Duquesne Light

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August 21, 1984

United States Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Mr. George W. Knighton, Chief
Licensing Branch 3
Office of Nuclear Reactor Regulation

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
Responses to ER Site Visit Action Items

Gentlemen:

Please find enclosed responses to Action Item Nos. 1, 2, 3, 4, 6, and 7 that were requested in the Environmental Site Visit Meeting Summary letter to Duquesne Light Company dated May 8, 1984. All responses to Action Items referenced in the above letter have now been submitted for staff review.

DUQUESNE LIGHT COMPANY

By E. J. Woolever
E. J. Woolever
Vice President

TJZ/wjs
Attachment

cc: Ms. M. Ley, Project Manager (w/a)
Mr. E. A. Licitra, Project Manager (w/a)
Mr. G. Walton, NRC Resident Inspector (w/a)

SUBSCRIBED AND SWORN TO BEFORE ME THIS 20th DAY OF August, 1984.

Anita Elaine Reiter
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

C001
1/1

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

On this 20th day of August, 1984, before me, a Notary Public in and for said Commonwealth and County, personally appeared E. J. Woolever, who being duly sworn, deposed and said that (1) he is Vice President of Duquesne Light, (2) he is duly authorized to execute and file the foregoing Submittal on behalf of said Company, and (3) the statements set forth in the Submittal are true and correct to the best of his knowledge.

Anita Elaine Reiter
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

1. Describe the structure and function of the chemical waste sump.

Response:

BVPS-1 and -2 demineralizer wastes, BVPS-1 auxiliary boiler blowdown, and cold lab sink drainage are batch-neutralized in the chemical waste sump prior to discharge to the BVPS-1 cooling tower blowdown. The demineralizer and the waste sump are located in the water treatment area of the BVPS-1 turbine building. This batch neutralization system consists of a chemical waste sump (a 15,000-gal sump constructed of concrete), two 20,000-gal steel tanks, a mixer located in the chemical waste sump, and acid and caustic feed valves. The wastes are sent to the steel storage tanks where coneutralization of the wastes results in a pH between 2 and 12. The contents of the storage tanks are then bled into the chemical waste sump where the wastes are mixed for further coneutralization and then either acid or caustic is added to adjust the pH to 6-9. The neutralized wastes are then discharged to the BVPS-1 cooling tower blowdown.

2. Justify the flow estimate given for Peggs Run. What other data on flow, water quality, and biota are available for the creek? What other effluents are discharged to Peggs Run, in addition to that from the BVPS-2 sewage treatment facility? The sewage effluent could constitute more than one percent of the creek's mean flow. Where appropriate, define the expected effluent water quality (BOD, DO, TSS, chlorine, etc.) and discuss the expected effects on Peggs Run.

Response:

There are no flow, water quality, or biota data available for Peggs Run. The flow estimate for Peggs Run is based on published annual average runoff figures for the area and comparison with a nearby gauged small watershed. The annual average runoff for Peggs Run is estimated to be 18 inches per year (Rouse 1950). Given a drainage area for Peggs Run of 3.74 mi^2 (rounded to 4.0 mi^2 in ER Section 2.4.3), the average flow is estimated to be 4.9 cfs. The Raccoon Creek watershed was also examined in order to obtain an average flow for Peggs Run. This watershed has been gauged at Moffatt Mill, Pennsylvania, for 34 years and has an average annual flow of 190 cfs corresponding to a watershed area of 178 mi^2. This equates to an average annual flow of 1.07 cfs per mi^2. Using this value for Peggs Run gives an average annual flow of 4.0 cfs.

In addition to sewage treatment plant effluent estimated at 22,325 gpd during normal plant operation, there are several other waste streams being discharged into Peggs Run. These include storm water runoff, BVPS-2 cooling tower pumphouse floor and equipment drains estimated to be a maximum of 72,000 gpd, and HVAC cooling tower blowdown from the Emergency Response Facility estimated to be less than 1000 gpd. During the summer, it is expected that the flow in Peggs Run will primarily consist of discharges from the cooling tower pumphouse and the sewage treatment plant.

Due to a lack of data on the aquatic biota of Peggs Run, the specific effects of water approaching the quality of sewage treatment plant effluent on aquatic biota cannot be qualified. The expected effluent quality from the sewage treatment plant is discussed in Sections 3.7 and 5.4. Sewage treatment plant effluent is discharged into Peggs Run as it flows through a 15-foot diameter culvert. The distance between the end of the culvert and Ohio River is less than 1000 feet. Approximately 400 feet of this is a sheet pile and concrete retention structure with a weir at the discharge. The distance between the Ohio River and the weir is approximately 200 feet. Generally, the low dissolved oxygen associated with sewage effluents can be expected to exclude permanent settlement of fish and benthos from the area downstream of the sewage treatment discharge. However, the culvert and steep-sloped concrete-and-sheet-pile-lined retention structures which make up a large portion of the stream below the sewage discharge are not preferred habitat for most fish and benthic species. While the water quality changes have potential to impact aquatic biota typical of small tributaries to the Ohio River, most of the lower portion of Peggs Run does not possess the physical habitat typical of such tributaries. The 200-foot backwater between the weir and the Ohio River, however, does possess the physical habitat typical of small tributaries to the Ohio River and is expected to be subjected to periodic low dissolved oxygen conditions due to sewage treatment plant effluent. The duration and intensity of these periodic conditions are related to a combination of Ohio River, Peggs Run, and sewage treatment plant effluent flows.

Reference:

Rouse, Hunter 1950. Engineering Hydraulics, Proceedings of the Fourth Hydraulic Conference, Iowa Institute of Hydraulic Research, June 12-15, 1949. John Wiley and Sons, New York, 1950.

3. Provide element-specific source terms for metals corroded from condenser tubes. Specify whether this information has been entered into the concentration estimates for discharges; if not, it should be. If the corroded chromium and nickel are assumed to all appear in 10,463 gpm blowdown, the resulting concentrations would each be about 0.01 gpm, or about 20 percent of the ambient criteria for nickel and hexavalent chromium given in Tables 5.1-4, 5.1-5, and 5.3-4.

Response:

Type 304 stairless steel consists primarily of iron (66 percent), chromium (18-20 percent) and nickel (8-11 percent). The loss of metal from Type 304 stainless steel is not a function of corrosion but of erosion. The surface of stainless steel is protected by metal oxide consisting of chromium and iron oxides.

The stainless steel metal oxide is formed primarily of Cr_2O_3. Iron in trace amounts is also present, but nickel is not normally found. The chromium is in trivalent form. The oxide layer is periodically removed due to erosion and is replaced with a new oxide layer due to the self-healing nature of this type of stainless steel (ASM 1976). ER Section 3.6.4, Corrosion Products, discusses the amount of metal that may be lost from the stainless steel condenser tubes. This section states that the corrosion rate will be less than 0.1 mil per year. The use of the 0.1 mil per year rate is a very conservative estimate, since the actual loss of metal for mild service conditions is not readily detectable. Actual erosion of the tubes will not be uniform but will be a localized phenomenon. Therefore, the estimate of 6 ft^3/yr metal loss is even more conservative, since it is based on a uniform erosion rate over the entire condenser tube surface.

Due to the inert nature of this oxide and the conservatism of the corrosion rate projection, the potential quantity of removed material is not included in the blowdown estimates listed in Table 5.3-4.

Reference:

American Society of Metals (ASM) 1976. Source Book of Stainless Steels, Section III, American Society of Metals, Metals Park, Ohio.

4. Not all chemicals shown on Table 3.6-3 are described in the text (e.g., Corrshield K-8, Potassium chromate); make sure that the use and location in the water use plan is described for each chemical in the table.

Response:

Sections 3.6.1, and 3.6.7, and Table 3.6-3 have been revised (Amendment 6) so that the uses for all chemicals listed in Table 3.6-3 are discussed in the text.

6. Provide a copy of the State endangered/threatened species list and relevant information on known/expected distributions of listed species.

Response:

The wildlife classification for the Commonwealth of Pennsylvania is shown in Table 1. This classification identifies the state-listed endangered and threatened species in Pennsylvania. The state-listed endangered or threatened species which are found or are expected to be found at the BVPS-2 site are included in ER Table 2.2-10, Amendment 3.

The Pennsylvania Game Commission maintains a wildlife data base to provide information on distribution and habitat preference for numerous fish and wildlife species. This includes information on the presence or absence of each species by county. Ten of the 13 state-listed endangered or threatened species are expected to be present in all counties of Pennsylvania. The other three species are expected to be present in some counties, and their occurrence in the remaining counties is unknown. Figures 1 through 4 display the distribution of all state-listed endangered or threatened species in the Commonwealth of Pennsylvania. None of the state-listed threatened/endangered species has been confirmed to be absent in any county.

Table 1

CHAPTER 147. WILDLIFE CLASSIFICATION

SUBCHAPTER A. BIRDS

§ 147.1. Classification of birds.

The following birds shall be classified as follows:

(1) Endangered.

(i) Bald Eagle (Haliaeetus leucocephalus)
(ii) King Rail (Rallus elegans)
(iii) Short-eared Owl (Asio flammeus)
(iv) Bewick's Wren (Thryomanes bewickii)

(2) Threatened.

(i) Least Bittern (Ixobrychus exilis)
(ii) American Bittern (Botaurus lentiginosus)
(iii) Upland Sandpiper (Bartramia longicauda)
(iv) Black Tern (Chlidonias niger)
(v) Sedge Wren (Cistothorus platensis)
(vi) Henslow's Sparrow (Ammodramus henslowii)

(3) Species of Concern.

(i) Great Blue Heron (Ardea herodias)
(ii) Cooper's Hawk (Accipiter cooperii)
(iii) Red-shouldered Hawk (Buteo lineatus)
(iv) Northern Harrier (Circus cyaneus)
(v) Bobwhite (Colinus virginianus)
(vi) Barn Owl (Tyto alba)
(vii) Red-headed Woodpecker (Melanerpes erythrocephalus)
(viii) Purple Martin (Progne subis)
(ix) Marsh Wren (Telmatodytes palustris)
(x) Eastern Bluebird (Sialia sialis)
(xi) Grasshopper Sparrow (Ammodramus savannarum)

Table 1 (cont'd)

(xii) Vesper Sparrow (Pooecetes gramineus)

(4) Status undetermined.

(i) Northern Goshawk (Accipiter gentilis)
(ii) Sharp-shinned Hawk (Accipiter striatus)
(iii) Long-eared Owl (Asio otus)
(iv) Whip-poor-will (Caprimulgus vociferus)
(v) Yellow-bellied Sapsucker (Sphyrapicus varius)
(vi) Least Flycatcher (Empidonax minimus)
(vii) Bobolink (Dolichonyx oryzivorus)

(5) Extirpated.

(i) Osprey (Pandion haliaetus)
(ii) Peregrine Falcon (Falco peregrinus)
(iii) Greater Prairie Chicken (Tympanuchus cupido)
(iv) Piping Plover (Charadrius melodus)
(v) Common Tern (Sterna hirundo)
(vi) Loggerhead Shrike (Lanius ludovicianus)
(vii) Dickcissel (Spiza americana)
(viii) Bachman's Sparrow (Aimophila aestivalis)
(ix) Lark Sparrow (Chondestes grammacus)

(6) Extinct.

(i) Passenger Pigeon (Ectopistes migratorius)

Table 1 (cont'd)

SUBCHAPTER B. MAMMALS.

§ 147.21. Classification of mammals.

The following mammals shall be classified as follows:

(1) Endangered.

(i) Indiana Bat (Myotis sodalis)

(2) Threatened.

(i) Small-footed Myotis (Myotis leibii)
(ii) Eastern Woodrat (Neotoma floridana)

(3) Species of Concern.

(i) Keen's Little Brown Bat (Myotis keenii)
(ii) Snowshoe Hare (Lepus americanus)
(iii) Rock Vole (Microtus chrotorrhinus)
(iv) Spotted Skunk (Spilogale putorius)
(v) River Otter (Lutra canadensis)
(vi) Bobcat (Lynx rufus)

(4) Status undetermined.

(i) Maryland Shrew (Sorex fontinalis)
(ii) Water Shrew (Sorex palustris punctulatus)
(iii) Water Shrew (Sorex palustris albibarbis)
(iv) Pigmy Shrew (Microsorex hoyi)
(v) Least Shrew (Cryptotis parva)
(vi) Seminole Bat (Lasiurus seminolus)
(vii) Silver-haired Bat (Lasionycteris noctivagans)
(viii) Evening Bat (Nycticeius humeralis)
(ix) New England Cottontail (Sylvilagus transitionalis)
(x) Eastern Fox Squirrel (Sciurus niger vulpinus)

Table 1 (cont'd)

(xi) Rice Rat (Oryzomys palustris)
(xii) Red-backed Vole (Clethrionomys gapperi rupicola)
(xiii) Red-backed Vole (Clethrionomys gapperi paludicola)
(xiv) Coyote (Canis latrans)
(xv) Badger (Taxidea taxus)
(xvi) Least Weasel (Mustela nivalis)
(xvii) Marten (Martes americana)
(xviii) Fischer (Martes pennanti)
(xix) Eastern Mountain Lion (Felis concolor cougar)
(xx) Lynx (Lynx canadensis)

(5) Extirpated.

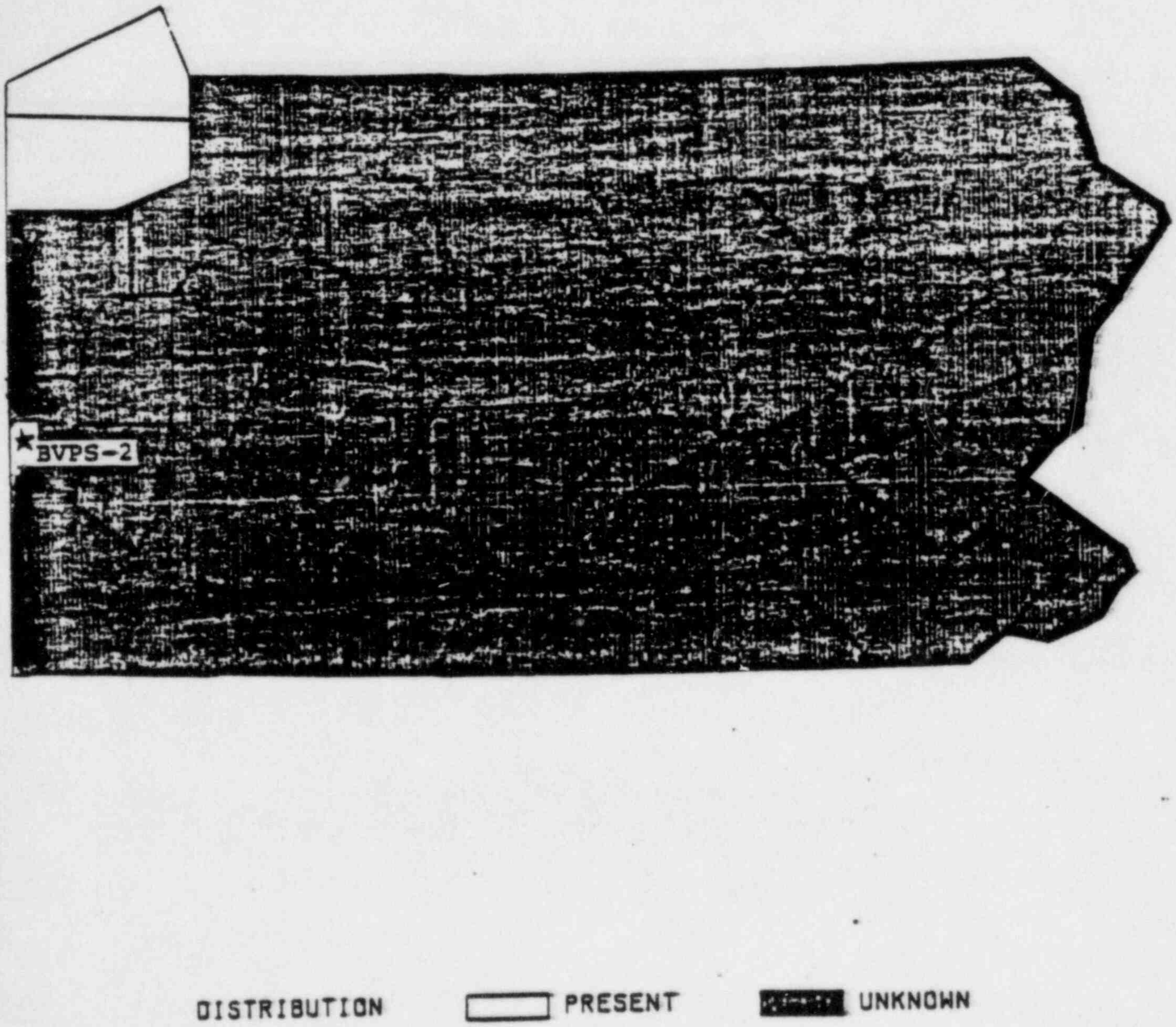
(i) Eastern Gray Wolf (Canis lupus lycaon)
(ii) Wolverine (Gulo gulo)
(iii) Wapiti (Cervus elaphus canadensis)
(iv) Moose (Alces alces)
(v) Bison (Bison bison bison)

Source

Pa. B. Doc. No. 83-365. Filed March 11, 1983, 9:00 a.m.

Figure 1

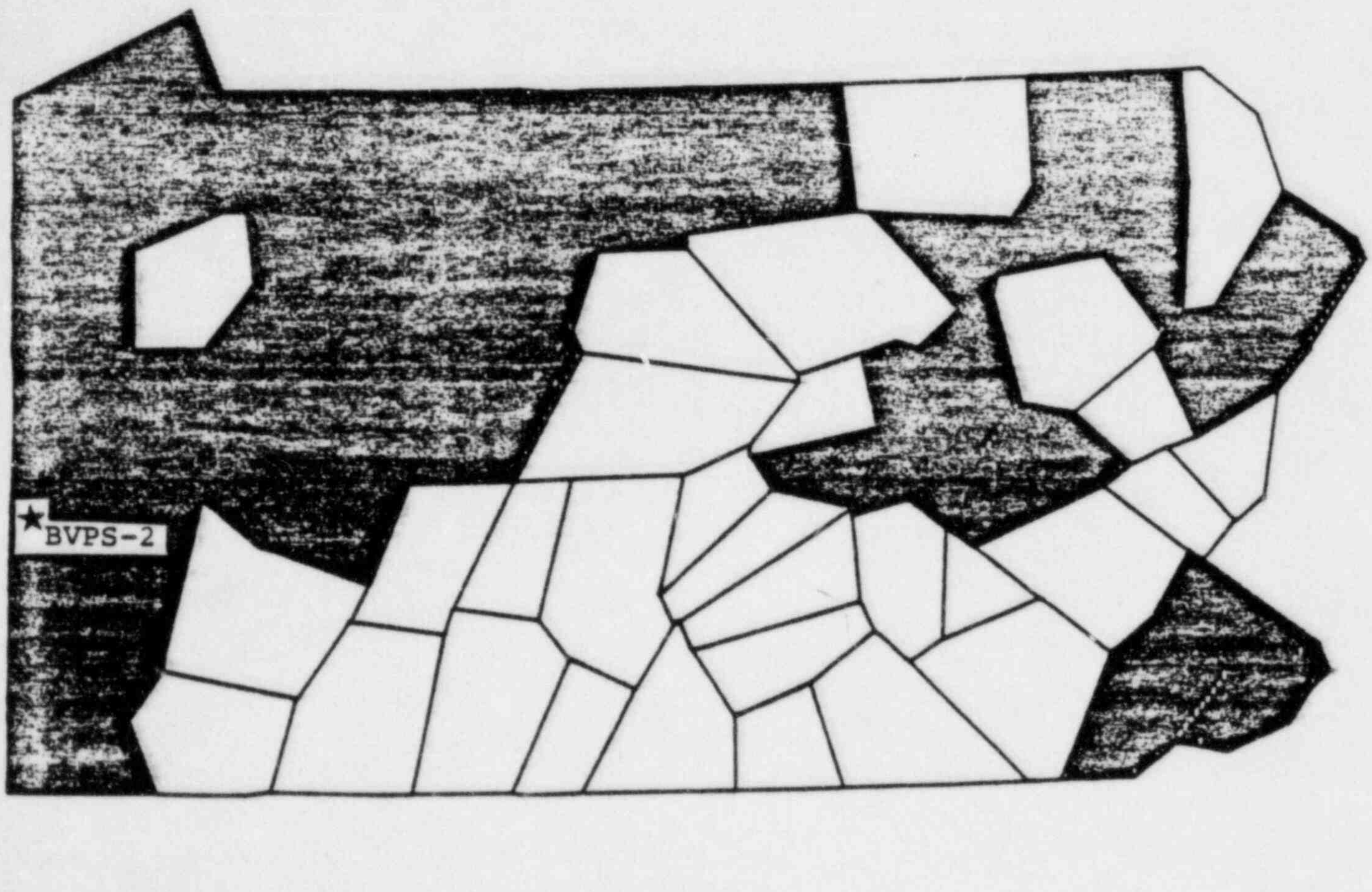
DISTRIBUTION OF BALD EAGLE



FROM PENN. FISH AND WILDLIFE DATA BASE

Figure 2

DISTRIBUTION OF EASTERN WOOD RAT

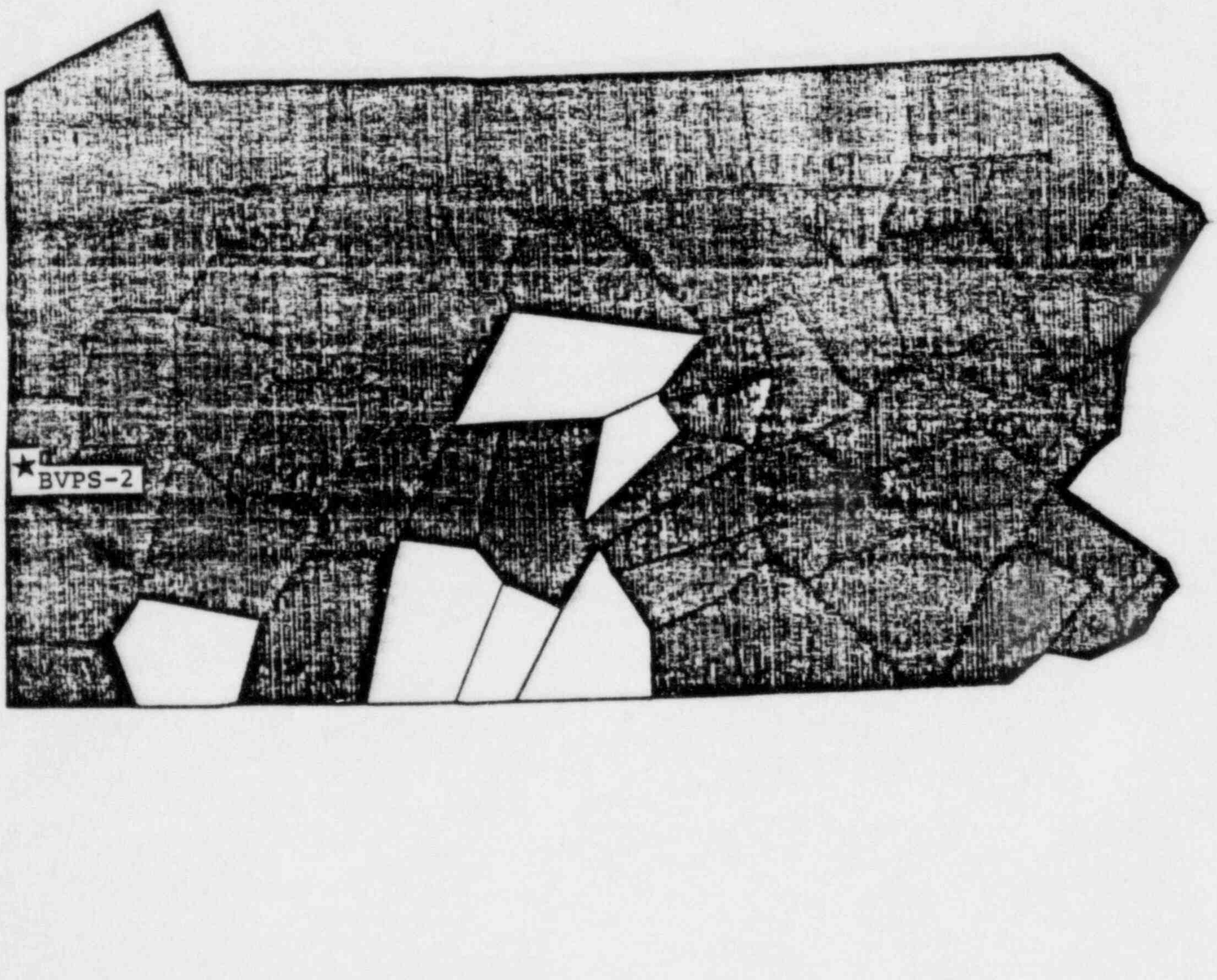


DISTRIBUTION PRESENT UNKNOWN

FROM PENN. FISH AND WILDLIFE DATA BASE

Figure 3

DISTRIBUTION OF INDIANA MYOTIS

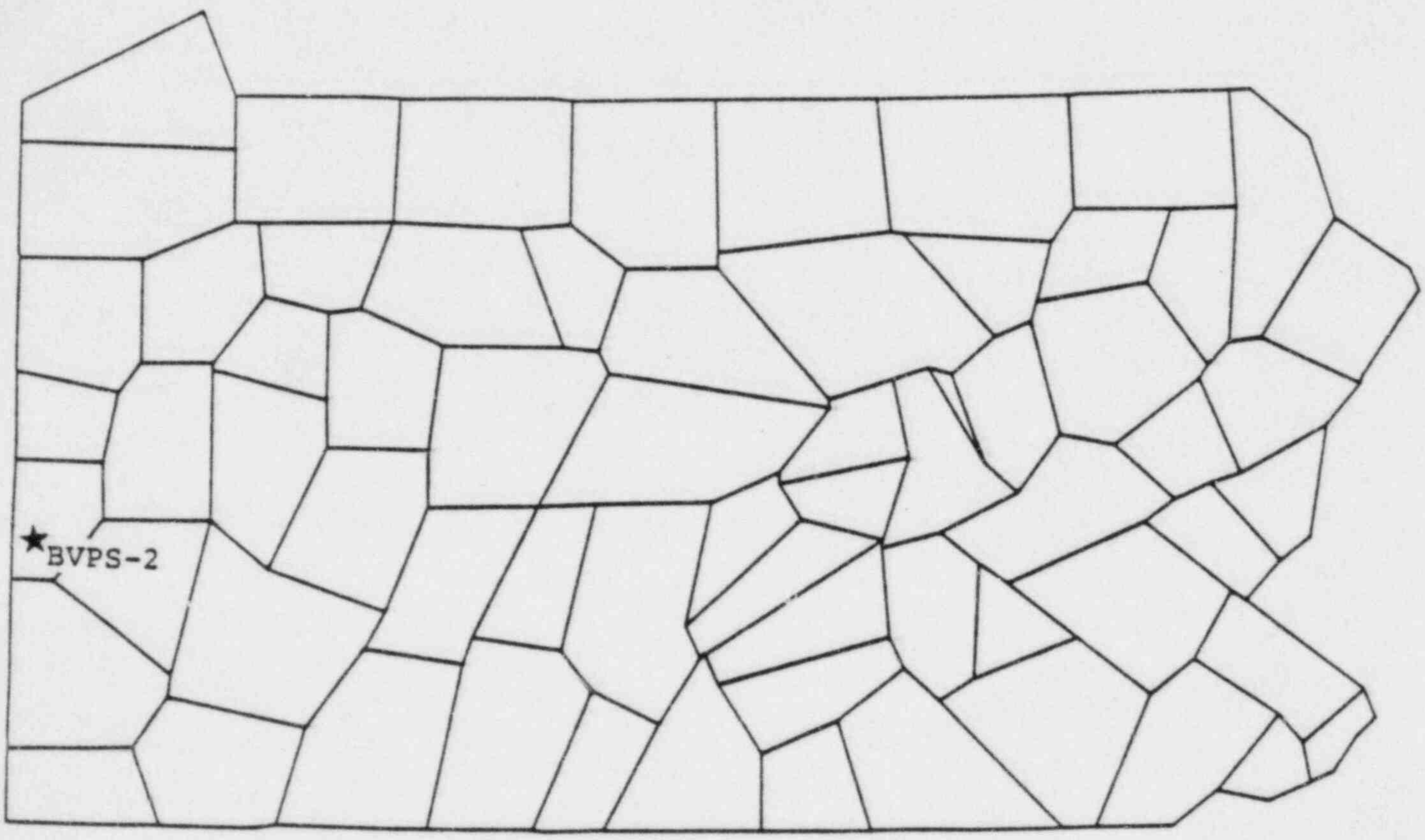


FROM PENN. FISH AND WILDLIFE DATA BASE

Figure 4

DISTRIBUTION OF

SHORT-EARED OWL, SMALL-FOOTED MYOTIS, HENSLOW'S SPARROW, AMERICAN BITTERN, LEAST BITTERN, KING RAIL, BEWICK'S WREN, SEDGE WREN, UPLAND SANDPIPER, BLACK TERN



DISTRIBUTION ▭ PRESENT

FROM PENN. FISH AND WILDLIFE DATA BASE

7. Indicate which model was used to estimate the chemical dilution in plant non-radiological liquid discharges, radiological discharge model, or thermal discharge model. Include a justification of the values found in Table 5.3-4A of the ER.

Response:

As recommended for initial dilution in Regulatory Guide 1.113, the surface discharge model by Shirazi and Davis was used to estimate chemical dilution factors. The results were interpolated from the Workbook of Thermal Prediction, Vol. 2, Surface Discharge, by M. A. Shirazi and L. R. Davis, Pacific Northwest Environmental Research Laboratory, Corvallis, Oregon, May 1974, PB-235 841. Typical of near-field predictions, decay is negligible; the model is equally applicable to radiological, chemical, or thermal discharges.

To determine the mixing zones for the four constituents listed in Table 5.3-4a, the dilution requirements for each of the constituents were first calculated. As an example, the maximum concentration of nitrite in the cooling tower blowdown is 1.59 ppm, while the stream standard is 1.0 ppm, and the maximum Ohio River concentration recorded at the site is 0.66 ppm. The amount of Ohio River water required to dilute the cooling tower blowdown to the 1.0 ppm stream standard $= (1.59-1)/(1-0.66) \cong 2$ (that is, two volumes of Ohio River water to one volume of cooling tower blowdown). This required dilution was then used to determine the values listed in Table 5.3-4a using graphs developed from the Shirazi and Davis surface discharge model.