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EIS Concerning Activities of the NASA at Wallops, Virginia

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ENVIRONMENTAL IMPACT STATEMENT

Concerning activities of the

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

at

Wallops Island, Virginia

February 1972

() Draft (X) Final Environment Statement

1. Activities of NASA at Wallops Station, Virginia.
2. The purpose of the Activity is to conduct scientific research in the areas of the upper atmosphere, aeronautics, and remote environment sensing applications. The Activity is located at Wallops Station, Accomack County, Virginia.
3. Other than controlled heating plant and automotive combustion emissions, and intermittent launch vehicle exhaust constituents, there will be no environmental change or adverse environmental effects resulting from operation of the Activity.
4. There are no practical or feasible alternate methods of performing the Activity's mission.
5. Comments have been received from:

Environmental Protection Agency
6. Draft statement made available to Council on Environmental Quality:

March 1971

This statement is submitted pursuant to the requirements of the National Environmental Policy Act of 1969 and contains an assessment of the environmental impact of activities at Wallops Station, Virginia.

DESCRIPTION OF THE ACTIVITY

Wallops Station, a research field center of the National Aeronautics and Space Administration, is assigned the following functions:

-Conduct applied research to provide scientific payloads, applications, systems, instrumentation, data acquisition, and data processing relating to assigned missions.

-Plan and conduct launches of scientific payloads and aeronautical tests and other research, development, and related activities as requested by elements of NASA and the worldwide scientific community.

-Develop and provide facilities, supporting instrumentation, and techniques of tracking, data acquisition, storage, reduction and retrieval used in conducting tests.

-Assist and train foreign nationals in launch techniques and operations, collection of flight data, and other phases of launch support.

History: The Wallops Island launch facility was established in 1945 as a field station of the National Advisory Committee for Aeronautics, predecessor to NASA. The initial function of Wallops was to conduct rocket-launched aeronautical experiments as extensions of wind tunnel and laboratory research, obtaining aerodynamic data at transonic, supersonic and hypersonic velocities. As the developing space program imposed demands for data resulting from research conducted at Wallops, facilities and techniques relating to space vehicle research were expanded and refined. When the National Aeronautics and Space Administration was established in 1958, Wallops Station became a separate entity under NASA Headquarters in Washington, D. C. In 1959, Wallops expanded into facilities of a de-activated Naval Air Station and Ordnance Test facility on the mainland, immediately to the northwest of Wallops Island.

Geography: Wallops Station is situated on Virginia's eastern seaboard, on the lower portion of the Delmarva Peninsula. It is approximately 150 miles southeast of Washington, D. C., 90 miles north of Norfolk, Virginia, and 40 miles south of Salisbury, Maryland.

(Figure 1) The Station complex is comprised of three areas: (Figure 2)

1. Main Base: Location of range control center, engineering and technical support facilities; administrative offices, telemetry and

computer facilities, rocket motor inspection and storage areas, and the only NASA-owned airfield.

2. Wallops Mainland: A strip of mainland adjacent and parallel to the launch area on Wallops Island, the site of tracking, data acquisition, and long-range communication facilities.

3. Wallops Island: A barrier island southeast of the Main Base and two miles east of the mainland across a causeway and tidal marshland. Here are located the launch pads, assembly shops for launch vehicle staging, dynamic balancing facilities, ready rocket motor and liquid fuel storage areas, and facilities providing immediate support of launch operations. The island is approximately six miles long and one-half mile wide.

The Wallops Station complex encompasses 6,612 acres of which 3,950 are woodland and brush, 1,140 are tidal marshland, 83 are out-leased to local farmers for agricultural use, and the remaining are improved grounds occupied by facilities, paved areas, and the airfield.

The area surrounding Wallops Station is predominantly rural and farming, timber development, and seafood harvesting constitute major land and marine resource utilization.

PROBABLE ENVIRONMENTAL IMPACT OF ACTIVITIES:

Wallops Station is the largest Federal installation in an area where farming, poultry growing, and seafood harvesting are the primary industries. All are adversely affected by air, water, or noise pollution extremes. The Station maintains a responsible attitude in controlling pollutants and co-operates with civil authorities or concerned individuals in the direction and control of activities which could adversely affect the total, local, or individual's environment.

The Wallops Station complex provides employment for approximately 900 persons and makes a substantial contribution to the economical stability of the surrounding county. Station employees reside in widely dispersed communities with no excessive concentrations which would significantly affect the resource base of a particular area.

The majority of the Station property is wooded area or tidal marshland, primarily in a natural state. Controlled access, reforestation, ~~control of insect~~ depredation of woodlands, and repair of eroded terrain and beachfront, are all methods used to maintain the ecological balance. Wallops Station has also discontinued nuisance insect spraying programs.

PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED:

In conducting research activities and operating the Station's physical plant, wastes are generated which adversely affect the environment. However, potential sources have been examined, altered, or operated to control pollution and conform to State and Federal regulations.

Sanitary Sewage Treatment: The Station's sewage treatment plant processes approximately 130,000 gallons of waste per day. The plant has dual facilities, each capable of processing twice the present loading. Each system consists of a comminutor, primary sedimentation tank, trickling filter, final sedimentation tank, chlorine contact tank, unheated sludge digester and sludge drying beds. The plant is capable of full gravity operation in case of power failure. The launch range on Wallops Island has a lagoon and polishing pond capable of processing 30,000 gallons of waste per day and is presently operating at one-third capacity. Outlying facilities use State-inspected septic tanks and drain fields for waste disposal. Waste disposal facilities are operated and effluents tested to control biological oxygen demands, dissolved oxygen, coliform bacteria, suspended solids and Ph factors. The Station's waste disposal systems were inspected by personnel of the Federal Activities Branch of the Environmental Protection Agency and Virginia Water Control Board in September of 1971. Recommendations for minor improvements are being implemented.

Water Supply: Potable water for the facility is pumped from 15 deep wells averaging 60 feet in depth. The Station uses approximately 200,000 gallons/day. The wells tap the Columbian aquifer of the Pleistocene strata. A test well casing drilled in 1948 has been used to measure water table levels in the aquifer at the request of the U. S. Geological Survey. Water levels and rainfall data are submitted periodically for analysis. The water table has remained stable since measurements were begun.

Solid Waste: Wallops Station processes approximately 10,000 cubic yards of non-compacted trash yearly. The closed collection containers are unloaded at the land-fill site situated at a remote fenced area of Station property. Metals and other salvageable material are separated for recycling and the remainder is deposited in a trench, burned when wind conditions are favorable, and the trench backfilled. This method is also used by the County for trash disposal.

Stack Emissions: The Station uses approximately 1.5 million gallons of fuel oil in the heating plants yearly. The present DFSC contract provides fuel with 1.86% sulphur content, which conforms to State regulations. Heating plant facilities and fuel storage tanks are being modified to allow use of fuels containing 1.0% or less sulphur. An industrial hygienist from NASA Headquarters will perform scheduled ambient air checks for nitrogen oxides, sulphur, and particulates at the Station, commencing in 1972.

Research Activities: Approximately 172,000 pounds of rocket motor fuels are expended into the upper atmosphere yearly as a result of launch activities. Altitude and upper atmospheric winds disperse and diffuse the emissions. Launch operations are conducted at the edge of, and towards the open sea. The limiting conditions imposed by range safety restrictions, such as dispersion parameters, wind velocities, range surveillance, and exacting safety procedures which must be followed are all factors which reduce adverse effects to the environment and the surrounding community. Prior to accepting experiments to be launched at Wallops, program plans must contain an analysis and documentation of potential upper atmospheric contamination. An example of the depth and scope of such a study is that conducted on the Barium Ion Cloud project. This project, conducted jointly by NASA and the Max-Planck Institute of Germany, resulted in the release of 29.5 pounds of barium at an altitude of five earth radii above the lower latitudes. This barium cloud was observed from data-collecting sites ranging from Canada to Anartica and from high altitude research aircraft. Without detailing the extensive objectives or scope of the project, the element relating to this statement was the concern that adverse environmental effects would result from the barium release. The project proposal was submitted to the Space Science Board of the Academy of Sciences to consider the contamination potential. After deliberation, the Board concluded that the barium release would not significantly contribute to optical diffusion and the barium released would be well below the existing estimated natural barium background.

The Station's airfield is located away from congested air corridors and concentrated urban areas. Flight patterns of research aircraft are directed to reduce noise effects on local communities.

Other: Radiation from photographic processes used in rocket motor inspection and calibration sources used in certain research projects are all controlled and handled according to the strict regulations of the Atomic Energy Commission.

The Station has approximately 190 units of self-propelled vehicular equipment. Anti-pollution devices are checked on preventive main-

tenance schedules and low-lead gasoline will be used when available from Federal supply.

Erosion: Repairs to eroded terrain, grading, and replanting are performed under a grounds maintenance contract. Loss of beachfront on the Wallops Island launch range has been a problem since the range was established. A degree of stability has been achieved by constructing a seawall parallel to the shoreline, covered with a sloping berm to contain the storm tides and provide natural beach contour. Groins or bulkheads extending at right angles to the seawall into the surf trap and deposit material from the littoral drift, thereby replacing sand lost during storm tides. Sand fences installed behind the seawall build up the foredunes and deep-rooting and matting grasses are planted to stabilize beachfront areas.

ALTERNATIVES TO THE ACTIVITY:

Wallops Station's assigned mission is to launch scientific payloads into the upper atmosphere. These payloads acquire and transmit data from altitudes and positions beyond the capabilities of any feasible alternate method. Certain operational and experimental aircraft research requires actual flight conditions, supported by the facilities and crash/rescue protection of an operational airfield. In addition to the experienced capabilities to perform these assigned functions, the location of Wallops Station meets the following criteria for the safe and efficient conduct of these functions with the least adverse effect on the environment:

- The launch area is on a barrier island isolated from congested areas.
- Spent rocket stages or unrecovered ballistic-flight payloads impact in the Atlantic Ocean, in areas under surveillance by aircraft or radar.
- The Station airfield, used for aircraft research is comparatively remote from congested commercial air corridors.

It is felt that no practical alternate method or site for conducting this important research will result in less adverse environmental impact or can be performed as efficiently or safely.

RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY:

While the activities at Wallops Station contribute short-term environment effects in the routine operation of the physical plant, the research conducted is primarily of a nature that will result in

long-term enhancement of the environment. Some examples are:

Two decades of probing the atmosphere with rocket and balloon-borne experiments have established comprehensive baseline data on atmospheric conditions affecting the earth's environment. In-depth studies of the upper atmosphere, ionosphere, and near space have significantly expanded knowledge in the fields of meteorology, aeronomy, and other physical characteristics of this vital area.

A Chesapeake Bay Ecological Test Site has been established for remote sensing applications. An organizational segment of experienced Wallops personnel has been assigned to develop a program which will establish the Chesapeake Bay as an area in which many potential applications of remote sensing from aircraft and spacecraft can be evaluated and calibrated, in particular those involving land-sea interfaces. Efforts and plans are directed at making the Bay area a multidisciplinary test site about which a substantial information center will develop. This information will be acquired from subsurface, surface, aircraft, and eventual earth resources satellite observations. Information resulting from work within, and the exchange and interaction between program objectives will strongly aid in the development of techniques for understanding and managing ecological parameters in the Chesapeake Bay area. The development of the site will provide a test-bed for earth resource experiments and calibration and ground truth area for earth survey systems. The developed technology can be extended to other geographical areas on an operational basis.

Wallops Station has been involved in ecological studies with the Virginia Institute of Marine Science since 1967. Some projects are:

-Using the USNS Range Recoverer, an instrumentation ship provided by Wallops, a study is being made of the surface and bottom circulation of the continental shelf waters off the mouth of the Chesapeake Bay.

-Using a rotating drum surface skimmer designed and built at Wallops, the top centimeter of Chesapeake Bay surface water is collected at selected areas to determine the effect of known and naturally occurring surface films on marine ecology.

-Overflights and photographs of the VIMS research laboratory in Wachapreague, Virginia, have been made, utilizing prototype multi-spectral cameras as a technique of photographically determining estuarine marsh environment. Ground truths of the site are provided by VIMS as comparative data. The same techniques have been used on overflights of agricultural and forest areas to detect elemental deficiencies and diseases, crop and forestry growth, identify soil types, and detect irrigation effects.

The Wallops Station airfield has been used to conduct experiments in reducing aircraft noise levels, such as boundary layer controls, steep approach and landing, quiet helicopter design, and subjective noise effects, using Station housing and human subjects.

In summary, institutional and research activity at Wallops Station is conducted to control adverse environmental effects. Constant surveillance and control of factors which affect the environment are exercised, and the position of Wallops Station as a Federal installation in a virtually pollution-free area is reflected in the harmonious relationship with State and local officials concerned with these matters, as well as the surrounding community. Within the confines of Wallops Station is a barrier island and substantial marshland, all Federal property and public domain to be held in stewardship for the future. Wallops Station will continue its present policies of environment controls, and in addition, it has the capability, and advantageous geographic location, to conduct research into ecological controls and means of enhancing the quality of the environment.

IRREVERSIBLE AND IRRETRIEVABLE RESOURCE COMMITMENTS:

Other than the use of fuels for heat and motive power and the negligible amount of resources expended in day-to-day activities, there are no known irreversible or irretrievable commitment of resources at Wallops Station.

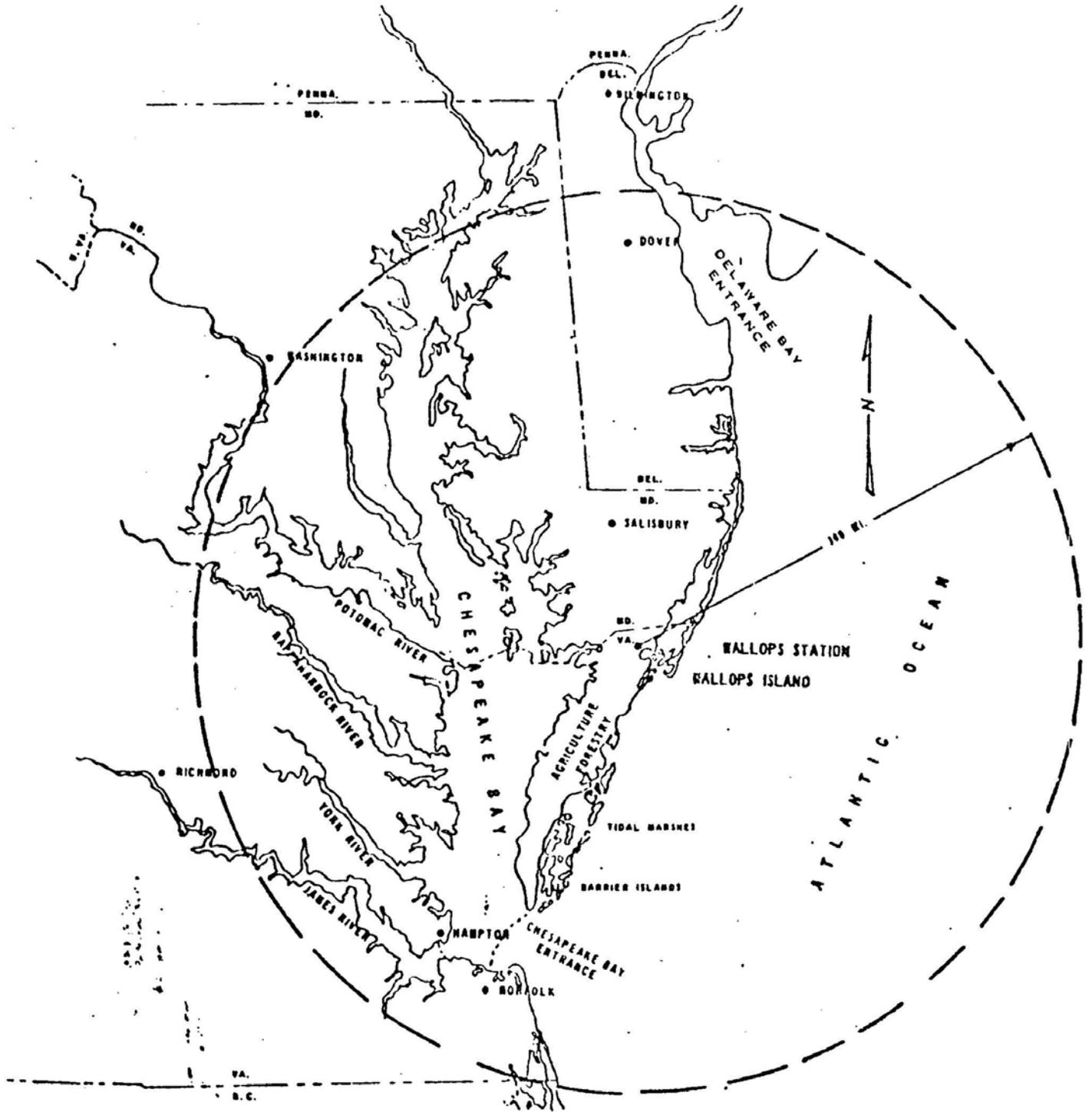


Figure 1. Map of Wallops Location

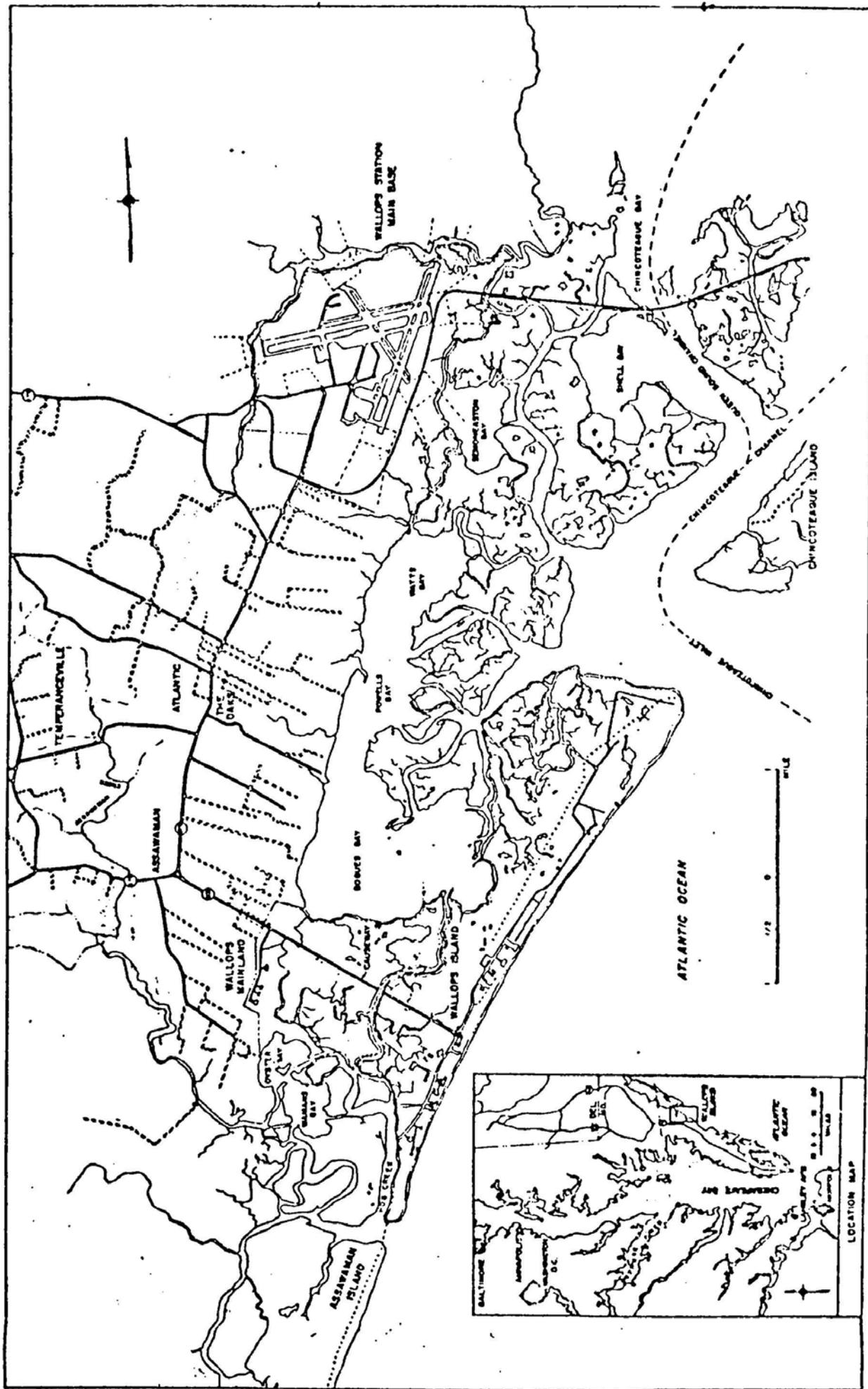


Figure 2. Map of Wallops Complex

ENVIRONMENTAL PROTECTION AGENCY
Comments on the Draft Environmental Impact Statement
on the NASA Wallops Station, Wallops Island, Va.

In general the impact statement provided a broad overview of ongoing and projected activities at Wallops Station. However, specific environmental factors were not addressed in adequate detail to permit a thorough analysis. As a consequence, the following comments should be considered in preparing the final impact statement, or in developing future plans to ensure an optimum environmental posture.

WATER QUALITY

In terms of ground water, what methods are being used to maintain a balance between water recharge, and sanitary waste and ground water pumping? What impact will pumping have on ground water levels?

EROSION

Are measures being implemented to restrict use and development on the fore-dune areas of the beaches? Have dune grasses been planted to help stabilize these sensitive areas? Current control, groins, bulkheads and sea walls only treat the symptoms of erosion, what is being done to eliminate the cause? In many instances the cause is a direct result of use and development of the fore-dune areas.

SOLID WASTE

In regard to solid waste, the statement cannot be properly evaluated since all current or proposed elements of solid waste management should be described both quantitatively and qualitatively. This should include an operational analysis of systems and methods pertaining to: generation, storage, collection, transport, processing, separation, recovery, recycling and disposal, as each might be applicable to the facility.

In the event that the sanitary landfill method is used for ultimate disposal, the requirements for operation and control should be detailed, in accordance with recent technological advancements. Typically, the term sanitary landfill is misused in describing all land disposal operations.

Many State and local governments have recognized the problems of inefficient and mismanaged solid waste systems, particularly the problem of environmental degradation. The environmental impact statement should include the agency's efforts (or lack of) to be a participant in the development of the state and local plans for comprehensive solid waste management.

In addition to the assistance that can be provided by the technical staff of the Solid Waste Management Office in Washington and the Solid Waste Management Representatives at each EPA Regional Office, the following references apply:

- a. Section 211 of the Solid Waste Disposal Act of 1965, as amended by the Resource Recovery Act of 1970.
- b. Section 76.8, Code of Federal Regulations, Title 42, Chapter 1, Part 76, Prevention, Control, and Abatement of Air Pollution from Federal Government Activities: Performance Standards and Techniques of Measurement.
- c. Executive Order 11507, February 4, 1970.
- d. Applicable publications of the Solid Waste Management Office, U.S. Environmental Protection Agency, issued in accordance with Section 209(b)(2) of the Solid Waste Disposal Act of 1965, as amended.

RADIOLOGICAL

It is indicated in the statement that radioactive materials will be used at the facility for photographic and instrument calibration purposes. Although it is not discussed in the statement, there seems to be a distinct possibility that radioactive isotopic power sources may be included in certain launches. In the event of an aborted launch, significant environmental effects could result. We assume that if such a vehicle is to be launched, the development of an environmental statement pertaining specifically to that launch will receive appropriate consideration. Aside from this, we foresee no possibility of radiological impact upon the environment resulting from the activities conducted at the Wallops Station as described in the draft statement.

PESTICIDES

The statement indicates that nuisance insect infestations are controlled by selective trapping to identify the species. Later an entomologist recommends the type of pesticide, concentration, and spraying patterns to be used. This section should be revised to show type of pesticide used, pests controlled, type of land treated, concentration of chemical, and total acreage treated for each pest species.