO_2
DB	38.0%	0.404	0.579	2.956	0.165	0.006
Idle	12.5%	0.057	0.108	0.331	0.018	0.000
1	6.5%	0.025	0.035	0.303	0.011	0.003
2	6.5%	0.025	0.051	0.601	0.020	0.006
3	5.2%	0.032	0.081	0.947	0.032	0.009
4	4.4%	0.030	0.124	1.215	0.028	0.012
5	3.8%	0.033	0.185	1.489	0.028	0.014
6	3.9%	0.043	0.282	2.008	0.042	0.019
7	3.0%	0.046	0.272	2.056	0.037	0.020
8	16.2%	0.296	1.449	12.692	0.255	0.127
	Weighted lb/hr	**0.932**	**3.058**	**24.267**	**0.618**	**0.216**

* *Locomotive Emissions Standards: Regulatory Support Document. United States Environmental Protection Agency, Office of Mobile Sources. April 1998.*

Emission Factors - Switch Engines

Notch-Specific In-Use Horsepower and Horsepower-Based Emission Factors

Notch	Power in Notch (bhp)	Emission Factor (g/bhp/hr)			
		HC	CO	NO_X	PM
DB	67	3.98	8.49	40.20	1.05
Idle	14	9.18	16.81	77.70	2.26
1	83	1.49	2.56	16.63	0.29
2	249	0.66	1.51	12.26	0.37
3	487	0.43	0.83	13.09	0.34
4	735	0.37	0.57	14.27	0.26
5	1,002	0.38	0.53	15.10	0.24
6	1,268	0.40	0.67	15.88	0.29
7	1,570	0.44	1.26	16.37	0.26
8	1,843	0.47	2.97	16.15	0.29

Hourly Notch Specific Emission Rates

Notch	Emissions (lb/hr)				
	HC	CO	NO_X	PM	SO2
DB	0.587	1.255	5.937	0.156	0.02
Idle	0.283	0.519	2.398	0.070	0.00
1	0.273	0.468	3.044	0.054	0.02
2	0.364	0.831	6.732	0.201	0.06
3	0.458	0.895	14.050	0.361	0.11
4	0.594	0.918	23.123	0.416	0.17
5	0.839	1.163	33.356	0.523	0.24
6	1.118	1.864	44.382	0.801	0.30
7	1.523	4.350	56.671	0.888	0.37
8	1.910	12.081	65.605	1.165	0.43

Time-in-Notch and Weighted Average Emission Rates

Notch	Average % in Mode	Emissions While in Mode (lb/hr)				
		HC	CO	NO_X	PM	SO2
DB	0.0%	0.000	0.000	0.000	0.000	0.000
Idle	59.8%	0.169	0.310	1.434	0.042	0.002
1	12.4%	0.034	0.058	0.377	0.007	0.002
2	12.3%	0.045	0.102	0.828	0.025	0.007
3	5.8%	0.027	0.052	0.815	0.021	0.007
4	3.6%	0.021	0.033	0.832	0.015	0.006
5	3.6%	0.030	0.042	1.201	0.019	0.008
6	1.5%	0.017	0.028	0.666	0.012	0.004
7	0.2%	0.003	0.009	0.113	0.002	0.001
8	0.8%	0.015	0.097	0.525	0.009	0.003
	Weighted lb/hr	**0.361**	**0.731**	**6.792**	**0.151**	**0.042**

* *Locomotive Emissions Standards: Regulatory Support Document. United States Environmental Protection Agency, Office of Mobile Sources. April 1998.*

Line Haul Locomotive Emission Factors EPA Regulatory Support Document

Model	Rated Power (bhp)	Notch	Power In Notch (bhp)	Emission Factor (g/bhp-hr)			
				HC	CO	NO_x	PM
Overall average of 17 line haul locomotives	3256	DB	70	6.89	9.90	53.65	2.82
		I	14	14.71	27.86	90.68	4.67
		1	164	1.06	1.47	13.69	0.45
		2	372	0.47	0.95	11.98	0.37
		3	764	0.36	0.93	11.49	0.37
		4	1,118	0.27	1.15	11.90	0.26
		5	1,568	0.25	1.41	12.05	0.22
		6	2,093	0.24	1.57	11.86	0.23
		7	2,818	0.25	1.46	11.72	0.20
		8	3,336	0.25	1.22	11.32	0.21

Locomotive Emissions Standards: Regulatory Support Document. United States Environmental Protection Agency, Office of Mobile Sources. April 1998.

Switching Locomotive Emission Factors EPA Regulatory Support Document

Model	Rated Power (bhp)	Notch	Power In Notch (bhp)	Emission Factor (g/bhp-hr)			
				HC	CO	NO_x	PM
Average switch locomotive	1750	DB	67	3.98	8.49	40.20	1.05
		I	14	9.18	16.81	77.70	2.26
		1	83	1.49	2.56	16.63	0.29
		2	249	0.66	1.51	12.26	0.37
		3	487	0.43	0.83	13.09	0.34
		4	735	0.37	0.57	14.27	0.26
		5	1002	0.38	0.53	15.10	0.24
		6	1268	0.40	0.67	15.88	0.29
		7	1570	0.44	1.26	16.37	0.26
		8	1843	0.47	2.97	16.15	0.29

Locomotive Emissions Standards: Regulatory Support Document. United States Environmental Protection Agency, Office of Mobile Sources. April 1998.

Phase 1 GHG Construction Summary

Activity	**Category**	**GHG Emissions (tonnes)**			
		CO_2	**CH_4**	**N_2O**	**CO_2e**
CP1 - Subgrade Prep - Access Driveway	Offroad	7.41	0.0023	N/A	7.47
	Employees	0.57	0.0001	0.0001	0.59
	CP1 Total	***8.0***	***0.002***	***0.000***	***8.1***
CP2 - Subgrade Prep - Container Storage Yard	Offroad	27.11	0.0084	N/A	27.32
	Employees	2.20	0.0002	0.0002	2.27
	CP2 Total	***29.3***	***0.009***	***0.000***	***29.6***
CP3 - Crushed Rock - Container Storage Yard	Offroad	31.85	0.0099	N/A	32.09
	Haulers	16.34	0.0090	0.0083	19.03
	Employees	1.95	0.0002	0.0002	2.02
	CP3 Total	***50.1***	***0.019***	***0.008***	***53.1***
CP4 - Class II Ag Base - Storage Yard & Access Driveway	Offroad	28.23	0.0088	N/A	28.45
	Haulers	5.45	0.0030	0.0028	6.34
	Employees	1.95	0.0002	0.0002	2.02
	CP4 Total	***35.6***	***0.012***	***0.003***	***36.8***
CP5 - Paving - Access Driveway	Offroad	3.09	0.0010	N/A	3.11
	Employees	0.38	0.0000	0.0000	0.39
	CP5 Total	***3.5***	***0.001***	***0.000***	***3.5***
Grand Total for Construction		***90.9***	***0.031***	***0.009***	***94.3***
Construction Amortized over 30 Years					*3.1*

Phase 2 GHG Emissions Summary

Activity	**Category**	**GHG Emissions (tonnes)**			
		CO_2	**CH_4**	**N_2O**	**CO_2e**
CP1 - Subgrade Prep - Access Driveway	Offroad	7.28	0.0023	N/A	7.34
	Employees	0.57	0.0001	0.0001	0.59
	CP1 Total	***7.9***	***0.002***	***0.000***	***7.9***
CP2 - Subgrade Prep - Container Storage Yard	Offroad	26.64	0.0084	N/A	26.85
	Employees	2.17	0.0002	0.0002	2.25
	CP2 Total	***28.8***	***0.009***	***0.000***	***29.1***
CP3 - Crushed Rock - Container Storage Yard	Offroad	31.53	0.0099	N/A	31.78
	Haulers	0.00	0.0000	0.0000	0.00
	Employees	0.00	0.0000	0.0000	0.00
	CP3 Total	***31.5***	***0.010***	***0.000***	***31.8***
CP4 - Class II Ag Base - Storage Yard & Access Driveway	Offroad	27.92	0.0088	N/A	28.14
	Haulers	0.00	0.0000	0.0000	0.00
	Employees	1.93	0.0002	0.0002	2.00
	CP4 Total	***29.8***	***0.009***	***0.000***	***30.1***
CP5 - Paving - Access Driveway	Offroad	3.03	0.0010	N/A	3.06
	Employees	0.38	0.0000	0.0000	0.39
	CP5 Total	***3.4***	***0.001***	***0.000***	***3.4***
Grand Total for Construction		***71.6***	***0.022***	***0.000***	***72.3***
Construction Amortized over 30 Years					*2.4*

Phase 3 GHG Emissions Summary

Activity	Category	GHG Emissions (tonnes)			
		CO_2	CH_4	N_2O	CO_2e
CP2 - Subgrade Prep - Container Storage Yard	Offroad	26.05	0.0084	N/A	26.26
	Employees	2.15	0.0002	0.0002	2.22
	CP2 Total	***28.2***	***0.009***	***0.000***	***28.5***
CP3 - Crushed Rock - Container Storage Yard	Offroad	30.61	0.0099	N/A	30.86
	Haulers	10.90	0.0060	0.0055	12.69
	Employees	1.91	0.0002	0.0002	1.98
	CP3 Total	***43.4***	***0.016***	***0.006***	***45.5***
CP4 - Class II Ag Base - Storage Yard & Access Driveway	Offroad	27.14	0.0088	N/A	27.36
	Haulers	5.45	0.0030	0.0028	6.34
	Employees	1.91	0.0002	0.0002	1.98
	CP4 Total	***34.5***	***0.012***	***0.003***	***35.7***
Grand Total for Construction		***71.6***	***0.025***	***0.006***	***74.0***
Construction Amortized over 30 Years					*2.5*

Construction Unmitigated Emissions Summary

Phase Activity	Category	Criteria Emissions (max lbs/d)				
		ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Phase 1 East Side (2018)	Off-road	5.29	25.15	58.30	2.52	2.32
	Haulers	0.70	1.95	10.38	0.50	0.18
	Employees	0.09	2.82	0.38	0.00	0.06
	Road Dust	--	--	--	332.86	1.68
	Grading Fugitive	--	--	--	0.41	0.04
	Phase 1 Max Daily	***6.1***	***29.9***	***69.1***	***335.9***	***4.2***
Phase 2 West Side (2019)	Off-road	4.98	24.53	53.63	2.28	2.10
	Haulers	0.59	1.65	8.69	0.42	0.17
	Employees	0.09	2.68	0.36	0.00	0.06
	Road Dust	--	--	--	326.42	1.65
	Grading Fugitive	--	--	--	0.41	0.04
	Phase 2 Max Daily	***5.7***	***28.9***	***62.7***	***329.1***	***4.0***
Phase 3 Center (2020)	Off-road	2.73	14.13	31.19	1.34	1.24
	Haulers	0.43	1.20	6.32	0.30	0.17
	Employees	0.05	1.54	0.20	0.00	0.04
	Road Dust	--	--	--	326.42	1.65
	Grading Fugitive	--	--	--	0.41	0.04
	Phase 3 Max Daily	***3.2***	***16.9***	***37.7***	***328.1***	***3.1***

Construction Mitigated Emissions Summary

Phase Activity	Category	Criteria Emissions (max lbs/d)				
		ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Phase 1 East Side (2018)	Off-road	5.29	25.15	58.30	2.52	2.32
	Haulers	0.70	1.95	10.38	0.50	0.18
	Employees	0.09	2.82	0.38	0.00	0.06
	Road Dust	--	--	--	143.13	0.72
	Grading Fugitive	--	--	--	0.41	0.04
	Phase 1 Max Daily	***6.1***	***29.9***	***69.1***	***146.2***	***3.3***
Phase 2 West Side (2019)	Off-road	4.98	24.53	53.63	2.28	2.10
	Haulers	0.59	1.65	8.69	0.42	0.17
	Employees	0.09	2.68	0.36	0.00	0.06
	Road Dust	--	--	--	140.36	0.71
	Grading Fugitive	--	--	--	0.41	0.04
	Phase 2 Max Daily	***5.7***	***28.9***	***62.7***	***143.1***	***3.0***
Phase 3 Center (2020)	Off-road	2.73	14.13	31.19	1.34	1.24
	Haulers	0.43	1.20	6.32	0.30	0.17
	Employees	0.05	1.54	0.20	0.00	0.04
	Road Dust	--	--	--	140.36	0.71
	Grading Fugitive	--	--	--	0.41	0.04
	Phase 3 Max Daily	***3.2***	***16.9***	***37.7***	***142.0***	***2.2***

Phase 1 Construction Employee Commute

Construction Employee Vehicle Activity

Activity	Total Work Days	Trips per day	Round Trip (mi)	VMT per day	Total VMT (mi)
CP1 - Subgrade Prep - Access Driveway	7	6	43	258	1,806
CP2 - Subgrade Prep - Container Storage Yard	18	9	43	387	6,966
CP1 + CP2	18	15		645	
CP3 - Crushed Rock - Container Storage Yard	18	8	43	344	6,192
CP4 - Class II Ag Base - Storage Yard & Access Driveway	18	8	43	344	6,192
CP5 - Paving - Access Driveway	7	4	43	172	1,204
CP4 + CP5	18	12		516	9,288
Max & Totals	***18***	***15***		***645***	***31,648***

Construction Employee Criteria Emissions

Activity	Pounds per Day				
	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
CP1 - Subgrade Prep - Access Driveway	0.037	1.128	0.151	0.001	0.025
CP2 - Subgrade Prep - Container Storage Yard	0.056	1.692	0.227	0.001	0.038
CP1 + CP2	0.093	2.821	0.378	0.002	0.064
CP3 - Crushed Rock - Container Storage Yard	0.050	1.504	0.201	0.001	0.034
CP4 - Class II Ag Base - Storage Yard & Access Driveway	0.050	1.504	0.201	0.001	0.034
CP5 - Paving - Access Driveway	0.025	0.752	0.101	0.001	0.017
CP4 + CP5	0.074	2.257	0.302	0.002	0.051
Maximum Pounds per Day	***0.09***	***2.82***	***0.38***	***0.00***	***0.06***

Construction Employee GHG Emissions

Activity	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
CP1 - Subgrade Prep - Access Driveway	0.57	0.0001	0.0001	0.59
CP2 - Subgrade Prep - Container Storage Yard	2.20	0.0002	0.0002	2.27
CP3 - Crushed Rock - Container Storage Yard	1.95	0.0002	0.0002	2.02
CP4 - Class II Ag Base - Storage Yard & Access Driveway	1.95	0.0002	0.0002	2.02
CP5 - Paving - Access Driveway	0.38	0.0000	0.0000	0.39
Totals	***7.0***	***0.001***	***0.001***	***7.3***

Phase 2 Construction Employee Commute

Construction Employee Vehicle Activity

Activity	Total Work Days	Trips per day	Round Trip (mi)	VMT per day	Total VMT (mi)
CP1 - Subgrade Prep - Access Driveway	7	6	43	258	1,806
CP2 - Subgrade Prep - Container Storage Yard	18	9	43	387	6,966
CP1 + CP2	18	15		645	
CP3 - Crushed Rock - Container Storage Yard	18	8	43	344	6,192
CP4 - Class II Ag Base - Storage Yard & Access Driveway	18	8	43	344	6,192
CP5 - Paving - Access Driveway	7	4	43	172	1,204
CP4 + CP5	18	12		516	
Max & Totals				***645***	***22,360***

Construction Employee Criteria Emissions

Activity	Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
CP1 - Subgrade Prep - Access Driveway	0.035	1.072	0.143	0.001	0.026
CP2 - Subgrade Prep - Container Storage Yard	0.052	1.607	0.214	0.001	0.039
CP1 + CP2	0.087	2.679	0.357	0.002	0.065
CP3 - Crushed Rock - Container Storage Yard	0.087	2.679	0.357	0.002	0.065
CP4 - Class II Ag Base - Storage Yard & Access Driveway	0.046	1.429	0.190	0.001	0.035
CP5 - Paving - Access Driveway	0.023	0.714	0.095	0.001	0.017
CP4 + CP5	0.070	2.143	0.285	0.002	0.052
Maximum Pounds per Day	***0.09***	***2.68***	***0.36***	***0.00***	***0.06***

Construction Employee GHG Emissions

Activity	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
CP1 - Subgrade Prep - Access Driveway	0.56	0.0001	0.0001	0.58
CP2 - Subgrade Prep - Container Storage Yard	2.17	0.0002	0.0002	2.25
CP3 - Crushed Rock - Container Storage Yard	0.00	0.0000	0.0000	0.00
CP4 - Class II Ag Base - Storage Yard & Access Driveway	1.93	0.0002	0.0002	2.00
CP5 - Paving - Access Driveway	0.38	0.0000	0.0000	0.39
Totals	***5.0***	***0.000***	***0.001***	***5.2***

Phase 3 Construction Employee Commute

Construction Employee Vehicle Activity

Activity	Total Work Days	Trips per day	Round Trip (mi)	VMT per day	Total VMT (mi)
CP2 - Subgrade Prep - Container Storage Yard	18	9	43	387	6,966
CP3 - Crushed Rock - Container Storage Yard	18	8	43	344	6,192
CP4 - Class II Ag Base - Storage Yard & Access Driveway	18	8	43	344	6,192
			Totals	***1,075***	***19,350***

Construction Employee Criteria Emissions

Activity	Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
CP2 - Subgrade Prep - Container Storage Yard	0.050	1.536	0.203	0.001	0.040
CP3 - Crushed Rock - Container Storage Yard	0.044	1.365	0.181	0.001	0.035
CP4 - Class II Ag Base - Storage Yard & Access Driveway	0.044	1.365	0.181	0.001	0.035
Maximum Pounds per Day	***0.05***	***1.54***	***0.20***	***0.00***	***0.04***

Construction Employee GHG Emissions

Activity	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
CP2 - Subgrade Prep - Container Storage Yard	2.15	0.0002	0.0002	2.22
CP3 - Crushed Rock - Container Storage Yard	1.91	0.0002	0.0002	1.98
CP4 - Class II Ag Base - Storage Yard & Access Driveway	1.91	0.0002	0.0002	1.98
Totals	***6.0***	***0.001***	***0.001***	***6.2***

Entrained Road Dust

Entrained road dust emissions are generated by vehicles traveling on both paved and unpaved roads. These equations are based on the paved and unpaved roads emission factors found in Section 5.3 of Appendix A, CalEEMod Users Guide, version 2016.3.2 and AP-42 Sections 13.2.1 and 13.2.2.

Emission Factors - Paved Roads

EF PM$_{10}$ =
EF PM$_{2.5}$ =

$[k * (sL^{0.91}) * (W^{1.02})] * (1 - P\ 4N) =$

0.01163 lbs PM$_{10}$/VMT
0.00286 lbs PM$_{2.5}$/VMT

Constant	Description	Value
k =	*PM $_{10}$ particle size multiplier for particle size range and units of interest*	*0.0022*

Emission Factors - Unpaved Roads

EF PM$_{10}$ =
EF PM$_{2.5}$ =

$(k * (s\ \ 12)^{1} * (S\ 30)^{0.5}\ \ (M\ \ 0.5)^{0.2} - C) * (1 - P\ 365) =$

0.7178 lbs PM$_{10}$/VMT
0.0715 lbs PM$_{2.5}$/VMT

Constant	Description	Value
k =	*PM $_{10}$ particle size multiplier for particle size range and units of interest*	*1.8*

** Data from Western Regional Climate Center. Brawley Period of Record General Climate Summary - Precipitation. https: wrcc.dri.edu cgi-bin cliMAIN.pl?ca1048*

2018 Entrained Road Dust Emissions

Phase/Category		Max VMT/d		Paved Roads (lbs/d)		Unpaved Roads (lbs/d)		Total Roads (lbs/d)		Mitigated (lbs/d)	
		(paved)	(unpaved)	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
CP1 - Subgrade Prep - Access Driveway	Employee	129	129	1.50	0.37	92.60	0.11	94.10	0.48	40.46	0.20
	Total	**129**	**129**	**1.5**	**0.4**	**92.6**	**0.1**	**94.1**	**0.5**	**40.5**	**0.2**
CP2 - Subgrade Prep - Container Storage Yard	Employee	194	194	2.25	0.55	138.89	0.16	141.15	0.71	60.69	0.31
	Total	**194**	**194**	**2.3**	**0.6**	**138.9**	**0.2**	**141.1**	**0.7**	**60.7**	**0.3**
CP1 + CP2 TOTAL		**323**	**323**	**3.8**	**0.9**	**231.5**	**0.3**	**235.2**	**1.2**	**101.2**	**0.5**
CP3 - Crushed Rock - Container Storage Yard	Employee	172	172	2.00	0.49	123.46	0.14	125.46	0.63	53.95	0.27
	Haulers	284	284	3.31	0.81	204.09	0.24	207.40	1.05	89.18	0.45
	Total	**456**	**456**	**5.3**	**1.3**	**327.6**	**0.4**	**332.9**	**1.7**	**143.1**	**0.7**
CP4 - Class II Ag Base - Storage Yard & Access Driveway	Employee	172	172	2.00	0.49	123.46	0.14	125.46	0.63	53.95	0.27
	Haulers	149	149	1.73	0.43	106.84	0.12	108.57	0.55	46.69	0.24
	Total	**321**	**321**	**3.7**	**0.9**	**230.3**	**0.3**	**234.0**	**1.2**	**100.6**	**0.5**
CP5 - Paving - Access Driveway	Employee	86	86	1.00	0.25	61.73	0.07	62.73	0.32	26.97	0.14
	Total	**86**	**86**	**1.00**	**0.2**	**61.7**	**0.1**	**62.7**	**0.3**	**27.0**	**0.1**
CP1 + CP2 TOTAL		**407**	**407**	**4.73**	**1.2**	**292.0**	**0.3**	**296.8**	**1.5**	**127.6**	**0.6**
Max Daily Emissions		***456***	***456***	***5.31***	***1.3***	***327.6***	***0.4***	***332.9***	***1.7***	***143.1***	***0.7***

2019 Entrained Road Dust Emissions

Phase/Category		Max VMT/d		Paved Roads (lbs/d)		Unpaved Roads (lbs/d)		Total Roads (lbs/d)		Mitigated (lbs/d)	
		(paved)	(unpaved)	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
CP1 - Subgrade Prep - Access Driveway	Employee	129	129	1.50	0.37	92.60	0.11	94.10	0.48	40.46	0.20
	TOTAL	**129**	**129**	**1.5**	**0.4**	**92.6**	**0.1**	**94.1**	**0.5**	**40.5**	**0.2**
CP2 - Subgrade Prep - Container Storage Yard	Employee	194	194	2.25	0.55	138.89	0.16	141.15	0.71	60.69	0.31
	TOTAL	**194**	**194**	**2.3**	**0.6**	**138.9**	**0.2**	**141.1**	**0.7**	**60.7**	**0.3**
CP1 + CP2 TOTAL		**323**	**323**	**3.8**	**0.9**	**231.5**	**0.3**	**235.2**	**1.2**	**101.2**	**0.5**
CP3 - Crushed Rock - Container Storage Yard	Employee	172	172	2.00	0.49	123.46	0.14	125.46	0.63	53.95	0.27
	Haulers	275	275	3.20	0.79	197.75	0.23	200.95	1.02	86.41	0.44
	TOTAL	**447**	**447**	**5.2**	**1.3**	**321.2**	**0.4**	**326.4**	**1.6**	**140.4**	**0.7**
CP4 - Class II Ag Base - Storage Yard & Access Driveway	Employee	172	172	2.00	0.49	123.46	0.14	125.46	0.63	53.95	0.27
	Haulers	146	146	1.69	0.42	104.54	0.12	106.24	0.54	45.68	0.23
	TOTAL	**318**	**318**	**3.7**	**0.9**	**228.0**	**0.3**	**231.7**	**1.2**	**99.6**	**0.5**
CP5 - Paving - Access Driveway	Employee	86	86	1.00	0.25	61.73	0.07	62.73	0.32	26.97	0.14
	TOTAL	**86**	**86**	**1.00**	**0.25**	**61.73**	**0.07**	**62.73**	**0.32**	**26.97**	**0.14**
CP1 + CP2 TOTAL		**404**	**404**	**4.70**	**1.15**	**289.74**	**0.34**	**294.43**	**1.49**	**126.61**	**0.64**
Max Daily Emissions		***447***	***447***	***5.21***	***1.28***	***321.21***	***0.37***	***326.42***	***1.65***	***140.36***	***0.71***

2020 Entrained Road Dust Emissions

Phase/Category		**Max VMT/d**		**Paved Roads (lbs/d)**		**Unpaved Roads (lbs/d)**		**Total Roads (lbs/d)**		**Mitigated (lbs/d)**	
		(paved)	**(unpaved)**	**PM_{10}**	**$PM_{2.5}$**	**PM_{10}**	**$PM_{2.5}$**	**PM_{10}**	**$PM_{2.5}$**	**PM_{10}**	**$PM_{2.5}$**
CP2 - Subgrade Prep - Container Storage Yard	Employee	194	194	2.25	0.55	138.89	0.16	141.15	0.71	60.69	0.31
	TOTAL	**194**	**194**	**2.3**	**0.6**	**138.9**	**0.2**	**141.1**	**0.7**	**60.7**	**0.3**
CP3 - Crushed Rock - Container Storage Yard	Employee	172	172	2.00	0.49	123.46	0.14	125.46	0.63	53.95	0.27
	Haulers	275	275	3.20	0.79	197.75	0.23	200.95	1.02	86.41	0.44
	TOTAL	**447**	**447**	**5.2**	**1.3**	**321.2**	**0.4**	**326.4**	**1.6**	**140.4**	**0.7**
CP4 - Class II Ag Base - Container Storage Yard	Employee	172	172	2.00	0.49	123.46	0.14	125.46	0.63	53.95	0.27
	Haulers	138	138	1.60	0.39	98.87	0.11	100.48	0.51	43.21	0.22
	TOTAL	**310**	**310**	**3.6**	**0.9**	**222.3**	**0.3**	**225.9**	**1.1**	**97.2**	**0.5**
Max Daily Emissions		***447***	***447***	***5.2***	***1.3***	***321.2***	***0.4***	***326.4***	***1.6***	***140.4***	***0.7***

Notes: Mitigation of 57% for traffic speed restriction

Per ICAPCD, vehicular travel in Imperial County is 50% on unpaved roads.

Equipment List & Number of Workers Phases 1 & 2

Construction Phase Activity

CP1 - Subgrade Prep - Access Driveway	**Off-road**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Grading, leveling, and compacting native soils in preparation for Class II aggregate base.	Rubber Tired Dozers	1	4	5	1	6
	Graders	1				
	Excavators	1				
	Rollers	1				

CP2 - Subgrade Prep - Container Storage Yard	**Off-road**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Grading, leveling, and compacting native soils in preparation for 3" crushed rock aggregate.	Rubber Tired Dozers	1	6	7.5	1.5	9
	Graders	2				
	Excavators	1				
	Rollers	2				

CP3 - Crushed Rock - Container Storage Yard	**Off-road**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Applying, leveling, and compacting 3" crushed rock agggregate.	Rubber Tired Loader	2	6	7.5	0.5	8
	Graders	2				
	Rollers	2				

CP4 - Class II Ag Base - Storage Yard & Access Driveway	**Off-road**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Applying, leveling, and compacting Class II aggregate base.	Rubber Tired Loader	2	6	7.5	0.5	8
	Graders	2				
	Rollers	2				

CP5 - Paving - Access Driveway	**Off-road**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Applying and compacting asphalt concrete.	Pavers	1	3	3.75	0.25	4
	Rollers	1				
	Tractors/Loaders/Backhoes	1				

Equipment List & Number of Workers Phase 3

Construction Phase Activity

CP2 - Subgrade Prep - Container Storage Yard	**Off-road**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Grading, leveling, and compacting native soils in preparation for 3" crushed rock aggregate.	Rubber Tired Dozers	1	6	7.5	1.5	9
	Graders	2				
	Excavators	1				
	Rollers	2				
CP3 - Crushed Rock - Container Storage Yard	**Off-road**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Applying, leveling, and compacting 3" crushed rock agggregate.	Rubber Tired Loader	2	6	7.5	0.5	8
	Graders	2				
	Rollers	2				
CP4 - Class II Ag Base - Container Storage Yard	**Off-road**	**Number**	**# Equip**	**# Emp**	**Extra**	**Total Emp**
Applying, leveling, and compacting Class II aggregate base.	Rubber Tired Loader	2	6	7.5	0.5	8
	Graders	2				
	Rollers	2				

Assumed Phase 1 Construction Schedule

Date	Week #	CP1	CP2	CP3	CP4	CP5
8/27/18	1	7	18			
8/28/18						
8/29/18						
8/30/18						
8/31/18						
9/1/18						
9/2/18						
9/3/18	2					
9/4/18						
9/5/18						
9/6/18						
9/7/18						
9/8/18						
9/9/18						
9/10/18	3					
9/11/18						
9/12/18						
9/13/18						
9/14/18				18		
9/15/18						
9/16/18						
9/17/18	4					
9/18/18						
9/19/18						
9/20/18						
9/21/18						
9/22/18						
9/23/18						
9/24/18	5					
9/25/18						
9/26/18						
9/27/18						
9/28/18						
9/29/18						
9/30/18						
10/1/18	6					
10/2/18					18	
10/3/18						
10/4/18						
10/5/18						
10/6/18						
10/7/18						
10/8/18	7					7
10/9/18						
10/10/18						
10/11/18						
10/12/18						
10/13/18						
10/14/18						
10/15/18	8					
10/16/18						
10/17/18						
10/18/18						
10/19/18						

Assumed Phase 2 Construction Schedule

Date	Week #	CP1	CP2	CP3	CP4	CP5
7/19/19	1	7	18			
7/20/19						
7/21/19						
7/22/19						
7/23/19						
7/24/19						
7/25/19						
7/26/19	2					
7/27/19						
7/28/19						
7/29/19						
7/30/19						
7/31/19						
8/1/19						
8/2/19	3					
8/3/19						
8/4/19						
8/5/19						
8/6/19				18		
8/7/19						
8/8/19						
8/9/19	4					
8/10/19						
8/11/19						
8/12/19						
8/13/19						
8/14/19						
8/15/19						
8/16/19	5					
8/17/19						
8/18/19						
8/19/19						
8/20/19						
8/21/19						
8/22/19						
8/23/19	6					
8/24/19					18	
8/25/19						
8/26/19						
8/27/19						
8/28/19						
8/29/19						
8/30/19	7					7
8/31/19						
9/1/19						
9/2/19						
9/3/19						
9/4/19						
9/5/19						
9/6/19	8					
9/7/19						
9/8/19						
9/9/19						
9/10/19						

Assumed Phase 3 Construction Schedule

Date	Week #	CP2	CP3	CP4
6/10/20	1	18		
6/11/20				
6/12/20				
6/13/20				
6/14/20				
6/15/20				
6/16/20				
6/17/20	2			
6/18/20				
6/19/20				
6/20/20				
6/21/20				
6/22/20				
6/23/20				
6/24/20	3			
6/25/20				
6/26/20				
6/27/20				
6/28/20			18	
6/29/20				
6/30/20				
7/1/20	4			
7/2/20				
7/3/20				
7/4/20				
7/5/20				
7/6/20				
7/7/20				
7/8/20	5			
7/9/20				
7/10/20				
7/11/20				
7/12/20				
7/13/20				
7/14/20				
7/15/20	6			
7/16/20				18
7/17/20				
7/18/20				
7/19/20				
7/20/20				
7/21/20				
7/22/20	7			
7/23/20				
7/24/20				
7/25/20				
7/26/20				
7/27/20				
7/28/20				
7/29/20	8			
7/30/20				
7/31/20				
8/1/20				
8/2/20				

Work Areas

Phase 1 - East Side

	Area	**ft^2**	**acres**				
Site Prep & Grading	Site Surfacing	195,080	4.48				
	Access Driveway	9,171	0.21				
	TOTAL	**204,251**	**4.69**	**Cubic Yards**		**Total # of Truck Trips**	
Fill	**Area**	**ft^2**	**acres**	**Ag Base**	**Crushed Rock**	**Ag Base**	**Crushed Rock**
	Site Surfacing	195,080	4.48	3,612.6	7,225	301.0	602.1
Paving	**Area**	**ft^2**	**acres**	**Ag Base**	**Crushed Rock**	**Ag Base**	**Crushed Rock**
	Access Driveway	9,171	0.21	169.8	340	14.2	28.3
			Total	***3,782***	***7,565***	***315***	***630***

Phase 2 - West Side

	Area	**ft^2**	**acres**				
Site Prep & Grading	Site Surfacing	189,020	4.34				
	Access Driveway	10,840	0.25				
	TOTAL	**199,860**	**4.59**	**Cubic Yards**		**Total # of Truck Trips**	
Fill	**Area**	**ft^2**	**acres**	**Ag Base**	**Crushed Rock**	**Ag Base**	**Crushed Rock**
	Site Surfacing	189,020	4.34	3,500.4	7,001	291.7	583.4
Paving	**Area**	**ft^2**	**acres**	**Ag Base**	**Crushed Rock**	**Ag Base**	**Crushed Rock**
	Access Driveway	10,840	0.25	200.7	401	16.7	33.5
			Total	***3,701***	***7,402***	***308***	***617***

Phase 3 - Center

	Area	**ft^2**	**acres**				
Site Prep & Grading	Site Surfacing	189,020	4.34	**Cubic Yards**		**Total # of Truck Trips**	
Fill	**Area**	**ft^2**	**acres**	**Ag Base**	**Crushed Rock**	**Ag Base**	**Crushed Rock**
	Site Surfacing	189,020	4.34	3,500.4	7,001	291.7	583.4
			Total	***3,500***	***7,001***	***292***	***583***

Hauling Truck Activity

Hauling Truck Activity

Project Phase/Construction Phase	Days per Phase	Total Trips	Round Trip (mi)	VMT per day	Total VMT (mi)
Phase 1/CP3 - Crushed Rock - Container Storage Yard	18	602	17	569	10,236
Phase 1/CP4 - Class II Ag Base - Storage Yard & Access Driveway	18	315	17	298	5,358
Phase 1 Truck Totals					***15,594***
Phase 2/CP3 - Crushed Rock - Container Storage Yard	18	583	17	551	9,918
Phase 2/CP4 - Class II Ag Base - Storage Yard & Access Driveway	18	308	17	291	5,243
Phase 2 Truck Totals					***15,161***
Phase 3/CP3 - Crushed Rock - Container Storage Yard	18	583	17	551	9,918
Phase 3/CP4 - Class II Ag Base - Container Storage Yard	18	292	17	275	4,959
Phase 3 Truck Totals					***14,877***

Trip mileage for sand and gravel is based pn product from All American Aggregates, 304 Shank Rd, Brawley (8.5 miles 1-way)

Hauling Truck Criteria Emissions

Project Phase/Construction Phase	Pounds per Day				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Phase 1/CP3 - Crushed Rock - Container Storage Yard	0.702	1.953	10.382	0.498	0.178
Phase 1/CP4 - Class II Ag Base - Storage Yard & Access Driveway	0.367	1.023	5.435	0.261	0.093
Phase 1 Truck Max Daily	***0.70***	***1.95***	***10.38***	***0.50***	***0.18***
Phase 2/CP3 - Crushed Rock - Container Storage Yard	0.587	1.649	8.692	0.415	0.173
Phase 2/CP4 - Class II Ag Base - Storage Yard & Access Driveway	0.310	0.872	4.595	0.220	0.091
Phase 2 Truck Max Daily	***0.59***	***1.65***	***8.69***	***0.42***	***0.17***
Phase 3/CP3 - Crushed Rock - Container Storage Yard	0.427	1.204	6.319	0.297	0.173
Phase 3/CP4 - Class II Ag Base - Container Storage Yard	0.214	0.602	3.160	0.149	0.086
Phase 3 Truck Max Daily	***0.43***	***1.20***	***6.32***	***0.30***	***0.17***

Hauling Truck GHG Emissions

Project Phase/Construction Phase	Total Tonnes			
	CO_2	CH_4	N_2O	CO_2e
Phase 1/CP3 - Crushed Rock - Container Storage Yard	11.10	0.00618	0.00568	12.95
Phase 1/CP4 - Class II Ag Base - Storage Yard & Access Driveway	5.81	0.00323	0.00298	6.78
Phase 1 Truck Totals	***16.9***	***0.0094***	***0.0087***	***19.7***
Phase 2/CP3 - Crushed Rock - Container Storage Yard	10.79	0.00599	0.00551	12.59
Phase 2/CP4 - Class II Ag Base - Storage Yard & Access Driveway	5.71	0.00317	0.00291	6.65
Phase 2 Truck Totals	***16.5***	***0.0092***	***0.0084***	***19.2***
Phase 3/CP3 - Crushed Rock - Container Storage Yard	10.90	0.00599	0.00551	12.69
Phase 3/CP4 - Class II Ag Base - Container Storage Yard	5.45	0.00299	0.00275	6.34
Phase 3 Truck Totals	***16.3***	***0.0090***	***0.0083***	***19.0***
Project Total	***49.76***	***0.0275***	***0.0253***	***58.00***

Phase 1 Off-road Equipment Emissions

CP1 - Subgrade Prep - Access Driveway

Equipment Type	Activity						Criteria Emissions (lbs/d)				
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Rubber Tired Dozers	247	0.40	7	8	1	56	1.17	4.38	12.56	0.61	0.56
Graders	187	0.41	7	8	1	56	0.52	1.91	7.13	0.23	0.21
Excavators	158	0.38	7	4	1	28	0.14	1.64	1.55	0.08	0.07
Rollers	80	0.38	7	8	1	56	0.21	1.55	1.99	0.14	0.13
Off Highway Truck	402	0.38	7	2	1	14	0.19	1.05	2.08	0.08	0.07
						Totals	**2.2**	**10.5**	**25.3**	**1.1**	**1.0**

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
2.73	0.0009	2.75
2.13	0.0007	2.14
0.82	0.0003	0.83
0.67	0.0002	0.68
1.06	0.0003	1.06
7.4	**0.002**	**7.5**

CP2 - Subgrade Prep - Container Storage Yard

Equipment Type	Activity						Criteria Emissions (lbs/d)				
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Rubber Tired Dozers	247	0.40	18	8	1	144	1.17	4.38	12.56	0.61	0.56
Graders	187	0.41	18	8	2	144	1.04	3.83	14.26	0.46	0.43
Excavators	158	0.38	18	4	1	72	0.14	1.64	1.55	0.08	0.07
Rollers	80	0.38	18	8	2	144	0.52	3.87	4.99	0.34	0.32
Off Highway Truck	402	0.38	18	2	1	36	0.19	1.05	2.08	0.08	0.07
						Totals	**3.1**	**14.8**	**35.4**	**1.6**	**1.4**
						CP1 + CP2 Totals	**5.3**	**25.2**	**58.3**	**2.5**	**2.3**

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
7.02	0.0022	7.08
10.94	0.0034	11.02
2.12	0.0007	2.14
4.31	0.0013	4.34
2.71	0.0008	2.74
27.1	**0.008**	**27.3**

CP3 - Crushed Rock - Container Storage Yard

Equipment Type	Activity						Criteria Emissions (lbs/d)				
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Rubber Tired Loader	247	0.40	18	8	2	144	1.16	4.69	14.40	0.49	0.45
Graders	187	0.41	18	8	2	144	1.04	3.83	14.26	0.46	0.43
Rollers	80	0.38	18	8	2	144	0.52	3.87	4.99	0.34	0.32
Off Highway Truck	402	0.38	18	2	1	36	0.19	1.05	2.08	0.08	0.07
						Totals	**2.9**	**13.4**	**35.7**	**1.4**	**1.3**

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
13.88	0.0043	13.99
10.94	0.0034	11.02
4.31	0.0013	4.34
2.71	0.0008	2.74
31.8	**0.010**	**32.1**

CP4 - Class II Ag Base - Storage Yard & Access Driveway

Equipment Type	Activity						Criteria Emissions (lbs/d)				
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Rubber Tired Loader	203	0.36	18	8	2	144	0.86	3.47	10.65	0.36	0.33
Graders	187	0.41	18	8	2	144	1.04	3.83	14.26	0.46	0.43
Rollers	80	0.38	18	8	2	144	0.52	3.87	4.99	0.34	0.32
Off Highway Truck	402	0.38	18	2	1	36	0.19	1.05	2.08	0.08	0.07
						Totals	**2.6**	**12.2**	**32.0**	**1.2**	**1.1**

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
10.27	0.0032	10.35
10.94	0.0034	11.02
4.31	0.0013	4.34
2.71	0.0008	2.74
28.2	**0.009**	**28.5**

CP5 - Paving - Access Driveway

Equipment Type	Activity						Criteria Emissions (lbs/d)				
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Pavers	130	0.42	7	8	1	56	0.33	2.93	3.61	0.18	0.16
Rollers	80	0.38	7	8	1	56	0.26	1.94	2.49	0.17	0.16
Tractors/Loaders/Backhoes	97	0.37	7	6	1	42	0.20	1.75	1.97	0.14	0.13
						Totals	**0.8**	**6.6**	**8.1**	**0.5**	**0.4**
						CP4 + CP5 Totals	**3.4**	**18.8**	**40.0**	**1.7**	**1.6**
						Phase 1 Max Daily	*5.3*	*25.2*	*58.3*	*2.5*	*2.3*

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
1.50	0.0005	1.51
0.84	0.0003	0.84
0.74	0.0002	0.75
3.1	**0.001**	**3.1**

Project Total

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
97.7	***0.030***	***98.4***

Phase 2 Off-road Equipment Emissions

CP1 - Subgrade Prep - Access Driveway

Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Rubber Tired Dozers	247	0.40	7	8	1	56	1.13	4.28	12.07	0.59	0.54	2.68	0.0009	2.71
Graders	187	0.41	7	8	1	56	0.49	1.84	6.58	0.21	0.19	2.09	0.0007	2.10
Excavators	158	0.38	7	4	1	28	0.13	1.63	1.34	0.06	0.06	0.81	0.0003	0.82
Rollers	80	0.38	7	8	1	56	0.18	1.53	1.79	0.12	0.11	0.66	0.0002	0.66
Off Highway Truck	402	0.38	7	2	1	14	0.18	1.00	1.80	0.07	0.06	1.04	0.0003	1.05
						Totals	***2.1***	***10.3***	***23.6***	***1.0***	***1.0***	***7.3***	***0.002***	***7.3***

CP2 - Subgrade Prep - Container Storage Yard

Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Rubber Tired Dozers	247	0.40	18	8	1	144	1.13	4.28	12.07	0.59	0.54	6.90	0.0022	6.96
Graders	187	0.41	18	8	2	144	0.97	3.68	13.16	0.42	0.39	10.74	0.0034	10.82
Excavators	158	0.38	18	4	1	72	0.13	1.63	1.34	0.06	0.06	2.09	0.0007	2.10
Rollers	80	0.38	18	8	2	144	0.45	3.81	4.48	0.29	0.27	4.24	0.0013	4.27
Off Highway Truck	402	0.38	18	2	1	36	0.18	1.00	1.80	0.07	0.06	2.67	0.0008	2.69
						Totals	***2.9***	***14.4***	***32.9***	***1.4***	***1.3***	***26.6***	***0.008***	***26.8***
						CP1 + CP2 Totals	***5.0***	***24.5***	***53.6***	***2.3***	***2.1***			

CP3 - Crushed Rock - Container Storage Yard

Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Rubber Tired Loader	247	0.40	18	8	2	144	1.16	4.69	14.40	0.49	0.45	13.88	0.0043	13.99
Graders	187	0.41	18	8	2	144	0.97	3.68	13.16	0.42	0.39	10.74	0.0034	10.82
Rollers	80	0.38	18	8	2	144	0.45	3.81	4.48	0.29	0.27	4.24	0.0013	4.27
Off Highway Truck	402	0.38	18	2	1	36	0.18	1.00	1.80	0.07	0.06	2.67	0.0008	2.69
						Totals	***2.8***	***13.2***	***33.8***	***1.3***	***1.2***	***31.5***	***0.010***	***31.8***

CP4 - Class II Ag Base - Storage Yard & Access Driveway

Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Rubber Tired Loader	203	0.36	18	8	2	144	0.86	3.47	10.65	0.36	0.33	10.27	0.0032	10.35
Graders	187	0.41	18	8	2	144	0.97	3.68	13.16	0.42	0.39	10.74	0.0034	10.82
Rollers	80	0.38	18	8	2	144	0.45	3.81	4.48	0.29	0.27	4.24	0.0013	4.27
Off Highway Truck	402	0.38	18	2	1	36	0.18	1.00	1.80	0.07	0.06	2.67	0.0008	2.69
						Totals	***2.5***	***12.0***	***30.1***	***1.1***	***1.1***	***27.9***	***0.009***	***28.1***

CP5 - Paving - Access Driveway

Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Pavers	130	0.42	7	8	1	56	0.29	2.90	3.12	0.15	0.14	1.48	0.0005	1.49
Rollers	80	0.38	7	8	1	56	0.23	1.91	2.24	0.15	0.14	0.82	0.0003	0.83
Tractors/Loaders/Backhoes	97	0.37	7	6	1	42	0.17	1.73	1.75	0.12	0.11	0.73	0.0002	0.74
						Totals	***0.7***	***6.5***	***7.1***	***0.4***	***0.4***	***3.0***	***0.001***	***3.1***
						CP4 + CP5 Totals	***3.2***	***18.5***	***37.2***	***1.6***	***1.4***			
						Phase 1 Max Daily	***5.0***	***24.5***	***53.6***	***2.3***	***2.1***			

Project Total

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
96.4	***0.030***	***97.2***

Phase 3 Off-road Equipment Emissions

CP2 - Subgrade Prep - Container Storage Yard

Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Rubber Tired Dozers	247	0.40	18	8	1	144	1.08	4.13	11.59	0.55	0.51	6.75	0.0022	6.81
Graders	187	0.41	18	8	2	144	0.95	3.63	12.65	0.41	0.37	10.50	0.0034	10.58
Excavators	158	0.38	18	4	1	72	0.12	1.63	1.21	0.06	0.05	2.04	0.0007	2.06
Rollers	80	0.38	18	8	2	144	0.42	3.79	4.16	0.26	0.24	4.15	0.0013	4.18
Off Highway Truck	402	0.38	18	2	1	36	0.17	0.95	1.58	0.06	0.05	2.61	0.0008	2.63
						Totals	***2.7***	***14.1***	***31.2***	***1.3***	***1.2***	***26.1***	***0.008***	***26.3***

CP3 - Crushed Rock - Container Storage Yard

Equipment Type	Activity						Criteria Emissions (lbs/d)					GHG Emissions (tonnes)		
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2e
Rubber Tired Loader	247	0.40	18	8	2	144	1.01	4.42	11.92	0.40	0.36	13.36	0.0043	13.47
Graders	187	0.41	18	8	2	144	0.95	3.63	12.65	0.41	0.37	10.50	0.0034	10.58
Rollers	80	0.38	18	8	2	144	0.42	3.79	4.16	0.26	0.24	4.15	0.0013	4.18
Off Highway Truck	402	0.38	18	2	1	36	0.17	0.95	1.58	0.06	0.05	2.61	0.0008	2.63
						Totals	***2.5***	***12.8***	***30.3***	***1.1***	***1.0***	***30.6***	***0.010***	***30.9***

CP4 - Class II Ag Base - Container Storage Yard

Equipment Type	Activity						Criteria Emissions (lbs/d)				
	BHP	Load Factor	Length (wkday)	hrs/ day	Number	total hours	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
Rubber Tired Loader	203	0.36	18	8	2	144	0.75	3.27	8.82	0.29	0.27
Graders	187	0.41	18	8	2	144	0.95	3.63	12.65	0.41	0.37
Rollers	80	0.38	18	8	2	144	0.42	3.79	4.16	0.26	0.24
Off Highway Truck	402	0.38	18	2	1	36	0.17	0.95	1.58	0.06	0.05
						Totals	*2.3*	*11.6*	*27.2*	*1.0*	*0.9*
						Phase 1 Max Daily	*2.7*	*14.1*	*31.2*	*1.3*	*1.2*

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
9.88	0.0032	9.96
10.50	0.0034	10.58
4.15	0.0013	4.18
2.61	0.0008	2.63
27.1	*0.009*	*27.4*

Project Total

GHG Emissions (tonnes)		
CO_2	CH_4	CO_2e
83.8	*0.027*	*84.5*

2018 Offroad Emission Factors

Equipment Type	BHP	Load Factor	Emission Factor (g/bhp-hr)						
			ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Excavator	158	0.38	0.273	3.093	2.924	0.142	0.130	490.7	0.153
Grader	187	0.41	0.384	1.416	5.271	0.171	0.158	495.4	0.154
Off-Highway Truck	402	0.38	0.287	1.560	3.090	0.113	0.104	493.5	0.153
Paver	130	0.42	0.339	3.039	3.747	0.183	0.168	491.3	0.153
Roller	80	0.38	0.481	3.610	4.650	0.320	0.294	492.2	0.153
Rubber Tired Dozer	247	0.40	0.669	2.512	7.208	0.350	0.322	493.6	0.154
Rubber Tired Loader	203	0.36	0.333	1.346	4.131	0.140	0.129	487.9	0.152
Tractors/Loaders/Backhoes	97	0.37	0.420	3.692	4.154	0.294	0.271	494.1	0.154

2019 Offroad Emission Factors

Equipment Type	BHP	Load Factor	Emission Factor (g/bhp-hr)						
			ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Excavator	158	0.38	0.246	3.082	2.533	0.122	0.112	482.7	0.153
Grader	187	0.41	0.360	1.359	4.866	0.156	0.144	486.3	0.154
Off-Highway Truck	402	0.38	0.263	1.483	2.669	0.097	0.089	485.4	0.153
Paver	130	0.42	0.299	3.013	3.245	0.159	0.146	483.4	0.153
Roller	80	0.38	0.423	3.557	4.179	0.275	0.253	484.3	0.153
Rubber Tired Dozer	247	0.40	0.651	2.459	6.929	0.338	0.311	485.2	0.154
Rubber Tired Loader	203	0.36	0.309	1.302	3.745	0.126	0.166	480.1	0.152
Tractors/Loaders/Backhoes	97	0.37	0.368	3.638	3.693	0.247	0.227	485.9	0.154

2020 Offroad Emission Factors

Equipment Type	BHP	Load Factor	Emission Factor (g/bhp-hr)						
			ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Excavator	158	0.38	0.231	3.086	2.278	0.110	0.102	472.3	0.153
Grader	187	0.41	0.352	1.342	4.678	0.150	0.138	475.3	0.154
Off-Highway Truck	402	0.38	0.246	1.414	2.347	0.086	0.079	474.6	0.153
Roller	80	0.38	0.388	3.531	3.882	0.247	0.228	473.9	0.153
Rubber Tired Dozer	247	0.40	0.619	2.371	6.653	0.318	0.293	474.8	0.154
Rubber Tired Loader	203	0.36	0.290	1.269	3.421	0.114	0.104	469.5	0.152

From: CalEEMod Users Guide - Appendix D (October 2017)

Grading Fugitive Dust

Fugitive dust emissions from grading equipment passes are estimated using the methodology described in Section 11.9, Western Surface Coal Mining, of the EPA AP-42.

AP-42 estimates the emission factor of PM_{10} applying a scaling factor to that of PM_{15}. Similarly, the emission factor of $PM_{2.5}$ is scaled from that of total suspended particulates (TSP). The equations used to calculate the emission factors for PM_{15} and TSP and the scaling factor for those of PM_{10} and $PM_{2.5}$ are presented below:

Emission Factors (lbs/day)

EF PM_{15} =	$0.051 \times S^{2.0}$ =	2.571
EF PM_{TSP} =	$0.04 \times S^{2.5}$ =	5.373

S = *mean vehicle speed (mph). The AP-42 default value is* *7.1*

EF PM_{10} =	$EF_{PM15} \times F_{PM10}$ =	1.5
EF $PM_{2.5}$ =	$EF_{PMTSP} \times F_{PM2.5}$ =	0.167

F_{PM10} = PM $_{10}$ scaling factor. The AP-42 default value is *0.6*

$F_{PM2.5}$ = PM $_{2.5}$ scaling factor. The AP-42 default value is *0.031*

Emissions

The grading dust emissions are calculated by multiplying the emission factors with the total vehicle miles traveled (VMT) for the grading equipment (i.e., grader). The VMT for grader (VMT_G) are estimated based on the dimensions of the grading area and the blade width of the grading equipment.

Emissions (lb) = **EF × VMT_G** *# of Days = 12*

Pollutant	Emissions	
	total lbs	lbs/d
PM_{10}	4.97	0.414
$PM_{2.5}$	0.54	0.045

where VMT = $A_S \div W_b \times ft^2$ per acre ÷ ft per mile = 3.2

	Phase 1	*4.7*
A_S = acreage disturbed	*Phase 2*	*4.6*
	Phase 3	*4.3*

W_b = Blade width of the grading equipment. (default based on Caterpillar's 140 Motor Grader. *12*