NASA Ames Research Center
Ames Environmental Procedural Requirements

Chapter 17 - Environmental Requirements for Construction Projects

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17.1 Applicability

This instruction is applicable to all civil servant and contractor employees, and tenant and partner personnel at Ames Research Center (Ames), Moffett Federal Airfield (MFA), and Crows Landing Flight Facility that handle or otherwise manage construction projects.

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17.2 Purpose

This chapter prescribes the minimum environmental requirements to be followed for all Ames construction projects to ensure that construction, demolition, and excavation practices do not pollute or otherwise damage the environment.

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17.3 Policy

It is the policy of Ames to comply with all applicable Federal, state and local regulations.

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17.4 Authority

All relevant Federal, state, and local laws and regulations related to environmental management, pollution control and prevention, and protection of natural and cultural resources including, but not limited to:

1. Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 and the Water Quality Act of 1987 (33 U.S.C. 1251 et seq.).
2. Clean Air Act, as amended by the Clean Air Act of 1977, and the Clean Air Act of 1990 (42 U.S.C. 7401 et seq.).
3. Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984 (42 U.S.C. 6901 et seq.).
4. Marine Protection, Research, and Sanctuaries Act of 1972, as amended (33 U.S.C. 1401 et seq., and 16 U.S.C. 1431 et seq.).
5. Safe Drinking Water Act, as amended (42 U.S.C. 300f et seq.).
6. Toxic Substances Control Act, as amended (15 U.S.C. 2601 et seq.).
7. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. 9601 et seq.), including the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 11001 et seq.).
8. National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347).
9. National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.).
10. Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469).
11. Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-470ll).
12. Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 et seq.).
13. Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661-666c).
14. Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901-2911).
15. Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).
16. Migratory Bird Treaty Act of 1918 (16 U.S.C. 703 et seq.).
17. Pollution Prevention Act of 1990 (42 U.S.C. 13101 et seq.).
18. Oil Pollution Act of 1990 (33 USC 2701).
19. Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451 et seq.).
20. Farmland Protection Policy Act (7 U.S.C. 4201 et seq.).
21. Federal Facility Compliance Act of 1992 (Public Law 102-386).
22. Executive Order 12088 of 1978, Federal Compliance with Pollution Standards, amended by Executive Order 12580 of October 18, 1991, Superfund Implementation.
23. Executive Order 11990 of October 13, 1978, Protection of Wetlands.
24. Executive Order 12873 of October 20, 1993, Federal Acquisition, Recycling, and Waste Prevention.
25. Executive Order 12856 of August 3, 1993, Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements.
26. Executive Order 12843 of April 21, 1993, Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances.
27. Executive Order 12902 of March 10, 1994, Energy Efficiency and Water Conservation Act.
28. Executive Order 13101, Greening the Government through Waste Prevention.
29. Executive Order 13123, Greening the Government through Energy Efficiency
30. Executive Order 13148, Greening the Government through Leadership
31. Executive Order 13150, Federal Workforce Transportation
32. Executive Memorandum of April 26, 1994, Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds. State and local laws and regulations related to pollution abatement, prevention, and control, as may be applicable to the Federal Government.

    - California Code of Regulations, Title 13 Air Resources Board.
    - California Code of Regulations, Title 22, Environmental Health.
    - California Code of Regulations, Title 23, Waters.
    - California Code of Regulations, Title 24, Energy Efficiency
    - California Code of Regulations, Title 26, Toxics.
    - California Health and Safety Code.
    - Bay Conservation and Development Commission, San Francisco Bay Plan
    - City of Sunnyvale, Sewerage System Ordinance, Municipal Code 12.
    - Palo Alto Regional Water Quality Control Plant, Sewer Use Ordinance, Chapter 16.09.
    - Rules and Regulations of the Bay Area Air Quality Management District and the San Joaquin Valley Unified Air Pollution Control District.

- Santa Clara County Hazardous Material Storage Ordinance: NS 517.31.
- Santa Clara County Toxic Gas Ordinance: NS 517.44.

33. NASA Strategy Document, Environmental Excellence for the Twenty-First Century.
34. NASA Policy Directive (NPD) 8800.16, NASA Environmental Management.
35. NPR 8580.1, Implementing the Provisions of the National Environmental Policy Act.
36. APR 8800.3, Ames Environmental Procedural Requirements.
37. Permits

    - Santa Clara County Hazardous Materials Storage: Ames currently has approximately 220 distinct storage permits.
    - Regional Water Quality Control Board Permit: Permit Number CAG612001.
    - Palo Alto Industrial Wastewater: Permit Number 96101.
    - City of Sunnyvale Industrial Wastewater: Permit Number 1132.
    - Department of Toxic Substance Control hazardous waste treatment permit, conditional authorization tier (Tiered Permitting Program).
    - Bay Area Air Quality Management District: See Chapter 8, Appendix A for most recent Air permit.

38. Federal Acquisition Regulation (FAR) Part 7, FAR Part 23, and NASA FAR Supplement Part 18-23.
39. Environmental Issues Management Plan.
40. NPD 8820.1, NASA Facility Design and Construction Sustainability Guidelines, Final Draft, March 11, 2002

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17.5 Responsibilities

17.5.1 Environmental Services Office, Code QE (Environmental Office)

1. Conduct the environmental review during project pre-construction activities and apply for the external regulatory permits, where applicable.
2. Prepare an environmental constraints report to identify the depth to groundwater, provide information on he extent and concentration of any contaminated media, and identify any groundwater monitoring and/or soil vapor extraction wells that may be impacted by the project.
3. Consult with QE Subsurface group regarding soil and groundwater investigations, if necessary.
4. Obtain and transmit information to U.S. Navy regarding the volume of contaminated media to be disturbed and he dates of proposed construction.
5. Coordinate with the Army Corps of Engineers for construction activity approval in the designated wetland areas at the Preliminary Engineering Study or Report phase. Ensure that project and construction managers are aware of areas that are classified as wetlands. Refer to Chapter 20, Floodplains and Wetlands Management, for more information.
6. Coordinate with the Bay Conservation and Development Commission for approval of projects in the coastal zone.
7. Coordinate with other appropriate agencies, such as California Department of Fish and Game, United States Fish and Wildlife Service, and the California Regional Water Quality Control Board, when natural resources will be affected.
8. Coordinate with the construction project manager to determine if pre-and /or post- construction sampling is required. The Environmental Office conduct the sampling required, if any, to determine potential fiscal impacts to the project.
9. Coordinate with the project manager regarding new equipment such as boilers, solvent degreasers, paint booths, engines, storage tans, hazardous waste treatment units, etc., that require a "permit to construct/permit to operate" prior to installation or construction. Determine additional requirements for external agency environmental permits. Prepare and submit permit applications.
10. Monitor construction activities to ensure that they will not negatively impact the environment. Monitoring may occur by conducting inspections or collecting and analyzing samples.
11. Identify operations that are not conducted as described in the approved plans and specifications and provide recommendations.
12. Conduct a review of all construction permits, plans, and specifications to ensure compliance with all applicable regulations and requirements. Conduct a review of excavation permits upon request. Attend pre-construction meetings as requested.
13. Attend Permit Review Board Meetings approve designs, and disseminate information to various compliance groups for review.
14. Review and update the Master Specifications on a periodic basis and when new regulations may impact construction practices.
15. Act as the point-of-contact for all external regulatory agency interface, correspondence, and inspections.

16. Approve the on-site "Abrasive Blasting" Permits. See Appendix A for a copy of the On-Site Abrasive Blasting Permit.

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17.5.2 Construction Project Managers

1. Implement construction requirements as prescribed by the Environmental Office through construction permitting and Environmental Specifications, Section 01500, and Ames Environmental Issues Management Plan.
2. Inform the Environmental Office of the volume of contaminated media to be disturbed and the dates of disturbance when the project occurs on Moffett Federal Airfield. If this coordination is not conducted the project may be responsible for hazardous waste disposal costs.
3. Visually inspect construction activities to ensure that they will not negatively impact the environment.
4. Provide information to the Environmental Office as requested during the construction permitting process.
5. Inform the Environmental Office of modifications to the approved plans and specifications.
6. Implement changes as requested by the Environmental Office when operations are not conducted as described in the approved plans and specifications, and are not in compliance with environmental regulations.
7. Ensure all needed permits have been acquired by the Environmental Office. For instance, new equipment such as boilers, solvent degreasers, paint booths, engines, storage tanks, hazardous waste treatment units, etc., require a "permit to construct/permit to operate" prior to installation or construction. Oil water separators, paint booths, cooling towers, etc. require a permit to discharge. Coordination with the Environmental Office is required to obtain the approvals.
8. Prior to work beginning, meet with the Contractor to discuss an environmental protection plan and to develop mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken.
9. Monitor and coordinate with the Contractor, the Federal, State and Local regulations that are to be complied with, pertaining to the environment, including but not limited to water (surface and subsurface), air, hazardous materials and waste, solid waste, and noise pollution.
10. Monitor Contractor's actions to provide environmental protective measures to control pollution that develops during normal construction practice.
11. Ensure Contractor's actions provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary features associated with the project.
12. Monitor Contractor's actions to preserve natural resources within the project boundaries and outside the limits of permanent work. Areas shall be restored to an equivalent or improved condition upon completion of work. Ensure there is no impact upon, or harm caused to any special-status bird, mammal, aquatic, insect, or plant species protected under Federal, State, or Local regulations.
13. Monitor Contractor's actions to ensure removal of traces of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess waste materials, and other signs of construction.
14. Monitor Contractor's actions to protect historical and archaeological resources. The Contractor shall carefully protect in-place and report immediately to the Construction Manager historical and archaeological items that are unexpectedly discovered.
15. Monitor Contractor's use and practice of high-noise emission products. Areas that will have noise levels above 85 dB during construction must be posted as a noise hazard area.
16. Ensure appropriate use of personal protective equipment.
17. Monitor Contractor's actions to control, manage, and dispose of hazardous materials, solid waste and hazardous waste properly. Contamination of the site shall be prevented, including other areas when handling and disposing of waste.
18. Monitor Contractor's actions to keep dust down at all times, including non-working periods.
19. Complete Abrasive Bast Permit (see Appendix A) and ensure it has been reviewed and approved by the Environmental Office.

    The use of silica sand is prohibited in abrasive blasting. Ensure proper protective measures are performed by the Contractor to confine and collect dust, abrasive agents, paint chips, and other debris. Handling and disposal of such materials, hazardous and non-hazardous, shall be conducted and managed properly.

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17.5.3 Facilities Engineering Branch, Code FEF

[redacted]

17. Coordinate any necessary contract modifications with Ames procurement office. Variations from contract requirements require approval pursuant to the Contract Clause. Variations of the contract must be reviewed to establish that variations, if incorporated, will be compatible with other environmental protection elements of the contract.
18. The Contractor shall submit the following to the Contracting Office with the contract bid (if applicable):

    - Solid waste disposal permit for the solid waste disposal facility.
    - Disposal permit for hazardous waste, including: EPA and State permits or licenses for treatment, storage, and disposal of hazardous waste by permitted facilities.
    - Environmental training documentation.

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17.6 Definitions

17.6.1 Construction Permit

A document that is signed by various internal groups to ensure that proposed construction activities meet requirements and to ensure that applicable regulatory requirements have been addressed prior to commencement of construction. The document is issued by Facilities Engineering and generally posted at the job site.

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17.6.2 Hazardous Material

As defined in Section 25501 of Chapter 6.95 of the California Health and Safety Code, any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, oil, fuel, caustic and acid cleaners, mineral spirits, petroleum distillate based solvents, oil based paints, aerosol spray paints, coolants and antifreeze, solvents and cleaners containing chlorinated compounds, hazardous substances, hazardous waste, and any material which a handler has a reasonable basis for believing it would be injurious to the health and safety of persons or harmful to the environment.

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17.6.3 Hazardous Waste

A solid waste, which because of its quantity, concentration, or physical, chemical or infectious characteristics, or regulatory listing may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. As defined in CCR title 22, Section 66261.3. Examples include waste paint, solvents, PCB transformers, contaminated soil, and oil.

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17.6.4 Industrial Wastewater

Wastewater from any maintenance, production, manufacturing, fabrication, research, development, or processing activity, where water is used to remove waste derived from non-domestic sources from processes connected to or otherwise flowing to the sanitary sewer system.

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17.6.5 Sustainability

Design and green building principles, which call for buildings that are designed, constructed, renovated, and reused in a resource and energy efficient manner.

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17.7 Environmental Requirements For Design And Construction

All construction projects shall be conducted using NASA's established specifications. The Specs-In-Tact 01500 section entitled Environmental Compliance and Pollution Prevention must be incorporated for all projects. These environmental compliance and pollution prevention and sustainability actions must be required of every project to which they apply All facilities shall be designed and constructed in accordance with the criteria and standards set forth in the authorities cited above. All facilities shall comply with local, state, and Federal regulations and codes applicable to the collection, transmission, and disposal of waterborne wastes contributing to the sanitary, storm, and industrial waste systems; to the abatement of airborne emissions; and to the handling of hazardous materials and wastes. When the possibility of an accidental release of contaminated material or waste exists, adequate safeguards shall be included in such designs. Due consideration shall be given to applicable discharge limits.

Control or treatment facilities may be required in order to prevent such accidental or normal releases. Secondary containment is required for hazardous material storage and hazardous waste accumulation areas.

The environmental impact and assessment of design, construction, and modification activities shall be evaluated in the initial planning stages. Requirements governing the preparation and review of assessments of the environmental impact of Ames activities are contained in Chapter 22, NEPA Management.

All construction projects shall be conducted using NASA's established specifications. The Specs-In-Tact 01500 section entitled Environmental Compliance Pollution Prevention must be incorporated for all projects handling hazardous materials and hazardous wastes or creating emissions into the air or water, or onto the land. These environmental compliance and pollution prevention actions must be required of every project to which they apply. Construction projects with the potential to impact protected wildlife species, wetlands, the coastal zone,

historical buildings, or archeological sites must coordinate with the Environmental Office in the early planning stages.

Among the Sustainability requirements is he requirement to utilize LEEDS (Leadership in Energy and Environmental Design Green Building System) in all building design and construction. LEEDS, developed by the U.S. Green Building Council, evaluates a building's environmental performance over its life cycle, and assigns credits to projects for satisfying a list of criteria. The system provides a definite standard for what constitutes a "green building" by awarding different levels of green building certification based on the total credits earned. Strive for the highest possible LEEDS rating in building design, and meet at least the minimum required score to achieve LEEDS Certification. For further information on sustainability requirements, including LEEDS, see the Sustainability Guidelines in Appendix C.

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17.8 Metrics

a. Percent of construction projects that obtain all appropriate permits.

   Goal: 100% of construction projects.

b. Percent of construction projects that prior to occupancy or use have complied with all permit conditions.

   Goal: 100% of construction projects.

c. Percent of plans reviewed within 2-week review period.

   Goal: 100% of plans reviewed with time period.

d. Percent of construction projects reviewed during design phase.

   Goal: 100% of projects.

17.9 Sources of Additional Information or Assistance

1. Environmental Office [redacted].
2. Specs-In-Tact Section 01500, Environmental Compliance and Pollution Prevention.
3. Environmental Resources Document

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17.10 Appendices

17.10.1 Appendix A: On-site Abrasive Blasting Permit

17.9.1 Appendix A: On-site Abrasive Blasting Permit

Instructions:

1. Complete form and submit to [redacted] or with construction permit review and approval form.
2. Please submit 10 working days prior to blasting activity.
3. Blasting activities are prohibited without prior approval from QH/QE.

ON-SITE ABRASIVE BLASTING PERMIT

Name : _____ **Code:** _____ **M/S:** _____ **Date:** _____

1. Article to be blasted:

_____

_____

2. Material to be removed (attach MSDS): _____

3. Has the material been sampled by an industrial hygienist or environmental protection specialist? _____**Yes** _____**No**

4. Has the material been analyzed by a certified analytical test method (AA or Graphite Furnace) or laboratory for (at a minimum) lead, chromium, arsenic, and mercury? _____**Yes** _____**No**

5. If yes, what are the results? (Attach analysis report if applicable.)

_____

_____

6. Blasting material to be used (attach MSDS): _____

7. Duration of blasting operation (dates and hours of operation): _____

8. Location on-site: _____

9. Contractor performing blasting operations: _____

10. Size of area needed for blasting operation (in square feet): _____

11. PPE to be worn by blasters/operators:

_____

_____

_____

_____

12. Environmental precautions implemented prior to operation: _____

_____

_____

_____

13. If lead based materials will be removed, please attach your company's lead compliance plan as defined by OSHA, and your environmental protection plan, for this operation.

Approval (Branch Chief): _____

Date:

_____

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17.10.2 Appendix B: Ames Standard Construction Specifications, Section 01500

Environmental Compliance and Pollution Prevention

Part 1 - General

1.1 Summary

A. The pollution prevention, environmental compliance, and sustainability provisions described in this section apply to all work conducted on Ames Research Center and Moffett Federal Airfield under this contract.
B. The information in this section is in addition to the requirements provided in the detailed sections.

1.2 References

A. Bay Area Air Quality Management District (BAAQMD)

BAAQMD Rules and Regulations Air Quality
BAAQMD Regulation 8, Rule 3 VOC Content, Architectural Coating Limits
BAAQMD Regulation 8, Rule 49 VOC Content, Aerosol Coatings
BAAQMD Regulation 8, Rule 51 Volatile Organic Compounds, Adhesives and Sealants
BAAQMD Regulation 8, Rule 29 Aerospace Coating Operations
BAAQMD Regulation 2 Permit Requirements
BAAQMD Regulation 11 Hazardous Air Pollutants

B. Code of Federal Regulations (CFR)

29 CFR 1910.120 Emergency Response Awareness Level/Operators Training
29 CFR 1910.1200 Hazard Communication Training
40 CFR 82 Protection of Stratospheric Ozone
40 CFR 112 Oil Pollution Prevention
40 CFR 1500 National Environmental Policy Act
40 CFR 260 Proper Management of Hazardous Waste
40 CFR 66265.16 Generator Training
49 CFR Transportation
50 CFR 402 Endangered Species Act Regulations
40 CFR Part 247 Comprehensive Procurement Guidelines
10 CFR Part 435 Energy Conservation

C. California Code of Regulations (CCR)

CCR Title 22 Section 66260,etal Hazardous Waste Management
CCR Title 22 Division 19 State Fire Marshal
CCR Title 22 Division 19.1 Office of Emergency Services
CCR Title 23 Waters
CCR Title 24, Part 6 California's Energy Efficiency Standard

D. United States Codes (USC)

16 USC 703 Migratory Bird Treaty
42 USC 6901 Resource Conservation and Recovery Act
42 USC 8251 Federal Energy Management
42 USC 13101- 13109 Pollution Prevention Act of 1990

E. NASA Policy and Plans and Executive Orders

- AHB 8800.3 Ames Environmental Handbook
- SWPP Ames Storm Water Pollution Prevention Plan
- SPCC Ames Spill Control and Countermeasures Plan
- June 20, 1990 NASA Policy on CFC and Halon Compounds
- EO 13101 Greening the Government through Waste Prevention
- EO 13123 Greening the Government through Energy Efficiency
- EO 13148 Greening the Government through Leadership
- EO 13150 Federal Workforce Transportation

F. Santa Clara County

- NS-517.31 Santa Clara County Hazardous Materials Storage Permit Ordinance
- Sunnyvale Municipal Code 12 City of Sunnyvale Waters and Sewer Ordinance
- Palo Alto Chapter 16 City of Palo Alto Sewer Use Ordinance
- CAG6 12001 General Industrial Storm Water Discharge Permit
- SCC NS-517.44 Santa Clara County Toxic Gas Ordinance

Items marked with an asterisk are available for review in the Ames Research Center Main Library, Building N202.

1.3 Submittals

The following shall be submitted in accordance with Section 01300, Submittals:

A. SD-01, Data

1. Site Inspection Checklists, every week for projects handling hazardous materials.
2. Request for Industrial Wastewater discharge form , at least 7 working days before commencement of discharge.
3. Hazardous Materials Inventories Statement (HMIS) and Material Safety Data Sheets (MSDS), at project commencement and as necessary to reflect changes in materials stored.
4. MSDSs of proposed coating and/or adhesive materials, before bringing these materials on-site.

B. SD-08, Statements

1. Hazardous Waste Disposal Subcontractors before project proposed commencement.
2. Hazardous Waste Profiles, and supporting analytical data before disposal.

C. SD-18, Records

1. Training records, before project commencement and personnel changes.
2. Records of wastewater discharges, including dates and quantities of water discharged, weekly.
3. Spill Cleanup Records, as necessary.
4. Records of solvent (paints and other organic coatings) usage, monthly.

1.4 General Responsibilities

The Contractor shall conduct project activities in a manner that protects surface/ground water and air quality, conserves resources, and minimizes the use of toxic chemicals and hazardous materials.

1.5 Definitions

A. **Hazardous Material -** As defined by Chapter 6.95 of the State of California Health and Safety Code, any material that poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Common examples are oil, fuel, caustic and acid cleaners, mineral spirits, petroleum distillate based solvents, oil based paints, aerosol spray paints, coolants and antifreeze, and solvents/cleaners containing chlorinated compounds.
B. **Solid Waste -** Includes rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, construction, and agricultural operations, and from community activities.
C. **Reclamation -** As defined by California Code of Regulations, Title 22, Section 66260.10 means that a material is processed to recover a usable product, or that it is regenerated. Examples are recovery of lead from spent batteries and regeneration of spent solvents.
D. **Hazardous Waste -** As defined in California Code of Regulation Title 22, Section 66261.3. Hazardous Waste, includes extremely hazardous waste, acutely hazardous waste, RCRA hazardous waste, non-RCRA hazardous waste and special waste. Examples include waste paint, solvents, PCB transformers, contaminated soil, and oil.
E. **Non-Sewerable -** Wastewater that contains at least one contaminant above the allowable discharge limit set by the Publicly Owned Treatment Works (POTWs) for discharge to the sanitary sewer.
F. **Recycle -** to take something that would otherwise be thrown away and make it into something that can be used again. Examples include fluorescent light tubes and cardboard boxes.
G. **Sustainability -** design and green building principles, which call for buildings that are designed, constructed, renovated, and reused in a resource and energy efficient manner.

Part 2 - Materials

2.1 AIR QUALITY

A. Construction operations and materials used on the project shall be in compliance with the Rules and Regulations for Air Quality of the Bay Area Air Quality Management District (BAAQMD).
B. Adhesives and Sealants - Adhesive and sealant products shall conform to Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 51 for Volatile Organic Compound (VOC) content - Adhesives and Sealants.
C. Architectural Coatings - Architectural coatings and paints shall conform to BAAQMD Regulation 8, Rule 3 for VOC content - Architectural Coating Limits.
D. Spray Paints - Spray paints shall conform to BAAQMD Regulation 8, Rule 49 for VOC content - Aerosol Coatings.
E. Chlorofluorocarbons (CFCs) and Other Class I Ozone Depleting Substances.

1. Class I Ozone Depleting Substances (ODS) as defined and identified herein shall not be used in the performance of this contract, nor be provided as part of the equipment. This prohibition shall prevail over any other provision, specification, drawing, or referenced documents.
2. Class I ODS is defined in Section 602(a) of the Clean Air Act and includes the following chemicals:

   a. Chlorofluorocarbon-11 (CFC-11)
   b. Chlorofluorocarbon-12 (CFC-12)
   c. Chlorofluorocarbon-13 (CFC-13)
   d. Chlorofluorocarbon-111 (CFC-111)
   e. Chlorofluorocarbon-112 (CFC-112)
   f. Chlorofluorocarbon-113 (CFC-113)
   g. Chlorofluorocarbon-114 (CFC-114)

h. Chlorofluorocarbon-115 (CFC-115)
i. Chlorofluorocarbon-211 (CFC-211)
j. Chlorofluorocarbon-212 (CFC-212)
k. Chlorofluorocarbon-213 (CFC-213)
l. Chlorofluorocarbon-214 (CFC-214)
m. Chlorofluorocarbon-215 (CFC-215)
n. Chlorofluorocarbon-216 (CFC-216)
o. Chlorofluorocarbon-217 (CFC-217)
p. Halon-1211
q. Halon-1301
r. Halon-2402
s. Carbon tetrachloride
t. Methyl chloroform.

3. Service, maintain, renovate, and demolish ODS containing equipment in accordance with 40 CFR 82. Prevent a discharge of ODS to the atmosphere. ODS recovery equipment shall meet applicable EPA requirements. Place recovered ODS in cylinders suitable for the type ODS (filled to no more than 80 percent capacity) and provide appropriate labeling. For new ODS added to existing equipment, provide the following data to Code QE, [redacted] within 48 hours of adding the new ODS: Type of ODS, quantity added, and date the work was performed.
4. The Contractor shall ensure that CFC refrigerants are recovered by a certified technician in accordance with the Final Rule of the Clean Air Act of 1990, Section 608, before the equipment is removed from Government property.
5. Aerospace Paints - All paints used on aerospace projects shall conform to BAAQMD Regulation 8, Rule 29 for VOC limits.
6. Reduce indoor levels of radon gas and formaldehyde emissions by following industry and USEPA guidelines on indoor environmental quality (see http://www.epa.gov/iaq for more information).

2.2 Storage Areas

A. Hazardous Materials Storage

1. Hazardous materials storage shall be in accordance with Santa Clara County Hazardous Materials Storage Ordinance No. NS-517.31, and the General Storm Water Permit. Hazardous materials shall be handled in manner that minimizes the potential for releases. All liquid hazardous materials must be secondarily contained. Adequate spill response equipment shall be readily available.
2. Hazardous materials and hazardous wastes shall be labeled, handled properly, and stored in secondary containment at the end of each work day. Secondary containment shall be of adequate size and compatible with the materials stored. Storage areas shall be properly labeled and secured.
3. At the beginning of the project, an accurate inventory of hazardous materials and hazardous wastes to be generated including the estimated maximum quantity of each hazardous material to be brought on-site shall be provided to the COTR. Material Safety Data Sheets (MSDSs) for hazardous materials shall be maintained by the Contractor so they are immediately available to assist emergency response personnel in the event of a hazardous materials incident.

B. Staging Area - In accordance with the Clean Water Act and Ames Storm Water Pollution Prevention Plan (SWPP), to the maximum extent practicable, the staging area must be located away from storm drain inlets, gutters, drainage ditches, and creeks.
C. Granular Material Storage - In accordance with the Clean Water Act and Ames SWPP, granular material shall be stored at least 3 meters from drainage ditches, catch basins, and curbs.
D. Refuse Bins - Refuse bins shall not be overloaded. Liquid materials shall not be placed in dumpsters or bins. Leaking dumpsters shall be replaced. Dumpsters and bins shall not be cleaned on-site. Dumpsters shall remain covered except when in use.
E. Landscaping - The Contractor shall control soil erosion and storm run-off to protect natural habitat from the project site to the satisfaction of the COTR.
F. Site Inspections - In accordance with Santa Clara County Hazardous Materials Storage Permit Ordinance No. NS-517.31 and Ames Industrial Storm Water Discharge Permit, the project site and storage areas shall be inspected weekly to ensure compliance. Compliance status shall be verified by the Contractor using the applicable portion of the checklist in Attachment A, or equal. The checklists shall be submitted to Code QE, mail stop 19-21, within 48 hours following the inspection.

2.3 Chemical Usage and Handling

A. Hazardous material shall be used only as described on the Material Safety Data Sheet. The Contractor shall wear the protective equipment recommended by the manufacturer. Containers of hazardous

materials and hazardous wastes shall be kept closed except when in use. Containers of liquid hazardous materials shall be stored in secondary containment at the end of each work shift.

B. Reclamation of Equipment Containing Hazardous Material Residues - The Contractor shall disclose to COTR the facility to which equipment containing hazardous material residues are shipped for reclamation, such as electrical wire wrapped with asbestos and electrical panels containing asbestos. The disclosure shall be documented on the Bill of Lading or by other written means.
C. Disposal of Non-Hazardous Waste Containing Hazardous Material Residue - The Contractor shall disclose to COTR the facility to which equipment containing hazardous material residues are shipped for disposal, such as steel coated with lead paint. The disclosure shall be documented on the Bill of Lading or by other written means. Supporting analytical data shall be included to document the equipment is not hazardous waste.
D. Labeling

1. Containers, drums, vessels, tanks, and associated piping containing hazardous materials shall be labeled in accordance with California Code of Regulations Title 8 Section 5194 and the most recent edition of the Uniform Fire Code.
2. Label containers with description of contents, percentages of components (if not pure), hazardous properties, name of contact person or waste generator, phone number, and date. If material is a waste, container shall have a hazardous waste accumulation label.

2.4 Sustainability

The Contractor shall conduct its activities in a manner that conserves resources and minimizes pollution in accordance with Executive Order 13101 "Greening the Government Through Waste Prevention, Recycling and Federal Acquisition," Executive Order 13123 "Greening the Government Through Efficient Energy Management," Executive Order 13148 "Greening the Government Through Leadership in Environmental Management," and the Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds.

A. Minimize the amount of energy required during construction and operation by using resource efficient construction techniques, building systems (including HVAC, heating, electrical, water, lighting, heat-pumps and boilers), insulation, fixtures, appliances, and controls.
B. Whenever possible, utilize energy efficient office equipment through the Environmental Protection Agency's Energy Star labeling program (@ http://www.epa.gov/energystar/).
C. Use automated monitors and controls for energy, water, waste, temperature, moisture, and ventilation.
D. Conserve water with systems that reduce consumption and recycle water through reclamation and treatment systems.
E. Maximize the reduction, reuse, recycling or composting of waste and scrap materials.
F. Minimize waste, spillage, pilferage, spoil, and misuse of building materials.
G. Consider adaptive reuse, rather than demolition whenever possible.
H. Follow federal Comprehensive Procurement Guidelines (@ http://www.epa.gov/epaoswer/non-hw/procure/) for building materials and products, and select materials that have a long-life cycle; select least toxic materials; select recyclable materials; select materials that are resource-efficient; select materials with the maximum recycled content; select materials harvested on a sustained yield basis; select products causing the least pollution during their manufacture, use and reuse.
I. Reduce, reuse, and recycle to minimize consumption and waste in business operations.
J. Utilize life cycle cost analysis in the development process.
K. Utilize LEEDS (Leadership in Energy and Environmental Design Green Building System) in building design and construction. LEEDS, developed by the U.S. Green Building Council, evaluates a building's environmental performance over its life cycle, and assigns credits to projects for satisfying a list of criteria. The System provides a definitive standard for what constitutes a "green building" by awarding different levels of green building certification based on the total credits earned. Strive for the highest possible LEEDS rating in building design, and meet at least the minimum required score to achieve LEEDS Certification.

Part 3 - Operations

3.1 Wastewater Discharge Permits

A. In accordance with the Clean Water Act, the City of Sunnyvale Water and Sewers Ordinance, and the City of Palo Alto Sewer Use Ordinance, a specific written Incidental Sewer Discharge permit is required before discharging wastewaters to the sanitary sewer system from project activities such as excavation

dewatering, saw cutting coolant water, cleaning operations, and decontamination water.

B. The Contractor shall complete and submit a Request for Incidental Sewer Discharge form to the COTR at least 7 work days before the planned discharged of groundwater or other wastewater. The request shall include the estimated discharge volume, discharge rate, source of the wastewater and the duration of discharge. The Government will sample the wastewater and obtain the discharge approval.

C. Wastewater Discharge

1. With the exception of groundwater from excavation, wastewater from Contractor operations shall be containerized by the Contractor until the Contractor is notified a discharge permit has been obtained.
2. The Contractor shall record and submit information specified in the discharge permit issued to the project including, but not limited to, the dates of discharge, quantity of water discharged, source of the wastewater, dates wastewater was sampled and analyzed (if required), and filtering method (if required).
3. Non-sewerable wastewater shall be disposed of by the Government in accordance with Paragraph 3.9, Government Disposal.
4. Non-sewerable wastewater shall be treated, managed, and disposed of properly by the Contractor in accordance with Paragraph 3.10, Contractor Disposal.

D. Groundwater Discharge - Groundwater from excavations shall be discharged in accordance with Section 02200, Site Preparation and Earthwork.

3.2 Training Requirements

A. All personnel shall be trained in the hazards and safe work practices for their tasks.

B. Personnel performing hazardous operations shall receive training as specified in applicable regulations.

1. Personnel handling hazardous materials shall have received Hazard Communication Training per 29 CFR 1910.1200 and CCR Title 8 Section 5194 and Emergency Response Awareness Level training per 29 CFR 1910.120. Employee training documents shall be kept at the jobsite.
2. Personnel containing spills or conducting cleanup of small spills shall have received First Responder Operators level training per 29 CFR 1910.120.
3. Personnel generating hazardous waste shall receive training on the proper management of hazardous waste per 40 CFR 66265.16 and CFR Title 22 Section 66265.16.
4. Personnel using personal protective equipment (PPE) shall receive training on its proper use per 29 CFR 1910.132

    a. Personnel handling hazardous materials shall have received Hazard Communication Training per 29 CFR 1910.1200 and CCR Title 8 Section 5194 and Emergency Response Awareness Level training per 29 CFR 1910.120. Employee training documents shall be kept at the jobsite.
    b. Personnel containing spills or conducting cleanup of small spills shall have received First Responder Operators level training per 29 CFR 1910.120.
    c. Personnel generating hazardous waste shall have receive training on the proper management of hazardous waste per 40 CFR 66265.16 and CFR Title 22 Section 66265.16.

3.3 Site Operations and Maintenance

A. Site Operations shall be conducted in accordance with the Clean Water Act and Ames Storm Water Pollution Prevention Plan.

B. Equipment Fueling and Maintenance - Equipment fluid changes and fueling shall be conducted over drip pans to prevent spilled materials from contacting the ground surface. The operator of leaking equipment shall contain and control the leak. All other maintenance and repairs of Contractor equipment is prohibited on-site.

C. Paint Clean-up

1. Painting operations must be conducted in accordance with Ames Storm Water Pollution Prevention Plan and applicable BAAQMD requirements.
2. Water Based Paints

    a. The Contractor shall paint out as much excess paint as possible from brushes, rollers, and equipment before starting clean up. Rinse brushes, rollers, and other tools over a sink that drains to the sanitary sewer using water only. Tools and equipment shall not be cleaned into streets, gutters, storm drains, or creeks. Dispose of dry brushes, rollers, rags, and drop cloths as solid waste.
    b. Disposal of containers with any liquids as a solid waste is prohibited. These materials must be used elsewhere or handled as a hazardous waste and disposed of in accordance with Paragraph 3.10, Contractor Disposal.

3. Oil Based Paints

    a. The Contractor shall paint out as much excess paint as possible from brushes, rollers, and equipment before starting clean up. Cleaning wash water shall be containerized and disposed of as hazardous waste. Reuse thinners and solvents by pouring back into original container through a filter.
    b. Dispose of waste thinners, solvents, paint sludge, and wash water from cleaning of equipment and tools as hazardous waste. Containers with residual product shall be managed as a hazardous waste and disposed of in accordance with Paragraph 3.10, Contractor Disposal.

D. Paving Operations

1. Catch basins and manholes shall be protected when paving or applying seal coat, tack coat, slurry seal, or fog seal. Sweeping or washing down excess sand (from applying sand seals or covering excess oil) into gutters, storm drains, or creeks is prohibited. Excess materials shall either be collected and returned to the stockpile or disposed of properly.
2. Paving operations shall not obscure existing utility boxes, ground water monitoring wells, manholes, valve boxes or similar features. Notify the COTR of any features potentially impacted.

E. Concrete/Asphalt Cutting and Core Drilling - The Contractor shall not allow slurry run-off from saw cutting or core drilling to enter the storm or sanitary sewer collection systems. Catch basins and drains shall be protected. The Contractor shall sweep/shovel up slurry cutting waste from work areas before leaving an area or at the end of each work day, whichever is sooner. If saw-cut slurry enters a drain, the Contractor shall remove the slurry and notify the COTR immediately.

F. Concrete Truck/Wash Out - Washing out concrete trucks or equipment into streets, gutters, storm drains, or creeks is prohibited. Trucks may be washed out on the ground surface in a location approved by the COTR.

G. Sweeping - Roadways and on-site paved areas impacted by the project shall be cleaned to the satisfaction of the COTR and swept at the end of each phase or at project completion. Hosing down paved areas and streets is prohibited.

H. Reclaimed Water - The Contractor shall use reclaimed water for dust control and other construction site operations unless an exception is granted by the COTR. Reclaimed water is available at no cost from a hydrant located on Moffett Federal Airfield approximately 100 m west of the intersection of Macon Road and Fifth Avenue.

I. Storm Drain Management

1. Catch basins near the project shall be protected to prevent debris, pollutants, sediments and releases from entering the storm drain system. Catch basins shall be inspected and cleaned out to the satisfaction of the COTR at the end of each phase or at project completion.
2. The Contractor shall control soil erosion and storm runoff from the Contractor's site to the satisfaction of the COTR.

J. Broken/Ruptured Pipes - If the Contractor breaks a utility pipe, or observes any broken or leaking pipes, it shall immediately notify the COTR. The Contractor shall immediately notify Ames Environmental Office if the pipe contained any liquid except potable water. The Contractor shall berm the area to prevent run-off from releases of non-potable water from entering the storm drain.

K. Draining, Tanks, Piping, and Equipment

1. Tanks, piping, and equipment shall be drained as required. Devices to properly contain the product shall be provided by the Contractor. Storm drains in the vicinity shall be covered during drainage operations.
2. The Government will conduct the sampling of drained fluid in order to determine disposal options unless there is sufficient generator knowledge to determine disposal options.
3. The Government will obtain the necessary sanitary sewer discharge permits if the discharge is sewerable. Non-sewerable water shall be treated to a level to allow discharge to the sanitary sewer or managed and disposed of properly.
4. Disposal of drained fluid and associated costs shall be by the Government in accordance with Paragraph 3.9, Disposal.

L. Contaminated Soil Management

1. The Contractor shall notify the COTR immediately if soil appears discolored or has an odor. The Contractor shall place suspect soil on plastic sheeting and cover with a plastic tarpaulin. The suspect soil will be tested by the Government for contamination.
2. Contaminated soil shall be transferred to a designated on-site location for disposal by the Government in accordance with Paragraph 3.9, Disposal or properly disposed of by the contractor in accordance with paragraph 3.10.

3.4 Electrical PCB Spill Clean Up

As specified in Section 16000, Electrical.

3.5 Spill Prevention, Control, and Reporting

A. All liquid petroleum products must be secondarily contained in accordance with Ames Spill Prevention Control and Countermeasures Plan and 40 CFR 112, spill clean-up materials (such as rags, absorbent booms/pads), and tools (such as shovels and brooms) shall be maintained at the project site and be readily accessible. Releases of hazardous materials to the environment shall be contained and measures implemented to prevent leaks and spills from entering storm drains. Spills of hazardous materials to unpaved surfaces in excess of 30 mL shall immediately be reported to Ames Environmental Office.
B. Dial [redacted] to request assistance of any spill by the Contractor.

3.6 Burrowing Owl Habitat

A. The Contractor shall conduct its activities in a manner that does not negatively impact fauna or flora, in accordance with 40 CFR 1500, 50 CFR 402, and Ames Environmental Handbook APG 8800.3.
B. The Contractor shall comply with the Burrowing Owl Management Policy for Ames Research Center.

3.7 Lead Abatement

As specified in Section 02090, Lead Abatement/Demolition.

3.8 Asbestos Abatement

As specified in Section 02080, Asbestos Abatement/Demolition.

3.9 Government Disposal

A. The Contractor shall label, package, and secondarily contain hazardous wastes before submitting the hazardous wastes to the Government for subsequent disposal.
B. Hazardous Waste Manifest

1. NASA Ames Research Center shall be designated as the generator on the manifest and only approved Ames Environmental Office personnel shall sign the Uniform Hazardous Waste Manifests. Contractors shall not sign hazardous waste manifests.
2. NASA Ames Research Center Environmental Office shall be designated as the emergency contact.

3.10 Contractor Disposal

A. Hazardous wastes generated by materials brought on site by the Contractor shall be properly handled, shipped, and disposed of as required by federal, state, and local regulations. No hazardous materials shall remain at the worksite upon completion of the project unless specified otherwise. The Government shall sample waste streams for purposes of waste characterization. Waste Profiles shall be submitted to the COTR. Hazardous wastes shall be disposed of at a permitted Treatment, Storage, and Disposal Facility (TSDF) authorized to accept the specific waste to be shipped. Use of deep well injection as a treatment or disposal method is prohibited.
B. Hazardous Waste Manifest

1. NASA Ames Research Center shall be designated as the generator on the manifest and only approved Ames Environmental Office personnel shall sign the Uniform Hazardous Waste Manifests. Contractors shall not sign hazardous waste manifests.
2. NASA Ames Research Center Environmental Office shall be designated as the emergency contact.
3. The Contractor shall perform disposal services in compliance with 49 CFR. The Contractor shall meet the removal and disposal time frames established by law.
4. The Contractor shall use only disposal facilities that have a valid permit to manage hazardous waste, and shall be responsible for determining that permit allows for the type of management and disposal intended for that waste. The Contractor shall be responsible for ensuring that any party handling hazardous waste, including subcontractors, transporters, and TSDFs are in compliance with applicable federal, state, and local regulations.

C. Treatment, Storage, And Disposal Facility List - The Contractor shall provide a list of storage and disposal facilities (TSDF) that perform treatment, storage, or disposal services under this contract. Each facility

shall have, as a minimum, EPA RCRA interim status or state approval as a treatment or disposal facility and be in good standing with the regulatory community. Recycling facilities shall meet applicable federal, state, and local regulations. The Contractor agrees that no facility other than those initially approved for use under this contract will be used, without first obtaining the written approval of the COTR.

D. Hazardous Waste Liability - For the purpose of this contract, the Contractor shall be responsible for any release or threatened release of the materials or substances handled under this contract, as well as any liabilities resulting or arising from or related to this contract, and shall bear all costs pertaining to such releases including, but not limited to, responses, remediation, testing, or disposal costs, and further shall defend and indemnify the Government for any costs including, but not limited to, any judgments, penalties, assessments, litigation, or attorney fees.
E. Hazardous Waste Transportation - Certified Waste Haulers shall be utilized. Government directed waste shall be transported to the disposal facility or interim storage facility without delay, in accordance with Department of Transportation (DOT) manifest regulations. The Contractor shall notify the Government if 10 days or more have a elapsed during shipment.
F. Containerized Hazardous Waste - Hazardous wastes and other materials picked up by the Contractor from other facilities may not be added to any container of Government hazardous waste.
G. Bulk Hazardous Waste - Bulk hazardous waste shipments shall be weighed to confirm shipping weight.
H. Fluorescent Light Tubes - Fluorescent light tubes removed by the Contractor shall be turned over to the Government for recycling.

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17.10.3 Appendix C: Ames Sustainability Guidelines

Sustainable Design and Operations

Sustainability is the term used to describe humanity's desire to sustain economic growth and environmental health for the long term. *Sustainable development* requires recognition that every design and operations choice has an impact on the natural and cultural resources of the local, regional and global environments. Sustainable development seeks to manage natural, economic and social systems in a fashion that enhances quality of life for current and future generations. *Sustainable design* and *green building* principles call for buildings that are designed, constructed, renovated, operated and reused in a resource and energy efficient manner.

Applicable federal and state regulatory drivers addressing sustainability include, but are not limited to:

Federal

- 42 U.S.C. 6901, Resource Conservation and Recovery Act
- 42 U.S.C. 8251 et. seq. Federal Energy Management
- 42 U.S.C. 13101 - 13109 Pollution Prevention Act of 1990
- Executive Order 13101 "Greening the Government Through Waste Prevention, Recycling and Federal Acquisition"
- Executive Order 13123 "Greening the Government Through Efficient Energy Management"
- Executive Order 13148 "Greening the Government Through Leadership in Environmental Management"
- Executive Order 13150 "Federal Workforce Transportation"
- Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds
- 40 CFR Part 247, Comprehensive Procurement Guideline
- 10 CFR Part 435, Energy Conservation Voluntary Performance Standards for New Buildings; Mandatory for Federal Buildings
- U. S. Energy Policy Act of 1992 (EPACT)

State

- California Code of Regulations Title 13, Air Resources Board
- California Code of Regulations Title 22, Environmental Health
- California Code of Regulations Title 23, Waters
- California Code of Regulations Title 24 Part 6, California's Energy Efficiency Standards for Residential and Nonresidential Buildings

- California Health and Safety Code

NASA

- NASA Strategy Document, Environmental Excellence for the 21st Century
- NPD 8500.1 "NASA Environmental Management"
- APD 8800.4 "Ames Environmental Programs"
- APG 8800.3 "Ames Environmental Procedures and Guidelines"

In particular, the following executive orders require federal facilities to apply sustainable design principles to new facility construction. EO 13123, Greening the Government Through Efficient Energy Management, directs Agencies to:

- Apply sustainable design principles to new facility construction
- Optimize energy, environmental, and life-cycle costs associated with construction, operation, and decommissioning of facilities
- Incorporate lease provisions that encourage energy and water efficiency wherever life-cycle cost-effective (including renegotiations or extension of existing leases)

- GSA Guidance on Energy, Environmental and Sustainable Design in Lease
- Acquisition issued July 18, 2000
- Mandatory for GSA; recommended for other agencies
- Available at http://www.ofee.gov/html/energy.htm

EO 13101, Greening the Government Through Waste Prevention, Recycling and Federal Acquisition, directs Agencies to:

- Use recycled content and environmentally preferable products
- Consider environmental factors in developing plans, drawings, work statements, specifications, or other product descriptions, including:

- Waste prevention;
- Recyclability;
- Use of recycled content, environmentally preferable, and biobased products;
- Life cycle cost; and
- Ultimate disposal

Design

Implement sustainable design strategies at the site and building levels of design. At the site level, adhere to all applicable laws and regulations, and develop a design that encourages resource efficiency, minimizes destruction of natural and cultural resources, and maximizes environmental health and safety. Site plans shall:

Transportation

- Facilitate and encourage alternative transportation modes, with a particular emphasis on creating a pedestrian-friendly environment through urban design, landscaping, land use, and street layout;
- Provide pedestrian and bicycle access to light rail, bus lines and CalTrain;
- Provide pedestrian and bicycle access to food vendors, shopping, banking; Provide a community infrastructure that reduces vehicle miles traveled;
- Provide bike paths to encourage the use of bicycles on the campus; provide convenient bike lockers for bicycle commuters;

Parking

- Provide priority parking spaces for carpools;
- Utilize parking decks; (Reduce land clearing and storm water runoff)
- Utilize separate parking structures at some distance from the building;

Design

- Minimize development of open space;

- Value aesthetics; (e.g. maintain attractive views and integrate natural and man-made elements)
- Incorporate the site's environmental conditions in the design solution, maximizing solar energy, utilizing natural light, and minimizing storm water runoff;
- Reduce heat islands;

Natural and Cultural Resource Protection

- Control erosion;
- Reduce, control and treat surface runoff;
- Minimize habitat disturbance; Protect sensitive habitat and threatened wildlife species; Restore sites by improving habitats for indigenous species;
- Preserve wetlands;
- Protect natural and cultural resources, including the Shenandoah Historic District, in accordance with applicable laws and consistent with NASA statutory authority;

Implementation

- Phase development to allow for the monitoring of cumulative environmental impacts of development;

Landscaping

- Adopt indigenous vegetation and wildflowers;
- Use low maintenance plants with high drought resistance;
- Conserve water; Install reclaimed water recovery system for landscape irrigation;
- Use plants as a barrier for vehicle exhaust;
- Provide opportunities for persons to enjoy the native landscaping;
- Minimize use of herbicides, pesticides, fertilizers and other chemicals;
- Compost all leave trimmings, wood fiber and cellulose;

At the **building level,** adhere to all applicable laws and regulations, and develop structures according to the Leadership in Energy and Environmental Design Green Building System (LEEDS). LEEDS, developed by the U.S. Green Building Council, evaluates a building's environmental performance over its life cycle, and assigns credits to projects for satisfying a list of criteria. The System provides a definitive standard for what constitutes a "green building" by awarding different levels of green building certification based on the total credits earned. Partners should strive for the highest possible LEEDS rating in their building design, and meet at least the minimum required score to achieve LEEDS Certification. More information on LEEDS is available at http://www.usgbc.org/programs/LEED-RSv2.0.pdf

Implementation

- Introduce sustainable strategies into the design process early. Incorporate and clearly state target requirements in the project construction documents;
- Use life-cycle cost analysis in the development process;
- Incorporate flexible design to reduce the waste generated from future remodeling;
- Provide consumer operating and maintenance information for best performance in this project through careful planning, specification, metering, job site management, and lab supervision;

Resource Efficiency

- Minimize the amount of energy required during construction and operation by using resource efficient construction techniques, building systems (including HVAC, heating, electrical, water, lighting, heat-pumps and boilers), insulation, fixtures, appliances, and controls;
- Optimize building performance and system control strategies; (e.g. occupancy sensors and air quality alarms)
- Employ solar and other renewable energy sources;
- Conserve water with systems that reduce consumption and recycle water through reclamation and treatment systems;
- Improve water quality; (e.g. eliminate lead-bearing products in potable water systems)
- Maximize the reduction, reuse, recycling, or composting of waste and scrap materials;
- Minimize waste, spillage, pilferage, spoil and misuse of building materials;
- Consider adaptive reuse, rather than demolition whenever possible.
- Reuse or recycle demolished building materials whenever possible.

- Establish waste treatment and recycling centers;

Procurement

- Follow federal Comprehensive Procurement Guidelines (@http://www.epa.gov/epaoswer/non-hw/procure/) for building materials and products, and select materials that have a long-life cycle; select least toxic materials; select recyclable materials; select materials that are resource-efficient; select materials with the maximum recycled content; select materials harvested on a sustained yield basis; select products causing the least pollution during their manufacture, use and reuse;
- Give preference to locally produced products and other products with low embodied energy content;
- Provide contractors with information about the Comprehensive Procurement Guidelines (@http://www.epa.gov/epaoswer/non-hw/procure/) and require adherence with guidelines in all contracts;

Indoor Environmental Quality

- Supply adequate levels of ventilation and outside air;
- Provide a healthy environment by reducing or eliminating the use or release of toxins and pollutants during building construction or operation;
- Use low VOC paints, sealants, adhesives and other materials;
- Reduce indoor levels of Radon gas and formaldehyde emissions by following industry and USEPA guidelines on indoor environmental quality;
- Provide thermal comfort with a maximum degree of personal control over temperature and humidity;
- Control noise through sound absorbing material and equipment isolation;
- Control disturbing odors through contaminant isolation and careful selection of cleaning products;
- Enhance lighting quality by integrating natural and artificial lighting;

Transportation

- Install showers for use by bikers and walkers.

Operations

Sustainability also applies to NASA Ames and its Partners' business operations. Partners shall conform to all applicable laws and regulations regarding sustainability in their business operations.

Resource Efficiency

- Reduce, reuse, and recycle to minimize consumption and waste in business operations;
- Whenever possible, utilize energy efficient office equipment through the Environmental Protection Agency's Energy Star labeling program @ http://www.epa.gov/energystar/;
- Purchase cleaning products and supplies that are resource-efficient, durable and non-toxic;
- Use automated monitors and controls for energy, water, waste, temperature, moisture, and ventilation;
- Establish a recycling/waste management plan that seeks to eliminate disposal off-site;
- Minimize travel by supporting telecommuting programs and enabling teleconferencing;

Procurement

- Adhere to federal Comprehensive Procurement Guidelines (@http://www.epa.gov/epaoswer/non-hw/procure/) when acquiring products; select materials that have a long-life cycle; select least toxic materials; select recyclable materials; select materials that are resource-efficient; select materials with the maximum recycled content; select materials harvested on a sustained yield basis; select products causing the least pollution during their manufacture, use and reuse;
- Give preference to locally produced products and other products with low embodied energy content;

Transportation

- Provide employees with incentives or means to bicycle, ride-share, vanpool, take transit, or commute to work through another means besides a single-occupancy vehicle.
- Coordinate with ACAP (Ames' Commute Alternatives Program @ http://code.arc.nasa.gov/jf/acap); Provide bikes for employees to commute across campus;

Education

- Train building occupants, facilities managers and maintenance crews in sustainable building concepts and requirements
- Maintain educational programs to reinforce staff's commitment to resource conservation in all areas of operations, including maintenance, landscaping, and, recycling of office and program generated refuse.

For more information:

- See the Whole Building Design Guide at http://www.wbdg.org
- See Greening Federal Facilities: An Energy, Environmental and Economic Resource Guide for Federal Facility Managers at http://www.eren.doe.gov/femp/greenfed

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