# AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

| 1. CONTRACT ID CODE | PAGE OF PAGES |
|---|---|
| | 1 \| 2 |

| 2. AMENDMENT/MODIFICATION NO. | 3. EFFECTIVE DATE | 4. REQUISITION/PURCHASE REQ. NO. | 5. PROJECT NO. (If applicable) |
|---|---|---|---|
| Four (4) | 12/31/85 | RG4-83-668 dtd 1/17 | |

6. ISSUED BY — CODE

U.S. Nuclear Regulatory Commission
Division of Contracts
Washington, DC 20555

7. ADMINISTERED BY (If other than Item 6) — CODE

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

Colorado Department of Health
4210 E. 11th Avenue
Denver, CO 8022o

CODE — FACILITY CODE

| | |
|---|---|
| | 9A. AMENDMENT OF SOLICITATION NO. |
| | 9B. DATED (SEE ITEM 11) |
| X | 10A. MODIFICATION OF CONTRACT/ORDER NO. NRC-31-83-668 |
| | 10B. DATED (SEE ITEM 13) 3/7/83 |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

APPN No. 31X0200.946 B&R No. 94-19-30-02-1 FIN B8501 INCREASE: $13,700.00

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|---|---|
| ☒ | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| X | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Mutual agreement of the parties. |
| | D. OTHER (Specify type of modification and authority) |

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return 2 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to 1) extend the period of performance, 2) provide CY 1986 funds, 3) incorporate revised Attachment A - Statement of Work, and 4) change the appropriation number.

1. ARTICLE III - PERIOD OF PERFORMANCE, paragraph A. is revised to read as follows:

"A. The period of performance hereunder shall commence on January 1, 1983 and shall continue through December 31, 1988, unless sooner terminated or extended, as herein provided."

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| 15A. NAME AND TITLE OF SIGNER (Type or print) | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) |
|---|---|
| Lee Thielen, Assistant Director | Paul J. Edgeworth |

| 15B. CONTRACTOR/OFFEROR | 15C. DATE SIGNED | 16B. UNITED STATES OF AMERICA | 16C. DATE SIGNED |
|---|---|---|---|
| Lee Thielen | 2/20/86 | BY Paul J. Edgeworth (Signature of Contracting Officer) | 2/6/86 |





STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

2. ARTICLE V - CONSIDERATION AND PAYMENT, paragraph A. Consideration, subparagraphs 1 and 3 are revised as follows:

"A. Consideration

1. The Commission will provide funds, subject to the availability of appropriation, to the State in the amount of $79,250.00 during the period of performance. The rate of payment to the State will be as follows:

CY-1983 - $ 9,600 per site, per year/environmental media program
CY-1983 - $ 1,300 per site, per year/TLD program

CY-1984 - $10,600 per site, per year/environmental media program
CY-1984 - $ 1,450 per site, per year/TLD program

CY-1985 - $11,700 per site, per year/environmental media program
CY-1985 - $ 1,600 per site, per year/TLD program

CY-1986 - $12,000 per site, per year/environmental media program
CY-1986 - $ 1,700 per site, per year/TLD program

CY-1987 - $12,600 per site, per year/environmental media program
CY-1987 - $ 1,800 per site, per year/TLD program

CY-1988 - $13,000 per site, per year/environmental media program
CY-1988 - $ 1,900 per site, per year/TLD program

2. The amount presently obligated by the Commission with respect to this cooperative agreement for the CY-1986 effort is $13,700.00."

3. ARTICLE II - SCOPE OF WORK, second paragraph is revised as follows:

"The full scope of this cooperative agreement is set forth in the revised Attachment A, STATEMENT OF WORK, which is attached hereto and made a part of this cooperative agreement."

4. The APPN No. "31X0200.945" cited in Block No. 12, Accounting and Appropriation Data is changed to APPN No. "31X0200.946."

All other terms and conditions under this cooperative agreement remain unchanged.

ATTACHMENT A

STATEMENT OF WORK

RADIATION MONITORING PROGRAM REQUIREMENTS

## I. PURPOSE

The purpose of this cooperative agreement is to establish a collaborative program between the State of Colorado (hereinafter called the "State") and the Commission to provide independent measurements of radioactivity and radiation levels in the environment around selected Commission licensed activities, and to provide reasonable assurance that a licensee's environmental measurements are valid.

## II. GENERAL REQUIREMENTS

The Commission and the State will collaborate in implementing and conducting programs at individual sites within the State in accordance with the following general requirements:

A. The State, within a reasonable time after the effective date of this cooperative agreement, will take action to provide facilities, qualified personnel and/or agencies as may be necessary to accomplish the work described in this cooperative agreement. The State thereafter will maintain for the period of this cooperative agreement, a sufficient level of effort to fulfill the objectives of the cooperative agreement.

B. Programs will be undertaken at the following sites:

Fort St. Vrain Generating Station and surrounding area.

C. Attachments 1, 2, and 3 show the overall sampling and analyses requirements. Attachment 2 also gives the minimum detectable capabilities for the samples analyzed. No onsite samples will be collected pursuant to the cooperative agreement unless specifically requested or approved by the Commission.

## III. PROCEDURES FOR IMPLEMENTING AND CONDUCTING THE PROGRAMS

A. The Commission's Region IV Office Technical Representative will provide technical liaison, as necessary, between the State and the licensee, in all matters relating to the program conducted pursuant to the cooperative agreement.

B. The State will make all necessary contacts and arrangements for collecting samples in the offsite environment, e.g., obtaining access to private property, assistance of State or local agencies, arranging with private firms for services, etc.

C. The State will make all necessary contacts and arrangements with the licensee to split samples with the licensee, obtain duplicate samples and obtain licensee's data on the comparative samples.

D. The Commission will assist the State in selecting sampling locations, arranging for laboratory support, as necessary, spliting samples periodically, assisting the State in obtaining the licensee's comparative data, and consulting with the State on matters of mutual concern.

E. The State will exchange TLD's at stations established jointly by the Commission and the State on a frequency of 92 ± 7 days starting on January 1, 1983. The interval between exchanges shall not be smaller than 80 days nor larger than 100 days.

During an exchange, the State will replace TLD's currently in the field with annealed TLD's supplied by NRC Region I office. Intransit control TLD's will be placed in a lead cask on arrival at the State's point of dispatch or handled per enclosed instructions.

Exposed TLDs will be shipped back to NRC Region I office as soon as possible by conveyance agreed upon by the Commission and State.

F. The State will notify the NRC Region IV office by telephone (817/860-8100), FTS 728-8100) and written confirmation as soon as practicable after it becomes aware of any observed unusual condition, level of radiation, or concentrations of radioactive material measured in carrying out the programs at individual sites.

G. The Commission will make the necessary inspections, investigations, and inquiries to ascertain the status of compliance by the licensees with license provisions, rules, orders, and regulations of the Commission and to determine the safety of licensee operations; and will initiate enforcement or other regulatory action as appropriate. Results of each inspections, investigations, or inquiries conducted in response to such notification shall be provided to the State.

IV. REPORTING

A. The State will provide the NRC Region IV office with an annual report of all offsite analyses with comparisons of similar analyses by the respective licensee within 120 days after January 1 of each year. The report shall follow the format of Attachment 3. In the event that some results are not available within the 120-day period, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report. If samples are not available, data analysis is not expected. However, a brief explanation as to why the sample was not provided is requested. If samples or data are not available because of the reluctance of the licensee to provide them, the NRC Region IV Technical Representative should be notified as soon as possible. The annual report shall also include a summary of the State's EPA crosscheck program results for the past year.

B. The Commission will arrange for the timely distribution of the reports within the Commission and to the licensee, and any other Federal, State, or local agencies as may be necessary in meeting the intent of the "National Environmental Policy Act of 1969" (Public Law 91-190 Stat. 853, dated January 1, 1970) for keeping affected agencies informed.

C. The Commission will work with the State in making the program findings publicly available as appropriate through special bulletins, press releases, and publication in appropriate technical journals or periodicals, or otherwise, to assure prompt and wide distribution of the data at minimum cost.

D. The State will provide to the Commission on a quarterly basis, a report covering NRC funds expended during the preceding quarter, a total expenditure of funds under this cooperative agreement, and a tabulation of Services Rendered by facility. The format is shown in Attachment 4. This report shall be submitted to the Contracting Officer and the NRC Region IV Project Officer.

ATTACHMENT 1

ENVIRONMENTAL RADIOLOGICAL VERIFICATION MONITORING PROGRAM
AROUND NUCLEAR POWER PLANTS

| Exposure Pathway and/or Sample | Number of Samples and Location | Sampling and Collection Frequency | Type of Analysis and Frequency |
|---|---|---|---|
| AIRBORNE: | | | |
| Particulates | One sample, from a location of high calculated ground level concentration and in close proximity to licensee's sampler. | Continuous operation of sampler with sample collection as required by dust loading but at least once per 7 days. | Gross beta radioactivity analysis following each filter change; composite (by location) for gamma isotopic analysis quarterly. |
| | One sample from a control location in close proximity to licensee's sampler. | Continuous operation of sampler with sample collection as required by dust loading but at least once per 7 days. | Gross beta radioactivity analysis following each filter change; composite (by location) for gamma isotopic analysis quarterly. |
| Radioiodine | Same as particulates. | Same as particulates | $^{131}I$ isotopic analysis following each cartridge change. |
| WATERBORNE: | | | |
| Surface | One sample, split with licensee, from immediate area of discharge, or at nearest downstream drinking water supply. | Monthly. | Gamma isotopic analysis and tritium analysis monthly. |
| | One sample, split with licensee, from an upstream control location. | Same as above. | Same as above. |

ATTACHMENT 1 (con't)

| Exposure Pathway and/or Sample | Number of Samples and Location | Sampling and Collection Frequency | Type of Analysis and Frequency |
|---|---|---|---|
| INGESTION: Milk | One sample, split with licensee, at an offsite dairy farm or individual milk animal at the location having the highest X/Q. | Monthly. | Gamma isotopic and radioiodine analyses monthly. |
| Fish or Invertebrates | One sample, split with licensee, of a commercially or recreationally important species in the vicinity of the plant discharge point. | Semiannually or in season. | Gamma isotopic analysis of edible portions. |
| Food Products | Two samples, split with licensee, of principal food products grown near point having the highest X/Q or from any area where liquid plant wastes have been discharged or green leafy vegetables at a private garden or farm in the immediate area of the plant. | At time of harvest. | Gamma isotopic analyses including radioiodine of edible portion. |
| Sediment from Shoreline | One sample, split with licensee, of shoreline sediment downstream from the plant. | Annually. | Gamma isotopic analysis. |

ATTACHMENT 1 (con't)

| Exposure Pathway and/or Sample | Number of Samples and Location | Sampling and Collection Frequency | Type of Analysis and Frequency |
|---|---|---|---|
| TLD-Direct Radiation | a. TLD badges in 16 sectors around the plant site at two distances from the site boundary:<br>(1) Site boundary out to 1 mile.<br>(2) From 2 to 4 miles from site boundary.<br>b. Population centers within 10 miles of the plant.<br>c. Maximum exposed residences within 3 miles of the plant.<br>d. High public interest sites within 5 miles of the plant.<br>e. Three background control sites greater than 15 miles from the plant. | Quarterly. | Analyses to be performed by the Commission. |

ATTACHMENT 2

DETECTION CAPABILITIES FOR ENVIRONMENTAL SAMPLE ANALYSES

| | LOWER LIMIT OF DETECTION (LLD) [a,g,h] | | | | | |
|---|---|---|---|---|---|---|
| Analysis | Water (pCi/l) | Airborne Particulate or Gas (pCi/$m^3$) | Fish, Meat or Poultry (pCi/kg,wet) | Milk (pCi/l) | Food Products (pCi/kg,wet) | Sediment (pCi/kg,dry) |
| gross beta | 4[b] | 1.0E-02 | | | | |
| $^{3}H$ | 2000<br>1000[b] | | | | | |
| $^{54}Mn$ | 15 | 1.0E-02[d] | 130 | | 60[e] | 100[f] |
| $^{59}Fe$ | 30 | 2.0E-02[d] | 260 | | 80[e] | 200[f] |
| $^{58}Co$ | 15 | 1.0E-02[d] | 130 | | 50[e] | 100[f] |
| $^{60}Co$ | 15 | 1.0E-02[d] | 130 | | 50[e] | 100[f] |
| $^{65}Zn$ | 30 | 2.0E-02[d] | 260 | | 60[e] | 200[f] |
| $^{95}Zr$-$^{95}Nb$ | 15[c] | 2.0E-02[d] | | | 80[e] | 200[f] |
| $^{131}I$ | 1 | 7.0E-02 | | 1 | 60 | 200[f] |
| $^{134}Cs$ | 15 | 5.0E-02 | 130 | 15 | 60 | 150 |
| $^{137}Cs$ | 18 | 6.0E-02 | 150 | 18 | 80 | 180 |
| $^{140}Ba$-$^{140}La$ | 15[c] | 2.0E-02[d] | | 15[c] | 60[e] | 200[f] |

ATTACHMENT 2 (con't)

a. The LLD is defined, for purposes of these specifications, as the smallest concentration of radioactive material in a sample that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. It should be recognized that the LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as a posteriori (after the fact) limit for a particular measurement. Analysis should be performed in such a manner that the stated LLD's will be achieved under routine conditions. These detection levels should be used as minimum criteria for objectives for instrumentation and analytical procedure selection.

For a particular measurement analysis (which may include radiochemical separation):

$$LLD = \frac{4.66\ s_b}{E \cdot V \cdot 2.22 \cdot Y \cdot \exp(-\lambda \Delta T)}$$

where:

LLD is the "a priori" lower limit of detection as defined above (as picocuries per unit mass or volume),

$s_b$ is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per disintegration),

V is the sample size (in units of mass or volume),

2.22 is the number of disintegrations per minute per picocurie,

Y is the fractional radiochemical yield (when applicable),

$\lambda$ is the radioactive decay constant for the particular radionuclide, and

$\Delta T$ for environmental samples is the elapsed time between sample collection (or end of the sample collection period) and time of counting.

Typical values for E, V, Y, and $\Delta T$ should be used in the calculations.

b. LLD for drinking water.

c. Total for parent and daughter.

ATTACHMENT 2 (con't)

d. Detection limit based on a 300 $m^3$ sample counted for a minimum of 1000 minutes using a Ge(Li) detector.

e. Detection limit based on a 1000 gram sample counted for a minimum of 1000 minutes using Ge(Li) detector.

f. Detection limit based on a 1 kilogram sample counted for a minimum of 1000 minutes using a Ge(Li) detector.

g. This does not mean that only the radionuclides listed in Attachment 2 are to be detected and reported. Other peaks which are measurable and identifiable, together with the above listed radionuclides, shall be identified and reported.

h. This table reflects the values given in the NRC Draft Radiological Effluent Technical Specifications, NUREG-0472, Revision 3, March 30, 1982.

ATTACHMENT 3

NAME OF FACILITY

(Location of Facility) (Reporting Period)

| Medium or Pathway Sampled | Split or Duplicate Sample | Location Name | Distance & Direction | Date | State Results | Licensee Results |
|---|---|---|---|---|---|---|

ATTACHMENT 4

Description of Services Rendered

Facility _____ Location _____

| No. Samples | Sample Type | Analyses Performed | | | | No. Analyses |
|---|---|---|---|---|---|---|
| | | Gross Beta | Gamma Isotopic | Tritium | I-131 | |
| | Air Particulate | | | | | |
| | Radioiodine | | | | | |
| | TLDs | | | | | |
| | Water | | | | | |
| | Sediment | | | | | |
| | Milk | | | | | |
| | Food Products | | | | | |
| | Fish | | | | | |

Man-hours expended:

Field Sampling ..... hours

Analytical Services ..... hours

Quality Assurance ..... hours

Administration ..... hours