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DOCKET	
09-AFC-1	
DATE	JUN 09 2009
RECD.	JUN 09 2009

June 9, 2009

383194

Felicia Miller
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Almond 2 Power Plant (09-AFC-02)
Supplement A – Data Adequacy Responses

Dear Ms. Miller:

Please find attached the Almond 2 Power Plant's Supplement A – Data Adequacy Responses. This supplement was prepared in response to the Staff's Data Adequacy Recommendation dated June 5, 2009. It is being submitted to respond to the Staff's requests for additional information.

Attached are 50 hard copies and 75 electronic copies on CD-ROM. Due to the size of Attachment DA5.3-2, Revised DPR 523 Forms, five hard copies have been provided. Additional copies are available upon request. In addition, Attachment DA5.3-1, Previously Conducted Surveys, will be provided separately under a request for confidentiality.

If you have any questions about this matter, please contact me at (916) 286-0249 or Susan Strachan at (530) 757-7038.

Sincerely,

CH2M HILL

Sarah Madams
AFC Project Manager

Attachment

cc: S. Strachan, Strachan Consulting
R. Baysinger, TID

DATA ADEQUACY SUPPLEMENT A

SUBMITTED TO

California
Energy Commission

FOR

TID Almond 2 Power Plant

SUBMITTED BY

Turlock Irrigation District

TECHNICAL ASSISTANCE BY

CH2MHILL

June 2009

Supplement A

Response to Data Adequacy Review

In support of the

Application for Certification

for the

Almond 2 Power Plant

Ceres, California

(09-AFC-02)

Submitted to the:

California Energy Commission

Submitted by:

With Technical Assistance by:

Sacramento, California

June 2009

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1.0 Introduction

This supplement to Turlock Irrigation District's (TID) Application for Certification (AFC) for the Almond 2 Power Plant (A2PP) (09-AFC-02), responds to comments that California Energy Commission (CEC) Staff have made as a result of their data adequacy review of the AFC. The intention of this supplement is to provide all additional information necessary for Staff to find that the AFC contains adequate data to begin a power plant site certification proceeding under Title 20, California Code of Regulations and the Warren-Alquist Energy Resources Conservation and Development Act.

The format for this supplement follows the order of the AFC and provides additional information and responses to CEC information requests for several disciplines. Only sections for which CEC Staff posed requests or questions related to data adequacy are addressed in this supplement. If the response calls for additional appended material, it is included at the end of each subsection. Appended material is identified by the prefix "DA" indicating an item submitted in response to a Staff Data Adequacy comment, a number referring to the applicable AFC chapter, and a sequential identifying number. For example, the attachment in response to a Transmission System Engineering comment would be Attachment DA3.0-1, because the AFC section describing electrical transmission is Section 3.0. Tables are also numbered in this way. Appended material is paginated separately from the remainder of the document.

Each subsection contains data adequacy questions or information requests, with numbers and summary titles and, in parentheses, the citation from Appendix B, Title 22, California Code of Regulations (Regulations Pertaining to the Rules of Practice and Procedure and Power Plant Site Certification) indicating a particular information requirement for the AFC. Each item follows with the CEC Staff comment on data adequacy for this item, under the heading "Information required to make AFC conform with regulations" followed by TID's response to the information request and the information requested.

3.0 Transmission System Design

1. System Impact Study (Appendix B (g) (2) (E)

A completed System Impact Study or signed System Impact Study Agreement with the California Independent System Operator and proof of payment. When not connecting to the California Independent System Operator controlled grid, provide the executed System Impact Study agreement and proof of payment to the interconnecting utility.

If the interconnection and operation of the proposed project will likely impact an transmission system that is not controlled by the interconnecting utility (or California Independent System Operator), provide evidence of a System Impact Study or agreement and proof of payment (when applicable) with/to the impacted transmission owner or provide evidence that there are no system impacts requiring mitigation.

Information required to make AFC conform with regulations:

Please provide the executed System Impact Study agreement or System Impact Study Report. The Study should analyze the system impact with and without the project during peak and off-peak system conditions, which will demonstrate conformance or non-conformance with the utility reliability and planning criteria with the following provisions:

a. *Identify major assumptions in the base cases including imports to the system, major generation and load changes in the system and queue generation.*

b. *Analyze system for N-0, important N-1 and critical N-2 contingency conditions and provide a list of criteria violations in a table showing the loadings before and after adding the new generation.*

c. *Short circuit studies.*

d. *Analyze system for Transient Stability and Post-transient voltage conditions under critical N-1 and N-2 contingencies, and provide related plots, switching data and a list for voltage violations in the studies.*

e. *Provide a list of contingencies evaluated for each study.*

f. *List mitigation measures considered and those selected for all criteria violations.*

g. *Provide electronic copies of *.sav and *.drw PSLF files.*

h. *Provide power flow diagrams (**MW, % loading & P. U. voltage**) for base cases with and without the project. Power flow diagrams must also be provided for all N-0, N-1 and N-2 studies where overloads or voltage violations appear.*

Response: TID is its own Balancing Authority and is not part of the California Independent System Operator. As a result, TID is preparing its own System Impact Study, which will be submitted in August 2009.

5.3 Cultural Resources

2. City and County Cultural Resources (Appendix B (g) (2) (B))

…Identify any cultural resources listed pursuant to ordinance by a city or county, or recognized by any local historical or archaeological society or museum…

Information required to make AFC conform with regulations:

Please provide evidence that there were no known cultural resources listed under a city and county ordinance.

Response: Neither the City of Ceres nor Stanislaus County maintain any lists of historical resources or have ordinances that list particular cultural resource properties. This was confirmed via telephone by Susan Strachan on May 21, 2009 with both Tom Westbrook/City of Ceres Planner and the Planner-on-duty with the Stanislaus County Planning and Community Development Department.

3. Survey Coverage (Appendix B (g) (2) (B))

The results of a literature search to identify cultural resources within an area not less than a 1-mile radius around the project site and not less that than one-quarter (0.25) mile on each side of the linear facilities. Identify any cultural resources listed pursuant to ordinance by a city or county, or recognized by any local historical or archaeological society or museum. Literature searches to identify the above cultural resources must be completed by, or under the direction of, individuals who meet the Secretary of the Interior's Professional Standards for the technical area addressed.

Copies of California Department of Parks and Recreation (DPR) 523 forms (Title 14 CCR §4853) shall be provided for all cultural resources (ethnographic, architectural, historical, and archaeological) identified in the literature search as being 45 years or older or of exceptional importance as defined in the National Register Bulletin Guidelines, (36CFR60.4(g)). A copy of the USGS 7.5' quadrangle map of the literature search area delineating the areas of all past surveys and noting the California Historical Resources Information System (CHRIS) identifying number shall be provided. Copies also shall be provided of all technical reports whose survey coverage is wholly or partly within .25 mile of the area surveyed for the project under Section (g)(2)(C), or which report on any archaeological excavations or architectural surveys within the literature search area.

Information required to make AFC conform with regulations:

As submitted (Vol. 2, Appendix 5.3E, Figures 5.3-1A-5.3-1D), this map series shows only the applicant's survey coverage. The series needs to show the coverages and identifying report numbers of all previous surveys whose coverage was wholly or partly within .25 mile of the area surveyed for the project, or which report on any archaeological excavations or architectural surveys within the literature search area.

Response: Revised maps identifying the coverages and identifying report numbers for surveys within 0.25 mile of the area surveyed are included as Attachment DA5.3-1, which has been provided to Staff under a request for confidentiality.

4. Location Maps for DPR Forms (Appendix B (g) (2) (C) (iii))

Copies of all new and updated DPR 523(A) forms. If a cultural resource may be impacted by the project, also include the appropriate DPR 523 detail form for each such resource;

Information required to make AFC conform with regulations:

Please add a location map to the DPR 523 forms provided in Vol. 2, Appendix 5.3B, Appendix A, to complete the recordation for each resource, and resubmit.

Response: Location maps have been added to each DPR 523 forms submitted in Appendix 5.3B. The revised DPR 523 forms are provided as Attachment DA5.3-2. Due to size only five copies of the document have been provided to CEC Staff. Additional copies will be provided upon request.

5. Locations of Cultural Resources (Appendix B (g) (2) (C) (iv))

A map at a scale of 1:24,000 U.S. Geological Survey quadrangle depicting the locations of all previously known and newly identified cultural resources compiled through the research required by Appendix B (g)(2)(B) and Appendix B (g)(2)(C) (ii); and

Information required to make AFC conform with regulations:

Plot locations of all previously known and newly identified cultural resources on a map or maps (at a scale of 1:24,000/U.S.G.S. topographic quadrangle) and submit under confidentiality if archaeological site locations are depicted.

Response: A map identifying previously known and newly identified cultural resources is provided in Attachment DA5.3-1, which has been provided to Staff under a request for confidentiality.

CONFIDENTIAL ATTACHMENT DA5.3-1

Cultural Survey Maps

CONFIDENTIAL ATTACHMENT DA5.3-1

Cultural Survey Maps

Attachment DA5.3-1 was submitted to the California Energy Commission under a request for confidentiality.

ATTACHMENT DA5.3-2

Revised DPR 523 Forms

ATTACHMENT DA5.3-2

Revised DPR 523 Forms

Due to its size, five copies of Attachment DA5.3-2 will be provided to the California Energy Commission under separate cover.

5.6 Land Use

6. Designated Areas (Appendix B (g) (3) (A) (i))

An identification of residential, commercial, industrial, recreational, scenic, agricultural, natural resource protection, natural resource extraction, educational, religious, cultural, and historic areas, and any other area of unique land uses;

Information required to make AFC conform with regulations:

Please identify whether any natural resource protection or extraction, or cultural resource designated areas exist within the project vicinity.

Response: There are no natural resource protection or extraction areas or cultural resource designated areas within the vicinity of the project.

7. Compatibility of Project (Appendix B (g) (7) (A) (vi))

A discussion of the compatibility of the proposed project with present and expected land uses, and conformity with any long-range land use plans adopted by any federal, state, regional, or local planning agencies. The discussion shall identify the need, if any, for land use decisions by another public agency or as part of the commission's decision that would be necessary to make the project conform to adopted federal, state, regional, or local coastal plans, land use plans, or zoning ordinances. Examples of land use decisions include: general plan amendments, zoning changes, lot line adjustments, parcel mergers, subdivision maps, Agricultural Land Conservation Act contracts cancellation, and Airport Land Use Plan consistency determinations.

Information required to make AFC conform with regulations:

Please provide a discussion regarding compatibility of the project with present and expected land uses.

Response: The Stanislaus County and the cities of Ceres and Modesto general plans, as well as the City of Ceres' Service Road Industrial Master Plan, identify several goals and policies that are applicable to the project. Table 5.6-7 of the AFC lists the relevant policies and goals from each plan; the project is consistent with all goals and policies.

The A2PP facility and a portion of the transmission corridors and natural gas pipeline lie on City of Ceres' lands with a land use designation of General Industrial (GI) and an M-2 General Industrial zoning designation, which permit heavy industrial and public and quasi-public uses. No land use changes are required; the project is consistent.

A portion of the 69-kV reconductored transmission route is within the City of Modesto on lands with land use designations of Industrial and Residential, and zoning designations of M-2 Heavy Industrial and R-1 Low Density. Utility development is permitted as a conditional use. No land use changes are required; the project is consistent.

A portion of the natural gas pipeline and transmission corridors are within Stanislaus County on lands with a land use designation of General Agriculture and zoning designation

of A-2-40 General Agriculture. Power plant development is permitted by issuance of a permit, provided that the proposed use does not conflict with agricultural uses within the vicinity, and is not within a productive agricultural area. As discussed in Section 5.6.3.2.2 of the AFC, construction of the pipeline and transmission corridors on these agricultural lands will be temporary, after which existing agricultural uses can resume. One transmission pole for Corridor 2 will be placed on active agricultural lands resulting in approximately 4 square feet to be permanently converted to non-agricultural uses. Per the Stanislaus County General Plan, because the project is not converting agricultural uses to residential uses, and would not require a General Plan or Community Plan amendment, no mitigation is required. Therefore, no land use changes are required; the project is consistent with General Plans and Master Plans, and zoning.

8. Crop Types (Appendix B (g) (3) (D) (i))

Crop types, irrigation systems, and any special cultivation practices

Information required to make AFC conform with regulations:

Please identify crop types, irrigation systems, and any special cultivation practices.

Response: Irrigation systems in the project vicinity consist primarily of irrigation canals. Main crops in the area appear to be nut trees and alfalfa/pasture grasses. Based on observations made during the biological field survey, most of the agricultural land along the linear features (transmission gas pipeline and transmission lines) was planted with either alfalfa or grasses. Additionally, it appeared that the alfalfa crops may be in the process of being phased out and replaced with a grass crop, which would require less irrigation. There appeared to be no special cultivation practices.

5.10 Socioeconomics

9. Water and Wastewater Capacities (Appendix B (g) (7) (A) (vi))

Capacities, existing and expected use levels, and planned expansion of utilities (gas, water and waste) and public services, including fire protection, law enforcement, emergency response, medical facilities, other assessment districts, and school districts. For projects outside metropolitan areas with a population of 500,000 or more, information for each school district shall include current enrollment and yearly expected enrollment by grade level groupings, excluding project-related changes for the duration of the project schedule.

Information required to make AFC conform with regulations:

Please provide details on water and wastewater capacities for conveyance and at the treatment plants and if there is an expectation of impact from increased cost to improve services, if necessary. Also, please identify if any water and waste water related assessment districts or community facilities districts are established and if there is a potential effect.

Response: TID provided a copy of the will-serve letter from the City of Ceres as Appendix 2A in the AFC. Per this letter, the City has enough capacity to both receive process wastewater and dispose of it in the treatment plant evaporation ponds.

10. Fire District and Emergency Response (Appendix B (g) (7) (A) (vi))

Capacities, existing and expected use levels, and planned expansion of utilities (gas, water and waste) and public services, including fire protection, law enforcement, emergency response, medical facilities, other assessment districts, and school districts. For projects outside metropolitan areas with a population of 500,000 or more, information for each school district shall include current enrollment and yearly expected enrollment by grade level groupings, excluding project-related changes for the duration of the project schedule.

Information required to make AFC conform with regulations:

Please provide details on the Fire District and Emergency Response Community Facilities District.

Response: The City of Ceres does not have a Fire District and Emergency Response Community Facilities District, but instead has the Ceres Emergency Services – Fire Division (CFD). CFD does not anticipate that the A2PP will place any burdens on its ability to provide services to its current service area, which includes the project site. Thus, the project will not impact CFD's ability to provide services. This was confirmed on June 5, 2009 in a conversation between CH2M HILL staff and CFD Battalion Chief, Brian Hunt. A copy of the record of conversation is provided as Attachment DA5.10-1.

11. Assessment Districts (Appendix B (g) (7) (B) (v))

The potential impacts, including additional costs, on utilities (gas, water, and waste) and public services, including fire, law enforcement, emergency response, medical facilities, other assessment districts, and school districts. Include response times to hospitals and for police, and emergency services. For projects outside metropolitan areas with a population of 500,000 or more, information

on schools shall include project-related enrollment changes by grade level groupings and associated facility and staffing impacts by school district during the construction and operating phases;

Information required to make AFC conform with regulations:

Please identify whether fees will be collected from assessment or community facility districts; or if the additional fees will be charged by the outside water contractor; or if the Ceres Wastewater Treatment Plant fees adequately cover the costs for service delivery and treatment.

Response: Service water for safety showers, facility wash water, and sanitary uses will be served from the existing onsite well. Therefore, no fees are associated with these water uses. Potable drinking water will be provided by an offsite water vendor (such as Arrowhead or Alhambra) based on their standard service agreement. Sanitary waste will not be generated at the A2PP because all sanitary waste connections are at the existing Almond Power Plant. Sanitary waste from the existing Almond Power Plant is disposed of through an onsite septic system and leach field. Regarding the Ceres Wastewater Treatment Plant (WWTP), process water will be provided from the City of Ceres WWTP through an existing connection, and non-reclaimable process wastewater from the A2PP will be discharged via the existing waterline between the Almond Power Plant and the Ceres WWTP pursuant to an existing services agreement. The commercial terms associated with the recycled water service and wastewater discharge will be set forth in a revised services agreement between the City of Ceres and TID. Finally, while there are no irrigation or other districts associated with the A2PP site, TID is not subject to community facility district or other similar fees.

12. Potential Impacts to Fire District and Emergency Response District (Appendix B (g) (7) (B) (v))

The potential impacts, including additional costs, on utilities (gas, water, and waste) and public services, including fire, law enforcement, emergency response, medical facilities, other assessment districts, and school districts. Include response times to hospitals and for police, and emergency services. For projects outside metropolitan areas with a population of 500,000 or more, information on schools shall include project-related enrollment changes by grade level groupings and associated facility and staffing impacts by school district during the construction and operating phases;

Information required to make AFC conform with regulations:

Please provide expected costs associated with the need for providing additional personnel for fire protection, law enforcement, emergency response and medical facilities, if necessary. Please provide potential impacts, including additional costs on the Fire District and Emergency Response Communities Facilities District.

Response: As stated in subsection 5.10.3.3.7 of the AFC, the peak workforce of 149 during construction is not expected to place a burden on public service providers. Additionally, both the Ceres Public Safety Department - Police Division (CPD) and the Ceres Emergency Services - Fire Division (CFD) have indicated that they do not expect the project to impact their ability to provide service to their service areas (Borges, 2008; Hunt, 2009). The project is also not expected to impact medical facilities. Copies of the records of conversation may be found in Attachment DA5.10-1.

As stated in subsection 5.10.3.4.7 of the AFC, the project will not make any new significant demands on public services or facilities since it will only employ four additional operations and maintenance workers.

Since the project will not impact public services, there would be no additional costs associated with providing additional personnel for fire protection, law enforcement, emergency response and medical facilities.

13. Property Taxes (Appendix B (g) (7) (B) (xi))

An estimate of property taxes generated during an operational year of the project;

Information required to make AFC conform with regulations:

Please provide an estimate of project property taxes during an operational year.

Response: As stated in Section 5.10.3.4.5 of the AFC, TID is tax exempt, and therefore is not expected to pay property taxes for the A2PP.

ATTACHMENT DA5.10-1

Records of Conversation

CH2MHILL TELEPHONE CONVERSATION RECORD

Call To:	Brian Hunt Battalion Chief		Ceres Emergency Services - Fire Division
Phone No.:	209-538-5709	**Date:**	June 05, 2009
Call From:	Fatuma Yusuf	**Time:**	11:43 AM
Message Taken By:	Fatuma Yusuf		
Subject:	Potential impact on services		

I called to follow up with Battalion Chief Randy Wheeler but he was out until later in the afternoon. I spoke to Battalion Chief Brian Hunt who informed that the A2PP project would have very little impact on his agency's ability to provide services to its service area.

His email address: brian.hunt@ci.ceres.ca.us

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CH2MHILL TELEPHONE CONVERSATION RECORD

Call To: Mike Borges

Phone No.: (209) 538-5722 **Date:** December 18, 2008

Call From: John J. Putrich/SAC **Time:** 1:28 PM

Message Taken By:

Subject: TID: Ceres Police Protection Information

I spoke with Mike Borges, Deputy Police Chief with the City of Ceres Public Safety Department – Police Division. He confirmed the TID project site is located within the jurisdiction of the Ceres Police.

Mr. Borges informed me that the Ceres Police has one station, which also serves as the headquarters. It is located at 2727 Third Street Ceres, CA 95307. This is about 4.2 miles driving away from the TID site, and 2.1 miles "as the crow flies". The Ceres Police Department has 57 full time officers.

Ceres Police has 4 levels of response, and a chart to calculate expected response time. Response time for the most serious of incidents is approximately 6-12 minutes. Response time for less serious incidents are 26-27 minutes. The project will not impact the current role of the police force.

Mutual aid response is available from the Stanislaus County Sherrif's Department, who's station and headquarters is at the Jail near the TID project site.

Mike Borges, Deputy Chief
2727 Third Street
Ceres, CA 95307
(209) 538-5722
mike.borges@ci.ceres.ca.us

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CH2MHILL TELEPHONE CONVERSATION RECORD

Call To: City of Ceres

Phone No.: 209538-5700 **Date:** June 05, 2009

Call From: **Time:** 11:50 AM

Message Taken By: Fatuma Yusuf

Subject: Assessment districts and fees assessed

I called the City's main line to find out if the City had assessment districts for fire, police, and water. I was informed by Cathy Holloway, Deputy City Clerk and Secretary in the City Manager's office that the City did indeed have assessment districts that fund public services such as police, fire, and water. Ms. Holloway suggested that I speak to the City Engineer Glen Gebhardt since his office was the one responsible for assessment districts.

I called Glen Gebhardt's office but was informed that he was out until Monday so I left a message for Mike Briton (sp) who was in a meeting.

Glen Gebhardt
Tel: 209-538-5792 (direct)

Mike Brinton
Tel: 209-538-5630 (direct)
michael.brinton@ci.ceres.ca.us

Mike Brinton returned my call in the afternoon and left me a vm message. In the message he indicated that he has done a thorough search of their records and TID does not show up as being assessed any fees by any assessment districts.

June 8, 2009

I spoke to Mike Brinton. I explained to him about the project again and asked him to confirm that there were no assessment districts that would be assessing fees on the TID A2PP. He informed me that the only assessment district that he thinks may be applicable is the Landscape and Lighting Assessment District. He said that all developments are supposed to be in this assessment district. He pointed out that most of the TID's properties are easements or canals which are not required to be part of an assessment district.

He is unaware of any assessment districts that pertain to fire, law enforcement, medical services, water, etc. And as he mentioned in his vm, he has checked all the assessment districts for any mention of TID and there were none. He did point out that there was the school district and I told him that we had already covered this one.

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5.11 Soils

14. Source of Borrow Material (Appendix B (g) (15) (A) (iii))

The location of any proposed fill disposal or fill procurement (borrow) sites; and

Information required to make AFC conform with regulations:

Figure 5.15-4 describes the proposed earthwork cut/fill volume would require a net fill of 9,680 cu-yds. Identify the source of proposed borrow material.

Response: Any borrow material would be provided by both the excavation of the onsite stormwater retention pond, or from excavations associated with project construction. Any additional fill would be purchased and transported from commercial suppliers in the local area.

15. Agency Contacts (Appendix B (i) (1) (B))

Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.

Information required to make AFC conform with regulations:

Include: Name, address, phone number and email address (if known) for CVRWQCB and Stanislaus County Dept. of Public Works contacts

Response: The name, address, phone number for CVRWQCB and Stanislaus County Department of Public Works is found in Table DA5.11-1.

TABLE DA5.11-1
Agency Contacts

Agency	Agency Contact Information
Central Valley Regional Water Quality Control Board	Rich Muhl/ Construction General Permit Lead Central Valley RWQCB 11020 Sun Center Drive #200 Rancho Cordova, CA 95670-6114 (916) 464-3291
Stanislaus County, Department of Public Works	Judy Lindsey Stanislaus County Public Works Department 1010 10th Street, Suite 3500 Modesto, CA 95354 (209) 525-6550

5.15 Water Resources

16. Location of TID Irrigation Canal (Appendix B [g][14][B][ii])

A detailed description of the hydrologic setting of the project. The information shall include a narrative discussion and on maps at a scale of 1:24,000 (or appropriate scale approved by staff), describing the chemical and physical characteristics of the following nearby water bodies that may be affected by the proposed project: Surface water bodies;

Information required to make AFC conform with regulations:

Section 5.15.1.4.3 identifies the TID Irrigation Canal, a surface water body, south of the A2PP Site. Identify the location of the canal on an appropriate map or provide a more detailed description of its location and distance from the site.

Response: Figure DA5.15-1 identifies the location of the TID irrigation canal.

17. Conveyance System for Construction Water (Appendix B [g][14][C][vi])

For all water supplied which necessitates transfers and/or exchanges at any point, identify all parties and contracts/agreements involved, the primary source for the transfer and/or exchange water (e.g., surface water, groundwater), and provide the status of all appropriate agencies' approvals for the proposed use, environmental impact analysis on the specific transfers and/or exchanges required to obtain the proposed supplies, a copy of any agency regulations that govern the use of the water, and an explanation of how the project complies with the agency regulation(s);

Information required to make AFC conform with regulations:

Section 5.15.1.4.3 and Section 5.15.2.1.3 describe that "TID Irrigation Canal water may be used for construction activities." Describe the conveyance method to be used to bring the canal water to the site.

Response: If water from the TID irrigation canal located to the south of the project site (Figure DA5.15-1) is used for construction purposes, a portable pump would be used to transfer the water through hoses into a water truck. The water truck would then transport the water to the project site for construction use. All activities associated with the transport of water from the TID irrigation canal to the project site would occur on TID-owned land.

18. Runoff Calculations (Appendix B [g][14][(D) (iii])

All assumptions and calculations used to calculate runoff and to estimate changes in flow rates between pre- and post construction;

Information required to make AFC conform with regulations:

Provide post construction drainage calculations or a copy of the applicable reference: CH2M HILL. 2009b. Preliminary Drainage Calculations for Peak Runoff and Retention Pond Sizing. Dated January 23, 2009.

Response: A copy of the Preliminary Drainage Calculations for Peak Runoff and Retention Pond Sizing has been provided as Attachment DA5.15-1.

19. Groundwater Characteristics (Appendix B (g) (14) (D) (iv])

A copy of applicable regional and local requirements regulating the drainage systems, and a discussion of how the project's drainage design complies with these requirements.

Information required to make AFC conform with regulations:

Describe applicable regional and local drainage system design requirements.

Response: Chapter 4, Public Facilities and Services, of the City of Ceres General Plan outlines goals and policies for stormwater drainage (Table DA5.15-1). In addition, the City's Municipal Code, Chapter 13.18, Urban Water Quality Control, contains conditions and requirements for stormwater discharge. Applicable sections include Sections 13.18.110 Outdoor Storage Areas, Commercial, and Industrial Facilities, and 13.18.120, Construction Sites (City of Ceres 2008 Municipal Code). Section 13.18.110 prohibits the improper storage of grease, oil, and other hazardous substances and outlines measures to prevent discharge of such contaminants. Section 13.18.120 requires compliance with the statewide General Construction Permit, as well as grants the City the authority to prescribe best management practices to minimize the discharge and transport of pollutants.

As described in Section 5.15 of the AFC, the existing Almond Power Plant stormwater system would be relocated to the north to accommodate both the existing Almond Power Plant and the A2PP. The stormwater system for the A2PP will include a series of inlets and storm drain pipes that convey runoff to a retention pond. Areas of potential oil contamination will use secondary containments that prevent the potential contaminants from traveling to the stormwater system. Runoff contained in the secondary containments will be treated and disposed of offsite. The retention pond will be sized to accommodate the 100-year peak runoff. As designed, the drainage system at the A2PP will comply with all applicable local and regional drainage system design requirements.

TABLE DA5.15-1
City of Ceres General Plan – Stormwater Drainage

Goal
Goal 4.E – To collect and dispose of stormwater in a manner that minimizes inconvenience to the public, minimizes potential water-related damage and enhances the environment.
Policies
4.E.1 The City shall require new development to adequately mitigate increases in stormwater peak flows and or volume. Mitigation measures should take into consideration impacts on adjoining lands in the city and immediately adjacent to the city in unincorporated Stanislaus County.
4.E.2 All drainage designs shall be in accordance with the accepted principles of civil engineering, the Stanislaus County Storm Drainage Design Manual, and City improvement standards.

TABLE DA5.15-1
City of Ceres General Plan – Stormwater Drainage

4.E.3 New development shall have surface drainage disposal accommodated in one of the following ways:
a. Positive drainage – positive drainage to a river stream creek or other natural water course.
b. Irrigation facility – drainage into an irrigation district facility either by gravity or pumping pursuant to the City TID agreement.
c. Drainage ponds, ponds either in individual lots within a subdivision or in the case of larger developments within a depressed portion of a common area.
d. Drainage unit – use of French drains within depressed areas of the street right-of-way for those subdivision or portions of subdivisions of such size that one of the solution in subsections a, b, or c is not feasible, as determined by the City Engineer.
e. On-site drainage – drainage retained on-site within the development.
Commercial development shall accommodate drainage onsite unless a method described subsections a or b above is available and the development participates in a system to address onsite drainage as approved by the City Engineer. All onsite industrial drainage shall remain onsite. The city shall encourage commercial and industrial development to integrate onsite storm drainage facilities with landscaping.
4.E.4 The City shall encourage project designs that minimize drainage concentrations and impervious coverage.
4.E.5 The City shall require appropriate mitigation for grading activities during the rainy season to avoid sedimentation of storm drainage facilities.
4.E.6 The City shall require projects that have significant impacts on the quality of surface water runoff to incorporate mitigation measures for water quality impacts related urban runoff.
4.E.7 Future drainage system requirement shall comply with applicable state and federal discharge requirements.
4.E.8 The City shall seek to minimize operational complexities and maintenance requirements of the storm drainage system.
4.E.9 The City shall allow stormwater detention facilities to mitigate drainage impacts and reduce storm drainage system costs. To the extent practical, stormwater detention facilities should be designed for multiple purposes, including recreation and/or stormwater quality improvement.
4.E.10 The City shall consider using stormwater of adequate quality to replenish the local groundwater basin, restore wetlands, and riparian habitat, and irrigate agricultural lands, or as open space or recreational enhancements.
4.E.11 The City shall, when necessary to meet federal stormwater quality requirements, establish a storm drain utility to address these requirements on a citywide basis.

Source: City of Ceres. 1997. General Plan. Available at http://www.ci.ceres.ca.us/GeneralPlan.pdf. Site Accessed June 2, 2009.

20. Pumping Groundwater(Appendix B [g][14][E][ii])

If the project will pump groundwater, an estimation of aquifer drawdown based on a computer modeling study shall be conducted by a professional geologist and include the estimated drawdown on neighboring wells within 0.5 mile of the proposed well(s), any effects on the migration of groundwater contaminants, and the likelihood of any changes in existing physical or chemical conditions of groundwater resources shall be provided.

Information required to make AFC conform with regulations:

Provide a copy of the well development pump test reference: Calwater Drilling Company, Inc. Well Completion Report conducted in 2000.

Response: The A2PP project will not pump groundwater. All potable water will be delivered by a water delivery service. Service water and fire water will be provided by an existing well at the Almond Power Plant, and is not part of the A2PP project. Nevertheless, a copy of the well development pump test for Almond Power Plant has been provided as Attachment DA5.15-2.

21. Agency Contacts (Appendix B [i][2])

The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.

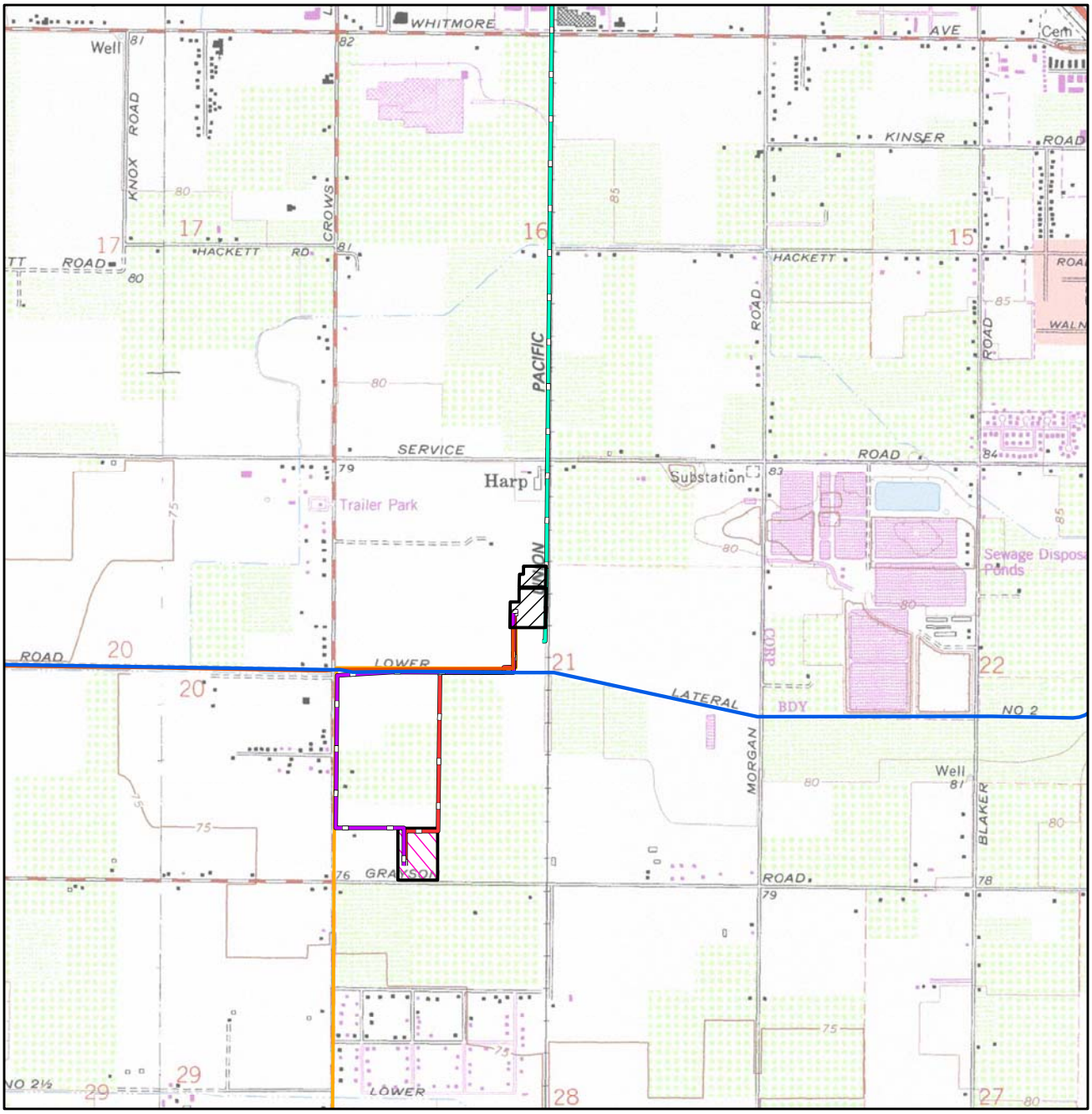
Information required to make AFC conform with regulations:

AFC only included addresses & phone numbers. Provide names of contacts at each agency.

Response: Agency contacts are found in Table DA5.15-2.

TABLE DA5.15-2
Agency Contacts

Agency	Agency Contact Information
Central Valley Regional Water Quality Control Board – Construction General Permits	Rich Muhl/ Construction General Permit Lead Central Valley RWQCB 11020 Sun Center Drive #200 Rancho Cordova, CA 95670-6114 rmuhl@waterboards.ca.gov (916) 464-3291
City of Ceres Community Development Department	Tom Westbrook City of Ceres Community Development Department 2220 Magnolia Street Ceres, CA 95307 (209) 538-5774



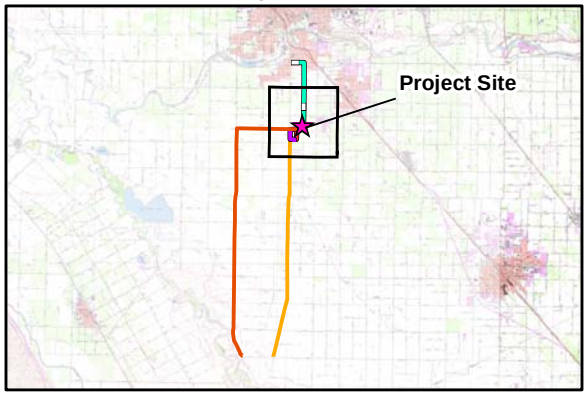
LEGEND

- TID Irrigation Canal
- Natural Gas Pipeline (Alternate A)
- Natural Gas Pipeline (Alternate B)
- 115-kV Circuit 1 Line (Corridor 1)
- 115-kV Circuit 2 Line (Corridor 2)
- Reconductored 69kV Sub-Transmission Line
- Proposed Grayson Substation
- Project Site

N

0 1,000 2,000
Feet

VICINITY MAP



Note:
The Grayson Substation is being developed as a separate Project

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

FIGURE DA5.15-1
LOCATION OF THE TID IRRIGATION CANAL
ALMOND 2 POWER PLANT
CERES, CALIFORNIA

CH2MHILL

SAC\\ZION\SACGIS\PROJ\TURLOCKIRRIGATIONDIS\383194\MAPFILES\APP_DA_TID_CANAL.MXD MHASKELL 6/1/2009 16:54:18

ATTACHMENT DA 5.15-1

Preliminary Drainage Calculations

CH2MHILL

CALCULATION SUMMARY & CONTROL SHEET

CALCULATION SET NO. 383416-CE-01

PRELIM.	FINAL	VOID	REVISION
X			A

Sheet 1 of 21

CLIENT: Turlock Irrigation District Water & Power

Discipline: Civil

PROJECT TITLE: Almond Two Power Plant

Project No. 383416

SUBJECT: Drainage calculations for Peak Runoff and Retention Pond sizing.

COMPLETED BY: *John Purdy, P.E.* JMP DATE: 1-23-09

CHECKED BY: *Mario Scacco, P.E.* MMS DATE: 1-23-09

APPROVED BY: N/A DATE:

REVISION SUMMARY: *Initial submittal*

TOTAL NUMBER OF SHEETS IN THIS ISSUE:

SHEETS REVISED, ADDED, or DELETED: *None*

PROBLEM STATEMENT: *Calculate subbasin peak runoff flows and confirm the size of the site stormwater retention pond.*

RESULTS & CONCLUSIONS: *The final pond size of 2.83 acre-feet will accommodate the calculated 100 -year storm runoff volume of 0.95 Ac-Ft with 2.74-feet of freeboard.*

DESIGN BASIS & ASSUMPTIONS: *See page 2*

UNVERIFIED ASSUMPTIONS/OPEN ITEMS: N/A

REFERENCES: NOAA Atlas 2, Volume XI

ATTACHMENTS (Including number of pages): *Drainage System Schematic (1p), Bentley CivilStorm Output Report (9p), California Precipitation Frequency Data Output (1p), Hydrologic Soil Group (4p), Retention Pond Stage-Storage for Rectangular Basin Calculation (1), 100-Year Storm Stormdrain Profiles (3)*

COMPUTER PROGRAM DISCLOSURE INFORMATION:

Program Used	Rev No./Issue Date	CH2M Verified
Bentley Civil Storm	*V8 XM /*	X Yes ____ No

Site hydrology will be based on the following criteria:

Method: SCS Unit Hydrograph Method
Rainfall Distribution: SCS Type I
Hydrologic Soil Group: Group B (See Attachment from NRCS)
Curve Number: 88 - Urban industrial, 72% imp (conservative), HSG B
Drainage Area: 8.03 Acres – Calculation takes into account the proposed project area of 3.01 Acres and the existing Almond Power Plant which is sited on 5.02 Acres.
Minimum Pipe Size for Storm Drain Main Line: 18-inches

Design Storms:

2-year 24 hour - 1.33 inches (Prec. Freq. Data Output, NOAA Atlas 2, See Attachment)
10-year 24 hour – 1.9 inches (NOAA Atlas 2, Volume XI, Figure 17, not Attached)
100-year 24 hour – 2.70 inches Prec. Freq. Data Output, NOAA Atlas 2, See Attachment)

Computed runoff volume tributary to the On-Site Retention Pond:

2-year 24 hour – 0.29 Acre-ft, peak elevation 75.72 ft
10-year 24 hour - 0.54 Acre-ft, peak elevation 76.34 ft
100-year 24 hour – 0.95 Acre-ft, peak elevation 77.26 ft with 2.74 ft of freeboard

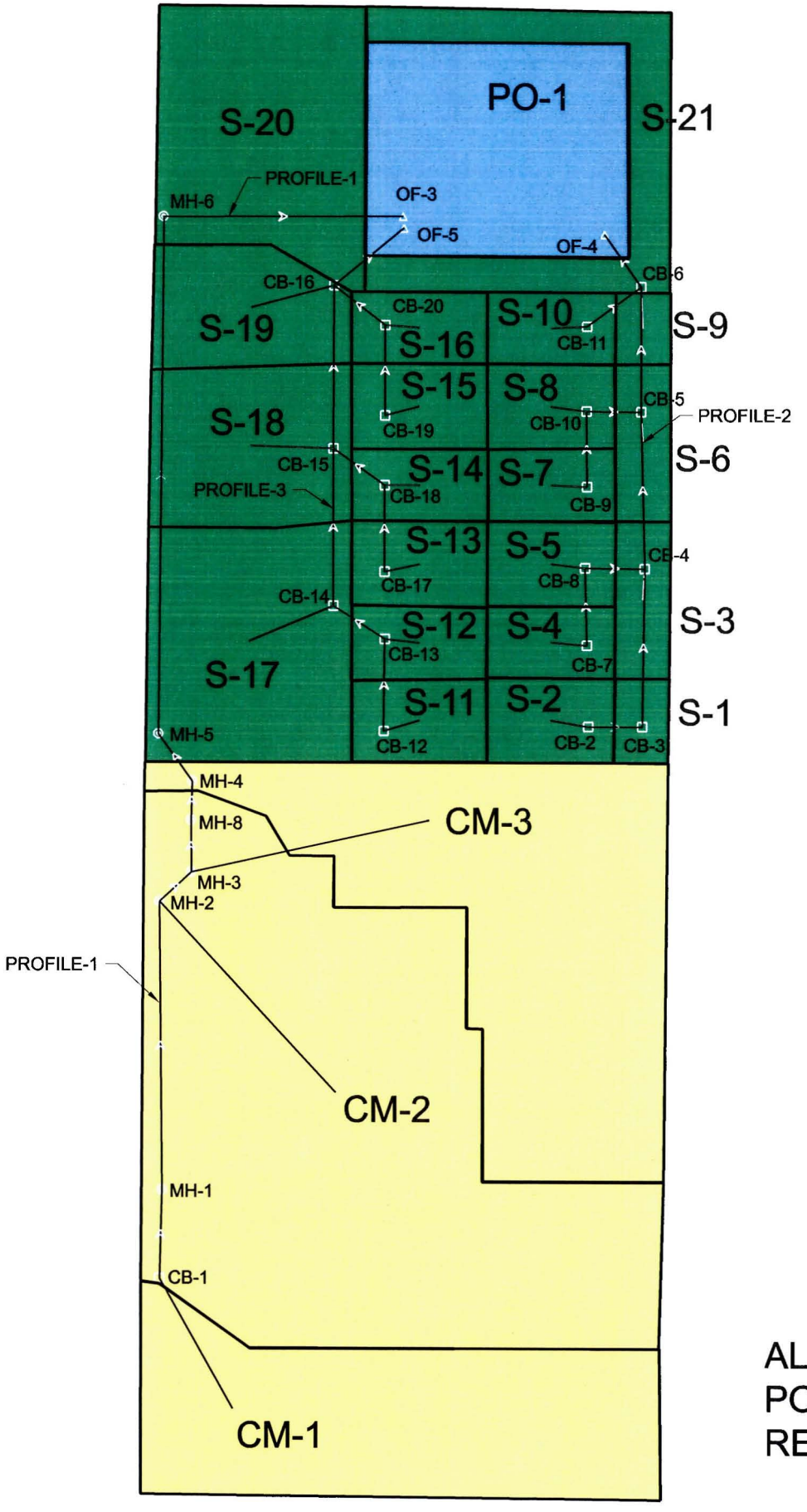
System Description:

The Almond Power Plant is an existing facility in Stanislaus County located near the Town of Ceres, California. The existing plant storm system incorporates a series of inlets and drainage pipes which convey runoff to a oil water separator, which is then discharged to an on-site retention pond.

The proposed project, Almond 2 Power Plant, involves expanding the facility to the north on an adjacent three acre parcel, which includes the existing on-site retention pond, bringing the total area of the facility to just over eight acres. The proposed facility will mitigate storm runoff with a series of inlets and storm drain pipes which will convey the runoff to a proposed on-site retention pond located on the north end of the site. Areas of potential oil contamination will be sited inside containments which will prevent potential contaminates from being conveyed to the storm system. Storm water that is contained will be treated and disposed of per the regulatory requirements. The implementation of these containments will enable for the balance of site runoff to be conveyed directly to the retention pond without prior treatment through an oil water separator.

The existing plant storm system will be tied into at the downstream end of the oil water separator and conveyed to the proposed retention pond by a separate storm drain pipe system. This system is over 550-feet long and therefore incorporates a 0.3 % slope to keep pond and trench depths reasonable. Referring to Profile-1 this system can convey the 100-year peak runoff without ponding at the existing facility even though the pipe invert at the oil water separator is about 2.5 feet above the oil water separator invert. A mechanical system will be implemented to drain the system up stream of the oil water separator when standing water is present.

DRAINAGE SYSTEM SCHEMATIC



NORTH

ALMOND 2
POWER PLANT
REV A 1/23/09

ALMOND TWO POWER PLANT 1/23/2009
100-YEAR
CATCHMENT SUMMARY

Label	Runoff Method	Loss Method	Total Rainfall Depth (in)	Area (acres)	Volume Total Runoff (ac-ft)	Flow (Peak) (ft^3/s)	Time To Peak (min)
CM-1	Unit Hydrograph	SCS CN	2.70	0.84	0.11	1.03	595.00
CM-2	Unit Hydrograph	SCS CN	2.70	1.98	0.26	2.42	595.00
CM-3	Unit Hydrograph	SCS CN	2.70	1.14	0.15	1.40	595.00
S-1	Unit Hydrograph	SCS CN	2.70	0.05	0.01	0.06	595.00
S-2	Unit Hydrograph	SCS CN	2.70	0.11	0.01	0.14	595.00
S-3	Unit Hydrograph	SCS CN	2.70	0.09	0.01	0.11	595.00
S-4	Unit Hydrograph	SCS CN	2.70	0.10	0.01	0.12	595.00
S-5	Unit Hydrograph	SCS CN	2.70	0.11	0.01	0.14	595.00
S-6	Unit Hydrograph	SCS CN	2.70	0.09	0.01	0.11	595.00
S-7	Unit Hydrograph	SCS CN	2.70	0.10	0.01	0.12	595.00
S-8	Unit Hydrograph	SCS CN	2.70	0.11	0.01	0.14	595.00
S-9	Unit Hydrograph	SCS CN	2.70	0.04	0.01	0.05	595.00
S-10	Unit Hydrograph	SCS CN	2.70	0.10	0.01	0.12	595.00
S-11	Unit Hydrograph	SCS CN	2.70	0.11	0.01	0.14	595.00
S-12	Unit Hydrograph	SCS CN	2.70	0.10	0.01	0.12	595.00
S-13	Unit Hydrograph	SCS CN	2.70	0.12	0.02	0.15	595.00
S-14	Unit Hydrograph	SCS CN	2.70	0.10	0.01	0.12	595.00
S-15	Unit Hydrograph	SCS CN	2.70	0.12	0.02	0.15	595.00
S-16	Unit Hydrograph	SCS CN	2.70	0.10	0.01	0.12	595.00
S-17	Unit Hydrograph	SCS CN	2.70	0.50	0.06	0.61	595.00
S-18	Unit Hydrograph	SCS CN	2.70	0.33	0.04	0.41	595.00
S-19	Unit Hydrograph	SCS CN	2.70	0.23	0.03	0.28	595.00
S-20	Unit Hydrograph	SCS CN	2.70	1.43	0.07	0.66	595.00
S-21	Unit Hydrograph	SCS CN	2.70	0.31	0.04	0.38	595.00

ALMOND TWO POWER PLANT 1/23/2009
100-YEAR
GENERAL SUMMARY

Label	Element Type	Branch	Time to Max Flow (min)	Flow (Max) (ft^3/s)	Velocity (Max) (ft/s)	Hydraulic Grade (Max) (ft)
MH-1	Manhole	8	---	---	---	78.75
MH-2	Manhole	8	---	---	---	77.86
MH-3	Manhole	8	---	---	---	77.82
MH-4	Manhole	8	---	---	---	77.49
MH-5	Manhole	8	---	---	---	77.39
MH-6	Manhole	8	---	---	---	77.26
MH-8	Manhole	8	---	---	---	77.58
CB-1	Catch Basin	8	---	---	---	78.76
CB-2	Catch Basin	4	---	---	---	78.67
CB-3	Catch Basin	4	---	---	---	78.52
CB-4	Catch Basin	4	---	---	---	78.08
CB-5	Catch Basin	4	---	---	---	77.64
CB-6	Catch Basin	4	---	---	---	77.26
CB-7	Catch Basin	5	---	---	---	78.66
CB-8	Catch Basin	5	---	---	---	78.43
CB-9	Catch Basin	6	---	---	---	78.67
CB-10	Catch Basin	6	---	---	---	78.41
CB-11	Catch Basin	7	---	---	---	78.61
CB-12	Catch Basin	1	---	---	---	78.68
CB-13	Catch Basin	1	---	---	---	78.43
CB-14	Catch Basin	1	---	---	---	78.34
CB-15	Catch Basin	1	---	---	---	77.94
CB-16	Catch Basin	1	---	---	---	77.48
CB-17	Catch Basin	2	---	---	---	78.68
CB-18	Catch Basin	2	---	---	---	78.38
CB-19	Catch Basin	3	---	---	---	78.68
CB-20	Catch Basin	3	---	---	---	78.35
CO-1	Conduit	8	598	0.97	1.24	78.76
CO-2	Conduit	8	595	3.28	4.18	78.23
CO-3	Conduit	8	595	3.27	4.17	77.83
CO-6	Conduit	8	598	4.51	4.52	77.43
CO-7	Conduit	8	598	4.54	4.42	77.26
CO-10	Conduit	8	598	4.21	4.14	77.26
CO-11	Conduit	8	595	4.63	5.89	77.60
CO-12	Conduit	8	598	4.51	4.52	77.52
CO-13	Conduit	4	595	0.13	0.74	78.60
CO-14	Conduit	4	595	0.18	1.65	78.27
CO-15	Conduit	4	598	0.53	2.31	77.82
CO-16	Conduit	4	598	0.88	2.75	77.41
CO-17	Conduit	4	598	1.03	2.91	77.26
CO-18	Conduit	5	595	0.11	0.64	78.53
CO-19	Conduit	5	595	0.24	2.46	78.20
CO-20	Conduit	6	595	0.11	0.65	78.55
CO-21	Conduit	6	595	0.24	3.34	77.98
CO-22	Conduit	7	595	0.12	0.64	77.87
CO-23	Conduit	1	595	0.13	0.76	78.53
CO-24	Conduit	1	595	0.25	1.67	78.34
CO-25	Conduit	1	595	0.83	2.70	78.08
CO-26	Conduit	1	598	1.46	3.17	77.67
CO-27	Conduit	1	598	1.99	3.56	77.30
CO-28	Conduit	2	595	0.14	0.80	78.55
CO-29	Conduit	2	595	0.26	2.95	78.00
CO-30	Conduit	3	595	0.14	0.79	78.53
CO-31	Conduit	3	595	0.26	3.51	77.71
PO-1	Pond	1	---	---	---	77.26

ALMOND TWO POWER PLANT
100-YEAR
NODE SUMMARY

1/23/2009

Label	Element Type	Branch	Time to Maximum Inflow (min)	Flow (Total In Max) (ft^3/s)	Time To Max Inlet Flow (min)	Flow (Surface Maximum) (ft^3/s)	Time To Max Captured Flow (min)	Flow (Captured Max) (ft^3/s)
MH-1	Manhole	8	595	3.37	---	---	---	---
MH-2	Manhole	8	595	3.28	---	---	---	---
MH-3	Manhole	8	595	4.67	---	---	---	---
MH-4	Manhole	8	598	4.51	---	---	---	---
MH-5	Manhole	8	598	4.51	---	---	---	---
MH-6	Manhole	8	598	4.54	---	---	---	---
MH-8	Manhole	8	595	4.63	---	---	---	---
CB-1	Catch Basin	8	595	1.03	595	1.03	595	1.03
CB-2	Catch Basin	4	595	0.14	595	0.14	595	0.14
CB-3	Catch Basin	4	595	0.19	595	0.06	595	0.06
CB-4	Catch Basin	4	595	0.53	595	0.11	595	0.11
CB-5	Catch Basin	4	598	0.86	595	0.11	595	0.11
CB-6	Catch Basin	4	598	1.03	595	0.05	595	0.05
CB-7	Catch Basin	5	595	0.12	595	0.12	595	0.12
CB-8	Catch Basin	5	595	0.25	595	0.14	595	0.14
CB-9	Catch Basin	6	595	0.12	595	0.12	595	0.12
CB-10	Catch Basin	6	595	0.25	595	0.14	595	0.14
CB-11	Catch Basin	7	595	0.12	595	0.12	595	0.12
CB-12	Catch Basin	1	595	0.14	595	0.14	595	0.14
CB-13	Catch Basin	1	595	0.26	595	0.12	595	0.12
CB-14	Catch Basin	1	595	0.86	595	0.61	595	0.61
CB-15	Catch Basin	1	595	1.49	595	0.41	595	0.41
CB-16	Catch Basin	1	598	1.98	595	0.28	595	0.28
CB-17	Catch Basin	2	595	0.15	595	0.15	595	0.15
CB-18	Catch Basin	2	595	0.26	595	0.12	595	0.12
CB-19	Catch Basin	3	595	0.15	595	0.15	595	0.15
CB-20	Catch Basin	3	595	0.26	595	0.12	595	0.12
OF-3	Outfall	0	(N/A)	(N/A)	---	---	---	---
OF-4	Outfall	0	(N/A)	(N/A)	---	---	---	---
OF-5	Outfall	0	(N/A)	(N/A)	---	---	---	---
PO-1	Pond	1	598	8.37	---	---	---	---

RETENTION POND
SUMMARY

Time to Max Inflow (min)	Flow (Total In Maximum) (ft^3/s)	Time to Max Hydraulic Grade & Storage (min)	Depth (Maximum) (ft)	Hydraulic Grade (Maximum) (ft)	Storage (Maximum) (ac-ft)
598	8.37	1437.98	2.26	77.26	0.95

ALMOND TWO POWER PLANT 1/23/2009
10-YEAR
CATCHMENT SUMMARY

Label	Runoff Method	Loss Method	Total Rainfall Depth (in)	Area (acres)	Volume Total Runoff (ac-ft)	Flow (Peak) (ft^3/s)	Time To Peak (min)
CM-1	Unit Hydrograph	SCS CN	1.90	0.84	0.06	0.56	595.00
CM-2	Unit Hydrograph	SCS CN	1.90	1.98	0.15	1.31	595.00
CM-3	Unit Hydrograph	SCS CN	1.90	1.14	0.08	0.76	595.00
S-1	Unit Hydrograph	SCS CN	1.90	0.05	0.00	0.03	595.00
S-2	Unit Hydrograph	SCS CN	1.90	0.11	0.01	0.07	595.00
S-3	Unit Hydrograph	SCS CN	1.90	0.09	0.01	0.06	595.00
S-4	Unit Hydrograph	SCS CN	1.90	0.10	0.01	0.06	595.00
S-5	Unit Hydrograph	SCS CN	1.90	0.11	0.01	0.08	595.00
S-6	Unit Hydrograph	SCS CN	1.90	0.09	0.01	0.06	595.00
S-7	Unit Hydrograph	SCS CN	1.90	0.10	0.01	0.06	595.00
S-8	Unit Hydrograph	SCS CN	1.90	0.11	0.01	0.07	595.00
S-9	Unit Hydrograph	SCS CN	1.90	0.04	0.00	0.03	595.00
S-10	Unit Hydrograph	SCS CN	1.90	0.10	0.01	0.06	595.00
S-11	Unit Hydrograph	SCS CN	1.90	0.11	0.01	0.08	595.00
S-12	Unit Hydrograph	SCS CN	1.90	0.10	0.01	0.07	595.00
S-13	Unit Hydrograph	SCS CN	1.90	0.12	0.01	0.08	595.00
S-14	Unit Hydrograph	SCS CN	1.90	0.10	0.01	0.07	595.00
S-15	Unit Hydrograph	SCS CN	1.90	0.12	0.01	0.08	595.00
S-16	Unit Hydrograph	SCS CN	1.90	0.10	0.01	0.07	595.00
S-17	Unit Hydrograph	SCS CN	1.90	0.50	0.04	0.33	595.00
S-18	Unit Hydrograph	SCS CN	1.90	0.33	0.02	0.22	595.00
S-19	Unit Hydrograph	SCS CN	1.90	0.23	0.02	0.15	595.00
S-20	Unit Hydrograph	SCS CN	1.90	1.43	0.04	0.36	595.00
S-21	Unit Hydrograph	SCS CN	1.90	0.31	0.02	0.21	595.00

ALMOND TWO POWER PLANT 1/23/2009
10-YEAR
GENERAL SUMMARY

Label	Element Type	Branch	Time to Max Flow (min)	Flow (Max) (ft^3/s)	Velocity (Max) (ft/s)	Hydraulic Grade (Max) (ft)
MH-1	Manhole	8	---	---	---	77.44
MH-2	Manhole	8	---	---	---	77.37
MH-3	Manhole	8	---	---	---	77.36
MH-4	Manhole	8	---	---	---	77.26
MH-5	Manhole	8	---	---	---	77.13
MH-6	Manhole	8	---	---	---	76.34
MH-8	Manhole	8	---	---	---	77.34
CB-1	Catch Basin	8	---	---	---	77.44
CB-2	Catch Basin	4	---	---	---	78.64
CB-3	Catch Basin	4	---	---	---	78.48
CB-4	Catch Basin	4	---	---	---	78.01
CB-5	Catch Basin	4	---	---	---	77.54
CB-6	Catch Basin	4	---	---	---	77.14
CB-7	Catch Basin	5	---	---	---	78.63
CB-8	Catch Basin	5	---	---	---	78.38
CB-9	Catch Basin	6	---	---	---	78.64
CB-10	Catch Basin	6	---	---	---	78.38
CB-11	Catch Basin	7	---	---	---	78.58
CB-12	Catch Basin	1	---	---	---	78.64
CB-13	Catch Basin	1	---	---	---	78.38
CB-14	Catch Basin	1	---	---	---	78.25
CB-15	Catch Basin	1	---	---	---	77.81
CB-16	Catch Basin	1	---	---	---	77.33
CB-17	Catch Basin	2	---	---	---	78.64
CB-18	Catch Basin	2	---	---	---	78.34
CB-19	Catch Basin	3	---	---	---	78.64
CB-20	Catch Basin	3	---	---	---	78.32
CO-1	Conduit	8	598	0.53	0.68	77.44
CO-2	Conduit	8	595	1.76	2.24	77.40
CO-3	Conduit	8	598	1.76	2.24	77.36
CO-6	Conduit	8	598	2.46	3.72	77.20
CO-7	Conduit	8	598	2.48	3.77	76.62
CO-10	Conduit	8	598	2.45	3.79	76.34
CO-11	Conduit	8	595	2.49	3.17	77.35
CO-12	Conduit	8	598	2.46	3.72	77.30
CO-13	Conduit	4	595	0.07	0.42	78.56
CO-14	Conduit	4	598	0.10	0.58	78.22
CO-15	Conduit	4	598	0.29	1.87	77.76
CO-16	Conduit	4	598	0.48	2.25	77.33
CO-17	Conduit	4	598	0.56	2.40	77.03
CO-18	Conduit	5	595	0.06	0.37	78.50
CO-19	Conduit	5	595	0.13	0.73	78.16
CO-20	Conduit	6	595	0.06	0.37	78.51
CO-21	Conduit	6	595	0.13	0.71	77.95
CO-22	Conduit	7	595	0.06	0.36	77.85
CO-23	Conduit	1	595	0.07	0.43	78.49
CO-24	Conduit	1	598	0.13	0.76	78.27
CO-25	Conduit	1	595	0.45	2.21	78.00
CO-26	Conduit	1	598	0.80	2.64	77.55
CO-27	Conduit	1	598	1.09	2.98	77.16
CO-28	Conduit	2	595	0.08	0.45	78.51
CO-29	Conduit	2	595	0.14	0.76	77.97
CO-30	Conduit	3	595	0.08	0.45	78.49
CO-31	Conduit	3	595	0.14	0.75	77.68
PO-1	Pond	1	---	---	---	76.34

ALMOND TWO POWER PLANT
10-YEAR
NODE SUMMARY

1/23/2009

Label	Element Type	Branch	Time to Maximum Inflow (min)	Flow (Total In Max) (ft^3/s)	Time To Max Inlet Flow (min)	Flow (Surface Maximum) (ft^3/s)	Time To Max Captured Flow (min)	Flow (Captured Max) (ft^3/s)
MH-1	Manhole	8	595	1.81	---	---	---	---
MH-2	Manhole	8	595	1.76	---	---	---	---
MH-3	Manhole	8	595	2.51	---	---	---	---
MH-4	Manhole	8	598	2.46	---	---	---	---
MH-5	Manhole	8	598	2.46	---	---	---	---
MH-6	Manhole	8	598	2.46	---	---	---	---
MH-8	Manhole	8	595	2.49	---	---	---	---
CB-1	Catch Basin	8	595	0.56	595.00	0.56	595	0.56
CB-2	Catch Basin	4	595	0.07	595.00	0.07	595	0.07
CB-3	Catch Basin	4	595	0.10	595.00	0.03	595	0.03
CB-4	Catch Basin	4	595	0.28	595.00	0.06	595	0.06
CB-5	Catch Basin	4	598	0.47	595.00	0.06	595	0.06
CB-6	Catch Basin	4	598	0.56	595.00	0.03	595	0.03
CB-7	Catch Basin	5	595	0.06	595.00	0.06	595	0.06
CB-8	Catch Basin	5	595	0.13	595.00	0.08	595	0.08
CB-9	Catch Basin	6	595	0.06	595.00	0.06	595	0.06
CB-10	Catch Basin	6	595	0.13	595.00	0.07	595	0.07
CB-11	Catch Basin	7	595	0.06	595.00	0.06	595	0.06
CB-12	Catch Basin	1	595	0.08	595.00	0.08	595	0.08
CB-13	Catch Basin	1	595	0.14	595.00	0.07	595	0.07
CB-14	Catch Basin	1	595	0.47	595.00	0.33	595	0.33
CB-15	Catch Basin	1	595	0.80	595.00	0.22	595	0.22
CB-16	Catch Basin	1	598	1.08	595.00	0.15	595	0.15
CB-17	Catch Basin	2	595	0.08	595.00	0.08	595	0.08
CB-18	Catch Basin	2	595	0.14	595.00	0.07	595	0.07
CB-19	Catch Basin	3	595	0.08	595.00	0.08	595	0.08
CB-20	Catch Basin	3	595	0.14	595.00	0.07	595	0.07
OF-3	Outfall	0	(N/A)	(N/A)	---	---	---	---
OF-4	Outfall	0	(N/A)	(N/A)	---	---	---	---
OF-5	Outfall	0	(N/A)	(N/A)	---	---	---	---
PO-1	Pond	1	598	4.60	---	---	---	---

RETENTION POND
SUMMARY

Time to Max Inflow (min)	Flow (Total In Maximum) (ft^3/s)	Time to Max Hydraulic Grade & Storage (min)	Depth (Maximum) (ft)	Hydraulic Grade (Maximum) (ft)	Storage (Maximum) (ac-ft)
598	4.6	1437.98	1.34	76.34	0.54

ALMOND TWO POWER PLANT 1/23/2009
2-YEAR
CATCHMENT SUMMARY

Label	Runoff Method	Loss Method	Total Rainfall Depth (in)	Area (acres)	Volume Total Runoff (ac-ft)	Flow (Peak) (ft^3/s)	Time To Peak (min)
CM-1	Unit Hydrograph	SCS CN	1.33	0.84	0.03	0.26	595.00
CM-2	Unit Hydrograph	SCS CN	1.33	1.98	0.08	0.61	595.00
CM-3	Unit Hydrograph	SCS CN	1.33	1.14	0.04	0.35	595.00
S-1	Unit Hydrograph	SCS CN	1.33	0.05	0.00	0.01	595.00
S-2	Unit Hydrograph	SCS CN	1.33	0.11	0.00	0.03	595.00
S-3	Unit Hydrograph	SCS CN	1.33	0.09	0.00	0.03	595.00
S-4	Unit Hydrograph	SCS CN	1.33	0.10	0.00	0.03	595.00
S-5	Unit Hydrograph	SCS CN	1.33	0.11	0.00	0.04	595.00
S-6	Unit Hydrograph	SCS CN	1.33	0.09	0.00	0.03	595.00
S-7	Unit Hydrograph	SCS CN	1.33	0.10	0.00	0.03	595.00
S-8	Unit Hydrograph	SCS CN	1.33	0.11	0.00	0.03	595.00
S-9	Unit Hydrograph	SCS CN	1.33	0.04	0.00	0.01	595.00
S-10	Unit Hydrograph	SCS CN	1.33	0.10	0.00	0.03	595.00
S-11	Unit Hydrograph	SCS CN	1.33	0.11	0.00	0.04	595.00
S-12	Unit Hydrograph	SCS CN	1.33	0.10	0.00	0.03	595.00
S-13	Unit Hydrograph	SCS CN	1.33	0.12	0.00	0.04	595.00
S-14	Unit Hydrograph	SCS CN	1.33	0.10	0.00	0.03	595.00
S-15	Unit Hydrograph	SCS CN	1.33	0.12	0.00	0.04	595.00
S-16	Unit Hydrograph	SCS CN	1.33	0.10	0.00	0.03	595.00
S-17	Unit Hydrograph	SCS CN	1.33	0.50	0.02	0.16	595.00
S-18	Unit Hydrograph	SCS CN	1.33	0.33	0.01	0.10	595.00
S-19	Unit Hydrograph	SCS CN	1.33	0.23	0.01	0.07	595.00
S-20	Unit Hydrograph	SCS CN	1.33	1.43	0.02	0.17	595.00
S-21	Unit Hydrograph	SCS CN	1.33	0.31	0.01	0.10	595.00

ALMOND TWO POWER PLANT 1/23/2009
2-YEAR
GENERAL SUMMARY

Label	Element Type	Branch	Time to Max Flow (min)	Flow (Max) (ft^3/s)	Velocity (Max) (ft/s)	Hydraulic Grade (Max) (ft)
MH-1	Manhole	8	---	---	---	77.18
MH-2	Manhole	8	---	---	---	77.15
MH-3	Manhole	8	---	---	---	77.15
MH-4	Manhole	8	---	---	---	77.06
MH-5	Manhole	8	---	---	---	76.94
MH-6	Manhole	8	---	---	---	75.90
MH-8	Manhole	8	---	---	---	77.14
CB-1	Catch Basin	8	---	---	---	77.19
CB-2	Catch Basin	4	---	---	---	78.59
CB-3	Catch Basin	4	---	---	---	78.44
CB-4	Catch Basin	4	---	---	---	77.95
CB-5	Catch Basin	4	---	---	---	77.47
CB-6	Catch Basin	4	---	---	---	77.06
CB-7	Catch Basin	5	---	---	---	78.58
CB-8	Catch Basin	5	---	---	---	78.35
CB-9	Catch Basin	6	---	---	---	78.58
CB-10	Catch Basin	6	---	---	---	78.35
CB-11	Catch Basin	7	---	---	---	78.55
CB-12	Catch Basin	1	---	---	---	78.60
CB-13	Catch Basin	1	---	---	---	78.34
CB-14	Catch Basin	1	---	---	---	78.18
CB-15	Catch Basin	1	---	---	---	77.71
CB-16	Catch Basin	1	---	---	---	77.21
CB-17	Catch Basin	2	---	---	---	78.60
CB-18	Catch Basin	2	---	---	---	78.31
CB-19	Catch Basin	3	---	---	---	78.60
CB-20	Catch Basin	3	---	---	---	78.29
CO-1	Conduit	8	598	0.25	0.35	77.19
CO-2	Conduit	8	598	0.84	1.07	77.17
CO-3	Conduit	8	598	0.84	1.07	77.15
CO-6	Conduit	8	598	1.17	3.02	77.00
CO-7	Conduit	8	598	1.15	3.01	76.42
CO-10	Conduit	8	600	1.15	3.01	75.72
CO-11	Conduit	8	598	1.18	1.50	77.14
CO-12	Conduit	8	598	1.17	3.02	77.10
CO-13	Conduit	4	598	0.03	0.21	78.52
CO-14	Conduit	4	598	0.05	0.30	78.19
CO-15	Conduit	4	598	0.14	0.76	77.70
CO-16	Conduit	4	598	0.23	1.71	77.25
CO-17	Conduit	4	598	0.26	1.84	76.94
CO-18	Conduit	5	598	0.03	0.18	78.45
CO-19	Conduit	5	598	0.06	0.36	78.13
CO-20	Conduit	6	598	0.03	0.19	78.46
CO-21	Conduit	6	598	0.06	0.35	77.93
CO-22	Conduit	7	595	0.03	0.17	77.81
CO-23	Conduit	1	598	0.03	0.22	78.45
CO-24	Conduit	1	598	0.06	0.39	78.23
CO-25	Conduit	1	598	0.21	1.67	77.93
CO-26	Conduit	1	598	0.38	2.06	77.45
CO-27	Conduit	1	598	0.52	2.35	77.04
CO-28	Conduit	2	598	0.04	0.23	78.47
CO-29	Conduit	2	598	0.07	0.38	77.94
CO-30	Conduit	3	598	0.04	0.23	78.45
CO-31	Conduit	3	598	0.07	0.37	77.65
PO-1	Pond	1	---	---	---	75.72

1 2

ALMOND TWO POWER PLANT
2-YEAR
NODE SUMMARY

1/23/2009

Label	Element Type	Branch	Time to Maximum Inflow (min)	Flow (Total In Max) (ft^3/s)	Time To Max Inlet Flow (min)	Flow (Surface Maximum) (ft^3/s)	Time To Max Captured Flow (min)	Flow (Captured Max) (ft^3/s)
MH-1	Manhole	8	595	0.84	---	---	---	---
MH-2	Manhole	8	598	0.84	---	---	---	---
MH-3	Manhole	8	598	1.17	---	---	---	---
MH-4	Manhole	8	598	1.17	---	---	---	---
MH-5	Manhole	8	598	1.16	---	---	---	---
MH-6	Manhole	8	600	1.15	---	---	---	---
MH-8	Manhole	8	598	1.18	---	---	---	---
CB-1	Catch Basin	8	595	0.26	595.00	0.26	595	0.26
CB-2	Catch Basin	4	595	0.03	595.00	0.03	595	0.03
CB-3	Catch Basin	4	595	0.05	595.00	0.01	595	0.01
CB-4	Catch Basin	4	598	0.14	595.00	0.03	595	0.03
CB-5	Catch Basin	4	598	0.22	595.00	0.03	595	0.03
CB-6	Catch Basin	4	598	0.26	595.00	0.01	595	0.01
CB-7	Catch Basin	5	595	0.03	595.00	0.03	595	0.03
CB-8	Catch Basin	5	595	0.06	595.00	0.04	595	0.04
CB-9	Catch Basin	6	595	0.03	595.00	0.03	595	0.03
CB-10	Catch Basin	6	595	0.06	595.00	0.03	595	0.03
CB-11	Catch Basin	7	595	0.03	595.00	0.03	595	0.03
CB-12	Catch Basin	1	595	0.04	595.00	0.04	595	0.04
CB-13	Catch Basin	1	595	0.06	595.00	0.03	595	0.03
CB-14	Catch Basin	1	595	0.22	595.00	0.16	595	0.16
CB-15	Catch Basin	1	598	0.38	595.00	0.10	595	0.1
CB-16	Catch Basin	1	598	0.52	595.00	0.07	595	0.07
CB-17	Catch Basin	2	595	0.04	595.00	0.04	595	0.04
CB-18	Catch Basin	2	595	0.07	595.00	0.03	595	0.03
CB-19	Catch Basin	3	595	0.04	595.00	0.04	595	0.04
CB-20	Catch Basin	3	595	0.07	595.00	0.03	595	0.03
OF-3	Outfall	0	(N/A)	(N/A)	---	---	---	---
OF-4	Outfall	0	(N/A)	(N/A)	---	---	---	---
OF-5	Outfall	0	(N/A)	(N/A)	---	---	---	---
PO-1	Pond	1	600	2.14	---	---	---	---

RETENTION POND
SUMMARY

Time to Max Inflow (min)	Flow (Total In Maximum) (ft^3/s)	Time to Max Hydraulic Grade & Storage (min)	Depth (Maximum) (ft)	Hydraulic Grade (Maximum) (ft)	Storage (Maximum) (ac-ft)
600	2.14	1437.98	0.72	75.72	0.29

Precipitation Frequency Data Output

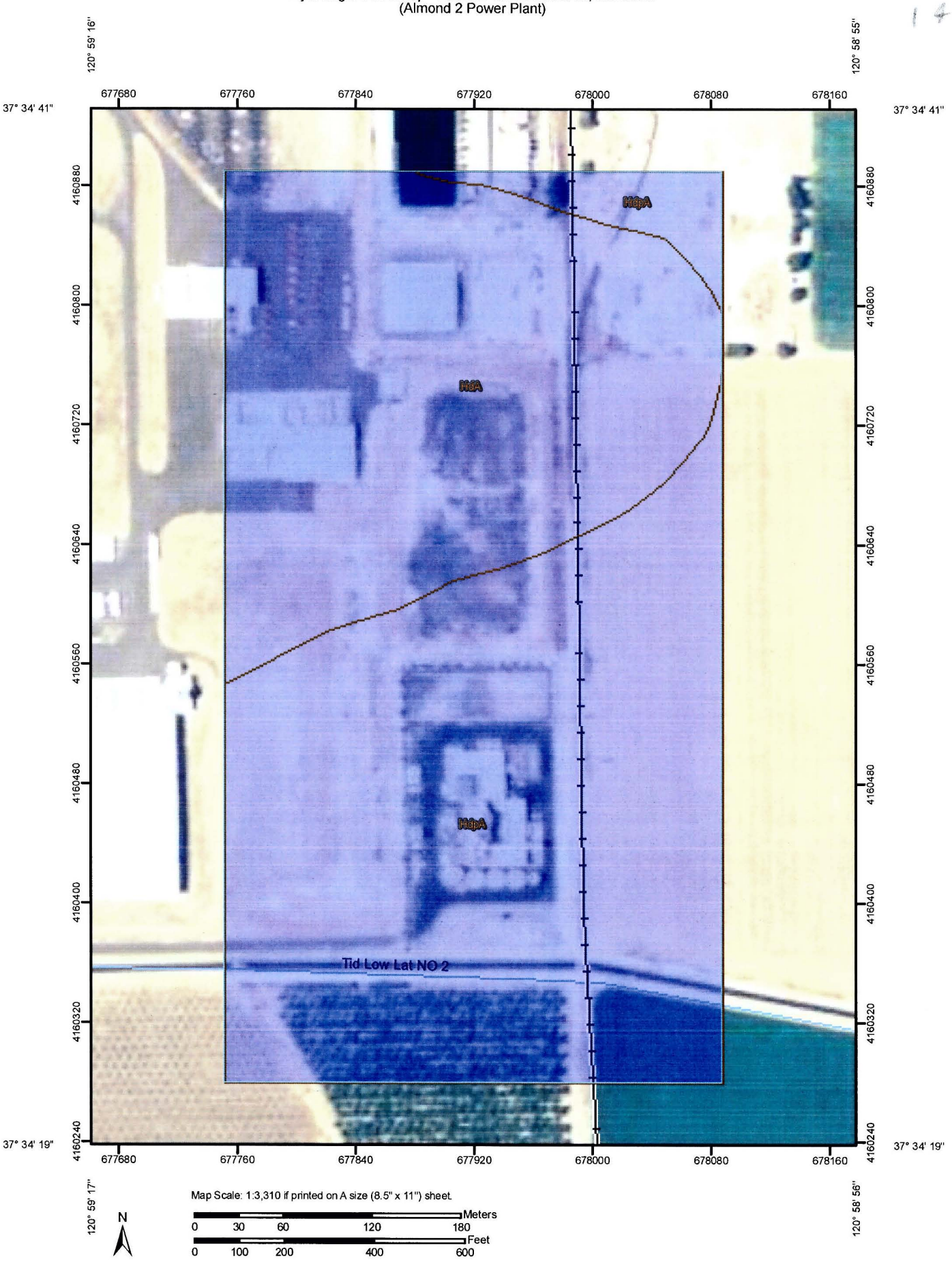
NOAA Atlas 2
California 37.5753?N 120.9853?W
Site-specific Estimates

Map	Precipitation (inches)	Precipitation Intensity (in/hr)
2-year 6-hour	0.89	0.15
2-year 24-hour	1.33	0.06
100-year 6-hour	1.85	0.31
100-year 24-hour	2.70	0.11

Hydrometeorological Design Studies Center - NOAA/National Weather Service
1325 East-West Highway - Silver Spring, MD 20910 - (301) 713-1669

Thu Jan 8 16:09:54 2009

Hydrologic Soil Group—Eastern Stanislaus Area, California
(Almond 2 Power Plant)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Soil Ratings

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Political Features

Cities

Water Features

Oceans

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:3,310 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Stanislaus Area, California
Survey Area Data: Version 5, Dec 17, 2007

Date(s) aerial images were photographed: 6/12/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Eastern Stanislaus Area, California				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
HdA	Hanford sandy loam, 0 to 3 percent slopes	B	20.6	40.7%
HdpA	Hanford sandy loam, moderately deep over silt, 0 to 1 percent slopes	B	30.0	59.3%
Totals for Area of Interest			**50.7**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

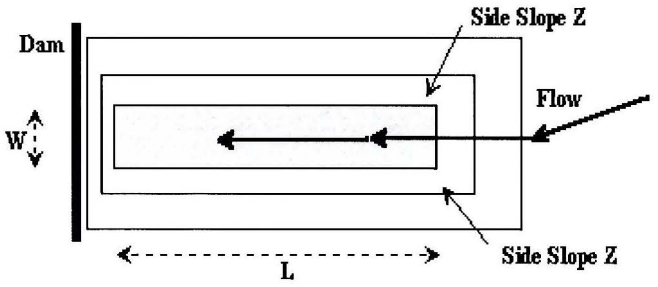
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

STAGE-STORAGE FOR RECTANGULAR BASIN



Design Information (Input):

Width of Basin Bottom	W =	112.80	ft
Length of Basin Bottom	L =	146.50	ft
Side-Slope of Dam (H:V)	Zd =	3.00	ft/ft

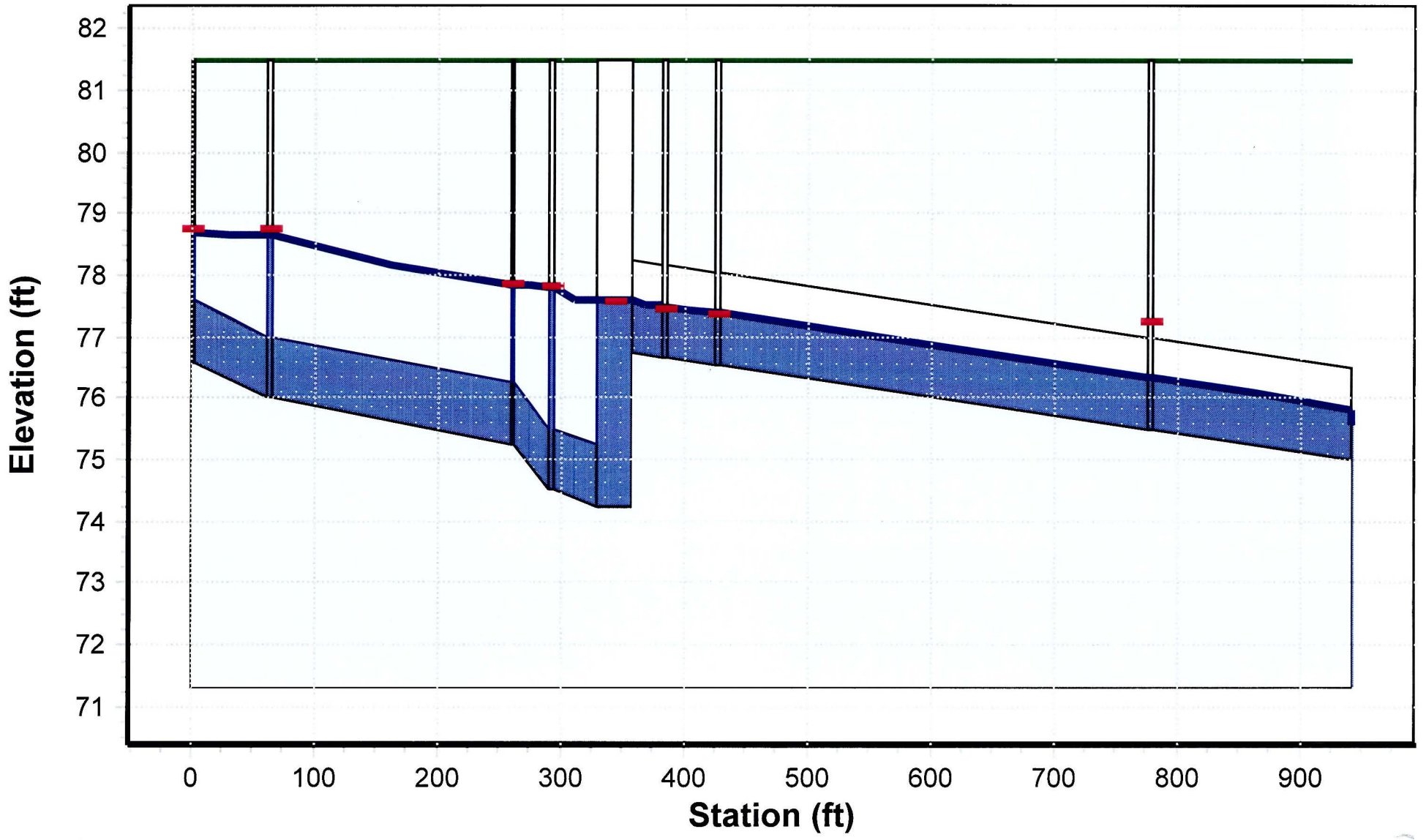
Stage-Storage Relationship:

Enter water surface elevations in ascending order.

Water Surface Elevation ft (input)	Side-slope for next depth stage ft/ft (H:V) (input)	Width of Cross Section ft (output)	Length of Cross Section ft (output)	Cross Section Area acres (output)	Volume above Datum acre-ft (output)
75.00	3.00	112.80	146.50	0.38	0.00
76.00	3.00	118.80	152.50	0.42	0.40
77.00	3.00	124.80	158.50	0.45	0.83
78.00	3.00	130.80	164.50	0.49	1.31
79.00	3.00	136.80	170.50	0.54	1.82
80.00	3.00	142.80	176.50	0.58	2.38
81.00	3.00	148.80	182.50	0.62	2.98

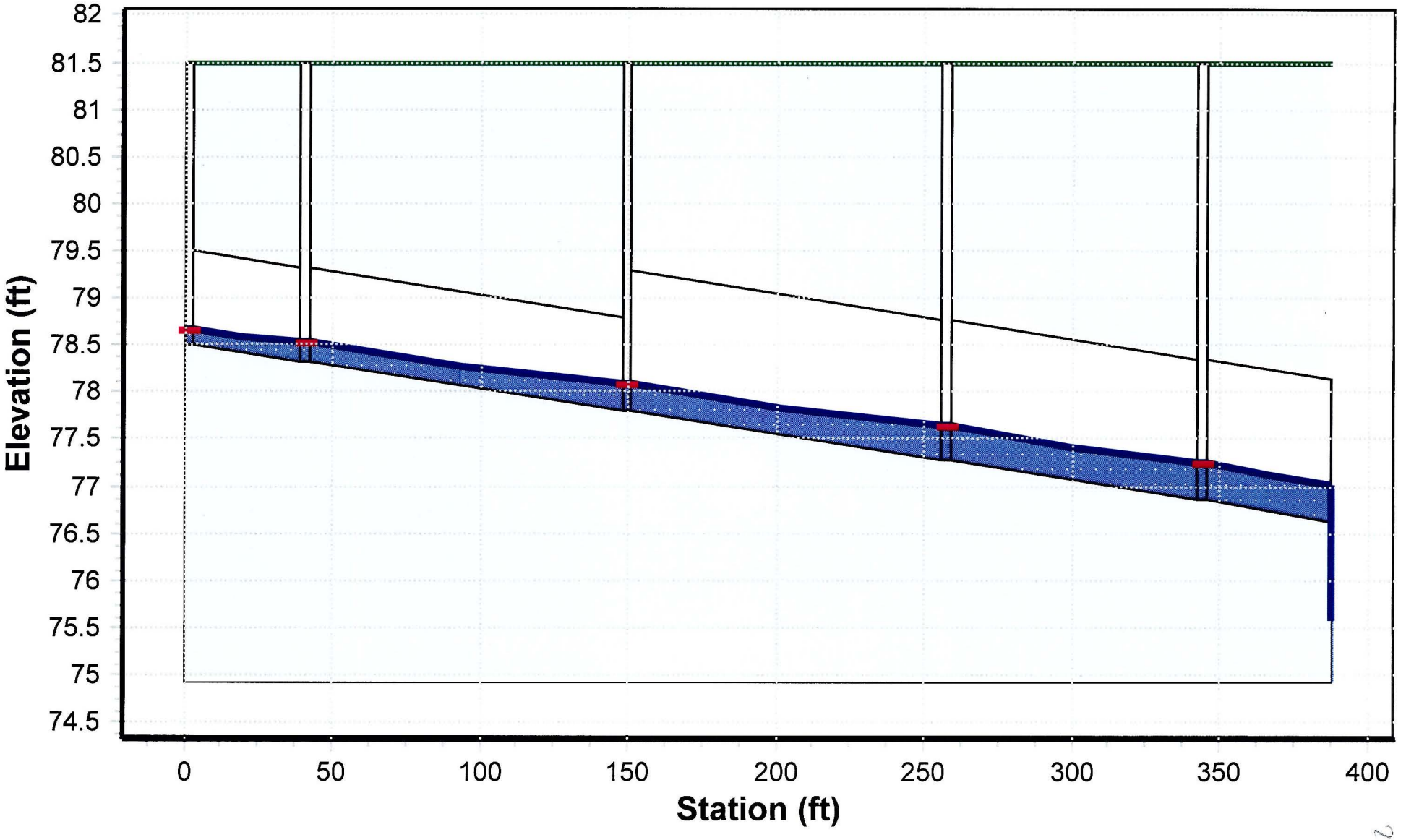
100 - YEAR STORM

Profile - 1 - Base Time: 09:58:00

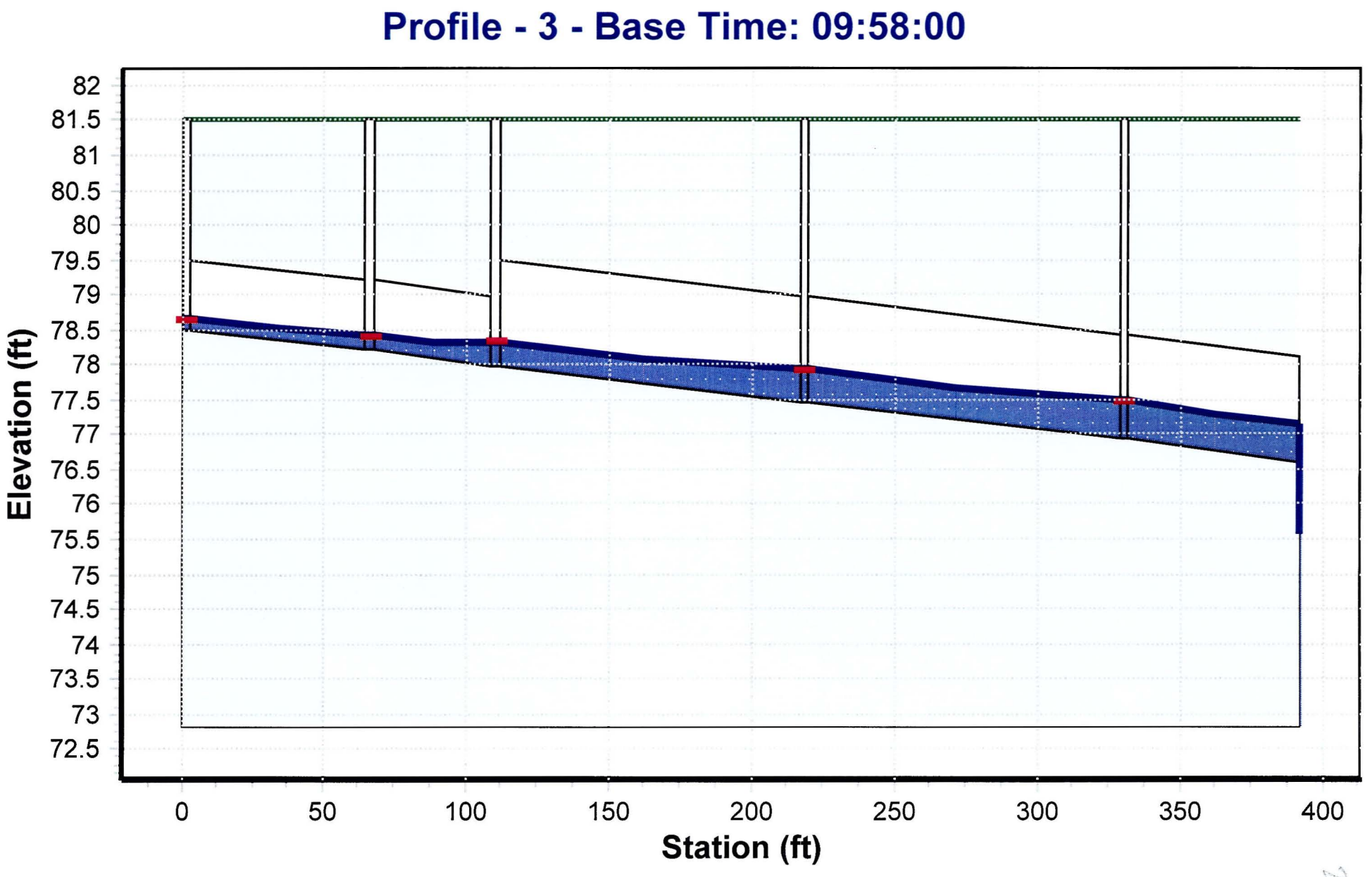


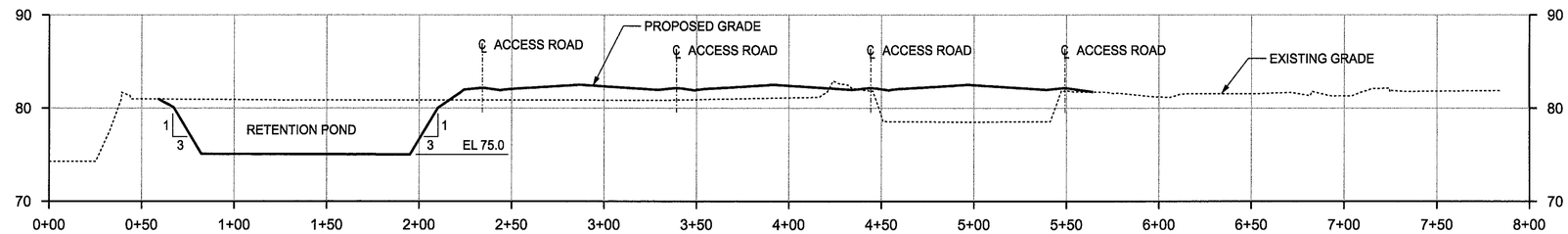
100-YEAR STORM

Profile - 2 - Base Time: 09:58:00

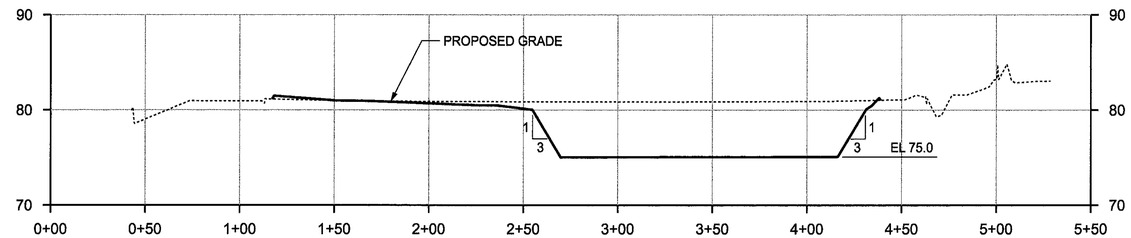


100-YEAR STORM

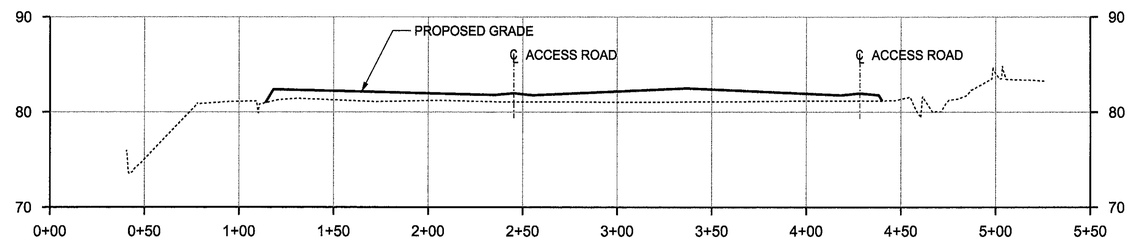




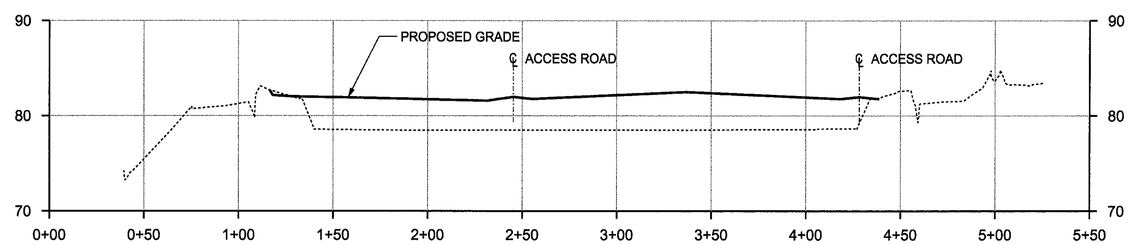
SECTION A
SCALE: 1" = 40' W-0-002



SECTION B
SCALE: 1" = 40' W-0-002



SECTION C
SCALE: 1" = 40' W-0-002



SECTION D
SCALE: 1" = 40' W-0-002

NO.	DATE	REVISION	BY	CHK
A	01/23/09	ISSUED FOR REVIEW	TC	JP

REVISION APPROVAL — REV A — DATE 01/23/09

DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL		ELECTRICAL	
STRUCTURAL		INST & CONT.	
MECHANICAL		ARCH.	
PROCESS		GEN. ARRANG.	
PIPING			

RESPONSIBLE ENGINEER — PE #

STATUS	REV	DATE	DM	SDE	PEM
ISSUED					
PRELIMINARY	P1				
FOR REVIEW AND APPROVAL	A	1-23-09			
APPROVED FOR CONSTRUCTION					
REVISED & APPROVED FOR CONSTRUCTION					

SCALE AS SHOWN

TURLOCK IRRIGATION DISTRICT
Almond 2 Power Plant
Ceres, CA

PROJECT NO. 383416

CH2MHILL

CIVIL
GRADING AND DRAINAGE SECTIONS

DWG. NO. C-000-R-0-001 REV. A

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

FILENAME: PLOT DATE: PLOT TIME:

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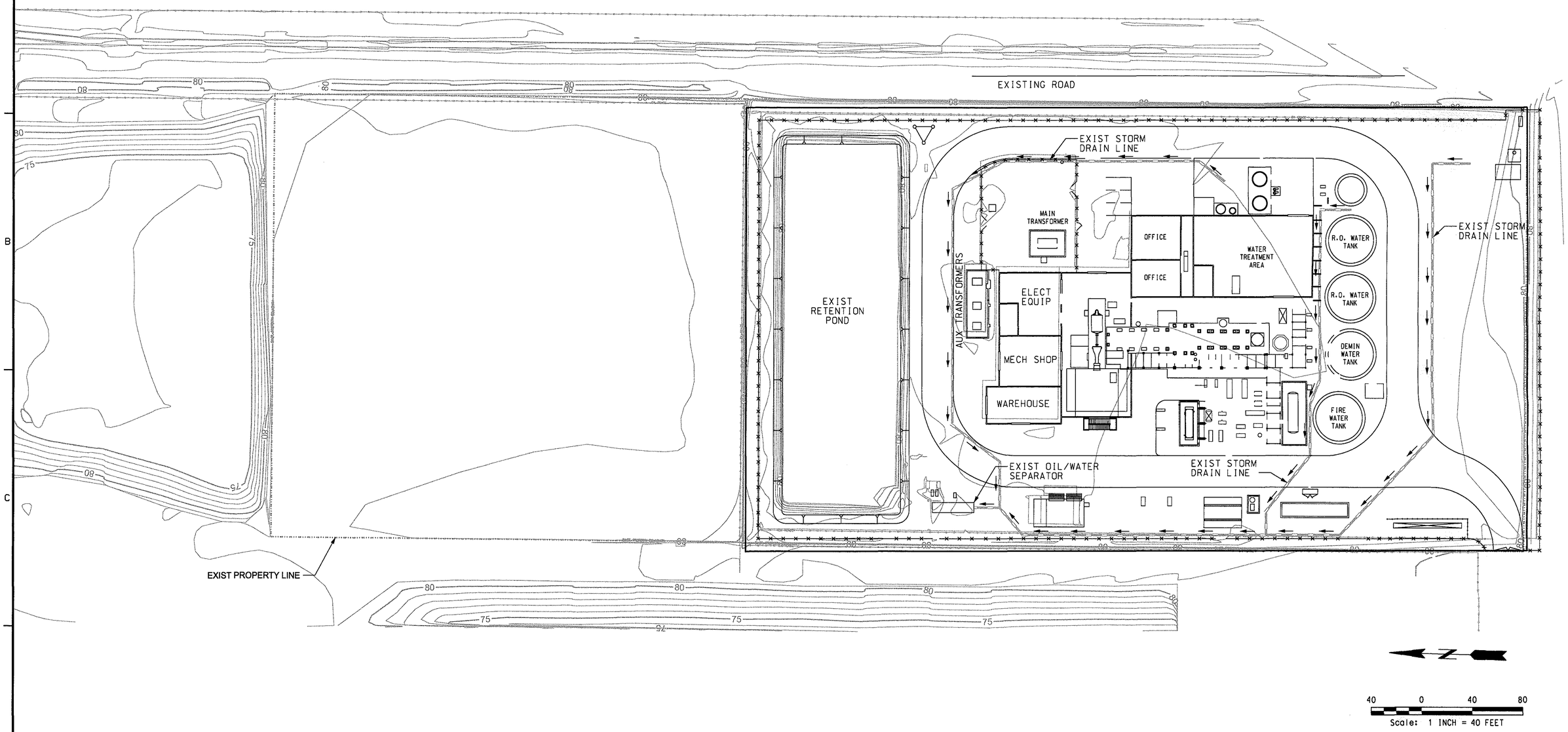

NO.	DATE	REVISION	BY	CHK
A	01/23/09	ISSUED FOR REVIEW	TC	JP

REVISION APPROVAL		REV A	DATE 01/23/09
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL	JMP	ELECTRICAL	
STRUCTURAL	[illegible]	INST & CONT.	
MECHANICAL		ARCH.	
PROCESS		GEN. ARRANG.	
PIPING			

STATUS					
ISSUED	REV	DATE	DM	SDE	PEM
PRELIMINARY	P1				
FOR REVIEW AND APPROVAL	A	1-23-09	JMP	[illegible]	[illegible]
APPROVED FOR CONSTRUCTION					
REVISED & APPROVED FOR CONSTRUCTION					

RESPONSIBLE ENGINEER

PE #

SCALE AS SHOWN

TURLOCK IRRIGATION DISTRICT
Almond 2 Power Plant
Ceres, CA

PROJECT NO. 383416

CH2MHILL

CIVIL
EXISTING SITE
PRE-CONSTRUCTION
TOPOGRAPHY & DRAINAGE

DWG. NO. C-000-W-0-001

REV. A

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

FILENAME: PLOT DATE: PLOT TIME:

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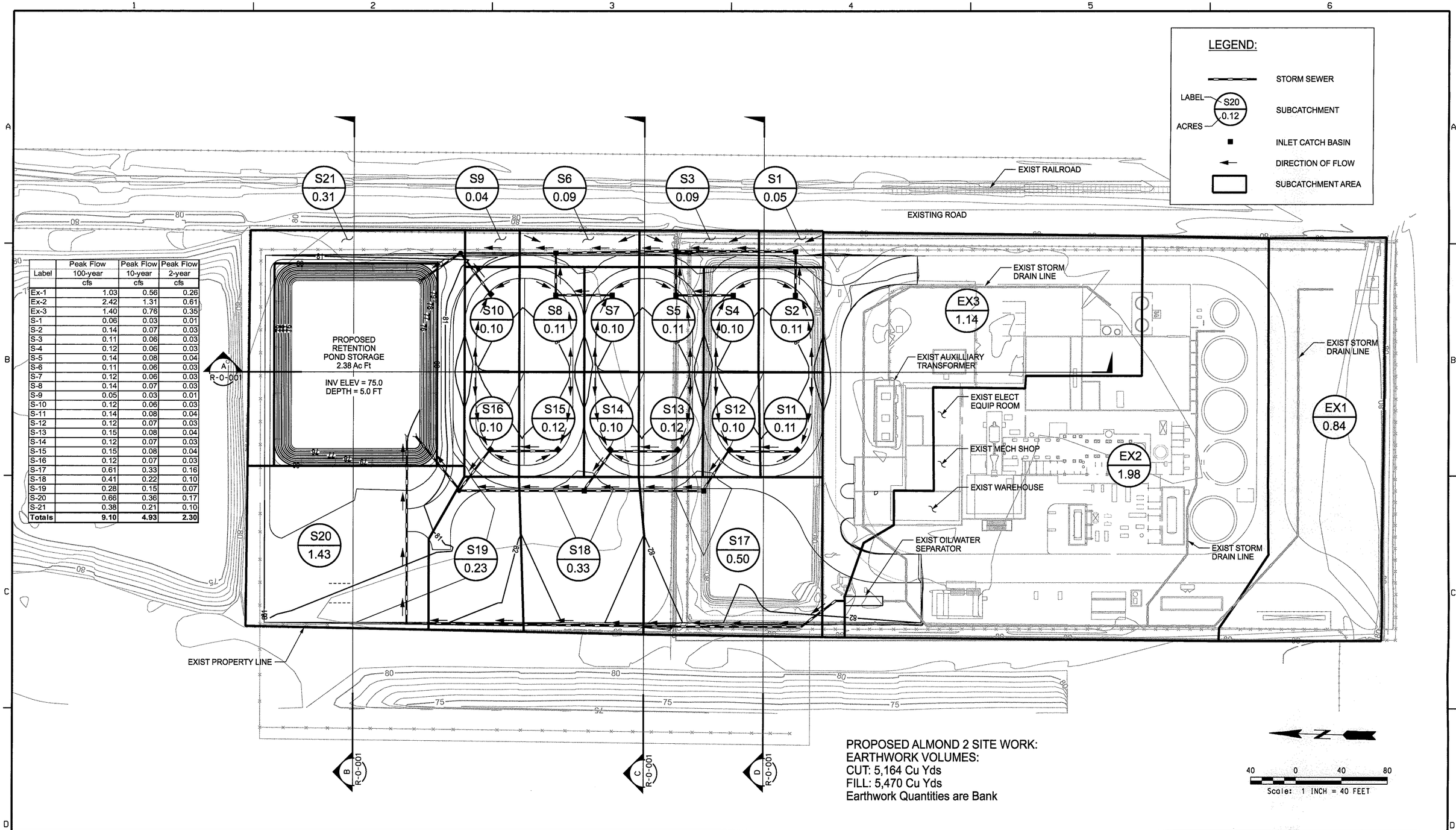

Label	Peak Flow 100-year cfs	Peak Flow 10-year cfs	Peak Flow 2-year cfs
Ex-1	1.03	0.56	0.26
Ex-2	2.42	1.31	0.61
Ex-3	1.40	0.76	0.35
S-1	0.06	0.03	0.01
S-2	0.14	0.07	0.03
S-3	0.11	0.06	0.03
S-4	0.12	0.06	0.03
S-5	0.14	0.08	0.04
S-6	0.11	0.06	0.03
S-7	0.12	0.06	0.03
S-8	0.14	0.07	0.03
S-9	0.05	0.03	0.01
S-10	0.12	0.06	0.03
S-11	0.14	0.08	0.04
S-12	0.12	0.07	0.03
S-13	0.15	0.08	0.04
S-14	0.12	0.07	0.03
S-15	0.15	0.08	0.04
S-16	0.12	0.07	0.03
S-17	0.61	0.33	0.16
S-18	0.41	0.22	0.10
S-19	0.28	0.15	0.07
S-20	0.66	0.36	0.17
S-21	0.38	0.21	0.10
Totals	**9.10**	**4.93**	**2.30**

PROPOSED ALMOND 2 SITE WORK:
EARTHWORK VOLUMES:
CUT: 5,164 Cu Yds
FILL: 5,470 Cu Yds
Earthwork Quantities are Bank

NO.	DATE	REVISION	BY	CHK
A	1/23/09	ISSUED FOR REVIEW	TC	JP

REVISION APPROVAL		REV A	DATE 01/23/09
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL		ELECTRICAL	
STRUCTURAL		INST & CONT.	
MECHANICAL		ARCH.	
PROCESS		GEN. ARRANG.	
PIPING			

STATUS					
ISSUED	REV	DATE	DM	SDE	PEM
PRELIMINARY	P1				
FOR REVIEW AND APPROVAL	A	1-23-09			
APPROVED FOR CONSTRUCTION					
REVISED & APPROVED FOR CONSTRUCTION					

RESPONSIBLE ENGINEER

PE #

SCALE AS SHOWN

TURLOCK IRRIGATION DISTRICT
Almond 2 Power Plant
Ceres, CA

PROJECT NO. 383416

CH2MHILL

CIVIL
GRADING AND DRAINAGE PLAN

DWG. NO. C-000-W-0-002

REV. A

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

FILENAME: PLOT DATE: PLOT TIME:

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ATTACHMENT DA5.15-2

Well Development Pump Test

ATTACHMENT 2

WELL DEVELOPMENT PUMP TEST REPORT

Project: Almond Power Plant

Spec Title: Vertical Turbine Pump P-1602

Standing Water Level = 12 feet

Draw down @ 500 gpm = 33 feet

Draw down @ 1250 gpm = 42 feet

Draw down @ 1500 gpm = 58 feet

projected 800 GPM
@ 74 psig
@ 174 Tdh

Attachment 3

WELL COMPLETION REPORT

Project: Almond Power Plant Spec Title: Vertical Turbine Pump #P-1602

Drilling Log

Feet	
0-23	Sand
12-60	Sand with Clay Streaks
62-77	Sand
77-83	Clay
83-94	Sand
94-106	Clay

Well Casing

Feet	
0-30	Blank Casing
31-70	Perforations (screen slot size .120)
70-80	Blank Casing
80-90	Perforations (screen slot size .120)

calwater drilling company, inc.
Lic.# 434218

October 4, 2000

George Dazies
TID
656-2142

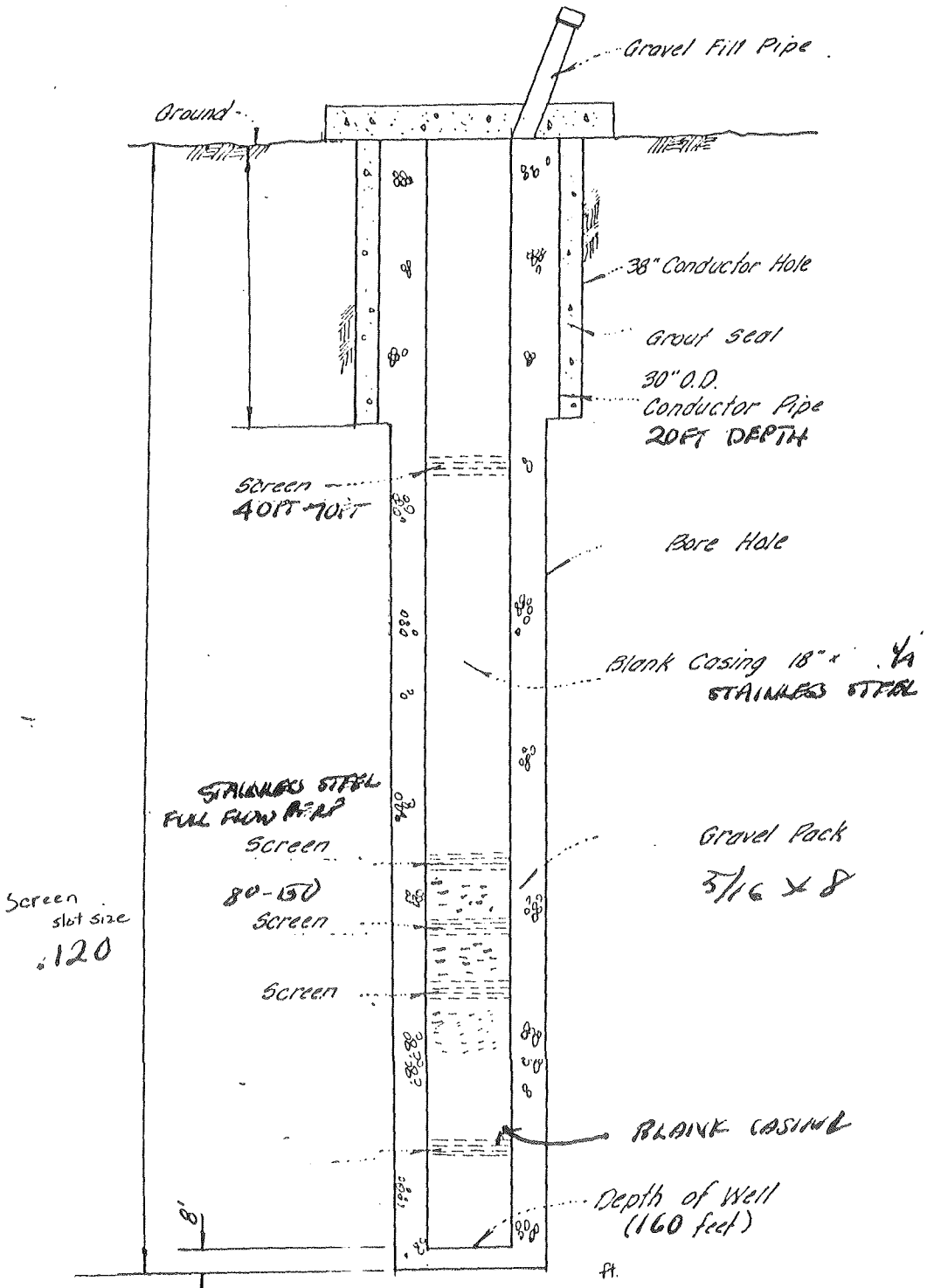
RE: City of Ceres Almond Power Plant

I recommend placement of the perforations between 40 feet and 70 feet; 80 feet and 150 feet, with 10 feet of blank casing from 150 feet to 160 feet. The total depth of the well would be 160 feet.

Please see attached well profile.

Blake K. Hennings

300 South Kilroy Turlock, CA 95380 Phone (209) 667-7932



WELL PROFILE
NO SCALE

J L ANALYTICAL SERVICES, INC.

217 Primo Way • Modesto, California 95358 • Office (209) 538-8111 • FAX (209) 538-3966

DATE: 10/02/00
SAMPLE DESCRIPTION:

WATER , TID MORGAN RD., 9-22-00, 12:30 PM, DEPTH 140 - 160 FT

CALWATER DRILLING CO, INC
ATTN: CURTIS HENNINGS
300 SOUTH KILROY
TURLOCK CA 95380

SUBMITTED BY:

LABORATORY NUMBER: 00903448

RESULTS OF ANALYSIS:		AS RECEIVED	
AMMONIA	EPA 350.3	1.2	mg/l
pH, SM 4500 H B		7.7	
ELECT. CONDUCTIVITY, SM2510B		1300	umho/cm*
TURBIDITY, SM2130B		0.8	NTU
COLOR, SM2150B		3	CU
TOTAL SOLIDS		800	mg/l
TOT. DISS. SOLIDS, EPA 160.1		800	mg/l
TOTAL ORGANIC CARBON, EPA 415.2		2.7	mg/l
COD, SM5220D		<20	mg/l
BOD, SM 5210 B		<2	mg/l

* AT 25 DEGREES C

RECEIVED
OCT 4 2000

RESPECTFULLY SUBMITTED,
Mary A. Jacobs

MARY A. JACOBS, DIRECTOR

J L ANALYTICAL SERVICES, INC.

217 Primo Way • Modesto, California 95358 • Office (209) 538-8111 • FAX (209) 538-3966

DATE: 10/03/00
SAMPLE DESCRIPTION:

WATER , TID MORGAN RD TH, 9-22, 12:30 PM, DEPTH 140 - 160 FT

CALWATER DRILLING CO, INC
ATTN: CURTIS HENNINGS
300 SOUTH KILROY
TURLOCK CA 95380

SUBMITTED BY:

LABORATORY NUMBER: 00903454

RESULTS OF ANALYSIS:	AS RECEIVED
COLIFORMS	POS/100mls
E. COLI	POS/100mls

This water does NOT meet standards of Calif. & U.S. Public Health Serv

RESPECTFULLY SUBMITTED,

Mary A Jacobs

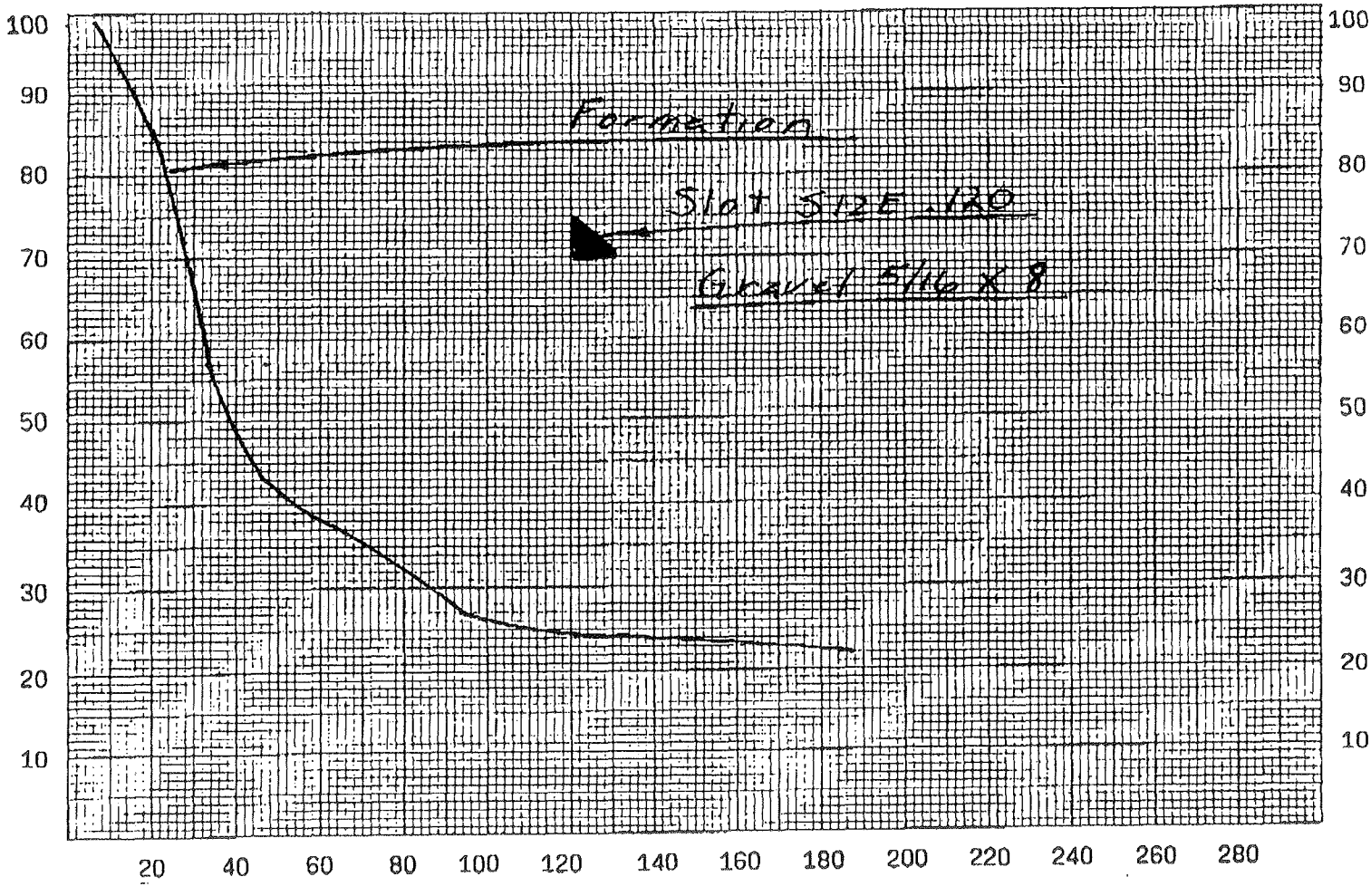
MARY A. JACOBS, DIRECTOR

ROSCOE MOSS MANUFACTURING COMPANY

SAN JOAQUIN VALLEY DIVISION
ROUTE 1, BOX 52, MCFARLAND, CALIF. 93250

(800) 827-1981

PHONE
BAKERSFIELD (661) 393-5756
FAX (661) 393-1824



(VERTICAL #'S REPRESENT PERCENT RETAINED)
(HORIZONTAL #'S REPRESENT SIEVE OPENINGS)

SIEVE OPENINGS	CUMULATIVE PERCENT RETAINED WT W/BKR	WT.	%
0.187		73	.22
0.132		78	.24
0.0937		88	.27
0.0661		105	.37
0.0469		140	.43
0.0331		189	.57
0.0197		275	.85
0.0117		300	.93
0.0059		319	.99
PAN		322	100
BKR. WT.	0		

NOTES: Cal Water Drilling
City of Ceres Power Plant
45 To 60 ft. Sample

SLOT OPENING RECOMMENDED .120

RECOMMENDED SCREEN : DIA. _____ IN. LENGTH _____ F

DATE 9/27/00

BY: R. G. Clark

ROSCOE MOSS MANUFACTURING COMPANY

SAN JOAQUIN VALLEY DIVISION
ROUTE 1, BOX 52, MCFARLAND, CALIF. 93250

(800) 827-1981

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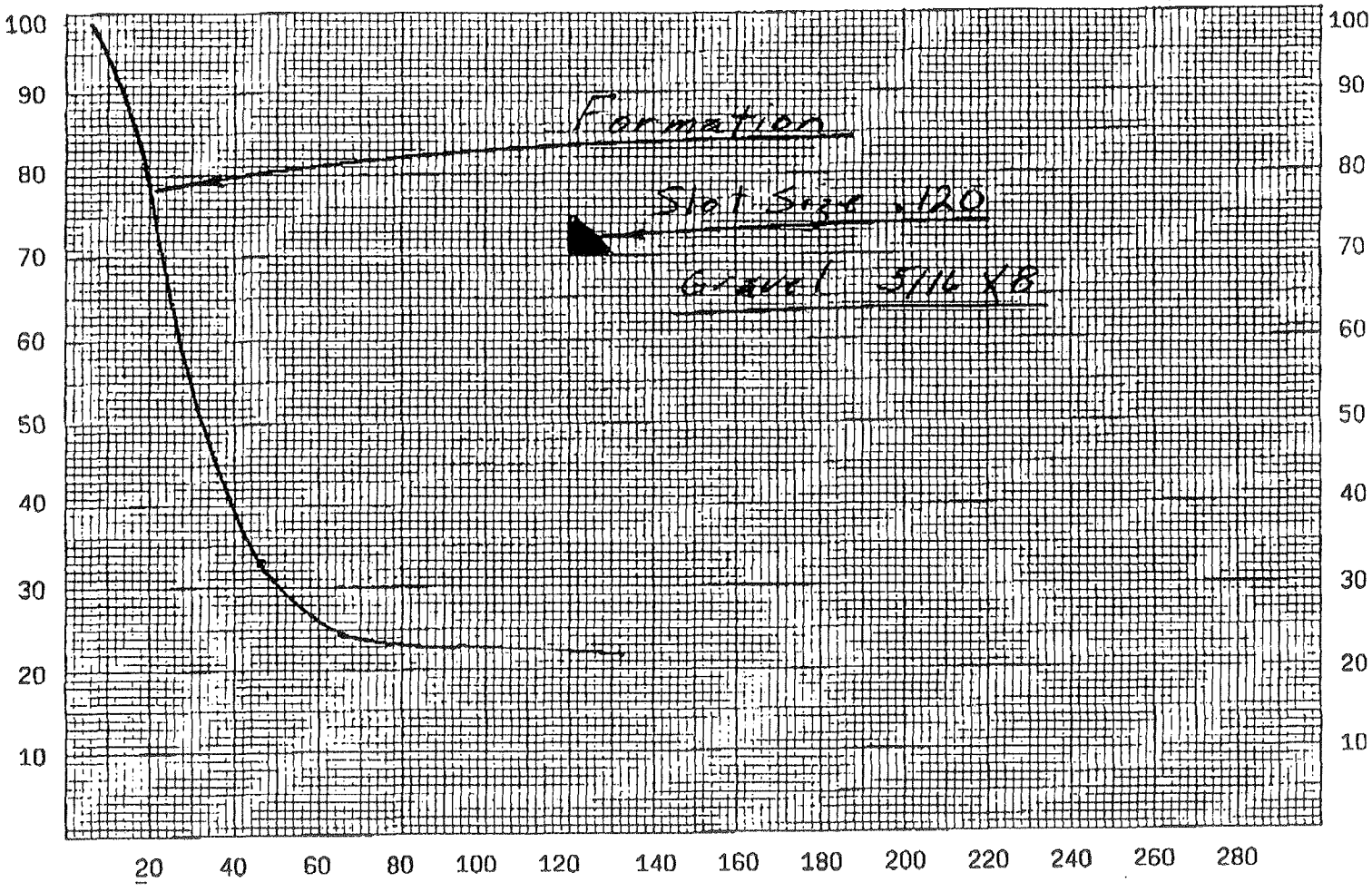

(VERTICAL #'S REPRESENT PERCENT RETAINED)
(HORIZONTAL #'S REPRESENT SIEVE OPENINGS)

SIEVE OPENINGS	CUMULATIVE PERCENT RETAINED WT W/BKR	WT.	%
0.187			
0.132		68	.22
0.0937		70	.23
0.0661		75	.24
0.0469		99	.32
0.0331		151	.49
0.0197		241	.79
0.0117		280	.92
0.0059		303	.99
PAN		307	100
BKR. WT.	0		

NOTES: Cal Water Drilling
City of Ceres Power Plant
83 To 94 ft. Sample

SLOT OPENING RECOMMENDED .120

RECOMMENDED SCREEN : DIA. _____ IN. LENGTH _____ F

DATE 9/27/00

BY: R. C. Clay

ROSCOE MOSS MANUFACTURING COMPANY

SAN JOAQUIN VALLEY DIVISION
ROUTE 1, BOX 52, MCFARLAND, CALIF. 93250

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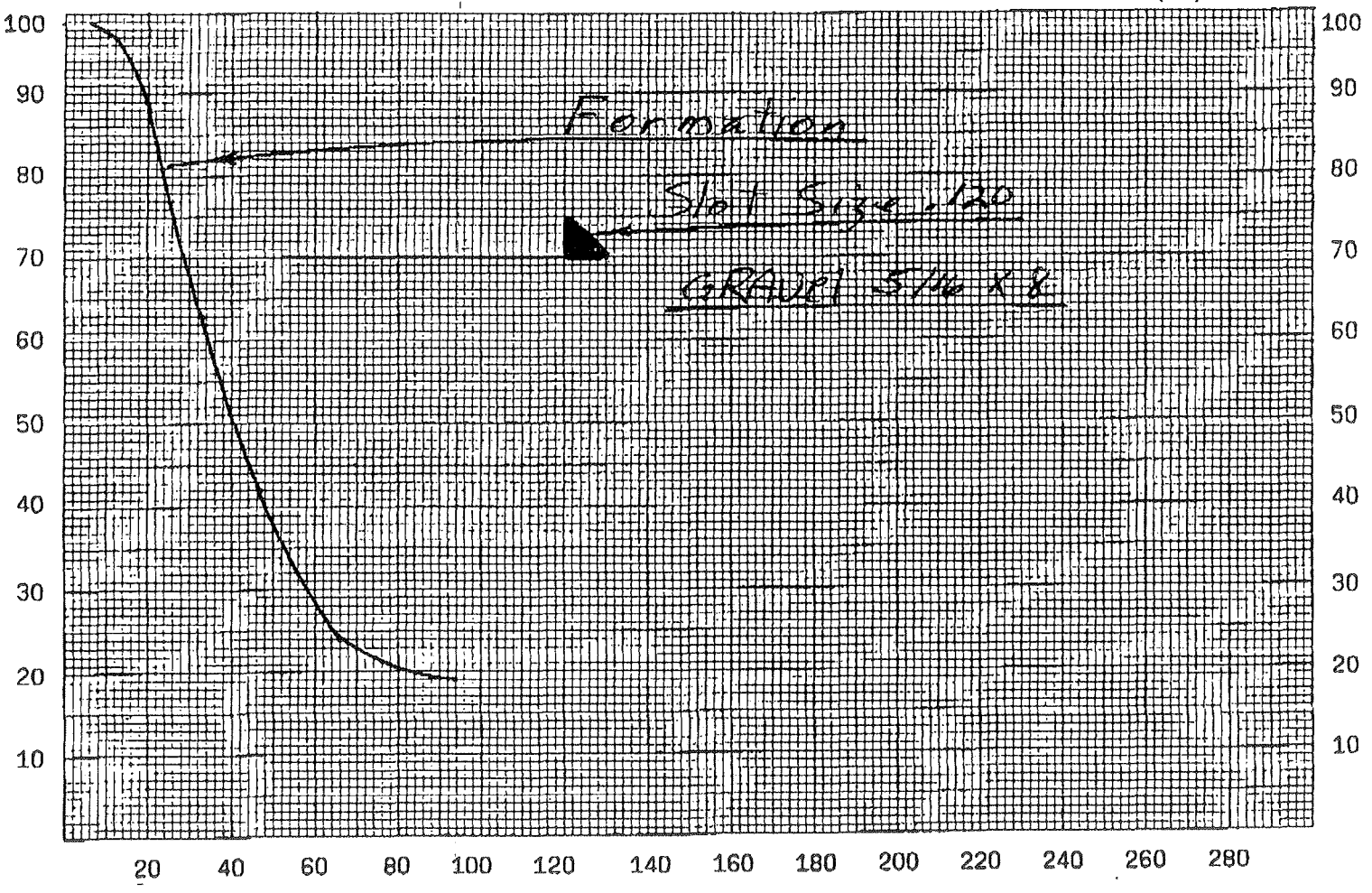
FAX (661) 393-1824



(VERTICAL #'S REPRESENT PERCENT RETAINED)
(HORIZONTAL #'S REPRESENT SIEVE OPENINGS)

SIEVE OPENINGS	CUMULATIVE PERCENT RETAINED WT W/BKR	WT.	%
0.187			
0.132			
0.0937		70	.19
0.0661		86	.24
0.0469		150	.42
0.0331		229	.63
0.0197		316	.88
0.0117		349	.97
0.0059		356	.99
PAN		361	100
BKR. WT.	0		

NOTES: Cal Water Drilling
City of Ceres Power Plant
10640 175 ft. Sample

SLOT OPENING RECOMMENDED .120

RECOMMENDED SCREEN : DIA. _____ IN. LENGTH _____ F

DATE 9/27/00

BY: R. A. Chup

ROSCOE MOSS MANUFACTURING COMPANY

SAN JOAQUIN VALLEY DIVISION
ROUTE 1, BOX 52, MCFARLAND, CALIF. 93250

(800) 827-1981

PHONE
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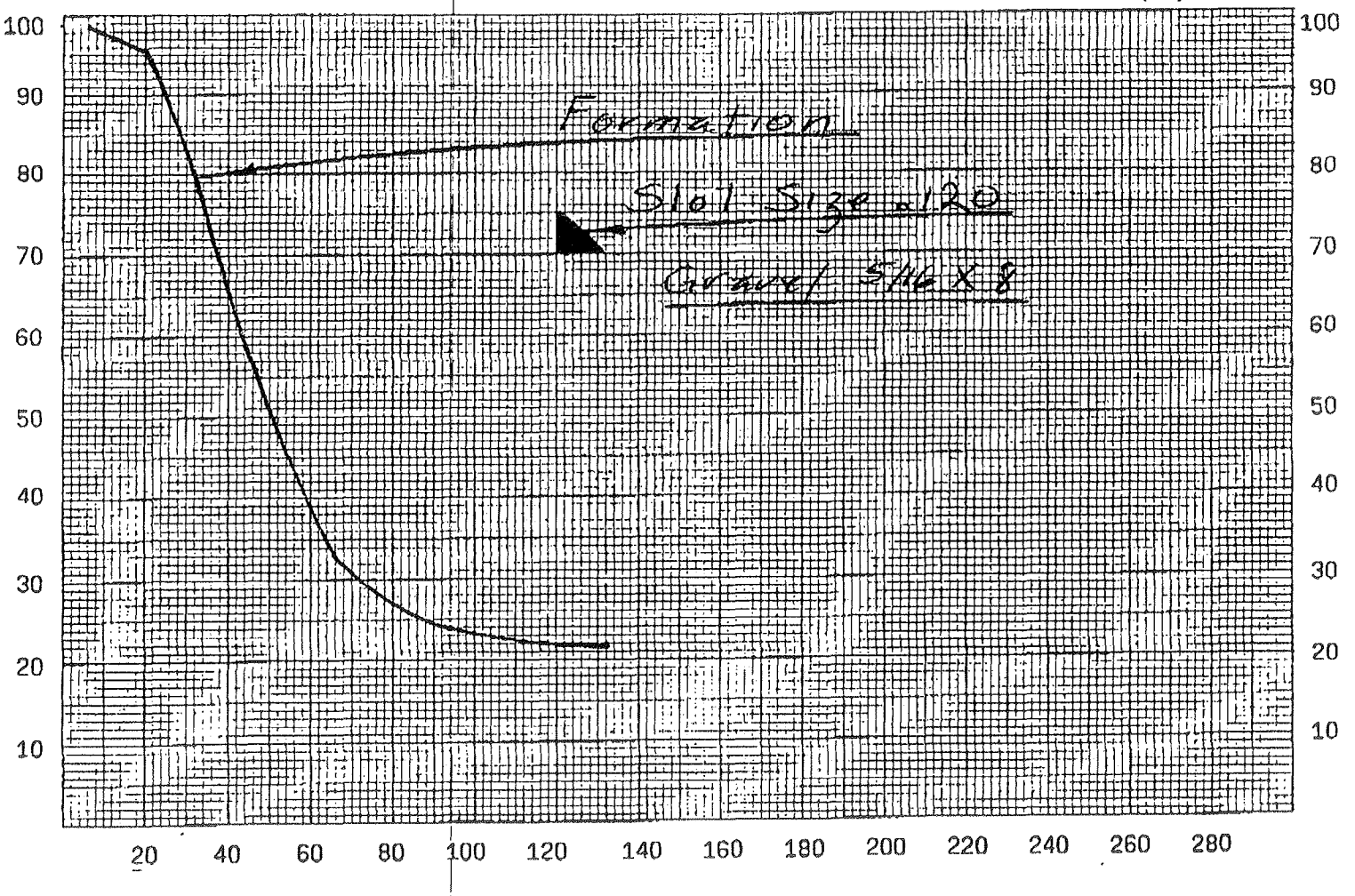
FAX (661) 393-1824



(VERTICAL #'S REPRESENT PERCENT RETAINED)
(HORIZONTAL #'S REPRESENT SIEVE OPENINGS)

SIEVE OPENINGS	CUMULATIVE PERCENT RETAINED WT W/BKR	WT.	%
0.187			
0.132		69	22
0.0937		74	24
0.0661		103	33
0.0469		176	56
0.0331		242	78
0.0197		302	96
0.0117		303	97
0.0059		310	99
PAN		312	100
BKR. WT.	0		

NOTES: Cal Water Drilling
City of Ceres Power Plant
175-193

SLOT OPENING RECOMMENDED .120

RECOMMENDED SCREEN : DIA. _____ IN. LENGTH _____ F

DATE 9/27/00

BY: R. A. Chris

ROSCOE MOSS MANUFACTURING COMPANY

SAN JOAQUIN VALLEY DIVISION
ROUTE 1, BOX 52, MCFARLAND, CALIF. 93250

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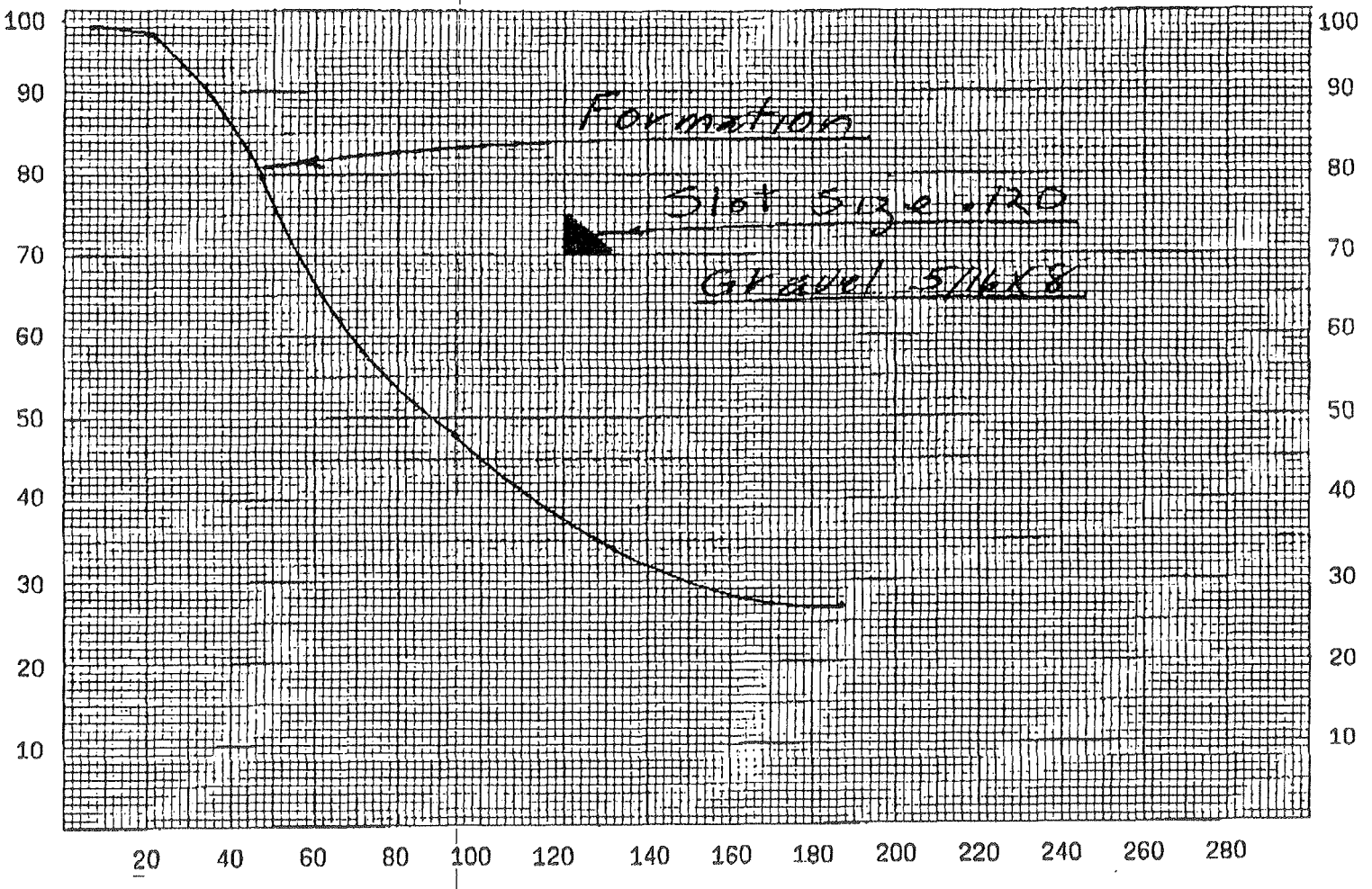
FAX (661) 393-1824



(VERTICAL #'S REPRESENT PERCENT RETAINED)
(HORIZONTAL #'S REPRESENT SIEVE OPENINGS)

SIEVE OPENINGS	CUMULATIVE PERCENT RETAINED WT W/BKR	WT.	%
0.187		77	.27
0.132		99	.34
0.0937		138	.48
0.0661		178	.62
0.0469		229	.80
0.0331		262	.91
0.0197		277	97
0.0117		277	97
0.0059		282	98
PAN		287	100
BKR. WT.	0		

NOTES: Cal Water Drilling
City of Ceres Power Plant
232 To 260 ft. Sample

SLOT OPENING RECOMMENDED .120

RECOMMENDED SCREEN : DIA. _____ IN. LENGTH _____ F

DATE 9/27/00

BY: R. A. Cline