



Acceptable Separation Distance (ASD) Assessment Tool Users Guide

Department of Housing and Urban Development
Community Planning and Development
Office of Environment and Energy
Environmental Planning Division

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PROVIDING FEEDBACK & CORRECTIONS

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Please send your comments or other input to
ATEC@HUD.gov

Overview of the Acceptable Separation Distance Assessment Tool

The Acceptable Separation Distance Assessment tool is an electronic application of the existing regulation 24 CFR Part 51 Subpart C and the Guidebook "Siting of HUD – Assisted Projects Near Hazardous Facilities. Mathematical equations were derived from the Nomographs located in the regulation 24 CFR Part 51 Subpart C and the Guidebook "Siting of HUD – Assisted Projects Near Hazardous Facilities", and applied to the component parts of the assessment to determine the Acceptable Separation Distance (ASD) for a proposed HUD-assisted project site in proximity to facilities that store, process or manufacture hazardous substances of fire or explosion prone nature. The resulting calculations automate the paper process by "filling in the blanks" and negating the need for the graphed curves and charts. The data requirements are interactive. Users only supply data to active input boxes, and those boxes are activated by the answers to questions about the site conditions. If it does not apply, users are not asked. If it should apply and a box is not active, answers to previous questions should be revisited.

Future developments will include a component to calculate the values required to design a barrier for mitigation.

Assessment Approach

The computerized ASD assessment process very closely mimics the paper worksheets to assess a proposed HUD-assisted project site in proximity to facilities that store, process or manufacture hazardous substances of fire or explosion prone nature. The same data must be gathered. Instead of blanks on the worksheet, boxes are filled in on a screen. The proposed HUD-assisted project site characteristics in relationship to the data pertaining to the hazardous facility containing stationary, above ground containers containing substances of fire or explosive prone nature are the inputs for the computerized ASD assessment process for the calculation of the Acceptable Separation for HUD-assisted projects.

Assessment Process

The process for using the ASD Assessment tool is relatively simple.

1. Go to Chapter 1 through Chapter 3 of the Guidebook “Siting of HUD-Assisted Projects Near Hazardous Facilities”. The information contained in the three Chapters serves as guidance to assess the proposed HUD-assisted project site near a facility that store, process or manufacture hazardous substances of fire or explosion prone nature.

a. Fill out the Site Analysis Worksheet located in the Appendix D of the Guidebook. A checklist of the data required to fill this form is located in Appendix C of the Guidebook.

Appendix C

Basic Data Requirements Checklist

I. Assemble the following geographic information:

1. A map covering the proposed project site and surrounding area up to at least one mile around the site.
2. An aerial photograph of the same area.
3. Sketch the proposed project site boundaries and approximate building locations on the map or photograph.
4. Similarly locate on the map or aerial photograph the positions of:
 - a. Industries handling chemical products.
 - b. Storage tanks and their surrounding dikes.
 - c. Railroad tracks.
 - d. Major highways and roads.
 - e. Barge docking areas.
5. Tanker truck and railroad car terminals.

II. Assemble the following information about the hazardous facility:

1. List the chemical name of all substances stored at the facility which poses a potential hazard to the proposed project site (e.g., gasoline, fuel oil, liquefied propane gas, vinyl chloride, etc.).
2. Determine the number of containers involved?
3. Determine the distance of the containers to the proposed project site (always measure from the center of the tank).
4. Identify the physical dimensions of all storage tanks (height and diameter).
5. Determine the volume (gallons) of each container.
6. Note the shape of each tank (i.e., spherical, cylindrical).
7. If the storage tanks are horizontal to the ground, which direction do the ends face (parallel or perpendicular to the project site)?
8. Identify each storage tank surrounded by a dike? What is the square footage of the diked area? The dike must completely surround the storage tank(s).
9. Are the storage tanks buried?
10. What are the general characteristics of the terrain surrounding the storage tanks? Does the terrain slope away from the storage tanks toward the proposed housing site?
11. Does the terrain provide a natural barrier between the proposed site and potential hazard?
12. Are there permanent structures between the project site and the hazard?

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Appendix C - Basic site data requirements checklist

Appendix D

Request for Headquarters Analysis of Potential Hazardous Site

Name: _____ Date: _____

Title: _____

Field Office: _____

Phone (FTS): _____

Site Profile

Project Name: _____

Project Location (City, County, State): _____

Type of Project

Residential: Yes _____ No _____

Single _____ Multi _____ High rise _____ No. of stories _____ Low rise _____

Elderly: Yes _____ No _____

Rehab _____ Rehab (new use) _____

Non-residential (describe) _____

Potential Problems (issues for Headquarters to address):

Project Status (Status of project, include any deadlines)

Appendix D – Site analysis worksheet

For purposes of illustration and better legibility, Appendix C checklist and Appendix D worksheet are presented in full size view in pages 5 and 6

Basic Data Requirements Checklist

I. Assemble the following geographic information:

1. A map covering the proposed project site and surrounding area up to at least one mile around the site.
2. An aerial photograph of the same area.
3. Sketch the proposed project site boundaries and approximate building locations on the map or photograph.
4. Similarly locate on the map or aerial photograph the positions of:
 - a. Industries handling chemical products.
 - b. Storage tanks and their surrounding dikes.
 - c. Railroad tracks.
 - d. Major highways and roads.
 - e. Barge docking areas.
 - f. Tanker truck and railroad car terminals.

II. Assemble the following information about the hazardous facility:

1. List the chemical name of all substances stored at the facility which poses a potential hazard to the proposed project site (e.g., gasoline, fuel oil, liquefied propane gas, vinyl chloride, etc.).
2. Determine the number of containers involved?
3. Determine the distance of the containers to the proposed project site (always measure from the center of the tank).
4. Identify the physical dimensions of all storage tanks (height and diameter).
5. Determine the volume (gallons) of each container.
6. Note the shape of each tank (i.e., spherical, cylindrical).
7. If the storage tanks are horizontal to the ground, which direction do the ends face (parallel or perpendicular to the project site)?
8. Identify each storage tank surrounded by a dike? What is the square footage of the diked area? The dike must completely surround the storage tank(s).
9. Are the storage tanks buried?
10. What are the general characteristics of the terrain surrounding the storage tanks? Does the terrain slope away from the storage tanks toward the proposed housing site?
11. Does the terrain provide a natural barrier between the proposed site and potential hazard?
12. Are there permanent structures between the project site and the hazard?

Appendix D

Request for Headquarters Analysis of Potential Hazardous Site

Date

Name: _____

Title: _____

Field Office: _____

Phone (FTS): _____

Site Profile

Project Name: _____

Project Location (City, County, State): _____

Type of Project

Residential: Yes _____ No _____

Single _____ Multi _____ High rise _____ No. of stories _____ Low rise _____

Elderly: Yes _____ No _____

Rehab _____ Rehab (new use) _____

Non-residential (describe) _____

Potential Problems (Issues for Headquarters to address):

Project Status (Status of project, include any deadlines):

2. The following is the Welcome Screen to the Community Planning and Development / Office of Environment and Energy/ Acceptable Separation Distance Assessment Tool. Users can get access to the Acceptable Separation Distance Assessment tool by going to the following URL:
<http://hudstage.hud.gov/offices/cpd/environment/asdCalculator.cfm>

2(a). Transfer the input data from the site analysis worksheet (located in Appendix D of the Guidebook) into the Hazardous Material Assessment Data fields. Here are some tips to help with the data entry.

- Boxes that need input will be white. Some boxes will not be available for input (non-colored and non-editable) based on previous responses.
- Boxes that report calculation results or display factors applied based on your responses are gray and non-editable. These are included for your information only.
- To re-start calculation procedures after an ASD assessment, click the Refresh button located on top of the URL address area

ASD calculation procedures

To calculate the Acceptable Separation Distance (ASD) from:

1. A stationary, above ground container, containing a pressurized product (gas)

The user is required to perform the following steps:

- Check the boxes identified with a “yes” answer to the questions as follow:
 - a. Is the container aboveground? and,
 - b. Is the container under pressure?, then,
- Check the box (yes or no) that identifies if the pressurized product being assessed is a cryogenic liquefied gas. The most common cryogenic liquefied gases used in industry are Liquid Natural Gas, Hydrogen and Methane. If the gas being assessed is a cryogenic liquefied gas check “yes”, if it is not check “No”.
- Check the box (yes or no) that identifies if the container being assessed is diked or undiked.
- If the container is diked, check the box with a “yes” and provide the diked length and width in “feet” units. if it is not, check “No” and provide the volume of the container in “gallon” units . Note: The ASD tool does not process numerical information with commas, only whole numbers and decimals without commas are the numerical data the ASD tool can process.
- Click the button identified as “Calculate Acceptable Separation Distance” for the ASD calculated result in “feet” units

Results: The ASD assessment tool will calculate the following information if the gas being assessed is a cryogenic liquefied gas contained in a diked container :

- The diked area in “square feet” units
- The ASD for thermal radiation for people (ASDPNPD)
- The ASD for thermal radiation for buildings (ASDBNPD)

If the gas being assessed is a cryogenic liquefied gas, but contained in an undiked container, the following information will be calculated:

- The ASD for thermal radiation for people (ASDPPU)
- The ASD for thermal radiation for buildings (ASDBPU)

If the gas being assessed is not a cryogenic liquefied gas, the following information will be calculated:

- The ASD for blast overpressure (ASDBOP)
- The ASD for thermal radiation for people (ASDPPU)
- The ASD for thermal radiation for buildings (ASDBPU)

Example #1: The ASD assessment tool screen calculating the ASD from **a stationary, above ground container, containing a pressurized product as a cryogenic liquefied gas contained in a diked container.** The screen should look as follows:

Homes & Communities
U.S. Department of Housing and Urban Development

Community Planning & Development

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Acceptable Separation Distance (ASD) Assessment Tool

The ASD is the distance from a hazard, to where a HUD assisted project can be located. The Environmental Planning Division (EPD) has developed an electronic-based tool to calculate Acceptable Separation Distances (ASDs) from explosive and flammable hazards.

The ASD assessment tool was designed to help users calculate the ASD from a hazard, to where a HUD assisted project can be located.

In addition to the ASD assessment tool, the guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C provide useful information for the calculation of the ASD from a hazard.

Information by State
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Providing Feedback & Corrections
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Acceptable Separation Distance Assessment Tool	
Is the container above ground?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Is the container under pressure?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Does the container hold a cryogenic liquefied gas?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Is the container diked?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
What is the volume (gal) of the container?	
What is the Diked Area Length (ft)?	150
What is the Diked Area Width (ft)?	234
Calculate Acceptable Separation Distance	
Diked Area (sqft)	35100
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPI)	
ASD for Thermal Radiation for Buildings (ASDBPU)	
ASD for Thermal Radiation for People (ASDPNPD)	684.60
ASD for Thermal Radiation for Buildings (ASDBNPD)	137.30

Check these boxes

Provide dike length and width information

Click here for assessment result(s)

Diked area result

ASD result(s)

Example #2: The ASD assessment tool screen calculating the ASD from a **stationary, aboveground container, containing a pressurized product as a cryogenic liquefied gas contained in an undiked container**. The screen should look as follows:

Homes & Communities
U.S. Department of Housing and Urban Development

Community Planning & Development

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Acceptable Separation Distance (ASD) Assessment Tool

The ASD is the distance from a hazard, to where a HUD assisted project can be located. The Environmental Planning Division (EPD) has developed an electronic-based tool to calculate Acceptable Separation Distances (ASDs) from explosive and flammable hazards.

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Acceptable Separation Distance Assessment Tool

Is the container above ground?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Is the container under pressure?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Does the container hold a cryogenic liquefied gas?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Is the container diked?	Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/>
What is the volume (gal) of the container?	334
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
<input type="button" value="Calculate Acceptable Separation Distance"/>	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	175.14
ASD for Thermal Radiation for Buildings (ASDBPU)	30.29
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

Check these boxes

Provide **container volume** (gallons) information

Click here for assessment result(s)

ASD result(s)

Example #3: The ASD assessment tool screen calculating the ASD from a stationary, aboveground container, containing a pressurized product (not a cryogenic liquefied gas). The screen should look as follows:

Home & Communities

U.S. Department of Housing and Urban Development

Community Planning and Development

About CPD

Economic Development

Community Development

Affordable Housing

Homeless Assistance

HUDVet

Environment

Environmental Contacts

Review Requirements

Laws and Regulations

Training

Resource Library

Acquisition/Relocation

Energy

HIV/AIDS Housing

Technical Assistance

Online Systems/ Databases

Library

Laws and Regulations

About HUD

Homes

Communities

Working with HUD

Resources

USA.gov

Government Made Easy

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Acceptable Separation Distance (ASD) Assesment Tool

The ASD is the distance from a hazard, to where a HUD assisted project can be located. The Environmental Planning Division (EPD) has developed an electronic-based tool to calculate Acceptable Separation Distances (ASDs) from explosive and flammable hazards.

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Acceptable Separation Distance Assessment Tool

Is the container above ground?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Is the container under pressure?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Does the container hold a cryogenic liquified gas?	Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/>
Is the container diked?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
What is the volume (gal) of the container?	234
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
<div>Calculate Acceptable Separation Distance</div>	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	135.51
ASD for Thermal Radiation for People (ASDPPU)	151.01
ASD for Thermal Radiation for Buildings (ASDBPU)	25.69
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

Check these boxes

Provide **container volume** (gallons) information

Click here for assessment result(s)

ASD result(s)

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2. A stationary and diked or undiked aboveground container, containing an unpressurized product (liquid)

The user is required to perform the following steps:

- Check the box identified with a “yes” answer to the following question:
 - a. Is the container aboveground?
- Check the box identified with a “No” answer to the following question:
 - a. Is the container under pressure?
- Check the box (yes or no) that identifies if the container being assessed is diked or undiked. If the container is diked, check the box with a “yes” and provide the diked length and width in “feet” units. if it is not, check “No” and provide the volume of the container in “gallon” units.
- Click the button identified as “Calculate Acceptable Separation Distance” for the ASD calculated result in “feet” units

Results: The ASD assessment tool will calculate the following information if the liquid being assessed is contained in a diked container:

- The diked area in “square feet” units
- The ASD for thermal radiation for people (ASDPNPD)
- The ASD for thermal radiation for buildings (ASDBNPD)

If the liquid being assessed is contained in an undiked container, the following information will be calculated:

- The ASD for thermal radiation for people (ASDPPU)
- The ASD for thermal radiation for buildings (ASDBPU)

Example #4: The ASD assessment tool screen calculating the ASD from a stationary, aboveground container, containing an unpressurized product in a diked container. The screen should look as follows:

Homes & Communities
U.S. Department of Housing and Urban Development

Community Planning & Development

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Acceptable Separation Distance Assessment Tool	
Is the container above ground?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Is the container under pressure?	Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/>
Does the container hold a cryogenic liquified gas?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
Is the container diked?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
What is the volume (gal) of the container?	<input type="text"/>
What is the Diked Area Length (ft)?	<input type="text" value="345"/>
What is the Diked Area Width (ft)?	<input type="text" value="345"/>
<input type="button" value="Calculate Acceptable Separation Distance"/>	
Diked Area (sqft)	119025
ASD for Blast Over Pressure (ASDBOP)	<input type="text"/>
ASD for Thermal Radiation for People (ASDPPU)	<input type="text"/>
ASD for Thermal Radiation for Buildings (ASDBPU)	<input type="text"/>
ASD for Thermal Radiation for People (ASDPNPD)	1140.56
ASD for Thermal Radiation for Buildings (ASDBNPD)	241.28

Check these boxes

Provide dike length and width information

Click here for assessment result(s)

Diked area result

ASD result(s)

Example #5: The ASD assessment tool screen calculating the ASD from a **stationary, aboveground container, containing an unpressurized product in an undiked container**. The screen should look as follows:

Homes & Communities
U.S. Department of Housing and Urban Development

Community Planning and Development

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Acceptable Separation Distance (ASD) Assessment Tool

The ASD is the distance from a hazard, to where a HUD assisted project can be located. The Environmental Planning Division (EPD) has developed an electronic-based tool to calculate Acceptable Separation Distances (ASDs) from explosive and flammable hazards.

The ASD assessment tool was designed to help users calculate the ASD from a hazard, to where a HUD assisted project can be located.

In addition to the ASD assessment tool, the guidebook "Siting of HUD- Assisted Projects Near Hazardous Facilities" and the regulation 24 CFR Part 51, Subpart C provide useful information for the calculation of the ASD from a hazard.

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Acceptable Separation Distance Assessment Tool	
Is the container above ground?	Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>
Is the container under pressure?	Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/>
Does the container hold a cryogenic liquified gas?	Yes: <input type="checkbox"/> No: <input type="checkbox"/>
Is the container diked?	Yes: <input type="checkbox"/> No: <input checked="" type="checkbox"/>
What is the volume (gal) of the container?	234
What is the Diked Area Length (ft)?	
What is the Diked Area Width (ft)?	
<input type="button" value="Calculate Acceptable Separation Distance"/>	
Diked Area (sqft)	
ASD for Blast Over Pressure (ASDBOP)	
ASD for Thermal Radiation for People (ASDPPU)	151.01
ASD for Thermal Radiation for Buildings (ASDBPU)	25.69
ASD for Thermal Radiation for People (ASDPNPD)	
ASD for Thermal Radiation for Buildings (ASDBNPD)	

Check these boxes

Provide **container volume** (gallons) information

Click here for assessment result(s)

ASD result(s)

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