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 VAN BRUNT, E.E. Arizona Public Service Co.
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 Office of Nuclear Reactor Regulation, Director

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ARIZONA



PUBLIC SERVICE COMPANY

P. O. BOX 21666 · PHOENIX, ARIZONA 85036

September 8, 1980
ANPP-16218 - JMA/JRM

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station
Units 1, 2 and 3
Docket Nos. STN-50-528/529/530

Dear Sir:

Arizona Public Service Company (APS), as Project Manager and Operating Agent for Palo Verde Nuclear Generating Station (PVNGS) Units 1,2&3, is submitting herewith Forty-one (41) copies of Supplement 1 to the PVNGS Units 1,2&3 Environmental Report tendered December 5, 1979.

This Supplement provides an update to the Environmental Report.

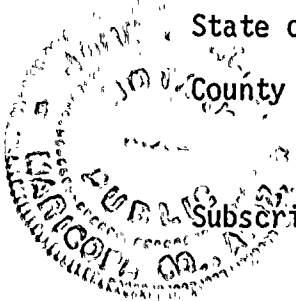
Respectfully submitted,

ARIZONA PUBLIC SERVICE COMPANY

By: *Edwin E. Van Brunt*
Edwin E. Van Brunt, Jr.
APS Vice President,
Nuclear Projects
ANPP Project Director

On its own behalf and as agent
for all other joint applicants.

State of Arizona)
County of Maricopa) ss.



Subscribed and sworn to before me this 25 day of August, 1980.

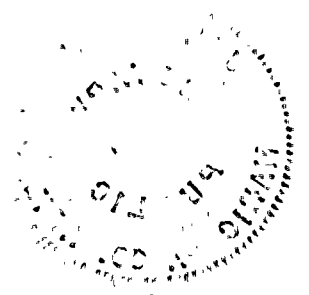
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Jan 23 1983

John M Allen

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ARIZONA



PUBLIC SERVICE COMPANY

P. O. BOX 21666 · PHOENIX, ARIZONA 85036

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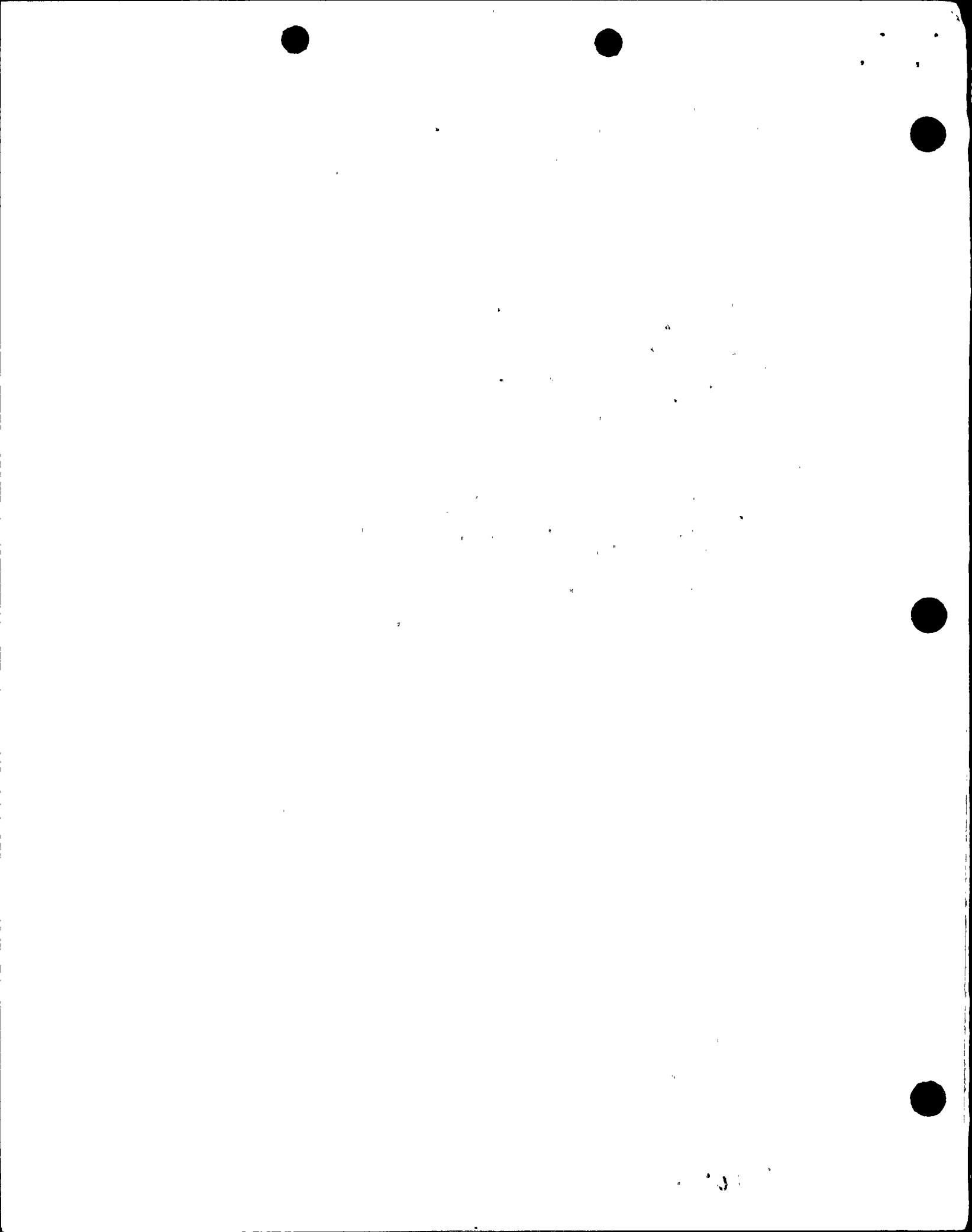
On its own behalf and as agent
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Superseded pgs. per Supp. 1 to Envir. Rpt. 60

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FOREWORD

The engineering symbols used on piping and instrumentation diagrams (P&ID's) are shown on figure F-1. Standards used for editorial abbreviations and symbols are the latest editions of the following American National Standards Institute publications: ANSI-Y1.1, Abbreviations; ANSI-Y10.5, Letter Symbols for Quantities used in Electrical Science and Electrical Engineering; and ANSI-Y10.9, Letter Symbols for Units used in Science and Technology.

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SYSTEM DEMAND AND RELIABILITY

units such as PVNGS. The participants will continue seeking means to promote effectively prudent electric energy management practices.

1.1.1.3 Power Exchanges

Past and expected future net power sales and purchases outside the participants' combined system, which are applicable at the time of annual peak demand, are presented in table 1.1-1. Both firm and nonfirm sales and purchases are tabulated; they contribute respectively to load and generation totals. Firm purchases are not included in the calculation of reserve requirements as the reserve is provided by the seller. Reserve for firm sales is provided on the participants' combined system.

1.1.2 SYSTEM CAPACITY

System capabilities for each of the participants at the time of the annual peak demand for 1968 through 1988 are presented in table 1.1-8 along with a combined resources summary for all participants. These resource schedules are the result of generation planning that makes use of the load forecasting discussed in section 1.1.1.2.

Each participant is responsible for determining its own criteria for bulk generation planning, including the methodology for load forecasting. The Reliability Council of the WSCC recently issued guidelines for the measurement of the adequacy of power supply, including as an alternative a reliability test that uses a loss-of-load probability (LOLP) criterion of one day of outage in 10 years.

Table 1.1-9 contains information showing the existing generation capability as of January 1, 1978, for the Arizona-New Mexico Power Area and the Southern California-Nevada Power Area, respectively, as defined in WSCC. Table 1.1-10 is a summary of generation additions for these two power areas.

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1.1.3 RESERVE MARGINS

The participants do not participate jointly in any single regional power pool. Each participant is responsible for establishing and maintaining its own reserve. Reserve criteria vary with the participant. Each participant's reserve requirements are listed below in outline form.

- A. Arizona Public Service Company: The APS generation reserve requirements are based on an LOLP criterion applied to the proposed Cactus Pool. The proposed pool includes Arizona Electric Power Cooperative, APS, EPE, Plains Electric Generation and Transmission Cooperative, Public Service Company of New Mexico, and Salt River Project. Although formal operating agreements have not been established for this pool, the pool concept has been used in planning studies to establish APS installed reserve requirements. The LOLP criterion is expressed in terms of the expected number of times in a specified period that the pool generating capacity fails to meet load.

The criterion used by APS (in conjunction with the APS load forecast on May 31, 1978) is that the pool reserves shall be 16% of pool load from 1979 through 1981 and sufficient to yield an expected failure to meet pool load of no more than one occurrence in 3 years beyond 1981. This is sometimes referred to as a 1/3 LOLP index. A computer simulation that represents both forced and maintenance outages is used to compute the probability of failure to meet load on a daily basis, with the daily probabilities added to yield an annual index. Allocation of the pool reserves among individual utilities is in proportion to the sum of their peak load, plus twice their largest hazard.

Figures 2.1-4 through 2.1-12 illustrate the estimated residential population located within a 10-mile radius of the plant site for the years 1980, 1982, 1984, 1986, 1990, 2000, 2010, 2020, and 2030. Data are displayed at 1, 2, 3, 4, 5 and 10-mile distances from the centerline of the Unit 2 containment building, for the 16 compass sectors. Maricopa County population estimates provided by the Arizona State Department of Economic Security⁽³⁾ for the years 1980, 1982, 1984, 1986, 1990, and 2000 were used for all six radii calculations. Maricopa County population projections for the years 2010, 2020, and 2030 were derived from the assumption that decennial growth rates from 2000 to 2030 would be held constant to the same rate of growth as experienced between 1990 and 2000. Population projections were calculated in the same manner as the 1978 estimated 5-10 mile radius population.

Listed below is a generalized Maricopa County age distribution for the year 2000.

<u>Age Group</u>	<u>Percentage of Total Population</u>
0-11 years	15
12-17 years	9
18-65+ years	76

These figures were derived from data prepared by the Arizona State Department of Economic Security.⁽³⁾

2.1.2.2 Population Between 10 and 50 Miles

Figure 2.3-1 illustrates population settlements located within a 50-mile radius of PVNGS. Figure 2.1-3 illustrates the 1978 estimated residential population located between 10 and 50 miles of the plant site. Figures 2.1-4 through 2.1-12 show the estimated residential population located between 10 and 50 miles of the plant site for the years 1980, 1982, 1984,

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1986, 1990, 2000, 2010, 2020, and 2030. Data are displayed at 10, 20, 30, 40, and 50 mile distances, from Unit 2 for 16 compass sectors. Population input data for Maricopa, Pinal, Yavapai, and Yuma Counties were prepared by the Arizona State Department of Economic Security⁽³⁾ and calculated according to the methodology described in section 2.1.2.1.

Maricopa County age distribution projections for the year 2000, are given in section 2.1.2.1. It is assumed that the same age distribution projections will apply to Pinal, Yavapai, and Yuma Counties.

2.1.2.3 Transient Population

Transient population within a 10-mile radius of Unit 2 for 1978 is estimated to have been approximately 150 persons.⁽⁴⁻⁸⁾ This is a conservative estimate based upon the consideration that 100 people included in the total represent migrant farm workers⁽⁴⁾. The remaining 50 persons are employed at the Hassayampa Cotton Gin, the Ruth Fisher and Arlington School Districts, and Gila Compressor Station. Table 2.1-3 lists employment centers within a 10-mile radius of PVNGS according to distance and direction from the plant site, number of employees, season of employment, and combined residential and transient population totals per sector.

Construction phase manpower is discussed in section 8.1.

2.1.3 USES OF ADJACENT LANDS AND WATERS

2.1.3.1 Land Use Within a 5-Mile Radius of the PVNGS Plant Site

2.1.3.1.1 Residential Land Use

As indicated in section 2.1.2.1, residential land use within a 5-mile radius of the PVNGS site is low density, since most

Table 2.1-3
 1978 TRANSIENT POPULATION WITHIN A 10-MILE RADIUS OF PVNGS (4-8)

Employment Center	Distance and Direction from PVNGS (a)	Number of Employees	Season of Employment	Combined 1978 Residential and Transient Population Total, per Sector
Farms	3-10 Miles: N, NNE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, WNW, NW, NNW	100 (Migrant)	High in Spring and Fall, Low in Summer, Winter	3,032
Hassayampa Cotton Gin	6.0 Miles SE	10	November-March	10
Ruth Fisher School District	7.5 Miles N	6	September-June	6
Arlington School District	8.0 Miles SE	10	September-June	10
Gila Compressor Station	10.0 Miles SSE	25	Year-round	25

a. All measurements taken from Unit 2.

2.1-7

PVNGS ER-01

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of the area is zoned under either a Maricopa County Rural-190 (maximum density of one dwelling unit per 190,000 square feet) or a Rural-43 (maximum density of one dwelling unit per acre) land use classification.

There are two trailer parks located within a 5-mile radius of PVNGS: the Nuclear Trailer Park, and the You and I Trailer Park. The Nuclear Trailer Park is zoned under a Maricopa County Residential-5 land use classification which is defined as a maximum density of one dwelling unit per 1000 square feet.⁽⁹⁾ The You and I Trailer Park constitutes a nonconforming land use as the area in which it is located is zoned as a Maricopa County Rural-43 land use classification.⁽⁹⁾

From October, 1977 to October, 1978, the Nuclear Trailer Park expanded from 7 trailers and 10 people to 65 trailers and 97 people. Short term plans call for adding 5 acres to the park which will add an additional 60 trailers and bring the total population up to 187 persons.⁽¹⁰⁾

There was no expansion of the You and I Trailer Park between October, 1977 and October 1978. Development plans call for expansion in 10-unit increments with a maximum expected development of 100 units.⁽¹¹⁾

The proposed Phoenix Valley West development is not active because the project developers are suspended from further action by the Arizona State Department of Real Estate. To date, there are only six homes constructed in the area.

2.1.3.1.2 Commercial Land Use

Within a 5-mile radius of PVNGS there are four commercially zoned parcels located along Buckeye-Salome Road, either at or near its intersection with Wintersburg Road. These parcels are zoned as either a Maricopa County Commercial-2 (intermediate) or Commercial-3 (general) land use classification.⁽⁹⁾

east-northeast of the plant site. All training areas are located well beyond a 10-mile radius of the plant site.

2.1.3.3.2.2 Williams Air Force Base. Figure 2.1-14 illustrates the location of Williams Air Force Base and some of its Military Operations Areas (MOA). Williams Air Force Base is located approximately 70 miles east of the plant site. Williams Air Force Base MOAs are located to the north, east, and south of the base, well beyond a 50-mile radius of the plant site.

2.1.3.4 Agricultural Land Uses Within a 50-Mile Radius of the PVNGS Plant Site

2.1.3.4.1 Radiological Dose Pathways

Table 2.1-5 presents the distance from Unit 2 to the nearest resident, milk cow/cattle, milk goat, and vegetable garden (greater than 500 square feet). This information is based on an aerial survey backed by ground verification made in October, 1978. Within a 5-mile radius of Unit 2, none of the milk cow or milk goat locations are dairy operations, and no vegetable gardens greater than 500 square feet were observed. Similar information for Units 1 and 3 is provided in table 2.3-30.

2.1.3.4.2 Crop Production Within a 50-Mile Radius of the PVNGS Plant Site

Table 2.1-6 provides a summary of the 1977 annual agricultural production of Maricopa and Pinal Counties.^(25,26) Table 2.1-7 provides a breakdown of 1977 vegetable production yields within a 50-mile radius of PVNGS. In order to produce this information, it was assumed that (1) the spatial distribution of cropland has not changed since October, 1973, when aerial photography was taken as the basis for compiling the Cropland Atlas of Arizona⁽²⁷⁾ and (2) approximately 65% of the

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Table 2.1-5
 DISTANCE TO NEAREST RECEPTOR WITHIN 5 MILES AS
 MEASURED FROM THE CENTERLINE OF THE PVNGS
 UNIT 2 CONTAINMENT BUILDING, IN METERS

Direction	Residence	Milk Cow/Cattle	Milk Goat	Vegetable Garden ₂ >500 ft. ²
N	2640	5064	-	-
NNE	3288	-	-	-
NE	3408	6840	-	-
ENE	4656	5760	-	-
E	5280	-	-	-
ESE	5808	-	-	-
SE	-	-	-	-
SSE	7080	-	-	-
S	6960	-	-	-
SSW	5112	8064	-	-
SW	6360	7584	10200	-
WSW	10416	10416	-	-
W	-	-	-	-
WNW	-	-	-	-
NW	3552	8352	-	-
NNW	3984	-	-	-

Maricopa County and approximately 2% of the Pinal County vegetable production occurs within a 50-mile radius of PVNGS. Table 2.1-8 lists normal planting and harvesting dates in Maricopa and Pinal Counties. No agricultural production occurs in those areas of Yavapai and Yuma Counties located within a 50-mile radius of PVNGS.

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The yields assumed that:

- All beef cattle feedlots located within Maricopa County are constantly filled throughout the year at their maximum capacity
- All beef cattle feedlots located in Maricopa County operate on a six complete turn-over cycle annually⁽³¹⁾
- The same percentage of cattle, hogs and sheep grown in Maricopa County are also slaughtered in Maricopa County
- Hogs and sheep are raised in the same sector as beef cattle
- Forty-seven percent of the total liveweight of beef cattle is destined for human consumption⁽³²⁾
- Seventy-five percent of the total liveweight of hogs is destined for human consumption⁽³²⁾
- Forty-five percent of the total liveweight of sheep is destined for human consumption⁽³²⁾

Range cattle raised within a 50-mile radius of PVNGS are excluded from consideration as steers and heifers not used for herd replacement are shipped to feedlots prior to slaughtering.⁽³³⁾ It is assumed that the number of cull cows and bulls shipped directly from the range to packing houses is negligible.

The feeding regime of beef cattle located within a 50-mile radius of PVNGS is as follows: for the period from March 1 to June 1, the feeding regime consists of a blend of 95% stored feed and 5% green chop.⁽³³⁾ During the remainder of the year, cattle are fed a diet that is primarily stored feed.⁽³³⁾

Seventy-three percent of the beef feedlots located within a 50-mile radius of PVNGS are considered to be located in either 1) congested areas where public improvements are adversely affected or 2) rural areas where public improvements may be

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adversely affected.⁽³³⁾ It is expected that as Maricopa County becomes increasingly more urbanized, a number of the feedlots will have to be relocated to the strictly rural parts of the county.

2.1.4 REFERENCES

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8. McFall, J. H., Director, Public Relations and Advertising, El Paso Natural Gas Company, Houston, Texas, Letter to Higman, S. L., NUS Corporation, January 20, 1979.

GEOGRAPHY AND DEMOGRAPHY

29. Collier, R., State of Arizona Dairy Commission, Phoenix, Arizona, Letter to Higman, S. L., NUS Corporation, June 15, 1979.
30. Lough, O. G., Agricultural Extension Agent, Maricopa County Cooperative Extension Service, Phoenix, Arizona, Letter to Higman, S. L., NUS Corporation, December 18, 1978.
31. Loughhead, H. V., Agricultural Extension Agent, Maricopa County Cooperative Extension Service, Phoenix, Arizona, Personal Interview with Higman, S. L., NUS Corporation, October 13, 1978.
32. Duewer, L. A., U.S. Department of Agriculture, Economics, Statistics and Cooperative Services, Commodity Economic Division, Washington, D.C., Telephone Conversation with Wedgle, S. A., NUS Corporation, April 23, 1979.
33. Mikles, Dr., Assistant State Veterinarian, Disease Control Section, Arizona State Livestock Sanitary Board, Letter to Higman, S. L., NUS Corporation, October 30, 1978.



and local meteorological conditions (including atmospheric diffusion) expected at and in the vicinity of PVNGS.

Figure 2.3-1 indicates the location of PVNGS and the meteorological data collection stations used to assess the local meteorology. Table 2.3-3 more specifically provides the locations and a brief topographical description of the offsite meteorological stations.

2.3.2.1.1 Wind Direction and Speed

Onsite monthly and annual wind roses for the 35-foot and 200-foot levels are presented in figures 2.3-2 through 2.3-6 for the 5-year period August 13, 1973 through August 13, 1978. Wind roses are provided monthly for the 5 years combined as well as annually for each individual year and the 5-year summary. Wind direction distributions are similar for both levels on the tower and for all 5 years of data collection. Prevailing winds are from the southwesterly sectors on an annual basis and during the spring and summer months. During the fall and winter months, however, prevailing winds are from the east and northeast sectors.

Shown in figures 2.3-7 through 2.3-9 are monthly and annual wind roses for Phoenix for the same 5-year period as the onsite data. For comparison to the 5-year period of site data, annual 5-year wind roses for Phoenix (1960 through 1964), Gila Bend (1984 through 1953), and Luke AFB (1960 through 1964) are presented in figure 2.3-10.

Comparison of the wind roses for the various time periods and locations shows the topographic influences on predominant wind flows and the inherent differences in wind distributions between the recording stations. Prevailing winds at Phoenix are east and west along the axis of the valley in which the airport and city are situated. The effect of the north-south oriented White Tank Mountains, immediately to the west of Luke AFB, are evident

Table 2.3-3
 OFFSITE METEOROLOGICAL DATA COLLECTION STATIONS
 USED TO ASSESS THE LOCAL METEOROLOGY

Station	Distance From Site (Miles)	Direction	Local Topography
Phoenix (Sky Harbor International Airport)	50	ENE	Flat; east-west valley
Luke Air Force Base	33	ENE	Flat; mountains immediately to the west
Gila Bend Airport	34	SSE	Flat; scattered hills in the area
Buckeye	18	E	Flat
Litchfield Park	32	ENE	Flat

EXTERNAL APPEARANCE

shown on the site general arrangement plan in figure 3.1-4. Figure 3.1-7 shows a typical power block in isometric form. Figures 3.1-8 through 3.1-11 illustrate the four main elevations of the power block.

3.1.3.1 Power Block Complex

Each power block complex consists of the following major structures:

- Containment building
- Auxiliary building
- Fuel building
- Control building
- Turbine building
- Diesel generator building
- Radwaste building
- A laundry and decontamination facility at Unit 1 only

The containment is a cylindrical concrete structure with a hemispherical dome and is the highest part of the power block. The containment is surrounded by lower power block structures. With the exception of the turbine building, all other structures of the power block are constructed of concrete. The turbine building consists of a structural steel frame enclosed with concrete base and metal siding walls of a color to complement the other structures within the complex.

EXTERNAL APPEARANCE

The locations of the release points for gaseous wastes are illustrated on figure 3.1-9.

3.1.3.2 Other Structures

Each power block is served by cooling towers located west or northwest of the power block. Other structures in the plant area include the administration building, the guardhouse, service warehouse building, water reclamation plant, switchyard structures, and miscellaneous ancillary buildings. These structures have low silhouettes.

3.1.4 CONCLUSION

Because of the distances of the vantage points from the station and the high Palo Verde Hills backdrop, the visual impact to the public is negligible.

No properties listed in the National Register of Historic Places exist near the vicinity of the site, therefore there is no visual or aesthetic plant impact upon these properties.

TRANSMISSION FACILITIES

3.9.1.3.2 Project 3

This route was divided into the nine segments indicated in figure 3.9-2. Each segment is discussed separately. The transmission line will follow an existing 345 kV line except through segments 8 and 9, which will modify the visual impact of this additional 345 kV line.

Segment 1 and segment 2 will not intersect frequently traveled public roads. Segment 3 will have a low visual impact on the agricultural land located at Highways 70 and 75. The presence of a second power line could also detract from the scenic Gila River Valley. Aesthetic modification could also occur at the points where the line crosses these.

The major part of segment 4 will cover isolated desert lands. Visual interference to motorists will be almost nonexistent. However, the line does intersect U.S. Highway 70 north of Lordsburg.

Segment 5 will create only slight visual effects from frequently traveled public roads. The initial 3 to 5 miles of the eastern portion is within 1 to 2 miles of the highway. However, telephone wires and poles immediately border this highway, already obstructing the view of the motorist. The remainder of this segment is in a very remote area beyond the view of the motorist.

Segment 6 will have the greatest aesthetic impact where the line will cross State Roads 26 and 260 about 2 miles north of Deming. For the greater portion of this segment, infringement on the landscape will be minimized by the remote location of the line.

Segment 7 will intersect I-10 at a point 2 miles west of the Luna-Dona Ana County line. Some visual disruption is likely to occur at this intersection point. Segment 8 will not cross frequently traveled public roads. In segment 9 the Anapra area will be subject to the highest visual modification from frequently traveled public roads.

TRANSMISSION FACILITIES

3.9.1.3.3 PVNGS To Devers

Information concerning the PVNGS to Devers line is contained in the U.S. Department of Interior Bureau of Land Management and U.S. Nuclear Regulatory Commission Final Environmental Statement, Palo Verde-Devers 500 kV Transmission Line, February, 1979. Descriptions are presented for preferred and alternate routes. Final route approval has not been received from the Bureau of Land Management.

3.9.1.4 Structures

3.9.1.4.1 Project 1 Structures

Figure 3.9-3 illustrates the structures which will be used for the Project 1 Lines. The transmission towers will be of open lattice-type construction, with dull finish. Grey shaded suspension insulators will be used on the towers. These features will tend to make the transmission lines less visible from a distance against the desert backdrop, and the blending effect of the lattice construction and color help make the line less noticeable when visually compared with other man-made features which are more opaque, or of a more contrasting color.

The self-supporting steel lattice towers average approximately 129 feet high. The towers used on straight portions of the transmission line are tangent structures, which support the conductor vertically and absorb other loads such as wind forces or ice loads on the conductor. This is the basic type of tower used on the line.

Each tower will have five attachments for cables. There will be three sets of conductors (a total of at least six conductors) with each set attached to a separate point on the tower. Two statics will be suspended above the three sets of conductors. The average length of conductor span from tower to tower will vary from approximately 1280 to 1650 feet.

5.5 EFFECTS OF OPERATION AND MAINTENANCE OF THE TRANSMISSION AND CONVEYANCE SYSTEMS

5.5.1 TRANSMISSION SYSTEM

The transmission systems associated with PVNGS are described in section 3.9.1. Information presented in ER-CP Section 5.6.1 and the FES has been updated to reflect final line routing and the addition of a transmission line from PVNGS to Devers Substation in California. The impacts expected due to operation and maintenance of the Projects 1 and 3 transmission systems are updated and summarized in this section. Information concerning the expected impacts of the PVNGS to Devers line is presented in the U.S. Department of Interior Bureau of Land Management and U.S. Nuclear Regulatory Commission Final Environmental Statement, Palo Verde-Devers 500 kV Transmission Line, February 1979. Descriptions are presented for preferred and alternate routes.

5.5.1.1 Transmission System Impacts

5.5.1.1.1 Maintenance Program

Maintenance programs are not expected to have significant environmental effects, however, those environmental effects that do occur from maintenance will be short term. Transmission-system construction practices will result in stable open-field associations and therefore minimal right-of-way maintenance. Where maintenance clearing is required the biotic association as a whole will not be adversely affected.

Maintenance will be conducted on an as-required basis. Frequent ground access to the transmission lines for maintenance will not be required. The same environmental precautions that were taken during construction will be taken for non-emergency maintenance and repairs. The comfort and safety of local residents will be provided for by controlling noise and dust created by maintenance-vehicle traffic.

EFFECTS OF OPERATION AND MAINTENANCE OF
THE TRANSMISSION AND CONVEYANCE SYSTEMS

Access roads built during the construction phase of the transmission systems ordinarily will not be maintained.

Herbicides and pesticides will not be used for maintenance of transmission-system corridors. Soil sterilants may be used within the confines of substations to control weed growth.

5.5.1.1.2 Electrical Effects

No adverse effects resulting from corona or electrical field effects are expected. Standard procedures will be followed to eliminate the interference with communication or railroad systems. Grounding systems will be installed to handle currents that occur under fault conditions.

5.5.1.1.3 Ecological Resources

The effects of transmission-line operation and maintenance relate primarily to the access roads that create increased access to areas that were previously difficult to reach. The operation and maintenance activities will have very little, if any, adverse effects on terrestrial and aquatic systems once construction activities have been completed.

In sensitive areas with species such as Gila monster, desert tortoise and bighorn sheep, and in areas vegetated with endangered and threatened plant species, fences and gates will be placed appropriately to inhibit unauthorized off-highway vehicle use of access roads. It is expected that no changes of long-term significance to the area's fauna will result from operation and maintenance activities.

5.5.1.1.4 Cultural and Paleontological Resources

Cultural and paleontological resources are likely to be impacted the greatest during the construction phase of the project. Access and spur roads will be closed as required after construction to minimize relic hunting.

APPLICANT'S PREOPERATIONAL
ENVIRONMENTAL PROGRAMS

the filters and I-131 activity on the charcoal will be determined weekly. The gamma spectrum will be determined once per quarter.

6.1.5.3.2 Direct Radiation

Ambient external radiation will be measured by thermoluminescent dosimeters (TLDs). Quarterly doses will be determined at each of the locations where air samples are to be taken. To estimate annual fading characteristics caused by climatic factors, a third dosimeter will be placed at locations 1 to 5 noted in table 6.1-4.

TLDs will also be placed:

- A. On the west site boundary, 1 mile west of Unit 1
- B. Near the northeast corner of the site boundary, 2 miles northeast of Unit 1
- C. On the east site boundary, 1.5 miles southeast of Unit 1

6.1.5.4 Waterborne Pathway

Preoperational monitoring of offsite surface waters is not planned.

6.1.5.4.1 Groundwater

Groundwater samples of the regional aquifer will be taken quarterly from the two onsite wells. Drinking water will be sampled from wells at Ward Road (Desert Farms Well No. 1), in Wintersburg (Winters Wells), and at Buckeye Road and 355th Avenue. These samples will be monthly composites of weekly grab samples. Gross beta and gamma spectrum analysis will be performed monthly; tritium will be determined in quarterly composites. Water from the community drinking water supply at Gila Bend will be taken for analysis as a control.

APPLICANT'S PREOPERATIONAL
ENVIRONMENTAL PROGRAMS6.1.5.5 Ingestion Pathway

6.1.5.5.1 Milk

The grass-cow-milk or grass-goat-milk pathways for radioiodine will be monitored. Milk is produced at one dairy in the region about 6 miles east of Unit 1 as noted in section 2.1.3.

While the dairy cattle are out on pasture or are being fed green chop, samples will be obtained at least twice per month. Otherwise, the samples will be obtained at least monthly. Gamma spectrum and I-131 analyses of each sample will be performed.

There are isolated head of cattle within 5 miles of the plant; however, it appears that most of the cattle are on stored feed and are not grazing on pasture.

At the time of implementation of the preoperational program, it will be determined, for analytical purposes, if any milk can be obtained from cows or goats within a 5-mile radius of the site. Potential milk locations will be surveyed annually during the growing season to determine whether any milk is being produced for human consumption.

6.1.5.5.2 Fish and Invertebrates

There are no fish or invertebrates to be sampled.

6.1.5.5.3 Food Products

If available, locally grown leafy vegetables will be sampled in Wintersburg north and northeast of the plant site. Gamma spectral analyses will be performed on the edible portion.

Control samples will be taken at suitable locations. An annual census will be conducted during the growing season to locate the nearest gardens larger than 500 square feet growing leafy vegetables in each of the 16 meteorological sectors, out to a distance of 5 miles from the plant.