BNWL-1865
UC-2
Special
Distribution

**PACIFIC NORTHWEST LABORATORY
MONTHLY ACTIVITIES REPORT
AUGUST 1974**

**Division of Production and Materials
Management and Hanford Plant
Assistance Programs**

Battelle

Pacific Northwest Laboratories
Richland, Washington 99352

SEPTEMBER 1974

Prepared for the U.S. Atomic Energy
Commission under Contract AT(45-1):1830

BNWL-1865

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Atomic Energy Commission, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

PACIFIC NORTHWEST LABORATORY
operated by
BATTELLE
for the
U.S. ATOMIC ENERGY COMMISSION
Under Contract AT(45-1)-1830

Printed in the United States of America
Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22151
Price: Printed Copy \$4.00; Microfiche \$2.25

Date March 21, 1975
To Recipient of BNWL-1865
From R. E. Burns *R. E. Burns*
Subject Revised Issue of BNWL-1865 titled

Pacific Northwest Laboratory
Monthly Activities Report

August 1974

Division of Production and Materials
Management and Hanford Plant
Assistance Programs

This new revised issue replaces your present issue of BNWL-1865.
Please destroy your present issue.

3 3679 00062 2383

BNWL-1865

UC-2

(Special Distribution)

PACIFIC NORTHWEST LABORATORY
MONTHLY ACTIVITIES REPORT

AUGUST 1974

Division of Production and Materials Management
and
Hanford Plant Assistance
Programs

by the

Staff of Battelle-Northwest
E. L. Alpen, Director

September 1974

BATTELLE
PACIFIC NORTHWEST LABORATORY
RICHLAND, WASHINGTON 99352

TABLE OF CONTENTS

	<u>Page</u>
Assistance to Atlantic Richfield Hanford Company - Summary.	3
Assistance to Atlantic Richfield Hanford Company.	6
Technical Assistance to the Hanford Plant - Summary	18
Technical Assistance to the Hanford Plant	19

PACIFIC NORTHWEST LABORATORY
MONTHLY ACTIVITIES REPORT
DIVISION OF PRODUCTION AND MATERIALS MANAGEMENT
AND HANFORD PLANT ASSISTANCE PROGRAMS

ASSISTANCE TO ATLANTIC RICHFIELD HANFORD COMPANY

Summary

PROCESS TECHNOLOGY - DEVELOPMENT ENGINEERING DEPARTMENT

Storage of High-Level Liquid Wastes

Tank Integrity

Tests are in progress to determine current distribution in a simulated cathodically protected mild steel waste tank as a function of the number and placement of the anodes. Results to date indicate adequate current distribution can be obtained with six equally spaced anodes. Tests are continuing to determine the suitability of stainless steel as an anode material.

The electronics portion of a field prototype "point probe" inspection system was fabricated. An initial probe system was built. Work on the program has been terminated at the sponsor's request.

Leak Detection

Liquid-Level Measurement

The breadboard ultrasonic logging system for detection of liquid level in waste storage tanks is ready for field installation. Installation is being delayed until the "wet wells" are in place. Initial design of the prototype electronics system has begun.

The electronic probe which is to be tested in Tank 111S for liquid-level monitoring is being fabricated. The current design provides for salt cake penetration.

External Measurements

The test installation (BX Tank Farm) for detecting waste tank leaks through changes in electrical transmissivity of soil is in operation. Conclusions based on data taken to date are presented.

Work on soil impedance measurement involved evaluating available equipment, contacting vendors capable of providing total system capability, evaluating previous tank farm data, acquiring new data and simulating steel probe, soil and tank circuits in the laboratory.

PROCESS TECHNOLOGY - RESEARCH DEPARTMENT

Soil Characteristics in Z-Trenches

In a soil sample from the 216-Z1A-a tile field, glassy groundmass was much less stable to altering solutions than was crystalline feldspar though the two were nearly identical in chemical composition. A portion of the plutonium in the altered area may be present as a plutonium silicate.

Tank Farm Support

Data obtained from analysis of S and T tank farm soils have been stored in the data retrieval system.

Analysis of hydraulic properties has begun on soil samples for characterization of soil classes in 200 East and 200 West Areas tank farms.

Prevention of Accidental Releases

● Surficial Contamination and Airborne Release Studies

The fractional airborne release of Cs-137 during the heating of contaminated B-C crib control area surface materials at a temperature of 400°C, as in earlier experiments, was low -- in the range of 0.003 to 2.9 percent.

Further analysis of the basic equations which describe the downwind concentrations of airborne material resuspended from the B-C crib control area

showed that the distribution of resuspended air contamination is a function only of the ratios of resuspension rate to average wind speed, and deposition velocity to average wind speed.

Samples of surface soil and vegetation from U-pond area selected for radiochemical assay will be homogenized, a necessary step prior to detailed radiochemical analysis.

Am-241 measurements became available for filters from air samplers operated at U-Pond from May 13 through June 17, 1974. However, they are all in question due to instrumentation or computer software malfunction.

An analysis in which aircraft-measured concentrations in a plume of SF_6 were compared with concentrations predicted from a plume model showed aircraft-measured concentrations to be somewhat higher than predicted, but the difference was believed due to the instantaneous nature of the aircraft samples.

A visual count with photographic record of dust devils in a prescribed area on the reservation showed eleven dust devils per hour in a few acres observed. The interim report on this study is in preparation.

Groundwater Management Studies

Four topical reports covering the boundary conditions and assumptions on the primary models used in the transport modeling effort were completed and submitted for review.

Error and sensitivity analysis on the Transmissivity Iterative Routine have resulted in improved procedures.

Several information retrieval system programs are operative allowing access to a large bank of accumulated Hanford well data.

Monitoring of moisture contents in the lysimeter soil has continued.

A document, "Assumptions, Input Parameters, and Limitations of the PERCOL and Chemical Portion of the MMT Model" was completed and submitted to ARHCO for review.

A planning document entitled, "Soil-Waste Relationships Planning Document for July 1974 to July 1975," was submitted to Dr. Raul A. Deju, ARHCO consultant in hydrology, for comment.

ASSISTANCE TO ATLANTIC RICHFIELD HANFORD COMPANYPROCESS TECHNOLOGY - DEVELOPMENT ENGINEERING DEPARTMENTStorage of High-Level Liquid Waste● Tank IntegrityCorrosion Studies

(R. F. Maness, Corrosion Research and Engineering Section)

Tests are in progress to determine probable current distribution in a cathodically protected waste storage tank as a function of the number of anodes used and their placement. Data obtained to date were obtained using a flat bottom 2 ft dia. mild steel tank containing a dilute salt solution with conductance (25 ohm-cm) similar to solidified waste. Stainless-steel anodes (1/8 in. dia.) were used and the average cathodic current density was held constant at 10 amp/ft². Potentials were measured at various positions in the tank vs a saturated calomel electrode (SCE) using a Luggin capillary. The tank was used in the as-fabricated condition. It was filled with a dilute salt solution (0.01M NaOH - 0.01M NaNO₃ - 0.01M NaNO₂) and allowed to stand for two weeks prior to use. Before the application of a polarizing current the potential of the tank was -260 mv (vs SCE) at all positions. The worst current distribution was obtained with a single central anode and the best with six equally spaced anodes 4 in. from the side and 2 in. from the bottom. Under these conditions the potential range was about -900 to -960 mv. The effect of using more than six anodes on current distribution was slight. The use of four equally spaced anodes would not be unreasonable. Assuming six 1 in. dia. anodes with an immersion length of 24 ft and an average cathodic current density of 10 amp/ft² the anodic current density would be 3 amp/ft². Platinized titanium anodes can be operated with a current density in excess of 100 amp/ft² in many environments. Therefore, stainless-steel anodes are being investigated for use in solidified waste. An accelerated test with 308L rod at a current density of 20 amp/ft² in aliquots of simulated solidified waste at 60°C which contained 10, 15, and 20 wt% water resulted in severe attack in all cases. A high-resistance dry salt cake

formed on the anodes which resulted in a very-high anode temperature. Tests are in progress with a current density of 4.5 amp/ft^2 .

Mild steel coupons exposed to simulated solidified waste in sealed mild steel containers at 60 and 90°C were examined after 22 exposure months. Corrosion rates as evidenced by weight loss ranged from 0.7 to 4.7 mils/year. The maximum pit depth observed was 20 mils.

Detection of Stress Cracks in Tank Walls
(G. J. Posakony, Nondestructive Testing Section)

The electronics portion of the field prototype "point probe" inspection system has been fabricated. Initial laboratory tests of the electronics system have demonstrated the satisfactory operation of the system. An initial "needle point" inspection probe assembly has been built and assembled. Initial tests with the probe assembly have been successful.

Work on this program was stopped early in August and the program is currently being reviewed to establish its priority with respect to other areas of work.

● Leak Detection

Liquid Level Measurement - Ultrasonic Techniques
(G. J. Posakony, Nondestructive Testing Section)

Some minor improvements and modifications were made to the breadboard electronics system for ultrasonic measurement of liquid level in waste tanks. These changes will allow application of higher drive voltages to the transmitter transducers. A set of three matched ultrasonic transducers was fabricated and checked out in the laboratory in simulated wet-wells. The entire breadboard ultrasonic logging system was tested under simulated waste tank conditions with satisfactory results. The breadboard system is presently available for field installation which will occur as soon as the wet-wells are installed in the waste tank. Some delays have been encountered in obtaining the tubing material needed for fabrication of wet-wells to be installed in the waste tank. Efforts by ARHCO are currently underway to locate and procure the needed tubing. In-tank tests of the breadboard ultrasonic logging

system are being delayed until the wet-wells are in place. Laboratory testing of the system is continuing.

Work was started on design of a prototype ultrasonic logging electronics system. The signal processing and data storage requirements are currently under review, with special consideration being given to methods for automated (computer controlled) data retrieval and analysis. Ultrasonic transducer design considerations are being reviewed.

Electronic Techniques for Liquid Level Measurement (O. H. Koski, Chemical Development Section)

The electronic probe which is to be tested in Tank 111S for liquid level monitoring is being fabricated. Recent changes in the tentative design resulted from an anticipated salt cake of unknown depth. The probe design must, therefore, be rigid and, with the assistance of purge water, be able to penetrate the salt cake.

Provisions for four data sources on the probe are being made. Two will be designed to give liquid level, one for liquid-solid phase characteristics and one for radiation and temperature effects. Other data points for the total system would then include seven values associated with a second liquid level probe and span and zero calibration values.

Field checks on system operation will be made with a capacitance measuring system capable of five digits resolution of capacitance.

● External Measurements

Soil Conductance (E. M. Woodruff, Corrosion Research and Engineering Section)

A concept for improved waste tank leak detection based on electrical transmissivity changes in soil surrounding a waste tank is being investigated. Tests were continued under tank farm conditions with an installation in the BX tank farm involving a tank with a leak history, a tank with a well in close proximity for fluid injections and tanks with no-leak history. Current activity involves evaluation of tank farm readings, efforts to clear a plug found in the well to be used for water injection, and design of a permanent installation.

A report issued by Boeing Aerospace Company on July 31, 1974, summarizes results obtained from the BX tank farm installation. Their conclusions follow:

1. Feasibility of establishing a stable AC potential gradient between a test tank and the remainder of a tank farm has been confirmed and individual tank isolation has been demonstrated.
2. Feasibility of sensing tank-to-tank voltage for amplifier feedback has been established. A method of mutual inductance cancellation utilizing precise conductor spacing is employed.
3. The source of an existing gross leak (water or salt solution) can be identified and patterned.

The BX tank farm installation is currently being monitored routinely and will be used to determine the quantity of leakage detectable when the plugged well is opened.

Soil Impedance

(O. H. Koski, Chemical Development Section)

During the report period, available equipment was evaluated, vendors capable of providing total system capability were contacted; previous tank farm data were evaluated; additional tank farm data were acquired; and steel probe, soil, and tank circuits were simulated in the laboratory.

- Equipment Evaluated

ESI Model 275 - 0.1% accuracy results not applicable

ESI Model 251 - 0.25% accuracy results conditionally applicable

- Vendors Contacted

Foxboro - total systems capability - requires adaptation of their conductivity bridge to the problem. They are evaluating this possibility and expect to provide a no-cost unit for field evaluation.

Environmental Systems - a conductivity device based on resistance to frequency conversion. They will supply a test unit for no cost for evaluation.

- Impedance measurement data obtained at a tank farm disclosed that some instability, both short and long term, may arise from apparent polarization potentials developed from the tank and steel wells when in contact with an electrolyte, either ground moisture or leaked tank contents. A test was performed to determine short-circuit currents for the various circuits from well-to-well and tank-to-well. The results showed currents in the milliamp range for the leaked tank and from the tens to on the order of 100 microamps for the suspected and sound tank. Simulation of the soil and well system using mild steel rods, sand and caustic sodium nitrate showed that potentials up to 500 mV DC may develop between electrodes. Imposing AC power on the electrode system showed that the AC current and voltages were linear except when current limited at an electrode at which point a characteristic of the wave form suggested a poor rectifying junction or coulometric-type reaction.

Although the field observations regarding short-circuit current may be values largely influenced by a cathodic protection potential applied to the tank, the implied value of the observation would suggest the applicability of a DC field potential, a DC amperometric, or a coulometric measurement method. Although polarization potential would exist, limiting values of short-circuit current would be expected. Additionally, a DC field potential method would supply polarity information which would result in easier data analysis and simplified data acquisition.

PROCESS TECHNOLOGY - RESEARCH DEPARTMENT

Soil Characteristics in Z-Trenches

Characterization of 216-Z1A-a Tile Field Sediments (L. L. Ames, Water and Waste Management Section)

A topical report was prepared on the alteration found in soil sample 1-6, taken at a depth of 5.9 ft. in the 216-Z1A-a well. The differences in chemical stability of crystalline plagioclase feldspars and glassy groundmass of nearly the same gross chemical composition to the same altering solution were marked.

The glassy groundmass was changed much more from its original composition as shown by elemental scans across the altered area into the original glass composition. Actinide elements were concentrated in this same area of glass alteration. A portion of the glass structure itself was removed while the crystalline feldspars underwent a relatively mild hydrolysis reaction only. Removal of aluminum from the glass aluminosilicate framework leaves the remaining silica very reactive. Binding of a portion of the plutonium in a plutonium silicate is a possible reaction.

Tank Farm Support

Hydraulic Properties of Hanford Sediments (S. J. Phillips, Resources Systems Section)

Analysis has begun on samples obtained for characterization of soil classes in the 241-SX and 241-TX tank farms. These analyses are part of the tank farm sediment characterization program.

The data display of previously determined fluid retentivity curves has been delayed in order that the display page format be reduced in size as requested by ARHCO. Facilitation of this format change will be completed on the adjustable scale Gould electrostatic printer.

A report on laboratory procedures used in the measurement of hydraulic properties of Hanford sediments is in the review process.

Prevention of Accidental Releases

- Surficial Contamination and Airborne Release Studies

B-C Crib Studies

(J. Mishima and L. C. Schwendiman, Particulate and Gaseous Waste Research Section)

Potential Airborne Release of Contaminated Surface Material During Heating

With the completion of 16 runs at 600°C involving the various types of contaminated surface materials collected in the B-C crib control area, the design experimental program has been completed. Remaining samples have been submitted for analysis.

All Cs-137 measurements on samples from experiments at 200°C and 400°C have been received and continue to indicate that fractional airborne release of this radionuclide under these conditions is low. The measured Cs-137 content of the filters and bubbler samples collected indicate a positive response at the lower level of the gamma spectrometer range (10 to 20 dpm). Since the quantities measured in all filter and bubbler samples were nearly the same, the fractional release calculated is determined by the quantity found in the residue. Fractional release values calculated ranged from 3×10^{-5} to 2.9×10^{-2} .

Results have been received for Sr-90 analysis on samples taken during charring experiments at 200°C and 400°C. In some cases, greater than order of magnitude correlations are found between the Sr-90:Cs-137 ratios calculated for the source material and residue. In most cases, Cs-137 recoveries exceed the quantity calculated present using the specific activity for the source material. Thus, the Sr-90 contents measured are considered reasonable estimates and in general agree reasonably well with calculated values.

Safety Analysis of B-C Area Contamination

Calculation of resuspension factors, the ratio of air concentration to local surface concentration, for the B-C crib area have shown them to be usefully constant for a given set of conditions on the upwind portion of the surface contamination pattern, i.e., up to the contamination maximum, but much more variable on the downwind side of the contamination pattern. Analysis of the basic equations has shown that the distribution of resuspended air contamination, χ , is a function only of the ratios

$\Lambda/\bar{u}$ and $v_d/\bar{u}$ and not of Λ , $\bar{u}$ and v_d independently. Here Λ is a resuspension rate (sec^{-1}), $\bar{u}$ is the mean wind speed (m/sec) and v_d is a deposition velocity (m/sec). χ , of course, is also a function of atmospheric stability and the surface contamination pattern G . A very limited number of case studies has shown that for neutral atmospheric stability the resuspension on the upwind side of the B-C crib contamination might be described by an equation like

$$K = \frac{\chi}{G} \approx \frac{100 \frac{\Lambda}{\bar{u}}}{1 + 100 \frac{v_d}{\bar{u}}}$$

This equation describes the analysis to date and has some reasonable asymptotic limits. For zero deposition it becomes

$$\chi \approx 100 \frac{\Lambda G}{\bar{u}}$$

which is to be expected for a simple diffusion process. For very large deposition it becomes

$$\Lambda G = v_d \chi$$

which simply says that the deposition is locally equal to the resuspension.

These results are encouraging for a simple description of resuspension from the B-C crib area, but are based on only a small number of cases. Numerous additional cases will be run to pursue this further.

U-Pond Contamination Studies

(L. C. Schwendiman and J. Mishima, Particulate and Gaseous Waste Research Section)

Samples of organic materials (litter and dried vegetation) collected from the area around U-pond were submitted to the ARHCO Analytical Laboratory for homogenization. Preliminary samples for a spectrum of radionuclides will be submitted after homogenized material is received.

Resuspension from Contaminated Surfaces - Field Studies
(G. A. Sehmel, Particulate and Gaseous Waste Research Section)

Radiochemical measurement data became available during the month on filters from air samplers operated around the U-Pond from May 13 through June 17, 1974. Air was sampled only when the air was blowing from the west (170 to 340°) across U-Pond. Initial measurements on one downwind filter installed one foot above the ground indicated an average airborne Am-241 concentration of $8 \times 10^{-12} \mu\text{Ci}/\text{cm}^3$ during 50.82 hr of sampling at wind speeds greater than 3 mph during May 16 to 20, 1974. Subsequently this filter has been measured on two different highly sensitive detectors. Am-241 was found to be below the detection limits for these detectors which corresponds to an average airborne Am-241 concentration $\leq 3 \times 10^{-15} \mu\text{Ci}/\text{cm}^3$. The cause of the erroneous high value has not been clearly identified but it presumably originated from an instrumental or computer software malfunction.

A program has been instituted of interlaboratory confirmation of any transuranium isotope measurement on air samples which indicates a significant quantity of plutonium or americium. The Maximum Permissible Concentration (air) for Am-241 is $6 \times 10^{-12} \mu\text{Ci}/\text{cm}^3$ for a 40-hr week (occupational) or $2 \times 10^{-12} \mu\text{Ci}/\text{cm}^3$ for continuous exposure (168-hr week).

All other measurements on the air sampler filters collected at U-Pond in the May 13 to June 17, 1974 interval indicated average Am-241 airborne concentrations one to three orders of magnitude lower than for the filter discussed above. However, these measurements were made with the same detectors as used for the initial measurements on that filter. The filters were not remeasured using the more sensitive detectors. Hence, all of these measurements are very probably biased to the high side due to the malfunction of instrumentation or computer software. They are considered questionable and cannot be used to draw conclusions on resuspension of Am-241 from the area as a function of windspeed and direction.

The filters from test U-8 of U-Pond using the 100 ft tower to determine changes of airborne activity with height were removed for analysis. Filters are being assembled for the next experiment. The wind-direction controller for the air samples is still being repaired. The resuspension experiment at B-C crib area is continuing.

Potential for Airborne Release During Interim Processing and Storage of High Level Wastes

(L. C. Schwendiman, J. Mishima and S. L. Sutter, Particulate and Gaseous Waste Research Section)

This investigation was initiated with a review of documentation on various procedures proposed for the interim storage of high level wastes as a prelude to formulating an experimental program to evaluate the potential airborne release from accidents during processing.

Wind Trajectory Studies

(D. L. Elliott, M. M. Orgill, W. E. Sandusky, and L. L. Wendell, Atmospheric Sciences Department)

Concentrations were calculated from a standard plume model for comparison with the concentrations in the two SF₆ plumes sampled by aircraft under stable conditions. As in the earlier tests it was found again that the aircraft-measured concentrations were somewhat higher, because they were instantaneous samples while the model results represent average conditions over at least a ten-minute period. The dilution with travel distance, however, showed the same characteristics in both the measured and the modeled results.

First preparations were completed on a paper entitled "Transport and Diffusion Measurements with an Airborne Gas Chromatograph," by M. M. Orgill, R. N. Lee, L. L. Wendell, and P. W. Nickola, for presentation at the American Meteorological Society Symposium on Atmospheric Diffusion and Air Pollution at Santa Barbara, California on September 9-12, 1974. It will appear in the proceedings of the conference.

The temperature sounding device received from Argonne National Laboratories was sent to the Hanford radio shop for frequency testing.

The editing program for the telemetry data has been completed. It is now producing, from raw telemetry coded data on punches cards, edited temperature and wind speed data on punched cards for use in future analyses.

Significance of Dust Devils and Anomalous Winds

(L. C. Schwendiman and M. M. Orgill, Particulate and Gaseous Waste Research Section)

The frequency of occurrence of dust devils was determined in an area of several acres on August 9. Eleven dust devils per hour were observed in an

area of 3 to 4 acres northwest of the 300 Area near, but not within, burned over terrain. Dust devils were photographed for future compilation of frequency and size. The summer of 1974 proved to be atypical and not conducive to frequent dust devil development. An interim report on this research is underway.

- Groundwater Management Studies

Groundwater Model and Data Storage and Retrieval

(K. L. Kipp, A. E. Reisenauer, C. R. Cole, D. R. Friedrichs and D. D. Hostetler, Resources Systems Section)

Four documents were written and submitted to ARHCO personnel and their consultants for review. These are:

1. Variable Thickness Transient Model Assumptions and Boundary Conditions - by C. R. Cole
2. Partially-Saturated Transient Flow Model Boundary Conditions and Assumptions - by A. E. Reisenauer
3. Transmissivity Iterative Calculation Routine Assumptions and Implications - by K. L. Kipp
4. The Macro-Micro-Transport Model - Assumptions and Boundary Conditions - by S. W. Ahlstrom

Error and sensitivity analyses on the Transmissivity Iterative Routine have examined the variation of parameters of flow tube deviation angle, step adjustment factors and step reduction adjustments. The optimum combination was selected for the test surfaces. A sensitivity to placement of reference lines was uncovered and procedures were established to minimize these errors.

The first phase of the well based data selection routine was completed. This program enables the selection of all data types for any Hanford well. The well based portion of the retrieval system is operational with hydrographs, driller logs, well development activities (perforation, screen, casing and piezometer data) and contamination data currently available.

A new procedure for tabulating, filing, and checking data on disposal volumes and relating these flows to nodal positions in the Variable Thickness Transient model has been initiated. This procedure will minimize data errors and permit easy data verification.

Field Measurements and Monitoring Assistance
(K. L. Kipp and V. L. McGhar, Resources Systems Section)

Moisture content of the lysimeter soils was monitored with the neutron probe on August 6, 7, and 8 and again on August 28 and 29. A new set of measurement locations within the access tubes was adopted at the request of ARHCO personnel.

Soil-Waste Reactions
(R. J. Serne, Water and Waste Management Section)

A document, "Assumptions, Input Parameters and Limitations of the PERCOL and Chemical Portions of the MMT Model," was submitted to ARHCO personnel and their consultants for review.

Based on discussions with Dr. Raul A. Deju, ARHCO Consultant on hydrology, a document entitled, "Soil-Waste Relationships Planning Document for July 1974 to July 1975," was written and submitted to ARHCO personnel. Discussions with members of the ARHCO staff will resume September 3 when Dr. Deju returns.

All the data on soil characterization, B-Plant condensate waste and sorption data from columns and batch systems will be presented in a topical report which will be completed about September 16.

Data on the T-tank soil and synthetic wastes solution sorption capacities determined in 1973 were collected in preparation for writing a topical report on the studies.

TECHNICAL ASSISTANCE TO THE HANFORD PLANT

Summary

Environmental Evaluations

Several groundwater sampling wells have been dropped from the sampling schedule and will require replacement or structural modification. A limited survey of river island areas showed no significant changes in gamma dose-rates as a result of this year's high water.

Radiation Protection

The Cyber Visitor program went on production status generating the first set of reports for the period ending July 26, 1974.

Radiation Standards and Engineering

Effort is continuing to qualify bidders for the new Hanford CPs. A new alpha air monitor purchased for evaluation appears to be a useful instrument.

TECHNICAL ASSISTANCE TO THE HANFORD PLANT

Environmental Evaluations

(J. P. Corley, Environmental Evaluations Section)

A review of groundwater sampling well structures and associated water elevations was completed. Approximately 25 wells of the more than 300 in current use will require replacement or extensive modification and have been dropped from the routine sampling schedule. A cost estimate is being prepared.

A limited resurvey was made of river island areas for which ground surveys and the ARMS survey of April showed small increments in gamma dose rate (0.01 - 0.02 mR/hr) above the background level of 0.01 - 0.015 mR/hr. In general, the results were not significantly different either in areas submerged during the high water period or above this year's high water line. Nearly all of the areas in question are densely vegetated. Routine river samples have continued to show no radioactivity above detection level.

Radiation Protection

(K. R. Heid, Personnel Dosimetry Section)

The Cyber Visitor Program went on production status generating the first set of reports for the period ending July 26, 1974. Besides providing in-house reports for our use, it will furnish a report to each contractor of the visitors to their facilities during each report period. A report is prepared for the AEC and each AEC contractor of their personnel who were monitored during a visit to the Richland Operation. A second report is also furnished for each individual who has a recorded radiation exposure in excess of 50 mrem for the period.

Work was finally begun on the actual programming of the conversion of EXP from the 7090 to the Cyber during the month.

The JA Jones craft identification numbers are being entered into the third and fourth position of the existing suffix number of the EXP file. This will allow us to furnish Jones with totals by craft on their radiation exposure reports.

Engineering drawings for a proposed cadmium/copper lining for the iron room were completed. The lining, if installed, should reduce low energy background ($E < 80$ kev) significantly. If this proved out it would be advantageous to move the lung counter into the iron room.

Radiation Standards and Engineering
(J. M. Selby, Radiation Standards and Engineering Section)

Effort is continuing to qualify bidders for the new Hanford CPs. Two companies had submitted the required proposals and prototype instruments. A third company had submitted an incomplete technical proposal and no prototype. They are asking for a time extension in order to provide the prototype instrument.

A new alpha air monitor was received for evaluation. The instrument incorporates a second window in the radon compensation circuit. This is the first alpha air monitor available that theoretically can handle the varying radon background conditions experienced during an inversion. The unit checked out well in the shop and has been placed in the field to gain operational experience. A retrofit circuit board will be made available to upgrade the older alpha air monitors to the new specifications.

Meteorological Services
(E. H. Phinney, Synoptic Meteorology Section)

Meteorological services, viz., weather forecasts and observations and climatological services were provided to plant operations and management on a routine basis.

August 1974

<u>Type</u>	<u>No. Made</u>	<u>% Reliability</u>
Production Forecasts:	93	86.5
General Forecasts:	62	94.2
Special Forecasts:	184	95.6
Other Requests:	268	
Publications Distributed:	1	
Number of Calls Processed by Code-A-Phone:	<u>3,595</u>	
Total Service Actions:	4,203	

Copy
Number

-21-

BNWL-1865
UC-2
Special Distribution

OFF-SITE DISTRIBUTION

1-3	<u>USAEC, Washington-Division of Production</u> F. P. Baranowski	5	<u>AEC Chicago Patent Group</u> A. A. Churm
4	<u>USAEC Headquarters</u> J. L. Liverman, AGMBER		
(27 copies)	<u>Technical Information Center, Oak Ridge Tennessee</u>		
7	<u>Savannah River AEC Operations Office</u>		
8-9	<u>E. I. du Pont de Nemours & Company</u> <u>Savannah River Laboratory</u>		
10	<u>AEC Idaho Operations Office</u> K. K. Kennedy		
11	<u>Allied Chemical Corporation, Idaho Falls</u> J. A. Buckham		

ON-SITE DISTRIBUTION

	<u>AEC Richland Operations Office</u>		<u>Atlantic Richfield Company (cont.)</u>
12	O. J. Elgert	31	R. E. Felt
13	A. G. Fremling	32	R. D. Fox
14	P. G. Holsted	33	R. G. Geier
15	B. J. Melton	34	D. G. Harlow
16	R. B. St. John	35	W. M. Harty
17	F. R. Standerfer	36	H. H. Hopkins
	<u>United Nuclear Industries, Inc.</u>	37	W. P. Ingalls
18	J. R. Bolliger	38	R. E. Isaacson
19	P. A. Carlson	39	H. Jensen
20	R. E. Dunn	40	L. M. Knights
21	A. E. Engler	41	W. D. Luening
22	A. R. Maguire	42	C. W. Malody
23	N. R. Miller	43	T. R. McKenzie
24	R. S. Peterson	44	B. J. McMurray
25	R. K. Robinson	45	G. A. Nicholson
26	H. F. Tew	46	G. C. Oberg
	<u>Atlantic Richfield Company</u>	47	J. V. Panesko
27	G. E. Backman	48	K. R. Price
28	D. J. Brown	49	W. W. Schulz
29	L. E. Bruns	50	H. P. Shaw
30	M. H. Campbell	51	A. E. Smith
		52	R. E. Smith
		53	G. T. Stocking
		54	M. J. Szulinski
		55	W. J. Van Slyke
		56	D. D. Wodrich

ON-SITE DISTRIBUTION (continued)

Westinghouse Hanford Company

57 G. J. Alkire
58 A. G. Blasewitz

Battelle-Northwest

59 R. E. Burns
60 E. D. Clayton
61 J. P. Corley
62 J. R. Eliason
63 R. F. Foster
64 T. R. Garland
65 K. M. Harmon
66 H. L. Henry
67 G. Jansen
68 J. H. Jarrett
69 J. L. McElroy
70 J. E. Minor
71 R. E. Nightingale
72 D. E. Olesen
73 W. D. Richmond
74 W. H. Rickard
75 R. C. Routson
76 L. C. Schwendiman
77 G. A. Sehmel
78 A. J. Shuckrow
79 C. L. Simpson
80 W. G. N. Slinn
81 R. I. Smith
82 H. H. Van Tuyl
83 B. E. Vaughan
84 D. G. Watson
85 R. E. Wildung
86 R. K. Woodruff
87 J. R. Young
88-90 Technical Information Files
91 Technical Publications