

## **REVIEW OF NEW OR MODIFIED RADIOACTIVE AIR EMISSION SOURCES**

**Purpose** This Meteorology and Air Quality Group (MAQ) procedure describes the process for review and evaluation of new and modified sources of radioactive air emissions to determine the requirement for stack monitoring and/or the requirement for pre-construction approval as required by 40 CFR Part 61, Subpart H; and evaluation of requirements in DOE Orders 5400.1 and 5400.5.

**Scope** This procedure applies to all new or modified radionuclide air emission sources at LANL as identified through the laboratory ESH ID process or presented by project managers.

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**Hazard Control Plan** The hazard evaluation associated with this work is documented in HCP-MAQ-Office Work.

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02/03/04

### **CONTROLLED DOCUMENT**

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## General information about this procedure

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**Attachments** This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Examples of Standard Responses	3

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**History of revision**

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	9/12/97	New document.
1	1/8/99	Changed “inventory” to “usage survey” in Attachment 1; added wording to Overview in Chapter 1.
2	3/18/02	Incorporated new guidance on AIRNET station siting evaluations into chapter 2 and added chapter 6 <i>Environmental ALARA Reviews</i> .
3	5/6/02	Quick-change revision to change wording of standard response #10 in attachment.

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**Who requires training to this procedure?**

The following personnel require training before implementing this procedure:

- MAQ personnel assigned to perform this procedure
  - MAQ AIRNET Project Leader
  - Rad-NESHAP Project Leader
  - MAQ administrative personnel assigned to perform the data entry steps in this procedure
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**Training method**

The training method for this procedure is “self-study” (reading) and is documented in accordance with the procedure for training (MAQ-024).

## General information, continued

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**Definitions specific to this procedure**     ALARA (As Low As Reasonably Achievable): Conducting operations in such a manner that the radiological impacts of the operations are minimized to a sensible extent.

Modification: Defined in 40 CFR Part 61, Subpart A as any physical or operational change to a stationary source which results in an increase in the rate of emissions to the atmosphere of a hazardous pollutant except those specifically exempted.

Point source: As defined in the Rad-NESHAP project plan, a release location that meets these criteria: 1) The release point must be stationary (Title III of the Clean Air Act), 2) the effluent discharged from the operation or building must be “actively exhausted through a forced ventilation system via a single point” (FFCA), and 3) the operation must have the potential to emit radionuclides “based on the discharge of the effluent stream that would result if all pollution control equipment did not exist, but the facilities operations were otherwise normal” (40 CFR 61.93.b.4.ii).

Non-point source: Emissions which do not meet the definition of a point source.

Sealed source: A source of radioactivity that remains unopened with no reasonable potential for emissions during routine operations.

Controlled Emissions: Estimates of radioactive air emissions, taking credit for emissions controls such as HEPA filtration. These estimates are typically performed in strict accordance with 40 CFR 61, Subpart H, Appendix D methods, and are designed to be a first check on whether or not a new/modified project will require pre-construction notification to the Environmental Protection Agency.

Uncontrolled Emissions: Estimates of emissions, with no credit taken for emissions controls. These emissions estimates are typically calculated to determine requirements for effluent stream monitoring. 40 CFR 61.93(b)(4)(ii) states that uncontrolled emissions estimates must be made “based on discharge of the effluent stream, that would result if all pollution control equipment did not exist, but the facility operations were otherwise normal.” These calculations can be performed using best engineering and scientific judgement.

## General information, continued

### References

The following documents are referenced in this procedure:

- MAQ-024, “Personnel Training”
- MAQ-RN, “QA Project Plan for the Rad-NESHAP Compliance Project”
- MAQ-238, “Evaluating New Diffuse Sources and New Receptors for AIRNET Coverage”
- MAQ-610, “Radioactive Air Emissions Management Plan for LANSCE”
- DOE Order 5400.1, “Radiation Protection of the Public and the Environment”
- DOE Order 5400.1, “General Environmental Protection Program”

### Note

Actions specified within this procedure, unless preceded with “should” or “may,” are to be considered mandatory guidance (i.e., “shall”).

### Implementation

The following table lists specific responsibilities.

Who	What
MAQ New Source Review Personnel	Perform initial analysis steps in this procedure; respond to ESH-IDs or other information requests; transfer responsibility to appropriate project personnel for more advanced analyses or permitting requests as needed.
MAQ Rad-NESHAP Personnel	Supply peer review and supplemental analyses for NSR Project personnel upon request. Develop pre-construction approval permit request and perform ALARA reviews as needed, upon assignment from Project Leader
MAQ AIRNET Project Personnel	Perform AIRNET station evaluations according to procedure MAQ-238 as needed. Coordinate with Rad-NESHAP personnel on these evaluations as needed.
AIRNET and Rad-NESHAP Project Leaders	Provide guidance as needed for analyses and permitting. Provide final approval of evaluations.

# 1: New and modified source review

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## Overview

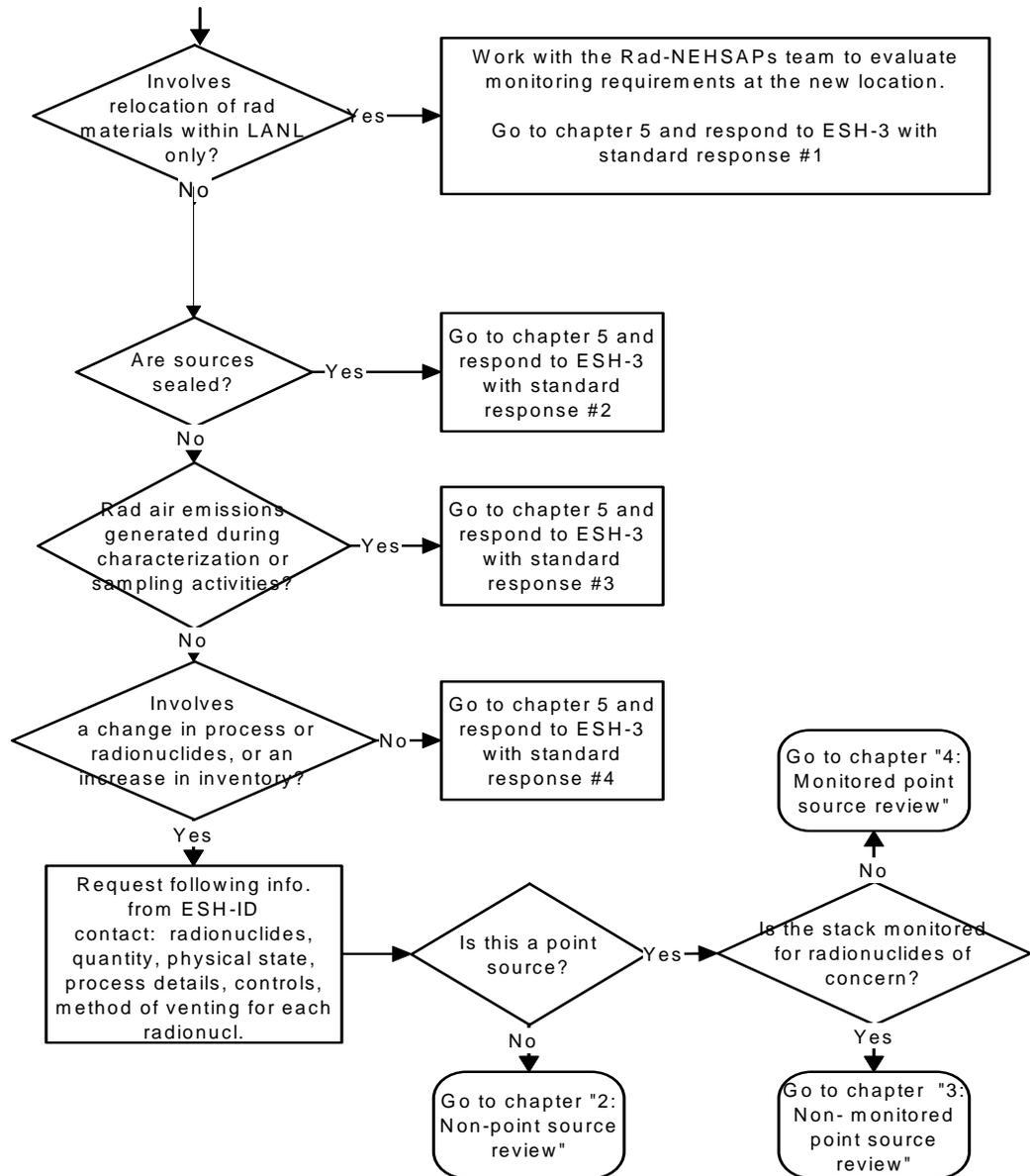
When a proposed new operation or a proposed modification to an existing operation involving radioactive material is identified through the ESH Identification Process or submitted directly to MAQ by project staff, MAQ evaluates the new or modified source to determine if stack monitoring and/or pre-construction approval is required. Monitoring is required when uncontrolled emissions contribute a dose greater than 0.1 mrem/yr to the nearest off-site receptor. Pre-construction approval is required when controlled emissions contribute a dose greater than 0.1 mrem/yr to the nearest off-site receptor. A public dose ALARA review is required when emissions are expected to exceed 3 millirem/year to the nearest off-site receptor. When evaluating non-point sources, an evaluation of AIRNET coverage is required.

Follow, with best professional judgment, the steps in this chapter and subsequent chapters as indicated in the flow chart below. Conclude all actions by selecting and adjusting the appropriate example standard response from Attachment 1 and documenting the response as described in chapter “5: Documenting Decisions and Responding.”

# 1: New and modified source review, continued

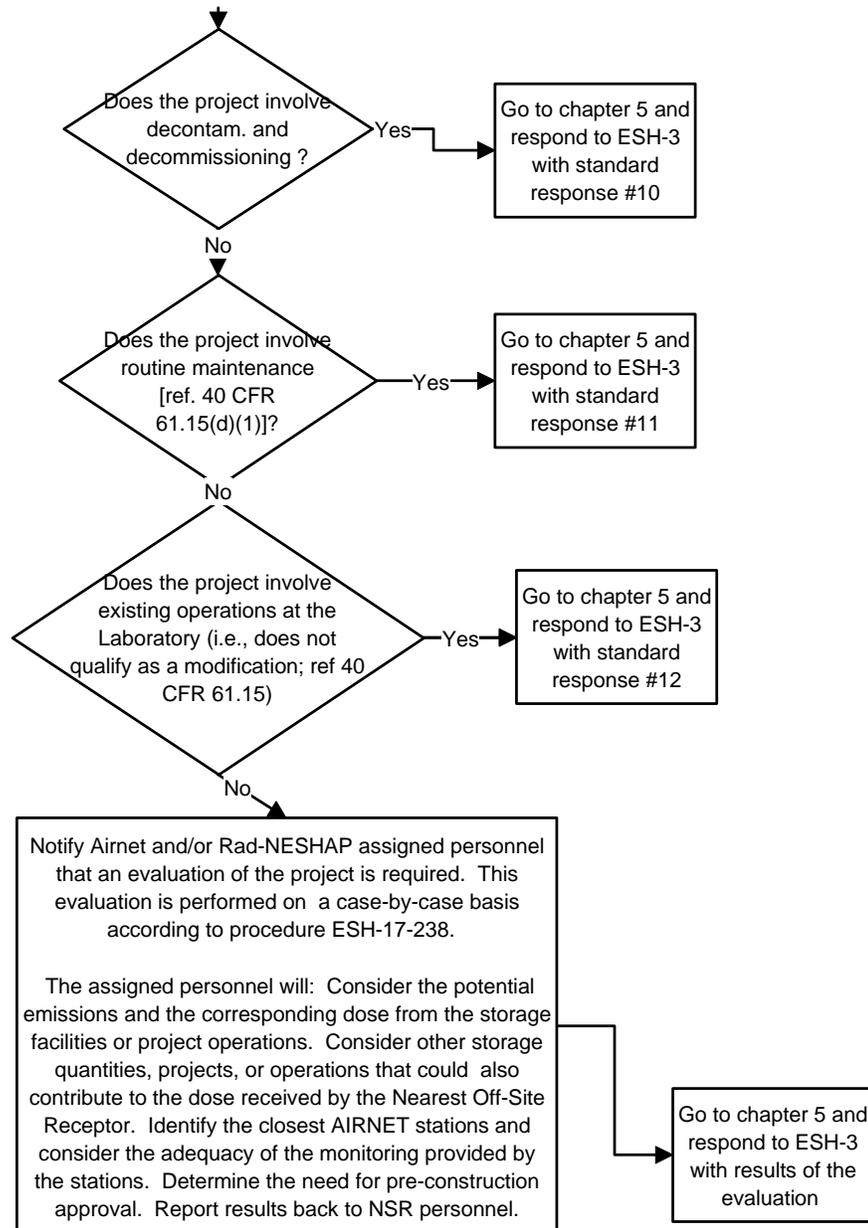
## Steps to review a new source

To review a new or modified radioactive air emission source, perform the actions described in the following flow chart:



## 2: Non-point source review

**Reviewing for fugitive source** To review a proposed project involving a non-point source, perform the actions described in the following chart. Confer with the NSR and Rad-NESHAP Project Leaders for guidance with the decisions in the chart below.



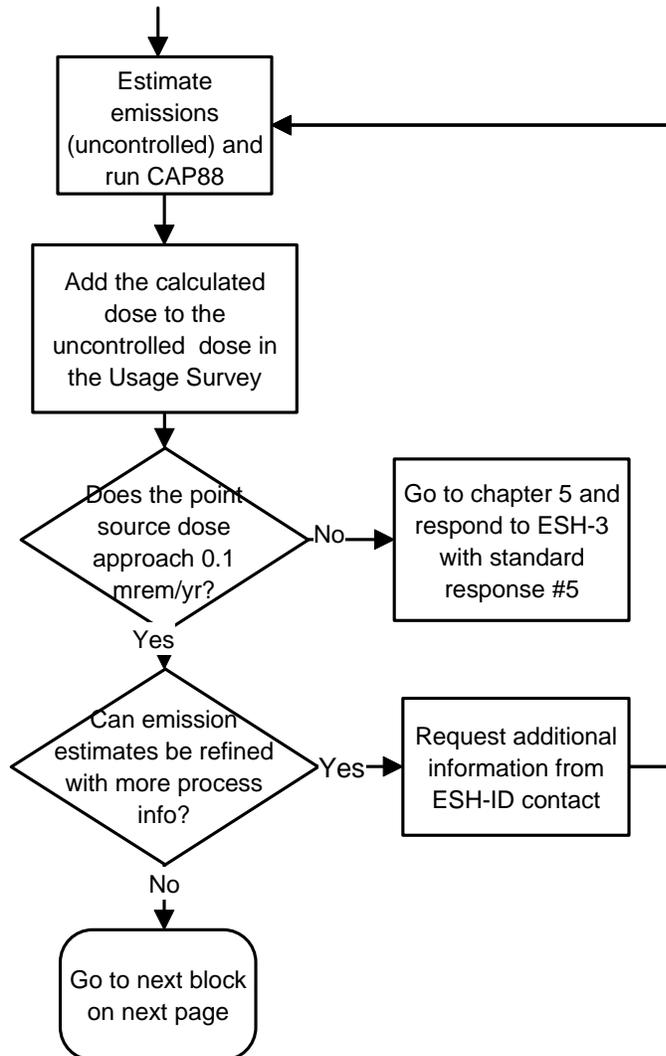
### 3: Non-monitored point source review

#### Reviewing a non-monitored point source

To review a proposed project involving a non-monitored point source, perform the actions described in the following blocks.

#### Steps to determine if monitoring is necessary

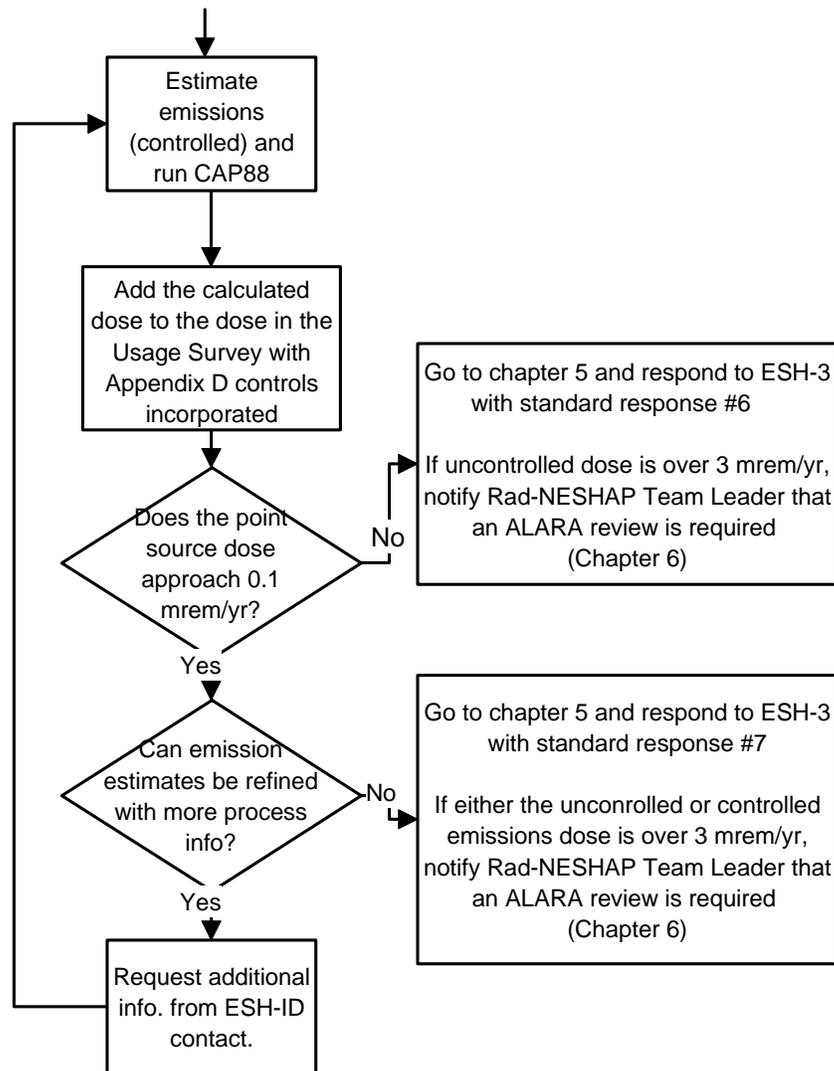
To determine if monitoring is necessary, perform the actions described in the following flow chart:



### 3: Non-monitored point source review, continued

**Steps to determine if pre-construction application is necessary**

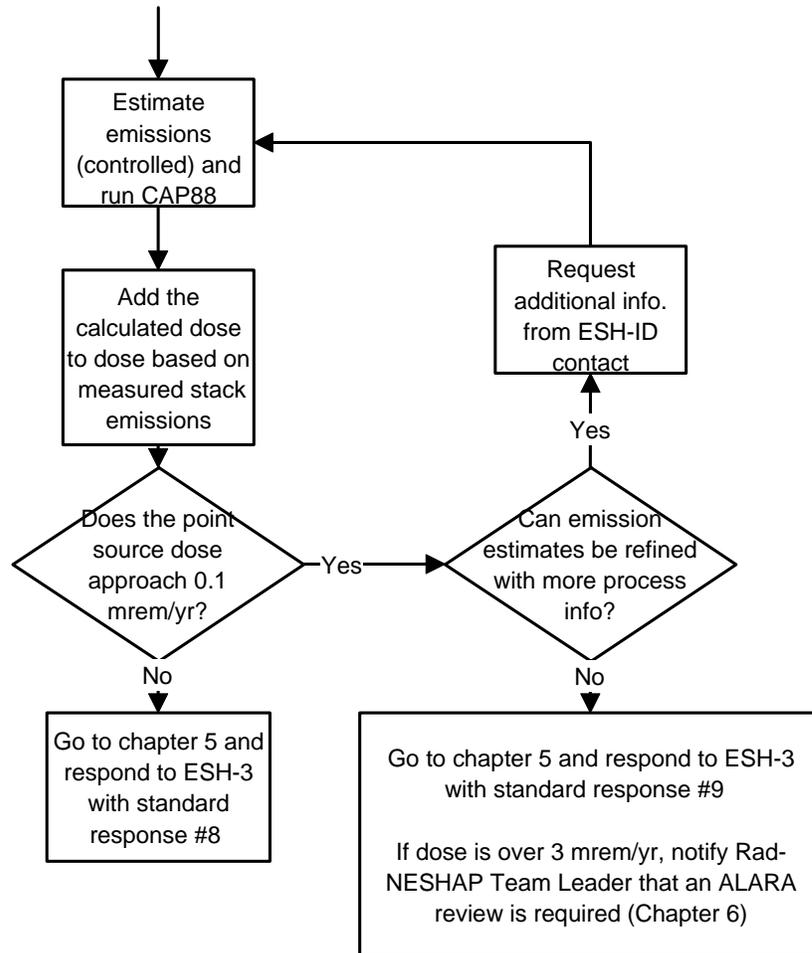
To determine if a pre-construction application is necessary, perform the actions described in the following flow chart:



## 4: Monitored point source review

### Steps to review monitored point sources

To review a proposed project involving a monitored point source, perform the actions described in the following flow chart:



## 5: Documenting decisions and responding

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### Standard responses

When referred to this chapter by a previous chapter, use the indicated example standard response (given in Attachment 1) as a guide or template to prepare the documentation with best professional judgment.

Other requirements may be noted in the flow charts; AIRNET evaluations are described in procedure MAQ-238, while ALARA review requirements are outlined in Chapter 6. Comments related to these subsequent analyses may not be available at the time that initial comments are submitted. Depended on the actions that are required for these analyses, additional comments may be needed and submitted at a later time.

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### Attach database parameters

Attach the following database parameters (e.g., via e-mail) to the response:

- status: active/inactive (are we waiting for more information?)
- RAEM: Yes/no (are we recommending AIRNET or stack monitoring?)
- NESHAP: Yes
- NONRAD: Yes/no (are there any toxic or hazardous chemicals?)
- Asbestos: Yes/no (is there potential to encounter asbestos, e.g., in building renovation?)
- 0.1 mrem/yr exemption: Yes/no (are we applying exemption for pre-construction approval in 40 CFR Part 61.96[b]?)

The following additional information is necessary if the project review was not initiated by the ESH-ID process:

- contact name, group, and phone number
  - TA and building numbers
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### Document response

Document the response in either an e-mail message or a formal memo to the project contact in ESH-3 or other organization.

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### Obtain peer review

Submit comments for peer review by qualified project personnel.

The **peer reviewer** resolves comments with author, makes or requests necessary changes.

Send comments to records coordinator and administrative personnel.

## 5: Documenting decisions and responding, continued

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### Log and forward the response

If a memo is to be prepared, **MAQ administrative personnel** finalizes the memo, obtains signatures on the memo by the project leader, logs the memo into the group memo log, sends the memo to the appropriate contact, and forwards a copy to the individual who does data entry.

If an e-mail was used, the **MAQ administrative personnel** assigns a tracking number, records into the appropriate log, and forwards to the appropriate contact and to the individual who does data entry.

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### Enter parameters in database

The **MAQ administrative personnel** enter the database parameters, comments, and additional information (listed on previous page) into the Microsoft Access ESH-ID database.

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### Review database entries

Periodically, review the database entries for typing errors, spelling errors or other mistakes.

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### Make changes to database

If any substantial changes are needed in a database record, generate a *new* record in the database and send a *new* memo or e-mail as described above in this chapter. Never delete or modify existing records in the database except to make simple editorial or spelling corrections.

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### Generate summary reports

Generate summary reports from the ESH-ID database and forward them to the project leaders for Rad-NESHAP, Asbestos, Environmental Surveillance, and New Source Review when requested.

## 6: Environmental ALARA Reviews

### Overview

DOE Order 5400.5 discusses ALARA requirements, as applied to the public and the environment. Implementation of this Order at the Los Alamos National Laboratory requires an ALARA review for operations that may produce a public dose impact of 3 millirem per year or more.

To perform an Environmental ALARA review, see “Performing an Environmental ALARA Review” section, below.

### Performing Environmental ALARA reviews

An Environmental ALARA review should be performed in conjunction with the applicable operating group for the operations under analysis.

The following steps should be used as a guideline for planned operations at Los Alamos National Laboratory.

Step	Action
1	Determine if alternative processes could be used, such as different types of treatment to discharge air streams, different operational methods, or different or additional engineering controls.  Examples of engineering controls can include the use of HEPA filtration to remove radioactive particulates, charcoal filters or wet scrubbers to remove radioactive vapors, or delay systems to remove short-lived radioactive gases.
2	Determine relative doses to the maximally exposed off-site receptors for the different alternatives discussed in Step 1.
3	Determine relative cost differences for the different alternatives discussed in Step 1.
4	Determine changes in the societal impacts associated with the various alternatives discussed in Step 1. For example, are discharges to water preferable to airborne releases.
5	Compare the estimated emissions and dose impacts with the expected emissions from other operations throughout the Laboratory. Determine if changes to existing “allowed” levels of emissions need to be made at other LANL facilities, to ensure that LANL does not exceed the 10 millirem per year limit for emissions of radionuclides to the air.
5	Fully document the decisions made by the operating group and MAQ representatives, and maintain records in the MAQ records center.
6	If possible, incorporate the opinions of public representatives in the decision making process to gauge their response to proposed alternatives. This can be done through public meetings, sampling of populace, the Citizen’s Advisory Board, or other methods.

*Continued on next page.*

## 6: Environmental ALARA Reviews, continued

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**Existing  
ALARA  
reviews**

Procedure MAQ-610, "Environmental Management Plan for LANSCE" evaluates emissions of radioactive gases from the monitored stacks at the Los Alamos Neutron Science Center, LANSCE. Emissions from these sources have historically dominated the off-site dose impacts in years when the LANSCE accelerator is in operation.

When actual or projected emissions exceed certain thresholds, increasing reporting frequency and levels of authorization are required.

## 7: Records resulting from this procedure

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### Records

The following records generated as a result of this procedure are to be submitted **at the time of completion** as records to the records coordinator:

- electronic copies of memos or e-mail responses sent to project contacts
- other documentation or correspondence generated for analyzed operations
- All records of AIRNET analysis, as described in procedure MAQ-238
- All Environmental ALARA reviews and supporting documentation

[Click here to record “self-study” training to this procedure.](#)



## EXAMPLES OF STANDARD RESPONSES

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**Response #1 - Relocation of radioactive materials/operation** Relocation of existing radioactive materials/operations do not require pre-approval under the Rad-NESHAP (40 CFR 61). Therefore, this project will not require a Rad-NESHAP pre-construction application. However, MAQ needs to be notified about the relocation of radioactive materials/operations. The information included in this notification will be used to update the Radioactive Materials Usage Survey for Point Sources and to evaluate the need for stack/exhaust monitoring at the new location. The notification and any questions can be directed to staff of the New Source Review Project in MAQ.

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**Response #2 - Sealed source** This work involves sealed sources. No emissions will be generated from the sealed sources. Therefore, no Rad-NESHAP permitting or stack monitoring will be required. However, should activities change and the sealed sources be required to be open, please contact staff of the New Source Review Project in MAQ so that we may reevaluate the need for air quality permitting and monitoring.

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**Response #3 - Characterization and sampling activities** It is the policy of MAQ that characterization and sampling activities that are conducted in order to determine the extent of contamination do not require pre-construction approval. However, should activities enter the remediation phase where the potential for emissions is heightened, MAQ should review these activities before they begin in order to reevaluate the need for air quality permitting.

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**Response #4 - No change in process or materials** Controlled emissions from this project are estimated to be [*fill in number*] Ci/yr. Historic measured emissions from this facility range between [*fill in number*] and [*fill in number*] Ci/yr (199x-199y). Since no additional material is being added to the existing inventory and the estimated emissions are consistent with the historic emissions data, this project will not increase the overall radioactive air emissions generated from this facility and is not a modification to the facility. Therefore, a Rad-NESHAP pre-construction application will not be required. In addition, since no changes to the types or amounts of radionuclides are expected, the monitoring status should not change.

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**Response #5 - No monitoring or permitting requirements** In order to determine the applicability of NESHAP requirements, dose assessments were calculated using CAP88, an EPA-approved dispersion modeling program. Based on the modeling results, the potential effective dose equivalent from the point source at the nearest receptor is *[fill in number]* mrem/yr and is well below the monitoring and permitting threshold of 0.1 mrem/yr specified in 40 CFR 61, Subpart H (NESHAP). Therefore, the project will not require EPA pre-approval or emissions monitoring. However, to ensure compliance with the NESHAP, you must notify MAQ before the start-up of this project. In addition to this notification, staff of the Rad-NESHAP Project in MAQ may contact you in the future to request more information for the Radioactive Materials Usage Survey for Point Sources.

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**Response #6 - Monitoring requirement** Based on the modeling results of uncontrolled emission estimates of *[fill in number]*, the operations planned for this project will require stack/exhaust monitoring under 40 CFR 61, Subpart H (NESHAP). However, based on the modeling results of the controlled estimated emissions, the potential effective dose equivalent from the point source at the nearest receptor is well below the permitting threshold of 0.1 mrem/yr specified in the NESHAP. Therefore, the project will not require EPA pre-approval. However, to ensure compliance with the NESHAP, you must perform stack/exhaust monitoring and notify MAQ before the start-up of this project. In addition to this notification, staff of the Rad-NESHAP Project in MAQ may contact you in the future to request more information for the Radioactive Materials Usage Survey for Point Sources and to offer assistance in the design of the stack monitoring system. If you have any questions, please contact staff of the New Source Review Project in MAQ.

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**Response #7 - NESHAP review requirement** This project will require a Rad-NESHAP pre-construction review and an evaluation of monitoring requirements under 40 CFR 61, Subpart H. MAQ will be contacting you for additional information in order to complete the Rad-NESHAP review and to update the Radioactive Materials Usage Survey for Point Sources. If you have any questions please contact staff of the New Source Review Project in MAQ.

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- Response #8 - No permitting requirement** In order to determine the applicability of NESHAP requirements, dose assessments were calculated using CAP88, an EPA-approved dispersion modeling program. Based on the modeling results, the potential effective dose equivalent from the point source at the nearest receptor is *[fill in number]* mrem/yr and is well below the permitting threshold of 0.1 mrem/yr specified in 40 CFR 61, Subpart H (NESHAP). Therefore, the project will not require EPA pre-approval. However, to ensure compliance with the NESHAP, you must notify MAQ before the start-up of this project. In addition to this notification, staff of the Rad-NESHAP Project in MAQ may contact you in the future to request more information for the Radioactive Materials Usage Survey for Point Sources.
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- Response #9 - NESHAP review requirement** This project will require a Rad-NESHAP pre-construction review under 40 CFR 61, Subpart H. MAQ will be contacting you for additional information in order to complete the Rad-NESHAP review and to update the Radioactive Materials Usage Survey for Point Sources. If you have any questions, please contact staff of the New Source Review Project in MAQ.
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- Response #10- Non-point source emissions from D&D operations** Review of the D&D activities at the Laboratory clearly indicates that facility emissions decrease as result of the activities, despite temporary potential increases during D&D operations. Therefore, D&D projects will be evaluated on a case-by-case basis to determine the requirements for pre-construction approval or emissions monitoring under 40 CFR 61- Subpart H (NESHAP). If you have any questions, please contact staff of the New Source Review Project in MAQ.
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- Response #11- Non-point source emissions from routine maintenance operations** The activities planned for this project, including *[fill in applicable activities]*, are considered to be routine maintenance activities (40 CFR 61.15 (d)(1)); therefore, the emissions that are generated are exempt from permitting and monitoring requirements under 40 CFR 61- Subpart H (NESHAP). If you have any questions, please contact staff of New Source Review Project in MAQ.
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- Response #12- Non-point source emissions from existing operations** This is not a new or modified process for *[fill in area]*; these operations have been conducted at this facility in the past. In addition, these levels of emissions of *[fill in the radionuclides]* are well within the normal levels handled at this facility. Since this project is a continuation of existing activities that will not increase the overall radioactive emissions from this facility, Rad-NESHAP pre-construction approval under 40 CFR 61, Subpart H is not required. If you have any questions, please contact staff of New Source Review Project in MAQ.