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U.S. Department of Housing and Urban Development  
Office of Community Planning and  
Development

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Special Attention of: Transmittal Handbook No.: 1390.4

Grant Recipients under Title I of  
the Housing and Community  
Development Act of 1974 as amended,  
42 U.S.C. 5301

Issued: August 1984

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1. This Transmits

Handbook 1390.4: A Guide to HUD Environmental Criteria and Standards  
contained in 24 CFR Part 51.

2 Explanation of Materials

This handbook contains background material on the development of the  
standards and criteria, an annotated copy of each regulation and a  
clean reference copy of each regulation.

3. Filing Instructions

Insert: Handbook 1390.4 dated 8/84.

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Handbook 1390.4

U.S. Department of Housing and Urban Development  
Office of Community Planning and Development

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Program Participants  
and Departmental Staff

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August 1984

A Guide to HUD  
Environmental Criteria  
and Standards  
Contained in  
24 CFR Part 51



A Guide to the Environmental Criteria and Standards  
Contained in 24 CFR Part 51

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## Chapter 1

### Introduction

The Department of Housing and Urban Development, Office of Environment and Energy, Environmental Planning Division, has prepared this Handbook to assist the HUD field staff and local government officials who are responsible for implementing Part 51 as well as the private builders and developers who are affected by it. The Handbook is designed to meet two basic needs:

1. The need for a single reference source containing all the environmental criteria and standards contained in Part 51.
2. The need for explanatory and background material on the regulations, material that is normally only provided in either HUD training or through policy memos to HUD field offices. Neither local government officials nor private builders and developers receive such training and neither are part of the policy memo "loop."

We intend that this Handbook will be a permanent resource that will be expanded as new regulations are issued. It has been printed in a looseleaf fashion to make that easier.

The Handbook is composed of three sections:

1. Background material on the development of the regulations, the basis for standards contained in the regulations, and sources for materials necessary to implement the regulations.
2. An annotated copy of each regulation. The annotations include policy interpretations that have evolved since the regulations went into effect, clarifications of terms and wording based on questions raised by HUD field staff and others, and hints on implementation.
3. A clean copy of each regulation.

Supplements to each of these sections will be provided for each new regulation issued.

Users of this Handbook must realize that, despite the title of Part 51 (Environmental Criteria and Standards), these regulations do not contain all the environmental criteria and standards that must be considered in developing projects for HUD assistance. Part 51 contains only those criteria and standards that were developed specifically for HUD projects and which are Department-wide in effect. There are Federal statutes, executive orders, and other Federal agencies' regulations which also establish criteria and standards that must be considered. Handbooks for specific HUD program areas, such as single family housing, contain additional criteria and standards.

We would also like to point out that while the standards contained in the regulations are only binding on HUD assisted projects and actions, local governments may find them useful in evaluating other projects and in preparing local plans.





## Chapter 2

### Background on the Environmental Criteria and Standards in 24 CFR Part 51

Part 51 contains one subpart (Subpart A) that establishes some general definitions of responsibility and three subparts (B-D) that establish specific environmental standards. Because Subpart A is a purely administrative section, of interest primarily to HUD staff, it is not discussed in this Chapter. It is, however, included in both Chapters 3 and 4.

#### NOISE ABATEMENT AND CONTROL

##### SUBPART B

###### Summary

The purpose of the noise regulation is to encourage land use patterns for housing and other noise sensitive urban needs that will provide a suitable separation between them and major noise sources. It provides minimum national standards applicable to HUD programs to protect citizens against excessive noise in their communities and places of residence. It also provides policy on the use of structural and other noise attenuation measures.

###### Historical Background

The Department of Housing and Urban Development's concern with the problem of noise is a longstanding one. As early as 1961 The Federal Housing Administration's appraisal guidance identified noise as an issue to be considered in property appraisals as part of our efforts to meet the requirements of the Housing Act of 1949 which set forth the national goal of "a decent home and a suitable living environment for every American Family."

In the mid 1960's, attention was focused on aircraft noise with the issuance of a report by the Executive Office of the President on Alleviation of Jet Aircraft Noise Near Airports. The report was prepared by a jet Aircraft Noise Panel composed of Federal, State and local officials and representatives of the airport operators, airlines, and aircraft manufacturing industry. Subsequently, a Federal Interagency Aircraft Noise Abatement Program (IANAP) was established and emphasis was placed on the three major aspects of the problem: the noise source (the aircraft), the noise path (how aircraft are flown), and the receiver (those living around airports). HUD was charged with chairing two interagency panels on the receiver portion of the problem, namely compatible land use planning and development around airports and methods of providing attenuation features in residential structures. Several studies were undertaken in support of the IANAP effort. About the same time, the Housing and Urban Development Act of 1965 was enacted. Under this Act, the Secretary was tasked to "determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the



airports in the vicinity of their homes, including a study of feasible methods of insulating such homes from the noise of aircraft."

The Department's first comprehensive noise standards were issued in 1971 in HUD Circular 1390.2: Noise Abatement and Control. This Circular contained standards for exterior noise levels along with policies for approving HUD supported or assisted housing projects in high noise areas. In general, the Circular established three zones: an acceptable zone where all projects could be approved, a normally unacceptable zone where mitigation measures would be required and where each project would have to be individually evaluated for approval or denial, and an unacceptable zone in which projects would not, as a rule, be approved.

During the 1970's significant improvements were made in the technology of noise measurement and description. In 1979, HUD issued the current noise regulation which reflects these changes and replaces the old Circular 1390.2. The Department kept the same basic standards but adopted new descriptor systems which were considerably advanced over those in use before.

While there continue to be improvements in noise measurement systems and computer noise modeling techniques, these are primarily refinements to the existing systems and techniques rather than major changes. Therefore the Department does not expect to make any significant revisions to its noise regulation anytime in the near future.

HUD's concern and involvement with the noise issue has been part of a larger Federal involvement with the noise problem. For example, the Department of Defense has had an aggressive program to promote compatible development around its installations since the early 1970's. (The Air Installation Compatible Use Zone program, as it is called, is a major source of noise data for HUD.) The Federal Aviation Administration has been working towards a quieter aviation environment for years as well. The focus of much of their earlier efforts was source reduction through their Federal Aviation Regulation 36 standards for engine noise. More recently the FAA has been looking at land use planning as another approach to reducing conflicts between aircraft noise and development through 46 CFR Part 150 on airport noise compatibility planning. The Federal Highway Administration has been working towards reducing highway noise conflicts through standards for new highway construction and guidance to States and localities. And finally, the Environmental Protection Agency had been a major force in source reduction and standards setting, particularly during the time Part 51B was under development.

#### Background on the Standards

Noise has two different types of effects on people: the direct physical effects such as hearing loss and the less direct effects of interference with activities such as sleep and conversation. The standards contained in the noise regulation are based on levels which cause interference effects, not the levels which can cause hearing loss.

welfare with an adequate margin of safety but without regard to cost or feasibility. To develop these criteria, the EPA drew upon a large body of survey data describing the degree of activity interference and resulting annoyance for a variety of noise levels. These surveys are summarized in the 1974 EPA report Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With An Adequate Margin of Safety.

Most of the surveys indicated that there were two breakpoints in reported interference and annoyance. Below 55 Ldn there was very little interference (for example, speech intelligibility was over 99%) and very little resulting annoyance. (Ldn stands for the Day-Night Average Sound Level and is the noise description system currently in use. It represents the average of all sound levels that occur during a 24 hour period, with a significant penalty added to sound levels between 10 pm and 7 am. See Figure 1 for an example of aircraft noise contours developed using the Ldn system.) Over 65 Ldn, interference and annoyance both increase rapidly. The EPA set 55 Ldn as the basic goal. But other Federal agencies, in consideration of their own program requirements and goals as well as the difficulty of actually achieving a goal of 55 Ldn, have settled on the 65 Ldn level as their standard. At 65 Ldn activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that we can realistically expect to achieve. Following the Federal lead, most local jurisdictions that have adopted noise standards have adopted 65 Ldn as the breakpoint for acceptability.

The common thinking of the various Federal agencies involved in the noise problem is reflected in a publication issued by the Federal Interagency Committee on Urban Noise: Guidelines for Considering Noise in Land Use Planning and Control. This booklet contains fairly specific land use recommendations and advice on various techniques that might be used to foster more compatible development. The booklet was the joint effort of the Environmental Protection Agency, the Department of Transportation, The Department of Defense, The Veterans Administration, and the Department of Housing and Urban Development.

#### Implementing Materials

The basic document needed to implement the noise regulation is the Noise Assessment Guidelines. These Guidelines contain desk top methods for calculating noise levels from aircraft, highways and railroads. The Guidelines also contain procedures for estimating the noise reduction from barriers and berms. The Guidelines are available from the Department of Housing and Urban Development. Contact the regional HUD office.

Also available is the Noise Guidebook. The Noise Guidebook is more of a background report that contains information on the basics of noise, noise legislation, noise attenuation and noise measurements. It also contains a series of tests so it can be used as a self-teaching device. It is available from the HUD User service. The address for the HUD User is: HUD User; P.O. Box 280; Germantown, MD 20874.

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CHAPTER 3

AN ANNOTATED COPY OF 24 CFR PART 51

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DEPARTMENT OF HOUSING AND  
URBAN DEVELOPMENT

Office of the Secretary

24 CFR Part 51

Environmental Criteria and Standards

Subpart A - General Provisions

EFFECTIVE DATE: August 13, 1979

SOURCE: Federal Register: July 12,  
1979; pp 40860-40862

51.1 Purpose

51.2 Authority

51.3 Responsibilities

51.4 Program coverage

51.5 Coordination with environmental  
clearance requirements

51.6 Reserved

Authority: Section 7(d). Department  
of Housing and Urban Development Act  
(42 U.S.C. 3535 (d)).

51.1 PURPOSE

The Department of Housing and  
Urban Development is providing program  
Assistant Secretaries and  
administrators and field offices with  
environmental standards, criteria and  
guidelines for determining project  
acceptability and necessary mitigating  
measures to insure that activities  
assisted by the Department achieve the  
goal of a suitable living environment.

51.2 AUTHORITY

This Part implements the

Department's responsibilities under the following statutes:

- (a) The National Housing Act of 1934 (P.L. 73-479 ) which was

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enacted "to encourage improvements in housing standards and conditions, to provide a system of mutual mortgage insurance, and for other purposes," thus providing the basis for HUD's Minimum Property Standards (MPS) which have evolved as required by legislation over the past 44 years.

- (b) The Housing Act of 1949 (P.L. 81-171) which sets forth the national goal of "a decent home and a suitable living environment for every American family," affirmed by the Housing and Urban Development Act of 1968 (P.L. 90-448).
- (c) The Department of Housing and Urban Development Act of 1965 (P.L. 89-174) which provides that the Secretary may make such rules and regulations as may be necessary to carry out functions, powers, and duties, and sets forth, as a matter of national purpose, the sound development of the Nation's communities and metropolitan areas.
- (d) The National Environmental Policy Act of 1969 (P.L. 91-190) which directs Federal agencies to develop procedures to carry out the purposes of the Act.
- (e) Intergovernmental Cooperation Act of 1968 (P.L. 90-577) which, under Title IV, directs that Federal programs and projects serve the objectives of appropriate

land use for housing,  
commercial, industrial,  
governmental, institutional,

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and other purposes to achieve  
sound and orderly development  
of all areas, both urban and  
rural.

### 51.3 RESPONSIBILITIES

- (a) Assistant Secretary for  
Community Planning and  
Development. The Assistant  
Secretary for Community  
Planning and Development  
shall be responsible for  
administering environmental  
regulations, and shall  
provide oversight,  
interpretation and guidance, and  
shall update the regulations  
as required. The Assistant  
Secretary shall also maintain  
liaison with other Federal  
agencies on matters of  
environmental policy  
implementation.
- (b) Assistant Secretary for  
Policy Development and  
Research. The Assistant  
Secretary for Policy  
Development and Research shall  
undertake research and  
demonstration studies  
necessary for the technical  
development of environmental  
standards, criteria, and  
implementing techniques as a  
basis for the development and  
implementation of  
environmental regulations. The  
Assistant Secretary shall  
also maintain liaison with  
Federal agencies on related  
technical matters.
- (c) Other Assistant Secretaries,  
Administrators, and the  
General Counsel. Other  
Assistant Secretaries,  
Administrators, and the

General Counsel shall:

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- (1) Incorporate adopted environmental regulations by reference into program regulations, guidance documents, and administrative forms and procedures;
- (2) Evaluate the effects of, and compliance with Departmental environmental regulations policy and report significant issues and problems to the Assistant Secretary for Community Planning and Development; and
- (3) Identify program areas under their jurisdiction in which additional environmental regulations are needed, and refer them to the Assistant Secretary for Community Planning and Development.

(d) Regional Administrators, Area Office Managers, Service Office Supervisors. Regional Administrators, Area Office Managers, and Service Office Supervisors shall assure that adopted environmental regulations are implemented in relation to program decisions and recommendations. They shall also monitor projects to assure that mitigation measures are implemented.

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51.4 PROGRAM COVERAGE

Environmental standards shall apply to all HUD actions except where special provisions and exemptions are contained in each Subpart.

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51.5 COORDINATION WITH ENVIRONMENTAL  
CLEARANCE REQUIREMENTS

Environmental standards shall be implemented prior to commitment in the decision-making process and, where environmental clearances are required, the decision points shall be identical. Compliance with HUD environmental standards shall be addressed in the environmental clearance process.

51.6 (RESERVED)

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Subpart B - Noise Abatement  
and Control

EFFECTIVE DATE: August 13, 1979

SOURCE: Federal Register: July 12,  
1979; pp 40862-40866

- 51.100 Purpose and Authority
- 51.101 General policy
- 51.102 Responsibilities
- 51.103 Criteria and standards
- 51.104 Special requirements
- 51.105 Exceptions
- 51.106 Implementation

Appendix I to Subpart B

51.100 PURPOSE AND AUTHORITY

- (a) Purpose. The Department of Housing and Urban Development finds that noise is a major source of environmental pollution which represents a threat to the serenity and quality of life in population centers and that noise exposure may be a cause of

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adverse physiological and  
psychological effects as well  
as economic losses.

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It is the purpose of this  
Subpart to:

- (1) Call attention to the  
threat of noise  
pollution;
- (2) Encourage the control of  
noise at its source in  
cooperation with other  
Federal departments and  
agencies;

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- (3) Encourage land use  
patterns for housing and  
other noise sensitive  
urban needs that will  
provide a suitable  
separation between them  
and major noise sources;
  - (4) Generally prohibit HUD  
support for new  
construction of noise  
sensitive uses on sites  
having unacceptable  
noise exposure;
  - (5) Provide policy on the  
use of structural and  
other noise attenuation  
measures where needed;  
and
  - (6) Provide policy to guide  
implementation of  
various HUD programs.
- (b) Authority. Specific  
authorities for noise  
abatement and control are  
contained in:
- (1) The Noise Control Act of  
1972 (P.L. 92-574) which  
directs Federal agencies  
to administer their  
programs in ways which  
reduce noise pollution.

- (2) The Quiet Communities Act of 1978 (P.L. 95-609) which amended P.L. 92-574.
- (3) The General Services Administration, Federal Management Circular 75-2: Compatible Land Uses at Federal Airfields prescribes the Executive Branch's general policy with respect to achieving

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compatible land uses on either public or privately owned property at or in the vicinity of Federal airfields.

- (4) Section 1113 of the Housing and Urban Development Act of 1965 (P.L. 89-117) directs the Secretary " \* \* \* to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes, including a study of feasible methods of insulating such homes from the noise of aircraft."

51.101 GENERAL POLICY

- (a) It is HUD's general policy to provide minimum national standards applicable to HUD programs to protect citizens against excessive noise in their communities and places of residence.

- (1) Comprehensive planning assistance. HUD requires that grantees give adequate consideration to noise exposures and sources of noise exposures and sources of noise as an integral part of the urban environment in HUD assisted comprehensive planning, as follows:

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- (i) Particular emphasis shall be placed on the importance of compatible land use planning in relation to airports, highways and other sources of high noise.
- (ii) Applicants shall take into consideration HUD environmental standards impacting the use of land as required in 24 CFR Part 600.
- (iii) Environmental studies, including noise assessments, are allowable costs.
- (2) Community Development Block Grants. Recipients of community development block grants under the Housing and Community Development Act of 1974 (P.L. 93-383), as amended by the Housing and Community Development Act of 1977 (P.L. 95-128), must take into consideration the noise

criteria and standards  
in the environmental  
review process and  
consider ameliorative  
actions when noise  
sensitive land  
development is proposed in  
noise exposed areas.  
Grant recipients shall  
address deviations from

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the standards in their  
environmental reviews as  
required in 24 CFR Part  
58.

Where CDBG activities  
are planned in a noisy  
area, and HUD assistance  
is contemplated later  
for housing and/or other  
noise sensitive  
activities, the CDBG  
grantee risks denial of  
the HUD assistance  
unless the HUD standards  
are met. Environmental  
studies, including noise  
assessments, are  
allowable costs.

- (3) HUD support for new  
construction. HUD  
assistance for the  
construction of new noise  
sensitive uses is  
prohibited generally for  
projects with Unacceptable  
noise exposures and  
is discouraged for  
projects with Normally  
Unacceptable noise  
exposure. (Standards of  
acceptability are  
contained in section  
51.103(c).) This policy  
applies to all HUD  
programs providing  
assistance, subsidy or  
insurance for housing,  
college housing, mobile  
home parks, nursing  
homes, hospitals, and

all programs providing assistance or insurance for land development, new communities, redevelopment or any other provision of facilities and services which are directed to making land available

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for housing or noise sensitive development. The policy does not apply to research demonstration projects which do not result in new construction or reconstruction, flood insurance, interstate land sales registration, or any action or emergency assistance under disaster assistance programs which are provided to save lives, protect property, protect public health and safety, remove debris and wreckage, or assistance provided that has the effect of restoring facilities substantially as they existed prior to the disaster.

- (4) HUD support for existing construction. Noise exposure by itself will not result in the denial of HUD support for the resale and purchase of otherwise acceptable existing buildings. However, environmental noise is a marketability factor which HUD will consider in determining the amount of insurance or other assistance that may be given.

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| (5) | HUD support of modernization and rehabilitation. For modernization projects located in all noise exposed areas, HUD shall encourage noise attenuation features in alterations. For major | *<br>* GRAPHICS *<br>* MATERIAL *<br>* IN *<br>* ORIGINAL *<br>* DOCUMENT *<br>* OMITTED *<br>* *<br>***** |
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or substantial rehabilitation projects in the Normally Unacceptable and Unacceptable noise zones, HUD actively shall seek to have project sponsors incorporate noise attenuation features, given the extent and nature of the rehabilitation being undertaken and the level of exterior noise exposure. In Unacceptable noise zones, HUD shall strongly encourage conversion of noise exposed sites to land uses compatible with the high noise levels.

- (6) Research, guidance and publications. HUD shall maintain a continuing program designed to provide new knowledge of noise abatement and control to public and private bodies, to develop improved methods for anticipating noise encroachment, to develop noise abatement measures through land use and building construction practices, and to foster better understanding of the consequences of noise. It shall be HUD's policy to issue guidance documents

periodically to assist  
HUD personnel in  
assigning an  
acceptability category to  
projects in accordance  
with noise exposure  
standards, in evaluating  
noise attenuation

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measures, and in  
advising local agencies  
about noise abatement  
strategies. The guidance  
documents shall be  
updated periodically in  
accordance with advances  
in the state-of-the-art.

- (7) Construction equipment  
building equipment and  
appliances. HUD shall  
encourage the use of  
quieter construction  
equipment and methods in  
population centers, the  
use of quieter equipment  
and appliances in  
buildings, and the use  
of appropriate noise  
abatement techniques in  
the design of  
residential structures  
with potential noise  
problems.
  
- (8) Exterior noise goals.  
It is a HUD goal that  
exterior noise levels do  
not exceed a day-night  
average sound level of  
55 decibels. This level  
is recommended by the  
Environmental Protection  
Agency as a goal for  
outdoors in residential  
areas. The levels  
recommended by EPA are  
Mt standards and do not  
take into account cost  
or feasibility. For the  
purposes of this regulation  
and to meet other  
program objectives

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sites with a day-night average sound level of 65 and below are acceptable and are allowable (see Standards in section 51.103(c)).

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- (9) Interior noise goals. It is a HUD goal that the interior auditory environment shall not exceed a day-night average sound level of 45 decibels. Attenuation measures to meet these interior goals shall be employed where feasible. Emphasis shall be given to noise sensitive interior spaces such as bedrooms. Minimum attenuation requirements are prescribed in section 51.104(a).
- (10) Acoustical privacy in multifamily buildings. HUD shall require the use of building design and acoustical treatment to afford acoustical privacy in multifamily buildings pursuant to requirements of the minimum Property Standards.

51.102 RESPONSIBILITIES

- (a) Authority to approve projects.
  - (1) Decisions on proposed projects with acceptable noise exposures shall be delegated to the program personnel within field offices, including projects where increased noise levels are considered acceptable because of non-acoustic benefits under section



51.105(a). Field office program personnel may also approve projects in normally unacceptable noise exposed areas

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where adequate sound attenuation is provided and where the project does not require an Environmental Impact Statement under section 51.104(b).

- (2) Other approvals in normally unacceptable noise exposed areas require the concurrence of the Regional Administrator.
  - (3) Requests for approvals of projects or portions of projects with unacceptable noise exposures shall be referred through the Regional Office to the Assistant Secretary for Community Planning and Development for approval pursuant to section 51.104(b).
  - (4) In cases where the Regional Administrator determines that an important precedent or issue is involved, such cases shall be referred with recommendations to the Assistant Secretary for Community Planning and Development.
- (b) Surveillance of noise problem areas. Appropriate field staff shall maintain surveillance of potential noise problem areas and advise local officials, developers, and planning groups of the unacceptability

of sites because of noise exposure at the earliest possible time in the decision process. Every

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attempt shall be made to insure that applicants' site choices are consistent with the policy and standards contained herein.

- (c) Notice to applicants. At the earliest possible stage, HUD program administrators shall:
- (1) Determine the suitability of the acoustical environment of proposed projects;
  - (2) Notify applicants of any adverse or questionable situations; and
  - (3) Assure that prospective applicants are apprised of the standards contained herein so that future site choices will be consistent with these standards.
- (d) Technical assistance. Technical assistance in the measurement, estimation, interpretation, or prediction of noise exposure is available from the Office of Community Planning and Development and the Office of Policy Development and Research. Field office questions shall be forwarded through the Regional Office to the Assistant Secretary for Community Planning and Development or his designee.
- (e) Interdepartmental coordination. Regional Administrators shall foster appropriate coordination between field offices and

other departments and agencies, particularly the Environmental Protection

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Agency, the Department of Transportation, Department of Defense representatives, and the Veterans Administration. HUD staff shall utilize the acceptability standards in commenting on the prospective impacts of transportation facilities and other noise generators in the Environmental Impact Statement review process.

51.103 CRITERIA AND STANDARDS

These standards apply to all programs as indicated in section 51.101.

- (a) Measure of external noise environments. The magnitude of the external noise environment at a site is determined by the value of the day-night average sound level produced as the result of the accumulation of noise from all sources contributing to the external noise environment at the site. Day-night average sound level, abbreviated as DNL and symbolized as Ldn, is the 24-hour average sound level, in decibels, obtained after addition of 10 decibels to sound levels in the night from 10 p.m. to 7 a.m. Mathematical expressions for average sound level and day-night average sound level are stated in the Appendix I to this Subpart.
- (b) Loud impulsive sounds. On an interim basis, when loud impulsive sounds, such as explosions or sonic booms, are experienced at a site,

the day-night average sound level produced by the loud impulsive sounds alone shall

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have 8 decibels added to it in assessing the acceptability of the site (see Appendix). Alternatively, the C-weighted day-night average sound level (Lcdn) may be used without the 8 decibel addition, as indicated in section 51.106(a)(3).

Methods for assessing the contribution of loud impulsive sounds to day-night average sound level at a site and mathematical expressions for determining whether a sound is classed as "loud impulsive" are provided in the Appendix.

- (c) Exterior standards. The degree of acceptability of the noise environment at a site is determined by the sound levels external to buildings or other facilities containing noise sensitive uses. The standards shall usually apply at a location 2 meters (6.5 feet) from the building housing noise sensitive activities in the direction of the predominant noise source. Where the building location is undetermined, the standards shall apply 2 meters (6.5 feet) from the building setback line nearest to the predominant noise source. The standards shall also apply at other locations where it is determined that quiet outdoor space is required in an area ancillary to the principal use on the site.

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The noise environment inside a building is considered

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acceptable if (a) the noise environment external to the building complies with these standards, and (b) the building is constructed in a manner common to the area or, if of uncommon construction, has at least the equivalent noise attenuation characteristics.

Site Acceptability Standards

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Day-Night average sound level (in decibels)	Special approvals and requirements
Acceptable..... Not exceeding 65 dB(1).....	None
Normally.....Above 65 dB but not Unacceptable exceeding 75 dB	Special Approvals (2) Environmental Review (3) Attenuation (4)
Unacceptable.....Above 75 dB.....	Special Approvals (2) Environmental Review (3) Attenuation (5)

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Notes:

- (1) Acceptable threshold may be shifted to 70 dB in special circumstances pursuant to section 51.105(a).
- (2) See section 51.104(b) for requirements.
- (3) See section 51.104(b) for requirements.
- (4) 5 dB additional attenuation required for sites above 65 dB but not exceeding 70 dB and 10 dB additional attenuation required for sites above 70 dB but not exceeding 75 dB. (See section 51.104(a).)
- (5) Attenuation measures to be submitted to the Assistant Secretary for CPD for approval on a case-by-case basis.

51.104 SPECIAL REQUIREMENTS

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(a) Noise attenuation. Noise attenuation measures are those required in addition to attenuation provided by buildings as commonly constructed in the area, and requiring open windows for ventilation. Measures that reduce external noise at a site shall be used wherever practicable in preference to the incorporation of additional noise attenuation in buildings. Building designs and construction techniques that provide more noise attenuation than typical construction may be employed also to meet the noise attenuation requirements.

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(1) Normally Unacceptable noise zone. Approvals in this zone require a minimum of 5 decibels additional sound attenuation for buildings having noise-sensitive uses if the day-night average sound level is greater than 65 decibels but does not exceed 70 decibels, or a minimum of 10 decibels of additional sound attenuation if the day-night average sound level is greater than 70 decibels but does not exceed 75 decibels.

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(2) Unacceptable noise zone. Noise attenuation measures require the approval of the Assistant Secretary for Community Planning and Development. (See section 51.104(b)(2).)

(b) Special Approvals and Environmental Review Requirements. Environmental clearances shall be conducted pursuant to the requirements of HUD's Departmental Policies, Responsibilities and Procedures for Protection and Enhancement of Environmental Quality (38 FR 19182 as amended) or other environmental regulations which may be issued by the Department. \*\*\*\*\*  
The Special Clearance and \* \* \* \* \*  
Environmental Impact \* GRAPHICS MATERIAL \*  
Statement (EIS) threshold \* IN ORIGINAL \*  
requirements are hereby \* DOCUMENT OMITTED \*  
modified for all projects \* \* \* \* \*  
proposed in the Normally \*\*\*\*\*  
Unacceptable and Unacceptable  
noise exposure zones as  
follows:

(1) Normally Unacceptable noise zone.

(i) All projects located in the Normally Unacceptable Noise Zone require a Special Environmental Clearance except an EIS is required for a proposed project located in a largely undeveloped area, or where the HUD action is likely to encourage the establishment of incompatible land use in this noise zone.

(ii) When an EIS is required, the

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concurrence of the Regional Administrator is also required before a project can be approved. For the purposes of this paragraph, an area will be considered as largely undeveloped unless the area within a 2-mile radius of the project boundary is more than 50 percent developed for urban uses and infrastructure (particularly water and sewers) is available and has capacity to serve the project.

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- (iii) All other projects in the Normally Unacceptable zone require a Special Environmental Clearance, except where an EIS is required for other reasons pursuant to HUD environmental policies.
- (2) Unacceptable noise zone. An EIS is required prior to the approval of projects with unacceptable noise exposure. Projects in or partially in an Unacceptable Noise Zone shall be submitted through the Regional



Administrator to the Assistant Secretary for Community Planning and Development for approval. The Assistant Secretary may waive the EIS requirement in cases where noise is the only environmental issue and no outdoor sensitive activity will take place on the site. In such cases, a Special Environmental Clearance is required.

51.105 EXCEPTIONS

- (a) Flexibility for non-acoustic benefits. Where it is determined that program objectives cannot be achieved on sites meeting the acceptability standard of 65 decibels, the Acceptable Zone may be shifted to Ldn 70 on a case-by-case basis if all the following conditions are satisfied:

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- (1) The project does not require an Environmental Impact Statement under provisions of section 104(b)(1) and noise is the only environmental issue.
- (2) The project has received a Special Environmental Clearance and has received the concurrence of the Environmental Clearance Officer.
- (3) The project meets other program goals to provide housing in proximity to employment, public facilities and transportation.

- 
- (4) The project is in

conformance with local goals and maintains the character of the neighborhood.

- (5) The project sponsor has set forth reasons acceptable to HUD: as to why the noise attenuation measures that would normally be required for new construction in the Ldn 65 to Ldn 70 zone cannot be met.
- (6) Other sites which are not exposed to noise above Ldn 65 and which meet program objectives are generally not available.

The above factors shall be documented and made part of the project file.

51.106 IMPLEMENTATION

- (a) Use of available data. HUD field staff shall make maximum use of noise data prepared by others when such data are determined to be current and adequately projected into the future and are in terms of the following:
  - (1) Sites in the vicinity of airports. The noise environment around airports is described sometimes in terms of Noise Exposure Forecasts, abbreviated as NEF or, in the State of California, as Community Noise Equivalent Level, abbreviated as CNEL. The noise environment for sites in the

sound level data are not available may be evaluated from NEF or CNEL analyses using the following conversions to DNL:

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DNL = NEF+35

DNL = CNEL

- (2) Sites in the vicinity of highways. Highway projects receiving Federal aid are subject to noise analyses under the procedures of the Federal Highway Administration.

Where such analyses are available they may be used to assess sites subject to the requirements of this standard. The Federal Highway Administration employs two alternate sound level descriptors:

- (a) The A-weighted sound level not exceeded more than 10 percent of the time for the highway design hour traffic flow, symbolized as L10; or  
(b) the equivalent sound level for the design hour, symbolized as Leq. The day-night average sound level may be estimated from the design hour L10 or Leq values by the following relationships, provided heavy trucks do not exceed 10 percent of the total traffic flow in vehicles per 24 hours

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and the traffic flow between 10 p.m. and 7 a.m. does not exceed 15

percent of the average  
daily traffic flow in  
vehicles per 24 hours:

DNL = L10 (design  
hour) minus 3 decibels

DNL = Leq (design  
hour) decibels

Where the auto/truck mix  
and time of day  
relationships as stated in  
this Section do not  
exist, the HUD Noise  
Assessment Guidelines or  
other noise analysis  
shall be used.

- (3) Sites in the vicinity of  
installations producing  
loud impulsive sounds.  
Certain Department of  
Defense installations  
produce loud impulsive  
sounds from artillery  
firing and bombing  
practice ranges. Noise  
analyses for these  
facilities sometimes  
encompass sites that may  
be subject to the  
requirements of this  
standard. Where such  
analyses are available  
they may be used on an  
interim basis to  
establish the  
acceptability of sites under  
this standard.

The Department of  
Defense uses day-night  
average sound level  
based on C-weighted  
sound level, symbolized  
Lcdn, for the analysis

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of loud impulsive  
sounds. Where such  
analyses are provided,  
the 8 decibel addition  
specified in section

51.103(b), is not required, and the same numerical values of day-night average sound level used as an interim basis to determine site suitability for nonimpulsive sounds apply to the Lcdn.

- (4) Use of areawide acoustical data. HUD encourages the preparation and use of areawide acoustical information, such as noise contours for airports. Where such new or revised contours become available for airports (civil or military) and military installations they shall first be referred to the Regional Office (Environmental Clearance Officer) for review, evaluation and decision on appropriateness for use by HUD.

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The Regional Office shall submit revised contours to the Assistant Secretary of Community Planning and Development for review, evaluation and decision whenever the area affected is changed by 20 percent or more, or whenever it is determined that the new contours will have a significant effect on HUD programs, or whenever the contours are not provided in a methodology acceptable

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under section 51.106(a)(1) or in other cases where the Regional Office determines that Headquarters review is

warranted. For other areawide acoustical data, review is required only where existing areawide data have been changed to reflect changes in the measurement methodology or underlying noise source assumptions. Requests for determination on usage of new or revised areawide data shall include the following:

- (i) Maps showing old, if applicable, and new noise contours, along with brief description of data source and methodology.
- (ii) Impact on existing and prospective urbanized areas and on development activity.
- (iii) Impact on HUD-assisted projects currently in processing.
- (iv) Impact on future HUD program activity. Where a field office has determined that immediate approval of new areawide data is

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necessary and warranted in limited geographic areas, the request for approval should state the

circumstances warranting such approval. Actions on proposed projects shall not be undertaken while new areawide noise data are being considered for HUD use except where the proposed location is affected in the same manner under both the old and new noise data.

- (b) Site assessments. Compliance with the standards contained in section 51.103(c) shall, where necessary, be determined using noise assessment guidelines, handbooks, technical documents and procedures issued by the Department.
- (c) Variations in site noise levels. In many instances the noise environment will vary across a site, with portions of the site being in an Acceptable noise environment and other portions in a Normally Unacceptable noise environment. The standards in section 51.103(c) shall apply to the portions of a building or buildings used for residential purposes and for ancillary noise sensitive open spaces.

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- (d) Noise measurements. Where noise assessments result in a finding that the site is borderline or questionable, or is controversial, noise measurements may be performed. Where it is determined that noise

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measurements are required, such measurements will be conducted in accordance with methods and measurement criteria established by Department. Locations for noise measurements will depend on the location of noise sensitive uses that are nearest to the predominant noise source (see section 51.103(c)).

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(e) Projections of noise exposure. In addition to assessing existing exposure, future conditions should be projected. To the extent possible, noise exposure shall be projected to be representative of conditions that are expected to exist at a time at least 10 years beyond the date of the project or action under review.

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(f) Reduction of site noise by use of berms and/or barriers. If it is determined by adequate analysis that a berm and/or barrier will reduce noise at a housing site, and if the barrier is existing or there are assurances that it will be in place prior to occupancy, the environmental noise analysis for the site may reflect the benefits afforded by the berm and/or barrier.

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In the environmental review process under section 51.104(b), the location, height and design of the berm and/or barrier shall be evaluated to determine its effectiveness, and impact on design and aesthetic quality, circulation and other environmental factors.

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APPENDIX I TO SUBPART B--definition of  
acoustical quantities

1. Sound level. The quantity in decibels measured with an instrument satisfying requirements of American National Standard Specification for Type 1 Sound Level Meters S1.4-1971. Fast time-averaging and A-frequency weighting are to be used, unless others are specified. The sound level meter with the A-weighting is progressively less sensitive to sounds of frequency below 1,000 hertz (cycles per second), somewhat as is the ear. With fast time averaging the sound level meter responds particularly to recent sounds almost as quickly as does the ear in judging the loudness of a sound.
  
2. Average Sound Level. Average sound level, in decibels, is the level of the mean-square A-weighted sound pressure during the stated time period, with reference to the square of the standard reference sound pressure of 20 micropascals.

Day-night average sound level, abbreviated as DNL, and symbolized mathematically as  $L_{dn}$  is defined as:

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Time (t) is in seconds, so the limits shown in hours and minutes are actually interpreted in seconds.  $L_A(t)$  is the time varying value of A-weighted sound level, the quantity in decibels measured by an instrument satisfying requirements of American

National Standard Specification for  
Type 1 Sound Level Meters S1.4-1971.

3. Loud Impulsive Sounds. When loud impulsive sounds such as sonic booms or explosions are anticipated contributors to the noise environment at a site, the contribution to day-night average sound level produced by the loud impulsive sounds shall have 8 decibels added to it in assessing the acceptability of a site.

A loud impulsive sound is defined for the purpose of this regulation as one for which:

- (i) The sound is definable as a discrete event wherein the sound level increases to a maximum and then decreases in a total time interval of approximately one second or less to the ambient background level that exists without the sound; and
- (ii) The maximum sound level (obtained with slow averaging time and A-weighting of a Type 1 sound level meter whose characteristics comply with ANSI S1.4-1971) exceeds the sound level prior to the onset of the event by at least 6 decibels; and
- (iii) The maximum sound level obtained with fast averaging time of a sound level meter exceeds the maximum value obtained with slow averaging time by at least 4 decibels.

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Subpart C

Siting of HUD-Assisted Projects  
Near Hazardous Operations Handling  
Conventional Fuels or Chemicals  
of an Explosive or Flammable Nature

EFFECTIVE DATE: April 2, 1984

SOURCE: Federal Register: February 10, 1984; pp. 5100-5108; March 20, 1984, p. 10253; March 29, 1984, p. 12214

Section

51.200 Purpose

51.201 Definitions

51.202 Approval of HUD-Assisted  
Projects

51.203 Safety Standards

51.204 HUD-Assisted Hazardous  
Facilities

51.205 Mitigating Measures

51.206 Implementation

51.207 Amendments to Appendix 1  
to this Subpart

51.208 Reservation of Administrative  
and Legal Rights

Appendix I to Subpart C

Appendix II to Subpart C

Authority: Sec. 2 Housing Act of 1949 (42 U.S.C. 1441); Sec. 7(d) Department of Housing and Urban Development Act (42 U.S.C. 3535(d)); Sec. 2, Housing and Urban Development Act of 1969 (42 U.S.C. 1441(a)).

51.200 PURPOSE

The Department of Housing and Urban Development finds that it is necessary to establish standards for the location of proposed HUD-assisted

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projects near hazardous operations handling petroleum products or chemicals of an explosive or fireprone nature in order to minimize the

possibility of loss of life and substantial property loss from such hazards.

The purpose of this subpart is to:

- (a) Establish safety standards which can be used as a basis for calculating acceptable separation distances (ASD) for HUD-assisted projects from specific, stationary, hazardous operations which store, handle, or process hazardous substances;
- (b) Alert those responsible for the siting of HUD-assisted projects to the inherent potential dangers when such projects are located in the vicinity of such hazardous operations;
- (c) Provide guidance for identifying those hazardous operations which are most prevalent;
- (d) Provide the technical guidance required to evaluate the degree of danger anticipated from explosion and thermal radiation (fire); and
- (e) Provide technical guidance required to determine acceptable separation distances from such hazards.

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51.201 DEFINITIONS

Acceptable Separation Distance (ASD)  
- means the distance beyond explosion or combustion of a hazard is not likely to cause structures or individuals to be subjected to blast overpressure or thermal radiation flux levels in excess of the safety standards in section 51.203. The ASD

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is determined by applying the safety standards established by this subpart to the guidance set forth in HUD Guidebook, "Urban Development Siting With Respect to Hazardous Commercial/

Industrial Facilities."

Blast Overpressure - means the pressure, in pounds per square inch, in excess of normal atmospheric pressure on the surrounding medium caused by an explosion.

Danger Zone - means the land area circumscribed by the radius which delineates the ASD of a given hazard. Department - means the Department of Housing and Urban Development (HUD).

Hazard - means any stationary container which stores, handles or processes hazardous substances of an explosive or fire prone nature. The term "hazard" does not include pipelines for the transmission of hazardous substances, if such pipelines are located underground or comply with applicable Federal, State and local safety standards. Also excepted are: (1) containers with a capacity of 100 gallons or less when they contain common liquid industrial fuels, such as gasoline, fuel oil, kerosene and crude oil since they generally would pose no danger in terms of thermal radiation or blast overpressure to a project; and (2) facilities which are shielded from a proposed HUD-assisted project by the topography, because these topographic features effectively provide a mitigating measure already in place.

Hazardous Substances - means petroleum products (petrochemicals) and chemicals that can produce blast overpressure or thermal radiation levels in excess of the standards set forth in section 51.203. A specific list of hazardous substances is found in Appendix 1 to this Subpart.

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HUD-Assisted Project - the development, construction, rehabilitation, modernization or conversion with HUD subsidy, grant assistance, loan, loan guarantee, or mortgage insurance, of any project

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which is intended for residential, institutional, recreational, commercial or industrial use. For purposes of this Subpart the terms "rehabilitation" and "modernization" refer only to such repairs and renovation of a building or buildings as will result in an increased number of people being exposed to hazardous operations by increasing residential densities, converting the type of use of a building to habitation, or making a vacant building habitable.

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Secretary - means the Secretary of Housing and Urban Development.

Thermal Radiation Level - means the emission and propagation of heat energy through space or a material medium, expressed in BTU per square foot per hour (BTU/sq. ft. hr.)

51.202 APPROVAL OF HUD-ASSISTED PROJECTS

(a) It is HUD's policy that projects receiving HUD assistance will be located in a safe and healthful environment. The Department will not approve an application for assistance for a proposed project located at less than the acceptable separation distance from a hazard, as defined in section 51.201, unless appropriate mitigating measures, as defined in section 51.205, are implemented, or unless mitigating measures are already in place.

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(b) In the case of all applications for proposed HUD-assisted projects, the Department shall evaluate projected development

plans in the vicinity of these projects to determine whether there are plans to install a hazardous operation in close proximity to the proposed project. If the evaluation shows that such a plan exists, the

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Department shall not approve assistance for the project unless the Department obtains satisfactory assurances that adequate mitigating measures will be taken when the hazardous operation is installed.

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51.203 SAFETY STANDARDS

The following standards shall be used in determining the acceptable separation distance of a proposed HUD-assisted project from a hazard:

- (a) Thermal Radiation Safety Standard. Projects shall be located so that:
  - (1) The allowable thermal radiation flux level at the building shall not exceed 10,000 BTU/sq. ft. per hr.;
  - (2) The allowable thermal radiation flux level for outdoor, unprotected facilities or areas of congregation shall not exceed 450 BTU/sq. ft. per hour.
- (b) Blast Overpressure Safety Standard. Projects shall be located so that the maximum allowable blast overpressure at both buildings and outdoor, unprotected facilities or areas shall not exceed 0.5 psi.
- (c) If a hazardous substance constitutes both a thermal radiation and blast overpressure hazard, the ASD for each hazard

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shall be calculated, and the larger of the two ASDs shall be used to determine compliance with this Subpart.

51.204 HUD-ASSISTED HAZARDOUS FACILITIES

In reviewing applications for proposed HUD-assisted projects involving the installation of hazardous facilities, the Department shall ensure that such hazardous facilities are located at an acceptable separation distance from residences and from any other facility or area where people may congregate or be present. The mitigating measures listed in section 51.205 may be taken into account in determining compliance with this section.

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51.205 MITIGATING MEASURES

Application of the standards for determining an Acceptable Separation Distance (ASD) for a HUD-assisted project from a potential hazard of an explosion or fire prone nature is predicated on level topography with no Intervening object(s) between the hazard and the project. Application of the standards can be eliminated or modified if:

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- a. The nature of the topography shields the proposed project from the hazard.
- b. An existing permanent fire resistant structure of adequate size and strength will shield the proposed project from the hazard.
- c. A barrier is constructed surrounding the hazard, at the site of the project, or in between the potential hazard and the proposed project.

- 
- d. The structure and outdoor areas used by people are designed to withstand blast overpressure and thermal radiation anticipated from the potential hazard (e.g., the project is of masonry and steel or reinforced concrete and steel construction).



51.206 IMPLEMENTATION

This Subpart shall be implemented for each proposed HUD-assisted project by the Departmental official responsible for Departmental review of the project. The implementation procedure will be part of the environmental assessment process in accordance with the procedures set forth in 24 CFR Part 50 and 24 CFR Part 58. In the case of HUD-assisted projects for which the Department's Project Selection Criteria at 24 CFR Section 200.700 et seq. are applicable, the requirements of this Subpart shall be implemented by the Departmental official responsible for determining compliance with such criteria.

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51.207 AMENDMENTS TO APPENDIX I TO THIS SUBPART

- (a) The Secretary may prescribe supplementary substances for inclusion in Appendix I to this Subpart without prior notice and public procedure. Specific notice of these supplementary substances, to include the reason for including the substances, shall be published in the Federal Register, in accordance with 5 U.S.C. 552 and 24 CFR 15.11. Such notice may incorporate these supplementary substances by reference. In addition, discussion of the basis for including these supplementary substances will be available for examination and distribution in

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the Office of Environment and Energy, Room 7152, Department of Housing and Urban Development, 451 Seventh Street, SW, Washington, DC 20410, and in each HUD Regional and local office.

- (b) The Secretary or his designee may, on a case-by-case basis,

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when circumstances warrant, require the application of this Subpart with respect to a substance not listed in Appendix I to this Subpart that would create thermal or overpressure effect in excess of that listed in section 51.203.

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(c) Any interested person may petition the Secretary for amendment of Appendix I to this Subpart in accordance with 24 CFR 10.20.

51.208 RESERVATION OF ADMINISTRATIVE AND LEGAL RIGHTS

Publication of these standards does not constitute a waiver of any right: (a) of HUD to disapprove a project proposal if the siting is too close to a potential hazard not covered by this Subpart, and (b) of HUD or any person or other entity to seek to abate or to collect damages occasioned by a nuisance, whether or not covered by the Subpart.

Dated February 1, 1984

Samuel R. Pierce, Jr.  
Secretary of Housing and  
Urban Development

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APPENDIX I - TO SUBPART C

Specific Hazardous Substances

The following is a list of specific petroleum products and chemicals defined to be hazardous substances under section 51.201.

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HAZARDOUS LIQUIDS

- Acetic Acid
- Acetic Anhydridge
- Acetone
- Acrylonitrile
- Amyl Acetate
- Amyl Alcohol

Benzene  
Butyl Acetate  
Butyl Acrylate  
Butyl Alcohol  
Carbon Bisulfide  
Carbon Disulfide  
Cellosolve  
Cresols  
Crude Oil (Petroleum)  
Cumene  
Cyclohexane  
No. 2 Diesel Fuel  
Ethyl Acetate  
Ethyl Acrylate  
Ethyl Alcohol  
Ethyl Benzene  
Ethyl Dichloride  
Ethyl Ether  
Gasoline  
Heptane  
Hexane  
Isobutyl Acetate  
Isobutyl Alcohol  
Isopropyl Acetate  
Isopropyl Alcohol  
Jet Fuel & Kerosene  
Methyl Alcohol  
Methyl Amyl Alcohol  
Methyl Cellosolve  
Methyl Ethyl Ketone  
Naptha  
Pentane  
Propylene Oxide

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Toluene  
Vinyl Acetate  
Xylene

#### HAZARDOUS GASES

Acetaldehyde  
Butadiene  
Butane  
Ethene  
Ethylene  
Ethylene Oxide  
Hydrogen  
Liquefied Natural Gas (LNG)  
Liquefied Petroleum Gas (LPG)  
Propane  
Propylene  
Vinyl Chloride

(Primary Source: "Urban Development Siting with respect to Hazardous Commercial/Industrial Facilities," by Rolf Jensen and Associates, Inc., April 1982)

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APPENDIX II - TO SUBPART C

Development of Standards;  
Calculation Methods

- I. Background Information Concerning The Standards:
  - (a) Thermal Radiation
    - (1) Introduction. Flammable products stored in above ground containers represent a definite, potential threat to human life and structures in the event of fire. The resulting fireball emits thermal radiation which is absorbed by the surroundings. Combustible structures, such as wooden houses, may be ignited by the thermal radiation being emitted. The radiation can cause severe burn, injuries and even death to exposed persons some distance away from the site of the fire.
    - (2) Criteria for Acceptable Separation Distance (ASD). Wooden buildings, window drapes and trees generally ignite spontaneously when exposed for a relatively long period of time to thermal radiation levels of approximately 10,000 BTU/hr. sq. ft. It will take 15 to 20 minutes for a building to ignite

at that degree of

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thermal intensity. Since the reasonable response time for fire fighting units in urbanized areas is approximately 5 to 10 minutes, a standard of 10,000 BTU/hr. sq. ft. is considered an acceptable level of thermal radiation for buildings.

People in outdoor areas exposed to a thermal radiation flux level of approximately 1,500 BTU/sq. ft. hr will suffer intolerable pain after 15 seconds. Longer exposure causes blistering, permanent skin damage, and even death. Since it is assumed that children and the elderly could not take refuge behind walls or run away from the thermal effect of the fire within the 15 seconds before skin blistering occurs, unprotected (outdoor) areas, such as playgrounds, parks, yards, school grounds, etc., must be placed at such a distance from potential fire locations so that the radiation flux level is well below 1500 BTU/sq. ft. hr. An acceptable flux level, particularly for elderly people and children, is 450 BTU/sq. ft. hr. The skin can be exposed to this degree of thermal radiation for 3 minutes or longer with no

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serious detrimental effect. The result would be the same as a bad sunburn. Therefore, the standard for areas in which there will be exposed people, e.g. outdoor recreation areas such as playgrounds and parks, is set at 450 BTU/hr. sq. ft. Areas covered also include open space ancillary to residential structures, such as yard areas and vehicle parking areas.

- (3) Acceptable Separation Distance From a Potential Fire Hazard. This is the actual setback required for the safety of occupied buildings and their inhabitants, and people in open spaces (exposed areas) from a potential fire hazard. The specific distance required for safety from such a hazard depends upon the nature and the volume of the substance. The Technical Guidebook entitled "Urban Development Siting With Respect to Hazardous/Commercial Industrial Facilities," which supplements this regulation, contains the technical guidance required to compute Acceptable Separation Distances (ASD) for those flammable substances most often encountered.

The Acceptable Separation Distance (ASD) for people and structures from materials prone to explosion is dependent upon the resultant blast measured in pounds per square inch (psi) overpressure. It has been determined by the military and corroborated by two independent studies conducted for the Department of Housing and Urban Development that 0.5 psi is the acceptable level of blast overpressure for both buildings and occupants, because a frame structure can normally withstand that level of external exertion with no serious structural damage, and it is unlikely that human beings inside the building would normally suffer any serious injury. Using this as the safety standard for blast overpressure, nomographs have been developed from which an ASD can be determined for a given quantity of hazardous substance. These nomographs are contained in the handbook with detailed instructions on their use.

(c) Hazard evaluation

The Acceptable Separation Distances for buildings, which are determined for thermal radiation and blast overpressure, delineate separate identifiable danger zones for each potential accident source. For some materials the fire danger zone will have the greatest radius and cover the largest area, while for others the

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explosion danger zone will be the greatest. For example,

conventional petroleum fuel products stored in unpressurized tanks do not emit blast overpressure of dangerous levels when ignited. In most cases, hazardous substances will be stored in pressurized containers. The resulting blast overpressure will be experienced at a greater distance than the resulting thermal radiation for the standards set in section 51.203. In any event the hazard requiring the greatest separation distance will prevail in determining the location of HUD-assisted projects.

The standards developed for the protection of people and property are given in the following table.

	THERMAL RADIATION	BLAST OVERPRESSURE
Amount of acceptable exposure allowed for building structures	10,000 BTU/sq. ft.-hr	0.5 psi
Amount of acceptable exposure allowed for people in open areas	450 BTU/sq. ft.-hr	0.5 psi

Problem Example:

The following example is given as a guide to assist in understanding how the procedures are used to determine an acceptable separation distance. The technical data are found in the HUD Guidebook. Liquid propane is used in the example since it is both an explosion and a fire hazard.

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In this hypothetical case a proposed housing project is to be located 850 feet from a 30,000 gallon liquid propane (LPG) tank. The objective is to determine the acceptable separation distance from the LPG



tank. Since propane is both explosive and fire prone it will be necessary to determine the ASD for both explosion and for fire. The greatest of the two will govern. There is no dike around the tank in this example.

Nomographs from the technical Guidebook have been reproduced to facilitate the solving of the problem.

ASD For Explosion:

Use Figure 1 to determine the acceptable separation distance for explosion.

The graph depicted on Figure 1 is predicated on a blast overpressure of 0.5 psi.

The ASD in feet can be determined by applying the quantity of the hazard (in gallons) to the graph.

In this case locate the 30,000 gallon point on the horizontal axis and draw a vertical line from that point to the intersection with the straight line curve. Then draw a horizontal line from the point where the lines cross to the left vertical axis where the ACCEPTABLE SEPARATION DISTANCE of 660 feet is found.

Therefore the ASD for explosion is 660 feet.

Since the proposed project site is located 850 feet from the tank it is located at a safe distance with regards to blast overpressure.

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ACCEPTABLE SEPARATION DISTANCE  
BLAST OVERPRESSURE  
(NO BLAST BARRIERS)  
HAZARDOUS GAS CONTAINER

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\* \* \* \* \*  
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- 51.303 General Policy
- 51.304 Responsibilities
- 51.305 Implementation

Authority: Section 2 of the Housing Act of 1949 as amended, 42 U.S.C 1441, affirmed by Section 2 of the Housing and Urban Development Act of 1969, P.L. No. 90-448; Section 7(d) of the Department of Housing and Urban Development Act of 1965, 42 U.S.C. 3535(d); Office of Management and Budget, Federal Management Circular 75-2: Compatible Land Uses At Federal Airfields.

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51.300 PURPOSE

- (a) The Department of Housing and Urban Development finds that HUD assisted or insured projects aid their occupants in Runway Clear Zones, Clear Zones and Accident Potential Zones are exposed to a significant risk of personal injury or property damage from aircraft accidents.
- (b) It is the purpose of this Subpart to promote compatible land uses around civil airports and military airfields by identifying suitable land uses for Runway

Clear Zones at civil airports and Clear Zones and Accident Potential Zones at military airfields and by establishing them as standards for providing HUD assistance, subsidy or insurance.

51.301 DEFINITIONS: For the purposes of this regulation, the following definitions apply:

- (a) Accident Potential Zone. An area at military airfields which is beyond the Clear Zone. The standards for the Accident Potential Zones are set out in Department of Defense Instruction 4165.57, "Air Installations

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Compatible Use Zones," November 8, 1977, 32 CFR Part 256. There are no Accident Potential Zones at civil airports.

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(b) Airport Operator. The civilian or military agency, group or individual which exercises control over the operations of the civil airport or military airfield.

(c) Civil Airport. An existing commercial service airport as designated in the National Plan of Integrated Airport Systems prepared by the Federal Aviation Administration in accordance with Section 504 of the Airport and Airway Improvement Act of 1982.

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(d) Runway Clear Zones and Clear Zones. Areas immediately beyond the ends of a runway. The standards for Runway Clear Zones for civil airports are established by FAA regulation 14 CFR Part 152. The standards for Clear Zones for military airfields are established by DOD Instruction 4165.57, 32 CFR Part 256.

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51.302 COVERAGE:

(a) These policies apply to HUD programs which provide assistance, subsidy or insurance for construction, land development, new communities, community development or redevelopment or any other provision of facilities and services which are designed to make land available for construction. When the HUD assistance, subsidy or insurance is used to make land available for construction rather than for the actual construction, the provision of the HUD assistance, subsidy or insurance shall be dependent upon whether the facility to be built is itself

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acceptable in accordance with the standards in section 51.303.

- (b) These policies apply not only to new construction but also to substantial or major modernization and rehabilitation and to any other program which significantly prolongs the physical or economic life of existing facilities or which, in the case of Accident Potential Zones:

- (1) Changes the use of the facility so that it becomes one which is no longer acceptable in accordance with the standards contained in section 51.303(b);
- (2) Significantly increases the density or number of people at the site; or
- (3) Introduces explosive, flammable or toxic materials to the area.

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- (c) Except as noted in section 51.303(a)(3), these policies do not apply to HUD programs where

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the action only involves the purchase, sale or rental of an existing property without significantly prolonging the physical or economic life of the property.

- (d) The policies do not apply to research or demonstration projects which do not result in new construction or reconstruction, to interstate land sales registration, or to any action or emergency assistance which is provided to save lives, protect property, protect public health and safety, or remove debris and wreckage.

51.303 GENERAL POLICY: It is HUD's general policy to apply standards to

prevent incompatible development around civil airports and military airfields.

- (a) HUD policy for actions in Runway Clear Zones and Clear Zones.
  - (1) HUD policy is not to provide any assistance, subsidy or insurance for projects and actions covered by this part except as stated in section 51.303 (a)(2) below.
  - (2) If a project proposed for HUD assistance, subsidy or insurance is one which will not be frequently used or occupied by people, HUD policy is to provide assistance, subsidy or insurance only when written assurances are provided to HUD by the airport operator to the effect that there are no plans to purchase the land involved with such facilities as part of a Runway Clear Zone or Clear Zone acquisition program.

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- (3) Special notification requirements for Runway Clear Zones and Clear Zones. In all cases involving HUD assistance, subsidy, or insurance for the purchase or sale of an existing property in Runway Clear Zone or Clear Zone, HUD (or the Grant Recipient under Title I of the Housing and Community Development Act of 1974, as amended, 42 U.S.C. 5301 et seq.) shall advise the buyer that the property is in a Runway Clear Zone or Clear Zone, what the implications of such a location are, and that there is a possibility that the property may, at a later date, be acquired by the airport operator. The

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buyer must sign a statement acknowledging receipt of this information.

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- (b) HUD policy for actions in Accident Potential Zones at Military Airfields. HUD policy is to discourage the provision of any assistance, subsidy or insurance for projects and actions in the Accident Potential Zones. To be approved, projects must be generally consistent with the recommendations in the Land Use Compatibility Guidelines For Accident Potential Zones chart contained in DOD Instruction 4165.57, 32 CFR Part 256.

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51.304 RESPONSIBILITIES

- (a) The following persons have the authority to approve actions in Accident Potential Zones:
  - (1) For Title I of the Housing and Community Development Act of 1974, as amended, 42 U.S.C. 5301 et seq: the

certifying officer of the grant recipient as defined in Part 58 of this Title.

- (2) For all other HUD programs: the program personnel having approval authority for the project.
- (b) The following persons have the authority to approve actions in Runway Clear Zones and Clear Zones:
  - (1) For Title I of the Housing and Community Development Act of 1974, as amended, 42 U.S.C. 5301 et seq: The certifying officer of the grant recipient as defined in Part 58 of this Title.
  - (2) For all other HUD programs:

the Regional Administrator.

51.305 IMPLEMENTATION

- (a) Projects already approved for assistance. This regulation does not apply to any project approved for assistance prior to the effective date of the regulation whether the project was actually under construction at that date or not.  
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- (b) Acceptable data on Runway Clear Zones, Clear Zones and Accident Potential Zones. The only Runway Clear Zones, Clear Zones and Accident Potential Zones which will be recognized in applying this part are those provided by the airport operators and which for civil airports are defined in accordance with FAA regulations 14 CFR Part 152 or for military airfields, DOD Instruction 4165.57, 32 CFR Part 256. All data, including changes, related to the dimensions of Runway Clear  
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Zones for civil airports shall be verified with the nearest FAA Airports District Office before use by HUD.

- (c) Changes in Runway Clear Zones, Clear Zones, and Accident Potential Zones. If changes in the Runway Clear Zones, Clear Zones or Accident Potential Zones are made, the field offices shall immediately adopt these revised zones for use in reviewing proposed projects.
  
- (d) The decision to approve projects in the Runway Clear Zones, Clear Zones and Accident Potential Zones must be documented as part of the environmental assessment or, when no assessment is required, as part of the project file.  
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Dated: December 30, 1983

Samuel R. Pierce, Jr.  
Secretary of Housing and  
Urban Development

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CHAPTER 4

A REFERENCE COPY OF 24 CFR PART 51

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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Office of the Secretary

24 CFR Part 51

Environmental Criteria and Standards

Subpart A - General Provisions

EFFECTIVE DATE: August 13, 1979

SOURCE: Federal Register: July 12, 1979; pp 40860-40862

51.1 Purpose

51.2 Authority

51.3 Responsibilities

51.4 Program coverage

51.5 Coordination with environmental clearance requirements

51.6 Reserved

Authority: Section 7(d). Department of Housing and Urban Development Act (42 U.S.C. 3535 (d)).

51.1 PURPOSE

The Department of Housing and Urban Development is providing program Assistant Secretaries and administrators and field offices with environmental standards, criteria and guidelines for determining project acceptability and necessary mitigating measures to insure that activities assisted by the Department achieve the goal of a suitable living environment.

51.2 AUTHORITY

This Part implements the Department's responsibilities under the following statutes:

- (a) The National Housing Act of 1934 (P.L. 73-479 ) which was enacted "to encourage improvements in housing standards and conditions, to provide a system of mutual mortgage insurance, and for other purposes," thus providing the basis for HUD's Minimum Property Standards (MIPS) which have evolved as required by legislation over the past 44 years.

- (b) The Housing Act of 1949 (P.L. 81-171) which sets forth the national goal of "a decent home and a suitable living environment for every American family," affirmed by the Housing and Urban Development Act of 1968 (P.L. 90-448).

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- (c) The Department of Housing and Urban Development Act of 1965 (P.L. 89-174) which provides that the Secretary may make such rules and regulations as may be necessary to carry out functions, powers, and duties, and sets forth, as a matter of national purpose, the sound development of the Nation's communities and metropolitan areas.
- (d) The National Environmental Policy Act of 1969 (P.L. 91-190) which directs Federal agencies to develop procedures to carry out the purposes of the Act.
- (e) Intergovernmental Cooperation Act of 1968 (P.L. 90-577) which, under Title IV, directs that Federal programs and projects serve the objectives of appropriate land use for housing, commercial, industrial, governmental, institutional, and other purposes to achieve sound and orderly development of all areas, both urban and rural.

### 51.3 RESPONSIBILITIES

- (a) Assistant Secretary for Community Planning and Development. The Assistant Secretary for Community Planning and Development shall be responsible for administering environmental regulations, and shall provide oversight, interpretation and guidance, and shall update the regulations as required. The Assistant Secretary shall also maintain liaison with other Federal agencies on matters of environmental policy implementation.
- (b) Assistant Secretary for Policy Development and Research. The Assistant Secretary for Policy Development and Research shall undertake research and demonstration studies necessary for the technical development of environmental standards, criteria, and implementing techniques as a basis for the development and implementation of environmental regulations. The Assistant Secretary shall also maintain liaison with Federal agencies on related technical matters.
- (c) Other Assistant Secretaries, Administrators, and the General Counsel. Other Assistant Secretaries, Administrators, and the General Counsel shall:
  - (1) Incorporate adopted environmental regulations by reference into program regulations, guidance documents, and administrative forms and procedures;
  - (2) Evaluate the effects of, and compliance with Departmental environmental regulations policy and report significant issues and problems to the Assistant Secretary for Community Planning and Development; and

- (3) Identify program areas under their jurisdiction in which additional environmental regulations are needed, and refer them to the Assistant Secretary for Community Planning and Development.

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- (d) Regional Administrators, Area Office Managers, Service Office Supervisors. Regional Administrators, Area Office Managers, and Service Office Supervisors shall assure that adopted environmental regulations are implemented in relation to program decisions and recommendations. They shall also monitor projects to assure that mitigation measures are implemented.

#### 51.4 PROGRAM COVERAGE

Environmental standards shall apply to all HUD actions except where special provisions and exemptions are contained in each Subpart.

#### 51.5 COORDINATION WITH ENVIRONMENTAL CLEARANCE REQUIREMENTS

Environmental standards shall be implemented prior to commitment in the decision-making process and, where environmental clearances are required, the decision points shall be identical. Compliance with HUD environmental standards shall be addressed in the environmental clearance process.

#### 51.6 (RESERVED)

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### Subpart B - Noise Abatement and Control

EFFECTIVE DATE: August 13, 1979

SOURCE: Federal Register: July 12, 1979; pp 40862-40866

- 51.100 Purpose and Authority
- 51.101 General policy
- 51.102 Responsibilities
- 51.103 Criteria and standards
- 51.104 Special requirements
- 51.105 Exceptions
- 51.106 Implementation

Appendix I to Subpart B

51.100 PURPOSE AND AUTHORITY

- (a) Purpose. The Department of Housing and Urban Development finds that noise is a major source of environmental pollution which represents a threat to the serenity and quality of life in population centers and that noise exposure may be a cause of adverse physiological and psychological effects as well as economic losses.

It is the purpose of this Subpart to:

- (1) Call attention to the threat of noise pollution;
  - (2) Encourage the control of noise at its source in cooperation with other Federal departments and agencies;
  - (3) Encourage land use patterns for housing and other noise sensitive urban needs that will provide a suitable separation between them and major noise sources;
  - (4) Generally prohibit HUD support for new construction of noise sensitive uses on sites having unacceptable noise exposure;
  - (5) Provide policy on the use of structural and other noise attenuation measures where needed; and
  - (6) Provide policy to guide implementation of various HUD programs.
- (b) Authority. Specific authorities for noise abatement and control are contained in:

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- (1) The Noise Control Act of 1972 (P.L. 92-574) which directs Federal agencies to administer their programs in ways which reduce noise pollution.
  - (2) The Quiet Communities Act of 1978 (P.L. 95-609) which amended P.L. 92-574.
  - (3) The General Services Administration, Federal Management Circular 75-2: Compatible Land Uses at Federal Airfields prescribes the Executive Branch's general policy with respect to achieving compatible land uses on either public or privately owned property at or in the vicinity of Federal airfields.
  - (4) Section 1113 of the Housing and Urban Development Act of 1965 (P.L. 89-117) directs the Secretary "\* \* \* to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes, including a study of feasible methods of insulating such homes from the noise of aircraft."

51.101 GENERAL POLICY

- (a) It is HUD's general policy to provide minimum national standards applicable to HUD programs to protect citizens against excessive noise in their communities and places of residence.
- (1) Comprehensive planning assistance. HUD requires that grantees give adequate consideration to noise exposures and sources of noise exposures and sources of noise as an integral part of the urban environment in HUD assisted comprehensive planning, as follows:
- (i) Particular emphasis shall be placed on the importance of compatible land use planning in relation to airports, highways and other sources of high noise.
  - (ii) Applicants shall take into consideration HUD environmental standards impacting the use of land as required in 24 CFR Part 600.
  - (iii) Environmental studies, including noise assessments, are allowable costs.
- (2) Community Development Block Grants. Recipients of community development block grants under the Housing and Community Development Act of 1974 (P.L. 93-383), as amended by the Housing and Community Development Act of 1977 (P.L. 95-128), must take into consideration the noise criteria and standards

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in the environmental review process and consider ameliorative actions when noise sensitive land development is proposed in noise exposed areas. Grant recipients shall address deviations from the standards in their environmental reviews as required in 24 CFR Part 58.

Where CDBG activities are planned in a noisy area, and HUD assistance is contemplated later for housing and/or other noise sensitive activities, the CDBG grantee risks denial of the HUD assistance unless the HUD standards are met. Environmental studies, including noise assessments, are allowable costs.

- (3) HUD support for new construction. HUD assistance for the construction of new noise sensitive uses is prohibited generally for projects with Unacceptable noise exposures and is discouraged for projects with Normally Unacceptable noise exposure. (Standards of acceptability are contained in section 51.103(c).) This policy applies to all HUD programs providing assistance, subsidy or insurance for housing, college housing, mobile home parks, nursing homes, hospitals, and all programs providing assistance or insurance for land development, new communities,



redevelopment or any other provision of facilities and services which are directed to making land available for housing or noise sensitive development. The policy does not apply to research demonstration projects which do not result in new construction or reconstruction, flood insurance, interstate land sales registration, or any action or emergency assistance under disaster assistance programs which are provided to save lives, protect property, protect public health and safety, remove debris and wreckage, or assistance provided that has the effect of restoring facilities substantially as they existed prior to the disaster.

- (4) HUD support for existing construction. Noise exposure by itself will not result in the denial of HUD support for the resale and purchase of otherwise acceptable existing buildings. However, environmental noise is a marketability factor which HUD will consider in determining the amount of insurance or other assistance that may be given.
- (5) HUD support of modernization and rehabilitation. For modernization projects located in all noise exposed areas, HUD shall encourage noise attenuation features in alterations. For major or substantial rehabilitation projects in the Normally Unacceptable and Unacceptable noise zones, HUD actively shall seek to have project sponsors incorporate noise attenuation features, given the extent and nature of the rehabilitation being undertaken and the level of exterior

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noise exposure. In Unacceptable noise zones, HUD shall strongly encourage conversion of noise exposed sites to land uses compatible with the high noise levels.

- (6) Research, guidance and publications. HUD shall maintain a continuing program designed to provide new knowledge of noise abatement and control to public and private bodies, to develop improved methods for anticipating noise encroachment, to develop noise abatement measures through land use and building construction practices, and to foster better understanding of the consequences of noise. It shall be HUD's policy to issue guidance documents periodically to assist HUD personnel in assigning an acceptability category to projects in accordance with noise exposure standards, in evaluating noise attenuation measures, and in advising local agencies about noise abatement strategies. The guidance documents shall be updated periodically in accordance with advances in the state-of-the-art.
- (7) Construction equipment, building equipment and appliances. HUD shall encourage the use of quieter construction equipment and methods in population centers, the use of quieter equipment and appliances in buildings, and the use of appropriate noise abatement techniques in the design of residential structures with potential noise problems.

- (8) Exterior noise goals. It is a HUD goal that exterior noise levels do not exceed a day-night average sound level of 55 decibels. This level is recommended by the Environmental Protection Agency as a goal for outdoors in residential areas. The levels recommended by EPA are not standards and do not take into account cost or feasibility. For the purposes of this regulation and to meet other program objectives, sites with a day-night average sound level of 65 and below are acceptable and are allowable (see Standards in section 51.103(c)).
- (9) Interior noise goals. It is a HUD goal that the interior auditory environment shall not exceed a day-night average sound level of 45 decibels. Attenuation measures to meet these interior goals shall be employed where feasible. Emphasis shall be given to noise sensitive interior spaces such as bedrooms. Minimum attenuation requirements are prescribed in section 51.104(a).
- (10) Acoustical privacy in multifamily buildings. HUD shall require the use of building design and acoustical treatment to afford acoustical privacy in multifamily buildings pursuant to requirements of the Minimum Property Standards.

#### 51.102 RESPONSIBILITIES

- (a) Authority to approve projects.

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- (1) Decisions on proposed projects with acceptable noise exposures shall be delegated to the program personnel within field offices, including projects where increased noise levels are considered acceptable because of non-acoustic benefits under section 51.105(a). Field office program personnel may also approve projects in normally unacceptable noise exposed areas where adequate sound attenuation is provided and where the project does not require an Environmental Impact Statement under section 51.104(b).
  - (2) Other approvals in normally unacceptable noise exposed areas require the concurrence of the Regional Administrator.
  - (3) Requests for approvals of projects or portions of projects with unacceptable noise exposures shall be referred through the Regional Office to the Assistant Secretary for Community Planning and Development for approval pursuant to section 51.104(b).
  - (4) In cases where the Regional Administrator determines that an important precedent or issue is involved, such cases shall be referred with recommendations to the Assistant Secretary for Community Planning and Development.
- (b) Surveillance of noise problem areas. Appropriate field staff

shall maintain surveillance of potential noise problem areas and advise local officials, developers, and planning groups of the unacceptability of sites because of noise exposure at the earliest possible time in the decision process. Every attempt shall be made to insure that applicants' site choices are consistent with the policy and standards contained herein.

- (c) Notice to applicants. At the earliest possible stage, HUD program administrators shall:
  - (1) Determine the suitability of the acoustical environment of proposed projects;
  - (2) Notify applicants of any adverse or questionable situations; and
  - (3) Assure that prospective applicants are apprised of the standards contained herein so that future site choices will be consistent with these standards.
- (d) Technical assistance. Technical assistance in the measurement, estimation, interpretation, or prediction of noise exposure is available from the Office of Community Planning and Development and the Office of Policy Development and Research. Field office questions shall be forwarded through the Regional Office to the Assistant Secretary for Community Planning and Development or his designee.

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- (e) Interdepartmental coordination. Regional Administrators shall foster appropriate coordination between field offices and other departments and agencies, particularly the Environmental Protection Agency, the Department of Transportation, Department of Defense representatives, and the Veterans Administration. HUD staff shall utilize the acceptability standards in commenting on the prospective impacts of transportation facilities and other noise generators in the Environmental Impact Statement review process.

51.103 CRITERIA AND STANDARDS

These standards apply to all programs as indicated in section 51.101.

- (a) Measure of external noise environments. The magnitude of the external noise environment at a site is determined by the value of the day-night average sound level produced as the result of the accumulation of noise from all sources contributing to the external noise environment at the site. Day-night average sound level, abbreviated as DNL and symbolized as Ldn, is the 24-hour average sound level, in decibels, obtained after addition of 10 decibels to sound levels in the night from 10 p.m. to 7 a.m. Mathematical expressions for average sound level and day-night average sound level are stated in the Appendix.

- (b) Loud impulsive sounds. On an interim basis, when loud impulsive sounds, such as explosions or sonic booms, are experienced at a site, the day-night average sound level produced by the loud impulsive sounds alone shall have 8 decibels added to it in assessing the acceptability of the site (see Appendix). Alternatively, the C-weighted day-night average sound level (Lcdn) may be used without the 8 decibel addition, as indicated in section 51.106(a)(3).

Methods for assessing the contribution of loud impulsive sounds to day-night average sound level at a site and mathematical expressions for determining whether a sound is classed as "loud impulsive" are provided in Appendix I to this Subpart.

- (c) Exterior standards. The degree of acceptability of the noise environment at a site is determined by the sound levels external to buildings or other facilities containing noise sensitive uses. The standards shall usually apply at a location 2 meters (6.5 feet) from the building housing noise sensitive activities in the direction of the predominant noise source. Where the building location is undetermined, the standards shall apply 2 meters (6.5 feet) from the building setback line nearest to the predominant noise source. The standards shall also apply at other locations where it is determined that quiet outdoor space is required in an area ancillary to the principal use on the site.

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The noise environment inside a building is considered acceptable if (a) the noise environment external to the building complies with these standards, and (b) the building is constructed in a manner common to the area or, if of uncommon construction, has at least the equivalent noise attenuation characteristics.

Site Acceptability Standards

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	Day-Night average sound level (in decibels)	Special approvals and requirements
Acceptable.....	Not exceeding 65 dB(1).....	None
Normally..... Unacceptable	Above 65 dB but not exceeding 75 dB	Special Approvals (2) Environmental Review (3) Attenuation (4)
Unacceptable.....	Above 75 dB.....	Special Approvals (2) Environmental Review (3) Attenuation (5)

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Notes:

- (1) Acceptable threshold may be shifted to 70 dB in special circumstances pursuant to section 51.105(a).

- (2) See section 51.104(b) for requirements.
- (3) See section 51.104(b) for requirements.
- (4) 5 dB additional attenuation required for sites above 65 dB but not exceeding 70 dB and 10 dB additional attenuation required for sites above 70 dB but not exceeding 75 dB. (See section 51.104(a).)
- (5) Attenuation measures to be submitted to the Assistant Secretary for CPD for approval on a case-by-case basis.

51.104 SPECIAL REQUIREMENTS

(a) Noise attenuation. Noise attenuation measures are those required in addition to attenuation provided by buildings as commonly constructed in the area, and requiring open windows for ventilation. Measures that reduce external noise at a site shall be used wherever practicable in preference to the incorporation of additional noise attenuation in buildings. Building designs and construction techniques that provide more noise attenuation than typical construction may be employed also to meet the noise attenuation requirements.

- (1) Normally Unacceptable noise zone. Approvals in this zone require a minimum of 5 decibels additional sound attenuation for buildings having noise-sensitive uses if the day-night average sound level is greater than 65 decibels but does not

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exceed 70 decibels, or a minimum of 10 decibels of additional sound attenuation if the day-night average sound level is greater than 70 decibels but does not exceed 75 decibels.

- (2) Unacceptable noise zone. Noise attenuation measures require the approval of the Assistant Secretary for Community Planning and Development. (See section 51.104(b)(2).)

(b) Special Approvals and Environmental Review Requirements. Environmental clearances shall be conducted pursuant to the requirements of HUD's Departmental Policies, Responsibilities and Procedures for Protection and Enhancement of Environmental Quality (38 FR 19182 as amended) or other environmental regulations which may be issued by the Department. The Special Clearance and Environmental Impact Statement (EIS) threshold requirements are hereby modified for all projects proposed in the Normally Unacceptable and Unacceptable noise exposure zones as follows:

- (1) Normally Unacceptable noise zone.

- (i) All projects located in the Normally Unacceptable Noise Zone require a Special Environmental Clearance except an EIS is required for a proposed project located in a largely undeveloped area, or where the HUD action is likely to encourage the establishment of incompatible land use in this noise zone.

- (ii) When an EIS is required, the concurrence of the

Regional Administrator is also required before a project can be approved. For the purposes of this paragraph, an area will be considered as largely undeveloped unless the area within a 2-mile radius of the project boundary is more than 50 percent developed for urban uses and infrastructure (particularly water and sewers) is available and has capacity to serve the project.

- (iii) All other projects in the Normally Unacceptable zone require a Special Environmental Clearance, except where an EIS is required for other reasons pursuant to HUD environmental policies.
- (2) Unacceptable noise zone. An EIS is required prior to the approval of projects with unacceptable noise exposure. Projects in or partially in an Unacceptable Noise Zone shall be submitted through the Regional Administrator to the Assistant Secretary for Community Planning and Development for approval. The Assistant Secretary may waive the EIS requirement in cases where noise is the only environmental issue and no outdoor sensitive activity will take place on the site. In such cases, a Special Environmental Clearance is required.

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51.105 EXCEPTIONS

- (a) Flexibility for non-acoustic benefits. Where it is determined that program objectives cannot be achieved on sites meeting the acceptability standard of 65 decibels, the Acceptable Zone may be shifted to Ldn 70 on a case-by-case basis if all the following conditions are satisfied:
  - (1) The project does not require an Environmental Impact Statement under provisions of section 104(b)(1) and noise is the only environmental issue.
  - (2) The project has received a Special Environmental Clearance and has received the concurrence of the Environmental Clearance officer.
  - (3) The project meets other program goals to provide housing in proximity to employment, public facilities and transportation.
  - (4) The project is in conformance with local goals and maintains the character of the neighborhood.
  - (5) The project sponsor has set forth reasons, acceptable to HUD, as to why the noise attenuation measures that would normally be required for new construction in the Ldn 65 to Ldn 70 zone cannot be met.
  - (6) Other sites which are not exposed to noise above Ldn 65 and which meet program objectives are generally not available.

The above factors shall be documented and made part of the project file.

51.106 IMPLEMENTATION

- (a) Use of available data. HUD field staff shall make maximum use of noise data prepared by others when such data are determined to be current and adequately projected into the future and are in terms of the following:

- (1) Sites in the vicinity of airports. The noise environment around airports is described sometimes in terms of Noise Exposure Forecasts, abbreviated as NEF or, in the State of California, as Community Noise Equivalent Level, abbreviated as CNEL. The noise environment for sites in the vicinity of airports for which day-night average sound level data are not available may be evaluated from NEF or CNEL analyses using the following conversions to DNL:

$$\text{DNL} = \text{NEF} + 35$$

$$\text{DNL} = \text{CNEL}$$

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- (2) Sites in the vicinity of highways. Highway projects receiving Federal aid are subject to noise analyses under the procedures of the Federal Highway Administration.

Where such analyses are available they may be used to assess sites subject to the requirements of this standard. The Federal Highway Administration employs two alternate sound level descriptors: (a) The A-weighted sound level not exceeded more than 10 percent of the time for the highway design hour traffic flow, symbolized as L10; or (b) the equivalent sound level for the design hour, symbolized as Leq. The day-night average sound level may be estimated from the design hour L10 or Leq values by the following relationships, provided heavy trucks do not exceed 10 percent of the total traffic flow in vehicles per 24 hours and the traffic flow between 10 p.m. and 7 a.m. does not exceed 15 percent of the average daily traffic flow in vehicles per 24 hours:

$$\text{DNL} = \text{L10 (design hour)} \text{ minus } 3 \text{ decibels}$$

$$\text{DNL} = \text{Leq (design hour)} \text{ decibels}$$

Where the auto/truck mix and time of day relationships as stated in this Section do not exist, the HUD Noise Assessment Guidelines or other noise analysis shall be used.

- (3) Sites in the vicinity of installations producing loud impulsive sounds. Certain Department of Defense

installations produce loud impulsive sounds from artillery firing and bombing practice ranges. Noise analyses for these facilities sometimes encompass sites that may be subject to the requirements of this standard. Where such analyses are available they may be used on an interim basis to establish the acceptability of sites under this standard.

The Department of Defense uses day-night average sound level based on C-weighted sound level, symbolized Lcdn, for the analysis of loud impulsive sounds. Where such analyses are provided, the 8 decibel addition specified in section 51.103(b), is not required, and the same numerical values of day-night average sound level used on an interim basis to determine site suitability for non-impulsive sounds apply to the Lcdn.

- (4) Use of areawide acoustical data. HUD encourages the preparation and use of areawide acoustical information, such as noise contours for airports. Where such new or revised contours become available for airports (civil or military) and military installations they shall first be referred to the Regional Office (Environmental Clearance Officer) for review, evaluation and decision on appropriateness for use by HUD. The

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Regional Office shall submit revised contours to the Assistant Secretary of Community Planning and Development for review, evaluation and decision whenever the area affected is changed by 20 percent or more, or whenever it is determined that the new contours will have a significant effect on HUD programs, or whenever the contours are not provided in a methodology acceptable under section 51.106(a)(1) or in other cases where the Regional Office determines that Headquarters review is warranted. For other areawide acoustical data, review is required only where existing areawide data have been changed to reflect changes in the measurement methodology or underlying noise source assumptions. Requests for determination on usage of new or revised areawide data shall include the following:

- (i) Maps showing old, if applicable, and new noise contours, along with brief description of data source and methodology.
- (ii) Impact on existing and prospective urbanized areas and on development activity.
- (iii) Impact on HUD-assisted projects currently in processing.
- (iv) Impact on future HUD program activity. Where a field office has determined that immediate approval of new areawide data is necessary and warranted in limited geographic areas, the request



for approval should state the circumstances warranting such approval. Actions on proposed projects shall not be undertaken while new areawide noise data are being considered for HUD use except where the proposed location is affected in the same manner under both the old and new noise data.

- (b) Site assessments. Compliance with the standards contained in section 51.103(c) shall, where necessary, be determined using noise assessment guidelines, handbooks, technical documents and procedures issued by the Department.
- (c) Variations in site noise levels. In many instances the noise environment will vary across a site, with portions of the site being in an Acceptable noise environment and other portions in a Normally Unacceptable noise environment. The standards in section 51.103(c) shall apply to the portions of a building or buildings used for residential purposes and for ancillary noise sensitive open spaces.
- (d) Noise measurements. Where noise assessments result in a finding that the site is borderline or questionable, or is controversial, noise measurements may be performed. Where it is determined that noise measurements are required, such measurements will be

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conducted in accordance with methods and measurement criteria established by the Department. Locations for noise measurements will depend on the location of noise sensitive uses that are nearest to the predominant noise source (see section 51.103(c)).

- (e) Projections of noise exposure. In addition to assessing existing exposure, future conditions should be projected. To the extent possible, noise exposure shall be projected to be representative of conditions that are expected to exist at a time at least 10 years beyond the date of the project or action under review.
- (f) Reduction of site noise by use of berms and/or barriers. If it is determined by adequate analysis that a berm and/or barrier will reduce noise at a housing site, and if the barrier is existing or there are assurances that it will be in place prior to occupancy, the environmental noise analysis for the site may reflect the benefits afforded by the berm and/or barrier.

In the environmental review process under section 51.104(b), the location, height and design of the berm and/or barrier shall be evaluated to determine its effectiveness, and impact on design and aesthetic quality, circulation and other environmental factors.

#### APPENDIX I to Subpart B--definition of acoustical quantities

1. Sound level. The quantity in decibels measured with an instrument satisfying requirements of American National Standard Specification for Type 1 Sound Level Meters S1.4-1971. Fast time-averaging and

A-frequency weighting are to be used, unless others are specified. The sound level meter with the A-weighting is progressively less sensitive to sounds of frequency below 1,000 hertz (cycles per second), somewhat as is the ear. With fast time averaging the sound level meter responds particularly to recent sounds almost as quickly as does the ear in judging the loudness of a sound.

2. Average Sound Level. Average sound level, in decibels, is the level of the mean-square A-weighted sound pressure during the stated time period, with reference to the square of the standard reference sound pressure of 20 micropascals.

Day-night average sound level, abbreviated as DNL, and symbolized mathematically as Ldn is defined as:

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*                                                                 *  
*                                                                 *  
*                                                                 *  
*          GRAPHICS MATERIAL IN ORIGINAL DOCUMENT OMITTED      *  
*                                                                 *  
*                                                                 *  
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Time (t) is in seconds, so the limits shown in hours and minutes are actually interpreted in seconds. LA(t) is the time varying value of A-weighted sound level, the quantity in decibels measured by an instrument satisfying requirements of American National Standard Specification for Type 1 Sound Level Meters S1.4-1971.

3. Loud Impulsive Sounds. When loud impulsive sounds such as sonic booms or explosions are anticipated contributors to the noise environment at a site, the contribution to day-night average sound level produced by the loud impulsive sounds shall have 8 decibels added to it in assessing the acceptability of a site.

A loud impulsive sound is defined for the purpose of this regulation as one for which:

- (i) The sound is definable as a discrete event wherein the sound level increases to a maximum and then decreases in a total time interval of approximately one second or less to the ambient background level that exists without the sound; and
- (ii) The maximum sound level (obtained with slow averaging time and A-weighting of a Type 1 sound level meter whose characteristics comply with ANSI S1.4-1971) exceeds the sound level prior to the onset of the event by at least 6 decibels; and
- (iii) The maximum sound level obtained with fast averaging time of a sound level meter exceeds the maximum value obtained with slow averaging time by at least 4 decibels.

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Subpart C

Siting of HUD-Assisted Projects Near Hazardous Operations  
Handling Conventional Fuels or Chemicals of an Explosive or  
Flammable Nature.

Effective Date: April 2, 1984

Source: Federal Register: February 10, 1984, pp 5100-5108; March 20,  
1984; p 10253; March 29, 1984, p 12214

Sec.

51.200 Purpose

51.201 Definitions

51.202 Approval of HUD-Assisted Projects

51.203 Safety Standards

51.204 HUD-Assisted Hazardous Facilities

51.205 Mitigating Measures

51.206 Implementation

51.207 Amendments to Appendix I to this Subpart

51.208 Reservation of Administrative and Legal Rights

Appendix I to Subpart C

Appendix II to Subpart C

Authority: Section 2 Housing Act of 1949 (42 U.S.C. 1441); Section 7(d)  
Department of Housing and Urban Development Act (42 U.S.C. 3535(d));  
Section 2, Housing and Urban Development Act of 1969 (42 U.S.C. 1441(a)).

51.200 PURPOSE

The Department of Housing and Urban Development finds that it is necessary to establish standards for the location of proposed HUD-assisted projects near hazardous operations handling petroleum products or chemicals of an explosive or fire-prone nature in order to minimize the possibility of loss of life and substantial property loss from such hazards.

The purpose of this Subpart is to:

- (a) Establish safety standards which can be used as a basis for calculating acceptable separation distances (ASD) for HUD-assisted projects from specific, stationary, hazardous operations which store, handle, or process hazardous substances;

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- (b) Alert those responsible for the siting of HUD-assisted projects to the inherent potential dangers when such projects are located in the vicinity of such hazardous operations;
  - (c) Provide guidance for identifying those hazardous operations which are most prevalent;
  - (d) Provide the technical guidance required to evaluate the degree of danger anticipated from explosion and thermal radiation (fire); and
  - (e) Provide technical guidance required to determine acceptable separation distances from such hazards.

#### 51.201 DEFINITIONS

Acceptable Separation Distance (ASD) - means the distance beyond which the explosion or combustion of a hazard is not likely to cause structures or individuals to be subjected to blast overpressure or thermal radiation flux levels in excess of the safety standards in section 51.203. The ASD is determined by applying the safety standards established by this subpart to the guidance set forth in HUD Guidebook, "Urban Development Siting With Respect to Hazardous Commercial/Industrial Facilities."

Blast Overpressure - means the pressure, in pounds per square inch, in excess of normal atmospheric pressure in the surrounding medium caused by an explosion.

Danger Zone - means the land area circumscribed by the radius which delineates the ASD of a given hazard.

Department - means the Department of Housing and Urban Development (HUD).

Hazard - means any stationary container which stores, handles or processes hazardous substances of an explosive or fire prone nature. The term "hazard" does not include pipelines for the transmission of hazardous substances, if such pipelines are located underground or comply with applicable Federal, State and local safety standards. Also excepted are: (1) containers with a capacity of 100 gallons or less when they contain common liquid industrial fuels, such as gasoline, fuel oil, kerosene and crude oil since they generally would pose no danger in terms of thermal radiation or blast overpressure to a project; and (2) facilities which are shielded from a proposed HUD-assisted project by the topography, because these topographic features effectively provide a mitigating measure already in place.

Hazardous Substances - means petroleum products (petrochemicals) and chemicals that can produce blast overpressure or thermal radiation levels in excess of the standards set forth in section 51.203. A specific list of hazardous substances is found in Appendix 1 to this Subpart.

HUD-Assisted Project - the development, construction, rehabilitation, modernization or conversion with HUD subsidy, grant assistance, loan, loan

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guarantee, or mortgage insurance, of any project which is intended for residential, institutional, recreational, commercial or industrial use. For purposes of this Subpart the terms "rehabilitation" and "modernization" refer only to such repairs and renovation of a building or buildings as will result in an increased number of people being exposed to hazardous operations by increasing residential densities, converting the type of use of a building to habitation, or making a vacant building habitable.

Secretary - means the Secretary of Housing and Urban Development.

Thermal Radiation Level - means the emission and propagation of heat energy through space or a material medium, expressed in BTU per square foot per hour (BTU/sq. ft. hr.).

#### 51.202 APPROVAL OF HUD-ASSISTED PROJECTS

- (a) It is HUD's policy that projects receiving HUD assistance will be located in a safe and healthful environment. The Department will not approve an application for assistance for a proposed project located at less than the acceptable separation distance from a hazard, as defined in section 51.201, unless appropriate mitigating measures, as defined in section 51.205, are implemented, or unless mitigating measures are already in place.
- (b) In the case of all applications for proposed HUD-assisted projects, the Department shall evaluate projected development plans in the vicinity of these projects to determine whether there are plans to install a hazardous operation in close proximity to the proposed project. If the evaluation shows that such a plan exists, the Department shall not approve assistance for the project unless the Department obtains satisfactory assurances that adequate mitigating measures will be taken when the hazardous operation is installed.

#### 51.203 SAFETY STANDARDS

The following standards shall be used in determining the acceptable separation distance of a proposed HUD-assisted project from a hazard:

- (a) Thermal Radiation Safety Standard. Projects shall be located so that:
  - (1) The allowable thermal radiation flux level at the building shall not exceed 10,000 BTU/sq. ft. per hr.;
  - (2) The allowable thermal radiation flux level for outdoor, unprotected facilities or areas of congregation shall not exceed 450 BTU/sq. ft. per hour.
- (b) Blast Overpressure Safety Standard. Projects shall be located so that the maximum allowable blast overpressure at both buildings and outdoor, unprotected facilities or areas shall not exceed 0.5 psi.

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- (c) If a hazardous substance constitutes both a thermal radiation and

blast overpressure hazard, the ASD for each hazard shall be calculated, and the larger of the two ASDs shall be used to determine compliance with this Subpart.

#### 51.204 HUD-ASSISTED HAZARDOUS FACILITIES

In reviewing applications for proposed HUD-assisted projects involving the installation of hazardous facilities, the Department shall ensure that such hazardous facilities are located at an acceptable separation distance from residences and from any other facility or area where people may congregate or be present. The mitigating measures listed in section 51.205 may be taken into account in determining compliance with this section.

#### 51.205 MITIGATING MEASURES

Application of the standards for determining an Acceptable Separation Distance (ASD) for a HUD-assisted project from a potential hazard of an explosion or fire prone nature is predicated on level topography with no intervening object(s) between the hazard and the project. Application of the standards can be eliminated or modified if:

- a. The nature of the topography shields the proposed project from the hazard.
- b. An existing permanent fire resistant structure of adequate size and strength will shield the proposed project from the hazard.
- c. A barrier is constructed surrounding the hazard, at the site of the project, or in between the potential hazard and the proposed project.
- d. The structure and outdoor areas used by people are designed to withstand blast overpressure and thermal radiation anticipated from the potential hazard (e.g., the project is of masonry and steel or reinforced concrete and steel construction).

#### 51.206 IMPLEMENTATION

This Subpart shall be implemented for each proposed HUD-assisted project by the Departmental official responsible for Departmental review of the project. The implementation procedure will be part of the environmental assessment process in accordance with the procedures set forth in 24 CFR Part 50 and 24 CFR Part 58. In the case of HUD-assisted projects for which the Department's Project Selection Criteria at 24 CFR Section 200.700 et seq. are applicable, the requirements of this Subpart shall be implemented by the Departmental official responsible for determining compliance with such criteria.

#### 51.207 AMENDMENTS TO APPENDIX I TO THIS SUBPART

- (a) The Secretary may prescribe supplementary substances for inclusion in Appendix I to this Subpart without prior notice and public procedure.

reason for including the substances, shall be published in the Federal Register, in accordance with 5 U.S.C. 552 and 24 CFR 15.11. Such notice may incorporate these supplementary substances by reference. In addition, discussion of the basis for including these supplementary substances will be available for examination and distribution in the Office of Environment and Energy, Room 7152, Department of Housing and Urban Development, 451 Seventh Street, SW, Washington, DC 20410, and in each HUD Regional and local office.

- (b) The Secretary or his designee may, on a case-by-case basis, when circumstances warrant, require the application of this Subpart with respect to a substance not listed in Appendix I to this Subpart that would create thermal or overpressure effect in excess of that listed in section 51.203.
- (c) Any interested person may petition the Secretary for amendment of Appendix I to this Subpart in accordance with 24 CFR 10.20.

#### 51.208 RESERVATION OF ADMINISTRATIVE AND LEGAL RIGHTS

Publication of these standards does not constitute a waiver of any right: (a) of HUD to disapprove a project proposal if the siting is too close to a potential hazard not covered by this Subpart, and (b) of HUD or any person or other entity to seek to abate or to collect damages occasioned by a nuisance, whether or not covered by the Subpart.

Dated February 1, 1984

Samuel R. Pierce, Jr.  
Secretary of Housing and  
Urban Development

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#### APPENDIX I - TO SUBPART C

##### Specific Hazardous Substances

The following is a list of specific petroleum products and chemicals defined to be hazardous substances under section 51.201.

##### HAZARDOUS LIQUIDS

Acetic Acid	Crude oil (Petroleum)	Isobutyl Alcohol
Acetic Anhydride	Cumene	Isopropyl Acetate
Acetone	Cyclohexane	Isopropyl Alcohol
Acrylonitrile	No. 2 Diesel Fuel	Jet Fuel & Kerosene
Amyl Acetate	Ethyl Acetate	Methyl Alcohol
Amyl Alcohol	Ethyl Acrylate	Methyl Amyl Alcohol
Benzene	Ethyl Alcohol	Methyl Cellosolve

Butyl Acetate	Ethyl Benzene	Methyl Ethyl Ketone
Butyl Acrylate	Ethyl Dichloride	Naptha
Butyl Alcohol	Ethyl Ether	Pentane
Carbon Bisulfide	Gasoline	Propylene Oxide
Carbon Disulfide	Heptane	Toluene
Cellosolve	Hexane	Vinyl Acetate
Cresols	Isobutyl Acetate	Xylene

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HAZARDOUS GASES

Acetaldehyde	Ethylene	Liquefied Petroleum Gas (LPG)
Butadiene	Ethylene oxide	Propane
Butane	Hydrogen	Propylene
Ethene	Liquefied Natural Gas (LNG)	Vinyl Chloride

(Primary Source: "Urban Development Siting with respect to Hazardous Commercial/Industrial Facilities," by Rolf Jensen and Associates, Inc., April 1982)

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APPENDIX II - TO SUBPART C

Development of Standards; Calculation Methods

I. Background Information Concerning the Standards:

(a) Thermal Radiation

- (1) Introduction. Flammable products stored in above ground containers represent a definite, potential threat to human life and structures in the event of fire. The resulting fireball emits thermal radiation which is absorbed by the surroundings. Combustible structures, such as wooden houses, may be ignited by the thermal radiation being emitted. The radiation can cause severe burn, injuries and even death to exposed persons some distance away from the site of the fire.
- (2) Criteria for Acceptable Separation Distance (ASD). Wooden buildings, window drapes and trees generally ignite



spontaneously when exposed for a relatively long period of time to thermal radiation levels of approximately 10,000 BTU/hr. sq. ft. It will take 15 to 20 minutes for a building to ignite at that degree of thermal intensity. Since the reasonable response time for fire fighting units in urbanized areas is approximately five to ten minutes, a standard of 10,000 BTU/hr. sq. ft. is considered an acceptable level of thermal radiation for buildings.

People in outdoor areas exposed to a thermal radiation flux level of approximately 1,500 BTU/sq. ft. hr will suffer intolerable pain after 15 seconds. Longer exposure causes blistering, permanent skin damage, and even death. Since it is assumed that children and the elderly could not take refuge behind walls or run away from the thermal effect of the fire within the 15 seconds before skin blistering occurs, unprotected (outdoor) areas, such as playgrounds, parks, yards, school grounds, etc., must be placed at such a distance from potential fire locations so that the radiation flux level is well below 1500 BTU/sq. ft. hr. An acceptable flux level, particularly for elderly people and children, is 450 BTU/sq. ft. hr. The skin can be exposed to this degree of thermal radiation for 3 minutes or longer with no serious detrimental effect. The result would be the same as a bad sunburn. Therefore, the standard for areas in which there will be exposed people, e.g. outdoor recreation areas such as playgrounds and parks, is set at 450 BTU/hr. sq. ft. Areas covered also include open space ancillary to residential structures, such as yard areas and vehicle parking areas.

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- (3) Acceptable Separation Distance From a Potential Fire Hazard. This is the actual setback required for the safety of occupied buildings and their inhabitants, and people in open spaces (exposed areas) from a potential fire hazard. The specific distance required for safety from such a hazard depends upon the nature and the volume of the substance. The Technical Guidebook entitled "Urban Development Siting With Respect to Hazardous/Commercial Industrial Facilities," which supplements this regulation, contains the technical guidance required to compute Acceptable Separation Distances (ASD) for those flammable substances most often encountered.

(b) Blast Overpressure

The Acceptable Separation Distance (ASD) for people and structures from materials prone to explosion is dependent upon the resultant blast measured in pounds per square inch (psi) overpressure. It has been determined by the military and corroborated by two independent studies conducted for the Department of Housing and Urban Development that 0.5 psi is the acceptable level of blast overpressure for both buildings and occupants, because a frame structure can normally withstand that level of external exertion with no serious structural damage, and it is unlikely that human beings inside the building would normally suffer any serious

injury. Using this as the safety standard for blast overpressure, nomographs have been developed from which an ASD can be determined for a given quantity of hazardous substance. These nomographs are contained in the handbook with detailed instructions on their use.

(c) Hazard evaluation

The Acceptable Separation Distances for buildings, which are determined for thermal radiation and blast overpressure, delineate separate identifiable danger zones for each potential accident source. For some materials the fire danger zone will have the greatest radius and cover the largest area, while for others the explosion danger zone will be the greatest. For example, conventional petroleum fuel products stored in unpressurized tanks do not emit blast overpressure of dangerous levels when ignited. In most cases, hazardous substances will be stored in pressurized containers. The resulting blast overpressure will be experienced at a greater distance than the resulting thermal radiation for the standards set in section 51.203. In any event the hazard requiring the greatest separation distance will prevail in determining the location of HUD-assisted projects.

The standards developed for the protection of people and property are given in the following table.

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	THERMAL RADIATION	BLAST OVERPRESSURE
Amount of acceptable exposure allowed for building structures	10,000 BTU/sq. ft. hr	0.5 psi
Amount of acceptable exposure allowed for people in open areas	450 BTU/sq. ft. hr	0.5 psi

Problem Example:

The following example is given as a guide to assist in understanding how the procedures are used to determine an acceptable separation distance. The technical data are found in the HUD Guidebook. Liquid propane is used in the example since it is both an explosion and a fire hazard.

In this hypothetical case a proposed housing project is to be located 850 feet from a 30,000 gallon liquid propane (LPG) tank. The objective is to determine the acceptable separation distance from the LPG tank. Since propane is both explosive and fire prone it will be necessary to determine the ASD for both explosion and for fire. The greatest of the two will govern. There is no dike around the tank in this example.

Nomographs from the technical Guidebook have been reproduced to facilitate the solving of the problem.

ASD For Explosion:



To determine the ASD for fire it will be necessary to first find the fire width (diameter of the fireball) on Figure 2. Then apply this to Figure 3 to determine the ASD.

Since there are two safety standards for fire: (a) 10,000 BTU/sq. ft. hr. for buildings; and (b) 450 BTU/sq. ft. hr. for people in exposed areas, it will be necessary to determine an ASD for each.

To determine the fire width locate the 30,000 gallon point on the horizontal axis on Figure 2 and draw a vertical line to the straight line curve. Then draw a horizontal line from the point where the lines cross to the left vertical axis where the FIRE WIDTH is found to be 350 feet.

Now locate the 350 ft. point on the horizontal axis of Figure 3 and draw a vertical line from that point to curves 1 and 2. Then draw horizontal lines from the points where the lines cross to the left vertical axis where the ACCEPTABLE SEPARATION DISTANCES of 240 feet for buildings and 1150 feet for exposure to people is found.

Based on this the proposed project site is located at a safe distance from a potential fire ball. However, exposed playgrounds or other exposed areas of congregation must be at least 1150 feet from the tank, or be appropriately shielded from a potential fireball.

(Source: HUD Handbook, "Urban Development Siting With Respect to Hazardous Commercial/Industrial Facilities.")

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FIRE WIDTH - UNCONFINED SPILL  
HAZARDOUS GAS CONTAINER  
NOT DIKED

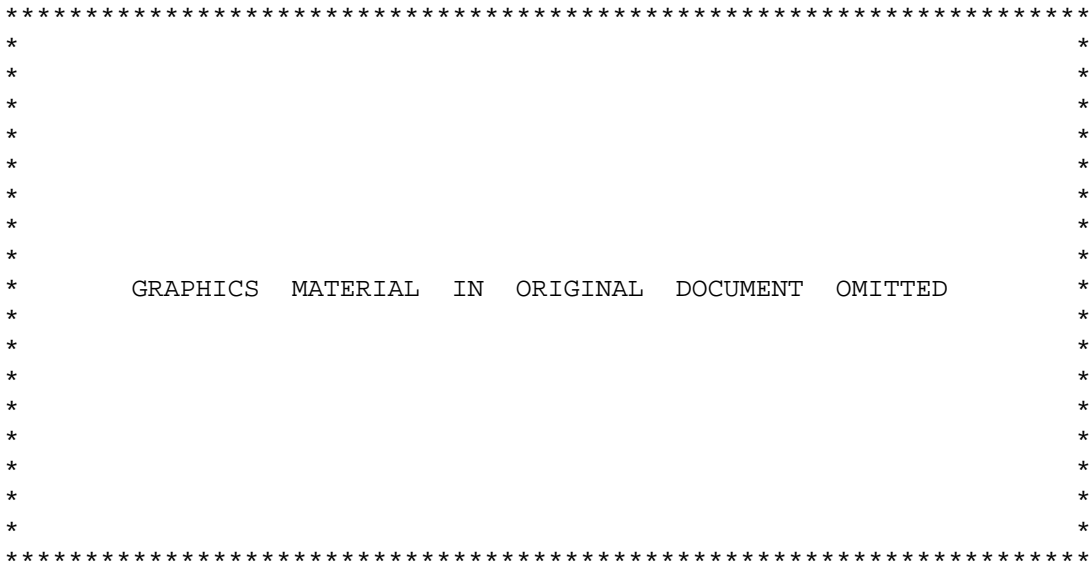


Figure 2



1969, P.L. No. 90-448; Section 7(d) of the Department of Housing and Urban Development Act of 1965, 42 U.S.C. 3535(d); Office of Management and Budget, Federal Management Circular 75-2: Compatible Land Uses At Federal Airfields.

51.300 PURPOSE

- (a) The Department of Housing and Urban Development finds that HUD assisted or insured projects and their occupants in Runway Clear Zones, Clear Zones and Accident Potential Zones are exposed to a significant risk of personal injury or property damage from aircraft accidents.
- (b) It is the purpose of this Subpart to promote compatible land uses around civil airports and military airfields by identifying suitable land uses for Runway Clear Zones at civil airports and Clear Zones and Accident Potential Zones at military airfields and by establishing them as standards for providing HUD assistance, subsidy or insurance.

51.301 DEFINITIONS: For the purposes of this regulation, the following definitions apply:

- (a) Accident Potential Zone. An area at military airfields which is beyond the Clear Zone. The standards for the Accident Potential Zones are set out in Department of Defense Instruction 4165.57, "Air Installations Compatible Use Zones," November 8, 1977, 32 CFR Part 256. There are no Accident Potential Zones at civil airports.

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- (b) Airport Operator. The civilian or military agency, group or individual which exercises control over the operations of the civil airport or military airfield.
  - (c) Civil Airport. An existing commercial service airport as designated in the National Plan of Integrated Airport Systems prepared by the Federal Aviation Administration in accordance with Section 504 of the Airport and Airway Improvement Act of 1982.
  - (d) Runway Clear Zones and Clear Zones. Areas immediately beyond the ends of a runway. The standards for Runway Clear Zones for civil airports are established by FAA regulation 14 CFR Part 152. The standards for Clear Zones for military airfields are established by DOD Instruction 4165.57, 32 CFR Part 256.

51.302 COVERAGE:

- (a) These policies apply to HUD programs which provide assistance, subsidy or insurance for construction, land development, new communities, community development or redevelopment or any other provision of facilities and services which are designed to make land available for construction. When the HUD assistance, subsidy or insurance is used to make land available for construction rather than for the actual construction, the provision of the HUD assistance, subsidy or insurance shall be dependent upon whether the facility to be built is itself acceptable in accordance with the standards in section 51.303.

- (b) These policies apply not only to new construction but also to substantial or major modernization and rehabilitation and to any other program which significantly prolongs the physical or economic life of existing facilities or which, in the case of Accident Potential Zones:
  - (1) Changes the use of the facility so that it becomes one which is no longer acceptable in accordance with the standards contained in section 51.303(b);
  - (2) Significantly increases the density or number of people at the site; or
  - (3) Introduces explosive, flammable or toxic materials to the area.
- (c) Except as noted in section 51.303(a)(3), these policies do not apply to HUD programs where the action only involves the purchase, sale or rental of an existing property without significantly prolonging the physical or economic life of the property.
- (d) The policies do not apply to research or demonstration projects which do not result in new construction or reconstruction, to interstate land sales registration, or to any action or emergency assistance which is provided to save lives, protect property, protect public health and safety, or remove debris and wreckage.

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51.303 GENERAL POLICY: It is HUD's general policy to apply standards to prevent incompatible development around civil airports and military airfields.

- (a) HUD policy for actions in Runway Clear Zones and Clear Zones.
  - (1) HUD policy is not to provide any assistance, subsidy or insurance for projects and actions covered by this part except as stated in section 51.303 (a)(2) below.
  - (2) If a project proposed for HUD assistance, subsidy or insurance is one which will not be frequently used or occupied by people, HUD policy is to provide assistance, subsidy or insurance only when written assurances are provided to HUD by the airport operator to the effect that there are no plans to purchase the land involved with such facilities as part of a Runway Clear Zone or Clear Zone acquisition program.
  - (3) Special notification requirements for Runway Clear Zones and Clear Zones. In all cases involving HUD assistance, subsidy, or insurance for the purchase or sale of an existing property in a Runway Clear Zone or Clear Zone, HUD (or the Grant Recipient under Title I of the Housing and Community Development Act of 1974, as amended, 42 U.S.C. 5301 et seq.) shall advise the buyer that the property is in a Runway Clear Zone or Clear Zone, what the implications of such a location are, and that there is a possibility that the property may, at a later date, be acquired by the airport operator. The buyer must sign a statement

acknowledging receipt of this information.

- (b) HUD policy for actions in Accident Potential Zones at Military Airfields.

HUD policy is to discourage the provision of any assistance, subsidy or insurance for projects and actions in the Accident Potential Zones. To be approved, projects must be generally consistent with the recommendations in the Land Use Compatibility Guidelines For Accident Potential Zones chart contained in DOD Instruction 4165.57, 32 CFR Part 256.

#### 51.304 RESPONSIBILITIES

- (a) The following persons have the authority to approve actions in Accident Potential Zones:
  - (1) For Title I of the Housing and Community Development Act of 1974, as amended, 42 U.S.C. 5301 et seq: the certifying officer of the grant recipient as defined in Part 58 of this Title.
  - (2) For all other HUD programs: the program personnel having approval authority for the project.

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- (b) The following persons have the authority to approve actions in Runway Clear Zones and Clear Zones:

- (1) For Title I of the Housing and Community Development Act of 1974, as amended, 42 U.S.C. 5301 et seq: The certifying officer of the grant recipient as defined in Part 58 of this Title.

- (2) For all other HUD programs: the Regional Administrator.

#### 51.305 IMPLEMENTATION

- (a) Projects already approved for assistance. This regulation does not apply to any project approved for assistance prior to the effective date of the regulation whether the project was actually under construction at that date or not.
- (b) Acceptable data on Runway Clear Zones, Clear Zones and Accident Potential Zones. The only Runway Clear Zones, Clear Zones and Accident Potential Zones which will be recognized in applying this part are those provided by the airport operators and which for civil airports are defined in accordance with FAA regulations 14 CFR Part 152 or for military airfields, DOD Instruction 4165.57, 32 CFR Part 256. All data, including changes, related to the dimensions of Runway Clear Zones for civil airports shall be verified with the nearest FAA Airports District Office before use by HUD.
- (c) Changes in Runway Clear Zones, Clear Zones, and Accident Potential Zones. If changes in the Runway Clear Zones, Clear Zones or Accident Potential Zones are made, the field offices shall immediately adopt these revised zones for use in reviewing proposed projects.



- (d) The decision to approve projects in the Runway Clear Zones, Clear Zones and Accident Potential Zones must be documented as part of the environmental assessment or, when no assessment is required, as part of the project file.

Dated: December 30, 1983

Samuel R. Pierce, Jr.  
Secretary of Housing and  
Urban Development

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ATTACHMENT 1

SELECTIONS FROM DEPARTMENT OF DEFENSE INSTRUCTION 4165.57, NOVEMBER 8, 1977: AIR INSTALLATIONS COMPATIBLE USE ZONES

1. DEFINITIONS OF CLEAR ZONES AND ACCIDENT POTENTIAL ZONES FOR MILITARY AIRFIELDS
2. LAND USE COMPATIBILITY GUIDELINES FOR ACCIDENT POTENTIAL ZONES

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From: DODI 4165.57: Air Installation Compatible Use Zones

3. Accident Potential

a. General

(1) Areas immediately beyond the ends of runways and along primary flight paths are subject to more aircraft accidents than other areas. For this reason, these areas should remain undeveloped, or if developed should be only sparsely developed in order to limit, as much as possible, the adverse effects of a possible aircraft accident.

(2) DOD fixed wing runways are separated into two types for the purpose of defining accident potential areas. Class A runways are those restricted to light aircraft and which do not have the potential for development for heavy or high performance aircraft use or for which no foreseeable requirements for such use exists. Typically these runways have less than 10 percent of their operations involving Class B aircraft and are less than 8000 feet long. Class B runways are all other fixed wing runways.

(3) The following descriptions of Accident Potential Zones are guidelines only. Their strict application would result in increasing the safety of the general public but would not provide complete protection against the effects of aircraft accidents. Such a degree of protection is probably impossible to achieve. Local situations may differ significantly from the assumptions and data upon which these guidelines are based and require individual study. Where it is desirable to restrict the density of

development of an area, it is not usually possible to state that one density is safe and another is not. Safety is a relative term and the objective should be the realization of the greatest degree of safety that can be reasonably attained.

b. Accident Potential and Clear Zones

(1) The area immediately beyond the end of a runway is the "Clear Zone," an area which possesses a high potential for accidents, and has traditionally been acquired by the Government in fee and kept clear of obstructions to flight.

(2) Accident Potential Zone I (APZ I) is the area beyond the clear zone which possesses a significant potential for accidents.

(3) Accident Potential Zone II (APZ II) is an area beyond APZ I having a measurable potential for accidents.

(4) Modifications to APZs I and II will be considered if:

(a) The runway is infrequently used.

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(b) The prevailing wind conditions are such that a large percentage (i.e., over 80 percent) of the operations are in one direction.

(c) Most aircraft do not overfly the APZs as defined herein during normal flight operations (modifications may be made to alter these zones and adjust them to conform to the line of flight).

(d) Local accident history indicates consideration of different area.

(e) Other unusual conditions exist.

(5) The takeoff safety zone for VFR rotary-wing facilities will be used for the clear zone; the remainder of the approach-departure zone will be used as APZ I.

(6) Land use compatibility with clear zones and APZs is shown in enclosure 4.

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Land Use Compatibility Guidelines for Accident Potential

Zones

Land Use Category

Compatibility /1

Clear Zone      APZ I      APZ II

Residential			
Single family	NO	NO	YES /2
2-4 family	NO	NO	NO
Multi-family dwellings	NO	NO	NO
Group quarters	NO	NO	NO
Residential hotels	NO	NO	NO
Mobile home parks or courts	NO	NO	NO
Other residential	NO	NO	NO
Industrial/Manufacturing /3			
Food and kindred products	NO	NO	YES
Textile mill products	NO	NO	YES
Apparel	NO	NO	NO
Lumber and wood products	NO	YES	YES
Furniture and Fixtures	NO	YES	YES
Paper and Allied Products	NO	YES	YES
Printing, publishing	NO	YES	YES
Chemicals and allied products	NO	NO	NO
Petroleum refining and related industries	NO	NO	NO
Rubber and misc. plastic goods	NO	NO	NO

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Land Use Category	Compatibility /1		
	Clear Zone	APZ-I	APZ II
Industrial/Manufacturing /3 (Cont.)			
Primary metal industries	NO	YES	YES
Fabricated metal products	NO	YES	YES
Professional, scientific and controlling instruments	NO	NO	NO
Misc. manufacturing	NO	YES	YES

Transportation, Communications & Utilities /4

Railroad, rapid rail transit (on-grade)	NO	YES /4	YES
Highway and street right-of-way	YES	YES	YES
Auto parking	NO	YES	YES
Communication	YES	YES	YES
Utilities	YES	YES /4	YES
Other transportation, communications & utilities	YES	YES	YES
Commercial/Retail Trade			
Wholesale trade	NO	YES	YES
Building materials-retail	NO	YES	YES
General merchandise-retail	NO	NO	YES
Food-retail	NO	NO	YES
Automotive, marine, aviation-retail	NO	YES	YES
Apparel and accessories-retail	NO	NO	YES
Furniture, home furnishings-retail	NO	NO	YES

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Land Use Category	Compatibility /1		
	Clear Zone	APZ-I	APZ II
Commercial/Retail Trade (Cont.)			
Eating and drinking places	NO	NO	NO
Other retail trade	NO	NO	YES
Personal and Business Services /5			
Finance, insurance and real estate	NO	NO	YES
Personal services	NO	NO	YES
Business services	NO	NO	YES
Repair services	NO	YES	YES
Professional services	NO	NO	YES
Contract construction services	NO	YES	YES

Indoor recreation services	NO	NO	YES
Other services	NO	NO	YES
Public and Quasi-Public Services			
Government services	NO	NO	YES /5
Educational services	NO	NO	NO
Cultural activities	NO	NO	NO
Medical and other health services	NO	NO	NO
Cemeteries	NO	YES /6	YES /6
Non-profit organizations including churches	NO	NO	NO
Other public and quasi-public services	NO	NO	YES
Outdoor Recreation			
Playground and neighborhood parks	NO	NO	YES

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Land Use Category	Compatibility /1		
	Clear Zone	APZ-I	APZ II
Outdoor Recreation (Cont.)			
Community and regional parks	NO	YES /7	YES /7
Nature exhibits	NO	YES	YES
Spectator sports incl. arenas	NO	NO	NO
Golf courses /8, riding stables /9	NO	YES	YES
Water based recreational areas	NO	YES	YES
Resort and group camps	NO	NO	NO
Entertainment assembly	NO	NO	NO
Other outdoor recreation	NO	YES /7	YES
Resource Production & Extraction and Open Land			
Agriculture /10	YES	YES	YES
Livestock farming, animal breeding /11	NO	YES	YES
Forestry activities /12	NO /13	YES	YES

Fishing activities and related services /14	NO /15	YES /14	YES
Mining activities	NO	YES	YES
Permanent open space	YES	YES	YES
Water areas /14	YES	YES	YES

Footnotes

1. A "Yes" or "No" designation for compatible land use is to be used only for gross comparison. Within each, uses exist where further definition may be needed as to whether it is clearly or normally acceptable/unacceptable owing to variations in densities of people and structures.

2. Suggested maximum density 1-2 DU/AC, possibly increased under a Planned Unit Development where maximum lot coverage less than 20%.

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3. Factors to be considered: Labor intensity, structural coverage, explosive characteristics, air pollution.

4. No passenger terminals and no major above ground transmission lines in APZ I.

5. Low intensity office uses only. Meeting places, auditoriums, etc., not recommended.

6. Excludes chapels.

7. Facilities must be low intensity.

8. Clubhouse not recommended.

9. Concentrated rings with large classes not recommended.

10. Includes livestock grazing but excludes feedlots and intensive animal husbandry.

11. Includes feedlots and intensive animal husbandry.

12. No structures (except airfield lighting), buildings or above ground utility/communication lines should be located in the clear zone. For further runway safety clearance limitations pertaining to the clear zone see AFM 86-6 (reference (a)), TM 5-803-4 (reference (d)) and NAVFAC P-80 (reference (c)).

13. Lumber and timber products removed due to establishment, expansion or maintenance of clear zones will be disposed of in accordance with DOD Instruction 4170.7, "Natural Resources - Forest Management," June 21, 1965 (reference (h)) and DOD Instruction 7310.1, "Accounting and Reporting for Property Disposal and Proceeds from Sale of Disposable Personal Property and Lumber or Timber Products," July 10, 1970

(reference (i)).

14. Includes hunting and fishing.

15. Controlled hunting and fishing may be permitted for the purpose of wildlife control.

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ATTACHMENT 2

DESIGNATED COMMERCIAL SERVICE AIRPORTS COVERED BY 24 CFR PART 51D

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Designated Commercial Service Airports Covered By  
24 CFR Part 51D

As of January 1, 1984

REGION I	AIRPORT LOCATION	AIRPORT NAME
CT	Bridgeport	Igor I. Sikorsky Memorial
	Groton	Groton-New London
	New Haven	Tweed-New Haven
	Windsor Locks	Bradley International*
MA	Boston	General Edward Lawrence Logan International*
	Hyannis	Barnstable Municipal
	Marthas Vineyard	Marthas Vineyard
	Nantucket	Nantucket Memorial
	New Bedford	New Bedford Municipal
	Pittsfield	Pittsfield Municipal
	Provincetown	Provincetown Municipal
	Worcester	Worcester Municipal
ME	Auburn-Lewiston	Auburn-Lewiston Municipal
	Augusta	Augusta-State
	Bangor	Bangor International*
	Bar Harbor	Bar Harbor
	Frenchville	Northern Aroostook Regional
	Portland	Portland International Jetport*
	Presque Isle	Northern Maine Regional
	Rockland	Knox County Regional
Waterville	Waterville-Robert Lafleur	
NH	Keene	Dillant-Hopkins
	Laconia	Laconia Municipal
	Lebanon	Lebanon Municipal
	Manchester	Manchester Municipal
RI	Providence	Theodore F. Green State*

	Westerly	Westerly State
VT	Barre-Montpelier Burlington Rutland	Edward F. Knapp State Burlington International* Rutland State

\*Airports with 100,000 + enplanements per year

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REGION II	AIRPORT LOCATION	AIRPORT NAME
NJ	Atlantic City	NAFEC Atlantic City
	Atlantic City	Atlantic City Municipal/Bader Field
	Belmar	Monmouth Airport
	Newark	Newark International Airport*
	Wildwood	Cape May County Airport
NY	Albany	Albany County*
	Binghamton	Broome County Airport*
	Buffalo	Greater Buffalo International
	Elmira	Chemung County Airport
	Islip	Long Island - Mac Arthur*
	Ithaca	Tompkins County Airport
	Jamestown	Chautauqua County
	Massena	Richards Field
	New York	John F. Kennedy International*
	New York	Laguardia*
	Ogdensburg	Ogdensburg International
	Oneonta	Oneonta Municipal
	Plattsburgh	Clinton County
	Poughkeepsie	Dutchess County
	Rochester	Rochester Monroe County*
	Saranac Lake	Adirondack
	Syracuse	Syracuse-Hancock International*
Utica	Oneida County	
White Plains	Westchester County	
New York	W.T.C.-Battery Park Heliport	
PR	Fajardo	Fajardo
	Humacao	Humacao
	Isla De Vieques	Vieques
	Isla De Culebra	Culebra
	Mayaguez	Mayaguez
	Ponce	Mercedita
	San Juan	Isla Grande
	San Juan	Puerto Rico International*
Fajardo	Fajardo Harbor Seaplane Base	
REGION III		
DC	Washington	Dulles International*
	Washington	Washington National*



DE	Wilmington	Greater Wilmington
MD	Baltimore Cumberland Hagerstown Salisbury	Baltimore-Washington International* Cumberland Municipal Hagerstown Regional Salisbury Wicomico County

\*Airports with 100,000 + enplanements per year

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REGION III	AIRPORT LOCATION	AIRPORT NAME	
PA	Allentown	Allentown-Bethlehem-Easton*	
	Bradford	Bradford Regional	
	Du Bois	Du Bois-Jefferson County	
	Erie	Erie International*	
	Franklin	Chess-Lamberton	
	Johnstown	Johnstown-Cambria County	
	Lancaster	Lancaster	
	Latrobe	Westmoreland County	
	Altoona	Altoona-Blair County	
	Middletown	Harrisburg International*	
	Philadelphia	Northeast Philadelphia*	
	Philadelphia	Philadelphia International*	
	Ambler	Wings Field	
	Pittsburgh	Greater Pittsburgh International*	
	Reading	Reading Muni, General Carl A. Spaatz Fld.	
VA	State College	University Park	
	Wilkes-Barre/Scranton	Wilkes-Barre/Scranton*	
	Williamsport	Williamsport-Lycoming County	
	VA	Charlottesville	Charlottesville-Albermarle
		Lynchburg	Lynchburg Municipal -Preston Glenn Field
		Newport News	Patrick Henry International*
		Norfolk	Norfolk International*
		Richmond	Richard Evelyn Bird International*
		Roanoke	Roanoke Municipal*
		Staunton/Harrisonburg	Shenandoah Valley
		WV	Beckley
	Bluefield		Mercer County
	Charleston		Kanawha*
	Clarksburg		Benedum
	Elkins		Elkins-Randolph Co - Jennings Randolph Fld.
Huntington	Tri-State/Walker-Long Field		
Lewisburg	Greenbrier Valley		
Morgantown	Morgantown Muni -Walter L. Bill Hart Fld.		
Parkersburg	Wood County		

REGION IV

AL	Anniston	Anniston-Calhoun County
	Auburn	Auburn-Opelika
	Birmingham	Birmingham Municipal*
	Dothan	Dothan Municipal
	Gadsden	Gadsden Municipal
	Huntsville	Huntsville-Madison Co Jetport*
	Mobile	Bates Field*
	Montgomery	Dannelly Field*
	Muscle Shoals	Muscle Shoals
	Tuscaloosa	Tuscaloosa Municipal

\*Airports with 100,000 + enplanements per year

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REGION IV	AIRPORT LOCATION	AIRPORT NAME
FL	Daytona Beach	Daytona Beach Regional*
	Fort Lauderdale	Fort Lauderdale - Hollywood International*
	Fort Myers	Page Field*
	Gainesville	Gainesville Regional*
	Jacksonville	Jacksonville International*
	Key West	Key West International
	Marathon	Marathon Flight Strip
	Melbourne	Melbourne Regional Airport*
	Miami	Miami International*
	Naples	Naples Municipal*
	Ocala	Ocala Municipal/Jim Taylor Field
	Orlando	Orlando International*
	Panama City	Panama City-Bay County
	Pensacola	Pensacola Regional*
	Punta Gorda	Charlotte County
	Sarasota	Sarasota-Bradenton*
	St. Petersburg	St. Petersburg Clearwater International
	Tallahassee	Tallahassee Municipal*
	Tampa	Tampa International*
	Valparaiso	Eglin Air Force Base*
	Vero Beach	Vero Beach Municipal
	West Palm Beach	Palm Beach International*
	Marco Island	Marco Island
	Miami	Chalk Seaplane Base
GA	Albany	Albany-Dougherty County
	Athens	Athens Municipal
	Atlanta	William B. Hartsfield - Atlanta Intl.*
	Augusta	Bush Field*
	Brunswick	Glynco Jetport
	Columbus	Columbus Metropolitan
	Macon	Lewis B. Wilson
	Savannah	Savannah Municipal*
	Valdosta	Valdosta Municipal
KY	Covington	Greater Cincinnati International*
	Lexington	Blue Grass Field*

	Louisville	Standiford Field*
	Owensboro	Owensboro-Daviess County
	Paducah	Barkley Field
MS	Columbus-Starkville	
	- West Point	Golden Triangle Regional
	Greenville	Greenville Municipal
	Gulfport-Biloxi	Gulfport-Biloxi Regional
	Jackson	Allen C. Thompson Field*
	Laurel-Hattiesburg	Pine Belt Regional
	Meridian	Key Field
	Tupelo	C. D. Lemons Municipal

\*Airports with 100,000 + enplanements per year

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REGION IV	AIRPORT LOCATION	AIRPORT NAME
NC	Asheville	Asheville Regional*
	Charlotte	Douglas Municipal*
	Fayetteville	Fayetteville Municipal/ Grannis Field*
	Greensboro	Greensboro-High Point - Winston Salem*
	Greenville	Pitt-Greenville
	Hickory	Hickory Municipal
	Jacksonville	Albert J. Ellis
	Kinston	Eastern Regional Jetport at Stallin
	New Bern	Simmons-Nott
	Raleigh	Raleigh-Durham*
	Wilmington	New Hanover County
	Winston-Salem	Smith Reynolds
SC	Charleston	Charleston AFB/International*
	Columbia	Columbia Metropolitan*
	Florence	Florence City-County*
	Greer	Greenville-Spartanburg*
	Myrtle Beach	Myrtle Beach Air Force Base
TN	Bristol	Tri-City*
	Chattanooga	Lovell Field*
	Jackson	McKellar Field
	Knoxville	McGhee-Tyson*
	Memphis	Memphis International*
	Nashville	Nashville Metropolitan*
REGION V		
IL	Bloomington	Bloomington-Normal
	Carbondale	Southern Illinois Airport
	Champaign/Urbana	University of Illinois-Willard
	Chicago	Chicago-O'Hare International*
	Chicago	Chicago Midway*
	Chicago	Merrill C. Meigs

Danville	Vermilion County
Decatur	Decatur
Galesburg	Galesburg Municipal
Marion	Williamson County
Mattoon-Charleston	Coles County Memorial
Moline	Quad-City*
Mount Vernon	Mt. Vernon-Outland
Peoria	Greater Peoria*
Quincy	Quincy Municipal-Baldwin Field
Rockford	Greater Rockford
Springfield	Capital*
Sterling Rockfalls	Whiteside Co Arpt
	-Jos H. Bittorf Field

\*Airports with 100,000 + enplanements per year

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REGION V	AIRPORT LOCATION	AIRPORT NAME
IN	Bloomington	Monroe County
	Elkhart	Elkhart Municipal
	Evansville	Evansville Dress Regional*
	Fort Wayne	Fort Wayne Municipal/Baer Field*
	Indianapolis	Indianapolis International*
	Lafayette	Purdue University
	Muncie	Delaware County
	South Bend	Michiana Regional*
	Terre Haute	Hulman Field
MI	Alpena	Phelps Collins
	Battle Creek	W. K. Kellogg Regional
	Benton Harbor	Ross Field
	Detroit	Detroit Metropolitan-Wayne County*
	Detroit	Detroit City
	Escanaba	Delta County
	Flint	Bishop*
	Grand Rapids	Kent County*
	Hancock	Houghton County Memorial
	Iron Mountain/Kingsford	Ford
	Ironwood	Gogebic County
	Jackson	Jackson County Reynolds Field
	Kalamazoo	Kalamazoo Municipal*
	Lansing	Capital City*
	Marquette	Marquette County
	Menominee	Menominee-Marinette Twin County
	Muskegon	Muskegon County
	Pellston	Emmet County
Saginaw	Tri-City*	
Traverse City	Cherry Capital	
Sault Ste. Marie	Chippewa County International	
MN	Bemidji	Emidji-Beltrami Co.
	Brainerd	Brainerd-Crow Wing County
	Duluth	Duluth International*
	Fairmont	Fairmont Municipal

	Grand Rapids	Grand Rapids-Itasca County
	Hibbing	Chisholm-Bibbing
	International Falls	Falls International
	Mankato	Mankato Municipal
	Minneapolis	Minneapolis-St. Paul International*
	Rochester	Rochester Municipal*
	Thief River Falls	Thief River Falls Regional
OH	Akron	Akron-Canton Regional*
	Cleveland	Burke Lakefront
	Cleveland	Cleveland-Hopkins International*
	Columbus	Port Columbus International*

\*Airports with 100,000 + enplanements per year

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REGION V	AIRPORT LOCATION	AIRPORT NAME
OH	Dayton	James M. Cox Dayton International*
	Mansfield	Mansfield Lahm Municipal
	Port Clinton	Arl R. Keller Field
	Toledo	Toledo Express*
	Youngstown	Youngstown Municipal
WI	Appleton	Outagamie County
	Eau Claire	Eau Claire Municipal
	Green Bay	Austin-Straubel Field*
	Hayward	Hayward Municipal
	Janesville	Rock County
	La Crosse	La Crosse Municipal
	Madison	Dane County Regional*
	Manitowoc	Manitowoc Municipal
	Marshfield	Marshfield Municipal
	Milwaukee	General Mitchell Field*
	Mosinee	Central Wisconsin*
	Oshkosh	Wittman Field
	Rhineland	Rhineland-Oneida County
	Sheboygan	Sheboygan County Memorial
	Wisconsin Rapids	Alexander Field
REGION VI		
AR	Camden	Harrell Field
	El Dorado	Goodwin Field
	Fayetteville	Drake Field*
	Fort Smith	Fort Smith Municipal
	Harrison	Boone County
	Hot Springs	Memorial Field
	Jonesboro	Jonesboro Municipal
	Little Rock	Adams Field*
	Mountain Home	Baxter County Regional
	Texarkana	Texarkana Municipal-Webb Field
LA	Alexandria	Esler Regional

Baton Rouge	Baton Rouge Metropolitan, Ryan Field*
Houma	Houma-Trerrebonne
Lafayette	Lafayette Regional
Lake Charles	Lake Charles Municipal
Monroe	Monroe Regional*
New Orleans	New Orleans International (Moisant)*
New Orleans	Lakefront
Patterson	Harry P. Williams Memorial
Shreveport	Shreveport Regional*

\*Airports with 100,000 + enplanements per year

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REGION VI	AIRPORT LOCATION	AIRPORT NAME
NM	Alamogordo	Alamogordo-White Sands Regional
	Albuquerque	Albuquerque International*
	Carlsbad	Cavern City Air Terminal
	Clovis	Clovis Municipal
	Farmington	Farmington Municipal
	Gallup	Gallup Municipal
	Hobbs	Lea County (Hobbs)
	Roswell	Roswell Industrial Air Center
	Santa Fe	Santa Fe County Municipal
	Silver City	Silver City-Grant County Airport
	Los Alamos	Los Alamos
	OK	Lawton
Oklahoma City		Will Rogers World Airport*
Stillwater		Stillwater Municipal
Tulsa		Tulsa International*
TX	Abilene	Abilene Municipal
	Amarillo	Amarillo International*
	Austin	Robert Mueller Municipal*
	Beaumont/Port Arthur	Jefferson County*
	Brownsville	Brownsville/ South Padre Island Intl.
	Brownwood	Brownwood Municipal
	College Station	Easterwood Field
	Corpus Christi	Corpus Christi International*
	Dallas	Dallas Love Field*
	Dallas-Ft. Worth	Dallas-Fort Worth Regional*
	El Paso	El Paso International*
	Fort Worth	Meacham Field
	Harlingen	Valley International*
	Houston	William P. Hobby*
	Houston	Houston Intercontinental*
	Killeen	Killeen Municipal
	Laredo	Laredo International
	Longview	Gregg County
	Lubbock	Lubbock International*

Lufkin	Angelina County
McAllen	Miller International*
Midland	Midland Regional Airport*
San Angelo	Mathis Field
San Antonio	San Antonio International*
Temple	Draughon-Miller Municipal
Tyler	Pounds Field
Victoria	Victoria Regional
Waco	Waco-Madiscn Cooper
Wichita Falls	Sheppard AFB/Wichita Falls Municipal
Lake Jackson	Brazoria County

\*Airports with 100,000 + enplanements per year

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REGION VII	AIRPORT LOCATION	AIRPORT NAME
IA	Burlington	Burlington Municipal
	Cedar Rapids	Cedar Rapids Municipal*
	Des Moines	Des Moines Municipal*
	Dubuque	Dubuque Municipal
	Fort Dodge	Fort Dodge Municipal
	Mason City	Mason City Municipal
	Ottumwa	Ottumwa Industrial
	Sioux city	Sioux City Municipal
	Waterloo	Waterloo Municipal
KS	Dodge City	Dodge City Municipal
	Garden City	Garden City Municipal
	Great Bend	Great Bend Municipal
	Hays	Hays Municipal
	Lawrence	Lawrence Municipal
	Liberal	Liberal Municipal
	Manhattan	Manhattan Municipal
	Parsons	Tri City
	Salina	Salina Municipal
	Wichita	Wichita Mid-Continent*
Topeka	Forbes Field	
MO	Cape Girardeau	Cape Girardeau Municipal
	Columbia	Columbia Regional
	Jefferson City	Jefferson City Memorial
	Joplin	Joplin Municipal
	Kansas City	Kansas City International*
	Kansas City	Downtown
	Springfield	Springfield Municipal*
	St. Louis	Lambert-St. Louis International*
Fort Leonard Wood	Forney AAF	
NE	Alliance	Alliance Municipal
	Grand Island	Hall County Regional
	Kearney	Kearney Municipal
	Lincoln	Lincoln Municipal*

McCook	McCook Municipal
Norfolk	Karl Stefan Memorial
North Platte	Lee Bird Field
Omaha	Eppley Airfield*
Scotts Bluff	Scotts Bluff County

REGION VIII

CO	Alamosa	Alamosa Municipal
	Aspen	Aspen-Pitkin Co/Sardy Field*
	Colorado Springs	City of Colorado Springs Municipal*
	Cortez	Cortez-Montezuma County

\*Airports with 100,000 + enplanements per year

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REGION VIII	AIRPORT LOCATION	AIRPORT NAME
CO	Denver	Stapleton International*
	Durango	Durango-La Plata County
	Fort Collins	Fort Collins-Loveland
	Grand Junction	Walker Field*
	Gunnison	Gunnison County
	Hayden	Yampa Valley
	Montrose	Montrose County
	Pueblo	Pueblo Memorial
	Rifle	Garfield County
	Steamboat Springs	Routt County-STOL
MT	Billings	Billings-Logan International*
	Bozeman	Gallatin Field
	Butte	Bert Mooney-Silver Bow County
	Great Falls	Great Falls International*
	Helena	Helena
	Kadispell	Glacier Park International
	Missoula	Johnson-Bell Field
	Sidney	Sidney-Richland Municipal
West Yellowstone	West Yellowstone	
ND	Bismarck	Bismarck Municipal*
	Devils Lake	Devils Lake Municipal
	Fargo	Hector Field*
	Grand Forks	Grand Forks International*
	Jamestown	Jamestown Municipal
	Minot	Minot International
	Williston	Sloulin Field International
SD	Aberdeen	Aberdeen Regional
	Brookings	Brookings Municipal
	Huron	Huron Regional
	Pierre	Pierre Municipal
	Rapid City	Rapid City Regional*
	Sioux Falls	Joe Foss Field*
	Watertown	Watertown Municipal



	Yankton	Chan Gurney Municipal
UT	Cedar City Logan St. George Salt Lake City Vernal	Cedar City Municipal Logan-Cache St. George Municipal Salt Lake City International* Vernal
WY	Casper Cheyenne Cody Gillette	Natrona County International* Cheyenne E E Faust Regional Airport Gillette Campbell County

\*Airports with 100,000 + enplanements per year

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REGION VIII	AIRPORT LOCATION	AIRPORT NAME
WY	Jackson Laramie Riverton Rock Springs Sheridan Worland	Jackson Hole General Brees Field Riverton Regional Rock Springs-Sweetwater County Sheridan County Worland Municipal
REGION IX		
AS	Pago Pago OFU Island	Pago Pago International OFU
AZ	Flagstaff Grand Canyon Lake Havasu Page Phoenix Tucson Yuma	Pulliam Grand Canyon National Park* Lake Havasu City Page Phoenix Sky Harbor International* Tucson International* Yuma MCAS/Yuma International
CA	Arcata/Eureka Bakersfield Burbank Carlsbad Chico Fresno Imperial Inyokern Long Beach Los Angeles Mammoth Lakes Merced Modesto Monterey Oakland Ontario	Arcata Meadows Field* Burbank-Glendale-Pasadena* McClellan-Palomar Chico Municipal Fresno Air Terminal* Imperial County Inyokern-Kern County Airport #8 Long Beach-Daugherty Field* Los Angeles International* Mammoth-June Lakes Merced Muni Modesto City-County Arpt --Harry Sham Field Monterey Peninsula* Metropolitan Oakland International* Ontario International*

Oxnard	Oxnard
Palm Springs	Palm Springs Municipal*
Redding	Redding Muni
Sacramento	Sacramento Metropolitan*
San Diego	San Diego International - Lindbergh Field*
San Francisco	San Francisco International*
San Jose	San Jose Muni*
San Luis Obispo	San Luis Obispo County*
Santa Ana	John Wayne Airport-Orange County*
Santa Barbara	Santa Barbara Municipal*
Santa Maria	Santa Maria Public
Santa Rosa	Sonoma County

\*Airports with 100,000 + enplanements per year

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REGION IX	AIRPORT LOCATION	AIRPORT NAME
CA	South Lake Tahoe	Lake Tahoe
	Stockton	Stockton Metropolitan
	Visalia	Visalia Muni
	Avalon	Catalina
	Palmdale	AF Plant 42
CQ	Obyan	Saipan International
	Rota Island	Rota International
	Peipeinimaru	West Tinian
GU	Agana	Agana NAS
HI	Hana	Hana
	Hilo	General Lyman Field*
	Honolulu	Honolulu International*
	Kahului	Kahului*
	Kailua-Kona	Ke-Ahole*
	Kamuela	Waimea-Kohala
	Kaunakakai	Molokai
	Lanai City	Lanai
	Lihue	Lihue*
	Hanalei	Princeville
Lahaina	Kaanapali	
NV	Elko	Elko Municipal - J.C. Harris Field
	Ely	Ely Arpt/Yelland Field
	Las Vegas	North Las Vegas Air Terminal
	Las Vegas	Mc Carran International*
	Reno	Reno Cannon International*
TT	Enenelip Island	Marshall Islands International
	Ponape Island	Ponape International
	Moen Island	Truk International
	Yap Island	Yap International
	Babelthuap Island	Babelthuap/Koror

REGION X

AK	Alakanuk	Alakanuk
	Anchorage	Anchorage International*
	Andreafsky	St. Marys
	Aniak	Aniak
	Barrow	Wiley Post Will Rogers Memorial
	Bethel	Bethel
	Chevak	Chevak
	Cold Bay	Cold Bay
	Cordova	Cordova-Mile 13
	Deadhorse	Deadhorse

\*Airports with 100,000 + enplanements per year

REGION X	AIRPORT LOCATION	AIRPORT NAME
AK	Dillingham	Dillingham
	Fairbanks	Fairbanks International*
	Fort Yukon	Fort Yukon
	Galena	Galena
	Gambell	Gambell
	Golovin	Golovin
	Gustavus	Gustavus
	Haines	Haines
	Homer	Homer
	Hoonah	Hoonah
	Hooper Bay	Hooper Bay
	Iliamna	Iliamna
	Juneau	Juneau International*
	Kenai	Kenai Municipal
	Ketchikan	Ketchikan International
	King Salmon	King Salmon
	Kipnuk	Kipnuk
	Kodiak	Kodiak Airport
	Kodiak	Inner Harbor SPB
	Kotzebue	Ralph Wien Memorial
	McGrath	McGrath
	Mountain Village	Mountain Village
	New Koliganek	New Koliganek
	Nome	Nome
	Noorvik	Robert (Bob) Curtis Memorial
	Petersburg	Petersburg
	Point Hope	Point Hope
	Savoonga	Savoonga
	Sitka	Sitka
	Skagway	Skagway
	Unalakleet	Unalakleet
	Unalaska	Unalaska
	Valdez	Valdez Municipal No. 2
	Wrangell	Wrangell
	Yakutat	Yakutat

ID	Boise	Boise Air Terminal*
	Hailey	Friedman Memorial
	Idaho Falls	Idaho Falls Municipal Airport (Fanning Fld)
	Lewiston	Lewiston-Nez Perce County
OR	Pocatello	Pocatello Municipal
	Twin Falls	City-County Airport
	Eugene	Mahlon Sweet Field*
	Klamath Falls	Kingsley Field
	Medford	Medford-Jackson County*
	North Bend	North Bend Municipal

\*Airports with 100,000 + enplanements per year

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REGION X	AIRPORT LOCATION	AIRPORT NAME
OR	Pendleton	Pendleton Municipal
	Portland	Portland International*
	Redmond	Roberts Field
	Salem	McNary Field
WA	Bellingham	Bellingham International
	Bremerton	Kitsap County
	Burlington/Mt. Vernon	Skagit Regional/Bayview
	Eastsound	Orcas Island
	Friday Harbor	Friday Harbor
	Pasco	Tri-Cities*
	Port Angeles	William R. Fairchild International
	Pullman	Pullman-Moscow Regional
	Seattle	Seattle-Tacoma International*
	Spokane	Spokane International*
	Walla Walla	City-County Airport
	Wenatchee	Pangborn Field
Yakima	Yakima Air Terminal	

\*Airports with 100,000 + enplanements per year

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ATTACHMENT 3

BUYER NOTIFICATION FORM

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APPENDIX

REGIONAL ENVIRONMENTAL OFFICERS AND STATES COVERED

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REGIONAL ENVIRONMENTAL OFFICERS

Region I	States Covered
Regional Environmental Officer Department of HUD John F. Kennedy Building, Rm. 800 Boston, MA 02203 Commercial #: (617) 223-4301 FTS: 223-4301	Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont
Region II	
Regional Environmental Officer Department of HUD 26 Federal Plaza New York, NY 10278 Commercial #: (212) 264-5806 FTS: 264-5806	New Jersey New York Puerto Rico
Region III	
Regional Environmental Officer Department of HUD Curtis Building 6th and Walnut Streets Philadelphia, PA 19106 Commercial #: (215) 597-3903 FTS: 597-3903	DC Delaware Maryland Pennsylvania West Virginia Virginia
Region IV	
Regional Environmental Officer Department of HUD Richard B. Russell Federal Bldg. 75 Spring Street, S.W. Atlanta, GA 30303 Commercial #: (404) 221-5197 FTS: 242-5197	Alabama Florida Georgia Kentucky Mississippi North Carolina South Carolina Tennessee
Region V	
Regional Environmental Officer Department of HUD 300 South Wacker Drive Chicago, IL 60606 Commercial #: (312) 353-0862 FTS: 353-0862	Illinois Indiana Michigan Minnesota Ohio Wisconsin

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Region VI	States Covered
Regional Environmental Officer Department of HUD 221 W. Lancaster Fort Worth, TX 76113 Commercial #: (817) 870-5482 FTS: 728-5482	Arkansas Louisiana New Mexico Oklahoma Texas
Region VII	
Regional Environmental Officer Department of HUD Professional Building 1103 Grand Avenue Kansas City, MO 64106 Commercial #: (816) 374-3192 FTS: 758-3192	Iowa Kansas Missouri Nebraska
Region VIII	
Regional Environmental Officer Department of HUD Executive Tower Building 1405 Curtis Street Denver, CO 80202 Commercial #: (303) 837-3102 FTS: 327-3102	Colorado Montana North Dakota South Dakota Utah Wyoming
Region IX	
Regional Environmental Officer Department of HUD 450 Golden Gate Avenue P. O. Box 36003 San Francisco, CA 94102 Commercial #: (415) 556-6642 FTS: 556-6642	Arizona California Trust Territories Hawaii Nevada
Region X	
Regional Environmental Officer Department of HUD Arcade Plaza Building 1321 Second Avenue Seattle, WA 98101 Commercial #: (206) 442-4521 FTS: 399-4521	Alaska Idaho Oregon Washington