PVNGS

Palo Verde Nuclear Generating Station
Units 1, 2, and 3

Updated Final Safety Analysis Report Figures

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Date: 2017.07.13 11:01:23 -07'00'

Revision 19 Corrected

Redacted per RIS 2015-17

July 2017

PaloVerde™
GENERATING STATION

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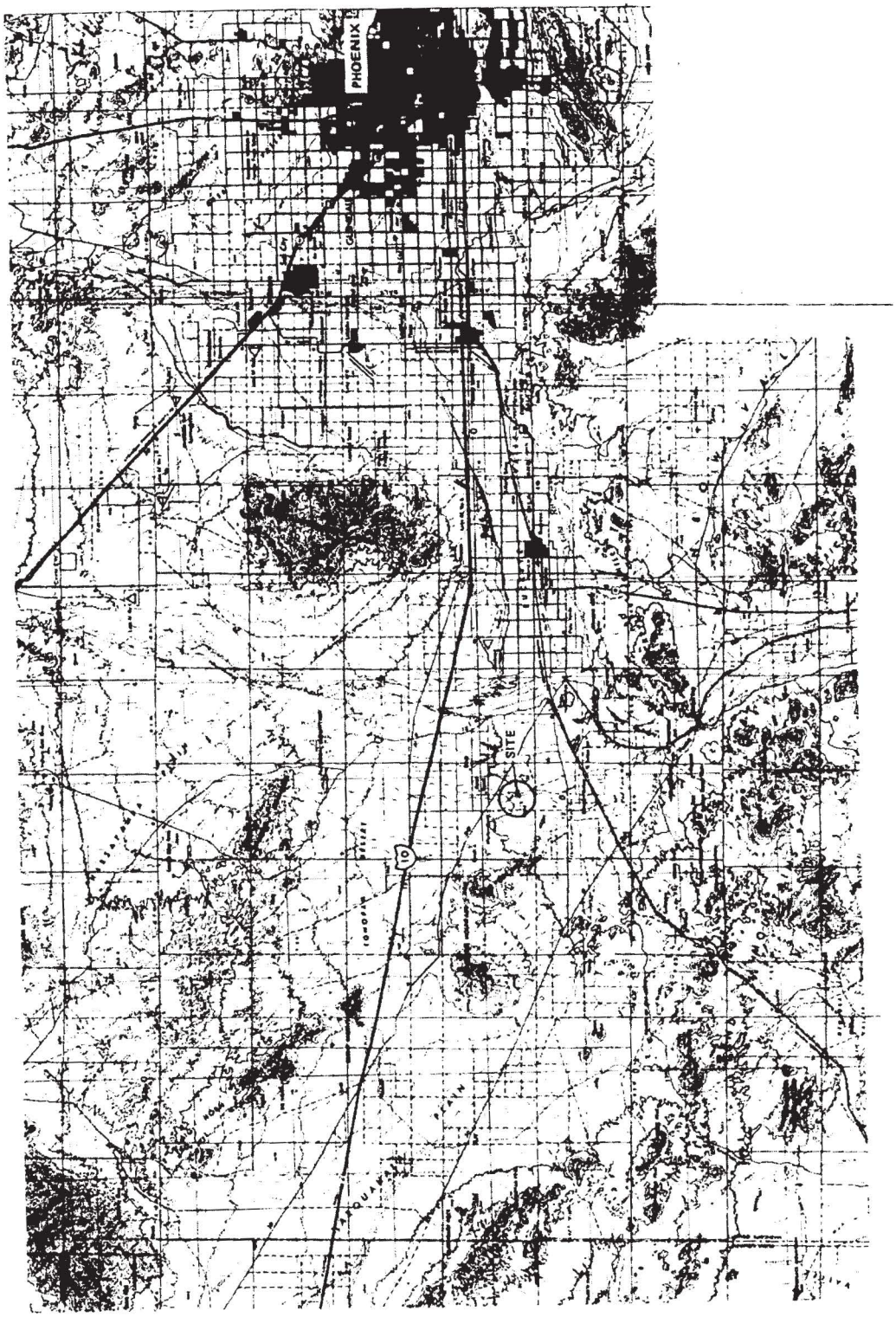
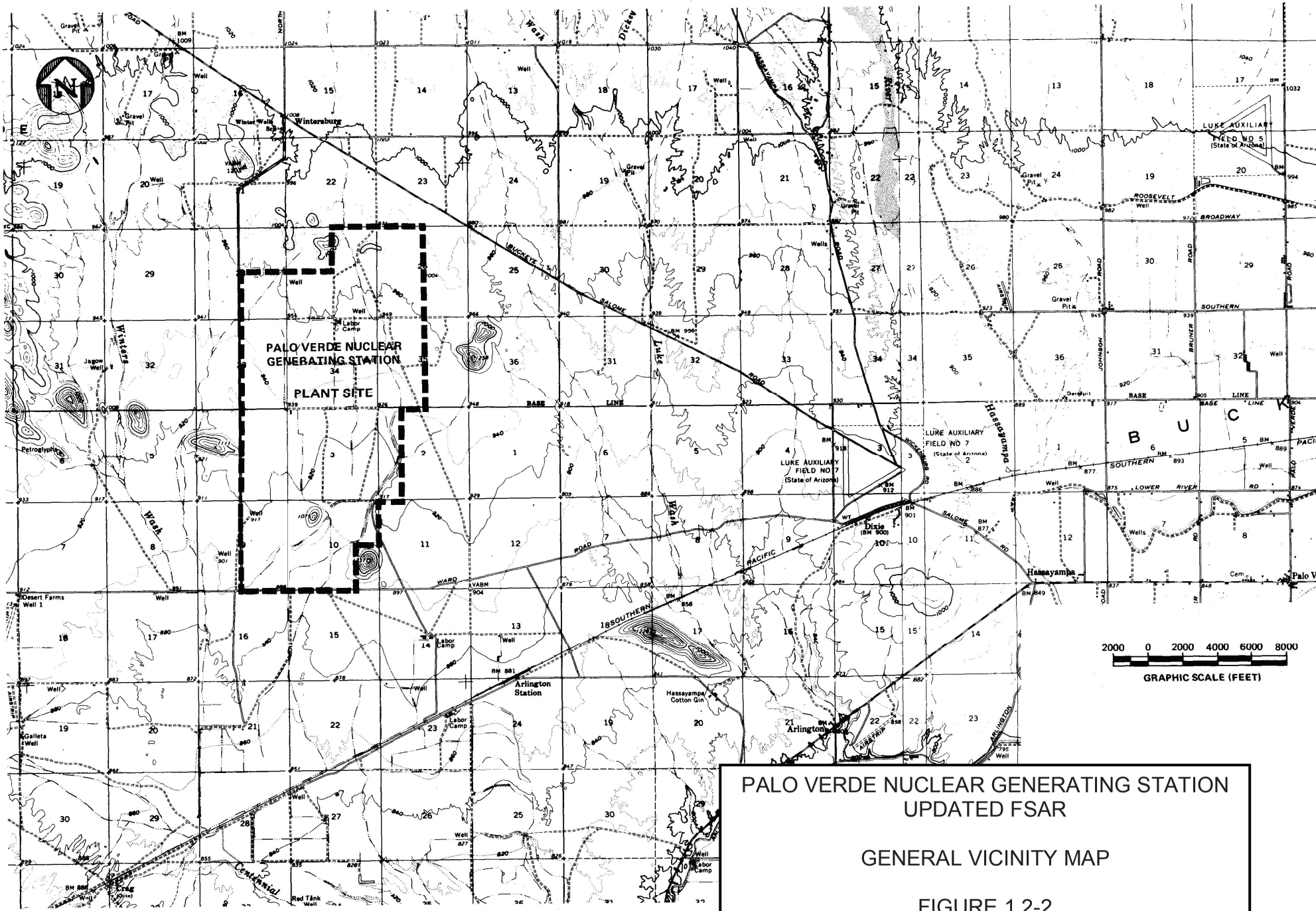


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR
SITE LOCATION

FIGURE 1.2-1

JUNE 2001 REVISION 11

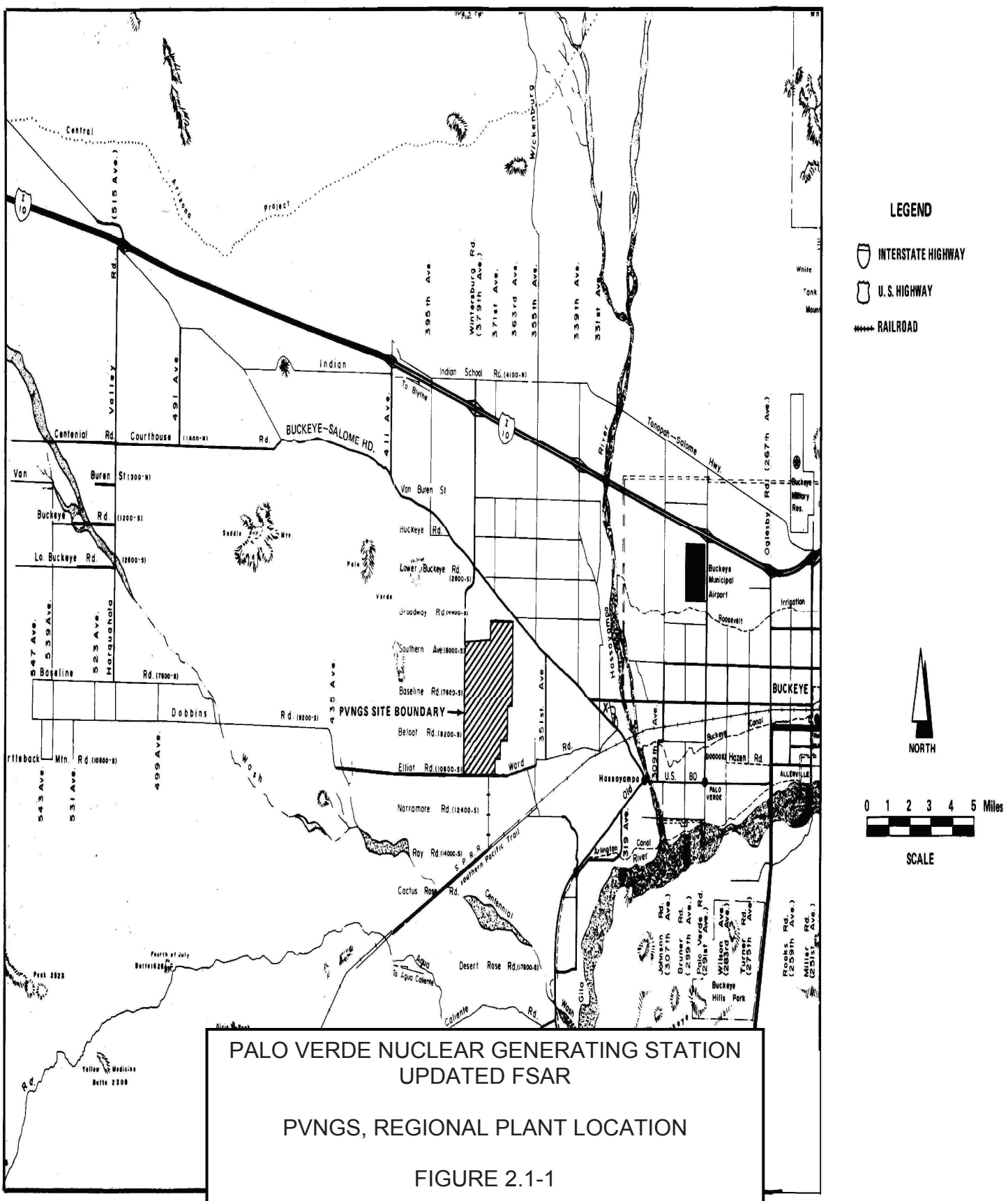


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

GENERAL VICINITY MAP

FIGURE 1.2-2

JUNE 2009 REVISION 15



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PVNGS, REGIONAL PLANT LOCATION

FIGURE 2.1-1

JUNE 2009 REVISION 15

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

IMMEDIATE ENVIRON OF PALO VERDE SITE

FIGURE 2.1-2

JUNE 2001 REVISION 11

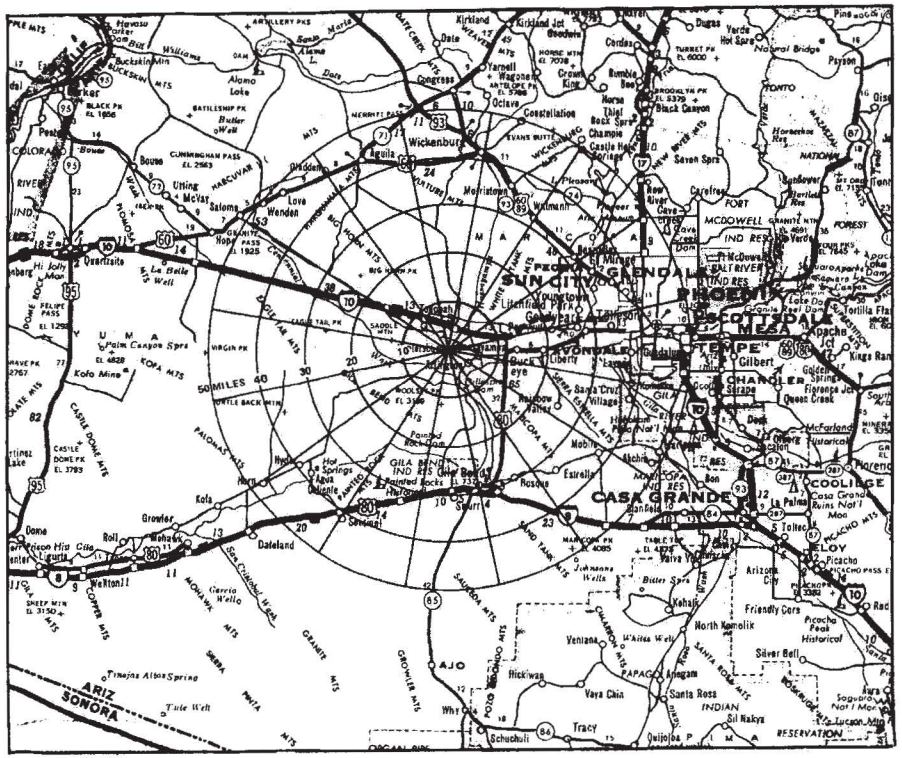
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

GENERAL ENVIRONS OF PALO VERDE SITE

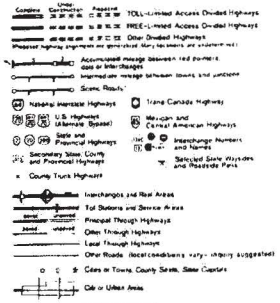
FIGURE 2.1-3

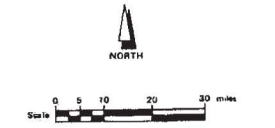
JUNE 2001

REVISION 11



EXPLANATION OF MAP SYMBOLS

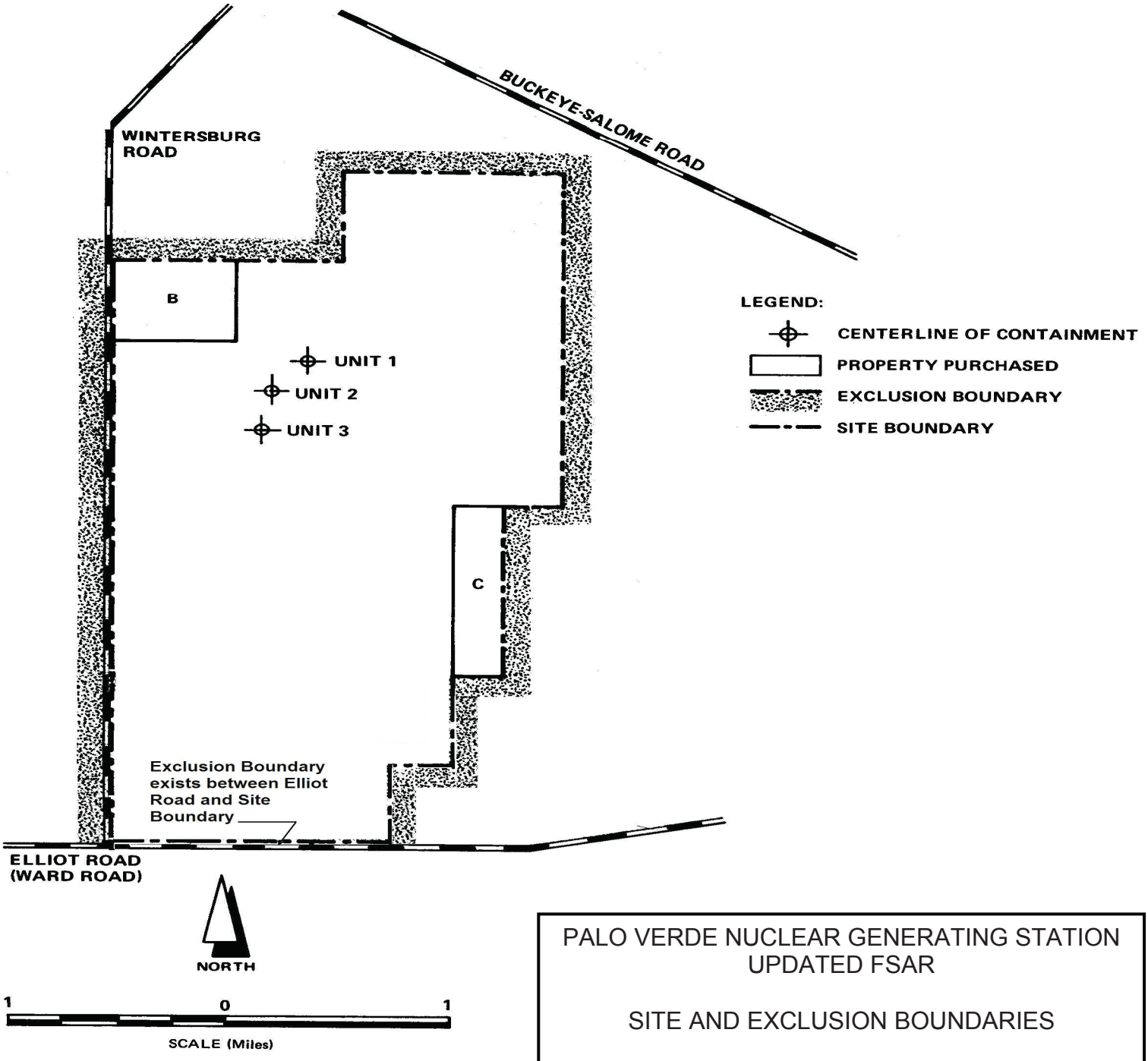




Palo Verde Nuclear Generating Station
Updated FSAR

GENERAL ENVIRONS OF
PALO VERDE SITE

Figure 2.1-3



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

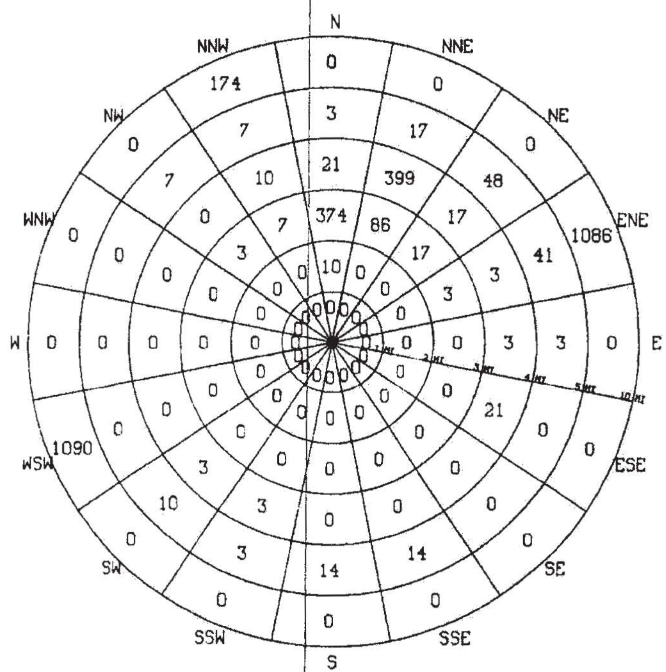
SITE AND EXCLUSION BOUNDARIES

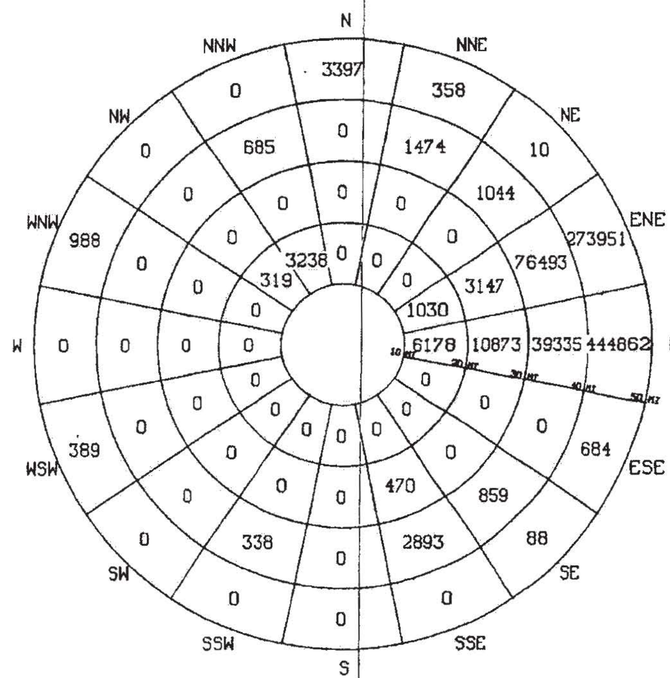
FIGURE 2.1-4

JUNE 2009 REVISION 15

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	10	490	480	167	2,350	3,497

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	10,765	14,490	123,121	724,727	873,103





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

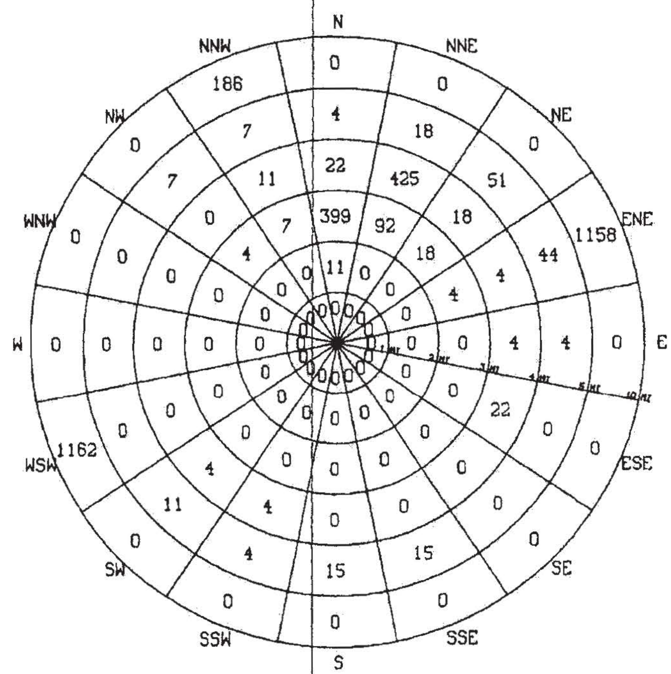
POPULATION DISTRIBUTION – 1978
PALO VERDE SITE, 0 to 50 MILES

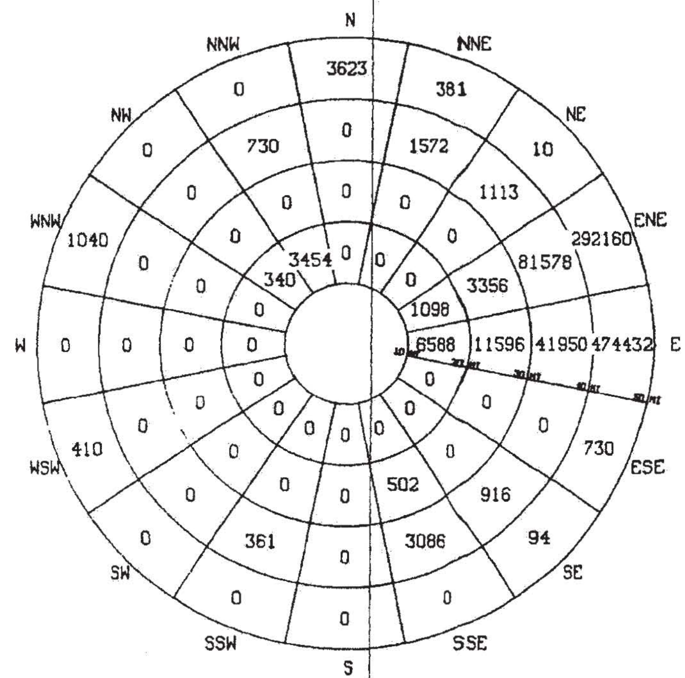
FIGURE 2.1-5

JUNE 2001 REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	11	524	514	180	2,506	3,735

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	11,480	15,454	131,306	772,880	931,120





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

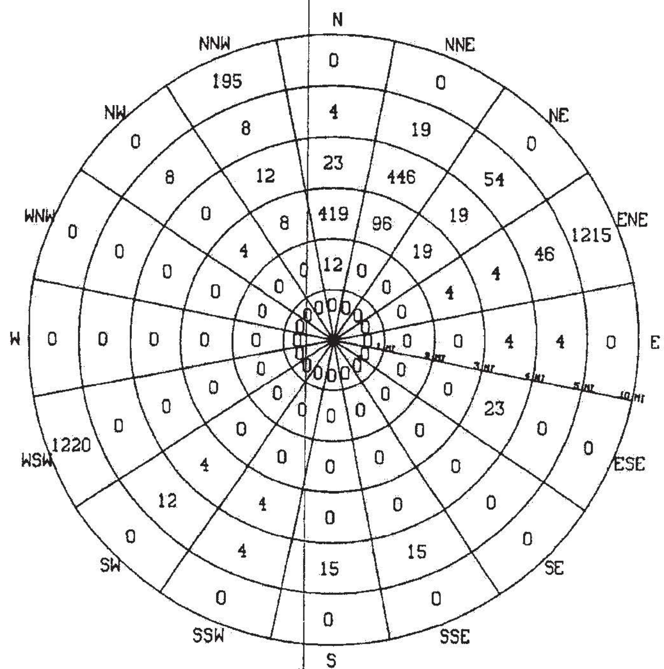
POPULATION DISTRIBUTION -- 1980
PALO VERDE SITE, 0 to 50 MILES

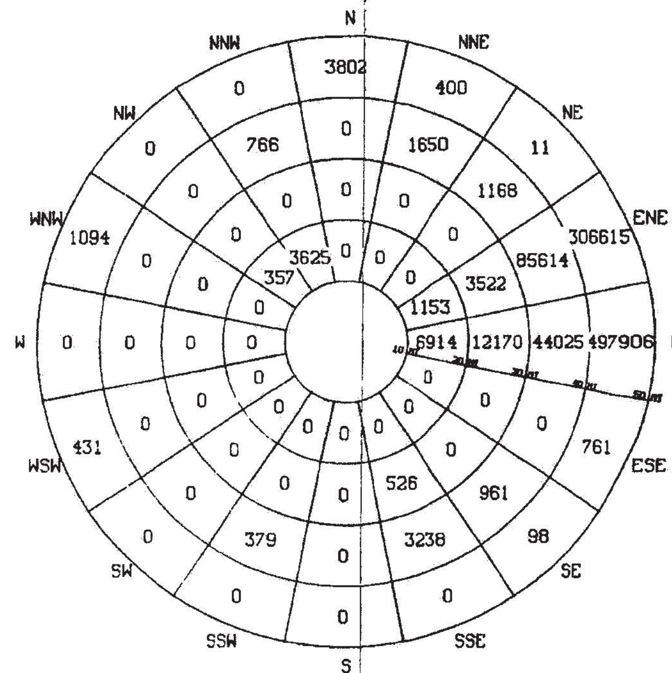
FIGURE 2.1-6

JUNE 2001 REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	12	560	639	189	2,630	3,920

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	12,049	16,218	137,801	811,118	977,186





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

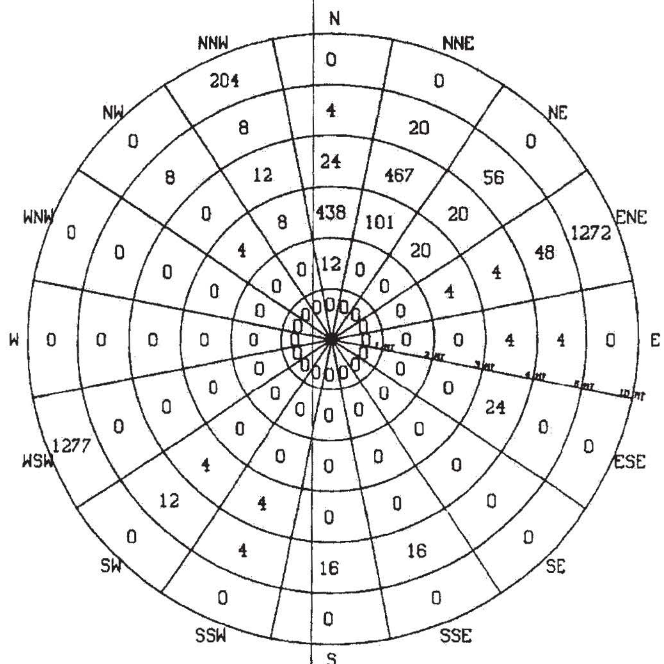
POPULATION DISTRIBUTION -- 1982
PALO VERDE SITE, 0 to 50 MILES

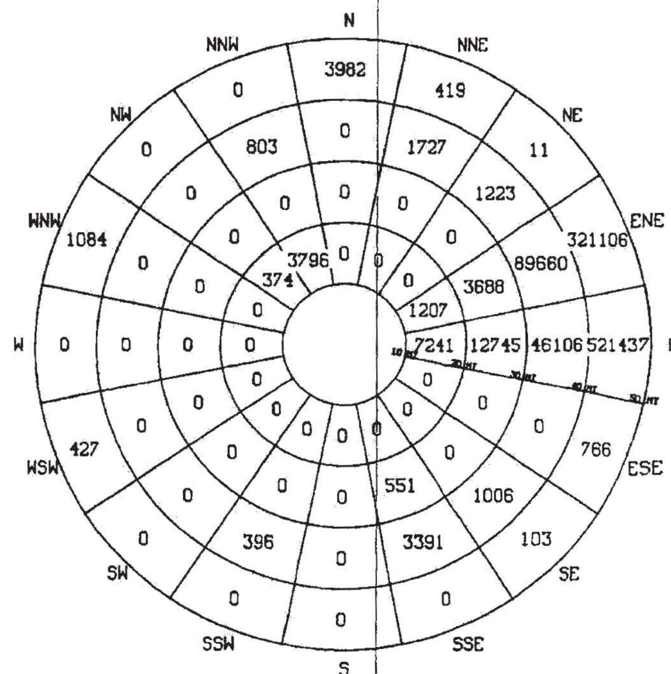
FIGURE 2.1-7

JUNE 2001 REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	12	576	563	196	2,753	4,099

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	12,618	16,984	144,312	849,335	1,023,249





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

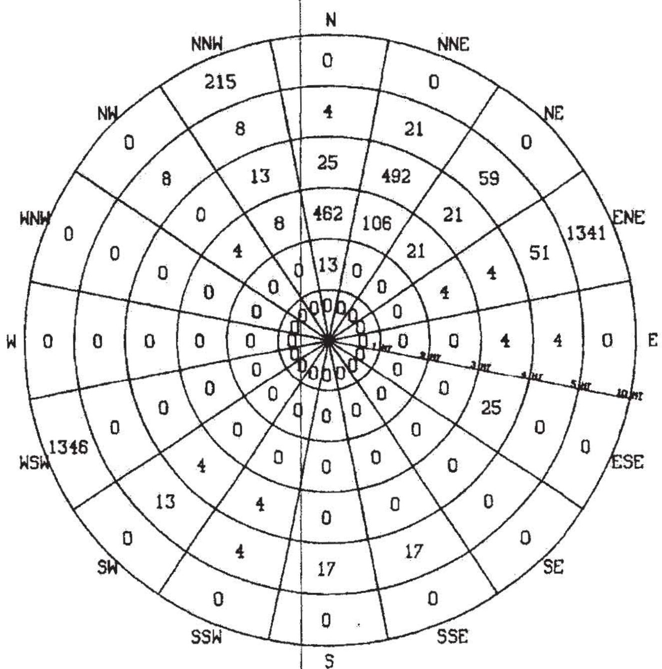
POPULATION DISTRIBUTION -- 1984
PALO VERDE SITE, 0 to 50 MILES

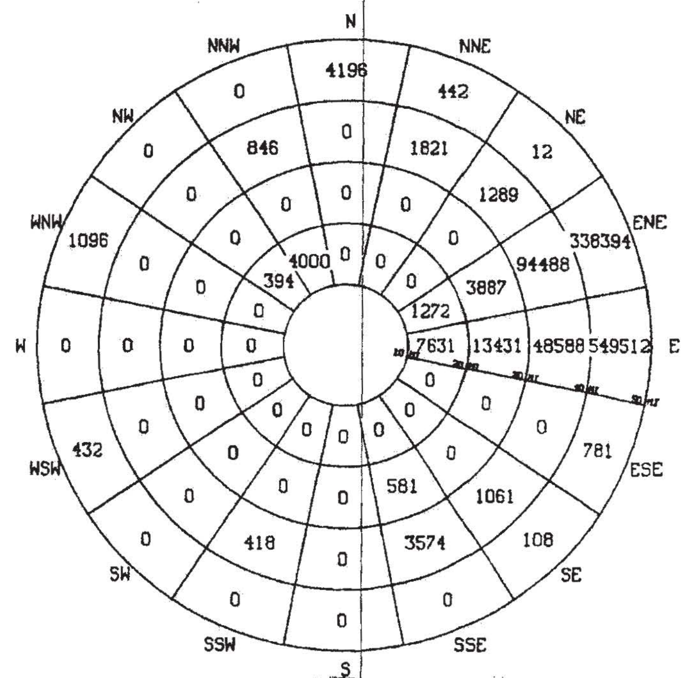
FIGURE 2.1-8

JUNE 2001 REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	13	605	692	206	2,902	4,318

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	13,297	17,899	152,085	894,973	1,078,264





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

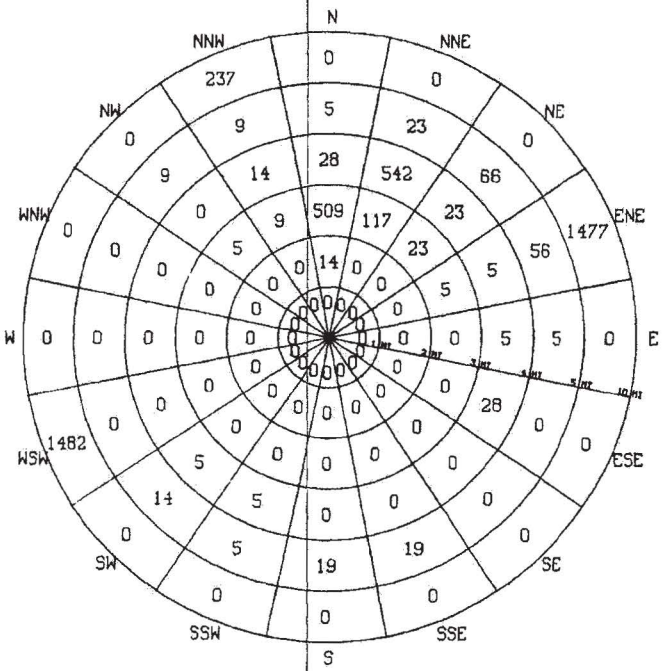
POPULATION DISTRIBUTION -- 1986
PALO VERDE SITE, 0 to 50 MILES

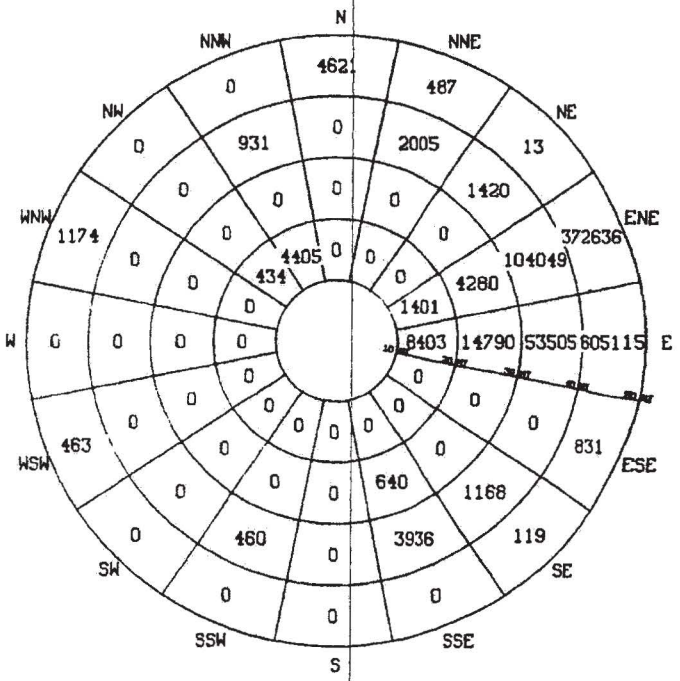
FIGURE 2.1-9

JUNE 2001 REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	14	668	655	230	3,196	4,763

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	14,643	18,710	167,474	985,459	1,187,286





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

POPULATION DISTRIBUTION -- 1990
PALO VERDE SITE, 0 to 50 MILES

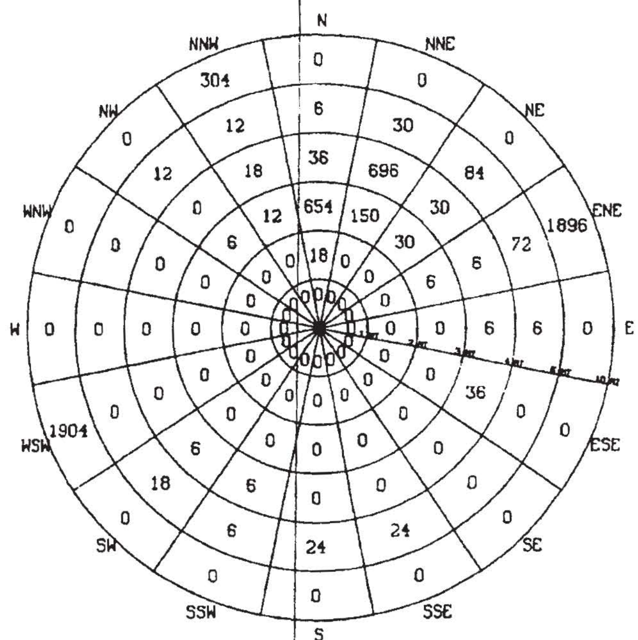
FIGURE 2.1-10

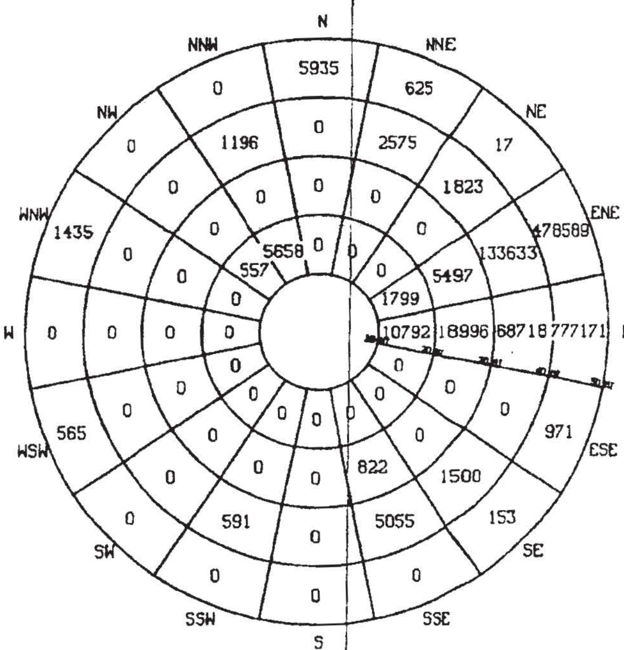
JUNE 2001

REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	18	858	840	294	4,104	6,114

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	18,806	25,315	215,091	1,265,461	1,524,873





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

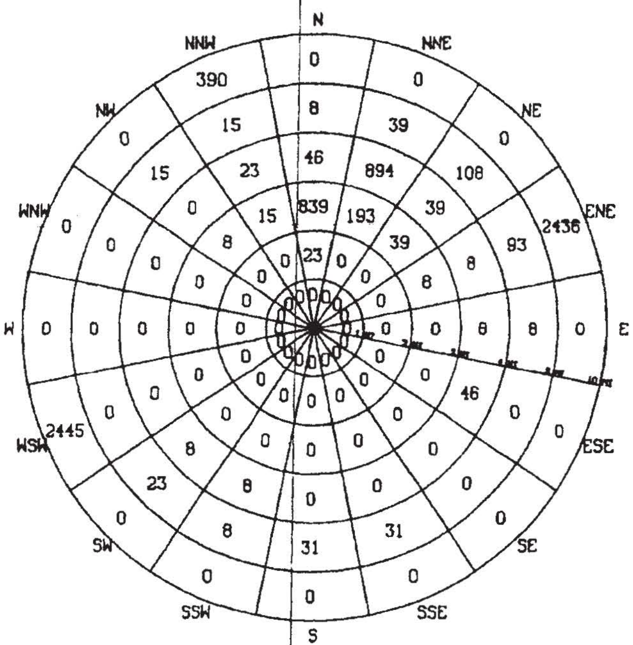
POPULATION DISTRIBUTION -- 2000
PALO VERDE SITE, 0 to 50 MILES

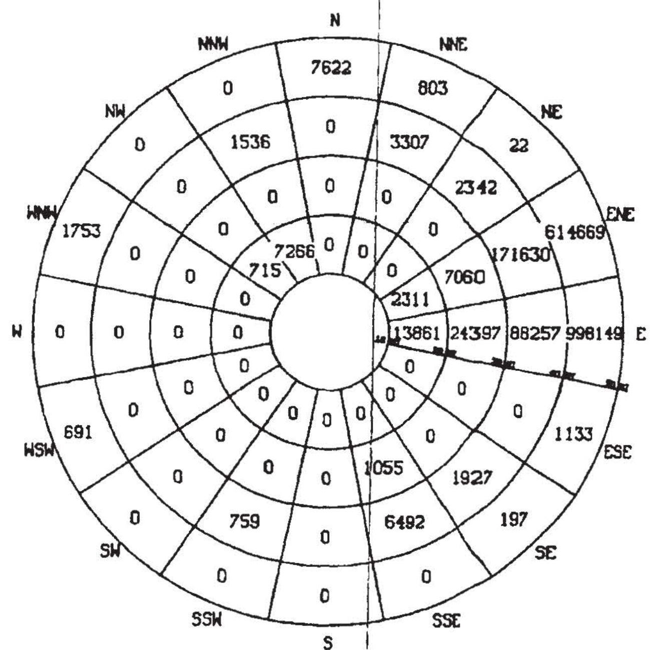
FIGURE 2.1-11

JUNE 2001 REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	23	1,102	1,080	379	5,271	7,855

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	24,153	32,612	276,250	1,626,039	1,957,954





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

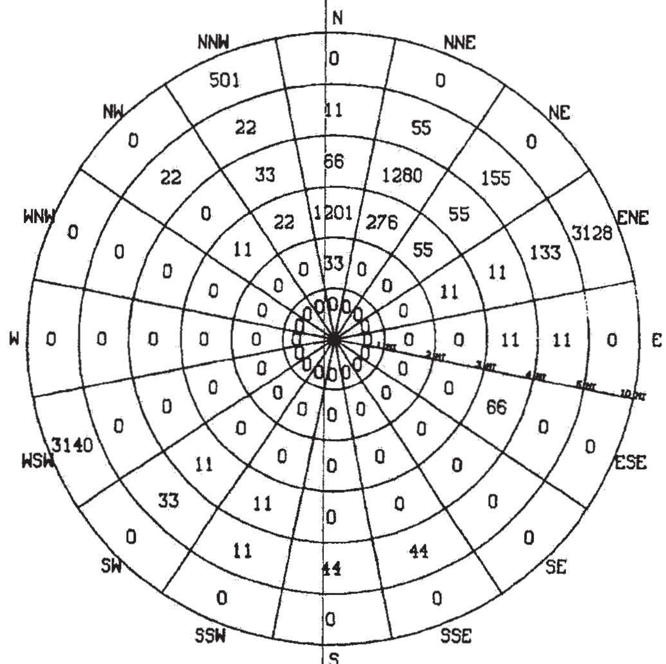
POPULATION DISTRIBUTION -- 2010
PALO VERDE SITE, 0 to 50 MILES

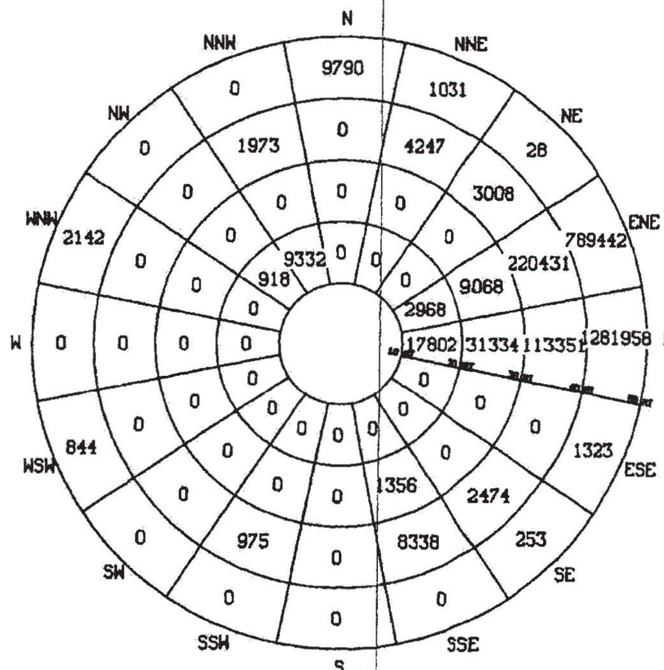
FIGURE 2.1-12

JUNE 2001 REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	33	1,576	1,544	541	6,769	10,463

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	31,020	41,758	354,797	2,086,811	2,514,386





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

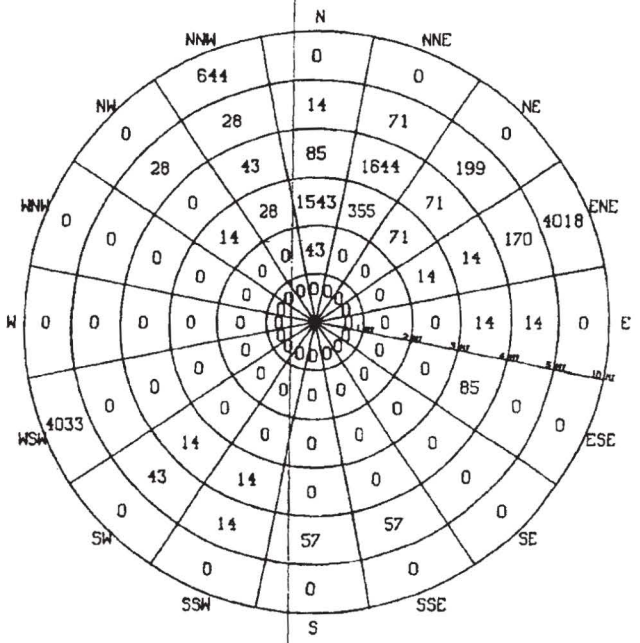
POPULATION DISTRIBUTION -- 2020
PALO VERDE SITE, 0 to 50 MILES

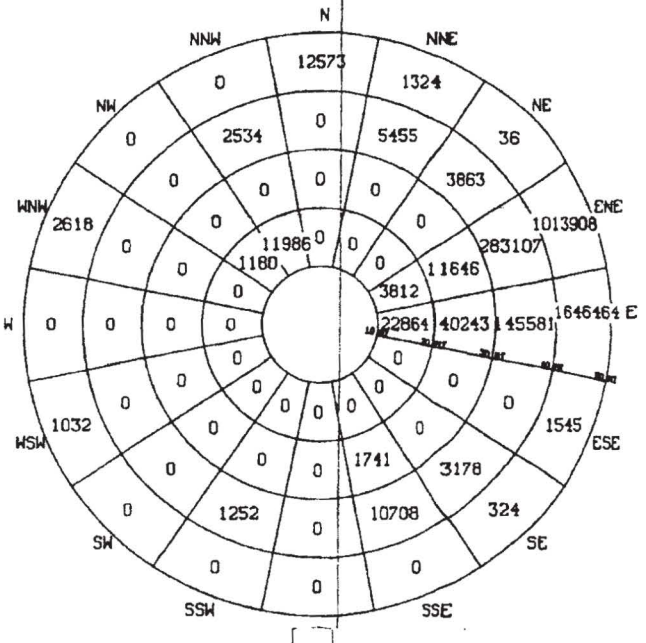
FIGURE 2.1-13

JUNE 2001 REVISION 11

Annulus (miles)	0-1	1-2	2-3	3-4	4-5	5-10	0-10
Population	0	43	2,026	1,984	695	8,695	13,442

Annulus (miles)	10-20	20-30	30-40	40-50	10-50
Population	39,842	53,830	456,678	2,879,824	3,228,974





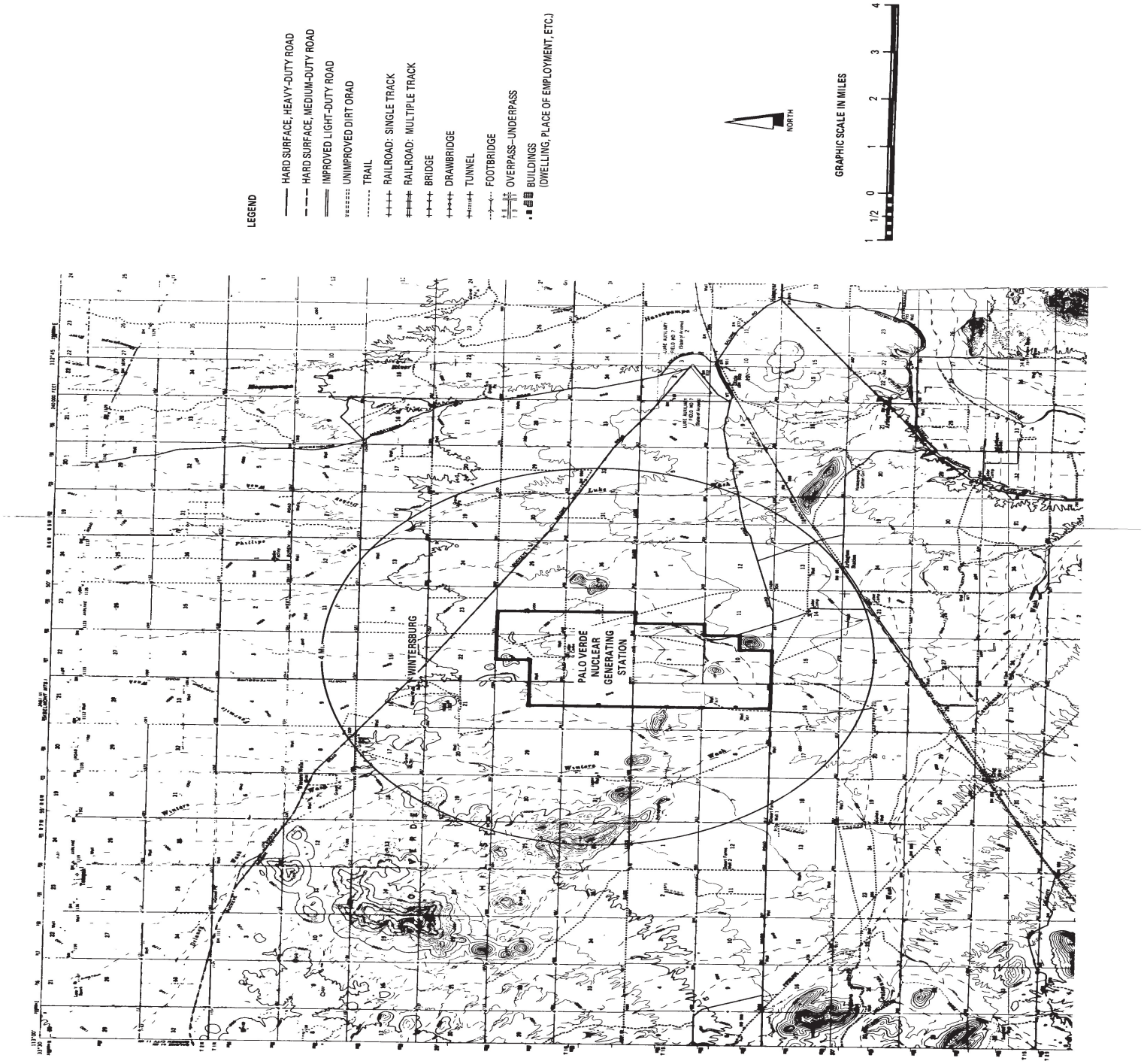
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

POPULATION DISTRIBUTION -- 2030
PALO VERDE SITE, 0 to 50 MILES

FIGURE 2.1-14

JUNE 2001

REVISION 11

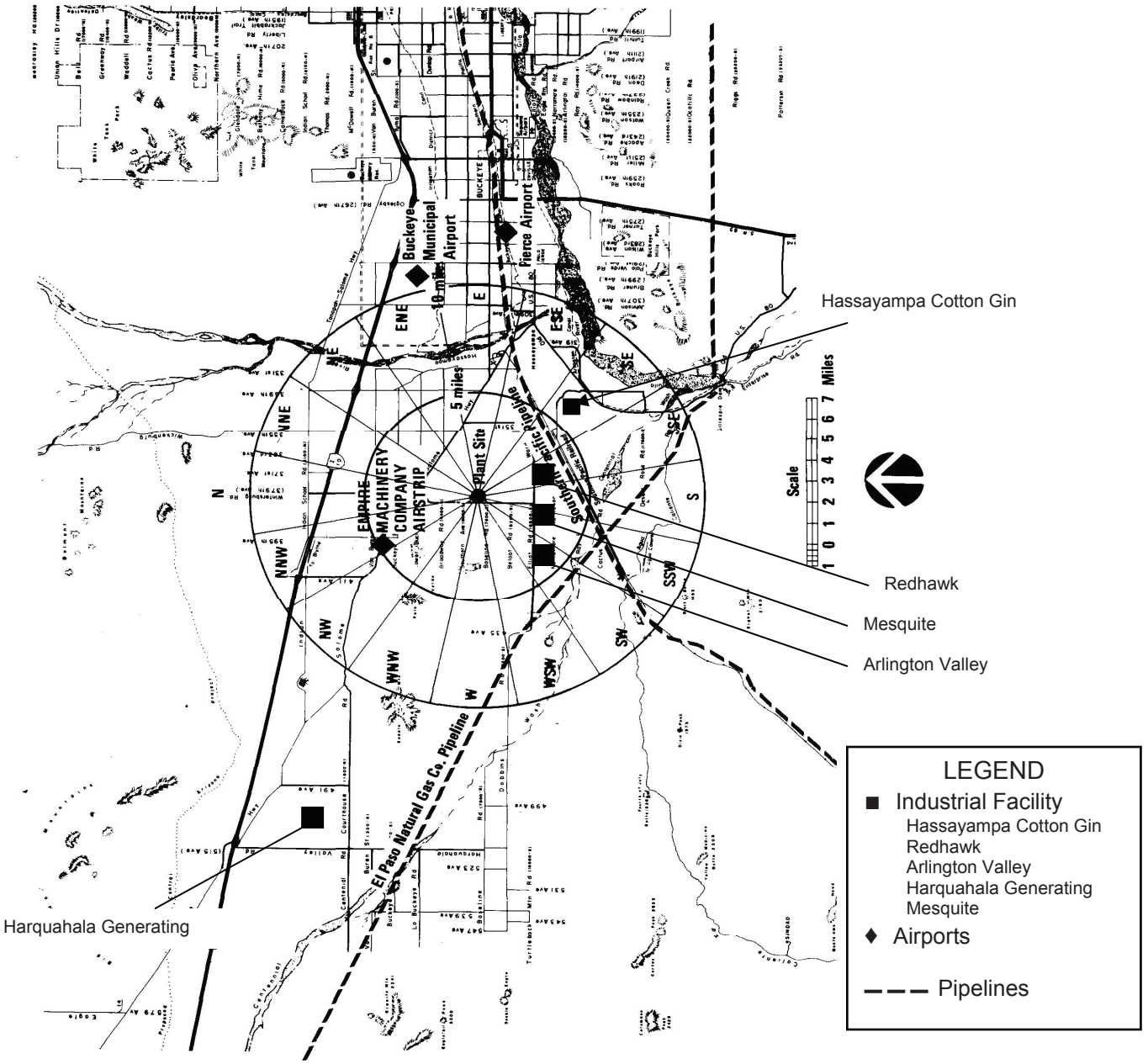


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

LOW POPULATION ZONE

FIGURE 2.1-15

JUNE 2009 REVISION 15

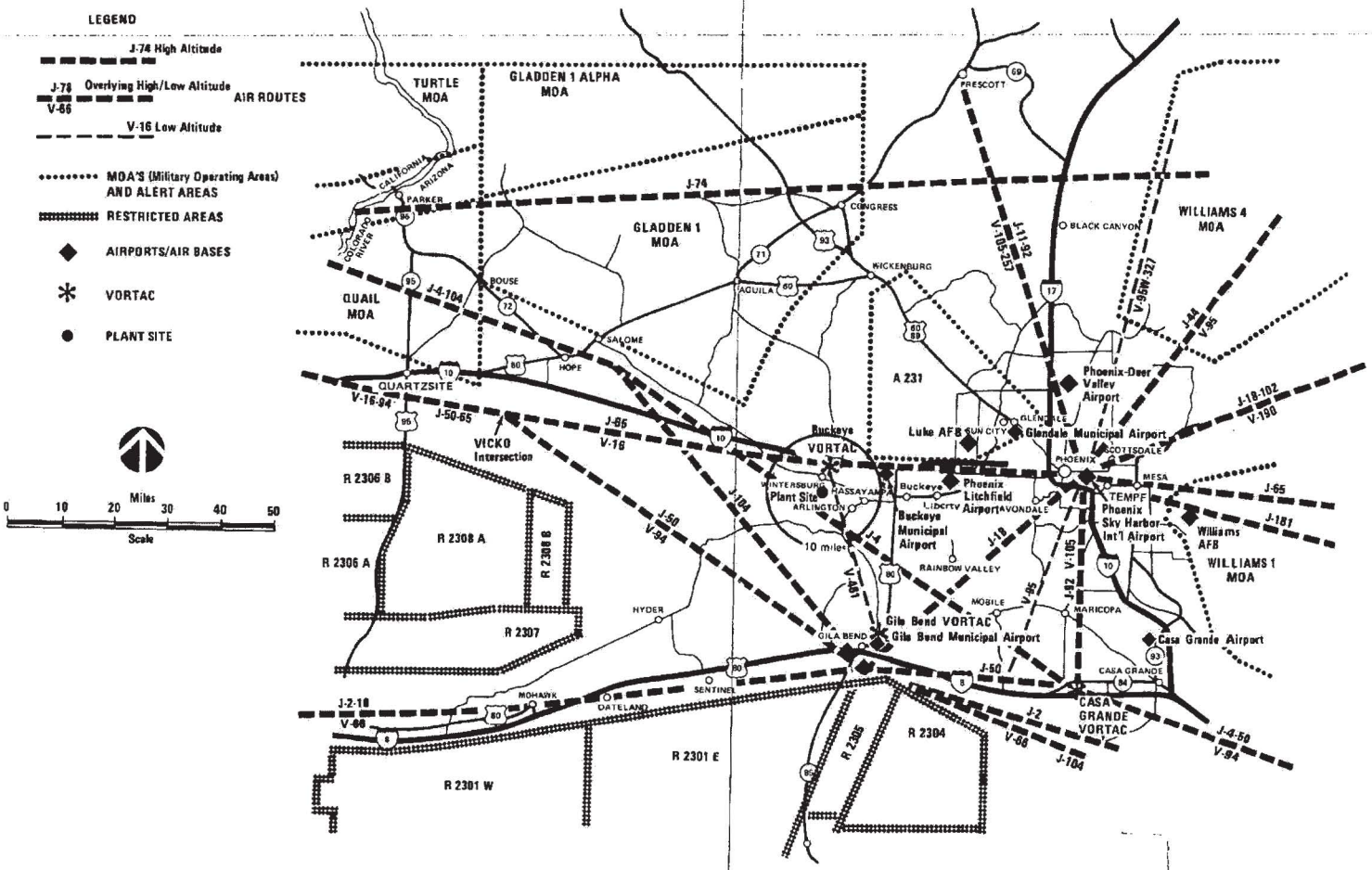


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

INDUSTRIAL AND TRANSPORTATION FACILITIES
IN THE ENVIRONS OF THE PALO VERDE SITE

FIGURE 2.2-1

JUNE 2009 REVISION 15



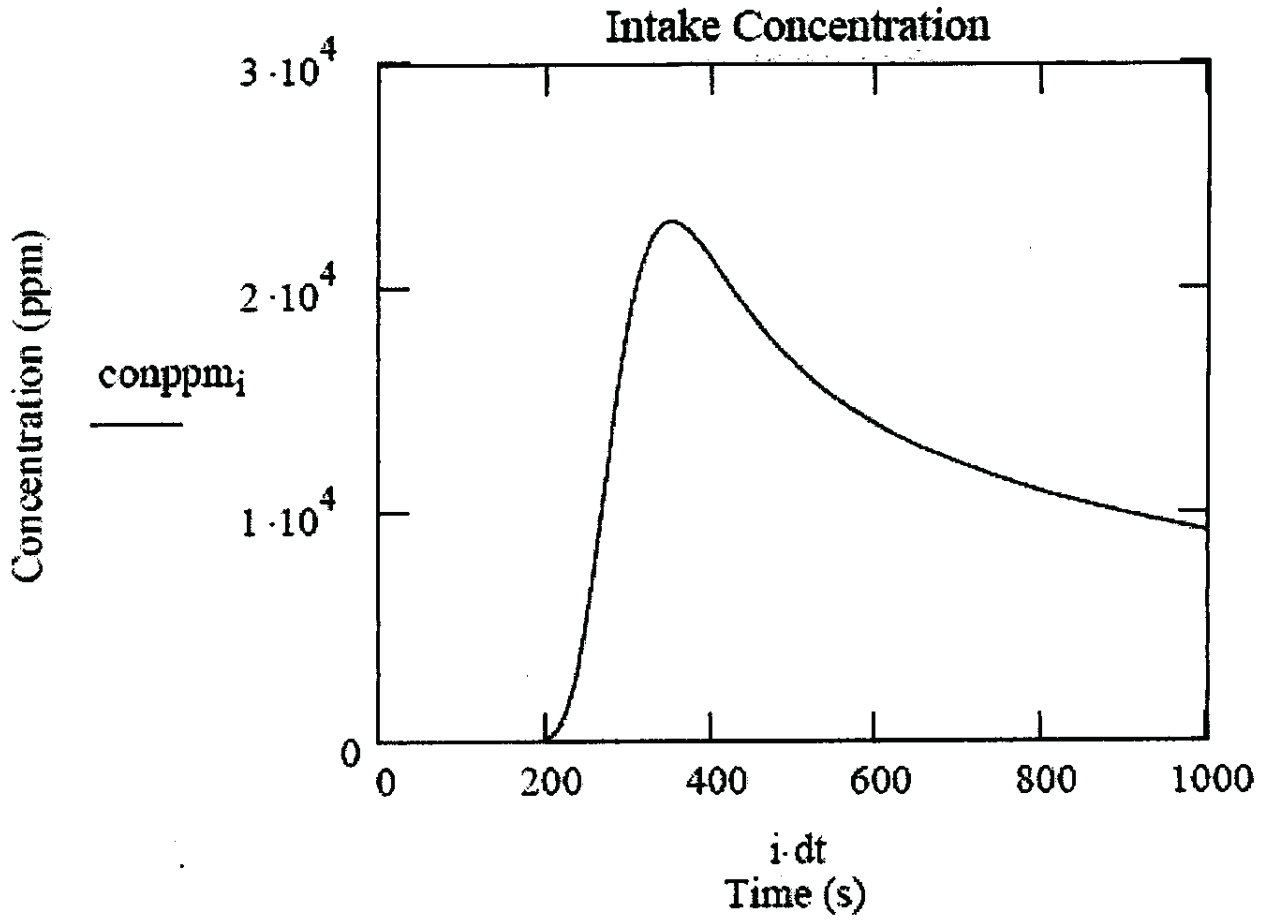
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

AIR ROUTES, AIRPORT, MOA's, ALERT AND RESTRICTED AREAS IN THE ENVIRONS OF THE PALO VERDE SITE

FIGURE 2.2-2

JUNE 2001

REVISION 11

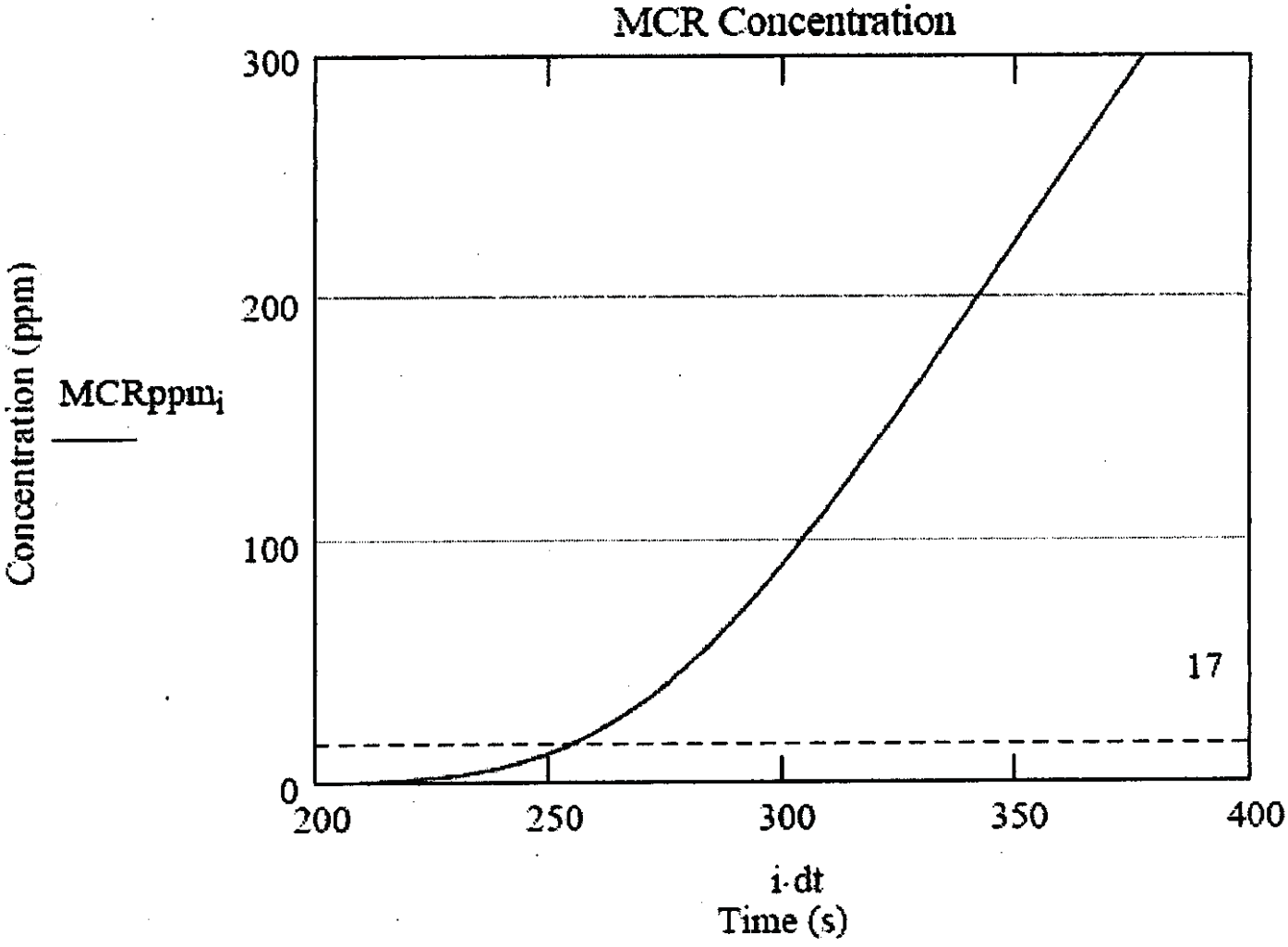


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

AMMONIA CONCENTRATION AT PVNGS FOR TANK CAR RUPTURE AIR INTAKE CONCENTRATION

FIGURE 2.2-3a

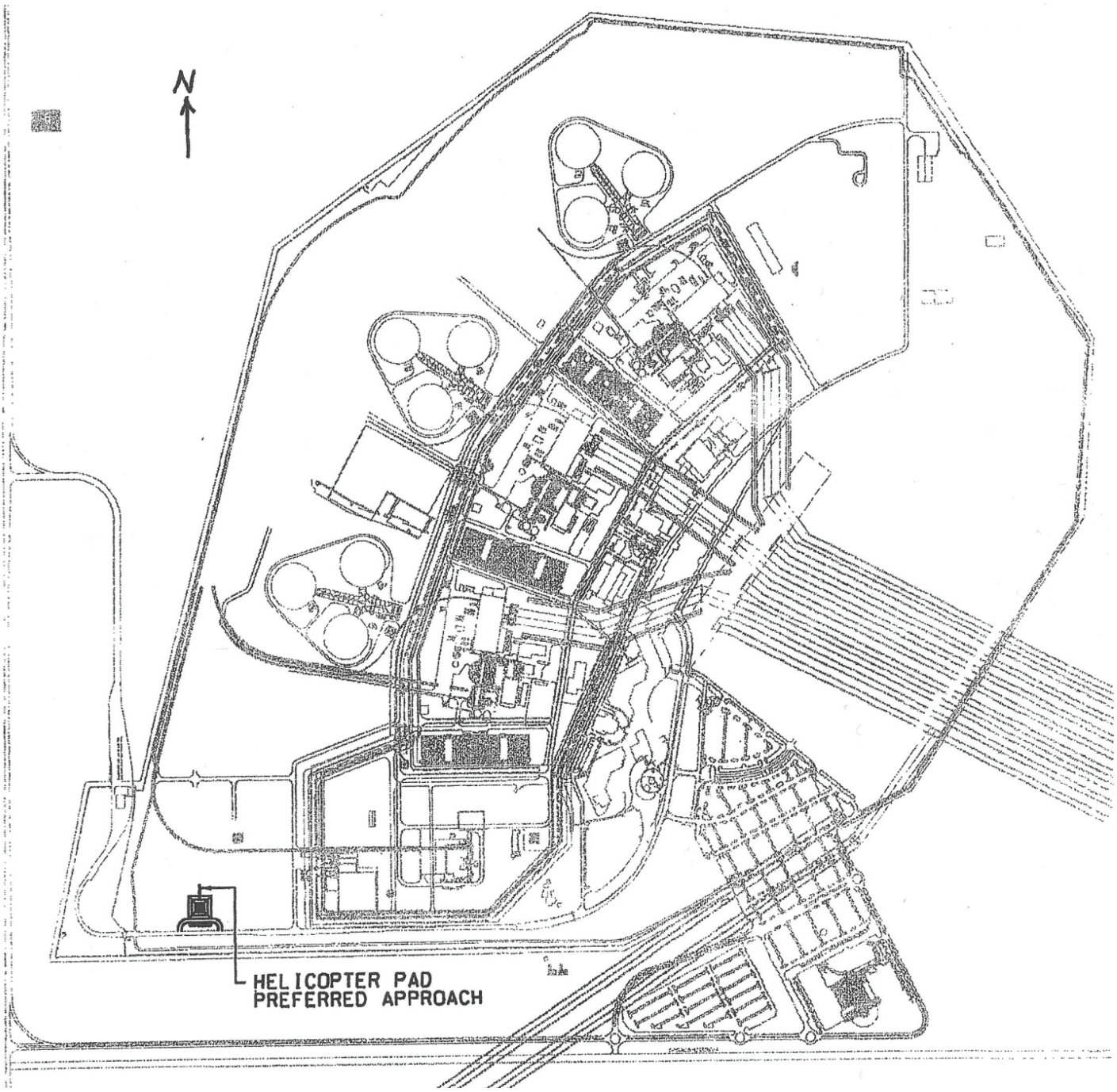
JUNE 2011 REVISION 16



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

AMMONIA CONCENTRATION AT PVNGS FOR TANK CAR RUPTURE MAIN CONTROL ROOM CONCENTRATION

FIGURE 2.2-3b

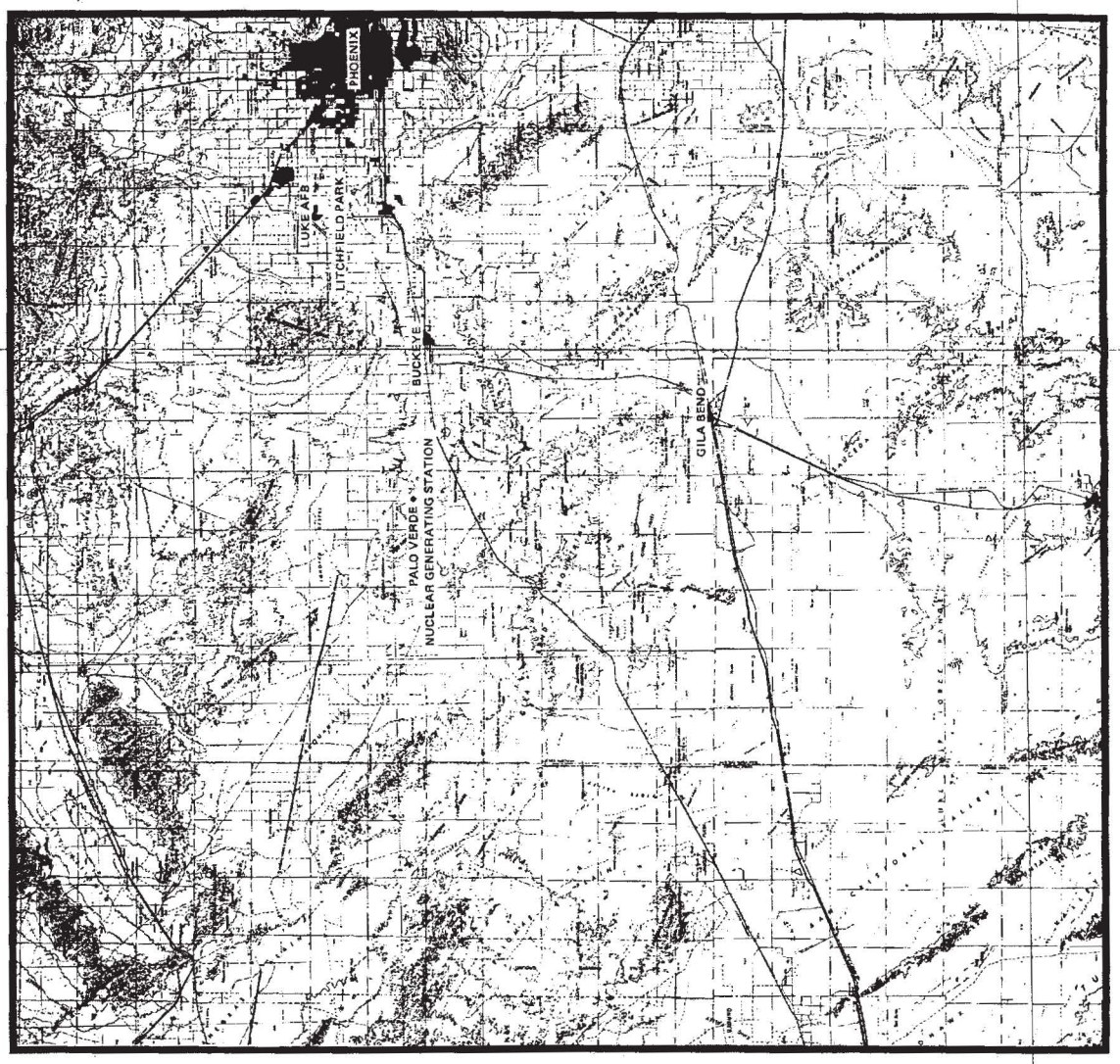


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HELICOPTER PAD AND PREFERRED APPROACH

FIGURE 2.2-4

JUNE 2015 REVISION 18



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC REGIONAL SITE MAP

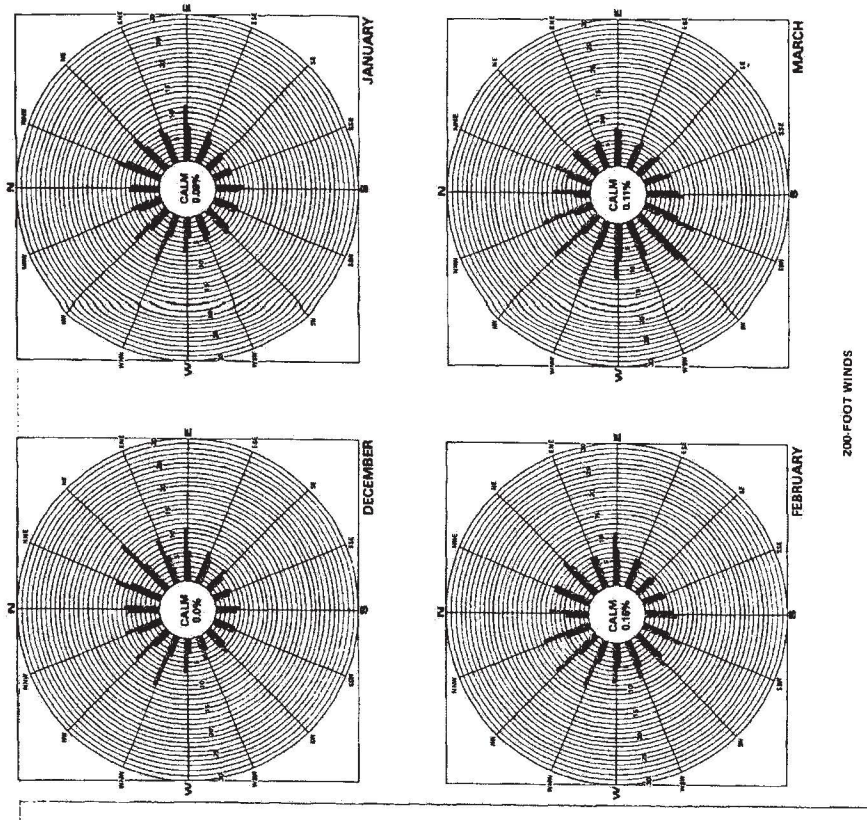
FIGURE 2.3-1

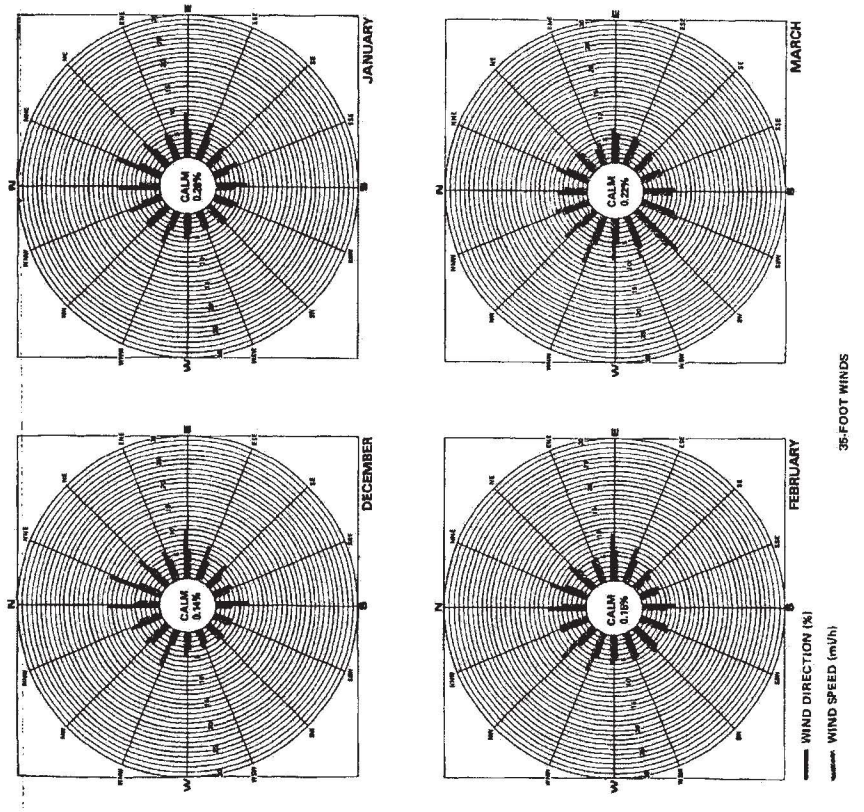
JUNE 2001 REVISION 11

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WIND ROSES -- PVNGS
AUGUST THROUGH NOVEMBER
AUGUST 13, 1973 to AUGUST 13,1978

FIGURE 2.3-2



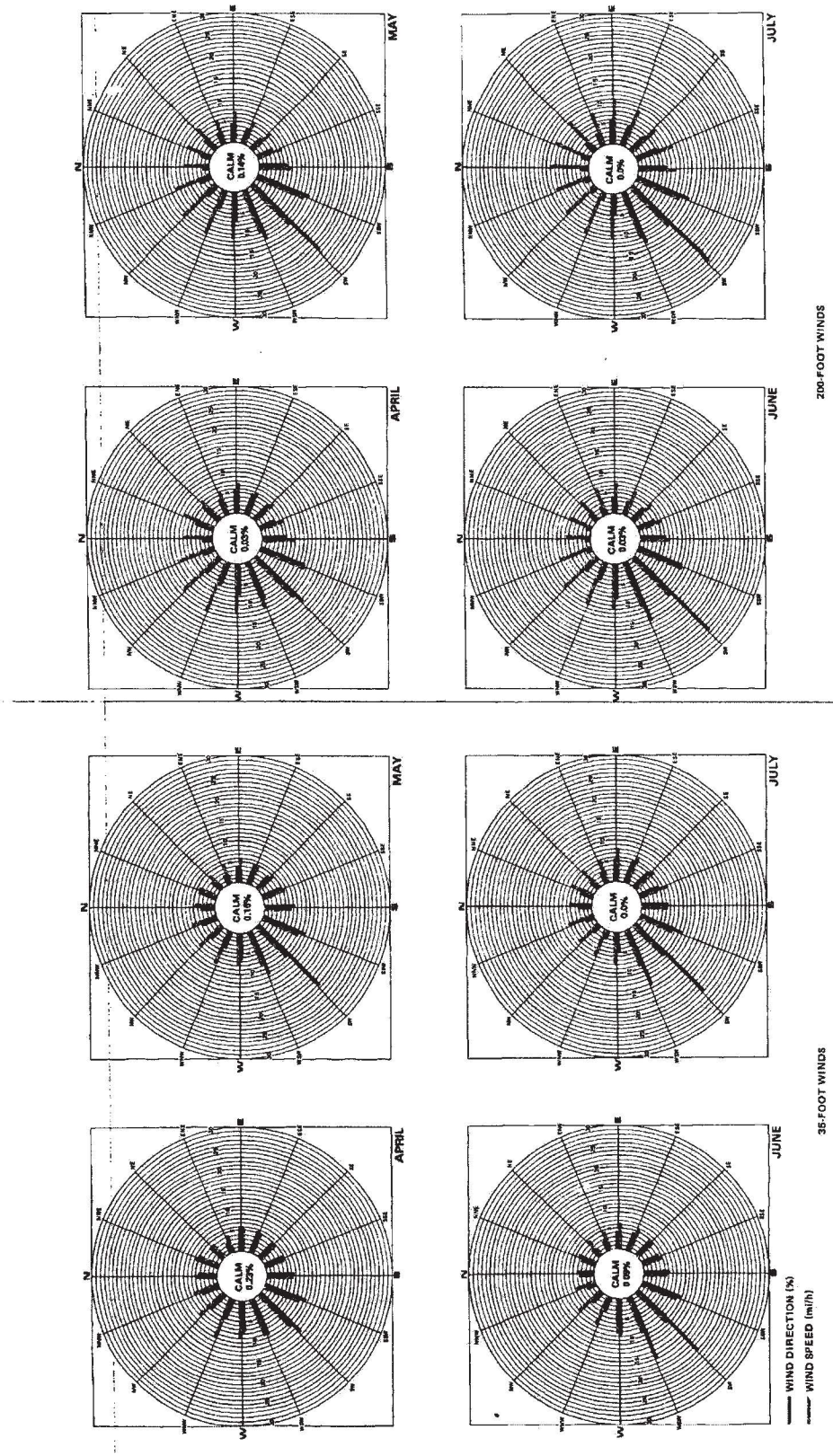


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WIND ROSES -- PVNGS
DECEMBER THROUGH MARCH
AUGUST 13, 1973 to AUGUST 13, 1978

FIGURE 2.3-3

JUNE 2001 REVISION 11

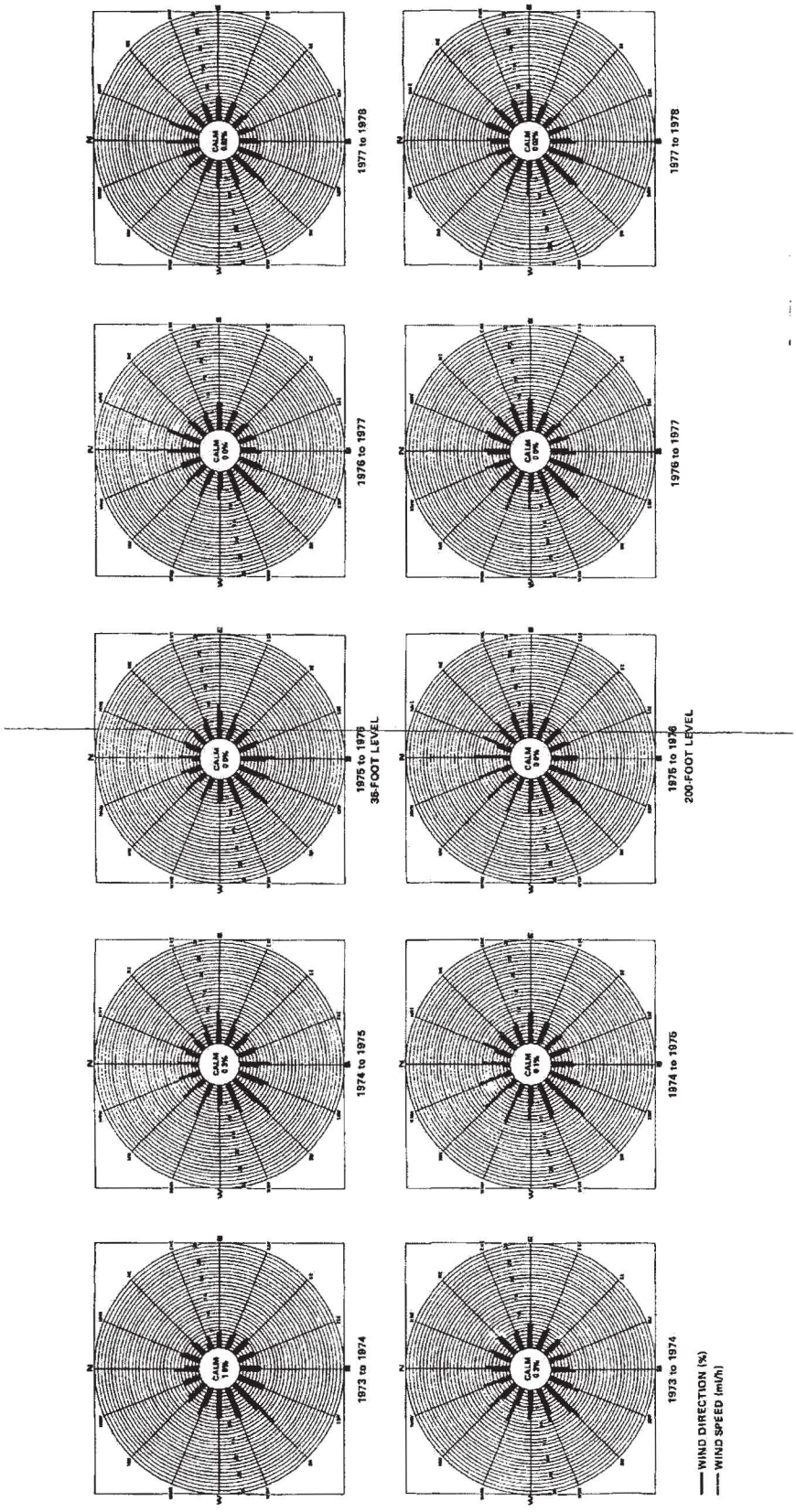


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WIND ROSES -- PVNGS
APRIL THROUGH JULY
AUGUST 13, 1973 to AUGUST 13, 1978

FIGURE 2.3-4

JUNE 2001 REVISION 11

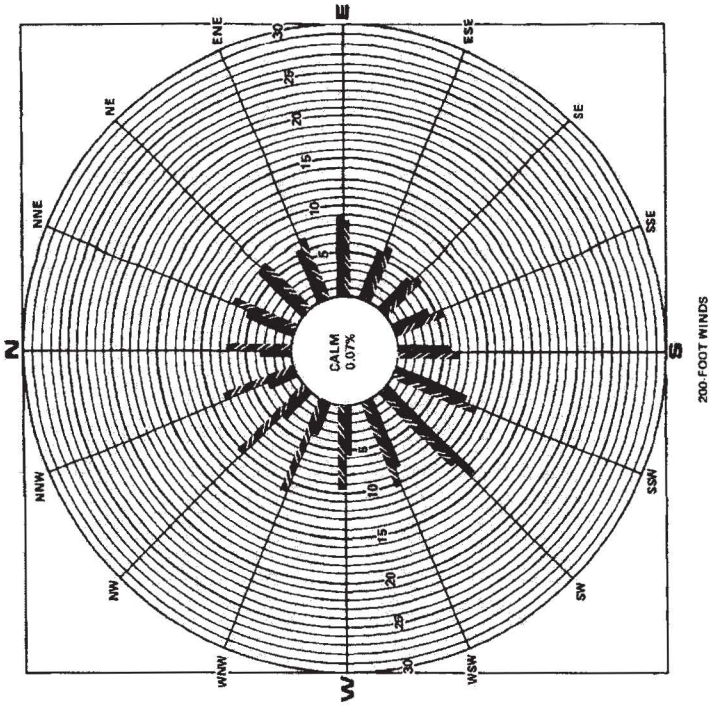


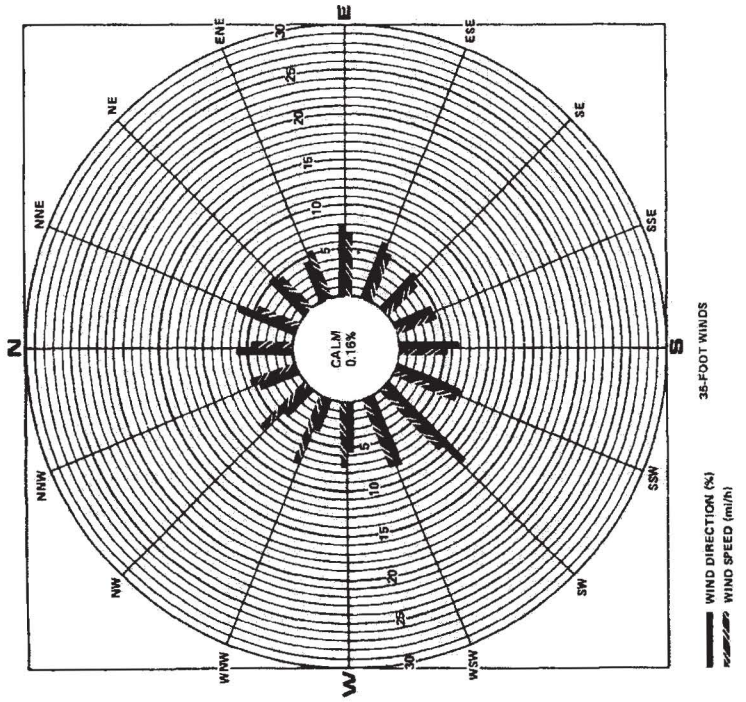
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WIND ROSES -- PVNGS
AUGUST 13, 1973 to AUGUST 13, 1978

FIGURE 2.3-5

JUNE 2001 REVISION 11





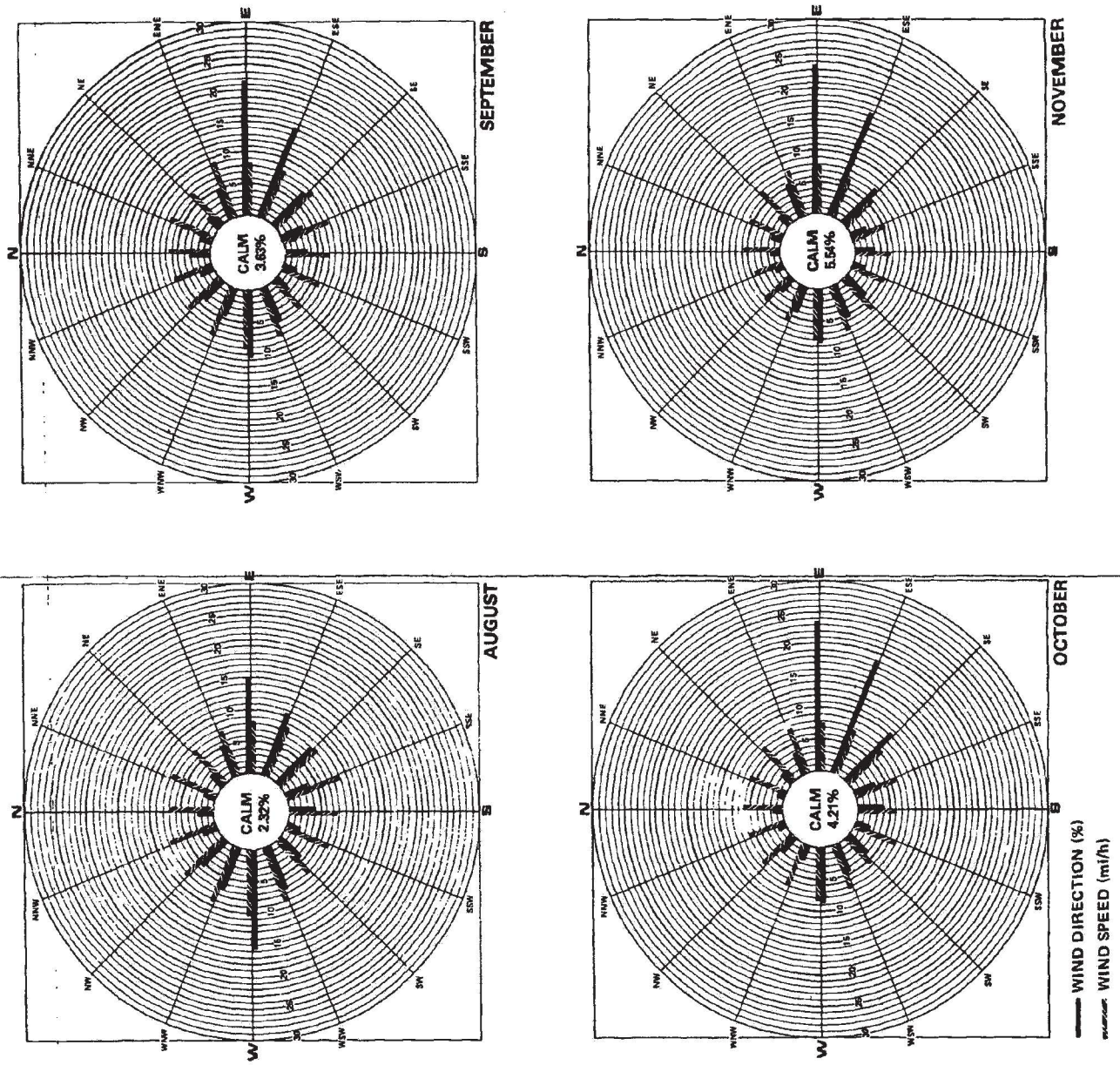
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WIND ROSES -- PVNGS,

AUGUST 13, 1973 to AUGUST 13, 1978

FIGURE 2.3-6

JUNE 2001 REVISION 11

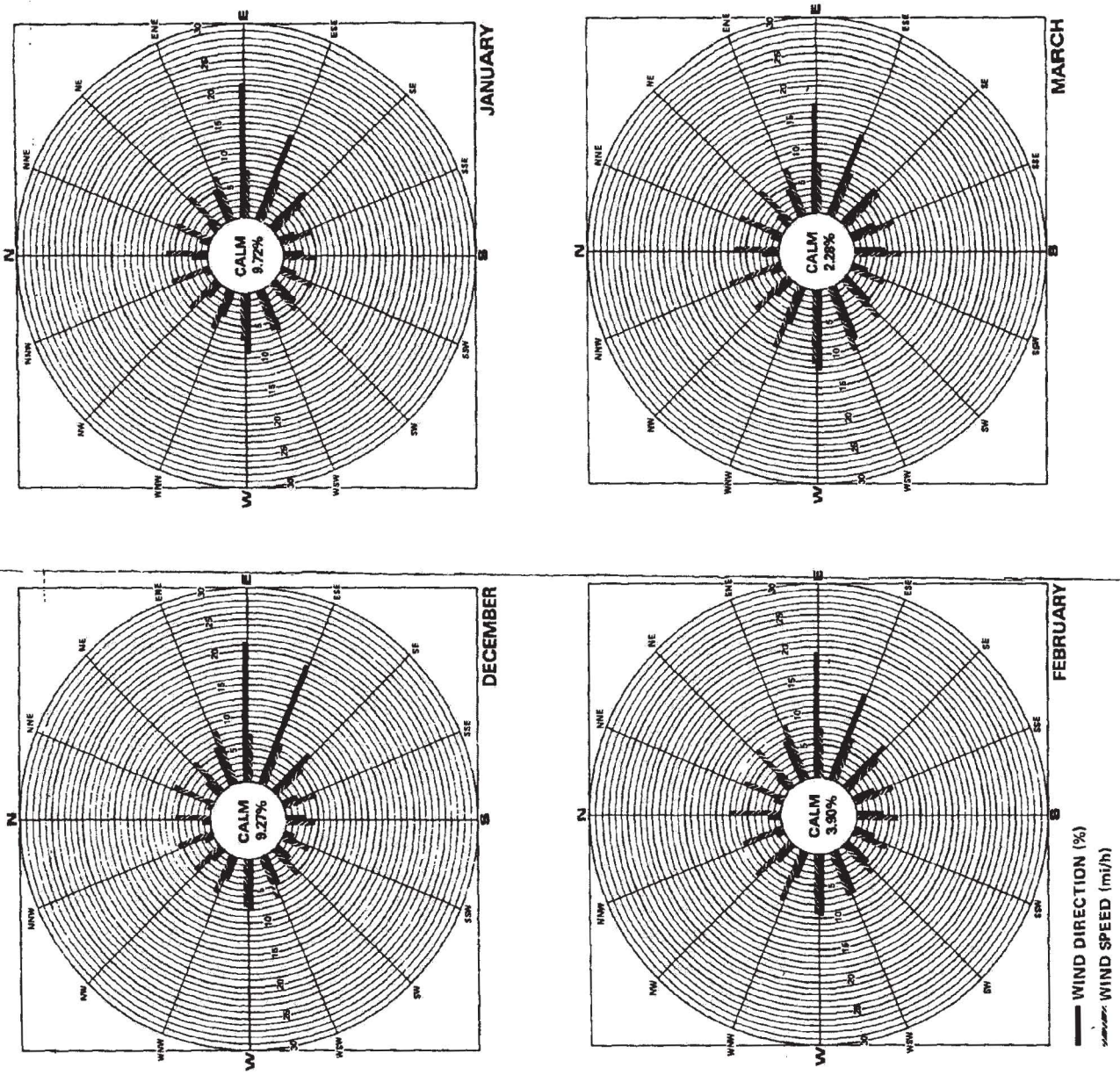


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WIND ROSES -- PVNGS,
AUGUST THROUGH NOVEMBER
AUGUST 13, 1973 to AUGUST 13, 1978

FIGURE 2.3-7

JUNE 2001 REVISION 11

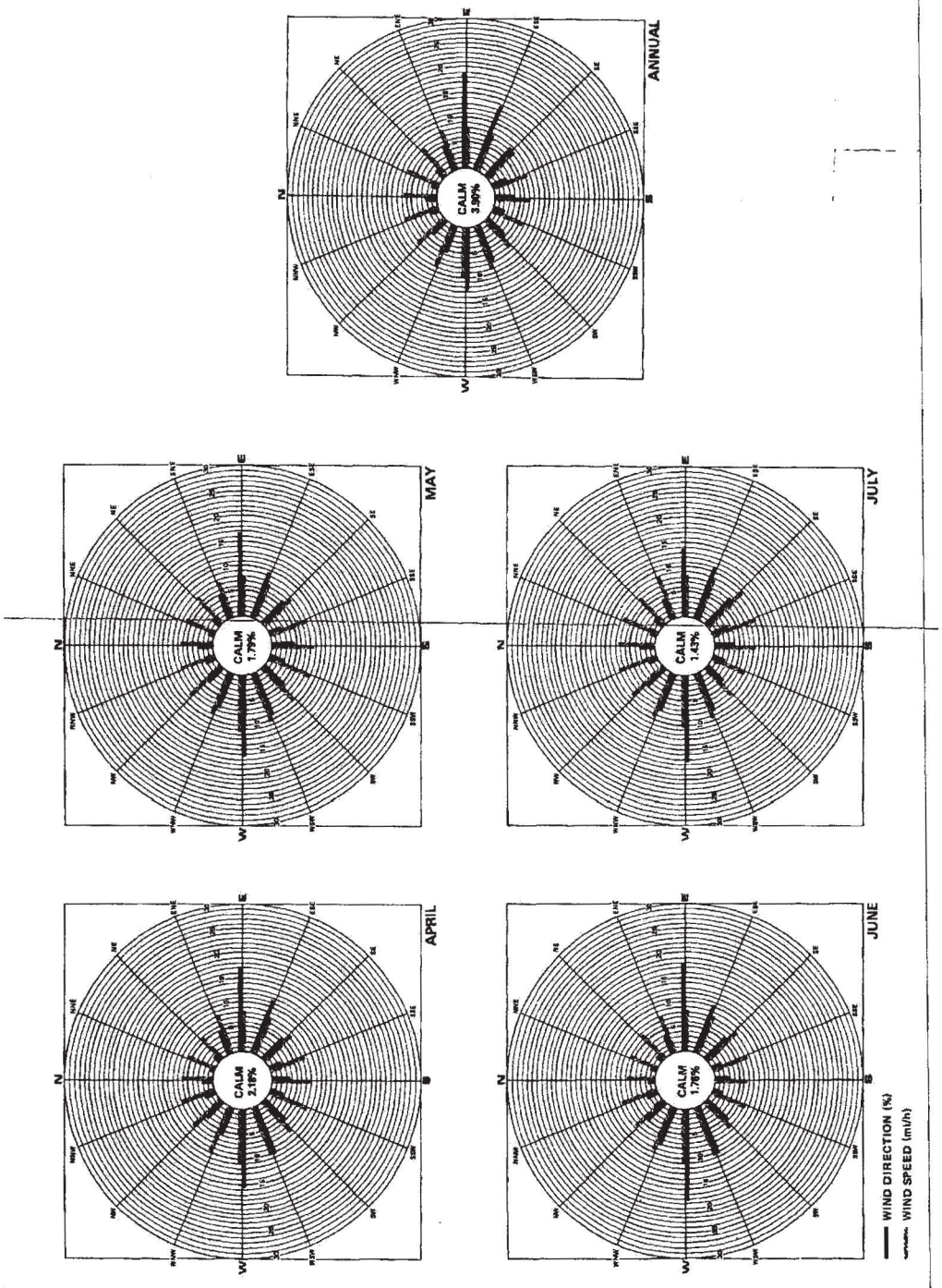


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WIND ROSES -- PVNGS,
DECEMBER THROUGH MARCH
AUGUST 13, 1973 to AUGUST 13, 1978

FIGURE 2.3-8

JUNE 2001 REVISION 11

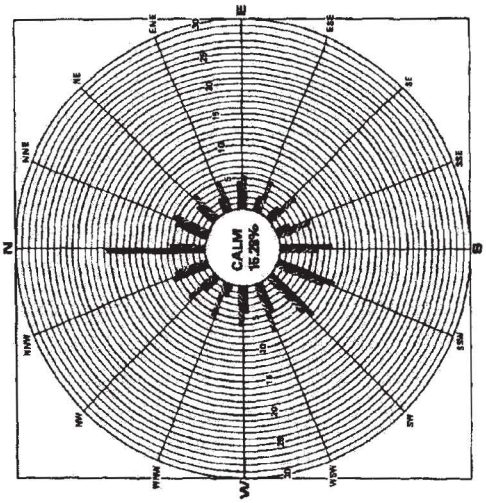


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

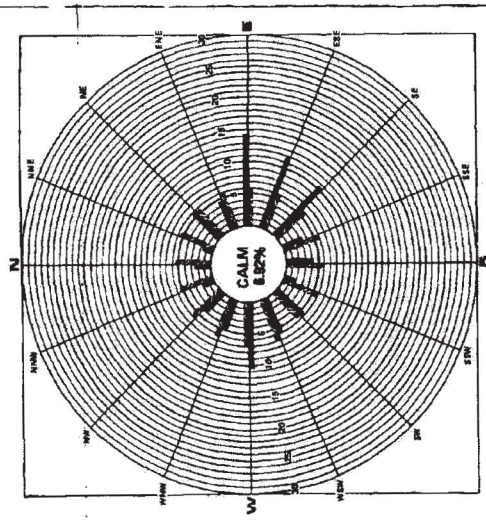
WIND ROSES -- PVNGS,
APRIL THROUGH JULY, AND ANNUAL
AUGUST 13, 1973 to AUGUST 13, 1978

FIGURE 2.3-9

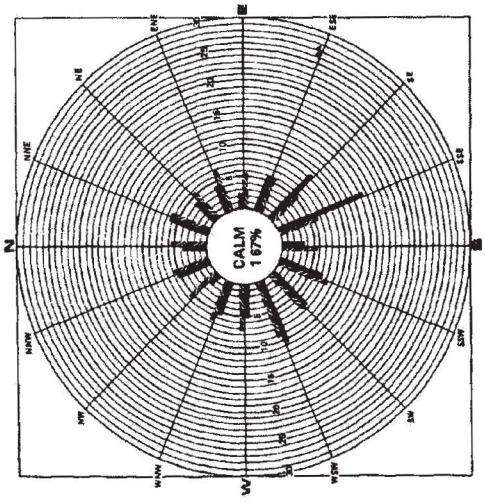
JUNE 2001 REVISION 11



LUKE AIR FORCE BASE
(JANUARY 1960 to DECEMBER 1964)



PHOENIX
(JANUARY 1960 to DECEMBER 1964)



GILA BEND
(DECEMBER 1948 to NOVEMBER 1953)

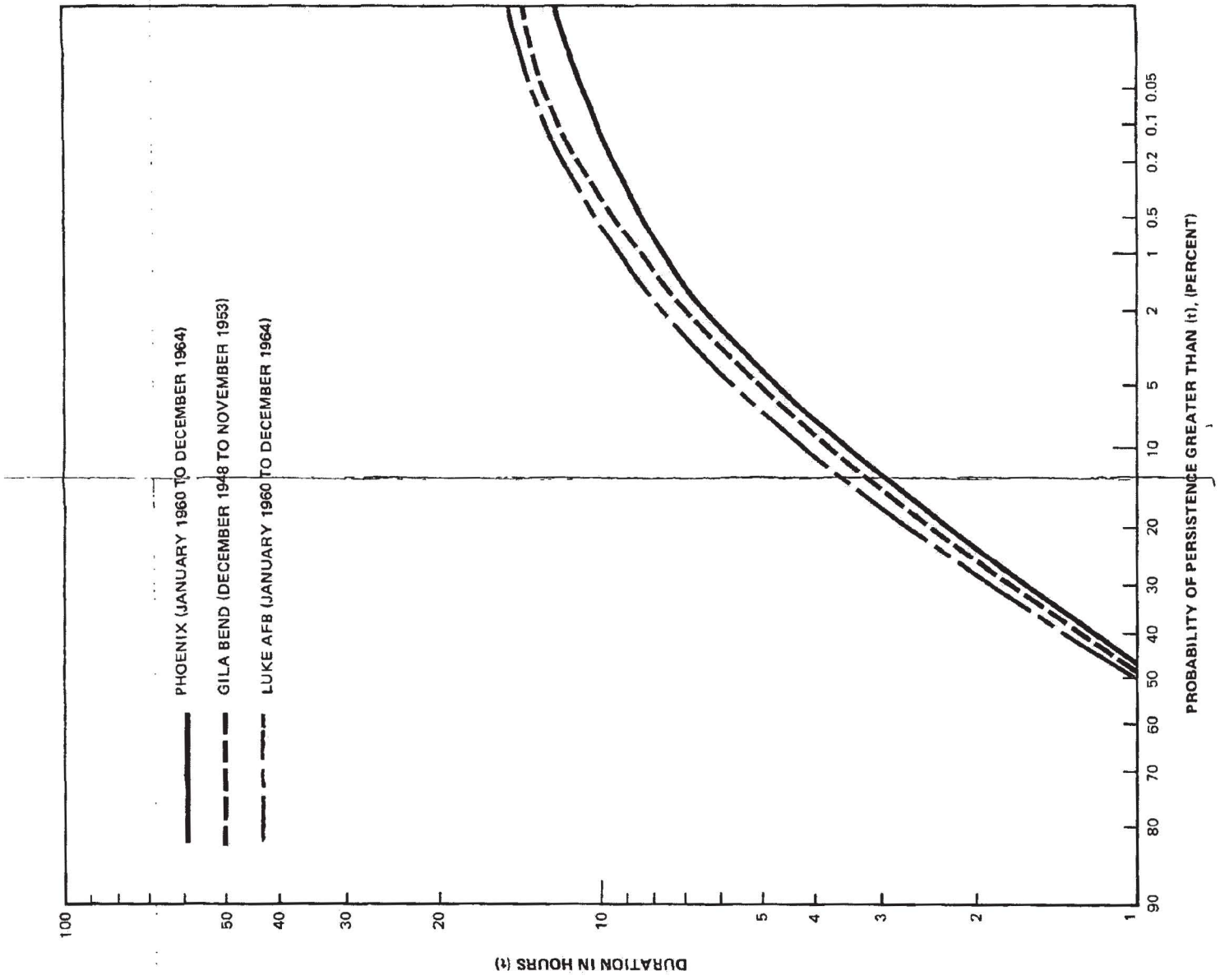
WIND DIRECTION (%)
WIND SPEED (KNOTS)

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

ANNUAL WIND ROSES FOR PHOENIX,
GILA BEND, AND LUKE AIR FORCE BASE

FIGURE 2.3-10

JUNE 2001 REVISION 11

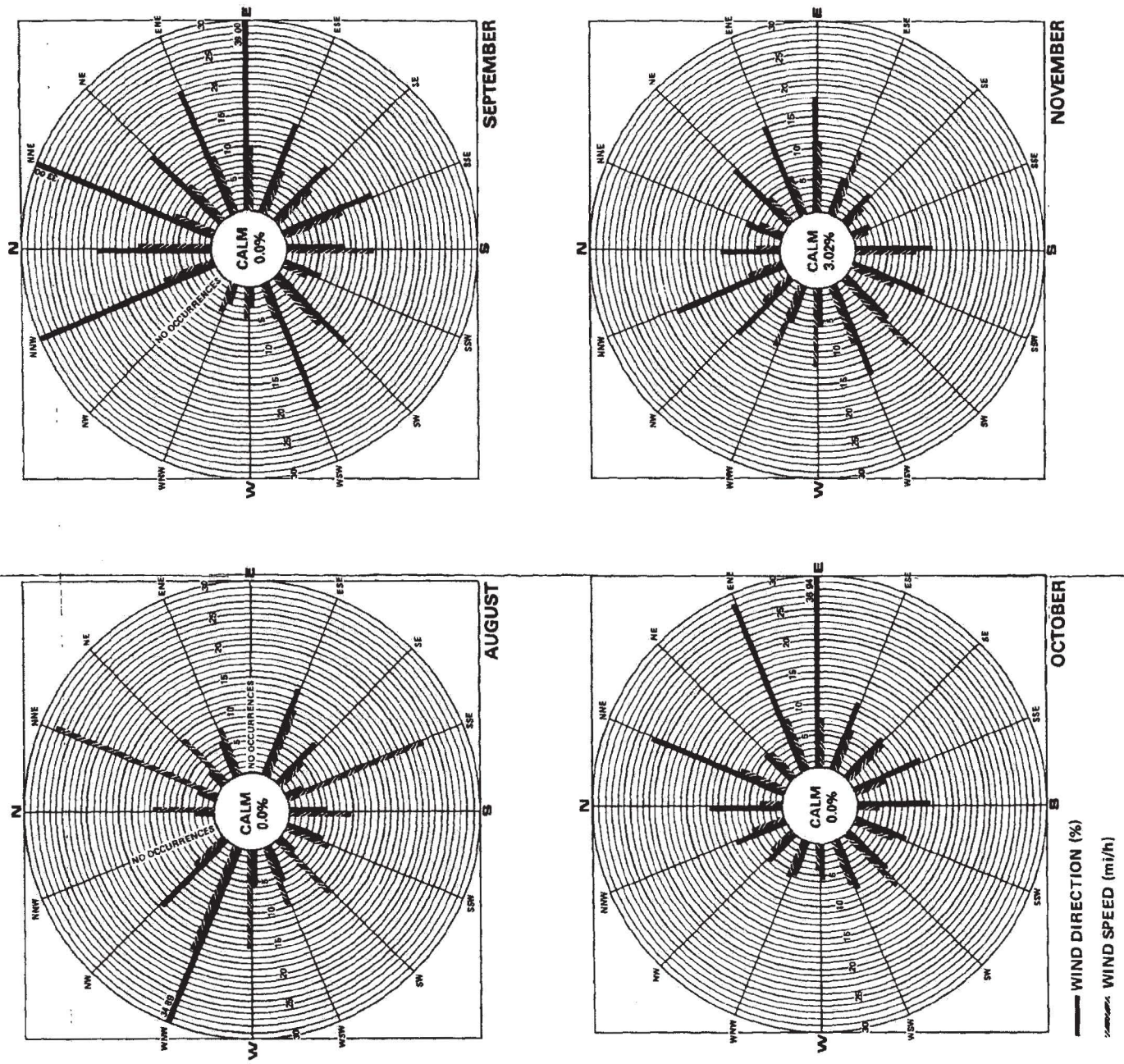


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WIND DIRECTION PERSISTENCE (%),ONE SECTOR (22-1/2 deg) INCLUDING CALMS, FOR PHOENIX, GILA BEND, AND LUKE AIR FORCE BASE

FIGURE 2.3-11

JUNE 2001 REVISION 11



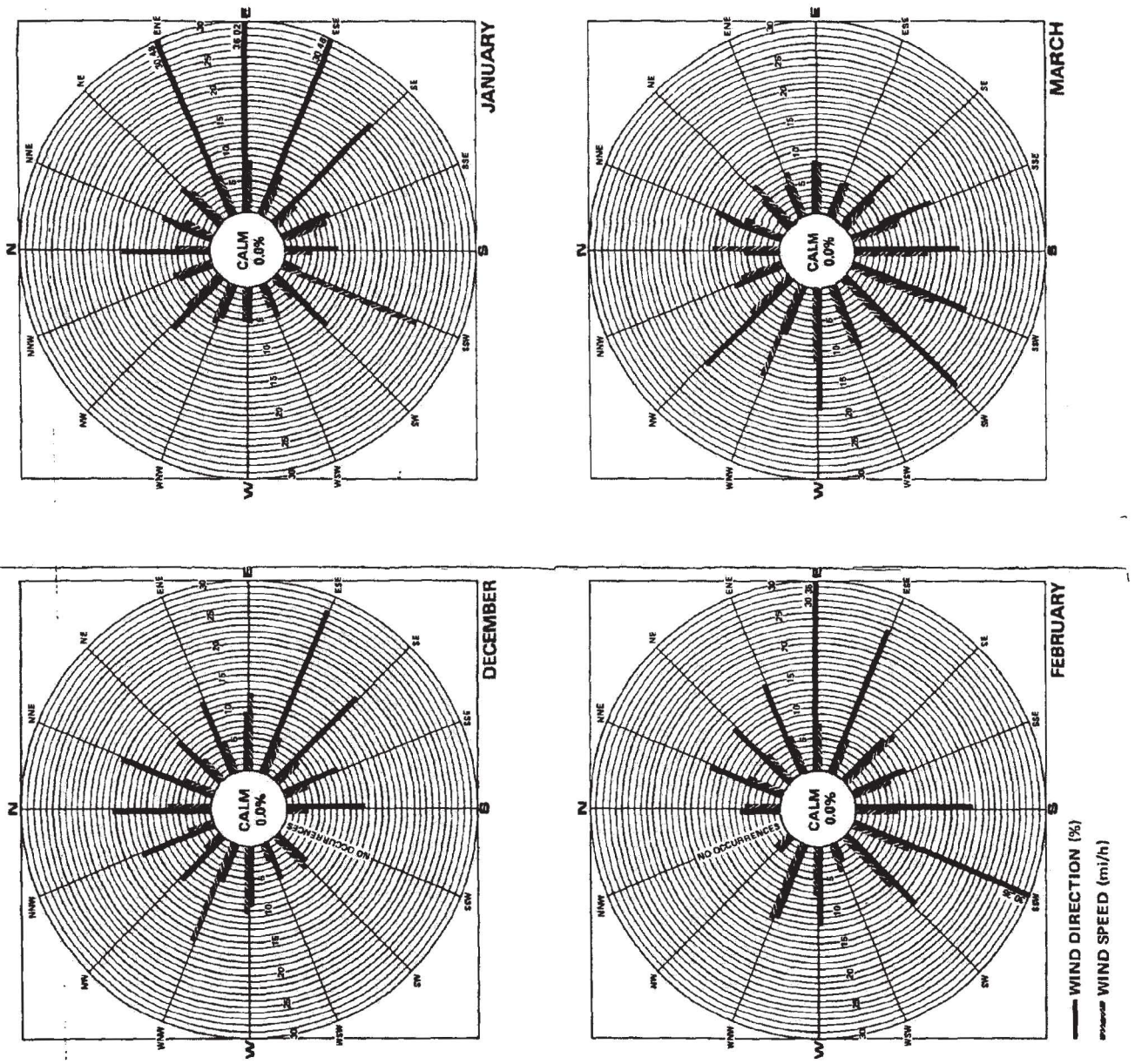
NOTE: PERCENTAGES ARE PERCENT x 100
EXCEPT WHERE NOTED

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PRECIPITATION WIND ROSES
(35-FOOT WINDS) PVNGS,
AUGUST THROUGH NOVEMBER
AUGUST 13, 1973 TO AUGUST 13, 1978

FIGURE 2.3-12

JUNE 2001 REVISION 11



NOTE: PERCENTAGES ARE PERCENT x 100
EXCEPT WHERE NOTED

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PRECIPITATION WIND ROSES
(35-FOOT WINDS)-- PVNGS,
DECEMBER THROUGH MARCH
AUGUST 13, 1973 TO AUGUST 13, 1978

FIGURE 2.3-13

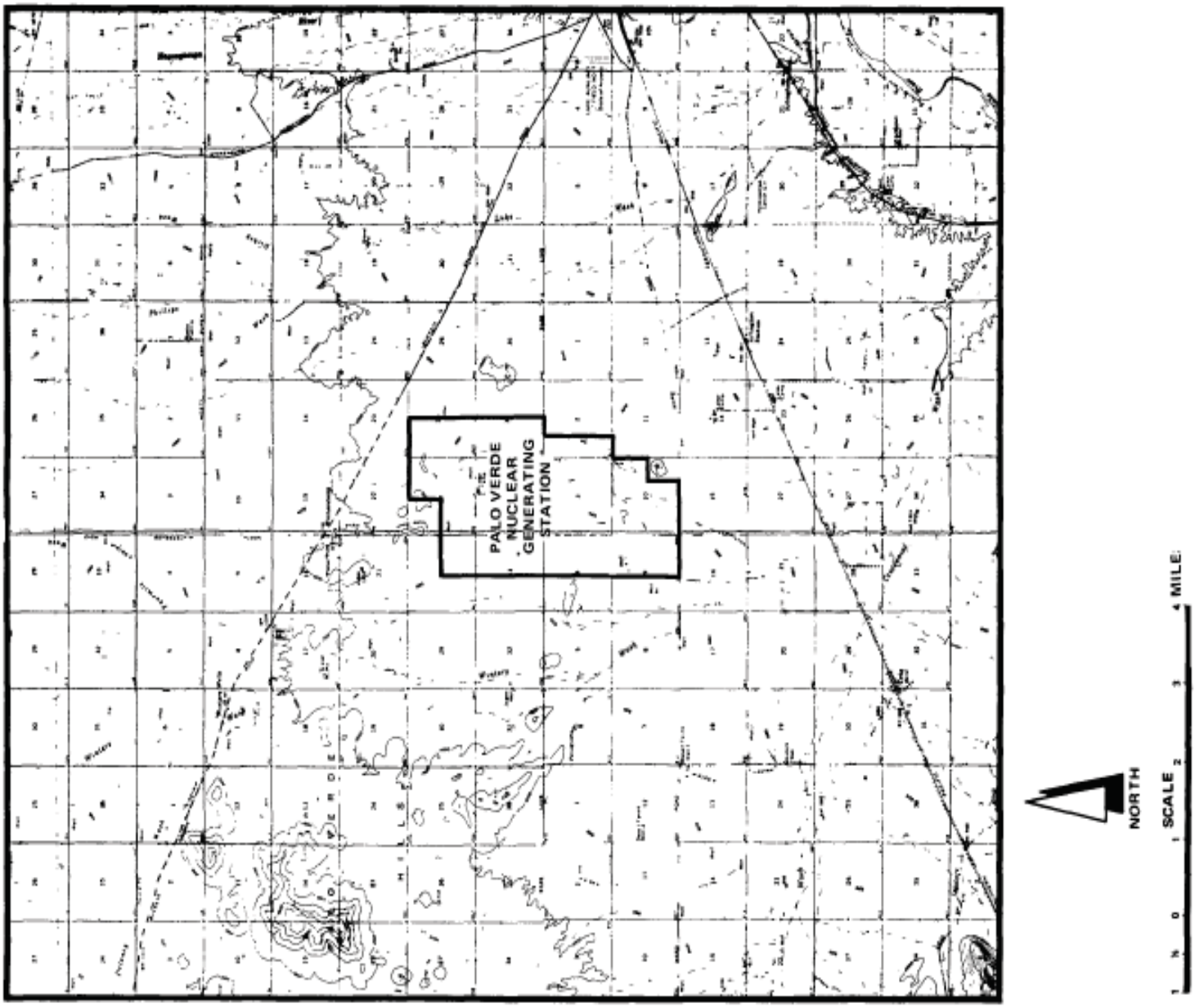
JUNE 2001 REVISION 11

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PRECIPITATION WIND ROSES (35-FOOT WINDS)--
PVNGS, APRIL THROUGH JULY, AND ANNUAL
AUGUST 13, 1973 TO AUGUST 13, 1978

FIGURE 2.3-14

JUNE 2001 REVISION 11

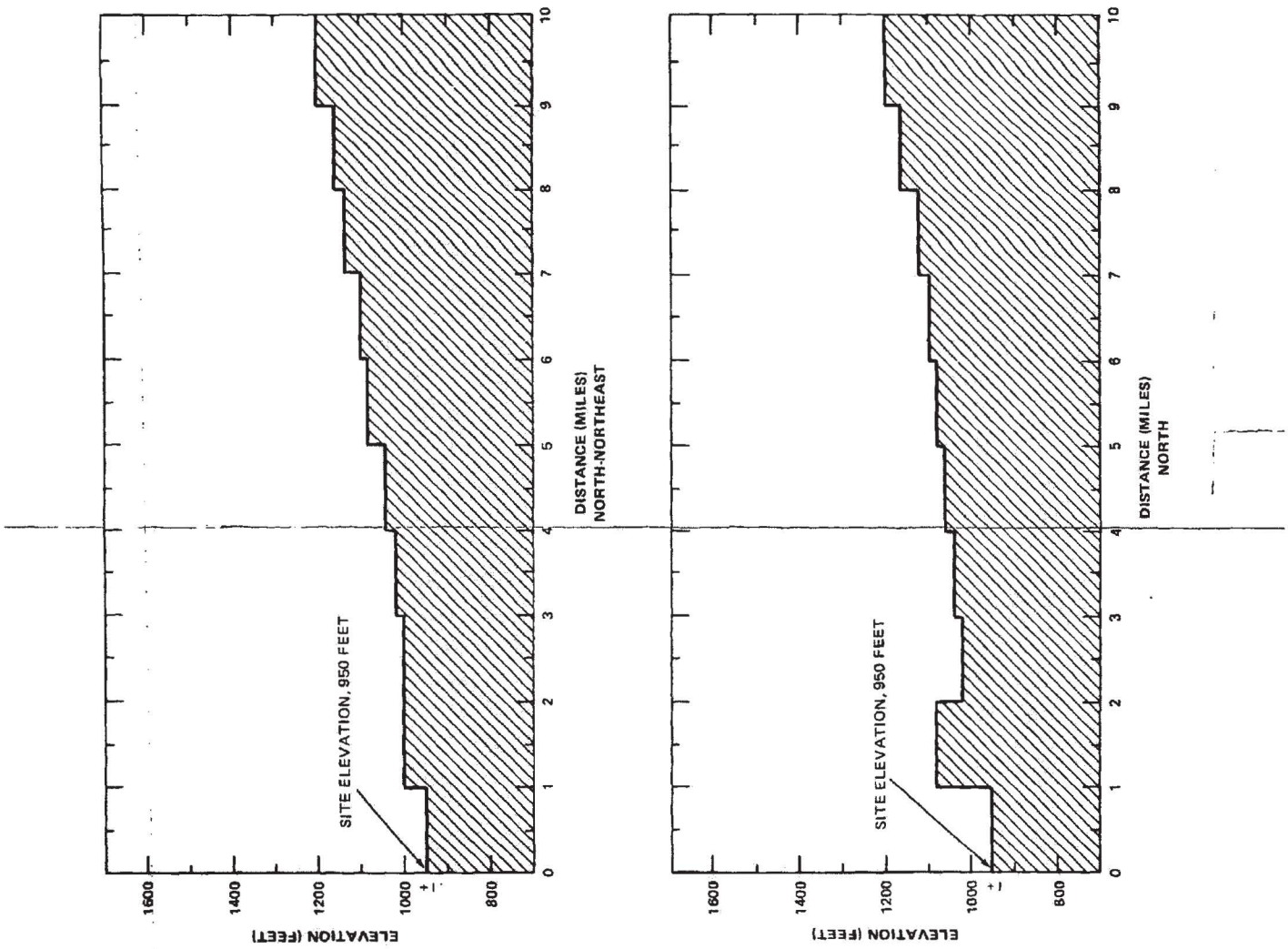


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC MAP WITHIN A 5-MILE RADIUS
OF THE PVNGS SITE

FIGURE 2.3-15

JUNE 2009 REVISION 15

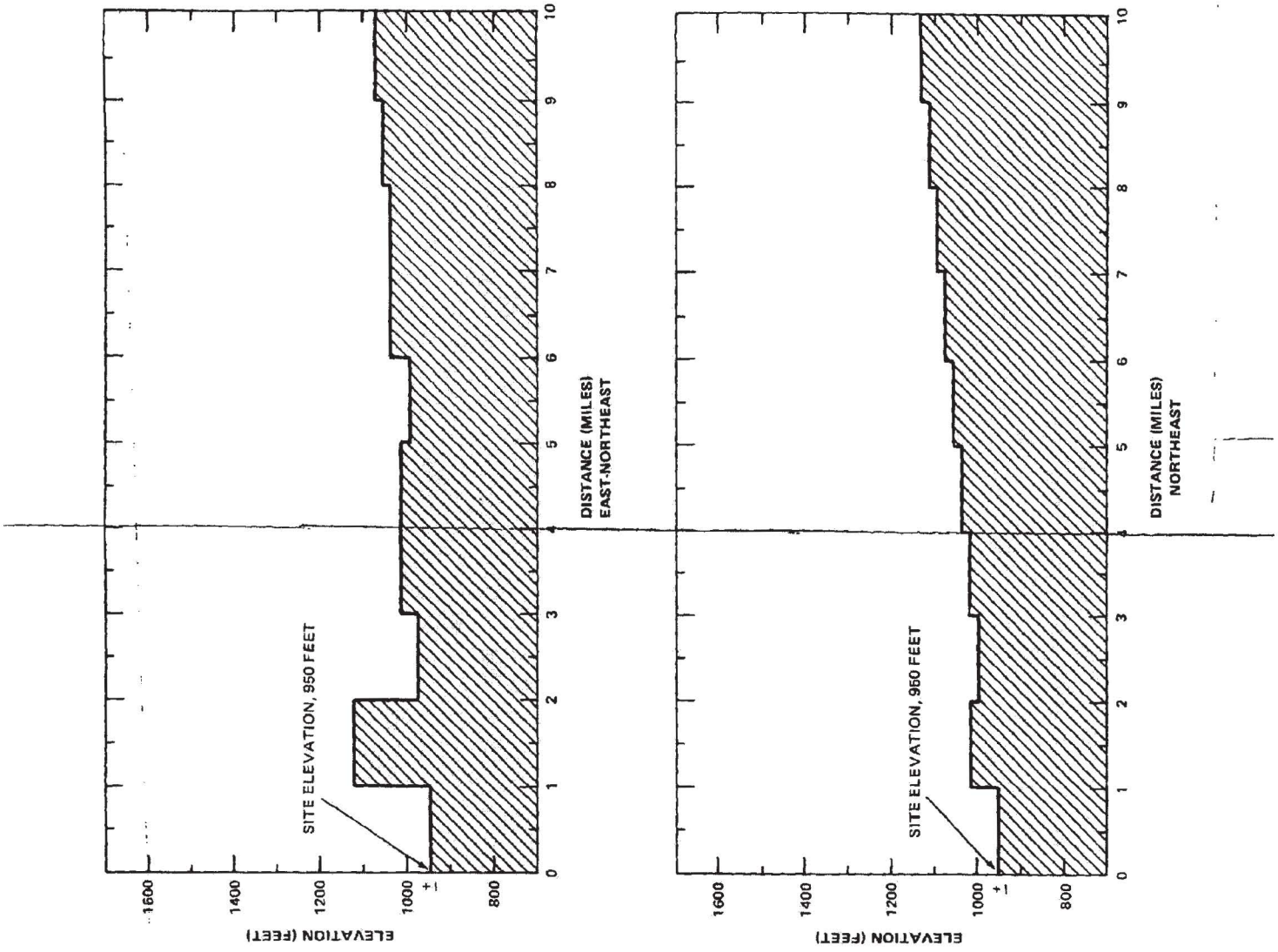


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC HIGH POINTS TO 10 MILES
NORTH AND NORTH-NORTHEAST OF PVNGS

FIGURE 2.3-16

JUNE 2001 REVISION 11

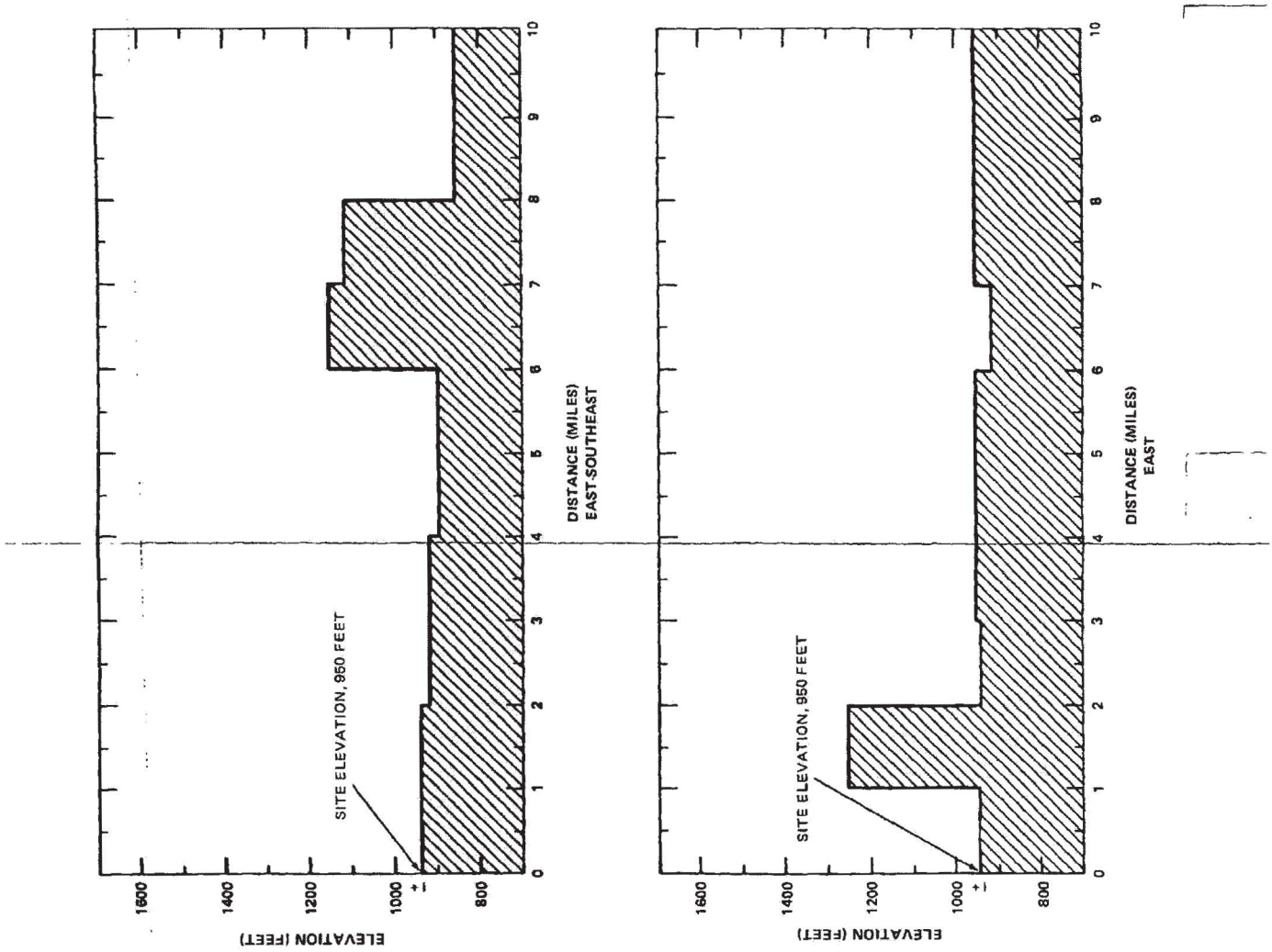


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC HIGH POINTS TO 10 MILES NORTHEAST AND EAST-NORTHEAST OF PVNGS

FIGURE 2.3-17

JUNE 2001 REVISION 11

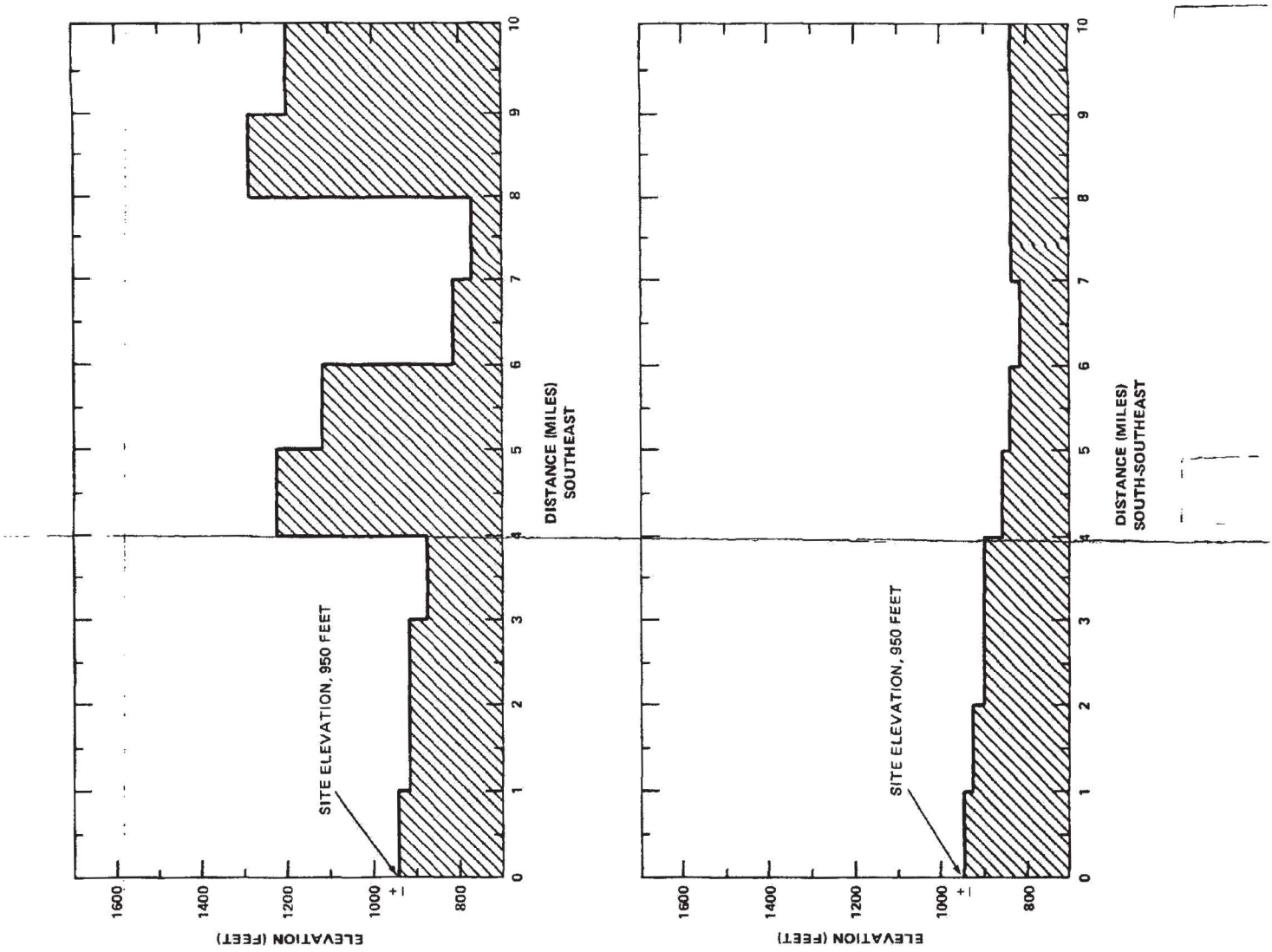


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC HIGH POINTS TO 10 MILES EAST AND EAST-SOUTHEAST OF PVNGS

FIGURE 2.3-18

JUNE 2001 REVISION 11

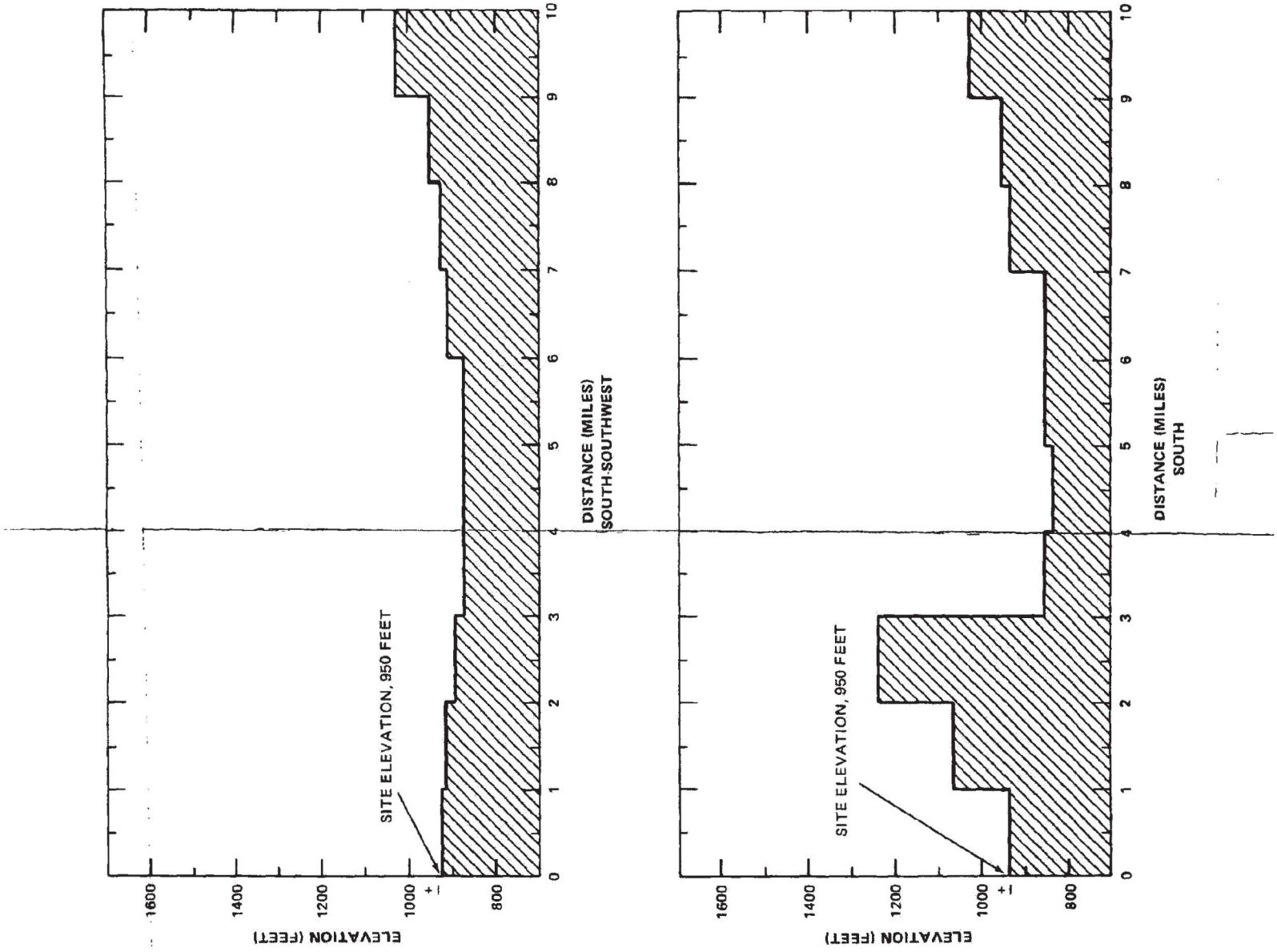


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC HIGH POINTS TO 10 MILES SOUTHEAST AND SOUTH-SOUTHEAST OF PVNGS

FIGURE 2.3-19

JUNE 2001 REVISION 11

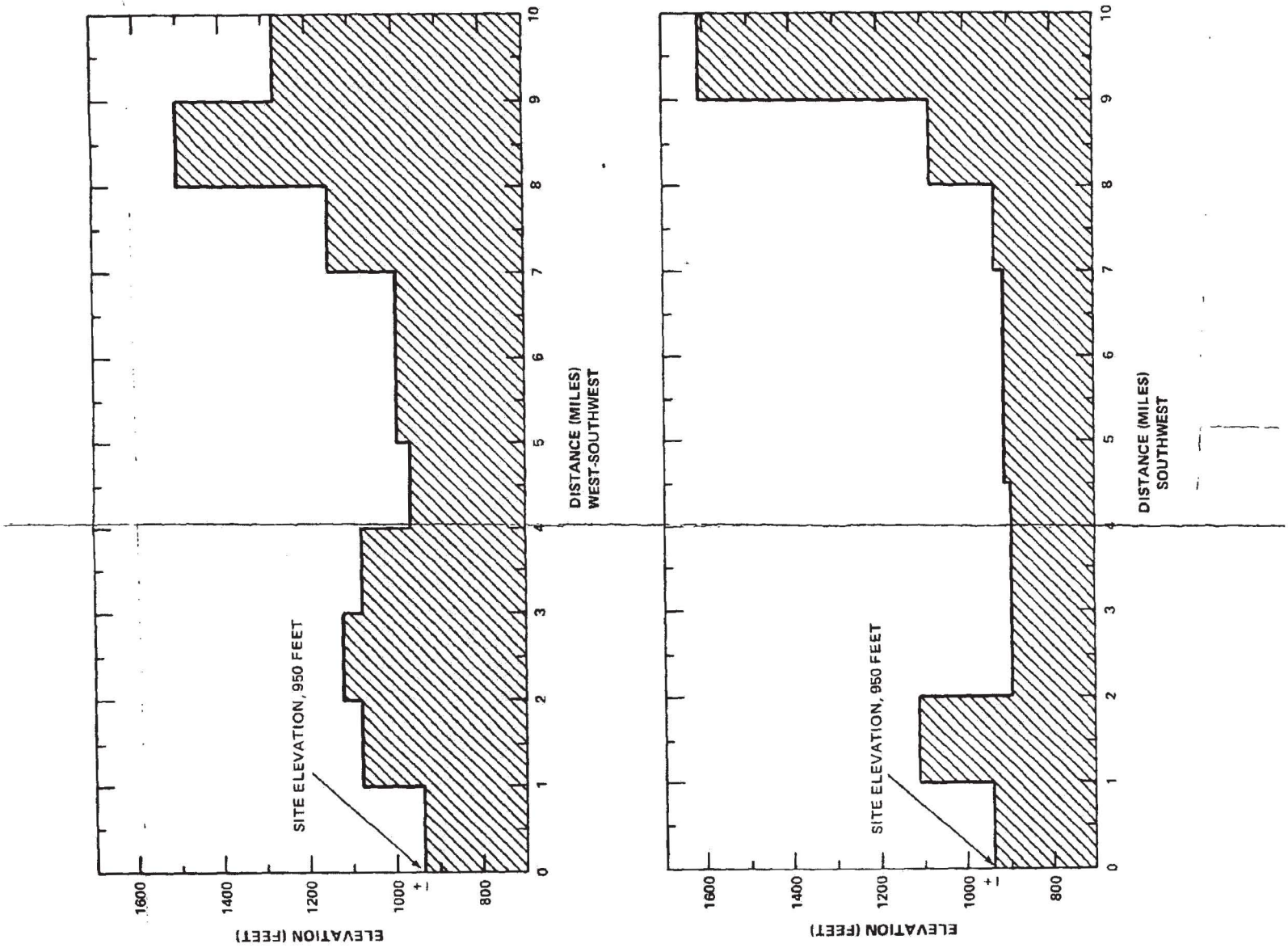


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC HIGH POINTS TO 10 MILES SOUTH
AND SOUTH-SOUTHWEST OF PVNGS

FIGURE 2.3-20

JUNE 2001 REVISION 11

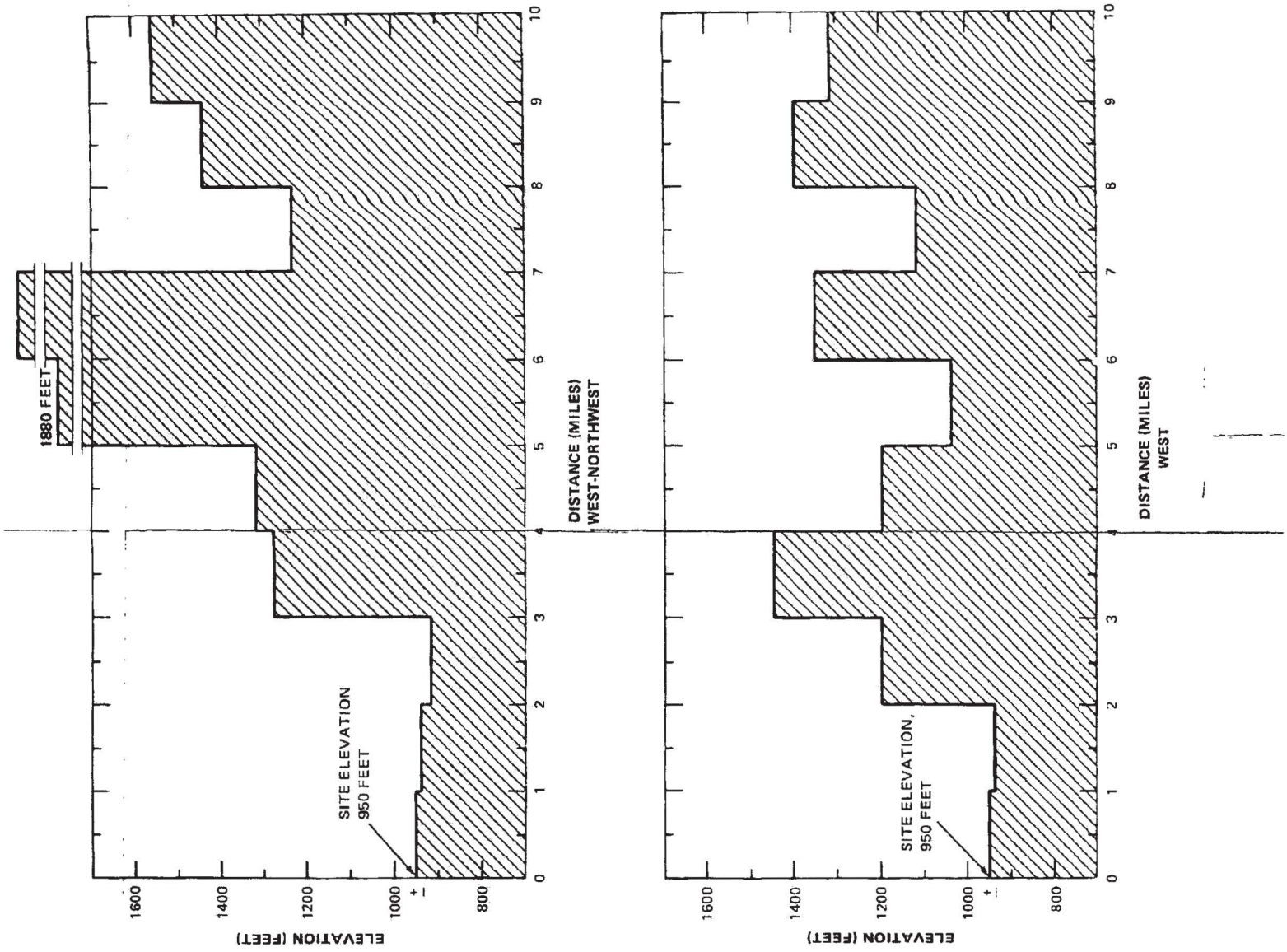


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC HIGH POINTS TO 10 MILES
SOUTHWEST AND WEST-SOUTHWEST OF PVNGS

FIGURE 2.3-21

JUNE 2001 REVISION 11

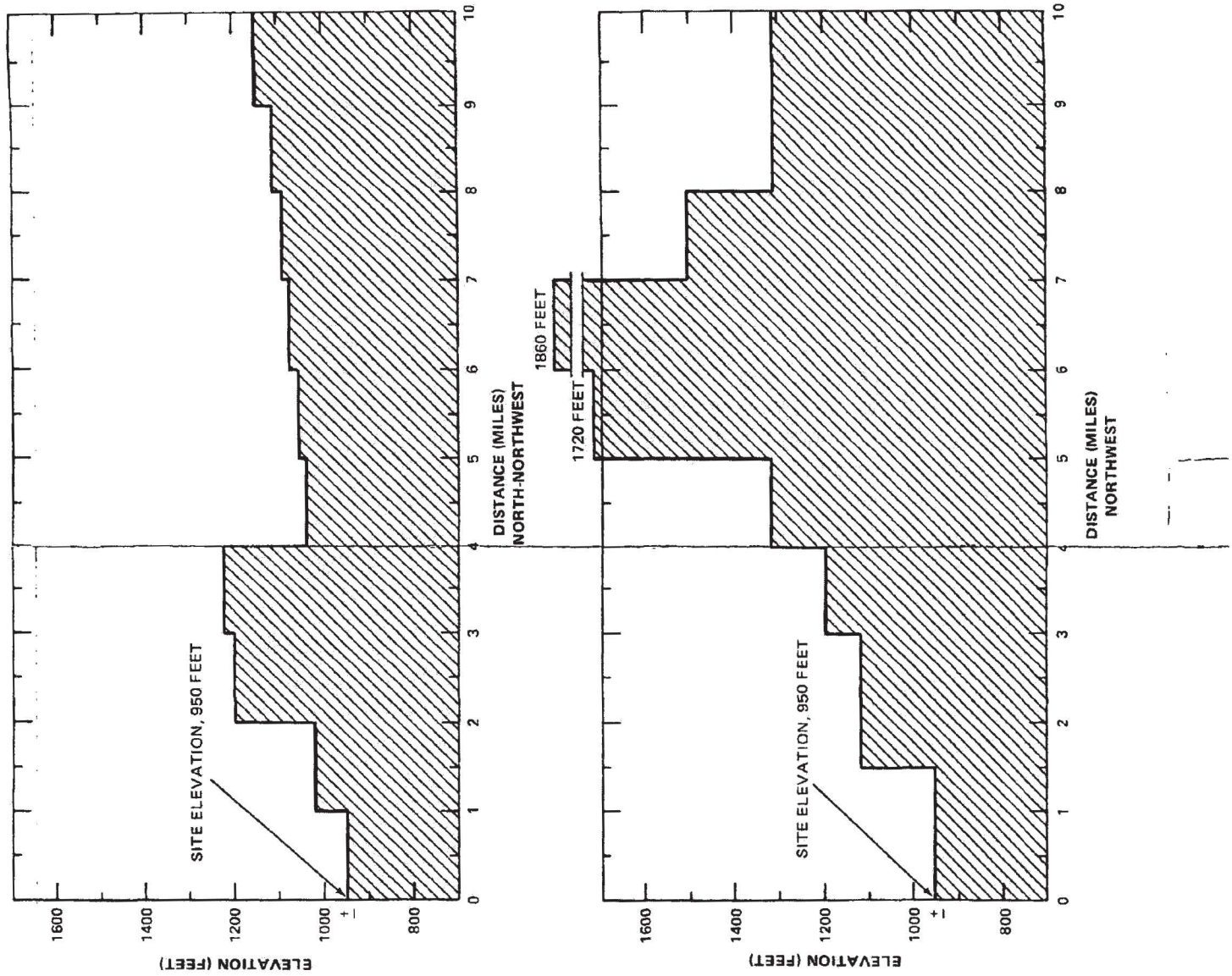


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC HIGH POINTS TO 10 MILES WEST
AND WEST-NORTHWEST OF PVNGS

FIGURE 2.3-22

JUNE 2001 REVISION 11



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TOPOGRAPHIC HIGH POINTS TO 10 MILES
NORTHWEST AND NORTH-NORTHWEST OF PVNGS

FIGURE 2.3-23

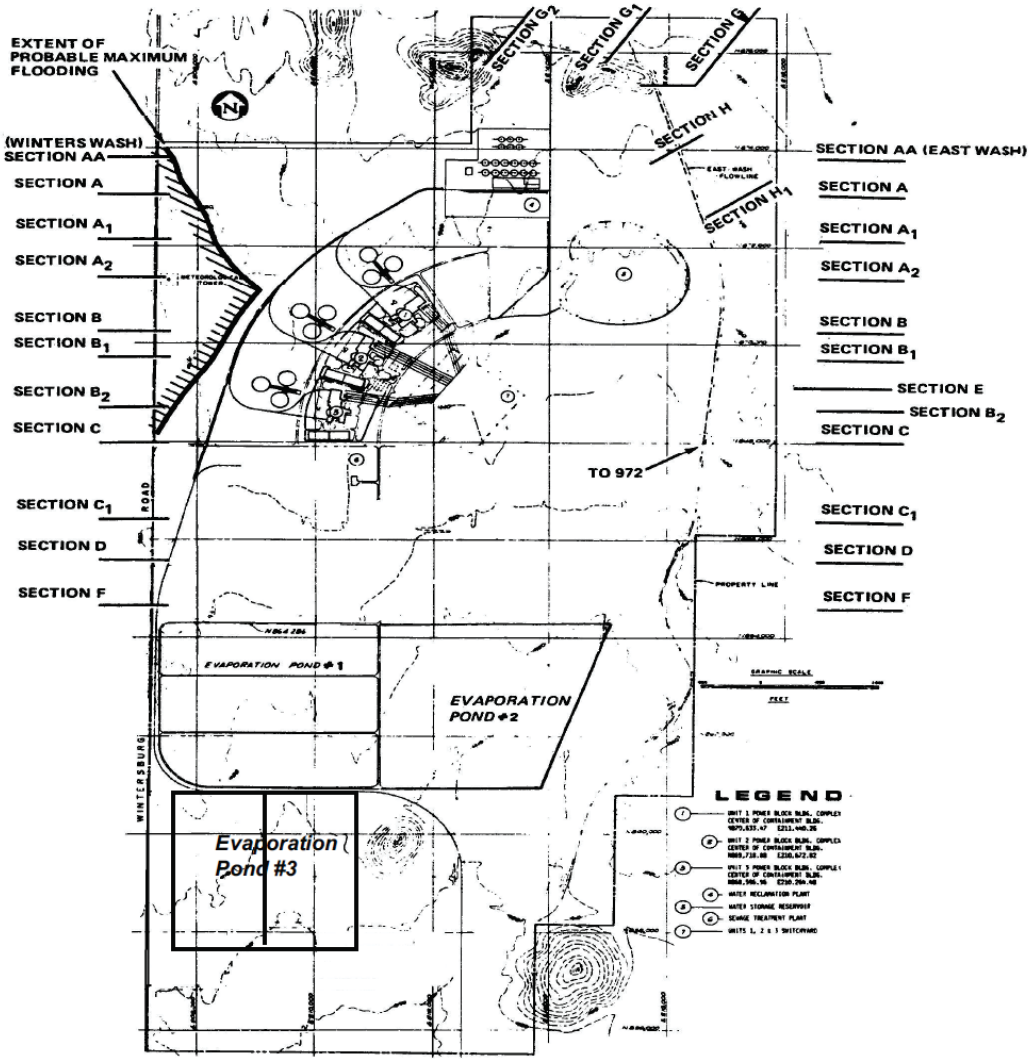
JUNE 2001 REVISION 11

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PLANT SITE AND HYDROSPHERE LOCATIONS
OF CROSS SECTIONS

FIGURE 2.4-1

JUNE 2009 REVISION 15

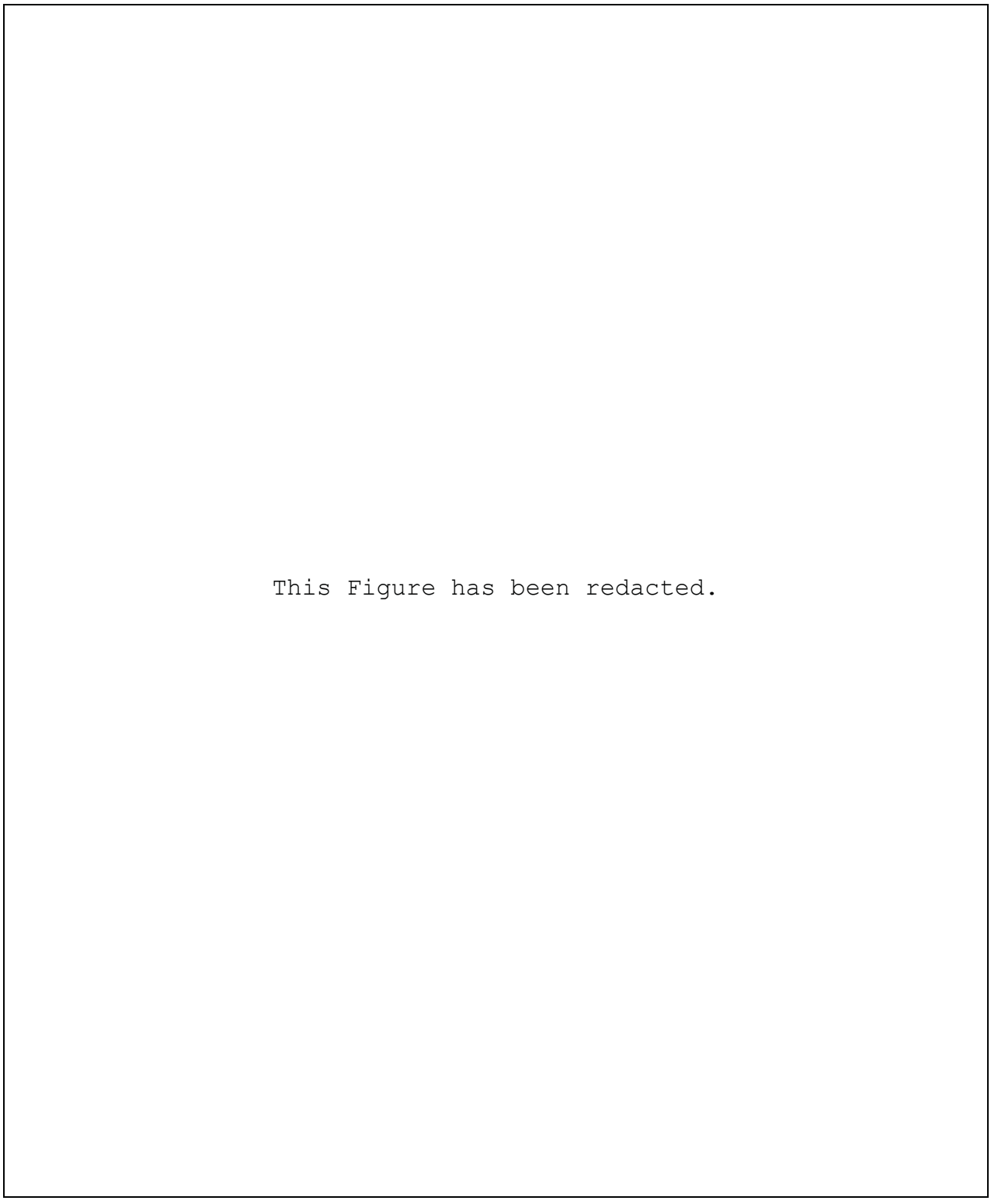


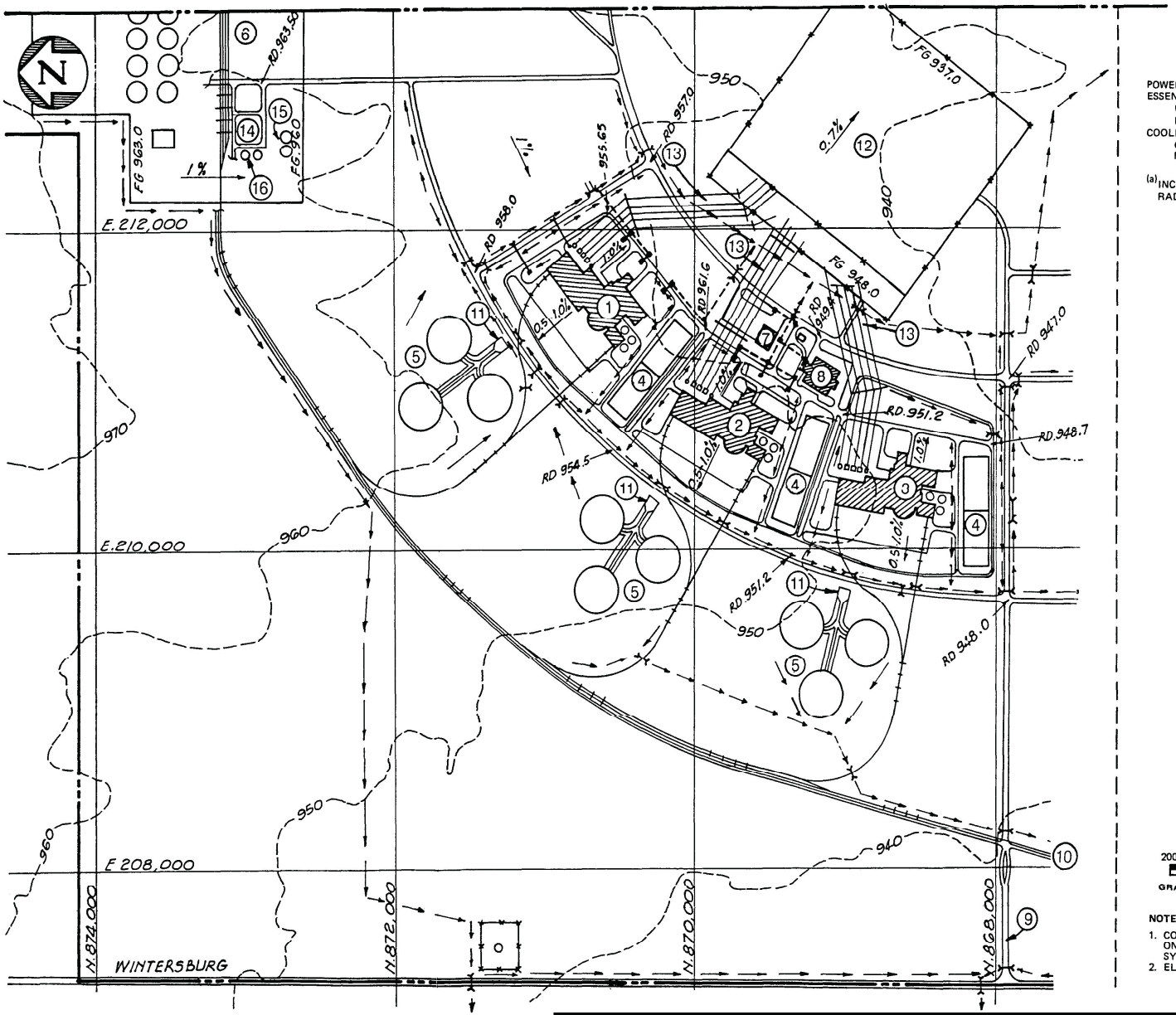
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

SITE DRAINAGE PLAN

FIGURE 2.4-2

JUNE 2011 REVISION 16


This Figure has been redacted.



ELEVATIONS AT MAJOR STRUCTURES

	UNIT 1	UNIT 2	UNIT 3
POWER BLOCK:[a]	957.5	954.5	951.5
ESSENTIAL SPRAY PONDS			
GRADE	954	951	948
MAX WATER SURFACE:	963.5	960.5	957.5
COOLING TOWERS			
GRADE	957	954	951
MAX WATER SURFACE:	956	953	950

[a] INCLUDES CONTAINMENT, AUXILIARY, FUEL STORAGE, CONTROL, RADWASTE, TURBINE, DIESEL GENERATOR, AND WATER STORAGE

LEGEND

1. UNIT 1 CONTAINMENT BUILDING COORDINATE POSITION: N870, 633.47 E211, 440.26
2. UNIT 2 CONTAINMENT BUILDING COORDINATE POSITION: N869, 718.88 E210, 672.82
3. UNIT 3 CONTAINMENT BUILDING COORDINATE POSITION. N868, 596.96 E210, 264.48

RD - ROAD ELEVATION
FG - FINISH GRADE ELEVATION
0.5% - SLOPE
- CULVERT
- DRAINAGE DITCH
- STORM DRAIN

4. ESSENTIAL SPRAY PONDS - 2 PER UNIT
5. COOLING TOWER AREA
6. WATER RECLAMATION AREA
7. ADMINISTRATION BUILDING
8. SERVICE BUILDING
9. MAIN ACCESS ROAD
10. RAILROAD ACCESS
11. CIRCULATING WATER INTAKE STRUCTURE
12. SWITCHYARD
13. TRANSMISSION LINES
14. WATER TREATMENT BUILDING
15. FIRE PROTECTION/WELL WATER STORAGE TANKS
16. DOMESTIC WATER TANKS

200 0 200 400
GRAPHIC SCALE (FEET)

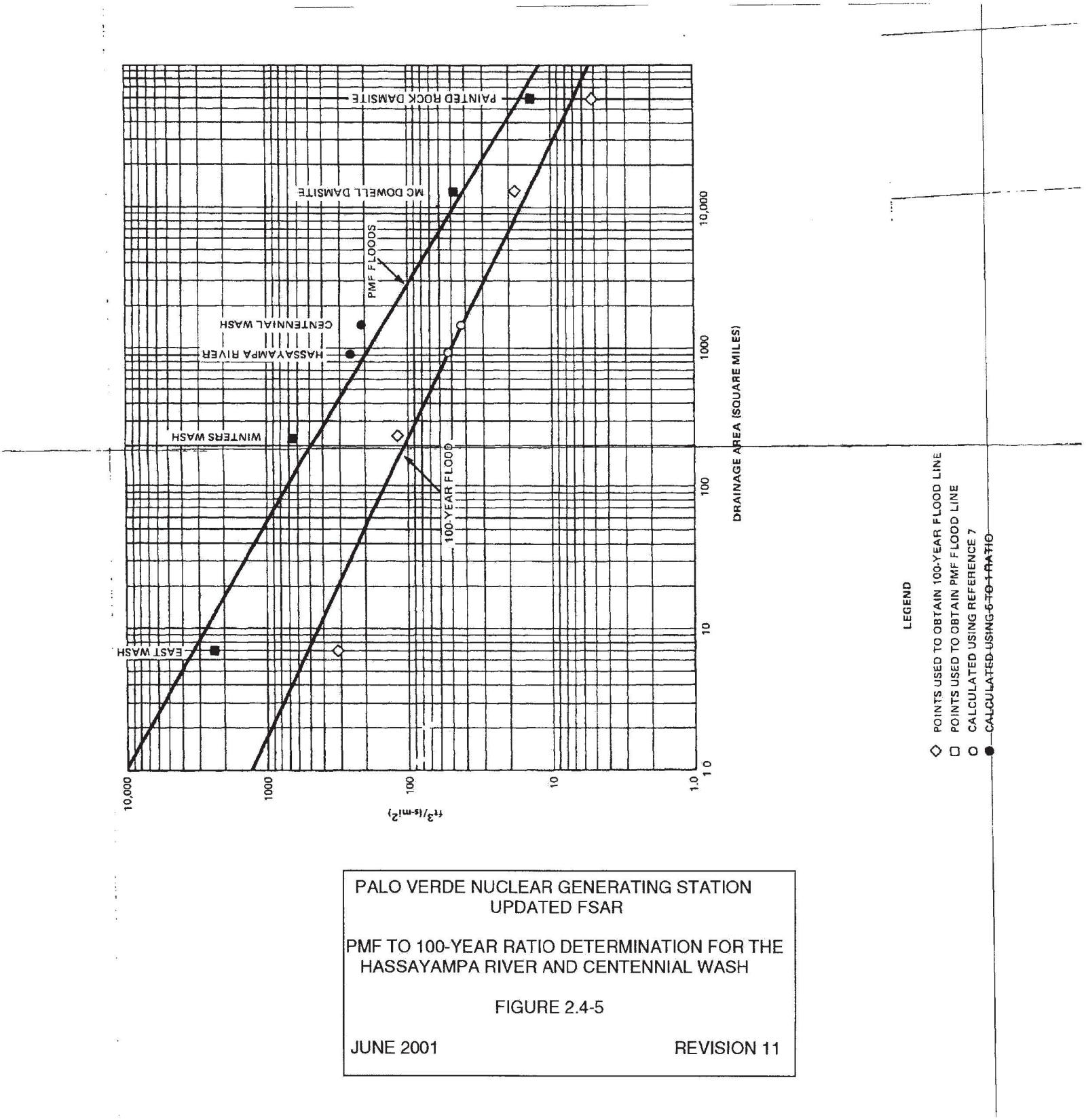
NOTES:
1. COORDINATES ARE BASED ON ARIZONA STATE GRID SYSTEM.
2. ELEVATIONS IN FEET

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

SITE DRAINAGE PLAN POWER BLOCK AREA

FIGURE 2.4-4

JUNE 2009 REVISION 15

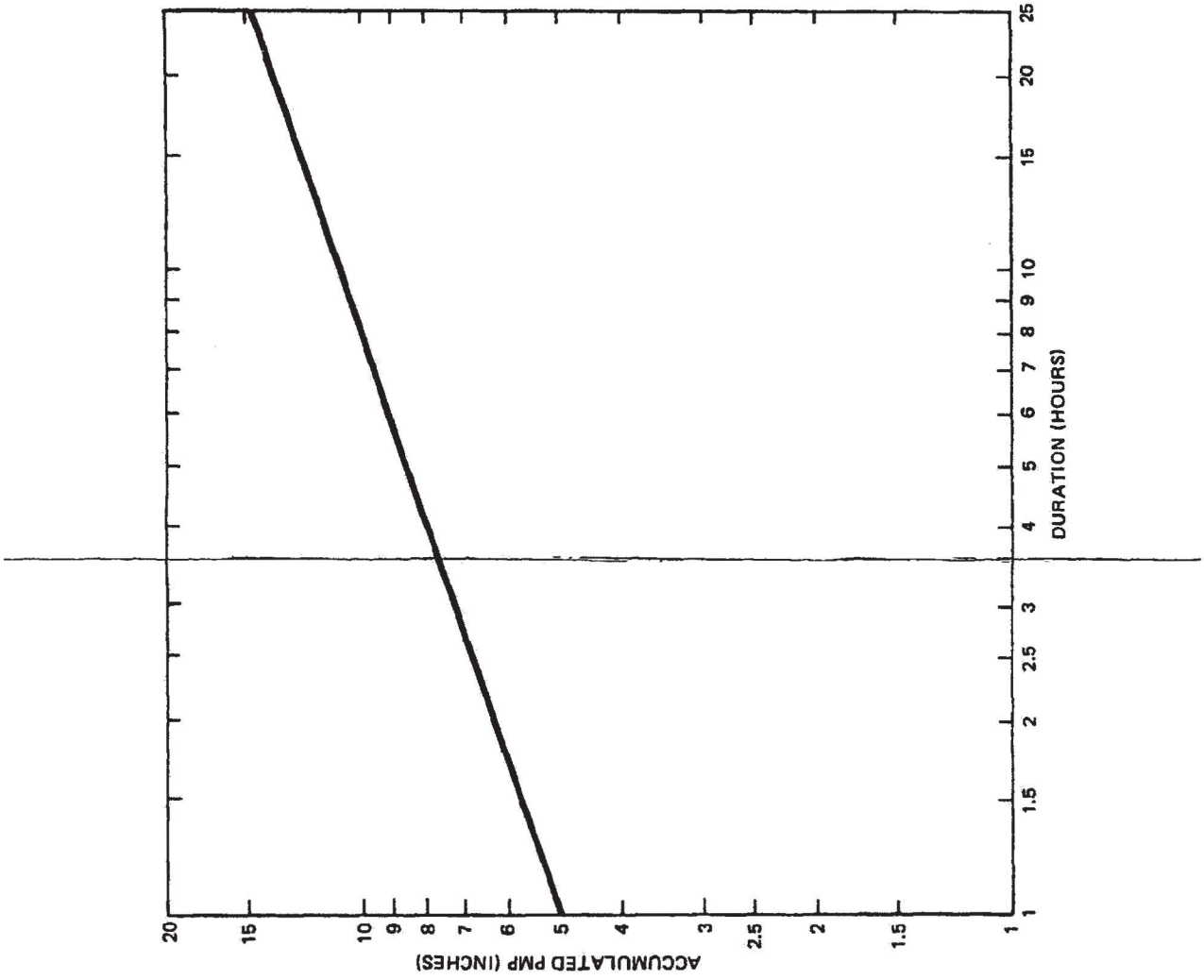


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PMF TO 100-YEAR RATIO DETERMINATION FOR THE HASSAYAMPA RIVER AND CENTENNIAL WASH

FIGURE 2.4-5

JUNE 2001 REVISION 11

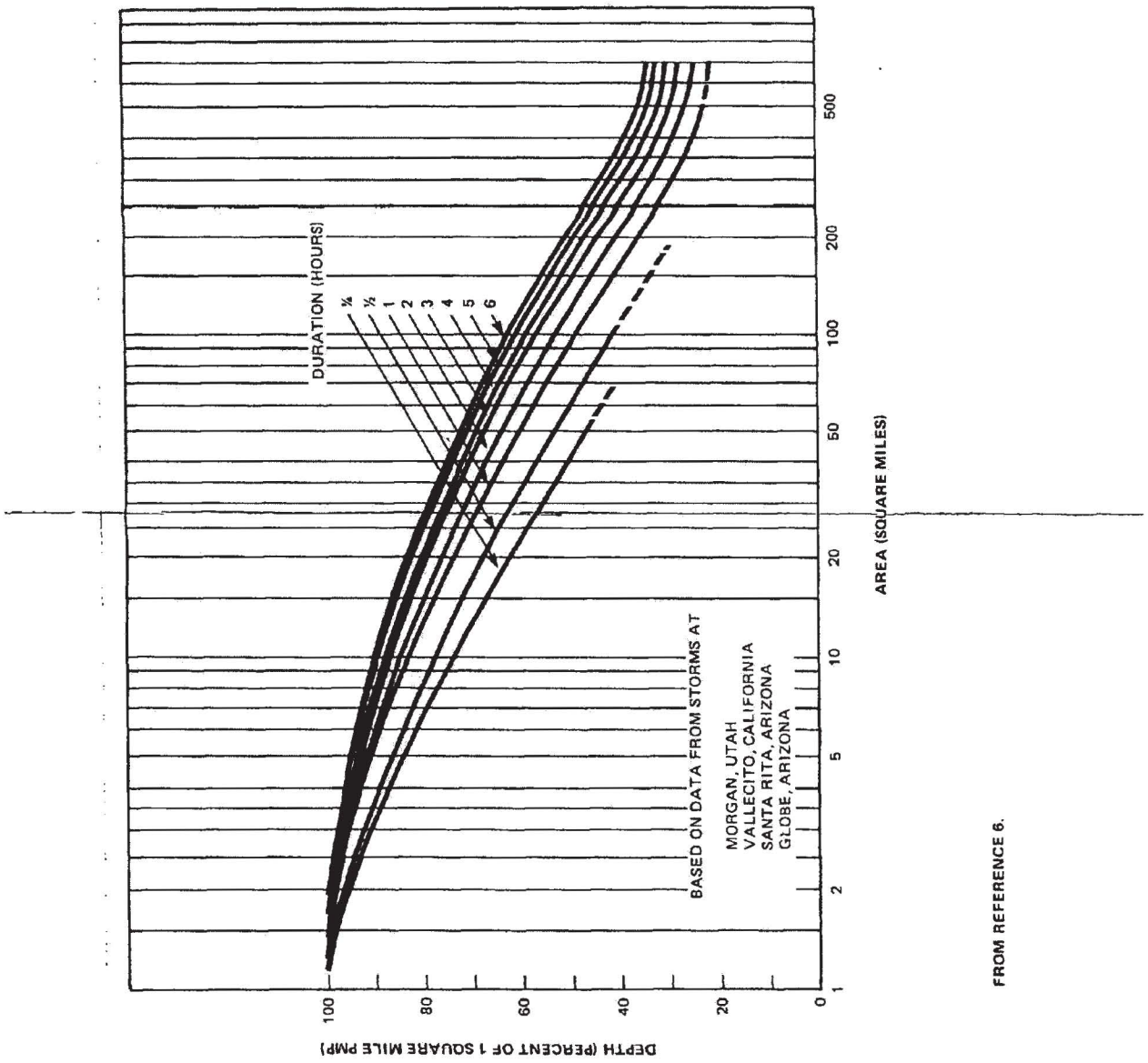


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PROBALBE MAXIMUM PRECIPITATION (PMP)
FOR WINTER WASH DEPTH-DURATION CURVE

FIGURE 2.4-6

JUNE 2001 REVISION 11

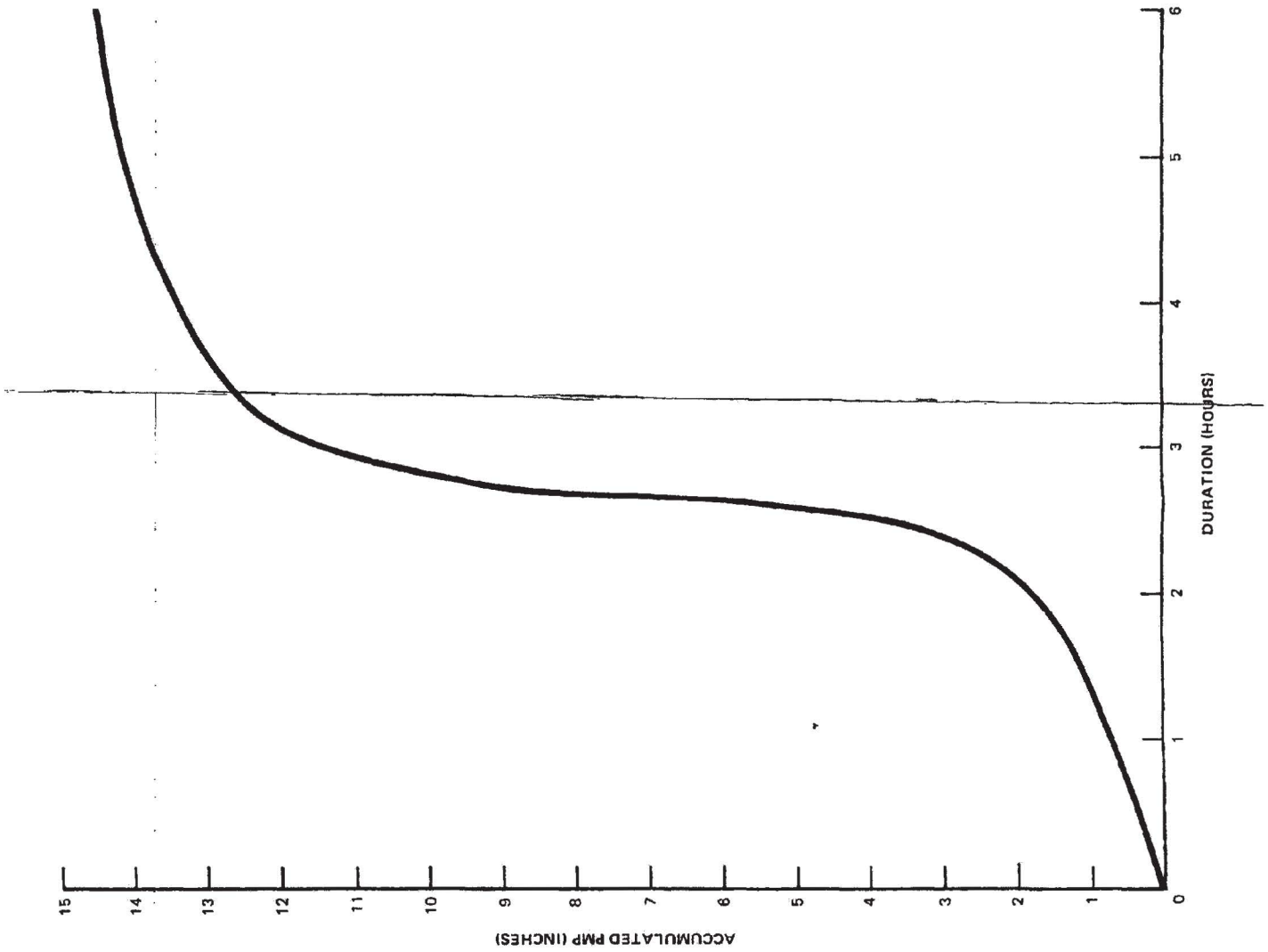


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

ADOPTED DEPTH AREA RELATION FOR
THUNDERSTORM PMP IN THE
SOUTHWESTERN STATES

FIGURE 2.4-7

JUNE 2001 REVISION 11

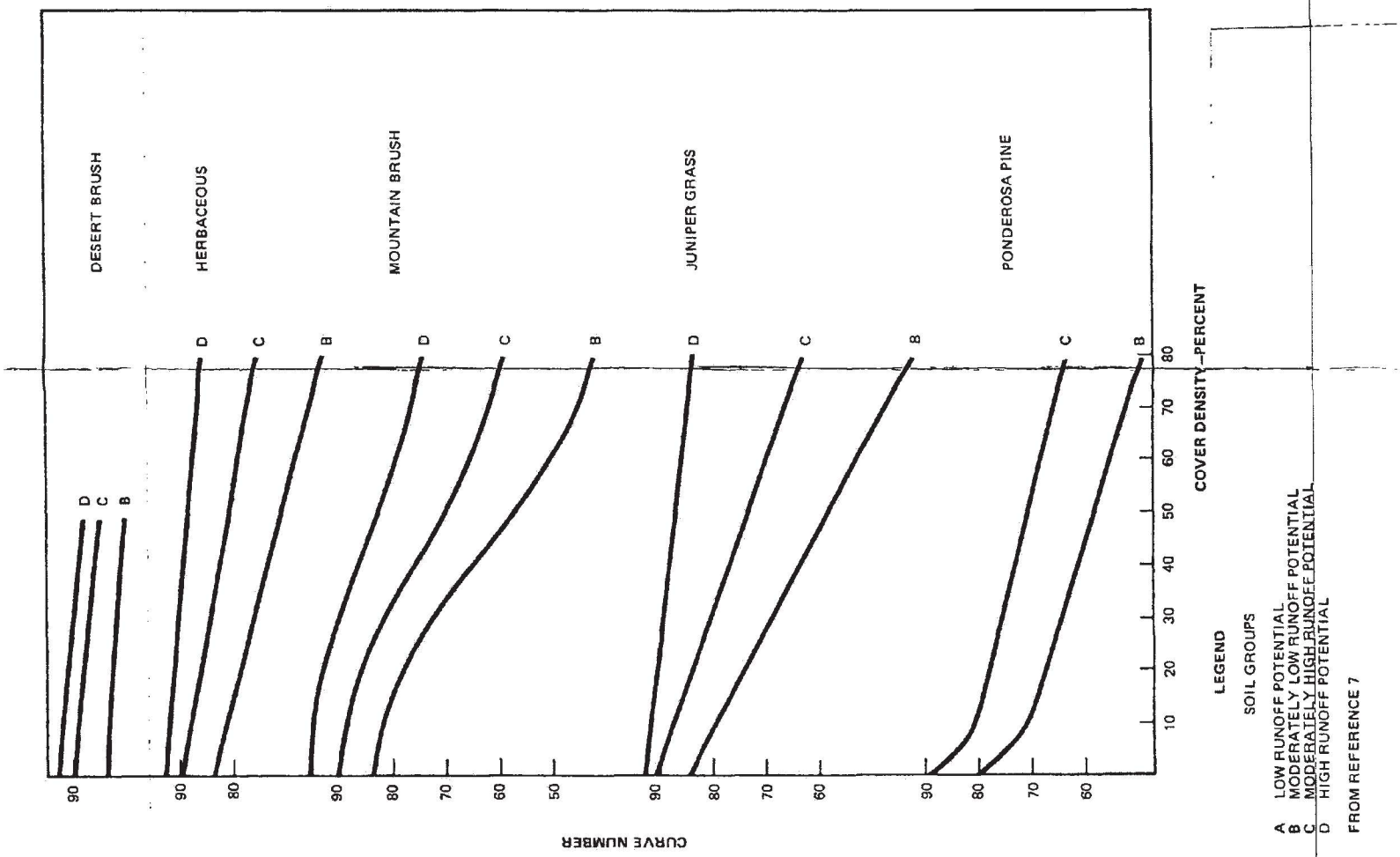


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PROBABLE MAXIMUM PRECIPITATION
FOR EAST WASH DEPTH-DURATION CURVE

FIGURE 2.4-8

JUNE 2001 REVISION 11

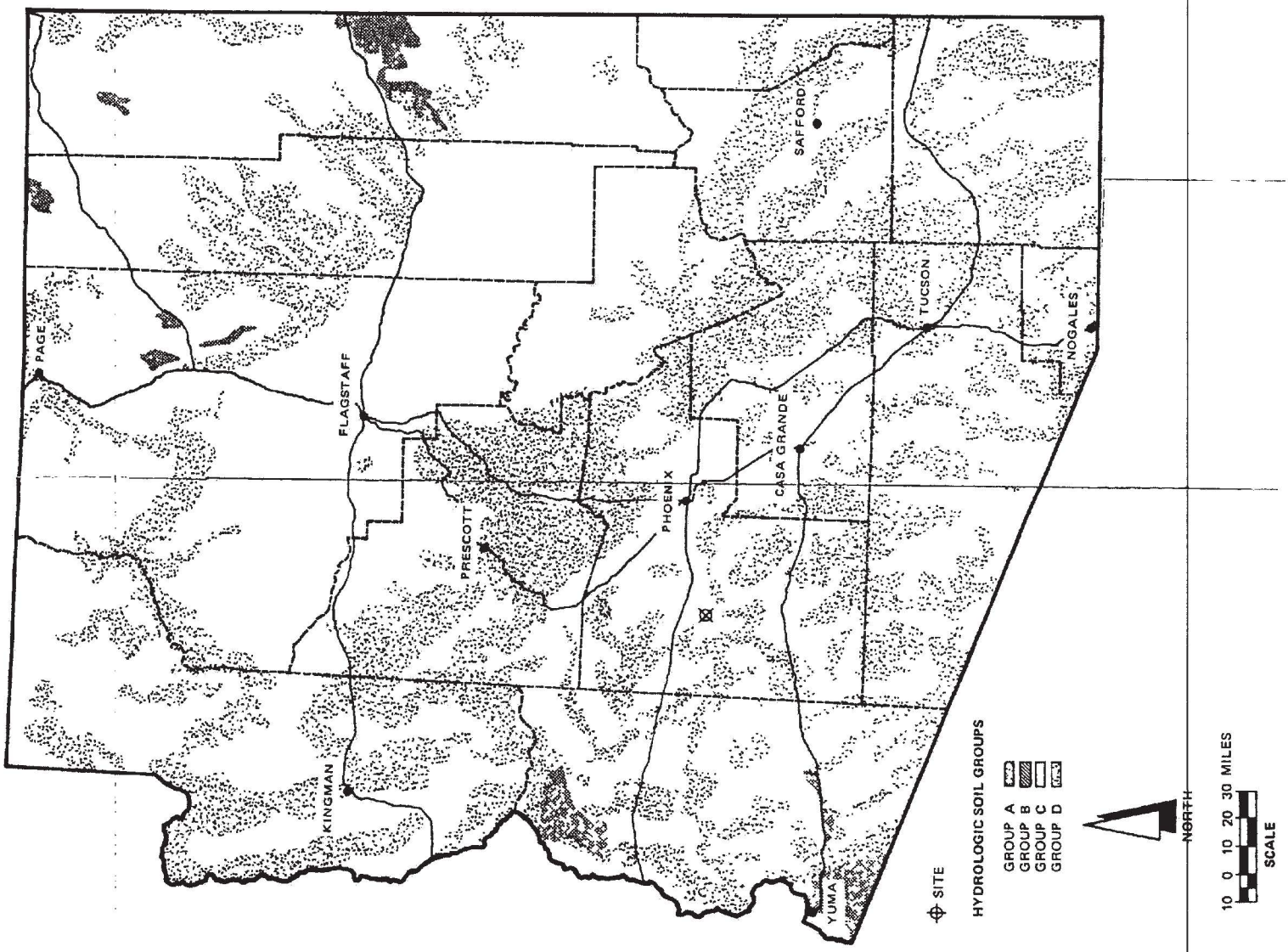


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROLOGIC SOIL-COVER COMPLEXES
AND ASSOCIATED CURVE NUMBERS

FIGURE 2.4-9

JUNE 2001 REVISION 11

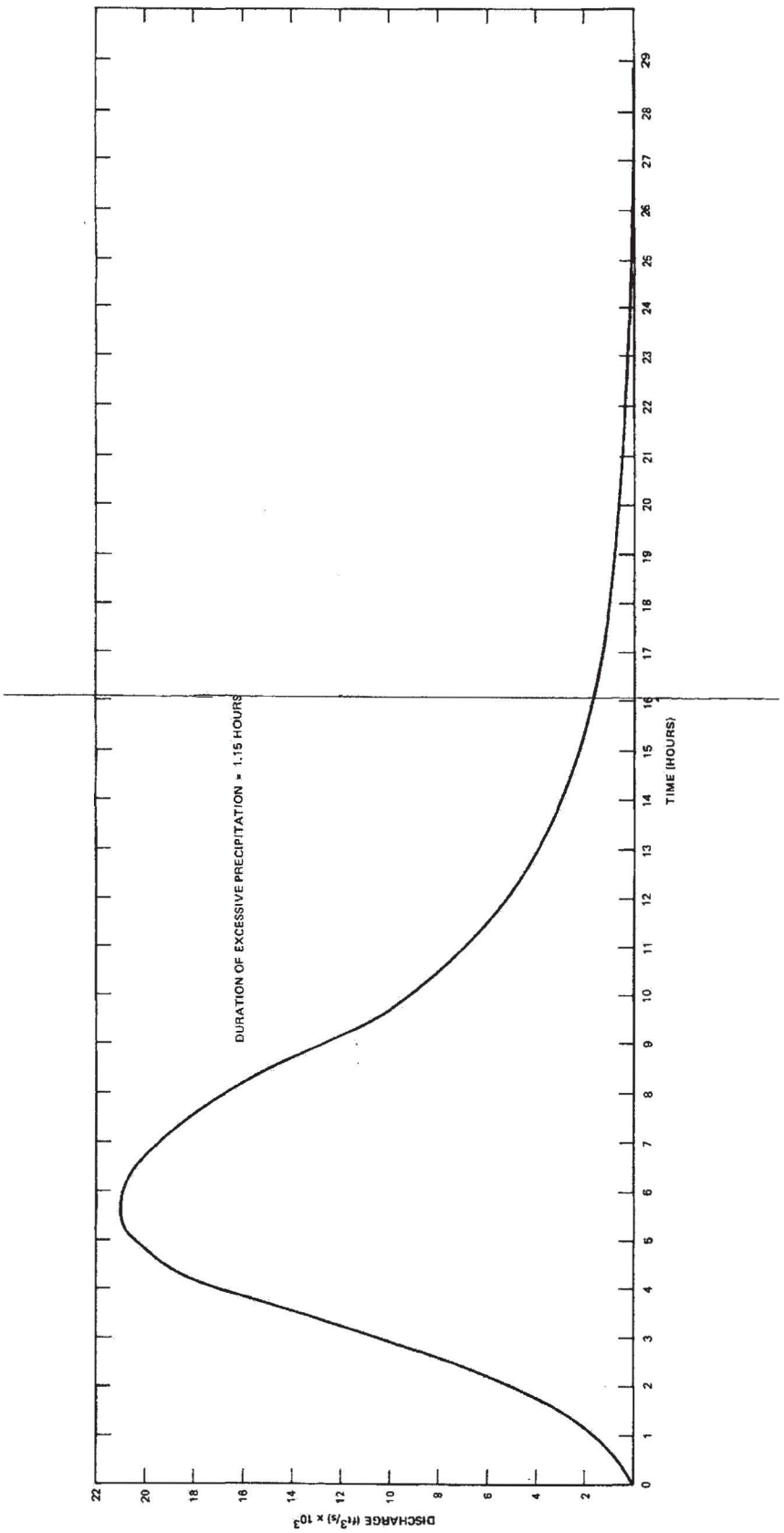


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

GENERALIZED HYDRLOGIC SOIL MAP

FIGURE 2.4-10

JUNE 2001 REVISION 11

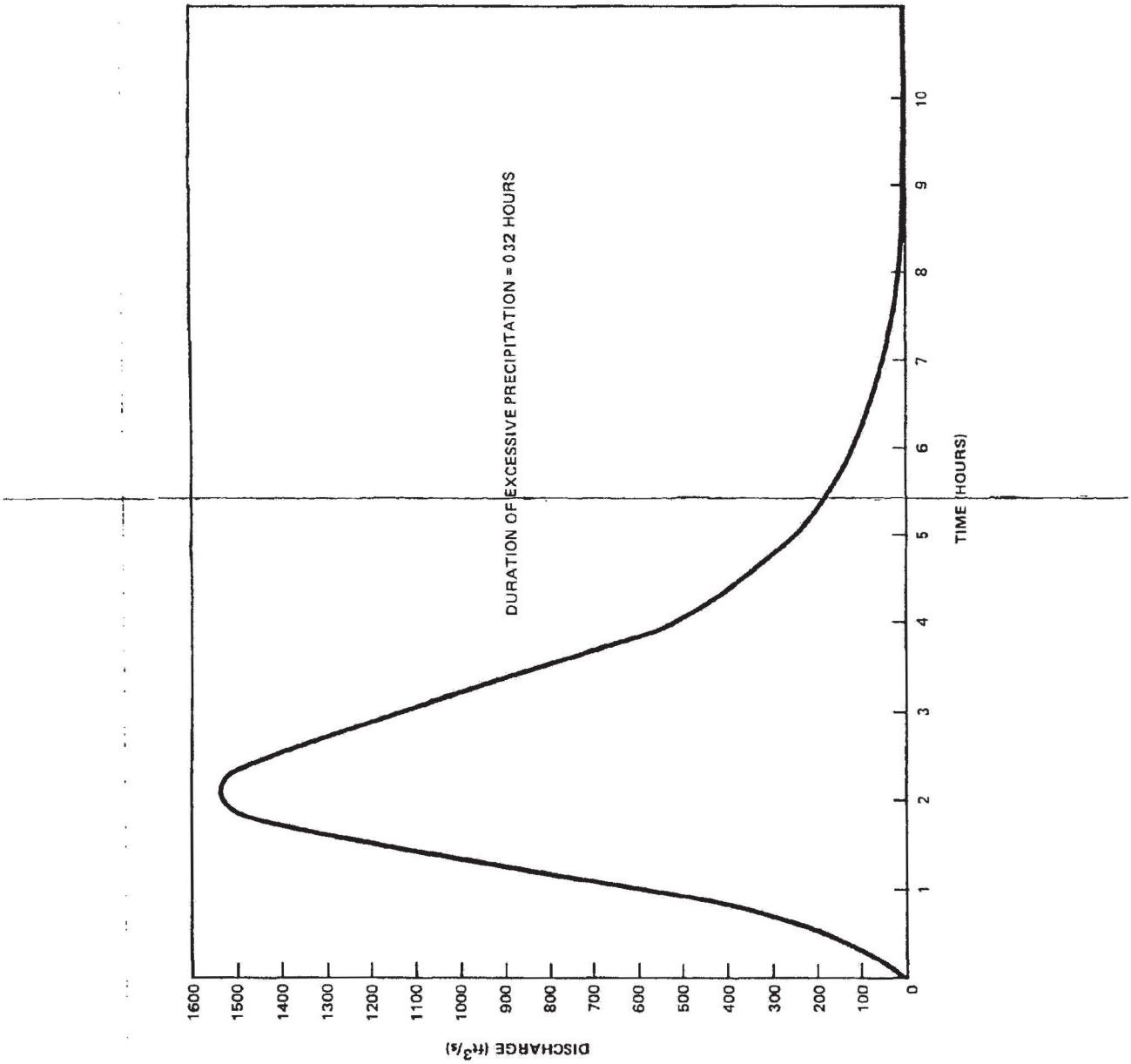


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

UNIT HYDROGRAPH OF WINTER WASH BASIN

FIGURE 2.4-11

JUNE 2001 REVISION 11

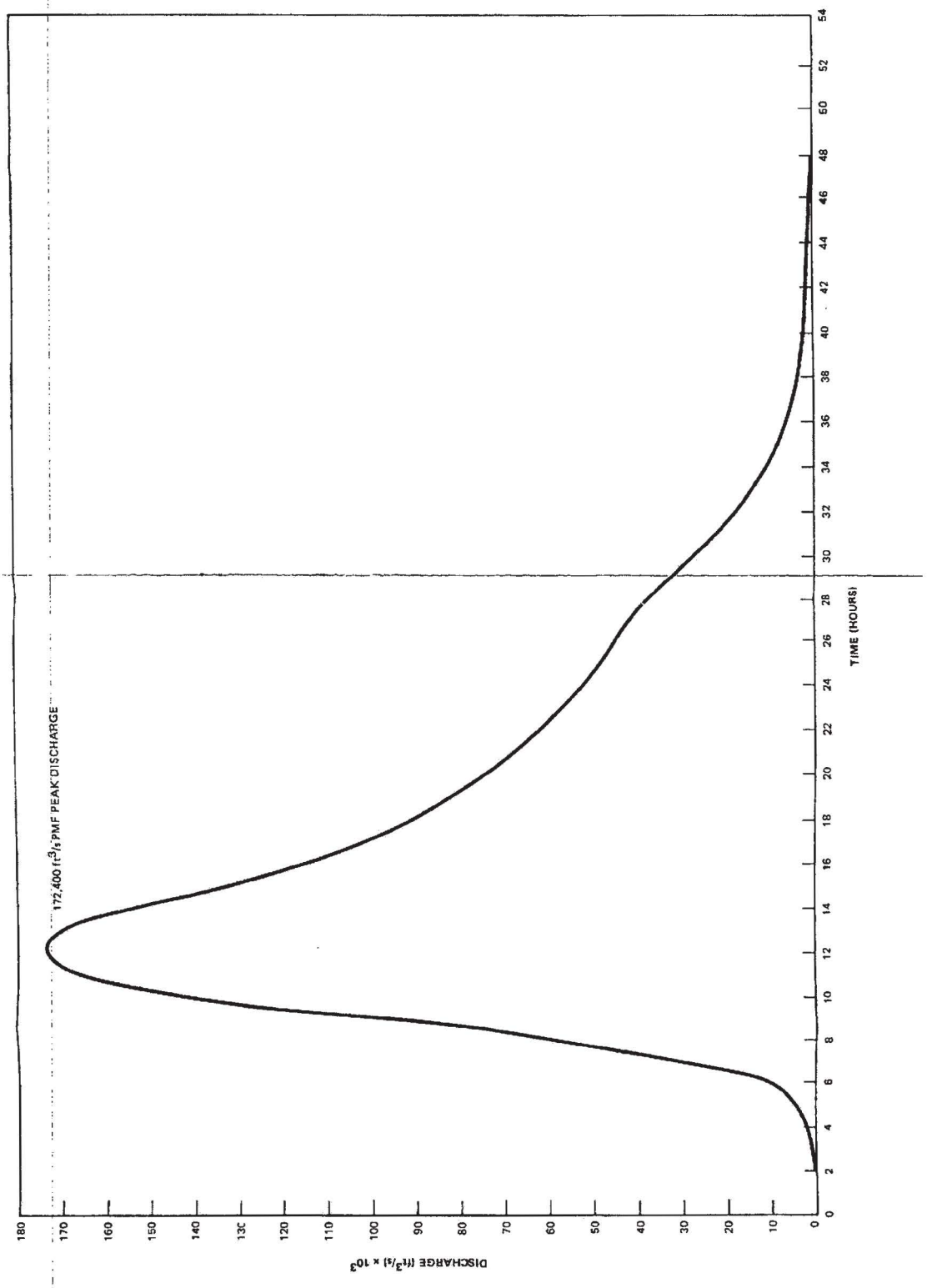


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

UNIT HYDROGRAPH OF EAST WASH
DRAINAGE AREA

FIGURE 2.4-12

JUNE 2001 REVISION 11

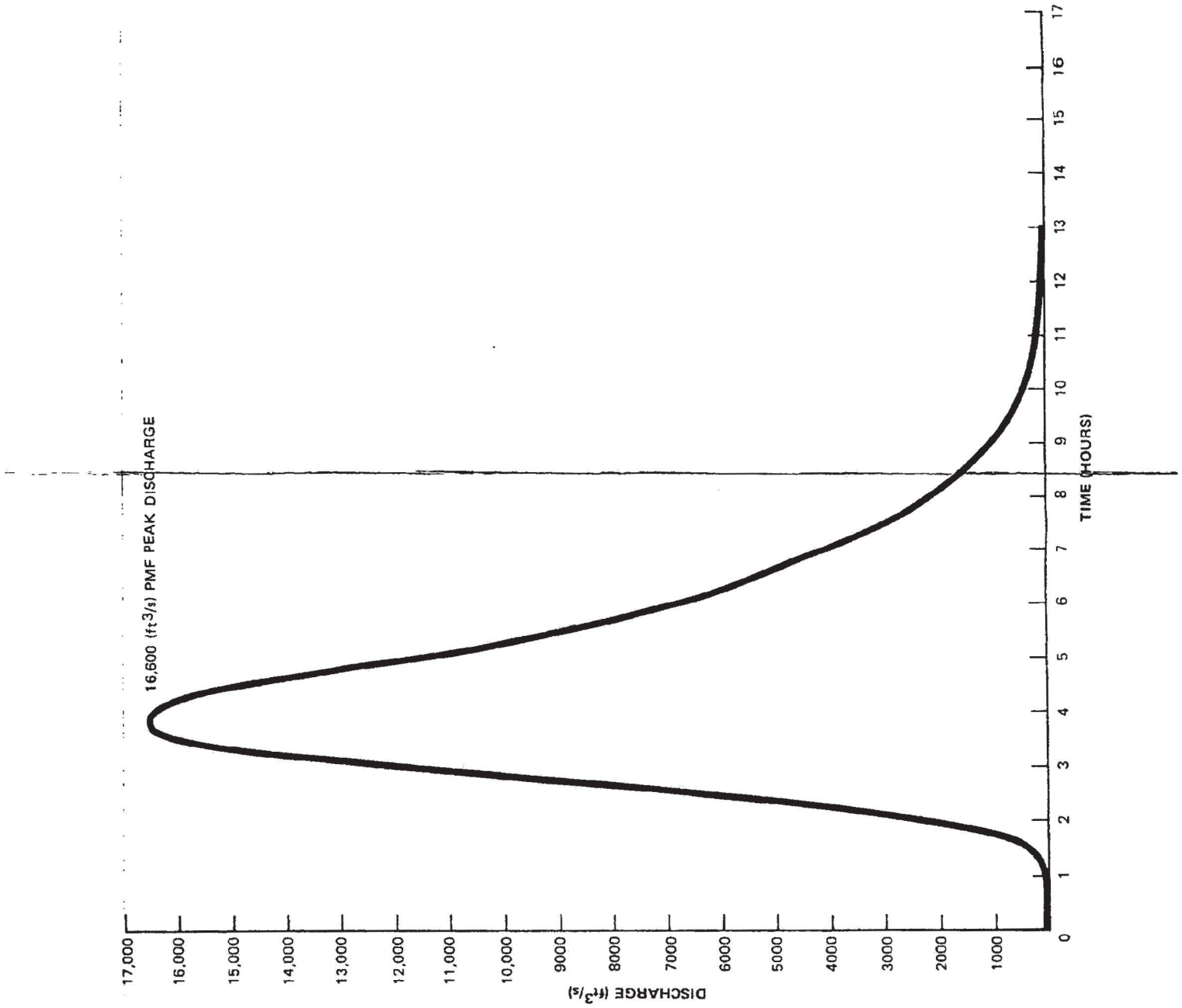


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PMF RUNOFF HYDROGRAPH OF WINTERS WASH
DRAINAGE AREA

FIGURE 2.4-13

JUNE 2001 REVISION 11



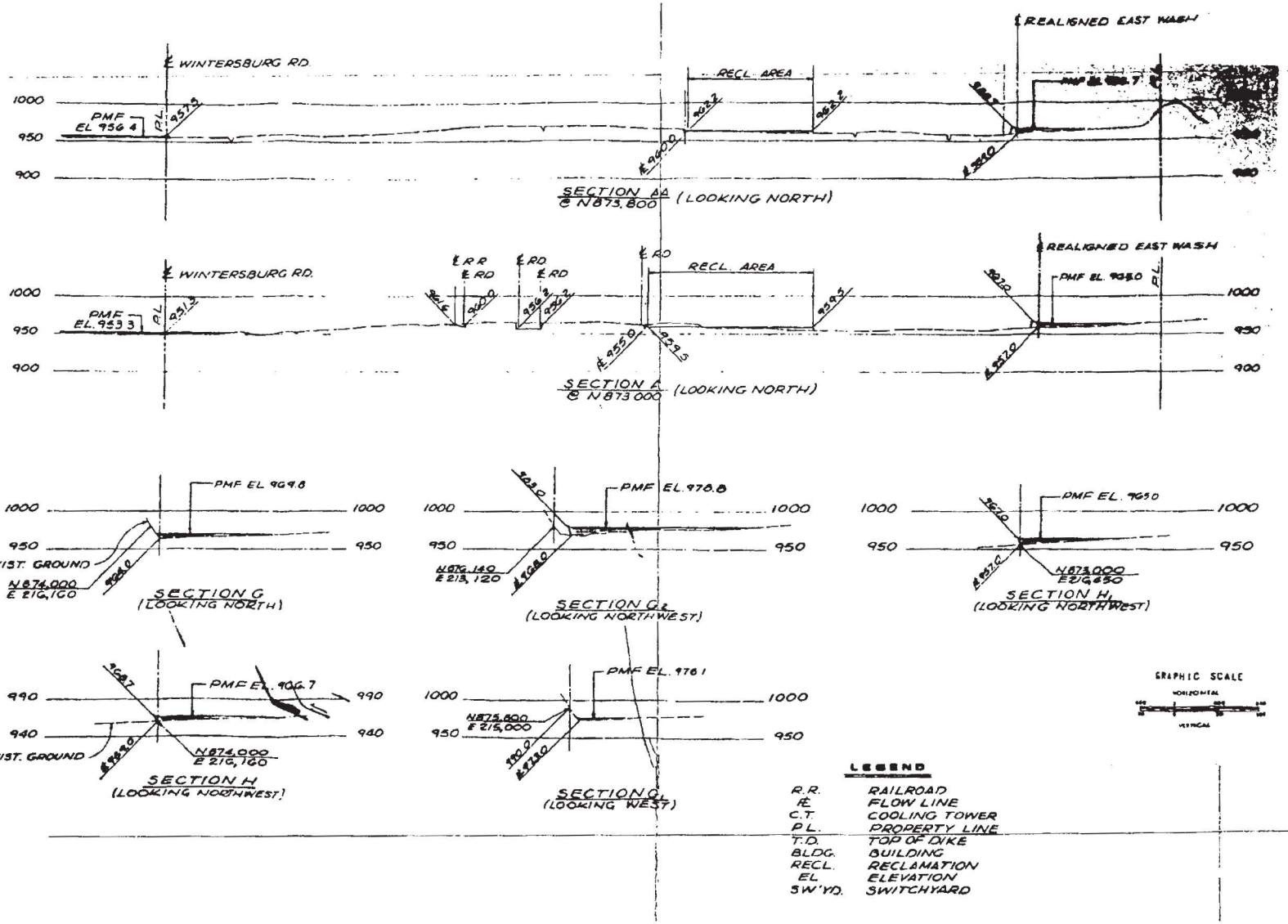
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PMF RUNOFF HYDROGRAPH OF EAST
WASH DRAINAGE AREA

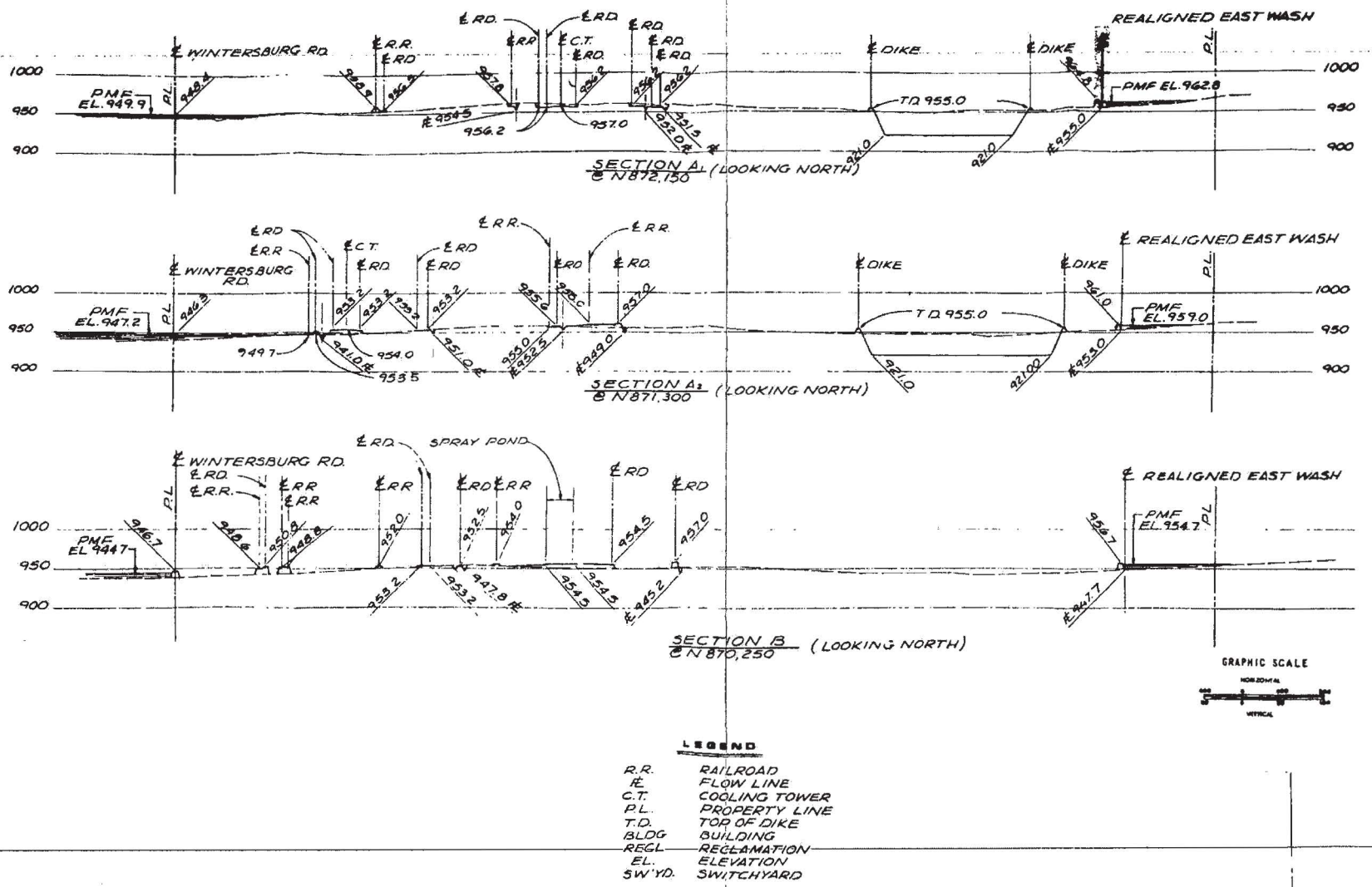
FIGURE 2.4-14

JUNE 2001 REVISION 11

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR
SITE CROSS SECTIONS
FIGURE 2.4-15 Sheet 1 of 4
JUNE 2001
REVISION 11



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR
SITE CROSS SECTIONS
FIGURE 2.4-15 Sheet 2 of 4
JUNE 2001
REVISION 11



LEGEND

R.R.	RAILROAD
℄	FLOW LINE
C.T.	COOLING TOWER
P.L.	PROPERTY LINE
T.D.	TOP OF DIKE
BLDG	BUILDING
REGL	RECLAMATION
EL.	ELEVATION
SW'YD.	SWITCHYARD

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR
SITE CROSS SECTIONS
FIGURE 2.4-15 Sheet 3 of 4
JUNE 2001
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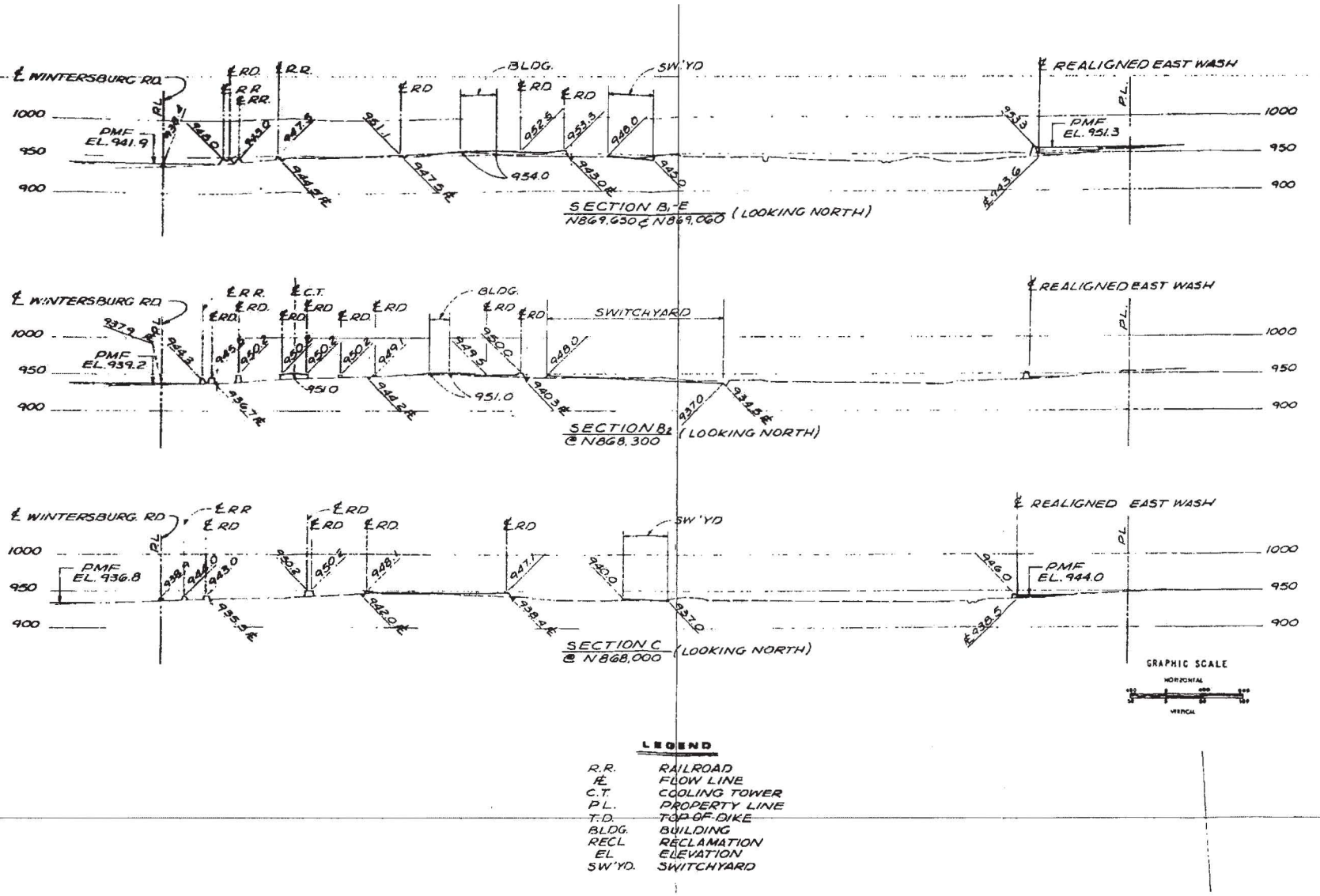


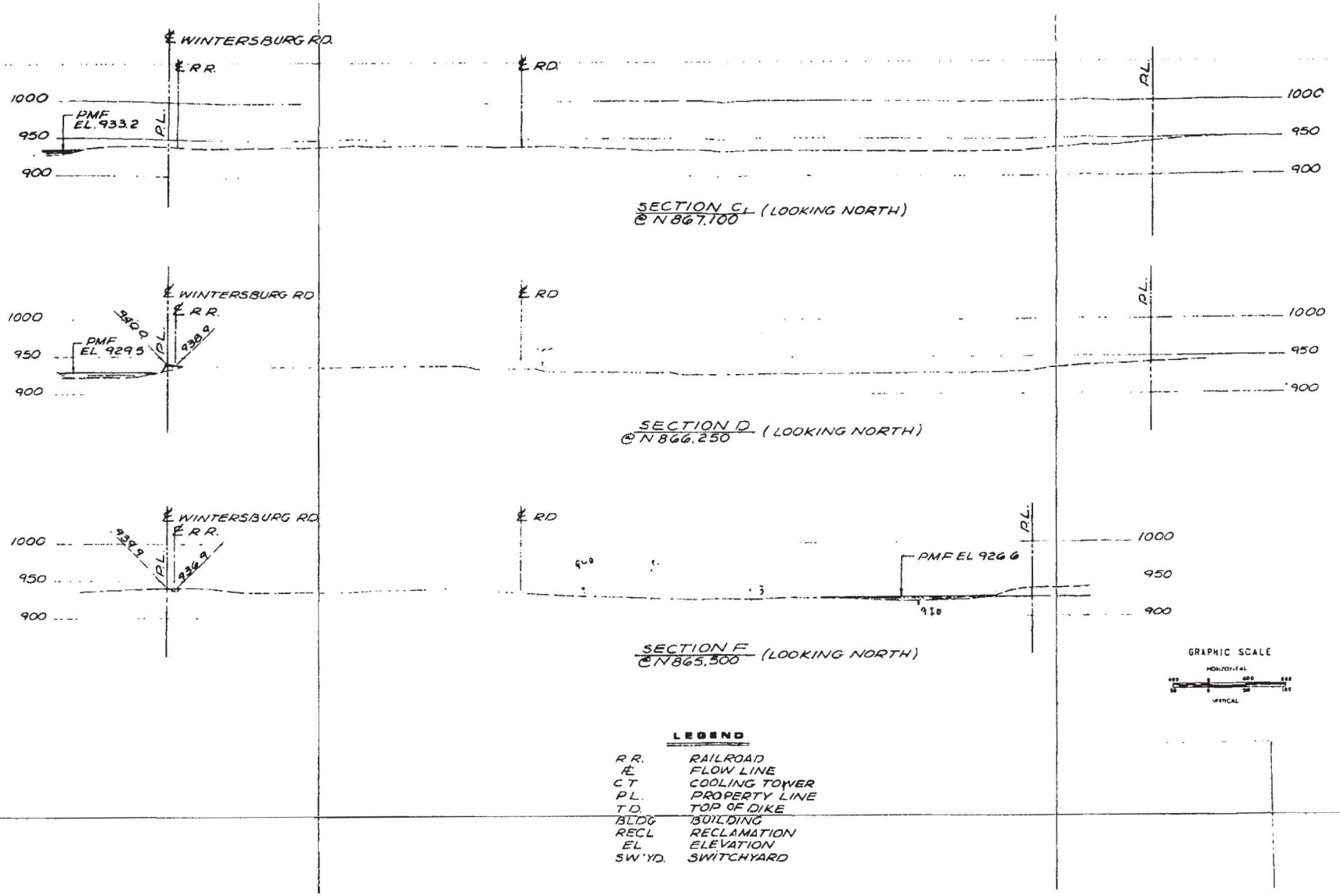
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

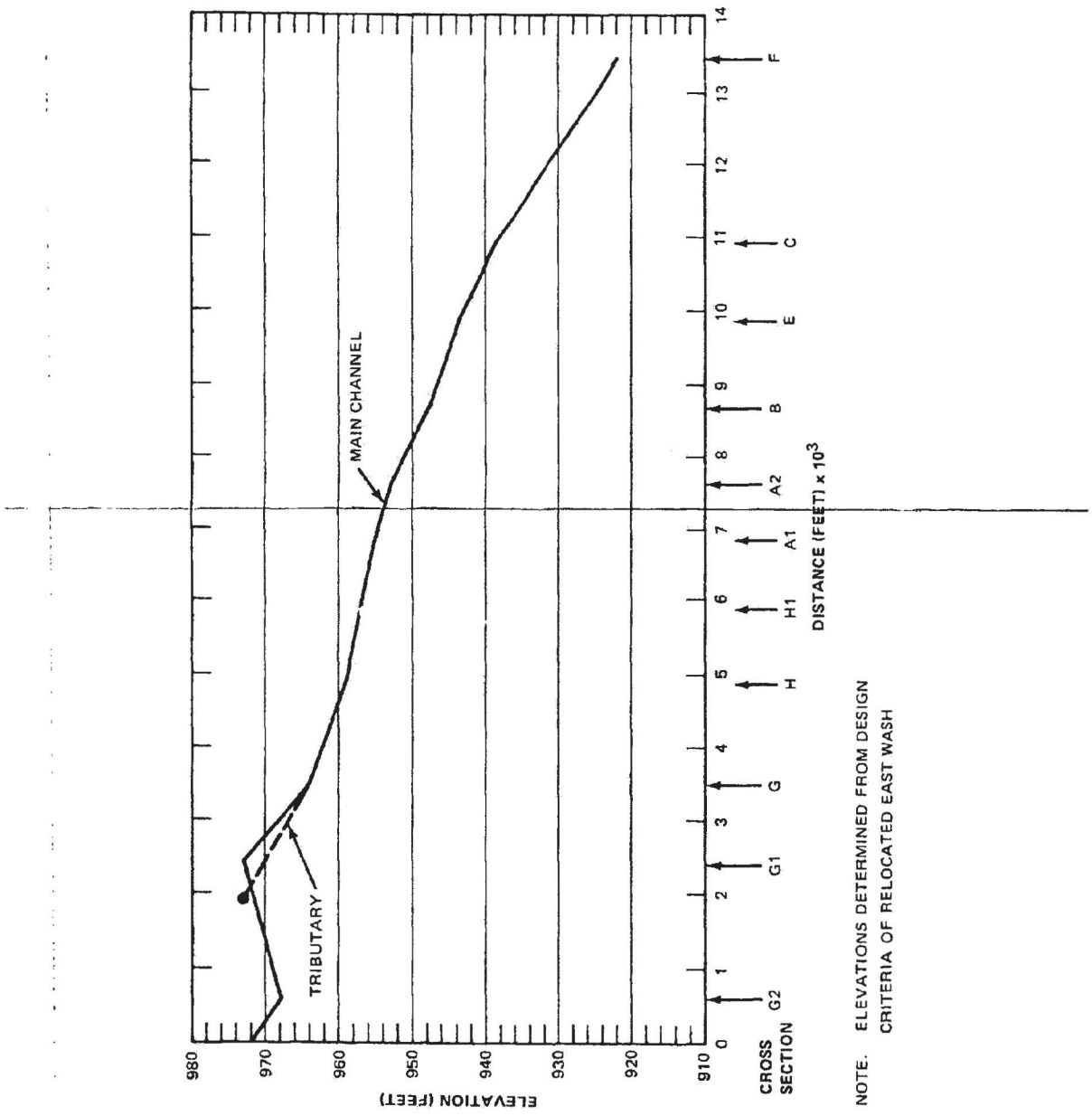
SITE CROSS SECTIONS

FIGURE 2.4-15 Sheet 4 of 4

JUNE 2001

REVISION 11





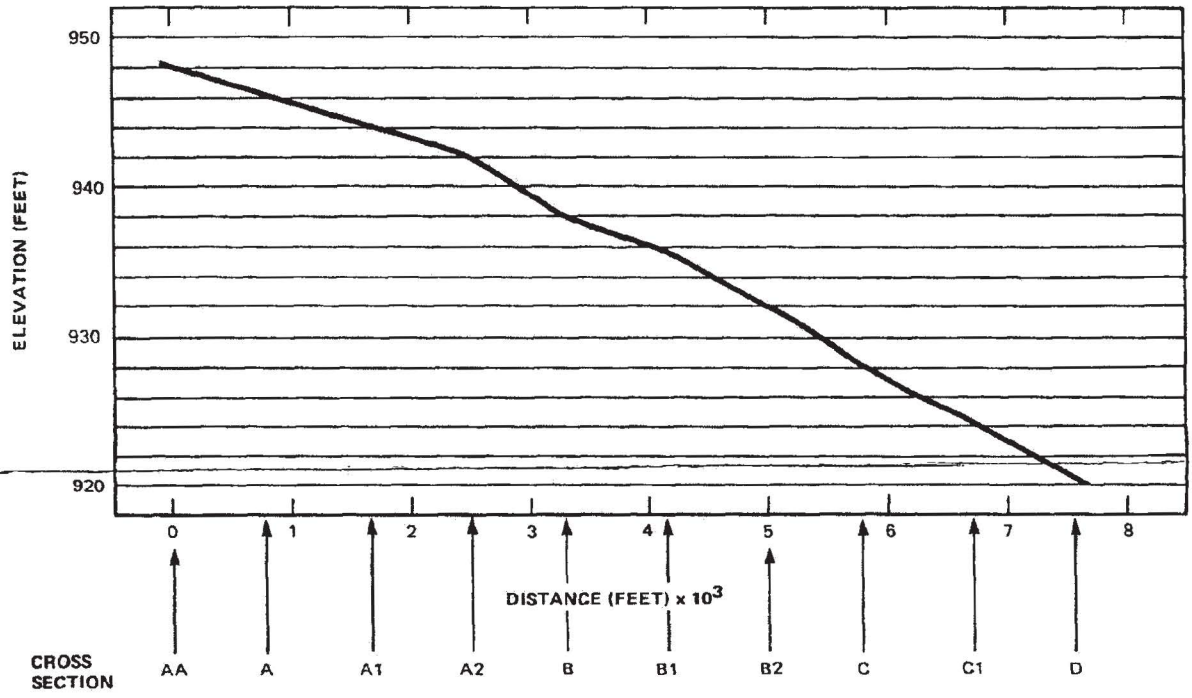
NOTE. ELEVATIONS DETERMINED FROM DESIGN CRITERIA OF RELOCATED EAST WASH

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

EAST WASH STREAM BED PROFILE

FIGURE 2.4-16

JUNE 2001 REVISION 11



NOTE

ELEVATIONS DETERMINED FROM 2-FOOT INTERVAL CONTOUR MAP OF SITE AREA

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WINTERS WASH STREAM BED PROFILE

FIGURE 2.4-17

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ZONE A — DUMPED STONE RIPRAP·

FLOW VELOCITY≃6 ft/s

STONE UNIT WEIGHT≃155 lb/ft^3

AVERAGE STONE DIAMETER≃1.0 FOOT

MINIMUM THICKNESS≃1.5 FEET

ZONE B — FILTER BLANKET

FILTER RATIO

$$5 < \frac{D_{15}(\text{OF RIPRAP})}{D_{85}(\text{OF BANK})} < 40 \text{ WHERE}$$

D_{15} = 15 PERCENT PARTICLE SIZE

D_{85} = 85 PERCENT PARTICLE SIZE

SECTION	WATER DEPTH FEET
G	5.8
H	7.7
A1	7.8
A2	6 0
B	7 0

NOTE:

SECTION LOCATION AS PER FIGURE 2.4-2

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

TYPICAL SECTION FOR EMBANKMENT
PROTECTION EAST WASH

FIGURE 2.4-18

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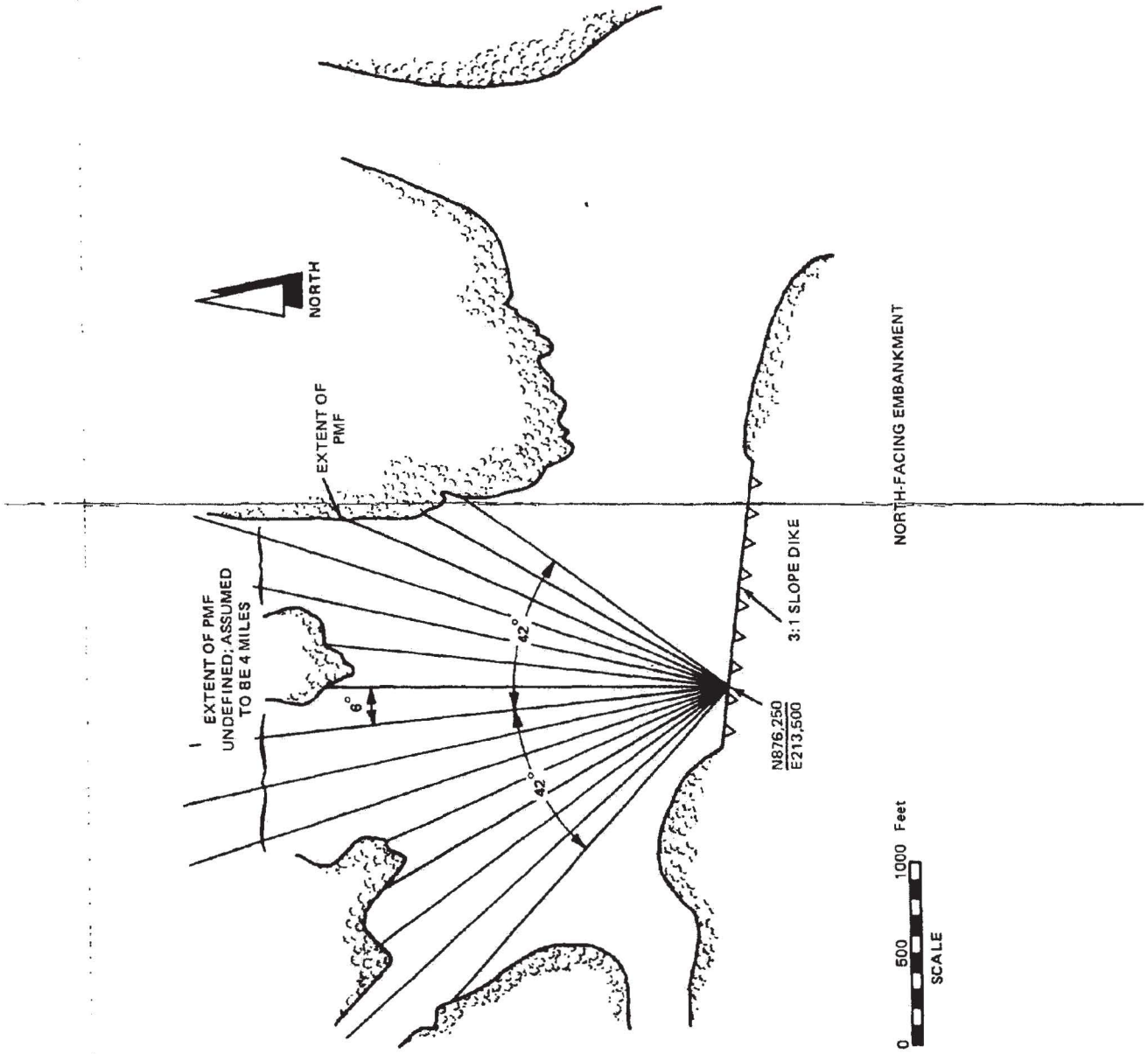
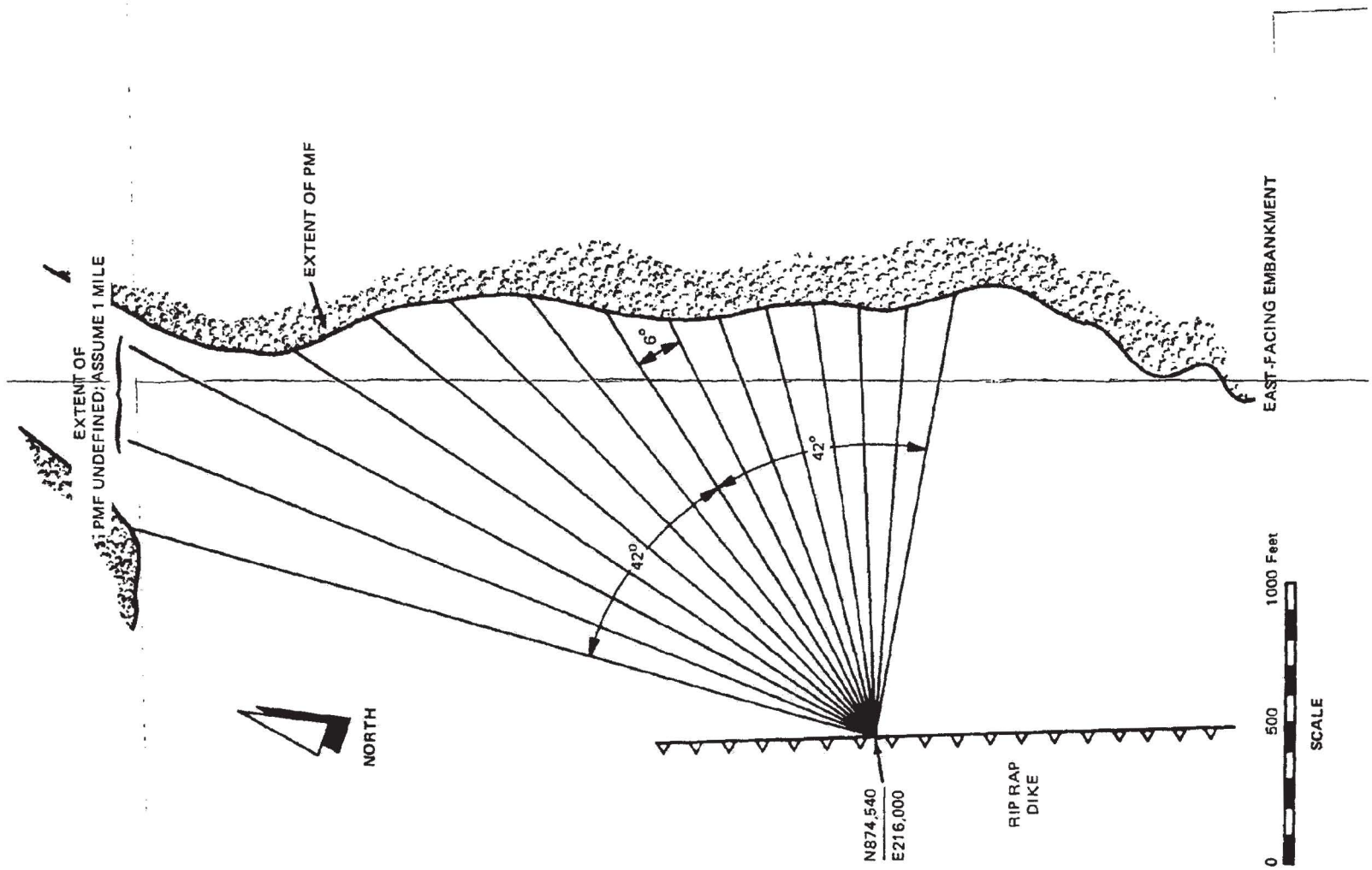


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

EAST WASH FETCH DIAGRAM

FIGURE 2.4-19 Sheet 1 of 2

JUNE 2001 REVISION 11

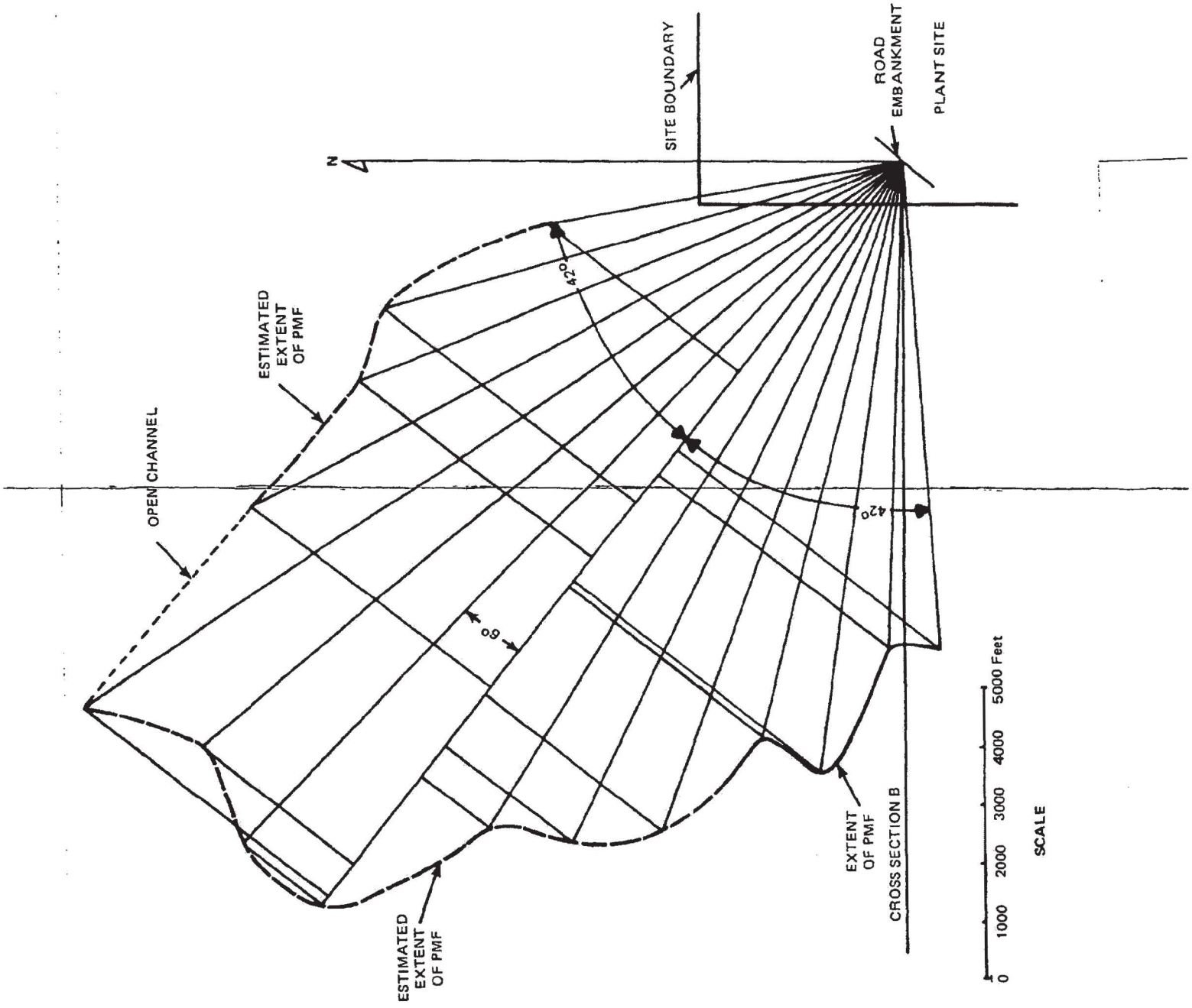


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

EAST WASH FETCH DIAGRAM

FIGURE 2.4-19 Sheet 2 of 2

JUNE 2001 REVISION 11

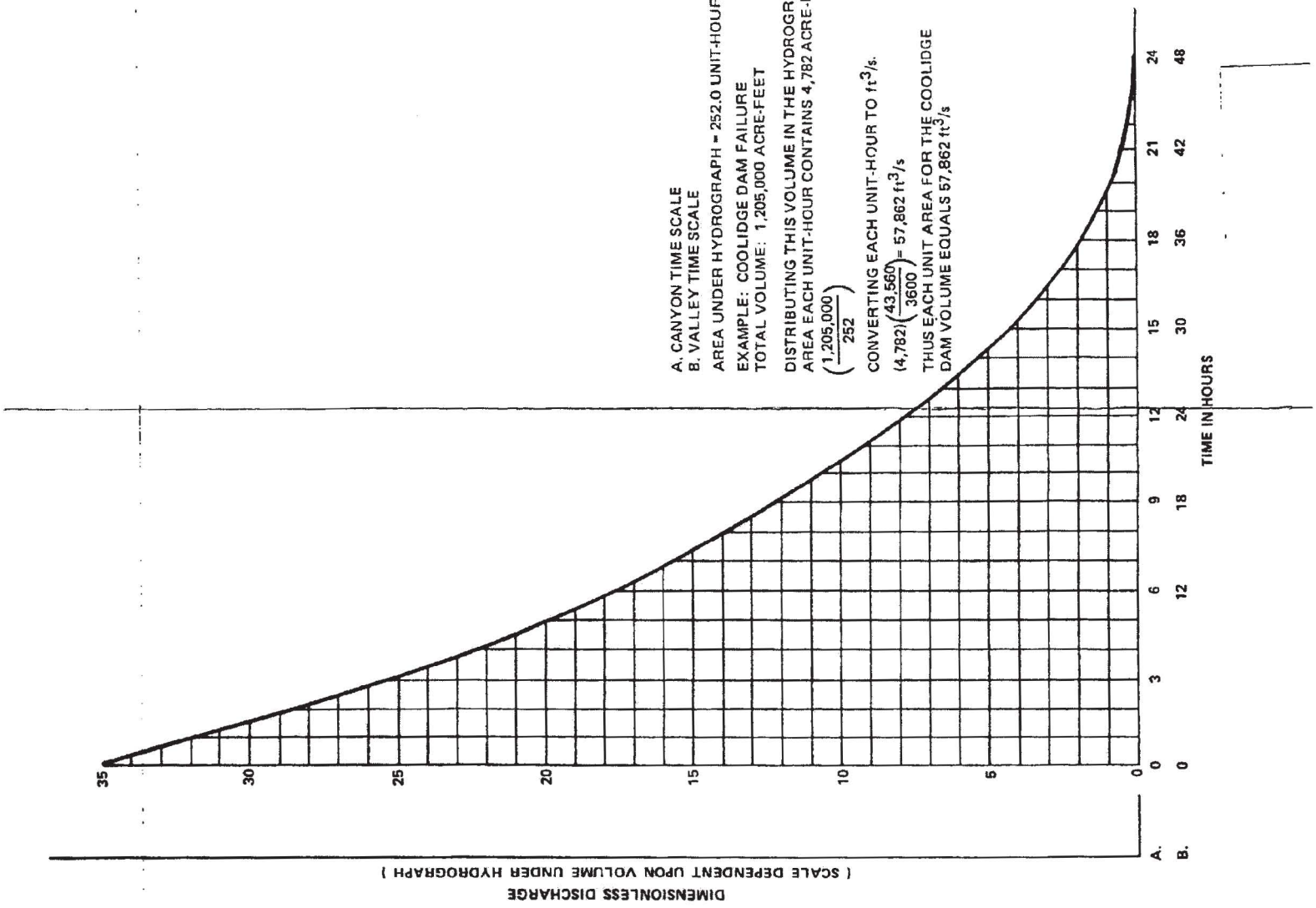


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WINTERS WASH FETCH DIAGRAM

FIGURE 2.4-20

JUNE 2001 REVISION 11

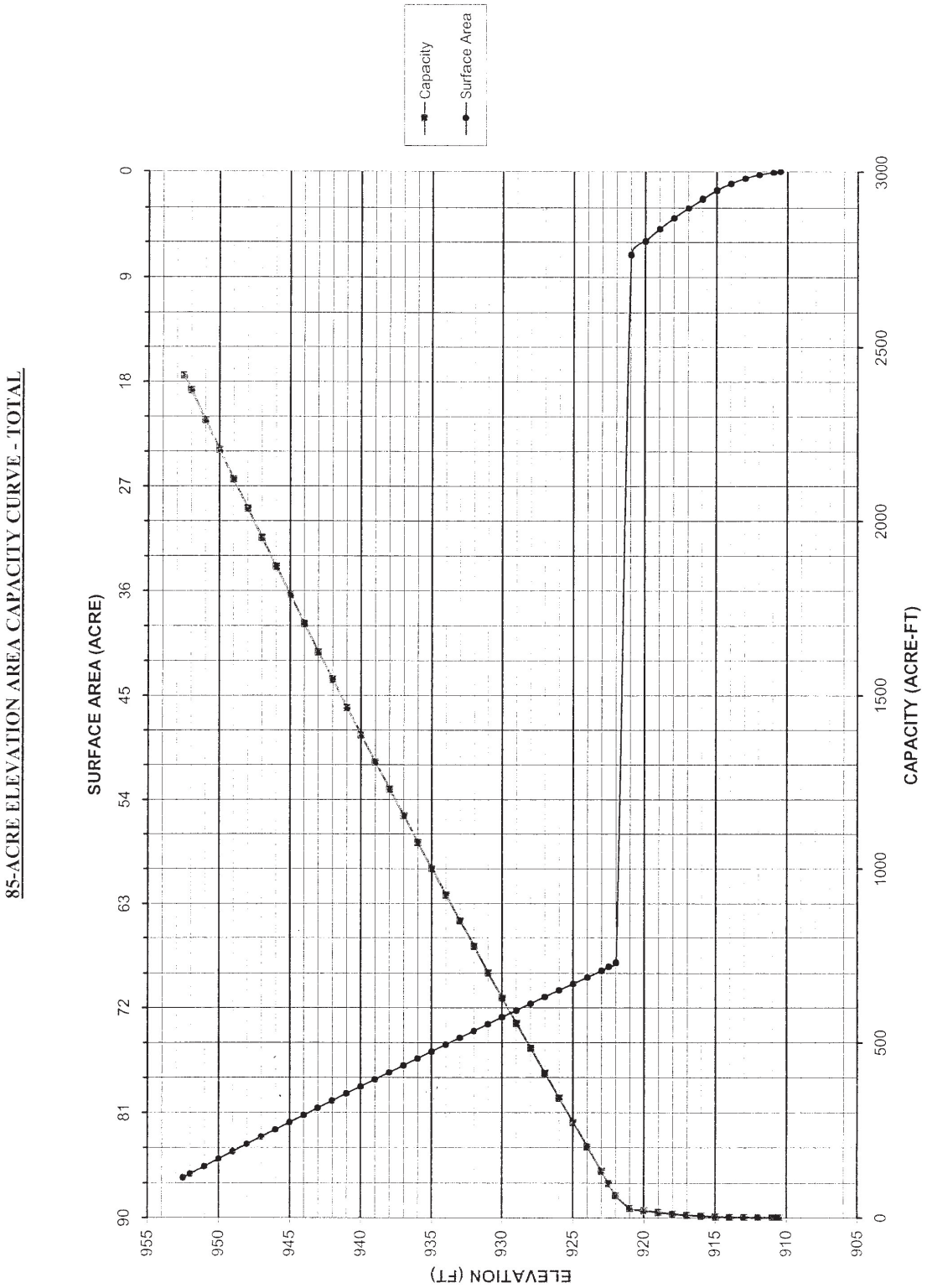


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPH OF FLOW ENTERING
DESERT VALLEY AFTER DAM FAILURE

FIGURE 2.4-21

JUNE 2001 REVISION 11

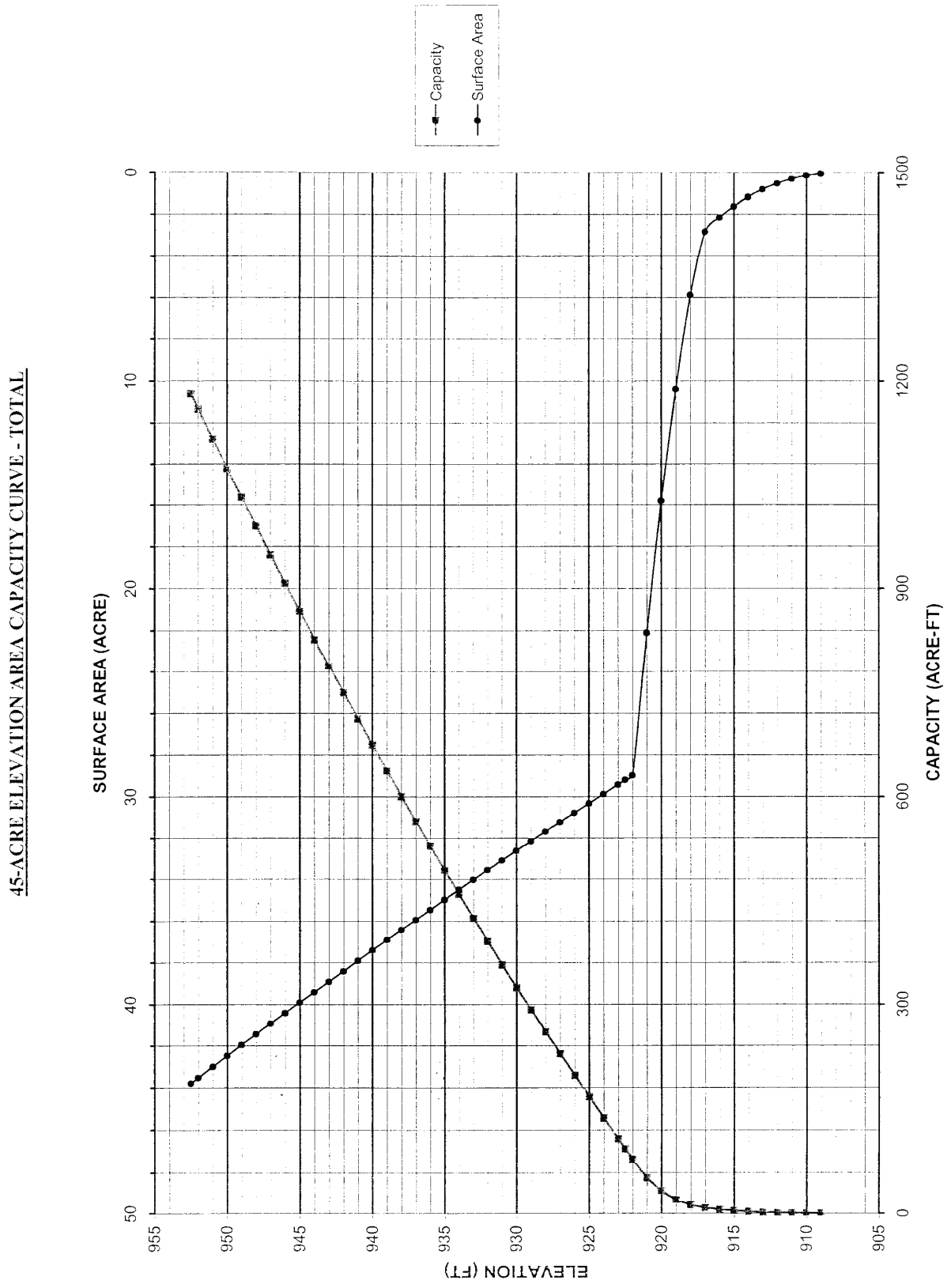


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

85-ACRE RESERVOIR AREA CAPACITY CURVE

FIGURE 2.4-22a

JUNE 2009 REVISION 15

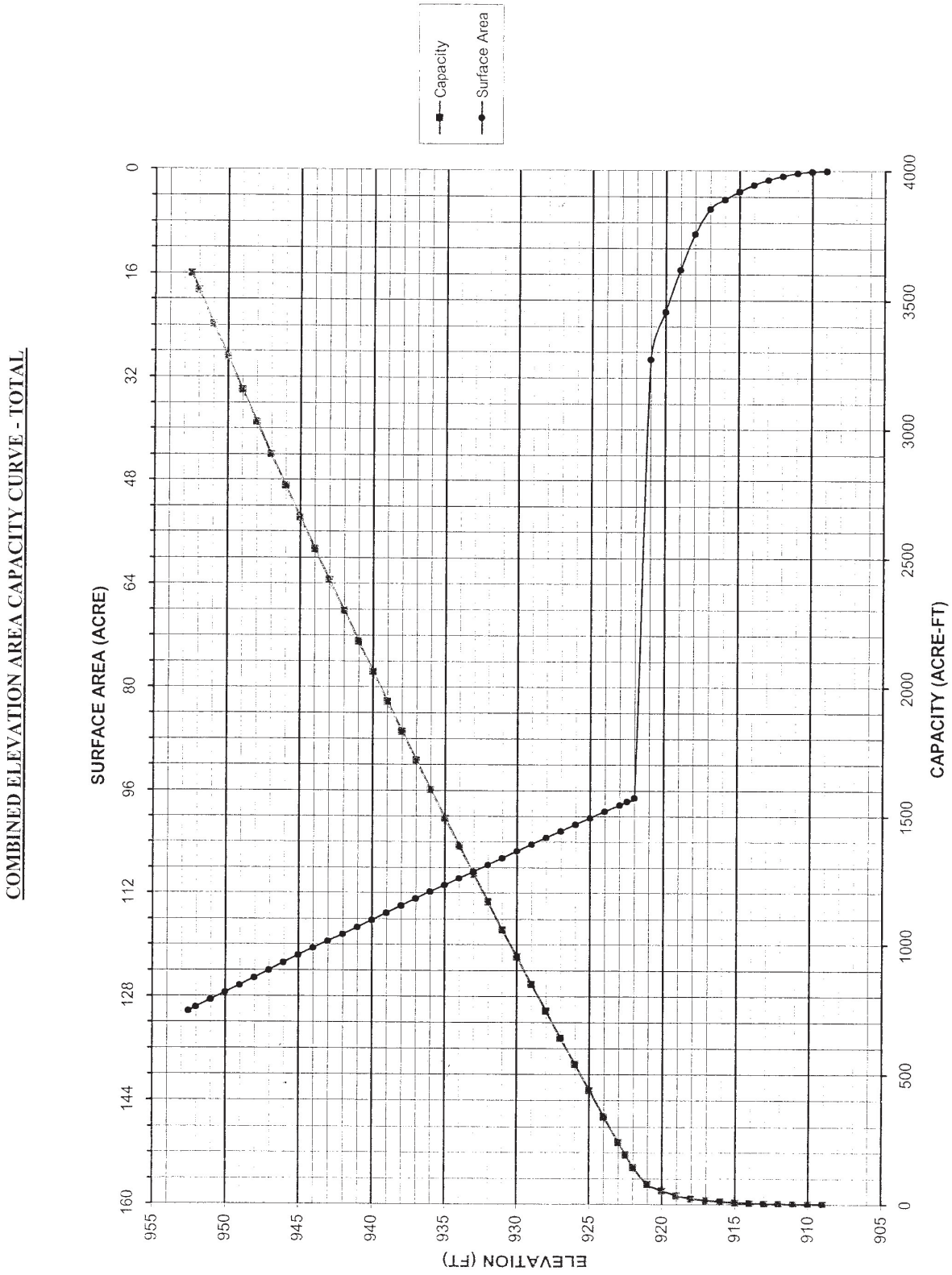


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

45-ACRE RESERVOIR AREA CAPACITY CURVE

FIGURE 2.4-22b

JUNE 2009 REVISION 15



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

45-ACRE & 85-ACRE RESERVOIR AREA CAPACITY CURVE

FIGURE 2.4-22c

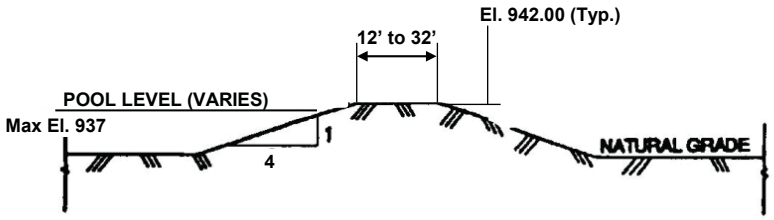
JUNE 2009 REVISION 15

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

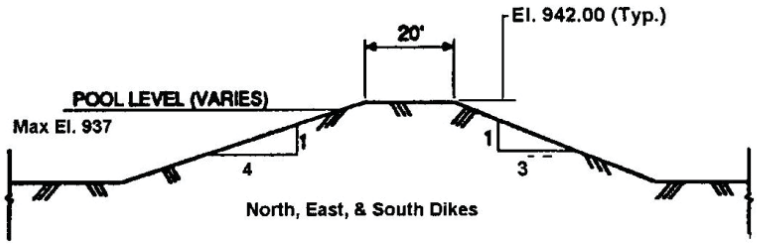
45-ACRE & 85-ACRE RESERVOIR DESIGN DETAILS

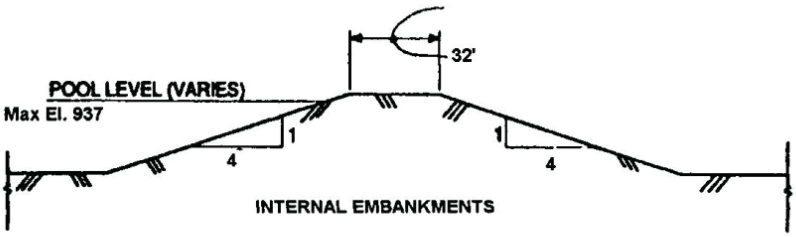
FIGURE 2.4-23

JUNE 2009 REVISION 15



TYPICAL EVAPORATION POND #1 SECTIONS





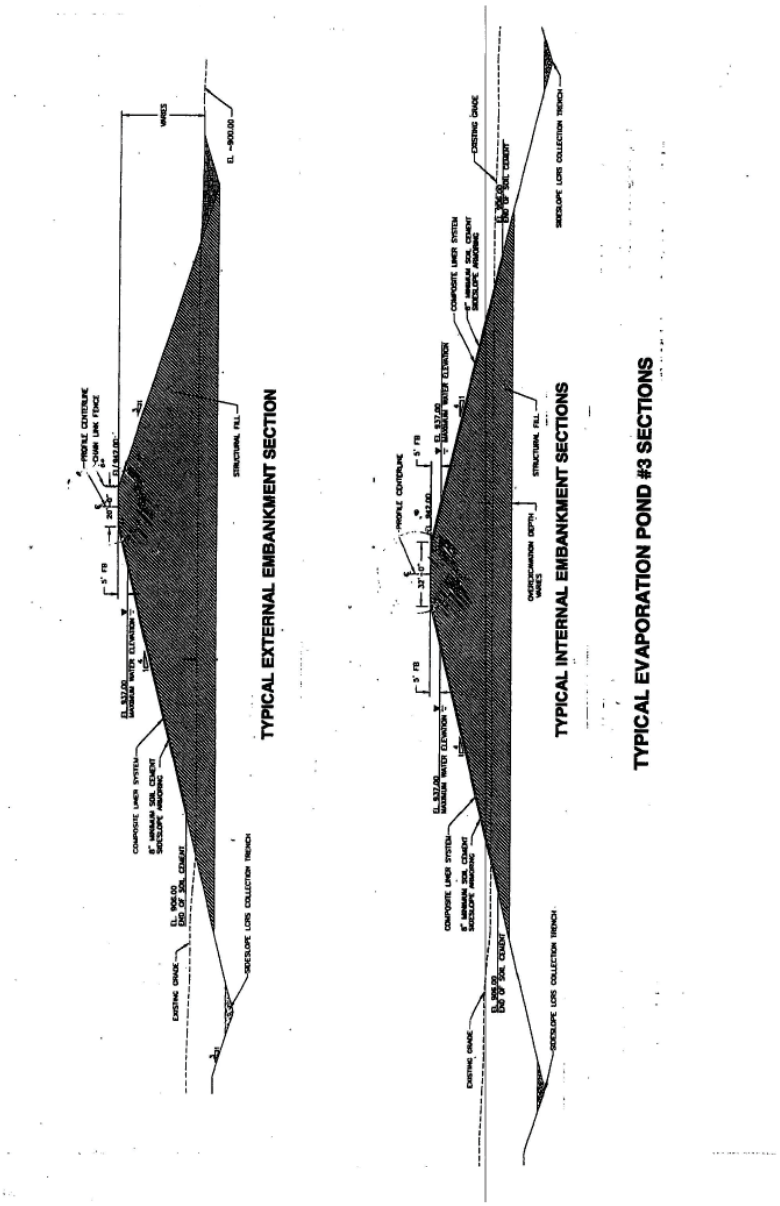
TYPICAL EVAPORATION POND #2 SECTIONS

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

EVAPORATION POND DESIGN DETAILS

FIGURE 2.4-25

JUNE 2017 REVISION 19

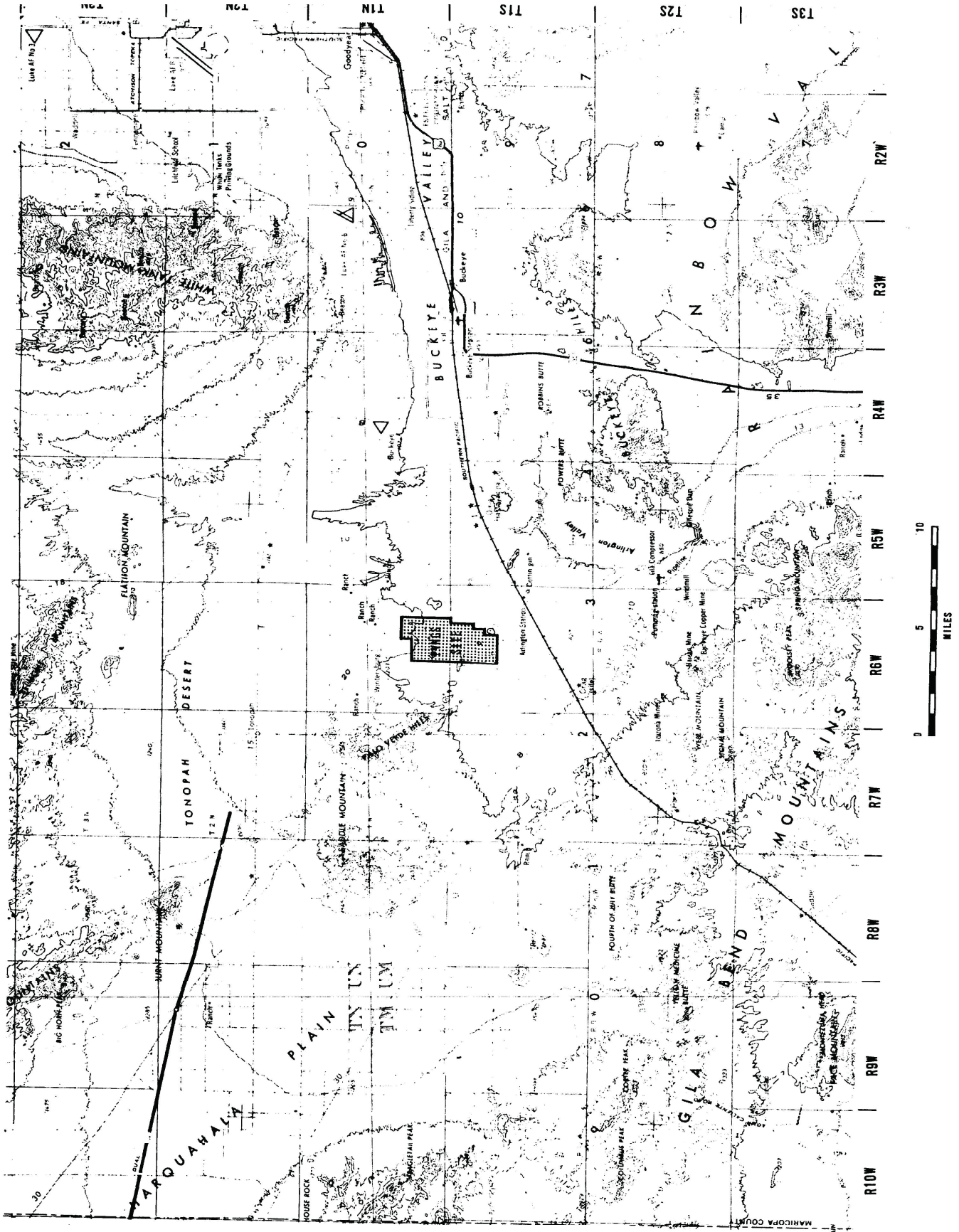


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

EVAPORATION POND DESIGN DETAILS

FIGURE 2.4-25a

JUNE 2011 REVISION 16

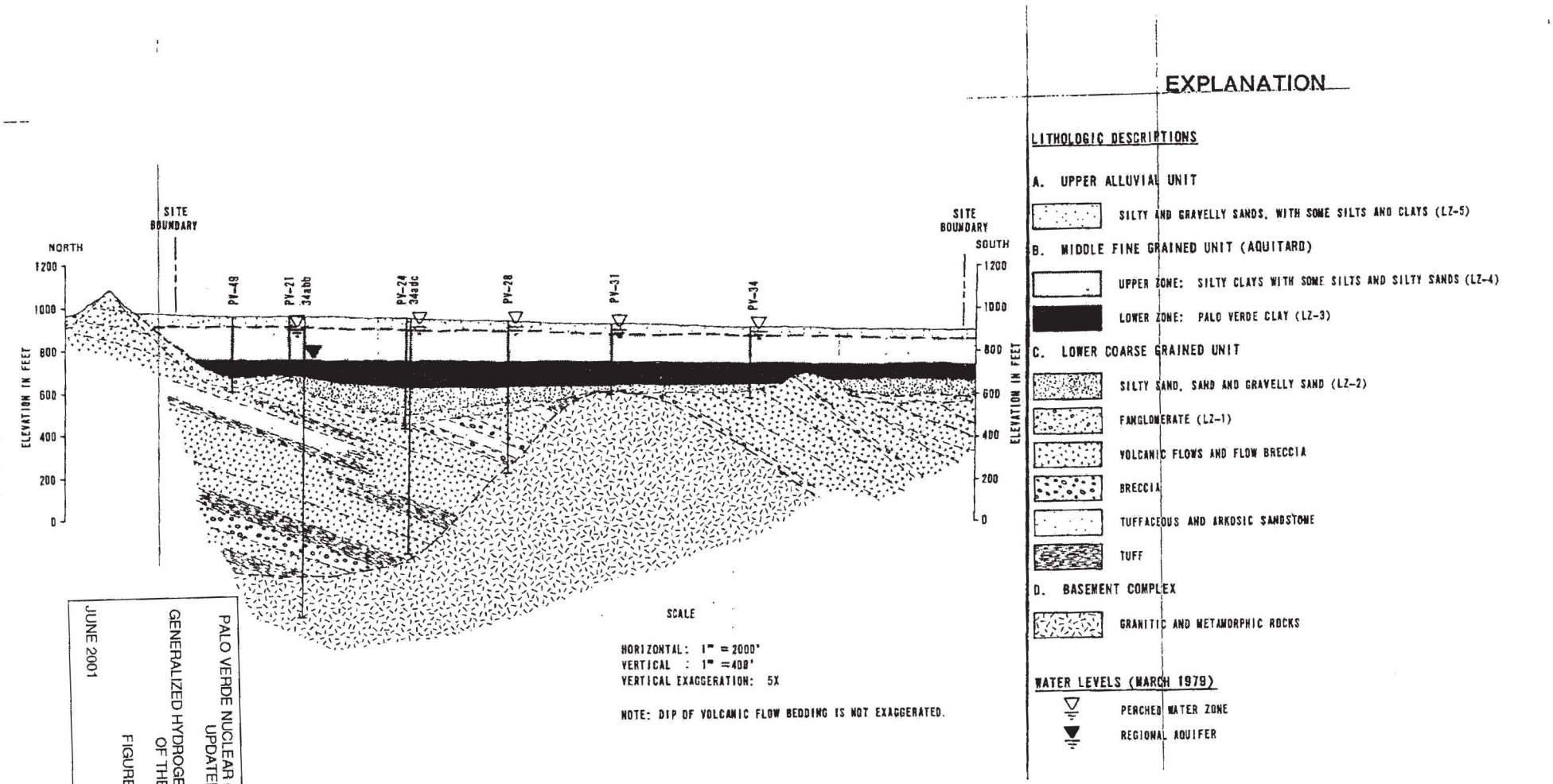


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

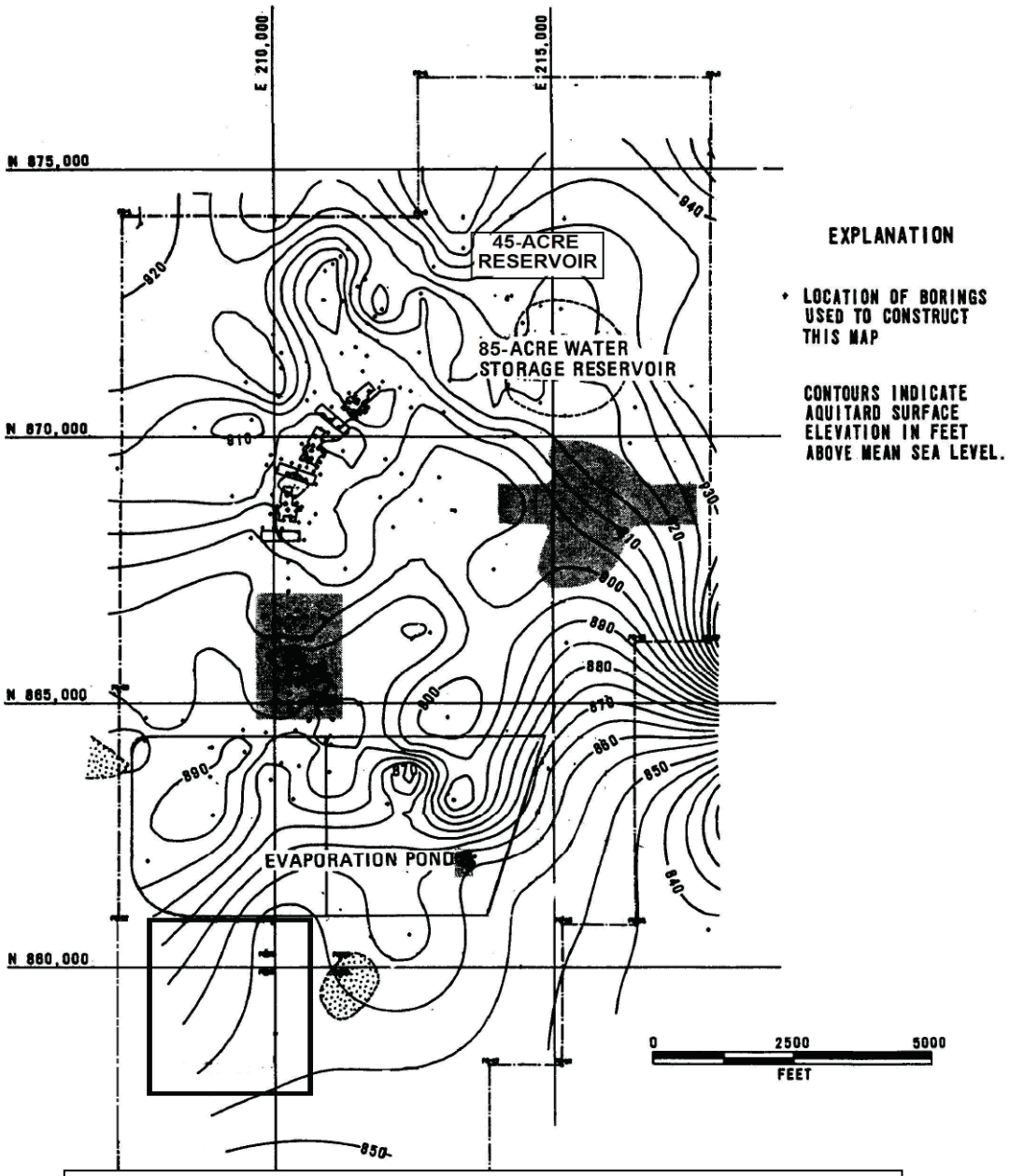
MAP OF THE SITE REGION

FIGURE 2.4-26

JUNE 2009 REVISION 15



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR
GENERALIZED HYDROGEOLOGIC ROSS-SECTION
OF THE SITE
FIGURE 2.4-27
JUNE 2001
REVISION 11

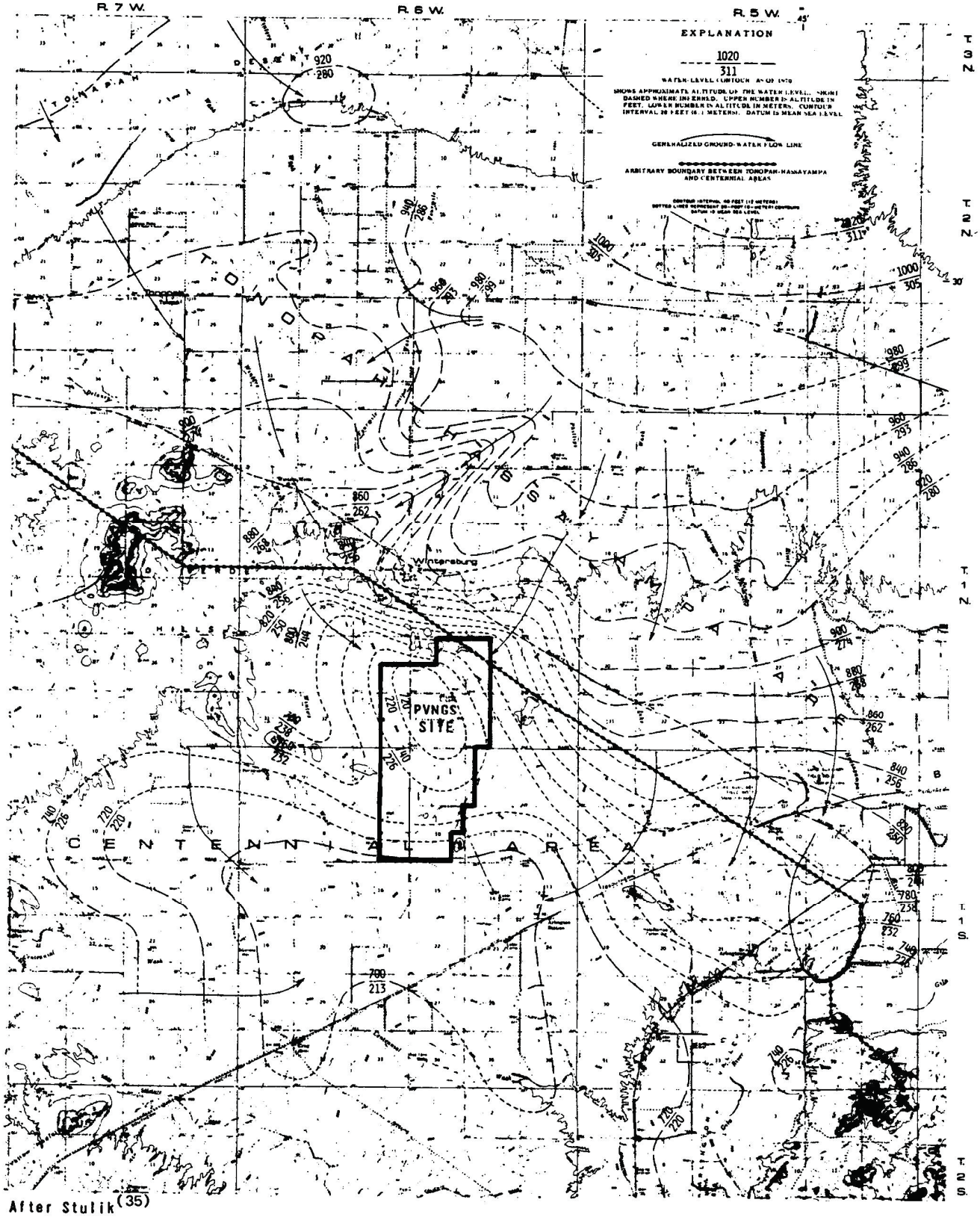


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

STRUCTURE CONTOUR MAP TOP OF MIDDLE FINE GRAINED UNIT (AQUITARD)

FIGURE 2.4-28

JUNE 2011 REVISION 16



After Stulik(35)

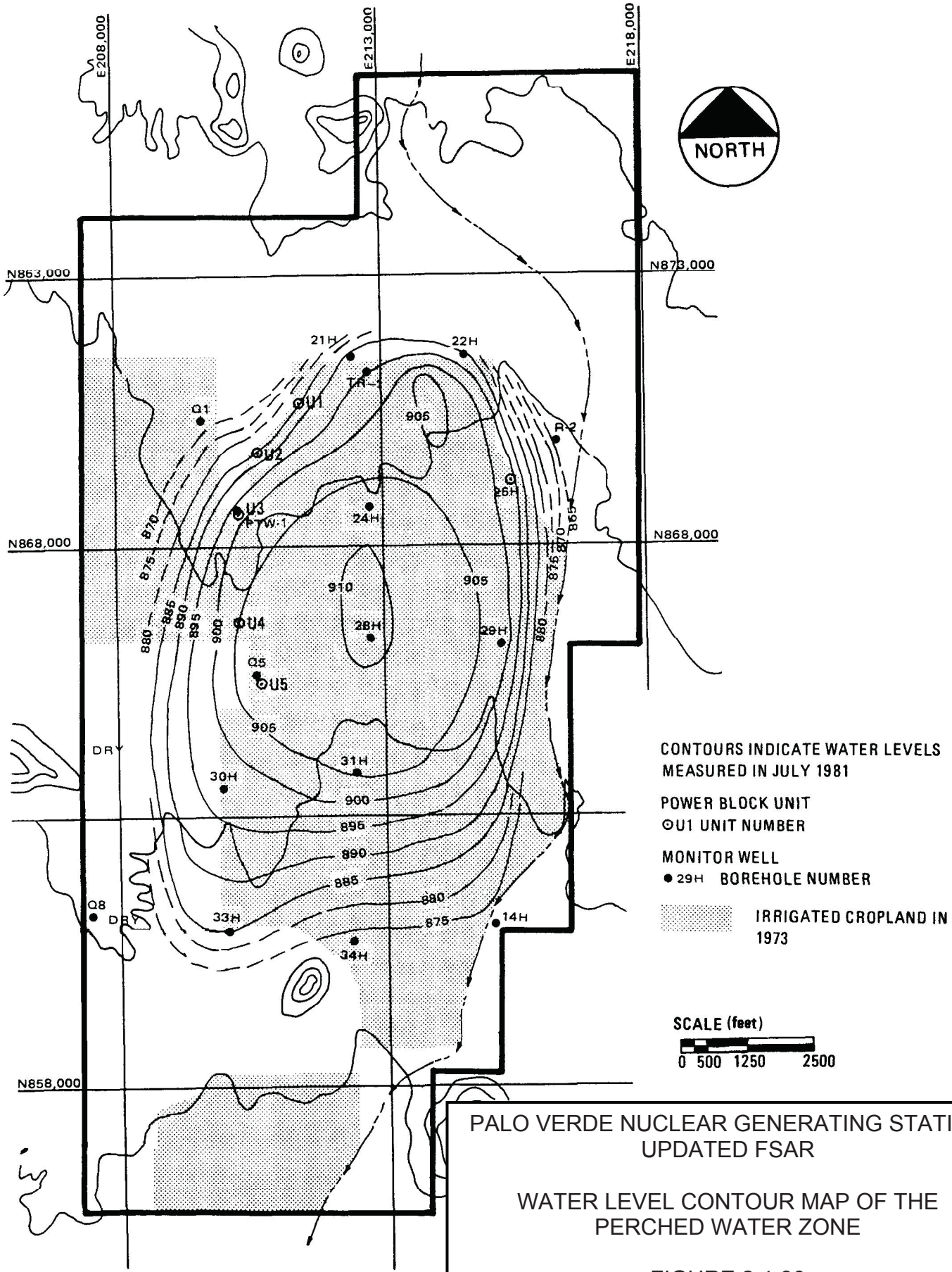
0 1 2 3 4
MILES

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WATER LEVEL CONTOUR MAP OF THE REGIONAL AQUIFER

FIGURE 2.4-29

JUNE 2009 REVISION 15



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

WATER LEVEL CONTOUR MAP OF THE PERCHED WATER ZONE

FIGURE 2.4-30

JUNE 2009 REVISION 15

LEGEND

WELLS

970
● IRRIGATION
NUMBER INDICATES WATER LEVEL IN FEET ABOVE MSL (1969 – 1973)

○ STOCK, DOMESTIC

Ø UNUSED, DESTROYED

▲ STREAM GAGING STATION

△ CREST-STAGE GAGING STATION

▨ IRRIGATED CROPLAND IN 1970

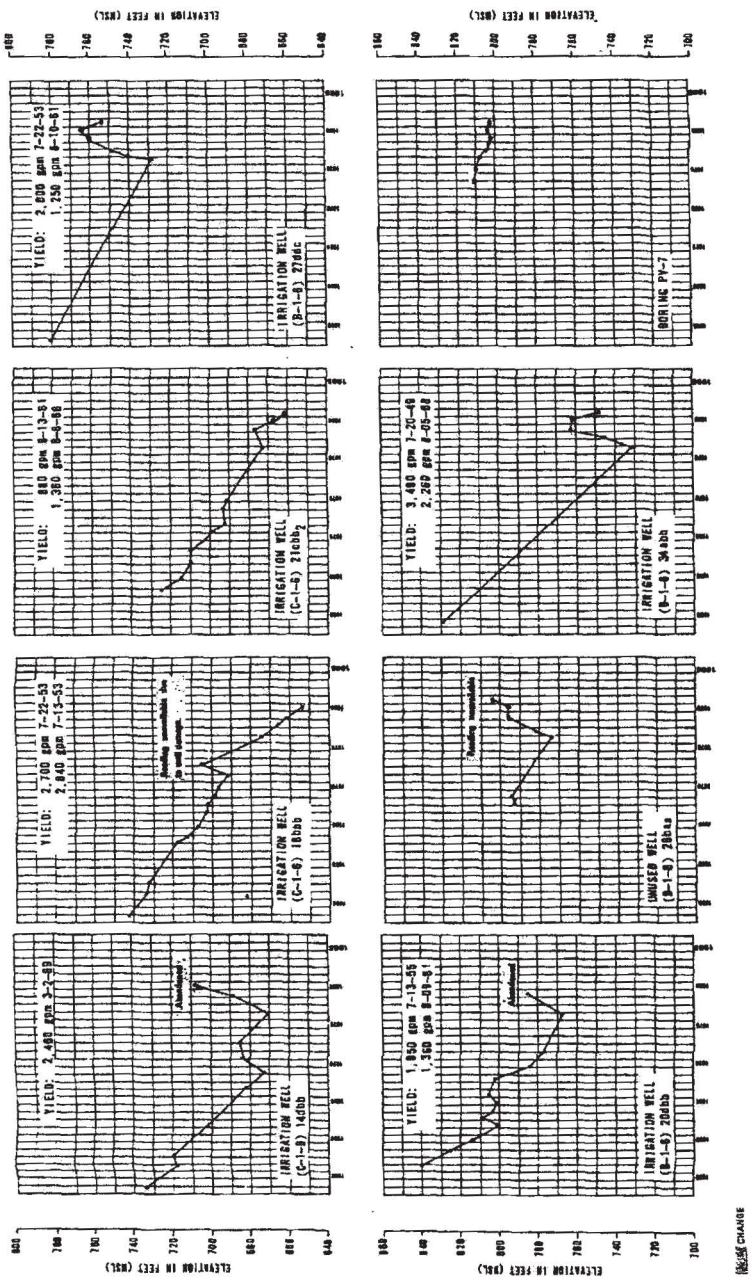
PALO VERDE NUCLEAR GENERATING STATION UPDATED FSAR

LOCATION MAP OF WELLS IN THE LOWER HASSAYAMPA-CENTENNIAL AREA

FIGURE 2.4-31

JUNE 2001

REVISION 11

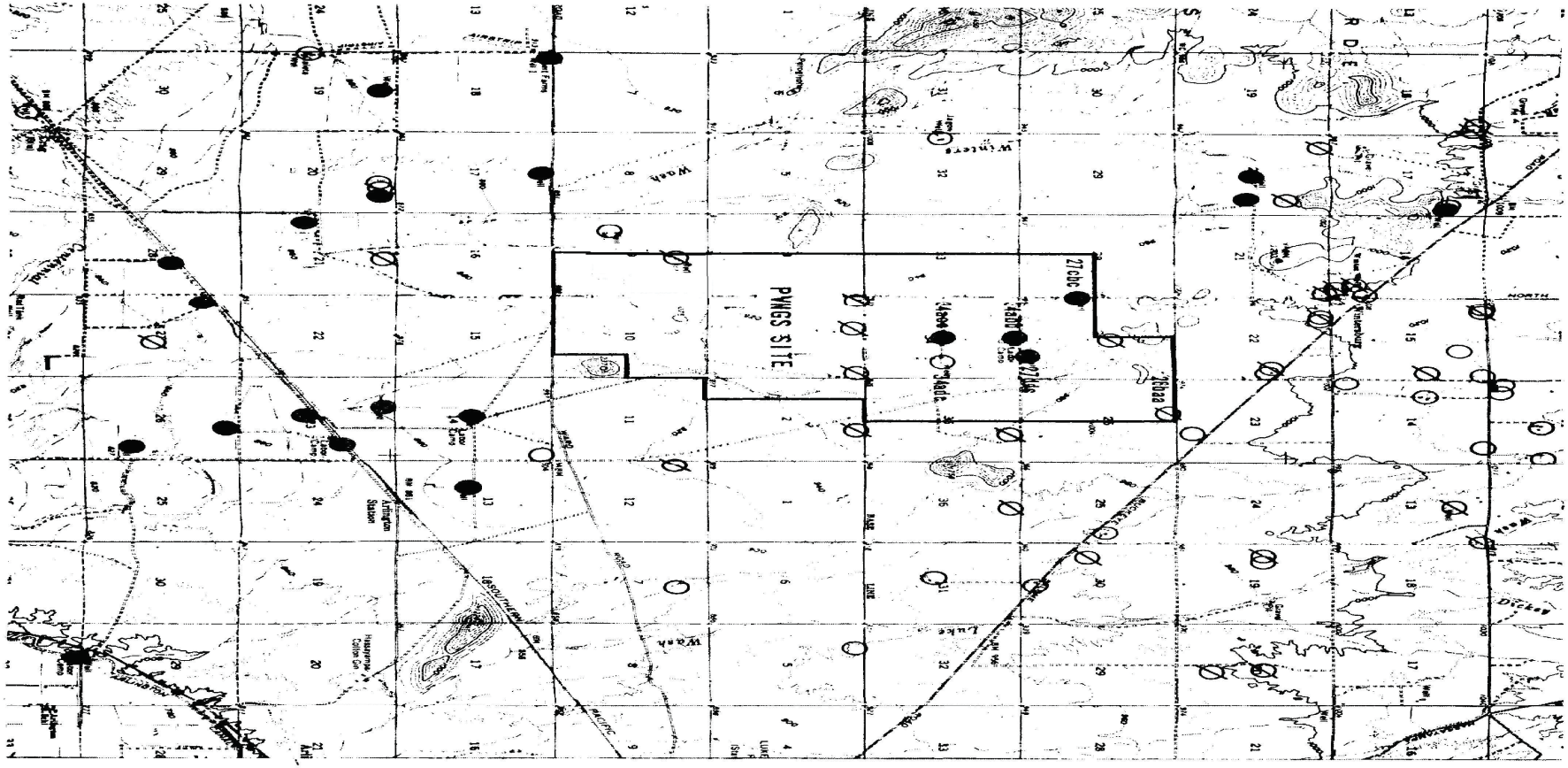


PALO VERDE NUCLEAR GENERATING STATION UPDATED FSAR

HYDROGRAPHS OF DEEP WELLS
IN THE SITE AREA

FIGURE 2.4-32

JUNE 2001 REVISION 11



NOTE: ALL ON-SITE WELLS EXCEPT 34abb, 27ddc, 27cbc AND 26baa WERE ABANDONED IN 1977 AND SEALED OFF BY FILLING WITH CEMENT GROUT.

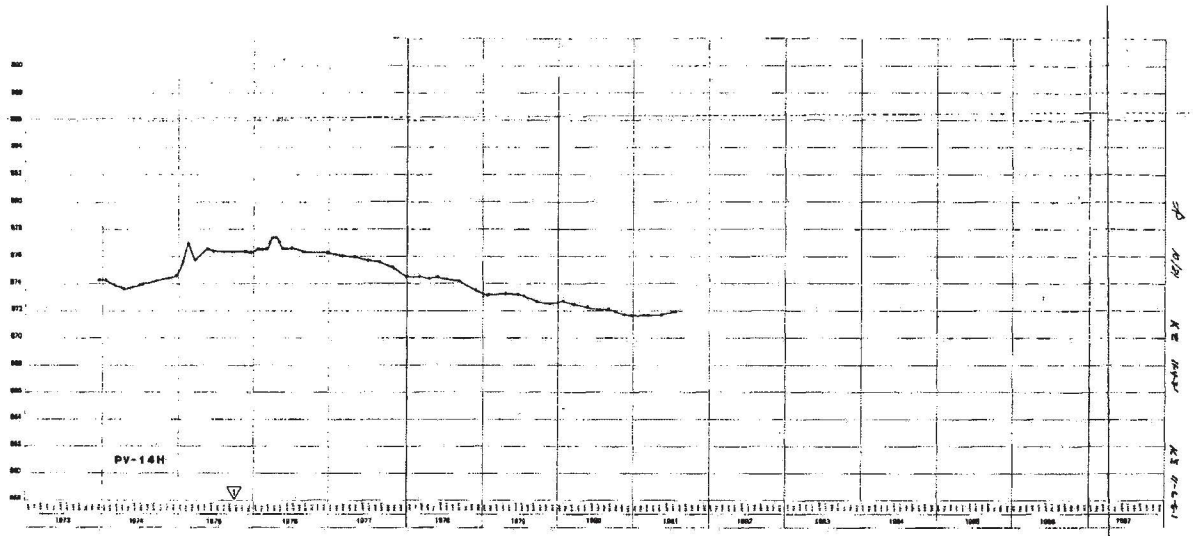
EXPLANATION
● IRRIGATION
○ STOCK, DOMESTIC
Ø UNUSED DESTROYED

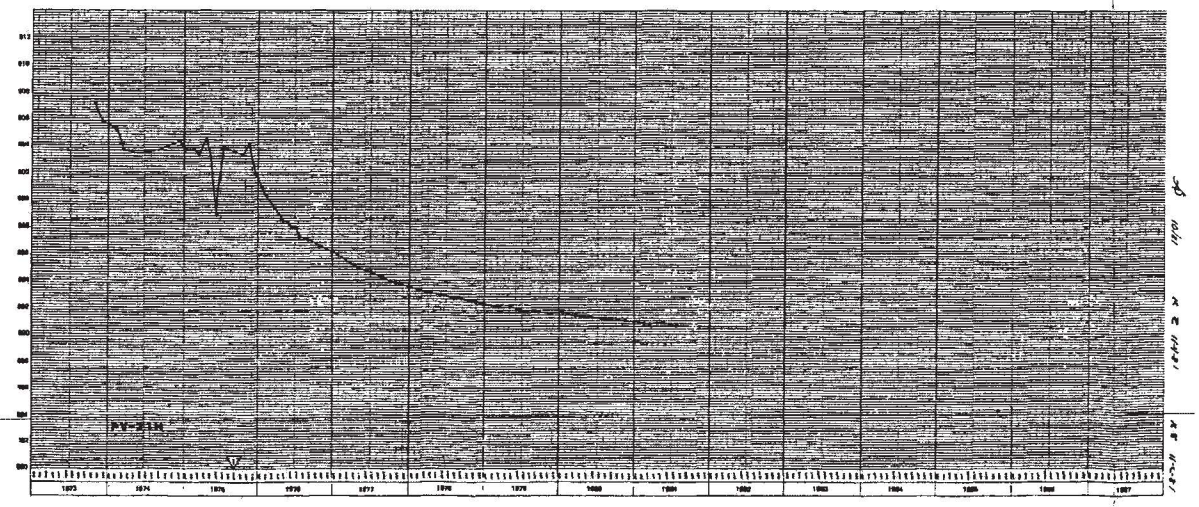
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

LOCATION MAP OF WELLS IN THE SITE AREA

FIGURE 2.4-33

JUNE 2009 REVISION 15





NOTES:

1. ▽ ON SITE IRRIGATION CEASED SEPTEMBER, 1975.
2. ▽ WELL RESPONSE TO FLUSHING.
3. ▽ IRRIGATION WELL B-1-6-34acc, LOCATED AT A DISTANCE OF 214' FROM PV-24H AND ½ MILE FROM PV-25H, WAS SEALED BY GROUTING IN JULY 1976. THE SUDDEN RISE IN THE MEASURED WATER LEVELS INDICATES THAT THESE WELLS WERE LOCATED WITHIN THE CONE OF DEPRESSION CAUSED BY PERCHED WATER CASCADING THROUGH THE IRRIGATION WELL.

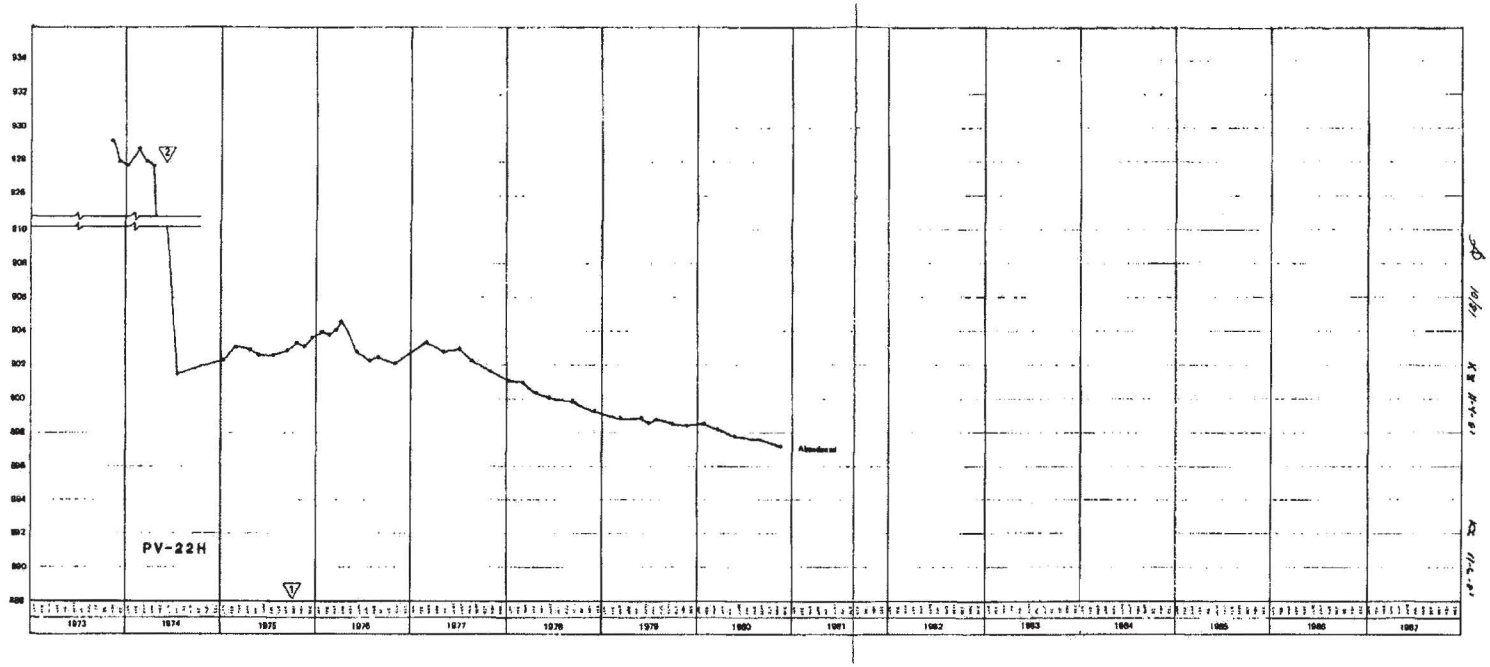
ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP A - NORTHERN HALF)

FIGURE 2.4-34 Sheet 1 of 3

JUNE 2001 REVISION 11



NOTES:

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3. IRRIGATION WELL B–1–6–34acc, LOCATED AT A DISTANCE OF 214' FROM PV–24H AND ½ MILE FROM PV–25H, WAS SEALED BY GROUTING IN JULY 1976. THE SUDDEN RISE IN THE MEASURED WATER LEVELS INDICATES THAT THESE WELLS WERE LOCATED WITHIN THE CONE OF DEPRESSION CAUSED BY PERCHED WATER CASCADING THROUGH THE IRRIGATION WELL.

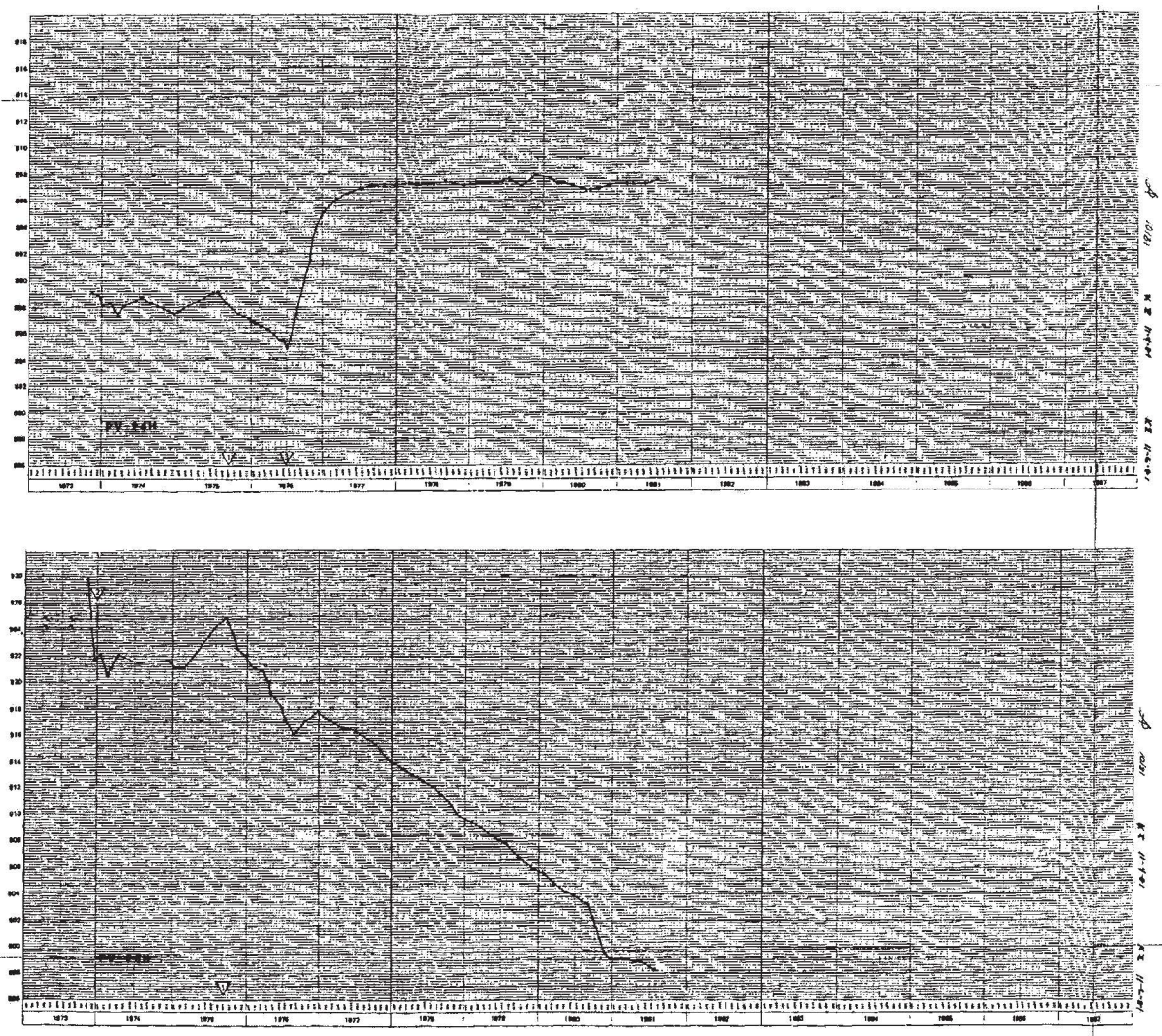
ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP A - NORTHERN HALF)

FIGURE 2.4-34 Sheet 2 of 3

JUNE 2001 REVISION 11



NOTES:

(1) ON SITE IRRIGATION CEASED SEPTEMBER, 1975.

(2) WELL RESPONSE TO FLUSHING.

(3) IRRIGATION WELL B-1-6-34acc, LOCATED AT A DISTANCE OF 214' FROM PV-24H AND ½ MILE FROM PV-25H, WAS SEALED BY GROUTING IN JULY 1976. THE SUDDEN RISE IN THE MEASURED WATER LEVELS INDICATES THAT THESE WELLS WERE LOCATED WITHIN THE CONE OF DEPRESSION CAUSED BY PERCHED WATER CASCADING THROUGH THE IRRIGATION WELL.

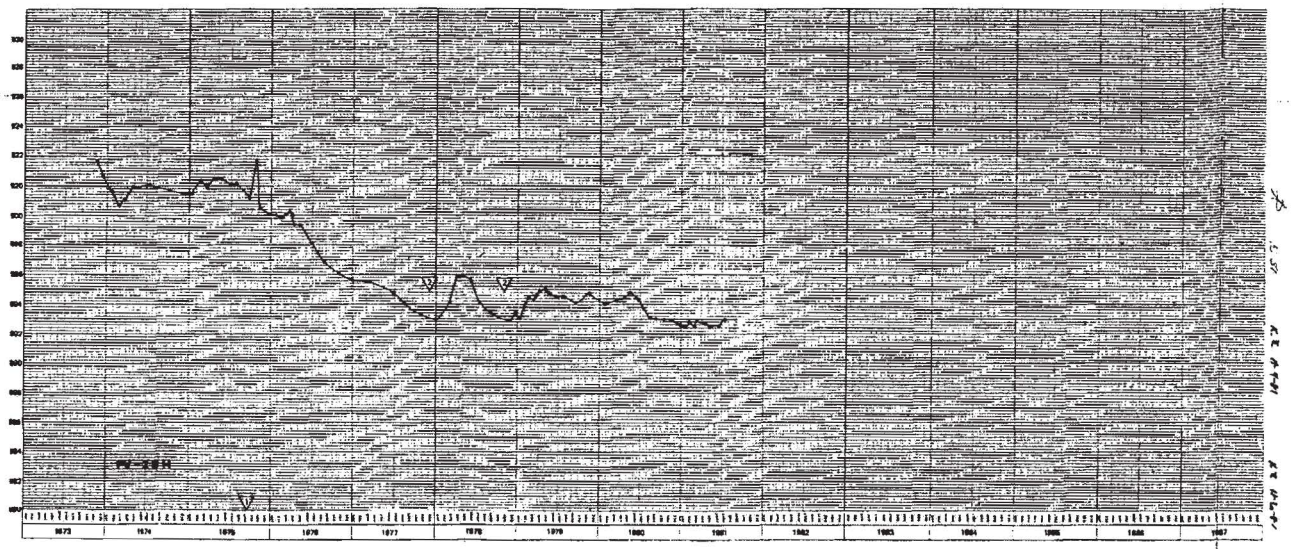
ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.

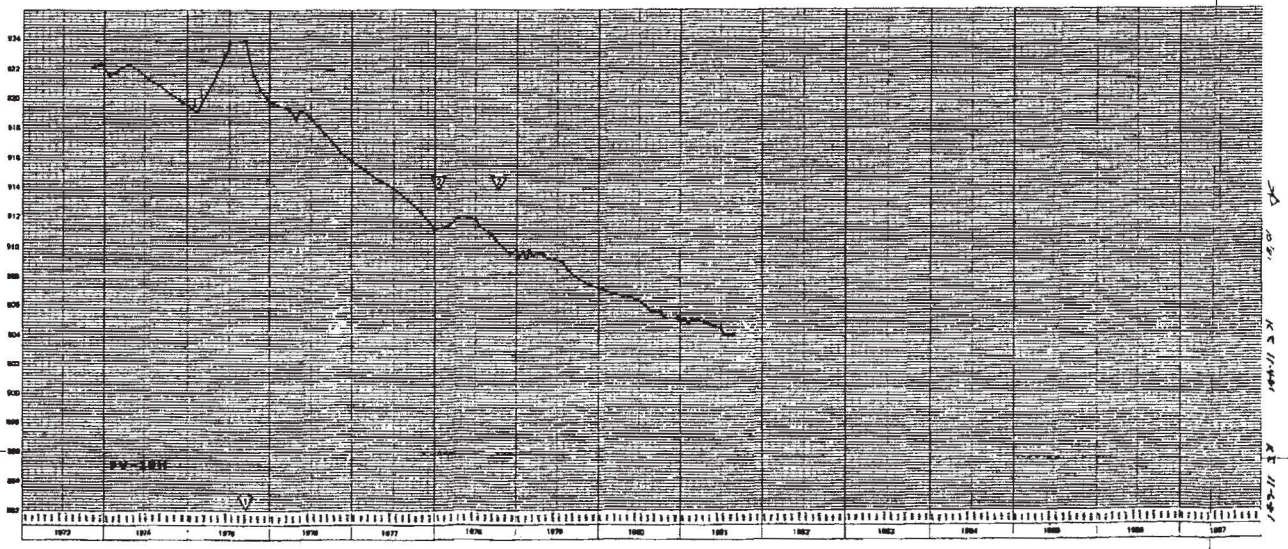
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE (GROUP A - NORTHERN HALF)

FIGURE 2.4-34 Sheet 3 of 3

JUNE 2001 REVISION 11





PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP A - SOUTHERN HALF)

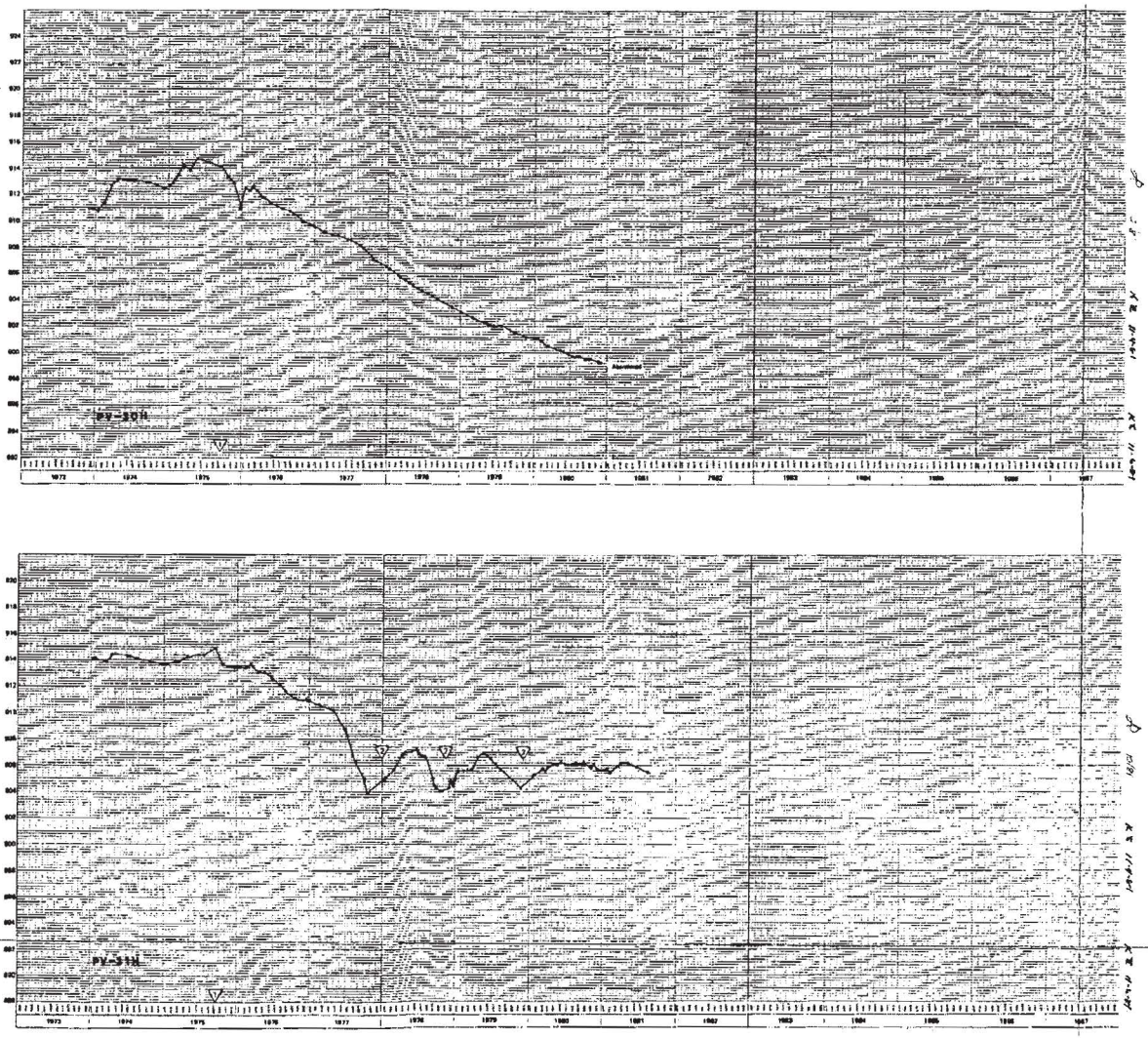
FIGURE 2.4-35 Sheet 1 of 3

JUNE 2001 REVISION 11

NOTES:

1. ▽ ON SITE IRRIGATION CEASED SEPTEMBER, 1975.
2. ▽ CYCLIC SEASONAL VARIATIONS REFLECT RECHARGE FROM SEDIMENTATION BASIN LOCATED NEAR THE CENTER OF THE SITE. SURFACE RUNOFF WITHIN THE NORTHERN HALF OF THE SITE IS COLLECTED IN THE SEDIMENTATION BASIN.

ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP A - SOUTHERN HALF)

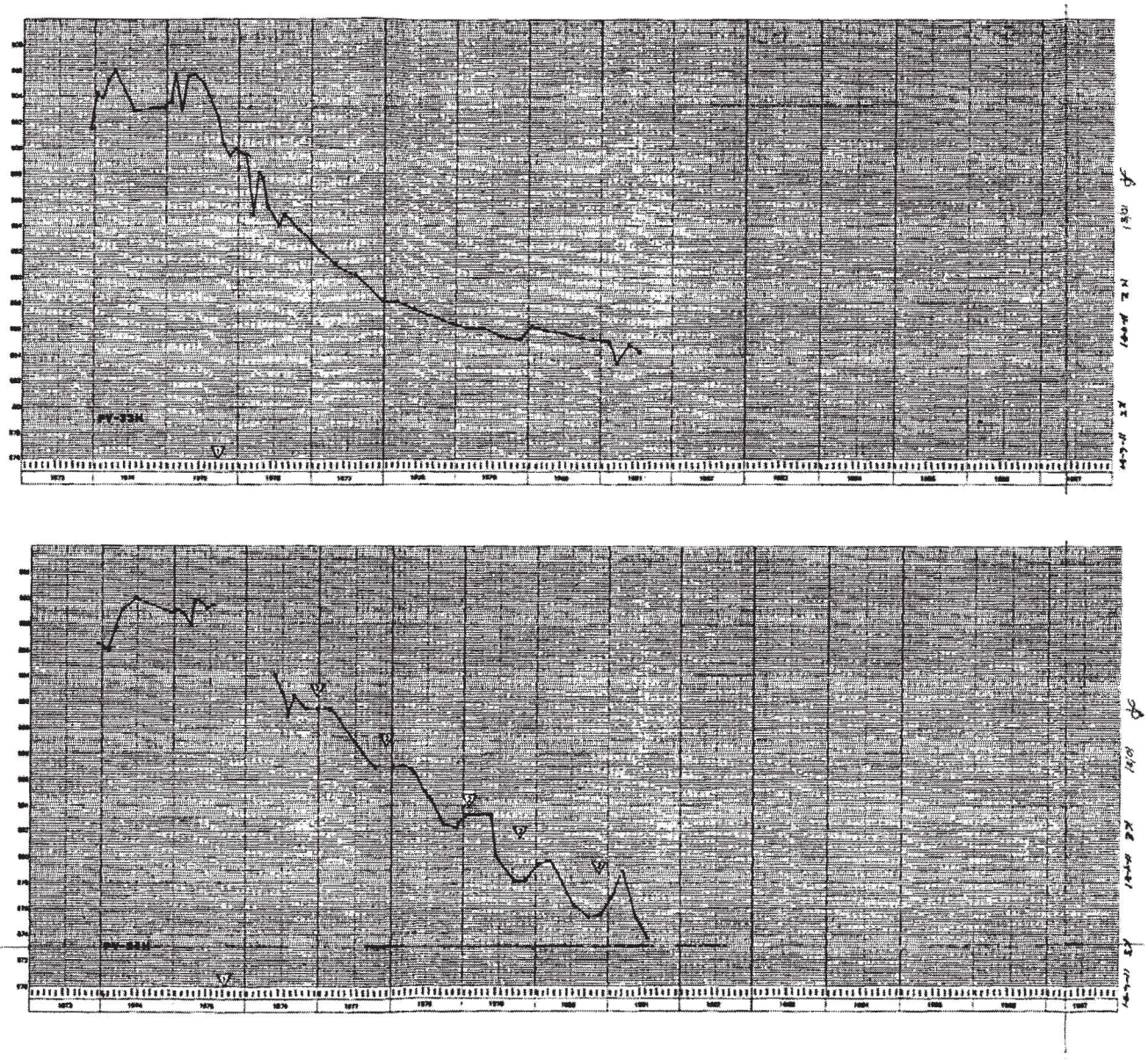
FIGURE 2.4-35 Sheet 2 of 3

JUNE 2001 REVISION 11

NOTES:

1. ON SITE IRRIGATION CEASED SEPTEMBER, 1975.
2. CYCLIC SEASONAL VARIATIONS REFLECT RECHARGE FROM SEDIMENTATION BASIN LOCATED NEAR THE CENTER OF THE SITE. SURFACE RUNOFF WITHIN THE NORTHERN HALF OF THE SITE IS COLLECTED IN THE SEDIMENTATION BASIN.

ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.



NOTES:

1. ▽ ON SITE IRRIGATION CEASED SEPTEMBER, 1975.
2. ▽ CYCLIC SEASONAL VARIATIONS REFLECT RECHARGE FROM SEDIMENTATION BASIN LOCATED NEAR THE CENTER OF THE SITE. SURFACE RUNOFF WITHIN THE NORTHERN HALF OF THE SITE IS COLLECTED IN THE SEDIMENTATION BASIN.

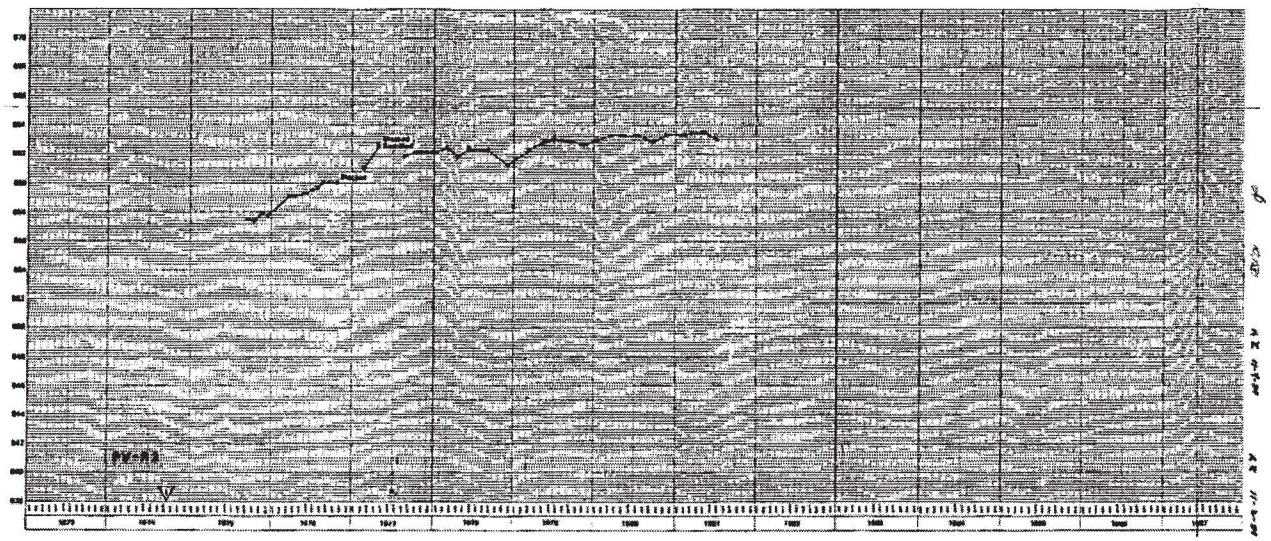
ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.

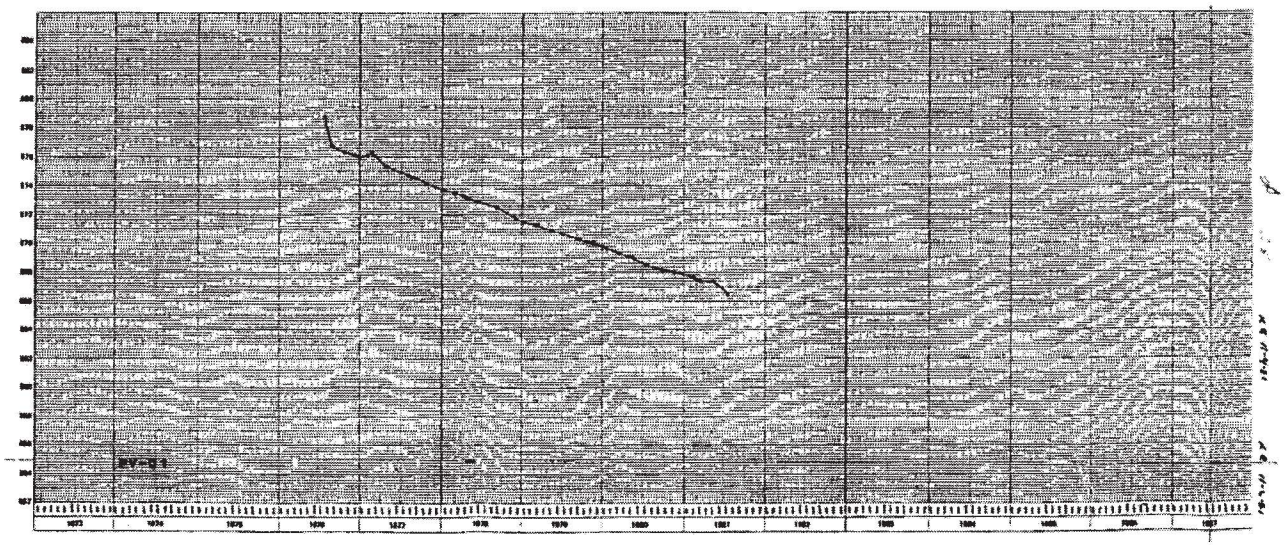
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP A - SOUTHERN HALF)

FIGURE 2.4-35 Sheet 3 of 3

JUNE 2001 REVISION 11





NOTES.

▽ ON SITE IRRIGATION CEASED SEPTEMBER, 1975.

▽ OBSERVATION WELL U3-PTW-1, LOCATED NEAR THE CENTER OF UNIT 3, WAS ABANDONED IN OCTOBER 1977 BECAUSE OF THE POWER BLOCK EXCAVATION. MONITORING OF WATER LEVELS IN THE AREA WAS CONTINUED IN WELL PV-03, INSTALLED AT THE EDGE OF THE EXCAVATION IN JANUARY 1978. THE STEEP DECLINE OF WATER LEVELS OBSERVED IN PV-03 REFLECTS THE LOCALIZED EFFECT OF DEWATERING IN THE EXCAVATION.

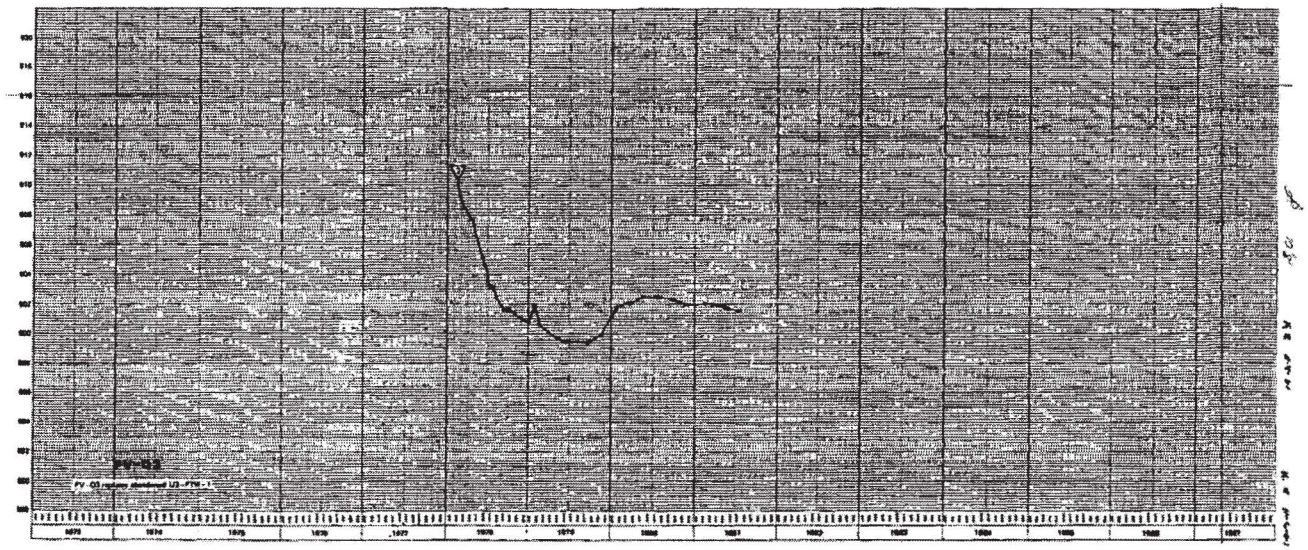
ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.

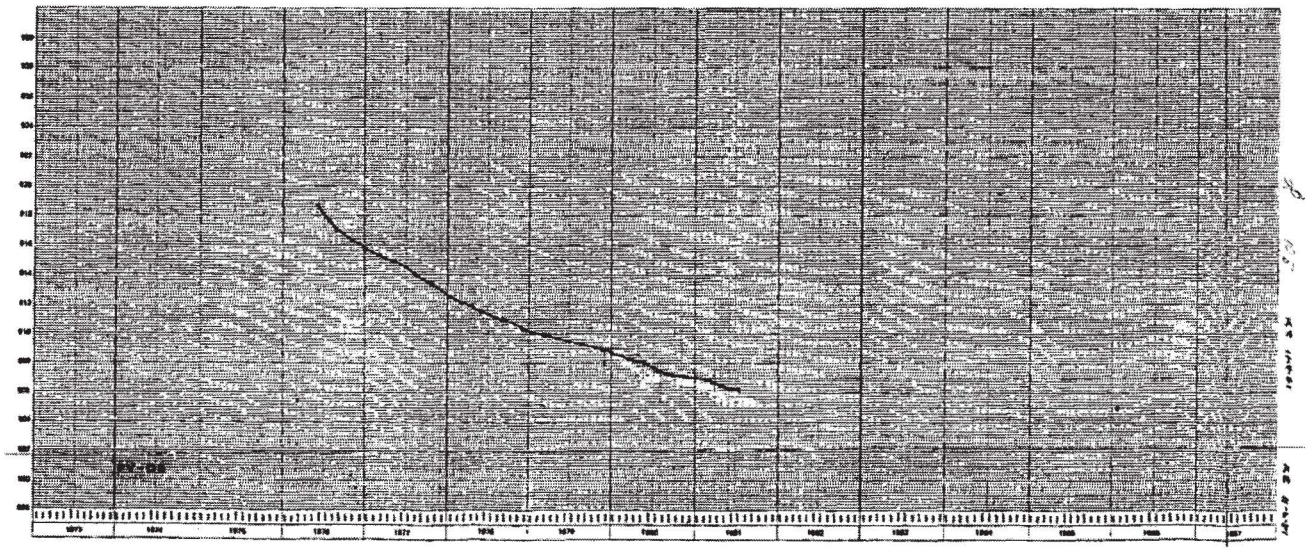
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP B and C)

FIGURE 2.4-36 Sheet 1 of 4

JUNE 2001 REVISION 11





NOTES:

1. ON SITE IRRIGATION CEASED SEPTEMBER, 1975.
2. OBSERVATION WELL U3–PTW–1, LOCATED NEAR THE CENTER OF UNIT 3 , WAS ABANDONED IN OCTOBER 1977 BECAUSE OF THE POWER BLOCK EXCAVATION. MONITORING OF WATER LEVELS IN THE AREA WAS CONTINUED IN WELL PV–03, INSTALLED AT THE EDGE OF THE EXCAVATION IN JANUARY 1978. THE STEEP DECLINE OF WATER LEVELS OBSERVED IN PV–03 REFLECTS THE LOCALIZED EFFECT OF DEWATERING IN THE EXCAVATION.

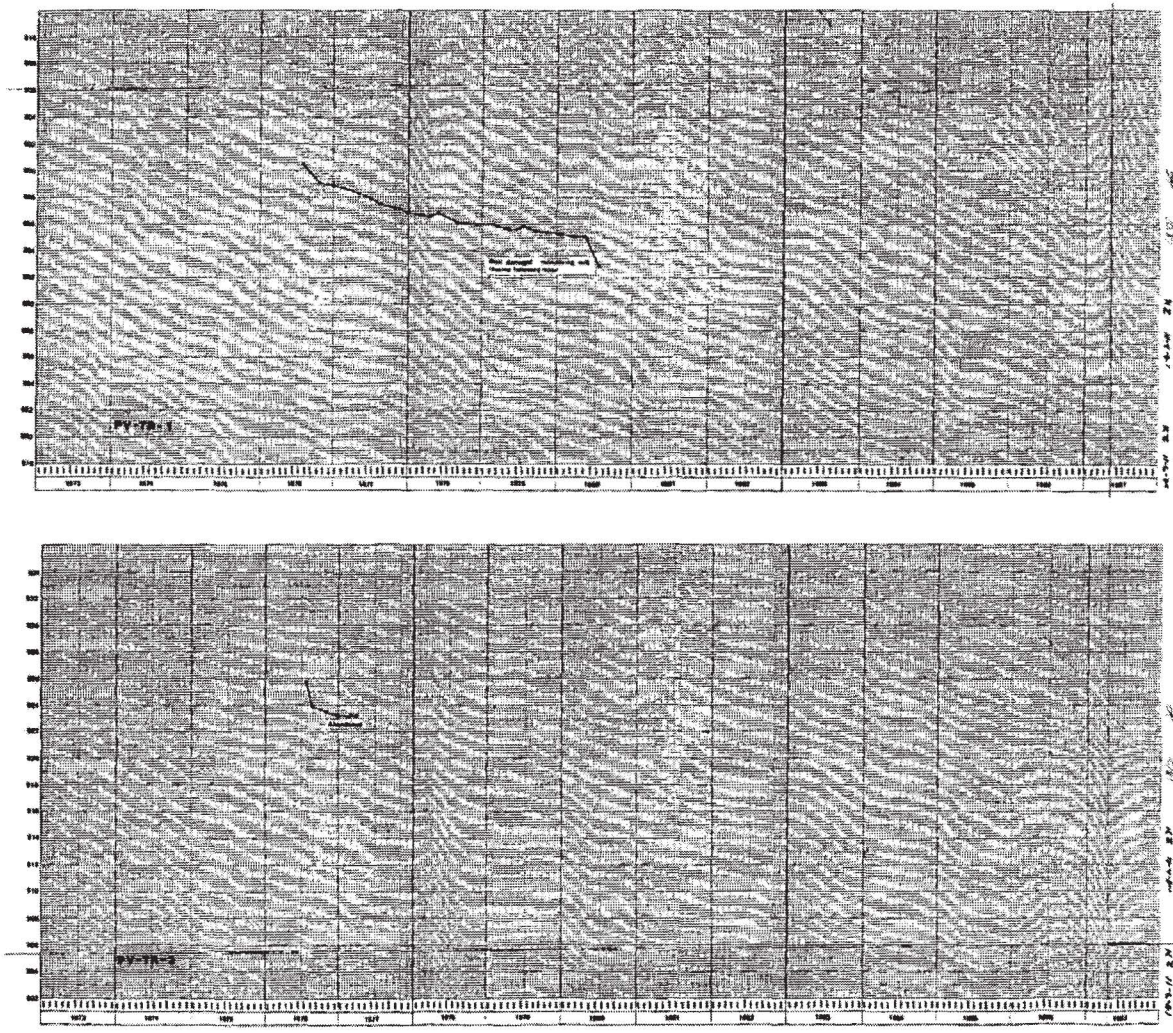
ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP B and C)

FIGURE 2.4-36 Sheet 2 of 4

JUNE 2001 REVISION 11



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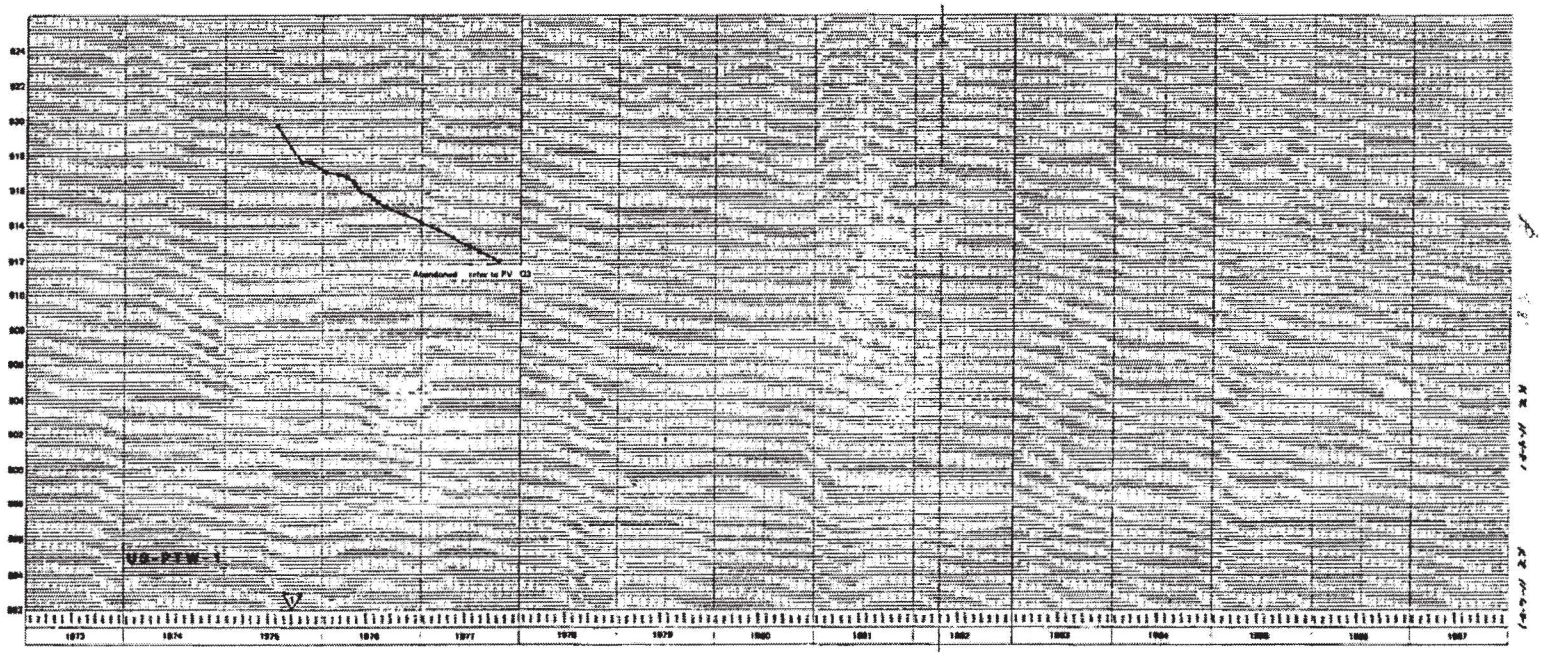
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP B and C)

FIGURE 2.4-36 Sheet 3 of 4

JUNE 2001 REVISION 11



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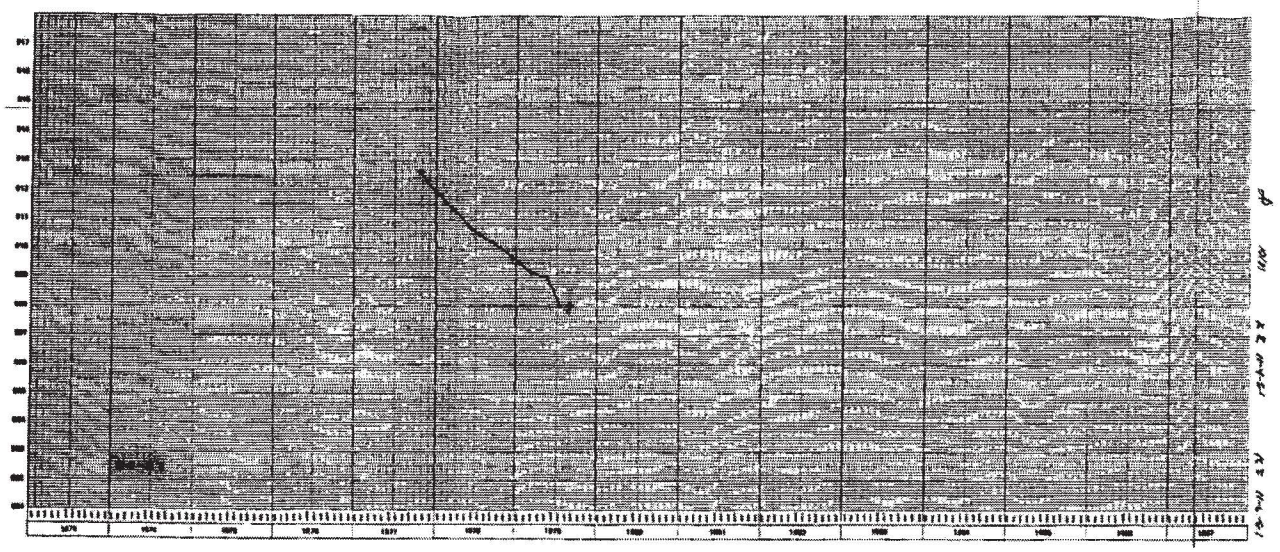
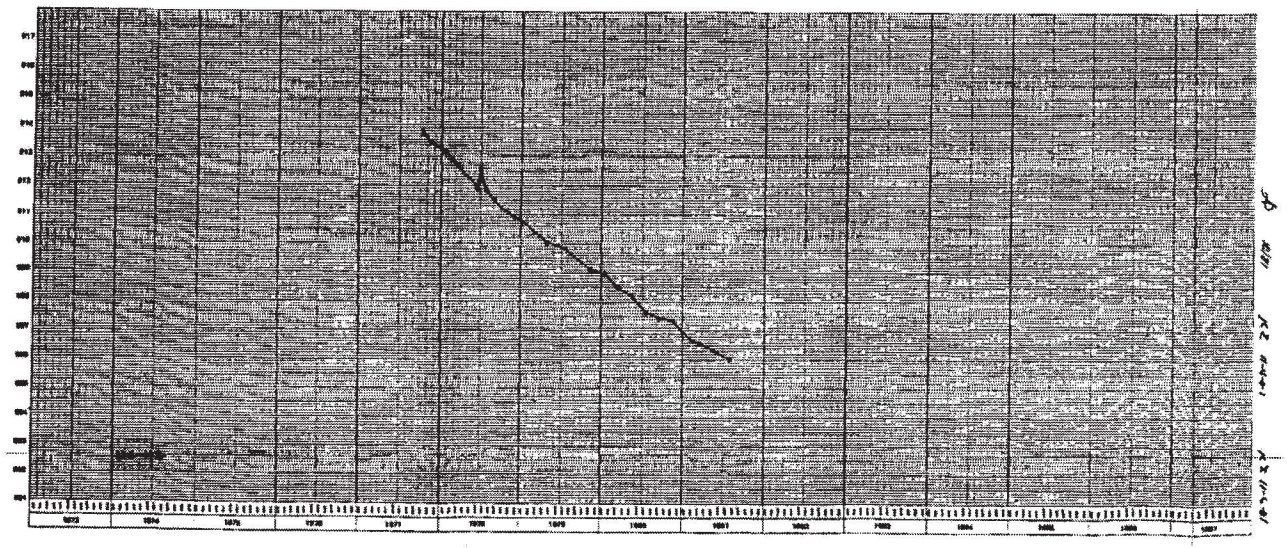
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP B and C)

FIGURE 2.4-36 Sheet 4 of 4

JUNE 2001 REVISION 11





NOTES:

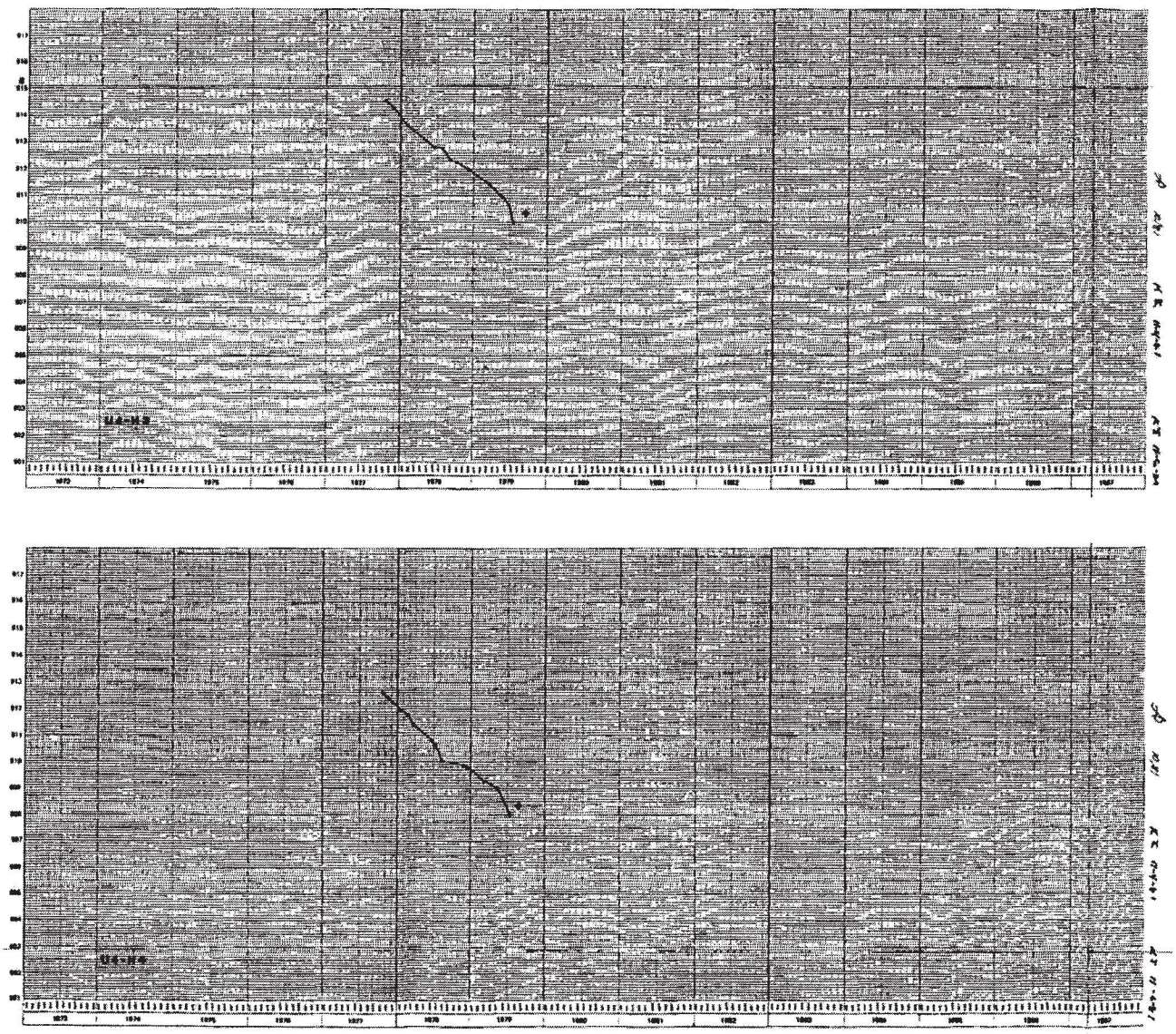
- MONITORING DISCONTINUED JULY 1979; WELL ON STANDBY.

PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-37 Sheet 1 of 4

JUNE 2001 REVISION 11



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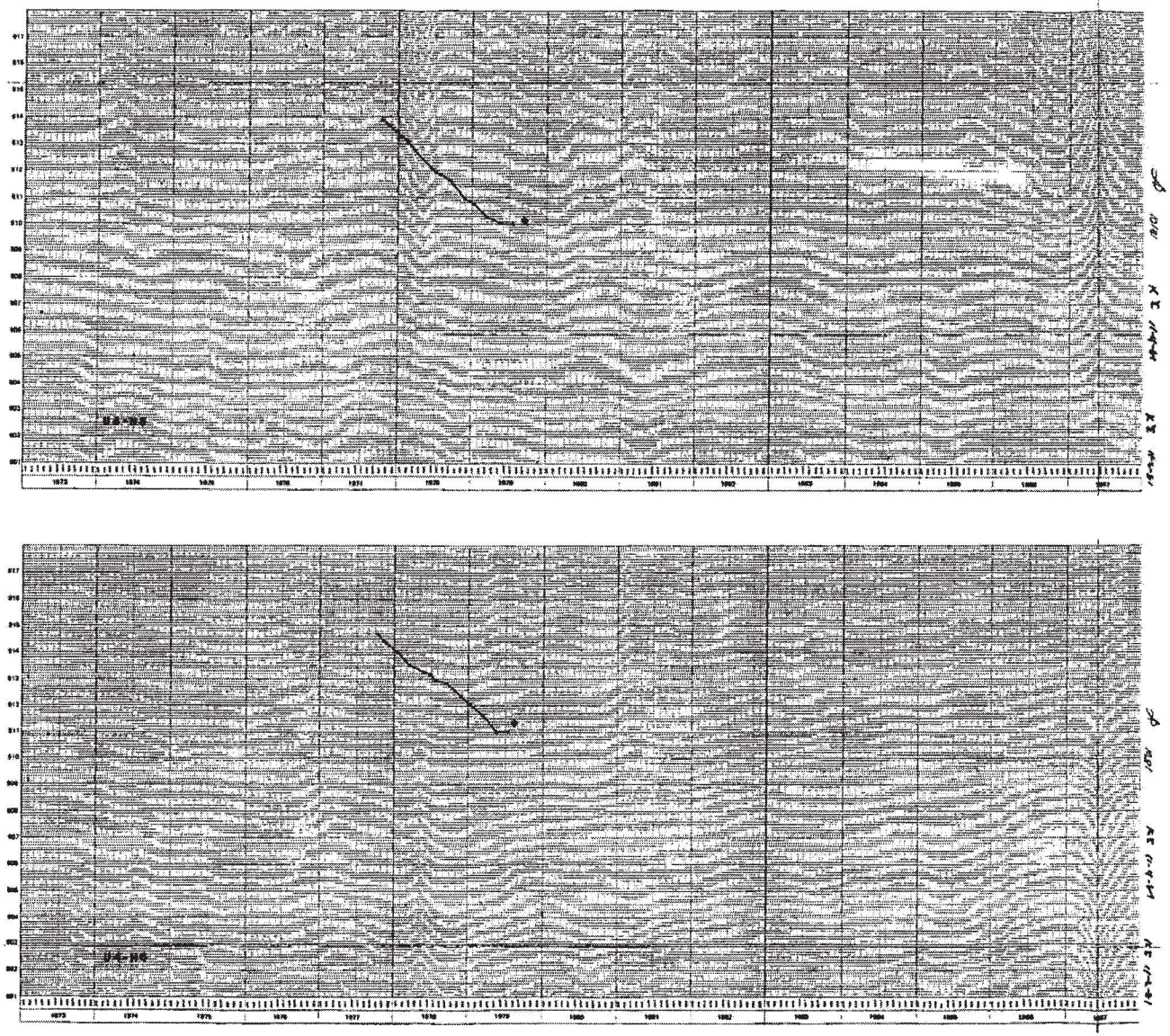
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-37 Sheet 2 of 4

JUNE 2001 REVISION 11



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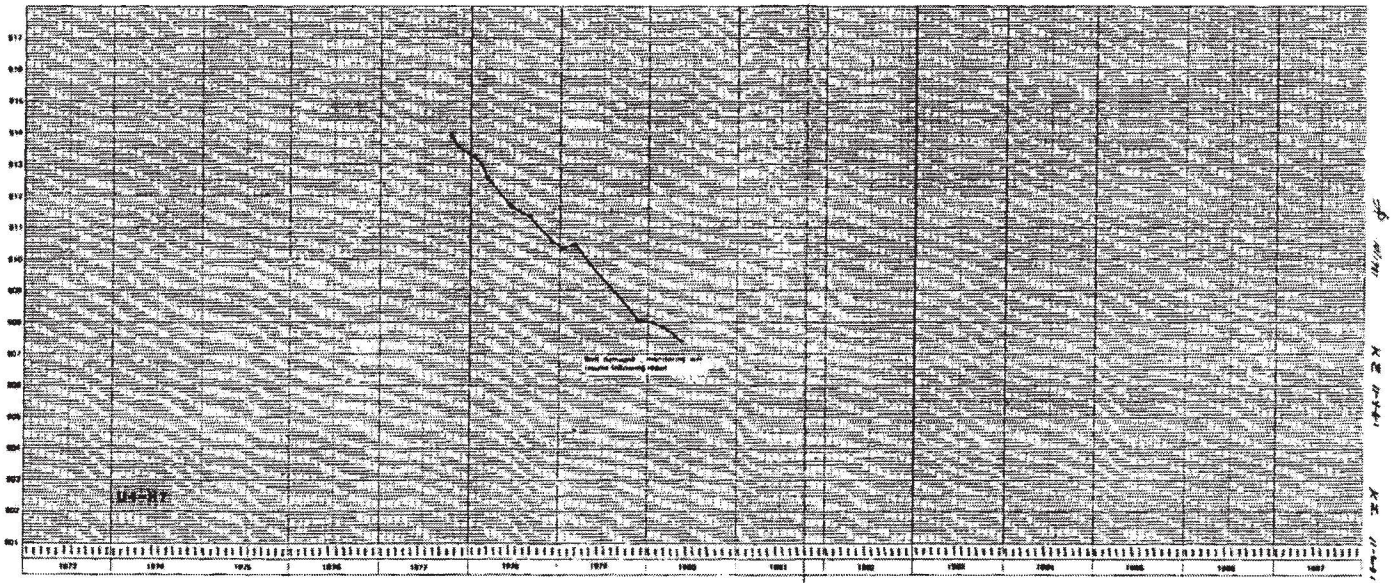
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-37 Sheet 3 of 4

JUNE 2001 REVISION 11



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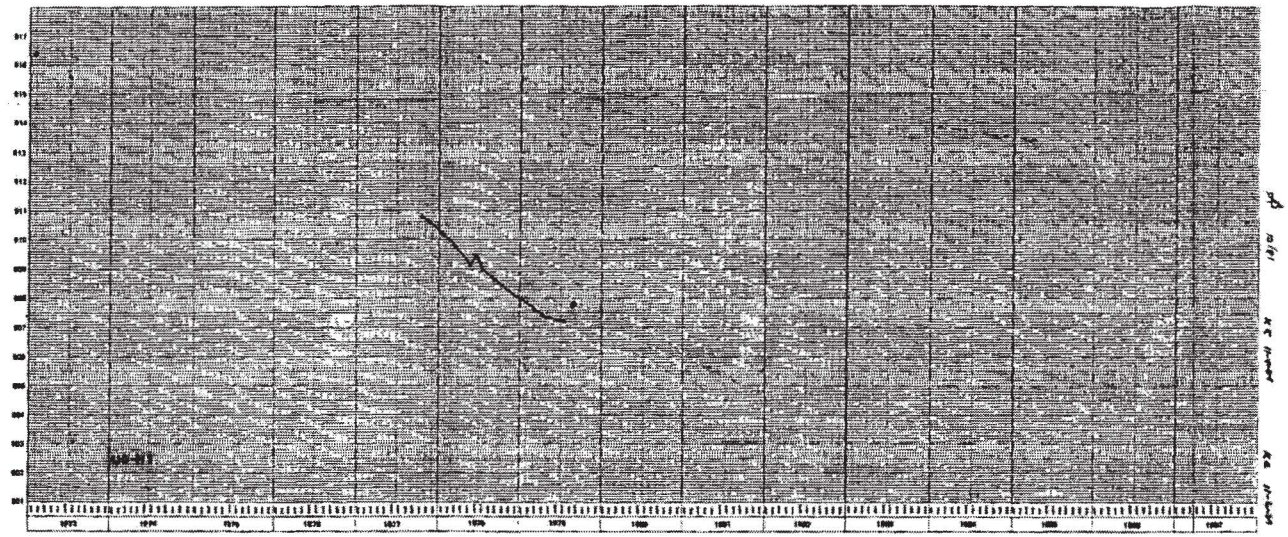
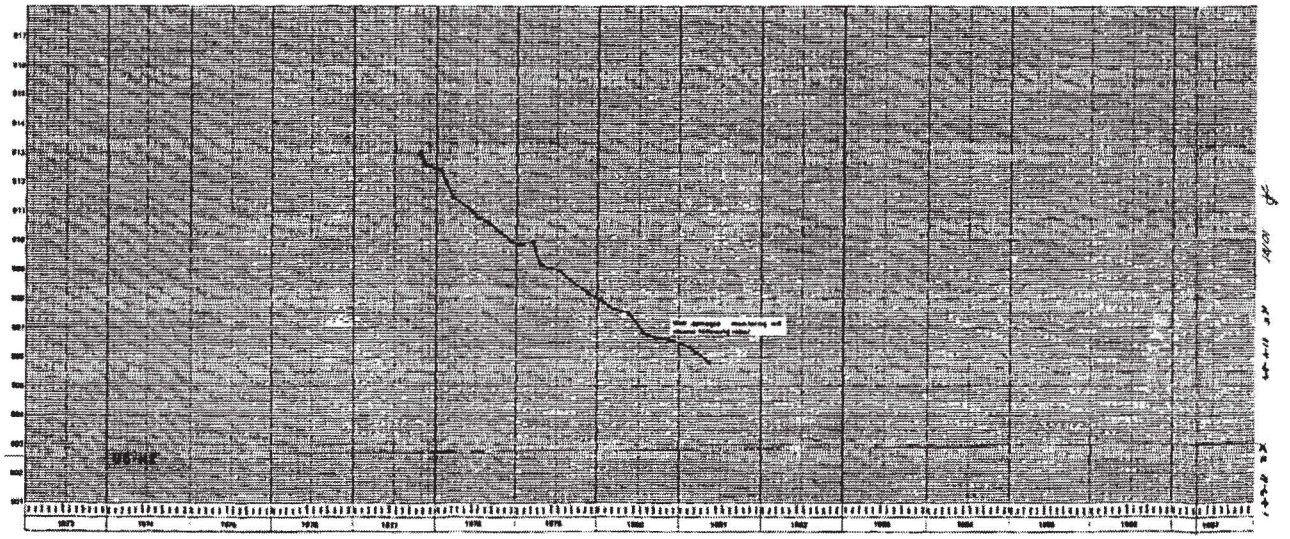
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-37 Sheet 4 of 4

JUNE 2001 REVISION 11





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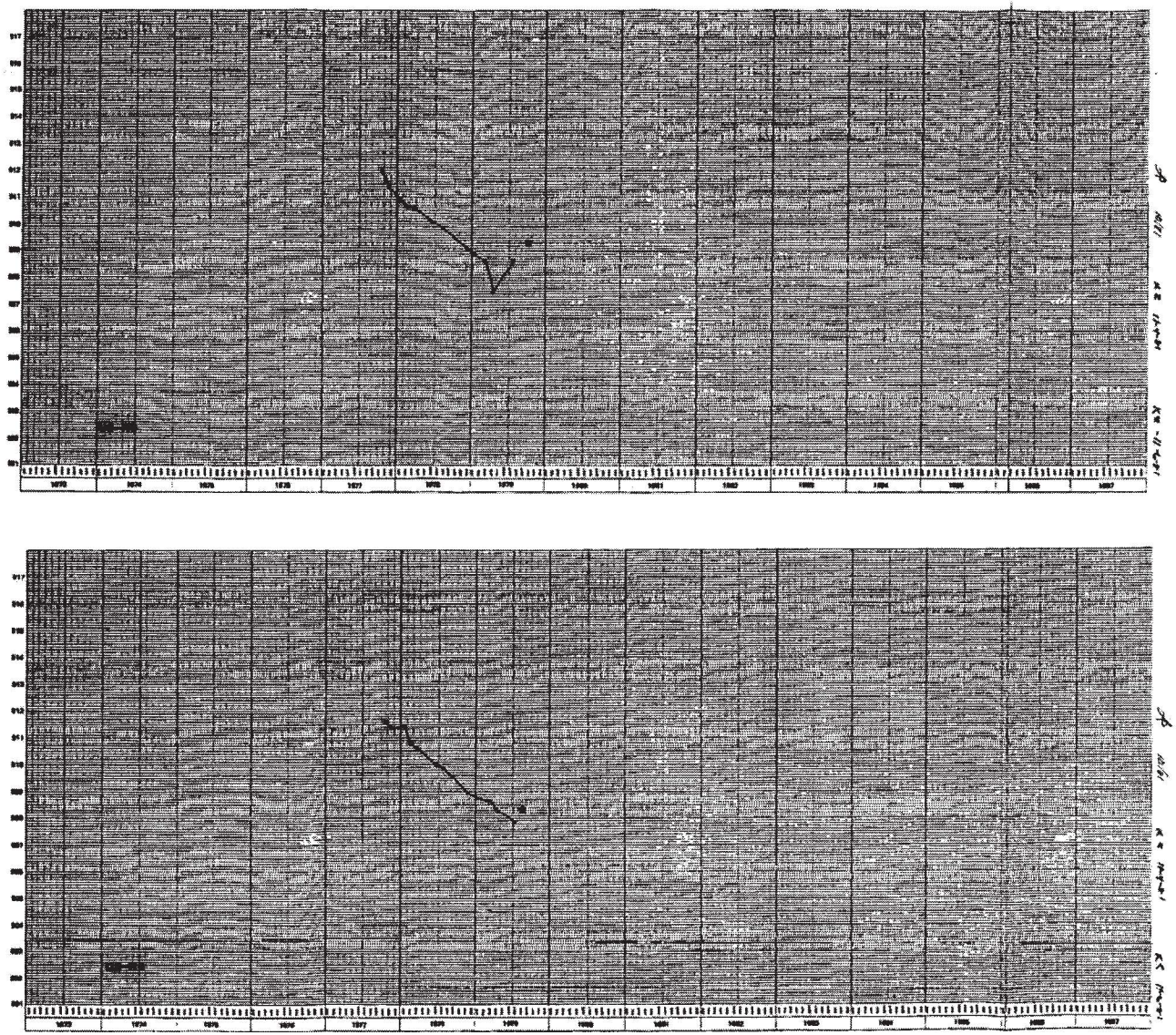
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-38 Sheet 1 of 6

JUNE 2001 REVISION 11



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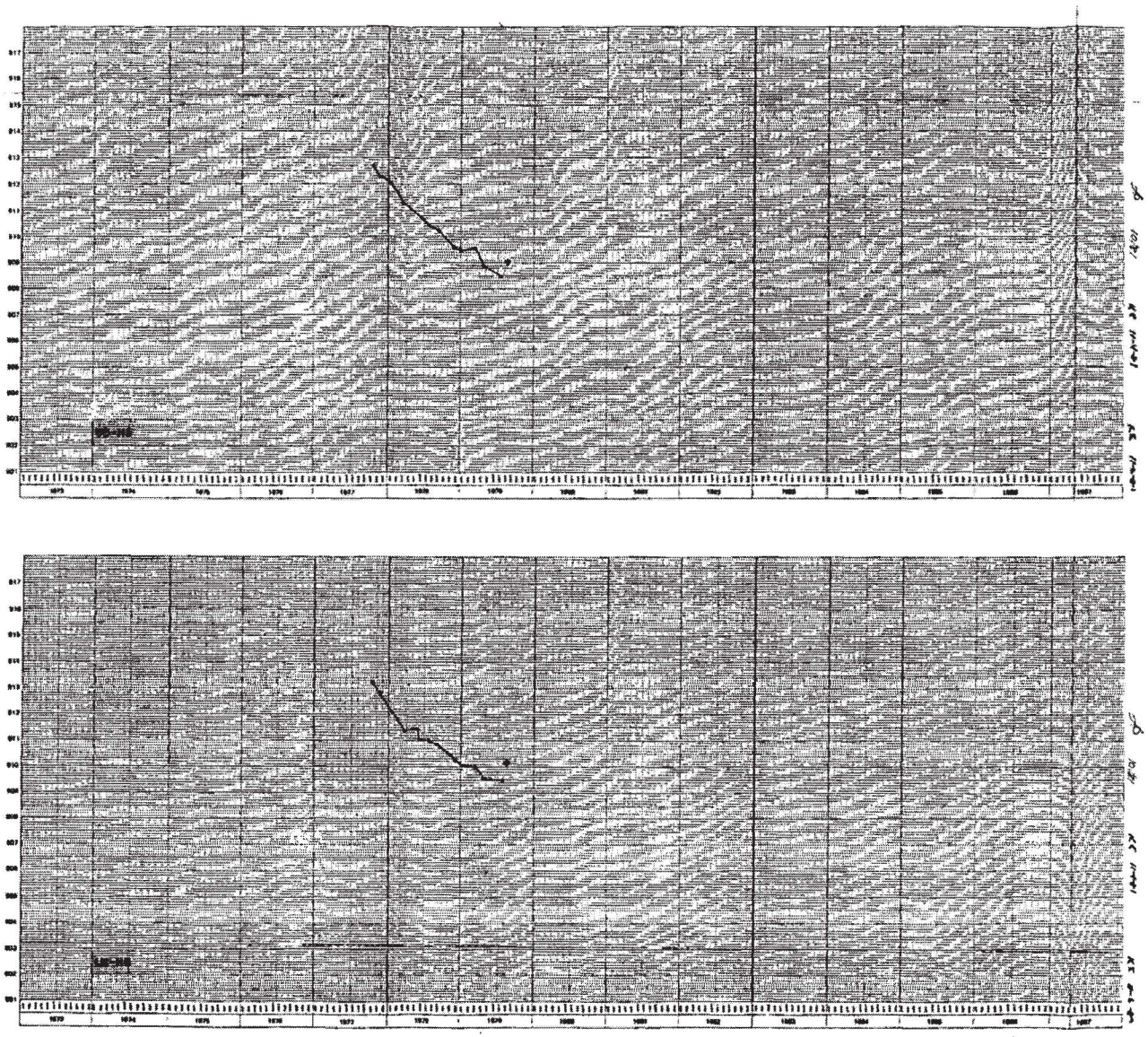
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-38 Sheet 2 of 6

JUNE 2001 REVISION 11



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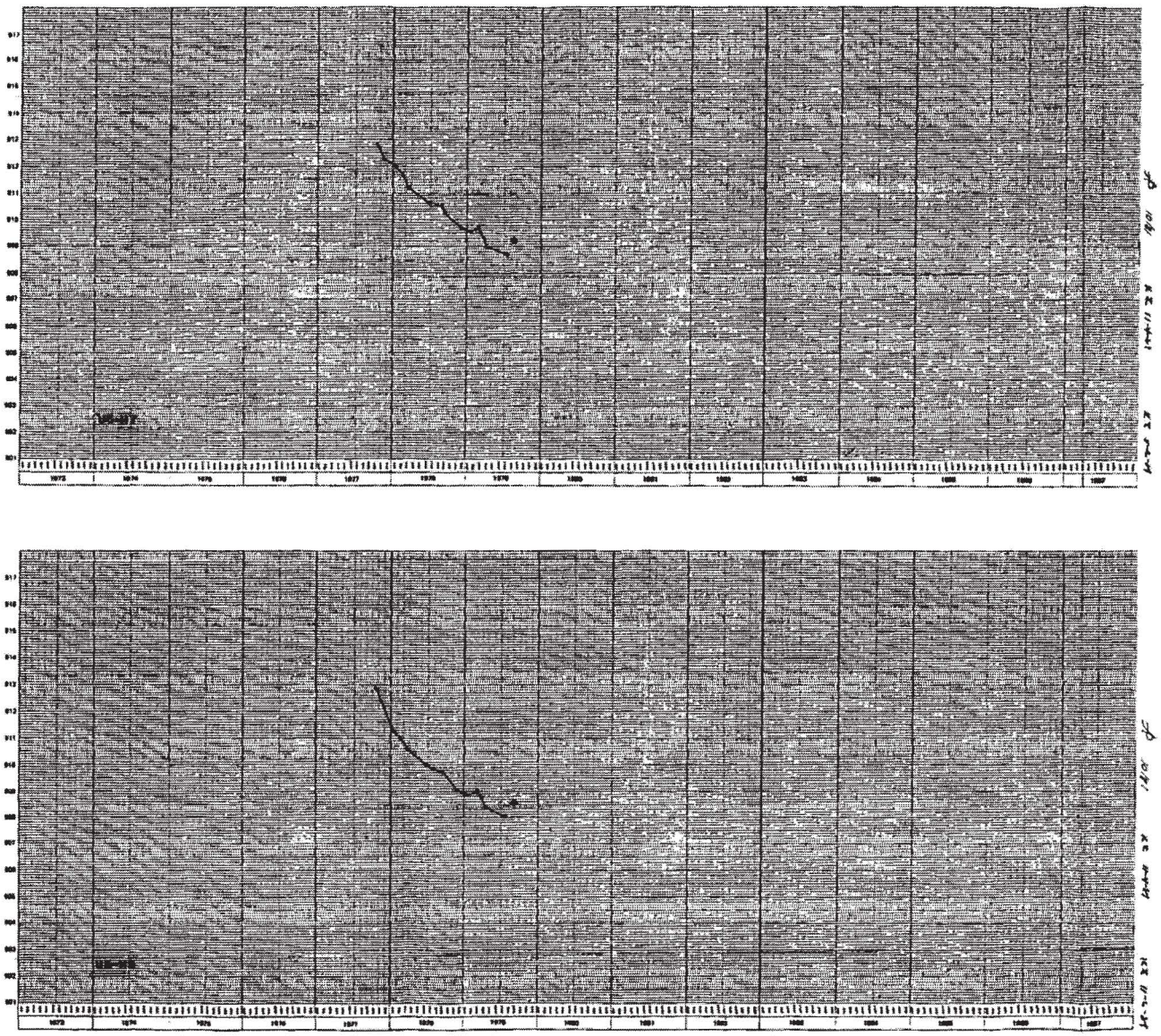
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-38 Sheet 3 of 6

JUNE 2001 REVISION 11



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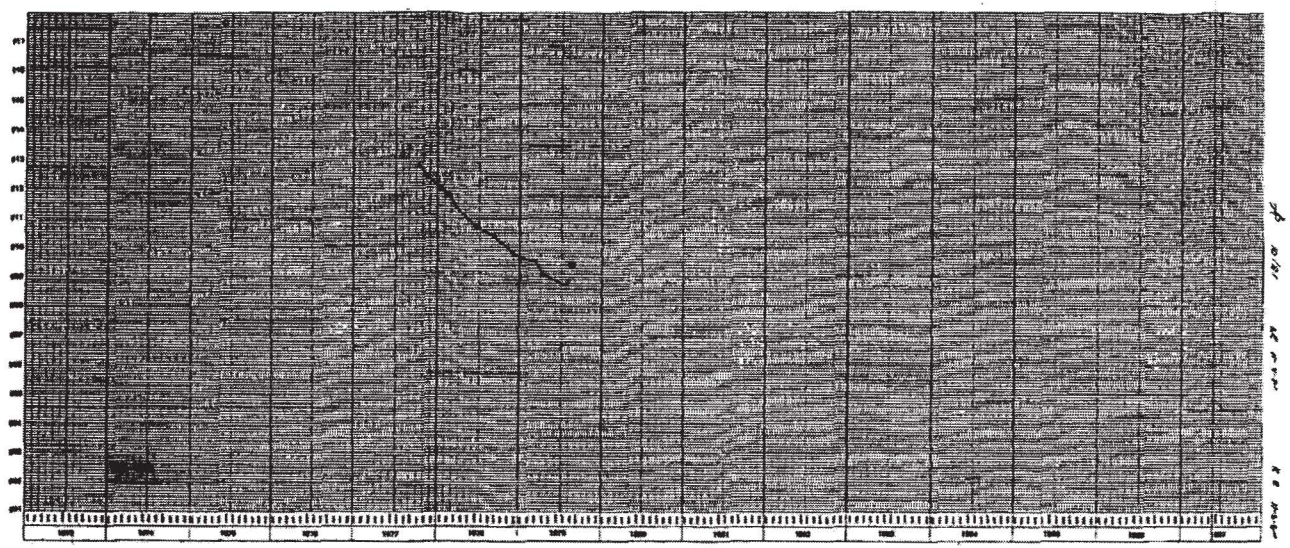
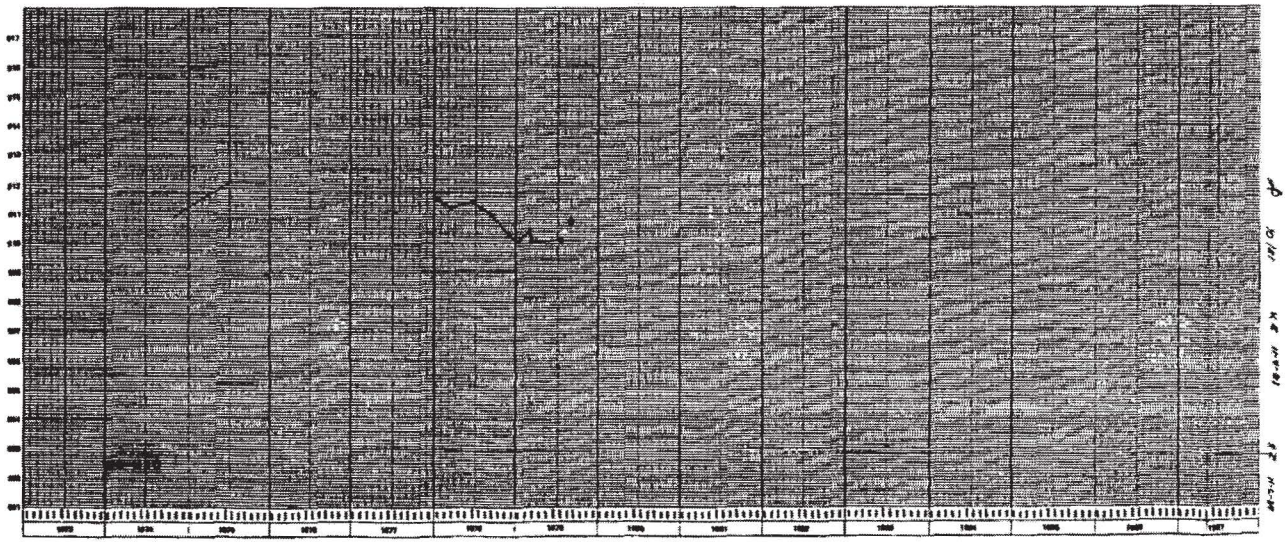
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-38 Sheet 4 of 6

JUNE 2001 REVISION 11





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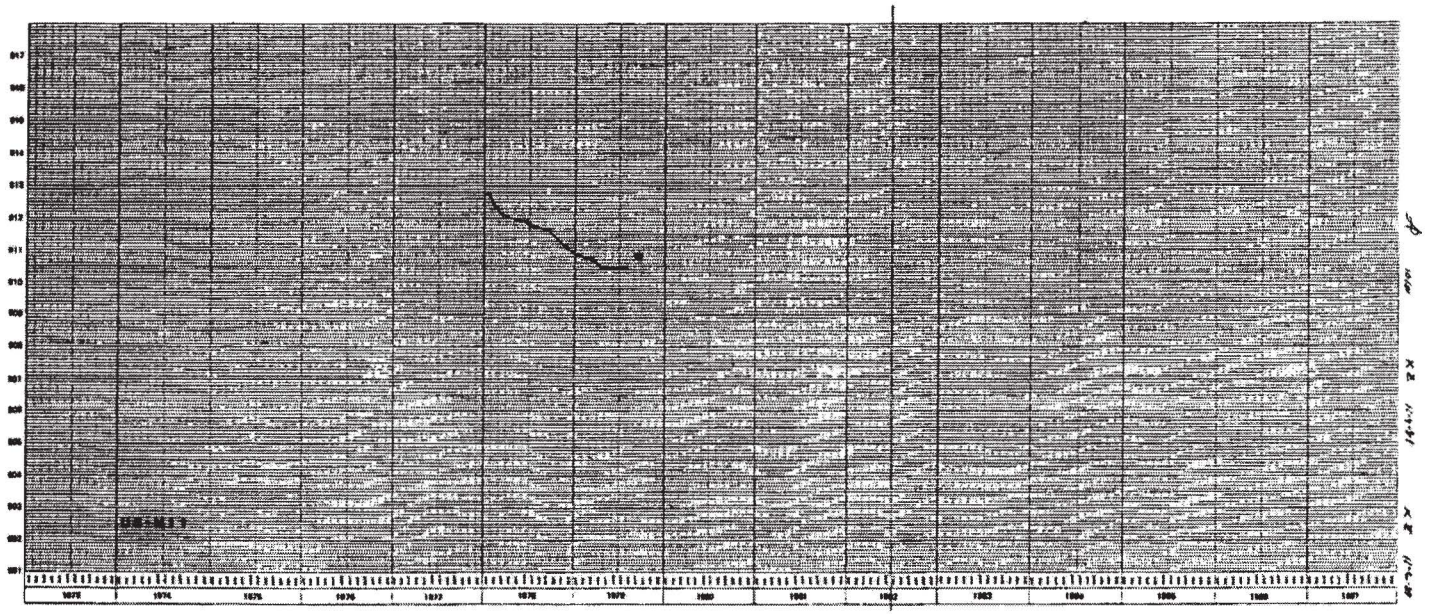
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-38 Sheet 5 of 6

JUNE 2001 REVISION 11



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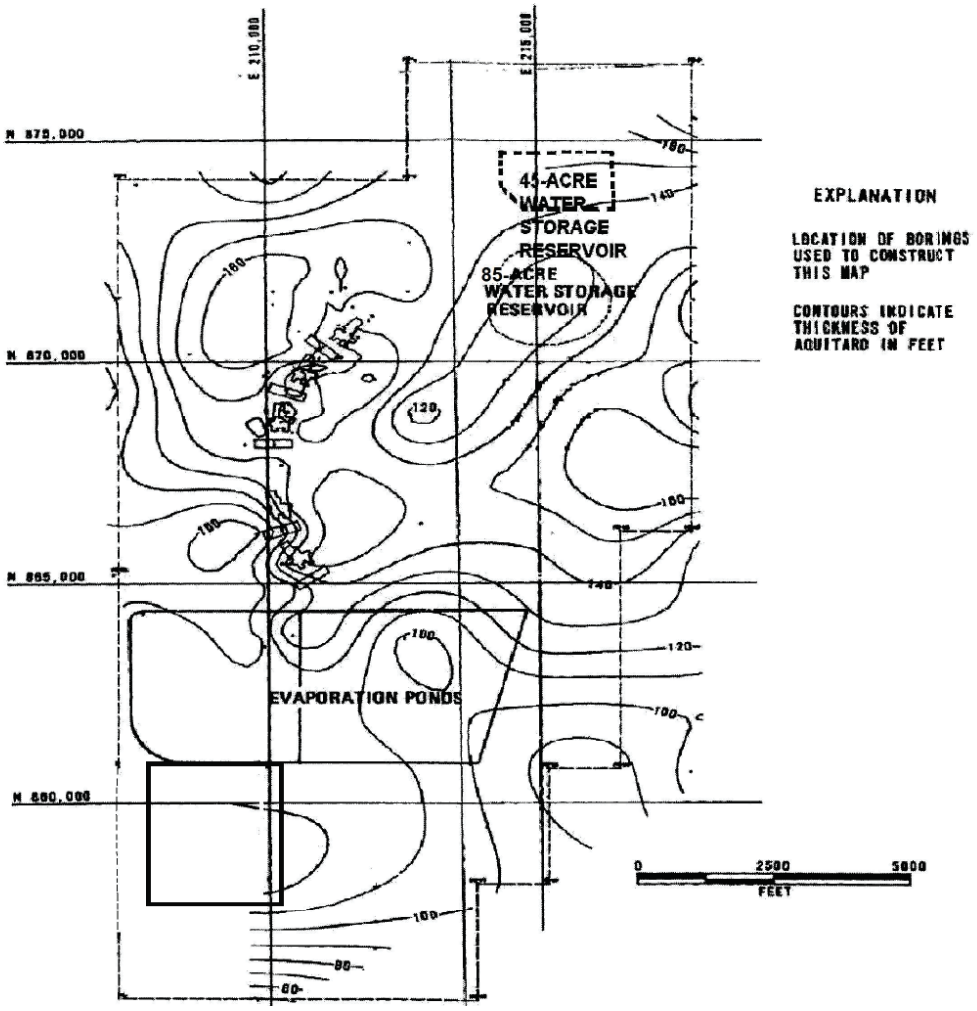
PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

HYDROGRAPHS OF OBSERVATION WELLS
IN THE PERCHED WATER ZONE
(GROUP D)

FIGURE 2.4-38 Sheet 6 of 6

JUNE 2001 REVISION 11

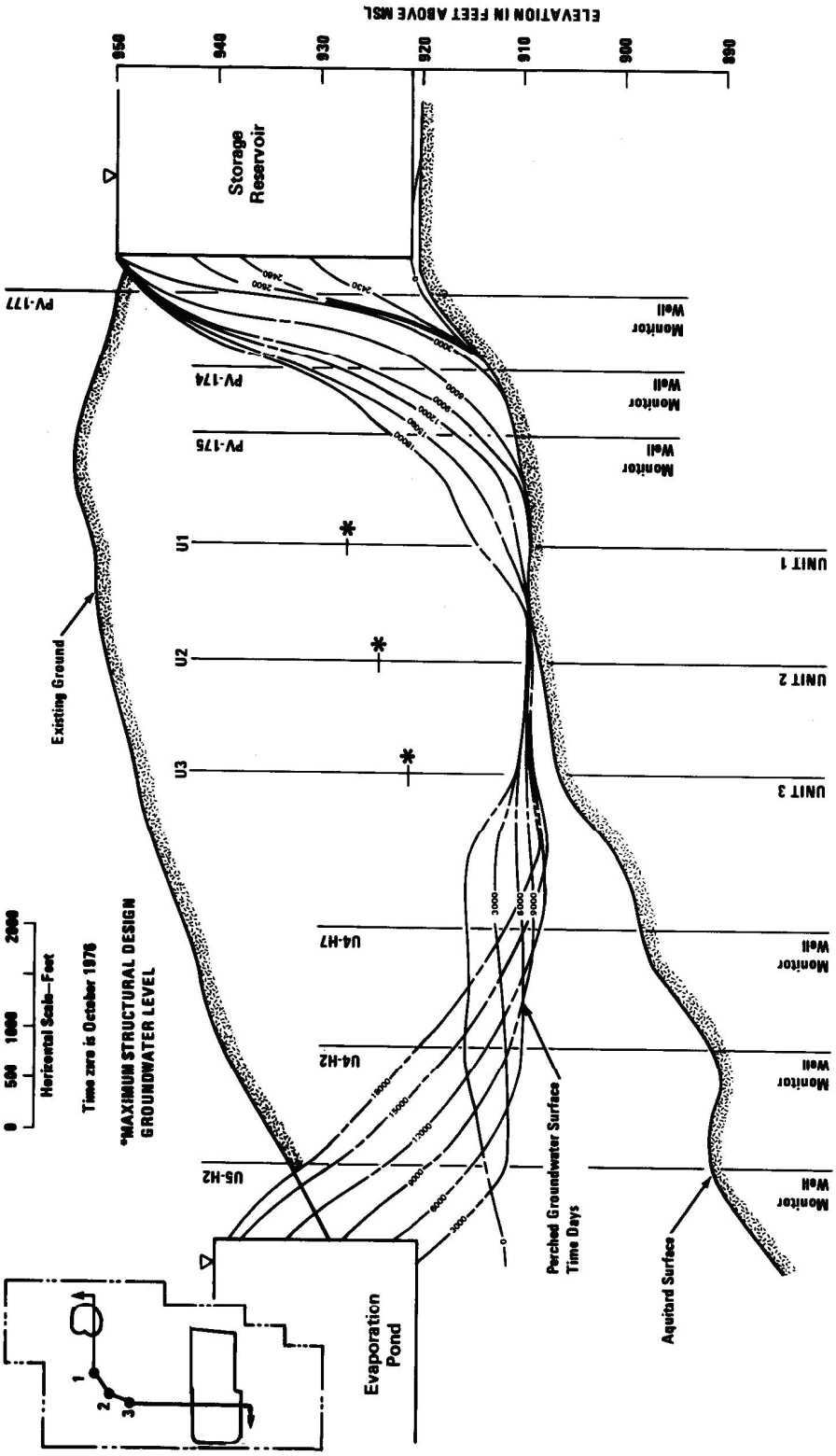


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

AQUITARD THICKNESS COUNTOURS (ISOPACH)

FIGURE 2.4-39

JUNE 2011 REVISION 16

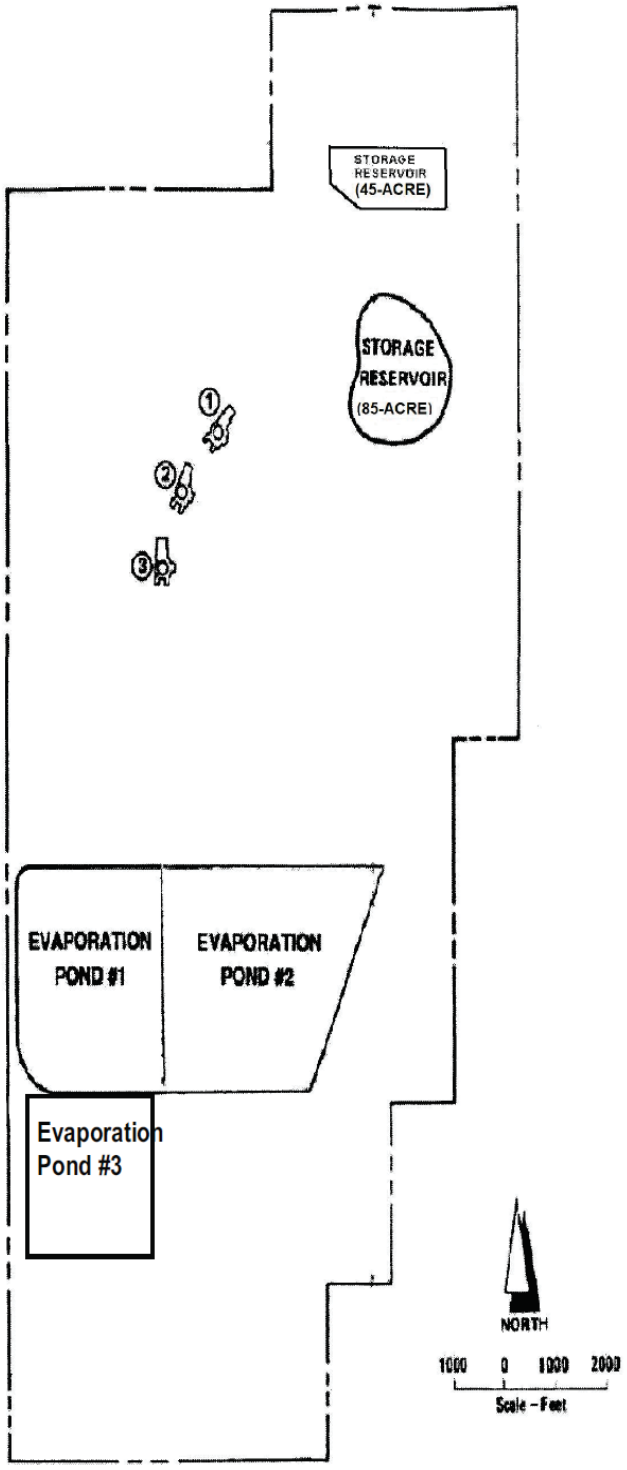


PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

PREDICTED CHANGES IN PERCHED GROUNDWATER LEVELS

FIGURE 2.4-40

JUNE 2009 REVISION 15



PALO VERDE NUCLEAR GENERATING STATION
UPDATED FSAR

LOCATIONS OF STORAGE RESERVOIR AND EVAPORATION PONDS

FIGURE 2.4-42

JUNE 2011 REVISION 16