Nuclear Power Business Unit

RADIATION WORK PERMIT

Revision: 0 **RWP Number:** 04-141

Controlling Work Document: Various **RG 1.16 Class:** 2 **Estimated Dose:** 4.320 Rem

Job Title: Nozzle Dam Install/Remove

Job Location: U1 Containment

Job Description: Remove/ Install Nozzle Dams in Steam Generators

Radiological Assessment of Work

Significant increase in radiation levels is likely? ☒Yes ☐No Reason: Removal of Shielding (ie, Manways, ALARA doors.)

Significant increase in contamination levels is likely? ☒Yes ☐No Reason: Removing nozzle dams after use.

Potential for internal dose? ☒Yes ☐No Reason: Removing nozzle dams after use.

RWP Tasks

Task 1: Remove and Install Nozzle Dams

Task 2:

Task 3:

Task 4:

Task 5:

Task 6:

Task 7:

Task 8:

Task 9:

Task 10:

Task 11:

Task 12:

RWP Review and Approval

Prepared By: CD (Initials) 2/24/04 (Date)

ALARA Review By: WWL (Initials) 2-24-04 (Date) ALARA Review No.: ☐ N/A ☒ 2004-0017

Approved By: _____ (RP Supervisor) 3-28-04 (Date)

Terminated By: _____ (RP Supervisor) _____ (Date)

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Nuclear Power Business Unit
RADIATION WORK PERMIT

Revision: 0 **RWP Number:** 04-141

TASK 1: Remove and Install Nozzle Dams

Radiation Protection personnel are authorized to suspend work activities in the event of a change in job scope, changes in radiological conditions, or a failure of personnel working under the RWP to abide by the RWP conditions.

Stop Work Dose Rate: 30,000 mr/hr **ED Dose Rate Alarm:** 25,000 mr/hr **ED Dose Alarm:** 904mrem

Radiation Protection Hold Points: ☐ N/A
No entries into the S/G Channelhead without RP approval.
Contact RP before entering any HRA's

Authorized Radiological Work Areas: Any RWP permits entry into RCA(s), RMA, and RA.

☒ HRA ☒ LHRA ☐ VHRA ☐ Ctmt, Reactor Critical
☒ CA ☒ HCA ☒ HPCA ☒ Airborne Radioactivity Area

Expected Radiological Conditions: Data From: ☐ Current Survey ☒ Historical Data ☒ Estimated

Radiation: GA 500 to 10,000 mrem/hr Contact: 10,000 to 20,000 mrem/hr

Contamination: 10,000 to > 1E6 dpm/100 cm^2 Internal Contamination: 10,000 to > 1E6 dpm/100 cm^2 (☒ estimated)

Airborne Radioactivity: < .25 DAC ☒ P ☒ I_2 ☒ NG ☐ ^3H (☒ Estimated / ☐ Actual DAC)

RP Job Coverage: ☐ Routine ☒ Direct ☐ Start of Job ☐ System Breach ☒ Pre-Job Briefing Required

Special Instructions: Direct RP Coverage required for all entries into the S/G Channelhead. See Job files 132, 133.

Radiological Survey Requirements:

A. Radiation: ☐ Prior to/Start of Work ☐ System Breach ☒ Other

Special Instructions: Verification Platform/Channel Head surveys required.
Hot particle surveys required for all worker's every 2 hours and immediately after exit from the S/G Channelhead .
Loop Area surveys performed per RP based on job evolution.

B. Contamination: ☐ Prior to/Start of Work ☐ System Breach ☒ Other

Special Instructions: Verify conditions prior to entry.

C. Airborne: ☐ Prior to/Start of Work ☐ System Breach ☒ Other

Special Instructions: Shiftly Platform Air Samples required during S/G work. Grab samples required based on job evolution and radiological conditions.

Nuclear Power Business Unit
RADIATION WORK PERMIT

Revision: 0 **RWP Number:** 04-141

III. Dose Assessment: TLD and EPD required.

Special Instructions: Special multiple dosimetry packs required for full body/half body entries into channelhead IAW HPIP 1.66. RP to relocate WB Dosimetry to area expected to receive the highest exposure.
Extremity Dosimetry required as per HPIP 1.66.
Perform time keeping on personnel making whole body entries into the channelhead.
Rescue team does not require multiple dosimetry and should wear dosimetry on the chest.

IV. Protective Clothing

- ☒ Coveralls, Booties, and Rubber Gloves (Minimum requirements for entering a contaminated area)
- ☐ Labcoat, Booties, and Rubber Gloves may be used only with RP permission.
- ☒ Coveralls, Double Booties or Booties and Rubber Totes/Boots, and Double Rubber Gloves to enter HCA.
- ☐ Double coveralls, Double Rubber gloves, Double Booties, Rubber Totes/Boots.(1)
- ☒ Plastic suit, Double Rubber Gloves, Double Booties, Rubber Totes/Boots.(1)
- ☐ Surgeon's Gloves may be substituted for Rubber Gloves with RP permission.
- ☒ Hood and Face Shield required as per RP.
- ☒ Other: See Special Instructions

(1) Safety review may be required for additional coveralls or plastics.

Special Instructions: Additional Dress requirements as per RP. Plastic suit for all entries into the S/G Channelhead.

V. Respiratory Protection: ☐ N/A ☒ TEDE ALARA Review:

Special Instructions: Bubble Hoods to be used for whole body entries. Reach-ins require a face shield.

VI. Engineering Controls:

Special Instructions: HEPA ventilation required on opposite leg for reach-ins and full jumps as much as practicable.

Ex 5

Nuclear Power Business Unit
RADIATION WORK PERMIT

Revision: 0 **RWP Number:** 04-141

VII. ALARA Requirements: COL ☒ See ALARA Review

LDWA: To be identified by RP.

Special Instructions: Prejob briefing to cover all items in the ALARA Review.
ALARA Doors to be shut when not actively working in S/G Channelhead
RP to monitor for Hot Particles at a minimum of once every two hours and immediately upon exit.

RP TO SURVEY ALL ITEMS EXITING THE STEAM GENERATOR.

Ensure ventilation is running on 1 channelhead at all times.
RP to be present when opening bags or equipment boxes on the 8'.

DO NOT HANDLE ITEMS FROM CHANNELHEAD WITHOUT RP APPROVAL!!!

Foreign debris found within the S/G channel head may be highly radioactive and shall not be handled without RP permission.

- When working in these areas or handling equipment from these areas (such as refueling tools) workers shall monitor at least every two hours.
- Contact RP immediately if, during monitoring of protective clothing, the worker discovers >10,000 cpm above bkg using a frisker or >5 mRem/hr above bkg using an open window beta instrument.
- Contact RP immediately if, during monitoring of skin, personal clothing, or modesty garments any contamination above bkg is discovered.

Point Beach Nuclear Plant

Level 3 Pre-Job ALARA Review

COPY

ALARA Review Number:	2004-0017 U1R28	Estimated dose:	4.320	Rem

Part 1: Job Description	
A. Job Description (Attach work list if appropriate)	Install and Remove S/G Primary Nozzle Dams
B. Controlling job procedures.	Scientech Document No. 83A7564 and the job specific RWP
C. Job History/O.E./Lessons Learned	See the attached INPO Just-in Time Operating Experience report. Lessons learned during U2R26 concerning the stainless steel brush use are to be implemented (the drills that will be used for the hole cleaning evolutions will be taped so they can only be operated in the correct direction).
D. Dose history.	Nozzle Dams were installed during U2R26 using 2.038 rem. Dose estimate calculations are on page 3.
Part 2: ALARA Checklist	
NOTE: The following exposure reduction measures should be considered during job planning.	
Section 1: Pre-Job Planning/	
E. Designated low dose waiting/staging areas.	Low dose areas on the platforms will be out of the shine from the manways, near the top of the platform access ladder and also on the 8' el. of containment. See the attached survey maps of the S/G platforms, the 10' platforms and the 8' G.A.'s.
F. Remote job coverage equipment.	Audio and video equipment will be used. Teledosimetry use is also recommended.
G. Communication devices used.	Westinghouse comm. gear will be used.
H. Services required. (lighting, air, electrical)	Grade D breathing air will be required.
I. Designated work area access/exit points.	Access to the generators will be at the entrance to the 10' platforms, then to the manway platform ladders.
J. Coordination with other groups.	Coordination between Scientech, RP and Operations will be required.
K. Work performed outside of radiation areas: Prefabrication Disassembly Assembly	Set-up and assemble as much of the nozzle dam equipment as possible outside of the loop areas.
L. Post-job cleanup requirements.	An inspection of the S/G bowls after installation of the dams will be required. Also the S/G manway platform will need to be deconned prior to the eddy current equipment setup.

Point Beach Nuclear Plant
Level 3 Pre-Job ALARA Review

COPY

ALARA Review Number:	2004-0017 U1R28	Estimated dose:	4.320	Rem

M. Special tools/equipment used to minimize time and exposure. (Use contaminated tools when practicable)	None
N. Radwaste minimization.	Survey and decon all tools and equipment as required.
O. Work activities/equipment status that could result in significant interruption of job or changes in radiological conditions.	Loss of S/G channel head ventilation will interrupt the job. Interruption → Stop Work condition?

Section 2: Radiological Controls	
P. Describe temporary shielding to be used.	Shielding package #'s 94 and 95 are to be installed on the "A" S/G manway platform. Shielding package #'s 15, 63 and 64 are to be installed on the "B" S/G manway platform.
Q. What systems/components will be filled with water or flushed to reduce job area dose rates?	N/A
R. Engineering controls to control airborne activity. (HEPA filters, glove bags, etc.)	Use of the channel head HEPA/ventilation system.
S. Attach applicable survey data.	All current survey data will be attached and discussed during the pre-job briefings.
Section 3: Worker Preparation and Training	
T. Consider the following: • Experienced workers selected. • Special training, photos, drawings, video tapes available • Rehearsal • Mock-up training • Use of fewer workers evaluated • Method of shift turnovers	Experienced workers will be utilized. Mock-up training will be performed with all necessary personnel involved.

ALARA-As Low As Reasonably Achievable
RWP-Radiation Work Permit
HEPA-High Efficiency Particulate Air

COPY

Point Beach Nuclear Plant
Level 3 Pre-Job ALARA Review

ALARA Review Number:	2004-0017 U1R28	Estimated dose:	4.320	Rem

Dose calculations for Nozzle Dam Installation/Removal

Two minutes for installing and one minute for removal of each nozzle dam is assumed.

"A" S/G Hot Leg Max dose rate is 15 R/hr or 300 mrem/min x 3 min. = 900 mrem
"A" S/G Cold Leg Max dose rate is 20 R/hr or 400 mrem/min x 3 min. = 1200 mrem
"B" S/G Hot Leg Max dose rate is 15 R/hr or 300 mrem/min x 3 min. = 900 mrem
"B" S/G Cold Leg Max dose rate is 16 R/hr or 320 mrem/min x 3 min. = 960 mrem

There will be 3 men on the platform. 1 RP and 2 Scientech

The average dose on the platform is ~ 80 mR/hr

Using 2 mR/min x 3 men x 30 min. = 360 mrem

Total Dose 4320 mrem

These dose rates being used are from historical data, current survey data will be used to update this estimate if necessary.

Completed By: W.W. Lemerond	Date: 9-22-03
Approved By:	Date: 4/2/04

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Point Beach Nuclear Plant

In-Progress ALARA Review/Assessment

ALARA Review Number:	2004-0017	Date:	4-11-04

Review Purpose:

☐ In-Progress ALARA Review (No pre-job ALARA Review Performed)
☒ In-Progress ALARA Assessment (Dose Adjustment)
☒ In-Progress ALARA Assessment (Job at 50% of Original Dose Estimate)

Part 1: Job Description	
A. Job Description (Attach work list if appropriate)	Install and Remove S/G Primary Nozzle Dams
B. Controlling job procedures.	Scientech Document No. 83A7564 and the job specific RWP
C. Job History/O.E./Lessons Learned	See the attached INPO Just-in Time Operating Experience report. Lessons learned during U2R26 concerning the stainless steel brush use are to be implemented (the drills that will be used for the hole cleaning evolutions will be taped so they can only be operated in the correct direction).
D. Dose history.	Nozzle Dams were installed during U2R26 using 2.038 rem.

Part 2: Person-Rem Radiation Dose Evaluation					
Date	Current Dose Estimate (Rem)	Dose Expended to Date (Rem)	% of Current Estimate	% of Job Completed	Revised Dose Estimate (Rem)
4-11-04	4.32 rem	4.442 rem	1.03 %	66 %	6.002 rem

Part 3: Dose Effectiveness Evaluation	
1. Check one or more of the items listed below which may have contributed to higher than expected RWP Person-Rem accumulation. Provide an explanation for all items checked.	
☐ a. Job scope changed/expanded.	
☐ b. Job site radiation levels different/changed.	
☐ c. Encountered scheduling/coordination difficulties.	
☐ d. Work extended due to tool/equipment failure.	
☐ e. Work extended due to wrong or unavailable parts/tools/material.	
☐ f. Work extended due to unplanned job site preparation requirements.	

COPY

☐ g. Work extended due to interruptions/interferences caused by other work activities.	
☐ h. Inadequate compliance with radiological controls/requirements.	
☐ i. Inadequate consideration of Pre-Job ALARA Worksheet items.	
☐ j. Inadequate shielding.	
☒ k. Other.	Currently all four dams are installed; total dose expended to accomplish this was 4.442 rem, 67mRem of that total was for equipment set-up. There were numerous difficulties during the installation process. These included service air supply for the bubble hoods, which increased time on the platforms. A bolt could not be installed on the "A" hot leg (was eventually resolved by chasing the threads). But the biggest impact was having to remove the "A" hot leg dam and then installing it again once a vent path for the RCS was established. Additionally a proper jump platform was not available on the "A" S/G platform. See the attached AR. Also when making the original dose estimate, nothing was allotted for the camera installation and nozzle dam verification, which was at least 140 mRem plus the RP support dose. The new estimate is for one minute in each bowl for dam removal. Which is 1.32 rem, plus 0.120 rem for S/G platform support and .120 rem for removing cameras and S/G close-out inspections added to the current total of 4.442 for a total of 6.002 rem.
2. Exposure Reduction Action to Be Implemented (If Applicable).	Install a proper jump platform on the "A" S/G manway platform prior to nozzle dam removal.
3. AR Generated: ☐ No ☒ Yes AR Number:	CAP055587

Dose cost... In CAP ≈ 900 mrem

Completed By: W. W. Lemerond	Date: 4-11-04
Approved By:	Date:

Point Beach Nuclear Plant

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TEDE ALARA EVALUATION	RWP 04 - 141

DESCRIBE THE WORK TO BE PERFORMED (DOSE RATES, EST. AVERAGE AIR CONCENTRATIONS, CONTAMINATION LEVELS):

Steam generator nozzle dam installation/removal – The work involves installation and removal of the steam generator nozzle dams. The work area is a confined area and entry/exit through the manway will abrasively scrub exposed surfaces. Dose rates in the work area is 20 R/hr based on historical data. Expected contamination levels are 200 mrad/hr beta/gamma. From historical data, highest measured alpha contamination was 600 dpm/100 cm^2. Long-lived alpha contamination levels are unknown. Estimated work duration is 3 minutes per worker. The estimated beta/gamma DAC fraction from HPIP 4.40 for work in a confined area is 450 DAC beta/gamma and 10 DAC for alpha.

DESCRIBE THE ENVIRONMENTAL CONDITIONS AND EFFECTS ON PERSONNEL SAFETY: The environmental conditions in the work area are typical refueling temperature and humidity conditions (i.e, approximately 80 °F and 50 % humidity).

DESCRIBE PROCESS AND ENGINEERING CONTROLS TO BE USED: Steam generator channelhead ventilation will be operating during the entry.

DESCRIBE THE PROTECTIVE EQUIPMENT AND CLOTHING, INCLUDING THE RESPIRATOR, TO BE USED AND THEIR EFFECTS ON WORKER EFFICIENCY: The protective clothing that will be worn is the standard protective clothing requirement for work in a contaminated area (coveralls, booties, cotton liners, rubber gloves). Additionally, the standard protective clothing will be augmented with plastic coveralls and additional sets of booties and rubber gloves. An airline/hood is planned for respiratory protection.

DESCRIBE POTENTIAL POST-ACTIVITY NEGATIVE IMPACTS (E.G., PERSONNEL DECONTAMINATION AND SKIN DOSE ASSESSMENTS, PORTAL MONITOR ALARMS): Potential post-activity negative impacts include facial contamination and uptakes without the use of respiratory protective equipment. Additional time and energy will be spent responding to portal monitor alarms, documenting the contamination and uptake, and assessing the dose impacts.

DOSE WITHOUT RESPIRATORY PROTECTION:

[Time (hrs) x Dose rate (mR/h)]	0.05 x 20000	=	1000	mrem, external dose
[Time (hrs) x DAC fraction x 2.5 mR/DAC-h)]	0.05 x 460 x 2.5	=	60	mrem, internal dose
Est. dose for implementating engineering or process controls		=	0	mrem
Total		=	1060	mrem

DOSE WITH RESPIRATORY PROTECTION:

[Time (hrs) x Dose rate (mR/h)]	0.05 x 1.15 x 20000	=	1150	mrem, external dose
[Time (hrs) x DAC fraction x 2.5 mR/DAC-h / Respirator PF]	0.058 x 460 x 2.5 / 50	=	1	mrem, internal dose
Est. dose for implementating engineering or process controls		=	0	mrem
Total		=	1151	mrem

Note: Time value should reflect worker efficiency impact due to respirator use. Work time increased by 15 percent per HPIP 4.40.

ALARA RECOMMENDATIONS:

	Without respirator					
X	With respirator	Type:	☐ Negative Pressure/PAPR	☒ Airline/Hood	☐ SCBA	
	As indicated below					

Justification/Comments: This evaluation determines that the use of an airline/hood for this work is not ALARA. However, the increase in dose due to the use of the airline/hood does not negate its use when accounting for the additional time and energy needed to address the effects of external and internal contamination that will result when the airline/hood is not used.

Preparer (Name/Date): Carl Onesti 4-3-04

Approver (Name/Date): 4-3-04

Ex 5

Ex 5

Ex 5

PBF-4230a
Revision 1 02/06/02
HP 15.12

Isotope ??

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS

LOCATION: 111 A S/G Hot Leg RWP No. 04-109

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME. (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30 - 109	4-8-04	1830	4-8-04	1845	1.65 EG	HUS-22	GM

Sample start flow 110 cpm
Sample stop flow ↓
Average sample flow ↓

Total sample time (min) 15m
Flow correction factor
Remarks

ANALYSIS DATA:

[X] Isotopic Analysis [ ] MECDOS (for DAC data) S.I. #

Date	Time	Isotope	*Concentration (µCi/cc)	By Initials	Date	Time	Isotope	Concentration (µCi/cc)	By Initials
4/8/04	2022	I-131	2.66E-10	GW	4/8/04	2022	Cl-38	ZMDA	GW
↓	↓	I-132	6.09E-9	↓	↓	↓	Br-82	↓	↓
		I-133							
		I-134							
		I-135							
↓	↓	Total Iodine	6.36E-9	↓	↓	↓	Total Additional	↓	↓

Total Iodine Concentration + Total Additional Concentration = 6.36E-9 µCi/cc By (Initials) GW

[ ] Unit 1 [ ] Unit 2 RE-211: _____ µCi RE-212: _____ µCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.2SE-09 µCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: [signature] Date: 4/9/04

References: HPIPs 3.52, 3.52.2, 3.53, 5.1

RADIOLOGICAL SURVEYS

LOCATION: "A" Loop - ... w "A" Steam Generator

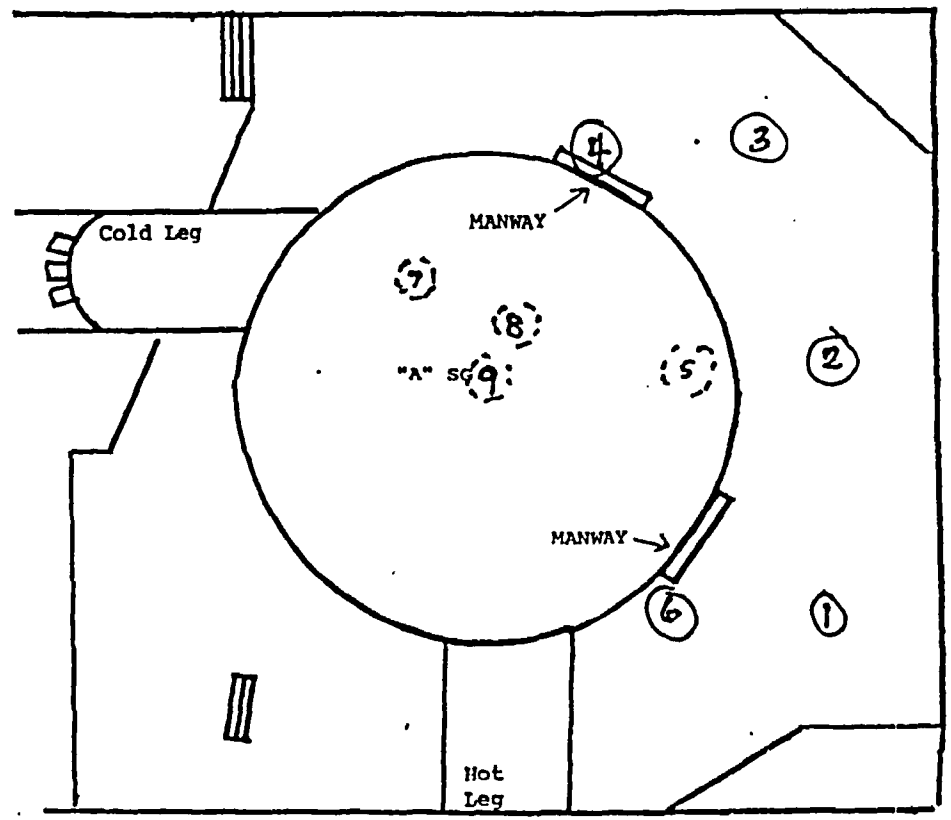
DATE 4-8-04
TIME 1100
MONITOR J. Pesantka

INSTRUMENT TYPE ABCS / RO-2A
SERIAL NO. [illegible] / 4551
COUNTED BY K. Wichayk / [illegible]

PURPOSE: ☐ Daily Survey ☐ Pre-RWP ☐ RWP # ☒ Other Follow up
REVIEWED BY: [signature]

NO.	MREM/ HR	βγ DPM/ 100 CM²	α DPM/ 100 CM²	REMARKS
1	N/A	650	≤21	
2		371		
3		720		
4		24 mRad*		manway bolts - box
5		2280	≤21	
6		1762		manway bolts - box
7		~~379~~ 1746		
8		1676		
9		11470		drain line

Follow up to personnel contamination
8'
POSTED: HRA, NRP



Area 1C-9

PBF-4021
Revision 0 01/01/93
HP 1.9

Notes: 1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

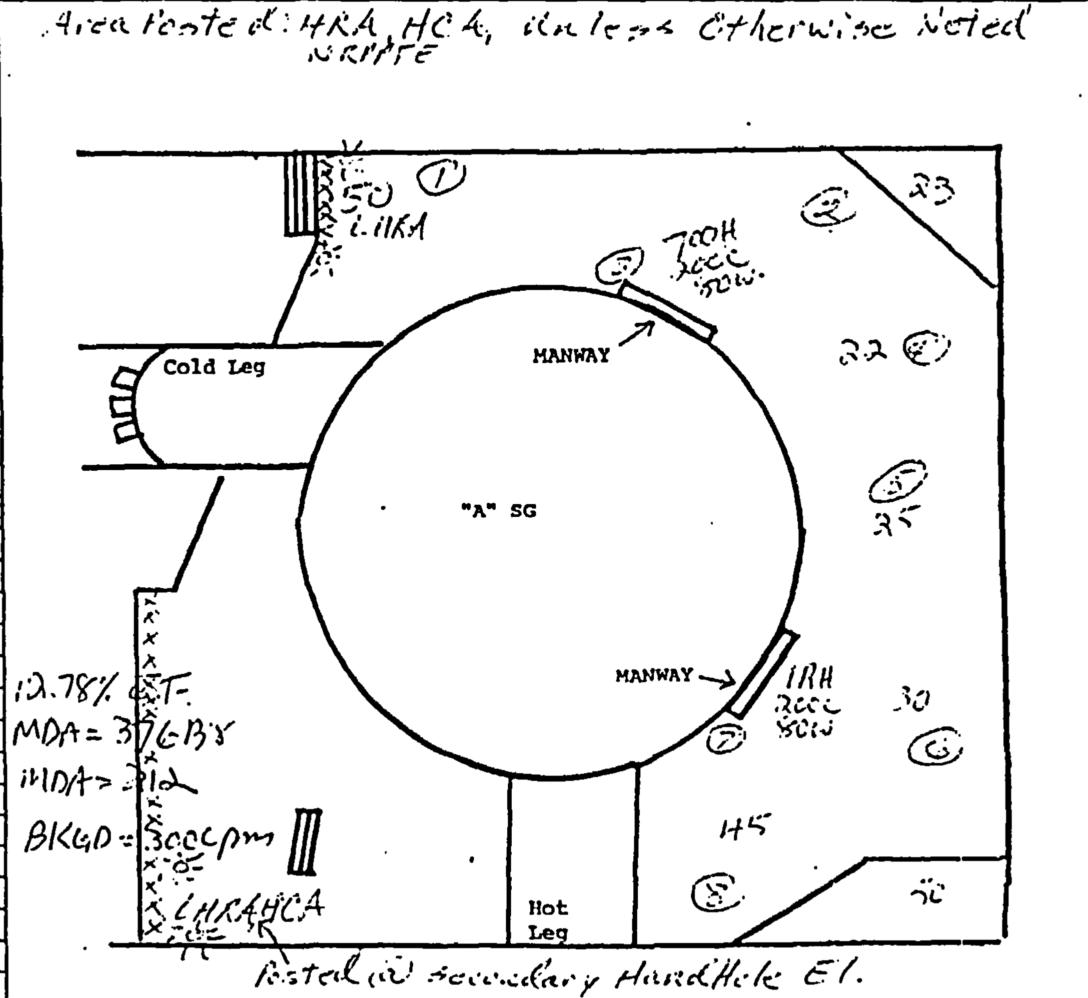
RADIOLOGICAL SURVEYS

LOCATION: "A" Loop - Below "A" Steam Generator

COPY

DATE	4-8-04	INSTRUMENT TYPE	ASO50 / [illegible] / RM14	PURPOSE:	☐ Daily Survey ☐ Pre-RWP
TIME	1530	SERIAL NO.	7626 / 9684 / 7698	☒ RWP # 04-140	☒ Other [illegible]
MONITOR	[illegible]	COUNTED BY	[illegible]	REVIEWED BY:	[illegible]

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS
1		40K	<MDA	Floor
2		50K	<MDA	Floor
3		35K	<MDA	Strongback
4		20K	N/A	Floor
5		350K	↓	Floor
6		200K	↓	Floor
7		100K	↓	Floor Under [illegible]
8		500K	↓	Strongback
9		1200 mRad	↓	H/L Manway
10		150 mRad	↓	C/L Manway



Area 1C-9

PBF-4021
Revision 0 01/01/93
HP 1.9

Notes: 1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

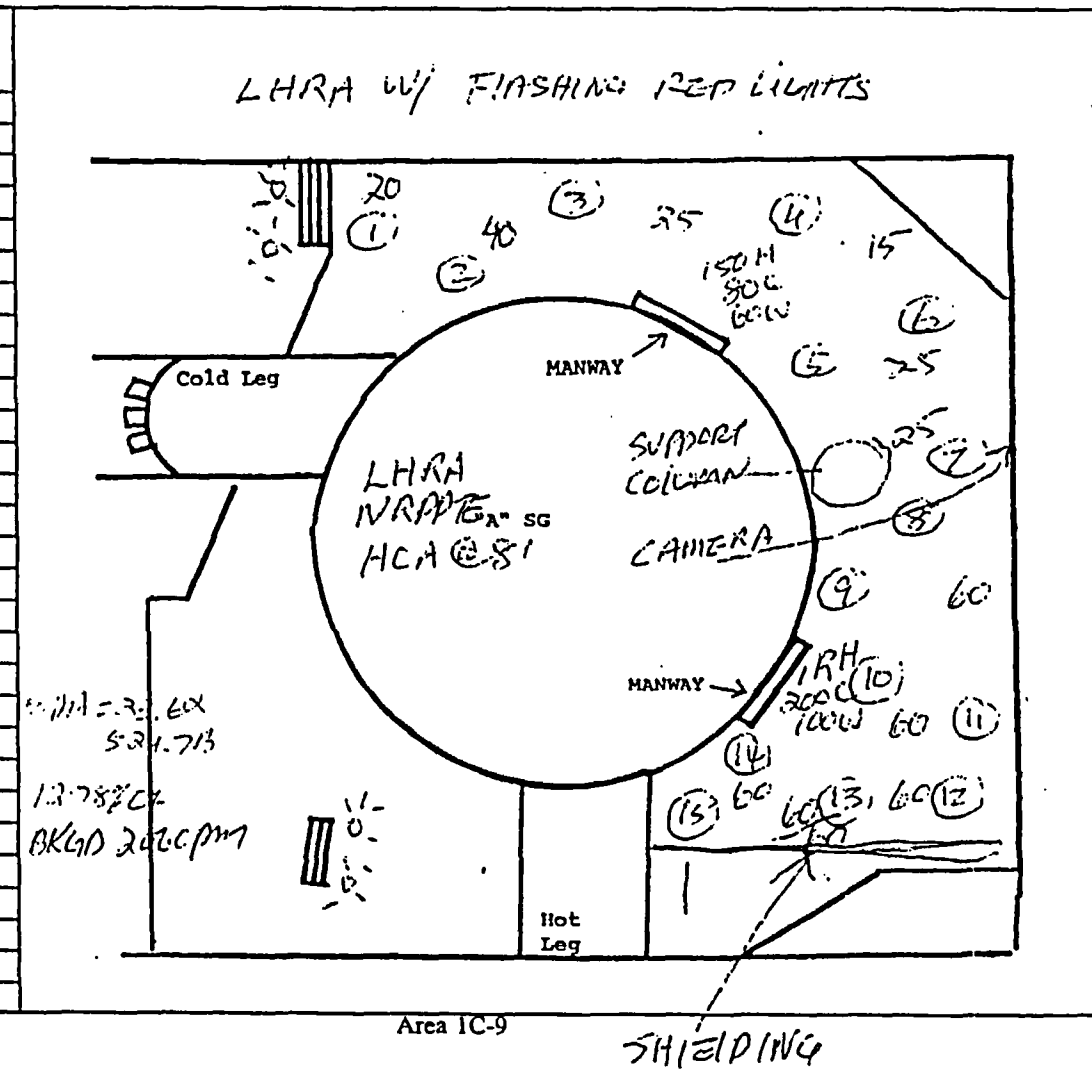
RADIOLOGICAL SURVEYS

LOCATION: "A" Loop - ...ow "A" Steam Generator

COPY

DATE 4-9-04 | INSTRUMENT TYPE RSO5 / ABACUS / RM14 | PURPOSE: ☐ Daily Survey ☐ Pre-RWP
TIME 1530 | SERIAL NO. 7337 / 9684 / 7695 | ☒ RWP # 04-141 ☐ Other
MONITOR PETER STEVENS | COUNTED BY PETER STEVENS | REVIEWED BY:

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS
1		3K	<MDA	FLOOR
2		2K	<MDA	
3		<1K	<MDA	
4		5K	<MDA	
5		<1K	<MDA	
6		150K		
7		70K		
8		100K		
9		4K		
10		5K		
11		10K		
12		2K	<MDA	
13		1K	<MDA	
14		2K	<MDA	
15	10K	100K		STEAM BHAC
16		10K		
17		200K		
18		40K		
19		200K		
20		2K		



PBF-4021
Revision 0 01/01/93
HP 1.9

Notes:
1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

COPY

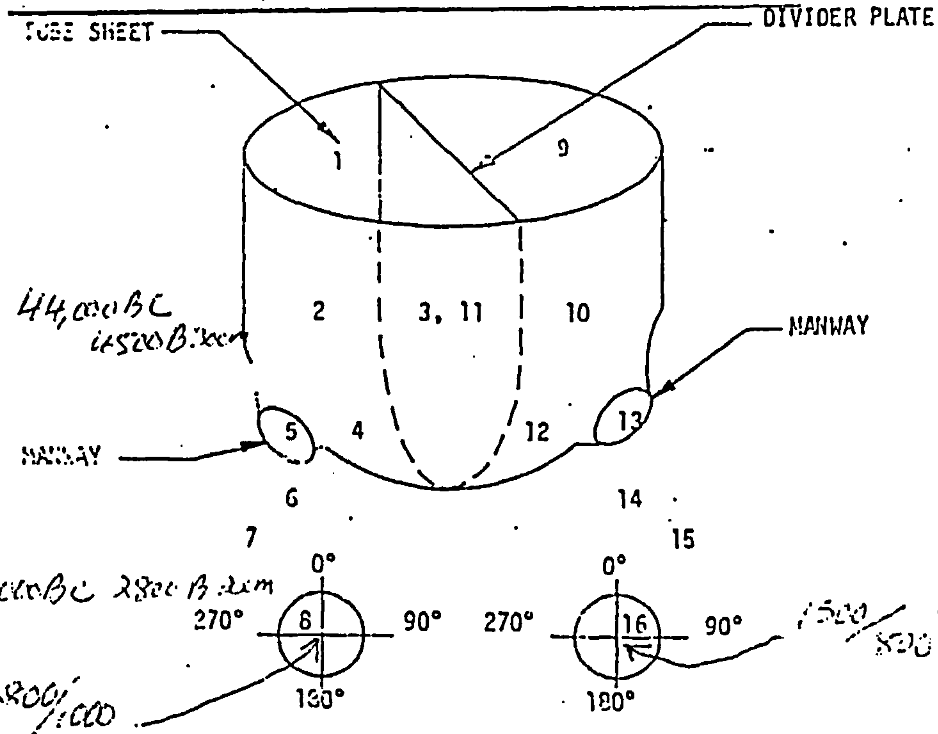
POINT BE. 'UCLEAR PLANT
RADIOLOGICAL SURVEYS

LOCATION: UNIT [redacted] STEAM GENERATOR CHANNEL HEAD

DATE 4-8-04	INSTRUMENT TYPE RSO50 / TELETECTOR	PURPOSE: ☐ Routine Daily Survey	
TIME 1530	SERIAL NO. 7626 / 2865	☒ RWP # 04-140	☐ Other
MONITOR BEN WICHBYK, FCM	COUNTED BY NA	REVIEWED BY: [signature]	

Area Posted LHRA, HCA, NRITE

NO.	LOCATION	DOSE RATE (mrem/hr)
	INLET CHANNEL (HOTLEG)	
1	Midpoint of tube sheet	5,000
2	Channel head center	8,000
3	~~Center divider head~~	~~7000~~
4	Bottom of channel head	10,000
5	Manway entrance	1900
6	1' from manway	1100
7	3' from manway	350
8	Center of diaphragm	7000 BC 15000B@30cm 44,000BC 14500B:30cm
	OUTLET CHANNEL (COLDLEG)	
9	Midpoint of tube sheet	11000
10	Channel head center	9000
11	~~Center divider plate~~	~~[illegible]~~
12	Bottom of channel head	10000
13	Manway entrance	2000
14	1' from manway	1000
15	3' from manway	300
16	Center of diaphragm	1500 BC 5000B 30cm 10000BC 2800B:30cm
	HOT SPOTS (DESCRIBE LOCATION)	
17	N/A	
18		
19		
20		



Ventilation Operational Check

	RAD DOORS INSTALLED (YES / (NO))	VENTILATION OPERABLE (SAT / (UNSAT) / NA)
Hot Leg	No	Unsat
Cold Leg	No	Unsat

INLET DIAPHRAGM		
8A* - 0°	1300	mrem/hr
8B - 90°	1300	
8C - 180°	1500	
8D - 270°	1500	

OUTLET DIAPHRAGM		
16A* - 0°	900	mrem/hr
16B - 90°	1000	
16C - 180°	1300	
16D - 270°	900	

*TAKE DIAPHRAGM SURVEY BEFORE REMOVAL

AREA C-1

PBF-4021
Revision 1 08/29/95
HP 1.9

Notes:
1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

RADIOLOG[illegible]L SURVEYS

LOCATION: "A" Loop - Below "A" Steam Generator

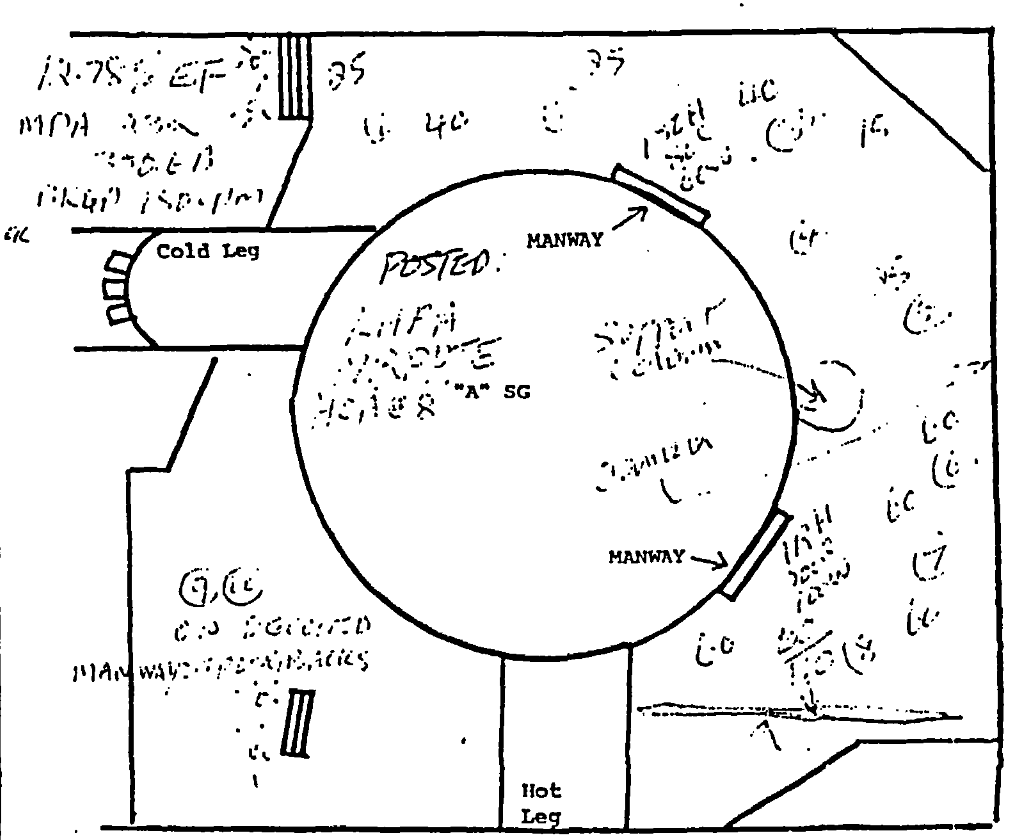
COPY

DATE [illegible]
TIME 1000
MONITOR [illegible]

INSTRUMENT TYPE [illegible] / ABACUS / [illegible]
SERIAL NO. 7855 / 9684 / 7698
COUNTED BY [illegible]

PURPOSE: ☐ Daily Survey ☐ Pre-RWP
☒ RWP # 04-142 ☐ Other
REVIEWED BY: [illegible]

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS
[illegible]	[illegible]	[illegible]K		FLOOR
[illegible]	↓	2K		↓
[illegible]		100K		
[illegible]		7K	[illegible]	
[illegible]		1K	[illegible]	
[illegible]		3K	[illegible]	
[illegible]		15K		
[illegible]		3K		↓
[illegible]		[illegible]K		MANWAY STRONGBACK
[illegible]	↓	[illegible]K		↓



Area IC-9

SHIELDING

PBF-4021
Revision 0 01/01/93
HP 1.9

Notes:
1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

SAMPLE TYPE: ☐ AP ☒ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. _____

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U-1 CTMT [redacted]

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START DATE	SAMPLE START TIME	SAMPLE STOP DATE	SAMPLE STOP TIME	SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
30-104	NA	NA	[redacted]	1830	[redacted]	NA	RLK

Sample Start Flow: NA
Sample Stop Flow: /
Average Sample Flow: /

Total Sample Time (min): NA
Flow Correction: /
Remarks: _____

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ/ NET cpm α[3]	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☒ Isotopic Analysis ☒ NOBLGS ☒ DACDOS Return to RP by _____ hr. for LLA counting.

Date 4/8/04 Time 1853 Spectrum Index No. NJAm ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS
Xe 133	3.39E-7	SJL			

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6.09E-09 μCi/cc, or the total for noble gases exceeds 6.86E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1, and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (μCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4/5/07

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda\Delta t})}{1 - e^{-\lambda\Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 μCi/cc).
2. If C_{LL} is greater than 7.5E-13 μCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_4/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant
*** NOBLE GAS SKIN EXPOSURE ***

SAMPLE DATE: 04/08/04 18:30 SAMPLE ID: 30-104 TAKEN BY: RLK
SAMPLE LOCATION: U1 CTMT CHANNEL ANALYSIS BY: EK
REMARKS:

COP

ISOTOPIC ANALYSIS RESULTS

ISOTOPE	NOBLE GAS CONC. (uCi/cc)	FRACTION	GAMMA WHOLE BODY (mR/hr)	BETA SKIN DOSE (mR/hr)	GAMMA SKIN DOSE (mR/hr)	TOTAL SKIN DOSE (mR/hr)
XE-133	3.390E-07	1.0000	0.01	0.01	0.02	0.03
TOTALS	3.390E-07	1.0000	0.01	0.01	0.02	0.03

Reviewed by: _____ Date: 4/5/04

Point Beach Nuclear Plant

*** RESTRICTED DAC IN AIR CALCULATIONS ***

SAMPLE DATE: 4/8/2004 18:30 SAMPLE ID: 30-104 TAKEN BY: RLK

SAMPLE LOCATION: U1 CTMT CHANNEL ANALYSIS BY: EK

REMARKS:

COT

ISOTOPIC ANALYSIS RESULTS

ISOTOPE	RESTRICTED DAC (uCi/cc)	CONC (uCi/cc)	FRAC. OF CONC.	% OF DAC
XE-133	1.00E-04	3.39E-07	1.00	0.339
	TOTALS	3.39E-07	1.00	0.339

Based on a 40 hour work week, the maximum stay time for the listed concentrations is: 1.2E+04 hours.

Reviewed by: _____ Date: 4/9/04

SAMPLE TYPE:
☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-140

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U-1 CTMT S/G platform (Asphalt removal)

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START DATE	SAMPLE START TIME	SAMPLE STOP DATE	SAMPLE STOP TIME	SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
30-105	4-8-04	1440	4-8-04	~~1613~~ RLK 1613	2.7E6	LVS 3	RLK

Sample Start Flow 35 lpm
Sample Stop Flow
Average Sample Flow

Total Sample Time (min) 93
Flow Correction 0.83
Remarks

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (µCi/cc)[1,2]	BY INITIALS
4-8-04	1638	Pac-2	121.6	0.6	121	4.2	5.48 E-11	RLK

(1) If sample activity is greater than or equal to 5E-10 µCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 µCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ/ NET cpm α[3]	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (µCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (µCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ µCi RE-212: _____ µCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ µCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6.66E-09 µCi/cc, or the total for noble gases exceeds 6.86E-06 µCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13. perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (μCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4										--		
C_{LL}											----	

Reviewed By: _____ RP Supervision

Date: 4-9-09

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_n	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1. or if the activity of any count is less than LLD. airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 μCi/cc).
2. If C_{LL} is greater than 7.5E-13 μCi/cc. notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_2/C_1 ratio is greater than that in Table 1. refer to HPIP 3.53. Counting of Air Samples for Low Level. Long-Lived Radioactive Alpha Particulate Contamination.

1 there is no Isotopic B Isotopic

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS

LOCATION: U1 CNMT S/G PLATFORM - DIAPHRAM REMOVAL RWP No. 04-140

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA COT

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME, (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30-106	4-8-04	1440	4-8-04	1613	27.6E6	CUS-3	RLK

Sample start flow 35 LPM
Sample stop flow ↓
Average sample flow ↓
Total sample time (min) 93
Flow correction factor 0.83
Remarks

ANALYSIS DATA:

[X] Isotopic Analysis [ ] MECDOS (for DAC data) S.I. #

Date	Time	Isotope	*Concentration (µCi/cc)	By Initials	Date	Time	Isotope	Concentration (µCi/cc)	By Initials
4/8/04	1756	I-131	<MDA	GL	4/8/04	1756	Cl-38	<MDA	GL
↓	↓	I-132	↓	↓	↓	↓	Br-82	↓	↓
↓	↓	I-133	↓	↓	↓	↓	↓	↓	↓
↓	↓	I-134	↓	↓	↓	↓	↓	↓	↓
↓	↓	I-135	↓	↓	↓	↓	↓	↓	↓
↓	↓	Total Iodine	↓	↓	↓	↓	Total Additional	↓	↓

Total Iodine Concentration + Total Additional Concentration = <MDA µCi/cc By (Initials) GL

[ ] Unit 1 [ ] Unit 2 RE-211: _____ µCi RE-212: _____ µCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.28E-09 µCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: [signature] Date: 4/9/04

References: HPIPs 3.52, 3.52.2, 3.53, 5.1

SAMPLE TYPE: ☑ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-141

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U-1 "A" S/G platform

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-123	4-8-04	1900	4-9-04	1010	3.02 E7	LVS-30	RLK

Sample Start Flow: 40 lpm
Sample Stop Flow: ✓
Average Sample Flow: ✓

Total Sample Time (min): ~~40~~ 910
Flow Correction: 0.93
Remarks:

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (µCi/cc)[1,2]	BY INITIALS
4-9-04	1030	CAN 5	11117	31.2	14085.8	9.4	1.98 E-9	RLK

(1) If sample activity is greater than or equal to 5E-10 µCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 µCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS
4-9-04	1040	7272	54.8	0.1	44.7	315.1	RLK

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☑ Isotopic Analysis ☐ NOBLGS ☒ DACDOS Return to RP by 1410 hr. for LLA counting.

Date 4-9-04 Time 1161 Spectrum Index No. ☐

ISOTOPE	ACTIVITY (µCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (µCi/cc)	BY INITIALS
Cr-51	3.65E-10 ✓	KLB	Zr-95	1.02E-10 ✓	KLB
MN-54	5.23E-11 ✓	KLB	Sn-113	6.17E-12 ✓	KLB
Co-57	1.13E-11 ✓	KLB	Sn-117M	4.24E-12 ✓	KLB
Co-58	2.67E-9 ✓	KLB	Sb-125	1.16E-11 ✓	KLB
Fe-59	2.62E-11 ✓	KLB			
Co-60	8.93E-10 ✓	KLB			
Nb-95	1.60E-10 ✓	KLB			

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ µCi RE-212: _____ µCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ µCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 8.E-09 µCi/cc, or the total for noble gases exceeds 6.8E-06 µCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an abnormal release.

LONG LIVED ALPHA COUNTING DATA:

Sample Volume (cc): 3.02E7 (from Page 1)

If the ratio of (C_2/C_1) is greater than the value given in Table 1, and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Multi. Factor	Activity (µCi/cc)	LLD [4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1	4-9-04	1410	7270	17.8	0.5	17.3	4.25	1.09E-12	7.46E-14	----	----	RLK
C_2	4-9-04	1610	7270	14.8	0.5	14.3	4.25	9.02E-13	7.46E-14	2	0.832	RLK
C_3												
C_4										–		
C_{LL}											----	

Reviewed By: RLK RP Supervision Date: 4-11-04

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{24}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda\Delta t})}{1 - e^{-\lambda\Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_2/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

SAMPLE TYPE: ☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

AIRBORNE RADIOACTIVITY SURVEY

RWP No. 4-8-04 (1) 04-140

Sample Location: U1 A-5/6 PLATFORM

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

COL

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START DATE	SAMPLE START TIME	SAMPLE STOP DATE	SAMPLE STOP TIME	SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
30-110	4-8-04	1514	4-8-04	1900	6.56 E6	[illegible]-3	RM

Sample Start Flow: 3.5 cpm
Sample Stop Flow:
Average Sample Flow: ↓

Total Sample Time (min): 226
Flow Correction: 0.83
Remarks:

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS
4-8-04	2002 / 4-9-04 1900	P20-2	70.2	0.6	69.6	4.2	2.01 E-11	RM

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

P[illegible]e Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6.[illegible]-09 μCi/cc, or the total for noble gases exceeds 6.56E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1, and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4/9/04

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3,}$ etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_2/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

SAMPLE TYPE:
☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-104

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: 1A1 A S/G Hot Leg

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-108	4-8-04	1830	4-8-04	1845	1.65E6	HUS-22	RM-DD

Sample Start Flow: 110 cpm
Sample Stop Flow: ↓
Average Sample Flow: ↓

Total Sample Time (min): 15m
Flow Correction:
Remarks:

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS
4-8-04	1953	PRO-2	27.6	0.6	27.0	4.2	3.10 E-11	RM

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6.09E-09 μCi/cc, or the total for noble gases exceeds 6.86E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1, and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4] Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4										—		
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4/9/04

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda\Delta t})}{1 - e^{-\lambda\Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0 6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0 4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0 4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0 4338		

NOTES:

1. If the ratio of activity ($C_{2,3,}$ etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_3/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

SAMPLE TYPE:
☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-138

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U1 A-S/G PLATFORM

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-107	4-6-04	1100	4-8-04	1440	9.01 E7	-003-3	RM

Sample Start Flow: 35 cfm
Sample Stop Flow: ↓
Average Sample Flow: ↓

Total Sample Time (min): 3100
Flow Correction: 0.83
Remarks: _____

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS
4-8-04	1750	PRO-1	275.2	0.5	274.7	4.1	5.63 E-12	RM

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6.56E-09 μCi/cc, or the total for noble gases exceeds 6.56E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1, and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4/19/04

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_4/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant
*** RESTRICTED DAC IN AIR CALCULATIONS ***

SAMPLE DATE: 4/9/2004 10:10 SAMPLE ID: 30-123 TAKEN BY: RK
SAMPLE LOCATION: U1 A S/G platform ANALYSIS BY: KCB
REMARKS:

COP

ISOTOPIC ANALYSIS RESULTS

ISOTOPE	RESTRICTED DAC (uCi/cc)	CONC (uCi/cc)	FRAC. OF CONC.	% OF DAC
CO-57	3.00E-07	1.13E-11	0.00	0.004
CO-58	3.00E-07	2.67E-09	0.62	0.890
CO-60	1.00E-08	8.93E-10	0.21	8.930
CR-51	8.00E-06	3.65E-10	0.08	0.005
FE-59	1.00E-07	2.62E-11	0.01	0.026
MN-54	3.00E-07	5.23E-11	0.01	0.017
NB-95	5.00E-07	1.60E-10	0.04	0.032
SN-113	5.00E-07	6.17E-12	0.00	0.001
SB-117M	5.00E-07	4.24E-12	0.00	0.001
SB-125	2.00E-07	1.16E-11	0.00	0.006
ZR-95	5.00E-08	1.02E-10	0.02	0.204
	TOTALS	4.30E-09	1.00	10.116

Based on a 40 hour work week, the maximum stay time for the listed concentrations is: 395.4 hours.

Reviewed by: _____ Date: 4-11-04

SAMPLE TYPE:
☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. ____________

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U-1 "A" S/G PlaT

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA

COPY

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START DATE	SAMPLE START TIME	SAMPLE STOP DATE	SAMPLE STOP TIME	SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
20-129	4-9-04	1010	4-10-04	0940	3.5E7	[illegible]	RCK

Sample Start Flow 30 lpm
Sample Stop Flow ↓
Average Sample Flow ↓

Total Sample Time (min) 1410
Flow Correction 0.83
Remarks ____________

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)(1,2)	BY INITIALS
[illegible]	[illegible]	[illegible]	[illegible]	25.5	[illegible]	[illegible]	[illegible]	[illegible]

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ/ NET cpm α(3)	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by ______ hr. for LLA counting.

Date ________ Time ________ Spectrum Index No. ________ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: ________ μCi RE-212: ________ μCi/cc
Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: ________ μCi/cc SAE Flow: ________ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds [illegible]E-09 μCi/cc, or the total for noble gases exceeds 6.80E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection [illegible]isor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an [illegible]orne release.

[illegible]F-4022
[illegible]vision 16 11/13/03

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13. perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4] Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD [4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ Date: 4-10-01

RP Supervision

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$ ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_2/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS

LOCATION: U-1 "A" S/G Platt RWP No. _____

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME, (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30-130	4-9-04	1010	4-10-04	0940	3.5E7	405-3	RLK

Sample start flow 30 lpm
Sample stop flow ↓
Average sample flow ↓
Total sample time (min) 1410
Flow correction factor 0.83
Remarks

ANALYSIS DATA:

[X] Isotopic Analysis [ ] MECDOS (for DAC data) S.I. # _____

Date	Time	Isotope	*Concentration (μCi/cc)	By Initials	Date	Time	Isotope	Concentration (μCi/cc)	By Initials
4-10-04	1579	I-131	4.88E-12	KCB			Cl-38		
		I-132					Br-82		
		I-133							
		I-134							
		I-135							
		Total Iodine	4.88E-12	KCB			Total Additional	LLRT	KCB

Total Iodine Concentration + Total Additional Concentration = 4.88E-12 μCi/cc By (Initials) KCB

[ ] Unit 1 [ ] Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.28E-09 μCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: _____ Date: 4/11/04

Point Beach Nuclear Plant
*** RESTRICTED DAC IN AIR CALCULATIONS ***

SAMPLE DATE: 4/10/2004 09:40
SAMPLE ID: 30-130
TAKEN BY: RLK
SAMPLE LOCATION: U-1 A S/G PLAT
ANALYSIS BY: KCB
REMARKS:

COPY

ISOTOPIC ANALYSIS RESULTS

ISOTOPE	RESTRICTED DAC (uCi/cc)	CONC (uCi/cc)	FRAC. OF CONC.	% OF DAC
I-131	2.00E-08	4.88E-12	1.00	0.024
	TOTALS	4.88E-12	1.00	0.024

Based on a 40 hour work week, the maximum stay time for the listed concentrations is: 1.6E+05 hours.

Reviewed by: _____ Date: 4/11/04

SAMPLE TYPE: ☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

AIRBORNE RADIOACTIVITY SURVEY

RWP No. 142 04-146 4-10-04 Rm

Sample Location: U1 A S/G PLATFORM

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-131	4-10-04	0938	4-10-04	2250	1.97 E7	LOS-3	Rm

Sample Start Flow: 30 LPM
Sample Stop Flow: ↓
Average Sample Flow: ↓

Total Sample Time (min): 792
Flow Correction: 0.83
Remarks: _____

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS
4-10-04	2256	Pro-1	43.3	1.0	42.3	4.1	4.61 E-12	Rm

[1] If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

[2] If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS

[3] If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Clerical Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 9 μCi/cc, or the total for noble gases exceeds 6.50E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an effluent release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1, and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each coun

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ Date: 4/11/04

RP Supervision

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda\Delta t})}{1 - e^{-\lambda\Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_4/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS

LOCATION: U1 A S/G PLATFORM   RWP No. 04-142 (04-HC) 4-10-04 RN

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

COPY

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME, (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30-132	4-10-04	0938	4-10-04	2250	1.97 E7	205-3	RN

Sample start flow 30 LPM
Sample stop flow ↓
Average sample flow ↓

Total sample time (min) 792
Flow correction factor 0.83
Remarks

ANALYSIS DATA:

[X] Isotopic Analysis   [ ] MECDOS (for DAC data)   S.I. # ____

Date	Time	Isotope	*Concentration (μCi/cc)	By Initials	Date	Time	Isotope	Concentration (μCi/cc)	By Initials
4/11/04	0113	I-131	<MDA	GR	4/11/04	0112	Cl-38	<MDA	GR
↓	↓	I-132	↓	↓	↓	↓	Br-82	↓	↓
		I-133							
		I-134							
		I-135							
		Total Iodine					Total Additional		

Total Iodine Concentration + Total Additional Concentration = <MDA μCi/cc By (Initials) GR

[ ] Unit 1 [ ] Unit 2 RE-211: ____ μCi RE-212: ____ μCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.28E-09 μCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: [signature]   Date: 4/11/04

PBF-4002
Revision 6 11/13/03
HP 1.1 - 1.7 or C3.2/P6.3

References: HPIPs 3.52, 3.52.2, 3.53, 5.1

SAMPLE TYPE:
☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-142

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U-1 "A" S/G Plat

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA

COPY

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-137	4-10-04	2250	4-11-04	0845	1.73 E7	L-09-3	RLK

Sample Start Flow: 35 lpm
Sample Stop Flow: /
Average Sample Flow: ✓

Total Sample Time (min): 595
Flow Correction: 0.83
Remarks: _____

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS
4-11-04	1025	CAN 8	371.2	27.8	343.4	9.4	8.4E-11	RLK

[1] If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

[2] If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS

[3] If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds [illegible]E-09 μCi/cc, or the total for noble gases exceeds 6.86E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection Supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4										--		
C_{LL}											----	

Reviewed By: _____ Date: 4/11/04

RP Supervision

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4,}$ ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3,}$ etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_4/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

POINT BE[illegible] 'UCLEAR PLANT
RADIOL[illegible]CAL SURVEYS

LOCATION: UNIT [illegible] STEAM GENERATOR CHANNEL HEAD

DATE 4-8-04
TIME ~2310
MONITOR [illegible]

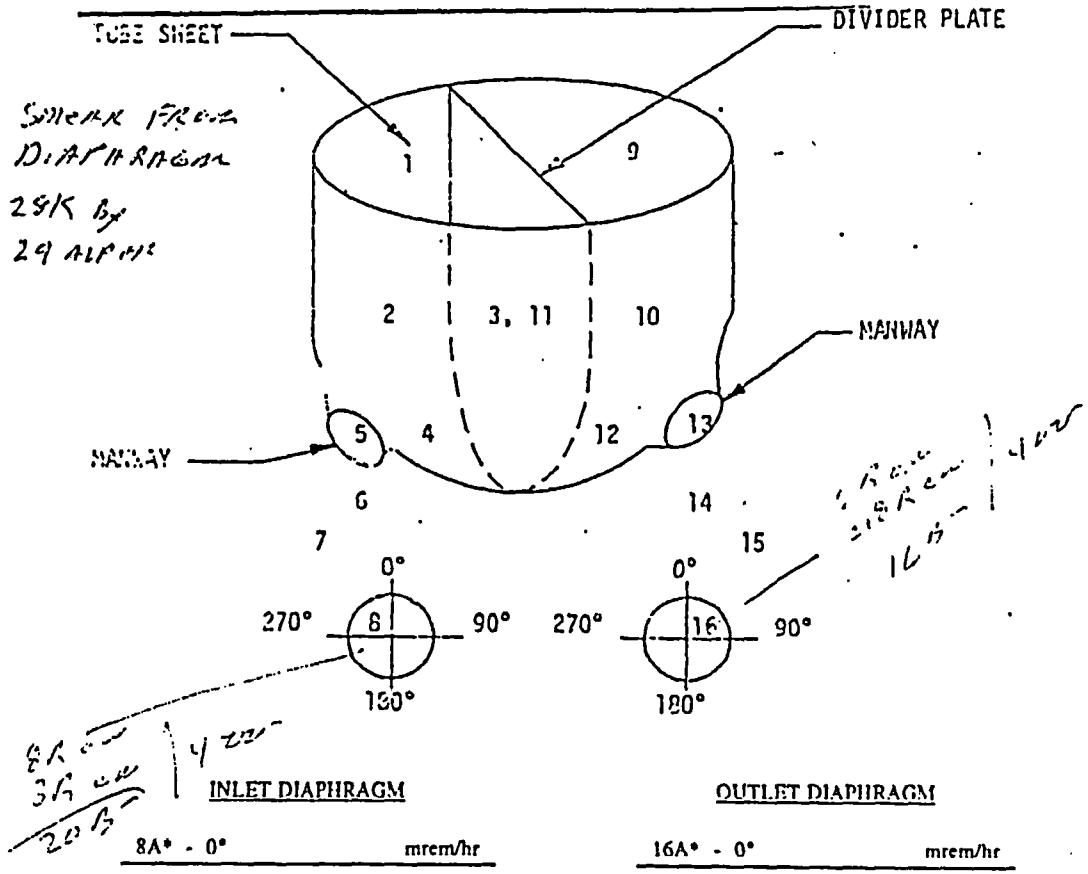
INSTRUMENT TYPE TT / ABACUS
SERIAL NO. 7935 / 9681
COUNTED BY [illegible]

PURPOSE: ☐ Routine Daily Survey
☒ RWP # 04140 ☒ Other Diaphragm Removal
REVIEWED BY: [illegible]

NO.	LOCATION	DOSE RATE (mrem/hr)
	INLET CHANNEL (HOTLEG)	
1	Midpoint of tube sheet	8R
2	Channel head center	7R
3	Center divider head	20R
4	Bottom of channel head	8R
5	Manway entrance	2.5R
6	1' from manway	1R
7	3' from manway	250
8	Center of diaphragm	3R
	OUTLET CHANNEL (COLDLEG)	
9	Midpoint of tube sheet	12R
10	Channel head center	9R
11	Center divider plate	15R
12	Bottom of channel head	10R
13	Manway entrance	2.5R
14	1' from manway	1R
15	3' from manway	300
16	Center of diaphragm	2.8R
	HOT SPOTS (DESCRIBE LOCATION)	
17		
18		
19		
20		

Ventilation Operational Check

	RAD DOORS INSTALLED (YES / NO)	VENTILATION OPERABLE (SAT / UNSAT / NA)
Hot Leg	Yes	
Cold Leg		



INLET DIAPHRAGM

8A* - 0°	mrem/hr
8B - 90°	
8C - 180°	
8D - 270°	

OUTLET DIAPHRAGM

16A* - 0°	mrem/hr
16B - 90°	
16C - 180°	
16D - 270°	

*TAKE DIAPHRAGM SURVEY BEFORE REMOVAL

AREA C-1

PBF-4021
Revision 1 08/29/95
HP 1.9

Notes: 1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

POI. BEACH NUCLEAR PLANT

RADIOLOGICAL SURVEYS

LOCATION: "B" LOOP - BELOW "B" STEAM GENERATOR

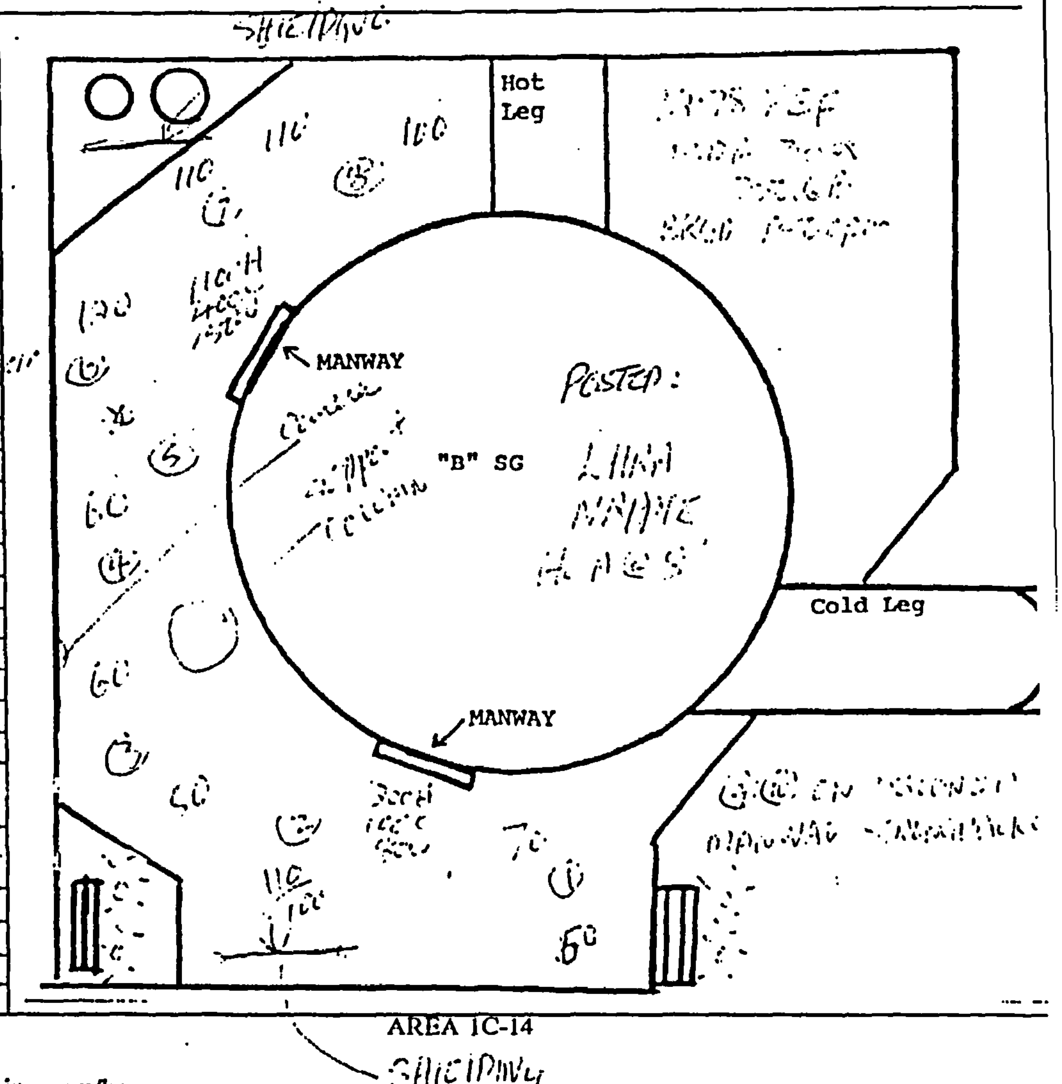
COPY

DATE 4-10-06
TIME 1000
MONITOR [illegible]

INSTRUMENT TYPE [illegible]
SERIAL NO. [illegible]
COUNTED BY [illegible]

PURPOSE: ☐ Daily Survey ☐ Pre-RWP
☒ RWP # 04-143 ☐ Other
REVIEWED BY: [illegible]

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS
1	[illegible]	[illegible]	< MDA	FLOOR
2	[illegible]	[illegible]	< MDA	[illegible]
3	[illegible]	[illegible]	< MDA	[illegible]
4	[illegible]	[illegible]		[illegible]
5	[illegible]	[illegible]		[illegible]
6	[illegible]	[illegible]		[illegible]
7	[illegible]	[illegible]		[illegible]
8	[illegible]	[illegible]		[illegible]
9	[illegible]	[illegible]		[illegible]
10	[illegible]	[illegible]		[illegible]



PBF-4021
Revision 0 01/01/93
HP 1.9

Notes:
1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

POINT ACH NUCLEAR PLANT
RADIOLOGICAL SURVEYS

COPY

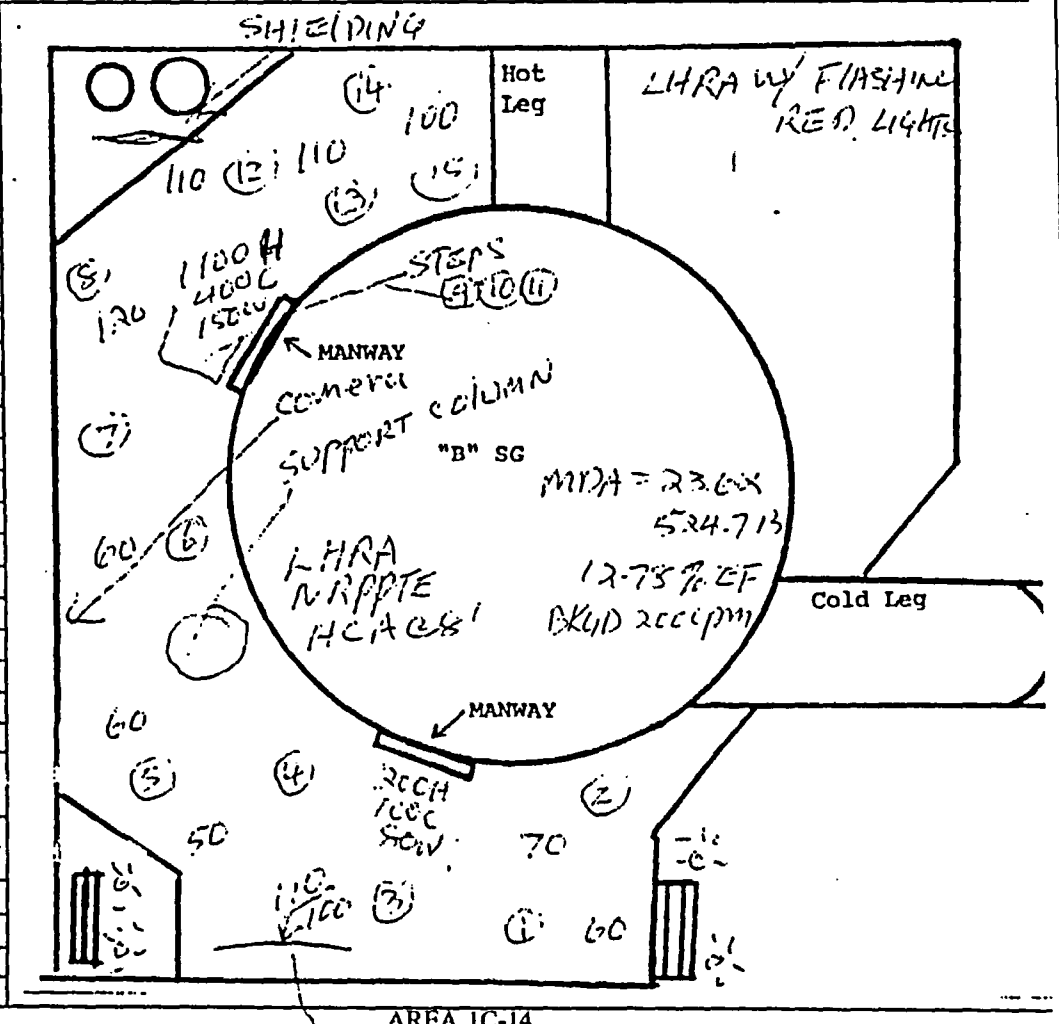
LOCATION: "B" LOOP - BELOW "B" STEAM GENERATOR

DATE 4-9-04
TIME 1500
MONITOR PETER STENIM

INSTRUMENT TYPE RSO5 / AMIGUS / RM14
SERIAL NO. 7337 / 9684 / 7695
COUNTED BY PETER STENIM

PURPOSE: ☐ Daily Survey ☐ Pre-RWP
☒ RWP # 04-141 ☐ Other
REVIEWED BY:

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS
1		1500	<MDA	FLOOR
2		50K		
3		1K		
4		50K		
5		4K		
6		10K		
7		1K	<MDA	
8		<1K	<MDA	
9		<1K	<MDA	
10		<1K		
11		2K		
12		4K		
13		5K		
14		1.5K	<MDA	
15		1K	<MDA	



PBF-4021
Revision 0 01/01/93
HP 1.9

Notes: 1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

POINT ACH NUCLEAR PLANT
RADIOLOGICAL SURVEYS

COPY

LOCATION: "B" LOOP - BELOW "B" STEAM GENERATOR

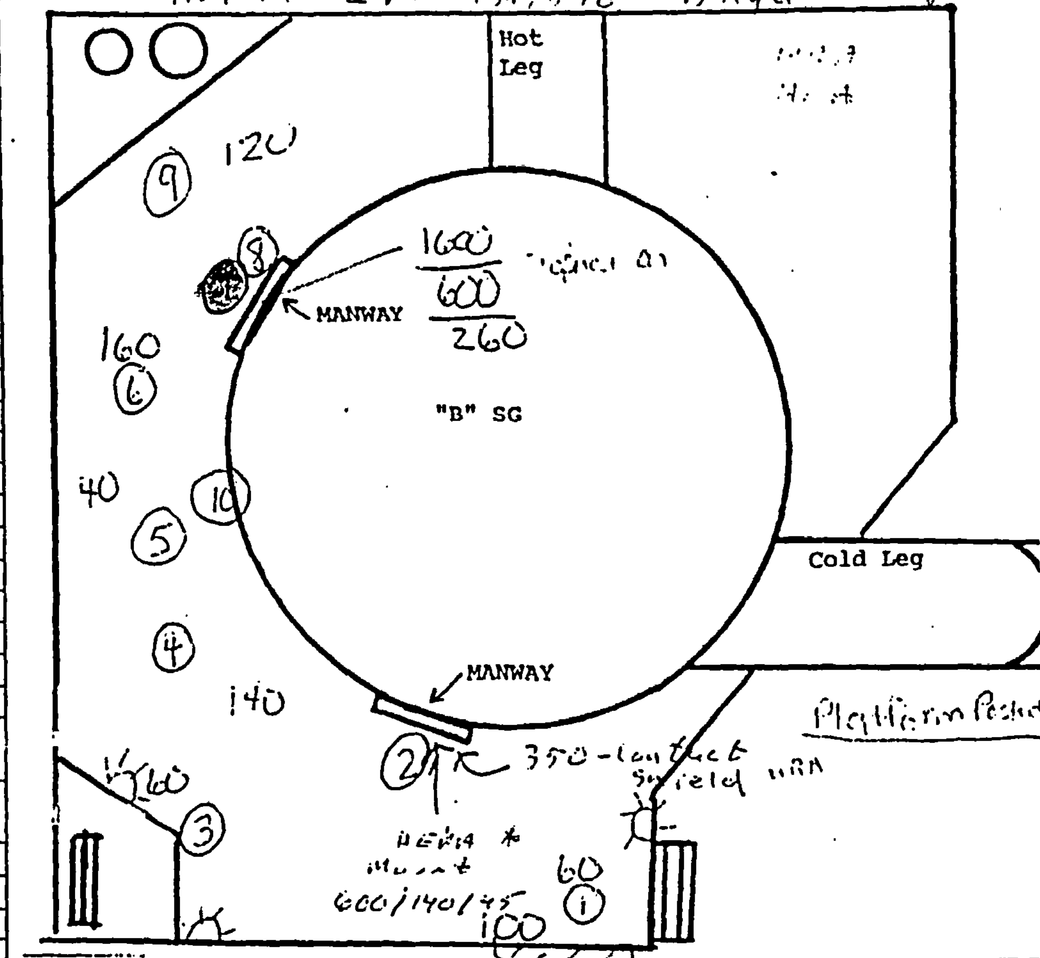
DATE 4-9-04
TIME 133_
MONITOR Dan Mihalik

INSTRUMENT TYPE RO-2A / RM-14 / 560H
SERIAL NO. 4010 / 7648 / 9691
COUNTED BY D. Mihalik

PURPOSE: ☐ Daily Survey ☐ Pre-RWP ☐ RWP # ______ ☒ Other Post Decon
REVIEWED BY: M [signature]

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS
1	smear	5K		
2	↓	6K		
3		30K		
4		5K		
5		20K		Column
6		10K		
7		300K	463.6	Stairs
8		10K	<32.8	Mat-floor
9		10K	<32.8	
10	↓	8K		

RM-14 Eff. 17.78% Bkgd 200 cpm



AREA 1C-14

PBF-4021
Revision 0 01/01/93
HP 1.9

Notes: 1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

* Contact
1 ft
3 ft

POINT [illegible] CH NUCLEAR PLANT
RADIOLOGICAL SURVEYS

COPY

LOCATION: "B" LOOP - BELOW "B" STEAM GENERATOR

DATE 4-6-04
TIME 2315
MONITOR K. Kono

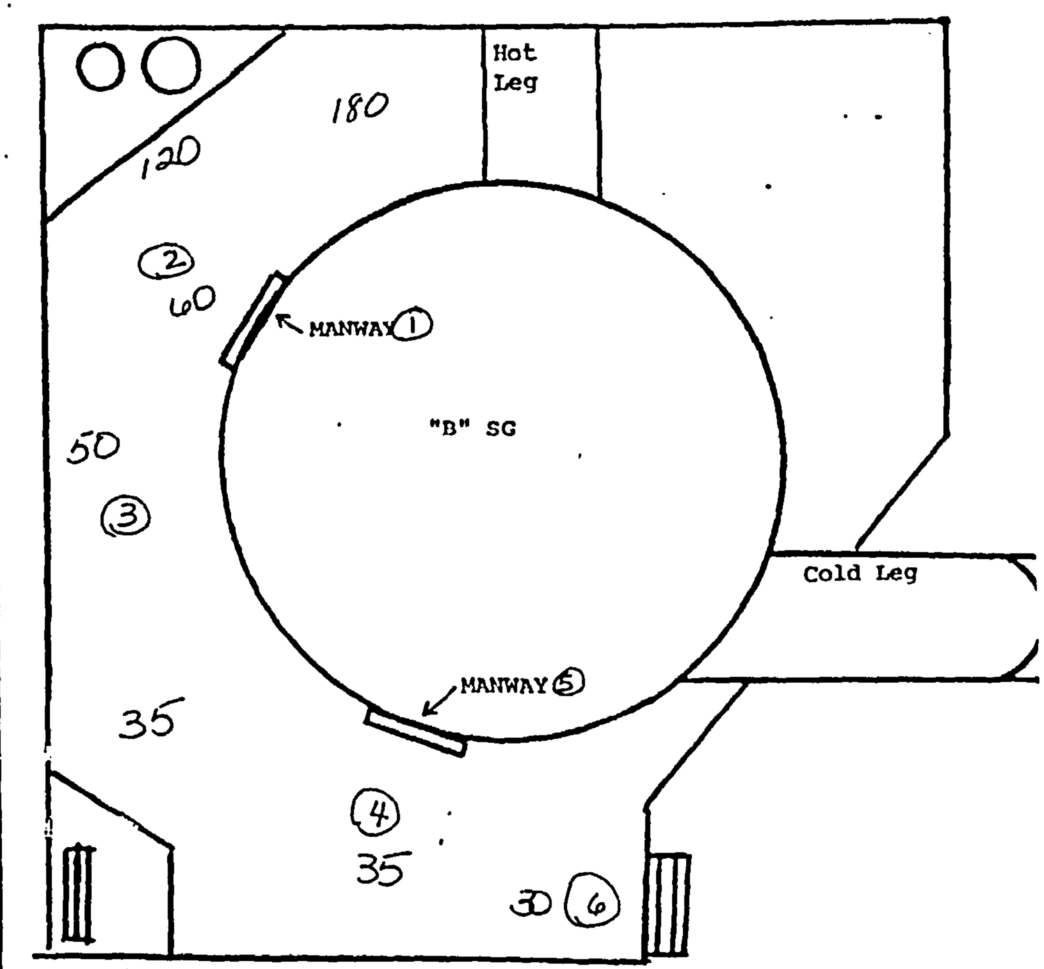
INSTRUMENT TYPE RSO5 / Abacus
SERIAL NO. 7855 / 9684
COUNTED BY K. Kono

PURPOSE: ☒ Daily Survey ☐ Pre-RWP
☐ RWP # ☐ Other
REVIEWED BY: [signature]

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS
1	N/A	~~30.2~~ <34	~~9.2~~ <24	Manway (CL)
2	↓	499 ~~<350~~	<24	Griphlon
3	↓	166 <350	<24	Support Beam
4	↓	596	<24	Griphlon
5	↓	130 <350	<24	Manway (HL)
6	✓	365 <350	<24	Grating
		ill. — KK 4-7-04		

KK 4-6-04

NA



AREA 1C-14

PBF-4021
Revision 0 01/01/93
HP 1.9

Notes:
1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

POIN :H NUCLEAR PLANT

RADIOLOGICAL SURVEYS

LOCATION: "B" LOOP - BELOW "B" STEAM GENERATOR

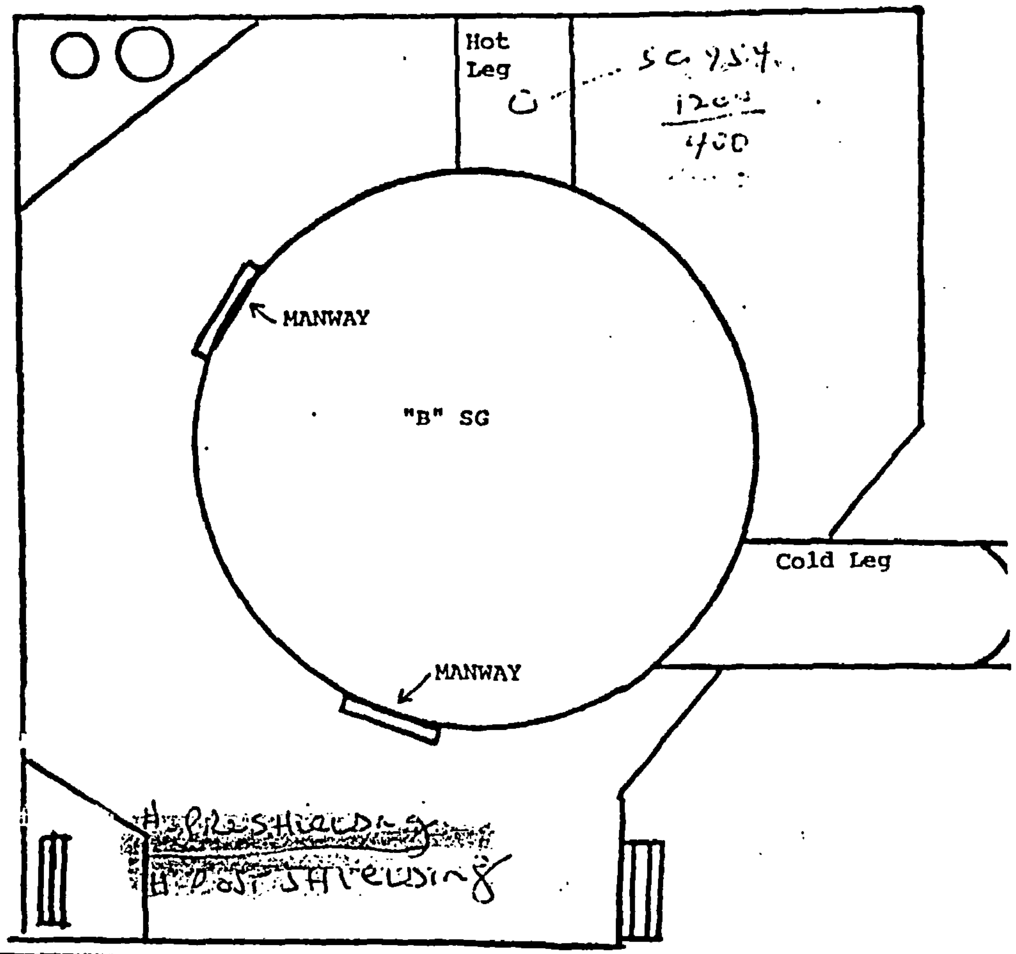
COPY

DATE 4/5/04
TIME 2200
MONITOR HINRICHSEN

INSTRUMENT TYPE RO-2A
SERIAL NO. A011
COUNTED BY N/A

PURPOSE: ☐ Daily Survey ☐ Pre-RWP
☐ RWP # ☐ Other Pre/Post Shield
REVIEWED BY: Mathews

NO.	MREM/HR	βγ DPM/100 CM²	αDPM/100 CM²	REMARKS
N/A	N/A	N/A	N/A	



AREA 1C-14

PBF-4021
Revision 0 01/01/93
HP 1.9

Notes:
1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

POINT .H NUCLEAR PLANT

RADIOLOGICAL SURVEYS

LOCATION: "B" LOOP - BELOW "B" STEAM GENERATOR

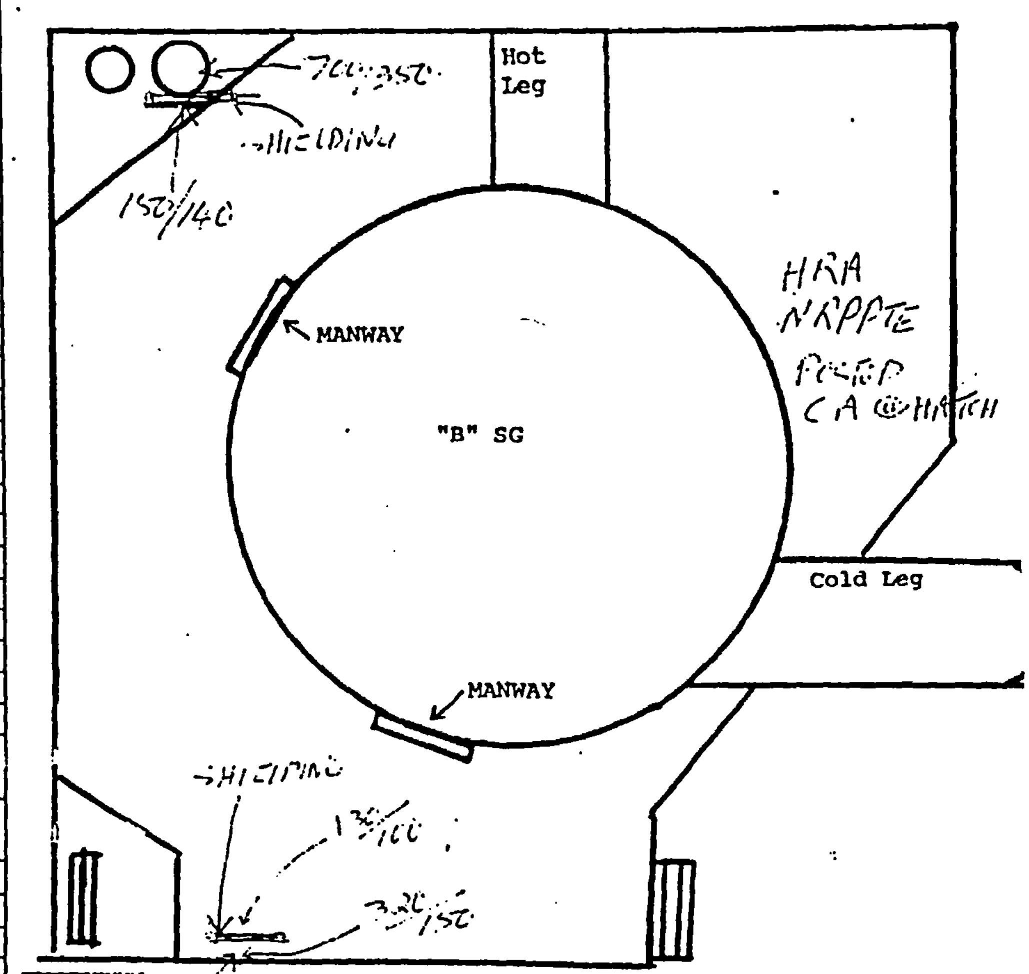
COPY

DATE 4-5-04 INSTRUMENT TYPE RO-2A PURPOSE: ☐ Daily Survey ☐ Pre-RWP

TIME 1520 SERIAL NO. 7137 ☐ RWP # ☒ Other POST SHIELDING SURV

MONITOR PETER SAGENIM COUNTED BY PETER SAGENIM REVIEWED BY: [illegible]

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS
		N/A		



NOTE: SHIELDING @ PIPE NEEDS TO BE MODIFIED THERE ARE GAPS BETWEEN SHIELDING BLANKETS; SAMPLE LINES ALREADY SHIELDED. PETER SAGENIM 1630, 4-5-04

AREA IC-14

PBF-4021

Revision 0 01/01/93

HP 1.9

Notes:
1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

POINT B[illegible]H NUCLEAR PLANT
RADIOLOGICAL SURVEYS

COPY

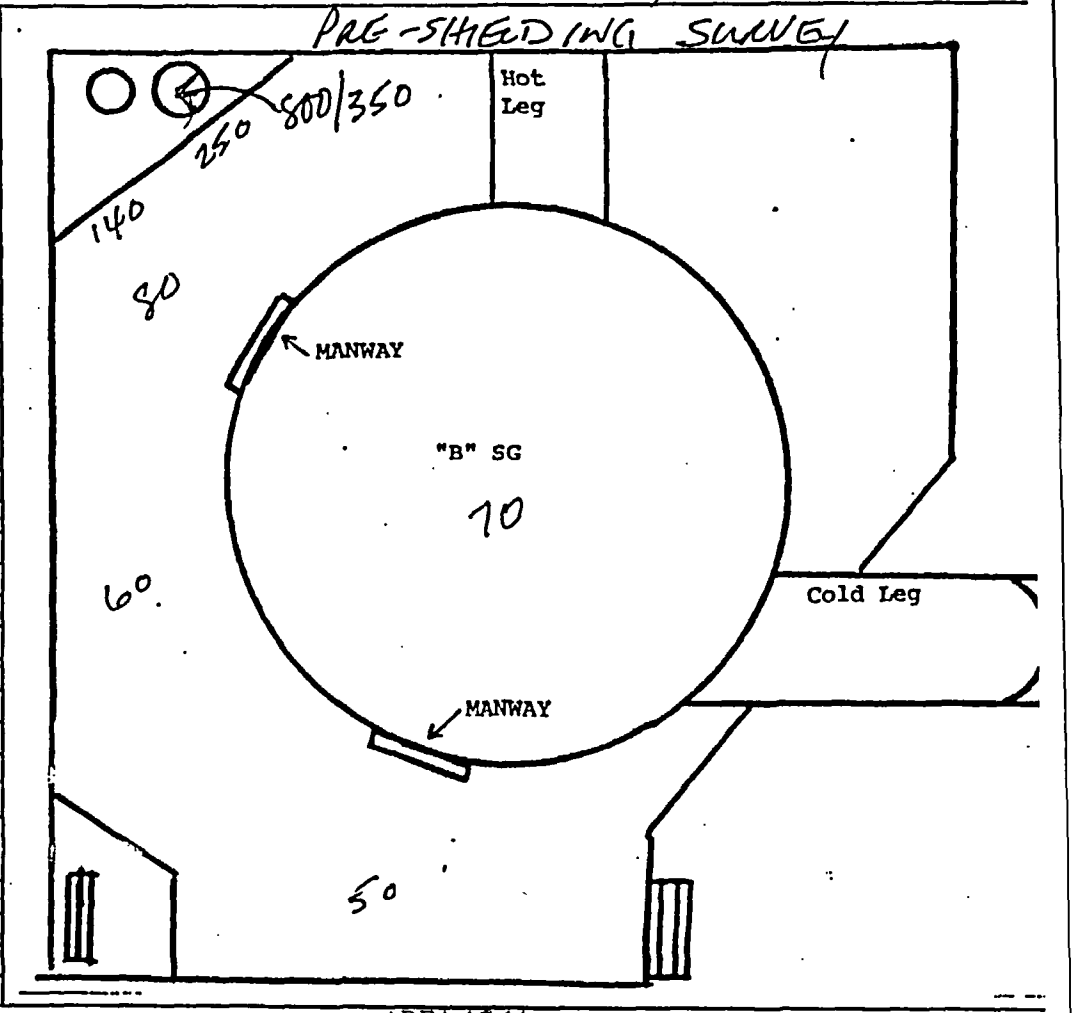
LOCATION: "B" LOOP - BELOW "B" STEAM GENERATOR

DATE 4-5-04
TIME 1040
MONITOR M A TABER

INSTRUMENT TYPE RO2A
SERIAL NO. 7137
COUNTED BY

PURPOSE: ☐ Daily Survey ☐ Pre-RWP
☑ RWP # 4-104 ☐ Other
REVIEWED BY:

NO.	MREM/ HR	βγ DPM/ 100 CM²	αDPM/ 100 CM²	REMARKS



AREA 1C-14

PBF-4021
Revision 0 01/01/93
HP 1.9

Notes: 1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

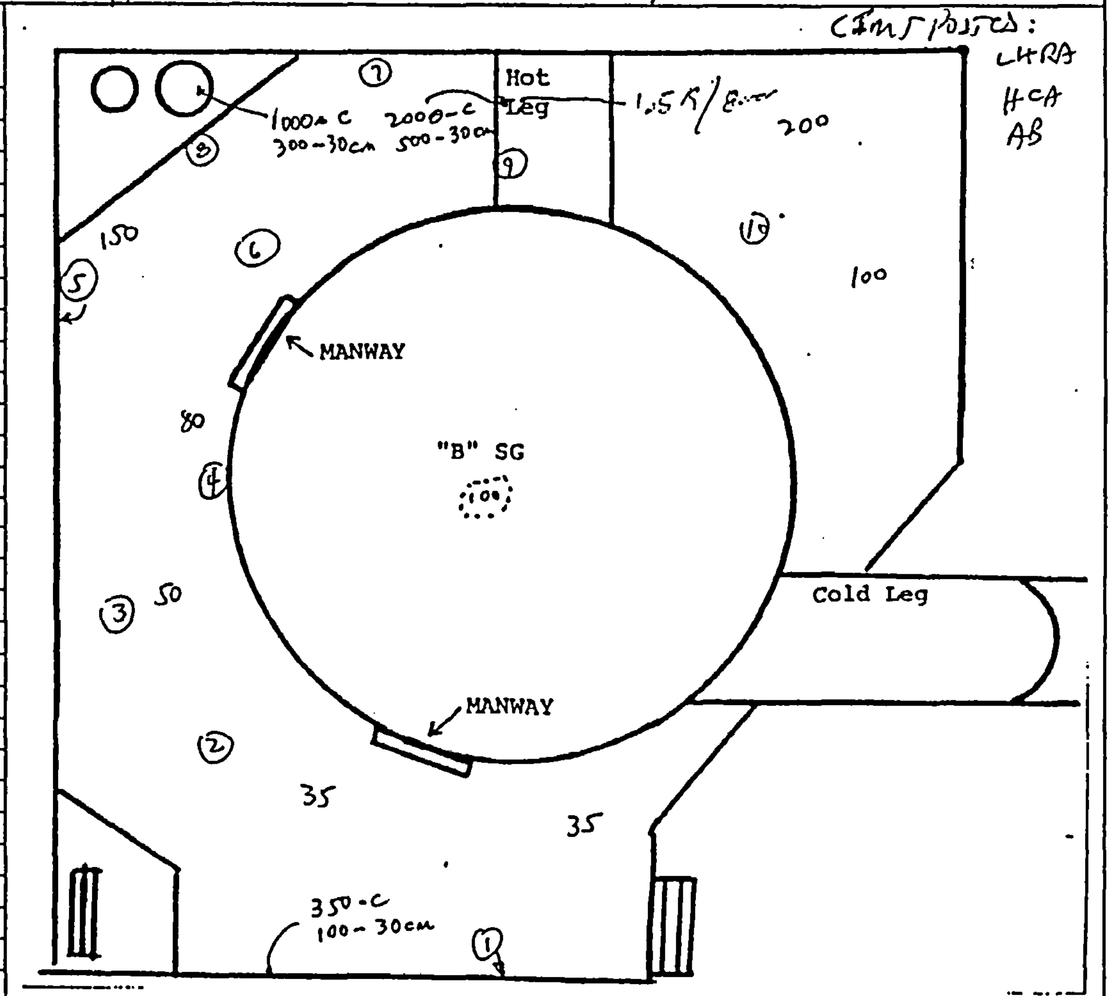
POINT BEACH NUCLEAR PLANT
RADIOLOGIC SURVEYS

LOCATION: "B" LOOP - BEL. "B" STEAM GENERATOR

DATE 4/3/04 — INSTRUMENT TYPE R02A | RM14 | SAC4 — PURPOSE: ☐ Daily Survey ☐ Pre-RWP
TIME 0320 — SERIAL NO. A012 | 7202 | 7172 — ☐ RWP # 04-109 ☒ Other INITIAL
MONITOR Dole / Hinrichsen — COUNTED BY Dole — REVIEWED BY: [signature]

Rm 14 Bkgd = ~~14~~ 20 cpm

NO.	MREM/HR	βγ DPM/100 CM²	αDPM/100 CM²	REMARKS
1	See map	<1K		WALL
2		<1K		STRUT
3		3K	<22	GRATING
4		5K	<22	I-BEAM
5		<1K		WALL
6		<1K		STRUT
7		4K	<22	I'BEAM
8		1K		RAILING
9		8K	33	Pipe INSULATION
10	See MAP	<1K		Deck grate



AREA 1C-14

#/# = CONTACT / 30cm

PBF-4021
Revision 0 01/01/93
HP 1.9

Notes:
1) All readings in mrem/hr
2) *Designates hot spots
3) ⊗Designates routinely updated posting
4) "Potential Hazards" identified are indicated on map

SAMPLE TYPE: ☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-140

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U1 B 5/6 PLATFORM

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-111	4-8-04	1342	4-8-04	1855	8.83 E6	LOS-30	RM

Sample Start Flow: 30 cpm
Sample Stop Flow: ↓
Average Sample Flow: ↓

Total Sample Time (min): 313
Flow Correction: 0.94
Remarks:

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)(1)(2)	BY INITIALS
4-8-04	2015	PRC-2	23.0	0.6	22.4	4.2	4.80E-12	RM

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α(3)	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Fuse Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6.86E-09 μCi/cc, or the total for noble gases exceeds 6.86E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13. perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4/5/04

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4,}$ ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3,}$ etc.)/C_1 is equal to or less than that indicated in Table 1. or if the activity of any count is less than LLD. airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc. notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_3/C_1 ratio is greater than that in Table 1. refer to HPIP 3.53. Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

SAMPLE TYPE: ☐ AP ☒ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-140

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U1 B 5/6

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA SOP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START DATE	SAMPLE START TIME	SAMPLE STOP DATE	SAMPLE STOP TIME	SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
30-112	—	—	4-8-04	2330	1075	N/A	RM

Sample Start Flow: N/A
Sample Stop Flow: ↓
Average Sample Flow: ↓

Total Sample Time (min): N/A
Flow Correction: ↓
Remarks: ↓

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☒ Isotopic Analysis ☒ NOBLGS ☒ DACDOS Return to RP by _____ hr. for LLA counting.

Date 4/8/04 Time 2353 Spectrum Index No. N1Azw ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS
[redacted]	2 MDA	RM			

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

[illegible]se Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds [illegible]-09 μCi/cc, or the total for noble gases exceeds 6.86E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13. perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (μCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4/4/04

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 μCi/cc).
2. If C_{LL} is greater than 7.5E-13 μCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_4/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS

LOCATION: U1 B S/G D.P. Removal RWP No. 04-140

Remote containment sampling system used? ☐ Yes ☐ No ☑ ~~NA~~

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME, (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30-115	4-8-04	2320	4-8-04	2330	1.13 E6	HUS-17	GR

Sample start flow 113 lpm
Sample stop flow ↓
Average sample flow ↓
Total sample time (min) 10
Flow correction factor
Remarks

ANALYSIS DATA:

[X] Isotopic Analysis [X] MECDOS (for DAC data) S.I. #

Date	Time	Isotope	*Concentration (µCi/cc)	By Initials	Date	Time	Isotope	Concentration (µCi/cc)	By Initials
4/9/04	0141	I-131	7.45E-11	GR	4/9/04	0141	Cl-38		
↓	↓	I-132	7.12E-10	↓	↓	↓	Br-82		
↓	↓	I-133	<MDA	↓	↓	↓	↓	↓	↓
↓	↓	I-134	↓	↓	↓	↓	↓	↓	↓
↓	↓	I-135	↓	↓	↓	↓	↓	↓	↓
↓	↓	Total Iodine	7.87E-10	↓	↓	↓	Total Additional		

Total Iodine Concentration + Total Additional Concentration = 7.87E-10 µCi/cc By (Initials) GR

[ ] Unit 1 [ ] Unit 2 RE-211: _____ µCi RE-212: _____ µCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.28E-09 µCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: _____ Date: 4/9/04

PBF-4002
Revision 6 11/13/03
HP 1.1 - 1.7 or C3.2/P6.3

References: HPIPs 3.52, 3.52.2, 3.53, 5.1

Point Beach Nuclear Plant

*** RESTRICTED DAC IN AIR CALCULATIONS ***

SAMPLE DATE: 4/8/2004 23:30 SAMPLE ID: 30-115 TAKEN BY: RM

SAMPLE LOCATION: U1 B S/G D.P ANALYSIS BY: EK

REMARKS:

COL

ISOTOPIC ANALYSIS RESULTS

ISOTOPE	RESTRICTED DAC (uCi/cc)	CONC (uCi/cc)	FRAC. OF CONC.	% OF DAC
I-131	2.00E-08	7.45E-11	0.09	0.373
I-132	3.00E-06	7.12E-10	0.91	0.024
	TOTALS	7.87E-10	1.00	0.396

Based on a 40 hour work week, the maximum stay time for the listed concentrations is: 1.0E+04 hours.

Reviewed by: _____ Date: 4/9/04

SAMPLE TYPE: ☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-140

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U1 B S/G PLATFORM

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-116	4-8-04	1855	4-8-04	2340	8.04E6	LUS-30	RM

Sample Start Flow: 30 LPM
Sample Stop Flow: ↓
Average Sample Flow: ↓

Total Sample Time (min): 285
Flow Correction: 0.94
Remarks: _____

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS
4-9-04	0022	PRO-2	59.2	0.6	58.6	4.2	1.38E-11	RM

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6.56E-09 μCi/cc, or the total for noble gases exceeds 6.56E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1, and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4/5/04

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda\Delta t})}{1 - e^{-\lambda\Delta t}}$$

VALUES OF ($C_{2,3,4,}$ ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3,}$ etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_4/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS

LOCATION: U1 B S/G PLATFORM RWP No. 04-140

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME, (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30-117	4-8-04	1855	4-8-04	2340	8.04 EG	LVS-30	RM

Sample start flow 30 LPM
Sample stop flow ↓
Average sample flow ↓

Total sample time (min) 285
Flow correction factor 0.94
Remarks

ANALYSIS DATA:

[X] Isotopic Analysis [X] MECDOS (for DAC data) S.I. #

Date	Time	Isotope	*Concentration (μCi/cc)	By Initials	Date	Time	Isotope	Concentration (μCi/cc)	By Initials
4/9/04	0104	I-131	5.43E-12	EW	4/9/04	0104	Cl-38	LMPA	EW
		I-132	8.15E-11				Br-82		
		I-133	LMPA						
		I-134	↓						
		I-135	↓						
↓	↓	Total Iodine	8.69E-11	↓	↓	↓	Total Additional	↓	↓

Total Iodine Concentration + Total Additional Concentration = 8.69E-11 μCi/cc By (Initials) EW

[ ] Unit 1 [ ] Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.28E-09 μCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: _____ Date: 4/9/04

PBF-1002
Revision 6 11/13/03
HP 1.1 - 1.7 or C3.2/P6 3

References: HPIPs 3.52, 3.52.2, 3.53, 5.1

Point Beach Nuclear Plant

*** RESTRICTED DAC IN AIR CALCULATIONS ***

SAMPLE DATE: 4/8/2004 23:40 SAMPLE ID: 30-117 TAKEN BY: RM

SAMPLE LOCATION: U1 B S/G PLATFORM ANALYSIS BY: EK

REMARKS:

COF

ISOTOPIC ANALYSIS RESULTS

ISOTOPE	RESTRICTED DAC (uCi/cc)	CONC (uCi/cc)	FRAC. OF CONC.	% OF DAC
I-131	2.00E-08	5.43E-12	0.06	0.027
I-132	3.00E-06	8.15E-11	0.94	0.003
	TOTALS	8.69E-11	1.00	0.030

Based on a 40 hour work week, the maximum stay time for the listed concentrations is: 1.3E+05 hours.

Reviewed by: [signature] Date: 4/9/04

SAMPLE TYPE: ☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. _____

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U-1 "B" S/G Platform

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA

COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START DATE	SAMPLE START TIME	SAMPLE STOP DATE	SAMPLE STOP TIME	SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
30-125	4-3-04	2340	4-9-04	1605	~~LOS-30~~ 2.78E7	~~2.70E7~~ LOS-30	RLK

Sample Start Flow: 30 cpm
Sample Stop Flow: ↓
Average Sample Flow: _____

Total Sample Time (min): 985
Flow Correction: 0.54
Remarks: _____

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)(1)(2)	BY INITIALS
4-9-04	1650	PRO-2	3335.6	0.1	3555.5	4.2	2.28E-9	RLK

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α(3)	BY INITIALS
4-9-04	1650	PRO-2	14.4	0.0	14.4	246.9	RLK

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☒ Isotopic Analysis ☐ NOBLES ☒ DACDOS Return to RP by _____ hr. for LLA counting.

Date 4/9/04 Time 2345 2400 Spectrum Index No. N/A ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS
Cr51	2.77E-11	RLK	Ru103	7.57E-13	RLK
Mn54	2.80E-12	RLK	Sn113	1.62E-12	RLK
Co57	5.39E-13	RLK	Sn117M	6.66E-13	RLK
Co58	1.05E-10	RLK	Sb125	2.58E-12	RLK
Co60	2.53E-11	RLK			
Nb95	7.38E-11	RLK			
Zr95	5.69E-11	RLK			

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 5.8E-09 μCi/cc, or the total for noble gases exceeds 6.8oE-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4] Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD [4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4/10/08

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$ ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3,}$ etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0055			

3. If the C_2/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant

*** RESTRICTED DAC IN AIR CALCULATIONS ***

SAMPLE DATE: 4/9/2004 16:05 SAMPLE ID: 30-125 TAKEN BY: RLK
SAMPLE LOCATION: U1 'B' S/G PLATFORM ANALYSIS BY: EK
REMARKS:

COP

ISOTOPIC ANALYSIS RESULTS

ISOTOPE	RESTRICTED DAC (uCi/cc)	CONC (uCi/cc)	FRAC. OF CONC.	% OF DAC
CR-51	8.00E-06	2.77E-11	0.09	0.000
MN-54	3.00E-07	2.80E-12	0.01	0.001
CO-57	3.00E-07	5.39E-13	0.00	0.000
CO-58	3.00E-07	1.05E-10	0.35	0.035
CO-60	1.00E-08	2.53E-11	0.08	0.253
NB-95	5.00E-07	7.38E-11	0.25	0.015
ZR-95	5.00E-08	5.69E-11	0.19	0.114
RU-103	3.00E-07	7.57E-13	0.00	0.000
(1) SN-113	5.00E-07	2.29E-12	0.01	0.000
SB-125	2.00E-07	2.58E-12	0.01	0.001
	TOTALS	2.98E-10	1.00	0.420

Based on a 40 hour work week, the maximum stay time for the listed concentrations is: 9.5E+03 hours.

(1) Sn113 value is actually Sn117M + Sn113 values. Reference CAP 055511. 4/19/04
(6.66E-13 µCi/cc) → (1.62E-12 µCi/cc)

Reviewed by: Date: 4/19/04

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS

LOCATION: U-1 "B" S/G Platform RWP No. _____

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA COPY

SAMPLING DATA:

2.78 E7

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME, (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30-126	4-8-04	2340	4-9-04	1605	~~605.30~~ 2.78E6 4-9-04 RM	~~2~~ 105.30 RM 4-9-04	RM

Sample start flow 30 LPM
Sample stop flow ↓
Average sample flow ↓

Total sample time (min) 985
Flow correction factor 0.94
Remarks _____

ANALYSIS DATA:

[X] Isotopic Analysis [ ] MECDOS (for DAC data) S.I. # _____

Date	Time	Isotope	*Concentration (µCi/cc)	By Initials	Date	Time	Isotope	Concentration (µCi/cc)	By Initials
4/9/04	2129	I-131	<MDA	GW	4/9/04	2129	Cl-38	<MDA	GW
		I-132					Br-82		
		I-133							
		I-134							
		I-135							
		Total Iodine					Total Additional		

Total Iodine Concentration + Total Additional Concentration = <MDA µCi/cc By (Initials) GW

[ ] Unit 1 [ ] Unit 2 RE-211: _____ µCi RE-212: _____ µCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.2SE-09 µCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: _____ Date: 4/10/04

PBF-4002
Revision 6 11/13/03
HP 1.1 - 1.7 or C3.2-P6.3

References: HPIPs 3.52, 3.52.2, 3.53, 5.1

SAMPLE TYPE:
☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

AIRBORNE RADIOACTIVITY SURVEY

RWP No. ____________

Sample Location: U-1 "B" S/G Plat

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA

COPY

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START DATE	SAMPLE START TIME	SAMPLE STOP DATE	SAMPLE STOP TIME	SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
30-127	4-9-04	1605	4-10-04	0950	3.0E7	LVS-30	RLK

Sample Start Flow: 30 lpm
Sample Stop Flow: ↓
Average Sample Flow: ↓

Total Sample Time (min): 1065
Flow Correction: 0.94
Remarks: ____________

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS
[illegible]	1458	[illegible]	272	34	238	92	3.[illegible]	[illegible]

[1] If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

[2] If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ/ NET cpm α[3]	BY INITIALS

[3] If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS

Return to RP by ________ hr. for LLA counting.

Date ____________ Time ____________ Spectrum Index No. ____________ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: ____________ μCi RE-212: ____________ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: ____________ μCi/cc SAE Flow: ____________ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6[illegible]-09 μCi/cc, or the total for noble gases exceeds 6.86E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection [illegible]visor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

PBF-4022
Revision 16 11/13/03

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13. perform G_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4										–		
C_{LL}											----	

Reviewed By: _____ RP Supervision Date: 4-10 04

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3,}$ etc.)/C_1 is equal to or less than that indicated in Table 1. or if the activity of any count is less than LLD. airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc. notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_4/C_1 ratio is greater than that in Table 1. refer to HPIP 3.53. Counting of Air Samples for Low Level. Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS

LOCATION: U-1-"B" S/G Plat RWP No. _____

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA COP

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME. (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30-128	4-9-04	1605	4-10-04	0950	3.0E7	LVS-3C	RLK

Sample start flow 30 lpm
Sample stop flow ↓
Average sample flow ↓
Total sample time (min) 1065
Flow correction factor 0.94
Remarks _____

ANALYSIS DATA:

[X] Isotopic Analysis [ ] MECDOS (for DAC data) S.I. # _____

Date	Time	Isotope	*Concentration (μCi/cc)	By Initials	Date	Time	Isotope	Concentration (μCi/cc)	By Initials
4-10-04	1532	I-131					Cl-38		
		I-132					Br-82		
		I-133							
		I-134							
		I-135							
		Total Iodine	LMDA	KCB			Total Additional	LMDA	KCB

Total Iodine Concentration + Total Additional Concentration = LMDA μCi/cc By (Initials) KCB

[ ] Unit 1 [ ] Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.28E-09 μCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: _____ Date: 4/11/04

References: HPIPs 3.52, 3.52.2, 3.53, 5.1

SAMPLE TYPE: ☑ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-142

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U1 . B ¾ PLATFORM

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

COPY

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-133	4-10-04	0950	4-10-04	2255	2.21 E7	LVS-30	RM

Sample Start Flow: 30 cfm
Sample Stop Flow: ↓
Average Sample Flow: ↓

Total Sample Time (min): 785
Flow Correction: 0.74
Remarks:

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)(1)(2)	BY INITIALS
4-10-04	2256	P20 2	31.2	0.8	30.4	4.2	2.60 E-12	RM

(1) If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α(3)	BY INITIALS

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 5.[illegible]09 μCi/cc, or the total for noble gases exceeds 6.86E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13. perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4] Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3										--		
C_4												
C_{LL}											----	

Reviewed By: _____ Date: 4/11/07

RP Supervision

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_3/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant

IODINE ACTIVITY CONCENTRATIONS COPY

LOCATION: U1 B/G PLATFORM RWP No. 04-142

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME, (cc)	SAMPLER NUMBER	INITIALS
	DATE	TIME	DATE	TIME			
30-134	4-10-04	0950	4-10-04	2255	2.21 E7	LVS-30	[illegible]

Sample start flow: 30 LPM
Sample stop flow: /
Average sample flow: /
Total sample time (min): 785
Flow correction factor: 0.94
Remarks:

ANALYSIS DATA:

[X] Isotopic Analysis [ ] MECDOS (for DAC data) S.I. #

Date	Time	Isotope	*Concentration (µCi/cc)	By Initials	Date	Time	Isotope	Concentration (µCi/cc)	By Initials
4/11/04	0113	I-131	<MDA	GV	4/11/04	0113	Cl-38	<MDA	W
		I-132					Br-82		
		I-133							
		I-134							
		I-135							
		Total Iodine					Total Additional		

Total Iodine Concentration + Total Additional Concentration = <MDA µCi/cc By (Initials) GV

[ ] Unit 1 [ ] Unit 2 RE-211: _____ µCi RE-212: _____ µCi/cc

This form should be used for all radioiodine analysis results.
*RELEASE ACCOUNTABILITY - (for release paths only)
If the concentration of total for radioiodines exceeds 2.2SE-09 µCi/cc, follow steps outlined in RAM 5.2.
Save the charcoal filter until the investigation is completed.

Approved by: [signature] Date: 4/11/04

SAMPLE TYPE: ☑ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-142

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U-1 "B" S/G Plat

Remote containment sampling system used? ☐ Yes ☐ No ☒ NA

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START		SAMPLE STOP		SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
	DATE	TIME	DATE	TIME			
30-138	4-10-04	2255	4-11-04	1017	1.92 E7	VS-30	RLK

Sample Start Flow: 30 lpm
Sample Stop Flow: /
Average Sample Flow: /

Total Sample Time (min): 682
Flow Correction: 0.94
Remarks: _____

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (μCi/cc)[1,2]	BY INITIALS
4-11-04	1040	CAN-8	67.5	27.3	40	9.4	3768.3E-7	RLK

[1] If sample activity is greater than or equal to 5E-10 μCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

[2] If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 μCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ / NET cpm α[3]	BY INITIALS

[3] If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☐ Isotopic Analysis ☐ NOBLGS ☐ DACDOS Return to RP by _____ hr. for LLA counting.

Date _____ Time _____ Spectrum Index No. _____ ☐

ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS	ISOTOPE	ACTIVITY (μCi/cc)	BY INITIALS

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ μCi RE-212: _____ μCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ μCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 1.09 μCi/cc, or the total for noble gases exceeds 6.56E-06 μCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection Supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

Sample Volume (cc): _____ (from Page 1)

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter No.	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1										----	----	
C_2												
C_3												
C_4												
C_{LL}											----	

Reviewed By: _____ Date: 4/11/04

RP Supervision

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

ΔT		ΔT		ΔT		ΔT	
1	0.9366	5.5	0.6975	9.25	0.5456	13	0.4268
2	0.8772	5.75	0.6862	9.5	0.5367	13.25	0.4198
2.25	0.8630	6	0.6750	9.75	0.5280	13.5	0.4130
2.5	0.8490	6.25	0.6641	10	0.5194	13.75	0.4063
2.75	0.8352	6.5	0.6533	10.25	0.5110	14	0.3997
3	0.8216	6.75	0.6427	10.5	0.5027	16	0.3506
3.25	0.8083	7	0.6322	10.75	0.4945	18	0.3076
3.5	0.7951	7.25	0.6220	11	0.4865	20	0.2698
3.75	0.7822	7.5	0.6119	11.25	0.4786	22	0.236
4	0.7695	7.75	0.6019	11.5	0.4708	23	0.222
4.25	0.7570	8	0.5921	11.75	0.4632	24	0.208
4.5	0.7447	8.25	0.5825	12	0.4557	26	0.182
4.75	0.7326	8.5	0.5731	12.25	0.4483	28	0.160
5	0.7207	8.75	0.5638	12.5	0.4410	30	0.140
5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3,}$ etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
				0.0655			

3. If the C_4/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

SAMPLE TYPE: ☒ AP ☐ Gas ☐ Other

Point Beach Nuclear Plant

RWP No. 04-140

AIRBORNE RADIOACTIVITY SURVEY

Sample Location: U1 B-5/6 D.P Removal

Remote containment sampling system used? ☐ Yes ☐ No ☑ NA

COPY

SAMPLING DATA:

SAMPLE NUMBER	SAMPLE START DATE	SAMPLE START TIME	SAMPLE STOP DATE	SAMPLE STOP TIME	SAMPLE VOLUME (cc)	SAMPLER NUMBER	BY INITIALS
30-113	4-8-04	2320	4-8-04	2330	~~HUST~~ 1.13E6	HUS-17	

Sample Start Flow 113 cpm
Sample Stop Flow
Average Sample Flow

Total Sample Time (min) 10
Flow Correction
Remarks

GROSS BETA-GAMMA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm βγ	MULT. FACTOR	SAMPLE ACTIVITY (µCi/cc)[1,2]	BY INITIALS
4-9-04	0011	PRO-1	7397.2	0.5	7396.7	4.1	1.21 E-8	

(1) If sample activity is greater than or equal to 5E-10 µCi/cc, notify RP supervision, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

(2) If sample taken from an area with known alpha contamination (e.g., refueling cavity, spent fuel pool transfer canal, reactor head) and sample activity is greater than 1E-10 µCi/cc, perform gross alpha counting and take or send sample to Chemistry for isotopic analysis.

GROSS ALPHA COUNTING DATA:

DATE	TIME	Counter Number	GROSS cpm	BKGD cpm	NET cpm α	NET cpm βγ/ NET cpm α[3]	BY INITIALS
4-9-04	0011	PRO-1	7.4	0.0	7.4	~~7997.6~~	

(3) If sample activity ratio of net cpm beta-gamma to net cpm alpha is less than 180, notify RP supervision and perform long-lived alpha counting.

☒ Isotopic Analysis ☐ NOBLGS ☒ DACDOS Return to RP by 0330 hr. for LLA counting.

Date 4/9/04 Time 0055 Spectrum Index No. N/A ☐

ISOTOPE	ACTIVITY (µCi/cc)	BY INITIALS	~~Network~~ ISOTOPE	ACTIVITY (µCi/cc)	BY INITIALS
~~Mn 54~~	~~8.62E-12~~		~~Bi 214~~	~~1.89E-10~~	~~4/9/04~~
~~Co 57~~	~~1.63E-12~~		Co 58	9.04E-10	
~~Co 58~~	~~1.12E-11~~		Co 60	1.76E-10	
~~Co 60~~	~~8.66E-11~~		Nb 95	6.08E-9	
~~Sb 125~~	~~1.52E-11~~		Zr 95	3.51E-9	
Cr 51	3.59E-10		Sn 113	1.95E-10	
Mn 54	6.30E-11		Sn 117M	2.02E-11	
			Sb 125	5.14 E-10	

Record RE-211 and RE-212 readings for all at-power containment air samples.
☐ Unit 1 ☐ Unit 2 RE-211: _____ µCi RE-212: _____ µCi/cc

Record RE-215 reading and SAE flow for all SAE air samples.
☐ Unit 1 ☐ Unit 2 RE-215: _____ µCi/cc SAE Flow: _____ scfm

NOTE: All release path air samples must be counted for long-lived alpha. See back side of form.

Release Accountability - (For release paths only) If the total concentration for particulates (excluding naturally occurring isotopes) exceeds 6.88E-09 µCi/cc, or the total for noble gases exceeds 6.56E-06 µCi/cc, notify the Chemistry lab supervisor and/or the Radiation Protection supervisor. Save the air particulate filter until the investigation is completed. The sample should be investigated to determine its significance as an airborne release.

LONG LIVED ALPHA COUNTING DATA:

Sample Volume (cc): 1.13 EG (from Page 1)

If the ratio of (C_2/C_1) is greater than the value given in Table 1. and if C_2 is greater than 7.5E-13, perform C_{LL} screening.

[4]Record LLD for the counter being used at each count.

COUNT	DATE	TIME	Counter	Gross (cpm)	Bkgd (cpm)	Net (cpm)	Mult. Factor	Activity (µCi/cc)	LLD[4]	Hours From C_1	Activity Ratio/C_1	BY INIT.
C_1	4-9-04	0330	7272	2.06	0.1	1.96	4.3	3.36 E-12	3.44 E-13	----	----	RM
C_2	4-9-04	0750	7272	2.14	0.1	2.04	4.3	3.5 E-12	3.44 E-13	4	1.04	RLK
C_3	4-9-04	1330	7272	1.94	0.1	1.84	4.3	3.15 E-12	3.44 E-13	10	9387	RLK
C_4	4-10-04	0330	7272	2.16	0.1	2.06	4.3	3.53 E-12	3.44 E-13	24	1.050	RM
C_{LL}	4-12-04	0330	7272	1.64	0.2	1.44	4.3	2.47 E-12	3.44 E-13	75	----	RM

Reviewed By: _____ Date: _____

RP Supervision

COUNTING INFORMATION FOR LONG LIVED ALPHA

Count	Time	
C_1	At T_4	Start first count 4 hours after sample stop time. (Essentially all radon decayed.)
C_2	At T_6	Start second count at least 2 hours after C_1.
C_3	At T_x	Start time dependent upon results of C_2.
C_4	At T_{28}	Start count 24 hours after C_1.
C_{LL}	At $T_{>75}$	Start count at least 75 hours after T_0.

$$C_{LL} = \frac{C_2 - (C_1 e^{-\lambda \Delta t})}{1 - e^{-\lambda \Delta t}}$$

VALUES OF ($C_{2,3,4}$, ETC.)/C_1 FOR C_{LL} EQUAL TO ZERO

TABLE 1

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5.25	0.7090	9	0.5546	12.75	0.4338		

NOTES:

1. If the ratio of activity ($C_{2,3}$, etc.)/C_1 is equal to or less than that indicated in Table 1, or if the activity of any count is less than LLD, airborne alpha activity will be considered as not present (the LLD must be ≤ 7.5E-13 µCi/cc).
2. If C_{LL} is greater than 7.5E-13 µCi/cc, notify RP supervision for review.

Date	Time	C_1	C_2	λ	Δt	C_{LL}	RP Supervision Notified (initials)
4-12-04	1615	3.36E-12	3.5E-12	0.0655	4	N/A	

3. If the C_4/C_1 ratio is greater than that in Table 1, refer to HPIP 3.53, Counting of Air Samples for Low Level, Long-Lived Radioactive Alpha Particulate Contamination.

Point Beach Nuclear Plant

*** RESTRICTED DAC IN AIR CALCULATIONS ***

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SAMPLE DATE: 4/8/2004 23:30 SAMPLE ID: 30-113 TAKEN BY: RM

SAMPLE LOCATION: U1 B S/G D.P ANALYSIS BY: EK

REMARKS:

ISOTOPIC ANALYSIS RESULTS

ISOTOPE	RESTRICTED DAC (uCi/cc)	CONC (uCi/cc)	FRAC. OF CONC.	% OF DAC
CR-51	8.00E-06	3.59E-10	0.03	0.004
MN-54	3.00E-07	6.30E-11	0.01	0.021
CO-58	3.00E-07	9.04E-10	0.08	0.301
CO-60	1.00E-08	1.76E-10	0.01	1.760
NB-95	5.00E-07	6.08E-09	0.51	1.216
ZR-95	5.00E-08	3.51E-09	0.30	7.020
(1) SN-113	5.00E-07	2.15E-10	0.02	0.043
SB-125	2.00E-07	5.14E-10	0.04	0.257
	TOTALS	1.18E-08	1.00	10.623

Based on a 40 hour work week, the maximum stay time for the listed concentrations is: 376.5 hours.

(1) Sn 113 concentration = Sn 117 M + Sn 113 Activity. EW 4/9/04

Reviewed by: _____ Date: _____

COPY

Ex 4

Ex. 4