Brookhaven Graphite Research Reactor (BGRR) Decommissioning Project

ACTIVITY CLOSURE REPORT FOR WASTE WATER SHIPPING AND DISPOSAL

January 3, 2000

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES
Under Contract No. DE-AC02-98CH01886 with the
UNITED STATES DEPARTMENT OF ENERGY

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Attachment 1 — Letter, W.E. Gunther to K.D. Helms, dated October 31, 1997
Subject: Transmittal of Interim Safety Evaluation for the Temporary Storage of BGRR Vent Duct Water at the Waste Management Facility

Attachment 2 — Technical Work Document
Transfer and Storage of BGRR Water, dated November 3, 1997

Attachment 3 — Safety Evaluation Form for Unreviewed Safety Question (USQ) Determination (WMF-SE-97-03), dated November 6, 1997

Attachment 4 — Letter, K.D. Helms to W.E. Gunther, dated November 6, 1997
Subject: Interim Safety Evaluation of the Temporary Storage of BGRR Vent Duct Water at the Waste Management Facility

Attachment 5 Letter, K.D. Helms to W.E. Gunther, dated November 21, 1997
Subject: Unreviewed Safety Question/Safety Evaluation (USQD/SE) for Temporary Storage of BGRR Vent Duct Water at the Waste Management Facility (WMF)

Attachment 6 Letter, K.D. Helms to W.E. Gunther, Dated November 24, 1997
Subject: Conditional Approval on BGRR Pumping Operation

Attachment 7 Technical Work Document
Transfer and Storage of BGRR Water, Revision 1
dated November 25, 1997

Attachment 8 Work Instruction for Pumping out the Accumulated Water in the BGRR Instrument House and South and North Drain Cooler Sumps

Attachment 9 Letter, M. Schlender to S. Mallette, dated October 19, 1998
Subject: Temporary Storage of BGRR Air Cooling Duct Water at the Waste Management Facility

Attachment 10 Memo, A. MacIntyre to Distribution, dated November 5, 1998
Subject: Temporary Structure for BGRR Frac Tanks

Attachment 11 Memo, J. Eckroth to A. MacIntyre, dated December 3, 1998
Subject: ES&H Plan Review – Temporary Tent for BGRR Water Storage Tanks

Attachment 12 Memo, A. MacIntyre to J. Eckroth, dated December 9, 1998
Subject: Response to ESH Comments – BGRR Tent Structure

Attachment 13 Memo, F. Petschauer to A. MacIntyre, dated December 11, 1998
Subject: Memorandum of Understanding (MOU) for BGRR Water Storage at WMD

Attachment 14 Letter, M. Schlender to S. Mallette, dated January 27, 1999
Subject: Temporary Storage of the BGRR Air Cooling Duct Water at the Waste Management Facility

Attachment 15 Letter, S. Mallette to M. Schlender, dated March 4, 1999
Subject: Temporary Storage of the BGRR Air Cooling Duct Water at the Waste Management Facility

Attachment 16 Liquid Sample Analysis - BGRR/WMF Frac Tanks Inventory as of March 4, 1999

Attachment 17 Letter, P.K. Jackson to S. Mallette, dated March 24, 1999
Subject: BGRR Activity Authorization Request: Waste Water Disposal

Attachment 18 Letter, G. Malosh to M. Schlender, dated April 15, 1999
Subject: Authorization to Conduct Waste Water Disposal and Remove Museum Walls and Material from the Brookhaven Graphite Research Reactor (BGRR)

1.0 INTRODUCTION

1.1 Purpose

This activity closure report provides a compilation of the information that was used to develop and execute the Contractor Work Breakdown Structure (CWBS) for the shipment and disposal of the stored radioactively contaminated water removed from the below ground primary air ducts of the Brookhaven Graphite Research Reactor (BGRR) primary air cooling system in the deep drain sump.

1.2 Removal Authority

Removal, shipment, and disposal of the contaminated water was authorized by Department of Energy (DOE) Brookhaven Group letter dated April 15, 1999, Subject: Authorization to Conduct Waste Water Disposal and Remove Museum Walls and Material from the Brookhaven Graphite Research Reactor (BGRR) (Attachment 19).

2.0 SITE DESCRIPTION AND HISTORY

2.1 Brookhaven National Laboratory

Brookhaven National Laboratory (BNL) is located in Upton, Long Island, New York, near the geographic center of Suffolk County, approximately 60 miles east of New York City (Figure 1). Approximately 1.32 million people reside in Suffolk County and about 0.41 million people reside in Brookhaven Township, within which BNL is situated.

The BNL facility contains 5,265 acres (8.23 square miles). BNL terrain is gently rolling with elevations varying between 44 and 120 feet above mean sea level (amsl). The land lies on the western rim of the shallow Peconic River watershed, with a principal tributary of the river in the north and west sections of BNL.

BNL's principal facilities are located, with few exceptions, near the geographic center of the site. They are contained in an area of approximately 900 acres, of which about 500 acres were originally developed for U.S. Army uses. The remaining 400 acres are occupied, for the most part, by various large research facilities. Outlying facilities occupy about 550 acres and include apartment areas, biology research fields, a solid waste management area, closed landfills, a sewage treatment plant, and firebreaks. The balance of the site, approximately 75 percent of its total area, is largely wooded. The BNL site, formerly known as Camp Upton, was used by the U.S. Army during World Wars I and II as a Civilian Conservation Corps Camp between the wars. In 1947, ownership was transferred to the Atomic Energy Commission for peaceful research on atomic energy and materials. The site was subsequently transferred to the Energy Research and Development Administration in 1975, and finally to the DOE in 1977. These later transfers were the result of agency name changes, not changes in occupancy or function.

Figure 1. BNL Location Map

BNL carries out basic and applied research in the fields of high-energy nuclear and solid state physics; fundamental material and structure properties and the interactions of matter; nuclear medicine, biomedical and environmental sciences; and selected energy technologies.

2.2 Brookhaven Graphite Research Reactor

The Brookhaven Graphite Research Reactor (BGRR) at BNL was the first reactor built for the sole purpose of providing neutrons for research. During its years of operation it was one of the principal research reactors in the United States. Construction on the BGRR was completed in August 1950, and initial criticality of the reactor was achieved the same month. The BGRR operated until June 10, 1968 when operation of the reactor was terminated and deactivation of the facility was initiated. In June of 1972, defueling

and shipment of the fuel to the DOE Savannah River Site was completed. The BGRR complex was described as being in a safe shutdown condition by the U.S. Atomic Energy Commission and became a Surplus Facility within the DOE complex. From 1977 until 1997, portions of the facility were used as the BNL Science Museum.

The BGRR was an air-cooled graphite moderated reactor. The Primary Air Cooling System utilized cooling fans that were located in a building (704) separate from the reactor building (701). Exhaust ducting constructed of reinforced concrete runs in two separate ducts below the ground from the reactor exhaust plenums to the system cooler and filters. Downstream of the filters the ducting rises above the ground and combines into one large duct, which is located on, and supported by, the Fan House (704). The individual cooling fans took suction through 48-nch diameter ducts, which penetrated the building roof and connected at the duct bottom. There is approximately 225 feet of above grade ducting. An aerial photograph of the BGRR site is shown in Figure 2.

During reactor operations, filtered outside cooling air was drawn across the reactor pile through this ductwork by the fans where it was cooled, filtered and eventually exited through the 100-meter-tall exhaust stack.

Figure 2. BGRR Site – Looking North

2.3 Waste Water Background

In the Fall of 1997, during the performance of a Facility Review of the BGRR, approximately 57,500 gallons of contaminated water was discovered in the underground portion of the primary air cooling duct work of the deep drain sump. The underground portion of the duct work extends to the north from the south wall of Building 701 and to the south of the building approximately 165 feet, where it exits the ground east of the Instrument House (Building 708).

In November 1997, conditional approval was granted for pumping the water from the below ground ducts and transferring it to temporary storage tanks prior to ultimate shipment and disposal. Initially, approximately 20,000 gallons of contaminated water was shipped and disposed of at an approved off-site processing facility. The 20,000 gallons of waste water was shipped via tanker truck in lots of 5,000 gallons per shipment. Shipments began on August 18, 1998 with the fourth shipment concluding on November 6, 1998.

The remaining contaminated water pumped from the underground cooling air exhaust duct work, approximately 35,700 gallons of water, was stored at the BNL Waste Management Division (WMD) facility in two temporary storage tanks that have been covered with a leased temporary structure. WMD technicians and supervision performed necessary surveillance and monitoring of the stored water.

In January 1999, a request to extend the temporary storage time for the water at the Waste Management Facility was approved March 4, 1999 by DOE/BHG for continued storage of waste water through September 1999 (Attachment 15).

3.0 REMOVAL ACTIVITY

3.1 Objectives

3.1.1 Dispose of stored contaminated water.

3.2 Removal Activity

The work was performed following authorization on April 15, 1999 by letter from G. Malosh, Brookhaven Group Manager to M. Schlender, Brookhaven Science Associates, Subject: Authorization to Conduct Waste Water Disposal and Removal of Museum Material from the Brookhaven Graphite Research Reactor (BGRR).

Approximately 35,700 gallons of water removed from the BGRR primary air duct was stored at the Waste Management Facility.

Following approval of the authorization request to dispose of the water in the temporary storage tanks the contents of the tanks were transferred into a tanker truck that transported the water in approximately seven, 5,000 gallon loads to the waste processor for disposal. Waste water shipments resumed in May 1999 with the seventh and final shipment being completed in July 1999. The method of disposal was by incineration.

3.3 Final Conditions

Following the waste water shipment and disposal activities, water intrusion monitoring of the below ground ducts, repair, and waste water pumping in small quantities continues from the north cooler drain sump.

A surveillance and monitoring activity to monitor the water level in the North Cooler Drain sump insures there will be no water intrusion into the underground ducts. Water level in this sump is monitored every two weeks or when there is rainfall in excess of one inch. When water level increases in the sump, the temporary water intrusion repair measures are inspected for a breach and repaired. The sump is pumped into 55-gallon drums if the water level increases to 15 inches, ± 2 inches. The waste water is then transported to the Waste Management Division for processing and disposal.

3.4 Activity Cost

The cost of the activity was $844,522. This cost includes the cost for shipping and disposal of the total amount of waste water, approximately 57,500 gallons. The cost includes planning, execution, and closure of the activity.

4.0 WASTE MANAGEMENT

There were a total of three temporary storage tanks staged in secondary containments in the WMD yard. The tanks were protected during the winter months by a temporary enclosure that was erected over the tanks. Heat and emergency powered was provided to prevent freezing of the waste water.

The waste water was transferred from the temporary storage tanks to the tanker for shipment and disposal.

5.0 LESSONS LEARNED

- Communications is one of the lessons learned during the performance of this activity. Whenever, physical work is planned it is necessary to communicate to the affected divisions the work that is planned, the expected duration and any potential affects that may result from the activity.

- During the performance of this activity, no waste water was inadvertently spilled. Each time waste water was transferred or pumped, extra effort was exerted to insure secondary containment was in place to prevent the spill of water. All fittings were double-checked before any pumping operations began. All hoses were capable of being drained of water before any connections were opened. Good planning and organization resulted in no water being spilled during the many waste water transfer operations.

ATTACHMENT 1

BROOKHAVEN NATIONAL LABORATORY
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P.O. Box 5000
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Office of the Director

October 31, 1997

Mr. K. Dean Helms
Executive Manager
U.S. Department of Energy
Brookhaven Group
Upton, New York 11973

Dear Mr. Helms:

SUBJECT: Transmittal of Interim Safety Evaluation for the Temporary Storage of BGRR Vent Duct Water at the Waste Management Facility

To expedite the dispositioning of the Brookhaven Graphite Research Reactor (BGRR) underground vent duct water inventory, the attached Interim Safety Evaluation is offered for review and approval, while in parallel the development of a full and complete Safety Evaluation for Determination of Unreviewed Safety Question is ongoing.

It is anticipated that the ability to transfer water (establishing compliance and/or consensus with various regulatory interests) will precede the completion of the full Safety Evaluation.

The Interim Safety Evaluation has already received informal though extensive review and comment from DOE-BHG staff.

If you have any questions about either the Interim Safety Evaluation or the anticipated availability of the full and complete USQD/SE, please feel free to contact Steve Moss of the Hazardous Waste Management Section at Ext. 5724.

Sincerely,

Bill Gunther

W. E. Gunther
Interim Associate Director

WEG/SM/ajs
QW0220.97
Attachment

cc: W. R. Casey, w/o attachment
L. C. Emma, w/o attachment
S. Hoey, w/ attachment
P. Kelley, w/ attachment
R. McNair, w/o attachment
S. Moss, w/o attachment
L. Nelson, w/ attachment
F. Petschauer, w/ attachment
C. Polanish, w/ attachment
A. Tope, w/ attachment

INTERIM SAFETY EVALUATION FOR THE TEMPORARY STORAGE OF BROOKHAVEN GRAPHITE RESEARCH REACTOR (BGRR) AIR COOLING DUCT WATER AT THE WASTE MANAGEMENT FACILITY

INTRODUCTION

This interim safety evaluation (SE) was developed using the guidance of DOE Order 5480.21, Unreviewed Safety Question and HWM-ADM-910, Safety Evaluations for Unreviewed Safety Question Determinations. Due to the potential transfer of the Brookhaven Graphite Research Reactor (BGRR) radioactively contaminated air cooling duct water to the Waste Management Facility (WMF) in the immediate future, this interim SE was prepared. An Unreviewed Safety Question Determination (USQD) is currently being developed using HWM-ADM-910.

Although not necessarily needed for a SE, the following paragraphs in this section illustrates the administrative complexities, as opposed to safety issues (which have been evaluated as acceptable), associated with the transfer and storage of the BGRR air cooling duct water at the WMF.

Due to the BNL internal approval process required per HWM-ADM-910, the segmentation of the WMF (as described below), the dynamic nature of current events (publicly and politically) corresponding to the BGRR air cooling duct water, and the changing operating status of the WMF (described below), it was determined that this interim SE would allow for a more expedient DOE authorization for the temporary transfer and storage of the BGRR air cooling duct water to the WMF. Using HWM-ADM-910 could potentially delay the transfer of water should it be necessary to remove the water from the BGRR air cooling ducting in an urgent manner for environmental, safety, and health concerns. Although this SE was developed in lieu of a HWM-ADM-910 USQD, this SE meets the intent of HWM-ADM-910 and DOE Order 5480.21.

BACKGROUND

The WMF is a newly constructed facility. The WMF complex is segmented, physically and administratively, into two facilities: a "nuclear" facility as defined in DOE Standard 1027-92, and a non-nuclear facility. The determination as to whether a facility is "nuclear" or not is based on the inventory (curie content and amount) of radioactive material that exists or is expected to exist at the facility. The WMF "nuclear" facility is categorized by DOE Standard 1027-92 as a Category 3 facility. A Category 3 nuclear facility requires a certain minimum and maximum radionuclide inventory. The WMF "nuclear" facility includes the Reclamation Building, Mixed Waste Building, a portion of the Operations Building, and any land area that resides within the earthen berm, and the fence line. The non-nuclear facility, which is the remainder of the WMF, includes the RCRA Building, a portion of the Operations Building, and any land area that resides outside the earthen berm, but within the fence line. The temporary storage tanks (FRAC tanks) proposed for the BGRR water will be placed on the non-nuclear side of the WMF.

The WMF ("nuclear" and non-nuclear) is not yet authorized to commence full operations. Prior to commencing operations of the "nuclear" WMF, the Safety Analysis Report (SAR) is required to be approved by DOE AND the Operational Readiness Review (BNL AND DOE) must be completed AND the WMF must then be authorized for startup by DOE. Presently, the SAR has been approved by DOE, the BNL ORR is complete, and the DOE ORR is anticipated the week of November 10.

From a DOE compliance/regulatory and, above all, safety viewpoint, the non-nuclear side of the WMF could be presently used or "started" without the ORR. This is due to non-nuclear facilities not requiring a nuclear ORR (nor a SAR). The nuclear side requires the DOE approved SAR and ORR, and requires DOE authorization for startup.

However, there are prohibitions as described in the SAR, and described below, that limit actions on the non-nuclear side of the WMF. Hence, this SE has been prepared which verifies that the transfer and storage of the BGRR air cooling duct water does not pose an unacceptable risk to workers, the public, or the environment nor does it place the WMF, and its operation, in a condition that would adversely affect its safe operation.

It was with the above justification that BNL presented to DOE its plans to transfer and store the BGRR air cooling duct water at the WMF. Upon further discussions with DOE, when taking into account the urgency involved for the commencing of pumping the BGRR air cooling duct water and the other more lengthy ORR reviews and approvals as described above, it was concluded to store the BGRR air cooling duct water on the non-nuclear side of the WMF.

This interim SE includes an evaluation for the transfer and storage of contaminated BGRR vent duct water at the WMF only and does not include any evaluation of actions at the BGRR facility.

SAFETY EVALUATION

Due to the potential of upwards of 60,000 gallons of radioactively contaminated water in the BGRR flooded underground air cooling ducting leaking to the environment, the water will be transferred and temporarily stored in three (3) 21,000 gallon FRAC tanks (empty) located inside the fence line of the non-nuclear side of the WMF, between Bldg. 860, Operations Building, and Bldg. 855, RCRA Building. The FRAC tanks will be installed with dedicated secondary containment (meeting the intent of Suffolk County Article 12 requirements) capable of holding 66,000 gallons of liquid. The BGRR air cooling duct water will be disposed of elsewhere and should not require any treatment at the WMF. The storage of the water at the WMF is considered to be temporary and the water will be removed from the WMF when plans have been fully developed for its transfer to a treatment/disposal facility (in less than one year).

The radiological inventory (copy attached) contained, in solution, within the BGRR air cooling

duct water, represents less than 18% of the threshold required for a facility storing this water to be considered a Category 3 Nuclear Facility, as defined in DOE Standard 1027-92. As such, the storage of water with 18% of the threshold values, by DOE Standard 1027-92 definition, creates a Radiological Facility. All requirements associated with a Radiological Facility as described in 10 CFR 835 and the BNL RadCon Manual will be complied with.

The trace presence of fissile nuclides has been independently reviewed by both the BNL Criticality Safety Officer and the Reactor Safety Committee, with the determination that criticality concerns are not credible, nor is the introduction of a neutron poison (criticality controller) to the stored water warranted.

The FRAC tanks will be located outside of the berm, thus, on the "non-nuclear" side of the WMF. The SAR prohibitions against storage and/or transfer of radiological material on the non-radiological side of the WMF includes the following:

SAR Paragraph 4.10.2 - Radiation Control Philosophy which represents both an ALARA consideration and a method to preclude the accidental or inadvertent creation of a mixed waste. The projected dose rates expected for the tanks themselves when filled with the BGRR air cooling duct water is less than 5 millirem/hour (mR/Hr) on contact with the FRAC tanks. The secondary containment in which the FRAC tanks will be located will provide an additional separation between the tanks and any expected personnel near the tanks thus reducing exposure rates even lower. The personnel working on the non-nuclear side of the WMF (where the tanks will be located) are the same personnel that work on the nuclear side of the WMF. These personnel are radiation worker trained and qualified and have radiation dosimetry assigned to them. With the water being stored outside the RCRA Building, with no credible pathway for the stored water to enter the RCRA building, the criterion of SAR 4.10.2 will be met.

SAR Paragraph 4.1.2 - Principle Features which represents both a design feature and administrative control allowing the transfer and storage of any waste material only on paved and curbed areas, and only inside of buildings. The FRAC tanks will be located on a curbed, paved surface but the transfer and storage of the water will be outside of buildings. The WMF was designed with a completely isolable storm drain system complete with shutoff valves. The risk of temporary storage outdoors (especially in consideration of 1) the immersion heaters that will be installed in the FRAC tanks and 2) supplemental weather protection (e.g.,covers/tarps) to be provided for freeze protection) is much lower than the risk of creation of mixed waste by placing the FRAC tanks inside the RCRA Building and providing the potential for the creation of mixed waste. Additionally, special controls will be implemented to protect the contaminated water and the FRAC tanks to preclude tank leakage. These controls are specified in the Technical Work Document - Transfer of BGRR Water into Storage Tanks. The Technical Work Document includes requirements for worker radiological precautions (Radiation Work Permits - radiation signs, radiation surveys, barricades) during the actual transfer of the water from the transport vehicle to the FRAC tanks and during storage, providing for adequate leak protection for the hoses

during the transfer from/to the transport vehicle to/from the FRAC tanks, periodic inspections of the FRAC tanks, and precautions during the pumpdown of rainwater or other free liquid from the secondary containment (sampling requirements). Additionally, on a routine basis, BNL Security provides roving patrols of the area and the FRAC tanks are located within a fenced area.

The above provisions will be in place for the duration that the BGRR vent duct water is at the WMF. With these additional design features and administrative controls, the intent of Paragraph 4.1.2 will be met.

As a further action, an additional Abnormal Operations Assessment (copy attached) was performed which, while not originally considered to be within the scope of activities (i.e., temporary storage of a quantity of contaminated water) that would normally occur at the WMF, this Assessment clearly indicates that temporary storage of contaminated water is within the broader events and scenarios that were considered in the development of the SAR.

CONCLUSION

The temporary transfer and storage of BGRR air cooling duct water at the WMF will not increase the radiological risk to workers, the public, or the environment beyond acceptable and authorized levels.

REFERENCES

(1) Waste Management Facility - Final Safety Analysis Report.

(2) Technical Safety Requirements (TSR) for Waste Management Facility as approved by DOE on 9/18/97.

(3) Waste Management Facility - Operational Readiness Review (ORR) Implementation Plan as approved by DOE on 1/29/97.

(4) Waste Management Facility Procedure No. HWM-ADM-910, Safety Evaluation For Unreviewed Safety Question Determination, Rev. 0 dated 2/7/97.

(5) Radiological analysis of water sample(s) taken from BGRR underground vent duct.

(6) Design data on 20,000 gallon portable FRAC tank, including secondary containment.

(7) BGRR Underground Storage Vent Duct Inventory (copy attached)

(8) BNL E, S & H Standard 1.3.3, Safety Analysis Reports / Safety Assessment Documents, Rev. 1 dated 7/28/92.

(9) HWM Technical Work Document - Transfer of BGRR Water into Storage Tanks

ABNORMAL OPERATIONS ASSESSMENT

SYSTEM: WMF Facility [Temporary FRAC Tanks]

HAZARD: To On-site Personnel, Equipment, Program

Event:	FRAC Tank(s) Failure.
Possible Consequences & Hazards:	Radiation release to environment. Ground contamination. Exposure to radioactive materials through ingestion, inhalation, or dermal exposure. Groundwater contamination.
Potential Initiators:	Natural phenomena. manufacturer defect, missile strike, operator error.

Risk Assessment Prior to Mitigation	
Severity:	III - Marginal
Probability:	C - Occasional
Risk Category:	3 - Low Risk

Hazard Mitigation:	Secondary containment for spills or leaks. Protocol for daily inspection for visible leakage. Groundwater monitoring wells. Isolation valves for storm drain system Tank immersion heaters and supplemental weather protection Administrative controls in accordance with Technical Work Document - Transfer of BGRR Water into Storage Tanks.

Risk Assessment Following Mitigation	
Severity:	IV - Negligible
Probability:	D - Remote
Risk Category:	4 - Routine Risk

BGRR Underground Storage Vent Duct Inventory

1) 1 Liter = 0.26418 Gallons
60.000 Gallons = 227117.9 Liters

2)

ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Cat 3 Ci Limit	Threshold Fraction
Am-241	30.2	6.86E-06	2.00554E-06	55	1.247E-07	0.52	1.31903E-05
Pu-238	3.28	7.45E-07	4.35641E-08	62	1.202E-08	0.62	1.20153E-06
Pu-239/40	164	3.72E-05	0.000600763	56	6.651E-07	0.52	7.16295E-05
U-234	67.1	1.52E-05	0.002442245	220	6.927E-08	4.2	3.62848E-06
U-235	14	3.18E-06	1.472060296	240	1.325E-08	4.2	7.5706E-07
U-238	72	1.64E-05	48.6681159	240	6.814E-08	4.2	3.89345E-06
Cs-137	4.35E+06	0.987963		8.90E+04	1.11E-05	60	0.016466046
Ra-226	27.5	6.25E-06		55	1.136E-07	0.52	1.2011E-05
Sr-90	1.09E+07	2.475585		139	0.0[illegible]781	16	0.154724052
Tc-99	1.46E+04	0.003316		3.80E+06	8.726E-10	1.70E+03	1.95054E-06
H-3	5.00E+04	0.011356		3.00E+05	3.785E-08	1.00E+03	1.13559E-05
				SUM =	0.0178222	SUM =	0.171309715
				< 1.8% of Cat. 2 Threshold		< 17.2 % of Cat. 3 Threshold	

ATTACHMENT 2

TECHNICALWORK DOCUMENT

TRANSFER AND STORAGE OF BGRR WATER

November 3, 1997

Prepared by: _____ Date 11/3/97

Reviewed by: _____ Date 11-3-97

Reviewed by: _____ Date 11-4-97

Approved by: _____ Date 11/4/97

I Purpose/Scope

This Technical Work Document (TWD) specifies the controls and outlines the steps required for the transportation and offloading of the 60,000 gallons of contaminated water from the BGRR into three (3) 21,000 gallon FRAC tanks located at the Waste Management Facility (WMF) using one 7,000 gallon capacity tanker truck. The operational tasks covered in this TWD are listed below:

a. Set-up: Containment for pump and hoses, tank isolation valves, and tank heaters.
b. Transport: Tanker truck transport from BGRR 701 to the WMF and valve line-up for isolation of storm drains.
c. Pumping: Offloading of the tanker contents into FRAC Tank(s) and monitoring.
d. Post-Job: Post-job surveys of equipment and periodic monitoring of water in storage.

II Prerequisites

1. Each FRAC storage tank shall be leak tested prior to use.

2. Secondary containment systems shall be in place at the WMF tank storage and tanker offloading area near Bldg. 855.

3. An approved Radiation Work Permit (RWP) No. 62 HWM 97 has been prepared and specifies the required protective clothing, monitoring requirements and hold-points.

4. The South WMF storm drain isolation valve shall be CLOSED prior to transfer of each tanker truck.

5. Notify the HWM Operations Supervisor prior to each tanker transfer from Bldg. 701 into the WMF.

III Equipment Set-Up

1. The transfer pump and hoses shall be prepared as follows:
   a. The pump shall be placed inside of secondary containment.
   b. Hoses outside of containment shall be enclosed within PVC tubing, the outer ends of the PVC secondary shall terminate inside of tank containment areas.

2. Each FRAC tank shall be equipped with the following:
   a. One operational submersible heating element.
   b One isolation valve on the FRAC inlet connection.
   c. Cap or plug used to secure inlet connection when not in use.

IV. Precautions

1. In the event of leakage, uncontrolled releases (spills), high area dose rates, injury or personnel contamination :
   a. All transfer operations shall STOP.
   b. Fire/Rescue shall be notified (x 2222) - in the case of a spill or release outside of containment.
   c. The FS Supervisor shall be notified immediately.
   d. Continued operations will be evaluated by FS and the HWM Operations Supervisor.
   e. Verify that the South storm drain is closed, if a leak or spill occurs at the WMF.

V. Transport of Tanker Truck (from 701 to WMF)

1. Safeguards and Security Division (SSD) shall be notified (x2238) prior to movement of the tanker truck from Bldg. 701 to the WMF.

2. The H/L alarm shall be disconnected from the tanker and placed in a bag.

3. The tanker cover shall be secured using the provided latches.

4. The platform railing (Speed-Rail) shall be disassembled and removed (or secured on top of the tanker) prior to transport.

5. Unhitch the front gate of the tanker containment (if not already down).

6. Rollback the plastic fabric such that the incoming tractor wheels will not be in contact with the containment material during hook-up.

7. Verify that the South storm drain isolation is CLOSED at the WMF prior to transport from the BGRR.

8. Escort the tanker truck into the WMF via a pre-determined route (to be specified by the HWM Operations Supervisor).

9. Drop the gate on the secondary containment where the truck will be offloaded (at the WMF).

10. Guide the truck into place - being careful to avoid tearing the containment material during parking operations.
    a. The tractor should remain hitched to the tanker (for offloading durations of 3 hours or less).
    b. The tractor engine shall be shut-off when in position.

11. Secure the gate to the truck containment structure once the tanker has been parked.

VI. Pump-Out Into FRAC Storage Tanks

1. The HWM Operations Supervisor shall record the volume of water transferred into the WMF and verify that the capacity of the FRAC tank will not exceed 20,000 gallons (for each transfer).

2. Discharge and inlet hoses shall be secured in place and cam-lock connections shall be wrapped with tape or tie-wraps to prevent uncoupling.
   a. Place spill trays beneath the tanker discharge and FRAC tank inlet connections.
   b. Remove caps/plugs and connect hoses to fittings with care - practice contamination control.
   c. Hoses outside of containment shall be sleeved with PVC tubing.

3. Vent the tanker by removing the 2" plug next to the top cover.

4. Lift the internal tanker discharge plug by pumping the handle on the blue box (minor lever should be extended out the left).

5. Open the tanker discharge valve.

6. Open the FRAC tank inlet (isolation) valve connection.

7. Start pumping.

8. Continuously check for leaks during transfer operations.

9. Monitor the FRAC tank water level continuously during the transfer. Stop the pump when the tanker is empty or when the FRAC liquid level reaches 13,000 gallons.
   a. Install a visual monitor (camera) on the FRAC tank before adding more than 13,000 gallons to each FRAC tank.
   b. Continuously monitor the level in the FRAC tank when adding more than 13,000 gallons.

10. DO NOT EXCEED 20,000 GALLONS IN THE FRAC TANK.

11. Upon completion of pumping (i.e., the tanker truck is empty or the FRAC tank limit of 20,000 gallons has been reached) perform the following steps:
    a. Replace the 2" plug used to vent the tanker and verify top cover is secured.
    b. Close the tanker internal plug valve (swing the lever on the blue box down)
    c. Close the tanker discharge valve.
    d. Disconnect the discharge hose from the tanker, affix a cap/plug to the end and bag the end of the hose.
    e. Empty (drain) the FRAC tank fill line.
    f. Close the FRAC tank inlet valve.

12. Once a FRAC tank has become full (20,000 gallons):
    a. Ensure that a submersible heater is in place and functioning properly.
    b. Reconnect inlet hoses to an empty FRAC.
    c. PVC secondary pipe shall be used for hose lengths between secondary containment systems.

13. Return the tanker truck to BGRR (Bldg. 701):
    a. Position tanker so that the ladder is accessible.
    b. Secure gate for tanker containment.
    c. Re-install platform railing on top of tanker.
    d. Re-install H/L alarm unit.
    e. Secure discharge hose into top of tanker.

VII. Post Job Activities

1. Post job surveys of all equipment (pumps, hoses, instruments, etc.) and tanker will be performed by FS, in addition to any personnel monitoring requirements.

2. The FRAC storage tank levels will be periodically monitored by the HWM Operations Supervisor.

3. The 7,000 gallon tanker will be returned to AGS after steps are taken to decontaminate the interior.

ATTACHMENT 3

Safety Evaluation Form for Unreviewed Safety Question (USQ) Determination

Safety Evaluation Number: WMF-SE-97-03 **Revision Number:** 0

Prepared by: S. H. Moss SHM 11/06/97 **Date:** 11/06/97

Description of proposed activity:

The proposed activity is the temporary installation of three (3) 21,000 gallon FRAC tanks to be filled with up to 60,000 gallons of contaminated water from the flooded underground air cooling ducts of the old Brookhaven Graphite Research Reactor (BGRR) on the non-nuclear side of the new Waste Management Facility (WMF). The tanks will be installed with dedicated secondary containment capable of holding 66,000 gallons of liquid. This is required immediately and would be expected to occur before the completion of the DOE Nuclear ORR for the WMF. The contaminated water will be disposed of elsewhere and should not require any treatment at the WMF other than transfer into the tanks to be installed and removal from the tanks when ready for transfer to treatment/disposal facility, (within 1 year of its arrival).

Purpose:

In response to a request from the Laboratory Director's Office and in accordance with an agreement worked out between the BNL Director's Office and DOE-BHG, this USQD/SE (with the attached Interim Safety Evaluation) will initiate the process for considering the possibility of utilizing the non-nuclear side of the new WMF as the location for the temporary installation and monitoring of three tanks to be used to hold the standing contaminated water which is to be removed from the underground air cooling ducting associated with the old BGRR.

References:

(1) Waste Management Facility Final Safety Analysis Report as approved by DOE-BHG on 10/31/97.

(2) Technical Safety Requirements (TSR) for Waste Management Facility as approved by DOE-BHG on 9/18/97.

(3) Waste Management Facility - Operational Readiness Review (ORR) Implementation Plan as approved by DOE-BHG on 1/29/97.

(4) Procedure No. HWM-ADM-910, Safety Evaluations For Unreviewed Safety Question Determinations, Rev. 0 dated 2/7/97.

(5) Interim Safety Evaluation for the Temporary Storage of Brookhaven Graphite Research Reactor (BGRR) Air Cooling Duct Water at the Waste Management Facility (WMF) [transmitted 10/31/97 from W.E. Gunther to K. Dean Helms - copy attached].

(6) Radiological analysis of water sample(s) taken from BGRR air cooling duct.

(7) Design specifications of 21,000 gallon FRAC tank, including secondary containment.

(8) BNL WMF-SE-97-01, Temporary Exclusion of Certain System Components and/or Equipment that are described in the WMF-FSAR from the Associated Nuclear ORR, Rev. 0 dated 7/21/97.

(9) BGRR Underground Storage Air Cooling Duct Inventory (based upon Reference 6)

(10) BNL E,S&H Standard 1.3.3, Safety Analysis Reports / Safety Assessment Documents, Rev. 1 dated 7/28/92.

(11) HWM Technical Work Document - Transfer and Storage of BGRR Water [copy attached]

SCREENING CRITERIA

Safety Function(s) of Systems Affected

1. Will the proposed activity affect the safety function(s) or failure mode(s) of the equipment/facility? (Yes) No N/A

The Waste Management Facility (WMF) is a non-complex, Nuclear Hazard Category 3 facility, and as such, its operations represent a potential hazard only to the immediate vicinity surrounding the facility. DOE has concurred that the WMF is a Low-Risk facility based upon its radiological inventory limit, which follows the guidance of DOE-STD-1027-92, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports, for Category 3 facilities.

As a Nuclear Nonreactor Hazard Category 3 facility, the WMF has no requirements for redundant systems and/or safety class or safety significant SSCs (Systems, Structures and Components). Therefore, no safety functions exist that are directly associated with components or equipment designed to be installed in the WMF (though the radiological inventory and fissile material inventory are both controlled by Administrative Controls in the Technical Safety Requirements (TSR) document).

Without a more rigorous accident analysis than that provided by the Risk Assessment in WMF-FSAR Section 7.3, it cannot be conclusively determined whether or not the activities contemplated by this USQD/SE affects the failure mode(s) of the equipment / facility. The introduction of three FRAC tanks to be filled with up to 20,000 gallons of contaminated water each was not originally considered as a typical operational evolution for the Reclamation Building. Consequently, the failure modes described in the FSAR, which were based upon anticipated operational activities and associated faults which could occur during those activities, do not reflect either in their probabilities or consequences the impact of the activities addressed by the USQD/SE. While the temporary installation of three (3) 21,000 gallon FRAC tanks, to be filled with up to 60,000 gallons of contaminated water from the flooded underground air cooling ducts of the old Brookhaven Graphite Research Reactor (BGRR), on the non-nuclear side of the new Waste Management Facility (WMF), will not affect the safety function of the equipment/ facility, as there are no safety functions, by definition; [See Reference 8 for a complete discussion of safety function and components of the WMF] it may have an impact on the failure modes (initiators, probabilities and consequences).

While the impact on the failure modes of the Waste Management Facility and its equipment, posed by the temporary installation of three FRAC tanks (and their subsequent filling with up to 60,000 gallons of contaminated water) may not now be rigorously known; the consequences associated with the failure modes are nonetheless conclusively defined.

Because the WMF has not, as yet, been authorized to operate (accept waste), its present radiological inventory is zero. The installation of the FRAC tanks, at this time, and their filling with contaminated water would raise the radiological inventory from 0 to less than 1.8% of the Category 2 Threshold Limit (based upon the analysis of the sample given in Reference 6 and the calculation based on it in Reference 9, which assumes homogeneity between the sample and the rest of the water). This is also comparable to less than 17.2 % of the Category 3 Threshold Limit, which would justify the classification of the filled tanks as merely a "Radiological Facility". This represents the maximum consequence conceivable for the proposed activity, the release of the inventory from primary containment to secondary or even to the environment (depending upon the accident mode / scenario).

The attached Interim Safety Evaluation and Technical Work Document does include a new Abnormal Operation Assessment for the storage tanks, comparable to those included in Chapter 7 of the WMF-FSAR. A comparison clearly shows that though this particular equipment and its postulated failure was not included in the approved WMF-FSAR, it does not challenge the envelope of those abnormal events which were considered and analyzed.

By introducing new equipment which could fail and release radiological material to the environment, one is affecting the failure mode(s) (though not the safety function(s) of the facility).

2. Will any new failure modes be introduced by the proposed activity? (Yes) No N/A

Before this question can be answered, the failure modes described by the Risk Assessment Tables of Chapter 7 in the WMF-FSAR must be acknowledged as representing the known or anticipated types of failure modes possible for the WMF. The specific examples cited represent the single-most severe combination of consequences and frequency deemed credible. This

means each separate Risk Assessment Table represents an individual envelope subsuming a variety of similar or related events whose severity and probability fall within the bounds of the specific event analyzed. That is to say, each Risk Assessment Table event includes all lesser similar events with lower overall risk (a function of the combination of severity or consequence and probability or frequency).

Among the types of events covered in the Risk Assessment Tables for the Waste Management Facility are included; Decon bath spill, Underground storage vault lid failure, Criticality, Crane failure, Fire, Power failure, Carbon dioxide walk-in fume hood failure/ Decon bath fume hood failure, HVAC HEPA filter failure, Lead melter failure, Radiation portal monitor failure, Underground storage vault breach, Flooding, Area alarm failure, Propane tank explosion, D-Waste tank failure and Fall into Compactor. On each of these Risk Assessment Tables is an entry for "Potential Initiators" wherein are listed a number of generic possible causes or triggering precursors for each and every event covered.

This combination of assorted possible types of events caused by any of a variety of potential initiators compels the conclusion that a bounding spectrum of accidents is being defined with the capability of absorbing or subtending numerous specific but otherwise unnamed incidents under their overlapping umbrellas, so long as the specific event does not exceed the envelope for the type of event it represents.

The temporary installation of three (3) 21,000 gallon FRAC tanks to be filled with up to 60,000 gallons of contaminated water from the flooded underground air cooling ducts of the old Brookhaven Graphite Research Reactor (BGRR) on the non-nuclear side of the new Waste Management Facility (WMF) represents an entirely new operation for the facility with failure modes as defined in the attached Interim Safety Evaluation accident analysis for installation , filling and draining of these FRAC tanks. By the creation and addition of a new table of Abnormal Operations Assessment, one is clearly introducing new failure modes with the placement and filling of these temporary storage tanks on the non-nuclear side of the WMF. It would likely fall under the umbrella of the current "FLOODING" hazard for the WMF, Event No. 34. The consequence analysis as discussed in response to Question No. 1 above would still hold true, however.

Effects on Safety

1. Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR? (Yes) No N/A

Because of the Low-Risk nature of the WMF, a rigorous probabilistic risk assessment was not required as part of the nuclear safety analysis report. Instead, using a Graded Approach and the guidance offered in BNL E,S &H Standard 1.3.3, Safety Analysis Reports / Safety Assessment Documents, the Risk Assessment Tables of Chapter 7 of the WMF-FSAR were developed.

A review of all the accidents evaluated in the FSAR was made to determine the potential for an increase in the probability of an occurrence attributable to the temporary installation of three (3) 21,000 gallon FRAC tanks, to be filled with up to 60,000 gallons of contaminated water from the flooded underground air cooling ducts of the old Brookhaven Graphite Research Reactor (BGRR) on the non-nuclear side of the new Waste Management Facility (WMF).

Based upon the analysis already provided in response to Question No. 1 and Question No. 2 under **Safety Function(s) of Systems Affected** the answer to this question is **YES.** However, as also discussed previously, the consequence associated with ANY accident occurring as a result of or during the stay of the three FRAC tanks on the non-nuclear side of the WMF is limited to the release of the limited inventory of the contaminated water to secondary containment or possibly the immediate environment.

2. Could the proposed activity increase the probability of occurrence of a malfunction of equipment, systems, or components that are important to safety? Yes (No) N/A

As was already discussed in response to Screening Criterion No.1 under **Safety Function(s) of Systems Affected**, the WMF has no requirements for redundant systems and/or safety-class or safety-significant SSCs (Systems, Structures and Components). Therefore, no safety functions exist that are directly associated with the activities covered by this USQD/SE (though the WMF radiological inventory and fissile material inventory will both be controlled by Administrative Controls in the Technical Safety Requirements document). Without equipment, systems, or components that are important to safety, there can be no probability of occurrence of a malfunction of equipment, systems, or components that are important to safety; nor any increase in same.

Given the limitations and/or the restrictions described under Screening Criterion 1 - **Safety Function(s) of Systems Affected**, the temporary installation of three (3) 21,000 gallon FRAC tanks, to be filled with up to 60,000 gallons of contaminated water from the flooded underground air cooling ducts of the old Brookhaven Graphite Research Reactor (BGRR), on the non-nuclear side of the new Waste Management Facility (WMF) **COULD NOT** increase the probability of occurrence of a malfunction of equipment, systems, or components that are important to safety.

3. **Could the proposed activity create the possibility of an accident of a different type than those previously evaluated in the SAR?** (Yes) No N/A

For the reasons already discussed in the response to Screening Criterion No. 2 under **Safety Function(s) of Systems Affected** and Screening Criterion No. 1 under **Effects on Safety**, the answer to this question is **YES**. However, any such accident could be easily fit under the umbrella of the FLOODING event associated with Scenario No. 34 in the Chapter 7 of the WMF-FSAR, with the consequences limited to less than 2% of the Category 2 Threshold Limit, equivalent to less than 18 % of the Category 3 Threshold Limit. (See also Abnormal Operations Assessment attached as part of the Interim Safety Evaluation).

4. **Could the proposed activity create the possibility of an equipment, system, or component malfunction of a different type than those previously evaluated in the SAR?** (Yes) No N/A

For the reasons already discussed in the response to Screening Criterion No. 2 under **Safety Function(s) of Systems Affected** and Screening Criterion No. 1 under **Effects on Safety**, the answer to this question is **YES**. However, any such accident could be easily fit under the umbrella of the FLOODING event associated with Scenario No. 34 in the Chapter 7 of the WMF-FSAR, with the consequences limited to less than 2% of the Category 2 Threshold Limit, equivalent to less than 18 % of the Category 3 Threshold Limit. (See also Abnormal Operations Assessment attached as part of the Interim Safety Evaluation).

5. **Does the proposed activity reduce the margin of safety as defined in the basis for any TSR?** Yes (No) N/A

In HWM-ADM-910, "Safety Evaluations for Unreviewed Safety Question Determinations", the procedure states "in the context of this procedure a margin of safety is reduced if the Safety Limit or Limiting Condition of Operation as defined in the Technical Safety Requirements is violated". As this safety evaluation is based upon the guidance provided in the above referenced procedure, that definition of margin of safety compels the answer **NO**.

Given the limitations and/or the restrictions described under Screening Criterion 1 - Safety Function(s) of Systems Affected, the temporary installation of three (3) 21,000 gallon FRAC tanks, to be filled with up to 60,000 gallons of contaminated water from the flooded underground air cooling ducts of the old Brookhaven Graphite Research Reactor (BGRR), on the non-nuclear side of the new Waste Management Facility (WMF) **DOES NOT** reduce the margin of safety as defined in the basis for any TSR because the activity does not introduce even 2% of the Category 2 threshold for radiological material to the facility.

Technical Safety Requirements/Safety Analysis Report Changes

1. **Is a change to the facility TSRs or SAR being made?** Yes (No) N/A

No changes to the Technical Safety Requirements are contemplated or required by this Safety Evaluation. However, the WMF-FSAR does not describe the temporary modification being contemplated here and in consideration of the non-operational nature of some of the equipment taken credit for in the WMF-FSAR, special administrative controls would have to be implemented if permission were granted to allow the temporary installation of three (3) 21,000 gallon FRAC tanks, to be filled with up to 60,000 gallons of contaminated water from the flooded underground air cooling ducts of the old Brookhaven Graphite Research Reactor (BGRR), on the non-nuclear side of the new Waste Management Facility (WMF).

See the attached Interim Safety Evaluation for a complete discussion of the exceptions being taken to sections of the WMF-FSAR, namely; Section 4.10.2 - Radiation Control Philosophy and Section 4.1.2 - Principle Features. Though exceptions are

being taken for this temporary situation, no change to FSAR (either permanent or temporary) is planned.

AFETY EVALUATION CONCLUSION

Based on the evaluation of the evidence cited above, the issue --

_____ Does NOT constitute an Unreviewed Safety Question.

_____ Does constitute an Unreviewed Safety Question.

**** IF ANY OF THE ABOVE ARE <u>YES</u>, THEN a USQ EXISTS. ****

J Petschauer 11/10/97
HWM Group Leader's Signature/ Date

M. Carter 11/7/97
HWM FS Representative Signature/ Date

J Petschauer for LCE 11/10/97
HWM Section Head Signature/ Date

[signature] 11-07-97
HWM QA Officer Signature/ Date

ATTACHMENT 4

Department of Energy
Brookhaven Group
Building 464
P.O. Box 5000
Upton, New York 11973

NOV - 6 1997

Mr. William E. Gunther
Brookhaven National Laboratory
Associated Universities, Inc.
Upton, New York 11973

Dear Mr. Gunther:

SUBJECT: INTERIM SAFETY EVALUATION OF THE TEMPORARY STORAGE OF BGRR VENT DUCT WATER AT THE WASTE MANAGEMENT FACILITY

Reference: Letter, Gunther to Helms, Dated October 31, 1997, Subject: Same as Above

I am in receipt of the above referenced document. Based on the BHG staff review, I agree with your assessment that the temporary storage of the BGRR vent duct water at the WMF does not increase the radiological risk to workers, the public, or the environment beyond acceptable and authorized levels.

Although stated in the interim safety evaluation, please be prepared to show that the transfer and storage of BGRR water at the WMF does meet Suffolk County Article 12 requirements. It is understood that you are presently preparing a final safety evaluation/unreviewed safety question determination (SE/USQD) based on your approved procedures. This SE/USQD shall also be transmitted to BHG for review and approval. Should information become available during the preparation of the SE/USQD which could change the conclusion of the interim safety evaluation, you will notify BHG as soon as possible.

This letter approves the interim safety evaluation **only** and **does not authorize** the pumping of the BGRR water for transfer and storage to the WMF. Additional BHG authorization will be given when pumping can to begin. If you have any questions, please contact Caroline Polanish of my staff at extension 5224.

Sincerely,

K. Dean Helms
Executive Manager

cc: C. Polanish, BHG
B. Patel, BHG
G. Penny, BHG
P. Kelley, BHG
S. Moss, BNL
L. Emma, BNL
P. Kwaschyn, BNL

ATTACHMENT 5

Department of Energy
Brookhaven Group
Building 464
P.O. Box 5000
Upton, New York 11973

NOV 21 1997

Mr. William E. Gunther
Brookhaven National Laboratory
Associated Universities, Inc.
Upton, New York 11973

Dear Mr. Gunther

SUBJECT: UNREVIEWED SAFETY QUESTION/SAFETY EVALUATION (USQD/SE) FOR TEMPORARY STORAGE OF BGRR VENT DUCT WATER AT THE WASTE MANAGEMENT FACILITY(WMF)

We have reviewed the subject document and based on that review we agree with your assessment that temporary storage on the BGRR vent duct water at the WMF, does not increase the radiological risk to workers, the public, or the environmental beyond acceptable and authorized levels.

This letter approves the USQD/SE only and does not authorize the pumping of the BGRR water. Additional BHG authorization will be given to begin pumping once the prestart conditions outlined in my November 19, 1997 letter to you are addressed. If you should have any questions, please contact Caroline Polanish at extension 5224.

Sincerely,

K. Dean Helms
Executive Manager

cc: J. Arthur, BHG
B. Patel, BHG
L. Emma, BNL
F. Petschauer, BNL
S. Moss, BNL

ATTACHMENT 6

Department of Energy
Brookhaven Group
Building 464
P.O. Box 5000
Upton, New York 11973

File 9131-2-2
cc M Fuller
M Toscano

November 24, 1997

Mr. William E. Gunther
Associated Universities, Inc.
Brookhaven National Laboratory
Upton, New York 11973

Dear Mr. Gunther:

SUBJECT: CONDITIONAL APPROVAL ON BGRR PUMPING OPERATION

References: 1: Letter from K. D. Helms to W. E. Gunther, Subject: Brookhaven Graphite Research Reactor (BGRR) Pumping Operation, dated November 19, 1997

2: E-mail from Bhavesh Patel to Distribution, Comments on Revised BGRR Sump Pumpout Technical Work Documents, dated November 21, 1997

On Friday, November 21, 1997, BHG staff met with you to discuss resolution of the surveillance report items transmitted in Reference 1, as they pertain to initiation of pumping operations at the BGRR deep drain sump. During discussions it appeared that the majority of DOE's comments and all the regulatory issues have been addressed. BHG conducted an expedited review of the revised Technical Work Documents and radiation work permit and submitted comments per Reference 2 regarding original comments that were not addressed fully. In addition, on November 24, 1997, BHG staff met with Bob Miltenberger to gain a better understanding of the air monitoring plans during pumpout.

Based on these discussions, BHG provides conditional approval for initiation of pumping starting Wednesday, November 26, 1997 provided the following occurs:

1. Install an appropriate continuous air monitor (CAM) on the effluent side of the BGRR HEPA filter/fan system. This CAM should be equipped with an alarm set point to allow response should the HEPA filter become ineffective. Remote alarm capability needs to be operational during times that personnel are not local. This action is in addition to the current plan of passively sampling the airborne concentrations on the inlet side of the HEPA filter.

2. Revise the Technical Work Document to require that as a prerequisite to uncovering the sediments that potentially exist on the bottom of the air plenum, that a portable ventilation unit (PVU) be available and ready as a backup/supplement to the current HEPA should

breakthrough occur. PVU's contain an internal fan and the HEPA filter can be tested and certified effective. This will provide for an appropriate action to be taken should breakthrough occur on the primary HEPA. Use of the CAM needs to continue with the use of the PVU.

3. Incorporation of the final BHG comments provided in Reference 2 above.

4. Prior to transfer to the FRAC tanks, establish a mechanism to better detect failure of the heater elements, alarm and notify waste management personnel during off-normal hours and allow timely response.

In addition, the following are not prerequisites to operations, but are longer term suggestions for your consideration:

- Prior to pumping the air ducts dry a hold point should be instituted to allow for review of radiological conditions and plans for mitigating potential airborne releases. This review should include an evaluation of emissions to ensure compliance with NESHAPs.

- The proposal to extend the passive sampling frequency from daily to weekly following the pumpout should be reevaluated considering that this will be the condition under which the potential for airborne material is greatest.

- The BGRR stabilization plan that is currently under development should include an evaluation of the long term implications of the residual radioactive material remaining in the air plenum. The plan should also include an evaluation of the need for operation of the fan/HEPA system, upgrades to that system if necessary, and a mechanism to continuously monitor the liquid level in the air plenum.

If you should have any questions, please contact either Bhavesh Patel at extension 4363 or Caroline Polanish at extension 5224.

Sincerely,

K. Dean Helms
Executive Manager

cc: J. Arthur, BHG
B. Patel, BHG
L. C. Emma, BNL
F. Petschauer, BNL
A. MacIntyre, BNL

ATTACHMENT 7

TECHNICAL WORK DOCUMENT

TRANSFER AND STORAGE OF BGRR WATER

Revision 1

November 25, 1997

Prepared by: _____ Date 11/25/97

Reviewed by: _____ Date 11-26-97

Reviewed by: _____ Date 11.26.97

Approved by: _____ Date 11/26/97

I Purpose/Scope

This Technical Work Document (TWD) specifies the controls and outlines the steps required for the transportation and offloading of the 60,000 gallons of contaminated water from the BGRR into three (3) 21,000 gallon FRAC tanks located at the Waste Management Facility (WMF) using one 7,000 gallon capacity tanker truck. The operational tasks covered in this TWD are listed below:

a. Set-up: Containment for pump and hoses, tank isolation valves, and tank heaters.
b. Transport: Tanker truck transport from BGRR 701 to the WMF and valve line-up for isolation of storm drains.
c. Pumping: Offloading of the tanker contents into FRAC Tank(s) and monitoring.
d. Post-Job: Post-job surveys of equipment and periodic monitoring of water in storage.

II Prerequisites

1. Each FRAC storage tank shall be leak tested prior to use.
   a. Heaters shall be installed in each tank after the first tanker load has been transferred.
   b. A Current Transformer (CT) will be used to verify if heaters are drawing current (i.e., operability check).

2. Secondary containment systems shall be in place at the WMF tank storage and tanker offloading area near Bldg. 855.

3. The storage installation shall be designed in accordance with SCDHS Article 12 and receive written approval from Suffolk County prior to use.

4. An approved Radiation Work Permit (RWP) No. 62 HWM 97 has been prepared and specifies the required protective clothing, monitoring requirements and hold-points.

5. The South WMF storm drain isolation valve shall be CLOSED prior to the transfer of each tanker truck.

6. Notify the HWM Operations Supervisor prior to each tanker transfer from Bldg. 701 into the WMF.

III Equipment Set-Up

1. The transfer pump and hoses shall be prepared as follows:
   a. The pump shall be placed inside of secondary containment.
   b. Hoses outside of containment shall be enclosed within PVC tubing, the outer ends of the PVC secondary shall terminate inside of secondary containment areas.

2. Each FRAC tank shall be equipped with the following:
   a. One operational submersible heating element (one spare available).
   b. One submersible temperature sensor (monitored to prevent freezing).
   c. One isolation valve on the FRAC inlet connection.
   d. Cap or plug used to secure inlet connection when not in use.
   e. Locks on all outlet butterfly valves.

IV. Precautions

1. In the event of leakage, uncontrolled releases (spills), dose rates greater than 25 mRem/hr at contact, injury or personnel contamination :
   a. All transfer operations shall STOP.
   b. Verify that the South storm drain is closed, if a leak or spill occurs at the WMF.
   c. Fire/Rescue shall be notified (x 2222) - in the case of a spill or release outside of containment.
   d. The FS Supervisor shall be notified immediately.
   e. Continued operations will be evaluated by FS and the HWM Operations Supervisor.

V. Transport of Tanker Truck (from 701 to WMF)

1. Contact Health Physics prior to movement of the tanker truck.

2. Safeguards and Security Division (SSD) shall be notified (x2238) prior to movement of the tanker truck from Bldg. 701 to the WMF.

3. The H/L alarm shall be disconnected from the tanker and placed in a bag.

4. The tanker cover shall be secured using the provided latches.

5. The platform railing (Speed-Rail) shall be disassembled and removed (or secured on top of the tanker) prior to transport.

6. Unhitch the front gate of the tanker containment (if not already down).

7. Rollback the plastic fabric such that the incoming tractor wheels will not be in contact with the containment material during hook-up.

8. Verify that the South storm drain isolation is CLOSED at the WMF prior to transport from the BGRR.

9. Escort the tanker truck into the WMF via a pre-determined route (to be specified by the HWM Operations Supervisor).

10. Drop the gate on the secondary containment where the truck will be offloaded (at the WMF).

11. Guide the truck into place - being careful to avoid tearing the containment material during parking operations.
    a. The tractor should remain hitched to the tanker (for offloading durations of 3 hours or less).
    b. The tractor engine shall be shut-off when in position.

12. Secure the gate to the truck containment structure once the tanker has been parked.

VI. Pump-Out Into FRAC Storage Tanks

1. The HWM Operations Supervisor shall record the volume of water transferred into the WMF (for each transfer) and verify that the capacity of the FRAC tank will not exceed 20,000 gallons.

2. Discharge and inlet hoses shall be secured in place and cam-lock connections shall be wrapped with tape or tie-wraps to prevent uncoupling.
    a. Place spill trays beneath the tanker discharge and FRAC tank inlet connections.
    b. Remove caps/plugs and connect hoses to fittings with care - practice contamination control.
    c. Hoses outside of containment shall be sleeved with PVC tubing.

3. Vent the tanker by removing the 2" plug next to the top cover.

4. Lift the internal tanker discharge plug by pumping the handle on the blue box (minor lever should be extended out the left).

5. Open the FRAC tank inlet (isolation) valve connection.

6. Open the tanker discharge valve slowly and check for leaks.

7. Start pumping.

8. Continuously check for leaks during transfer operations.

9. Monitor the FRAC tank water level periodically during the transfer. Stop the pump when the tanker is empty or when the FRAC liquid level reaches 13,000 gallons.
    a. Install a visual monitor (camera) on the FRAC tank before adding more than 13,000 gallons to each FRAC tank.
    b. Continuously monitor the level in the FRAC tank when exceeding 13,000 gallons.

10. DO NOT EXCEED 20,000 GALLONS IN THE FRAC TANK.

11. Upon completion of pumping (i.e., the tanker truck is empty or the FRAC tank limit of 20,000 gallons has been reached) perform the following steps:
    a. Close the tanker internal plug valve (swing the lever on the blue box down)
    b. Close the tanker discharge valve.
    c. Replace the 2" plug used to vent the tanker and verify top cover is secured.
    d. Disconnect the discharge hose from the tanker, affix a cap/plug to the end and bag the end of the hose.
    e. Empty (drain) the FRAC tank fill line.
    f. Close the FRAC tank inlet valve.
    g. Ensure that the submersible heater is in place and functioning properly.

12. Once a FRAC tank has become full (20,000 gallons):
    a. Provide continuous monitoring of the water temperature (indicators shall be used to signal near-freezing temperatures)
    b. Reconnect inlet hoses to an empty FRAC.
    c. PVC secondary pipe shall be used for hose lengths between secondary containment systems.

13. The secondary containment shall be sampled and analyzed for radioactivity if rainwater or other liquids accumulate during transfer or storage.
    a. Release of secondary liquid shall be authorized by SEP Environmental Protection personnel.

14. Radiation area boundaries, postings and surveys for the storage/transfer area shall be provided by FS in accordance with the Rad Con Manual and applicable FS procedures.
    a. **Hold Point**: Radiation dose rates greater than 5 mRem/hr on contact with the FRAC tank(s). Discontinue transfer activities. FS shall re-evaluate radiation area boundaries.

15. Return the tanker truck to BGRR (Bldg. 701):
    a. Position tanker so that the ladder is accessible.
    b. Secure gate for tanker containment.
    c. Re-install platform railing on top of tanker.
    d. Re-install H/L alarm unit and test for operability.
    e. Secure discharge hose into top of tanker.

VII. Post Job Activities

1. Post job surveys of all equipment (pumps, hoses, instruments, etc.) and tanker will be performed by FS, in addition to any personnel monitoring requirements.

2. The FRAC storage tanks will be periodically monitored by the HWM Operations Supervisor. Checks will include water level, heater operability, water temperature and containment status as a minimum.
    a. Water temperature sensors will activate a remote alarm (to Bldg. 599, Firehouse) at a set-point above freezing.
    b. HWM personnel will respond according to a call list provided to Bldg. 599.

ATTACHMENT 8

WORK INSTRUCTION
FOR
PUMPING OUT THE ACCUMULATED WATER IN THE BGRR INSTRUMENT HOUSE
AND
SOUTH AND NORTH DRAIN COOLER SUMPS

A- Instrument house Activity

1. The amount of the accumulated water in the BGRR Instrument house is estimated to be approximately 300 Gal.

   The sample data analysis results indicate RAD limits below the drinking water limits.
   The scope of this activity is to remove the accumulated water from the BGRR instrument house by the HWM personnel.

2. The removal will be accomplished by pumping the accumulated water with a small submersible pump and suitable hose to drums or into a HIC (approximately 10 drums required) .
   The pumped liquid then will be transferred the BLDG 811 for storage or precessing as directed by the HWM supervisor.
3. The following items should be available the perform this activity:
   - .1 Rack Truck
   - .2 10 Drums(or a HIC)
   - .3 submersible pump and hose to reach the drums on the truck.(Or to the HIC)
   - .4 Extension cord to power the pump (With/GFCI) from BLDG 701.

.5 **Spill kit of pumping activities**
.6 **RWP and safety instruction as required**
.7 **Door key for access. (The door is locked and after the work is completed shall be secured closed). For the key Please contact A. Epple at ext.-5943**

B- DRAIN COOLER SUMPS-PUMPING ACTIVITIES

1. The sample analysis of the cooler sumps indicate RAD. activity.
   The sample results are attached for the RWP consideration.

2. The pumping set-up will require :

   1- Compressor and a diaphragm pump with Associated hoses. The suction hose will Be connected to 1 ½" PVC pipe which will be inserted into the sump pumpout Stand pipe. The length should be 17'-6" with the free end cut in an angle.

Note: If the pump-out standpipe connection is blocked, and the liquid could not be pumped-out at a sufficient rate for pumping operation, an access hole 2 ½" dia., (via a hall cutting saw) shall be opened on the

sump top plate next to pumpout stand pipe and the pump suction pick up tube will reach the pool of water and accomplish the pumpout operation.

2- The AOD discharge hose will be routed to a designated collection HIC and secured for the pumping operation.

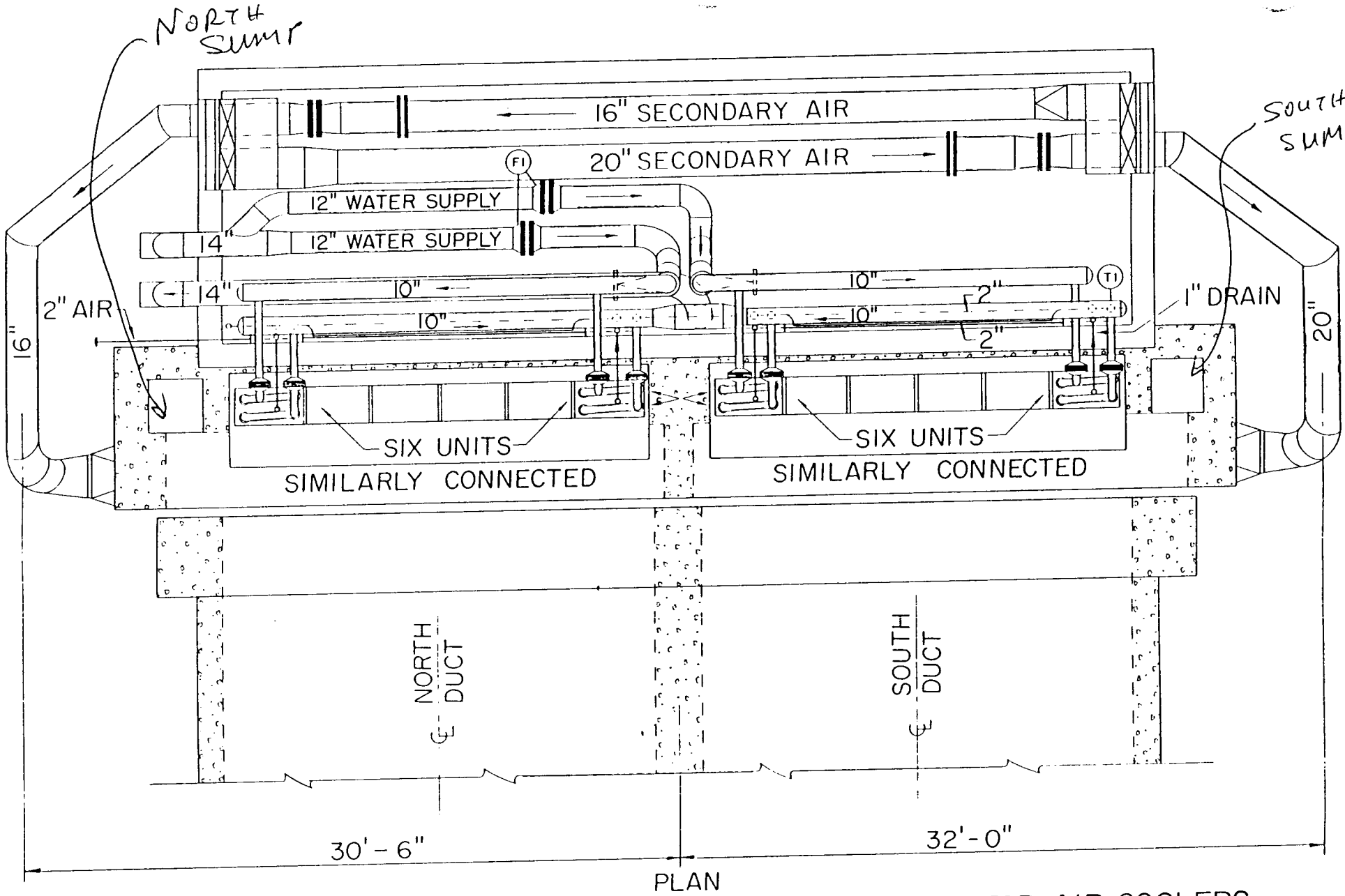
Note: The amount of water will very for each sump. The set-up (Compressor)will be in front of the Exit Air Duct Filter pad, or near the Instrument house (Bldg. 708), and the suction hose will be moved from one sump to the other. The 1 ½" PVC pick-up tube could be left in place for future pumping if desired. The AOD wiht the secondary containment can be plased inside the Instrument house.

3. To access the sump the cover plate shall be removed and placed flat on the adjacent area , the stand pipe cap removed from the pipe and then the suction 1 ½" PVC pipe will be lowered into the 3" pipe.

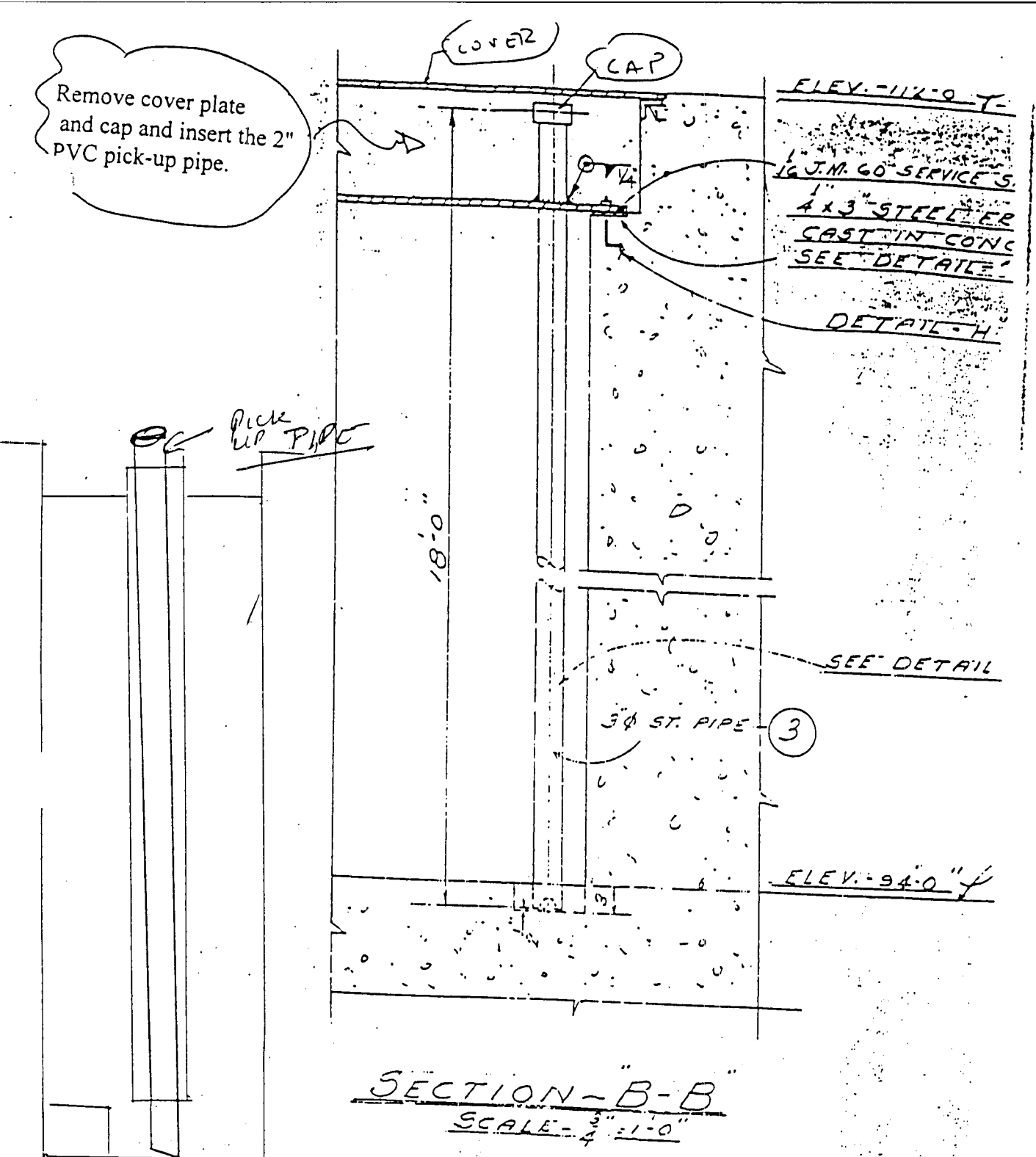
4. After the first sump is pumped out the operation and setup will move to pump the other sump.

5. At the completion of the pumping of the sump content, all temporary pumping components will be removed as per FS direction.
Removed covers and caps will be reinstalled and the area will be restored /cleared or posted as required.
Any additional access holes opened on the top plate will plugged to prevent any water accumulation in the sump from rain intrusion.

Note: The removed water will be stored as directed by HWM supervision.

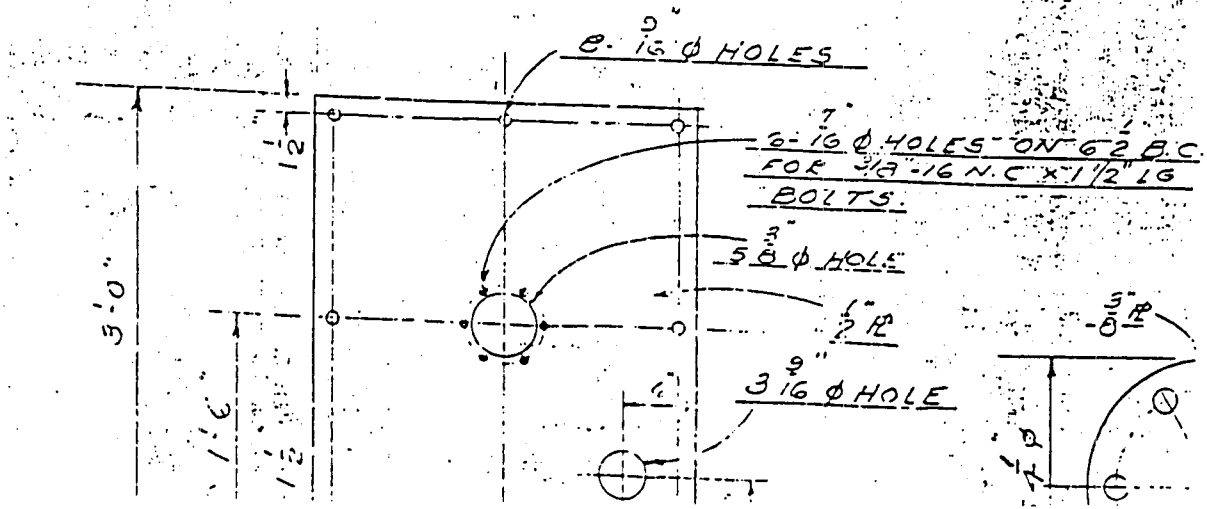


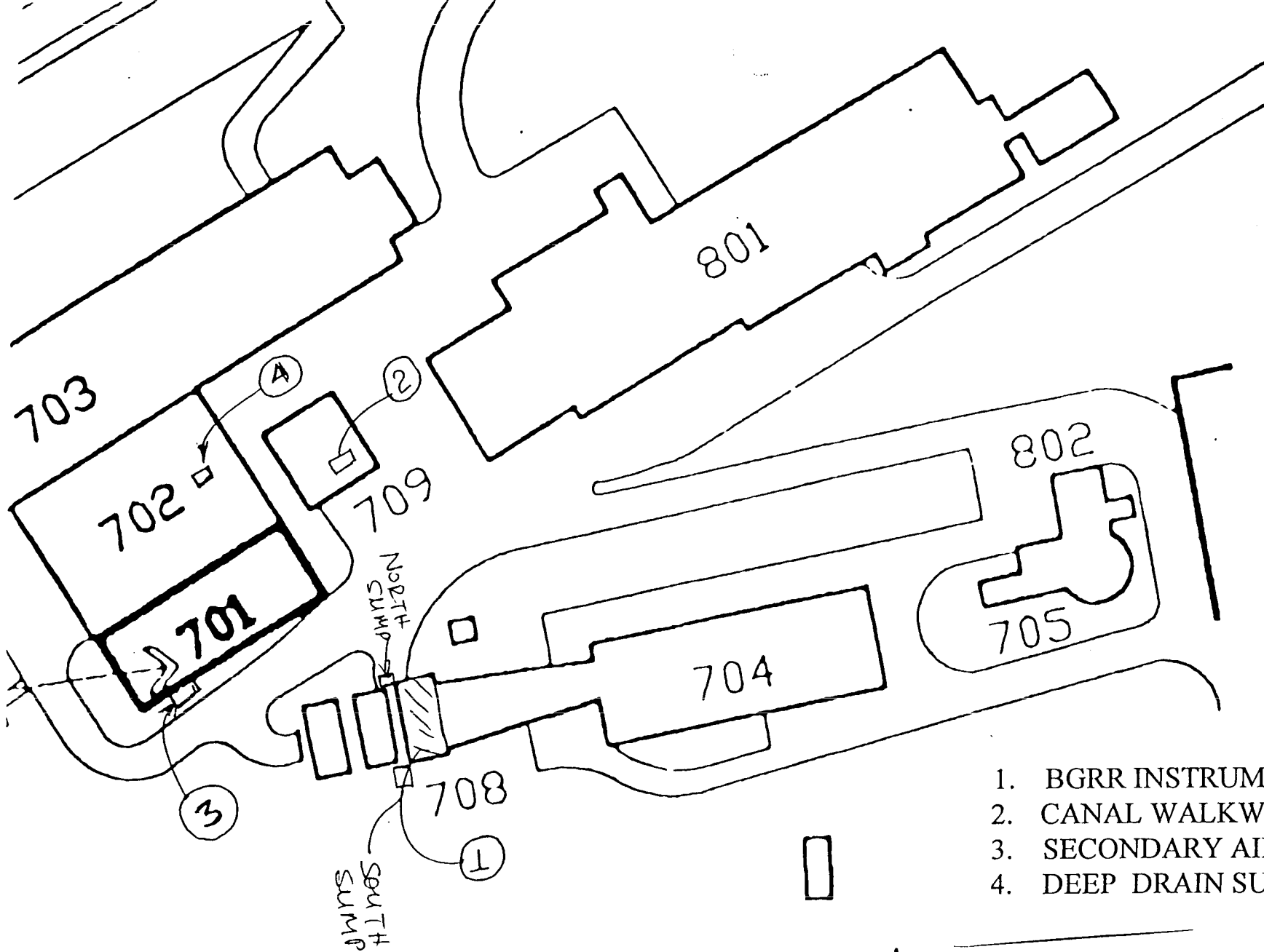
PIPING FOR AIR COOLERS
FIGURE G06.06-2



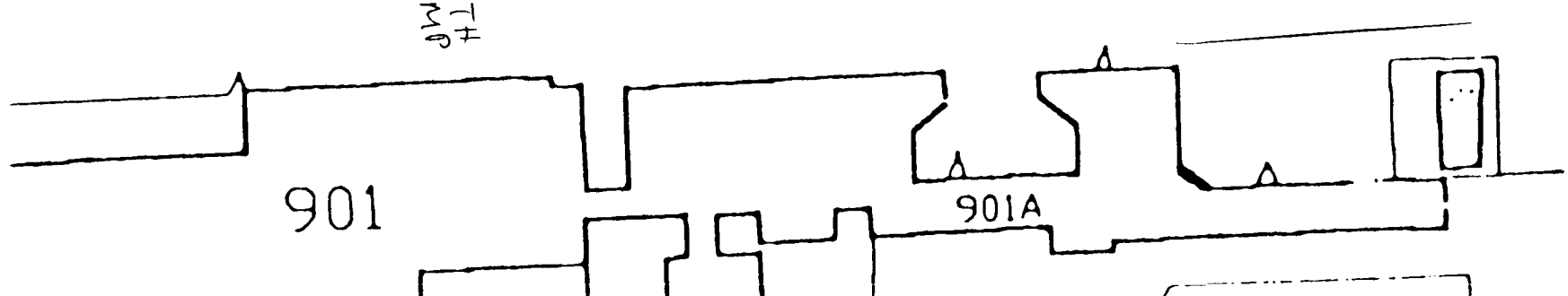
SECTION - B - B

SCALE - 3/4" = 1'-0"





1. BGRR INSTRUMENT HOUSE
2. CANAL WALKWAY SUMP
3. SECONDARY AIR PLENUM SUMP
4. DEEP DRAIN SUMP



C. O: ..umber
98031208

Contractor Number

Page 1 of 1

BROOKHAVEN NATIONAL LABORATORY
SAFETY & ENVIRONMENTAL PROTECTION DIVISION

ANALYTICAL SERVICES LABORATORY
BLDG 535A
UPTON, N.Y. 11973-5000

Chain of Custody Information

BNL P.O. No:
Ship to:
Pick Up by:
Attention:

Bioassay samples will not be accepted if bottles are filled above the shoulder.

Project Name: MGRR-708			
Requested by: ALAN MACINTYRE	**E-Mail Reports to:**	**SAMPLER:** M. LILIMPAKIS	**Priority Authorization**
Life Number: 19259 Ex. 2638	**EP Manager:** G. SCHROEDER	**SAMPLER:**	**Group Leader or Higher CALL**
Account No.: 07127 **Dept. Code:** HP	**FSS Manager:** EPPLE/ MILTENBERGER	**SAMPLER:**	x2502 (Rad), x4860 (Non-Rad)

FILL OUT ONLY SHADED AREAS. CANNOT ACCEPT SAMPLES WITH ACTIVITY >1mR/hr

ASL Number	Sample Information								Container		Analysis Requested***									
	Grid	-ID	Date	-C	Time	Bldg. #	Matrix	Description	#	vol.	αβ	3H	γ	Sr90	MET	WQ	VOA	PCB	pH	
98031208-01			3/11/98		1545	708	WATER	SOUTH DRAIN COOLER SUMP	2	500	X	X	X							
98031208-02			3/11/98		1615	708	WATER	NORTH DRAIN COOLER SUMP	2	500	X	X	X							

Must be one of the samplers

Transferred to :	M. LILIMPAKIS	E. SCANLAN	A. MEIER		
Signed by:	M. LILIMPAKIS	E. SCANLAN	A. MEIER		
Date/time	03/11/98 1545	03/11/98 1630	03/12/98 1006		

***OTHER ANALYSIS NOT LISTED

COMMENTS

BNL F 2963B WHITE COPY: SAMPLE CUSTODIAN YELLOW COPY: ANALYST PINK COPY: RECEIVER OR INTRA-LAB TRANSFER GOLDENROD COPY: SAMPLER

C.O.C. NUMBER
98031208

COUNTING ROOM
INFORMATION SHEET

Preparation date and initials: 03/12/98 EK

		Alpha Beta Information				Tritium Info				
I.D. NUMBER	MATRIX	mL EVAP	Gross Wgt. g	Tare Wgt. g	Net Wgt. g	sample / water	vol. ct'd	Gamma	pH	SHELF #
98031208-01	WATER	5					1	300		
98031208-02	WATER	5					1	300		

C.O.C. NUMBER
98 208

BROOKHAVEN NATIONAL LABORATORY
SAFETY AND ENVIRONMENTAL PROTECTION DIVISION
Radiological Analysis Laboratory

RADIOLOGICAL REPORT

Analyzed by: Anette H. Meier
Reviewed by: Robert R. Gaschott 3/13/98

SAMPLE I.D. NUMBER	ALPHA uCi/mL	ALPHA Error	BETA uCi/mL	BETA Error	TRITIUM uCi/mL	TRITIUM Error	MDL - uCi/mL Alpha	Beta	Tritium	
98031208-01	1.03E-06	3.42E-07	8.38E-04	8.06E-06	8.60E-05	7.46E-06	7.71E-08	4.02E-07	3.78E-06	
98031208-02	-1.90E-09	1.47E-08	1.55E-07	2.39E-07	1.82E-06	2.33E-06	7.71E-08	4.02E-07	3.78E-06	

C. O. C. Number
98031011

Contractor Number

Page 1 of 1

BROOKHAVEN NATIONAL LABORATORY
SAFETY & ENVIRONMENTAL PROTECTION DIVISION

ANALYTICAL SERVICES LABORATORY
BLDG 535A
UPTON, N.Y. 11973-5000

Chain of Custody Information

BNL P.O. No:
Ship to:
Pick Up by:
Attention:

Bioassay samples will not be accepted if bottles are filled above the shoulder.

Project Name: BGRR		
Requested by: A. EPPLE	**E-Mail Reports to:**	**SAMPLER:**
LIfe Number: 13095 Ex. 5943	**EP Manager:** G. SCHROEDER	**SAMPLER:**
Account No.: 07127 **Dept. Code:** OER	**FSS Manager:** A. EPPLE	**SAMPLER:**

Priority Authorization
Group Leader or Higher CALL
x2502 (Rad), x4860 (Non-Rad)

FILL OUT ONLY SHADED AREAS. CANNOT ACCEPT SAMPLES WITH ACTIVITY >1mR/hr

ASL Number	Sample Information								Container		Analysis Requested***								
	Grid	-ID	Date	-C	Time	Bldg. #	Matrix	Description	#	vol.	αβ	3H	γ	Sr90	MET	WQ	VOA	PCB	pH
98031011-01			3/10/98		1545	708	WATER	BLDG. 708 SUMP SAMPLE	1	1LITER	X	X	X						X

Must be one of the samplers

Transferred to :	A. EPPLE	L. GINTY			
Signed by:	A. EPPLE	L. GINTY			
Date/time	03/10/98 1545	03/10/98 1605			

***OTHER ANALYSIS NOT LISTED	COMMENTS

BNL F 2963B WHITE COPY: SAMPLE CUSTODIAN YELLOW COPY: ANALYST PINK COPY: RECEIVER OR INTRA-LAB TRANSFER GOLDENROD COPY: SAMPLER

C.O.C. Number
98031208

Brookhaven National Laboratory
Safety and Environmental Protection Division
Radiological Analysis Laboratory

GAMMA RESULTS

Analyzed by: Anette H. Meier
Reviewed by: Robert R. Gaschott

3/12/98

Sample I.D.	Nuclide Name	Activity uCi/mL	1-Sigma % Error
98031208-01	CO-60	3.32E-07	21.49
	CS-137	2.17E-04	5.82
98031208-02	CS-137	1.32E-07	36.97

C.O.C. NUMBER
98031011

COUNTING ROOM
INFORMATION SHEET

Preparation date and initials: 03/10/98 EK

		Alpha Beta Information				Tritium Info				
I.D. NUMBER	MATRIX	mL EVAP	Gross Wgt. g	Tare Wgt. g	Net Wgt. g	sample / water	vol. ct'd	Gamma	pH	SHELF #
98031011-01	WATER	100	7	7			7	300		

C.O "UMBER
98 .011

BROOKHAVEN NATIONAL LABORATORY
SAFETY AND ENVIRONMENTAL PROTECTION DIVISION
Radiological Analysis Laboratory

RADIOLOGICAL REPORT

Analyzed by: Anette H. Meier
Reviewed by: Robert R. Gaschott 3/13/98

SAMPLE I.D. NUMBER	ALPHA uCi/mL	ALPHA Error	BETA uCi/mL	BETA Error	TRITIUM uCi/mL	TRITIUM Error	MDL - uCi/mL Alpha	Beta	Tritium	pH
98031011-01	1.23E-09	1.05E-09	2.61E-08	6.25E-09	1.61E-07	2.32E-07	7.71E-10	7.69E-09	3.28E-07	7
0										
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0										
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0										

C.O.C. Number
98031011

Brookhaven National Laboratory
Safety and Environmental Protection Division
Radiological Analysis Laboratory

GAMMA RESULTS

Analyzed by: Anette H. Meier
Reviewed by: Robert R. Gaschott 3/10/98

Sample I.D.	Nuclide Name	Activity uCi/mL	1-Sigma % Error
98031011-01	There are no nuclides meeting the summary criteria		

☒ Special

HWM Requestor Fill Out Gray Areas

Radiation Work Permit

Expiration 06/15/9

1. Requested by	2. Life No.	3. Phone	4. Bldg.	5. Job Location
MANNY KILIMPAKIS	0180L	6392	860	708

6. Job Description TO PUMP OUT ANY ACCUMULATED WATER FROM BGRR: INSTUMENT HOUSE, DRAIN COOLER NORTH SUMP AND DRAIN COOLER "SOUTH" SUMP, AS PER ATTACHED WORK INSTRUCTIONS

Work begins: 5-7-98 Ends: 6-7-98

7. Radiological conditions/hazard: (include radiological survey information)

Low level activity (up to 1000 pCi/l α) in S. Cooler sump water. North sump ~1000x less activity.

8. Conditions that will void the RWP: DOSE RATE > 5mR/h at any point in instru~~pump~~ house, Contamination levels >1000 dpm/100 cm² (β γ), 20 dpm/100 cm² (

9. Historical/Other concerns: OSHA walking/working surfaces

10. ALARA review:	11. Estimated dose:	12. Attachments:	13. Training Requirements:
☒ Pre-job review	Highest individual: < 20 mrem	☐ TWD No.	☒ Radiation Worker I
☒ Pre-job conference	Collective: < 50 mrem	Title WORK INSTRUCTION for pumping... in BGRR INST. HOUSE...	☒ Radiation Worker II
☒ Summary/closeout		☐ Other	☐ Other

14. Work Controls:	15. Protective Equipment:	16. Dosimetry:	17. Check-out Instructions
☒ Posting	☒ Gloves	☒ ~~Film Badge~~ TLD	Contamination check:
☒ Radiation Survey	☒ Outer Gloves	☐ Self Reading Dosimeter	☒ Personnel
☒ Air Monitoring	☐ Shoe Covers	☐ Alarming Dosimeter	☒ Equipment
☐ Shielding	☐ Coveralls	☐ Finger Ring	☒ Bioassay
☒ FS Coverage	☐ Respirator	☐ Extremity Dosimeter	☐ Whole Body Count
☒ Hold Points 2 mR/h at grating, >1000 dpm (β γ) 20 dpm (α) contamination	☒ Other LAB-COAT NOTE: GLOVES ARE TAPED TO LAB COAT	☐ Other	☒ Radiation Survey
☐ Other			☐ Other

18. Special Instructions ☐ Dose / contamination reduction ☐ Coordination with other group ☐ Emergency reponse ☐ Other

(1) HEPA VACUUM is to be USED FOR OPERATION, NOZZLE AT THE POINT OF OPERATION.

(2) FS to SET UP A RADIOACTIVE MATERIALS Area during operation

(3) UPON EXIT, perform a frisk (whole body), Then proceed To Bldg. 811 PCM1b contamination monitor.

19. Approval: Supervisor: [signature]	Life Number: 0180L	Date: 5-6-98
S&EP Representative: Rick [signature]	18500	5/6/98
ALARA Coordinator:		

ATTACHMENT 9

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES

Office of the Director

P.O. Box 5000
Upton, New York 11973-5000

TEL: (516) 344-8631
FAX: (516) 344-7888
E-mail: schlender@bnl.gov

October 19, 1998

Mr. Scott Mallette
Senior Environmental Manager
Brookhaven Group
U.S. Department of Energy
Upton, New York 11973

Subject: Temporary Storage of BGRR Air Cooling Duct Water at the Waste Management Facility

Dear Mr. Mallette:

Prior to the pumping of BGRR air cooling duct water, an Unreviewed Safety Question Determination/Safety Evaluation (USQD/SE) was prepared for the temporary storage of BGRR air cooling duct water at the Waste Management Facility (WMF-SE-97-03, Rev. 0, dated November 6, 1997). This document was reviewed by DOE-BHG and approval of the USQD/SE was granted by letter from K. Dean Helms to William E. Gunther, dated November 21, 1997. The approved safety evaluation in question took the term "temporary" to be defined as "within 1 year of its [the water's] arrival."

The first transfer of BGRR air cooling duct water to the FRAC tanks at the WMF occurred on January 5, 1998. The maximum value of water volume reached was 56,800 gallons, which occurred in the beginning of August 1998. While several shipments of water from WMF FRAC tanks have already occurred, and other shipments are anticipated before the end of the calendar year, it is not currently expected that all the BGRR air cooling duct water will be gone by January 5, 1999.

We are asking for your concurrence to allow for the continued storage and scheduling and shipment of BGRR air cooling duct water from the WMF FRAC tanks beyond January 5, 1999, but no later than September 30, 2000. This will allow for the flexibility to balance competing remediation activities currently anticipated with the availability of resources dedicated for those functions.

Prior to the anniversary date of January 5, 1999, additional shipments of BGRR air cooling duct water from the WMF FRAC tanks will reduce the total volume to ≤38,000 gallons. By such volume reductions, the need for the third FRAC tank will be entirely eliminated, and it will be removed from service. The remaining two FRAC tanks would receive enhanced environmental protective measures in order to reduce the risk inherent to the storage of radioactive liquid outdoors

through the winter. It should be noted that the current protective measures were more than adequate for the period of last winter, when water was present (although it was a particularly mild winter).

The Waste Management Division has already catalogued the measures recommended to be taken and the estimated costs for implementing those improvements (see attached BNL memorandum dated September 17, 1998 from M. LaBarge to F. Petschauer). It is in response to this memorandum that DOE is requested to provide approval for preparations to store and protect the residual BGRR air cooling duct water through the winter, but not beyond September 30, 2000.

Sincerely,

Michael Schlender

Michael Schlender
Assistant Laboratory Director
Environmental Management

/mcb
Atachment: 1
c: G. Granzen, DOE-BHG
M. LaBarge, WMD
M. Lilimpakis, BGRR
A. Mac Intyre, WMD
G. Malosh, DOE-BHG
C. Newson, BGRR
F. Petschauer, BGRR ✓
R. Pierce, WMD
C. Polanish, DOE-BHG
T. Sheridan, DO
File 1.6.3

BROOKHAVEN NATIONAL LABORATORY
WASTE MANAGEMENT DIVISION

MEMORANDUM

DATE: 9/17/98

TO: F. Petschauer

FROM: M. La Barge

SUBJECT: **BGRR Water Storage Issues**

There is a concern that Frac storage tanks outside of Bldg. 855 may not provide adequate containment for the liquid under severe winter weather conditions. For example, the existing storage configuration will not prevent freezing of the wastewater in the event of sustained below-freezing temperatures, despite the continued use of the installed submersible tank heaters. As you are well aware, the winter of 1997-1998 was extremely mild with no temperature excursions below 20 degrees F for more than several days. I am not confident that the upcoming winter will provide similarly mild temperatures.

The Waste Management Division (WMD) recommends the following steps be taken in order to reduce the risk inherent to the storage of this large volume of radioactive liquid through the winter.

1. Provide a rigid cover over the tanks to provide protection from precipitation and facilitate better ways to provide auxiliary heating. The cost-effective way to do this is to empty one of the three storage tanks completely. This requires the disposal of an additional 5-7000 gallons of wastewater from Frac Tank No. 3 and from other storage locations. A rigid structure could then be constructed over the remaining two Frac tanks (footprint: 35'W x 70'L). Rough cost including material and labor is ~$20,000. If all three Frac tanks contain water, then the coverage using a rigid structure becomes more difficult and could cost ~$80,000.
2. Provide auxiliary heating capabilities to be utilized during cold temperature excursions (ie <20 degrees F.). Estimated cost would be $5000 for the purchase/rental and operation of auxiliary heating.
3. Provide increased surveillance of the tanks and heaters during the same cold temperature excursions. I estimate this cost to be $10000.
4. The rental of a back-up generator to sustain tank heating during a power outages at a cost of $2000.

5. The purchase of spare submersible heaters to replace failed units. Estimated cost of each spare heater is $2300. If only two tanks remain, only two spares would be necessary. With three tanks, three spares would be required.
6. The rental of one circulator pump for each Frac tank plus one spare. The pumps are necessary to provide a mechanism for circulating the wastewater to reduce the possibility of freezing. Rental costs are estimated at $3000 per pump for a 3-month period.
7. An upgrade to the electrical service will be necessary if three tanks continue to be stored. An electrical upgrade may be necessary even if only two tanks are storing water. A better understanding of the electrical requirements can only be made after determine a more detailed design for the rigid structure, auxiliary heating, and circulator pumps. I estimate an electrical service upgrade to be $50,000.
8. An engineering evaluation as to the integrity of the tanks to determine if any routine testing may be necessary. I estimate the engineering evaluation to cost $10,000.
9. Notifications to SCDHS and DOE are necessary as the initial storage period was assumed to be only 1 year. Costs for these notification should be minimal (<$1000).

These nine items are estimated to cost a total of $61,600 if only two Frac tanks remain in storage, but increases to $176,900 when all three Frac tanks are being stored. Please understand that these estimates are rough, and our ability to predict the weather is extremely limited. Actual weather conditions may require other actions be taken, and additional costs may have to be incurred. Even if all 9 items are provided, I cannot ensure the water can be stored in its current configuration indefinitely. I plan to institute a contingency plan to deal with any potential problems, including tank failure.

If we hope to get delivery of a rigid structure and erect it before the onset of winter weather, a decision of this matter will be necessary within one month. Your consideration on this matter is greatly appreciated.

Copy: M. Lillimpakis
A. MacIntyre
C. Newson
R. Pierce

OE4020.98

ATTACHMENT 10

BROOKHAVEN NATIONAL LABORATORY

MEMORANDUM

DATE: November 5, 1998

TO: Distribution

FROM: A. MacIntyre AM

SUBJECT: **Temporary Structure for BGRR Frac Tanks**

Reference: Memo from LaBarge to Petschauer, "BGRR Water Storage Issues", 9/17/98..

In preparation for the potential early onset of freezing weather, WMD has developed a schedule for the construction of a temporary tent over the BGRR Frac storage tanks outside of Bldg. 855. The tent and associated freeze protection equipment is expected to be in place by mid-December 1998.

The individuals on this distribution have some role to play in completion of the overall project and should briefly review the attached schedule. Please provide your comments/questions to me as soon as you are able.

Thank you for your cooperation.

Attachements: As stated.

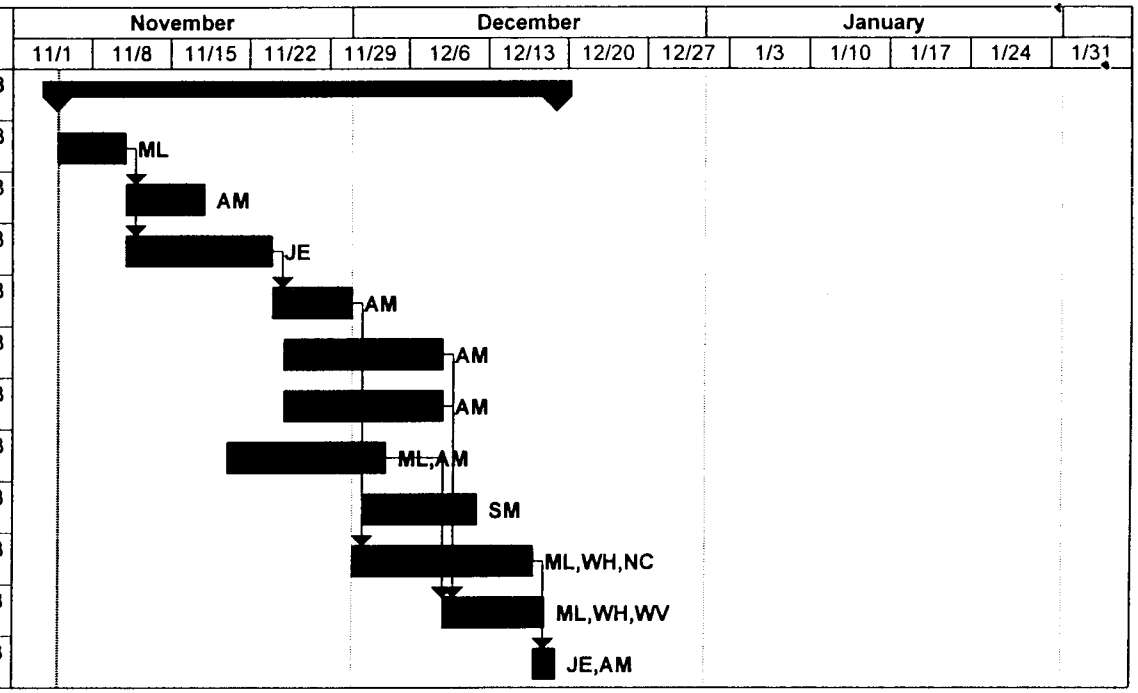
Distribution: N. Contos
J. Eckroth
W. Hulse
M. Lilimpakis
S. Moss
W. Voegelin

Copy: M. Clancy
M. La Barge
F. Petschauer
R. Pierce

OE002098

BGRR Water Storage
Tent for Frac Tanks

ID	Task Name	Durat	Start	Finish
1	**BGRR Tent Structure**	**32d**	**11/5/98**	**12/18/98**
2	obtain material specs (vendor)	4d	11/5/98	11/10/98
3	WMD review of structure	5d	11/11/98	11/17/98
4	BNL review of structure	9d	11/11/98	11/23/98
5	procure tent	5d	11/24/98	11/30/98
6	generator select/order	10d	11/25/98	12/8/98
7	space heater select/order	10d	11/25/98	12/8/98
8	submersible pumps/select order	10d	11/20/98	12/3/98
9	incoming ispections	8d	12/2/98	12/11/98
10	construct/erect	12d	12/1/98	12/16/98
11	hook-up gen., heaters,pumps	7d	12/9/98	12/17/98
12	readiness assess./corr.actions	2d	12/17/98	12/18/98



ATTACHMENT 11

BROOKHAVEN NATIONAL LABORATORY
Safety & Health Services Division

MEMORANDUM

DATE: December 3, 1998

TO: A. MacIntyre

FROM: J. Eckroth

SUBJECT: **ES&H Plan Review - Temporary Tent for BGRR Water Storage Tanks**

The purchase quotation and scope of work documents for the Temporary Tent for BGRR Water Storage Tanks project have been reviewed. The project involves the installation of a temporary tent structure that will protect two Frac tanks located outside of Bldg. 855 from wind, rain, and freezing weather.

The purchase quotation and scope of work documents for the above referenced project were submitted by the Waste Management Division for review via transmittal received by the Safety & Health Services Division on 11/17/98. The Safety & Health Services Division and the Environmental Services Division have reviewed the submitted quotation and scope of work documents. These documents are approved for construction with the exceptions noted in the attached table.

It is the responsibility of the Project Manager to ensure that regulatory issues have been resolved before initiation of the project. Any disagreement with the recommendations listed in the attached table should be supported with written documentation. A copy of this documentation should be forwarded to me prior to the award of a construction contract.

Attachment

JE/lg/SE342098

Cc: N. Contos
T. Grieve
S. Hoey
R. Lee
T. Monahan

ES&H PLAN REVIEW
TEMPORARY TENT FOR BGRR WATER STORAGE TANKS
PURCHASE QUOTATION AND SCOPE OF WORK DOCUMENTS
DECEMBER 3, 1998

CATEGORY*	COMMENTS
R	1. The structure must be designed to withstand a wind load of 25 lbs/sq.ft., including anchoring of the structure to the asphalt pavement.
B	2. Page 3 of the quotation indicates that standard pre-engineered drawings are available upon request. These drawings should be requested from the manufacturer. The drawing should be reviewed for conformance to general design requirements and placed on file for future reference.
R	3. All power must be GFCI protected due to the potential for wet/damp conditions in the vicinity of the tent.
R	4. If the temporary lights or other electrical power devices are attached to the aluminum frame, the aluminum frame must be grounded.
R	5. It is understood that the generator referenced in the scope of work is of the standard portable type available from Plant Engineering which would only be set-up and used in the event of an extended power outage or other emergency. The portable generator which would be used in these instances should comply with the requirements of the National Electric Code (NEC) including Article 250 (Grounding) and Article 445 (Generators). While not a mandatory requirement since the generator is not a permanent installation, the requirements in Article 701 (Legally Required Standby Generators) and Article 702 (Optional Standby Systems) should also be considered as they relate to the use of the portable generator. A copy of these four NEC Articles have been provided directly to A. MacIntyre.
R	6. All piping associated with the pumping systems must be located within the secondary containment structure.
R	7. Any fuel powered equipment must be maintained on a 24 hour watch and should be provided with secondary containment.
R	8. General Employee Radiation Training (GERT) will be required for all workers.
R	9. Dosimetry (TLD) will be required for all workers.
R	10. A Radiation Work Permit (RWP) will be required for the construction project.

B	11. The project will require fifty percent coverage from Facility Support, including pre and post job coverage, and periodic coverage during the construction.
B	12. The portable forced air space heater should be U.L. listed. Clearances between the heater and combustible materials, including the tent structure, should be in accordance with the manufacturer's recommendations. The propane supply for the heater should be located exterior to the tent and a minimum of six feet from the heater. If the heater is operated due to an emergency, it must be maintained on a 24 hour watch.
B	13. A Readiness Assessment, with participation by appropriate Safety & Health Services Division personnel, should be performed for this installation.

*Category: Regulatory (R), Best Management Practice (B)

COMMENTS CATEGORIZED AS REGULATORY REQUIRE FULL COMPLIANCE. ALL OTHER COMMENTS ARE CONSIDERED BEST MANAGEMENT PRACTICES. ANY DISAGREEMENT WITH THE COMMENTS SHOULD BE SUPPORTED WITH WRITTEN DOCUMENTATION.

ATTACHMENT 12

BROOKHAVEN NATIONAL LABORATORY

MEMORANDUM

DATE: December 9, 1998

TO: J. Eckroth

FROM: A. MacIntyre AM

SUBJECT: **Response to ESH Comments – BGRR Tent Structure**

Reference: 1. Memo from J. Eckroth to A. MacIntyre, "ES&H Plan Review – Temporary Tent for BGRR Water Storage Tanks", December 3, 1998.

The following responses are offered with regard to recommendations contained in the ES&H Plan Review, referenced above:

1. The manufacturer (SPRUNG) states in product design literature that the structure will normally withstand wind speeds up to 89 mph and a corresponding wind load of 20 psf.
2. A set of detailed drawings of the tent structure has been obtained is will be kept on file by WMD.
3. The current power source adjacent to the tank storage area is GFCI protected. Any additional modifications/additions from this source or to the tank area will also be GFCI protected.
4. The aluminum frame will be grounded if any electrical equipment is in contact with the structure.
5. A Memorandum of Understanding (MOU) will be drafted between WMD and PE which outlines the conditions and terms of use of the electric generator. Installation and operation of the generators will be in accordance with the NEC Articles that were provided.
6. Pumping systems to recirculate the water, if used, will be located inside of the tanks. Both storage tanks are secondarily contained. (see Note below).
7. During the use of emergency back-up equipment, such as the diesel generator or propane space heater, a shift will be established to provide 24 hour surveillance during operation. Secondary containment for this equipment is not required.
8. GERT training will be provided for all workers.
9. Dosimetry will be provided for all workers, per Facility Support (FS).
10. A Radiation Work Permit will be issued for construction of the tent.
11. Health Physics coverage will be provided as needed by FS.
12. The supply hose for the portable forced air heater is UL listed, and the entire unit is AGA certified (American Gas Association). The propane supply tank will be located at least six feet from the tent exterior during operation and the heater will be kept at a safe distance from combustible materials. A 24 hour watch will be in effect during heater operation.
13. The tent installation will undergo a Readiness Assessment, as recommended, prior to authorized use.

Note: WMD believes that the purchase and installation of additional submersible pumps is not needed at this time, due to the redundant freeze protection systems planned for use. Two submersible pumps are currently available for use in the event of an emergency.

Please contact me on x 2638 if you have any questions or comments.

Attachments: *Reference 1

Copy: N. Contos
T. Grieve
M. La Barge*
M. Lilimpakis*
F. Petschauer*
R. Pierce
W. Voegelin*

OE4020.98

ATTACHMENT 13

BROOKHAVEN NATIONAL LABORATORY
M E M O R A N D U M

Brookhaven Graphite Research Reactor (BGRR)
Building 701

DATE: December 11, 1998

TO: A. MacIntyre

FROM: F. Petschauer FP

SUBJECT: **Memorandum of Understanding (MOU) for BGRR Water Storage at WMD**

I have agreed to and signed the attached MOU. It would be helpful if Waste Management could provide me with monthly anticipated charges and actuals associated with this project.

Thank you.

FP/mcb
Attachment
c: M. Cowell, BU
M. Fallier, PE
M. LaBarge, WM
M. Lilimpakis, BGRR
C. Newson, BGRR ✓
R. Pierce, WM
M. Schlender, DO
T. Sheridan, DO
File A013

Memorandum of Understanding
For Storage of BGRR Wastewater at the Waste Management Facility (Bldg. 855)

Purpose

The purpose of this MOU is to summarize the management responsibilities between BGRR Project Management and the Waste Management Division (WMD) related to the ongoing and continued maintenance of the BGRR wastewater. The MOU will provide guidelines designed to clarify the roles and responsibilities associated with the storage, inspection, transfer and shipment of the BGRR wastewater.

It is understood that while WMD bears the primary responsibility for the effective and safe maintenance of this temporary water storage facility, BGRR is responsible for funding those activities, personnel and purchase of material needed to facilitate safe and effective storage. In short, BGRR owns the waste and WMD agrees to manage it.

This MOU shall remain in effect until superceded or cancelled. At a minimum, the MOU shall be reviewed (and updated if appropriate) every six months.

WMD Responsibilities

The Waste Management Division has the responsibility for maintenance and operation of the temporary BGRR wastewater storage facility which is defined as the controlled area surrounding the Frac tanks adjacent to Bldg. 855. The critical components of this storage facility under WMD's immediate control are as follows: Frac tanks, secondary containment systems, freeze protection systems (heaters, recirculating pumps), temperature controls, electrical supply panel, and low temperature alarms. WMD agrees to ensure or provide the following:

Administrative Functions (administered or coordinated through WMD):
- Inventory Controls (maintain compliance with previous limits as stated in USQD and other documents)
- Work Controls (use of Technical Work Documents [TWD] and Radiation Work Permits, as appropriate)
- Occurrence Reporting
- Notifications (in the event of a spill, leak or other emergency)
- Safety Evaluations

Maintenance Functions:
- Daily inspections and monitoring of Frac tank levels
- Daily inspections and monitoring of containment systems and
- Daily check of freeze protection systems
- Weekly Inspections
- Sampling Tank Contents as necessary or as directed

Support Functions:
- Security and Access Controls
- Response to alarms and abnormal conditions
- Equipment maintenance, replacement or modification
- Radiological Controls (through Facility Support)

Additional Responsibilities:
- Regulatory Compliance
- Worker Safety
- Decontamination (due to equipment defects or failure)
- Decontamination of the AGS Tanker
- Construction and maintenance of a weather protection enclosure (tent) for Frac tanks. *Reference the attached schedule for more detail on this sub-task.*

BGRR Project Management Responsibilities

Provide a valid ILR and Account number to cover the scope of all WMD functions and responsibilities contained in this MOU.
Communicating any expected additional volume of wastewater to be handled by WMD.
Inform WMD of changes in plans or budget that would impact previous agreements, TWDs or Unreviewed Safety Question Determination (USQD) commitments.
Generation of appropriate Waste Control Forms (RWCF or HWCF) for waste generated by BGRR Project activities (solids and liquids).
Maintain a budget and/or valid Task/Purchase Orders in order to provide:

- Required equipment (leased or purchased)
- Sub-contractor field/engineering support
- Health Physics support

Project Completion Responsibilities for WMD and BGRR

Demobilization and characterization of Frac tanks for return to vendor (WMD/PE)
Disassembly of containment systems (WMD/PE)
Removal and return of submersible heaters (WMD)
Pay for Frac tank decontamination (BGRR)
Task Order/Contract resolution for all costs associated with Frac rental (BGRR)
Pay for AGS Tanker decontamination (BGRR)

Points of Contact

Name	Position	Extension
Alan MacIntyre	WMD, Operations Support	2638 (page 6042)
Fred Petschauer	BGRR, Project Manager	7498
Manny Lilimpakis	WMD/BGRR Support Engineer	6392 (page 257-1842)

Approvals

Reviewed by:

MJ LaBorge

A. MacIntyre

Approved by: Richard Pierce

Waste Management Division

BGRR Project Manager

BROOKHAVEN NATIONAL LABORATORY

MEMORANDUM

DATE: November 5, 1998

TO: Distribution

FROM: A. MacIntyre AM

SUBJECT: **Temporary Structure for BGRR Frac Tanks**

Reference: Memo from LaBarge to Petschauer, "BGRR Water Storage Issues", 9/17/98..

In preparation for the potential early onset of freezing weather, WMD has developed a schedule for the construction of a temporary tent over the BGRR Frac storage tanks outside of Bldg. 855. The tent and associated freeze protection equipment is expected to be in place by mid-December 1998.

The individuals on this distribution have some role to play in completion of the overall project and should briefly review the attached schedule. Please provide your comments/questions to me as soon as you are able.

Thank you for your cooperation.

Attachements: As stated.

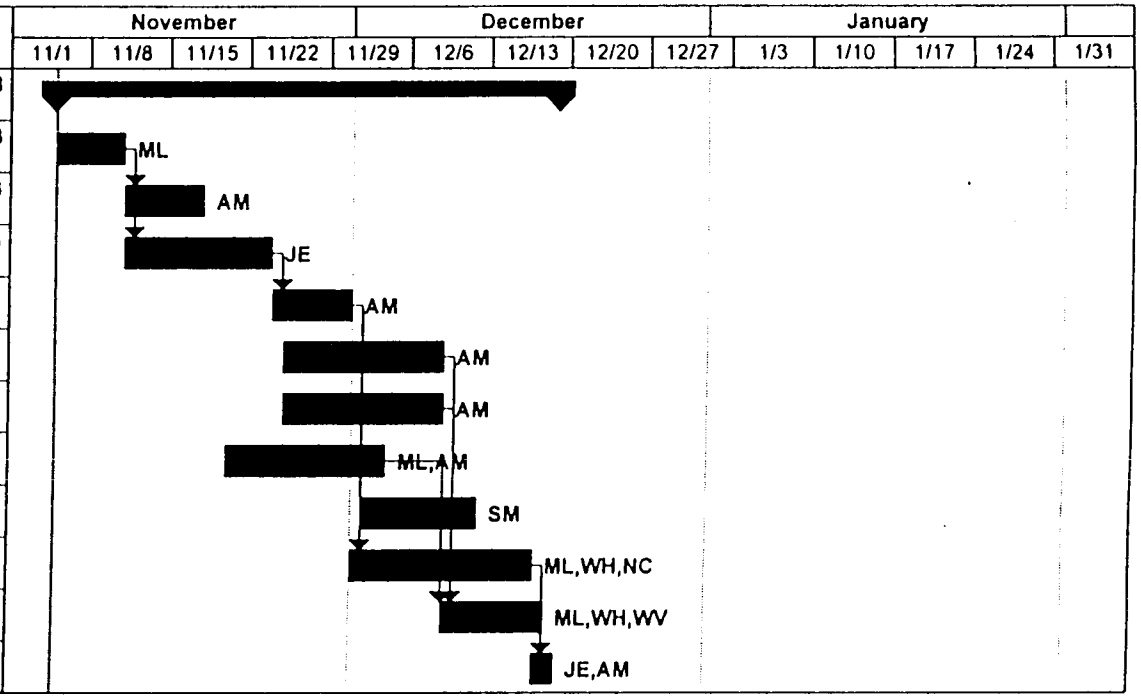
Distribution: N. Contos
J. Eckroth
W. Hulse
M. Lilimpakis
S. Moss
W. Voegelin

Copy: M. Clancy
M. La Barge
F. Petschauer
R. Pierce

OE002098

BGRR Water Storage
Tent for Frac Tanks

ID	Task Name	Durat	Start	Finish
1	**BGRR Tent Structure**	**32d**	**11/5/98**	**12/18/98**
2	obtain material specs (vendor)	4d	11/5/98	11/10/98
3	WMD review of structure	5d	11/11/98	11/17/98
4	BNL review of structure	9d	11/11/98	11/23/98
5	procure tent	5d	11/24/98	11/30/98
6	generator select/order	10d	11/25/98	12/8/98
7	space heater select/order	10d	11/25/98	12/8/98
8	submersible pumps/select order	10d	11/20/98	12/3/98
9	incoming ispections	8d	12/2/98	12/11/98
10	construct/erect	12d	12/1/98	12/16/98
11	hook-up gen., heaters,pumps	7d	12/9/98	12/17/98
12	readiness assess./corr.actions	2d	12/17/98	12/18/98



LEGEND

NC	Nick Contos
JE	Jim Eckroth
WH	Wayne Hulse
ML	Manny Lilimpakis
AM	Alan MacIntyre
SM	Steve Moss
WV	Warren Voegelin

ATTACHMENT 14

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES

Office of the Director

P.O. Box 5000
Upton, New York 11973-5000
Tel: 516-344-8631
Fax: 516-344-7888

January 27, 1999

Mr. Scott Mallette
Senior Environmental Advisor
U.S. Department of Energy
Brookhaven Group
Upton, New York 11973

Dear Mr. Mallette:

Subject: Temporary Storage of the BGRR Air Cooling Duct Water at the Waste Management Facility

In response to your letter of January 4, 1999, which extended the deadline for continued storage of BGRR air cooling duct water at the Waste Management Facility frac tanks through March 5, 1999; the attached Safety Evaluation for Unreviewed Safety Question Determination (WMF-SE-99-01) is submitted. It addresses extending the deadline on the storage of BGRR air cooling duct water at the Waste Management Facility frac tanks through 9/30/00. As it modifies an approved Safety Evaluation previously classified as an Unreviewed Safety Question, it also is an Unreviewed Safety Question and so must be reviewed and approved by DOE before it can be implemented.

If you have any questions, please call Steve Moss at Ext. 7639.

Sincerely,

Michael H Schlender

Michael H. Schlender
Assistant Laboratory Director
for Environmental Management

MHS/SM
QW0220.99
cc: M. Dikeakos, DOE, w/attachment
P. Kelley, DOE, w/attachment
M. LaBarge, BNL, w/o attachment
S. Moss, BNL, w/o attachment
F. Petschauer, BNL, w/attachment
R. Pierce, BNL, w/o attachment
C. Polanish, DOE, w/attachment
CC1999-189

ATTACHMENT 15

Department of Energy
Brookhaven Group
Building 464
P.O. Box 5000
Upton, New York 11973

March 4, 1999

Mr. Michael Schlender
Brookhaven Science Associates, LLC
Brookhaven National Laboratory
Upton, New York 11973

Dear Mr. Schlender:

SUBJECT: TEMPORARY STORAGE OF THE BGRR AIR COOLING DUCT WATER AT THE WASTE MANAGEMENT FACILITY

Reference: Letter, M. Schlender, BNL to S. Mallette, BHG, Dated, October 19, 1998, Subject: Same As Above

This letter allows for the continued storage of Brookhaven Graphite Research Reactor (BGRR) air cooling duct water from the Waste Management Facility (WMF) FRAC tanks through September 2000 when it is anticipated that the water will be removed and properly disposed. This approval is based on our review of the Safety Evaluation and Unreviewed Safety Question Determination (SE/USQD) which was submitted to this office on January 27, 1999 (WMF-SE-99-01, Rev. 0, dated 1/06/99).

The SE/USQD states that the Memorandum of Understanding (MOU) between BNL BGRR Project Management and BNL Waste Management Division is reviewed (and updated, if necessary) every six months. Since the MOU plays an important role in continued safe storage of the water, we request that BNL inform BHG in writing as to the outcome of each of these reviews.

If you have any questions, please call Caroline Polanish at extension 5224.

Sincerely,

Scott Mallette
Senior Environmental Advisor
Project Management Division

cc: R. Warner, BHG
F. Petschauer, BNL

ATTACHMENT 16

BGRR/WMF FRAC TANKS INVENTORY

as of ~~1/7/98~~ 3/4/99

1) 1 Liter = 0.26418 Gallons

Tanker 1@6000 gals=	22711.79 Liters	Tanker 6@6000 gals=	22711.79 Liters
Tanker 2@5700 gals=	21576.20 Liters	Tanker 7@6000 gals=	22711.79 Liters
Tanker 3@6000 gals=	22711.79 Liters	Tanker 8@6400 gals=	24225.91 Liters
Tanker 4@5500gals=	20819.14 Liters	Tanker 9@4400 gals=	16655.31 Liters
Tanker 5@6000gals=	22711.79 Liters	Tanker 10@1300 gals=	4920.89 Liters

2)

Tanker 1 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Am-241	3.02E+01	6.86E-07	2.01E-07	5.50E+01	1.25E-08	0.10%	0.52	1.32E-06
Pu-238	3.28E+00	7.45E-08	4.36E-09	6.20E+01	1.20E-09	0.01%	0.62	1.20E-07
Pu-239/40	1.64E+02	3.72E-06	6.01E-05	5.60E+01	6.65E-08	0.53%	0.52	7.16E-06
U-234	6.71E+01	1.52E-06	1.58E-04	2.20E+02	6.93E-09	0.06%	4.2	3.63E-07
U-235	1.40E+01	3.18E-07	1.47E-01	2.40E+02	1.32E-09	0.01%	4.2	7.57E-08
U-238	7.20E+01	1.64E-06	4.87E+00	2.40E+02	6.81E-09	0.05%	4.2	3.89E-07
Cs-137	4.35E+06	9.88E-02		8.90E+04	1.11E-06	8.90%	60	1.65E-03
Ra-226	2.75E+01	6.25E-07		5.50E+01	1.14E-08	0.09%	0.52	1.20E-06
Sr-90	1.09E+07	2.48E-01		2.20E+04	1.13E-05	90.21%	16	1.55E-02
Tc-99	1.46E+04	3.32E-04		3.80E+06	8.73E-11	0.00%	1.70E+03	1.95E-07
H-3	5.00E+04	1.14E-03		3.00E+05	3.79E-09	0.03%	1.00E+03	1.14E-06
				SUM =	1.25E-05		SUM =	1.71E-02

Tanker 2 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	5.76E+06	1.24E-01		8.90E+04	1.40E-06		60	2.07E-03
Sr-90	4.00E+05	8.63E-03		2.20E+04	3.92E-07		16	5.39E-04
				SUM =	1.79E-06		SUM =	2.61E-03

Tanker 3 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	4.56E+06	1.03E-01		8.90E+04	1.16E-06		60	1.72E-03
Sr-90	4.00E+05	9.08E-03		2.20E+04	4.13E-07		16	5.68E-04
				SUM =	1.58E-06		SUM =	2.29E-03

Tanker 4 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	7.18E+06	1.49E-01		8.90E+04	1.68E-06		60	2.49E-03
Sr-90	4.00E+05	8.33E-03		2.20E+04	3.79E-07		16	5.20E-04
				SUM =	2.06E-06		SUM =	3.01E-03

Tanker 5 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	6.51E+06	1.48E-01		8.90E+04	1.66E-06		60	2.46E-03
Sr-90	4.00E+05	9.08E-03		2.20E+04	4.13E-07		16	5.68E-04
				SUM =	2.07E-06		SUM =	3.03E-03

Tanker 6 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	5.27E+06	1.20E-01		8.90E+04	1.34E-06		60	1.99E-03
Sr-90	4.00E+05	9.08E-03		2.20E+04	4.13E-07		16	5.68E-04
				SUM =	1.76E-06		SUM =	2.56E-03

Tanker 7 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	5.33E+06	1.21E-01		8.90E+04	1.36E-06		60	2.02E-03
Sr-90	4.00E+05	9.08E-03		2.20E+04	4.13E-07		16	5.68E-04
				SUM =	1.77E-06		SUM =	2.59E-03

Tanker 8 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	4.93E+06	1.19E-01		8.90E+04	1.34E-06		60	1.99E-03
Sr-90	4.00E+05	9.69E-03		2.20E+04	4.40E-07		16	6.06E-04
				SUM =	1.78E-06		SUM =	2.59E-03

Tanker 9 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	3.75E+07	6.25E-01		8.90E+04	7.02E-06		60	1.04E-02
Sr-90	1.88E+06	3.12E-02		2.20E+04	1.42E-06		16	1.95E-03
				SUM =	8.44E-06		SUM =	1.24E-02

Tanker 10 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	4.32E+07	2.13E-01		8.90E+04	2.39E-06		60	3.54E-03
Sr-90	3.46E+06	1.70E-02		2.20E+04	7.73E-07		16	1.06E-03
				SUM =	3.16E-06		SUM =	4.61E-03

Category 2 Threshold Fraction Summation =	3.69E-05	vs.	1.25E-04 WMF-SE-97-03 Limit
Category 3 Threshold Fraction Summation=	5.28E-02	vs.	1.71E-01 WMF-SE-97-03 Limit
Total Tankers Volume Summation [gals] =	5.44E+04	vs.	6.00E+04 WMF-SE-97-03 Limit
BGRR Duct Water first arrived at WMF =	1/05/98	vs.	1 Year Lim. WMF-SE-97-03 Limit

Any future transfers of BGRR duct water to the three Frac Tanks outside Bldg 855 must be sampled and analyzed for impact on the appropriate WMF-SE-97-03 limits PRIOR to physical transfer. Furthermore, the calendar is flipping on the one year hold limit and extensions or exemptions must begin to be explored with DOE-BHG, starting soon.

HICs Inventory ISOTOPE	pCi/L	2.40E+03 gals. Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	4.32E+07	3.92E-01		8.90E+04	4.41E-06		60	6.54E-03
Sr-90	3.46E+06	3.14E-02		2.20E+04	1.43E-06		16	1.96E-03
To Be Added if O.K. ~ 8/04/98				SUM =	5.84E-06		SUM =	8.50E-03

Category 2 Threshold Fraction Summation =	4.27E-05	vs.	1.25E-04 WMF-SE-97-03 Limit
Category 3 Threshold Fraction Summation=	6.13E-02	vs.	1.71E-01 WMF-SE-97-03 Limit
Total Tankers Volume Summation [gals] =	5.68E+04	vs.	6.00E+04 WMF-SE-97-03 Limit
BGRR Duct Water first arrived at WMF = O.K.	1/05/98	vs.	1 Year Lim. WMF-SE-97-03 Limit

Liquid Sample Analysis

Deleting from Frac Tank Inventory BGRR Shipment 1 @ 5,000 gals on 8/18/98 & BGRR Shipment 2 @ 5,000 gals on 8/26/98

3) BGRR Shipment No. 1 @ 5000 gals. To GTS/Duratek on 8/18/98 (from Frac Tk #3)
18926.49 liters

Tanker 1 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	2.46E+07	4.65E-01		8.90E+04	5.23E-06	78.85%	60	7.75E-03
Sr-90	1.63E+06	3.08E-02		2.20E+04	1.40E-06	21.15%	16	1.93E-03
				Sum	6.63E-06		Sum	9.68E-03

BGRR Shipment No. 2 @ 5000 gals. To GTS/Duratek on 8/26/98 (from Frac Tk #3)
18926.49 liters

Tanker 2 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	2.46E+07	4.66E-01		8.90E+04	5.23E-06	78.86%	60	7.76E-03
Sr-90	1.63E+06	3.08E-02		2.20E+04	1.40E-06	21.14%	16	1.93E-03
				Sum	6.63E-06		Sum	9.69E-03

Category 2 Threshold Fraction Summation =	2.95E-05	vs.	1.25E-04 WMF-SE-97-03 Limit
Category 3 Threshold Fraction Summation=	4.19E-02	vs.	1.71E-01 WMF-SE-97-03 Limit
Total Tankers Volume Summation [gals] =	4.68E+04	vs.	6.00E+04 WMF-SE-97-03 Limit
BGRR Duct Water first arrived at WMF = O.K.	1/05/98	vs.	1 Year Lim. WMF-SE-97-03 Limit

Proposed transfer of 700 gals of DDS water from BGRR to Frac Tank 3
2649.709 liters

DDS Transfer Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	8.72E+07	1.65E+00		8.90E+04	1.85E-05	92.21%	60	2.75E-02
Sr-90	1.82E+06	3.44E-02		2.20E+04	1.57E-06	7.79%	16	2.15E-03
				Sum	2.01E-05		Sum	2.97E-02

Category 2 Threshold Fraction Summation =	**4.96E-05**	vs.	1.25E-04 WMF-SE-97-03 Limit
Category 3 Threshold Fraction Summation=	**7.16E-02**	vs.	1.71E-01 WMF-SE-97-03 Limit
Total Tankers Volume Summation [gals] =	**4.75E+04**	vs.	6.00E+04 WMF-SE-97-03 Limit
BGRR Duct Water first arrived at WMF = **O.K.**	**1/05/98**	vs.	1 Year Lim. WMF-SE-97-03 Limit

4) Proposed transfer of 2500 gals (1200 + 1300) of water from BGRR to Frac Tank 3

4542.357 liters = 1200 gals.

BGRR Transfer Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	4.60E+04	2.09E-04		8.90E+04	2.35E-09	0.01%	60	3.48E-06
Sr-90	1.22E+04	5.54E-05		2.20E+04	2.52E-09	0.01%	16	3.46E-06
				Sum	4.87E-09		Sum	6.95E-06

4920.887 liters = 1300 gals.

BGRR Transfer Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	6.57E+05	3.23E-03		8.90E+04	3.63E-08	0.18%	60	5.39E-05
Sr-90	1.65E+05	8.12E-04		2.20E+04	3.69E-08	0.18%	16	5.07E-05
				Sum	7.32E-08		Sum	1.05E-04

Category 2 Threshold Fraction Summation =	**4.96E-05**	vs.	1.25E-04 WMF-SE-97-03 Limit
Category 3 Threshold Fraction Summation=	**7.17E-02**	vs.	1.71E-01 WMF-SE-97-03 Limit
Total Tankers Volume Summation [gals] =	**5.00E+04**	vs.	6.00E+04 WMF-SE-97-03 Limit
BGRR Duct Water first arrived at WMF =	**1/05/98**	vs.	1 Year Lim. WMF-SE-97-03 Limit

O.K.

Deleting from Frac Tank Inventory BGRR Shipment 3 @ 5,000 gals on 10/30/98 & BGRR Shipment 4 @ 5,000 gals on 11/06/98

5) BGRR Shipment No. 3 @ 5000 gals. To GTS/Duratek on 10/30/98 (from Frac Tk #3)

18926.49 liters

Tanker 3 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	2.46E+07	4.65E-01		8.90E+04	5.23E-06	78.85%	60	7.75E-03
Sr-90	1.63E+06	3.08E-02		2.20E+04	1.40E-06	21.15%	16	1.93E-03
				Sum	6.63E-06		Sum	9.68E-03

BGRR Shipment No. 4 @ 5000 gals. To GTS/Duratek on 11/06/98 (from Frac Tk #3)

18926.49 liters

Tanker 4 Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	2.46E+07	4.65E-01		8.90E+04	5.23E-06	78.85%	60	7.75E-03
Sr-90	1.63E+06	3.08E-02		2.20E+04	1.40E-06	21.15%	16	1.93E-03
				Sum	6.63E-06		Sum	9.68E-03

Category 2 Threshold Fraction Summation =	**3.64E-05**	vs.	1.25E-04 WMF-SE-97-03 Limit
Category 3 Threshold Fraction Summation=	**5.23E-02**	vs.	1.71E-01 WMF-SE-97-03 Limit
Total Tankers Volume Summation [gals] =	**4.00E+04**	vs.	6.00E+04 WMF-SE-97-03 Limit
BGRR Duct Water first arrived at WMF =	**1/05/98**	vs.	1 Year Lim. WMF-SE-97-03 Limit

O.K. **[N.B. - This transfer completes the emptying of FRAC TANK #3.]**

6) Proposed transfer of 150 gals of BGRR Sump water to Frac Tank 2
567.7947 liters

DDS Transfer Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	**3.02E+05**	1.71E-04		**8.90E+04**	**1.93E-09**	16.83%	**60**	**2.86E-06**
Sr-90	**3.69E+05**	2.10E-04		**2.20E+04**	**9.52E-09**	83.17%	**16**	**1.31E-05**
				Sum	1.15E-08		Sum	1.60E-05

Category 2 Threshold Fraction Summation = **3.64E-05** vs. 1.25E-04 WMF-SE-97-03 Limit

Category 3 Threshold Fraction Summation= **5.24E-02** vs. 1.71E-01 WMF-SE-97-03 Limit

Total Tankers Volume Summation [gals] = **4.02E+04** vs. 6.00E+04 WMF-SE-97-03 Limit

BGRR Duct Water first arrived at WMF = **1/05/98** vs. 1 Year Lim. WMF-SE-97-03 Limit
O.K.

7) Actual liquid volume present in Frac Tank #1 measured to be 19,850 gals as of 12/14/98.
Actual liquid volume present in Frac Tank #2 measured to be 15,400 gals as of 12/14/98.

Total Tankers volume summation [gals] =	35250	**vs.**
WMF-SE-99-01 limit (proposed) [gals] =	40000	**O.K.**
WMF-SE-97-03 limit (for 3 tanks) [gals] =	60000	**O.K.**

8) Proposed transfer of 80 gal WWS Sump and 50 gal DDS Sump water to Frac Tank # 2
302.8238 liters 189.2649 liters

DDS Transfer Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	**2.65E+07**	5.02E-03		**8.90E+04**	**5.64E-08**	73.19%	**60**	**8.36E-05**
Sr-90	**2.40E+06**	4.54E-04		**2.20E+04**	**2.06E-08**	26.81%	**16**	**2.84E-05**
				Sum	7.70E-08		Sum	1.12E-04

WWS Transfer Inventory ISOTOPE	pCi/L	Total Ci	Grams	Cat 2 Ci Limit	Threshold Fraction	Fraction of Total	Cat 3 Ci Limit	Threshold Fraction
Cs-137	**5.19E+07**	1.57E-02		**8.90E+04**	**1.77E-07**	75.51%	**60**	**2.62E-04**
Sr-90	**4.16E+06**	1.26E-03		**2.20E+04**	**5.73E-08**	24.49%	**16**	**7.87E-05**
				Sum	2.34E-07		Sum	3.41E-04

Category 2 Threshold Fraction Summation = **3.67E-05** vs. 1.25E-04 WMF-SE-97-03 Limit

Category 3 Threshold Fraction Summation= **5.28E-02** vs. 1.71E-01 WMF-SE-97-03 Limit

Total Tankers Volume Summation [gals] = **3.54E+04** vs. 6.00E+04 WMF-SE-97-03 Limit
4.00E+04 WMF-SE-99-01 Limit

O.K.
Current Limit for Water Storage at WMF = **3/05/99** Per DOE letter extension.
Upon DOE approval of WMF-SE-99-01 = **9/30/00**
only O.K. if DOE approves separate extension or new Safety Evaluation.

ATTACHMENT 17

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES

P.O. Box 5000
Upton, New York 11973-5000

TEL: (516) 344- 2394
FAX: (516) 344- 7630
E-MAIL: kjackson@bnl.gov

BROOKHAVEN GRAPHITE RESEARCH REACTOR (BGRR)
BUILDING 701

March 24, 1999

Mr. Scott Mallette
Senior Environmental Advisor
Project Management Division
U.S. Department of Energy
Brookhaven Group, Building 464
Upton, NY 11973

Subject: BGRR Activity Authorization Request: Waste Water Disposal

Dear Mr. Mallette:

Attached is a proposed work scope, schedule, and cost estimate associated with the disposal of approximately 35,500 gallons of BGRR wastewater which was pumped from the Deep Drain Sump and is currently in storage at the Waste Management Facility. Your authorization and DOE funding for this activity is requested.

Approval of this request will eliminate the current risk of storing BGRR wastewater in temporary storage tanks, eliminate maintenance, surveillance, rental costs associated with these temporary tanks, and fulfill verbal commitments made to personnel from the Suffolk County Department of Health Services.

The proposed work would begin on/around April 13, 1999 and will be finished by May 25, 1999. Estimated cost for the work is $485,340.

Please contact me or Fred Petschauer (ext. 7498) if you have any questions.

Sincerely,

P. K. Jackson
BGRR Project Manager

Attachments: 2
Cc: M. Cowell, BNL (w/attach.)
F. Crescenzo, DOE/BHG (w/attach.)
A. Harvey, DOE/CH (w/attach.)
F. Petschauer, BNL (w/attach.)
J. Roberts, DOE/CH (w/attach.)
M. Schlender, BNL (w/attach.)
R. Warner, DOE/CH (w/attach.)

bcc: C. Newson
S. Pulsford

Brookhaven National Laboratory
Brookhaven Graphite Research Reactor (BGRR)

BGRR Decommissioning Project

Activity Authorization Request
Waste Water Disposal

This BGRR Decommissioning Project Activity Authorization Request documents the information needed to evaluate and authorize funding for disposal of approximately 35,500 gallons of BGRR-generated wastewater. This request contains four major sections: Scope of Work, Schedule, Cost, and Approval Signatures. The Scope of Work section is further divided into four sections, including a description of the work to be performed, a list of the activities, assumptions, and a justification for performing the work activity. The Schedule section provides a proposed schedule for the activity from initialization of the Activity Authorization Request to completion of the activity. The Cost section contains an estimate of the major costs associated with the described work activity from engineering to waste disposal and any additional funds needed for continued monitoring. The Signature Approval Section provides the signatures and dates of the preparer, reviewer, and necessary approvals.

1.0 Scope of Work

1.1 Description

The BGRR Project has successfully pumped out all radioactive water from the facility's tanks, sumps, and underground ventilation systems. The total volume pumped out was approximately 57,000 gallons. The major isotopic distribution of this water consisted of Sr-90, Cs-137 with very low levels of tritium and transuranics. Of the volume pumped, approximately 35,500 gallons remains at BNL in secondarily contained, temporary storage tanks. This proposed scope of work consists of transferring the water from the temporary storage tanks to a suitable shipping tanker truck and shipping the remaining BGRR water to an off-site vendor for processing and disposal. Based on the four previous shipments of this waste stream made in an identical manner with no problems identified, the proposed activity will be a continuation of that campaign.

This activity will include the technical support necessary for the vendor to remove the temporary storage tanks from the Waste Management Division area.

1.2 Activities

To disposition the remaining BGRR wastewater stored at BNL the following activities are required:

1. Secure a 5,000-gallon Department of Transportation (DOT) tanker truck licensed to transport the subject radioactive water over public roads. (Note: The recommended tanker truck for this activity has successfully, and repeatedly, been utilized to transport a total of 20,000 gallons of BGRR wastewater in the past, in addition to other BNL radioactive wastewater.)

2. Make 7 shipments of BGRR wastewater from BNL to GTS Duratek in Oak Ridge, Tennessee. Each shipment will include approximately 5,000 gallons.

3. At the completion of removing the remaining BGRR water, the storage tank rental agreement will be terminated, and the tank rental vendor will be asked to remove the two storage tanks from BNL.

1.3 Assumptions

1. There are no technical issues regarding this activity.

2. Storage tanks can be removed from site without decontamination except as required externally for transport.

3. Dismantlement of the containment tent at Waste Management is not required.

1.4 Justification

This request for authorization is warranted due to the following.

1. The storage of this radioactive water in temporary tanks has risks associated with it. Although there are emergency controls in place, such as secondary containment, any unnecessary risks, no matter how small, are not desirable.

2. Verbal commitments made in the past to personnel from Suffolk County Department of Health Services established a limited duration for storing this water in temporary tanks. The agreed duration for temporary on-site storage has passed.

3. The current cost of storing BGRR wastewater in temporary storage tanks at the Waste Management Facility includes a rental charge of $2,750 per tank per month. For two tanks this equates to $5,500 per month plus approximately $1,500 surveillance and maintenance costs performed by personnel from the Waste Management Division.

2.0 Schedule

Note: The start of the shipment of the BGRR water is contingent on the vendor having a DOT tanker available.

2.1	BGRR Project Activity Authorization Request Preparation	1wk	3/22/99 – 3/25/99
2.2	BGRR Project Activity Authorization Request Submitted to DOE		3/25/99
2.3	DOE/CH Funding Approval	1wk	3/29/99 – 4/02/99
2.4	Contracts issue work authorization	1 wk	4/05/99 –4/09/99
2.5	Begin Water Shipments		

Shipment Number	Date of Shipment
1	April 13
2	April 20
3	April 27
4	May 4
5	May 11
6	May 18
7	May 25

2.6 Notify contracts and vendor (GTS Duratek) week of May 24 to terminate rental agreement of storage tanks.

3.0 Estimated Cost

3.1 Volume of water = 35,500 gallons

3.2 Cost per gallon = $10.84 (This rate is the "total cost" which is inclusive of all transportation, brokerage, and processing. Reference attached letter from GTS Duretek to F. Petschauer, March 16, 1999)

3.3 Total cost of water processing = $10.84/gal x 35,500 gal = $384,820

3.4 Waste Management and Health Physics support for 7 shipments = $1,500/shipment x 7 shipments = $10,500

3.5 Waste Management and Health Physics support for demobilization and shipment of the two temporary storage tanks = $2,500.

3.6 Total Estimated Costs = ($384,820 + $10,500 + $2,500) + 22% BNL Burden = $485,340

4.0 Signature Approvals

4.1 Prepared By: F Petschauer Date: 3/24/99

4.2 Reviewed By: Stephen Pulsz Date: 3/25/99
Project Engineer

4.3 Approved By: [signature] Date: 3/25/99
Project Manager

4.4 Approval By: [signature] Date: 3/25/99
DOE Project Manager

ATTACHMENT 18

Department of Energy
Brookhaven Group
Building 464
P.O. Box 5000
Upton, New York 11973

APR 15 1999

Mr. Michael Schlender
Brookhaven Science Associates, LLC
Brookhaven National Laboratory
Upton, New York 11973

Dear Mr. Schlender:

SUBJECT: AUTHORIZATION TO CONDUCT WASTE WATER DISPOSAL AND REMOVE MUSEUM WALLS AND MATERIAL FROM THE BROOKHAVEN GRAPHITE RESEARCH REACTOR (BGRR)

As requested, we are authorizing $485,340 and $79,386 of BGRR Environmental Management (EM) funds for conducting waste water disposal and removing the museum walls and material from the BGRR. With regard to your third request for funding to remove the Pile Fan Sump (PFS), the Request for Authorization needs to be updated to include a regulatory strategy and updated schedule for development of CERCLA documentation (including soil cleanup goals) prior to our authorizing any funds for this activity. Excavation of contaminated soil associated with PFS is the responsibility of the BGRR Project and cannot stop at arbitrary depth limitations. In addition, please review the scope, schedule and costs to ensure that the appropriate planning documents (e.g. Work and Health & Safety Plans) are included.

The BGRR must also be included in the next EM-40 monthly report. Please provide a summary level cost plan and milestone log for EM funded activities that have been authorized to date with that report.

With regard to the overall FY99 budget for BGRR an additional $1.1 million of new funds from SC will be included in BNL's April Contract Modification under the following B&R Codes:

KA-02-02	$625,000
KB-02-01-03	$375,000
KC-02-01-01	$100,000
	$1,100,000

This new money together with the carryover from last year completes SC's FY 99 obligation for $1,784K. If you should have any questions, please contact Caroline Polanish at extension 5224.

Sincerely,

George J. Malosh
Brookhaven Group Manager

cc: J. Roberts, EPG, CH
A. Harvey, EPG, CH
J. Goodenough, EPG, CH
S. Mallette, BHG
G. Penny, BHG
K. Jackson, BNL
M. Cowell, BNL
M. S. Davis, BNL

APPROVED: _____ 4-15-99
Robert P. Gordon Date
Contracting Officer