SOIL AND WATER RESPONSES

Request #81 - Please clarify which of the following values are correct, or if there is a qualifying basis to justify the use of different parameters in different sections;

PROCESS PARAMETER	FIRST REFERENCE	VALUE	OTHER REFERENCE	VALUE
COOLING TOWER CIRCULATION FLOW	FIGURE 3.4-4, TABLE 3.4-1, #35	0 GPM	FIGURE 3.4-4, TABLE 3.4-1, #34	145,000 GPM
COOLING TOWER MAKE-UP, AVERAGE DAY	FIGURE 3.4-4, TBL 3.4-1,#38	488 GPM	FIGURE 3.4-6	2447 GPM
COOLING TOWER BLOW-DOWN, AVERAGE DAY	FIGURE 3.4-4, TBL 3.4-1,#39	29 GPM	FIGURE 3.4-6	489 GPM
TOTAL MAKE-UP WATER	TABLE 3.4-4 TABLE 3.4-4	3560 GPM AVE 6190 GPM MAX	FIGURE 3.4-6 FIGURE 3.4-7	2468 GPM AVE. 5136 GPM MAX
COOLING TOWER AVE. EVAPORATION /DRIFT LOSS	FIGURE 3.4-4	0 / 0 GPM	FIGURE 3.4-6	1957 / 0.8 GPM
EMWD DESALINATION PROJECT SCOPE	SECTION 5.4.1.4.3	8,000 AF/YR	TABLE 5.4-4 SECTION 5.4.2.3	12,000 AF/YR IN 2015 13,000 AF/YR, IEEC REDUCES TO 10,500 AF/YR
NON-POTABLE MAKE-UP WATER	SECTIONS 3.1, 1.5.6	5,000 AF/YR	9-27-01 EMWD LETTER, 1ST TABLE TABLE 3.4-3 TABLE 3.4-4	3,814 AF/YR 4,918 AF/YR 4,150 AF/YR
RECLAIMED WATER NITRATE CONCENTRATION	TABLE 3.4-5	0.4 TO 2.9 MG/L AS $CACO_3$	TABLE 5.4-3	12 TO 23 MG/L AS NO_3

Response #81 -

Table 3.4-1

The following corrections should be made to the data included in Table 3.4-1:

- The flow for Stream 35 should be corrected to read 72,394,531 pounds per hour (lb/hr).
- The flow for Stream 37 should be corrected to read 0 lb/hr.
- The flow for Stream 38 should be corrected to read 1,223,011 lb/hr.
- The flow for Stream 39 should be corrected to read 244,402 lb/hr.
- The flow for Stream 40 should be corrected to read 14,398 lb/hr.

See Revised Table 81-1

Table 81-1 Heat and Mass Balance Data – Design Case: Average Day

Stream No.	Units	1	2	3	4	5	6	7	8
Mass Flow	lb/hr	3,319,311	3,323,114	77,840	77,840	0	0	3,401,219	443,170
Temperature	°F	61	56	60	330	n/a	n/a	1,165	1,050
Pressure	psia	13.95	13.80	425	415	n/a	n/a	14.55	1,100
Stream No.	**Units**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Mass Flow	lb/hr	443,170	886,340	864,357	432,179	432,179	57,094	489,272	503,673
Temperature	°F	1,050	1,050	724	724	724	556	704	1,051
Pressure	psia	1,100	1,100	336	336	336	336	336	307
Stream No.	**Units**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Mass Flow	lb/hr	503,673	1,007,345	59,747	59,747	1,145,849	1,145,849	1,219,591	609,796
Temperature	°F	1,051	1,051	580	580	592	85	85	85
Pressure	psia	307	307	53	53	53	1.22	120	120
Stream No.	**Units**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
Mass Flow	lb/hr	609,796	550,047	92,479	412,958	30,213	35,385	35,385	0
Temperature	°F	85	290	292	295	295	424	128	n/a
Pressure	psia	120	57	435	1,285	1,285	410	400	n/a
Stream No.	**Units**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Mass Flow	lb/hr	3,401,219	0	72,394,531	0	1,223,011	1,223,011	244,402	14,398
Temperature	°F	191	65	80	n/a	n/a	70	80	292
Pressure	psia	13.95	35	25	n/a	n/a	20	25	435
Stream No.	**Units**	**41**	**42**	**43**	**44**				
Mass Flow	lb/hr	0	3,803	0	20				
Temperature	°F	n/a	70	n/a	290				
Pressure	psia	n/a	13.80	n/a	57				

Table 3.4-4

The values in Table 3.4-4 are essentially correct, except that the maximum daily flow should be revised to read 6,120,000 gallons, instead of 6,190,000 gallons. It should be noted that the units for the average daily and maximum daily water consumption are in thousands of gallons, not gallons per minute (gpm). The average daily flow of 3,560,000 gallons, shown in Table 3.4-4, correlates directly with the total plant make-up flow of 2,468 gpm, shown in Figure 3.4-6. For the maximum daily flow, there is no direct correlation between the value in Table 3.4-4 and that in Figure 3.4-7. This is because the maximum daily flow of 6,120,000 gallons, shown in Table 3.4-4, is based on 16 hours at the maximum flow of 5,136 gpm, and 8 hours at the average flow of 2,468 gpm.

Figure 3.4-4

The data request indicates that Figure 3.4-4 shows 0 gpm for the cooling tower average evaporation and drift loss, when in fact, Figure 3.4-4 does not show flow streams for the evaporation and drift. If these flow streams were shown on Figure 3.4-4, they would be the same as those shown in Figure 3.4-6, specifically, an evaporation rate of 1,957 gpm and a drift loss of 0.8 gpm.

EMWD Desalination Project Scope

A. To bring Section 5.4.1.4.3 into conformance with Table 5.4-4, modify the third sentence last paragraph on page 5.4-9 to read:

"Basin production is expected to increase up to 8,000 AF/YR by 2010 and up to 12,000 AF/YR by 2015, in response to planned extraction and desalination of brackish groundwater by EMWD."

B. Section 5.4.2.3, replace text from "Potential impacts associated with…" on page 5.4-21 to end of section with:

"Potential impacts associated with IEEC use of recycled water include:

- Improved basin salt balance due to export of cooling tower blow down outside the basin to the ocean via the non-reclaimable wastewater line (positive impact).
- Reduction of Total Inorganic Nitrogen (TIN) loading within the basin due to export of cooling tower blow down outside the basin to the ocean via the non-reclaimable wastewater line (positive impact).
- Increased operational flexibility for EMWD production and desalination of stored brackish groundwater within the Perris South subbasin; reduction of groundwater levels in the Perris South II subbasin and reduced migration of native high TDS groundwater into the adjacent Lakeview subbasin (positive impact).
- Reduction in the volume of stored recycled water lost to evaporation (positive impact).
- Negative impacts (none)."

It should be noted that the correction identified above removes the unfortunate misstatement from the AFC that the supply of recycled water to IEEC will reduce the recharge of the groundwater basin. This statement is untrue because EMWD has so many vehicles to manage the groundwater that the basin recharge is no longer controlled by natural factors but is instead controlled by EMWD. For example, the District operates and has plans to expand artificial recharge and recovery facilities for banking imported water from Northern California. Moreover while percolation of recycled water from un-lined storage ponds is causing undesirable water quality degradation of portions of the basin, EMWD has intentions to increase groundwater recharge utilizing recycled water in other areas.

As part of its management objectives, EMWD would like to lower water levels in the Perris sub basin and reduce the migration of saline water into other areas. Thus, the potential use by IEEC of excess winter period flows would contribute to EMWD's ability to accomplish this near-term objective. In the longer term, EMWD can engineer the annual yield in complex ways to meet its overall water management objectives. Service of recycled water to IEEC is consistent with and helpful to EMWD's water management programs. Recycled water service to IEEC will not adversely affect fresh water resources within EMWD.

Non-Potable Make-up Water

The estimated maximum annual non-potable make-up flow is 4,958 acre-feet per year (AF/yr). Table 3.4-3 incorrectly shows a total of 4,918 AF/yr. Table 81-2 is a corrected version of Table 3.4-3, assuming 100 percent of new recycled water flow will be allocated to the IEEC. In Sections 1.5.6 and 3.1 and Table 3.4-4, the maximum annual demand has been rounded up to 5,000 AF/yr. The 4,150 AF/yr value, indicated in Table 3.4-4, is the projected average annual flow. The 3,814 AF/yr value, indicated in the first table of the 9/27/01 letter from EMWD, is incorrect. This value represents an outdated water use projection. Table 81-3 provides the correct projection for the average annual flow of 4,150 AF/yr. Table 81-4 shows similar a projection based on the estimated maximum annual flow of 4,958 AF/yr. The estimated maximum annual flow represents a worse case demand that is not expected to occur year after year.

Table 81-2
Projected Summary of Recycled and Raw Water Use by Year (acre-feet/yr) (corrected AFC Table 3.4-3)

Year	Recycled Water	Raw Water	Total
2005	4,086	872	4,958
2006	4,276	682	4,958
2007	4,465	493	4,958
2008	4,628	330	4,958
2009	4,769	189	4,958
2010	4,888	70	4,958
2011	4,958	0	4,958
2012	4,958	0	4,958
2013	4,958	0	4,958
2014	4,958	0	4,958
2015	4,958	0	4,958
2016	4,958	0	4,958
2017	4,958	0	4,958
2018	4,958	0	4,958
2019	4,958	0	4,958
2020	4,958	0	4,958

Table 81-3
Projected Recycled Water Supply to IEEC with 100 Percent Allocation of New Flow – Average Annual Demand

Month	Demand AF/month	Year															
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Jan	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287
Feb	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260
Mar	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287
Apr	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262
May	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287
Jun	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278
July	485	322	369	417	464	485	485	485	485	485	485	485	485	485	485	485	485
Aug	485	256	304	351	399	446	485	485	485	485	485	485	485	485	485	485	485
Sept	469	256	304	351	399	446	469	469	469	469	469	469	469	469	469	469	469
Oct	485	420	467	485	485	485	485	485	485	485	485	485	485	485	485	485	485
Nov	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278
Dec	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287	287
Total	4,150	3,481	3,671	3,830	3,972	4,087	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150	4,150

Table 81-4
Projected Recycled Water Supply to IEEC with 100 Percent Allocation of New Flow – Maximum Annual Demand

Month	Demand AF/month	Year															
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Jan	398	398	398	398	398	398	398	398	398	398	398	398	398	398	398	398	398
Feb	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Mar	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304	304
Apr	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294
May	351	351	351	351	351	351	351	351	351	351	351	351	351	351	351	351	351
Jun	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340
July	536	322	369	417	464	511	536	536	536	536	536	536	536	536	536	536	536
Aug	536	256	304	351	399	446	493	536	536	536	536	536	536	536	536	536	536
Sept	519	256	304	351	399	446	493	519	519	519	519	519	519	519	519	519	519
Oct	536	420	467	515	536	536	536	536	536	536	536	536	536	536	536	536	536
Nov	386	386	386	386	386	386	386	386	386	386	386	386	386	386	386	386	386
Dec	398	398	398	398	398	398	398	398	398	398	398	398	398	398	398	398	398
Total	4,958	4,086	4,276	4,465	4,628	4,769	4,888	4,958	4,958	4,958	4,958	4,958	4,958	4,958	4,958	4,958	4,958

Reclaimed Water Nitrate Concentration

The nitrate values for recycled water from the Perris Valley Regional Wastewater Reclamation Facility (RWRF) and Moreno Valley RWRF are indicated in Table 3.4-5 as 0.4 milligrams per liter (mg/l) and 2.9 mg/l, respectively. These values are listed as mg/l (implied as nitrate), however, they should have been listed as mg/l as nitrogen. The values in Table 3.4-5 are based on Eastern Municipal Water District (EMWD) water quality data from the Year 2000. The values in Table 5.4-3 are based on EMWD data from earlier years. The nitrate concentrations listed in Table 5.4-3 for recycled water from Perris Valley RWRF and Moreno Valley RWRF are 12 mg/l and 19 mg/l, respectively. The units for these values are listed as mg/l as nitrate. If reported as mg/l as nitrogen, these concentrations would be 2.7 mg/l and 4.3 mg/l, similar to the values indicated in Table 3.4-5.

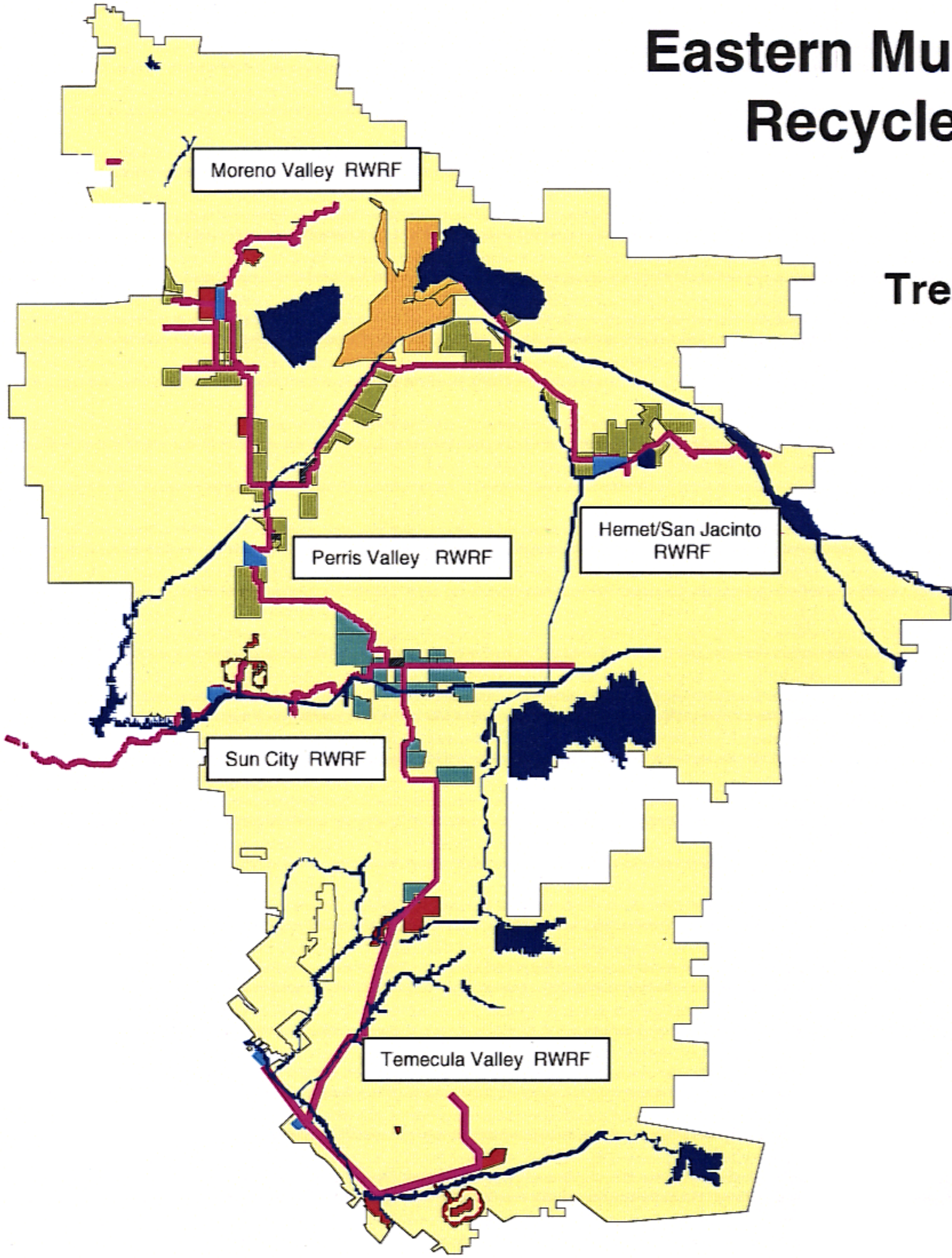
Request #82 - Please update Table 5.4-5 to reflect the proposed use of 100 percent reclaimed water on an annual basis, and Table W-b (from the Data Adequacy Response) on a peak month and peak annual basis, consistent with EMWD's 9-27-01 letter that commits to allocating 100 percent of future reclaimed water supply attributable from population growth, to fulfill IEEC requirements.

Response #82 - These projections of recycled water are from the EMWD Year 2000 Urban Water Management Plan (UWMP). The planning projections are not based upon specific projects currently applying for water within EMWD but are instead based upon an assumed general pattern of development. Although not specifically identified within the UWMP, the IEEC represents one of the potential uses of recycled water identified as Municipal and Industrial Uses. The decision by the EMWD Board to allocate all future recycled water supplies above current uses does not alter EMWD's estimate that Agricultural uses of recycled water will likely decline over the next ten years and that future increases in use will occur primarily in the M&I sector including IEEC's potential use. EMWD has been contacted to determine if these projections are altered materially by the change in allocation of future recycled water from 35% contained in the AFC to the 100% allocation provided by EMWD in their letter of September 27, 2001. EMWD has indicated that the projections shown in Table 5.4-5 are valid and correct even while considering this higher allocation of water to IEEC and that no correction to the table is required.

Request #83 - Please provide a schematic diagram of the various recycled water supply sources, uses, and storage accumulation/depletion on a peak summer day, as well as on a base line basis, to better explain their relationships. Please explain the transfers shown in Table 5.4-4 and any associated impacts on the source of these transfers on fresh surface water supplies in other areas.

Response #83 - Figure 83-1 is a schematic diagram of the EMWD regional water reclamation facilities, which constitute the source of recycled water on the EMWD system and the major distribution facilities. Also depicted are the current uses and storage facilities.

Table 83-1 describes the current capacity and current flows through each of the regional water reclamation facilities. As shown, EMWD currently produces approximately 32 MGD of recycled water on average through 4 regional treatment plants with a total capacity of 49 MGD. Please note that flows from the Temecula RWRF would not be allocated to IEEC because system constraints may limit the ability of EMWD to supply water from this source to IEEC. EMWD has considered only supplies from the Hemet, Moreno and Perris plants when estimating the availability of recycled water to serve IEEC. On the table, the monthly



Eastern Municipal Water District Recycled Water Program

Treatment Plant Capacities (MGD)

- MV RWRF – 16
- H/SJ RWRF – 11
- Perris Valley – 11
- Sun City – 2
- TV RWRF – 8

Figure 83-1

average flow for the month of August 2001 is shown. The monthly Average flow is quite stable from month to month. In fiscal year 2000-2001 monthly wastewater flows varied from a high total average daily flow in May 2001 of 33.4 MGD to a low in January 2001 of 30.67 MGD.

Table 83-1
Treatment Plant Capacity and Average Daily Flows

Regional Plant	Hemet	Moreno	Sun City	Temecula	Perris	Total All Plants
Plant Capacity	11 MGD	16 MGD	3 MGD	8 MGD	11 MGD	49 MGD
August 2001 Average Daily Flow	7.23 MGD	8.50 MGD	0.00 MGD	7.54 MGD	8.52 MGD	32.00 MGD

Table 83-2
Current Recycled Water Demand on the EMWD System by Type of Use

Customer Class	Yr 2000 Use (Acre-Feet)	Percentage of Total Use
Secondary Agriculture	15,605	45%
Tertiary Agriculture	3,564	10%
Environmental	2,081	6%
Municipal	3,448	10%
Disposal/Incidental Recharge	10,298	29%
Total All Uses	34,996	100%

Under EMWD reclaimed water allocation procedures, daily demand allocations for reclaimed water users are limited to daily production. Therefore, currently, daily maximum allocations are approximately 32 MGD. Table 83-2 delineates the current recycled water demand on the EMWD system.

Since allocations are limited to equalized daily plant flows, storage on the EMWD system neither accumulates nor depletes on a normal summer day. In the future, allocations to existing customers would remain about the same and increased supplies as they become available would be allocated to IEEC.

The water transfer shown in Table 5.4-4 represents a potential settlement of water rights claim between the Soboba Band of Mission Indians and the EMWD. This is a projection of what may occur in the future. All of this water currently exists and is utilized within EMWD. The identification of this as a water transfer reflects the potential that this water could, in fact, be owned by the Soboba and thus its continued use by EMWD would constitute a water transfer to EMWD.

In addition to the above, the following record of conversation is presented as clarification of EMWD's system.

Record of Conversation by Kris Helm, IEEC consultant

Eastern Municipal Water District staff workshop, January 30, 2002

Attendees:

IEEC	EMWD	CEC
Mike Hatfield	Charles Bachman	Jim Bartridge
Greg Lamberg	Mike Garner	Paul Kramer
Jim McLucas	Warren Back	John Kessler
Jane Luckhardt	Michael J. Truax	Greg Peterson
Kris Helm	Ralph Phraner	
Andrea Gruenier		

Eastern Municipal Water District (EMWD) staff explained the water resources management program of EMWD. EMWD provides wholesale and retail water service, and sewerage services to a 555 sq. mile service area in Riverside County. It is responsible for water supply, water treatment, wastewater collection, wastewater treatment, water recycling and groundwater management within its boundaries. EMWD is a member public agency of The Metropolitan Water District of Southern California, and is governed by a publicly elected Board of Directors.

Mr. Mike Garner made a presentation (copy attached) of the water supply plan that EMWD has developed to serve the energy center.

EMWD has developed an interconnected recycled water distribution system interconnecting 5 regional wastewater plants with approximately 135 miles of interconnecting pipelines.

EMWD operations encompass the sewer collection system, the wastewater treatment plants and the recycled water distribution system. Flow equalization, local storage and regional storage facilities are operated together to manage wastewater supplies and maximize beneficial re-use within EMWD. It is EMWD's objective to beneficially recycle as much of its wastewater as is technically feasible.

Reclaimed water is presently fully utilized in summer months but excess supplies exist in winter months. Excess supplies result in incidental recharge of water which does not meet groundwater basin objectives, export of excess water outside of EMWD and disposal to the Santa Ana River. These losses of water cause undesirable degradation of groundwater, migration of high-saline water into low TDS groundwater basins and possible long-term loss of reclaimed resources to other areas.

EMWD reviewed methodology by which EMWD has estimated the extent to which it might have to supplement the recycled water system with raw Colorado River Water in order to ensure non-interruptible service of water to the IEEC. The estimate is based upon a premise that existing users of recycled water would be unaffected by IEEC's use of recycled water, but new supplies of recycled water would be made available to the IEEC ahead of other potential future uses. Based upon a 3% growth rate in recycled water supplies, raw water to supplements to the recycled system should not be required after year 2009. Prior to that time raw water should constitute less than 8% of the water served to IEEC and approximately 92% of IEEC's use would be supplied with reclaimed water.

EMWD is the groundwater manager for the region. The operations of EMWD engineer the annual yield of the groundwater basin. EMWD also operates a desalination program to reduce saline influences within the basin and provide low-salt potable water to its customers. Saline resources are fully utilized in this program and EMWD would not make brackish water available to IEEC; reclaimed water is the preferred source.

EMWD considers salt management and maintenance of water quality as integral to management of water resources within EMWD. The non-reclaimable wastewater line was installed in order to enable salt balance with greater water use. Export of the salty water via the nonreclaimable wastewater line is essential to achieving the salt balance within EMWD. IEEC's use of reclaimed water, and export of blowdown via the wastewater line is consistent with this Plan.

EMWD's groundwater management is dynamic, responding to a number of exogenous variables that must be managed in real time. While dynamic, EMWD provides continuous management of the groundwater resources.

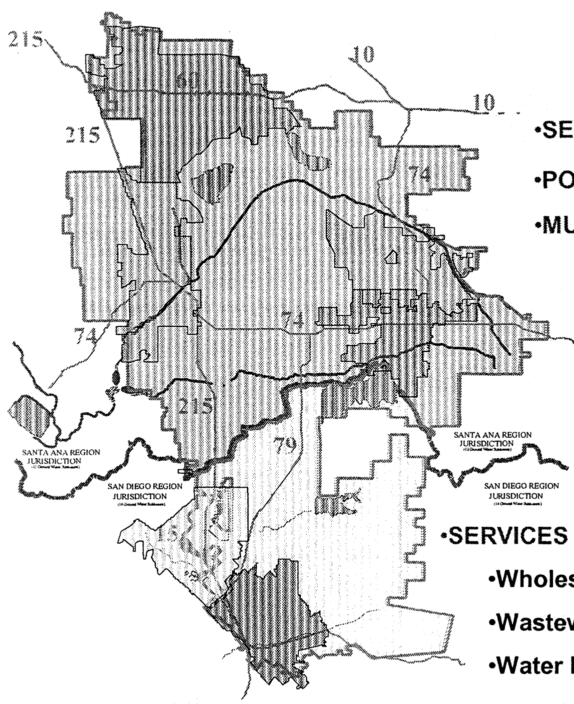
EMWD projects that IEEC's use of recycled water will temporarily reduce incidental recharge within the EMWD. EMWD considers this temporary effect to be beneficial to its groundwater management plan. Over the long term, however, EMWD will continue to have excess winter-period flows, which will be recharged or disposed of. EMWD will continue to develop means of beneficially using recycled water within EMWD to avoid permanent loss of these resources. IEEC's use of reclaimed water will substantially improve the revenues from the system enabling continued viability of existing EMWD programs.

EMWD also enforces Conservation Best Management Practices. As an industrial customer IEEC would comply with water efficiency guidelines established by EMWD. As part of its industrial water conservation program, EMWD would establish water use targets for the IEEC and could periodically audit water use efficiency to ensure that operations comply with best management practices.

EASTERN MUNICIPAL
WATER DISTRICT

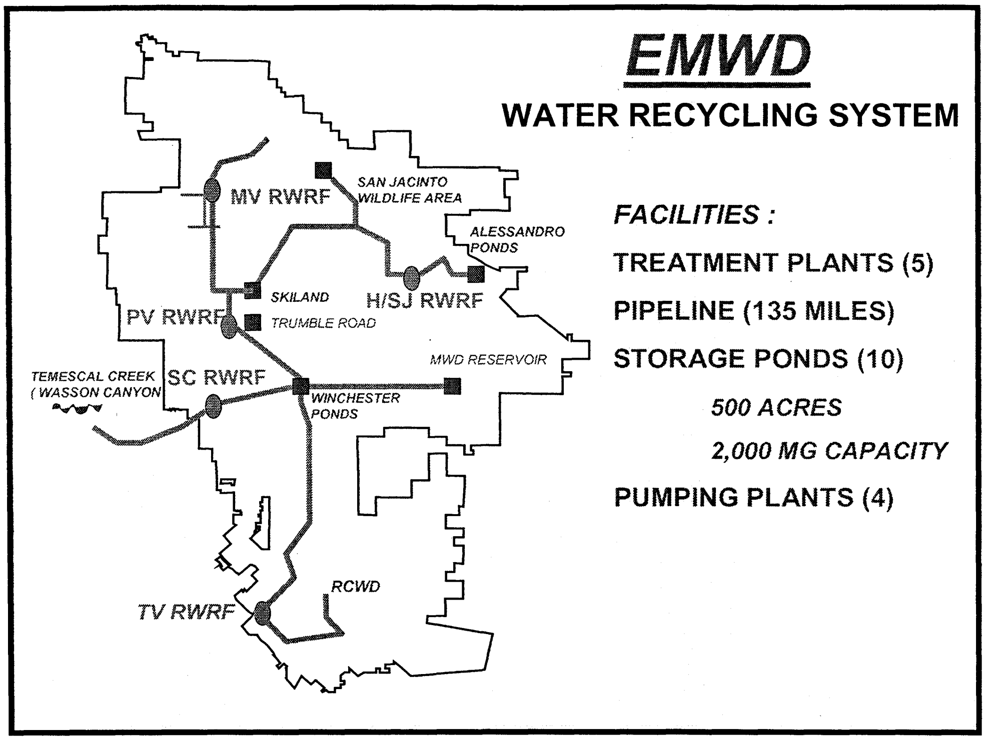
EMWD's IEEC Water Supply Plan

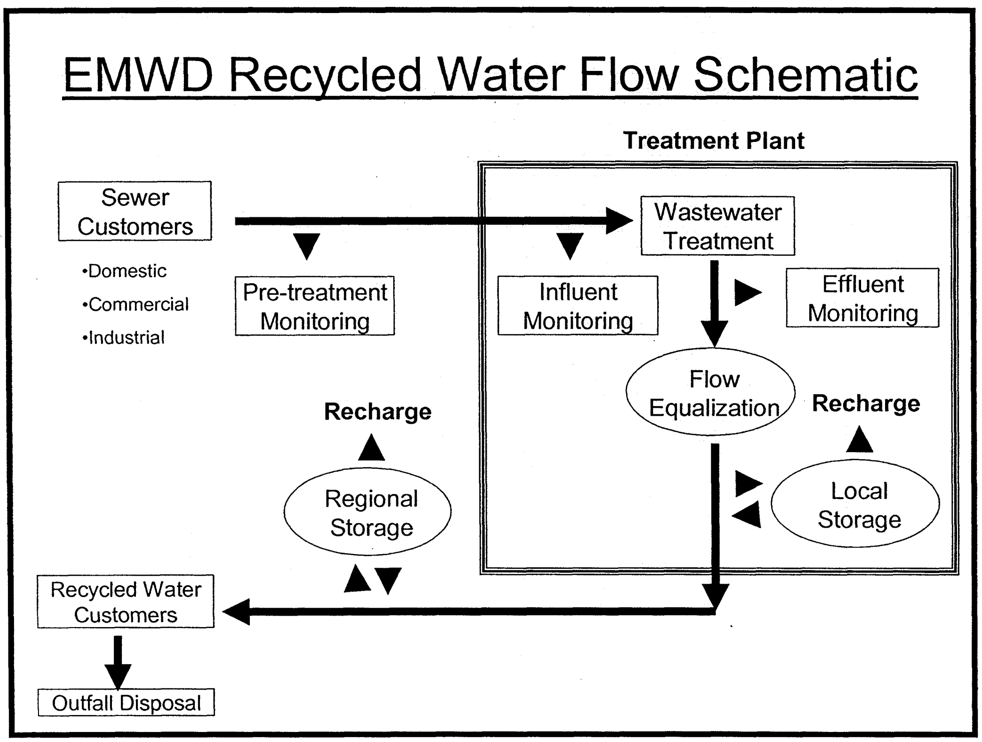
January 30, 2002

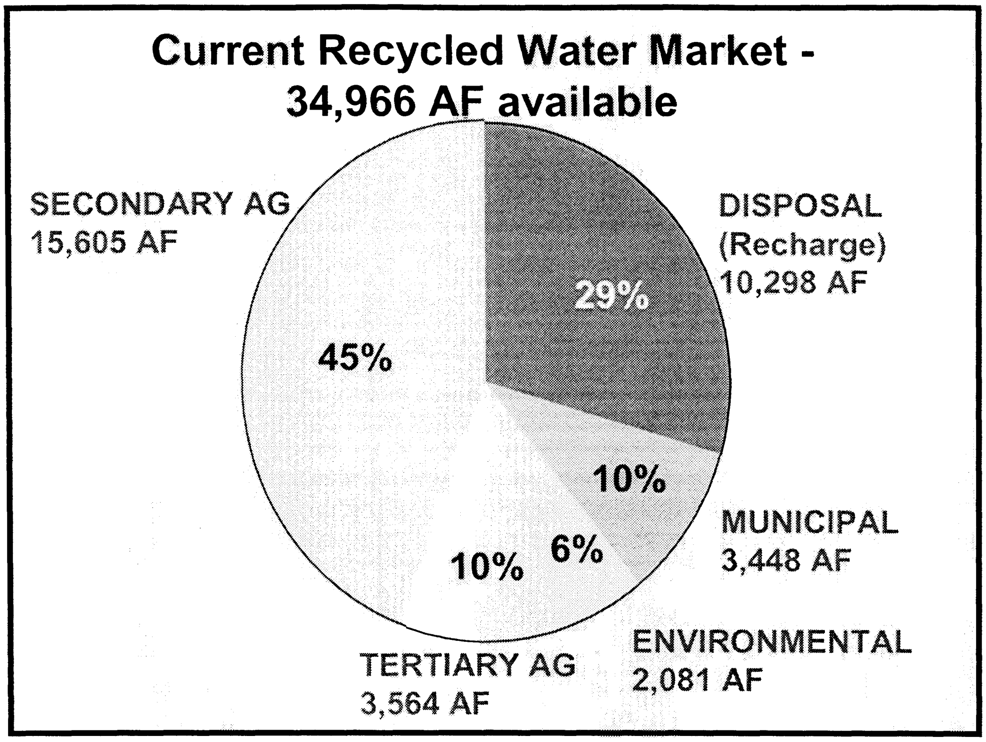


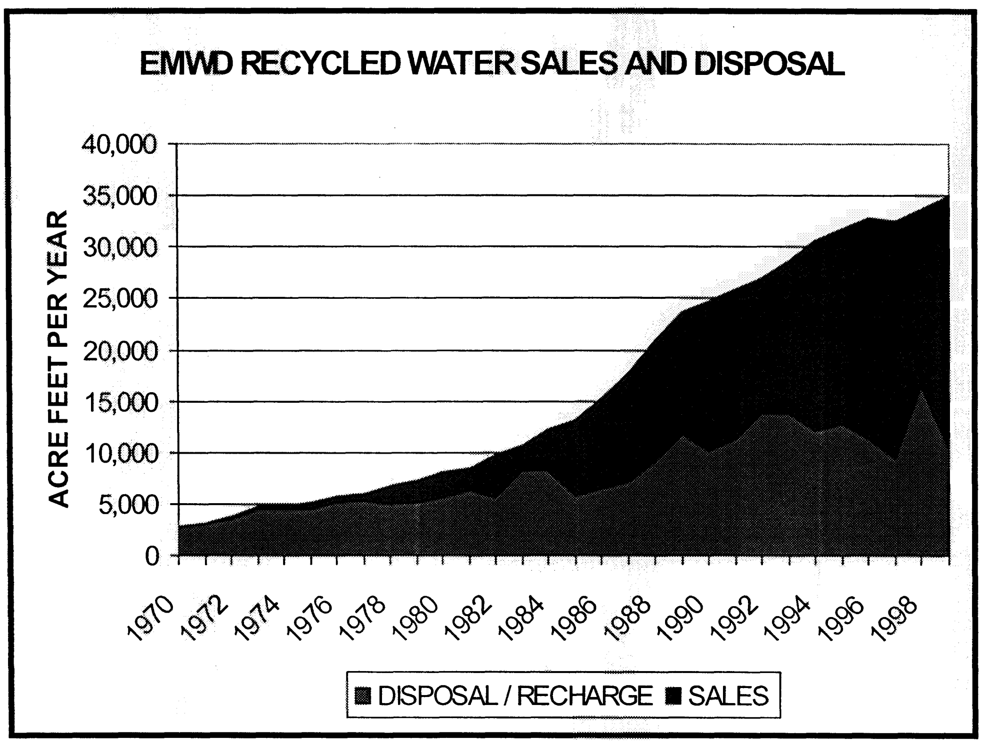
EMWD

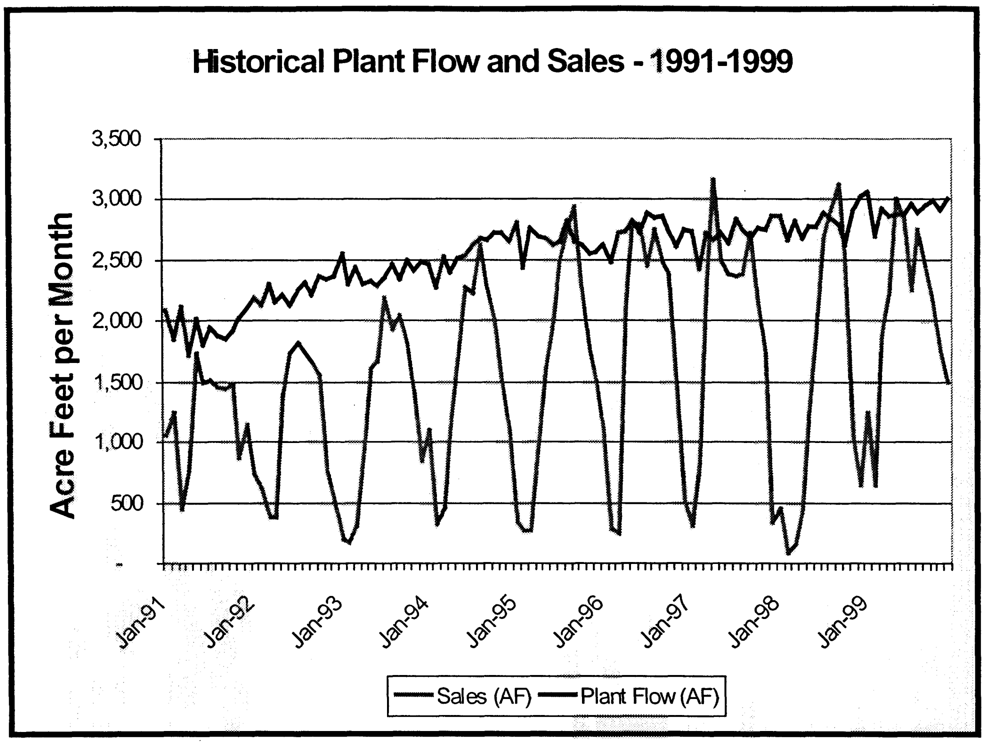
- SERVICE AREA - 555 SQ. MI.
- POPULATION - 480,000
- MUNICIPALITIES SERVED
  - *Moreno Valley*
  - *Perris*
  - *San Jacinto*
  - *Hemet*
  - *Murietta*
  - *Temecula*
- SERVICES PROVIDED
  - Wholesale / Retail Water Supply
  - Wastewater Treatment
  - Water Recycling

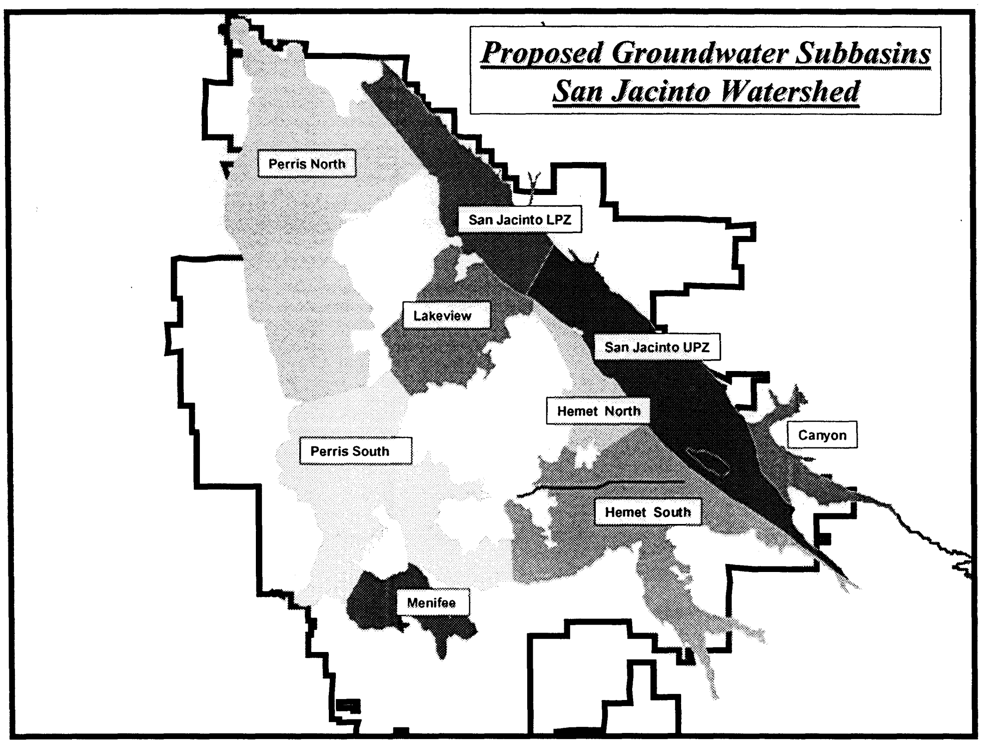

EMWD
WATER RECYCLING SYSTEM
FACILITIES :
TREATMENT PLANTS (5)
PIPELINE (135 MILES)
STORAGE PONDS (10)
500 ACRES
2,000 MG CAPACITY
PUMPING PLANTS (4)
MV RWRF
SAN JACINTO WILDLIFE AREA
ALESSANDRO PONDS
SKILAND
H/SJ RWRF
PV RWRF
TRUMBLE ROAD
MWD RESERVOIR
TEMESCAL CREEK (WASSON CANYON
SC RWRF
WINCHESTER PONDS
RCWD
TV RWRF


EMWD Recycled Water Flow Schematic
Treatment Plant
Sewer Customers
•Domestic
•Commercial
•Industrial
Pre-treatment Monitoring
Wastewater Treatment
Influent Monitoring
Effluent Monitoring
Flow Equalization
Recharge
Recharge
Regional Storage
Local Storage
Recycled Water Customers
Outfall Disposal


Current Recycled Water Market -
34,966 AF available
SECONDARY AG
15,605 AF
45%
DISPOSAL
(Recharge)
10,298 AF
29%
10%
MUNICIPAL
3,448 AF
10%
6%
ENVIRONMENTAL
2,081 AF
TERTIARY AG
3,564 AF


EMWD RECYCLED WATER SALES AND DISPOSAL
ACRE FEET PER YEAR
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
DISPOSAL / RECHARGE
SALES


Historical Plant Flow and Sales - 1991-1999
Acre Feet per Month
3,500
3,000
2,500
2,000
1,500
1,000
500
-
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Sales (AF)
Plant Flow (AF)

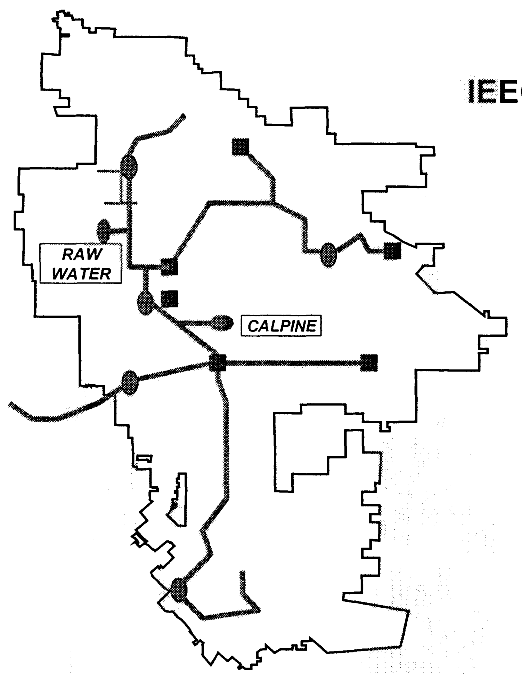

Proposed Groundwater Subbasins
San Jacinto Watershed
Perris North
San Jacinto LPZ
Lakeview
San Jacinto UPZ
Hemet North
Canyon
Perris South
Hemet South
Menifee

Current Recycled Water Program

- Surplus recycled water is available in the winter
- Surplus flow exceeds recharge capacity
- Recharge is impacting GW levels
- Recharge will result in regulatory impacts
- Salinity management issues need to be resolved

EMWD's IEEC Water Supply Plan

- Sell surplus recycled water to IEEC
- Augment with CRW during peak summer demands
- Reduce discharge to ponds as required
- Reduce outfall disposal as required
- Allocate flow from growth to IEEC
- Eliminate use of potable water as soon as possible



EMWD

IEEC Water Supply Plan

IEEC Water Supply Plan Benefits

- **Maximizes off season reuse of recycled water**
- **Reduces salt loading to local basins**
- **Does not impact recharge for Desalters**
- **Meets DHS desalter feedwater restrictions**
- **Minimizes use of potable water**
- **Significantly improves recycling revenue balance**

Request #84 - Please provide SDI, phosphate, iron, and other parameters needed for predicting RO membrane scaling. How will scaling be controlled?

Response #84 - Recycled water typically contains suspended and colloidal materials, which would foul surfaces of reverse osmosis systems at unacceptable rates. A microfilter will be used to remove suspended and colloidal solids from the reverse osmosis influent feed. A microfilter utilizes membranes with an effective filtration size less than 0.2 microns and has proven to be an effective means of pretreatment of RO feed to prevent fouling of the membrane surfaces which would diminish RO performance. Typically, Silt Density Indexes for MF filtrate are 2 or less and occasionally are less than unity. Fouling of the MF unit is typically controlled through addition of sodium hypochlorite solution to maintain a chloramine residual of between 1 and 3 ppm on the MF feed.

Separate and distinct from the fouling potential associated with the use of tertiary effluent as the feed, potential chemical scaling must be controlled within the RO system by chemical pretreatment of the RO feed and controlling the recovery percentage or cycles of concentration within the RO system. In the dual pass RO system contemplated for the IEEC process makeup train, scaling potential would exist only in the first pass of the RO system. The recovery percentage of the first pass RO process would be maintained at approximately 80% recovery with reject from the second pass RO constituting a portion of feed to the first pass. Overall the recovery percentage of the two-pass system has been conservatively estimated at 75%. Chemical pretreatment of RO feed to enable higher recovery percentages would include acid addition to lower pH and the addition of a threshold inhibitor or anti-scalant to the feed. Maintaining a lower pH using acid feed is a common method of minimizing the scale forming potential in reverse osmosis units. In addition the anti-scalant stabilizes scale-forming minerals and allows their super-concentration (concentration past normal solubility limits) in the reverse osmosis reject. Both acid and anti-scalant are fed neat (no dilution water) and will not require the use of additional fresh water.

The formation of phosphate scales is not common in reverse osmosis systems because temperatures are relatively low (less than 90 deg F). For this reason, phosphate is not normally evaluated during reverse osmosis system design. Phosphate in the reclaimed water would have to exceed 50 ppm as PO_4 before any chemical treatment would be required to inhibit phosphate scales.

The design water analysis iron level is 0.029 ppm. No significant iron scale or iron fouling will occur in the RO membranes if makeup water iron remains at or below this level.

Request #85 - Please estimate the ion balance, process duty, and availability for microfiltration (MR), reverse osmosis (RO), and demineralization processes. How will water required for chemical mix, dilution, and clean-up be met for each process.

Response #85 - Ion balance, process duty, and availability of the various treatment steps are extremely dependent on influent water quality. Influent water quality can change over the life of the project, so factors affected by water quality may also change. As such, the following data provided are only estimates. Actual conditions will depend on makeup water quality.

As described in DR 84 above, microfiltration removes suspended/colloidal material but does not remove dissolved solids. Thus, the ion balance of the incoming water is unchanged across the microfilter. Sodium hypochlorite solution (bleach), if required to maintain a chloramines residual in the MF feed, is fed neat and requires no dilution water. Periodic cleaning of the MF units will occur less than 10 times per year and require approximately 5,000 gal of water per cleaning for chemical mixing. RO permeate produced from the recycled water feed will be used as mixing water for these chemical cleaning solutions; fresh water is unsuitable for this purpose without softening or RO treatment.

The reverse osmosis system will require chemical addition (acid and anti-scalant). Since these products will be fed neat (without dilution), no additional water is required. Periodic RO membrane cleaning will be performed off-site. No cleaning waste will be generated on-site.

The RO unit will consist of a two-pass system. Reject from the second pass is recycled to the first pass. The projected ion balance is as follows:

Table 85-1
RO Ion Balance

Constituent (Reported as the Ion)	Untreated RO Feed	Treated RO Feed (pH Adjustment)	Recycle (2nd Pass Reject to First Pass Inlet)	1st Pass Net Feed	1st Pass Permeate (2nd Pass Feed)	Final Effluent (2nd Pass Permeate)	Final Concentrate (1st Pass Reject)
Calcium	73.3	73.3	1.89	65.27	0.28	0.00	260.21
Magnesium	26.9	26.9	0.69	23.95	0.10	0.00	95.49
Sodium	133.0	133.0	19.76	120.26	3.03	0.08	471.95
Potassium	14.2	14.2	2.72	12.91	0.42	0.01	50.37
Ammonium	0.2	0.2	0.08	0.19	0.01	0.00	0.71
Strontium	1.0	1.0	0.03	0.89	0.00	0.00	3.55
Barium	0.02	0.02	0.00	0.02	0.00	0.00	0.07
Iron	0.03	0.03	0.00	0.03	0.00	0.00	0.11
Manganese	0.01	0.01	0.00	0.01	0.00	0.00	0.04
Carbonate	1.0	0.13	0.00	0.11	0.00	0.00	0.45
Bicarbonate	158.5	137.44	30.63	125.42	4.72	0.98	488.07
Sulfate	237.8	255.95	4.8	227.69	0.72	0.00	908.61
Chloride	156.0	156.0	16.98	140.36	2.58	0.04	553.70
Nitrate	2.9	2.9	1.48	2.74	0.24	0.02	10.25
Fluoride	0.3	0.3	0.02	0.27	0.00	0.00	1.06
Silica	23.4	23.4	2.91	21.09	0.44	0.01	83.05
Carbon Dioxide	6.46	22.31	22.14	22.29	22.16	21.56	22.29
Total Dissolved Solids (ppm)	747.91	754.84	66.39	677.39	10.16	0.64	2927.69
pH (Units)	7.5	7.0	6.4	6.7	5.5	4.9	7.6

RO final effluent TDS is very low. Polishing of the RO final effluent will be accomplished using mobile demineralizers regenerated offsite. The mobile DI units require no additional water or chemical addition.

Process duty across the RO system is a function of demineralized water demand and appears in Figures 3.4-6 and 3.4-7. Individual modules of the MF system and RO system will have a projected availability of more than 90% after consideration of down time for cleanings and maintenance. Redundant equipment will be installed in each unit process to ensure a near 100% availability of process equipment.

Request #86 - Please describe how soluble silica, ammonia, bicarbonate, nitrate, sodium, chloride, oxygen, phosphate, and other constituents will be reduced to and maintained at the levels required in the HRSG condensate.

Response #86 - The makeup pretreatment system consists of reverse osmosis followed by a decarbonator (to remove bicarbonate) with final polishing accomplished by an off-site regenerated mixed-bed demineralizer. Reverse osmosis treatment removes nearly all cations and anions. The decarbonator lowers alkalinity. Any remaining alkalinity, cations, and anions are removed by the off-site regenerated mixed-bed demineralizers. Water exiting the demineralizers meets boiler feedwater quality requirements with total dissolved solids less than 0.1 ppm, silica level less than 0.005 parts per million (ppm), conductivity less than 0.1 umho/cm at 25 deg. C, and pH of 6.5-7.5.

Online analyzers for silica, oxidation/reduction potential, dissolved oxygen, sodium, pH, cation conductivity, and specific conductivity monitor water quality at various locations in the demineralizer, feedwater, HRSG, and steam systems.

After pretreatment, the demineralized water enters the HRSG steam cycle via the deaerating condenser. After deaeration, chemical oxygen scavenger will be added to maintain boiler feedwater dissolved oxygen less than 5 parts per billion (ppb). Dissolved oxygen levels will be monitored using both online oxidation/reduction potential and online dissolved oxygen analyzers.

A condensate corrosion inhibitor will be added to the boiler feedwater after the chemical oxygen scavenger. The condensate corrosion inhibitor will both elevate pH (to minimize corrosion) and neutralize any remaining carbon dioxide in the steam and condensate.

HRSG phosphate levels will be maintained through the addition of liquid phosphate-based treatment chemicals. Wet testing for phosphate and online pH analysis will be used to monitor and maintain HRSG phosphate within range.

Steam formed by the HRSG contains extremely low levels of dissolved solids. Online sodium and cation conductivity analysis will be used to verify that condensate formed from the HRSG steam remains within target ranges.

Request #87 - Please assess alternatives for reducing the volume of the non-reclaimable wastewater discharge by 75 percent (ref. Figures 3.4-6 & 3.4-7). Recovered wastewater could be used to reduce IEEC raw water make-up.

Response #87 - In practice the wastewater discharged to the non-reclaimable wastewater line would consist of water in which the ionic strength would be maximized, to the extent economically feasible, prior to discharge. Reductions in the volume of the wastewater in the range of 75 percent, as suggested, would require the installation of a zero liquid discharge (ZLD) system to separate water from dissolved materials (salts) in the wastewater. Recovered distilled water would be used as a source of makeup water. The resulting salt slurry would be unsuitable for discharge through the non-reclaimable wastewater line and would have to be dried to a solid cake for disposal in a landfill.

The Applicant believes that the use of complex treatment and solids disposal to recover water from the wastewater discharge is uneconomic and less environmentally desirable as compared to the discharge of this wastewater to the non-reclaimable wastewater line. Because of the high capital cost and operating costs associated with a ZLD system, it is far more costly to develop water in this manner compared to any resource option that EMWD is considering. From an environmental standpoint, it is more beneficial to discharge salt water to the ocean than dispose of ZLD residuals in a landfill.

Request #88 - Please clarify whether the "MF backwash" is meant to represent the normal MF reject stream or the periodic cleaning stream.

Response #88 - The MF backwash is meant to represent the normal reject stream from the continuous backwash of the MF unit. The periodic cleaning is described in DR 85 above. Periodic cleaning of the MF units will occur less than 10 times per year and require approximately 5,000 gal of water per cleaning for chemical mixing. RO permeate produced from the recycled water feed will be used as mixing water for these chemical cleaning solutions.

Request #89 - Please address the feasibility of dry, hybrid wet-dry, and spray-enhanced dry cooling.

Response #89 - As noted in IEEC's January 24, 2002 filing with the CEC, the projected date for this response is February 20, 2002.

Request #90 - Please address the benefits of; variable speed drives on each cooling tower fan. Considerations should include; power saving, reduced drift loss, and reduced maintenance.

Response #90 - During part load operation, reducing the cooling tower airflow is an effective means of reducing plant parasitic power losses. Turning off individual cells where constant speed motors are used, or reducing fan speed where two-speed motors or variable speed drives are used, are means by which cooling tower airflow may be reduced. The Applicant would rarely consider the use of variable speed drives for this service. Variable speed drives are costly, and would result in increased maintenance and decreased reliability as a result of the added components. Also, there would be efficiency losses associated with the drives and operation of the motors at part load. Two-speed motors would provide most of the advantages of variable speed drives but at a lower cost and with less maintenance. Typically, the Applicant would consider two-speed motors only for plants in cold weather climates or those expected to operate for extended periods of time at reduced load. The Applicant anticipates that the IEEC will normally operate near full-load, at least with respect to the base-load portion of its capacity. Even when the peaking capacity is not operating, it will typically be advantageous to operate all cooling tower fans at full speed to provide the coldest circulating water possible, thus allowing the steam turbine to operate at the lowest exhaust pressure resulting in the greatest electrical output. The exceptions to this would be; 1) during extremely cold weather when there is risk of freezing in the cooling tower, or 2) when the steam turbine exhaust is at such a low pressure that the electrical output begins to actually decrease as a result of increasing exhaust losses. Given the relatively mild climate at the IEEC site, there will be very few days when the potential will exist to damage the cooling tower by freezing. Likewise, there will be very few days where a reduction in cooling tower airflow will actually result in an increase in steam turbine electrical output. For both of these cases, it is the Applicant's intent to simply cycle individual cooling tower fans on and off as necessary to maintain the circulating water above a minimum temperature.

Reduction in drift loss as a result of lower airflow is a very minor benefit of operation using two-speed or variable speed fans; however, this benefit is not significant enough to justify decreasing the airflow. To put this benefit in perspective, the average day water balance indicates a drift loss of 0.8 gpm, representing only 0.03 percent of the total IEEC water use.

Request #91 - Please address the benefits of: non-clog cooling tower fill to reduce biological fouling and a plume abatement configuration to reduce visible cooling tower plume.

Response #91 - The Applicant typically specifies cooling towers with vertical flute, non-clog type fill, except for the top layer where high-efficiency, cross-fluted type fill is allowed. The advantage of the non-clog fill is that it is less likely to clog as a result of biological fouling. High-performance film fills have the advantage of requiring a smaller cooling tower footprint, resulting in a fewer number of cells, smaller basin, and lower capital cost. The disadvantage is that they are more susceptible to fouling. One cooling tower manufacturer, Marley, recommends the following water quality limits when using high-performance film fill:

- Aerobic Bacteria – 10,000 FCU/ml
- Total Suspended Solids (TSS) - <50 ppm
- Oil and Grease – 1 ppm
- Sulfides – 0.5 ppm

While the EMWD recycled water meets the above water quality limits, the Applicant will most likely still choose to use vertical flute, non-clog fill for the IEEC.

Plume-abated cooling towers are those incorporating a dry-cooled section in addition to an evaporative-cooled section. During hot weather, all of the circulating water is typically passed through the evaporative-cooled section. During cold weather with high ambient relative humidity, a portion of the circulating water is passed through the air-cooled section prior to passing through the evaporative-cooled section. The air exiting the air-cooled section is heated and mixed with the air exiting the evaporative-cooled section. The result of this is a combined air stream exiting the cooling tower with a higher temperature and lower relative humidity, resulting in less visible plume as compared to a conventional evaporative cooling tower. The primary benefit of using a plume-abated cooling tower is a reduction in visible plume with a secondary benefit being a minor reduction in water consumption. The amount of plume reduction and reduction in water consumption are a function of the size of the air-cooled section. The disadvantages of plume-abated cooling towers are the high capital cost, high operating cost, and lower efficiency. The Applicant proposes to use a conventional evaporative cooling tower without plume abatement for the IEEC.

Request #92 - Describe groundwater TDS and pumping trends in each sub-basin and how these trends would be impacted by 50, 75%, and 100% allocation of IEEC's projected demand.

Response #92 - In the Background section of this Data Request there are two statements that are incorrect that should be corrected. First, service of recycled water to IEEC will not in and of itself reduce groundwater recharge nor is it expected to reduce the scope of EMWD's brackish water desalination program. Additionally, the phrase which is reproduced "water quality varies seasonally and with climatic cycles" applies principally to water in Perris Lake, not groundwater in the basin as a whole. Wells immediately adjacent to the lake show some short and long term trends that may be related to the quality of recharge from the lake, but for most other wells in the basin, available groundwater quality data are not sufficient to establish seasonal trends and observed variations have not been correlated to date with climatic cycles. Overall, basin wells show a general increasing trend in TDS over time.

Between 2002 and 2020, groundwater production with the West San Jacinto Groundwater Basin is expected to increase in the Perris South II and western halves of the Menifee I and II subbasins as a result of planned extractions of brackish groundwater by EMWD. Projected increases in these subbasins are summarized in Table 5.4-4, category "Desalinated Groundwater". Groundwater production in the Perris North subbasin may increase to the extent it can be supported by available recharge. Production in the eastern halves of the Menifee I and II subbasins may decrease in response to rising TDS concentrations in groundwater. Production in the Lakeview subbasin is expected to be about the same or less than the level in 2000 (Table 5.4-2) depending upon future trends in groundwater TDS and available recharge. Production in the Winchester subbasin is expected to remain at about the same level recorded in 2000 (Table 5.4-2) unless EMWD decides to produce brackish groundwater for desalination.

Allocation of IEECs projected demand (50, 75 or 100%) is expected to have no impact on anticipated trends in groundwater production.

Groundwater quality within all subbasins of the groundwater basin shows a general increasing trend in TDS over time with the most dramatic rises documented in wells in the northeastern part of the Lakeview subbasin. Wells in the eastern halves of the Menifee I and II subbasins may be providing the first indications of a more steeply rising trend in TDS than appears to occur in most other areas of the basin with the exception of the Lakeview subbasin.

Allocation of IEECs projected demand is expected to have an overall beneficial effect on groundwater quality due to:

- Export of salts from the basin.
- Decreased migration of native high TDS groundwater from the Perris South II subbasin to the Lakeview subbasin to the extent that allocation of the projected demand assists EMWD with lowering groundwater levels in the Perris South II subbasin (as a result of planned brackish water production and desalination).

Request #93 - Please assess the feasibility of using brackish groundwater and irrigation return water for some or all IEEC make-up water (at a minimum of the 5:1 cycles of concentration shown in Figures 3.4-6 and 3.4-7). The analysis should include a discussion of the sustainable brackish water yield, implications of IEEC use of brackish water on the need for or required capacity of the planned EMWD desalination project, implications of IEEC use of brackish water as compared to wastewater/surface water on other water uses and quality within the EMWD, and costs of brackish water use in comparison to wastewater/surface water.

Response #93 - EMWD has indicated its intent to fully utilize brackish groundwater sources within its service area to produce potable water for its customers. As indicated in data response #81, the annual yield of brackish groundwater will be engineered by EMWD. EMWD has determined that brackish groundwater's highest and best use is for production of potable water. The district has requested that the IEEC use recycled water. As such, applicant feels that use of brackish groundwater by IEEC would be incompatible with EMWD's water management objectives. EMWD has determined that there is no recoverable agriculture returned water from any of its agricultural customers.

Request #94 - Please assess the feasibility of using contaminated groundwater from either area for some or all of IEEC make-up requirements.

Response #94 - A U.S. Environmental Protection Agency (EPA) approved Enhanced Groundwater Extraction and Treatment system (EGETS) is currently operational to treat and prevent the off-base migration of contaminated groundwater from March ARB into adjacent potable groundwater aquifers (Perris North subbasin). A system of containment wells along the eastern base boundary collectively produces on the order of 200 gallons per minute (approximately 320 AF/YR) for treatment. A portion of the treated water is re-injected into the local aquifer system and the remainder is used onsite. The volume of contaminated groundwater treated annually constitutes on the order of 7% of the total projected IEEC annual water demand. The treated water is already beneficially used in the local Perris North subbasin.

A gas collection system is reportedly in-place and operational at the Double Butte Landfill. The Riverside County Division of Waste Management reports monitoring wells are beginning to show reduced concentrations of volatile organic chemicals in groundwater. Given these conditions, the Santa Ana Regional Water Quality Control Board is reportedly considering an alternative to employ natural attenuation to mitigate observed levels of off-site contamination.

The volume of groundwater potentially available from these sites is very small and the water is already put to beneficial use so its delivery to IEEC would not have any apparent water resources advantage. Moreover, applicant is unwilling to accept the liabilities associated with altering these cleanup programs and developing these water supplies. Indeed applicant is proposing that all water for the project be supplied by EMWD utilizing sources that EWMD determines are available.

Request #95 - Section 5.4.1.5 states that EMWD's five RWRF facilities treat "over 32 MGD each year", which is confusing since if this is meant to be "32 MGD each day", then this would be equivalent to the 36,000 AF/yr shown in Table 5.4-5 only if run at full capacity, every day of the year. If it was meant to be "32 MG each year", then it would only be a tiny fraction of Table 5.4-5. Please explain annual, monthly, weekly, daily, and diurnal flow variation at the RWRFs which are proposed to provide recycled water to IEEC, including projected 7Q10 (7day low summer flow, 10 year reccurrence interval) low flow. How will these supply patterns change with future population growth?

Response #95 - Data response 83 above describes current uses and flows on the EMWD system. The diurnal flow variations at the RWRFs are eliminated by on site flow equalization. Seasonally, there is minimal fluctuation in the availability of source water to the reclaimed system and that supply pattern is expected to continue with overall growth. EMWD anticipates growth in its recycled water supply of approximately 3% per year.

Request #96 - Explain how demands from other EMWD recycled water customers will be prioritized (relative to IEEC) during periods of IEEC peak daily demand and low 7Q10 reclaimed water supply. Explain the basis used for sizing the reclaimed water storage tank to fulfill maximum IEEC demand for such a low flow period.

Response #96 - Current recycled water customers of EMWD are served on an interruptible basis and aggregate daily allocations are limited to equalized daily plant production. The supply of recycled water to IEEC will be on a non-interruptible basis supplemented with raw water as necessary to meet IEEC's demand. Recycled water service to IEEC will not affect supply allocations to existing recycled water customers. On-site storage is sized to allow IEEC to receive water at a uniform daily rate insulating the system from the hour-to-hour fluctuations in demand at IEEC. The volume required for daily regulation varies depending upon the total flow requirements of the energy center. Maximum daily regulatory requirements are approximately one million gallons. Storage in excess of this amount is held in the tank for unanticipated interruptions in the recycled water supply.

Request #97 - Assess the feasibility of using onsite or offsite seasonal storage to meet IEEC peak water demands above the average day conditions shown in Figure 3.4-6.

Response #97 - The projections of recycled water availability from EMWD submitted in Data Adequacy Responses dated November 30, 2001 provide estimates of the availability of recycled water after considering the seasonal storage capabilities of the two billion gallons of storage ponds that exist on the system. It is conceptually possible to add storage to the EMWD system to capture excess winter reclaimed water and store it for summer use. However, no project has been identified that would economically add to the supply EMWD currently has available. The addition of storage offsite would not enable EMWD to regulate flows to the IEEC because offsite storage would not regulate flows in facilities downstream of the storage. On site storage would be used to regulate daily flows to a uniform rate but would not address seasonal fluctuations in use. On site storage would have to be increased by perhaps two orders of magnitude to be sufficient to limit instantaneous flows to the IEEC to the average annual flow. There is insufficient land for such a storage facility on site. Moreover there is no apparent advantage to adding storage in this manner.

Request #98 - How will the site water balance be managed during maintenance downtime of 100 percent duty treatment processes during periods of peak demand? Will any intermediate storage be provided?

Response #98 - The three primary water treatment processes, microfiltration, reverse osmosis, and mixed bed demineralization, will all have redundant units. Each treatment process will include two 100 percent capacity trains or three 50 percent capacity trains.

Storage will be provided on the front end of the water treatment process via a 2.5-million gallon recycled water storage tank and on the back end of the water treatment process via a non-reclaimable wastewater tank. The intent of these tanks is to allow fluctuations in the IEEC makeup water demand and wastewater production while maintaining constant makeup and wastewater flows into and out of the facility. Demineralizer makeup and demineralized water storage tanks will provide intermediate storage. The demineralizer makeup tank will allow the reverse osmosis trains to be brought one and off line in step-mode while maintaining a relatively constant flow through the mixed bed demineralizers. The demineralized water tanks are designed to allow the makeup water needed for power augmentation steam to be generated over a 24-hour period in quantities to support up to 16 hours per day of use. This allows the use of smaller microfiltration, reverse osmosis, and mixed bed demineralizer systems. A second criterion used by the Applicant, is that the demineralized water tanks have sufficient capacity to support 48 hours of the average demand assuming no makeup. This criterion will allow the IEEC to operate for at least 2 days in base load mode (no peaking capacity) in the event there is a major interruption in the operation of the microfiltration, reverse osmosis, or mixed bed demineralizer systems. In the case of the IEEC, the power augmentation steam criterion governs the sizing of the demineralized water tanks.

Request #99 - How does the base line net heat rate compare to average and optimum CTG and STG conditions? Please provide heat and mass balances, net heat rate, thermal efficiency, water balance, auxiliary boiler output, and output for average, 90 percent, and 99 percent ASHRAE conditions, with and without supplemental firing.

Response #99 - As stated in Data Response #81, Table 3.4-1 of the AFC contained several errors. Stream 35 should be corrected to read 72,394,531 lb/hr (144,847 gm), Stream 38 should be corrected to read 1,223,011 lb/hr (2,147 gpm), and Stream 39 should be corrected to read 244,402 lb/hr (489 gpm), thus eliminating the discrepancies between Figure 3.4-4/ Table 3.4-1 (heat/mass balance) and Figure 3.4-6 (water balance).

As stated in Section 3.4.2 of the AFC and shown in the heat/mass balance (Figure 3.4-4/ Table 3.4-1), the IEEC is expected to have a base load heat rate of approximately 6,700 Btu/kWh on a higher heating value (HHV) basis under average ambient conditions. This correlates to an overall plant efficiency of better than 56 percent on a lower heating value (LHV) basis, which is comparable to other triple pressure combined cycle facilities. Under these conditions, the net output of the IEEC is expected to be about 538 MW.

The IEEC will be provided with a significant amount of peaking capacity in the form of power augmentation steam injection and HRSG duct firing. The peaking capacity will typically be used during hot weather when the need for peaking capacity in California is greatest. As indicated in Section 3.4.2 of the AFC, the net output of the IEEC with its peaking capacity operating is expected to be 670 MW on a 97 degree F day. The incremental heat rate for the peaking capacity is estimated to range from 8,100 to 9,000 Btu/kWh (HHV), depending on ambient and operating conditions. This corresponds to an efficiency of between 42 and 46 percent (LHV basis) for the incremental peaking capacity, comparing favorably to a typical simple cycle combustion turbine net efficiency of 37 to 38 percent (LHV basis). With the facility's peaking capacity operating, the base load portion of the capacity will continue to be generated with a high efficiency.

The IEEC peaking capacity requires that the steam turbine, condenser, and cooling tower be larger than they would for a "base load only" facility. When operating in base load mode, the steam turbine will be operating at part load. While this would normally result in a minor loss of efficiency, the large cooling system tends to cancel this efficiency loss by allowing the steam turbine to operate at a lower exhaust pressure.

The information provided above along with that included the AFC should be sufficient to conclude that the IEEC will be a "highly efficient" facility, both in terms of its base load capacity as well as its peaking capacity. The Applicant considers detailed heat balances for the peaking cases to be proprietary from the standpoint of maintaining a competitive advantage in the deregulated energy market. If staff determines that these heat/mass balances are absolutely required to analyze the soil and water resources impacts of the project, they will be provided under a confidential filing.

The auxiliary boiler is provided to generate steam when the IEEC is not operating. The primary function of the auxiliary boiler is to provide steam for HRSG drum sparging, steam turbine gland steam, and condenser steam jet air ejectors, allowing the IEEC to more rapidly start up. The auxiliary boiler will not normally be operated when the IEEC is operating and is thus not included in the heat/mass balance.

Water balances have been provided for the average annual operating condition as well as the peak operating condition. The average annual case assumes the average ambient temperature with base load operation and no peaking. The peak operating case assumes the maximum ambient temperature with base load operation plus duct firing and power augmentation steam injection. These two water balances bracket operation of the IEEC. Water balances at the average temperature with supplemental firing, maximum temperature without supplemental firing, and ASHRAE 90 percent temperature with and without supplemental firing would not provide significantly different results.

Request #100 - Assess the feasibility of alternatives for internal water conservation, including, but not limited to; a) reduced or no supplemental duct firing, b) increased CTG and STG capacity to enable a reduction in supplemental firing, c) hybrid wet-dry cooling, d) spray-enhanced dry cooling, e) pre-treatment of make-up water or other means needed to enable higher cooling tower cycles of concentration, and f) recovery of water from the cooling tower blow-down and MF waste streams by use of a RO, evaporator, direct osmosis, or other concentration process.

Response #100 - An objection to this request has been filed with the CEC.

Request #101 - Please explain why supplemental duct firing is proposed for this project, given the negative effect on thermal efficiency and water consumption.

Response #101 - As described in Data Response # 99, the IEEC is designed to provide a significant amount of peaking capacity through the use of HRSG duct firing and combustion turbine power augmentation steam injection. When this peaking capacity is operating, there will be an increase in steam flow to the steam turbine. Condensing the additional steam results in a greater cooling load on the cooling tower, thus increasing the evaporation rate and overall water consumption. The incremental efficiency of the IEEC peaking capacity is estimated to be 42 to 46 percent (LHV basis), depending on ambient and operating conditions. This peaking capacity is approximately 10 to 20 percent more efficient than the typical simple cycle combustion turbine net efficiency of 37 to 38 percent (LHV basis). The IEEC's peaking capacity will use more water than a simple cycle combustion turbine peaking facility, however, the additional water use is more than offset by the following benefits:

- The ability to provide both base load and peaking capacity from the same facility
- A higher incremental peaking efficiency than a simple cycle peaking facility, meaning less natural gas use
- A lower incremental capital cost for the peaking capacity compared to a simple cycle peaking facility
- No additional combustion turbines are required for the peaking capacity
- Fewer air emissions than a comparably sized simple cycle peaking facility

While the IEEC will use more of a renewable resource, water, it will conserve a non-renewable resource, natural gas. It is the Applicant's belief that the IEEC's of peaking capacity is environmentally superior to simple cycle combustion turbine peaking facilities.

Request #102 - Please clarify natural gas flow, CTG net output, and STG net output, with and without supplemental firing. Please summarize the total nominal capacity and overall thermal efficiency, with and without supplemental firing, at average, 90 percent, and 99 percent ASHRAE wet bulb conditions.

Response #102 - See Data Response # 99, which addresses the same issues.

Request #103 - How many hours/day and hours/month will the auxiliary boiler and supplemental duct firing be used and at what rate? Please define how CTG, STG, and overall thermal efficiency will be optimized under different loadings.

Response #103 - Because the IEEC will be a merchant plant operating in a deregulated market, it is difficult to predict the exact number of hours and load at which the IEEC will operate. As stated in Data Response #99, the auxiliary boiler is intended to operate when the IEEC is down. Up to 3,000 hours of operation per year have been assumed to represent a worst case from an air emissions standpoint. This works out to about 8 hours of operation per day, on average. Similarly, to represent worst-case air emissions, each HRSG duct burner has been assumed to operate for up to 5,100 hours per year. Market conditions and contractual obligations will determine the number of hours and load at which the IEEC will operate. Typically, the base load or combined cycle portion of the IEEC output, having the lowest heat rate, will be dispatched first. When economically justified, the HRSG duct firing will be dispatched next, having the lowest heat rate amongst the available forms of peaking capacity. The output of the HRSG duct burners will be variable over a 10:1 range, allowing their operation to be optimized to provide the exact amount of needed peaking capacity. Combustion turbine power augmentation steam injection, having the highest heat rate, will typically be dispatched last.

Request #104 - Please define recycled water quality parameters that will be monitored and how operations will respond to quality deviations.

Response #104 - Recycled water quality is monitored at both the source and within the energy center. DR 109 describes the parameters that the IEEC would monitor for control of internal systems. EMWD is responsible for maintenance of the quality of water into the recycled water system. EMWD employs a comprehensive water quality program including regulation and monitoring of discharges into its system, industrial pretreatment requirements monitoring of source water quality and management of the regional water reclamation facilities themselves. Taken together the collection system management and the management of the POTW's themselves ensure that the quality of recycled water served by EMWD meets quality requirements for reuse. EMWD monitors the following water quality parameters: see Tables 104-1 through 104-3. When any of the following parameters are exceeded, the flow is automatically diverted to on site storage to prevent off spec water from leaving the plant site. Applicant believes that together these actions ensure the quality of water into the distribution system. Moreover, the physical design of the system with its large storage ensures that any variations in water quality occur relatively slowly over time and well within the capabilities of the energy center to adjust its internal treatment program to respond to the quality variation. Indeed the recycled water system should have more consistent water quality than many cooling tower installations operating on fresh water where source waters of very different qualities can be delivered by the water utility. Applicant does not view quality upsets as having the potential to disrupt the supply of recycled water from EMWD.

Table 104-1 Perris Valley RWRF Discharge Limits

Parameter	Units	Avg Limit	Max Limit	Min Limit
Flow - Influent Plant #1 Daily	MGD	3		
Effluent-BOD-C 30 Day	mg/L	30		
Effluent - Total Suspended Solids 30 Day	mg/L	30		
Secondary Effluent pH Min 30 Day	pH Units			6.5
Secondary Effluent pH Minrt	pH Units			6.5
Secondary Effluent pH Maxrt	pH Units		9	
Secondary Effluent pH Max 30 Day	pH Units		9	
Sec Effluent EC Avg Plant #1	umho/cm			
Source Water TDS 12 Month	mg/L			
Effluent Total Dissolved Solids 12 Month	mg/L	825	643.12	
Effluent Hardness 12 Month	mg/L	330		
Effluent Chloride 12 Month	mg/L	160		
Effluent Sodium 12 Month	mg/L	180		
Effluent Sulfate 12 Month	mg/L	300		
Effluent Boron 12 Month	mg/L	0.75		
Effluent Fluoride 12 Month	mg/L	1		
Effluent Arsenic	ug/L		50	
Effluent Barium	ug/L		1000	
Effluent Cadmium	ug/L		10	
Effluent Chromium	ug/L		50	
Effluent Cobalt	ug/L		200	
Effluent Copper	ug/L		20	
Effluent Cyanide	mg/L		0.2	
Effluent Iron	ug/L		300	
Effluent Lead	ug/L		50	
Effluent Manganese	ug/L		50	
Effluent Mercury	ug/L		2	
Effluent Selenium	ug/L		10	
Effluent Silver	ug/L		50	
Effluent Zinc	ug/L		100	
Phenolic Compounds	ug/L		40	

Table 104-2 Temecula Valley RWRF Discharge Limts

Parameter	Units	Avg Limit	Max Limit	Min Limit
Flow - Influent Plant #1	MGD	8		
Effluent Flow Plant #1	MGD	8		
Tertiary Effluent TSS	mg/L	30	45	
Teriary Effluent VSS	mg/L			
Tertiary Effluent BOD	mg/L	30	45	
Tertiary Effluent pH Min	pH Units			6
Tertiary Effluent pH Max	pH Units		9	
Tertiary Effluent EC	umho/cm			
Tertiary Effluent Maximum Turbidity	NTU		5	
Tertiary Effluent Average Turbidity	NTU		2	
Tertiary Effluent Cl2 Residual Min	mg/L			
C/T compliance				450
Tertiary Effluent Total Coliform	MPN		23	
Tertiary Effluent Total Coliform 240 MPN Ma	MPN		240	
Tertiary Effluent Total Coliform 7 Day	MPN		2.2	
Freeboard Mo. Min.	Feet			1
Effluent Total Dissolved Solids 12 Month	mg/L	750		
Effluent Total Dissolved Solids Daily	mg/L		825	
Effluent Chloride 12 Month	mg/L	200		
Effluent Chloride Daily	mg/L		250	
Effluent Sulfate 12 Month	mg/L	200		
Effluent Sulfate Daily	mg/L		250	
Effluent Boron Daily	mg/L		0.8	
Effluent Boron 12 Month	mg/L	0.75		
Effluent Iron Daily	ug/L		400	
Effluent Iron 12 Month	ug/L	300		
Effluent Manganese 12 Month	ug/L	50		
Effluent Manganese Daily	ug/L		60	
Effluent Nitrate	mg/L			
Effluent Fluoride	mg/L			
Effluent Aluminum	ug/L			
Effluent Arsenic	ug/L			
Effluent Barium	ug/L			
Effluent Cadmium	ug/L			
Effluent Chromium	ug/L			
Effluent Copper	ug/L			
Effluent Lead	ug/L			
Effluent Mercury	ug/L			
Effluent Selenium	ug/L			
Effluent Silver	ug/L			
Effluent Zinc	ug/L			

Table 104-3 Moreno Valley RWRF Discharge Limits

Parmeter	Units	Avg Limit	Max Limit	Min Limit
Flow - Inf - Net	MGD	16		
BOD-C Weighted 12 Month	mg/L		30	
TSS Weighted 12 Month	mg/L		30	
Secondary Effluent pH Min	pH Units			6.5
Secondary Effluent pH Max	pH Units		8.5	
Sec Effluent EC Min				
Sec Effluent EC Max				
Sec Effluent NH4-N	mg/L			
Effluent Coliform-Sec 2.2 7 Day	MPN	2.2		
Effluent Coliform-Sec 2.2	MPN		23	
Total Coliform Secondary 23 7 Day	MPN		23	
Total Coliform Secondary 23	MPN		230	
Secondary Effluent TDS 12 Month	mg/L	550	530	
Sec Effluent Hardness 12 Month	mg/L	130		
Sec Effluent Chloride 12 Month	mg/L	155		
Sec Effluent Sodium 12 Month	mg/L	140		
Sec Effluent Sulfate 12 Month	mg/L	80		
Sec Effluent Boron 12 Month	mg/L	0.75		
Sec Effluent Fluoride 12 Month	mg/L	1		
Secondary Effluent Arsenic	ug/L		50	
Secondary Effluent Barium	ug/L		1000	
Secondary Effluent Cadmium	ug/L		10	
Secondary Effluent Chromium	ug/L		50	
Secondary Effluent Cobalt	ug/L		200	
Secondary Effluent Copper	ug/L		20	
Secondary Effluent Cyanide 4 Month	mg/L		0.2	
Secondary Effluent Iron	ug/L		300	
Secondary Effluent Lead	ug/L		50	
Secondary Effluent Manganese	ug/L		50	
Secondary Effluent Mercury	ug/L		2	
Secondary Effluent Zinc	ug/L		100	
Secondary Effluent Silver	ug/L		50	
Phenolic Compounds - Secondary Effluent	ug/L		40	
Tertiary Effluent pH Min	pH Units			6.5
Tertiary Effluent pH Max	pH Units		8.5	
Tertiary Effluent EC Min	umhos			
Tertiary Effluent EC Max	umhos			
Tertiary Effluent Average Turbidity	NTU		2	
Tertiary Effluent Maximum Turbidity	NTU		5	
Tertiary Effluent Total Coliform 7 Day	MPN		2.2	
Tertiary Effluent Total Coliform 240 MPN Ma	MPN		240	
Tertiary Effluent Total Coliform	MPN		23	
Freeboard Mo. Min.	Feet			1
Source Water TDS 12 Month	mg/L			

Table 104-3 (cont'd) Moreno Valley RWRF Discharge Limits

Effluent Total Dissolved Solids 12 Month	mg/L	550	564
Effluent Hardness 12 Month	mg/L	130	
Effluent Chloride 12 Month	mg/L	155	
Effluent Sodium 12 Month	mg/L	140	
Effluent Sulfate 12 Month	mg/L	80	
Effluent Boron 12 Month	mg/L	0.75	
Effluent Fluoride 12 Month	mg/L	1	
Effluent Arsenic	ug/L		50
Effluent Barium	ug/L		1000
Effluent Cadmium	ug/L		10
Effluent Chromium	ug/L		50
Effluent Cobalt	ug/L		200
Effluent Copper	ug/L		20
Effluent Cyanide	mg/L		0.2
Effluent Iron	ug/L		300
Effluent Lead	ug/L		50
Effluent Manganese	ug/L		50
Effluent Mercury	ug/L		2
Effluent Selenium	ug/L		10
Effluent Silver	ug/L		50
Effluent Zinc	ug/L		100
Phenolic Compounds	ug/L		40

Request #105 - Please estimate recycled water BOD5, COD, aluminum, chromium, copper, manganese, zinc, soluble and total nitrogen (all forms), and phosphate.

Response #105 - The requested additional estimated water quality data for the recycled water supply is indicated in Table 105-1.

Table 105-1
Additional Estimated Recycled Water Quality Data

Parameter/ Constituent	Value	Notes
BOD	<2 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF – data indicates occasional excursions up to 8 mg/l.
COD	22 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF.
Aluminum	0.230 mg/l	Aluminum is not listed in the Year 2000 data provided by EMWD. The value indicated represents a worst-case estimate, based on MWD Year 1996-2000 potable water data from Skinner Filtration Plants 1 and 2.
Total Chromium	<0.005 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF.
Copper	<0.007 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF.
Manganese	0.010 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF.
Zinc	0.081 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF.
Nitrate, as N	2.9 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF.
Nitrite, as N	<0.01 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF.
Ammonia, as N	<0.2 mg/l	Based on EMWD Year 2000 data for tertiary effluent from the Perris Valley RWRF and Moreno Valley RWRF.
Orthophosphate, as P	0.2	Based on EMWD Year 2000 data for tertiary effluent from the Moreno Valley RWRF. Note: Table 3.4-5 of the AFC incorrectly indicated "no data" for this constituent.

Request #106 - Please explain how IEEC operations will respond to an extended short-fall in recycled water supply, in reference to EMWD's historical supply interruptions (in hours) vs. the hours of available supply provided by onsite storage.

Response #106 - The supply of recycled water is quite reliable and predictable. IEEC's physical location between two major supply facilities will help to ensure the reliability of water. EMWD is making a number of system improvements within its recycled water system in order to accommodate the water use by the IEEC. Major facilities to be added by EMWD and described in the AFC include a connection to the raw water delivery system enabling deliveries to IEEC during any credible outage of recycled water supply. Based upon the reliability of the distribution system that would exist after these improvements are completed, applicant is of the opinion that outages of water service to the energy center would be caused by facility failures such as distribution system line failures and the like that would affect any water distribution system. Storage in the on-site tank in terms of hours would vary based upon the actual water requirements at the time of failure, but with a normally full tank it would provide water for between 4 and 12 hours of full operation of the IEEC. This provides ample opportunity to manage the outage. Normally water service could be restored within this period or alternatively, the energy center could reduce operations or shutdown in an orderly manner.

Request #107 - Please define the projected working volume for the Reclaimed Water Storage tank. Is this intended to dampen daily fluctuation in reclaimed wastewater quality as well as flow rate?

Response #107 - The recycled water storage tank will have a working volume of 2.5 million gallons, representing 8 hours of storage at the maximum demand of 5,136 gpm. As stated in Data Response # 96, the tank is intended to allow IEEC to receive water at a uniform daily rate, insulating the EMWD recycled water system from the hour-to-hour fluctuations in demand by the IEEC. Evaluation of several worst-case operating scenarios results in a needed storage volume of about 1.2 million gallons to meet the fluctuating demands of the IEEC while receiving a constant flow of recycled water from EMWD. The remaining volume is sufficient to provide over 4 hours of IEEC operation at the maximum demand of 5,136 gpm or almost 9 hours of operation at the average demand of 2,468 gpm.

Although not intended for this purpose, an added advantage of the large recycled water storage tank is that it will tend to dampen any fluctuations in water quality. In addition, the IEEC cooling tower basin will contain another million gallons of water. The combined capacity of the recycled water storage tank and cooling tower basin along with the fact that the qualities of recycled water from the Perris Valley and Moreno Valley RWRFs are so similar, should alleviate any concern regarding the effects of fluctuating water quality on the operation of the IEEC.

Request #108 - How will odor and algae be controlled in this tank?

Response #108 - The recycled water storage tank will be an enclosed tank. Algae require both nutrients and sunlight for survival. While there will be adequate nutrients in the recycled water, there will be no sunlight inside the tank, thus algae growth is not expected. Tertiary treated recycled water of the quality produced by EMWD typically does not present odor problems provided that algae growth is controlled. Also, during normal operating, the contents of the recycled water tank will be turned over frequently, not allowing water to stagnate. Once the IEEC is operating, if odors from the recycled water tank are found to be problematic, an additional sodium hypochlorite feed can be added to the tank inlet.

Request #109 - Please identify the key water constituents that will be monitored (e.g. silica, phosphate, ammonia, etc) for internal streams.

Response #109 - The water balances for the IEEC are relatively straight-forward. The sanitary wastewater and microfiltration reject stream will be sent directly to EMWD's sanitary sewer. The cooling tower blowdown will be sent to EMWD's non-reclaimable waste system. All other waste streams, including the reverse osmosis reject stream, HRSG blowdown, and miscellaneous process drains will be discharged to the cooling tower. Since these streams represent only a small portion of the cooling tower makeup (3 to 4 percent) and their quality is superior to that of the circulating water, they will have little impact on the quality of the circulating water.

The key water constituents to be monitored for the various internal streams, which have an impact on plant water use, include the following:

Cooling tower circulating water:

- pH
- Specific conductivity
- Total hardness
- Calcium hardness
- Silica

Cooling tower makeup water:

- pH
- Specific conductivity
- Total hardness
- Calcium hardness
- Silica

Demineralized water:

- pH
- Specific conductivity
- Total dissolved solids
- Silica

Phosphate and ammonia monitoring will be performed only to the extent that these constituents impact the chemistry of the cooling water or HRSG. For example, the cooling water chemical treatment program may not be sensitive to phosphate or ammonia. If such is the case, then no phosphate or ammonia monitoring will be performed.

Request #110 - Is water quality monitoring proposed by continuous real-time monitors or with grab samples? Will an alarm be automatically activated? What processes will shutdown or divert to storage?

Response #110 - Within the IEEC, both continuous real-time and grab-sample monitoring will be used to monitor water quality. The type of monitoring will be dictated by the inherent variability of the constituent and its associated treatment. Online analyzers will incorporate the use of alarms and interlocks. Setpoints depend on the system and the constituent. The control loop for processes controlled automatically will normally incorporate a low alarm, high alarm, control setpoint and shutoff interlock. Failure of the sensor associated with a particular process control will cause that process control to shutdown or enter a preprogrammed "safe" mode. For example, failure of the cooling tower pH analyzer will result in an alarm and the shutdown of the cooling tower acid feed system.

Request #111 - Please describe the control system (or procedure) that would be initiated if a stream does not meet discharge limits.

Response #111 - The quality of wastewater discharged by the IEEC will be monitored in accordance with the Industrial Waste Discharge Permit and Nonreclaimable Wastewater Discharge Permit to be issued by the EMWD to IEEC prior to plant operation. Typically, discharge permit conditions for cooling tower blowdown involve routine sampling and analysis and reporting to demonstrate that the discharge stream does not contain constituents that may harm the POTW or cause it to violate its discharge permit. Continuous sampling and monitoring is reliable only for basic water quality parameters like pH or specific conductance. EMWD will specify the necessary monitoring requirements in its permit to the IEEC. A baseline monitoring program during intitial operation will determine the future level of monitoring and any control mechanisms that need to be implemented to ensure the quality. If routine monitoring continues to show an on-going compliance problem, the enforcing agency will typically issue "clean up and abatement" orders requiring the permitee to immediately correct the problem. If problems continue to persist, the enforcing agency may then issue "cease and desist" orders requiring immediate cessation of discharge until the problem is corrected. A plant shutdown may be required under these severe circumstances.

Request #112 - Please define the basis of the design water balance, peaking factor, all recirculation flows, allowances for maintenance and wash down/cleaning, standby equipment, and assumed storage tank accumulation/depletion rates for the 7Q10 flow.

Response #112 - The 7Q10 flow relates to recycled water production. The water supplied to the IEEC is not limited by this flow. If recycled water production is not available to meet the demand of the IEEC and other recycled water customers, recycled water will first be drawn from EMWD's extensive system of storage ponds. If the storage ponds are empty, raw water from the Colorado River aqueduct can be injected into the recycled water system to supplement the available recycled water flow.

The IEEC water treatment systems will be sized to maintain the flows shown in the peak day water balance (Figure 3.4-7 of the AFC) on a continuous basis. The only physical limitation is that the process water treatment systems will be sized to only support up to 16 hours per day of power augmentation steam use. The peak day water balance is based on the maximum ambient dry bulb and wet bulb temperatures, both combustion turbines operating at full load with inlet air fogging, maximum HRSG duct firing, and power augmentation steam injection into the combustion turbines. The cooling tower is assumed to operate at a conservatively low 5 cycles of concentration, resulting in the highest makeup and blowdown rates. The discharge to the EMWD non-reclaimable wastewater system is based on 16 hours per day of peak operation and 8 hours per day of base load operation. The non-reclaimable wastewater tank will be used to equalize the flow to the EMWD system. Although the recycled water tank will similarly equalize the recycled water flow to the IEEC, this is not currently reflected in Figure 3.4-7, as the Applicant wants to assure that the recycled water delivery system is capable of delivering the maximum flowrate. The following is an example of how the various storage tanks will operate assuming an operating scenario with 16 hours per day of peaking and 8 hours per day of base load operation.

During the 16 hours per day of peak operation, the estimated accumulation/depletion rates for the tanks are:

- Recycle water tank – 889 gpm depletion
- Demineralized water tanks – 65 gpm depletion
- Non-reclaimable wastewater tank – 165 gpm accumulation

During the 8 hours per day of base load operation, the estimated accumulation/depletion rates are:

- Recycle water tank – 1,779 gpm accumulation
- Demineralized water tanks – 130 gpm accumulation
- Non-reclaimable wastewater tank – 330 gpm depletion

Request #113 - Please state the average and peak capacity for each treatment unit process and equipment item, and how "non-reclaimable wastewater" will be managed during downtime of key equipment items.

Response #113 - The main water treatment processes, including microfiltation, reverse osmosis, and mixed bed demineralization will be sized for the flows indicated in the peak day water balance (Figure 3.4-7 of the AFC) and provided with redundant units or trains. The average flows through the treatment processes are shown in the average day water balance (Figure 3.4-6 of the AFC). For each water treatment process, either two 100 percent capacity or three 50 percent capacity units will be used. Because of the redundant units, there will be no impact on the non-reclaimable waste system when key equipment items are down.

Request #114 - Please provide a cooling tower manufacturer's recommended features to reliably achieve this drift loss. Consideration should be provided to; drift eliminator configuration, impingement area, and separation from fill; whether the drift eliminator will be interrupted by the cooling tower structural frame; method of fan speed control; vertical air flow rate; and water loading rate.

Response #114 - While a cooling tower drift rate of 0.0005 percent of the circulating flow may be less than that of many operating cooling towers, it is offered and guaranteed by all cooling tower manufacturers who will be on the Applicant's list of acceptable manufacturers for IEEC. Figure 114-1 is drift eliminator catalog cut from one manufacturer, Marley, indicating the commercial availability of a 0.0005 percent drift rate. The cooling tower for the IEEC has not yet been purchased; therefore it is not possible to provide the design details listed in this data request at this time. Furthermore, these details (i.e. drift eliminator configuration, impingement area, drift eliminator separation from fill, whether or not fill is interrupted by the cooling tower structural frame, vertical air flow rate, and water loading rate) are factors that are considered by the manufacturers in the design of the cooling tower as necessary to meet the guaranteed performance and are not typically details that the Applicant determines.

Request #115 - Please provide a revised site map illustrating locations of these existing and proposed facilities, and provide a description of the proposed interconnection between raw and recycled water systems, demonstrating the ability to avoid backflow of recycled water into the raw water system.

Response #115 - As discussed in Section 3.4.9 of the AFC, recycled water will be supplied to the IEEC from a new lateral pipeline connecting to an existing EMWD 48-inch recycled

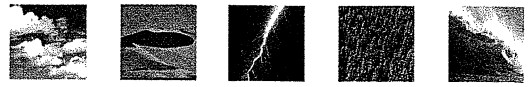
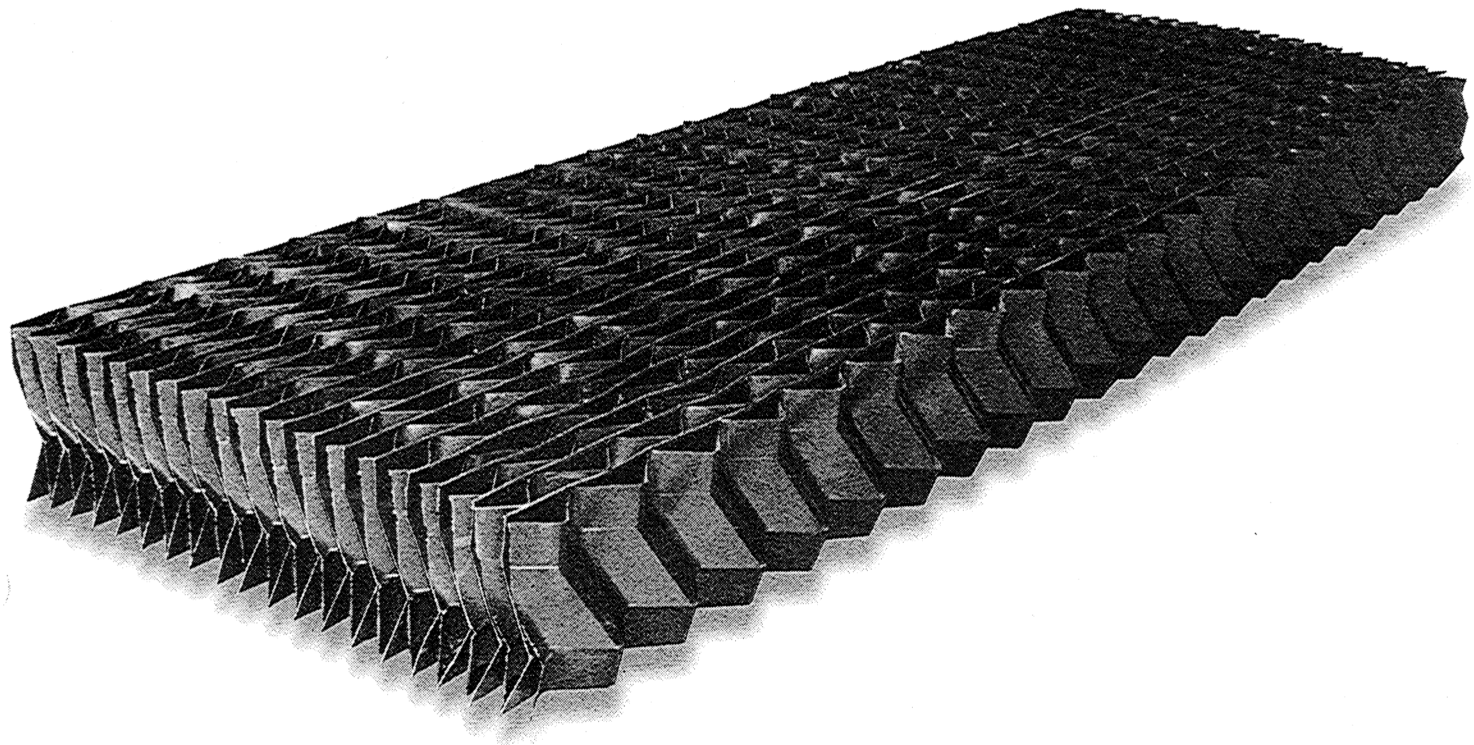


Figure 114-1

XCEL*plus*
Drift Eliminator



Marley developed the first cellular drift eliminator 20 years ago when eliminator designs were primarily blade type configurations and not very effective. Next, Marley patented the XCEL generation of eliminators in the early 80s. No other eliminator could come close to XCEL eliminator's low drift rate and low pressure drop. Now, virtually every eliminator is a nesting cellular PVC type design.

Introducing XCEL*plus,* a more advanced design that meets or exceeds today's demanding specifications for drift emissions, without sacrificing fan horsepower. Now you can have drift rates half of the original XCEL with equivalent pressure drop.

The eliminator discharge angle is important enough to warrant two separate eliminator designs for crossflow and counterflow towers. Tests show the air direction leaving the eliminator is extremely important—imperfect designs create additional work for the fan. This means either increased fan horsepower—or reduced cooling tower performance. The crossflow version features drainage slots within the eliminator pack to insure trapped drift is returned to the wet side of the cooling tower.

Low drift rate is the primary goal of eliminator design. XCEL*plus* boasts typical drift rates of .001% of the total GPM. Drift rates of .0005% and lower are available depending upon tower configuration. Drift rates with the original XCEL eliminator were so low that a better measurement method than the Sensitive Paper technique was required. The Hot Bead Isokinetic Drift Measurement (HBIK) method pioneered by Marley 20 years ago is now the endorsed CTI standard test procedure, ATC-140, for drift measurement today.

Considering low drift rates and low pressure drop, XCEL*plus* is the most effective cooling tower drift eliminator available in the market place today.

Marley

water pipeline located in McLaughlin Road, just south of the project site. The new lateral pipeline will be located in the Antelope Road right-of-way and owned by EMWD. Figure 115-1 shows the location of the proposed new EMWD linear facilities, including pipelines for recycled water, potable water, non-reclaimable waste, and the sanitary sewer.

As discussed in Section 3.4.9.1 of the AFC, a new recycled water pump station will be constructed at EMWD's Moreno Valley Regional Wastewater Reclamation Facility (MVRWRF). The general location of the MVRWRF is shown in Figure 115-2. Figure 115-3 shows the general arrangement of the MVRWRF and the location of the new recycled water pump station. Figure 115-4 shows the general arrangement of the existing recycled water pump station and the proposed location of the new pumps. The new pumps will allow recycled water to be pumped from the MVRWRF to the IEEC, thus increasing the reliability of the recycled water supply to the IEEC and also allowing EMWD more flexibility in the operation of their recycled water system.

As discussed in Section 3.4.9.2 of the AFC, new raw water facilities will be constructed by EMWD as part of their Perris Water Treatment Plant (PWTP). The PWTP will be located at EMWD's turnout EM-4 off of the Colorado River Aqueduct near Evans Road. The general location of this facility is indicated in Figure 115-2. Figure 115-5 shows the general arrangement of EMWD's proposed PWTP. A new pump station, located in the northwest corner of the PWTP site will supply raw water to both the PWTP and a second pump station. The second pump station will be used to pump raw water into the recycled water distribution system as necessary to supplement recycled water supplies. The fill pipe for the second pump station will discharge above the wet well water surface, thus providing an air gap to isolate the raw water supply from contact with recycled water. There will be no direct raw water connection to the IEEC.

Request #116 - Please provide an explanation of the nature and function of the future channel; that will build and be responsible for it, whether the space provided is sufficient for the channel right-of-way, and when it is expected this channel will be constructed.

Response #116 - The area described as "Future Channel" on Figure 3.5-2 of the AFC pertains to a future flood control channel that will be constructed to provide flood control protection for the Homeland/Romoland region. This flood control facility, which is several miles long, will be constructed, operated and maintained by the Riverside County Flood Control & Water Conservation District. The right-of-way requirement has been determined by the Flood Control District. Based upon discussions with the Flood Control District, there is no scheduled date for the construction of this facility.

Request #117 - Please summarize design criteria specified by the Riverside County Flood Control Agency and clarify under what criteria the IEEC storm water system, including the detention basin, is being designed.

Response #117 - The Riverside County Flood Control & Water Conservation District requires that all structures be protected from flooding associated with a 100-year storm event. The on-site storm drain system shall be designed in such a manner as to provide that protection. The IEEC storm water system will be designed using a combination of storm drain pipes and channels to adequately convey the on-site runoff associated with the 100-year storm event. Perimeter channels shall be designed to adequately collect and convey the off-site 100-year storm event around the site.

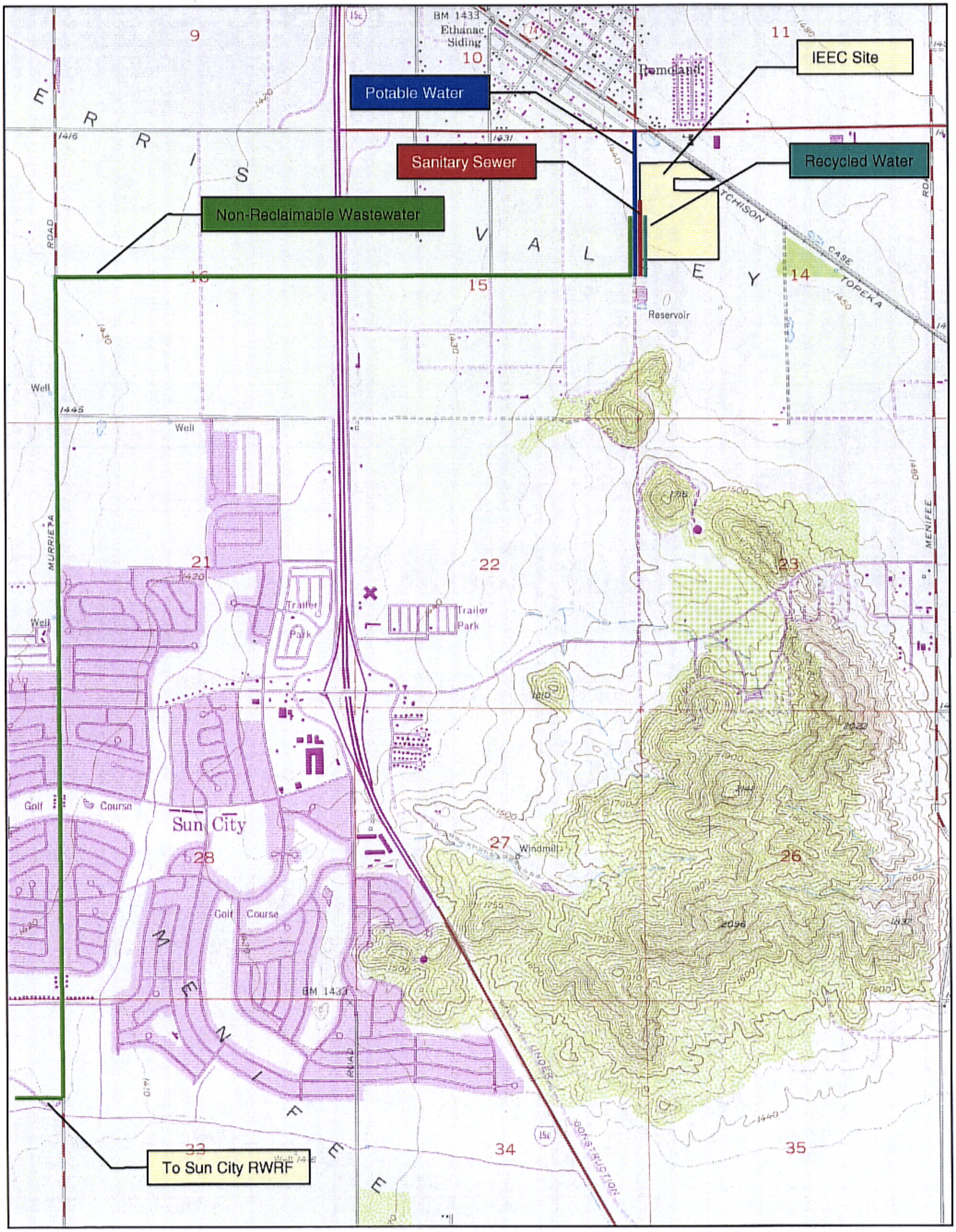
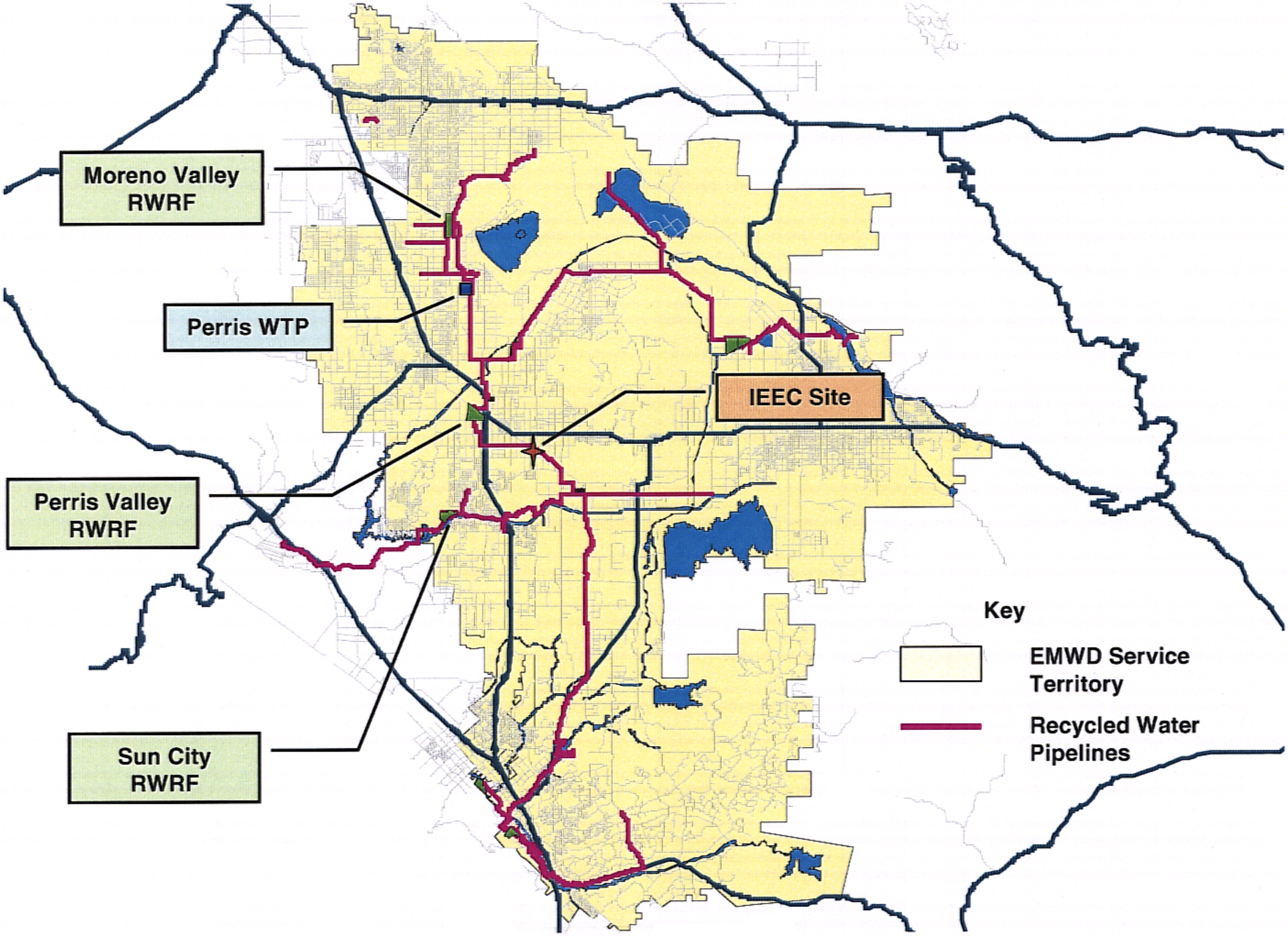


Figure 115-1 – New EMWD Linear Facilities to Serve the IEEC



Moreno Valley RWRF
Perris WTP
IEEC Site
Perris Valley RWRF
Sun City RWRF
Key
EMWD Service Territory
Recycled Water Pipelines

Figure 115-2

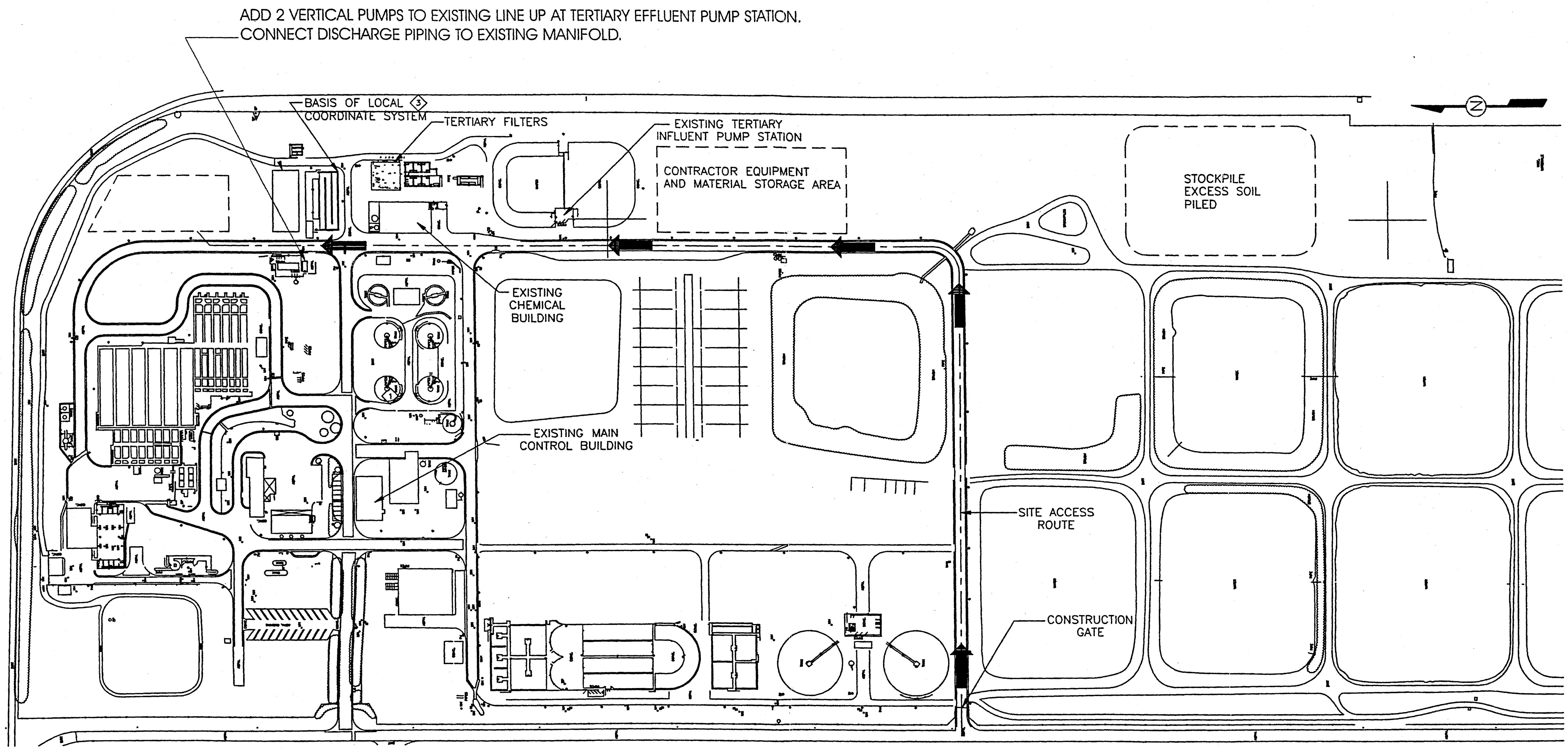


Figure 115-3

MORENO VALLEY RWRF SITE PLAN

CLIENT20/EMWD/6202A00/7-01/EMFIG2.CDR

carollo engineers

EASTERN MUNICIPAL WATER DISTRICT

Eastern Municipal Water District

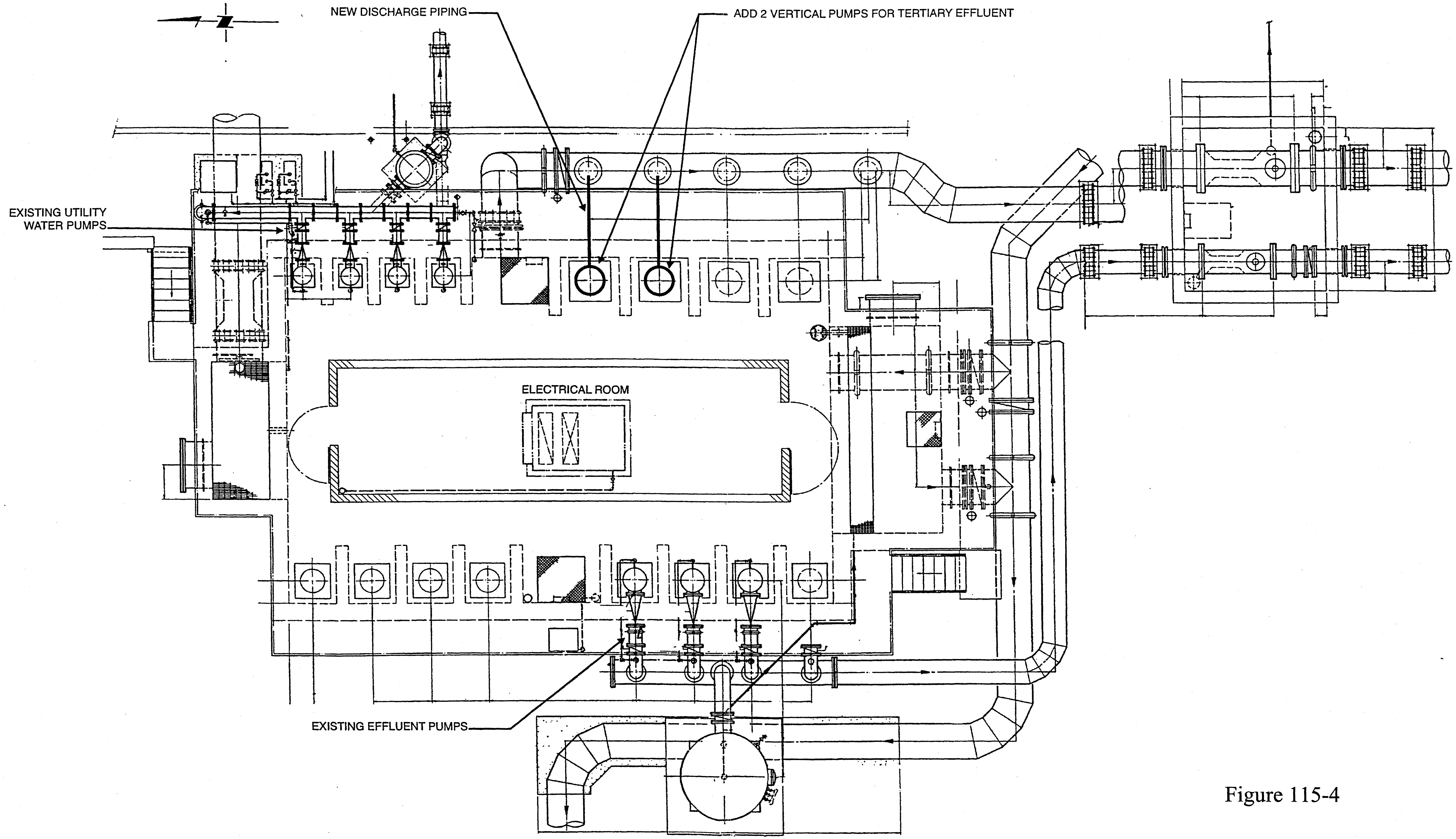


Figure 115-4

MORENO VALLEY RWRF
TERTIARY EFFLUENT PUMP STATION

CLIENT20/EMWD/6202A007-01/EMFIG3.CDR

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EASTERN MUNICIPAL WATER DISTRICT

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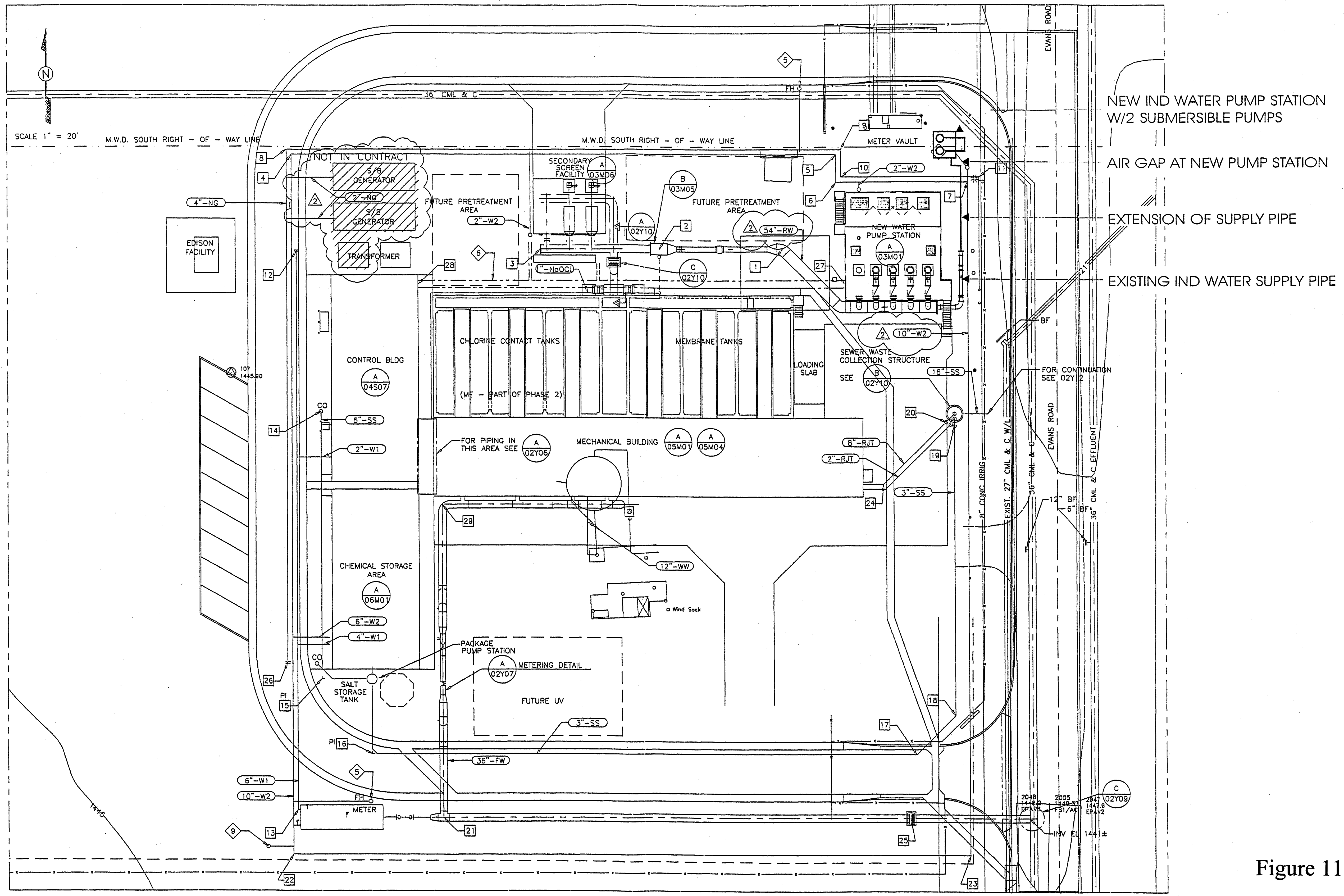

Figure 115-5

PERRIS WTP SIT MAP

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In addition to providing flood protection for the 100-year storm event, the Riverside County Flood Control & Water Conservation District requires that when a regional storm drain facility is not present, a proposed development shall mitigate the impacts associated with increased runoff as a result of developing the project. The Riverside County Flood Control & Water Conservation District requires that a proposed development provide mitigation, in the form of a retention basin, to mitigate the runoff from the 2-year, 5-year, and 10-year storm events for durations of 1-hour, 3-hour, 6-hour, and 24-hour. The retention basin designed for the IEEC will be sized to provide mitigation for the required storm events. Additionally, the outlet system for the retention basin will be designed to allow the larger level events (i.e., 100-year storm event) to pass through the basin without impacting the facility.

Request #118 - Since the detention basin outlet discharges as drainage across downstream property, the 2, 5, 10, 25 and 100-year discharge should be defined. As planned under Appendix C of the Draft SWPPP for Construction Activities, please provide a background hydrology study of sufficient detail to describe the contributing offsite and conceptual onsite watershed areas, peak discharge computations, and peak discharge rates at key concentration points for pre-developed and proposed developed conditions for the 2, 5, 10, 25 and 100-year discharges.

Response #118 - The proposed detention basin for the process area will be sized to provide mitigation for a wide range of storm events. The proposed basin outlet will be located within the project site so that the discharge point can be located in its historical location. Based upon the preliminary routing results for the basin, the 5-year through 100-year storm events are below historical runoff levels. The 2-year runoff from the process area has been reduced by 75% to better correlate with the historical runoff level. A summary of the results is included in Table 118-1.

Table 118-1
Process Area – Basin Discharge

24-Hour Storm Recurrence	Unit Hydrograph Results				Basin Routing Results		
	Pre-developed		Post-developed				
	Flood Volume acre-feet	Peak Flow cfs	Flood Volume acre-feet	Peak Flow cfs	Basin Volume acre-feet	Routed Peak cfs	Basin Depth feet
2-Year	0.40	0.63	2.40	4.60	0.80	1.1	1.00
5-Year	0.50	1.60	3.60	7.04	1.85	1.1	1.30
10-Year	2.20	6.80	4.80	9.08	3.16	1.1	1.70
25-Year	3.20	9.00	6.00	12.30	4.31	1.1	2.10
100-Year	4.70	12.30	8.00	16.03	6.20	1.1	2.60

6" outlet pipe at bottom basin elevation 1439.50 ft.

Basin capacity - 7.6 acre-feet with 3.0 ft. depth at 1442.50 ft. water surface elevation

This basin and the proposed culvert under Antelope Road serve as the key concentration points for the site. The detailed hydrologic information requested in Item #118 has been provided in the response to Item #125. Off-site runoff quantities are not affected by this development. Off-site runoff is collected in the proposed ditch along the easterly boundary and discharged on the project site in the natural watercourse before exiting the project area.

Request #119 - Please provide a background hydraulic study, or results of any existing studies, demonstrating the basis for the hydraulic design of the perimeter diversion channels, the culvert across Antelope Road, and the detention basin. The detention basin analysis should include a basin routing and/or hydrograph volume analysis to demonstrate the capacity and function and draining of this basin assuming back-to-back storms, and storms exceeding the capacity of the basin.

Response #119 - The culvert under Antelope Road is expected to convey non-process area runoff. Based upon the results of a preliminary hydrology study, this runoff will be 4.6 cfs (refer to Item #125) for the 100-year runoff. Using a hydraulic computer model accepted by the Riverside County Flood Control and Water Conservation District, the pipe size was estimated to be an 18-inch reinforced concrete pipe (RCP).

The interceptor channel along the easterly boundary of the site is sized to handle an expected 100-year runoff rate of 407 cfs. This channel will need to be concrete-lined with a 10-foot base width and 1.5:1 side slopes (this information supersedes the typical cross section shown in Figure 3.5-2, indicating a base width of 6 feet). The channel slope has been estimated to be 0.3%. Using a hydraulic computer model accepted by the Riverside County Flood Control & Water Conservation District, the channel will adequately convey the off-site flow with a minimum of one foot of freeboard in the channel.

The results of the detention basin routing are included in Data Response #118. A separate analysis was prepared assuming a back-to-back storm with the initial water surface in the basin equal to the depth of water in the basin at the end of the 24-hour storm. Based upon the results of analyzing the effect of back-to-back storms, the 100-year storm event is still contained within the basin. Therefore, all lower level events will also be contained in the basin. Since the basin is designed to handle a 100-year storm event, as required by the Riverside County Flood Control & Water Conservation District, storms larger than the 100-year event were not considered. However, an emergency spillway capable of handling the entire 100-year peak discharge will be provided in the event that the outlet pipe fails.

Request #120 - Please provide expected hydraulic flow conditions (flow depth, width and velocity) at key concentration points exiting the property for existing and proposed conditions. For locations where proposed discharges exiting the property will be greater in magnitude than under existing conditions, or diverted to a location where flow does not currently concentrate, please demonstrate the conditions of downstream terrain, land use and improvements, whether the diverted discharge will cause any increase in flooding or erosion damage, and what mitigation measures will be taken to avoid such damage.

Response #120 - Based upon the hydrology and the detention basin routing results provided in Items #118 and #125, the post-development discharge exiting the site in the major storm events, 5-year and greater, has been reduced significantly below the pre-development runoff level. Therefore, hydraulic conditions and erosion impacts will be reduced below historic levels. For the 2-year storm event, the discharge from the detention basin was reduced 75% below the post-development runoff level to be more consistent with the historical runoff level. Therefore, the hydraulic conditions and erosion impact are essentially the same exiting the site as exists in the pre-development condition.

Request #121 - Please provide evidence of consultation with the Riverside County Flood Control Agency regarding the existing and proposed grading and drainage plan and hydrologic and hydraulic conditions on the site, and demonstration that the proposed drainage plan, with modified downstream discharge points, complies with Riverside County regulations and standards.

Response #121 - Per the Applicant's notification of January 24, 2002, the projected filing date for this response is March 13, 2002.

Request #122 - Please provide evidence of consultation with the Army Corps of Engineers identifying design and permitting requirements applicable to the proposed grading and drainage plan, and particularly applicable to the discharge of storm water to adjacent wetlands.

Response #122 - On 19 October 2001 the Applicant's representative, Project Biologist Lenny Malo (949-756-7556), and USACE representative Robert Smith (213-452-3419) completed a field survey to verify / confirm the results of the applicant's surveys. Offsite stormwater runoff will be diverted around the site using a combination of berms and swales. The grading and drainage plan shows a concrete ditch constructed along the north site boundary connecting to a culvert across Antelope Road. A similar ditch is proposed along the east side of the property to end at the south property line (McLaughlin Road). It was determined that the project impact area will not directly or indirectly impact any USACE potential jurisdictional features (wetlands or waters of the U.S.). It was determined in the field that all USACE potential jurisdictional features within the San Jacinto River 100-year flood plain are located west of Highway 215, and south and east of the Energy Center site. The southern boundary of the Energy Center site runs parallel to a small bed and bank jurisdictional feature that will be avoided during construction with the use of trenchless technology and facility siting. Additionally, jurisdictional features located along the Alternative A Menifee Road natural gas pipeline, transmission line, and non-reclaimable wastewater line will be avoided through the use of trenchless construction methods, siting the facilities outside of potential jurisdictional feature boundaries, or by installing linear facilities within existing road right of ways.

Request #123 - Please provide a Construction Grading and Drainage Site Plan similar to AFC Figure 3.5-2, but clearly identifying and distinguishing existing vs. proposed drainage facilities, labeling the proposed flood control channel where storm water will be discharged, and the conceptual location of construction BMP's consistent with the Draft SWPPP for Construction Activity. In addition, please provide representative profiles and cross-sections further illustrating existing vs. proposed grades and storm water facilities.

Response #123 - A partial objection to this request has been filed with the CEC with IEEC's filing on January 24, 2002.

Notwithstanding the foregoing, Figures 123-1 and 123-2 show the proposed grading and drainage plan and the proposed construction BMP's. In addition, a detailed geologic cross section is provided in the AFC (Volume II, Appendix G, Figure 7). This figure shows the existing site grade and gradient.

Request #124 - Please provide a revised Figure 3.5-2 - Grading and Drainage Plan, or an additional figure, clearly distinguishing between existing vs. proposed drainage facilities, the proposed point of storm water discharge into the existing flood control channel, existing wetlands, and conceptual location of operational BMP's consistent with the draft SWPPP for Industrial Activity. The curbed (contact) portion of the site (with potential for contamination) and non-curbed drainage systems and design should be differentiated in terms of location, drainage area, drainage conveyance design, storage system design and capacity, peak flow rates and runoff volumes.

Response #124 - An objection to this request has been filed with the CEC. Per the Applicant's notification of January 24, 2002, the projected filing date for the portions of this response not covered by the objection is March 13, 2002.

Request #125 - Please provide pre-development and post-development storm water discharge rates and volumes for process and non-process areas for the 2, 5, 10, 25- and 100-year recurrence intervals.

Response #125 - The unit hydrographs were prepared for the Process and Non-Process areas for 2, 5, 10, 25, and 100-year recurrence interval with a duration of 24 hours. The Unit Hydrograph Method is outlined in the hydrology manual by the Riverside County Flood Control & Water Conservation District (RCFC & WCD). The hydrographs were prepared for two different areas (Process Area and Non-Process Area) based on the existing topography conditions and proposed grading and facility layout for both pre-and post-development conditions.

A comparison between the pre- and post-development conditions for each of the areas is shown in Table 125-1 (Pre- and Post-Development Conditions Unit Hydrograph Results for the Non-Process Area) and Table 125-2 (Pre-and Post-Development Conditions Unit Hydrograph Results for the Process Area).

Table 125-1
Volumes and Discharges for the Non-Process Area

24-Hour Storm Event	Pre-Development Flood Volume Ac. Ft.	Pre-Development Discharge CFS	Post-Development Flood Volume Ac. Ft.	Post-Development Discharge CFS
2-year	0.3	0.46	0.8	1.23
5-year	0.4	1.30	0.8	1.25
10-year	1.6	5.1	1.1	2.5
25-year	2.3	6.7	1.4	3.3
100-year	3.4	9.2	2.1	4.6

Table 125-2
Volumes and Discharges for the Process Area

24-Hour Storm Event	Pre-Development Flood Volume Ac. Ft.	Pre-Development Discharge CFS	Post-Development Flood Volume Ac. Ft.	Post-Development Discharge CFS
2-year	0.4	0.63	2.4	4.6
5-year	0.5	1.6	3.6	7.04
10-year	2.2	6.8	4.8	9.8
25-year	3.2	9.0	6.0	12.3
100-year	4.7	12.3	8.0	16.03

Request #126 - Please provide written evidence of consultation with the Regional Water Quality Control Board confirming expected compliance of the IEEC project under the General Permit for Discharge of Stormwater Associated with Industrial Activity.

Response #126 - Per the Applicant's notification of January 24, 2002, the projected filing date for this response is March 13, 2002.

Request #127 - Were other storm water management methods considered such as buried infiltration chambers or a larger detention basin considered as alternative to reduce surface discharge?

Response #127 - As an alternative to the retention basin shown in Figure 3.5-2, a larger basin has been considered on the unused portion of the site south of the process area. This larger basin would have the capability of further reducing surface discharge and could provide for a reduced quantity of on-site storm drain conduit. Other alternatives such as infiltration chambers and percolation basins were also considered because they are more expensive to install and operate, pose addition worker safety hazards, and are more expensive to operate and maintain.

Request #128 - Please provide a brief analysis considering the value of using the detention basin and/or perimeter runoff channels for storing and conveying storm water runoff for use as cooling tower make-up?

Response #128 - The average annual rainfall in the project vicinity is about 12 inches. Stormwater flow from approximately 25 acres will pass through the stormwater detention pond. Assuming no percolation occurs in the non-paved areas, this corresponds to an average annual volume of only 25 acre-feet, about 0.6 percent of the IEEC's projected average annual demand. This minor volume of water is not considered significant enough to justify installing facilities to accommodate its use.

Collecting offsite watershed stormwater flow for use in the IEEC is not considered feasible for the following reasons:

- No facilities are currently contemplated for capturing, storing, and pumping offsite stormwater flow.
- Because of the large parcels of unpaved land upstream of the IEEC, the offsite stormwater is expected to have much higher levels of suspended solids than the EMWD recycled water, making it unsuitable as makeup for the cooling tower or other process uses without additional treatment. Adding treatment processes for such an intermittent flow would be technically challenging and not economic.
- Using offsite-generated stormwater within the IEEC could raise complicated water rights issues.

Request #129 - Please describe how process drainage sent to the oil/water separator and Holding Tank will be analyzed, before transfer to the cooling tower. Explain how the cooling tower and condensers would deal with significant oil or chemical spills.

Response #129 - Per the Applicant's notification of January 24, 2002, the projected filing date for this response is February 20, 2002.

Request #130 - Please describe the basis for sizing the Holding Tank, its capacity, and the ability (in number of hours or days of storage) to contain contaminated storm water if found to not be of suitable quality for discharge to the cooling tower.

Response #130 - Two in-line stormwater oil/water separators are shown in Figure 3.5-2, near the west end of the cooling tower. The intent of these oil/water separators is to prevent oil and grease from being discharged offsite along with the stormwater. The potential source of oil and grease would be that originating in the facility parking areas and paved roads. The oil/water separators will be sized during final design. They will be designed to remove oil and grease from the stormwater, not contain contaminated stormwater. Stormwater will be discharged offsite from the discharge of the detention basin at the southwest corner of the site. Stormwater will not be discharged to the cooling tower, with exception of that which is collected in the plant process drain system.

Request #131 - Please describe any other potentially polluting materials (other than oil) that may come in contact with storm water, and the Post Construction BMPs (PCBMPs) that will be employed to remove the pollutants prior to discharge.

Response #131 - Per the Applicant's notification of January 24, 2002, the projected filing date for this response is March 13, 2002.

Request #132 - Please identify and describe the proposed disposal site for debris and large rocks, or provide guidelines for selecting an appropriate site, with examples of sites that would be considered appropriate

Response #132 - The disposal sites for construction related debris, including large rocks, is identified in AFC Section 5.13, Table 5.13-2. These sites are as follows:

- Lamb Canyon Landfill — Beaumont, CA.
- Badlands Landfill — Moreno Valley, CA.
- El Sobrante Landfill — Corona, CA.

Each of these facilities was re-contacted on 1-21-02 to confirm the ability of the landfill to accept construction debris (including large rocks). All of the above noted facilities will accept construction debris and large rocks. Oversized items, such as large rocks, may be subject to an additional disposal cost based on established rates for such items currently in effect. Contacts for the facilities are as follows:

Riverside County Dept. of Waste Management (Lamb Canyon and Badlands)
Yvonne Beingesser
1995 Market St.
Riverside, Ca. 92501
(909) 955-1370

El Sobrante Landfill (USA Waste Services, Inc.)
10910 Dawson Canyon
Corona, CA. 92883
(909) 277-1740
(Contact would not give name)

Request #133 - Please define how a chlorine residual can be maintained in the Fire Water Storage Tank if there is no make-up flow.

Response #133 - The Applicant is not aware of requirements that would require a chlorine residual be maintained in the fire water storage tank. Since the fire water tank will be an enclosed tank and the makeup to the tank will be from EMWD's potable water distribution system, there should be little potential for biological growth. Nonetheless, in the event that biological growth is determined to be a concern, an additional sodium hypochlorite feed point could be added to the tank return line allowing sodium hypochlorite to be injected during routine testing of the fire pumps.