APPENDIX F
PRELIMINARY DRAINAGE CALCULATIONS

CH2MHILL

CALCULATION SUMMARY & CONTROL SHEET

CALCULATION SET NO. 1

PRELIM.	FINAL	VOID	REVISION
X			B

Sheet 1 of 1

CLIENT: *MARSH LANDING GENERATING STATION*

Discipline *CIVIL*

PROJECT TITLE: *MIRANT*

Project No. *361690*

SUBJECT: *STORM DRAINAGE CALCULATIONS*

COMPLETED BY: *DAWN L. HATHAWAY* DATE: *4/21/2008*

CHECKED BY: *JOHN PURDY, P.E.* DATE: 5/1/2008

APPROVED BY: *MARIO SCACCO, P.E.* DATE: 5/1/08

REVISION SUMMARY:
Runs 2 and 5 revised

TOTAL NUMBER OF SHEETS IN THIS ISSUE: 42

SHEETS REVISED, ADDED, or DELETED: 14

PROBLEM STATEMENT: *PRELIMINARY DRAINAGE STUDY OF PEAK FLOWS TO STUCTURES FOR 25-YEAR AND 10 YEAR STORMS PER DESIGN BASIS CRITERIA.*

RESULTS & CONCLUSIONS: *SEE ATTACHMENTS FOR RESULTS.*

DESIGN BASIS & ASSUMPTIONS: *HYDROLOGY CALCULATION BASED ON 25-YEAR AND 100-YEAR STORM EVENTS*

UNVERIFIED ASSUMPTIONS/OPEN ITEMS:

REFERENCES: *INCLUDED WITH CALCULATIONS*

ATTACHMENTS (Including number of pages):

COMPUTER PROGRAM DISCLOSURE INFORMATION:

Program Used	Rev No./	CH2M Verified	Remarks/Number of Pages
SCS (NRCS) TR-55	Issue Date 12/2/2004	X Yes ___ No	

CHECKED BY: _____ DATE: _____

RUN BY: _____ DATE: _____

Marsh Landing Drainage Calculation 4/21/08

The Marsh Landing Generating Station Drainage Calculation considers a tributary drainage area of 32.3 acres. Of which 27 acres will be disturbed during project construction.

Existing site conditions consist of an industrial facility made up of approximately 82% impermeable surfacing.

The proposed power generating station finished site condition will approximately be 50% impervious.

Clean storm water will be conveyed by a system of ditches, swales, catch basins and pipes to the Outfall 001 located on the north end of the site. Areas of potential oil/chemical contamination will be contained within concrete curbs. Storm water contained within the containment will be conveyed to an on-site oil water separator.

Calculation Assumptions as follows:

- Calculation Method – SCS TR-55
- Total Tributary Area – 31.3 Acres
- Rainfall Distribution Type – Type 1A
- Hydrologic Soil Group – A (see NRCS Soil Map attached)
- Curve Number – 81 (Urban Industrial)

MIRANT

Marsh Landing Generating Station Site (Antioch) Rev B

25yr-24hr Storm

SUB-AREA	FLOW (cfs)
CC1	0.66
CC2	0.46
CC3	0.25
CC4	0.38
CC5	0.54
CC6	0.45
CC7	0.22
CC8	0.20
CC9	0.22
CC10	0.21
CC11	0.33
CC12	0.25
CC13	0.33
CC14	0.31
CC15	1.05
CC16	0.54
CC17	0.44
CC18	0.62
CC19	0.44
CC20	0.44

TOTAL AREA	TOTAL FLOW
31.30 acres	8.58 cfs

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MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC1	0.09	0.27	0.48	0.66	0.84	0.97
CC2	0.07	0.19	0.33	0.46	0.58	0.68
CC3	.00	0.10	0.18	0.25	0.32	0.37
CC4	0.05	0.15	0.27	0.38	0.48	0.55
REACHES						
OUTLET	0.21	0.71	1.26	1.76	2.22	2.56

MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC1	2.44	0.137	81	Outlet	Northern
CC2	1.69	0.100	81	Outlet	SouthWest
CC3	.92	0.100	81	Outlet	Center
CC4	1.39	0.114	81	Outlet	SouthWest

Total Area: 6.44 (ac)

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MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimater (ft)	Velocity (ft/sec)	Travel Time (hr)
CC1							
SHEET	100	0.0412	0.011				0.022
SHALLOW	47	0.0412	0.050				0.004
CHANNEL	589	0.0050	0.020	1.32	8.88	1.474	0.111
					Time of Concentration		.137
CC2							
SHEET	100	0.0600	0.011				0.019
SHALLOW	193	0.0168	0.050				0.026
					Time of Concentration		0.1
CC3							
SHEET	100	0.0318	0.011				0.025
SHALLOW	60	0.0412	0.050				0.005
SHALLOW	140	0.0089	0.050				0.026
					Time of Concentration		0.1
CC4							
SHEET	100	0.0075	0.011				0.044
SHALLOW	219	0.0091	0.050				0.040
CHANNEL	158	0.0050	0.020	1.32	8.88	1.463	0.030
					Time of Concentration		.114

MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC1	Industrial	A	2.44	81
	Total Area / Weighted Curve Number		2.44	81
			====	==
CC2	Industrial	A	1.69	81
	Total Area / Weighted Curve Number		1.69	81
			====	==
CC3	Industrial	A	.92	81
	Total Area / Weighted Curve Number		.92	81
			===	==
CC4	Industrial	A	1.39	81
	Total Area / Weighted Curve Number		1.39	81
			====	==

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT - 361690
SubTitle: Contr Costa Power Plant (1 OF 5)
State: California
County: Contra Costa
Filename: C:\Documents and Settings\dhathawa\Application Data\WinTR-55\MIRANT\Contra Costa Power Plant 1-5.w55

Date: 2/11/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC1	Northern	Outlet	2.44	81	.137
CC2	SouthWest	Outlet	1.69	81	0.1
CC3	Center	Outlet	0.92	81	0.1
CC4	SouthWest	Outlet	1.39	81	.114

Total area: 6.44 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

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MIRANT - 361690
Contr Costa Power Plant (1 OF 5)
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC1	0.09	0.27	0.48	0.66	0.84	0.97
	8.04	8.02	8.02	8.01	8.00	8.00
CC2	0.07	0.19	0.33	0.46	0.58	0.68
	8.02	8.02	8.01	8.01	7.94	7.94
CC3	.00	0.10	0.18	0.25	0.32	0.37
	n/a	8.02	8.01	8.01	7.94	7.94
CC4	0.05	0.15	0.27	0.38	0.48	0.55
	8.03	8.02	8.01	8.01	7.96	7.95
REACHES						
OUTLET	0.21	0.71	1.26	1.76	2.22	2.56

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC5	0.08	0.22	0.39	0.54	0.68	0.78
CC6	0.06	0.18	0.32	0.45	0.56	0.65
CC19	0.06	0.18	0.32	0.44	0.56	0.64
CC20	0.06	0.18	0.32	0.44	0.56	0.64
REACHES						
OUTLET	0.26	0.75	1.34	1.86	2.35	2.72

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT - 361690
SubTitle: Contra Costa Power Plant (2 OF 5) Rev2
State: California
County: Contra Costa
Filename: N:\Mirant\Structural\Civil\Contra-Costa\Calcs\Contra Costa Power Plant 2-5 Rev2.w55

Date: 4/21/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC5	West	Outlet	1.96	81	0.1
CC6	East	Outlet	1.63	81	0.1
CC19	south of CC5	Outlet	1.61	81	.124
CC20	south of CC6	Outlet	1.61	81	.128

Total area: 6.81 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC5	0.08	0.22	0.39	0.54	0.68	0.78
	8.02	8.02	8.01	8.01	7.94	7.94
CC6	0.06	0.18	0.32	0.45	0.56	0.65
	8.02	8.02	8.01	8.01	7.94	7.94
CC19	0.06	0.18	0.32	0.44	0.56	0.64
	8.04	8.02	8.01	8.01	8.00	7.96
CC20	0.06	0.18	0.32	0.44	0.56	0.64
	8.04	8.02	8.01	8.01	8.00	7.97
REACHES						
OUTLET	0.26	0.75	1.34	1.86	2.35	2.72

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC5	1.96	0.100	81	Outlet	West
CC6	1.63	0.100	81	Outlet	East
CC19	1.61	0.124	81	Outlet	south of CC5
CC20	1.61	0.128	81	Outlet	south of CC6

Total Area: 6.81 (ac)

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC5							
SHEET	100	0.0210	0.011				0.029
SHALLOW	130	0.0192	0.050				0.016
SHALLOW	174	0.0169	0.050				0.023
					Time of Concentration		0.1
CC6							
SHEET	100	0.0210	0.011				0.029
SHALLOW	209	0.0192	0.050				0.026
SHALLOW	168	0.0169	0.050				0.022
					Time of Concentration		0.1
CC19							
SHEET	100	0.0100	0.011				0.039
SHALLOW	83	0.0100	0.050				0.014
SHALLOW	292	0.0050	0.050				0.071
					Time of Concentration		.124
CC20							
SHEET	100	0.0100	0.011				0.039
SHALLOW	83	0.0100	0.050				0.014
SHALLOW	309	0.0050	0.050				0.075
					Time of Concentration		.128

MIRANT - 361690
Contra Costa Power Plant (2 OF 5) Rev2
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC5	Industrial	A	1.96	81
	Total Area / Weighted Curve Number		1.96	81
CC6	Industrial	A	1.63	81
	Total Area / Weighted Curve Number		1.63	81
CC19	Industrial	A	1.61	81
	Total Area / Weighted Curve Number		1.61	81
CC20	Industrial	A	1.61	81
	Total Area / Weighted Curve Number		1.61	81

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MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC7	.00	0.09	0.16	0.22	0.28	0.32
CC8	.00	0.08	0.14	0.20	0.25	0.29
CC9	.00	0.09	0.16	0.22	0.28	0.33
CC10	.00	0.08	0.15	0.21	0.26	0.30
REACHES						
OUTLET	.00	0.34	0.61	0.85	1.07	1.24

MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC7	.80	0.100	81	Outlet	Most West
CC8	.72	0.100	81	Outlet	West
CC9	.82	0.100	81	Outlet	East
CC10	.76	0.100	81	Outlet	Most East

Total Area: 3.10 (ac)

MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC7							
SHEET	100	0.0160	0.011				0.032
SHALLOW	148	0.0176	0.050				0.019
					Time of Concentration		0.1
CC8							
SHEET	100	0.0180	0.011				0.031
SHALLOW	158	0.0158	0.050				0.022
					Time of Concentration		0.1
CC9							
SHEET	100	0.0170	0.011				0.031
SHALLOW	121	0.0165	0.050				0.016
					Time of Concentration		0.1
CC10							
SHEET	100	0.0180	0.011				0.031
SHALLOW	119	0.0151	0.050				0.017
					Time of Concentration		0.1

MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC7	Industrial	A	.8	81
	Total Area / Weighted Curve Number		.8	81
			==	==
CC8	Industrial	A	.72	81
	Total Area / Weighted Curve Number		.72	81
			===	==
CC9	Industrial	A	.82	81
	Total Area / Weighted Curve Number		.82	81
			===	==
CC10	Industrial	A	.76	81
	Total Area / Weighted Curve Number		.76	81
			===	==

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT -361690
SubTitle: Contra Costa Power Plant (3 OF 5)
State: California
County: Contra Costa
Filename: C:\Documents and Settings\dhathawa\Application Data\WinTR-55\MIRANT\Contra Costa Power Plant 3-5.w55

Date: 2/11/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC7	Most West	Outlet	0.8	81	0.1
CC8	West	Outlet	0.72	81	0.1
CC9	East	Outlet	0.82	81	0.1
CC10	Most East	Outlet	0.76	81	0.1

Total area: 3.10 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

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MIRANT -361690
Contra Costa Power Plant (3 OF 5)
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC7	.00	0.09	0.16	0.22	0.28	0.32
	n/a	8.02	8.01	8.01	7.94	7.94
CC8	.00	0.08	0.14	0.20	0.25	0.29
	n/a	8.02	8.01	8.01	7.94	7.94
CC9	.00	0.09	0.16	0.22	0.28	0.33
	n/a	8.02	8.01	8.01	7.94	7.94
CC10	.00	0.08	0.15	0.21	0.26	0.30
	n/a	8.02	8.01	8.01	7.94	7.94
REACHES						
OUTLET	.00	0.34	0.61	0.85	1.07	1.24

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MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC11	.00	0.13	0.24	0.33	0.42	0.48
CC12	.00	0.10	0.18	0.25	0.31	0.36
CC13	.00	0.14	0.24	0.33	0.42	0.49
CC14	.00	0.13	0.22	0.31	0.39	0.46
CC15	0.14	0.41	0.75	1.05	1.34	1.55
REACHES						
OUTLET	0.14	0.91	1.63	2.28	2.88	3.32

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC11	1.20	0.100	81	Outlet	Most West
CC12	.91	0.100	81	Outlet	West
CC13	1.22	0.100	81	Outlet	East
CC14	1.14	0.100	81	Outlet	Most East
CC15	3.95	0.209	81	Outlet	South

Total Area: 8.42 (ac)

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Manningas's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC11							
SHEET	100	0.0150	0.011				0.033
SHALLOW	201	0.0129	1.5				0.030
					Time of Concentration		0.1
CC12							
SHEET	100	0.0150	0.011				0.033
SHALLOW	201	0.0129	1.5				0.030
					Time of Concentration		0.1
CC13							
SHEET	100	0.0160	0.011				0.032
SHALLOW	190	0.0126	1.5				0.029
					Time of Concentration		0.1
CC14							
SHEET	100	0.0150	0.011				0.033
SHALLOW	204	0.0108	1.5				0.034
					Time of Concentration		0.1
CC15							
SHEET	100	0.0025	0.011				0.068
SHALLOW	189	0.0048	1.5				0.047
CHANNEL	498	0.0050	0.020	1.32	8.88	1.472	0.094
					Time of Concentration		.209

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC11	Industrial	A	1.2	81
	Total Area / Weighted Curve Number		1.2	81
			===	==
CC12	Industrial	A	.91	81
	Total Area / Weighted Curve Number		.91	81
			===	==
CC13	Industrial	A	1.22	81
	Total Area / Weighted Curve Number		1.22	81
			====	==
CC14	Industrial	A	1.14	81
	Total Area / Weighted Curve Number		1.14	81
			====	==
CC15	Industrial	A	3.95	81
	Total Area / Weighted Curve Number		3.95	81
			====	==

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT - 361690
SubTitle: Contra Costa Power Plant (4 OF 5)
State: California
County: Contra Costa
Filename: C:\Documents and Settings\dbathawa\Application Data\WinTR-55\MIRANT\Contra Costa Power Plant 4-5.w55

Date: 2/11/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC11	Most West	Outlet	1.2	81	0.1
CC12	West	Outlet	0.91	81	0.1
CC13	East	Outlet	1.22	81	0.1
CC14	Most East	Outlet	1.14	81	0.1
CC15	South	Outlet	3.95	81	.209

Total area: 8.42 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

CH2MHILL

MIRANT - 361690
Contra Costa Power Plant (4 OF 5)
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC11	.00	0.13	0.24	0.33	0.42	0.48
	n/a	8.02	8.01	8.01	7.94	7.94
CC12	.00	0.10	0.18	0.25	0.31	0.36
	n/a	8.02	8.01	8.01	7.94	7.94
CC13	.00	0.14	0.24	0.33	0.42	0.49
	n/a	8.02	8.01	8.01	7.94	7.94
CC14	.00	0.13	0.22	0.31	0.39	0.46
	n/a	8.02	8.01	8.01	7.94	7.94
CC15	0.14	0.41	0.75	1.05	1.34	1.55
	8.08	8.05	8.04	8.03	8.03	8.03
REACHES						
OUTLET	0.14	0.91	1.63	2.28	2.88	3.32

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

WinTR-55 Current Data Description

--- Identification Data ---

User: CH2MHILL
Project: MIRANT - 361690
SubTitle: Contra Costa Power Plant (5 OF 5) Rev 2
State: California
County: Contra Costa
Filename: N:\Mirant\Structural\Civil\Contra-Costa\Calcs\Contra Costa Power Plant 5-5 Rev2.w55

Date: 4/21/2008
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
CC16	southeast	Outlet	1.96	81	0.1
CC17	north of CC16	Outlet	1.61	81	.134
CC18	north of CC16	Outlet	2.27	81	.137

Total area: 5.84 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	-Yr (in)
1.5	2.0	2.5	2.9	3.25	3.5	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS						
CC16	0.08	0.22	0.39	0.54	0.68	0.78
	8.02	8.02	8.01	8.01	7.94	7.94
CC17	0.06	0.18	0.32	0.44	0.56	0.64
	8.04	8.02	8.01	8.01	8.01	8.00
CC18	0.09	0.25	0.44	0.62	0.78	0.90
	8.04	8.02	8.02	8.01	8.00	8.00
REACHES						
OUTLET	0.22	0.64	1.15	1.60	2.01	2.32

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
CC16	1.96	0.100	81	Outlet	southeast
CC17	1.61	0.134	81	Outlet	north of CC16
CC18	2.27	0.137	81	Outlet	north of CC16

Total Area: 5.84 (ac)

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
CC16							
SHEET	100	0.0100	0.011				0.039
SHALLOW	282	0.0100	0.050				0.049
					Time of Concentration		0.1
CC17							
SHEET	100	0.0100	0.011				0.039
SHALLOW	164	0.0100	0.050				0.028
SHALLOW	277	0.0050	0.050				0.067
					Time of Concentration		.134
CC18							
SHEET	100	0.0100	0.011				0.039
SHALLOW	164	0.0100	0.050				0.028
SHALLOW	289	0.0050	0.050				0.070
					Time of Concentration		.137

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
CC16	Industrial	A	1.96	81
	Total Area / Weighted Curve Number		1.96	81
			====	==
CC17	Industrial	A	1.61	81
	Total Area / Weighted Curve Number		1.61	81
			====	==
CC18	Industrial	A	2.27	81
	Total Area / Weighted Curve Number		2.27	81
			====	==

MIRANT - 361690
Contra Costa Power Plant (5 OF 5) Rev 2
Contra Costa County, California

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
CC16	0.08	0.22	0.39	0.54	0.68	0.78
CC17	0.06	0.18	0.32	0.44	0.56	0.64
CC18	0.09	0.25	0.44	0.62	0.78	0.90
REACHES						
OUTLET	0.22	0.64	1.15	1.60	2.01	2.32

Hydrologic Soil Group

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
455786	DELHI SAND, 2 TO 9 PERCENT SLOPES	A	632.4	59.2%
455804	JOICE MUCK	D	9.9	0.9%
455866	URBAN LAND		49.6	4.6%
455872	WATER		282.4	26.4%
461894	Fluvaquents, 0 to 2 percent slopes, frequently flooded	D	1.4	0.1%
461988	Xeropsamments, 1 to 15 percent slopes	A	9.8	0.9%
461991	Water		82.6	7.7%
Totals for Area of Interest (AOI)			1,068.1	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower