

ENVIRONMENTAL ASSESSMENT

**COMPOSITE TECHNOLOGY CENTER (CTC)
BUILDING 49
FY93**

TASK ORDER 6173-006

**NASA LEWIS RESEARCH CENTER
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Abstract

The objective of this Environmental Assessment is to review the proposed action associated with the Modifications and Construction of the Composite Technology Center at NASA Lewis Research Center in Cleveland, Ohio. The information developed strongly suggests that the proposed action will not result in substantial impacts to the environment.

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ABBREVIATIONS AND ACRONYMS

CTC	Composite Technology Center
EA	Environmental Assessment
NEPA	National Environmental Policy Act
CEQ	Council on Environmental Quality
NASA	National Aeronautic and Space Administration
LeRC	Lewis Research Center
CFR	Code of Federal Regulations
EIS	Environmental Impact Statement
HVAC	Heating, Ventilation, and Air Conditioning
OEPA	Ohio Environmental Protection Agency
POTW	Publicly Owned Treatment Works
NPDES	National Pollution Discharge Elimination System
TSCA	Toxic Substances Control Act
PCB	Polychlorinated Biphenyls
OSHA	Occupational Safety and Health Administration
W/O/P	Warner/Osborn/Pardee
SARA	Superfund Amendment and Reauthorization Act
FEMA	Federal Emergency Management Agency
SHPO	State Historic Preservation Office

1.0 SUMMARY AND CONCLUSIONS

This Environmental Assessment (EA), required pursuant to the National Environmental Policy Act (NEPA), and Council on Environmental Quality (CEQ) regulations, concerns a proposed action at the National Aeronautic and Space Administration (NASA) Lewis Research Center (LeRC) in Cleveland, Ohio to renovate and modify Building 49, as well as construct an addition to Building 49. Under NASA's proposed action, Building 49 will consolidate in one building, many research and testing labs currently located in several buildings, create areas for new technology, and be renamed the Composite Technology Center (CTC). This EA addresses and evaluates environmental impacts associated with implementing the proposed action and two alternatives; no action or duplication of the CTC facility at an alternate site.

Table 1-1 summarizes the environmental impacts of the proposed action and the alternatives based on issues outlined in NEPA, the CEQ regulations, applicable NASA procedures (14 Code of Federal Regulations (CFR) Subpart 1216.3), and the Statement of Work. The Proposed Action column rates issues as having potential short-term, long-term, or no substantial impacts at all. The final two columns compare the expected environmental impacts of the alternatives against the proposed action. The comparisons indicate whether the alternatives will bear either more severe, similar, or less severe environmental impacts than the proposed action.

In general, the proposed action would result in little impact to the surrounding environment for the following reasons:

- The addition would be constructed in a previously disturbed (paved) location.
- The operations conducted in the CTC facility would not be new to the NASA LeRC. They would only be relocated to Building 49.
- There are no substantial problems with air quality, surface water and groundwater quality, waste generation, noise and vibration, hazardous substances, ionizing and non-ionizing radiation, endangered species and biotic resources, wetlands and floodplains, Historical and Archeological Sites, Prime and Unique Farmlands, Land Quality, Vicinity Land Use, Visual and Recreational Resources, Economic, Population and Employment Factors, Health and Safety and Coastal Zone Consistency associated with Building 49, nor with the activities proposed to be moved into the addition.

The two alternatives evaluated do not strongly impact any environmental parameters addressed in this EA. Neither alternative appears more beneficial to the surrounding environment than the proposed action. Standard construction activities seem to be the only cause of impact at the NASA LeRC. Therefore, it does not appear that preparation of an Environmental Impact Statement (EIS) would be necessary or prudent.

**TABLE 1-1
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS**

	Proposed Action	No Action (Impacts Relative to Proposed Action)	Duplicate CTC (Impacts Relative to Proposed Action)
Air Quality	Short-term (Construction)	Less Severe	More Severe (Construction)
Surface Water and Groundwater Quality	Short-term (Construction)	Similar/ More Severe	Similar/ More Severe
Waste Generation	Short-term (Construction) Slight Long-term	Less Severe	Similar
Noise and Vibration	Short-term (Construction)	Similar	Similar
Hazardous Substances	Long-term	Similar	Similar
Ionizing and Non-ionizing Radiation	None	Similar	Similar
Endangered Species and Biotic Resources: Fish and Wildlife Resources	None	Similar/ More Severe	Similar
Wetlands and Floodplains	None	Similar	Similar
Historical and Archeological Sites	None	Similar	Similar
Prime and Unique Farmlands	None	Similar	Similar
Land Quality, Vicinity Land Use, Visual, and Recreational Resources	Long-term (Land Use only)	Less Severe	More Severe (Land Use only)
Economic, Population, and Employment Factors	Short-term (Construction)	More Severe	Similar/ Less Severe
Health and Safety	Long-term Benefits	More Severe	Similar
Coastal Zone Consistency	None	Similar	Similar

2.0 INTRODUCTION

2.1 Purpose and Need

The NEPA, codified at 42 USC 4321 et seq., was enacted to articulate the federal government's policy and objectives in environmental protection. Regulations promulgated in support of NEPA are found at 40 CFR Parts 1500-1508. These regulations contain provisions necessary to ensure that federal agencies act within the intent of NEPA. In particular, these regulations address the procedural aspects of conducting environmental analyses and preparing and publishing EIS. The regulations also dictate that federal agencies shall adopt procedures to ensure that decisions are made in accordance with the scope and intent of NEPA. As a result, NASA enacted provisions found at 14 CFR Subparts 1216.1 and 1216.3 (NASA/NEPA provisions) for implementing NEPA requirements. This EA has been prepared pursuant to the NASA/NEPA provisions in support of a proposed action at the NASA LeRC in Cleveland, Ohio.

The Materials and Structures Building (Building 49) as it exists is severely deteriorated and does not provide the environment necessary to develop advanced composites. Development of advanced composite materials will involve the use of hazardous materials and chemicals, and requires the complete rehabilitation and upgrading of the existing Materials and Structures Building. The CTC will enable LeRC to continue its role in tailoring composite material systems for advanced aerospace applications, especially propulsion systems. Current and future NASA programs require high temperature composites to enable lightweight, long-life systems. These include programs for high speed civil transport and advanced chemical rockets. The addition to Building 49 will provide new laboratories with enhanced processing and testing proficiency, consolidation of existing facilities, and enable the strengthening of in-house capabilities. The new capabilities of this facility will allow for: an interdisciplinary interface science laboratory to guide and support NASA high temperature composite development; high resolution microstructural and microchemical analysis laboratories involving electron/optical characterization; and fabrication of prototype composite structural test components for application-related mechanical and rig/engine testing.

Building 49 is over 44 years old and still operates with many of the original electrical, mechanical, ventilation, and plumbing systems. The proposed modifications will increase worker safety by replacing the existing heating, ventilation, and air conditioning (HVAC) system and abate asbestos containing materials within the existing building. The proposed action is essential to increase research and testing efficiency, as well as to meet life safety requirements.

2.2 Existing Building and General Operations

Building 49 currently houses offices and various composite materials laboratories. Bench scale studies, including metallurgical and optical testing, are performed on composite materials which are in use or proposed for use. Building 49 as it exists is severely deteriorated and does not provide the environment necessary to develop advanced composites. The current facility impacts

long-term test programs by requiring continuous and costly maintenance. In addition, the building does not comply with current life safety codes, including NFPA 101 which regulates the number and location of emergency exits.

The proposed action at the CTC will consist of a complete renovation of Building 49 and construction of a new two-story addition with basement. The new addition to Building 49 will be offset 30° to the existing structure. "J" Road will be modified to only allow emergency traffic between Buildings 49 and 24. The new addition will require relocation of the existing hazardous materials storage unit and liquid nitrogen storage tank. The nitrogen storage tank will be relocated adjacent to the south side of Building 105 and the passageway between Buildings 49 and 105 and will be accessible for refilling from "J" Road. The nitrogen storage tank is also accessible from Building 49. The relocation site for the free standing hazardous storage unit will be on the northeast side of the new addition.

When this project is completed, the CTC will house elements of the Structures Division in close proximity with those of the Materials Division to further encourage and enhance joint programs. The proposed Interface Science Laboratory is an example of a joint program.

3.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section describes the proposed action and two alternatives; no action or duplication of the CTC facility at an alternate site.

3.1 Modifications and Construction of Building 49

The proposed action consists of the complete renovation and modification of the Materials and Structures Facility and construction of a two-story addition with a basement. The complete facility, Building 49 and the addition, will be designated as the CTC. Figure 1 shows the location of the proposed action at the LeRC.

The proposed layout of the CTC results in a combined total of approximately 13,900 square meters (149,500 gross square feet), 9,000 square meters (98,000 square feet) in the existing Building 49 and approximately 4,800 square meters (51,500 square feet) in the addition. The addition is designed to incorporate a continuous circulation corridor from Building 49. This will enhance flexibility during use and for the mechanical/electrical system distribution. Renovation work for the first and second floors will mostly follow the present floor plan except on the south wing of the first and second floors where existing laboratories will be converted into offices. A new exit stair tower will be added to the north wing of Building 49 to eliminate a dead-end corridor.

The proposed action includes upgrading existing electrical, plumbing, HVAC systems, and removal of asbestos containing materials. The complete renovation and construction of Building 49 will consolidate in one building, several research and testing labs. The proposed construction

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LEWIS RESEARCH CENTER
SAFETY AREAS

CLEV LAND HOPKINS INTERNATIONAL AIRPORT



BUILDING 49
AREA

NASA Lewis Research Center
Cleveland, Ohio

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CHECKED BY	SCALE NTS	DRAWING NUMBER FIGURE 1

REV	DATE	DESCRIPTION	BY	SR ENGR	DEPT MGR	PE

schedule for the CTC will permit the critical materials characterization laboratories to remain in operation during most of the construction. Construction is scheduled to begin after the final design is completed and approved. The planned construction schedule is April 1994 to June 1996.

The area for the proposed addition is currently being used as a parking lot with a two lane road, "J" Road, separating Building 49 and Building 24.

3.2 No Action

This alternative assumes the proposed action will not be performed. If this option is chosen, NASA will not eliminate current environmental and health and safety problems associated with Building 49 and its operations.

3.3 Duplication of CTC Facility at Alternate Site

This alternative assumes duplication of the operations of Building 49 and the addition, after construction and renovation, at an alternate site within the NASA LeRC border. Duplication of the CTC facility would affect the environment in the same manner or to a greater degree than the existing building. However, this alternative does not eliminate the need to perform a critical rehabilitation and upgrade of the existing systems in Building 49.

4.0 ENVIRONMENTAL IMPACT OF ALTERNATIVES

4.1 Introduction

The scope of this EA has been outlined following the NEPA, applicable NASA procedures¹, CEQ regulations, and the proposed CTC renovation Statement of Work.² This section compares the impact of the alternatives described in Section 3.0 with respect to the following issues:

- Air Quality
- Surface Water and Groundwater Quality
- Waste Generation
- Noise and Vibration
- Hazardous Substances
- Ionizing and Non-ionizing Radiation
- Endangered Species and Biotic Resources: Fish and Wildlife Resources
- Wetlands and Floodplains
- Historical and Archeological Sites
- Prime and Unique Farmlands
- Land Quality, Vicinity Land Use, Visual, and Recreational Resources
- Economic, Population, and Employment Factors
- Health and Safety

- Coastal Zone Consistency

4.2 Air Quality

The Ohio Environmental Protection Agency (OEPA) has designated areas within the state as either attainment or non-attainment for various pollutants. An attainment area for a particular pollutant is an area that meets the national primary or secondary ambient air quality standard for that pollutant. A non-attainment area is one which does not meet (or that contributes to poor ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.³ Table 4-1 summarizes Cuyahoga County's attainment and non-attainment designations for various pollutants.

TABLE 4-1 CUYAHOGA COUNTY ATTAINMENT/NON-ATTAINMENT STATUS ⁴					
	NO _x	SO ₂ ^A	PM ₁₀	OZONE	CO ^B
ATTAINMENT	X				
NON-ATTAINMENT		X	X	X	X
^A Cuyahoga County is both attainment and nonattainment areas for SO ₂ . Building 49 is in a nonattainment area of the county as of January 1994. ^B CO ₂ is in the process of being redesignated as in attainment.					

4.2.1 Modifications and Construction of Building 49

Construction activities associated with the proposed action will induce short-term impacts on air quality due to painting, paving, and grading/excavation/trenching (i.e., generation of dust) operations. Air quality will improve after completion of the proposed construction and renovation.

The CTC will include many fume hoods, but because equipment is being relocated from other NASA buildings, the proposed action will not have a significant impact on air quality for the NASA LeRC as a whole. Also, Ohio regulations do not require permits for fume hoods.⁵

Painting and paving activities will produce short-term nuisance fumes at worst. If fumes from painting become a problem at the point of painting, air exhaust fans can be used to remove foul air. Dust generation from trenching and excavation can be controlled by water spray application.

4.2.2 No Action

If no action is taken, there will be no short-term impacts on air quality from construction. This alternative is less severe than the proposed action.

4.2.3 Duplication of CTC Facility at Alternate Site

If this option is chosen there will be a greater impact on air quality than the proposed action due to the construction activities associated with an entirely new building. After construction of the duplicate CTC facility, air quality will be similar to the proposed action.

4.3 Groundwater and Surface Water Quality

Direct discharges from Building 49 may impact surface water and groundwater quality. Point sources are discharges to storm and sanitary sewers from Building 49. The sanitary sewer discharge ties into the Northeast Ohio Regional Sewer District line, which is ultimately treated at the Publicly Owned Treatment Works (POTW). Storm water runoff currently discharges into Abram Creek via National Pollution Discharge Elimination System (NPDES)-permitted outfall 008. Storm water runoff from Building 49 which is not collected in the storm sewer system is considered a non-point source which may impact both surface water and groundwater quality.

The OEPA recently completed a comprehensive study of the Rocky River and its tributaries, including Abram Creek. Table 4-2 contains the results of the study obtained upstream and downstream from outfall 008. The parameters in Table 4-2 are those which may be impacted by stormwater runoff.

TABLE 4-2 ABRAM CREEK EXISTING WATER QUALITY ⁶		
Parameter	Upstream Average	Downstream Average
pH	7.78	7.58
Dissolved Oxygen	7.5	5.4
Nitrate	5.52	4.61
Nitrite	0.73	0.76
Ammonia	0.94	2.48
Total Kjeldahl Nitrogen	1.9	3.8
Total Suspended Solids	3.9	7.2
Total Dissolve Solids	418	593
Phosphorus	0.16	0.26
Chemical Oxygen Demand	25	41

4.3.1 Modifications and Construction of Building 49

Like air quality, the impact of the proposed action on water quality is expected to be greatest during construction. Erosion of local soils and occurrences of surface water runoff may result in short-term impacts to Abram Creek and possibly the Rocky River.

Surface water runoff will be controlled using temporary diking measures. Soil erosion will be controlled by laying temporary barriers over a soils pile or delaying excavation until absolutely necessary.

The new CTC construction will include a new storm sewer and additional catch basins which will improve storm water drainage. The new sewer and catch basins will connect to an existing storm sewer. A subsurface drainage system installed for the basement perimeter walls will also improve water drainage and connect to an existing sewer. The proposed action should not impact groundwater quality as the water table is at least 25 feet below the ground surface.

4.3.2 No Action

If no action is taken, there will be no short-term impacts on water quality from construction. However, deterioration of any existing, original sewer systems will continue and result in infiltration of stormwater and soils into the sewer system. This infiltration will likely increase stormwater runoff to Abram Creek and the Rocky River and could consequently impact water quality.

4.3.3 Duplication of CTC Facility at Alternate Site

Duplication of this facility at an alternate site is expected to have a greater impact on surface water quality due to increased direct discharges over the current Building 49 discharge. Additionally, the proposed action would result in a new site providing suitable drainage. However, the larger construction site would result in more excavated soil which could be transported to surface water via stormwater run-off.

4.4 Waste Generation

Both solid and hazardous wastes are routinely generated by the operations occurring within Building 49. The solid waste fraction is comprised primarily of office wastes such as used paper, paper towels, and coffee grounds. These wastes are generally collected and transported off-site for ultimate disposal either in a landfill or incinerator. Solid waste transport and disposal is regulated by the OEPA in conjunction with the local County Health Department.⁷ NASA LeRC utilizes third-party contractors for transport and disposal services. These contractors have OEPA approval for solid waste disposal services.

Solid wastes exhibiting hazardous characteristics and listed hazardous wastes are regulated by the OEPA as hazardous wastes. OEPA regulates management of hazardous wastes, including generation, storage, transport and disposal of these wastes.⁸ Building 49 operations generate small quantities of hazardous wastes, typically in the form of empty containers which formerly held hazardous substances and spent materials (i.e., solvents). These wastes are stored in satellite collection areas near Building 49 or in laboratories in Building 49. Wastes in the satellite storage areas are collected every 30 to 60 days and stored in Building 212. Once in Building 212, wastes are consolidated, repackaged, and manifested for shipment to an off-site disposal facility.⁹

There are also special wastes that are not hazardous wastes, but which must be managed in accordance with regulations pursuant to the Toxic Substances Control Act (TSCA). The most common of these wastes are asbestos and polychlorinated biphenyls (PCBs). NASA LeRC asbestos removal requirements are listed in Section 02080 of the NASA Site Work document which references several federal publications focused on asbestos removal.¹⁰ This document includes subjects such as safety compliance, quality assurance, asbestos removal and disposal.

4.4.1 Modifications and Construction of Building 49

Solid and hazardous waste generation may increase slightly over the quantities currently generated at Building 49, as a result of consolidation of laboratory activities and researchers at the CTC. However, there will be no substantial net increase in solid and hazardous waste generation at LeRC as a result of selecting this alternative.

During construction and renovation activities, there will be a considerable amount of construction waste generated. These wastes typically include materials such as lumber, concrete, metal piping, and excavated soils. Wastes, including excavated soils, generated during the construction phase will be classified as a construction debris or a solid waste.¹¹ NASA has a soil excavation and removal policy which outlines the general procedure for handling, sampling, and disposal of soil and excavation debris.¹² Construction debris will be tested for hazardous characteristics, as appropriate, prior to being sent off-site for disposal. Soils or construction debris classified as hazardous waste will be managed in accordance with NASA LeRC hazardous waste procedures.

During modification of Building 49, asbestos containing materials will be abated. These wastes will be removed from the building and managed in compliance with 40 CFR Part 763 and NASA LeRC policies on asbestos removal and disposal, as well as Occupational Safety and Health Administration (OSHA) guidelines.

Warner/Osborn/Pardee (W/O/P) prepared a report, Soil Sampling for Addition to Material and Structures Laboratory, Building 49, which revealed the presence of Methylene Chloride at various depths (1-3 feet, 9-11 feet, and 19-21 feet) and concentrations (non-detectable to 48.40 parts per million [ppm]). Methylene chloride is a common laboratory solvent and is often

considered laboratory induced at concentrations less than 50 ppm. Due to the length of time since the W/O/P sampling, soils samples will have to be collected and analyzed again for disposal facilities before the construction project can proceed.

4.4.2 No Action

The no action alternative will result in no increase in the quantity of solid and hazardous wastes generated at Building 49. The quantity of solid waste generated will be less than the other two alternatives as there are no construction activities associated with this alternative. However, abatement of asbestos containing materials would still be necessary in the future. This alternative is less severe than the proposed action.

4.4.3 Duplication of CTC Facility at Alternate Site

As with the proposed action, solid and hazardous wastes generated during daily activities in the CTC would not increase the quantity currently generated by NASA LeRC. A new facility at an alternate site would generate approximately the same quantity of daily operational solid and hazardous waste as the proposed action. Additionally, if this alternative includes demolition of existing Building 49, there would be a substantial amount of solid, and possible hazardous, waste generated from demolition activities as well as the essential abatement of asbestos containing materials within Building 49 in the future. Construction at a completely new facility could also generate large volumes of construction soils for disposal as hazardous or solid waste.

4.5 Noise and Vibration

The daily activities planned for the CTC are primarily bench scale materials testing and research. There will be no significant noise and vibration generation by these activities. The instruments maintained within the facility will be isolated in order to prevent external noise and vibrations from affecting their use. Figure 2 shows the current noise contours in the vicinity of NASA LeRC. From the map, it is evident that the primary source of noise in the area is Cleveland Hopkins International Airport.

4.5.1 Modifications and Construction of Building 49

Construction activities will generate short-term impacts on noise and vibration. Once the project is completed, noise and vibration will decrease to current levels.

4.5.2 No Action

This option results in no noise and vibration generation. This option has a slightly lower impact than the proposed action.

Part 150 NEM Update



— CLE 1990

Scale in Feet
2000 0 2000 4000



Cleveland
Hopkins
International
Airport

CITY OF CLEVELAND

AVIATION
Consultant



Landrum+Brown
Team

FIGURE 2 February, 1991

PRELIMINARY

Current Noise
Contours - 1990

4.5.3 Duplication of CTC Facility at Alternate Site

Construction activities will generate short-term impacts on noise and vibration while building a new facility. Once the project is completed, noise and vibration will decrease to current levels. This option is similar to the proposed action.

4.6 Hazardous Substances

Hazardous substances are used in small quantities in the research laboratories at LeRC. In the case of Building 49 activities, these materials are stored (except for small quantities) in intermediate storage locations elsewhere at LeRC. Bulk materials maintained at LeRC are transported to the intermediate storage locations in quantities no greater than 4 gallons (15 liters) for a specific substance. Smaller quantities are withdrawn from the intermediate storage locations for use within the laboratories.

Material Safety Data Sheets are currently maintained in Building 49 for the hazardous substances in use at the laboratories. Personnel working with these hazardous substances participate in a Right-to-Know program, mandated by Superfund Amendment and Reauthorization Act (SARA) Title III, on an annual basis.

4.6.1 Modifications and Construction of Building 49

The quantities of hazardous substances stored at the CTC will increase slightly over current Building 49 storage practices. This local increase will result from consolidation of laboratory activities from other LeRC areas to the CTC. Overall, there will be no net increase in the quantities of hazardous materials stored at the LeRC as a result of selecting the proposed action.

During the modification and construction project, intermediate storage locations will be upgraded to include secondary containment for collection of spilled materials. Consequently, there will likely be little impact on the surrounding environment as a result of hazardous material storage.

4.6.2 No Action

There will be no substantial change in the quantities of hazardous substances utilized at Building 49 if the no action alternative is selected.

4.6.3 Duplication of CTC Facility at Alternate Site

Duplication of the CTC at an alternate site will have the same impact as the proposed action.

4.7 Ionizing and Non-ionizing Radiation

Building 49 contains radioactive material and radiation producing devices. Radioactive material includes thorium-232 used as thoriated metal alloys, an inactive cyclotron, several laboratories associated with the cyclotron, and the health physics laboratories. The former cyclotron radiochemistry laboratory includes two contaminated fume hoods which may have contaminated air ducts and filters. The cyclotron and some related areas have radioactive material as activation products from exposure to the cyclotron beam. The health physics laboratory includes sealed sources of radioactive material used for instrument calibration. There are also several X-ray diffraction units located in the building. Building 49 also contains one significant non-ionizing radiation source, a nuclear magnetic resonance unit.

4.7.1 Modifications and Construction of Building 49

There are no new radiation sources which are anticipated to move to Building 49 upon completion of the proposed action.

4.7.2 No Action

Similar to the proposed action, this option results in no additional radiation sources in Building 49.

4.7.3 Duplication of CTC Facility at Alternate Site

Construction of a new facility would require moving most of the existing radiation sources to the new site. Only the cyclotron would remain at the existing site. This option would result in no net increase in radiation sources over the proposed option.

4.8 Endangered Species and Biotic Resources: Fish and Wildlife Resources

The Upland Sandpiper is the only known endangered or protected species in the area of the NASA LeRC.¹³ No known endangered aquatic species live in the Rocky River. However, the crayfish, *Orconectes propinguus*, is classified as "Special Interest" and has been seen in the Rocky River and Abram Creek. The Big Mouth Shiner, *Notropis dorsalis*, is classified as "Threatened"¹⁴ and has been seen in the the Rocky River.

4.8.1 Modifications and Construction of Building 49

The proposed action should have no impact on endangered species and biotic resources. The addition is being constructed on an existing parking lot and will not affect any plants or animals. Building 49 is located approximately 1,000 feet (305 meters) from Abram Creek and approximately one-half mile from the Rocky River.

4.8.2 No Action

Similar to the proposed action, there should be minimal impacts, if any, on endangered species and biotic resources. Deterioration of any existing sewer systems could increase stormwater runoff to Abram Creek and the Rocky River and consequently impact water quality and any fish and wildlife resources in the area.

4.8.3 Duplication of CTC Facility at Alternate Site

Assuming duplication of the CTC facility at an alternate site at the NASA LeRC, the location could be selected to minimize any potential impact on biotic resources. This option has a similar impact as the proposed action on endangered species and biotic resources unless a previously unused site would be selected.

4.9 Wetlands and Floodplains

Wetlands are areas of land where the water table is at, near or above the land surface long enough each year to result in the formation of characteristically wet (hydric) soil types, and support growth of water-dependent (hydrophytic) vegetation. Wetlands include, but are not limited to, marshes, swamps, bogs, and other low-lying areas.¹⁵ There are no apparent wetlands within the vicinity of Building 49.

A review of Flood Insurance Rate Maps for NASA LeRC indicates that Building 49 is not in a flood hazard location.¹⁶ These maps are generated by the Federal Emergency Management Agency (FEMA) to display the zone designations for a community according to area of designated flood hazards.

4.10 Historical and Archeological Sites

Building 49 does not qualify as a historical or an archeological site; this section is not applicable.¹⁷

State Historic Preservation Office (SHPO) has been contacted by telephone.

Building 49 is located near the Zero Gravity Facility (Building 110) which is a historic place; however; the addition to Building 49 would not visually or actively impact the Zero Gravity Facility.

4.11 Prime and Unique Farmlands

There are no farmlands within the boundary of the NASA LeRC; this section is not applicable.

The Farmland Protection Policy Act is meant for the protection of unique and prime farmland and since this area is zoned commercial/industrial there is nothing unique or prime about this area.¹⁷

4.12 Land Quality, Vicinity Land Use, Visual, and Recreational Resources

The proposed site is located on the southeast side of the LeRC. Soils in the area of Building 49 are glacial deposits laid down during the Wisconsin Glacial Period.¹⁸ The bedrock underlying the site is believed to be part of the Cleveland Shale Formation. The soils are structurally capable of supporting the proposed addition.

The area of the LeRC where Building 49 is located is known as the South Area. The South Area contains 51.8 acres (21 hectares) of relatively isolated land, 48.2% of which is classified as open or undeveloped. This area is designated as containing buildings and other structures. Building 49 is surrounded by NASA LeRC buildings on the north, east, and south and by the Cleveland Hopkins International Airport on the west. There are no designated visual or recreational resources within the boundaries of the LeRC.

4.12.1 Modifications and Construction of Building 49

Selection of the proposed action will impact land quality, but there will be no substantial impact on vicinity land use, or visual and recreational resources. Major site work, including excavations, trenching, soil contouring, and construction of retaining walls will impact the land in this area. During construction, recommended drainage and compaction procedures will be followed in order to maintain the stability of soils in the area.¹⁹

4.12.2 No Action

The no action alternative will result in no impact on land quality, vicinity land use, or visual and recreation resources.

4.12.3 Duplication of CTC Facility at Alternate Site

Duplication of the CTC at an alternate site will result in greater impacts on the land use parameters than the proposed action due to the expanded area where construction will occur. The degree of the impact will depend upon the location of the alternate site.

4.13 Economic, Population, and Employment Factors

Economic, population and/or employment factors that are "interrelated with natural or physical environmental factors" can have an impact on an EA. Economic, population, or permanent employment factors associated with Building 49 relate solely to the number of NASA LeRC employees working in the building on a daily basis.

4.13.1 Modifications and Construction of Building 49

If the proposed action is chosen, approximately 75 to 100 temporary workers will be hired to perform construction and renovation. At this time, new NASA employees will not be hired to work in the CTC facility. There will be increased economic activity during the construction phase of the project. Traffic volume will increase during the time of construction.

Parking: The construction of the new building addition will mean a loss of 73 existing parking stalls east of Building 49. To provide sufficient parking for the new building addition, the existing parking lots south and southwest of Building 49 will be modified.

The existing southwest lot adjacent to Building 100, with a present capacity of 39 stalls, will be enlarged and re-lined to provide a total of 77 parking stalls. In addition, the parking lot south of Building 49 will also be extended, adding 65 stalls to its present capacity of 38 stalls, for a total of 103. Six handicapped parking stalls have been provided; three at the southwest lot and three at the south lot. This exceeds the minimum requirement of one for every 75 regular parking stalls.

Currently, the three existing lots provide 150 parking stalls. The proposed modifications outlined above will provide 180 stalls, for a net gain of 30 parking stalls.

4.13.2 No Action

If no action is taken, there will be no change in economic, population, and employment factors for the Cleveland area. As a result, the negative economic impact from no construction is more severe than the proposed action.

4.13.3 Duplication of CTC Facility at Alternate Site

In this case, the economic impacts should be greater than the proposed action. The magnitude of construction activities and costs associated with duplicating the CTC facility would be much greater than those of the proposed action. This alternative would impact economic and temporary, and possibly permanent, employment factors. Consequently, the negative impact on economy, population, and employment factors is similar or less severe than the proposed modification.

4.14 Health and Safety

Health and safety considers not only effects from use of hazardous substances within the laboratories, but also physical hazards present in the environment (*i.e.*, trip hazards, exit facilities). Worker health and safety is regulated primarily by OSHA.²⁰ However, worker protection is also addressed by regulations such as those issued pursuant to the TSCA and state Community Right-to-Know regulations.²¹

4.14.1 Modifications and Construction of Building 49

One of the purposes of the proposed modification is to increase worker safety by replacing the existing HVAC system and abate asbestos containing materials within the existing building, as well as consolidate many laboratory activities to a single building and improve life safety systems in the building. The HVAC system has the potential to allow chemical fumes to enter office space, producing unnecessary worker exposure. Consequently, the proposed action will result in a safer environment for laboratory and office personnel. In addition, the current configuration of Building 49 includes some laboratory space located in former office areas. The proposed action will provide the proper physical work space for both office and laboratory personnel. Also, life safety code concerns (*i.e.*, exit locations) will be addressed and both new and existing buildings will be equipped with sprinkler systems.

Construction contractors will be required to prepare task-specific Health and Safety Plans to protect temporary workers at the site during construction activities. Although there will be an increased concern for worker safety during construction, LeRC personnel health and safety will ultimately improve as a result of the proposed action. Although there will be an increased concern for worker safety during construction, LeRC personnel's health and safety will not be adversely affected during the construction period. The health and safety of LeRC personnel will ultimately improve as a result of the proposed action.

4.14.2 No Action

The no action alternative will allow the HVAC to continue to deteriorate, possibly resulting in a significant impact on LeRC personnel health and safety.

4.14.3 Duplication of CTC Facility at Alternate Site

This alternative will provide the same benefits to LeRC personnel as the proposed action. However, due to the increased construction time necessary to build the entire complex, there will be an increased impact on temporary worker health and safety. Existing asbestos containing materials will remain in Building 49 for future abatements.

4.15 Coastal Zone Consistency

Coastal zones include areas extending "landward only to the extent necessary to include shorelands, the uses of which have a direct and significant impact on coastal waters."²² Building 49 is not located in a coastal zone; this section is not applicable.

5.0 LIST OF AGENCIES AND INDIVIDUALS CONSULTED

TABLE 5-1 AGENCIES AND INDIVIDUALS CONSULTED		
ORGANIZATION	INDIVIDUAL(S)	INFORMATION
MK/NASA 21000 Brookpark Rd. Cleveland, OH 44135 (216) 433-2439	Elise Allen	Waste Generation, Hazardous Substances, Health and Safety
MK-Environmental 1500 West 3rd St. Cleveland, OH 44114 (216) 523-5600	Minden Hudak Lynn Rogozinski	Air Quality, Waste Generation, Hazardous Substances, Wetlands, Health and Safety
NASA Lewis Research Center 21000 Brookpark Rd. Cleveland, OH 44135	Pete Bizon Joe Morris Renee Palyo Gene Pinali Paul Weisenbach Luz Jeziorowski Rich Kalynchuk John Cooper	Waste Generation, Noise and Vibration, Hazardous Substances, Radiation, Land Quality and Use, Visual and Recreational Resources, Employment Factors, Health and Safety, Farmlands, Land Use
Cleveland Bureau of Air Pollution Control, City of Cleveland (216) 441-7444	George Young	Air Quality
The Ohio EPA Columbus, OH (614) 265-6752	Christopher Thomas	Floodplains and Coastal Zones
The Ohio EPA Columbus, OH (614) 777-6264	Chuck McKnight	Fish and Wildlife Resources
The Ohio EPA Twinsburg, OH (216) 963-1105	Steve Tuckerman	Water Resources

5.0 LIST OF AGENCIES AND INDIVIDUALS CONSULTED (continued)

TABLE 5-1 AGENCIES AND INDIVIDUALS CONSULTED		
ORGANIZATION	INDIVIDUAL(S)	INFORMATION
Cleveland Metroparks Cleveland, OH (216) 351-6300	Tom Stanley	Endangered Species
National Park Service History Division Washington, DC (202) 343-8155	Harry Butowski	Information Regarding National Historic Landmarks and the National Registry
Ohio State Historic Preservation Office Historic Preservation Div. Columbus, OH (614) 297-2470	John Rau	Information Regarding National Historic Sites

REFERENCES

1. 14 CFR Subpart 1216.3.
2. Statement of Work, Architect-Engineering Services for Preparation of Environmental Assessments for the C of F Projects: Modifications for Composite Technology Center; Rehabilitation of PSL Primary Cooler and CAEB Exhausters; Construction of Addition to Power Systems Facility (333) prepared by NASA Lewis Research Center, March 1993.
3. §107[42 USC 7407] (d).
4. Telephone discussion with George Young at the Cleveland Bureau of Air Pollution Control, City of Cleveland, Ohio.
5. Ohio Administrative Code §3745-31-03(f).
6. OEPA Study of 1993 Rocky River TSD, draft dated June 17, 1993.
7. Ohio Administrative Code §3745-29.
8. Ohio Administrative Code §3745-66.
9. Environmental Compliance Self-Evaluation for Lewis Research Center at the National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio prepared by Ebasco Services Incorporated, January 1993 (Environmental Compliance Document).
10. Site Work, Section 02080, Asbestos Removal, NASA Lewis Research Center, January 1992.
11. Soil Sampling for Addition to Materials and Structure Laboratory Building 49 prepared by Warner/Osborn/Pardee, November 1991.
12. Policy and Soil Excavation and Removal, NASA Lewis Research Center, December 26, 1990.
13. Telephone discussion with Tom Stanley at the Cleveland Metroparks Administration, Cleveland, Ohio.
14. Telephone discussion with Chuck McKnight at the Ohio EPA in Columbus.
15. Ohio Administrative Code §3645-102 (LLL).
16. Federal Insurance Flood Map
17. Per telephone discussion with Rich Kalynchuk of Bionetics at NASA Lewis Research Center.

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18. Report on Soil Conditions for Composite Technology Center Building 49 Addition, NASA - Lewis Research Center, Cleveland, Ohio prepared by David V. Lewin Corp., November 1991.
 19. Report on Soil Conditions.
 20. Regulations are found in 29 CFR 1910.
 21. Ohio Revised Code §3750.
 22. Ohio Revised Code §1506.01.