



Rolls-Royce Center of Excellence

Environmental Assessment

June 2005





**ENVIRONMENTAL ASSESSMENT
FOR THE ROLLS-ROYCE CENTER OF EXCELLENCE**

**JOHN C. STENNIS SPACE CENTER
HANCOCK COUNTY, MISSISSIPPI**

Lead Agency: National Aeronautics and Space Administration, John C. Stennis Space Center

Proposed Action: The proposed action requiring this environmental assessment is to modify an existing test stand facility for commercial gas turbine engine testing including performance, fan behavior, thrust reverser operation, and noise.

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Abstract: Rolls-Royce North America intends to modify the existing John C. Stennis Space Center H-1 Test Stand for testing gas turbine engines including performance, fan behavior, thrust reverser operation, and noise. The proposed action would provide Rolls-Royce North America with the capability and a facility to test their engines in the United States. Environmental impacts would include air emissions and noise, and potential impacts would include wastewater generation, solid and hazardous waste generation, and storm water runoff. The alternative considered is the "No Action Alternative".

Executive Summary

Rolls-Royce North America plans to modify the H-1 Test Stand, an existing, unused horizontal rocket engine test site at the John C. Stennis Space Center. The site is located on the southeast side of the Fee Area, approximately 762 meters (2,500 feet) northeast of the Main Canal. The modified test stand site would be used for research into gas turbine engine performance, fan behavior, thrust reverser operation, and noise. The new test site is needed to provide Rolls-Royce North America with the capabilities and facilities to test their manufactured engines within the United States.

The alternative considered is the "No Action Alternative." The "No Action Alternative" would have no environmental impact.

Environmental impacts for this project would include air emissions and noise, and potential impacts would include wastewater generation, solid and hazardous waste generation, and storm water runoff. Other aspects that require consideration are energy conservation, water conservation, native plant landscaping, and the purchase of materials under comprehensive procurement guidelines for using materials with recycled content.

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Acronyms/Abbreviations/Unit Conversions

BNOI	Baseline Notice of Intent
CFR	Code of Federal Regulations
CNOI	Construction Notice of Intent
COE	U.S. Army Corps of Engineers
dBA	decibels on the A-weighted scale
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
MDEQ	Mississippi Department of Environmental Quality
mg/L	milligrams per liter
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NO _x	nitrogen oxides
OSHA	Occupational Safety and Health Administration
pH	measure of acidity/alkalinity
PM ₁₀	particulate matter less than 10 microns
ppm	parts per million
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
SIC	Standard Industrial Classification
SSC	Stennis Space Center
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey

1.0 Purpose and Need

The National Aeronautics and Space Administration (NASA) John C. Stennis Space Center (SSC) is located near the Gulf of Mexico in western Hancock County, Mississippi, approximately 89 kilometers (55 miles) northeast of New Orleans, Louisiana and approximately 48 kilometers (30 miles) west of Biloxi/Gulfport, Mississippi. The facility is situated at latitude 30° 22' 48" N and longitude 89° 36' 0" W at its center point. In May 1962, the U.S. Army Corps of Engineers acquired approximately 56 square kilometers (13,800 acres) of land for NASA, now known as the "Fee Area," that is currently within the SSC security gates. The Fee Area is used by NASA along with numerous federal and state agencies for administrative, research, remote sensing and propulsion testing facilities.

Rocket testing operations necessitated the development of a "Buffer Zone" for safety and acoustic considerations so the U.S. Army Corps of Engineers acquired 506 square kilometers (125,001 acres) for NASA extending six miles in all directions of the Fee Area as a perpetual restrictive easement. The majority of the Buffer Zone is located in Hancock County, Mississippi, although portions extend into Pearl River County, Mississippi and St. Tammany Parish, Louisiana (Figure 1).

In 1996, NASA constructed the H-1 Test Stand on approximately 24 hectares (60-acres) located within the SSC on the southeast side of the Fee Area. This facility was constructed to test advanced solid rocket engines horizontally. The test program was cancelled before the facility was used, however, the H-1 Test Stand construction was substantially completed.

Rolls-Royce North America (Rolls-Royce) proposes to lease approximately 8 hectares (20 acres) of the H-1 Test Stand site and modify the existing test stand site into their new outdoor Center of Excellence for researching gas turbine engine performance, fan behavior, thrust reverser operation and noise. Rolls-Royce does not currently have a facility in the United States with the capabilities of testing all of the engines that they manufacture.

Since the H-1 Test Stand site was designed and constructed as a rocket engine test facility, it would be an ideal location for the proposed Center of Excellence for gas turbine engine testing.

This environmental assessment (EA) of the proposed project has been conducted in accordance with National Environmental Policy Act (NEPA) requirements, the Council

of Environmental Quality Regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and NASA's policies and procedures (14 CFR 1216.7). Information for this assessment was obtained from the NASA SSC and previous Environmental Impact Statements (EIS) and EA documents conducted for the SSC.

2.0 Description of Proposed Action and Alternatives

Rolls-Royce is proposing to construct a new outdoor Center of Excellence for research into gas turbine engine performance, thrust reverser operation, fan behavior, and noise. Approximately 8 hectares (20 acres) of the existing H-1 Test Stand site would be modified and reconfigured for gas turbine engine testing. The proposed gas turbine engine test facility would be constructed within the existing H-1 Test Stand footprint, and no previously undisturbed land would be impacted. A concept drawing of the proposed facility is provided in Figure 2.

At the Center of Excellence, Rolls-Royce would test the following engines and other engines as needed:

- Tay Engine Variants
- Trent 500, 700, 800, 900 & 1000 Variants
- BR 710 and 715 Variants
- V2500 Variants
- AE Engines

Modification of the existing H-1 Test Stand site would include the construction of a test bed, Test Bed #1, for cross wind testing, thrust reverser testing, noise performance and periodic ingestion testing. The design of Test Bed #1 would be a combination of two test beds currently used at other Rolls-Royce test sites. The test bed structure would be composed of a cantilever design with a vertical support column supporting a horizontal arm. The engine to be tested would be lifted by a hydraulic hoisting system and secured to a thrust frame assembly that is bolted to the arm.

Construction of the proposed project would require about 20 temporary employees through local construction contractors. During operations, the Center of Excellence would require three permanent employees and approximately 18 additional employees during engine testing.

During the planning process of this project, no other alternatives were considered since the H-1 Test Stand site is an existing facility constructed for similar testing. Construction of a new test site on undisturbed land would have greater environmental impacts.

Inclusion of the "No Action Alternative" is prescribed by the Council on Environmental Quality guidelines implementing the National Environmental Policy Act. The "No Action Alternative" provides the benchmark against which the proposed actions are evaluated.

3.0 Existing Environment and Environmental Consequences of Alternatives

There would be limited environmental impact as a result of the proposed project at the SSC. The following sections describe the existing environmental conditions at SSC and the possible impacts that could occur during construction and operation of the proposed gas turbine engine test facility. The most notable impacts from construction would be short-term fugitive emissions, short-term intermittent noise, waste generation, and construction storm water runoff potentially laden with sediments. Operational impacts would include intermittent noise during engine testing, wastewater generation, solid and hazardous waste generation, and potentially contaminated storm water runoff associated with the proposed project.

3.1 Air Quality

The SSC is located in a rural area for air quality and is most likely to remain rural due to NASA's restrictive easement surrounding the facility. The ambient air quality of Hancock, Harrison, and Jackson counties is considered to be in attainment of the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants (PM₁₀, ozone, carbon monoxide, sulfur dioxide, nitrogen oxides, and lead).

Air emissions expected from the construction of the proposed project include short-term fugitive air emissions from construction activities. Dust from the site would be controlled with water spray to minimize fugitive air emissions.

Gas turbine engine testing operations would generate air emissions from fuel burning, primarily nitrogen oxides (NO_x). The proposed facility would be classified as a major source of emissions (greater than 100 tons per year) by the Mississippi Department of Environmental Quality (MDEQ) and would require a Title V air permit. Rolls-Royce

would prepare and submit a Title V air permit application to the MDEQ prior to construction of the proposed facility. The proposed facility would be permitted as a separate, independent operation from the SSC. Discussions with the MDEQ were held regarding the proposed gas turbine engine test facility and the MDEQ agreed with the proposed permitting approach.

The proposed facility's potential-to-emit NOx emission rate would be limited below 250 tons per year through permit conditions. Therefore, the proposed facility would not be subject to Prevention of Significant Deterioration (PSD) requirements. Actual NOx emissions from the proposed facility are expected to be about 175 to 200 tons per year. Limited air quality impacts are predicted from the operation of the proposed facility.

The "No Action Alternative" would result in no increase of air emissions and no additional impact on air quality.

3.2 Noise

The SSC is surrounded by an acoustic Buffer Zone, which would minimize the impact of the noise and vibration generated by gas turbine engine testing.

Noise will be generated during construction of the proposed gas turbine engine test facility. Construction activity noise would only have a short-term intermittent impact.

Rolls-Royce has estimated that the maximum noise level during operation would be 90 decibels on the A-weighted scale (dBA) from gas turbine engine testing at the proposed test site. The projected maximum noise levels generated during turbine engine testing are shown on Figure 3. The highest noise levels would occur primarily within the Fee Area, with lower noise levels, less than 80 dBA, extending into, the Buffer Zone. Noise from turbine engine testing is not expected to have significant impacts outside the Fee Area. Rolls-Royce has estimated that the noise level would be above the OSHA standard near the engine testing arena, therefore employees working outdoors near the engine arena during testing would be required to use hearing protection.

The "No Action Alternative" would result in no additional noise.

3.2 Water Quality

Background surface water quality information in the SSC area is limited; however, discharge stations are maintained by the U.S. Geological Survey (USGS) on the Pearl River approximately 40 kilometers (25 miles) northwest of the SSC. A USGS monitoring station on the West Pearl River also measures flow and is located approximately seven miles west of SSC. The surface waters in the streams of the area are generally suitable for most uses. USGS analyses indicate that the water in freshwater streams is generally soft and slightly acidic (5.0 to 7.0 pH units), with low concentrations of dissolved solids. Dissolved solids concentrations are less than 100 mg/L and hardness is usually less than 50 mg/L. Amounts of dissolved oxygen are usually greater than 4 mg/L. Dissolved solids concentrations increase in the Pearl and Jourdan Rivers with the movement of saltwater during high tide.

Water quality at SSC is similar to the regional surface water quality with the following exceptions: (1) Water is slightly alkaline in the SSC Access Canal, between 7.0 and 8.0 pH units, and (2) Dissolved solids concentrations range between 60 and 120 mg/L.

Construction activities from the proposed project would potentially impact storm water runoff and therefore, would require coverage under the Mississippi General Construction Storm Water Permit No. MSR10000. Rolls-Royce would submit a Construction Notice of Intent (CNOI) to the MDEQ at least 30 days prior to construction and would prepare and implement a Storm Water Pollution Prevention Plan in accordance with the general permit and good engineering practices. Storm water runoff and erosion control would be accomplished by the use of hay bale barriers, silt fences, and good housekeeping practices. Any area disturbed during construction would be graded to drain and seeded with indigenous grasses upon completion of construction. Inspections would be performed weekly to verify that control devices are properly located and maintained.

The proposed gas turbine engine test facility would be classified as Standard Industrial Classification (SIC) Code 3724, Aircraft Engines and Engine Parts, therefore storm water discharges from the proposed test facility would require coverage under the Mississippi Baseline Industrial Storm Water Permit. Rolls-Royce would submit a Baseline Notice of Intent (BNOI) to the MDEQ for authorization. Storm water from the test arena will discharge through the existing outfall at the H-1 Test Stand site. The proposed facility would be permitted as a separate, independent operation from the SSC.

The proposed gas turbine engine test facility would be connected to the SSC's existing sanitary sewer and treatment system that discharges to Outfall 001/Lagoon 1. Sewage treatment at SSC is accomplished by the use of artificial wetlands (lagoon system) utilizing aquatic plants. The system is permitted by the MDEQ under the National Pollutant Discharge Elimination System (NPDES) Permit No. MS0021610. No adverse impact is expected from the increased sanitary flow into the SSC treatment system or resulting treated discharges.

Gas turbine engine testing operations would generate wastewater from the test bed engine washing. This wastewater would be collected in drums for offsite disposal and would not be discharged to any waterbody in the SCC area. Rolls-Royce would have the wastewater transported offsite for disposal at a permitted waste disposal or treatment facility.

An aboveground diesel tank and a single fuel storage facility containing jet fuels, such as Jet-A, JP-4, JP-10, and others, would be located on site. The diesel tank would have a capacity of 3,785 liters (1,000 gallons) and would be used for general-purpose requirements. The fuel storage facility would consist of a 299,805 liter (79,200 gallon) bulk storage tank and a 54,548 liter (14,410 gallon) day tank. Fuel would be pumped from the bulk storage tank to a day tank, then to the test bed during gas turbine engine testing. All aboveground storage tanks and loading/unloading areas will be equipped with secondary containment capable of containing the entire contents of the largest tank plus sufficient freeboard for precipitation. The SSC's existing Spill Prevention Control and Countermeasure (SPCC) Plan would be updated to reflect the new storage tanks associated with the proposed project. Rolls-Royce would implement the prevention and control measures in the SSC's SPCC plan.

There would be no change to existing SCC water quality if the "No Action Alternative" was implemented.

3.4 Groundwater Resources

Several aquifers can be traced through Hancock County, Mississippi. The area is underlain by fresh water bearing, southward-tipping sands of the Miocene and Pliocene ages. Within these fresh water-bearing sands, one unconfined aquifer is found near the surface with ten or more confined aquifers at a greater depth. The fresh water-bearing zone is 600 to 900 meters (2,000 to 3,000 feet) thick in this area. Individual aquifers range from 30 to 140 meters (100 to 450 feet) in thickness, with most measurements



closer to 30 meters (98 feet). Groundwater at the SSC is soft, containing sodium bicarbonate and exhibiting a high pH (above 8). Concentrations of chlorides range from 13 to 16 ppm and iron content is less than 0.3 ppm. Solids content does not exceed 315 ppm. The aquifers have plentiful, almost untapped supplies of fresh water.

Potable water at SSC is supplied from three deep wells on site. This water is used for drinking, sanitation, and fire protection.

The proposed gas turbine engine test facility would not significantly increase the present amount of potable water usage. Demineralized water will be used for engine intake ingestion tests and compressor washing. The demineralized water would be brought in by road tanker and therefore, would not have any impacts to groundwater usage during construction and operation.

The “No Action Alternative” would have no change to groundwater usage.

3.5 Wetland and Flood Plains



Wetlands occur on portions of the SSC and are under the jurisdiction of the Vicksburg District, U.S. Army Corps of Engineers (COE). The SSC has a District General Permit from the Vicksburg District, which includes provisions for providing compensatory mitigation for unavoidable wetland losses within either the Fee Area or the Buffer Zone. The majority of undeveloped land at the SSC would likely meet the criteria for federal jurisdiction as wetlands, and the drainage ditches along the major roads likely would be considered waters of the United States.

The development of the gas turbine engine test facility would not involve use of undeveloped land at the H-1 Test Stand. For the construction of the Center of Excellence, Rolls-Royce would primarily use non-wetland designated areas. However, there may be minimal impact to wetlands associated with the clearing of pine tress. If wetland impact is determined, Rolls-Royce would seek mitigation through the SCC’s on-site Mitigation Plan, as necessary. Therefore, construction and operation of the proposed project would have minimal impact to jurisdictional wetlands. The proposed project would not be located in a flood plain.

The “No Action Alternative” would not impact jurisdictional wetlands or flood plains.

3.6 Biotic Resources

Pine Flatwoods account for the majority of the vegetation in the undeveloped portions of SSC and in the surrounding Buffer Zone. The dominant species in this community is slash pine (*Pinus elliottii*) interspersed with some cypress (*Taxodium distichum*), sweet bay (*Magnolia virginiana*) and black gum (*Nyssa sylvatica*). The under-story in this community includes red maple (*Acer Rubrum*), magnolia (*Magnolia gradiflora*), smaller cypress (*Taxodium distichum*), sweet bay (*Magnolia virginiana*) and black gum (*Nyssa sylvatica*) trees.

The proposed project would be developed at the existing H-1 Test Stand site. The proposed area of development is previously cleared forest; therefore there would be minimal impact on vegetation from the construction and operation of the proposed project.

The "No Action Alternative" would not impact biotic resources.

3.7 Threatened and Endangered Species

Threatened and endangered species that are suspected to have ranges or suitable habitats that include the SSC Fee Area are the eastern indigo snake (*Drymarchon corais couperi*), gopher tortoise (*Gopherus polyphemus*), American Peregrine Falcon (*Falco peregrinus*), Red-cockaded woodpecker (*Picoides borealis*), Louisiana black bear (*Ursus americanus luteolus*) and Louisiana quillwort (*Isoetes louisianensis*). The SSC Fee Area has been surveyed for the presence of these species on several occasions. The most recent faunal study was completed in 1998 by Dr. E.D. Keiser and Dr. P.K. Lago entitled "Survey for Five Endangered Animal Species at the Stennis Space Center, Hancock County, Mississippi." The study found no indications of the occurrence of indigo snakes, red-cockaded woodpeckers, peregrine falcons or black bear. One abandoned burrow was found that may have been dug by a gopher tortoise, but no individuals were sighted. Dr. Jean Wooten has completed several vegetation surveys within the SSC Fee Area and has not found any species of quillwort present.

The U.S. Fish and Wildlife Service (USFWS) concurs with the opinions of Keiser, Lago and Wooten in a letter to NASA, February 1999, although they request a visual survey for federally listed species be conducted prior to any earth or vegetation disturbance.

The proposed gas turbine engine test facility would be constructed within an existing facility, which is previously disturbed land. Visual surveys were conducted of the H-1 Test Stand area and there is no evidence of the presence of federally listed species. Additionally, no habitat impacts would result from the construction and operation of the proposed project.

The "No Action Alternative" would not impact threatened and endangered species or habitat.

3.8 Archaeological Resources

Historically, the land at SSC has been severely disturbed by timber and the associated naval stores industry during the late nineteenth and early twentieth centuries. More recently, the land was disturbed by the construction of the SSC facility during the 1960's, making it unlikely that undisturbed archaeological sites would be found. In the Fee Area, only the townsite of Gainesville may require future archaeological considerations.

The proposed project would not be located near the Gainesville townsite and would be located on previously disturbed land at the H-1 Test Stand. There would be no anticipated archaeological impacts resulting from this project. If items of potential archaeological interest are uncovered during construction, construction in the immediate area would cease until the Section 106 requirements of the National Historic Preservation Act have been satisfied.

The "No Action Alternative" would have no impact to archaeological resources.

3.9 Cultural and Historical Resources

The A-1, A-2, and B-1/B-2 Test Stands at SSC have been designated as National Historic Landmarks and appear on the National Register of Historic Places. These test stands and associated control centers have been so designated because of the testing of Saturn rockets and the importance of the Saturn rocket in landing men on the moon.

The H-1 Test Stand, where the Rolls Royce Center of Excellence would be located, has not been considered for listing in the National Register of Historic Places since it is not a structure that was part of NASA's Man in Space program. The H-1 Test Stand is approximately 2.7 kilometers (1.7 miles) from the A-1 Test Stand, 2.2 kilometers (1.4

miles) from the A-2 Test Stand and 1.3 kilometers (0.83 miles) from the B1/B2 Test Stand. The proposed project construction and operation would not alter the historical attributes of the test stands or affect their status as National Historic Landmarks.

The "No Action Alternative" would not impact cultural and historical resources.

3.10 Transportation

Interstates 10 and 59 (I-10 and I-59), U.S. Highway 90, and Mississippi 607 serve the SSC area. Direct access to and through SSC from I-10 and I-59 is provided by Mississippi Highway 607. Highway 607 also connects with U.S. Highway 90 approximately 13.5 kilometers (9 miles) southeast of SSC.

Existing area highways and SSC roads would be used to transport equipment and materials for construction for the proposed project. No road improvements or new road construction would be required. Traffic congestion would not be significantly increased from the construction and operation of the proposed gas turbine engine test facility.

The "No Action Alternative" would not impact transportation in the area.

3.11 Waste Generation and Treatment

Solid and hazardous wastes would be generated from the construction and operation of the proposed gas turbine engine test facility. During the construction of the proposed project, construction waste, rubble, and debris would be disposed of in the SSC Class I permitted solid waste landfill or other approved landfills. Unacceptable wastes, such as hazardous waste, paint products, and solvents are excluded from disposal in SSC's landfill and would be shipped offsite to preapproved and permitted facilities for appropriate treatment or disposal by Rolls-Royce.

During operation of the proposed gas turbine engine test facility, Rolls-Royce would generate small amounts of solid and hazardous waste from maintenance activities. The solid waste generated would consist of household-type wastes and non-hazardous industrial waste. Solid waste would be disposed of at the SSC's on-site state permitted solid waste landfill or other approved landfills.

All of the waste fuel generated at the Center of Excellence from gas turbine engine testing would be recycled using the resources available in the area. The hazardous substances that would be used by the proposed project include aviation fuels, hydraulic fluid, engine oil, turbine oil, jet oil, inhibiting oil, antifreeze, and diesel fuel. Based on current available information, it is expected that the proposed gas turbine engine test facility would be considered a conditionally exempt small quantity generator under the Resource Conservation and Recovery Act (RCRA) and by the MDEQ. Rolls-Royce would obtain a generator ID from EPA as required.

SSC is committed to pollution prevention, including recycling and reuse activities to achieve waste minimization goals. SSC maintains ongoing recycling programs and identifies less hazardous substitutes for hazardous materials. Rolls-Royce would implement and comply with the SSC's pollution prevention and recycling programs. Recycling collection areas would be established in the new facility for paper, cardboard, aluminum cans and plastic bottles.

The "No Action Alternative" would not result in generation of solid or hazardous waste.

3.12 Socioeconomics

Construction of the proposed project would require temporary employment of approximately 20 employees, which would be obtained through local construction contractors. The proposed gas turbine engine test facility would require three permanent employees for daily operations. During engine testing periods, approximately 18 additional employees would be required. The additional employees would consist of 12 individuals from NASA services local contractor and up to six Rolls-Royce specialists.

The "No Action Alternative" would result in no temporary or permanent employment opportunities.

3.13 Public and Employee Health and Safety

Rolls-Royce would adhere to Occupational, Health, and Safety Administration (OSHA) standards for protection of employees onsite and the SSC's Safety and Health Procedures Guidelines, which detail specific emergency procedures for responding to natural and human-generated emergencies. At the SSC, procedures are in place to

monitor and protect employees as necessary during construction. Rolls-Royce would attend the SCC's ongoing training programs to ensure emergency preparedness.

3.14 Pollution Prevention and Environmental Justice

In accordance with Executive Order (EO) 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements," SSC has written a pollution prevention strategy into the *Pollution Prevention Plan*. This plan encourages elimination or reduction of the use and purchase of toxic chemicals, energy efficiency, solid waste reduction and recycling, water conservation, hazardous waste minimization, and oil spill prevention. Rolls-Royce would implement their own pollution prevention plan or adhere to the SCC's *Pollution Prevention Plan*.

In accordance with EO 13101, "Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition," SSC prevents pollution by recycling and reusing material whenever possible. Additionally, SSC complies with federal policies for acquisition and use of environmentally preferable products by purchasing items made from recycled materials such as carpet, insulation, and concrete. Rolls-Royce would be encouraged to adhere to the recycling/reuse program in place at the SSC.

In accordance with EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations," SSC considers environmental justice issues during program and project planning consistent with the SSC *Environmental Justice Strategy*. Any disproportionately high and adverse effects of proposed programs at SSC on minority or low income populations would be identified and action would be taken to resolve public concern. Because of the size of the SSC Buffer Zone surrounding the Fee Area, there are no environmental justice concerns associated with this proposed project.

4.0 Agencies and Individuals Consulted

The Mississippi Department of Environmental Quality (MDEQ) was consulted regarding air emissions and permitting, storm water runoff and permitting, and solid and hazardous waste generation from the proposed project. Information on environmental concerns from agencies and individuals on SSC activities has been addressed in previous environmental assessments and environmental impact statements. No new impacts have been identified for modifications to the H-1 Test



Stand by Rolls-Royce for their proposed gas turbine engine test facility that require such consultations.



5.0 List of Preparers

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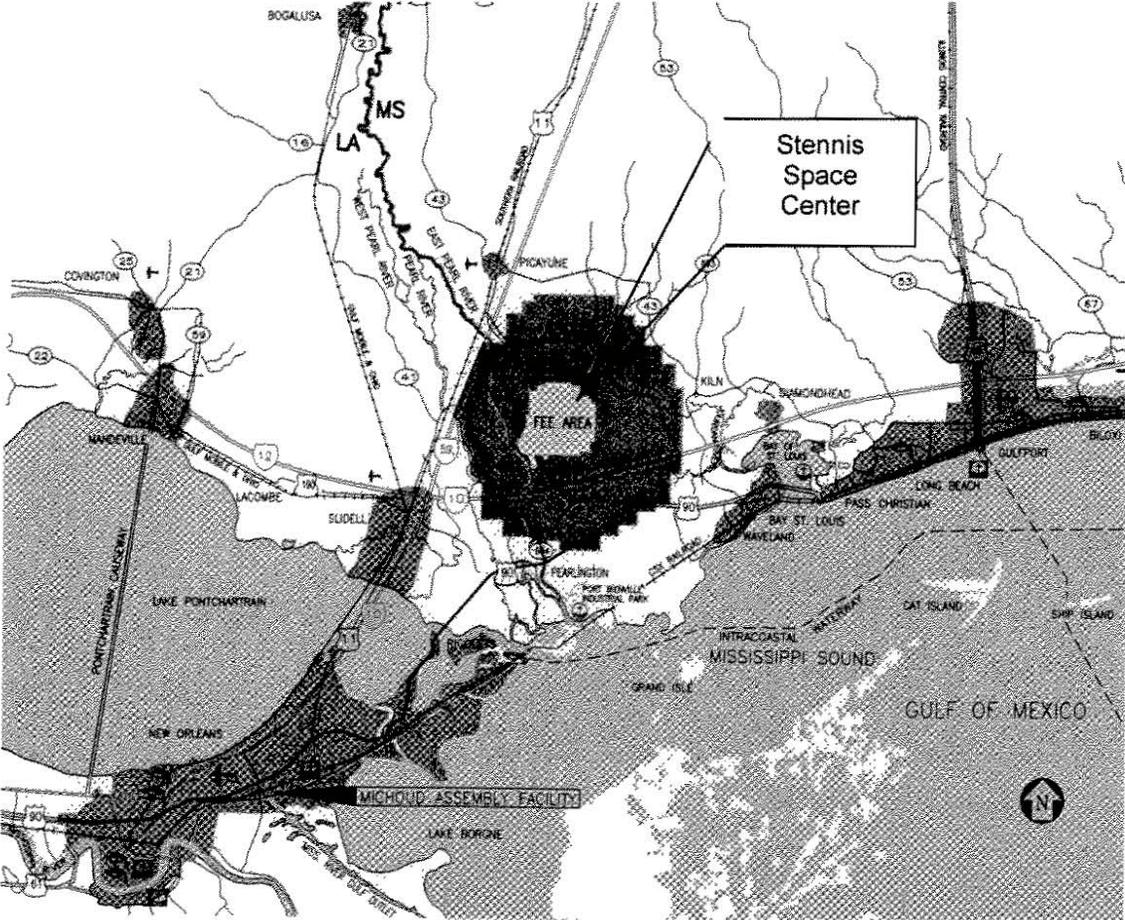


Figure 1
Stennis Space Center Location Map

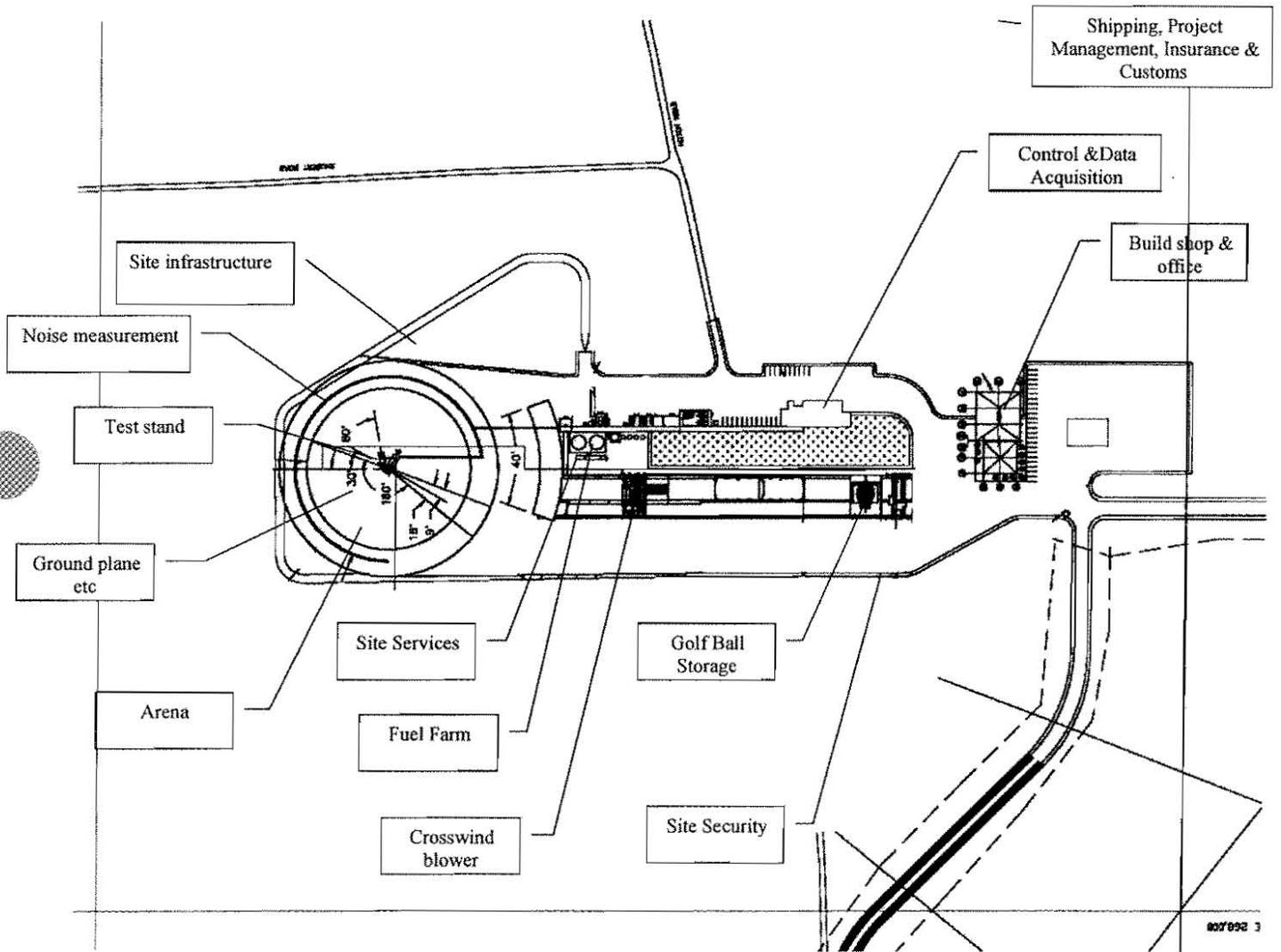
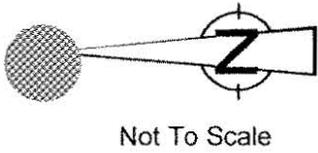


Figure 2
Center of Excellence Concept Layout