

ISSUED

RADIOLOGICAL CONTROL TECHNICAL BASIS DOCUMENT OR TECHNICAL EVALUATION

Title: Sampling Plan for the 700C Fan Startup and Testing	<input checked="" type="checkbox"/> TBD	<input type="checkbox"/> TE
	TBD/TE Number: TBD 20-003	
	Revision Number: 3	
	Effective Date: 12/2/20	
Author/Reviewer(s)/Approver(s):		
Jennifer Lemons	<i>Jennifer Lemons</i>	12/2/20
Author: (Print/Sign)		Date
Jennifer Lemons for Marty Jamieson	<i>Jennifer Lemons</i>	12/2/20
Peer Reviewer: (Print/Sign)		Date
Reviewer: (Print/Sign)		Date
Reviewer: (Print/Sign)		Date
Reviewer: (Print/Sign)		Date
Reviewer: (Print/Sign)		Date
Roger Groves	<i>Roger Groves</i>	12/2/2020
Approval: REDM/DRCDM (or designee): (Print/Sign)		Date
<i>Sean Britton</i>	<i>[Signature]</i>	12/2/2020
Approval: RCDM (or designee): (Print/Sign)		Date
Evaluation Summary:		
<p>This sampling plan encompasses onsite monitoring during the four hour duration period of the startup and testing of the 700C fan. The sampling plan includes specific coordinate locations for placement of sampling equipment and sample protocol.</p>		

Sampling Plan for the 700C Fan Startup and Testing

TBD 20-003 Rev. 3

Introduction

This sampling plan encompasses onsite monitoring during the four hour duration period of the startup and testing of the 700C fan. The plan consists of specific coordinate locations for placement of sampling equipment and sample protocol.

Methodology

Based on Radiological Engineering Paper TE 20-002 Radiological Assessment of the Startup and Testing of the 700C Fan, a source term of $5.92E-6$ curies is estimated to be released during the startup and 4 hour testing period of the 700C Fan. Requirements are established to provide assurance that radiological impacts to site personnel are minimized and controlled, and compliance with 10 CFR 835 is maintained as outlined in WIPP's radiological procedures. Additional requirements beyond 10 CFR 835 are outlined in the sampling plan to account for the uncertainty of actual radioactivity contained in the salt to ensure worker protection.

The sample locations were determined using National Atmospheric Release Center (NARAC) plume models for ground deposition using the estimated source term. The sample locations were identified by overlaying the 3 plume models representing a 320 degree to 20 degree wind direction range from the point of release assuming a wind speed of 20 miles per hour. Refer to Attachment 1 for onsite sampling locations. It is imperative the following meteorological conditions be met prior to execution to ensure proper implementation of the sampling plan and worker protection:

- wind direction between 320-20 degrees
- average wind speed below 20 mph
- no precipitation

Airborne radioactivity sampling will consist of Continuous Air Monitors (CAMs) and Portable Air Samplers (PASs). For ground deposition, swipes will be taken for measurement of removable activity and portable contamination monitoring equipment known as friskers will be used for total activity. Round aluminum ground deposition pans will be placed prior to the fan startup at the sample locations to allow for more accurate removable/total contamination surveys. A control ground deposition pan will be located near Building 952. This control pan will be treated as background when surveying all of the other pans. All ground deposition pans will be divided into two halves labeled side A and side B. Generators will be used at all CAM/PAS locations that do not have permanent power.

Notification will be made to the Radiological Controls (Radcon) department and Radiological Engineering that the conditions are ideal for starting the 700C Fan in 24 hours. Once the notification is received, the Radcon department will deploy the pre-staged equipment. See Attachment 3 for equipment list.

The sampling team will deploy PASs, CAMs, and ground deposition pans prior to 700C Fan startup/operation. See Attachments 1-2 for map and sample locations. If a sample location could be deemed as hazardous, then Radcon Supervisor will adjust the sample location and notify Rad

Sampling Plan for the 700C Fan Startup and Testing

TBD 20-003 Rev. 3

Engineering. To ensure an appropriate volume is collected in order to meet the minimum sensitivity for the air samples, PASs will be set to run at approximately 2 CFM.

Safety

During the initial startup of the 700C Fan, contractors supporting the SSCVS will not be allowed on the worksite. Onsite staffing will be restricted to essential and test support personnel during testing. The Central Monitoring Room will announce to remain indoors to notify all site personnel prior to starting the 700C Fan. The Radiological Controls Manager will determine the termination of area controls after reviewing the initial data.

In compliance with 10 CFR 835, areas on the WIPP site are required to be posted as Airborne Radioactivity Areas (ARAs) when the levels reach ≥ 0.3 DAC. A Technical Evaluation, TE 20-002, shows that the predicted DAC levels outside the 700C fan will be more than 0.02 DAC. Respiratory protection will be required as a precautionary measure to compensate for the uncertainty of the activity released.

Four CAMs will be placed in the cardinal directions for worker protection purposes. The CAM alarm set point will be 8 DAC-Hr, which is the current set point for work areas outside of airborne radiological areas. If the CAM alarms as a result of transuranic activity, then notify Fac Ops/CMR and Radcon Supervisor to request immediate shutdown of the fan. A recovery plan will then be implemented. If the CAM alarms as result of a malfunction or low flow alarm, the CAM will be secured in accordance with procedure WP- 12HP1304 Canberra iCAM Alpha/Beta Continuous Air Monitor and/or WP 12-HP1321 Bladewerx SabreAlert Alpha Continious Air Monitor.

Personal Protective Equipment (PPE) requirements: Employees working in the posted radiological area during the startup and initial four hour test operation of 700 Fan will be required to wear a single set of PPE including a respirator. The sampling team will carry a portable CAM as a precaution during the retrieval of samples. The PPE requirement will be in effect until the Radiological Protection Project Manager releases the area from controls.

Sample Protocol

Attachment 1 shows the approximate locations of the deposition pans and portable air samplers (PAS). Radiological Control management may change the positioning, type, and quantity of the samples, as necessary.

The sampling team should consist of at least 5 RCTs to execute the plan efficiently. It may be necessary to divide the sampling team into smaller groups in order to retrieve all the samples in a timely manner. Each group would be responsible for retrieving samples from a specific section of the map. The Radcon supervisor will verify the conformance of sample collection after every sample collection evolution.

The minimum collection time is 4 hours to ensure the required 0.02 DAC sensitivity is met. This means the test window run time may increase. It will be necessary to record and subtract the

Sampling Plan for the 700C Fan Startup and Testing

TBD 20-003 Rev. 3

volume from the filter for the time out of tolerance; either when the fan is off and/or when the wind shifts outside the window. A Stop Work consisting of stopping the fan and pausing the test will be required if the time out of tolerance is greater than 5 consecutive minutes.

The plan should be implemented in the following order:

1. 10 minutes after restart of 700C Fan- The sampling team will perform a removable (swipe) and total (1 minute frisk) contamination survey on side A of the control pan. The results will be considered as background.
2. The survey team will perform contamination surveys on side A of all ground deposition pans. The 1 minute direct results will immediately be reported to the Radcon supervisor. The swipes will then be counted and the results reported to the Radcon supervisor. The supervisor will compare results to the stop level set points of Attachment 4. If the net (total activity-control pan activity) result is greater than the listed stop level limit then request Fac Ops/CMR to secure 700C Fan. An offsite sampling plan will be implemented if elevated activity is detected onsite. The sampling team will also monitor the four CAMs in conjunction while performing the contaminations surveys. If the CAM alarms as a result of transuranic activity, then notify Fac Ops/CMR and Radcon Supervisor to request immediate shutdown of the fan. A recovery plan will then be implemented. If the CAM alarms as result of a malfunction or low flow alarm, the CAM will be secured in accordance with procedure WP- 12HP1304 Canberra iCAM Alpha/Beta Continuous Air Monitor and/or WP 12-HP1321 Bladewerx SabreAlert Alpha Continuous Air Monitor.

Steps 1 and 2 will be repeated every 60 minutes of fan operation.

3. After the fan has been secured, a final survey will be conducted on side B of all ground deposition locations. All PAS filters will then be collected.

Analysis

Swipes- During fan operation, all swipes performed on ground deposition pans and control pan will be counted using the normal one minute swipe count. After the fan has been secured and all swipes have been collected, then perform a 10 minute count on all swipes.

PASs- After fan is secured and all PAS filters have been collected, then perform a 10 minute air sample count on all PAS filters.

72 hour recount- After 72 hours, a 30 minute recount is to be performed on all PAS filters and swipes.

Sampling Plan for the 700C Fan Startup and Testing

TBD 20-003 Rev. 3

Upon completion of 72 hour recount, all PAS filters and swipes will be sent to WIPP Labs for gross alpha/beta analysis and gamma spectroscopy analysis. The need for isotopic analysis will be determined based on the gamma and gross alpha beta activity results.

Conclusion

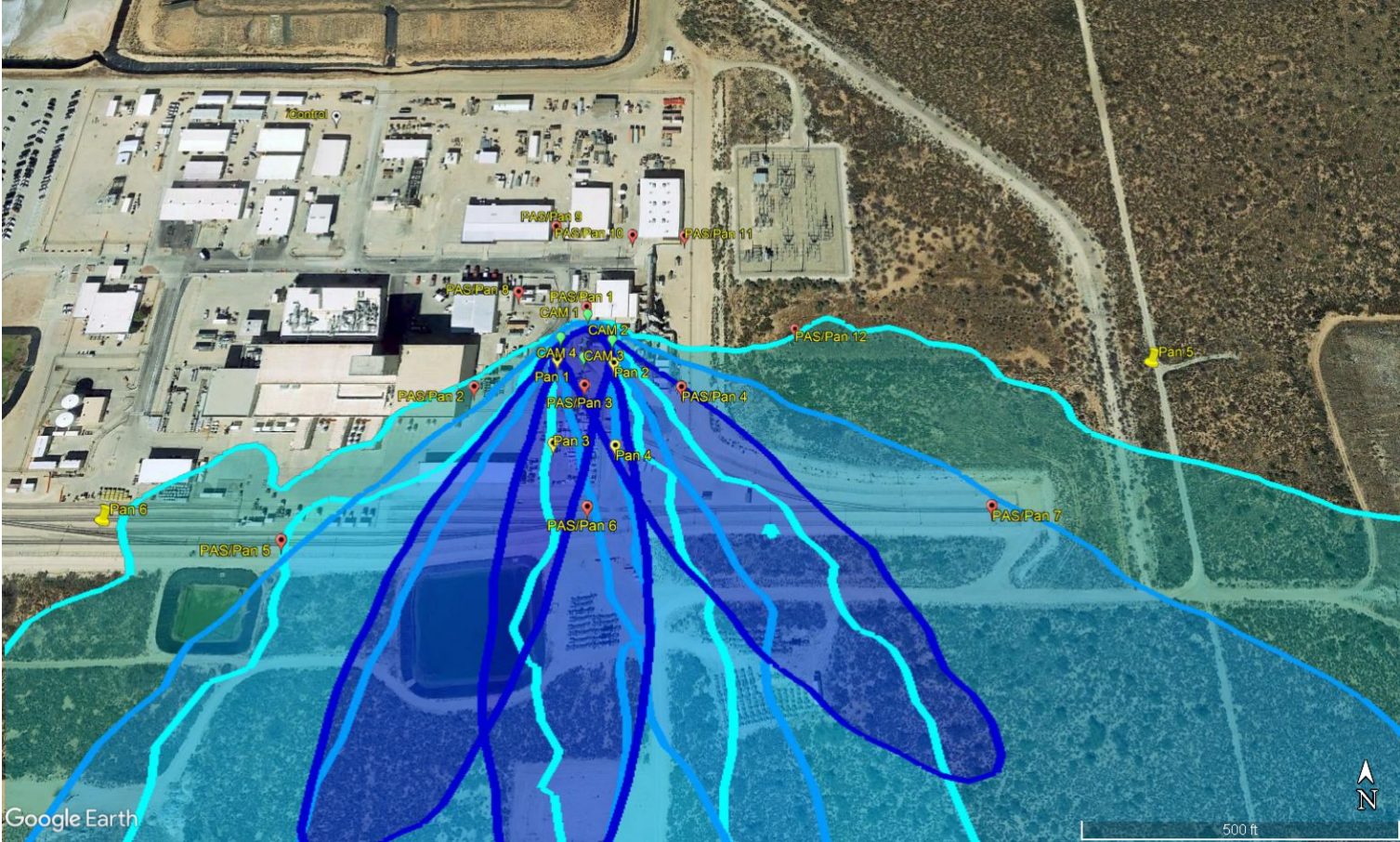
All results from the initial restart and 4 hour testing period will be used to determine the future monitoring and operating requirements of the 700C fan. The continuous operation of the 700C fan will require further evaluation demonstrating acceptable results. The results and evaluation will be peer reviewed and shared with CBFO for concurrence.

Sampling Plan for the 700C Fan Startup and Testing

TBD 20-003 Rev. 3

Attachment 1

Sampling Locations



Sampling Plan for the 700C Fan Startup and Testing

TBD 20-003 Rev. 3

Attachment 2

Sampling Location Coordinates

	Latitude	Longitude
Control Pan	32.373261	-103.793856
PAS/Pan 1	32.371908	-103.792031
PAS/Pan 2	32.371411	-103.792694
PAS/Pan 3	32.371422	-103.792017
PAS/Pan 4	32.371411	-103.791422
PAS/Pan 5	32.370556	-103.793711
PAS/Pan 6	32.370733	-103.791964
PAS/Pan 7	32.370733	-103.789611
PAS/Pan 8	32.372006	-103.792472
PAS/Pan 9	32.372447	-103.792261
PAS/Pan 10	32.372383	-103.791753
PAS/Pan 11	32.372378	-103.791411
PAS/Pan 12	32.371769	-103.790711
Pan 1	32.371575	-103.792194
Pan 2	32.371556	-103.791842
Pan 3	32.371081	-103.792186
Pan 4	32.371072	-103.791814
Pan 5	32.371561	-103.788534
Pan 6	32.370668	-103.794789
CAM 1	32.371873	-103.792021
CAM 2	32.371711	-103.791858
CAM 3	32.371602	-103.792031
CAM 4	32.371725	-103.792182

Sampling Plan for the 700C Fan Startup and Testing

TBD 20-003 Rev. 3

Attachment 3

Equipment List

14 Portable Air Samplers (PAS)
20 Ground Deposition Pans
4 iCAMS
3 Portable CAMS
3 Tennelecs with 30 min count capability
15 Generators
15 Extension Cords
20 Cinder Blocks
10 Tubes of Adhesive (Liquid Nail)
2 Caulking Guns

Sampling Plan for the 700C Fan Startup and Testing

TBD 20-003 Rev. 3

Attachment 4

Stop Level Set Points

Instrument	Stop Level	10CFR835 Level
2360	>55 dpm/100 cm ² alpha *	100 dpm/100 cm ² alpha
2360	>325 dpm/100 cm ² beta *	1000 dpm/100 cm ² beta
Tennelec	>14 dpm/100 cm ² alpha *	20 dpm/100 cm ² alpha
Tennelec	>20 dpm/100 cm ² beta *	200 dpm/100 cm ² beta
iCAM	>8 DAC-HR	No Applicable Limit

All stop level readings are based on typical MDAs of instrument.

* The stop level is the value above what was determined to be background on the control pan