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Docket No. 50-298

Nebraska Public Power District
ATTN: Mr. J. M. Pilant, Manager
Licensing and Quality Assurance
P. O. Box 499
Columbus, Nebraska 68601

Gentlemen:

Your letter dated May 16, 1974 submitted proposed changes to operating license DPR-46, Appendix B Environmental Technical Specifications. The proposed changes were requested to more accurately define the environmental sampling locations and to indicate required changes in sample types at specific locations or the substitution of sample stations for those currently identified in the Environmental Technical Specifications necessitated by factors beyond the control of the Nebraska Public Power District.

We have completed our review of the proposed changes and have designated our action as Amendment No. 3, Change No. 6 to Appendix B of Operating License No. DPR-46. We have also included in our action a revised Table of Contents, List of Tables, and changes in the wording of Environmental Technical Specifications 3.1.1 Maximum AT Across Condenser, 3.3 Chemical: Specification (General), 4.1.1.1.A Water Quality Studies, and 5.4.1 Routine Reports to clarify possible ambiguities in their intent.

The staff has evaluated the potential for environmental impact associated with the proposed amendment. Since the amendment consists of a restructured format for the Radiological Surveillance Program, the substitution of sampling stations similar to those no longer available to the applicant, and minor changes in wording to clarify possible ambiguities, we have determined that there will be no change in effluent types or amounts, no increase in authorized power level and no environmental impact attributable to the proposed action. Having made this determination, the Commission has further concluded pursuant to 10 CFR §51.5(d) that no environmental impact statement, negative declaration, or environmental impact appraisal need be prepared in connection with the proposed action.

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Nebraska Public Power District 2

The proposed amendment does not involve significant new safety information of a type not considered by any previous Commission safety review of the facility. It does not involve a significant increase in the probability or consequences of an accident, does not involve a significant decrease in a safety margin, and therefore does not involve a significant hazards consideration. The Commission has also concluded that there is reasonable assurance that the health and safety of the public will not be endangered by the proposed action.

Accordingly, Amendment No. 3 to Facility Operating License No. DPR-46 is enclosed revising the Appendix B, Environmental Technical Specifications thereto to authorize the requested changes. A copy of a notice which is being forwarded to the Office of the Federal Register for publication relating to this action is also enclosed for your information.

Sincerely,

/s/

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Enclosures:

1. Amendment No. 3 to License No. DPR-46
2. Federal Register Notice

cc w/encls.: (see attached page)

SEE ATTACHED YELLOW FOR PREVIOUS CONCURRENCES.

OFFICE	L:EP-4	L:EP-4	L:EP-4	OGC	L:OR
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DATE	9/09/74	9/6/74	9/09/74	9/13/74	9/23/74

Docket No. 50-298

Nebraska Public Power District
ATTN: Mr. J. M. Pilant, Manager
Licensing and Quality Assurance
P. O. Box 499
Columbus, Nebraska 68601

Gentlemen:

Your letter dated May 16, 1974 submitted proposed changes to operating license DPR-46, Appendix B Environmental Technical Specifications. The proposed changes were requested to more accurately define the environmental sampling locations and to indicate required changes in sample types at specific locations or the substitution of sample stations for those currently identified in the Environmental Technical Specifications necessitated by factors beyond the control of the Nebraska Public Power District.

We have completed our review of the proposed changes and have designated our action as Amendment No. 3, Change No. 6 to Appendix B of Operating License No. DPR-46. We have also included in our action a revised Table of Contents, List of Tables, and changes in the wording of Environmental Technical Specifications 3.1.1 Maximum AT Across Condenser, 3.3 Chemical: Specification (General), 4.1.1.1.A Water Quality Studies, and 5.4.1 Routine Reports to clarify possible ambiguities in their intent.

We have concluded that the proposed amendment does not involve significant new safety information of a type not considered by any previous Commission safety review of the facility; potentially involve a significant increase in the probability or consequence of an accident considered in a previous Commission safety review of the facility; or involve a potentially significant decrease in the margin of safety during normal plant operations, anticipated operational occurrence or postulated accidents considered in any previous Commission safety review of the facility and therefore does not involve a significant hazard consideration. We have also concluded that there is reasonable assurance that the health and safety of the public will not be endangered by the proposed action.

The staff has evaluated the potential for environmental impact associated with the proposed amendment. Since the amendment essentially consists of a restructured format for the Radiological Surveillance Program

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DATE ➤						

and the substitution of sampling stations similar to those no longer available to the applicant, we have concluded that there will be no environmental impact attributable to the proposed action other than has already been predicted and described in the Commission's FES for the Cooper Nuclear Station. Having made this conclusion, the Commission has further concluded that no environmental impact statement for the proposed action need be prepared, and that a negative declaration to this effect is appropriate.

Accordingly, Amendment No. 3 to Facility Operating License No. DPR-46 is enclosed revising the Appendix B, Environmental Technical Specifications thereto to authorize the requested changes. A copy of a notice which is being forwarded to the office of the Federal Register for publication relating to this action also is enclosed for your information.

Sincerely,

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Enclosures:

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cc w/encls: (see attached page)

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Attorney, OGC	
B. Jones, DRA (4)	
B. Scharf, DRA (15)	
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W. Regan/R. Loose, EP-4	

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Mr. William Siebert, Commissioner
Nemaha County Board of Commissioners
Nebraska County Courtroom
Auburn, Nebraska 68305

Auburn Public Library
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Auburn, Nebraska 68305

cc w/enclosures & cy NPPD

ltr dtd 5/16/74:

Mr. James L. Higgins, Director
Department of Environmental Control
Executive Building, 2nd Floor
Lincoln, Nebraska 68509

Mr. Ed Vest
Environmental Protection Agency
1735 Baltimore Avenue
Kansas City, Missouri 64108

OFFICE ➤						
SURNAME ➤						
DATE ➤						

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 3
License No. DPR-46

1. The Atomic Energy Commission (the Commission) having found that:
 - A. The application for amendment by Nebraska Public Power District (the licensee) dated May 16, 1974, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. Prior public notice of this amendment is not required since the amendment does not involve a significant hazards consideration.

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SURNAME →						
DATE →						

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C. (2) of Facility License No. DPR-46 is hereby amended to read as follows:

"(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 6."

3. This license amendment is effective as of the date of its issuance.

FOR THE ATOMIC ENERGY COMMISSION

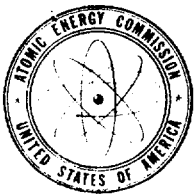
151

Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Attachment:
Change No. 6 - Appendix B
Environmental Technical
Specifications

Date of Issuance: SEP 30 1974

OFFICE ▶						
SURNAME ▶						
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UNITED STATES
ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

SEP 30 1974

Docket No. 50-298

Nebraska Public Power District
ATTN: Mr. J. M. Pilant, Manager
Licensing and Quality Assurance
P. O. Box 499
Columbus, Nebraska 68601

Gentlemen:

Your letter dated May 16, 1974 submitted proposed changes to operating license DPR-46, Appendix B Environmental Technical Specifications. The proposed changes were requested to more accurately define the environmental sampling locations and to indicate required changes in sample types at specific locations or the substitution of sample stations for those currently identified in the Environmental Technical Specifications necessitated by factors beyond the control of the Nebraska Public Power District.

We have completed our review of the proposed changes and have designated our action as Amendment No. 3, Change No. 6 to Appendix B of Operating License No. DPR-46. We have also included in our action a revised Table of Contents, List of Tables, and changes in the wording of Environmental Technical Specifications 3.1.1 Maximum ΔT Across Condenser, 3.3 Chemical: Specification (General), 4.1.1.1.A Water Quality Studies, and 5.4.1 Routine Reports to clarify possible ambiguities in their intent.

The staff has evaluated the potential for environmental impact associated with the proposed amendment. Since the amendment consists of a restructured format for the Radiological Surveillance Program, the substitution of sampling stations similar to those no longer available to the applicant, and minor changes in wording to clarify possible ambiguities, we have determined that there will be no change in effluent types or amounts, no increase in authorized power level and no environmental impact attributable to the proposed action. Having made this determination, the Commission has further concluded pursuant to 10 CFR §51.5(d) that no environmental impact statement, negative declaration, or environmental impact appraisal need be prepared in connection with the proposed action.

OCT 30 1974

The proposed amendment does not involve significant new safety information of a type not considered by any previous Commission safety review of the facility. It does not involve a significant increase in the probability or consequences of an accident, does not involve a significant decrease in a safety margin, and therefore does not involve a significant hazards consideration. The Commission has also concluded that there is reasonable assurance that the health and safety of the public will not be endangered by the proposed action.

Accordingly, Amendment No. 3 to Facility Operating License No. DPR-46 is enclosed revising the Appendix B, Environmental Technical Specifications thereto to authorize the requested changes. A copy of a notice which is being forwarded to the Office of the Federal Register for publication relating to this action is also enclosed for your information.

Sincerely,



Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Enclosures:

1. Amendment No. 3 to License No. DPR-46
2. Federal Register Notice

cc w/encls.: (see attached page)

cc w/enclosures:

Mr. Gene Watson, Attorney
Wilson, Barlow & Watson
Post Office Box 81686
Lincoln, Nebraska 68501

Mr. Arthur C. Gehr, Attorney
Snell & Wilmer
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Phoenix, Arizona 85004

Mr. Anthony Z. Roisman, Esquire
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Mr. William Siebert, Commissioner
Nemaha County Board of Commissioners
Nebraska County Courtroom
Auburn, Nebraska 68305

Auburn Public Library
1118 - 15th Street
Auburn, Nebraska 68305

cc w/enclosures & cy NPPD

ltr dtd 5/16/74:

Mr. James L. Higgins, Director
Department of Environmental Control
Executive Building, 2nd Floor
Lincoln, Nebraska 68509

Mr. Ed Vest
Environmental Protection Agency
1735 Baltimore Avenue
Kansas City, Missouri 64108

UNITED STATES ATOMIC ENERGY COMMISSION

DOCKET NO. 50-298

NEBRASKA PUBLIC POWER DISTRICT

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE

Notice is hereby given that the U. S. Atomic Energy Commission (the Commission) has issued Amendment No. 3 to Facility Operating License No. DPR-46 issued to Nebraska Public Power District which revised Appendix B, Environmental Technical Specifications for operation of the Cooper Nuclear Station, located in Nemaha County, Nebraska. The amendment is effective as of its date of issuance.

The amendment permits modification to the Environmental Technical Specification, Radiological Surveillance Program, by restructuring the format to more accurately define the environmental sampling locations, and to indicate required changes in sample types at specific locations or the substitution of sample stations for those currently identified in the Environmental Technical Specifications necessitated by factors beyond the control of the Nebraska Public Power District.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment.

For further details with respect to this action, see (1) the application for amendment dated May 16, 1974, (2) Amendment No. 3 to License No. DPR-46 with any attachments, and (3) the letter to Nebraska Public Power District transmitting Amendment No. 3 and containing details relating to the Regulatory staff's review of the application, dated September 30, 1974. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Auburn Public Library, 1118-15th Street, Auburn, Nebraska 68305.

A copy of items (2) and (3) may be obtained upon request addressed to the U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Deputy Director for Reactor Projects, Directorate of Licensing - Regulation.

Dated at Bethesda, Maryland, this 30th day of September 1974.

FOR THE ATOMIC ENERGY COMMISSION

Dennis L. Ziemann
Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Directorate of Licensing



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 3
License No. DPR-46

1. The Atomic Energy Commission (the Commission) having found that:
 - A. The application for amendment by Nebraska Public Power District (the licensee) dated May 16, 1974, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. Prior public notice of this amendment is not required since the amendment does not involve a significant hazards consideration.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C. (2) of Facility License No. DPR-46 is hereby amended to read as follows:

"(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 6."

3. This license amendment is effective as of the date of its issuance.

FOR THE ATOMIC ENERGY COMMISSION



Karl R. Goller, Assistant Director
for Operating Reactors
Directorate of Licensing

Attachment:

Change No. 6 - Appendix B
Environmental Technical
Specifications

Date of Issuance: SEP 30 1974

ATTACHMENT TO LICENSE AMENDMENT NO. 3

CHANGE NO. 6 TO THE TECHNICAL SPECIFICATIONS

FACILITY OPERATING LICENSE NO. DPR-46

Replace pages ii and iii of the Table of Contents, page iv of the List of Tables, pages 3, 9, 33, 46 thru 76, 79 and 81 of Appendix B - Environmental Technical Specifications with the attached revised pages. Changed areas are reflected by marginal lines on each page.

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Change No.
Date: SEP 30 1974

ENVIRONMENTAL TECHNICAL SPECIFICATIONSLIST OF TABLES

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Change No. 06Date: 10/10/88

2.0 ENVIRONMENTAL PROTECTION CONDITION

Specification (Cont'd)

- C. The maximum temperature across the condensers shall not exceed 30°F whenever a portion of the condenser discharge is recirculated to the inlet for ice control. Recirculation and backwashing will not be done concurrently.

Bases

Backwashing the main condenser is a necessity on a silt-laden river. Past experience at other generating stations on the Missouri River indicates that the condenser will require backwashing once per day. This process should take no longer than 1 hour.

Each of the four circulating water pumps should require maintenance every four years. However, with silt/sand-laden river conditions it could occur as often as once per year. Maintenance for one pump takes one week, thus three pump operation may be necessary for four weeks out of the year.

Surface and frazil ice are melted by recirculating a portion of the warm condenser discharge water back to the intake structure. This should occur intermittently from November through April, with primary use in December and January.

3.0 MONITORING REQUIREMENT

Specification (Cont'd)

RTD will be used to determine the ΔT which will be recorded hourly.

As an alternate, the temperature shall be obtained from the mid-depth continuous temperature recorder in the discharge canal as specified in 3.1.2.

Bases

Temperature monitoring sensors at the inlet to and outlet from the condensers will provide the ΔT across the condensers.

Change No. 3
Date: SEP 30 1974

2.0 ENVIRONMENTAL PROTECTION CONDITION

2.3 Chemical

Objective:

To insure that all chemical releases from the plant are controlled and diluted so as to not adversely affect public health, the natural aquatic environment, or the desirability of the water for domestic water supply usage.

Specification (General)

All plant chemical discharges except the heating boilers blowdown and the building heating/ventilation air washers and cooling tower blowdown shall be diluted by the plant cooling water effluent during release to assure that deleterious material concentrations shall be less than those which may affect public health, the natural aquatic environment, or the desirability of the water for domestic water supply usage. Heating boiler blowdown and the building heating/ventilation air washers and cooling tower blowdown may be discharged directly to the Missouri River.

Bases

Requiring that plant chemical discharges of significant quantity or concentration be diluted by the plant cooling water system will assure that concentrations of chemical

3.0 MONITORING REQUIREMENT

3.3 Chemical

Objective:

To insure that all chemical releases from the plant are identified by species and quantity and are monitored and maintained within the technical specifications.

Specification (General)

A physical inventory of all identifiable chemicals, excluding spent laboratory reagents, discharged directly to the river, the settling basin, or discharge canal shall be maintained and submitted as part of the semi-annual report. In addition, monitoring of water in the discharge canal will be done by monthly sampling and analysis in accordance with Section 4.1.1.1.A for copper, iron, potassium, sodium, chlorine, and pH, settleable solids in accordance with Section 3.3.4.a, and dissolved solids in accordance with Section 3.3.4.b.

Bases

The physical inventory of all identifiable chemicals, excluding spent laboratory reagents, discharged directly to the river, the settling basin, or the discharge canal

Change No. 11
Date: SEP 20 1961

Specification

A. Water Quality Studies

Duplicate water quality samples for laboratory analyses (Table 3) will be collected monthly (May-November) from four locations: RM 534, in the immediate area of the intake, in the discharge canal and at RM 528. Sampling will be restricted to the intake and discharge locations during the remainder of the year. Physical measurements (Table 4) and field analyses including dissolved oxygen, pH, total alkalinity, and turbidity will be performed at seven locations: RM 534, intake, discharge, RM 532, RM 530, RM 528 and RM 526. Field chemistry and nutrient analyses (Table 5) will also be performed at the appropriate locations as part of the biological sampling program.

Instrumentation and analytical methods shall be equivalent to instrumentation and methods for physical measurements as listed in Table 4 and analytical methods, reference, preservation techniques and detection limits as presented in Table 6.

B. Biological Studies

1. Phytoplankton

Duplicate samples for phytoplankton analyses will be collected monthly (May-November) near the surface with a Kemmerer sampler at RM 534, 532, 530, 528, and 526. Analyses will consist of cell counts to determine abundance and diversity of species.

2. Zooplankton

Duplicate samples for zooplankton analyses will be collected monthly (May-November) with a Miller plankton sampler equipped with a #10 (153 μ mesh) plankton net at RM 534, 532, 530, 528, and 526. Analyses will be made to determine abundance and seasonal occurrence of zooplankton species.

3. Periphyton

Floating artificial substrates for periphyton (attached algae) will be anchored at suitable locations near RM 534, 532, 530, 528, and 526 to permit colonization of attached algae. A Ryan temperature recorder will be fastened near each substrate to provide a continuous record of water temperature. Monthly

Change No. 16

Date: SEP 30 1974

along preselected transects. A thermistor accurate to 0.1°C will be used to obtain the temperature at the surface and at one meter intervals to the bottom. Measurement locations will be determined by two shore based transects using triangulation. The monitoring program shall incorporate consistent timing and sampling station relocation so as to reduce the stochastic variability of observations. The detailed monitoring program shall be submitted for staff review and approval prior to full power or commercial operation of the station.

Associated physical studies will be conducted in conjunction with the temperature measurements. These include a determination of the amount of heat discharged and the plume densometric Froude Number. Velocity measurements will be obtained with a combination of drogues and deck readout flowmeters. Time-temperature relationships will be determined by use of recording thermistors mounted on drogues. Measurements of pertinent meteorological parameters will be made as wind velocity, air temperature, relative humidity and sky cover. The jet and far field velocity structure of the plume will be determined (i.e., indirect velocity by induced momentum of the plume). The plume temperature and velocity data will be used to determine the time-temperature relationship for organisms entrained into the thermal plume.

Bases

The 5°F ΔT and 10°F ΔT isotherms will be mapped to determine the area of the mixing zone. Mixing zone isotherms will be correlated with station discharge temperature and other variables. Appropriate correlations models will be developed to allow calculation of plume isotherms based upon discharge temperatures. A downstream monitor will be used until the correlations method indicated above has been verified to be valid.

4.3.2 Terrestrial

Not applicable.

4.3.3 Aerial

Not applicable.

Change No. 1
Date: SEP 8 0 1974

along preselected transects. A thermistor accurate to 0.1°C will be used to obtain the temperature at the surface and at one meter intervals to the bottom. Measurement locations will be determined by two shore based transects using triangulation. The monitoring program shall incorporate consistent timing and sampling station relocation so as to reduce the stochastic variability of observations. The detailed monitoring program shall be submitted for staff review and approval prior to full power or commercial operation of the station.

Associated physical studies will be conducted in conjunction with the temperature measurements. These include a determination of the amount of heat discharged and the plume densometric Froude Number. Velocity measurements will be obtained with a combination of drogues and deck readout flowmeters. Time-temperature relationships will be determined by use of recording thermistors mounted on drogues. Measurements of pertinent meteorological parameters will be made as wind velocity, air temperature, relative humidity and sky cover. The jet and far field velocity structure of the plume will be determined (i.e., indirect velocity by induced momentum of the plume). The plume temperature and velocity data will be used to determine the time-temperature relationship for organisms entrained into the thermal plume.

Bases

The 5°F ΔT and 10°F ΔT isotherms will be mapped to determine the area of the mixing zone. Mixing zone isotherms will be correlated with station discharge temperature and other variables. Appropriate correlations models will be developed to allow calculation of plume isotherms based upon discharge temperatures. A downstream monitor will be used until the correlations method indicated above has been verified to be valid.

4.3.2 Terrestrial

Not applicable.

4.3.3 Aerial

Not applicable.

Change No. _____

Date: SEP 20 1974

4.4 RADIOLOGICAL

Objective

To provide the necessary information for evaluation of radiological effects on the environment.

Specification

An environmental radiological monitoring program will be carried out as defined in Tables 7, 8, and 9.

4.4.1 Initial External Radiation Background Measurements (Sample Type No. 1)

Initial measurements of external beta-gamma radiation backgrounds were made in December of 1970. Nuclear-Chicago, Model 2612, Geiger-Mueller survey instruments were used. Each measurement consisted of the average of at least 3, one minute readings taken with the instrument probe positioned 30 inches above the ground with the beta window open and directed downward. The readings have been recorded and are maintained by the District at CNS.

4.4.2 Background Radiation (Sample Type No. 2 and 3)

Ambient levels of external radiation are measured at selected locations within an approximate 10-mile radius of the plant by exposing thermoluminescent dosimeters (TLD) for various periods of time. Selection of locations and periods of exposure are based on prevailing winds and anticipated radiation levels to provide suitable measurements for evaluation of probable radiation doses to the environs surrounding the plant location.

4.4.3 Reference Soil (Sample Type No. 4)

Initially soil samples were collected in April of 1971 at the designated Reference Soil Locations. These samples were dried and sealed in polyethylene containers and are being stored for future reference.

4.4.4 Soil (Sample Type No. 5)

Soil samples consist of approximately 2 kg. of soil obtained by inserting a tubular sample template into the earth to a depth of approximately 6 inches and removing the enclosed soil to a suitable container.

4.4.5 Vegetation - Natural (Sample Type No. 6)

Natural vegetation samples consist of approximately 2 kg. of the leafy portions of the natural vegetation available at each of the designated sampling stations.

4.4.6 Vegetation - Food and Feed Crops (Sample Type No. 7)

Food and feed crop samples consist of approximately 2 kg. of the consumable portions of the food or feed crop being grown at the designated sample location.

4.4.7 Vegetation-Garden Crops (Sample Type No. 8)

Garden crop samples consist of approximately 2 kg. of the edible portions of garden vegetables (usually tomatoes, sweet corn, and cabbage, when available) taken from family gardens at the designated sample stations within a 5 mile radius of the plant.

4.4.8 Vegetation - Feed and Forage - Beef Producers and Nearest Milk Producers (Sample Type No. 9 and 10)

Approximately 2 kg. of forage will be sampled during the pasture season where milk and/or beef cattle are raised at the designated sample stations within an approximate 5-mile radius of the plant. These forage samples will be taken at the accelerated frequency rate as shown in Table 7. When the beef and milk cattle are not on pasture, sampling will consist of approximately 2 kg. of feed, sampled at the less frequent sampling frequency as shown in Table 7.

When coupled with the use of transfer coefficients and intake figures, a reliable monitoring program for Cs-137 uptake in beef cattle is obtained.

The average daily cattle intake of Cs-137 will be estimated from the forage sampling data as follows:

$$\left[\begin{array}{c} \text{Average Cs-137 concentration} \\ \text{in forage-dry matter} \end{array} \right] \frac{\text{pCi}}{\text{kg}} \times \left[\frac{0.03 \text{ kg dry matter intake}}{\text{kg animal body wt.}} \right]$$

$$\times 500 \text{ kg body wt.} = \left[\text{mean daily cattle intake of Cs-137} \right] \frac{\text{pCi}}{\text{day}}$$

The average beef concentrations may be estimated for the steady state (equilibrium) condition using the feed to meat transfer coefficient (T.C.) proposed by Johnson, Tyler and Ward (J. An. Sci 29, 695, 1969) for pasture conditions.

$$\text{T.C.} = \frac{\text{pCi/kg meat (wet basis)}}{\text{pCi/day intake}} = 0.02$$

Therefore the average beef concentration of Cs-137 in pCi/kg =

$$\text{T.C.} \left[\text{pCi/day intake} \right] \quad (\text{wet basis})$$

In the event the average beef concentration of Cs-137, as determined above, exceeds 500 pCi/kg (which is approximately twice the concentration present in beef due to Cs-137 fallout) beef cattle will be sampled directly.

4.4.9 Vegetation - Feed and Forage - Other Milk Producers (Sample Type No. 11)

These feed and forage samples will consist of approximately 2 kg. of the feed or forage that the milk cows have been consuming just prior to producing the milk sample.

4.4.10 Apples (Sample Type No. 12)

Since apples are grown for commercial market in the area of the plant at nearby locations, the fruit from these orchards are sampled. These samples will be of approximately 2 kg. each.

4.4.11 Airborne - Particulates and Halides (Sample Type No. 13 and 14)

Continuous air sampling is performed at selected locations within an approximate 10-mile radius of the plant. Locations have been selected on the basis of prevailing winds and existing populated areas for evaluation of probable exposure to airborne particulate and halide radioactivity of the environs surrounding the plant location. The collection devices for iodine will contain potassium iodide impregnated charcoal or equivalent, and be constructed and operated so as to retain quantitatively the iodine in the air passing through the device. Sensitivities will be such that an iodine concentration of 2.0×10^{-14} $\mu\text{Ci/cc}$ may be measured. Appropriate analyses of particulate filters and halide collection devices are performed on all samples in accordance with accepted techniques and nuclides of interest.

4.4.12 River Water (Sample Type No. 15)

Sampling of the Missouri River water is performed at the designated location extending from approximately 3 miles above the plant intake structure to approximately 35 miles downstream from the station.

4.4.13 River Bottom Sediment (Sample Type No. 16)

Samples of Missouri River Bottom sediment are collected at selected locations from immediately upstream of the plant intake structure to approximately two miles below the discharge canal outfall.

4.4.14 Aquatic Biota-Fish (Sample Type No. 17)

Approximately 5 fish of commercial size are collected from the Missouri River at locations from one to three miles upstream and one to three miles downstream from the plant. An attempt is made to include bottom-feeding types as well as middle- or top-feeding types in the species collected from each sampling location.

4.4.15 Aquatic Biota-Vegetation (Sample Type No. 18)

Rooted aquatic plants and slime growths on submerged surfaces in littoral locations of the Missouri River are sampled when available during scheduled collection times at selected locations from immediately upstream to two miles downstream from the plant.

4.4.16 Aquatic Biota-Benthic Organisms (Sample Type No. 19)

Benthic animals will be collected when available in sufficient quantities during scheduled collection times to perform the analysis.

4.4.17 Ground Water (Sample Type No. 20)

Sampling of ground water is performed from the plant well water supply header and from selected farm wells, municipal water supply wells, and from local rural water district supply wells.

4.4.18 Milk (Nearest Producers) (Sample Type No. 21)

During the season the cows are on pasture, samples of fresh milk will be obtained at the frequency specified in Table 7 from cows at locations that may be significantly affected by emissions from the Cooper Station (i.e., where the calculated dose to a child's 2 gram thyroid using AEC models and assumptions is equal to or exceeds 15 mrem/yr) and analyzed for their radioiodine content, calculated as iodine-131. Analysis will be carried out within eight days (one I-131 half-life) of sampling. Suitable analytical procedures will be used to determine the radioiodine content to a sensitivity of 0.5 picocuries I-131 per liter of milk at the time of sampling. Counting statistics will be such that the standard deviation (one sigma confidence level) of the net counting rate will be 10% or less. Overall error of the analysis will be within $\pm 25\%$. Results will be reported, with associated calculated error, as picocuries of I-131 per liter of milk at the time of sampling.

4.4.19 Milk (Sample Type No. 22)

Milk is sampled from other milk producers within an approximate 10-mile radius of the station. In the selection of milk sampling locations, an attempt has been made to select producers within areas of potential station influence with well established herds, who are most likely to remain in the business of milk production during succeeding years of station operation.

4.4.20 Eggs (Sample Type No. 23)

Since eggs are a common edible farm product in the area, egg samples (1 dozen per sample) are taken at the designated egg sample stations.

4.4.21 Terrestrial Wildlife - Rabbits (Sample Type No. 24)

Rabbits are collected at locations from one-half to three miles north-northwest to northwest to one half to three miles south to southeast of the plant site. Appropriate analyses of all rabbits are performed in accordance with accepted techniques and nuclides of interest, as given in Table 7.

Notes:

The limiting conditions for operation of CNS include restricting environmental effects due to the operation of CNS (including exposure to the population) in unrestricted areas surrounding the CNS plant site to within limits specified in AEC Regulations 10 CFR - parts 20, 50, and 100.

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 7 ~~1~~ 6
SAMPLE TYPE, DESCRIPTION, FREQUENCY, AND RADIOANALYSES

Type	Description	Sample Frequency	Radioanalyses and Remarks
1	Initial External Radiation Background Measurements	Reference only. Taken 12-2-70	Initial measurements of external beta-gamma radiation backgrounds were made with Geiger-Mueller type radiation survey instruments (Nuclear Chicago, Model 2612). Each measurement consisted of the average of at least 3, one minute readings taken with the instrument probe positioned 30 inches above the ground with the beta window open and directed downward.
2	Background Radiation	Quarterly	Thermoluminescent Dosimeters (TLD) exchanged and read out.
3	Background Radiation	Semi-annually	Thermoluminescent Dosimeters (TLD) exchanged and read out.
4	Reference Soil	Reference only. Samples taken April 6, 7, 8 and 29, 1971.	Two samples were taken at each station. One sample container, for each station, is being stored for future reference by the District. The other sample from each station was analyzed for Gross Beta, Gross Alpha, ⁹⁰ Sr and ¹³⁷ Cs.
5	Soil	Annually	(At the end of the growing season) Gross alpha Gross beta Sr-90, Sr-89 Cs-137 Gamma Spectrum
6	Vegetation - Natural	Annually	(In the latter portion of the growing season) Gross beta Sr-90, Sr-89 I-131 Gamma Spectrum Elemental Calcium

Change No. 1
Date: SEP 8 79

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 7
SAMPLE TYPE, DESCRIPTION, FREQUENCY, AND RADIOANALYSES

Type	Description	Sample Frequency	Radioanalyses and Remarks
7	Vegetation - Food and Feed Crops	2 times/year	(Mid-point and latter portions of growing season) Gross beta Sr-90, Sr-89 I-131 Gamma Spectrum Elemental Calcium
8	Vegetation - Garden Crops	Yearly	(Harvest time) Gross beta Sr-90, Sr-89 I-131 Gamma Spectrum Elemental Calcium
9	Vegetation - Feed and Forage Beef Producers	Weekly, Peak Pasture Period, Monthly - Rest of year	(Peak pasture can run from May to October) Cs-137 (monthly composite of the weekly samples otherwise monthly) Gamma Spectrum (monthly composite of weekly samples otherwise monthly)
10	Vegetation - Feed and Forage Nearest Milk Producers	Monthly, Peak Pasture Period, Quarterly - Rest of year	(Peak pasture can run from May to October) I-131 Cs-137 Sr-90, Sr-89 Gamma Spectrum Elemental Calcium
11	Vegetation - Feed and Forage Other Milk Producers	Quarterly	I-131 Cs-137 Sr-90, Sr-89 Gamma Spectrum Elemental Calcium

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Change No. 10
Date: 10/1/79

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 7
 SAMPLE TYPE, DESCRIPTION, FREQUENCY, AND RADIOANALYSES

Type	Description	Sample Frequency	Radioanalyses and Remarks
12	Apples	Annually	(Harvest time) Gross beta Sr-90, Sr-89 I-131 Gamma Spectrum Elemental Calcium
13	Airborne - Particulates	Weekly	(Continuous samples) Gross alpha Gross beta Gamma spectrum analysis on: 1. Quarterly composite each station 2. Elevated beta levels (>100 dpm/sample)
14	Airborne - Halide	Weekly	(Continuous samples) I-131
15	River Water	Monthly	(Four (4) liter grab sample) Suspended - gross alpha Suspended - gross beta Dissolved - gross alpha Dissolved - gross beta Gamma Spectrum - Quarterly Tritium (H-3) - Quarterly Sr-90, Sr-89
16	River Bottom Sediment	2 times/year	(Spring after natural peak flow and Fall) Gross alpha Gross beta Sr-90, Sr-89 Gamma Spectrum

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Change No. 6
 Date: SEP 30 1974

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 7 **6**
 SAMPLE TYPE, DESCRIPTION, FREQUENCY, AND RADIOANALYSES

Type	Description	Sample Frequency	Radioanalyses and Remarks
17	Aquatic Biota - Fish	2 times/year	(Summer and Fall) Gross beta K-40 Sr-90, Sr-89 Gamma Spectrum
18	Aquatic Biota - Vegetation	2 times/year	Gross beta K-40 Sr-90, Sr-89 Gamma Spectrum
19	Aquatic Biota - Benthic Organisms	2 times/year	Gross beta K-40 Sr-90, Sr-89 Gamma Spectrum
20	Ground Water	Quarterly	(Four (4) liter grab sample) Gross alpha Gross beta Gamma Spectrum Tritium (H-3)
21	Milk (Nearest Producers)	Weekly peak pasture period Monthly - rest of year	I-131 Sr-90, Sr-89 - Monthly Composite Cs-137 - Monthly Composite Gamma Spectrum - Monthly Composite Elemental Calcium - Monthly Composite
22	Milk	Quarterly	I-131 Sr-90, Sr-89 Cs-137 Gamma Spectrum Elemental Calcium

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Change No. **6**
 Date: SEP 30 1974

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 7
 SAMPLE TYPE, DESCRIPTION, FREQUENCY, AND RADIOANALYSES

Type	Description	Sample Frequency	Radioanalyses and Remarks
23	Eggs	Quarterly	(Edible portion only) Gross beta Sr-90, Sr-89 I-131 Gamma Spectrum Elemental Calcium
24	Terrestrial Wildlife - Rabbits	Annually	(In fall or early winter) I-131 - Thyroid Sr-90, Sr-89 - Femur Cs-137 - Muscle Tissue Gamma Spectrum - Muscle Tissue

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 8
 SAMPLE STATIONS AND SAMPLE TYPES

Sample Station	Sample Types																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	X	X	X	X	X	X							X	X										
2	X	X	X	X	X	X							X	X										
3	X	X	X	X	X	X							X	X										
4	X	X	X	X	X	X							X	X										
5	X	X	X	X	X	X							X	X										
6	X	X	X	X	X	X							X	X										
7	X	X	X	X	X	X							X	X										
8	X	X	X	X	X	X							X	X										
9	X	X	X	X	X	X							X	X										
10	X	X	X	X	X	X							X	X										
11																					X			
12															X	X		X	X					
13															X	X		X	X					
14 (1)	X			X																				
15	X	X	X	X	X		X																	
16 (1)																								
17 (1)	X			X																				
18	X	X	X	X	X		X																	

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Change No. 3
 Date 9 0 1974

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 8
SAMPLE STATIONS AND SAMPLE TYPES

Sample Station	Sample Types																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
19 (1)	X			X																				
20	X			X	X		X																	
21 (1)	X			X																				
22	X	X	X	X																				
23	X			X	X		X																	
24 (1)	X			X																				57
25 (1)	X			X																				
26 (1)	X			X																				
27					X		X																	
28															X	X	X	X	X					X
29	X			X	X		X																	
30 (1)	X			X																				
31					X			X													X			
32 (1)	X			X																				
33 (1)	X			X																				
34					X			X													X			
35															X		X							X
36 (1)	X			X																				

Change No. 1
 Date: SEP 26 1974

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 8
 SAMPLE STATIONS AND SAMPLE TYPES

Sample Station	Sample Types																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
37					X		X																	
38	X			X	X		X																	
39 (1)	X			X																				
40 (1)	X			X																				
41					X		X																	
42					X						X											X	X	58
43					X						X											X		
44	X	X	X	X																				
45																							X	
46																X								
47																								
48																					X			
49 (1)																					X			
50 (2)																							X	
51																							X	
52					X		X																	
53					X							X												
54					X							X												

Change No. 5
 Date: **SEP 30 1974**

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 8
 SAMPLE STATIONS AND SAMPLE TYPES

Sample Station	Sample Types																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
55					X			X																
56					X			X																
57																							X	
58		X	X																					
59		X	X																					
60					X						X												X	
61					X					X												X		
62					X			X												X				
63 (4)					X				X															
64					X				X															
65					X				X															
66					X				X															
67					X				X															
68					X				X	X												X		
69 (3)					X					X												X		
70					X					X												X		
71					X				X															

Change No. 16
 Date: SEP 30 1974

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NEBRASKA PUBLIC POWER DISTRICT
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ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>
No. 1	Type: 1-2-3-4-5-6-13-14 Location: On Site - Approximately 500 ft. N.N.W. of ERP. Sample types (13) & (14) are obtained from the top of the CNS materials warehouse. Sample types (2) & (3) are taken approx. 30 inches off the ground on the ladder going up to the air sampler. Sample (1) was taken at waist level near the ladder going up to the air sampler. Samples (5) and (6) are obtained at the west side of the CNS materials warehouse. Sample (4) was obtained at the west end of the CNS materials warehouse (NW 1/4 S32 T5N-R16E) Nemaha County, Nebraska.
No. 2	Type: 1-2-3-4-5-6-13-14 Location: On North Side of County Road access to the south portion of the CNS site approximately 275 feet West of former Jefferson Broady farmstead. (SW1/4 S32 T5N-R16E) Nemaha County, Nebraska
No. 3	Type: 1-2-3-4-5-6-13-14 Location: On North side of Brownville State Recreation Park access road, near water gauging station. (SE1/4 S18 T5N-R16E) Nemaha County, Nebraska.
No. 4	Type: 1-2-3-4-5-6-13-14 Location: 1/2 mile South of Phelps City, Mo. on West side of highway "U" (NE1/4 S2 T64N-R42W) Atchison County, Missouri on Henry Hinrich's farm.
No. 5	Type: 1-2-3-4-5-6-13-14 Location: 1/4 mile South and 1/4 mile East of Langdon, Missouri on North side of road, West of railroad tracks. (SW1/4 S18 T64N-R41W) Atchison County, Missouri on Dean A. Campbell farm.
No. 6	Type: 1-2-3-4-5-6-13-14 Location: 1 mile West of the end of Missouri State Highway "U", South side of road at SW corner of intersection with N-S county road (NW1/4 S34 T64N-R42W) Atchison County, Missouri on Bluford LaHue farm.
No. 7	Type: 1-2-3-4-5-6-13-14 Location: 150 yards West of Nemaha Elevator on the North Side of road. (SW1/4 S6 T4N-R16E) Nemaha County, Nebr. on Richard Andrew property.

NEBRASKA PUBLIC POWER DISTRICT
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ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>	
No. 8	Type:	1-2-3-4-5-6-13-14
	Location:	1/2 mile North, 3/4 mile West and 3/4 mile North of Nemaha on West side of road, adjacent to the "Mark T. Moore" transmission line. (NE1/4 S35 T5N-R15E) Nemaha County, Nebr. on Kenneth Andrew farm.
No. 9	Type:	1-2-3-4-5-6-13-14
	Location:	4 miles North of Highway #136 on Highway #67. One (1) mile east of Highway #67 and 1/2 mile North on West side of road. (SW1/4 S26 T6N-R15E) Nemaha County, Nebraska on Lloyd Reeves farm.
No. 10	Type:	1-2-3-4-5-6-13-14
	Location:	1 mile North of Barada, Nebr. in SW Corner of county road intersection. (NE1/4 S14 T3N-R16E) Richardson County, Nebr. on Mildred Birdsley farm.
No. 11	Type:	20
	Location:	CNS Site - Plant well water header at well pits. (NW1/4 S32 T5N-R16E) Nemaha County, Nebr.
No. 12	Type:	15-16-18-19
	Location:	Taken from Missouri River immediately upstream from the CNS Intake Structure at (River Mile 532.5)
No. 13	Type:	15-16-18-19
	Location:	Taken from Missouri River 1/4 mile below CNS Plant Discharge Flume Outfall (River Mile 532.2).
No. 14	Type:	1-4
	Location:	CNS Site at S.E. Corner of NPPD Training Facility lawn (SE 1/4 S32 T5N-R16E) Nemaha County, Nebraska
No. 15	Type:	1-2-3-4-5-7
	Location:	On site - approximately 2700 ft. from CNS Elevated Release Point in a SSW direction. (SW1/4 S32 T5N-R16E) Nemaha County, Nebr.

Change No. 100
Date: SEP 30 1974

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
 SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>	
No. 16	Type:	*8 - *20
	Location:	On the former "Jefferson Broady" farmstead building site approximately 4000 feet from the CNS Elevated Release Point in a SSW direction (SW1/4 S32 T5N-R16E) Nemaha County, Nebraska.
No. 17	Type:	1-4
	Location:	At SW corner of NPPD property, West of county road and Burlington R. R. Track at base of bluff (SE 1/4 S31 T5N-R16E) Nemaha County, Nebraska
No. 18	Type:	1-2-3-4-5-7
	Location:	West center of NPPD property boundary 45 ft. North of barn on former "Charles Garver" farmstead at base of the bluff. (NE 1/4 S31 T5N-R16E) Nemaha County, Nebraska.
No. 19	Type:	1-4
	Location:	At NW corner of NPPD property West of county road and Burlington R.R. track at base of bluff. (SE1/4 S30 T5N-R16E) Nemaha County, Nebraska.
No. 20	Type:	1-4-5-7
	Location:	On the NNW boundary of NPPD property, approximately 20 yds. East of the county road (SE1/4 S30 T5N-R16E) Nemaha County, Nebraska.
No. 21	Type:	1-4
	Location:	In NE corner of NPPD property in Missouri. 80 ft. West of center of Levee. South side of ramp at Levee Mile 14.5 (SW1/4 S10 T64N-R42W) Atchison County, Missouri.
No. 22	Type:	1-2-3-4
	Location:	East Center of NPPD property boundary in Missouri. 80 ft. West of Center of Levee. North side of ramp at Levee Mile 14.1 (NW 1/4 S15 T64N-R42W) Atchison County, Missouri.

*Note: Station No. 16 was discontinued during the preoperational environmental program due to abandonment of this farmstead.

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NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>
No. 23	Type: 1-4-5-7 Location: Three (3) miles South and 1/2 mile West of Phelps City, Missouri in the NE corner of intersection. (SE 1/4 S11 T64N-R42W) Atchison County, Missouri.
No. 24	Type: 1-4 Location: 1/4 mile North of Langdon, Mo. West side of road in ditch at intersection of fence lines approximately 200 yds. North of old fashion brick house. (SE 1/4 S13 T64N-R41W) Atchison County, Mo.
No. 25	Type: 1-4 Location: 1/4 mile South and 1/4 mile East of Langdon, Missouri. 50 yards East of R.R. Tracks on South side of road. (NW 1/4 S19 T64N-R41W) Atchison County, Missouri.
No. 26	Type: 1-4 Location: 1 mile South and 1 mile West of Langdon, Missouri. On South side of road where power line crosses road diagonally. (NW 1/4 S25 T64N-R41W) Atchison County, Mo.
No. 27	Type: 5-7 Location: Three (3) miles SE of CNS Plant Site in Missouri. 5 miles South of Highway #136 on State Highway "U" (SW of Langdon, Missouri) 100 ft. North of Paul Klump farm house (gray asbestos) on East side of road. (SE 1/4 S26 T64N-R42W) Atchison County, Missouri.
No. 28	Type: 15-16-17-18-19-24 Location: Sample types 15-16-17-18-19 are taken from the Missouri River at the general location of river mile 530. (approx. 2 miles below the Plant Discharge Flume Outfall) Sample type 24 is taken from the Nebr. bank of the river 1/2 to 3 miles downstream from the CNS Plant Discharge Flume Outfall. (River Mile 532 to River Mile 529) and encompasses S 1/2 S32 T5N-R16E and Section 5 T4N-R16E, Nemaha County, Nebraska.
No. 29	Type: 1-4-5-7 Location: 1 1/4 miles West of end of State Highway "U" and 50 yards East of Levee on the South side of the road on Bluford LaHue farm in Atchison County, Missouri (NW 1/4 S34 T64N-R42W).

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
 SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>
No. 30	Type: 1-4 Location: 3 miles South of Nemaha, Nebr. on Highway #67 2 miles East of Highway #67 at North-South dead end county road. In field on North side of East-West road approx. 50 yds. West of N-S intersection (SE 1/4 S20 T4N-R16E) Nemaha County, Nebr.
No. 31	Type: 5-8-20 Location: (20) Nemaha, Nebraska Municipal Water Supply Well. South-west corner of town of Nemaha. (Contact - Wes Able). (5) (8) Eugene Tucker garden across the street from N.E. corner of Nemaha City Park. (SE 1/4 S1 T4N-R15E) Nemaha County, Nebraska.
No. 32	Type: 1-4 Location: 2 miles South of Highway #136, 2 miles West of Highway #67 200 yds. North of "Mark T. Moore" Transmission Line, 100 yds. North of "Willard Allen" farmstead buildings in field on East side of county road. (NW 1/4 S35 T4N-R15E) Nemaha County, Nebraska.
No. 33	Type: 1-4 Location: 1 mile West of Highway #67, 1/2 mile South of Highway #136, 50 yards South of OPPD Transmission Line in field on East side of county road (SW 1/4 S24 T5N-R15E) Nemaha County, Nebraska.
No. 34	Type: 5-8-20 Location: (20)Municipal Well header at Treatment Plant located under City Offices in the town of Brownville, Nebr. (Contact LaVerne Wheeldon). (5) (8) Jim Garber garden at the Northeast edge of Brownville, Nebr. (SE 1/4 S18 T5N-R16E) Nemaha County, Nebraska.
No. 35	Type: 15-17-24 Location: Sample Type 15 is taken from the Missouri River near the State Recreation Area at Brownville, Nebr. (River Mile 535). Sample Type 17 is taken from the Missouri River, in that stretch of the river one to three miles above the CNS Plant Intake Structure (River Mile 532.5 to River Mile 535).

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9 **f**6
 SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>
No. 35 (cont'd.)	Sample Type 24 is taken from the Nebraska side of the river in the area from 1/2 mile north of the CNS plant site to the area of the Brownville State Recreation Area (at River Mile 535) which encompasses the W1/2 S29 T5N-R16E and the W1/2 S20 T5N-R16E Nemaha County, Nebraska.
No. 36	Type: 1-4 Location: 1 mile north of Brownville, Nebraska on N. 7th Street at top of hill on "S" curve - north side of road. (SE1/4 S12 T5N-R15E) Nemaha County, Nebraska.
No. 37	Type: 5-7 Location: Northwest of Brownville, Nebraska on N. 7th Street. Take first county road on left, then right at "Y" intersection. Samples collected in field on west side of road across from "Jim Smith" farmhouse. (SW1/4 S12 T5N-R15E) Nemaha County, Nebraska.
No. 38	Type: 1-4-5-7 Location: In Atchison County, Missouri (4 miles N. of CNS Plant Site) 3/4 mile E of Brownville Bridge, 1-1/4 miles N. of Highway #136, NE side of curve on county road. (NE1/4 S28 T65N-R42W) Atchison County, Missouri.
No. 39	Type: 1-4 Location: 1-3/4 miles East of Brownville Bridge and 1/4 mile South of Highway #136 on county road - 70 yards South of vacant house at fence line on West side of road. (SE1/4 S34 T65N-R42W) Atchison County, Missouri
No. 40	Type: 1-4 Location: In Atchison County, Missouri (4 miles NE of CNS Plant Site) NE of Phelps City, Mo. -- 1/4 mile North of Highway #136 on county road N of "Missouri Beef Packers" plant, Phelps City, Missouri on West side of county road - north of fence line in field South of Airport. (NE1/4 S35 T65N-R41W) Atchison County, Missouri.
No. 41	Type: 5-7 Location: 3/4 mile East of Watson, Missouri on Highway "A" North side of highway on the George Ellison farm. (NW1/4 S2 T65N-R42W) Atchison County, Missouri.

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 NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
 SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>	
No. 42	Type:	5-11-22-23
	Location:	1 mile South and 1-1/4 miles East of Barada, Nebraska on South side of county road "Meinert Wissman" dairy farm. (NW1/4 S30 T3N-R17E) Richardson County, Nebraska
No. 43	Type:	5-11-22
	Location:	Two (2) blocks East of the South end of the Main Street in the town of Stella, Nebraska - "Arnold Huffman" dairy farm. (NE1/4 S18 T3N-R15E) Richardson County, Nebraska.
No. 44	Type:	1-2-3-4
	Location:	Two (2) miles South of Auburn Stop Light on Highway #73-75. 1/4 mile South of Auburn Country Club turn East 1/2 mile to fence line (N-S) on the North side of county road. (SE1/4 S27 T5N-R14E) Nemaha County, Nebraska
No. 45	Type:	*5 - *7 - *22 - 23
	Location:	One (1) mile West of Brownville, Nebraska on U.S. Highway #136 - 1 mile North of highway on county road - jog to the right and proceed approximately 1/4 mile North up a lane to the "John Sierks" farm. (SW1/4 S12 T5N-R15E) Nemaha County, Nebraska
No. 46	Type:	15
	Location:	Taken from Missouri River South of Rulo, Nebraska bridge adjacent to the boat dock on the Nebraska side of the Missouri River (River Mile 498).
No. 47	Type:	20
	Location:	Falls City Municipal Water Supply Wells located approximately 1 mile South of Rulo, Nebraska. (SW1/4 S20 T1N-R15E) Richardson County, Nebraska.

*Note: These sample types were discontinued during the preoperational environmental program when the dairy herd was sold.

Change No. 6
 Date: SEP 28 1974

BRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
 SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>	
No. 48	Type:	20
	Location:	Sample is taken from the Nemaha Rural Water District No. 1 water plant located approximately 3 miles NW of Brownville, Nebr. - (NE 1/4 S2 T5N-R15E) Nemaha County, Nebraska. (Contact William "Bill" Gfeller).
No. 49	Type:	*23
	Location:	1/4 mile West and 1/2 mile North of Stella, Nebraska. Loy Dettman farm (NW 1/2 S7-T3N-R15E) Richardson County, Nebraska.
No. 50	Type:	***23
	Location:	1-1/2 miles North of Nemaha, Nebraska on Highway #67 then 3/4 miles East (Leland Moore farm) (NW1/4 S31 T5N-R16E) Nemaha County, Nebraska.
No. 51	Type:	23
	Location:	1-1/4 miles South of Langdon, Missouri on East side of county road (Irwin Palm farm). (NW1/4 S30 T64N-R41W) Atchison County, Missouri
No. 52	Type:	5-7**22
	Location:	Two (2) miles South of Rockport, Missouri on Highway #111, then one (1) mile East on North side of county road (Glenn Owen farm). (SE1/4 S3 T64N-R41W) Atchison County, Missouri.
No. 53	Type:	5-12
	Location:	1-1/2 miles South of CNS Plant Site on the East side of county road (Leonard Moore orchard) (SE1/4 S6 T4N-R16E) Nemaha County, Nebraska.
No. 54	Type:	5-12
	Location:	Two (2) miles West of Brownville, Nebraska on U.S. Highway #136, then 1-3/4 miles North on the East side of county road (Clay Kennedy orchard). (NW1/4 S11 T5N-R15E) Nemaha County, Nebraska.

*Note: This sample type was discontinued during the preoperational environmental program when layers were sold.

**Note: This sample type was discontinued during the preoperational environmental program when the dairy herd was sold.

***Note: This sample station was discontinued as of October, 1973 when the chickens were sold. Owner will not replace chickens.

Change No.

Date: SEP 30 1974

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
 SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>	
No. 55	Type:	5-8
	Location:	1-1/2 miles North of Nemaha, Nebraska on Highway #67, then West on county road. Farm is approximately 200 yards on South side of county road (C. Emil Skeen farm). (NE1/4 S36 T5N-R15E) Nemaha County, Nebraska.
No. 56	Type:	5-8
	Location:	1-1/4 miles South and West of Langdon, Missouri on State Highway "U". Farm is located on the right side of highway just at curve (Bill Gebheart farm). (NW1/4 S23 T64N-R42W) Atchison County, Missouri
No. 57	Type:	23
	Location:	3 miles North and 1/2 mile West of Shubert, Nebraska on N side of road (Harlan Brewer farm)(SE1/4 S26 T4N R15E) Nemaha County, Nebraska.
No. 58	Type:	2-3
	Location:	3 miles South of Brownville, Nebraska on county road at the SW corner of NPPD property boundary - 50 yds. East of county road. (NE1/4 S32 T5N-R15E) Nemaha County, Nebraska.
No. 59	Type:	2-3
	Location:	1 mile SSE of the CNS Elevated Release Point - 50 yards West of the Levee at the South boundary of NPPD property. (NE1/4 S33 T5N-R15E) Nemaha County, Nebraska.
No. 60	Type:	5-11-22
	Location:	1 mile W Rockport, Missouri, on highway #136 to highway #275 then 2 miles N on #275 E side of road. Lee Edward McCoy farm. (NE1/4 S16 T65N R41W), Atchison County, Missouri.
No. 61	Type:	5-10-21
	Location:	1 mile W of Brownville, Nebraska on highway #136 - 1 mile N of highway on county road, turn right and proceed approx. 1/2 mile E on S side of road (Raymond Gentert farm)(NW1/4 S13 T5N-R15E) Nemaha County, Nebraska
No. 62	Type:	5-8-20
	Location:	Approximately 1-1/2 mile SW of ERP on W side of County road (Leonard Moore farmstead) (NE1/4 S6 T4N-R16E)Nemaha County, Nebraska.

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9 ⁶
 SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>
No. 63	Type: ** 5-9 Location: 2 miles East of Phelps City, Missouri on U.S. Highway #136, 1/4 mile South on West side of county road (Guy Moorman farm). (SE1/4 S31 T65N-R41W) Atchison County, Missouri
No. 64	Type: 5-9 Location: 1 mile West of Langdon, Missouri and 1/2 mile North on West side of road (R.A. Meyer Korth farm). (SW 1/4 S14 T64N-R42W) Atchison County, Missouri.
No. 65	Type: 5-9 Location: 1-1/2 miles South of Brownville, Nebraska on the West side of county road at the NW corner of NPPD property boundary (on the Harold Davis farm). (NE1/4 S30 T5N-R16E) Nemaha County, Nebraska.
No. 66	Type: 5-9 Location: 2 miles South of Nemaha, Nebraska on Highway #67 - East side of highway (Clyde Kennedy farm). (NW1/4 S19 T4N-R16E) Nemaha County, Nebraska
No. 67	Type: 5-9 Location: 2-1/2 miles West of Brownville, Nebraska on U.S. Highway #136 then North 2 miles on county road, then East 3/4 mile on South side of road (Walter Parkhurst farm). (NE1/4 S11 T5N-R15E) Nemaha County, Nebraska
No. 68	Type: 5-9-10-21 Location: 2-1/2 miles West of Brownville, Nebraska on U.S. Highway #136, then South 2 miles on the East side of county road (Manford Cade farm). (SW1/4 S26 T4N-R15E) Nemaha County, Nebraska.
No. 69	Type: *5-10-21 Location: 1/4 mile West of Phelps City, Missouri on U.S. Highway #136 - North side of highway (Gerald Armstrong farm) (NE1/4 S35 T65N-R42W) Atchison County, Missouri

* Sample types 5, 10, & 21 were discontinued. Owner had only 1 cow and she died. Does not plan to replace the cow. This cow died prior to any samples being collected except for one type 5 on 10-18-73.

** Sample types 5 and 9 were discontinued. Sold cattle last fall prior to any samples collected except for one type 5 on 10-18-73.

Change No.
 Date: SEP 23 1974

NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM

TABLE 9
 SAMPLE TYPES AND SAMPLE LOCATIONS

<u>Sample Station</u>	<u>Sample Type and Location</u>
No. 70	Type: 5-10-21 Location: North edge of Phelps City, Missouri along side U.S. Highway 136 south side of highway (Donald Daugherty trailer) (SE $\frac{1}{4}$ S35 T65N-R42W) Atchison County, Mo.
No. 71	Type: 5-9 Location: 2 miles East of Phelps City, Missouri on U. S. Highway #136, then south $1\frac{1}{2}$ miles on county road, then West $\frac{1}{4}$ mile (Tom Boatman farm), (SE $\frac{1}{4}$ S6 T64N-R41W) Atchison County, Mo.

Change No. 6
 Date: **SEP 30 1974**

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Date: 05/10/10

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Date: SEP 19 1951

- 5.3.2 All procedures described in 5.3.1 above, and changes thereto, shall be reviewed as specified in Section 5.1 and approved by the Plant Superintendent prior to implementation. Temporary changes to procedures which do not change the intent of the original procedure may be made, provided such changes are approved by two members of the plant management staff. Such changes shall be documented, subsequently reviewed and approved on a timely basis.

5.4 Plant Reporting Requirements

5.4.1 Routine Reports

A semiannual Environmental Monitoring Report covering the previous six months operations shall be submitted within 60 days after January 1 and July 1 of each year. The first such period shall begin with the date of initial criticality. These reports shall include the following:

- a. A summary of the results of environmental monitoring programs required by technical specifications including the inventory of chemicals discharged as specified in Section 3.3.
- b. An assessment of the observed impacts of plant operation based on the results of environmental monitoring.
- c. A brief discussion of any changes in survey procedures of monitoring programs during the report period.
- d. A summary of the results of any special environmental studies not required by technical specifications.
- e. A brief discussion of any violations of the technical specifications; the date and time, cause, and action taken to prevent recurrence.
- f. A summary of the quantities of radioactive effluents released from the plant as outlined in USAEC Regulatory Guide 1.21, with data summarized following the format of Appendix B thereof.
- g. Results for all radiological monitoring samples taken shall be summarized on a quarterly basis following

Change No. _____
Date: SEP 30

TABLE 10

REPORTING OF RADIOACTIVITY IN THE ENVIRONS

Facility _____	Docket No. _____	Reporting Period _____	
A. Sample Results	Average Quarterly Results ^{5/} Frequency and ^{6/} Type of Samples	Analysis Results ^{2/} (specify radio-nuclide or entity)	Remarks ^{1/}
Sample	Location ^{3/}		
(1) External Radiation			
(2) Filterable Airborne			
a. Particulate Filters			
1)			
2)			
etc.			
b. Charcoal Filters			
1)			
2)			
etc.			
(3) Water ^{4/}			
a.			
b.			
etc.			
(4) Food (Human)			
a.			
b.			
etc.			
(5) Other Media			
a. Vegetation (include pasture and other animal foodstuffs)			
b. Soils			
c. Sediments			
d. Fish			
e. Molluscs			
f. Plankton			
g. Algae			
h. etc.			

- ^{1/} Explain any unusual measurements or deviation from sampling schedule.
- ^{2/} Use the following units; external radiation, mrem/quarter; filterable airborne, water and milk, $\mu\text{Ci/ml}$; soil, $\mu\text{Ci/m}^2$ (specify depth) precipitation, $\mu\text{Ci/m}^2$; stream sediments and terrestrial and aquatic vegetation $\mu\text{Ci/dry gm}$; other media, specify units.
- ^{3/} Specify location and its distance and direction from the facility, and indicate which is used for background.
- ^{4/} Indicate whether precipitation, surface, ground, lake, river, ocean, etc.; specify drinking water.
- ^{5/} Use separate table for each quarter.
- ^{6/} Type of sample means either grab, continuous, proportional, composite, etc.

Change No. 3
Date: SEP 30 1974