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PUBLIC MEETING

before

ASSEMBLY ENVIRONMENTAL QUALITY COMMITTEE

Status of Civilian and Military Cleanup
of Hazardous Discharge Sites

June 25, 1987
Room 334
State House Annex
Trenton, New Jersey

MEMBERS OF COMMITTEE PRESENT:

Assemblyman John O. Bennett, Chairman
Assemblyman Robert W. Singer, Vice Chairman
Assemblywoman Kathleen A. Donovan
Assemblyman Robert C. Shinn, Jr.
Assemblyman Frank J. Gargiulo
Assemblyman Robert G. Smith
Assemblyman Byron M. Baer

ALSO PRESENT:

Mark O. Smith
Office of Legislative Services
Aide, Assembly Environmental Quality Committee

New Jersey State Library

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Hearing Recorded and Transcribed by
Office of Legislative Services
Public Information Office
Hearing Unit
State House Annex
CN 068
Trenton, New Jersey 08625

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JOHN O. BENNETT
Chairman
ROBERT W. SINGER
Vice-Chairman
KATHLEEN A. DONOVAN
FRANK J. GARGIULO
ROBERT C. SHINN, JR.
BYRON M. BAER
ROBERT G. SMITH

New Jersey State Legislature

ASSEMBLY ENVIRONMENTAL QUALITY COMMITTEE
STATE HOUSE ANNEX, CN-068
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M E M O R A N D U M

June 23, 1987

TO: ASSEMBLY COMMITTEE ON ENVIRONMENTAL QUALITY
FROM: ASSEMBLYMAN JOHN O. BENNETT
SUBJECT: COMMITTEE MEETING - Thursday June 25, 1987

(Address comments and questions to Mark O. Smith, Aide to the Committee at (609) 292-7676.)

The Assembly Committee on Environmental Quality will meet on Thursday June 25, 1987, beginning at 10:00 AM in Room 334, State House Annex, Third Floor, Trenton. (Please note the room has been changed from 403). The subject of the meeting will be to review the status reports of the following facilities, representatives of which have been invited to brief the committee:

Federal Aviation Administration Technical Center, Atlantic City
Military Ocean Terminal, Bayonne
McGuire Air Force Base
Armament Research and Development Center, (Picatinny), Dover

Also, please be prepared to consider the following bills:

ACR-149 Directs Assembly Environmental Quality Committee to
Bennett review NJ Wastewater Treatment Trust financial plan.
Smith, J.

A-4352 Provides for the blending of radium contaminated
Shinn soil with non-contaminated soil and provides host
site benefit.

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mjz: 1-70

ASSEMBLYMAN JOHN O. BENNETT (Chairman): I am going to call the meeting to order. I apologize that we are getting started a little bit late. What we have done today is list two bills. We will get to the Wastewater Treatment Resolution; we may or may not get to Assemblyman Shinn's bill, because we have guests today with respect to four different military installations in the State, who have appeared in connection with the continuing questioning that has been going on with respect to hazardous waste.

As many of you know, on the hazardous waste sites in this State -- the private sites -- DEP comes forward every six months and gives us an update as to the status of the sites, so we can keep informed as to the direction those cleanups are going. Approximately a year ago -- perhaps now a year and a half ago -- the military installations in our State gave the predecessor committee to this the information as to the status of the cleanup operations on their sites, or what needed to be cleaned up. We have had representatives of several of the military installations appear to date -- in fact, five of them have appeared, and four of them are listed for today -- in an effort to continue to improve communications between the State facilities and the military installations. We have also tried to ask general questions with respect to all of the installations, so we will be able to develop, in this State at least, communication problems -- whether or not there are problems -- which the military feels or perceives can be corrected with their relationships with the Department.

The Department has been present for the hearings, and has given us a presentation; EPA has been present and given us a presentation. I believe both the Department and EPA are here again today, so they will be available to continue working toward the common goal, which I think all of us share, and I am certain the military also shares, so we can work together. The bottom line will be that we are going to be very aware of our

environmental problems in the State, and make a joint effort to ensure that we do cleanups wherever necessary, and preserve and protect our environment.

As the members of the Committee come in, I will make sure you are all aware of who they are. Assemblywoman Kathleen Donovan, from Bergen and Passaic, is here presently. Some of the members are at other committee meetings, but they will be coming in.

This entire matter, as far as the military thing, is being recorded. There will be a transcript available to any interested parties some time thereafter.

I would like to call on the FAA Tech Center in Atlantic City. I believe the representative is Michael Beres. Is that correct? (affirmative response from audience) Whomever you wish to bring up to the table with you will be fine.

M I C H A E L G. B E R E S: Mr. Chairman, Committee members: The FAA Technical Center is pleased to provide you with an update of our cleanup operations, and our hazardous waste management and disposal practices.

The mission of the Center is advancing aviation safety through research, test, and evaluation projects for the Federal Aviation Administration in five major areas of responsibility: Air Traffic Control, Communications, Navigation, Aircraft, and Airports.

When we last addressed this Committee, in December of 1985, our environmental staff consisted of one full-time and one part-time employee. At that time, we stated that we would be expanding our staff. We now have six full-time employees. Included is an environmental engineer licensed in both Pennsylvania and New Jersey, with nine years' experience, and an environmental biologist with a master's degree and 12 years' experience. Top management at the Technical Center continues to place a high priority on environmental protection and

restoration of areas that may have been contaminated in the past decades.

Hazardous Waste Management and Disposal Practices, Waste Generation and Disposal: The majority of the hazardous wastes generated at the Technical Center are aviation fuels and oils. These wastes are stored, transported, manifested, and disposed of strictly in accordance with the requirements of the New Jersey Department of Environmental Protection hazardous waste regulations.

Training: We are expanding our Hazardous Substance Training Program to include new employees and supervisory personnel. We are presently soliciting proposals from qualified environmental training firms as part of this effort. We have allotted \$175,000 this year for training in the environmental areas.

Spill Prevention and Hazardous Waste Management Plans: We indicated in our 1985 presentation to this Committee that our SPCC Plan was soon to be submitted to the NJDEP for approval. In January of 1986, the FAA did submit the first final versions of its Spill Prevention Control and Countermeasures -- SPCC -- Plan and Hazardous Waste Management Plan to the NJDEP. Final approval is contingent upon obtaining necessary permits required by the New Jersey Pollutant Discharge Elimination System Regulations. Draft NJPDES permits for surface and groundwater discharge are under review and formulation by NJDEP, respectively, with the final combined permit expected early this summer. We have been closely coordinating with NJDEP in this effort.

SPCC Improvements: A contract has been issued to redesign construction documents for spill containment facilities. Additionally, two 10,000-barrel, aboveground jet fuel storage tanks are expected to be taken completely out of service. This is anticipated to occur in March, 1989.

PCB Removal Program: In the past year, two PCB transformers in our aircraft maintenance hangar were replaced with non-PCB transformers. The remaining PCB transformers that were originally slated only for decontamination are now being reevaluated for total removal from the Center.

Facility Restoration Program: It was stated at the previous Committee hearing that the Technical Center was conducting price negotiations with TRC Environmental Consultants, Inc. to perform a Remedial Investigation/Feasibility Study. In September, 1986, a \$2 million contract was awarded to this firm, with contractual requirements jointly prepared by the NJDEP and FAA. The selection of a contractor was also a mutual NJDEP and FAA effort. The study is being conducted as if it were an NJDEP Superfund site, and each phase of the work proceeds only after receiving EPA and NJDEP approval.

The Atlantic County Board Clerk, the Atlantic County Environmental Committee, and the Egg Harbor and Galloway Township offices were each informed that the FAA would be conducting this investigation. The FAA has been working closely with the EPA, the Pinelands Commission, and the NJDEP in coordinating each phase of this study. Although no preset schedule has been established for interagency meetings, meetings have generally been held on a monthly basis. The regulatory agencies have been at our facility as often as twice a week to monitor and approve ongoing work. The frequency of site visits and formal meetings is largely dependent upon specific activities taking place.

This investigation includes the five sites previously identified by NJDEP as a result of the Roy F. Weston Report, entitled "Assessment of Potential Pollution Sources Near the Proposed Atlantic City Well Field," and also six other specific sites that the FAA believed worthy of investigation for potential contamination.

However, in the performance of site work throughout the Center, and as a result of reviewing historical data, TRC has recommended the inclusion of six additional sites to date for a preliminary assessment. The FAA also added three additional sites.

Recently, one more site was included, when leaking jet fuel was discovered due to a break in a fuel pipe. This occurred in early May, when soil was being excavated for new building construction. The NJDEP and USEPA were immediately notified, and a plan of action was mutually developed to investigate and remediate as required.

Thus far, TRC has provided the Health and Safety Plan, Quality Assurance Project Management Plan, and Field Sampling Plan, all of which have received EPA and NJDEP approval. A Background Investigation-Interim Report is presently under review by the NJDEP. A Project Schedule and Computer Modeling Procedures have been provided. Geophysical surveys have been performed at all sites. Field sampling of the sites, which includes monitor well installation, soil borings, and soil sampling, began on March 24 of this year.

All wells have been developed at those sites where monitor well installation is indicated. Sampling of these wells began on Monday, June 22. Analytical results have not yet been received from any surface soil samples or borings. However, raw data from the lab on the soil samples is being transmitted to TRC as it becomes available. We are anticipating receipt of initial soil results within a month.

Specific activities of each of the 21 sites, as illustrated in your handout, are as follows:

Site 20A - Salvage Yard: During the 1983-'84 pollution assessment conducted by Roy F. Weston, Inc., five monitor wells were installed and soil borings were taken. So far this year, we have completed a geophysical survey, an ambient air monitoring program, a soil gas survey, obtained 21

surface soil samples, and installed three additional monitoring wells. Four 30-foot borings have been completed, and samples from these borings have been collected and sent for lab analysis.

Site 27 - Fuel Mist Test Facility: Three monitor wells were originally placed at the site in 1983-'84. Investigations completed this year include: a geophysical survey, an ambient air monitoring program, a soil gas survey, 16 surface soil samples, and the installation of six wells. Three 30-foot borings have been completed and samples from these borings have been collected and sent for lab analysis. A 72-hour pump test at Site 27 began on June 22 of this year.

Site 29 - Fire Test Training Area: Three monitor wells were placed at this site during the 1983-'84 investigation. Thus far, we have completed a geophysical survey, an ambient air monitoring program, a soil gas survey, 16 surface soil samples, and the installation of two shallow monitor wells. Three of four 30-foot borings have been completed. Soil samples from these borings have been collected and sent for lab analysis.

Site 41 - Fuel Farm and Photo Lab: Three monitor wells were placed at this site as part of the Weston investigation. Investigations completed this year include: a geophysical survey, a soil gas survey, 11 surface soil samples, and the installation of three monitor wells. Four 30-foot borings have been completed and samples from these borings have been collected and sent for lab analysis.

Site 56 - Abandoned Navy Landfill: Five monitor wells were installed and two test borings were taken during the initial Weston assessment. So far this year, the following activities have occurred: a geophysical survey, a soil gas survey, surface soil samples from four locations, and the installation of two deep monitoring wells. Three of four soil borings have been completed and samples from these borings have been sent for lab analysis.

In addition to these five Weston sites, the six FAA identified Sites A through F are as follows:

Site A - R&D Navy Landfill: Investigations completed to date include: a geophysical survey, a soil gas survey, nine surface soil samples, and the installation of five shallow monitoring wells. The seven borings planned at Site A should be completed by June 26.

Site B - Navy Fire Test Facilities: Investigations completed to date include: a geophysical survey, a soil gas survey, five surface soil samples, and the installation of three shallow monitoring wells. The four 30-foot borings have been completed and samples from these borings have been sent for lab analysis.

Site C - Butler Aviation Fuel Spill: Completed thus far are: a geophysical survey, an ambient air monitoring program, a soil gas survey, seven surface soil samples, and the installation of six shallow monitoring wells. Four 30-foot borings have been completed and samples from these borings have been collected and sent for lab analysis.

Site D - Jet Fuel Farm: Activities completed to date include: a geophysical survey, an ambient air monitoring program, a soil gas survey, seven surface soil samples, and the installation of six monitoring wells. Four 30-foot borings have been completed and samples from these borings have been collected and sent for lab analysis.

Site E - Building 11 Tank Excavation Area: Accomplished thus far at this site are: a geophysical survey, a soil gas survey, and the installation of three shallow monitoring wells. Site E is being investigated because of a possible past tank leak. Therefore, no surface soil samples were taken. Four 30-foot borings have been completed and samples from these borings have been collected and sent for lab analysis.

Site F - Air Blast Facility: Activities include: a geophysical survey, a soil gas survey, one surface soil sample, and the installation of three shallow monitoring wells. Four 30-foot borings have been completed and samples from these borings have been collected and sent for lab analysis.

In reviewing aerial photographs and old site drawings as part of the Background Investigation-Interim Report, six more sites were identified by our contractor. The six sites -- G through L -- and the work accomplished are as follows:

Site G - Lumber Yard Transformer Storage Area: Ten composite soil samples were taken at Site G for PCB analysis. The FAA has not yet received the results of these analyses.

Site H - Salvage Yard Near Sewage Treatment Plant: Investigations completed to date include a soil gas survey and the collection of two composite soil samples. The FAA has not yet received the results of these analyses. No borings or monitoring wells are planned for this site. However, the wells at Site B are close to and down-gradient from Site H and could thereby serve to detect groundwater contamination emanating from this site as well.

Site I - Former Incinerator Building: A soil gas survey has been completed and three soil samples have been collected for metals analysis. The depth and horizontal extent of incinerator waste on the site was investigated by hand-augering 10 five-foot holes. No wells or borings are planned for the investigation at Site I.

Site J - Excavated Area Near Taxiway: Investigations completed to date include: a geophysical survey, a soil gas survey, and the installation of three shallow monitoring wells.

Site K - Storage Area West of Site 29: Site K was included in the investigation at Site 29. The investigation included a geophysical survey, a soil gas survey, and the collection of two surface soil samples. No wells or borings were installed within the area specified as Site K. However,

the up-gradient wells at Site 29 are down-gradient of Site K and could serve as monitors for this site as well.

Site L - Station Salvage Yard: Investigations completed to date include: a geophysical survey, a soil gas survey, and the collection of three composite soil samples. The FAA is still awaiting the results of the analytical work on the soil samples. No wells or borings are planned at the site.

While reviewing archive photographs and high-speed films of past Technical Center projects, and after receiving a comment regarding a past fuel pipe leak, the FAA included three additional sites which may be worthy of investigation. These are designated as Sites M through O. The following is proposed, pending New Jersey Department of Environmental Protection's approval:

Site M - Building 202 - Gelled Fuel Test Area: Our contractor -- TRC -- submitted a draft proposal to FAA concerning this site. The proposed investigation includes a soil gas survey and the collection of 11 surface soil samples.

Site N - Building 214 - Catapult Test Area: TRC submitted a draft proposal to FAA concerning this site. The proposed investigation includes a soil gas survey, surface soil sampling, and a combination test boring/monitoring well.

Site O - Building 16 - Heating Fuel Tank: A draft proposal from TRC was received concerning this site. The proposed investigation includes a soil gas survey, one test boring, and one well.

On May 7, while excavating footings for a new addition to Building 204, construction workers found evidence of a jet fuel leak. The DEP was notified immediately and subsequently the site became part of our Remedial Investigation/Feasibility Study. Because of its close proximity to the reservoir, this Site P will have top priority. Initial cleanup started three days later, and TRC is designing a method of groundwater treatment. The following activities have been accomplished to date:

Site P - Building 204 Jet Fuel Leak: The leaking pipes have been drained and plugged. A soil gas survey of the excavated area adjacent to building 204 was performed; six soil samples from the bottom of the excavation were collected; 13 shallow 6-foot, to 14-foot borings were completed; three shallow monitoring wells were installed; and the extent of plume was identified. Short-term pumping tests were performed on two of the wells at Site P to determine the hydraulic properties of the aquifer in the area. One hundred and fifty cubic yards of contaminated soil were removed from the building area. TRC also collected five composite samples from the stockpile of contaminated soil. This material will be classified and properly disposed of. TRC submitted a draft proposal to FAA to evaluate remedial alternatives at Site P, and is awaiting approval by DEP and EPA.

The following is a tentative schedule of upcoming activities:

Computer modeling for the five original Weston Focus Sites and the other additional sites is expected to be received by mid-August.

The preliminary Focus Feasibility Study should be completed by early August.

Conceptual design for the five Focus Sites and final Focus Feasibility Study Report are expected by mid-October.

The Preliminary Phase 1 Report for additional Sites A through F should be completed by mid-August, and a Final Phase 1 Report is expected in early November.

The completion of a remedial alternatives assessment for additional Sites A through F is planned for January, 1988.

Bench scale treatability studies, where deemed necessary for specific additional sites, should begin in January, 1988.

Evaluation of alternatives for remedial action and conceptual design is scheduled for submission by April, 1988 or any of the additional sites requiring remedial action.

The Technical Center has budgeted \$4 million for the next fiscal year in order to accomplish this RI/FS work, cleanup activity, and various other environmental projects.

Additional Activities:

Fuel Storage Tanks: A survey has been performed on all of our above and below ground storage tanks to determine the needs for replacement, upgrading, and closure. Action has been initiated to remove all product from tanks that are no longer in service.

Fuel Spill Cleanup: One hundred and twenty cubic yards of known jet fuel contaminated soil from a March, 1985 spill has been disposed of, and preliminary water quality findings indicate that the spill site is now restored to acceptable levels. A copy of the monitoring well sampling data was previously sent to this Committee.

Auditing: The FAA has recently initiated a self-audit program designed to assist facility hazardous waste generators in properly managing their wastes. This program consists of a comprehensive review of the generator's operation by the environmental staff to ensure compliance with State hazardous waste handling, labeling, packaging, storage, and disposal regulations.

This concludes our presentation.

ASSEMBLYMAN BENNETT: I thank you, Mr. Beres. May I just ask a couple of questions? Generally, the test data that you have indicated has been done at so many of these sites-- Generally, what have been the findings?

MR. BERES: We have not yet received any results of any analyses.

ASSEMBLYMAN BENNETT: On any of them?

MR. BERES: Right.

ASSEMBLYMAN BENNETT: Okay. When do you anticipate receiving results?

MR. BERES: I believe we should start seeing some results in about a month.

ASSEMBLYMAN BENNETT: Okay. How is it anticipated you will share the results with DEP and EPA?

MR. BERES: Well, the way we set up our contract -- and agreed mutually between EPA and DEP -- is that the contractor, as soon as he has data available and ready for submission-- It will be sent concurrently to FAA, DEP, and EPA.

ASSEMBLYMAN BENNETT: I believe in the beginning you also discussed that you have had some interreaction with some of the local municipalities. Did you say that?

MR. BERES: During one of our initial meetings, we were notified that we had to notify the Atlantic County Board Clerk and other officers, and we have done that. That was as a result of our meeting with the Pinelands Commission.

ASSEMBLYMAN BENNETT: Do they generally get a copy of your reports, or do you anticipate that the Pinelands Commission will also be receiving copies of the data as you receive them?

MR. BERES: Do you want to handle that one, Bob?

ROBERT B. HEITSENRETH: Generally, the Pinelands does not get the raw data. The Pinelands gets everything-- We have made everything available to them that they wanted. They indicated what they wanted, and what they want so far is any correspondence or minutes from any meetings they don't attend. Generally anything we send to DEP, the Pinelands gets a copy. They are also actively on site.

ASSEMBLYMAN BENNETT: Would you anticipate that this facility, at any point in time, would be proposed to be included on the NPL list, or do you anticipate that that would not be the case, or would really not be available data until you receive the balance of your data results?

MR. BERES: I can't answer that question; I don't know.

ASSEMBLYMAN BENNETT: Have you received any guidance from the Department of Transportation as to how to respond to the State environmental agencies, or has this been basically a

decision made by the director at the base as to how you will work with DEP?

MR. BERES: Top management at our facility is concerned about environmental protection. They have made a decision to go ahead and comply as best we can with EPA and DEP in whatever they wish us to do to clean up our facility.

ASSEMBLYMAN BENNETT: Have you had any -- switching the question around somewhat -- problems with communication, with an inability to know, at the State level, from whom you would need to receive information or receive data? Has there been a problem on that end with information coming back to you?

MR. BERES: DEP has a Site Coordinator, Carol Evenson, and if we have any problems we direct our problems and/or questions to her. She sees that the proper people at DEP are notified, and she gets any information we may need back to us.

ASSEMBLYMAN BENNETT: The Vice Chairman of this Committee is Bob Singer, from Ocean County. Bob, I believe you had a question?

ASSEMBLYMAN SINGER: Two questions. First of all, is it true the FAA is going to accept the radon if Ocean County doesn't want it? (laughter)

The only thing I am concerned about is, you know far better than I do, there is a heavy look at the facility to become the airport for Atlantic City. Do you perceive any of these problems blocking-- Do you perceive a problem along those lines? That is of grave concern to us, because we want to see that come about, where there is an airport there and we can start bringing in large jets to encourage our tourist trade.

MR. BERES: I feel that once our facility is cleaned up, there should be no problems in that area. We are working toward that goal as quickly as possible.

ASSEMBLYMAN SINGER: That is all I want.

ASSEMBLYMAN BENNETT: Assemblyman Bob Shinn is the Chairman of the Solid Waste Disposal Select Committee in the

Assembly, and also a member of this Committee. Bob is from Burlington County. I am introducing each member as they come in. Do you have any questions, Bob?

ASSEMBLYMAN SHINN: The data you have given us-- Does DEP have this data currently?

MR. BERES: Yes.

ASSEMBLYMAN SHINN: The detailed data, where your--

MR. BERES: Excuse me, the data you have in front of you?

ASSEMBLYMAN SHINN: I'm sorry?

MR. BERES: Are you referring to the data in front of you?

ASSEMBLYMAN SHINN: This general sketch data?

MR. BERES: Oh, no, that is just for this Committee. But they do have that information in various other forms.

ASSEMBLYMAN SHINN: Do they have information like, what aquifers you are testing, the depth of the aquifers, where your wells are screened?

MR. HEITSENRETH: Oh, yeah, they have all of that information.

ASSEMBLYMAN SHINN: And, you indicated you will share the test results as you receive the information.

MR. BERES: Absolutely, as soon--

ASSEMBLYMAN SHINN: You do not have a coordination problem with DEP at all?

MR. BERES: No, we have no problem coordinating with DEP or EPA.

ASSEMBLYMAN SHINN: Are you using any techniques other than drilling wells, for instance, to find buried tanks? Are you using--

MR. BERES: We have conducted--

ASSEMBLYMAN SHINN: --size marker, ground penetration radar, or anything?

MR. BERES: --ground penetration radar. We have conducted some surveys using electromagnetometry (phonetic spelling). Can you field the rest of them, Bob?

MR. HEITSENRETHETTER: Well, basically we have done a complete geophysical survey of all of the sites, using three types of electromagnetometry -- a magnetometer, ground penetrating radar, and we've done gamma logging, borings and wells -- deep wells and borings. So, yes.

ASSEMBLYMAN SHINN: When you picked your sites for investigation, how did you come up with, for instance, the buried tank sites you picked for further investigation, just from people who knew about potential sites on the base, or--

MR. BERES: We have had people come forward who were past employees, or are current employees of the FAA. If they had some concerns about some practices in the past, they would bring them to our attention, and we would include them in our investigation. We have taken aerial photographs and reviewed old photographs we had available, and looked through some of the basic history on the Technical Center and the Navy facilities that were there prior to the Technical Center. Using that information, we got together with DEP and EPA and decided which sites should be included.

ASSEMBLYMAN SHINN: Are you doing any downgrading -- aquifer monitoring at the edge of the base -- the groundwater flow direction -- to see what potential contamination is in the groundwater at the boundary line of the base -- that type of monitoring?

MR. HEITSENRETHETTER: Essentially, the Atlantic City Reservoir is downgraded and, yes--

ASSEMBLYMAN SHINN: Yes, sure.

MR. HEITSENRETHETTER: As far as at our property boundaries, we don't have any sites that are upgraded from our property boundaries where it would, you know, migrate off the Center.

ASSEMBLYMAN SHINN: Good, that is all I have.

ASSEMBLYMAN BENNETT: Kathy, do you have anything?

ASSEMBLYWOMAN DONOVAN: Yes, I have a couple of questions. I know you said that as you went through and did the work, several of those sites were discovered.

MR. BERES: Pardon me?

ASSEMBLYWOMAN DONOVAN: As you went through and did various testing, you found other sites, or other areas of contamination. Are the chances fairly decent at this point that you have found most of the contamination sites, or do you anticipate finding more as you go through the cleanup of these?

MR. BERES: There is always the possibility that we will discover more, but I think that at this point, this really should be about the extent of the sites. There shouldn't be any more.

ASSEMBLYWOMAN DONOVAN: Okay. That is really all I wanted to know. Thank you.

ASSEMBLYMAN BENNETT: Assemblyman Bob Smith, from Middlesex County, has joined us now. Bob, I am introducing the members to our guests as they come in.

I would like to thank you for a very thorough presentation. I say this to each of our guests as they appear, and in this case I am not certain that there will be, but in the event that a review of your testimony would reveal that there would be additional questions, the Committee will submit them to you in writing. I am sure that as you have submitted everything to us to date, that you would be happy to answer them as well. I don't anticipate that being the case, but I just want, you know, to point that out to you. I do appreciate your presence today, and the cooperation we have received from your facility in answering our questions. Thank you very much for coming.

MR. BERES: Thank you.

ASSEMBLYMAN BENNETT: I would now like to call on McGuire Air Force Base. I believe it is Lieutenant Colonel Orellana. Was I close to being accurate there?

L T. C O L O N E L W I L L I A M B. O R E L L A N A:
Yes.

ASSEMBLYMAN BENNETT: Fair enough, thank you. If we need more chairs, we can bring them from the front row so you can bring your staff together.

LT. COLONEL ORELLANA: Good morning, sir. I am Lt. Colonel William B. Orellana. I am the Deputy Base Commander at McGuire Air Force Base. Accompanying me today are Mr. Marty Eisenhart, on my immediate left, of our Civil Engineering Division, and Lt. David Wanningham, of our Bioenvironmental Engineering Division. They are going to help to answer any technical questions you may have following my presentation. Also accompanying me is Mr. Wayne Caughman, on my far right here, Environmental Engineer from Headquarters, Military Airlift Command, which is our major command headquarters for McGuire Air Force Base, and Mr. Bobby Ficquette, representing the environmental engineering function from the Air Force's Regional Civil Engineers in Atlanta.

Before I begin my prepared statement, I would like to thank you, Mr. Bennett, and the members of your Committee, for inviting us here today. This visit gives us another opportunity to point out McGuire's record of environmental responsibility. I might add that we are very proud of our record, and I will show you that we are not resting on this record, but are pressing forward, ever striving for improvements and progress.

By way of introduction, let me describe our base in a little detail, just to give you a reference point. McGuire is located due east of the main Fort Dix Complex and between Wrightstown and Cookstown. The base itself comprises approximately 3600 acres of land, along with another 220 acres

of leased land 11 miles away at the old BOMARC missile site. The 438th Military Airlift Wing, along with the 514th Military Airlift Wing -- Associate Reserve -- operate more than 50 C-141 Starlifter jet transport aircraft in support of this nation's global airlift requirements. This mission not only includes the airlanding of cargo and paratroops throughout the world, but it also incorporates a requirement to train for the airdropping of that cargo and those paratroops.

An average monthly work load will see more than 200 airlift missions depart McGuire and more than 120 other aircraft transiting McGuire for cargo or fuel. McGuire also hosts two units of the New Jersey Air National Guard. The 170th Aerial Refueling Group, operates the KC-135 tanker aircraft, and the 108th Tactical Fighter Wing flies the F-4 Phantom aircraft. As you can see, we are an operationally oriented base supporting varying missions. We do it well, and we do it proudly.

Among the many hats I wear at McGuire is that of Chairman of our own Internal Environmental Protection Committee. This Committee is made up of representatives from all the major functional areas of McGuire -- maintenance and civil engineering, medical and bioenvironmental, aircraft operations -- virtually the whole gamut of activities we have at our busy base. The Committee is charged with the responsibility of overseeing and guiding all base environmental programs.

Today I would like to begin with a brief description of our ongoing research efforts to identify potential environmental problems. I will follow that with a short discussion of the current status of some of our continuing environmental efforts.

Previously, Air Force representatives presented to a Special State Committee Investigating Hazardous Waste Disposal, a comprehensive briefing on the conduct of our handling and

disposing of hazardous materials and our efforts to identify and remediate any potential environmental problems created by past disposal practices. Colonel Richard Sula, my predecessor, spoke with them in December, 1985 -- as you mentioned -- on these matters, and made all material then available a matter of public record.

I will review some of the background materials he presented then. My chief concern in this area is that all of this Committee's members are aware of our efforts in this matter. We at McGuire are strong ecological partners with the other Pinelands communities, and we fully intend to continue the investigation, identification, and restoration actions which Colonel Sula described previously.

Let me first briefly review our Installation Restoration Program, or IRP. The IRP is a Department of Defense program; thus it is not unique to McGuire Air Force Base. It is a comprehensive program designed to identify, quantify, and remediate any potential environmental problems associated with past disposal practices. I stress past disposal practices, since other actions are ongoing to minimize the probability of future environmental hazardous incidents, and most phases of our IRP are closely associated with environmental conditions which have developed over a long period of time, many years in the past.

The Installation Restoration Program is a four-phased program. Phase One is an initial assessment phase which consists of a detailed review of historical records, photographs, field inspections, and personal interviews. This phase has been completed at McGuire, and our report is on file. Included in the material you have in front of you, at chapter 5, tab 2, is the Executive Summary of our base Phase One Report, and some basic information concerning the IRP and the environmental setting of McGuire is in chapters 2, 3, and 4. I will refer to some of this material in slightly more detail later.

Phase Two of the IRP is the Confirmation Study. Sites identified in Phase One are subjected to closer scrutiny. In this phase, specific pollutants are identified, along with the extent of that pollution. The possibility of the migration of that pollution is also closely evaluated. This phase has several stages. The first stage attempted to confirm the actual existence of contaminants, and it only reviewed the nine areas considered to have the highest potential for contamination. As a result of the findings from Stage One, we proceeded to a more detailed, more thorough Stage Two, which studied all sites of potential contamination. You have a copy of the Stage One Report in your package in chapter 6. We expect a final Stage Two Report sometime in early 1988.

Phase Three is entered whenever it is determined that mitigating action is necessary, but further research and thought is also necessary to determine the best, most effective, and safest methods to complete that mitigation. Essentially, this can be considered a research phase. I stress that this is not an automatic follow-on to Phase Two, but is entered when a research effort is required.

Finally, Phase Four consists of completing whatever remedial action is dictated. This could include, but is not limited to, capping, removal, or recovery of the potentially hazardous material. It could be a follow-on to Phase Two, skipping Phase Three, using existing environmentally tested and proven methods, or it could be a follow-on to Phase Three, after appropriate research determines effective mitigation methods.

Currently, McGuire has projects in Phase Two, Phase Three, and Phase Four of our IRP studies. We are working closely with the Federal and local regulatory agencies to keep them informed of our progress in all of these phases, and to ensure our current hazardous waste management practices are responsible and safe.

As you can see, the IRP is quite comprehensive. However, we at McGuire are not limiting our activities merely to the IRP. At the same time we work the IRP phases, we have ongoing research efforts, which include annual radiological investigations at the BOMARC missile fire site. These investigations and the analysis of the materials collected are completed by the staff of the Air Force Occupational and Environmental Health Laboratory.

In addition, air pollution emission studies and routine chemical analyses of the base surface water are completed by our own bioenvironmental staff. As you can see, our overall environmental research and control program has many facets and includes many participants.

In addition to the materials I have already described, I have provided you with an abstract of the current published Occupational and Environmental Health Laboratory Radiological Survey. That is at chapter 8. We are, at the present time, awaiting publication of the Phase Two, Stage Two IRP Report I previously mentioned. When that is available, we will ensure that all regulatory agencies are provided copies for their technical review.

We are also awaiting publication of the results of an October/November, 1986 Occupational and Environmental Health Laboratory Survey of the BOMARC fire site.

Some 21 sites were identified in our Phase One studies. These are described in the Phase One Executive Summary Report you have, so I will not replot that ground. Currently, we have no indications that any of those sites are health threats. We are proceeding with our efforts slightly reranked from what you see in the publication, and presently have locations in various stages of mitigation. The majority of the sites identified are in the Phase Two stage of the program. As an example of the dynamic aspects of the IRP, we have a site closely located to Site 8 annotated on your map,

which is tabbed as Tab 1 Map in chapter 5, which is now in Phase Four. This is the site of a fuel spill which was discovered in 1984, after all of the other sites had been identified by the Phase One study. This spill in our bulk storage, or tank farm area, occurred when some obsolete lines that were then connected to active JP-4 fuel tanks leaked. An immediate investigation took place, including the installation of eight permanent monitoring wells. The resulting draft report indicated a free-floating plume of fuel on the water table in that area.

Although we are currently awaiting DEP and EPA comments on our proposed remedial plan, we are pressing forward with contracting and funding requirements for recovery of this fuel. In the meantime, the monitoring wells will remain in operation. The Executive Summary of this study is also in your package in chapter 7. This incident serves to point out several facts: First, the IRP is not static, and will accommodate additional sites of potential environmental contamination. Secondly, we can, and will, react rapidly to analyze and measure the extent of an added site. Finally, this incident shows why the IRP phased approach is both efficient and cost-effective. Shortly after the spill was discovered, several agencies supported the immediate drilling of wells to recapture the JP-4 fuel. The draft report showed that the locations of the proposed wells would have been totally incorrect and would have produced nothing in the way of JP-4 fuel, at considerable cost.

I mentioned that one area is now progressing into Phase Three. Initial planning is under way to conduct a demonstration cleanup of the plutonium contaminated soil at the BOMARC site. Cleanup of a similarly contaminated site has been determined possible through the use of a pilot plant mining machine, which separates plutonium from soil. We are in the process of discussion and coordination with our Military

Airlift Command Headquarters personnel, New Jersey Department of Environmental Protection, and Department of Energy experts to determine the best methods and procedures for this test. We need to discover whether this machine will have the same positive results on soil the consistency and make-up of that at BOMARC.

As we learn more about the technical aspects of such an operation, we will include other local authorities and agencies in the coordination and information loop. No timetable is yet available. We are only in the initial thinking phases of this Phase Three research effort. There are a number of unanswered questions here. We pledge not to proceed with any specific action until all affected agencies are satisfied with plans and procedures. We are cautiously optimistic about potential results. This is just another example of the dynamics of both the IRP and McGuire's total environmental program.

In the area of hazardous waste management, McGuire is working diligently to ensure no new environmental problems are created by our current practices. We have submitted our initial Resource Conservation and Recovery Act Part B Permit for operation of a hazardous waste container storage facility and underground waste oil storage tanks. It has been accepted by the New Jersey Department of Environmental Protection for technical review. We submitted Part B of that application, but shortly afterward, because our requirements change, revised that application, including a comprehensive closure plan to close all of our old underground waste storage tanks.

Presently, our engineers are working closely with the New Jersey Department of Environmental Protection agency staff, to keep our efforts and plans in this area moving forward.

Again, I must emphasize that the most recent studies we have available to us indicate we have no imminent health hazards. We are, as I have previously stated, awaiting the

publication of two reports: the Phase Two, Stage Two Report of our IRP, and the results of the October/November, 1986 field radiological studies of the BOMARC site. We do not anticipate that these reports will indicate any significant problems, but instead feel that they will show that our programs are on the right track.

McGuire's environmental programs are moving forward, as we have shown. We will continue to expand our efforts to gain as much technical expertise as possible, before making final decisions for each of our sites. We also continue to work hand in hand with DEP, EPA, the Pinelands Commission, and any other source of assistance. Our policy of full public disclosure of all of the available facts will continue.

More than 10,000 people live and work on McGuire Air Force Base. They look to you, as well as to the base leadership, to ensure that their environment is a safe place to live, work, and raise their families. We, the leadership, are as interested as anyone in this very important area. We are committed to keeping McGuire a safe, enjoyable location.

Once again, thank you for this opportunity to outline what I am sure you will agree is a flexible, dynamic approach to McGuire Air Force Base's environmental partnership with the people of New Jersey.

ASSEMBLYMAN BENNETT: Thank you. Needless to say, we have a few questions. I would like to go back immediately to that aspect which, I think, as far as this Committee is concerned, is somewhat-- You gave us something new with respect to the mining proposed -- new equipment on the plutonium at the BOMARC site. Why is this something that is in the thinking stage at this point in time? I mean, what brings us, at this point, to where we would be thinking of it?

LT. COLONEL ORELLANA: This particular mining machine has really only been in existence since about 1986, if I am not mistaken. It was brought into existence primarily to test the

soil extraction and mining procedures at the Johnston Atoll out in the Pacific. That test proved to be effective. Only recently, within the last month or so, has the Department of Energy -- I'm sorry, the Defense Nuclear Agency -- which really owns this particular operation, had it become available from the contract that was working the Johnston Island program. Only this last week did our Military Airlift Command Headquarters people -- who watched this very closely -- the overall program -- let us know that the Department of Energy and the Defense Nuclear Agency, who have been doing the Johnston Atoll thing as a combined effort, and the contracting company -- A.W.C. Corporation, I think it is, and I don't know what that stands for -- let them know that the machine was available and they would like to give it a try on another type of soil.

We understand the machine is sensitive to soil composition; that is why this is a perfect example of Phase Three under the IRP program type of research. We don't know whether the soil in this particular area of the country will -- certainly it is not similar to that out at the Johnston Atoll -- work in the machine. We are in the process of asking similar technical questions, just like you might anticipate, to DNA, DOD, and the contractor that owns the mining machine -- technical aspects, technical questions. How would we work the program? What proposals -- or what procedures would you propose? What procedures are we concerned with? We contacted DEP earlier this week, and EPA earlier this week, and are getting the same feeling from them. We are not planning to proceed, even though it is purely a test program at this point, without the overall coordination and pretty much agreement of all of those people involved, because there are lots of questions that all of us have.

It is a coincidence, certainly, but our message traffic just started flowing at the end of last week, or the

early part of this week, that if we've got some time on the machine, let's try to give it a shot.

ASSEMBLYMAN BENNETT: But, there wouldn't be any actual work being done without having some coordination with both the -- without having an opportunity to review by DEP and EPA. Is that basically what you--

LT. COLONEL ORELLANA: That is absolutely correct. We contacted DEP and EPA earlier this week, and are proposing a get-together, or at least telephone conversations, to make sure that all of us agree that the concerns that each of us might have, have been addressed before we take any particular action.

ASSEMBLYMAN BENNETT: I believe the Department has informed this Committee that the results of the recent sampling that was conducted on the base in February and March of this year, as part of that Phase Two you talked about, will be available to the Department in a final report in February of '88. EPA has told this Committee that they expected the results in March of '88. They had originally expected to have the results immediately following the March testing, or they thought they were going to get the data simultaneously with you people getting the data. But now they have been told that they won't be getting it until some date not set in the future -- some undisclosed date.

Do we know the nature of that report at this point in time? Does it include more than just test results?

LT. COLONEL ORELLANA: Well, that report will have both test results and the Phase Two, Stage Two recommendations. The follow-on from Phase Two, Stage Two is any one of roughly three things: a recommendation of no action at a particular site because there is determined to be no problem; further study for that particular site or potentially moving to the Phase Three research program; or a recommendation on how to move into the Phase Four remediation and cleanup program.

We have not seen all of those results yet ourselves. The chronological follow-on, to answer your question, sir, is, we include DEP and EPA in the technical review loop of each of these reports as basically the second step. The first step is, our contractor gives the report to us. It is purely an administrative and basically technical review, to make sure it is typed correctly and doesn't have misspelled words. It is an administrative review.

The second review of that is the actual technical review of the data. At that point, we bring in DEP, EPA, and the other agencies. The final step of such a report is the actual publication of the report and the making it applicable, or available for public release.

So, we anticipate that the administrative review should start within the next month. When do we expect that, Dave? (consults with colleague sitting nearby) Within about the next month to two months, at which time, after the administrative review, DEP and EPA will get the data from a technical standpoint, which is the same time we will be looking at it from a technical standpoint. We anticipate final publication in early 1988.

ASSEMBLYMAN BENNETT: Why do the test results of the samplings have to wait until the final report before they are released to be reviewed by the two environmental agencies -- State and Federal?

LT. COLONEL ORELLANA: Go ahead.

L T. D A V I D W A N N I N G H A M: The test results are interpreted by the contractor who works-- We work with the Weston Company, as the FAA did. Part of the contract states that when they do the work, they also interpret it then and prepare remediation alternatives. That is included as part of the Phase Two, Stage Two report.

ASSEMBLYMAN BENNETT: Okay. But the sampling, itself, will be made available to you long before the final report?

The results of the sampling will be made available to the base long before the final report will be made available, I would assume.

LT. COLONEL ORELLANA: We haven't even seen the final results of the sampling, no, sir. Part of the reason for that is to make sure that the sampling results are, in fact, validated, and not just an erroneous report of any sort. We validate that very carefully. That is what our contract calls for.

ASSEMBLYMAN BENNETT: Perhaps some of you were here when the FAA testified right before you. This is something we find at some of the different military facilities. Some of the facilities, simultaneously with receiving the data from the contractor, release the data to the two environmental agencies, and others don't. I mean, basically, when I cut through it, I am kind of asking-- Yours is that it is not released simultaneously. I guess bottom line I am asking why, because some are and some aren't? In this case, it would appear that they are not released simultaneously.

LT. COLONEL ORELLANA: Well, essentially they are released simultaneously. We only get the report before DEP and EPA from a pure administrative standpoint, which is a very short period of time before we are actually both making the technical review, in, what would you say, a couple of weeks -- a month -- maybe between that first review from an administrative standpoint and a technical review standpoint when it is released. So, there is no effort to keep anyone out of the loop. We are not seeing the results until that time.

ASSEMBLYMAN BENNETT: So, while DEP will be waiting until February -- next February -- to get the final report, they won't be waiting that long to get the sampling data?

LT. COLONEL ORELLANA: That is correct.

ASSEMBLYMAN BENNETT: Okay.

LT. COLONEL ORELLANA: The final report that I am talking about in February or March -- whenever that really turns up -- is the report that should be absolutely publicly released, but we have DEP and EPA involved before that time.

ASSEMBLYMAN BENNETT: Fine. The same is true on the report that in your-- What is the process they are involved in beforehand, I mean, just to follow-up on that? You say they are involved before it goes public, and that's fine, but--

LT. COLONEL ORELLANA: Yes, sir, in October, I was just told, is when we would expect that information to be released to DEP and EPA, and us. That is purely from a technical review standpoint. Comments, requests for any additional information -- that's basically it.

ASSEMBLYMAN BENNETT: You are also awaiting publication of the October/November '86 survey. Now, does that mean that the test results of that survey, or any of the technical data, has been received and is being shared, or has not been?

LT. COLONEL ORELLANA: We haven't received anything from that one either.

ASSEMBLYMAN BENNETT: When do we anticipate that? I know you just said it.

LT. COLONEL ORELLANA: I didn't say it.

ASSEMBLYMAN BENNETT: I'm sorry.

LT. COLONEL ORELLANA: The end of this year. Interestingly, the laboratory that is processing some of this has a problem in their own laboratory. So, that is holding up some of their results. It has nothing to do with the sampling, nor the results of the samples. It is a technical problem in their own laboratory. We were anticipating that we would see that anytime in the very near future. It looks like that may slip to a little bit later this year, but it should be in 1987.

ASSEMBLYMAN BENNETT: But almost a whole year possibly from the time they actually did the survey?

LT. COLONEL ORELLANA: That is correct.

ASSEMBLYMAN BENNETT: On the 21 sites -- and I think twice during your presentation you said there are no indications of any sites as health threats-- Are any of those sites potential threats for groundwater contamination?

LT. COLONEL ORELLANA: That is what we expect our Phase Two, Stage Two final report to tell us. One of the things it is looking at is the possibility, or the potential, or even the results of any kind of migration of the contamination. At this point, we do not anticipate any. We are looking forward to the Stage Two report confirming that.

ASSEMBLYMAN BENNETT: So, at this point, there is no anticipation of any listings to be included on the NPL list?

LT. COLONEL ORELLANA: No.

ASSEMBLYMAN BENNETT: Okay. We were previously informed that there were six wells bored adjacent to the BOMARC site in December, 1986. DEP has indicated to this Committee that they have no information as to whether the soil samples of those borings have been analyzed. Have they been analyzed?

LT. COLONEL ORELLANA: We have water sampling going on out there this very week; as a matter of fact, yesterday and today. The analyzing of both the soil samples and the water samples is a project all of its own, and we have no results of that yet.

ASSEMBLYMAN BENNETT: I was informed that it happened last December -- that they were done last December. Not the ones being done this week, I was talking about the ones-- Borings had been done this past December.

LT. WANNINGHAM: There were 21 wells put around the whole BOMARC complex. Six were around the missile action area.

ASSEMBLYMAN BENNETT: Right.

LT. WANNINGHAM: Those six-- The wells were put in all at the same time, again in December, is what you are saying. Those six wells have not been analyzed yet. The water

samples-- Development of the sampling of the wells is occurring this week. When the wells are sampled, the soil and water analyses will occur simultaneously, and will be included in the report we expect at the end of October, 1987.

ASSEMBLYMAN BENNETT: Just so you understand where I am coming from, I am not looking for where that report is today. We are trying to make certain that there continues to be -- and I am not saying there isn't; don't misunderstand my statement -- but that there continues to be every effort made by all parties concerned to maximize communication between the Federal facility and the environmental agencies. That is why I am asking this line of questions.

The final report that comes a year from now will be fine for the public to view, but in the meantime I think it is imperative that we look toward sharing the data so we can move as expeditiously as possible, if certain steps do have to be taken. That is the direction I was going on that.

Some of the general questions that have been asked before-- Of course, under the Superfund, certain procedures have to be included for the State environmental agencies to be included in assessment, evaluation, and response to the hazardous discharges at the facilities. Have any of those procedures been established? For instance, has a technical review committee with State, local, and community representatives been set up?

M A R T Y E I S E N H A R T: Colonel, I will answer that, sir. No, not as yet. We are just in the initial phases of Phase Four with the tank farm cleanup. We just got the statement of work on what they propose to do out there, and we will be getting with DEP and EPA, and to all of the regulatory agencies, so their requirements are satisfied before any work is actually done.

ASSEMBLYMAN BENNETT: It is our understanding -- and, again, I qualify it that way, because obviously I don't know

firsthand -- that the Department -- DEP -- has requested to have meetings with base personnel, and that they have been refused those meetings. If that is the case, my question then is, why is there resistance to meeting with the environmental agencies?

LT. COLONEL ORELLANA: Well, I am not aware of any of those, and my staff are shaking their heads. But, let me basically go down through our procedures, and using the tank farm is a very good example. That is the first site we have on McGuire that has advanced to the point of Phase Four under our Installation Restoration Program, which is really essentially a remediation or cleanup effort. We are in the process of preparing a statement of work; in other words, to go to our contractor and tell him what, in particular, we want him to do. DEP and EPA are included in the review of that statement of work, so if there is a concern on their part as to something that should be included, or questions they have, they will have an opportunity to ask them and have input into that statement of work process. That is really step number one, so that is including them right from the beginning.

We are not past step number one yet on this particular project. Our intention, once that is completed and we go ahead and institute a recovery well -- which is what we anticipate we will do -- is that they will be included in the test results from that well, and in the general operating procedures of the well. So, I think we are working pretty much hand in hand.

ASSEMBLYMAN BENNETT: This is the information that was given to me: Representatives from both EPA and DEP had requested a joint meeting with McGuire Air Force Base, to discuss the ongoing IRP and the planned remediation. The United States Air Force has responded that such a meeting is unnecessary, and subsequently has not scheduled one. That is what we were informed. Now, I don't know.

-MR. EISENHART: That is basically correct. Up until recently, we had no new information to necessitate a so-called task force meeting with the State DEP and the EPA. Now, since we are going into Phase Four, that probably will happen.

ASSEMBLYMAN SINGER: Excuse me. Through the Chair, what is "probably"? Do you think it will happen, or-- Let's understand that.

ASSEMBLYMAN BENNETT: Sometimes it might be a good idea just to have a meeting to sit down and say there isn't anything further, rather than say, "No, we won't have a meeting," because they could have come back and told me that, quite frankly. I am not saying that that is not the case. I think you are being perfectly candid in saying that. But what happened was because the Air Force said, "We are not going to have a meeting." Evidently, reasons were not given, or the reasons at least were not repeated to us. Therefore, we now end up in a situation where it would appear on the surface to be a serious problem that there weren't meetings.

What you're saying is, "If there was any problem, there is certainly not going to be one from now on, and there really wasn't one in the first place."

LT. COLONEL ORELLANA: Well, we would contend that you're right, that there wasn't one. We had no real reason to have a meeting, nothing to share. We were doing nothing new with any new information. However, we are advancing now and meetings are planned. A perfect example is the communications with DEP and EPA on Tuesday of this week, letting them know about the Phase Three research program with BOMARC, which we only learned about on Monday. So, we are moving along rapidly in that area.

MR. EISENHART: Let me also say that we have never said no to any regulatory agency to come on McGuire to take a look, or to look at our reports, the test data we have, or the sites. The question was asked about a task force meeting, and

basically we replied we didn't think it was necessary at that time, since all the data we have now has been shared with them.

LT. WANNINGHAM: And, upon receipt of the Stage Two Report, then we could decide what was to be done, and maybe review it in that manner.

ASSEMBLYMAN BENNETT: Not just the report, though, the raw data you will be receiving. I mean, I don't think it would be -- and this is a personal, individual opinion -- necessarily appropriate to wait for the one-year period and having the final report in place. I think the Colonel has said that is not going to be the case; that as soon as you have had the opportunity to have your administrative review of the raw data, you will immediately then be working with the environmental agencies, long before we get to the final report, so that there would be some input. That is how I read what the Colonel said.

LT. COLONEL ORELLANA: That is correct. We have not received the raw data ourselves, so we can't share it.

ASSEMBLYMAN BENNETT: Right, I understand that. Again, it is our understanding that there were certain written comments given with respect to the IRP from both EPA and DEP, which were submitted to the Air Force, and that certain work was done disregarding those written comments, without comment. Is there any knowledge on that?

LT. COLONEL ORELLANA: Will you go ahead and answer that?

W A Y N E C A U G H M A N: I guess at our headquarters we were the office that received the comments -- not my office in particular -- but a person who is no longer there. And, apparently there was some misunderstanding when those comments came in about the timeliness of them, as well as the content of them. There was something that happened that resulted in those comments not being addressed to the satisfaction of the regulatory agencies. I do not have all of the specifics because it wasn't handled in my office. But we intend, in the

future-- We have changed the office that is in charge of the program to my office, and we intend to fully incorporate all of those sorts of things, or at least address them to everyone's satisfaction in the future. We did have that one problem.

LT. COLONEL ORELLANA: I would think an overall comment is probably appropriate. We are all learning with this as we go along. It is kind of new to most agencies. We have been doing it all for several years, obviously, but it is still reasonably new. Our headquarters organizations, whether it be DEP, EPA, or the Department of Defense, have had fragmented approaches somewhat in the past, and we are working our way toward getting more centralized, smarter operations, and people with a lot more experience. It is a basic communications process. We have been slow to respond to DEP in the past; they have been slow to respond to us in the past. I think we are working--

ASSEMBLYMAN BENNETT: We want to hear about that, too, by the way.

LT. COLONEL ORELLANA: I think we have arrived at a point where we have a pretty good working relationship right now, and are working closer and closer as we are getting more and more technical information. The IRP, that Phase One, was nothing more than a record search, primarily -- an investigation and record search -- as to what had gone on over many, many years in the past. Now we are into the much more technical aspects. What are we going to do to clean it up? First, does it need to be cleaned up? What are we going to do if we have to research, and what are we going to do if we have some sort of a Phase Four cleanup effort? Those things are going to lend themselves, certainly -- if the others didn't -- much more closely to a close coordination.

ASSEMBLYMAN BENNETT: And, following through on what was said, I think, Colonel, what you are basically saying is, when the comments -- for whatever reason -- were essentially --

and I don't want to really say "disregarded" -- but in fact not utilized, let's say, perhaps at that point in time you might have been able to have this meeting we talked about, so there could have been discussions with respect to those comments. Then you wouldn't have a Chairman sitting here asking these questions about it.

I think what the Colonel has pointed out is, this is something that has occurred in the past, but is something that is not likely to occur in the future, and that if comments are received, and there is going to be something -- a departure, or a disregard -- for whatever valid reason included, at least there would be some communication between the two, so that the departments, or the environmental groups, would know why a certain action was being taken. I think that is basically what you are saying. I don't want to put words in your mouth, but that is what I am hearing anyway.

LT. COLONEL ORELLANA: Well, that is certainly what we at McGuire Air Force Base intend to do. As I said, this is an overall DOD program -- Military Airlift Command. That is where Mr. Caughman is from, but I think he is pretty much committed to the same sort of thing.

MR. CAUGHMAN: Certainly.

ASSEMBLYMAN BENNETT: On that, and to the base, have you received any specific guidance from the Department of Defense as to how you should respond to State environmental agencies, if you are not included on the NPL list?

LT. COLONEL ORELLANA: Yes, sir. As I said, the IRP -- the Installation Restoration Program -- is a Department of Defense program. The steps that are being taken -- inclusion in the statement of work, inclusion in the review of the reports before they are made public -- are all DOD IRP programs, so essentially, yes, we have been given that direction.

ASSEMBLYMAN BENNETT: On a specific base question, in April, 1984, a pipe line leak caused the release of over 50,000 gallons of jet fuel into the ground. A confirmation quantification report for the spill remediation was not prepared until September of '86. Why such a long delay?

LT. COLONEL ORELLANA: We will have to look at the steps that went into it, and provide you with something for the record. I would be winging it if I said something off the top of my head.

ASSEMBLYMAN BENNETT: That's fine. I would rather do that. I don't anticipate-- If you can give that to us in writing, that would be perfectly acceptable.

Assemblyman Shinn is the Assemblyman for your area. He has said some positive things as to his work with basically the new command -- I guess is the way to clarify it. Perhaps he may have some questions. Assemblyman?

ASSEMBLYMAN SHINN: Just generally on the JP-4 spill. It was in '84, and was somewhere around 50,000 gallons, I guess. Why didn't you install a skimmer and retrieve that when the spill occurred? That is my initial question.

LT. COLONEL ORELLANA: Do you mean aboveground?

ASSEMBLYMAN SHINN: A skimmer. The JP-4 fuel is on a water table -- sitting on top of it. It is pretty standard technology if you have a spill to put a skimmer in and retrieve that fuel. Separate the water, run it through a filter, and it is usable; maybe not in aircraft, but certainly in diesel equipment. The problem with a fuel spill is that the longer you wait, the harder it is, and the broader the plume of contamination. It flows with the groundwater, and it just gets more and more difficult to recover. It just seems like an automatic thing to me if you have a fuel spill to get skimmers in the ground to recover the product. The quickest solution is by far the cheapest, and the best way to abate the future problem of having a broad problem where you have to start

pumping groundwater, and having a package treatment plant, and all that business.

LT. COLONEL ORELLANA: Answer it.

MR. EISENHART: We intend to put in what you are calling for now as a skimmer, which is basically a recovery well. Part of the reason we didn't do it originally, as the Colonel mentioned, was because it was put into the Phase Two IRP for study. We did not know exactly the size or the location of the plume. We wanted to make sure -- and what we have now is a final report on the plume -- that we could pinpoint where the plume was. Now we know where to put the recovery well in. At that time, we did not know where to put it in.

ASSEMBLYMAN SHINN: Your neighbor, Fort Dix, has an Environmental Committee which they established, probably, about three years ago, I guess. They meet monthly and talk about what they are doing all over the base. They have the county Health Department, DEP, and EPA, if they want to be represented, and I think in most cases they do. Colonel Richardson, I think, was the operation engineer responsible for, you know, conducting those meetings. They were started under General Kelly, I think, probably about two or three years ago. I think the benefit of that is that it takes the mystery out of what is happening, what you are looking at, and what potential problems you have -- whether you are looking for tanks or whether you are doing an inventory or whether you are sending letters out to old employees, to find out what they know about old landfills or buried tanks or old spills or what have you. It broadens your scope of communication, and I think it takes the mystery, or the mystique, out of what is going on. If you have information you are not sharing, it just snowballs into a lot of questions which I think create problems.

I know I have had a lot of very negative reports about McGuire. I think some of them are warranted; some of them

aren't. I think a change in philosophy to having open meetings and putting everything on the table would be really beneficial in the final analysis. I think you have a good example. In fact, the county, which had an adversarial position in the Fort Dix Landfill for a few years, ended up giving Fort Dix an environmental award. I think they received one from the Pentagon -- a nationwide award -- by virtue of having their trash-to-steam plant on-line, abandoning the landfill, and so on and so forth in the other environmental work they have done -- tank removal, etc.

I think that just in your decisions going forward from this point-- I just think that is so much of an improved process, not only when you get the data, but then you have the potential of having someone say, "Yes, but you didn't put a well downgrading in here," or, "You found something in here, but then you didn't step back and put the next well in to find out how far that plume is actually going to the point of no detection." It stops the 20/20 hindsight business after you get your results challenging your methodology to get to that point.

I am certainly not trying to tell the base what to do, but I just think that process went from a very negative situation to a very positive situation at Fort Dix. I think the same type of process-- You have experience in your general location of how that was received publicly with the different regulatory agencies, and I would really recommend it as something to consider in the future. I think it broadens the scope, and it takes a lot of the local fear out of the process of what you are dealing with. If you try, from a public standpoint, to deal with the data you have, based on what it is, you take a lot of the trepidations out of the public about what is going on next-door to their property line, and so on.

That would be my suggestion as a way to improve a lot of the communications. I know you have a good technical

staff. I think the whole issue has been a higher priority over the past several years than it was before that. I commend you for your progress, on my part, and on the part of the county, I can tell you this very constructive suggestion.

LT. COLONEL ORELLANA: Thank you, sir. Well, none of us have a corner on the market on good ideas. I will have my staff get with them and make sure we can start, not from square one, but from what Fort Dix has already learned, rather than start all over again. I think Phase Four, as we are starting to advance with many of our sites, really lends itself very well to that. We'll look at it, yes, sir.

ASSEMBLYMAN SHINN: Good.

ASSEMBLYMAN BENNETT: Vice Chairman, Mr. Singer?

ASSEMBLYMAN SINGER: I am pleased to see that we have come at least to a cooperative stage with McGuire. You know, there were some concerns from us and from DEP that things were not going ahead. Of course, being a little selfish, I was concerned about the BOMARC missile site, because, even though it is not my district, it is my county, and we were kind of led to believe at this time that there wasn't any form of remediation for that particular type of site because of the (indiscernible) theory. That became highlighted by DEP recently, as you know, with the ridiculous idea of storing radon just next to your site, saying, "As long as we have this BOMARC missile site -- which is the worst site in the State of New Jersey -- we might as well store the radon here."

I think the information you gave us today is possibly a light at the end of the tunnel. It is something I am glad about, and I am going to make sure DEP is aware of it. I think that will change their outlook on the storage of radon in our county, based on the fact that here you may have a site that can be remediated very shortly -- or at least there is the possibility of that. It just doesn't make sense to do something next to it. I think that is a positive thing that

came out of this meeting, something that enlightened me a lot, and I hope, though it is very difficult, might enlighten DEP also.

LT. COLONEL ORELLANA: If I might add something, sir, the one thing I might caution is-- I need to stress that this is a research project at this point. While we would certainly share your desire that the research would be very positive, and we could then advance into some sort of a remediation program that would not take -- I would hope -- too long, but a phased time period to get it all done, it is still a research project. But, yes, sir, we look at it the same way. We hope it is a light at the end of the tunnel, too.

ASSEMBLYMAN BENNETT: Assemblyman Bob Smith?

ASSEMBLYMAN SMITH: With respect to the demonstration project for the removal of the plutonium contaminated soil, what would be the end destination of the plutonium contaminated soil, once it is sifted out?

LT. COLONEL ORELLANA: One of the very good questions we are in the process of asking, too. One of the reasons why we need to get together the whole group -- EPA, DEP, etc. -- is because we have no idea.

ASSEMBLYMAN SMITH: Right now, for nuclear power plants in the United States, I think the wastes are stored on site, because there is no national nuclear waste depository for high-level wastes. Isn't it just as conceivable that once the plutonium is sifted out, it will be stored at McGuire?

LT. COLONEL ORELLANA: I wouldn't want to speculate. I would anticipate that when and if it proves to be effective as a mining method to begin with, the contract that is awarded, and discussed, and coordinated with everybody, will certainly include what we are going to do with it. But, I have no answer at this point. I would purely be speculating.

ASSEMBLYMAN SMITH: I'm sure DEP would appreciate whatever answer you can come up with. Does McGuire have a

position on the deposition of the radium contaminated soil on the property adjacent to the BOMARC facility?

LT. COLONEL ORELLANA: No, sir. You're asking me to really put it on the line there. We, at this point-- DOD's policy is that we will not open our land to the storage of hazardous wastes. As far as neighborhood, I am a neighbor just like you, and I am a bit concerned with whatever we might do. But that would be purely an out-of-the-uniform statement.

ASSEMBLYMAN SMITH: Okay. So there is no position from McGuire?

LT. COLONEL ORELLANA: No, sir.

ASSEMBLYMAN SMITH: We received a packet of information from Steven B. Smith, Colonel, dated April 7, 1987. He has a statement in here that: "Although the Air Force's environmental programs are highly dynamic, they depend, to a large degree, on congressional funding." What did McGuire Air Force Base put in as its request for environmental cleanup in the '87-'88 Federal budget?

MR. CAUGHMAN: They are not put in from the base. We do it from our headquarters, based on what we know and what the reports show us, in concert with these folks here.

ASSEMBLYMAN SMITH: Okay. What was the recommendation from DOD?

MR. CAUGHMAN: I don't recall. There is several million identified in our '88 budget.

ASSEMBLYMAN SMITH: For this base?

MR. CAUGHMAN: Yes, as I recall.

ASSEMBLYMAN SMITH: May I ask that you supply the Committee, through its Chairman, with that information?

MR. CAUGHMAN: Okay.

ASSEMBLYMAN SMITH: Do you know if that recommendation was kept in the Federal budget? Is that in the bill that is currently going through the Congress?

MR. CAUGHMAN: I don't know.

LT. COLONEL ORELLANA: We will have to look at that overall. Again, it will start to become more and more contingent upon what we determine are the remediation steps that come up. Of course, each one of those we provide to our Major Command Headquarters. They prioritize that, certainly with the pot of money with the other bases, and--

ASSEMBLYMAN SMITH: I understand, but it would be helpful to know what the recommendation was, and where it stands in the budget.

LT. COLONEL ORELLANA: We will provide that to you.

ASSEMBLYMAN SMITH: Thank you. In the prepared remarks, second to the last page, there is a statement: "Again, I must emphasize that the most recent studies we have available to us indicate we have no imminent health hazards." The real problem with the words "recent studies--" Which recent studies are you referring to?

LT. COLONEL ORELLANA: All the ones that have been published and have been made a matter of record.

ASSEMBLYMAN SMITH: Okay. DEP currently has these as well?

LT. COLONEL ORELLANA: Yes, sir.

ASSEMBLYMAN SMITH: Okay. That is a pretty strong statement, that "there are no imminent health hazards." We have the DEP present in the room. Mr. Chairman, I would like to ask Mr. Hoffman, or whomever, from DEP, if they are in concurrence with that statement -- or John -- Dr. Trela.

D R. J O H N J. T R E L A (speaking from audience): Mr. Smith and members of the Committee: My name is John Trela. I am from the Division of Hazardous Waste at DEP. I think that in general you could say that the statement is correct. However, the Commander did state earlier that he was assuming as a result of their second group of studies, that there wouldn't be any indications of groundwater contamination. We do not concur with that opinion, based on our knowledge of the

activities at the base, our past experience with similar types of disposal practices, and our knowledge of the geology of groundwater in the area.

ASSEMBLYMAN SMITH: And, if there was groundwater contamination, that would be a basis for DEP to conclude there was an imminent health hazard?

DR. TRELA: Well, to have an imminent health hazard, you have to have a direct exposure path. You not only need groundwater contamination, you need a well in that contaminated area and someone drinking the water. So, there is a difference between contamination and environmental degradation and escalating to the next step, or higher level, which would be direct--

ASSEMBLYMAN SMITH: Is the groundwater in that area being used for a public water supply?

DR. TRELA: Yes, it is.

ASSEMBLYMAN SMITH: It is?

DR. TRELA: Yes.

ASSEMBLYMAN SMITH: So, if the groundwater were contaminated, that would be an imminent health hazard?

DR. TRELA: I think you have to establish a direct cost and effect relationship before that conclusion can be drawn. In other words, the base is large, and it could have pockets of contamination of groundwater that are not directly, at this time, connected to a drinking water well that is supplying water somewhere.

ASSEMBLYMAN SMITH: Well, the areas that DEP is concerned about--

DR. TRELA: Yes, sir?

ASSEMBLYMAN SMITH: Are they in proximity to the drinking water supplies?

DR. TRELA: Well, on base, my understanding is that -- as is the case at Fort Dix -- the drinking water wells are in a deeper aquifer. They have very large wells at military bases.

The local residents in the area are generally not in proximity to the activities conducted on the base, so, in general, as I said earlier, we would agree with that. We have no direct evidence to disagree with the concept that there, you know, based on the history of activities at the base, the nature of those activities and their potential to impact-- There is no reason to believe that (remainder of Dr. Trela's statement indiscernible; no microphone)

ASSEMBLYMAN SMITH: Okay. Thank you, Mr. Chairman. Thank you, Dr. Trela.

ASSEMBLYMAN SHINN: Mr. Chairman, I would like to make one further comment. If you get to the point of excavation of the contamination relative to the BOMARC site -- and I would assume that that would be a high-level, radioactive type material -- and you have a disposal site, and you are above the standards for that disposal site, I am sure DEP would cooperate with letting you utilize their radon dirt to blend that material to a lower standard, so you could dispose of it. It might expand your sites for disposal by a blending process. I would like you to keep that in the back of your mind, in case that situation does occur.

ASSEMBLYMAN BENNETT: Colonel, I would like to thank you very much for bringing your staff and yourself here today. Please thank your base Commander for making you available to us. We look forward to continuing to have a relationship where we can exchange ideas such as have come up today. Hopefully, we will continue to see the feelings that have been expressed today, and will do everything possible to encourage the interchange of information between the environmental agencies and the military installations.

You mentioned that there had been a problem in the past, but right now it is working fine. If there is a problem with a delay from the Department and you wish to bring that to this Committee's attention, we stand ready to assist in that

matter, no matter which way it is going -- one way or the other -- because it takes both sides working together to assure that we will have those environmental protections in place. -- This Committee, I am certain, will be happy to work with you in the future. I am sure you will also be willing and able to continue to work with us.

Thank you again for being here today.

LT. COLONEL ORELLANA: Thank you, sir.

(RECESS)

AFTER RECESS:

ASSEMBLYMAN BENNETT: I would like to now move to the Military Ocean Terminal, Bayonne.

W I L L I A M M c G R A T H: Mr. Chairman, members of the Committee: My name is William McGrath. I am the Environmental Engineer at the Military Ocean Terminal, Bayonne. With me today is Dr. Charles Lachner of the United States Army Toxic and Hazardous Materials Agency -- USATHAMA. I apologize to the Committee for not having a prepared statement -- a prepared summary. I learned about the hearings approximately two weeks ago, at which time I forwarded a copy of our proposed sampling plan to the Committee. I was under the impression that we would respond to questions from the Committee about that sampling plan.

I can tell you that we are working with the New Jersey Department of Environmental Protection and the United States Environmental Protection Agency in finalizing the plan. We met with them just yesterday in Edison, to discuss deficiencies.

If you wish, I will summarize it. In 1980, USATHAMA conducted a preliminary assessment of the Military Ocean

Terminal, Bayonne -- MOTB -- which basically consisted of a record search and discussions with base personnel and former base personnel. From that, some areas of concern were identified, primarily it being a former landfill which was used up until the 1960s. Also some other spots, including an area where a PCB transformer had spilled, and an area where some waste oils were stored. We have included those areas in the sampling plan, which will entail 12 monitoring -- groundwater monitoring wells -- 18 total soil samples, three sediment samples, and three surface water samples. All of those right now will probably be modified upwards, based on the comments we received yesterday -- slightly upwards -- from the New Jersey Department of Environmental Protection and the United States Environmental Protection Agency.

ASSEMBLYMAN BENNETT: We are in receipt of the sampling plan which was forwarded by Lt. Miller, who you spoke of. That is scheduled to commence in October of this year. It is being done by Dames and Moore.

MR. McGRATH: Dames and Moore is the consultant to USATHAMA.

ASSEMBLYMAN BENNETT: If we could just go with some of the questions along the lines of: Once that sampling has been concluded by Dames and Moore, and the results of the sampling are received by your facility, would it be the intention of your facility to, simultaneously with you receiving them, sharing the results with DEP and EPA? How would you anticipate communicating with the two departments once you start to receive data from this report?

MR. McGRATH: Right now, I think the report would be forwarded to EPA and DEP, because we have been keeping them abreast of the progress we have been making so far, so I have no doubt that that situation will continue.

ASSEMBLYMAN BENNETT: Have you, at this point, established a technical review committee, which would include

the State and local or community representatives, together with you, working on environmental concerns? Has there been any formal setup at this point?

MR. McGRATH: No, sir. The extent of working with the local community has basically been in the recycling area, not in the hazardous waste area.

ASSEMBLYMAN BENNETT: Have you received any specific guidelines from the Department of Defense about how you are to respond or react to State environmental agencies? Has DOD been giving you any guidelines?

MR. McGRATH: Not specifically the DOD. The Military Traffic Management Command has indicated to us that it is up to the installation. We have cooperated fully with all of the environmental regulatory agencies in inspections and in this remedial investigation.

D. R. C H A R L E S L A C H N E R: It is the policy of USATHAMA to try to comply with the regulatory agencies as much as possible

ASSEMBLYMAN BENNETT: It is my understanding that the Department has had total access in working with you. That is my understanding. You said that when the report is received, you expect to be sharing it. But, in many cases, we receive raw data, many times many months before a report is finalized. As the data is received from your consultant -- or whatever information is received from your consultant -- would it be your intention to share that with the Department as you go along?

MR. McGRATH: If the Department were to request it, I don't think there would be any problem in forwarding it.

DR. LACHNER: As soon as it is validated by our agency -- has passed through the quality assurance procedures.

ASSEMBLYMAN BENNETT: Correct; I understand that. Sometimes I don't understand that quality assurance, but I now do. I didn't understand it before, but I now do. In some

cases, that quality assurance procedure, though, takes a long time.

DR. LACHNER: Perhaps a month or so.

ASSEMBLYMAN BENNETT: Well, unfortunately, we have seen-- That would be a short time, as far as I am concerned. We have seen, with some of the facilities, that they have said that process takes longer. I mean, I think in one case it was up to six months. To me, that is unfortunate, when they end up keeping data that could perhaps be helpful for a six-month period, while we go through that quality assurance program, or whatever that is.

Assemblyman Shinn, do you have any questions?

ASSEMBLYMAN SHINN: When you get to your one step beyond sharing the data, I think it would be helpful if we had the methodology that the contractor was going to use to recommend to the base for where he was going to drill wells, what he had found, how he was addressing it. I think what would be beneficial from that-- It would give the Department -- or EPA, or whomever -- a chance to look at the conceptual approach you were taking to the problem, whatever it may be. It would give them an opportunity to comment while they were considering what wells to put in where or what methodology they were going to employ, rather than giving them the final data from the tests, and saying, "Well, wait a minute, you didn't draw well downgrade in at this point, and you have indicated contamination in this well at this point." It just might stop 20/20 hindsight into your approach to the problem.

So, if you would consider that in your process, I think it would be helpful from the final aspect of dealing with the problem.

MR. McGRATH: Well, the methodology and the actual sample locations would be in the sampling plan; they would be laid out. We had discussions with DEP and EPA yesterday, and there were some geology concerns as to the locations, but they are being considered.

ASSEMBLYMAN SHINN: Do you have any kind of technical committee established under the new regs?

MR. McGRATH: Are you referring to the (indiscernible) amendments?

ASSEMBLYMAN SHINN: Yeah.

MR. McGRATH: With the local community?

ASSEMBLYMAN SHINN: Yeah.

MR. McGRATH: No, not as yet.

ASSEMBLYMAN SHINN: Is it something you are considering?

MR. McGRATH: That's right.

ASSEMBLYMAN SHINN: We found that to be a very good process. Ultimately it is very beneficial to everyone, I feel.

ASSEMBLYMAN BENNETT: Are there any monitoring wells presently at either, like, the closed landfill -- around the closed landfill -- or the storage area? Are there any presently in place?

MR. McGRATH: There are eight monitoring wells, but they are not at locations that are of concern in this remedial investigation. There are eight monitoring wells on the installation, so there would be a total of 20 wells altogether for the installation.

ASSEMBLYMAN BENNETT: Twelve new ones will be put in?

MR. McGRATH: That is correct.

ASSEMBLYMAN BENNETT: Generally, are the results of your existing eight wells detecting any problems?

MR. McGRATH: Of the eight wells that are in, we had eight sampling rounds, with a frequency, I believe, of two weeks in-between the sampling rounds, which is fairly quick. In one of those wells there are four hits of petroleum hydrocarbons, four times out of the eight sampling rounds, all under 100 parts per million. Based upon that, one of the heating fuel tanks has been abandoned as a possible leaking underground storage tank.

ASSEMBLYMAN SHINN: Excuse me. Do you use cluster wells? Do you have a shallow and deep well in your aquifer?

MR. McGRATH: Of the -- not the eight wells that are presently in -- other 12 that are going in--

DR. LACHNER: Four of them are cluster wells.

ASSEMBLYMAN SHINN: Four of them are clusters?

DR. LACHNER: Eight will be shallow, and four will cap the deep aquifer, if there is one.

ASSEMBLYMAN SHINN: How many aquifers are you testing in?

DR. LACHNER: We don't really know if there are distinct aquifers. We are not sure if there are distinct aquifers, but we are putting in a deep well -- or four deep wells -- just to get down to that depth.

ASSEMBLYMAN SHINN: I see. Have you determined the depth of the aquifer you are testing in?

DR. LACHNER: There is not really a distinct layer between the sand lenses.

ASSEMBLYMAN SHINN: There is no clay layer, no aquiclude that you have detected?

DR. LACHNER: Just some silt appears. They may not be distinct.

ASSEMBLYMAN BENNETT: A hundred parts per million or per billion?

MR. McGRATH: A hundred parts per million.

ASSEMBLYMAN BENNETT: Per million?

MR. McGRATH: They are all under that.

ASSEMBLYMAN BENNETT: I am a layperson when it comes to that. Usually, we deal with single digits per million, I thought.

DR. TRELA (speaking from audience): Mr. Chairman, according to my Department, this is a general measurement. It is not-- For example, if you take Wesson salad oil and put it in the groundwater and get a reading of petroleum

hydrocarbons. It's like oil and grease almost. It is a general kind of measurement. It is not the specific measurements that we usually deal with when we quote in terms of carcinogens like benzene, or things like that. So, it is a general indicator kind of measurement. That is why the sensitivity is less, first of all. It is usually rated parts per million as opposed to the parts per billion range.

The other issue is, it doesn't necessarily mean that there is any specific carcinogenic or other high (indiscernible; no microphone) compound. It doesn't mean that there isn't either.

ASSEMBLYMAN BENNETT: But they won't know until they have this data. Now, the data you have on those eight wells-- Has that been shared with the Department and EPA?

MR. McGRATH: At the meeting yesterday, we presented that information. The reports will be forwarded as soon as possible.

ASSEMBLYMAN BENNETT: Prior to yesterday, had that information been given to them?

MR. McGRATH: I do not believe so.

ASSEMBLYMAN BENNETT: How long have you been taking samples from the wells?

MR. McGRATH: It was just that one time period of eight rounds of sampling.

ASSEMBLYMAN BENNETT: And two weeks apart. How long ago was that?

MR. McGRATH: I believe that was about a year and a half ago.

ASSEMBLYMAN BENNETT: Was there a reason it was a year and a half before we gave the data to the Department? I mean, it sounds like a long time, but maybe there was a reason for it. That is why I am asking this question.

MR. McGRATH: It may have been provided to the Department -- I am not positive -- but it was definitely

provided yesterday during the meeting as part of the past sampling rounds.

ASSEMBLYMAN BENNETT: What I am hopeful of, and what I will say -- and I don't mean this to be taken incorrectly-- My hope is that when data becomes available to the Federal facilities, that data can be shared with the environmental agencies so they can collectively, with you, work toward a good, positive result of data. That is why I asked the question. Wherever we have a long delay, it is sometimes questionable as to how good those test results are. If they are a year and a half old, and there has been contamination detected at that point, how far has it gone, or what has happened to it after a year and a half? This could present a problem.

What we have attempted to do is encourage that as quickly as possible once they are received-- I mean, I think you heard earlier today someone said that their contractor, upon submitting the data to the facility, submits the data simultaneously to the two environmental agencies. Now, obviously, that is the ultimate goal. I believe that is what Fort Dix does, too. I believe we heard when they did it.

Then we have the other extreme where they go a year, year and a half, from the time the data is available. I merely mention that as what we are hoping to accomplish.

Have you had any communication problems with respect to the Department -- now we will turn the other way -- as far as receiving any information you needed, or having any questions answered that you may have posed to the environmental agencies? Have you had any communication coming backwards with a problem?

MR. McGRATH: No, we have a fairly good rapport with both DEP and EPA. Any questions I have posed to them have been answered. It is difficult sometimes trying to track down the right person in the bureaus, but that is understandable in the large organizations.

ASSEMBLYMAN BENNETT: Right. Do you have a project manager assigned to you in DEP?

MR. McGRATH: I believe Frank Groman (phonetic spelling) is the person who is handling this remedial investigation.

DR. LACHNER: Yes.

ASSEMBLYMAN BENNETT: Okay. So you do have a contact person?

MR. McGRATH: Right.

DR. LACHNER: We also have a contact person at EPA.

ASSEMBLYMAN BENNETT: And at EPA?

MR. McGRATH: Right.

ASSEMBLYMAN BENNETT: Okay. Thank you very much. Thank you for coming today. We also say thank you to Lt. Miller for sending the information that was sent. I look forward to your continuing to have a positive relationship with both the Federal facility and the State. Thank you.

MR. McGRATH: Thank you, sir. I hope we continue to have a good relationship also.

ASSEMBLYMAN BENNETT: From the Picatinny Arsenal in Dover, Mr. Garry Kosteck. Hopefully I said his name right.

M I C H A E L F. C L U N E: Mr. Chairman, I am Mike Clune. I am the Chief of the Division of Engineering Housing. Mr. Garry Kosteck doesn't work for us. He got a promotion.

ASSEMBLYMAN BENNETT: Oh.

MR. CLUNE: So, his replacement, Mr. Nabil Ghani, who is-- Garry was Chief of our Environmental Office, and Mr. Nabil Ghani has taken that over. Also with us today is Mr. William Heidelberger, who is Chief of our Operations Branch, which would be anything from sanitary waste, probably water supply, and our decontamination of former production buildings. We also have Ms. Josephine Nelson, Esq., who is from our Legal Department, and Mr. Pete Roland (phonetic spelling) from our Public Relations Office.

ASSEMBLYMAN BENNETT: Do you want to make a formal statement, or do you want me to just start with questions.

MR. CLUNE: I brought a little background on Picatinny Arsenal.

ASSEMBLYMAN BENNETT: I think that would be very helpful.

MR. CLUNE: I am not aware of how familiar you are with the Arsenal and the organization that occupies the land.

ASSEMBLYMAN BENNETT: Some background data would be excellent.

MR. CLUNE: Well, Picatinny Arsenal is a 6500 acre U.S. Army installation located in western Morris County. The Arsenal lies between Jefferson and Rockaway Townships within a 10-mile-long valley formed by two surrounding mountain ranges. Its main entrance is located off of State Highway 15.

Picatinny consists of 2200 developed acres containing more than 1000 buildings, 80 miles of paved roads, 4000 acres of woodland, and 300 acres of open water.

The installation was established by the Army more than 100 years ago as a storage and powder depot. Just before the turn of the century, production and manufacturing activities, which were performed at the installation until the mid-1970s, began.

These production activities included the loading of propellant. This activity began shortly before the Spanish-American War. Several years later, the Arsenal also began loading projectiles with explosives. In 1906, the Army's first powder plant was built at Picatinny. It began operating the following year. At the onset of World War I, Picatinny was producing all sizes of propellants in large quantities.

Following World War I, the Arsenal began melt-loading projectiles on a production basis -- melt-loading is a way of putting explosives into artillery shells; it is melted and then cast into the shell -- and developing and manufacturing

pyrotechnic signals and flares. In these years also, experimental plants for manufacturing more modern propellants, high explosives, fuzes, and metal components were established. In addition, production scale manufacturing of fuzes began.

At the beginning of World War II, while the Army waited for private industry to convert its assembly lines for ammunition production, it was Picatinny that filled the gap. Between July, 1939 and September, 1942, the Arsenal produced millions of bomb fuzes, boosters, artillery primers and fuzes, and millions of other items. After World War II, Picatinny resumed the task of researching, developing, and engineering better munitions for the Army.

During Korea and Vietnam, however, the Arsenal geared up once again, producing propellants, melt-loading projectiles, developing and manufacturing pyrotechnics and flares, developing various missiles, and producing bombs on a large scale.

In 1975, the Arsenal was selected by the Army as the site of a new organization intended to consolidate the management of all armament research and development work. After two years of preparation, Picatinny assumed this new mission in 1977.

The Arsenal is the Army center of scientific and technical expertise for weapons and munitions -- known as armaments -- research, development, and engineering. It has frequently been called one of the foremost installations of its kind in the world. Earlier this month, its largest organization, the Army Armament Research, Development and Engineering Center, was named Army Center of the Year.

Picatinny is the Army focal point for establishing and maintaining the technology base for all gun armament systems, most conventional munitions, and energetic materials. Its organizations oversee engineering development of new weapons and munitions arising from its research efforts and lifetime

engineering support of all weapons and munitions in the Army's inventory. This includes all aspects of production, fielding, and demilitarization.

The Arsenal employs roughly 5500 civilian employees from the tristate area, most of whom are residents of New Jersey. Nineteen of the 21 counties are represented in Picatinny's total work force. In addition, the installation has roughly 175 military and their dependents. Picatinny has an annual New Jersey payroll of \$150 million. In addition, the Arsenal awarded \$64 million in contracts to New Jersey businesses last fiscal year.

We can provide you with this little paper, if you so desire.

ASSEMBLYMAN BENNETT: Thank you. I would like to have it for inclusion in the record.

MR. CLUNE: It gives you a little bit of background as to where Picatinny was and what we are doing today.

ASSEMBLYMAN BENNETT: I am also in receipt of a letter dated March 25, 1987 -- which was received on April 6, 1987 -- from Thomas E. Fleming, Colonel, Aviation Director, Installation Support Activity--

MR. CLUNE: Colonel Fleming is my boss.

ASSEMBLYMAN BENNETT: --with respect to the testing of the 27 abandoned hazardous and solid waste sites that had been identified in the '83 IAS, which was funded by the United States Army Toxic and Hazardous Materials Agencies. In addition, according to that letter, there was indication that a groundwater pollution plume was emanating from Buildings 24 and 95, which would be under further investigation by the United States Geological Survey.

Are you aware of any other sites which may be in need of further investigation?

MR. CLUNE: No, sir, other than 27 surplus sites. They are composed of everything -- a 1926 accident at the

Arsenal, where the resultant munitions were buried, and therefore that is a contaminated site. The landfill that was formerly located at the site is located at the site that was closed out in '72, I believe. There are some rocket engine test sites there. That is the magnitude and the spectrum of the surplus sites.

The pollution plume consists of trichloral ethylene which was the result of plating operations in those two buildings. The USGS has been monitoring the situation. It is a unique opportunity for us and them, in that, fortunately, it is in the center of the Arsenal, and we have the surrounding area. So, we have been able to drill monitoring wells at a number of locations around that plume, to monitor its concentration and migration, if any, and effect on the quality of the water.

Other than those sites, there are no other known sites at this time at the Arsenal. Now, we do have, of course, the former production buildings, which are contaminated with explosives, which we are in the process of dismantling and, when necessary, decontaminating.

ASSEMBLYMAN BENNETT: We were informed by DEP and by EPA that DEP had identified an additional 25 sites, for a total of 54 sites. Are those buildings you are talking about the additional sites?

MR. CLUNE: They might be in the areas, yeah.

ASSEMBLYMAN BENNETT: The buildings-- Are there 25 additional ones?

W I L L I A M H E I D E L B E R G E R: There are more than 25.

MR. CLUNE: Yeah. I think what they have done is locate them in production areas. In the production of explosives, you usually do, like, one operation in a building, and it is a small building. Then you transfer that projectile, or that explosive to another building, so that if one building

detonates it doesn't propagate down the line. What we have done in that is identify areas, so an entire area may be affected.--That is what they might be considering a site.

For instance, on the surplus sites, that encompasses acres. I think almost 10% of the Picatinny Arsenal area is contained in those surplus sites.

ASSEMBLYMAN BENNETT: Well, why don't we find out? Are the additional 25 sites-- Are they the buildings or groups of buildings they are referring to?

DR. TRELA: Mr. Chairman, I don't have that report with me today. What I can explain to you is that the surplus sites that Picatinny is referring to are not really, in the strict sense, surplus sites, because they are not on the NPL.

MR. CLUNE: That's right.

DR. TRELA (speaking from audience): But they are being handled under the IRP that was discussed earlier today by the DOD. In addition to that, because Picatinny did file a Part A application pursuant to RCRA in the early 1980s, they had these two (indiscernible; no microphone) that you referred to earlier -- plumes of contamination. Because they weren't in the system of RCRA, we are required, along with the EPA, under the Hazardous and Solid Waste Amendments of 1984 to RCRA, to do what is called a RCRA Facility Assessment, as part of our statute. The RCRA Facility Assessment is essentially very similar to what was done in '82 or '83, when the facility identified the first 27 sites.

There is a team sent out to the facility to do an inspection and evaluate all of the historical stuff in terms of what has gone on there. So, I would say that the probability is that these buildings are, in fact, included in that report. I don't have the report with me, and I can't answer your question yes or no. The probability is that we can provide the Committee with the report-- (remainder of statement indiscernible; no microphone)

ASSEMBLYMAN BENNETT: Will there be, on these additional -- the buildings or groups we are talking about-- Is there going to be an additional IAS on them?

MR. CLUNE: The decontamination of the production buildings?

ASSEMBLYMAN BENNETT: Yes.

MR. CLUNE: I don't know if there is a study being done on them. When we determine that they are excess-- Picatinny is no longer in a production status.

ASSEMBLYMAN BENNETT: I see.

MR. CLUNE: We have said that these buildings, since they were production buildings, are excess. We go through a procedure for getting rid of these buildings. Since they did contain explosives and manufacturing processes, one of the things we have to do is do soil samples -- do a determination as to what is the environmentally safe method of getting rid of these. In fact, in this process, we have written an environmental assessment that is required. So, from the government's side, we have to do what you might call a study before we can even excess these buildings.

I don't think we intend, at this point in time, to bring in an outside agency to make that determination.

ASSEMBLYMAN BENNETT: Going back to the 27 plus the two-- When I say 29, I am talking about the original 27, plus the two plumes. All right?

MR. CLUNE: Right.

ASSEMBLYMAN BENNETT: Have there been any confirmation studies done on that?

MR. CLUNE: Yes, sir. As a matter of fact, they are due to begin this year. We have identified the areas of concern -- which of the 27 sites plus the two. We have had meetings this year with USATHAMA, subsequent to your letter there, at which USATHMA has agreed to fund--

ASSEMBLYMAN BENNETT: I'm sorry, with whom?

MR. CLUNE: USATHAMA -- the United States Army Toxilogical Health Agency.

ASSEMBLYMAN BENNETT: Okay.

MR. CLUNE: They have agreed to fund the studies for us. They have under contract an organization to command and initiate these efforts. They will survey the site, make a determination as to what the significance of it is, and then make recommendations to us for corrective actions.

ASSEMBLYMAN BENNETT: Has DEP had an opportunity to talk about -- or to review and comment on these confirmation studies that are being proposed?

MR. CLUNE: They haven't even been initiated yet, so--

ASSEMBLYMAN BENNETT: They are not started, but prior to them getting started, I would assume you would want to have some discussions with the Department, so that when the scope of the actual studies is going to be presented, the input will have been given, so that--

MR. CLUNE: Correct, so that what the State needs is contained in the study.

ASSEMBLYMAN BENNETT: Correct.

MR. CLUNE: Yes, sir. I am not sure if that has been done, but I will see to it that it is.

ASSEMBLYMAN BENNETT: Okay.

N A B I L G H A N I: The intent, sir, is normally that we really seek the cooperation of DEP whenever it is needed, if we feel it is outside our particular expertise.

MR. CLUNE: The question is, though, does the scope contain the requirements of the State? That is what we need to--

MR. GHANI: Correct.

MR. CLUNE: --ascertain.

ASSEMBLYMAN BENNETT: How many sites will have some types of remedial work performed during the year 1987?

MR. CLUNE: Those sites--

ASSEMBLYMAN BENNETT: Of the 29. I am only going to talk about the 29, because I am not sure about the buildings, and I think you have answered that.

MR. CLUNE: Okay. Only Buildings 94 and 24 have been submitted to the State. Those are the closure plans for those buildings. They have been submitted, or the draft has been submitted rather. They still have to be approved by the State.

ASSEMBLYMAN BENNETT: How many do you think will be done in '88?

MR. CLUNE: Well, the study is under way. We will initiate it the last part of '87. So, depending on the findings the USATHAMA contractor comes up with-- That is the first step, to include all those sites. So, the remaining 27 will be studied this year. Exactly how far we proceed is subject to the efficiency of the contractor and the magnitude of the effort.

ASSEMBLYMAN BENNETT: And the moneys available?

MR. CLUNE: Well, USATHAMA has already funded that.

ASSEMBLYMAN BENNETT: The studies, but not the remedial.

MR. CLUNE: The remedial action, yes, sir, that is what becomes a two-part deal.

ASSEMBLYMAN BENNETT: Is it anticipated that the center would be using any discretionary funds for any cleanups?

MR. CLUNE: Yes, sir. The first choice is to have USATHAMA fund it.

ASSEMBLYMAN BENNETT: Obviously.

MR. CLUNE: Obviously. If, at that point, USATHAMA is unable to fund it, it comes back to the center and we can apply for funds out of our base operation funds, or other funds that may be available. Of course, we would be in competition, but we have already started that work on other items.

ASSEMBLYMAN BENNETT: Would you be able to supply us, after the study is concluded -- and I understand that -- a

schedule of when you believe you would be doing the remedial action at the different sites?

MR. CLUNE: We could furnish you with a programmatic--

ASSEMBLYMAN BENNETT: Right. Okay, fair enough.

MR. CLUNE: --schedule of what we would like to see happen. Obviously, every year we put into our budget what we would like to get accomplished, and what we get accomplished is the function of the funds we do receive.

ASSEMBLYMAN BENNETT: I understand that, but perhaps working together we can help that to happen a little bit.

MR. CLUNE: Oh, yes, sir. We have done that in the past with the RCRA Part B aspects.

ASSEMBLYMAN BENNETT: The 1983 IAS indicated-- On any of these questions, by the way, that are specific in scope, if you don't have the answer, that is perfectly all right, if you are able to just get the answer to me. I don't expect you to have the answers at your fingertips.

MR. CLUNE: Certainly.

ASSEMBLYMAN BENNETT: I want to say that up-front, because I am not asking the questions to cause any embarrassment. I understand that the answers may not be available, but I want to pose the questions, and if you have them, fine.

The 1983 IAS indicated the detection of 12,000 parts per billion of TCEs in Well 9-A, and both vertical and horizontal movement at monitoring wells near Building 65. This could be characterized as a serious contamination problem. However, since the potable wells have been shut down, the movement of the contaminated water has been slowed. Has there been any further testing or water samples conducted in proximity to Well 9-A?

MR. CLUNE: Yes, sir. Specifically, in May we ran additional testing of all the wells. This summer, in conjunction with USGS and DEP, we are drilling additional wells

to further define the scope and any migration of that plume. What has happened is, based on the first well drillings-- They formed the basis for the additional well drillings to further define it. We have not gotten the test results from the May drillings yet.

ASSEMBLYMAN BENNETT: The May--

MR. CLUNE: The May samplings.

ASSEMBLYMAN BENNETT: But, prior to May?

MR. CLUNE: Prior to May, we had USGS conduct some samples, which indicated to you -- I think in that letter of March -- that they had been done, and that we had received the draft but not the final. The final was imminent; the final is still imminent. We expect it the first part of July now, which having listened to your previous questions to other agencies on furnishing the raw data, is a good point here. To just address that question, when we get a draft report, unfortunately, like anything else that is in draft, it is usually rough, and often errors are in there. We prefer not to release a draft report; however, raw data is something else.

ASSEMBLYMAN BENNETT: Right, that is my whole point.

MR. CLUNE: We will consider that. But, the test results we have received from USGS -- the raw data -- indicated that the concentration had decreased.

ASSEMBLYMAN BENNETT: Okay. Both the Department and EPA have indicated to us that the Army has closed down a number of lagoons, without DEP approval, which allegedly were contaminated with TCEs at 243 parts per billion and PCEs at 386 parts per billion and TCAs at 1780 parts per billion, and that they are awaiting post-closure plans from the facility. Are the closure and post-closure plans being prepared?

MR. CLUNE: Yes, they are. We can get back to you with specific dates and when they are due in.

ASSEMBLYMAN BENNETT: And when they are finished, will they be available to DEP?

MR. CLUNE: Oh, absolutely. As a matter of fact, they will be reviewed by them.

ASSEMBLYMAN BENNETT: DEP has also indicated to us that there are two inactive waste dumps at the lower end of the facility, over by Route 15, and that there are two or three monitoring wells installed around both dumps. Their recommendation has been that there should be three downgrading wells and one up. To date, there has not been an indication of them. Basically, my question is, are there any plans to install any additional wells around those locations?

MR. CLUNE: Those locations are part of those 27, and that will be in there. We are really waiting for the USATHAMA folks to come back in with their recommendation so we can do it once.

ASSEMBLYMAN BENNETT: These are not on the NPL list presently?

MR. CLUNE: No, sir, they're not. These are all sites through the historical search that we felt may, or may not-- Because they were a "may," they were included for review.

ASSEMBLYMAN BENNETT: Right, okay. So we do anticipate that in that study there will be some wells? I mean, I think--

MR. CLUNE: Well, we have some there now. The question is, what type should they be, and how deep should they be, and where should they be located? We will take DEP's comment, along with USATHAMA's, to come up with a single project to do it at one time.

ASSEMBLYMAN BENNETT: The last time the Federal facilities came before this Legislature, there was information that the Green Pond Brook, which runs through the base -- and, of course, is stocked with trout by the State -- that Green Pond Brook flows next into the Rockaway River, and that in some routine tissue checks, the tissue of the fish taken from the Green Pond Brook revealed traces of explosives. Have you

conducted any studies or reached any conclusions as to the source of the explosives?

MR. CLUNE: I don't know what explosives were in there. I know toxicity studies have been performed at Syracuse University for other Army ammunition plants for explosives that are ingested by fish and the resultant toxicity. I would have to find out--

ASSEMBLYMAN BENNETT: We were informed about the explosives the last time we were here. What we are wondering is if there have been any steps taken to see what the source of that was. We didn't know that; your people informed us.

MR. CLUNE: Obviously, the source of the explosives would be Picatinny Arsenal.

ASSEMBLYMAN BENNETT: If you could look into that--

MR. HEIDELBERGER: The source of the explosives is really the production facilities that were around the different ponds. The production facilities are the ones we are decontaminating and taking down now. But, anything more specific than that, I don't think anyone could really come up with.

MR. CLUNE: We know what the source of the explosives is.

MR. HEIDELBERGER: Yeah, we produced lots of ammunition up there, and the trend that was started back during the war was just, you know, to dump it.

MR. CLUNE: It was a once through operation.

MR. HEIDELBERGER: So, that is the source.

MR. CLUNE: But I think the question should be, what kind of explosives were they and what is the toxicity?

ASSEMBLYMAN BENNETT: Correct, and I don't know the answer to that.

MR. CLUNE: I know we have done studies -- not for Picatinny Arsenal, because the Arsenal isn't a major producer.

ASSEMBLYMAN BENNETT: Not any more, but it would be from--

MR. CLUNE: No, not then. But, what we have done for our Army ammunition plants where they do produce these explosives-- We have had toxicity tests done on fish, and we can get that data for you and see if it correlates.

ASSEMBLYMAN BENNETT: Have there been any surface water tests done to determine potential contamination of the Green Pond Brook?

MR. CLUNE: Surface water?

ASSEMBLYMAN BENNETT: Surface water.

MR. CLUNE: Sure. As a matter of fact, we periodically do testing.

ASSEMBLYMAN BENNETT: Are those results shared with the Department?

MR. CLUNE: They are provided to the Department.

ASSEMBLYMAN BENNETT: I was told there weren't any.

MR. HEIDELBERGER: The surface water on the post is the source of our drinking water. We are required by State law to process this information on the drinking water -- potable water -- to the State. That is done, absolutely.

ASSEMBLYMAN BENNETT: Green Pond Brook is--

MR. HEIDELBERGER: Well, Green Pond Brook drains the pond Picatinny Lake in Lake Denmark, which is the source of Green Pond Brook. (Mr. Clune and Mr. Heidelberg speaking at same time; some portion indiscernible) Our drinking water right now--

ASSEMBLYMAN BENNETT: Is from the lake?

MR. HEIDELBERGER: --is coming from these lakes, yeah, which drain into Green Pond Brook.

ASSEMBLYMAN BENNETT: I understand, okay. So, under our -- is it 280?

DR. TRELA (interjecting from audience; no microphone): Well, it is under either the Drinking Water Act or-- (cannot be transcribed; no microphone)

ASSEMBLYMAN BENNETT: Are there any plans to do any down there?

MR. CLUNE: There wasn't.

MR. HEIDELBERGER: No. If I may comment again?

ASSEMBLYMAN BENNETT: Sure.

MR. HEIDELBERGER: Our sewerage treatment plant discharges into this pond.

MR. CLUNE: Into the brook.

MR. HEIDELBERGER: Yeah. So we monitor what we discharge.

ASSEMBLYMAN BENNETT: Right.

MR. HEIDELBERGER: By contract. That is put on the documentary report to the State. What we don't know -- and I don't think we do -- is between the drinking water supply and discharging from the sewerage treatment plant. We are not monitoring that on any systematic basis.

MR. CLUNE: So the answer to your question is no.

ASSEMBLYMAN BENNETT: Okay. Let me ask it this way, because I think it would be fairer to you: Are you aware of any requests by the Department to have any tests done of that water? Maybe that is a fairer way of doing it.

MR. CLUNE: Well, Bill is not, I am not, but Nabil is new. I am going to have Nabil go back and see if there is any residual request in his file.

ASSEMBLYMAN BENNETT: I am not saying there is. I am just asking the question.

MR. CLUNE: To our knowledge, there isn't but, like I said, since Nabil heads up that department, and he just came on board, I would like him to go back and take a look to make sure.

ASSEMBLYMAN BENNETT: Have you established a technical review committee with State and local representatives on it at this point, to review some of the environmental work that is ongoing? You have heard us talking about it, I think, previously.

MR. CLUNE: Yes, sir. In the generation of a project such as the decontamination project, we did an environmental

assessment. That indicated that the effects were limited to the post. However, that was a public document made available to the public. We do hold meetings upon request with the local townships which surround us. As a matter of fact, when there was concern over the open burning issue, we invited not only DEP in, but EPA and the mayors of the townships that surround it, for not only a meeting in the morning, but a walk-through of the areas. We are hoping to establish -- and this is just preliminary at this point -- a meeting with the townships on a recurring basis, not to discuss just environmental problems, but anything that may affect the Arsenal and interrelationships to the townships.

So, at this point, to say "Is there an established consortium, or meetings," no. They are called at the request of the townships.

ASSEMBLYMAN BENNETT: Do you anticipate that the facility will be included ultimately on the NPL? You said, at one point, that it may. But you really won't know until your results are done, I guess is the answer.

MR. CLUNE: As far as we know, the answer is no. But, again, as we definitize these efforts, it may. But, I doubt it.

ASSEMBLYMAN BENNETT: Have you received any guidance from the -- same question; you have heard it three times today -- Department of Defense as to how you are to respond to State environmental agencies directly? Have you received any guidance right from the Department?

MR. CLUNE: Absolutely. As you know, EPA delegates to the State DEP. That is the authority for enforcement and compliance. If the State law is more severe than the Federal law, then we are obliged to follow the State law. In that regard, it is mandated. That's guidance. That's a fact.

As far as programmatic type efforts, meeting with the State as far as RCRA Part B and pollution abatement, PCB contamination -- these efforts -- we routinely confer with the

appropriate State agency to make sure that the direction we are going is the appropriate direction.

ASSEMBLYMAN BENNETT: I have no further questions. I would like to thank you, and request that you convey my thanks to Colonel Fleming for having all of you appear before us today. There were a couple of questions which came up which perhaps we can get the answers to at your convenience.

I am hopeful that what we are setting forth in place will be a continuing effort to see to it that there will be cooperative efforts, as I said to the previous speakers, and that Assemblyman Shinn's suggestions will be considered, on establishing communications similar to what has happened at Fort Dix, which has been a very positive thing in their area, where they meet on a very regular basis with EPA, DEP, and county and local representatives. Sometimes we can resolve certain problems by communicating them and sharing different data, which may result in a better atmosphere for all involved in the efforts to try to resolve some of these problems.

I certainly do appreciate your coming today, and I appreciate all the candor you have given us. I hope to be able to continue to work with you in the future. Thank you.

MR. CLUNE: Thank you.

ASSEMBLYMAN BENNETT: That concludes, at this point, the guests of the Committee. I again thank EPA for being present, and I thank DEP for being here. If you have any questions or comments you wish to place into the record, you are more than welcome to do so. I thank both Director Daggett and the Commissioner for making you available today.

Thank you. The meeting is adjourned.

(MEETING CONCLUDED)

APPENDIX

CHAPTER 2

IRP INTRODUCTION

New Jersey State Library

INTRODUCTION

BACKGROUND AND AUTHORITY

The United States Air Force has long been engaged in a wide variety of operations dealing with toxic and hazardous materials. Federal, state and local governments have developed strict regulations to require that disposers of hazardous wastes identify the locations and contents of disposal sites and take action to eliminate the hazards in an environmentally responsible manner. The Department of Defense (DOD) has issued Defense Environmental Quality Program Policy Memorandum (DEQPPM) 81-5 requiring the identification and evaluation of past hazardous material disposal sites on DOD property, the control of migration of hazardous contaminants, and the control of hazards to health or welfare that could result from these past operations. This program is called the Installation Restoration Program (IRP). The IRP will be a basis for response actions on Air Force installations under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. DEQPPM 81-5 implemented by Air Force message dated 21 January 1982 reissued and amplified all previous directives and memoranda on IRP.

PURPOSE AND SCOPE OF THE ASSESSMENT

The Installation Restoration Program has been developed as a four-phased program as follows:

- Phase I - Initial Assessment/Records Search
- Phase II - Confirmation
- Phase III - Technology Base Development
- Phase IV - Operations (Control Measures)

Engineering-Science (ES) was retained by the Air Force Engineering and Services Center to conduct the Phase I Records Search at McGuire Air Force Base under Contract No. F08637-80-G0009, Call No. 0017, using funding provided by the Military Airlift Command. This report contains

a summary and an evaluation of the information collected during Phase I of the IRP. The land areas included as part of the McGuire AFB study are as follows:

McGuire AFB	3,536 acres
McGuire Middle Marker	0.52 acres
McGuire Missile Site (BOMARC)	219 acres
Gibbsboro Radar Station	23 acres
Burlington POL Off-Loading Facility	2.13 acres
McGuire Approach Lights	2.18 acres

The goal of the first phase of the program was to identify the potential for environmental contamination from past waste disposal practices at McGuire AFB, and to assess the potential for contaminant migration. The activities that were performed in the Phase I study included the following:

- Reviewed site records
- Interviewed personnel familiar with past generation and disposal activities
- Inventoried wastes
- Determined quantities and locations of current and past hazardous waste storage, treatment and disposal
- Defined the environmental setting at the base
- Reviewed past disposal practices and methods
- Conducted field and aerial inspection
- Gathered pertinent information from federal, state and local agencies
- Assessed potential for contaminant migration.

ES performed the on-site portion of the records search during August 1982. The following core team of professionals were involved:

- J. R. Absalon, Hydrogeologist, BS Geology, 8 years of professional experience
- J. W. Braswell, Environmental Engineer, MS Environmental Health Engineering, 7 years professional experience
- R. M. Reynolds, Chemical Engineer, BSChE, 8 years of professional experience
- E. J. Schroeder, Environmental Engineer and Project Manager, MSCE, 15 years of professional experience

- M. I. Spiegel, Environmental Scientist, BS Environmental Science, 5 years of professional experience

More detailed information on these individuals is presented in Appendix A.

METHODOLOGY

The methodology utilized in the McGuire AFB Records Search began with a review of past and present industrial operations conducted at the base. Information was obtained from available records such as shop files and real property files, as well as interviews with past and present base employees from the various operating areas. Those interviewed included current and past personnel associated with the Civil Engineering Squadron, Bioenvironmental Engineering Services, Aircraft Ground Services, Field Maintenance Services, and Fuels Management. Experienced personnel from present and past tenant organizations were also interviewed. Interviews were conducted with 52 individuals from the base to obtain the needed past activity information. A listing of Air Force interviewees by position and approximate period of service is presented in Appendix B.

Concurrent with the base interviews, the applicable federal, state and local agencies were contacted for pertinent base related environmental data. The eleven agencies contacted and interviewed are listed below as well as in Appendix B.

- o U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Grounds, MD
- o U.S. Army Corps of Engineers, Philadelphia and New York Districts
- o U.S. Army Corps of Engineers Resident Engineer, Fort Dix, NJ
- o U.S. Environmental Protection Agency, Region II
- o New Jersey Dept. of Environmental Protection - Bureau of Pesticide Control
- o New Jersey Dept. of Environmental Protection - Div. of Fish, Game, and Wildlife
- o New Jersey Dept. of Environmental Protection - Div. of Water Resources

- o New Jersey Dept. of Environmental Protection - Div. of Waste Management
- o New Jersey Pinelands Commission, New Lisbon, New Jersey
- o Rutgers University, Department of Geology, Staff
- o U.S. Geological Survey, Water Resources Division

The next step in the activity review was to determine the past management practices regarding the use, storage, treatment, and disposal of hazardous materials from the various operations on the base. Included in this part of the activities review was the identification of all known past disposal sites and other possible sources of contamination such as spill areas.

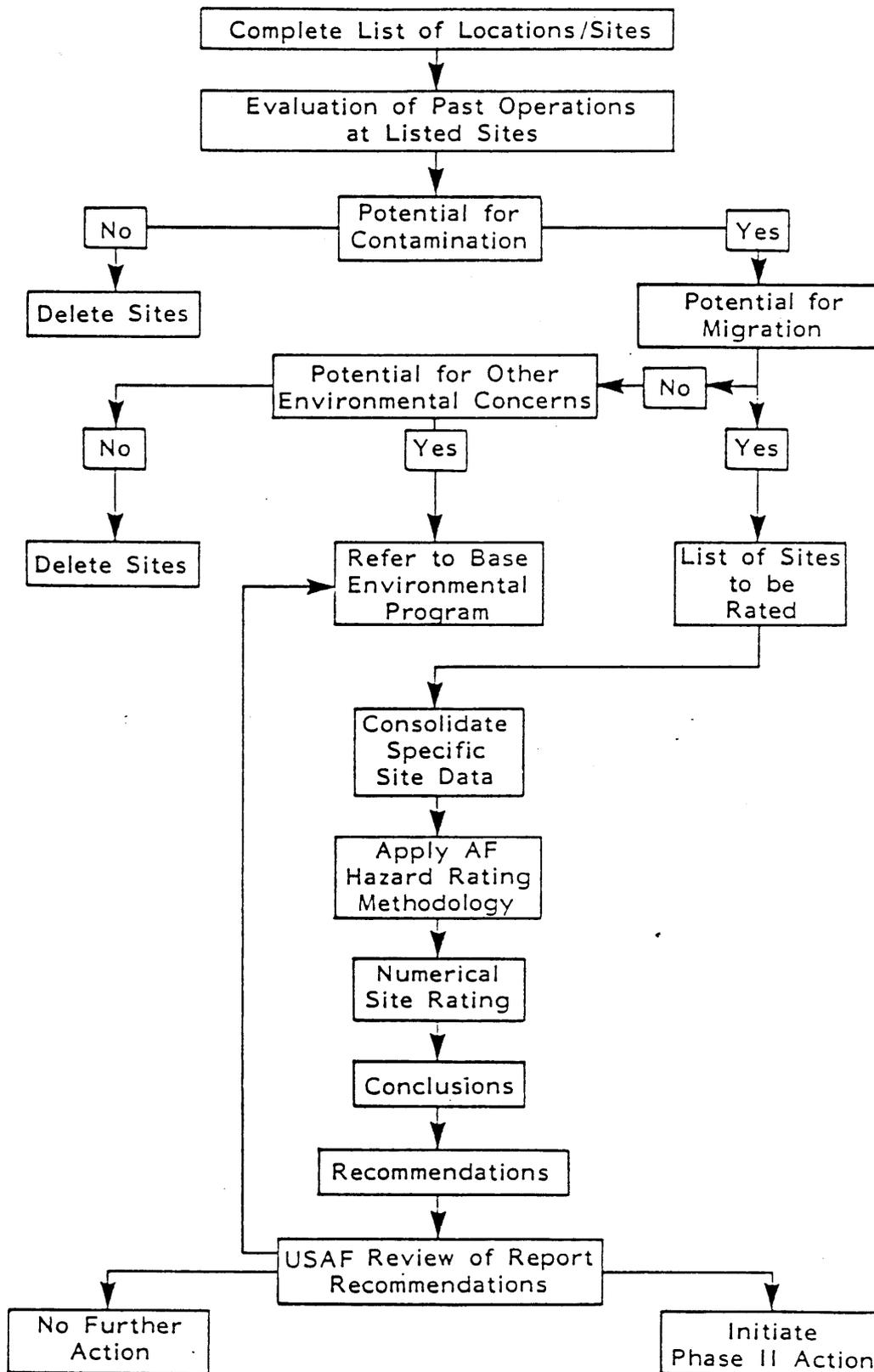
A general ground tour and an aerial overflight of the identified sites were then made by the ES Project Team to gather site-specific information including: (1) visual evidence of environmental stress; (2) the presence of nearby drainage ditches or surface water bodies; and (3) visual inspection of these water bodies for any obvious signs of contamination or leachate migration.

A decision was then made, based on all of the above information, whether a potential exists for hazardous material contamination at any of the identified sites using the Decision Tree shown in Figure 1.1. If no potential exists, the site was deleted from further consideration. For those sites where a potential for contamination was identified, a determination of the potential for migration of the contamination was made by considering site-specific conditions. If there were no further environmental concerns, then the site was deleted. If the potential for contaminant migration was considered significant, then the site was evaluated and prioritized using the Hazard Assessment Rating Methodology (HARM).

The HARM score indicates the relative potential for environmental contamination at each site. For those sites showing a high potential, recommendations are made to quantify the potential contaminant migration problem under Phase II of the Installation Restoration Program. For those sites showing a moderate potential, a limited Phase II program may be recommended to confirm that a contaminant migration problem does or does not exist. For those sites showing a low potential, no further follow-on Phase II work would be recommended.

PHASE I INSTALLATION RESTORATION PROGRAM

DECISION TREE



6X

CHAPTER 3

INSTALLATION DESCRIPTION

INSTALLATION DESCRIPTION

LOCATION, SIZE AND BOUNDARIES

McGuire Air Force Base is located in south central New Jersey, 18 miles southeast of Trenton and borders the community of Wrightstown in Burlington County (Figures 2.1 and 2.2). East, south and west boundaries of McGuire AFB border on the U.S. Army Fort Dix installation. The base is located in a semi-rural area with most adjacent lands either vacant, wooded or used for agricultural or military purposes. McGuire AFB is geographically positioned in the northeast corner of a region designated as the New Jersey Pine Barrens, an expanse of relatively level wooded land covering one and one-third million acres on the coastal plain between the piedmont and the tidal strip. The area is under the management of the New Jersey Pinelands Commissions. Figure 2.3 depicts the configuration of the 3,536 acres comprising McGuire AFB. Several installation annexes under the jurisdiction of McGuire AFB were also included in this study. These areas are identified below and depicted in Figure 2.2.

- | | | |
|-------------------------------|---|--|
| McGuire Middle Marker | - | 0.52 acres located approximately 900 feet outside of the base boundaries within the approach of Runway 06. The site is used to provide navigational markings. The land is owned by the U.S. Army but under custody of McGuire AFB. |
| McGuire Missile Site (BOMARC) | - | 219 acres located approximately 11 miles east of McGuire AFB within the Fort Dix Military reservation and directly west of the Lakehurst Naval Air Station. |

REGIONAL LOCATION

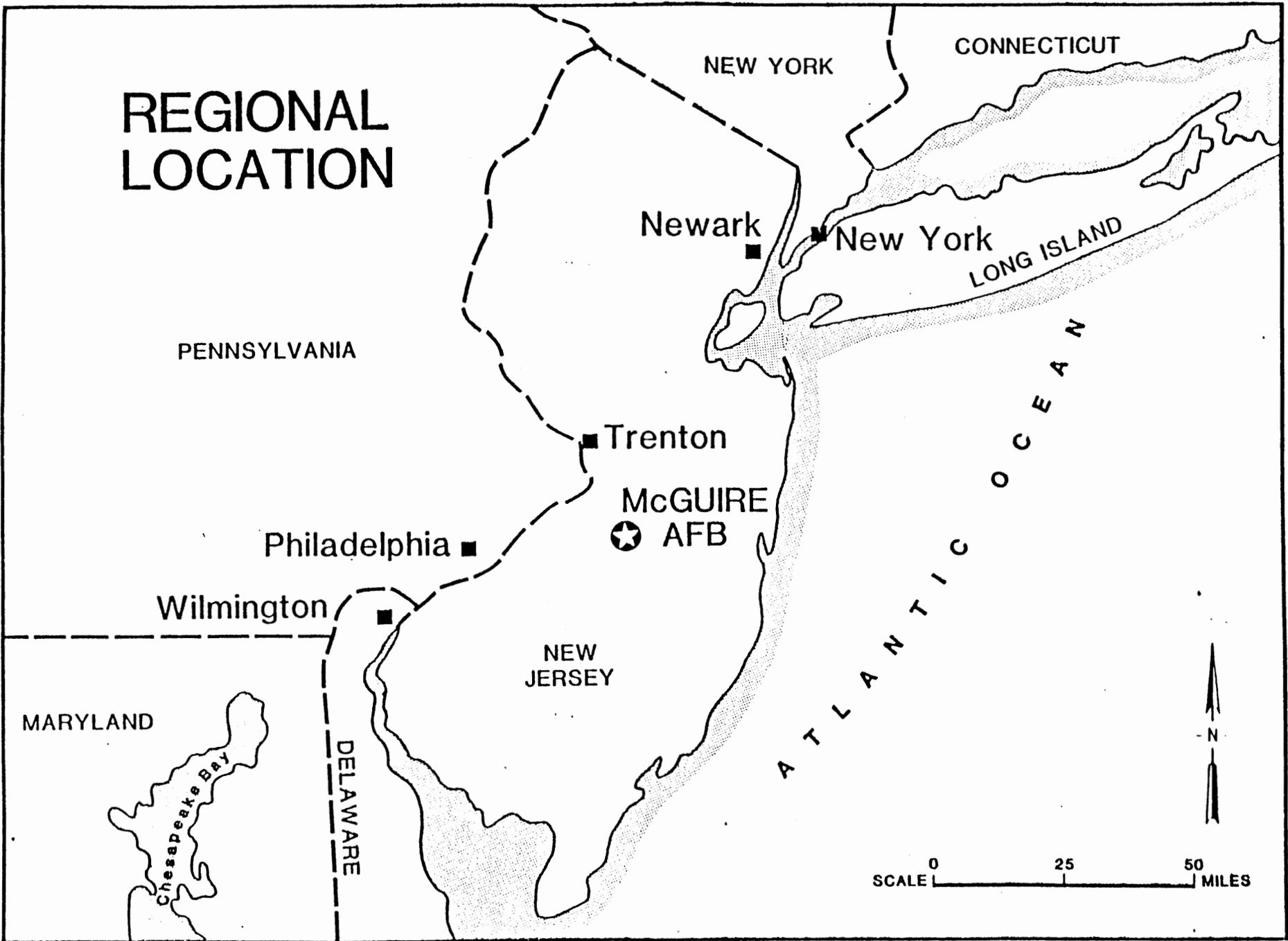
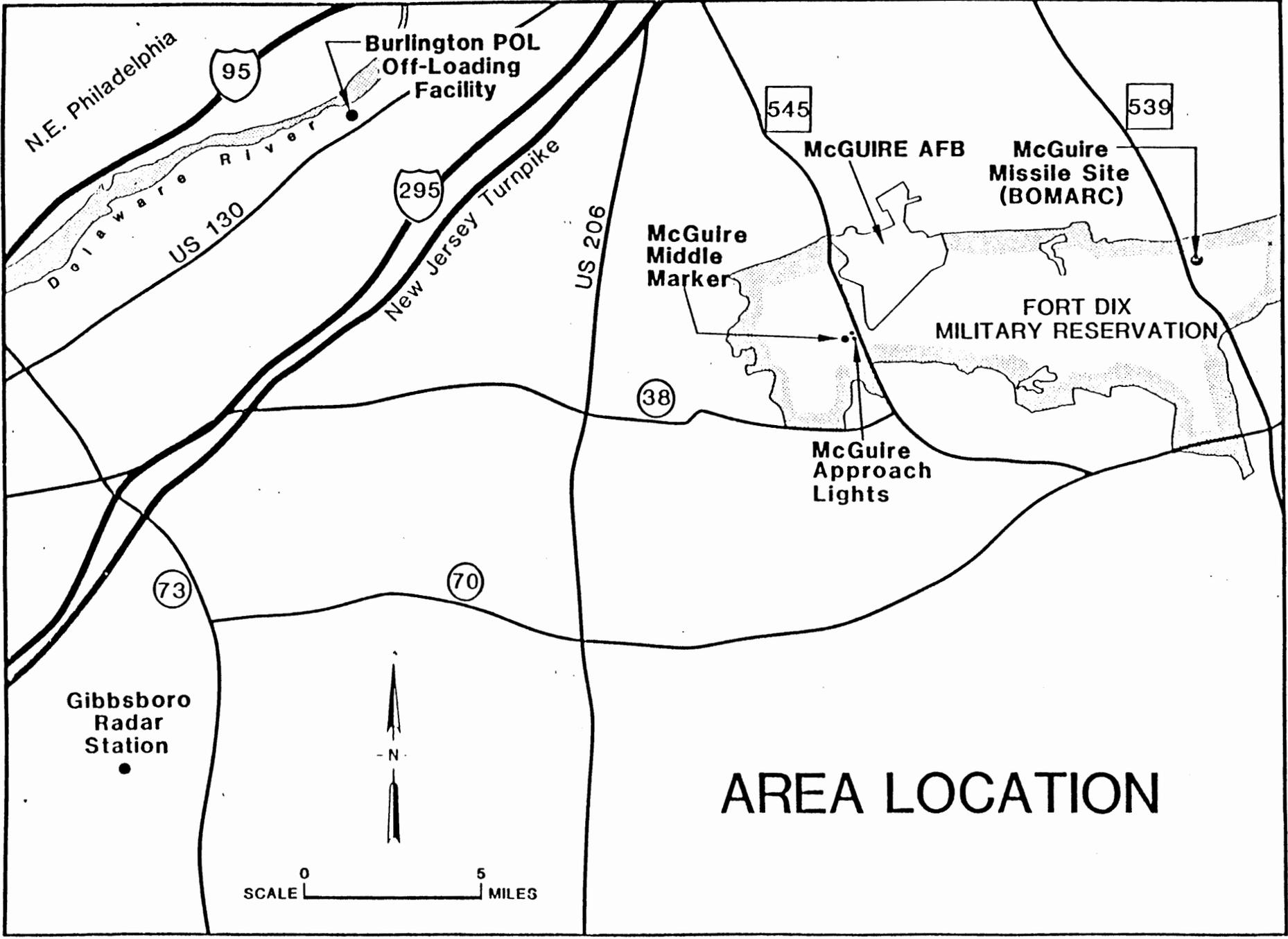


FIGURE 2.1

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9X

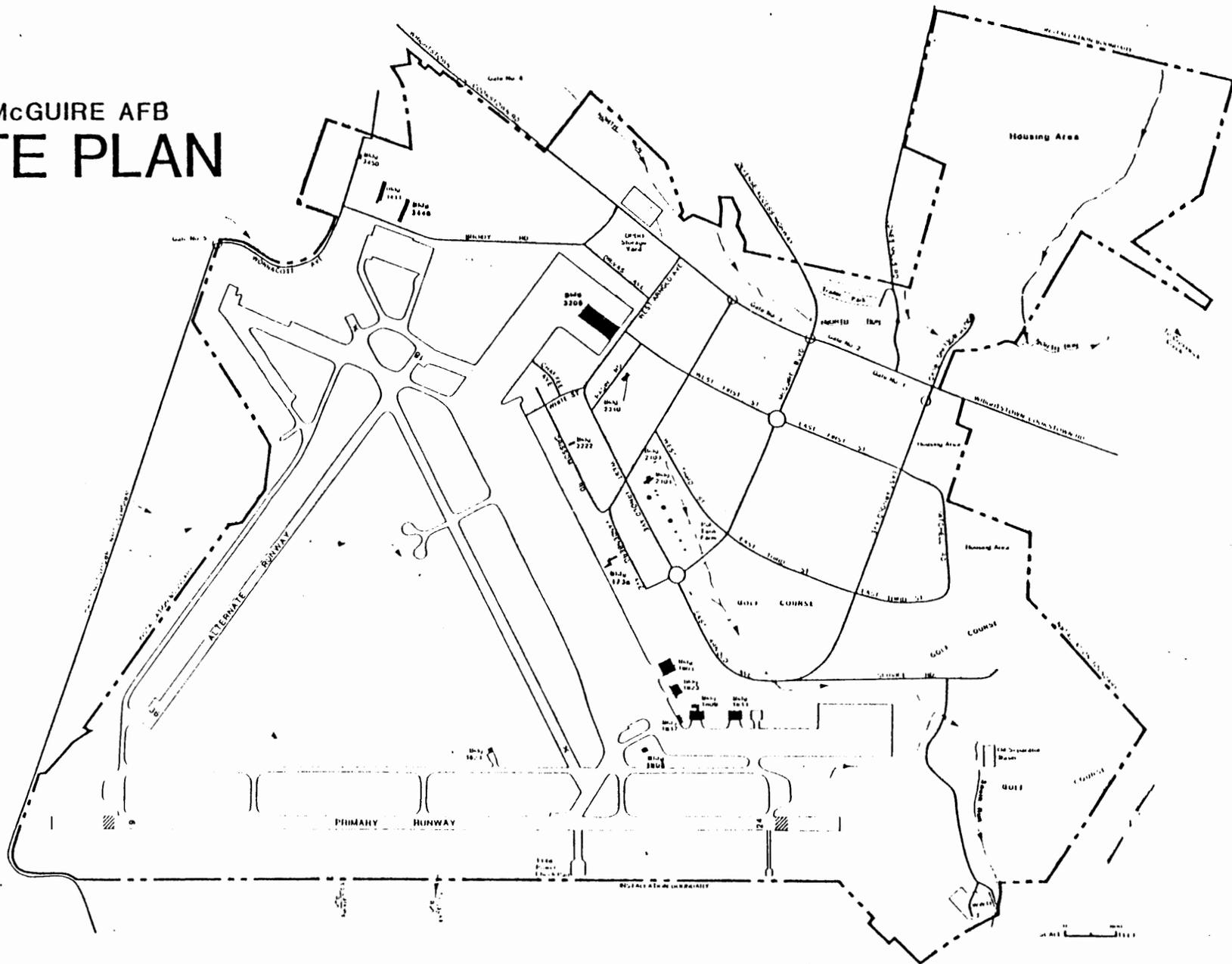
10X
2-3
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AREA LOCATION

FIGURE 2.2

McGUIRE AFB SITE PLAN



SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

2-4
//X

ES ENGINEERING - SCIENCE

FIGURE 2.3

- The area was utilized by the Air Force as a launch site for the BOMARC missiles between the mid 1950's and 1972. The land is owned by the U.S. Army but is under custody of McGuire AFB.
- Gibbsboro Radar Station - 23 acres located 25 air miles southwest of McGuire AFB along Hwy 561 near the town of Gibbsboro, New Jersey. The site is used as a Tactical Air Command radar tracking station.
 - Burlington POL Off-Loading Facility - 2.13 acres located on the south-east side of the Burlington Bridge along the eastern shore of the Delaware River. The site is 15 miles northwest of McGuire AFB. It is used as an off-loading terminal for the JP-4 pipeline that supplies McGuire AFB.
 - McGuire Approach Lights - 2.18 acres located approximately 900 feet outside of the base boundaries within the approach of Runway 06. The land is owned by the U.S. Army by is under custody of McGuire AFB.

BASE HISTORY

In 1937, McGuire AFB began as a single dirt-strip runway with a few maintenance and administrative buildings. The airfield called Rudd Field, at the time, was developed as an adjunct to the U.S. Army Training Center, Fort Dix, and was operated by the Army Air Corps.

During the period 1940 thru 1942, the U.S. Army Air Corps, under Command Headquarters located at New Castle Air Base, Delaware, made extensive improvements, including expanded aircraft pavements and landing

strips to meet World War II transitional training activities. The airfield remained under Army control until 1948.

In 1948, the Fort Dix Airfield and all existing facilities were transferred to the U.S. Air Force, and the installation was officially designated McGuire Air Force Base. The installation was assigned to the Strategic Air Command (SAC) until September 1949, when it was transferred to the Continental Air Command (CAC). In 1952 a major program of development was initiated to provide a port of aerial embarkation for Atlantic Division, Military Air Transport Service (MATS).

In July 1954, the base was officially assigned to the Military Air Transport Service with Air Defense Command (ADC) and the New Jersey Air National Guard (NJANG) as major tenant organizations. The NJANG consolidated their activities on the west side of the base supported by a major construction program. Subsequently, SAC and CAC tenant units were assigned to McGuire AFB. In January 1966, the Military Air Transport Service became the Military Airlift Command (MAC) with headquarters at Scott AFB, IL. Eastern Transport Air Force became the 21st Air Force with headquarters at McGuire AFB, and the 1611th Air Transport Wing became the 438th Military Airlift Wing. The SAC Tanker Squadron left McGuire in 1965 and its facilities were occupied by the 170th Air Transport Group NJANG.

ORGANIZATION AND MISSION

The present host organization at McGuire AFB is the 438th Military Airlift Wing whose primary mission is to provide quick reacting, concentrated, massive airlift to place Department of Defense forces into combat situations in a fighting posture and then furnish them with the material they need to stay in that posture. The Wing is also responsible for operating McGuire AFB and for providing adequate support to a large number of tenant units.

Tenant organizations at McGuire AFB are listed below. Descriptions of the major base tenant organizations and their missions are presented in Appendix C.

Headquarters Twenty First Air Force

Air Force Office of Special Investigation, Detachment 413

Air Force Audit Agency
Air Force ROTC, Northeast Area Office
Defense Fuel Region - Northeastern
Defense Property Disposal Office
Detachment 1, 1600th Management Engineering Squadron
Field Training, Detachment 203
OL-A Detachment 1, 375th Aeromedical Airlift Wing
OL-K, Headquarters Military Airlift Command
Detachment 10, 7th Weather Wing
Headquarters New Jersey Air National Guard
Headquarters 108th Tactical Fighter Wing
141st Tactical Fighter Squadron
Headquarters 170th Air Refueling Group
514th Military Airlift Wing and Associated Units
772nd Radar Squadron, Gibbsboro AFS, NJ
Military Airlift Command Non-Commissioned Officers Academy East
1998th Communication Squadron
3515th USAF Recruiting Squadron
590th Air Force Band

CHAPTER 4

ENVIRONMENTAL SETTING OF MCGUIRE AIR FORCE BASE

ENVIRONMENTAL SETTING

The environmental setting of McGuire Air Force Base is described in this chapter with the primary emphasis directed toward identifying features which may facilitate the movement of hazardous waste contaminants. A summary of the environmental setting pertinent to the study is presented at the conclusion of this section.

METEOROLOGY

Temperature, precipitation and snowfall data furnished by Detachment 10, 15th Weather Squadron, McGuire AFB, are presented in Table 3.1. The period of record is 33 years. The summarized data indicate that the mean annual precipitation is 43.5 inches. This corresponds with the value obtained from the National Oceanic and Atmospheric Administration Climatic Atlas of the United States (NOAA, 1977). The NOAA has determined that the mean annual Class A pan evaporation for the area is 45 inches with a 76 percent coefficient. These values result in a net precipitation of 9.3 inches.

GEOGRAPHY

The McGuire AFB area is located along the southern boundary of the inner coastal plain section of the Atlantic Coastal Plain Physiographic Province. This physiographic division is characterized by low dissected hills and broad sandy plains occurring in a narrow belt some ten to twenty miles wide that extends northeast along the Delaware Valley across New Jersey to Raritan Bay (Wolfe, 1977 and Minnard and Owens, 1962). Major features of the inner coastal plain include nearly level plains, gently rolling uplands, extensive surficial dissection, mature streams and swampy areas. Upland stream valleys possess "V-type" channels when viewed in cross section, indicative of rapidly eroding sandy soils. Lowland stream channels exhibit a "sag and swale" appearance,

TABLE 3.1
MCGUIRE AFB CLIMATIC CONDITIONS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
<u>TEMPERATURE</u>													
Average Max	40	42	49	62	71	80	84	83	76	66	54	43	63
Average Min	24	26	32	41	51	60	66	64	57	47	37	28	44
Days > 80°	0	0	--	2	6	17	25	22	11	2	--	0	85
Days < 32°	25	22	16	4	--	0	0	0	0	1	10	22	100
Record Max	74	74	85	93	94	97	102	100	100	88	82	75	102
Record Min	-4	-4	8	19	31	42	50	42	35	25	15	0	-4
<u>PRECIPITATION (All Forms)</u>													
Average Inches	3.0	3.0	3.9	3.5	3.2	3.3	4.2	5.0	3.6	3.3	3.4	4.1	43.5
Greatest Inches	9.19	5.73	6.02	6.54	6.50	8.34	10.2	15.0	8.58	7.22	8.83	12.4	62.8
Least Inches	.31	.72	1.14	1.17	.23	.05	.71	.78	.82	.08	.24	.16	27.2
24-Hr Max	2.23	2.41	2.29	2.59	2.91	4.06	4.15	9.61	3.76	3.32	3.40	6.74	9.61
<u>PRECIPITATION (As Snow)</u>													
No. Days Precip.	11	10	11	11	11	10	9	9	8	7	10	10	117
No. Days Snow	3	4	3	--	0	0	0	0	0	--	--	2	12
Average Inches	6.2	5.2	4.7	.5	T	0	0	0	0	T	.75	3.8	21.7
24-Hr Max	14.5	18.1	20.1	5.8	7	0	0	0	0	7	8.6	7.1	20.1

T = Trace

Source: Detachment 10, 15th Weather Squadron, McGuire AFB

Period of Record: 1948-1981

3-2

17X

indicating the presence of somewhat cohesive, fine-grained soils that tend to be more resistant to erosional effects. Figure 3.1 depicts the physiographic regions of New Jersey.

Topography

The topography of McGuire AFB ranges from generally level to gently rolling in appearance. Local relief is primarily the result of dissection by erosional activity or stream channel development. Base surface elevations range from a low of 80 feet mean sea level (MSL) along the South Run stream channel east of Building 1503 to 144 feet MSL at the cemetery located along the southwest base boundary.

Drainage

Drainage of McGuire AFB land areas is accomplished by overland flow to diversion structures and then to area surface streams, all of which are tributaries of the Delaware River. Typically, the north portion of the base drains to the North and South Runs of Crosswicks Creek. The south and east sections of the base drain to Bowker's Run, Jack's Run and Larkin's Run, all of which are tributaries of Rancocas Creek. Generally, the base is well drained and has not experienced any disruptions to service because of flooding. According to Schaefer (1982) the McGuire AFB - Fort Dix area is not subject to flooding. No wetland areas have been identified on base. Figure 3.2 depicts McGuire AFB drainage.

Surface Soils

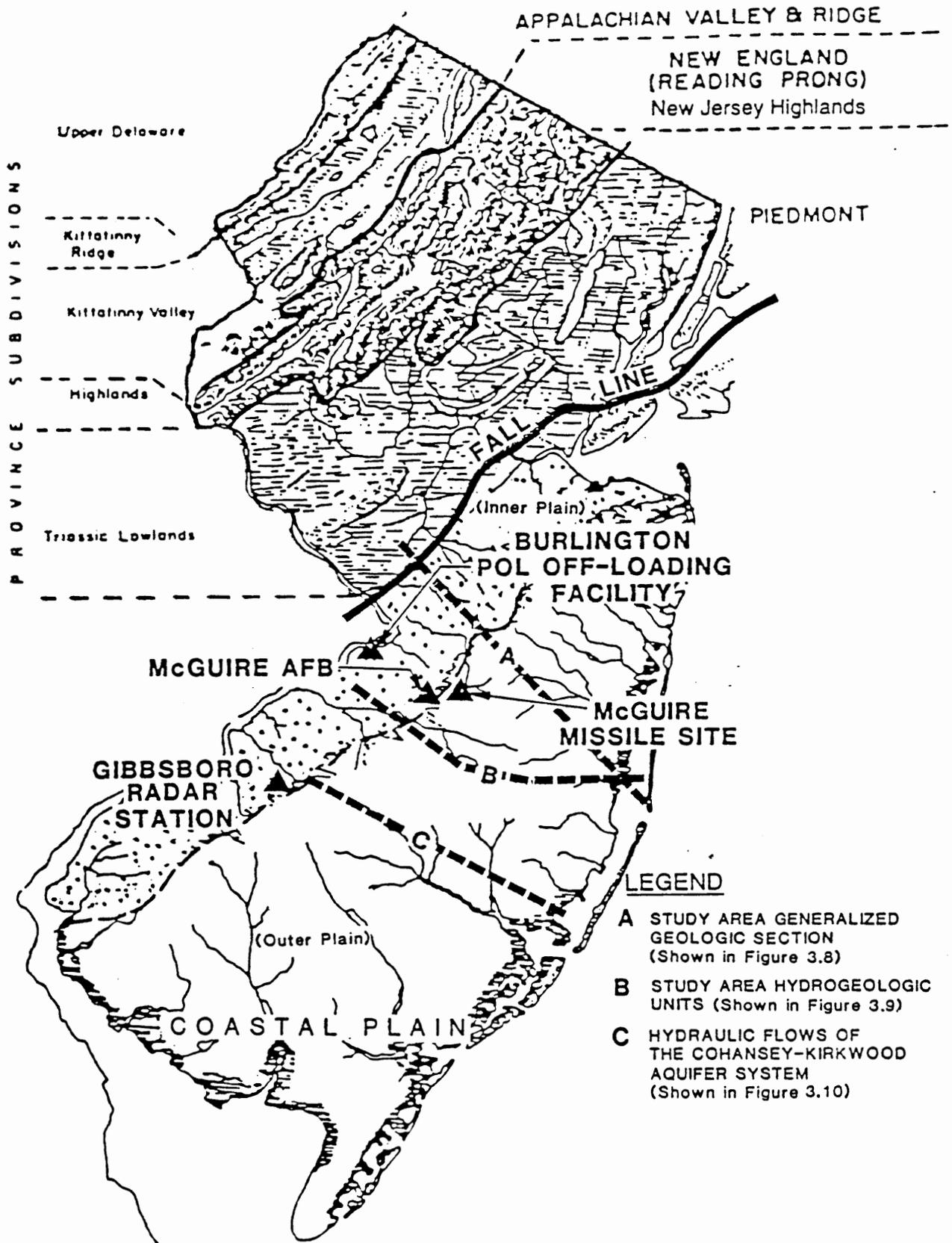
Surface soils of the McGuire AFB, the Burlington POL off-loading Facility and the McGuire Missile Site have been reported by the U.S. Department of Agriculture, Soil Conservation Service (1971 and 1980). Twenty-three soil types have been identified within the installation boundaries of these three sites. The individual soil units are described in Table 3.2 and are mapped in Figure 3.3. Most of the base soil units impose moderate to severe constraints on the development of waste disposal facilities. These soil units are typically sandy, well drained and possess a normally high water table.

GEOLOGY

Information describing the geologic setting of the McGuire AFB area has been obtained from Lewis and Kummel (1912, rev. 1950), Minard and

FIGURE 3.1

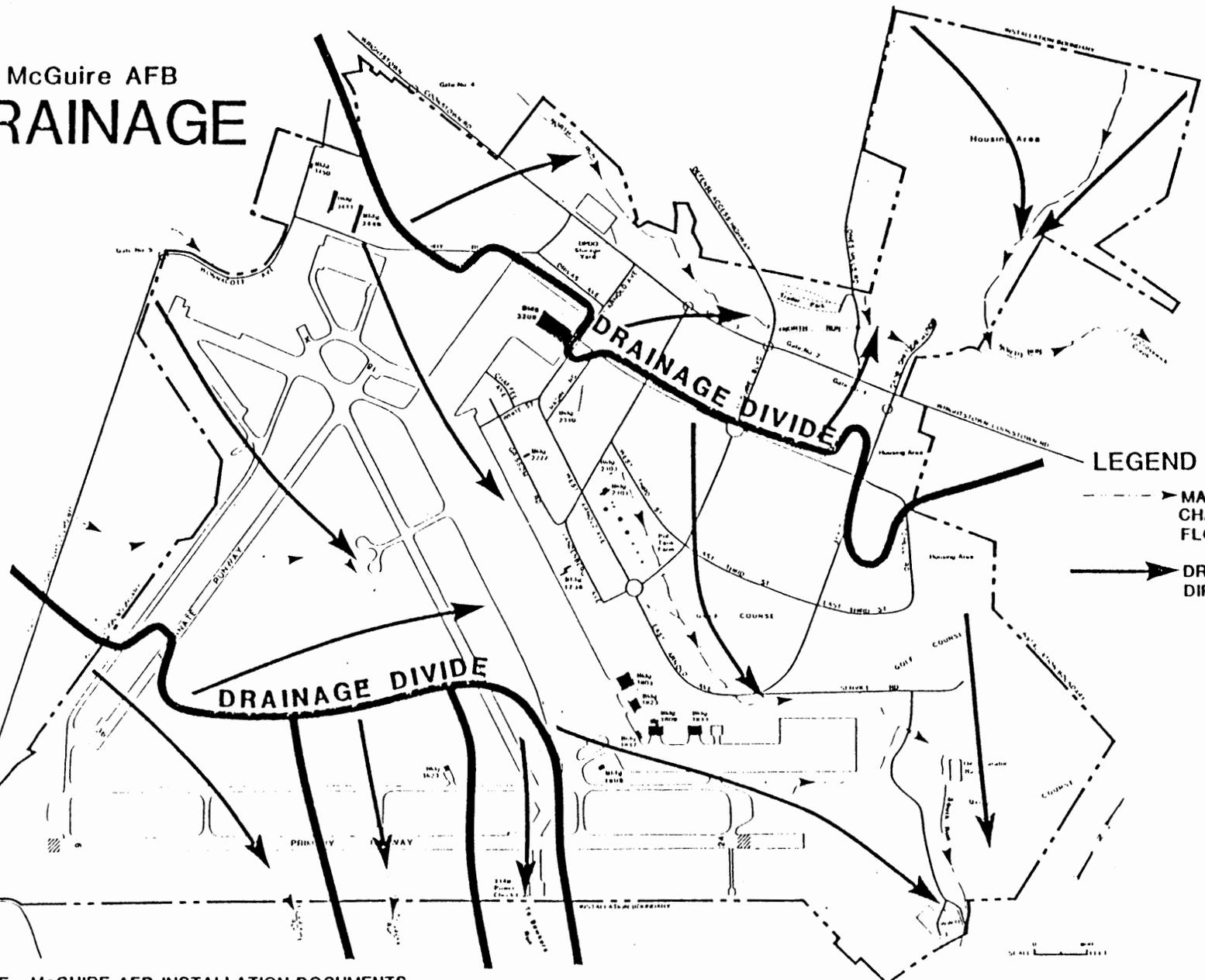
PHYSIOGRAPHIC DIVISIONS



SOURCE: WOLFE (1977)

3-4
19X

McGuire AFB DRAINAGE



- LEGEND**
- MAJOR DRAINAGE CHANNELS and FLOW DIRECTION
 - DRAINAGE DIRECTION

SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

20X

3-5

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FIGURE 3.2

TABLE 3.2
MCGUIRE AIR FORCE BASE SOILS

Map Symbol	Unit Description	USDA Texture (Major Fraction)	Thickness (Inches)	Unified Classification (Major Fraction)	Permeability (Inches/Hour)	Disposal Site Facility Use Constraints
Ao	Alluvial land	Loam, sandy loam, clay loam	60	SM, SC, ML, CL	Variable	Severe-high water table; floods
Ap	Alluvial land	Sand	60	SH, SP, SP-SM	>6.3	Severe-high water table; floods
Av	Atalon fine sand	Sand, fine sand, loamy fine sand	60	SP, SP-SM	2.0 - >6.3	Severe-high water table
DoB	Downer loamy sand	Loamy sand	60	SH, SP-SM	2.0 - 6.3†	Severe-limited unsaturated zone
EyB	Evesboro fine sand	Sand or fine sand	60	SP, SP-SM	0.2 - 6.3†	Moderate-slopes
FfC	Freehold fine sandy loam, 5-10% slopes	Fine sandy loam, clay loam, sandy clay loam	60	SC, SM, SM-SC	0.2 - 6.3†	Severe-slopes
FfD	Freehold fine sandy loam, 10-15% slopes	Fine sandy loam, clay loam, sandy clay loam	60	SC, SM, SM-SC	0.2 - 6.3 †	Severe-slopes
FfE	Freehold fine sandy loam, 15-25% slopes	Fine sandy loam, clay loam, sandy clay loam	60	SC, SM, SM-SC	0.2 - 6.3†	Severe-slopes
FoC3	Freehold sandy loam, 5-10% slopes	Fine sandy loam, clay loam, sandy clay loam	60	SC, SM, SM-SC	0.63 - 6.3†	Slight
KmA	Kle] sand	Sand, fine sand	60	SH, SP, SP-SM	>6.3	Severe-high water table
KoA	Kle] fine sand	Sand, fine sand	60	SH, SP, SP-SM	>6.3	Severe-high water table
LnA	Lakehurst fine sand	Sand, fine sand	60	SP, SP-SM	>6.3	Severe-high water table
Mq	Made land(or sanitary fill)	Highly Variable - Properties not estimated				Probably severe-water table
NbA	Nixonton fine sandy loam	Fine sandy loam, loamy fine sand	60	SM	0.2 - 2.0	Severe-high water table
NbA	Nixonton loamy fine sand	Loamy fine sand, sandy loam	60	SM, SP-SM	0.2 - 6.3†	Severe-high water table
Pa	Pasquotank fine sandy loam	Fine sandy loam, loamy sand, sand	60	SM, SP	0.63 - 2.0	Severe-high water table
SgB	Sassafras fine sandy loam	Fine sandy loam	60	SM, SC, ML	0.2 - 6.3†	Slight
So	Shrewsbury fine sandy loam	Loam, fine sandy loam, sandy clay loam	60	SM, SC, ML	0.63 - 2.0	Severe-high water table
Uq	Urban land (sandy)	Loamy sand or sandy loam	60	SM, SP-SM	2.0 - 6.3	Variable-probably moderate to severe
**	Urban land	Highly Variable - Properties not estimated				Probably Severe-permeability
WdB	Westphalia loamy fine sand	Loamy fine sand, fine sandy loam	60	SM, SP-SM	0.2 - 6.3	Slight-Unsat. zone may be limited
WdA	Westphalia fine sandy loam	Fine sandy loam	60	SM, SP-SM	0.2 - 6.3	Slight-Unsat. zone may be limited
WdB	Westphalia fine sandy loam	Fine sandy loam	60	SM, SP-SM	0.2 - 6.3	Slight-Unsat. zone may be limited

* Present at McGuire AFB and Burlington POL Station

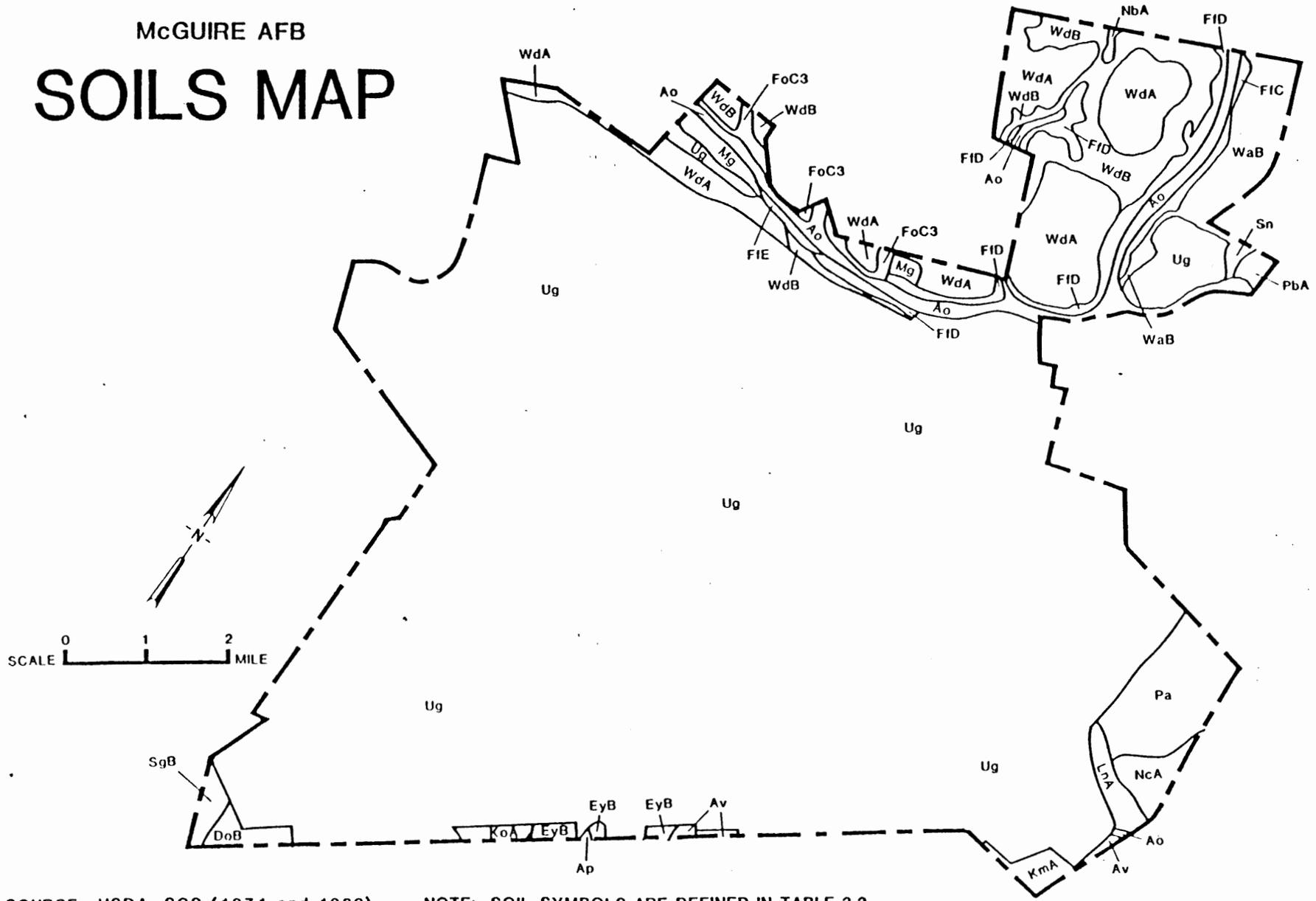
** Present at IMHARC Site

Source: USDA, Soil Conservation Service, 1971 and 1980

21X
3-6

New Jersey State Library

McGUIRE AFB SOILS MAP



SOURCE: USDA, SCS (1971 and 1980)

NOTE: SOIL SYMBOLS ARE DEFINED IN TABLE 3.2.

3-7
22X

ES ENGINEERING - SCIENCE

FIGURE 3.3

Owens (1962), Isphording and Lodding (1969), Markewicz (1969), Wolfe (1977) and N. J. Pinelands Commission (1980). Additional information has been obtained from an interview with U.S. Geological Survey (USGS) personnel. A brief review of their work and pertinent comments has been summarized to support this investigation.

Stratigraphy

Geologic units ranging in age from Cretaceous to Quaternary have been identified in the Coastal Plain. These units are typically unconsolidated materials consisting of gravel, sand, silt, clay, glauconite, marl and organic materials, reposing on a Pre-Cambrian/Lower Paleozoic crystalline (consolidated) basement complex. Although the units may be somewhat similar in character, they can usually be differentiated by variations in mineralogy, macro and microstructure, color (related to depositional environment) and fossils. Table 3.3 summarizes coastal plain geologic formations and describes their significant characteristics, in chronological sequence.

Distribution

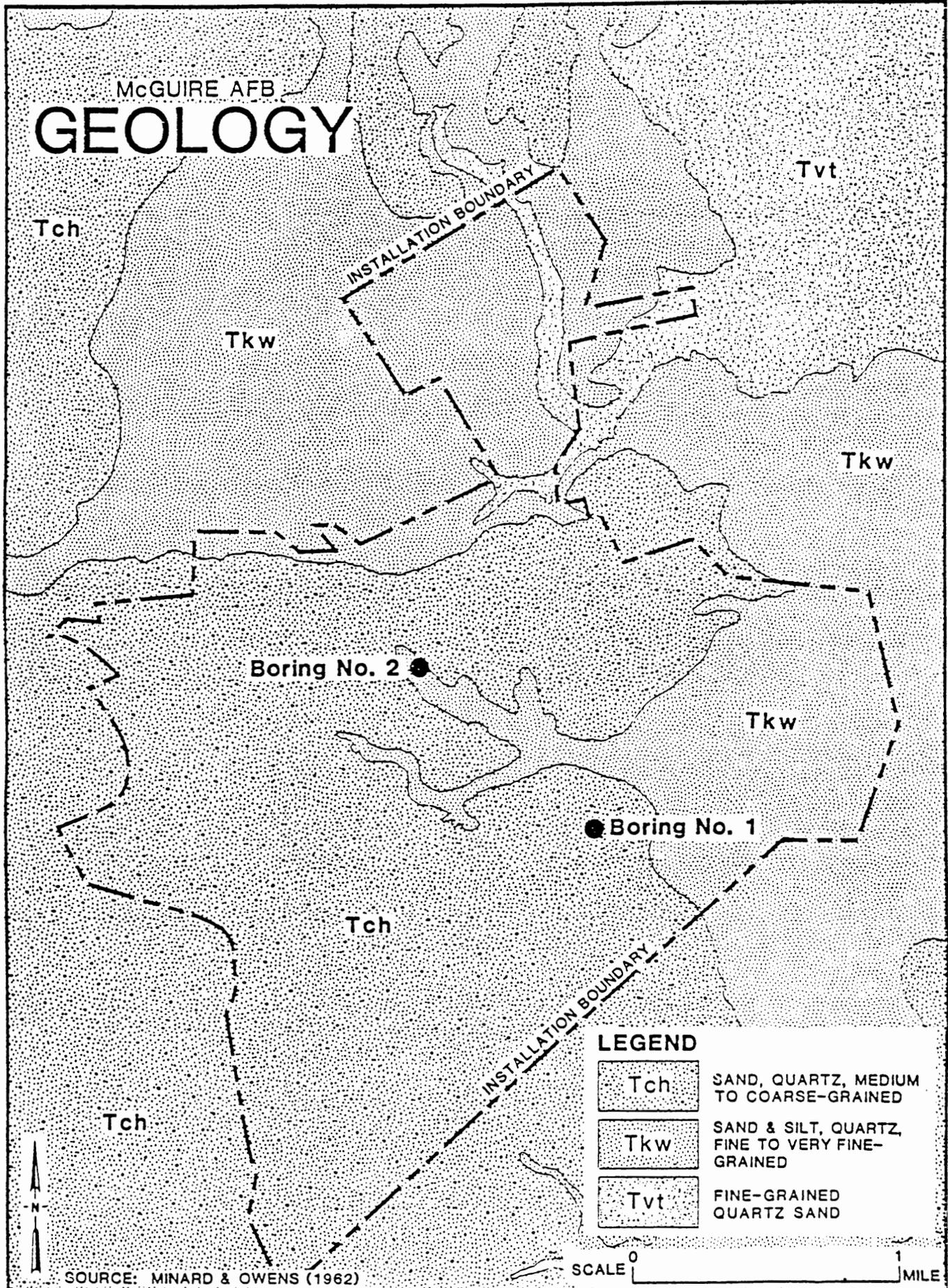
The surface distribution of geologic units relevant to this study is presented as Figure 3.4, which has been modified from the work of Minard and Owens (1962). Generally, the geology of McGuire AFB is dominated by moderately thick sections of interbedded continental and marine sands and clays of the Cohansey (Tch), Kirkwood (Tkw) and Vincentown (Tvt) Formations. According to Minard and Owens (1962), each unit reaches a maximum thickness of some 50 feet in the general area of McGuire AFB. The degree of interbedding is variable and it has been reported that individual layers within major formations cannot be correlated over long distances without some difficulty. This may be due to internal lithologic variations or past erosional effects following depositional cycles. The highly variable nature of upper geologic units present at McGuire AFB may be observed on the logs of two test borings, drilled approximately one mile apart (Figures 3.5 and 3.6). Their locations are shown on Figure 3.4.

The distribution, lithology, etc. of significant geologic units present at the McGuire Missile Site is similar to that of the main installation. In this area, it is believed that a relatively thin (40 feet or less) expression of the Cohansey Sand is present at ground sur-

TABLE 3.3
COASTAL PLAIN GEOLOGIC FORMATIONS

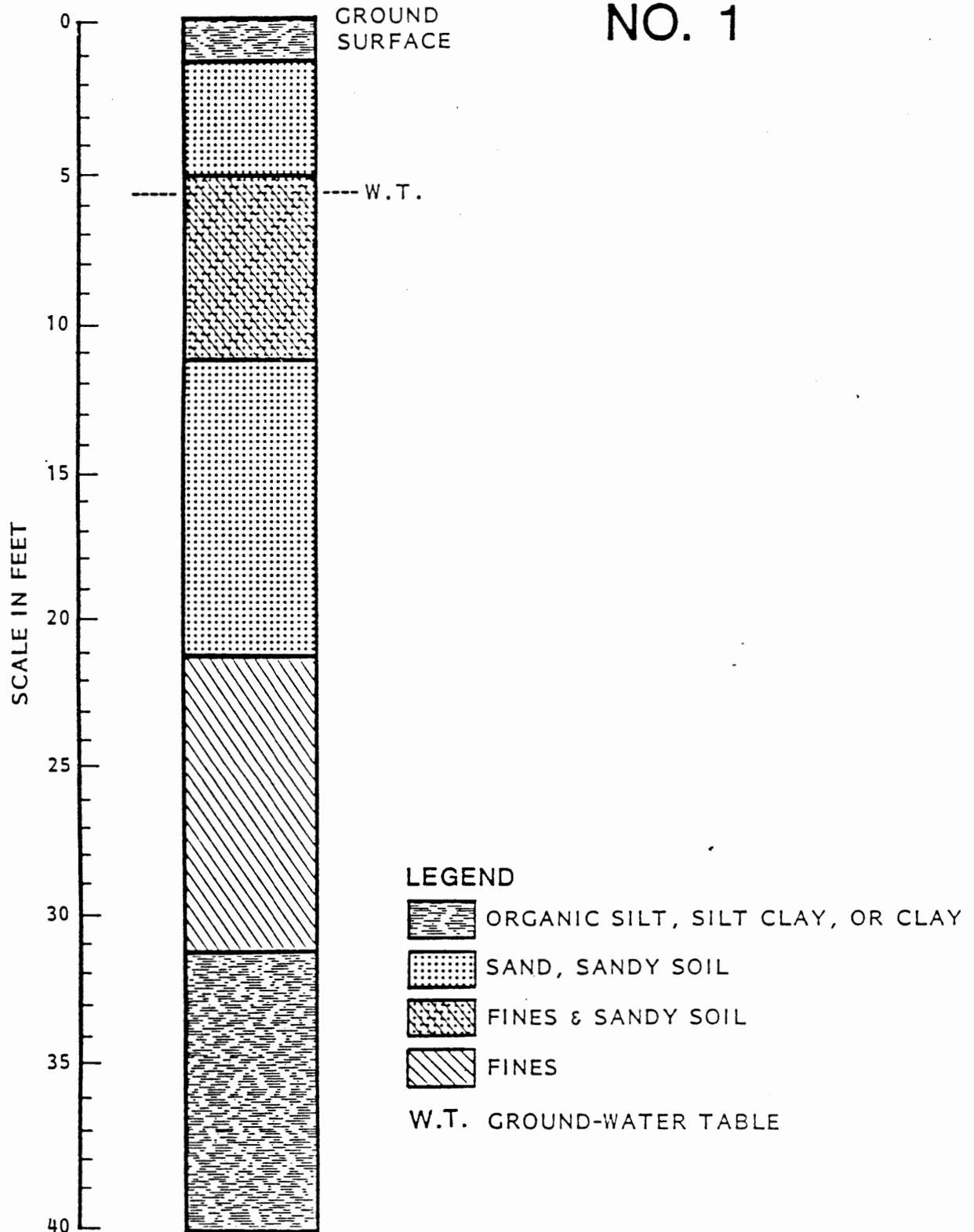
SYSTEM	FORMATION	MAXIMUM REPORTED THICKNESS	LITHOLOGY	
Quaternary	Alluvial deposits	30	Sand, silt, and black mud.	
	Beach sand and gravel		Sand, quartz, light-colored, medium grained, pebbly.	
	Cape May Formation	200	Sand, quartz, light-colored, heterogenous, clayey, pebbly, glauconitic.	
Pensauken Formation	40		Gravel, quartz, light-colored, sandy.	
Bridgeton Formation				
Tertiary	Seacon Hill Formation	250	Sand, quartz, light-colored, medium to coarse-grained, pebbly; local clay beds.	
	Cohansey Sand			
	Kirkwood Formation	780	Sand, quartz, gray to tan, very fine- to medium-grained, micaceous, and dark-colored diatomaceous clay.	
	Piney Point Formation	220	Sand, quartz and glauconitic, fine- to coarse-grained.	
	Shark River Marl	140?	Sand, quartz and glauconite, gray, brown, and green, fine- to coarse-grained, clayey, and green silty and sandy clay.	
	Manasquan Formation	180		
	Vincetown Formation	100	Sand, quartz, gray and green, fine- to coarse-grained, glauconitic, and brown clayey, very fossiliferous, glauconite and quartz calcarenite.	
	Hornertown Sand	35	Sand, glauconite, green, medium- to coarse-grained, clayey.	
	Cretaceous	Tinton Sand	25	Sand, quartz, and glauconite, brown and gray, fine- to coarse-grained, clayey, micaceous.
		Red Bank Sand	150	
Havesink Formation		50	Sand, glauconite, and quartz, green, black, and brown, medium- to coarse-grained, clayey.	
Mount Laurel Sand		220	Sand, quartz, brown and gray, fine- to coarse-grained, glauconitic.	
Penonan Formation			Sand, quartz, gray and brown, very fine- to fine-grained, glauconitic, micaceous.	
Marshalltown Formation		30	Sand, quartz and glauconite, gray and black, very fine- to medium-grained, very clayey.	
Englishtown Formation		220	Sand, quartz, tan and gray, fine- to medium-grained; local clay beds.	
Woodbury Clay		325	Clay, gray and black, micaceous.	
Merchantville Formation			Clay, gray and black, micaceous, glauconitic, silty; locally very fine-grained quartz and glauconitic sand.	
Magothy Formation		4100	Sand, quartz, light-gray, fine-grained, and dark-gray lignitic clay.	
Arctian Formation	Sand, quartz, light-gray, fine- to coarse-grained, pebbly, arkosic, red, white, and variegated clay.			
Potomac Group	Alternating clay, silt, sand, and gravel.			
Pre-Cretaceous	Pre-Cretaceous Unconsolidated rocks and Wissinickon Formation	?	Precambrian and lower Paleozoic crystalline rocks, metamorphic schist and gneiss; locally Triassic basalt, sandstone, and shale.	

Source: Vowinkel and Foster (1981)



25X

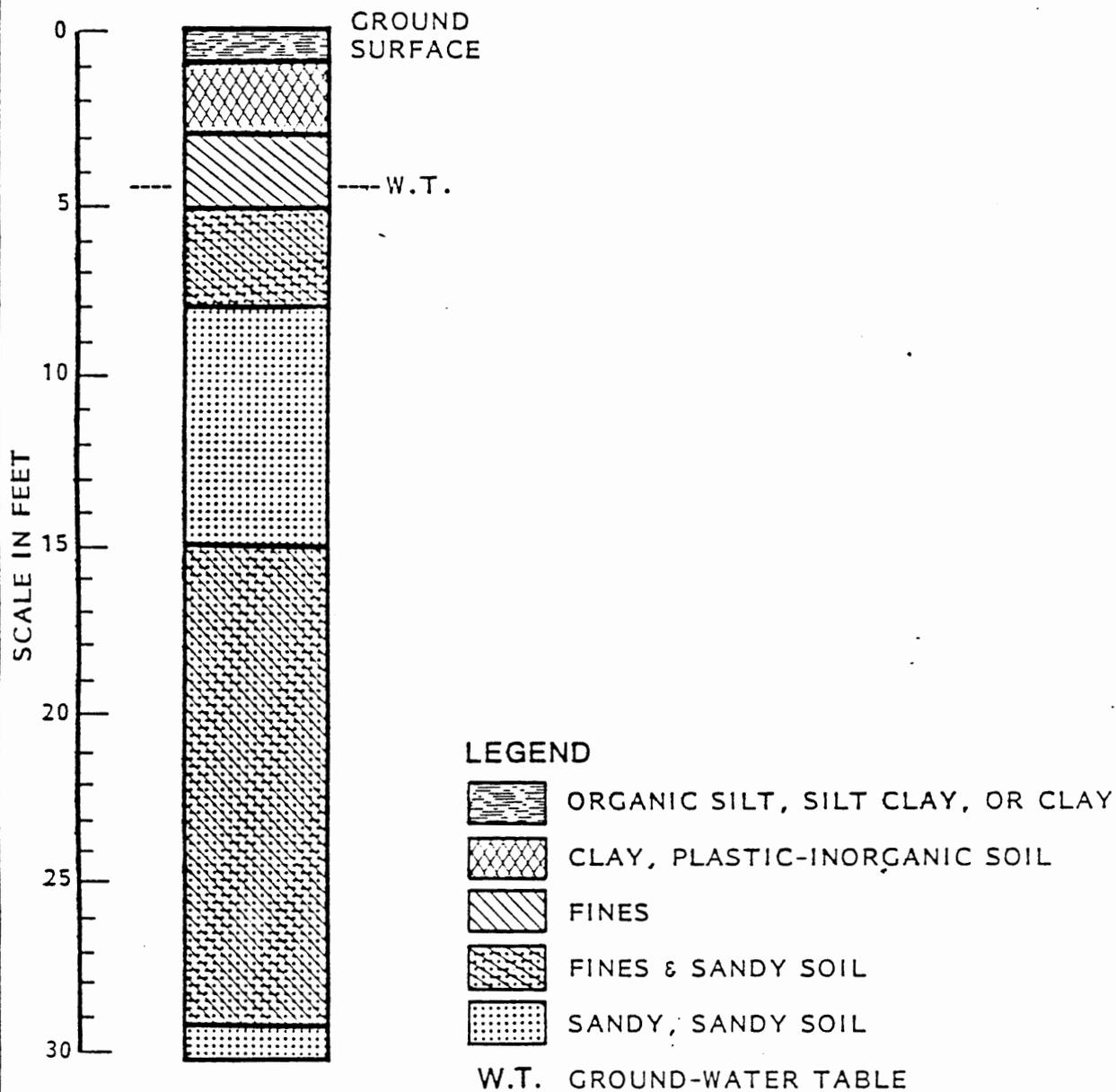
McGUIRE AFB LOG OF TEST BORING NO. 1



SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

NCTE: BORING LOCATED IN BUILDING 1809

McGUIRE AFB LOG OF TEST BORING NO. 2



NOTE: BORING LOCATED BETWEEN BUILDING 2402 & 2405
SOURCE: McGUIRE AFB, INSTALLATION DOCUMENTS

face and is underlain by an unknown thickness of the Kirkwood Formation. The log of a test boring drilled at the McGuire Missile Site is included as Figure 3.7.

Structure

The Coastal Plain sediments form a southeast dipping wedge, with a point of origin the Fall Line north of Trenton (refer to Figure 3.1) and thicken to the southeast (seaward). At the Fall Line, sediment thickness is no more than a few feet; however, at Cape May, New Jersey, the accumulation exceeds 6,000 feet (Vowinkel and Foster, 1981). Individual geologic units within the Coastal Plain sediments also tend to thicken downdip and possess an average unit dip ranging from 10 feet per mile (Cohansey) to 45 feet per mile (Hornerstown) (Minard and Owens, 1962). These units are not known to be disrupted by faulting or other geologic discontinuities; however, depositional or past erosional events may cause some isolated beds to occur at steeply dipping angles or be replaced abruptly on a local scale. Figure 3.8, a generalized subsurface section of the New Jersey Coastal Plain, depicts the significant structural conditions of major geologic units.

HYDROLOGY

Introduction

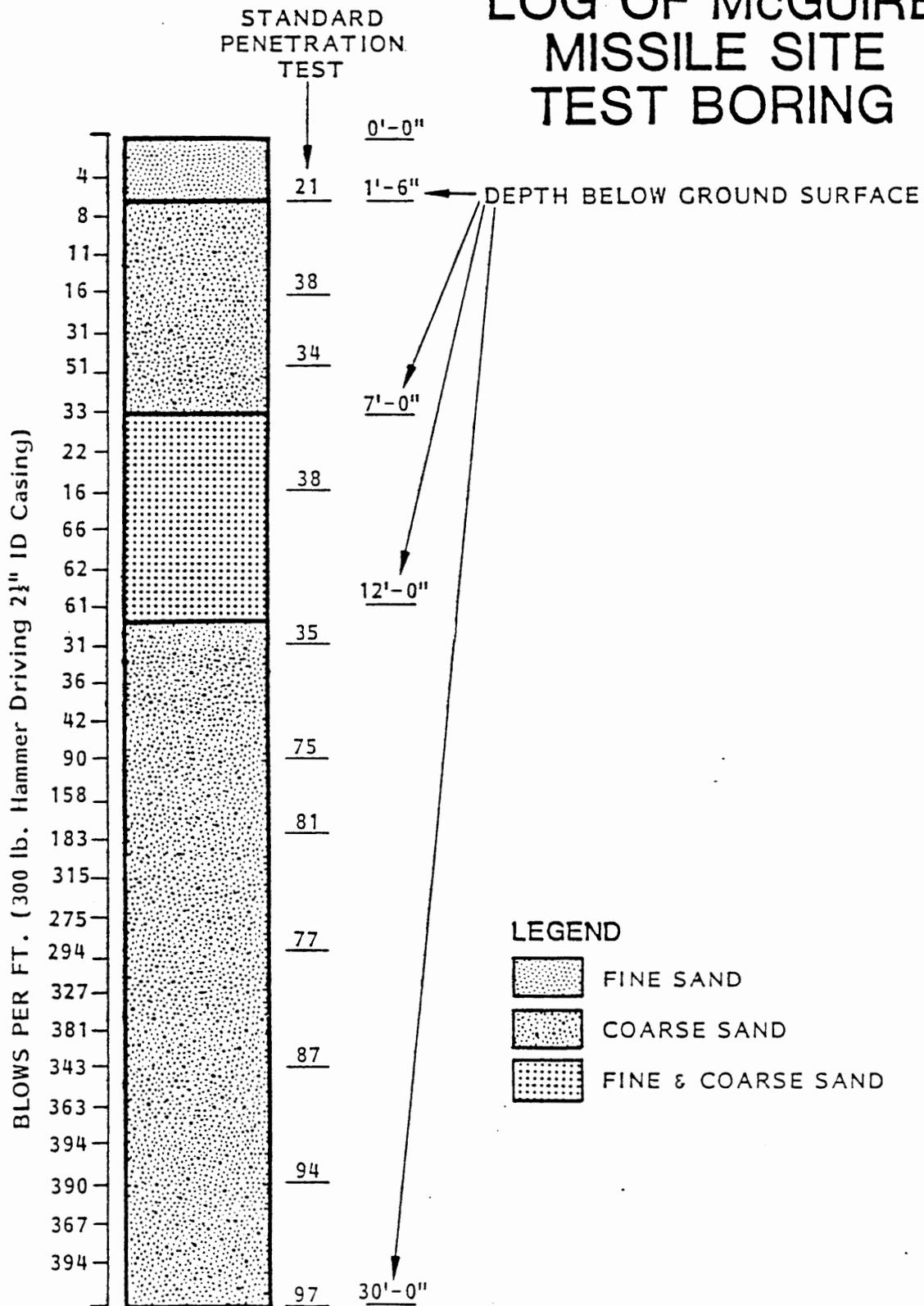
Ground-water hydrology of the project area has been reported by Gill and Farlekas (1976), N. J. Pinelands Commission (1980), Means et al (1981), Vowinkel and Foster (1981) and Fusillo and Voronin (1981). Additional information has been obtained from interviews with U.S. Geological Survey Water Resources Division and New Jersey Department of Environmental Protection Personnel.

Hydrogeologic Units

McGuire AFB lies within the northern pinelands section of the New Jersey Coastal Plain. In this area several major hydrogeologic units have been identified, which are listed in Table 3.3 and shown in cross-section on Figure 3.9. The units of particular interest to this investigation are as follows:

- o Cohansey Sand
- o Kirkwood Formation
- o Vincentown Formation
- o Potamac-Raritan-Magothy System (PRM)

McGUIRE AFB LOG OF McGUIRE MISSILE SITE TEST BORING

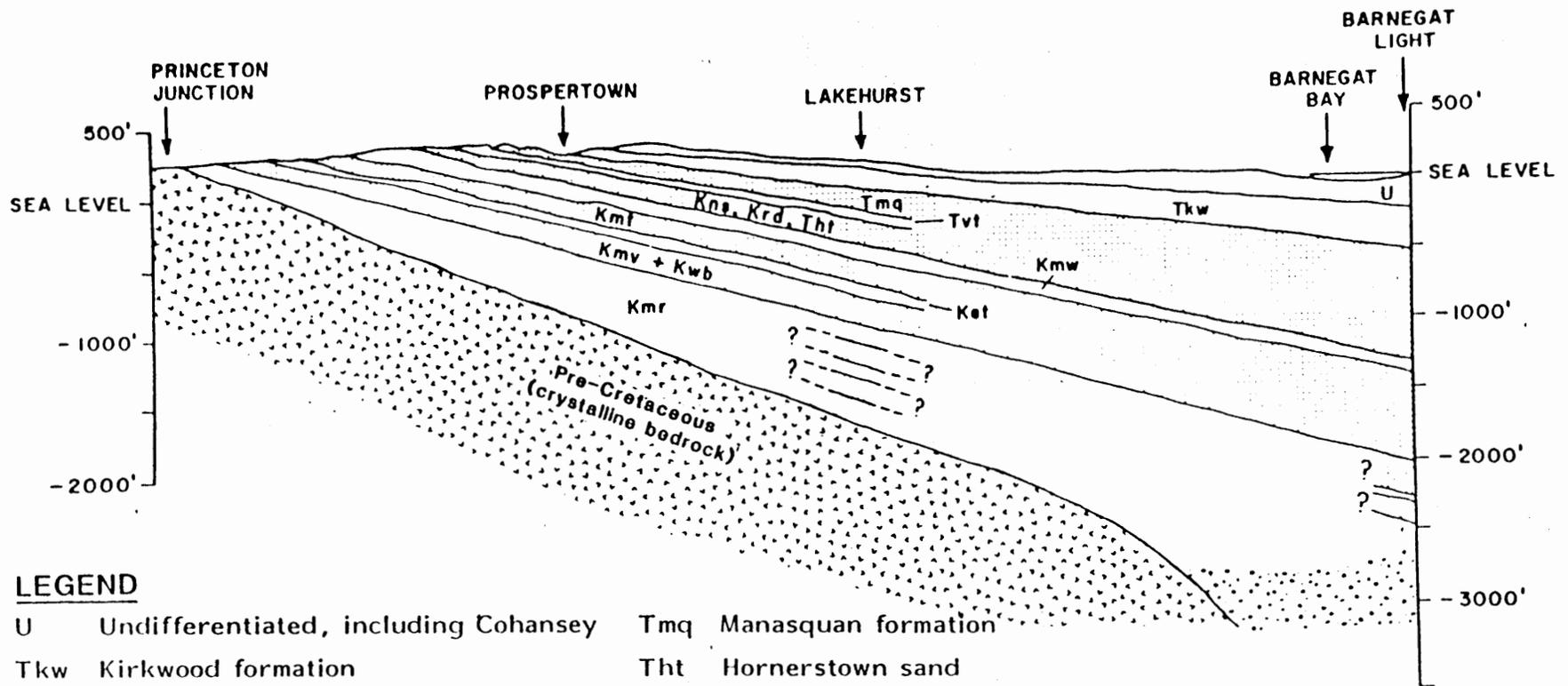


NOTES: WATER READING ON 8/19/57 AT 16'-3"
SURFACE ELEVATION - 165'-5"

SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

GENERALIZED GEOLOGIC SECTION OF THE NEW JERSEY COASTAL PLAIN

(Section A, Figure 3.1)



LEGEND

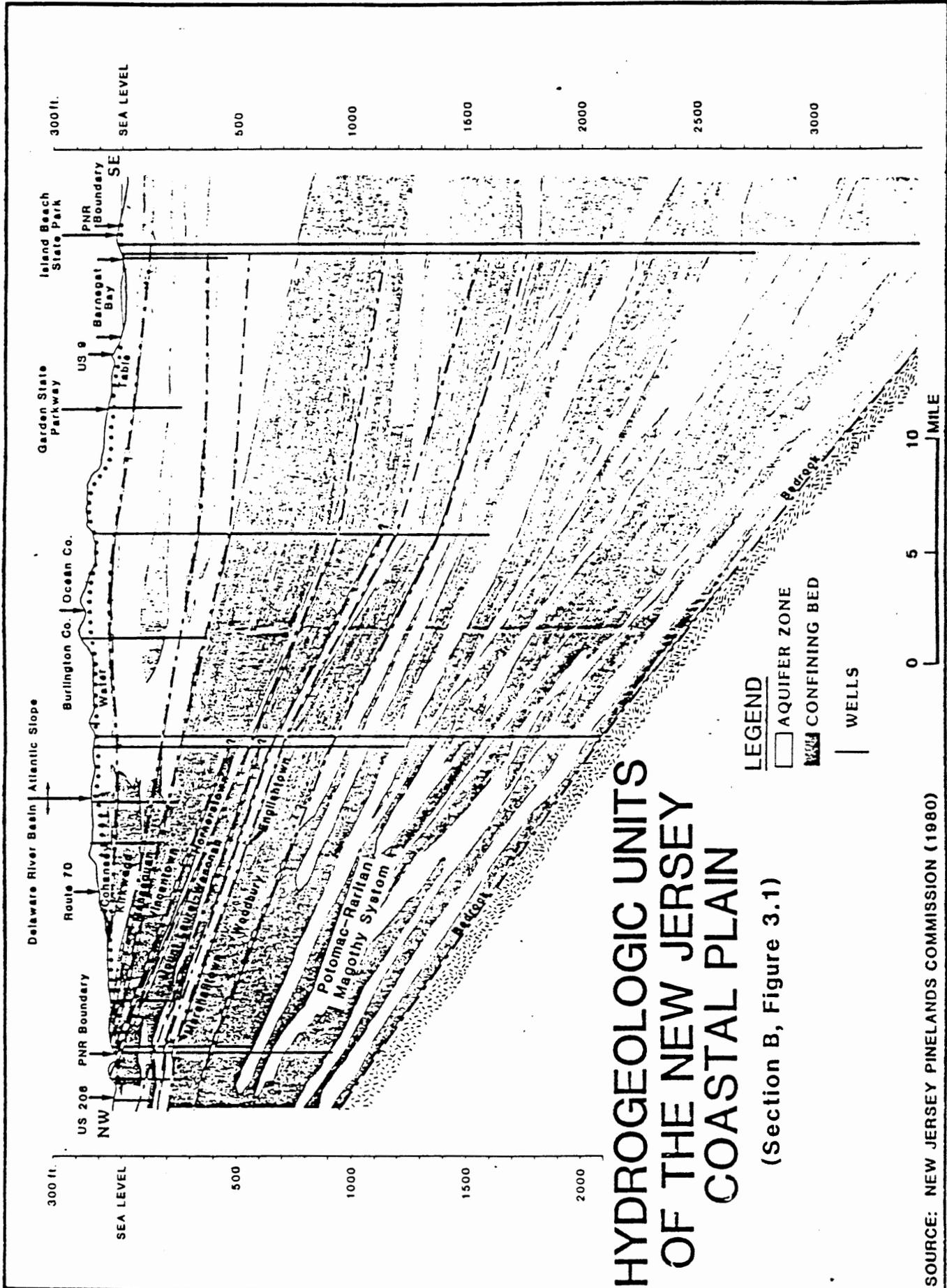
U	Undifferentiated, including Cohanse	Tmq	Manasquan formation
Tkw	Kirkwood formation	Tht	Hornerstown sand
Tvt	Vincentown formation	Krb	Red Bank sand
Kmw	Mount Laurel sand and Wenonah formation	Kmt	Marshalltown formation
Ket	Englishtown formation	Kwb	Woodbury clay
Kmr	Raritan and Magothy formation	Kmv	Merchantville formation
		Kns	Navesink formation

SOURCE: MEANS (1981)

NOTE: Vertical scale greatly exaggerated

0 2 4
MILE

3-15
30X



Shallow Units

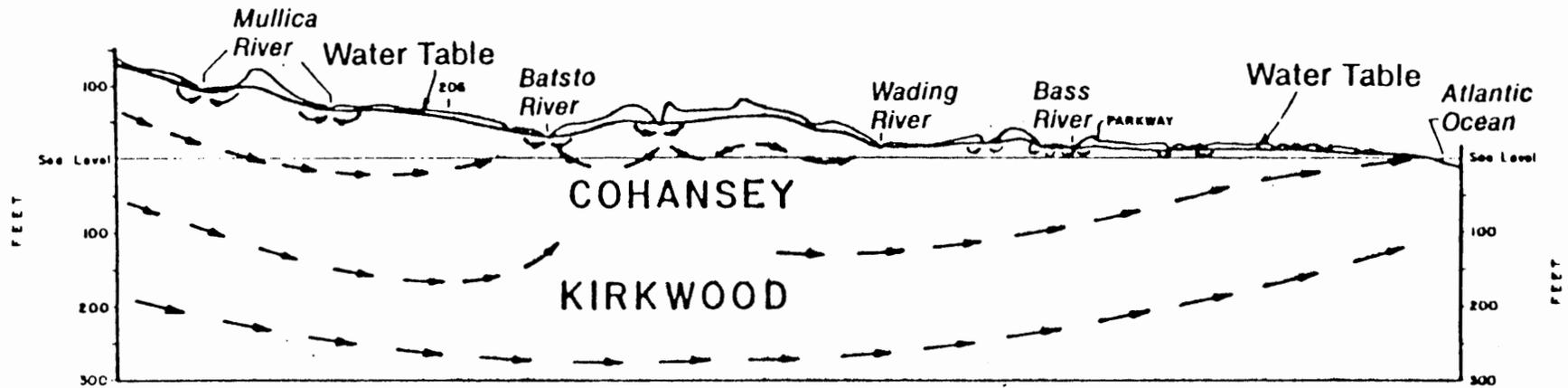
The Cohansey, Kirkwood and Vincentown Formations are of interest because they occur at or near ground surface within the study area. All of these hydrogeologic units are highly permeable and relatively thin in section (50 feet or less) where they crop out. In the vicinity of McGuire AFB, ground water occurs at shallow depths in these units under water table (unconfined) conditions, although artesian or semi-artesian conditions may occur locally. According to Vowinkel and Foster (1981), the Cohansey and Kirkwood are hydraulically connected locally. The Vincentown contains water in localized water-bearing beds that may yield small to moderate quantities of water to wells screened within them. Further down dip, the Vincentown is a confining bed (refer to Figure 3.9).

Recharge of the Cohansey and Kirkwood Formations occurs primarily by precipitation falling on exposed portions of the units. In this case, most of the land area of McGuire AFB is situated in the Cohansey-Kirkwood recharge zone. Once water enters the hydraulic regime, it flows under the influence of gravity to zones of decreasing hydraulic head. It is significant to note here that two major flow systems have been identified in the Cohansey-Kirkwood. These include a surficial or local system and an intermediate system. Figure 3.10 presents a conceptual view of these two systems.

The shallow system possesses fairly short flow paths, as "no point in the Pinelands is more than 1.5 miles from a surface water body," (N.J. Pinelands Commission, 1980). Using normal climatic conditions and typical hydraulic gradients, the water flow rate is estimated to be on the order of four (4) feet per day. Assuming a maximum travel distance of 1.5 miles, water detention time for the Cohansey-Kirkwood would not be expected to exceed five years. It is estimated that 85 percent of the infiltrated precipitation follows the shallow flow path (N.J. Pinelands Commission, 1980) and is therefore discharged to a surface water body only a short distance from the point of entry into the surficial aquifer system. Approximately ten percent of the infiltrating precipitation reaches the intermediate flow system (N.J. Pinelands Commission, 1980), which typically occurs at depths of 50 to 300 feet below sea

HYDRAULIC FLOWS OF THE COHANSEY-KIRKWOOD AQUIFER SYSTEM

(Section C, Figure 3.1)



33X
3-18

ES
ENGINEERING - SCIENCE

SOURCE: NEW JERSEY PINELANDS COMMISSION (1980)

0 5
SCALE | | | | | MILES

FIGURE 3.10

level. According to N.J. Pinelands Commission (1980) estimates, intermediate system flow travel times from a point in the central Pinelands southeast (down dip) to the Atlantic Ocean would be on the order of 2000 years.

Because the Cohansey-Kirkwood system is not normally utilized for water supply within the Fort Dix-McGuire AFB area, little base-specific information is available for review. Further down dip, especially in the Atlantic City area, the units substantially thicken and are utilized extensively as a source of potable water supplies.

Limited information describing the Cohansey-Kirkwood unit has been obtained by review of McGuire Missile Site test boring and water well data. Nineteen test borings, two water wells and one test pit excavation were advanced during site work performed in 1957 (from drawing entitled, "McGuire Special Facility - Core Boring Data and Test Pit," drawing number AW 16-14-01, contract 1917C, dated 20 January 1958). At the McGuire Missile Site, the unit appears to be present at or near ground surface, is permeable to the ground-water level and has uniformly shallow water levels (about 18 feet below ground surface). Prior to construction, the highest water elevations were shown to be occurring in the northwest quadrant of the McGuire Missile Site facility area. Assuming that the highest water elevations were indicative of active recharge to the aquifer, it is believed that ground-water flow moved across the site to the east and south. The subsequent construction and site-use modifications (leveling, filling and paving large areas) performed during the erection of the McGuire Missile Site complex have undoubtedly altered the original shallow aquifer, ground-water conditions. The actual extent of this alternation is unknown.

Deep Unit

The deep hydrogeologic unit present at McGuire AFB consists of the Potomac-Raritan-Magothy (PRM) aquifer system, shown in section on Figure 3.9. The PRM is regional in extent and is the primary source for potable water supplies in the study area. This hydrogeologic unit consists of three communicating geologic formations, the Potomac Group, the Raritan Formation and the Magothy Formation. By interpolation of published isopach data, it appears that this unit occurs within the study area at an approximate elevation of -450 feet (MSL) and is some 550 feet

thick. The PRM is defined by the crystalline basement rock on which it reposes and its upper limit is accepted to be the Late Cretaceous Merchantville Formation and Woodbury Clay (Gill and Farlekas, 1976). As in the case of all other Coastal Plain hydrogeologic units, it thickens substantially in a down dip (seaward) direction. Typically, the PRM includes many interconnected sand layers, isolated for short distances by interbedded clays, marl, etc. For this reason, wells drilled into the PRM are usually constructed with multiple screens to allow water intake from several productive zones.

The primary source of recharge to the PRM system consists of rainfall or surface water flow contacting the area of topographically high outcrop, such as that northeast of Trenton and represented on Figure 3.11 as a crown in the PRM potentiometric surface. The outcrop area forms a narrow band beginning in Delaware and trending northeast along the Delaware Valley, eventually crossing New Jersey and reaching Perth Amboy. Located within the outcrop area of the major regional aquifer are the highly industrialized centers of Wilmington, DE; Chester and Philadelphia, PA; Camden, Willingboro, Burlington and Trenton, NJ; etc. Lesser amounts of recharge are thought to occur as leakage from overlying units, down dip of the outcrop zone (Gill and Farlekas, 1976). Once water enters the outcrop area, it follows down dip into the system or towards local pumping centers. Water typically occurs in the PRM system under artesian (confined) conditions. Prior to massive pumping (1963) that is now commonplace in the region, ground-water flow was primarily down dip (south or southeast). Large pumping centers such as Fort Dix and McGuire AFB have caused large-scale reversal of the historical flow path, which may be seen on Figure 3.11, a potentiometric surface map of the PRM system, modified from Gill and Farlekas (1976). A large drawdown feature (cone of depression) may be seen in the surface of the potentiometric level at the base. During the period 1900-1968, ground-water levels in the PRM system declined some 80 feet in the Fort Dix-McGuire AFB area (Gill and Farlekas, 1976). At present it is estimated that the potentiometric surface for the primary regional aquifer is approximately 200 feet below ground level at McGuire. This estimate is based on a 1969 water level of 183 feet for Well D and an average decline rate of one foot per year.

36X

3-21

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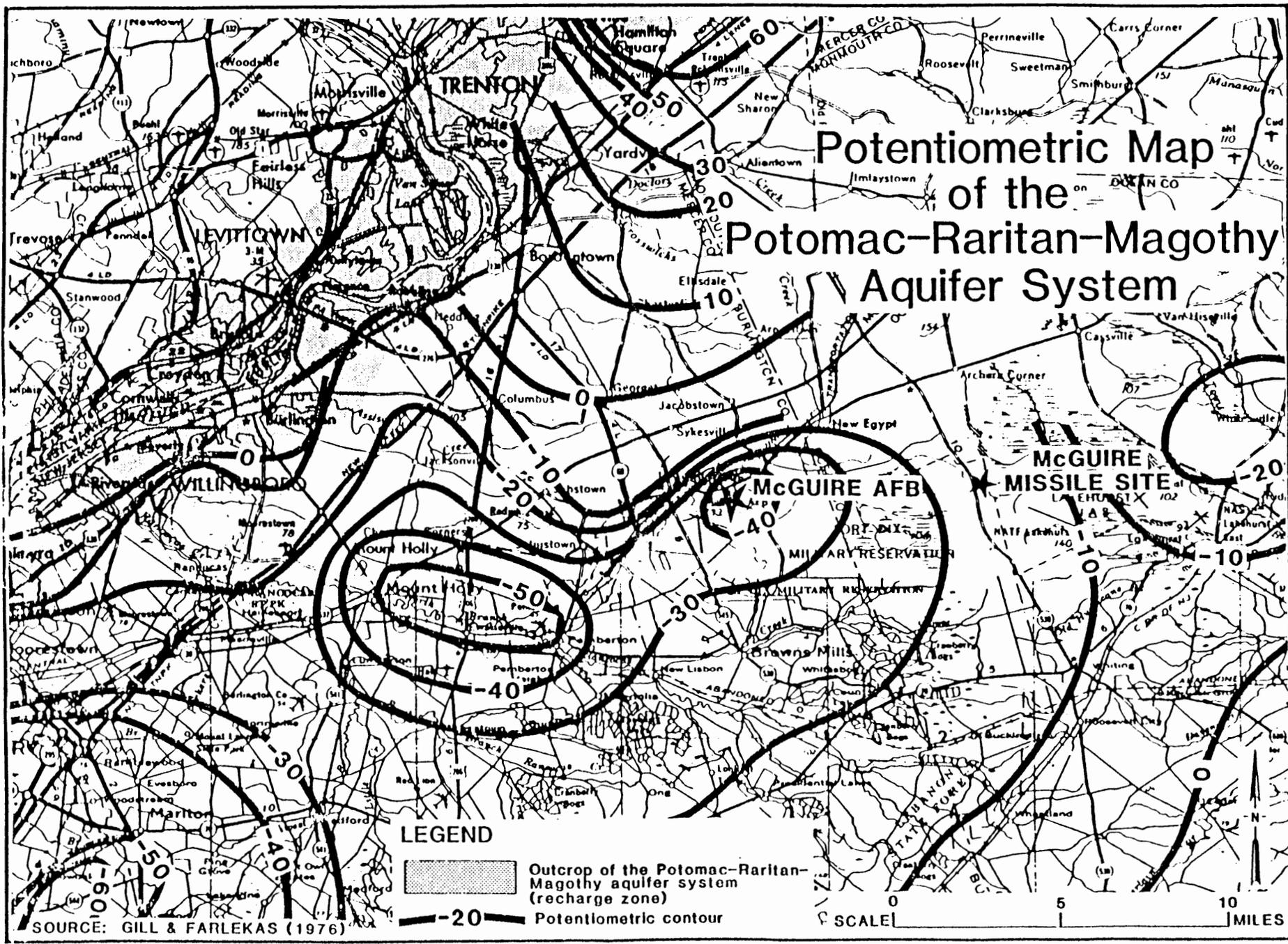


FIGURE 3.11

In the early 1900's a ground-water mound which followed surface topography was identified in the vicinity of McGuire AFB. This may indicate the location of a past recharge area where leakage through overlying semi-pervious strata could have occurred (Gill and Farlekas, 1976).

Base Wells

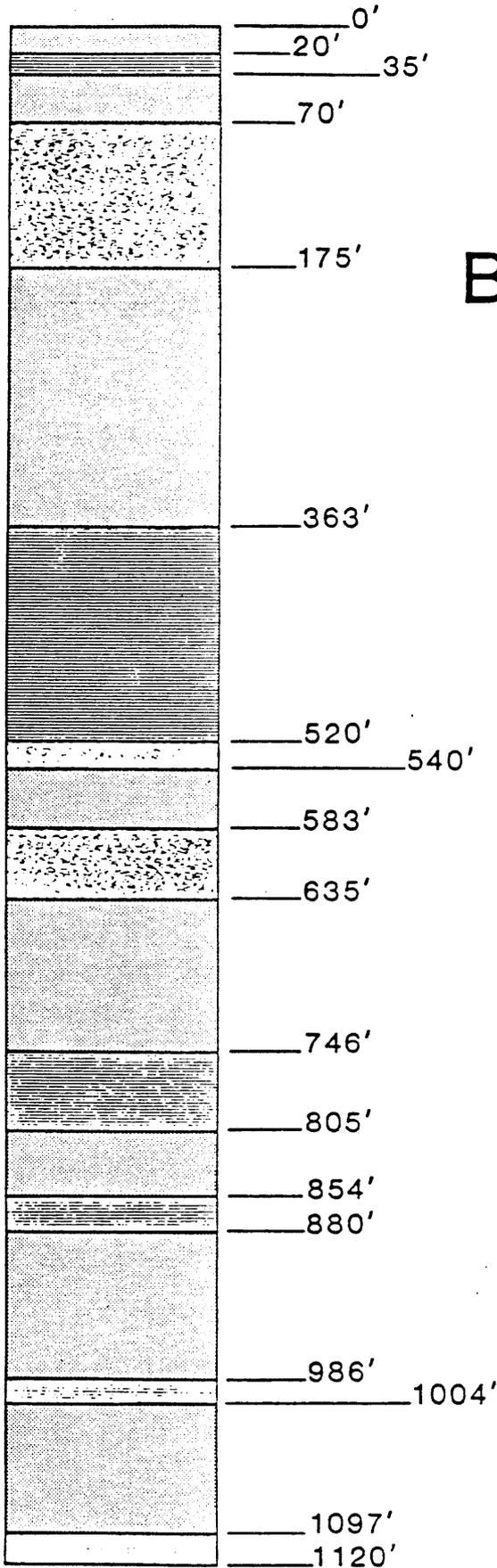
McGuire AFB derives its water resources from a supply system based on four deep wells, all presumably screened into the Potomac-Raritan-Magothy Aquifer System described above. Figure 3.12 is the log of a typical base water supply Well D, which penetrates the PRM system and terminates in the crystalline basement rock. An inspection of this well log indicates the presence of a substantial thickness of clay and marl confining materials encountered from 363 feet to 520 feet below ground surface, at the well location. Construction information summarizing available well data is presented in Table 3.4.

Two shallow inactive wells are present at the McGuire Missile Site. These wells are reported to be small diameter (six inch) and are apparently screened into the Kirkwood Formation. Water levels for these wells were determined to be elevation 125.5 feet MSL (1957 data). Figure 3.13 is the log of McGuire Missile Site Well Number 1 which depicts permeable soils encountered throughout the depth of drilling. The locations of installation water wells are shown on Figure 3.14.

Area Wells

The adjacent borough of Wrightstown obtains water supplies from a municipal distribution system based upon deep wells screened into the previously discussed Potomac-Raritan-Magothy Aquifer System (Lawson, 1982). Water quality was described as adequate. Water levels and well construction information were not available for review.

The nearby community of Cookstown and rural areas typically derive water supplies from individual wells. Generally, such wells are screened into the deeper and more dependable PRM system, although local exceptions probably occur. Consumptive use permitting of ground-water withdrawals is not required for those installations pumping less than 100,000 gallons per day. In addition, individuals possessing "grandfather rights" (users diverting ground-water resources prior to adoption of legislation and now, by virtue of chronology, exempt from permitting



McGUIRE AFB
**LOG OF
BASE WELL "D"**

-  SAND
-  CLAY
-  MARL/CLAY OR SAND
-  WEATHERED ROCK

SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

38X

TABLE 3.4
WELL DATA FOR MCGUIRE AIR FORCE BASE, NJ

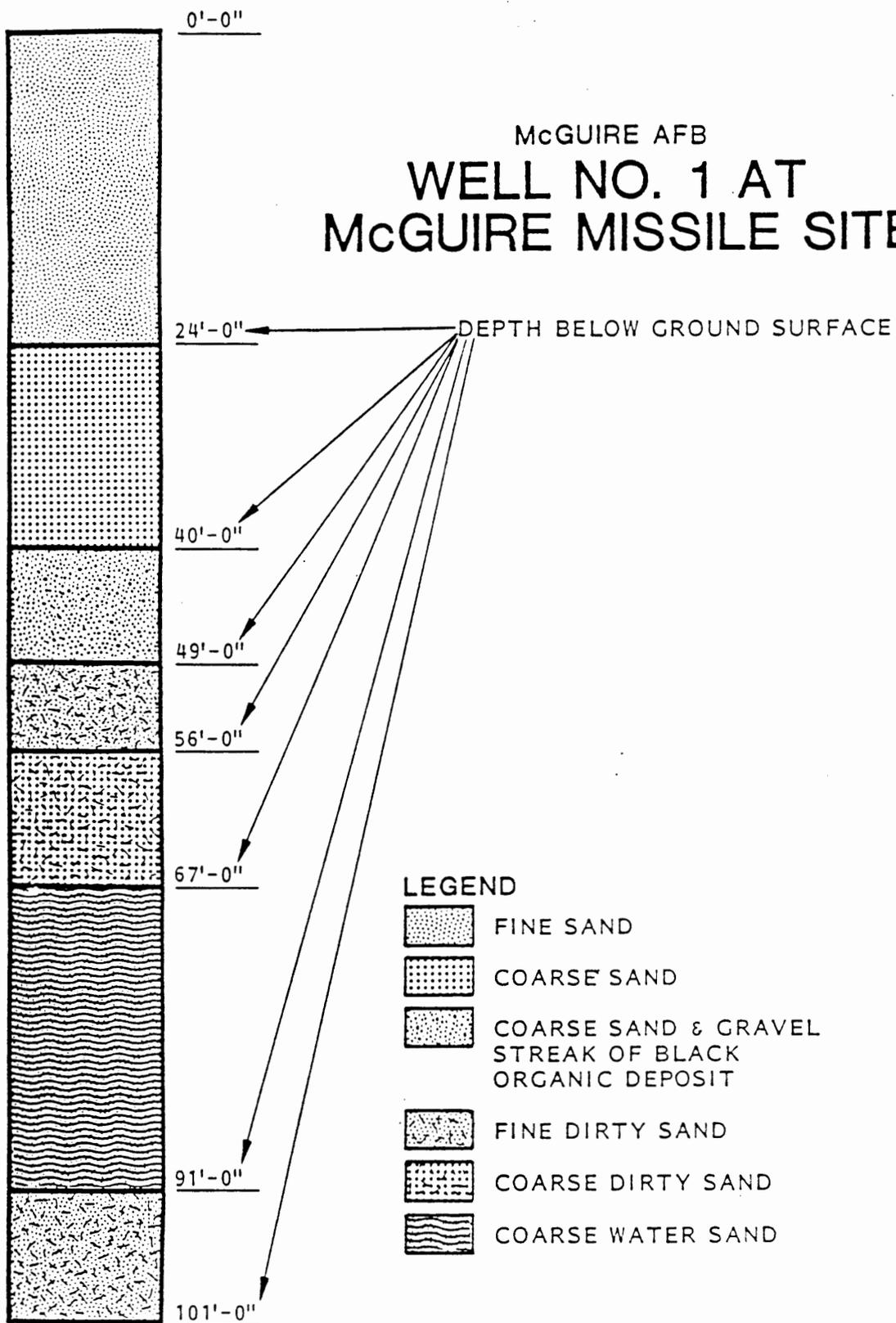
Well No.	Date Drilled	Casing (inches)	Total Depth (Feet)	Land Surface Elevation (Feet, MSL)	Static Water Level Feet Below Ground (Year)	Capacity (gal/min)
A	1953	16	1055	122	140 (1962)	925
B	1960	16	1008	130	123 (1960); 152 (1969)	785
C	1966	16	1096	105	110 (1962); 133 (1966)	710
D	1953	24	1020	110	110 (1953); 183 (1969)	925
* 1	1957	6	101	148.5	23 (1957)	---
* 2	1957	6	100	147.5	22 (1957)	---

* McGuire Missile Site Well (Inactive)
Source: Installation Documents

3-24

39X

McGUIRE AFB WELL NO. 1 AT McGUIRE MISSILE SITE

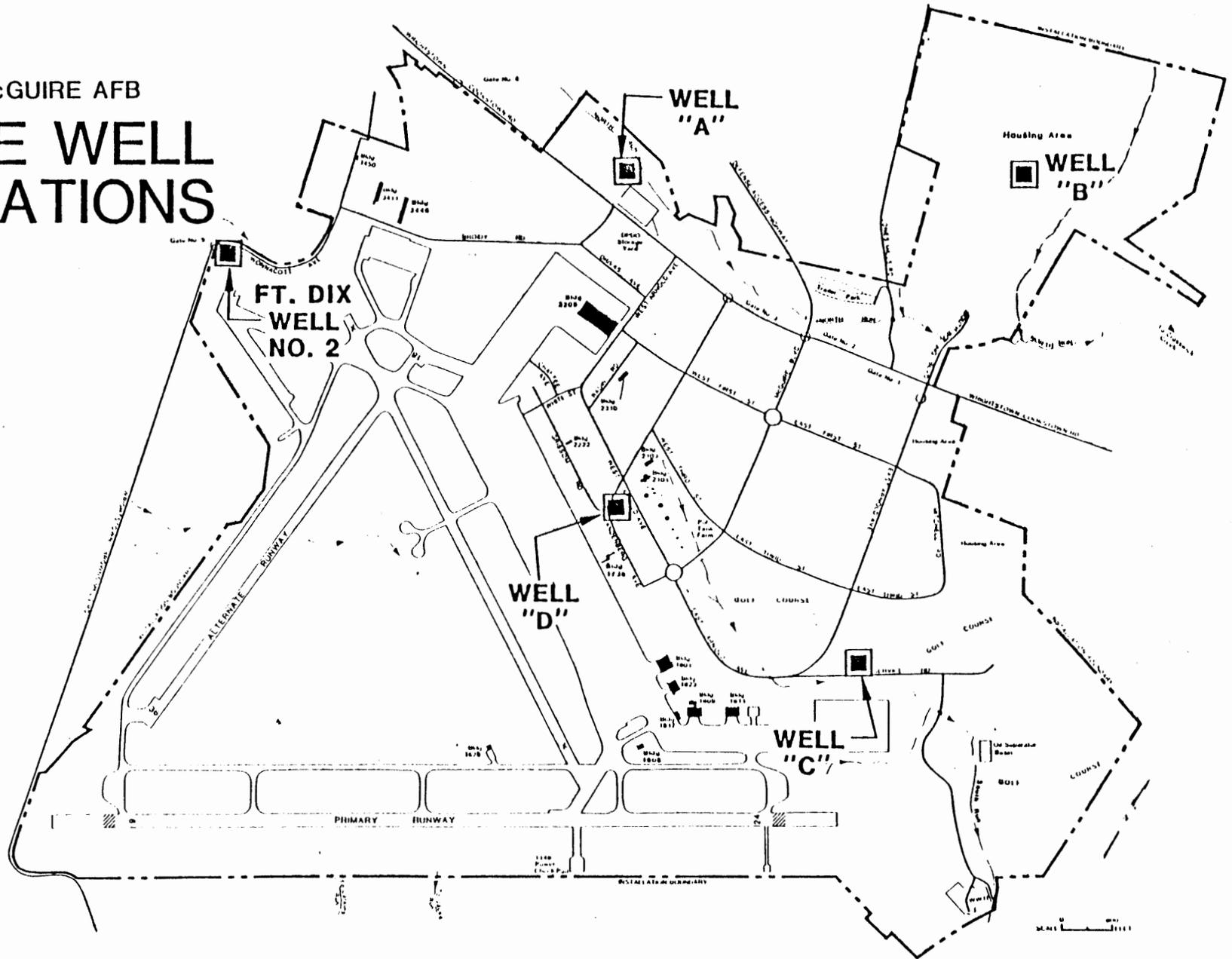


NOTES: WATER READING ON 12/19/57 AT 23'-0"
SURFACE ELEVATION - 148'-5"

SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

40X

McGUIRE AFB BASE WELL LOCATIONS



3-26
41X

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SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

FIGURE 3.14

requirements) are not subject to ground-water use regulations (NJ Pinelands Commission, 1980). Because of these two situations, it was not possible to determine the number, depth and location of individually owned domestic and irrigation wells installed near McGuire Air Force Base.

Ground-Water Quality

Ground-water quality information has been obtained from Fusillo and Voronin (1981), installation documents and from interviews conducted with New Jersey Department of Environmental Protection officials.

Ground water obtained from base wells penetrating the regional (PRM) aquifer produce water of generally good quality. A number of municipal, industrial and privately owned water wells producing water from the outcrop zone of the PRM system (15 miles west of McGuire AFB) do show evidence of contamination. A water quality study by Fusillo and Voronin (1981) analyzed samples obtained from 262 water wells located in the Delaware Valley between Trenton and Pennsville, primarily along the PRM outcrop. Approximately 19 percent (46 wells) of the 246 wells analyzed for organic materials showed evidence of contamination by organic chemicals including benzene, trichloroethylene, toluene, tetrachloroethylene and 1,1-dichloroethylene. It is believed that well contamination has been caused by industrial waste disposal activities practiced near the point where contamination was detected. Despite the obvious water degradation revealed in the PRM outcrop zone, it is assumed that such contamination will not migrate to the McGuire AFB area in detectable concentrations in the near future.

SURFACE WATER QUALITY

McGuire AFB routinely collects surface water samples at eight locations within the base. The sampling stations are identified in Figure 3.15. A review of recent water quality data collected within McGuire AFB and from streams in close proximity to the base indicated no significant water quality problems in the streams entering and exiting the base boundaries. The single large point source discharge on base is the wastewater treatment plant which discharges into South Run. The Fort Dix sanitary treatment plant also discharges into South Run about three miles upstream.

During the 1950's and 1960's several industrial shops and wash areas were known to have discharged or occasionally spilled wash water, dilute cleaning solutions, oils and fuels into the various drainage systems on the base. Shop wastes are no longer discharged to the storm drainage system. The base has installed several oil/water separator systems at key washracks and in 1977, constructed a skimming system and retention basin along South Run to divert and retain any floating substances accidentally discharged or spilled into the drainage system.

BIOTIC ENVIRONMENT

McGuire AFB is located in the northeast corner of a large tract of land classified as the New Jersey Pinelands Area, designated as such by the New Jersey Pinelands Protection Act. The Pinelands Area was designated as the country's first Natural Reserve. The Reserve concept has as its primary goal the management of the lands by innovative means, combining the capabilities and resources of the local, state and federal governments and the private sector. The main emphasis in the New Jersey Pinelands Comprehensive Management Plan has been the development of programs to safeguard the Pinelands' resources while the land remains in the care of the local people and governmental agencies.

The vast majority of McGuire AFB is developed area that supports a variety of trees, shrubs and grasses. A few small woodland areas exist within the base and the major types of trees found in these areas are sweetgum, maple, pine, sycamore and red cedar. No crops are grown on the base. No rare or endangered plant or animal species have been reported on McGuire AFB; however, the Pinelands Commission has developed records of reported sightings of rare and endangered plant and animal species in close proximity to McGuire AFB (Pinelands Comm., 1982). These species have been listed in Appendix D, Table D.1.

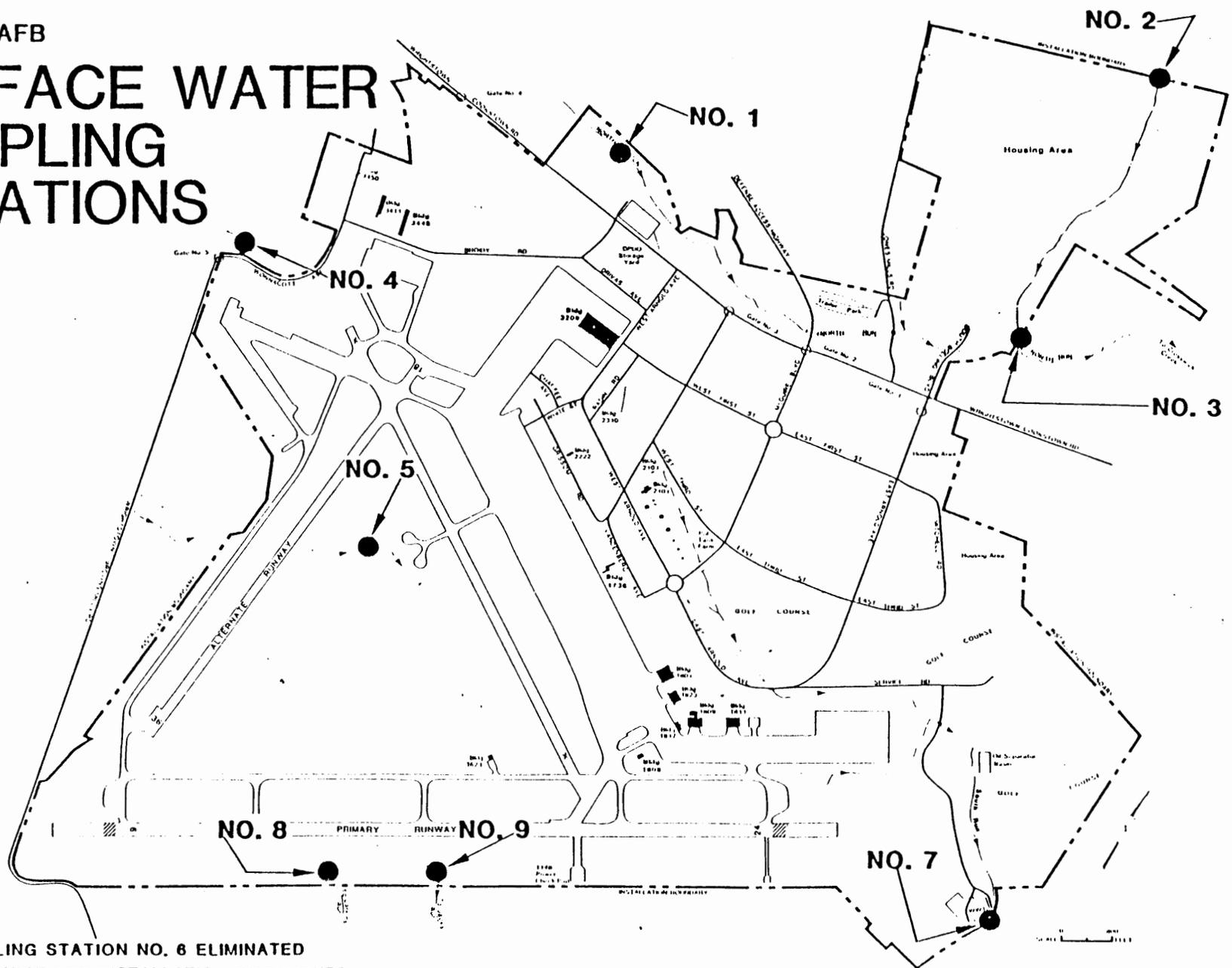
SUMMARY OF ENVIRONMENTAL SETTING

The environmental setting data reviewed for this investigation indicate the following major points that are relevant to the evaluation of past hazardous waste management practices at McGuire Air Force Base:

- o Surface soils of the McGuire Air Force Base area are typically sandy, permeable and possess shallow water levels (six feet or less).

McGUIRE AFB

SURFACE WATER SAMPLING LOCATIONS



NOTE: SAMPLING STATION NO. 6 ELIMINATED
SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

44X
3-29

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FIGURE 3.15

- o The Cohansey Sand, Kirkwood Formation and the Vincentown Formation are present at McGuire AFB, either exposed or very near ground surface. These formations are considered to be aquifers of limited significance in the study area. The base is located within the recharge zone of these aquifers.
- o The mean annual precipitation is 43.5 inches and the net precipitation is calculated to be 9.3 inches.
- o As much as 85% of the precipitation infiltrating into these shallow aquifers will be lost as baseflow to area streams, usually within a period of a few days from the time of infiltration.
- o The major regional aquifer exists at great depth in the study area (about 500 feet below ground surface). The regional aquifer is recharged at some distance from the base, but may receive some local recharge as leakage through semi-pervious zones from overlying shallow aquifers.
- o Evidence of limited contamination identified in wells constructed in the Potomac-Raritan-Magothy outcrop area has been published. This is not expected to impact base water quality in the near future.
- o Flooding is not a problem typical of the McGuire Air Force Base area.
- o The streams entering and existing the base are considered to have good water quality.
- o No threatened or endangered species have been observed within McGuire Air Force Base boundaries.

From these major points, it may be seen that potential pathways for the migration of hazardous waste-related contamination exist. If hazardous materials are present in or on the ground, they may encounter a shallow aquifer and subsequently be discharged as baseflow to area surface waters. A lesser potential for contamination of intermediate aquifer zones exists, due to the recharge relationships of shallow/intermediate ground-water systems. The potential for the migration of contamination to the major regional aquifer is considered to be remote.

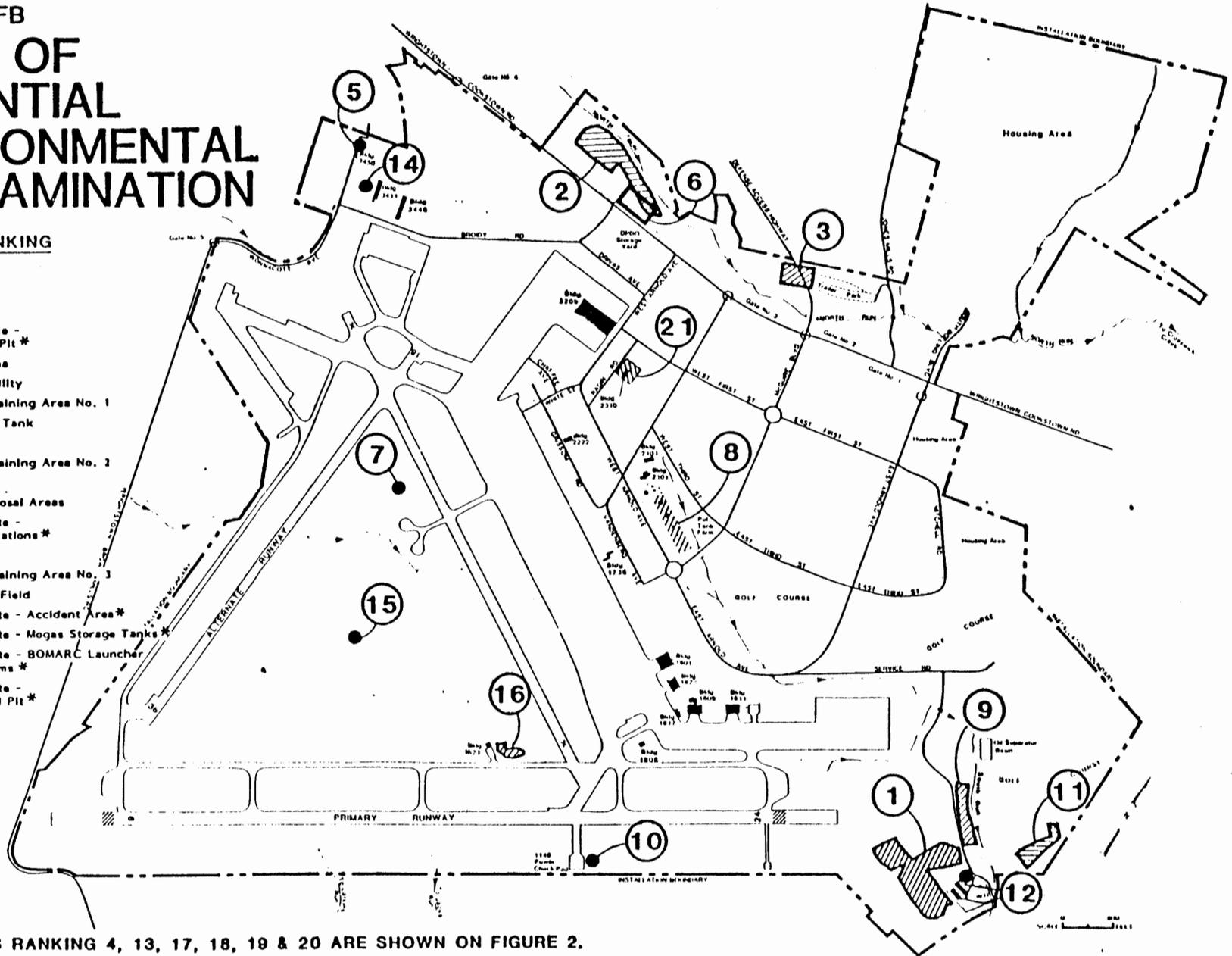
TAB 1

BASE SITE MAP

McGUIRE AFB SITES OF POTENTIAL ENVIRONMENTAL CONTAMINATION

LEGEND & RANKING

- ① Landfill No. 4
- ② Landfill No. 2
- ③ Landfill No. 3
- ④ McGuire Missile Site - JP-X Discharge Pit *
- ⑤ Pesticide Wash Area
- ⑥ DPDO Storage Facility
- ⑦ Fire Protection Training Area No. 1
- ⑧ Bulk Fuel Storage Tank
- ⑨ Landfill No. 5
- ⑩ Fire Protection Training Area No. 2
- ⑪ Landfill No. 6
- ⑫ WWTP Sludge Disposal Areas
- ⑬ McGuire Missile Site - Transformer Locations *
- ⑭ Buried Oil Drums
- ⑮ Fire Protection Training Area No. 3
- ⑯ NDI Shop - Drain Field
- ⑰ McGuire Missile Site - Accident Area *
- ⑱ McGuire Missile Site - Mogas Storage Tanks *
- ⑲ McGuire Missile Site - BOMARC Launcher Hydraulic Systems *
- ⑳ McGuire Missile Site - Neutralized Acid Pit *
- ㉑ PCB Spill Site



NOTE: *SITES RANKING 4, 13, 17, 18, 19 & 20 ARE SHOWN ON FIGURE 2.

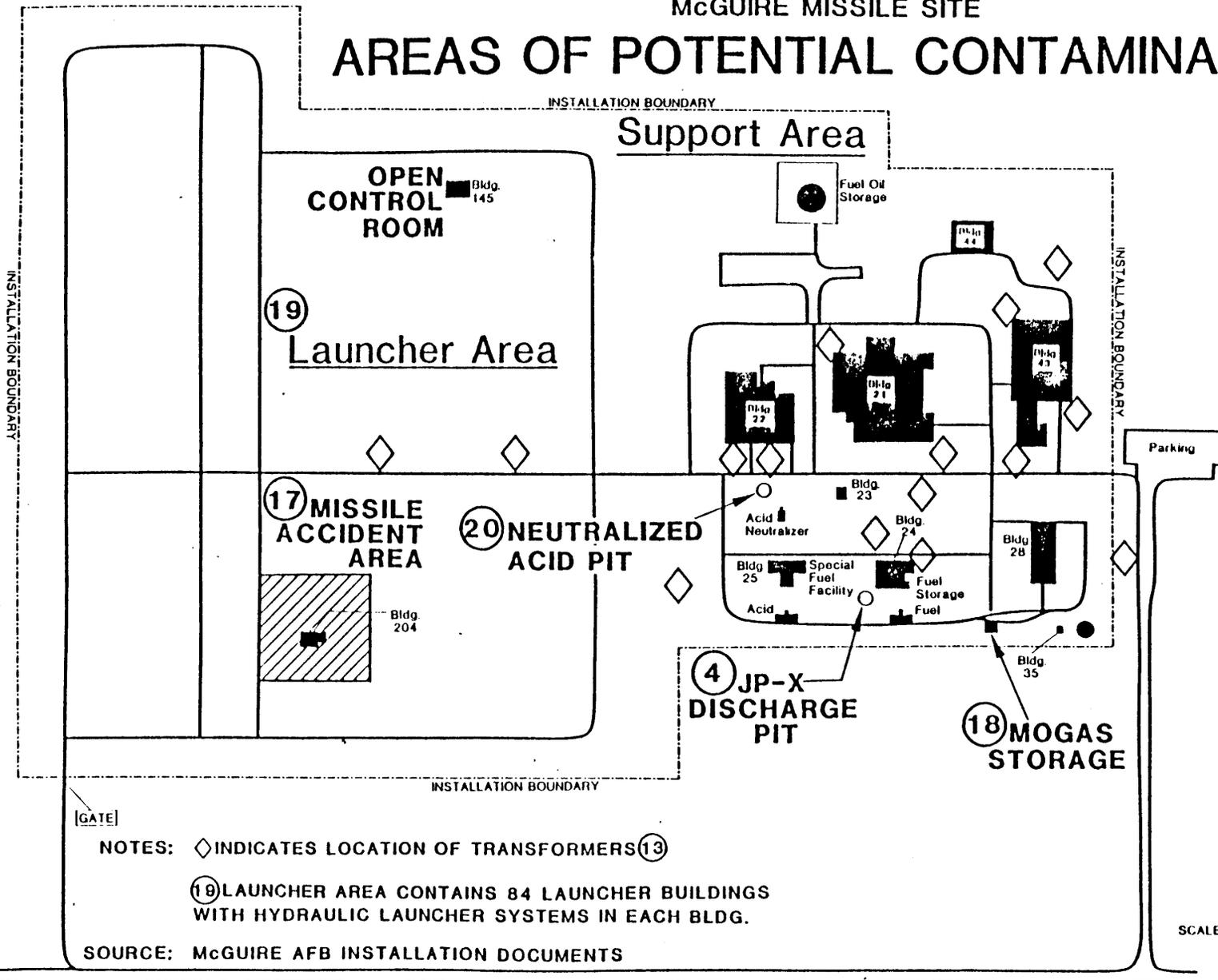
SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

FIGURE 1

47X

-5-

McGUIRE MISSILE SITE AREAS OF POTENTIAL CONTAMINATION



[GATE]

NOTES: ◇ INDICATES LOCATION OF TRANSFORMERS (13)

(19) LAUNCHER AREA CONTAINS 84 LAUNCHER BUILDINGS WITH HYDRAULIC LAUNCHER SYSTEMS IN EACH BLDG.

SOURCE: McGUIRE AFB INSTALLATION DOCUMENTS

SCALE 0 100 200 FEET

COUNTY RD. 539

X 87
-6-

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FIGURE 2

FINDINGS AND CONCLUSIONS

The following conclusions have been developed based on the results of the project team's field inspection, review of base records and files and interviews with base personnel.

The areas determined to have a high potential for environmental contamination are as follows:

- o Landfill No. 4
- o Landfill No. 2
- o Landfill No. 3

The areas determined to have a moderate potential for environmental contamination are as follows:

- o JP-X Discharge Pit (located at the McGuire Missile Site)
- o Pesticide Wash Area
- o DPDO Storage Facility
- o Fire Protection Training Area No. 1
- o Bulk Fuel Storage Tank Sludge Disposal Area

The areas determined to have a low potential for environmental contamination are as follows:

- o Landfill No. 5
- o Fire Protection Training Area No. 2
- o Landfill No. 6
- o WWTP Sludge Disposal Areas
- o Transformer Sites (located at the McGuire Missile Site)
- o Buried Oil Drums
- o Fire Protection Training Area No. 3
- o NDI Shop - Drain Field
- o McGuire Missile Site Accident Area
- o Mogas Storage Tanks (located at the McGuire Missile Site)
- o McGuire Missile Site BOMARC Launcher Hydraulic Systems
- o Neutralized Acid Pit (located at the McGuire Missile Site)
- o PCB Spill Site

RECOMMENDATIONS

The detailed recommendations developed for further assessment of environmental concern areas at McGuire AFB and the McGuire Missile Site are presented in Chapter 6. The recommendations are summarized as follows:

- | | |
|--|--|
| o Landfill No. 4 | Ground-water monitoring
Surface water monitoring |
| o Landfill No. 2 | Ground-water monitoring
Surface water monitoring |
| o Landfill No. 3 | Ground-water monitoring
Surface water monitoring |
| o JP-X Discharge Pit -
McGuire Missile Site | Ground-water monitoring |
| o Pesticide Wash Area | Core sampling and analyses
Surface water and sediment
monitoring |
| o DPDO Storage Facility | Soil sampling and analyses |
| o Fire Protection Training
Area No. 1 | Ground-water monitoring |
| o POL Bulk Fuel Storage Area | Ground-water monitoring
Surface water monitoring |
| o Buried Oil Drums | Metal detection survey of
the area |
| o McGuire Missile Site Accident
Area | Continuation of radiation
monitoring program |

TAB 2

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Department of Defense (DOD) has developed a program to identify and evaluate past hazardous material disposal sites on DOD property, to control the migration of hazardous contaminants, and to control hazards to health or welfare that may result from these past disposal operations. This program is called the Installation Restoration Program (IRP). The IRP has four phases consisting of Phase I, Initial Assessment/Records Search; Phase II, Confirmation; Phase III, Technology Base Development; and Phase IV, Operations. Engineering-Science (ES) was retained by the Air Force Engineering and Services Center to conduct the Phase I, Initial Assessment/Records Search for McGuire AFB under Contract No. F08637-80-G0009, Call No. 0017, using funding provided by the Military Airlift Command.

INSTALLATION DESCRIPTION

McGuire Air Force Base is located in south central New Jersey, 18 miles southeast of Trenton. The base borders the community of Wrightstown and the Fort Dix Army Installation in Burlington County. McGuire AFB is in a semi-rural area located in the northeast section of the New Jersey Pine Barrens. The study area for this project included the main base comprising 3,536 acres, and five off-base areas which are under the jurisdiction of McGuire AFB. These areas are as follows:

McGuire Middle Marker	0.52 acres
McGuire Missile Site (BOMARC)	219.0 acres
Gibbsboro Radar Station	23.0 acres
Burlington POL Off-Loading Facility.....	2.13 acres
McGuire Approach Lights.....	2.18 acres

McGuire AFB site was used as an Army Air Base between 1937 and 1948. In 1948, the Fort Dix Airfield was officially transferred to the Air Force and designated McGuire Air Force Base. The first command at the base was the Strategic Air Command (SAC), followed by the Continental Air Command (CAC) and in 1952 the Military Air Transport Service (MATS), a predecessor command of the Military Airlift Command (MAC). The primary mission of the base since 1952 has been to provide a port of aerial embarkation for the Atlantic Division. In 1954, the New Jersey Air National Guard (NJANG) became a major tenant on the base. In 1966, MATS was renamed MAC and the 1611th Air Transport Wing became the 438th Military Airlift Wing which is presently the host organization on McGuire AFB.

ENVIRONMENTAL SETTING

The environmental setting data reviewed for this investigation indicate that the following major points are relevant to the evaluation of past hazardous waste management practices at McGuire Air Force Base:

- o Surface soils of the McGuire Air Force Base area are typically sandy, permeable and possess shallow water levels (six feet or less).
- o The Cohansey Sand, Kirkwood Formation and the Vincentown Formation are present at McGuire AFB, either exposed or very near ground surface. These formations are considered to be aquifers of limited significance in the study area. The base is located within the recharge zone of these aquifers.
- o The mean annual precipitation is 43.5 inches and the net precipitation is calculated to be 9.3 inches.
- o As much as 85% of the precipitation infiltrating into these shallow aquifers will be lost as baseflow to area streams, usually within a period of a few days from the time of infiltration.

- o The major regional aquifer exists at great depth in the study area (about 500 feet below ground surface). The regional aquifer is recharged at some distance from the base, but may receive some local recharge as leakage through semipervious zones from overlying shallow aquifers.
- o Evidence of limited contamination identified in wells constructed in the Potomac-Raritan-Magothy outcrop area has been published. This is not expected to impact base water quality in the near term.
- o Flooding is not a problem typical of the McGuire Air Force Base Area.
- o The streams entering and exiting the base boundaries are considered to have good water quality.
- o No threatened or endangered species have been observed within the McGuire AFB boundaries.

METHODOLOGY

During the course of this project, interviews were conducted with base personnel (past and present) familiar with past waste disposal practices; file searches were performed for past hazardous waste activities; interviews were held with local, state and federal agencies; and field and aerial inspections were conducted at past hazardous waste activity sites. Twenty-~~two~~^{ONE} sites located within the McGuire AFB boundaries or on the McGuire Missile Site were identified as potentially containing hazardous contaminants resulting from past activities (Figure 1 and Figure 2). These sites have been assessed using a Hazard Assessment Rating Methodology (HARM) which takes into account factors such as site characteristics, waste characteristics, potential for contaminant migration and waste management practices. The details of the rating procedure are presented in Appendix G and the results of the assessment are given in Table 1. The rating system is designed to indicate the relative need for follow-on action.

TABLE 1
PRIORITY RANKING OF POTENTIAL CONTAMINATION SOURCES
MCGUIRE AFB

Rank	Site Name	Date of Operation or Occurrence	Overall Total Score
1	Landfill No. 4	1958-1973	73
2	Landfill No. 2	1950-1956	66
3	Landfill No. 3	1956-1957	65
4	McGuire Missile Site JP-X Discharge Pit	1958-1972	59
5	Pesticide Wash Area	1974-present	58
6	DPDO Storage Facility	1960-1979	56
7	Fire Protection Training Area No. 1	Late 1940's - 1958	54
8	Bulk Fuel Storage Tank	1963-1970	53
9	Landfill No. 5	1970-1973	52
10	Fire Protection Training Area No. 2	1958-1968	51
11	Landfill No. 6	1973-1976	50
11	WWTP Sludge Disposal Areas	1953-present	50
11	McGuire Missile Site - Transformer Locations	1958-present	50
14	Buried Oil Drums	Early 1950's	49
15	Fire Protection Training Area No. 3	1973-1976, 1982	48
16	NDI Shop - Drain Field	1960's-1972	47
17	McGuire Missile Site Accident Area	1960	46
19	McGuire Missile Site Mogas Storage Tanks	1958-present	45
19	McGuire Missile Site BOMARC Launcher Hydraulic Systems	1958-present	39
20	McGuire Missile Site Neutralized Acid Pit	1958-1972	37
21	PCB Spill Site	1982	6

NOTE: This ranking was performed according to the Hazard Assessment Rating Methodology (HARM) described in Appendix G. Individual site rating forms are in Appendix H.

CHAPTER 6

PHASE II STAGE I EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

ES1.0 Introduction

Roy F. Weston, Inc. (WESTON) was retained by the U.S. Air Force Occupational and Environmental Health Laboratory (OEHL) under Contract No. F33615-80-D-4006 to provide general engineering, hydrogeological and analytical services. These services were applied to the Installation Restoration Program (IRP) Phase II Stage 1 effort at McGuire Air Force Base (McGAFB) under Task Order 0020 of this contract.

In 1976 the Department of Defense (DoD) devised a comprehensive IRP. The purpose of the IRP is to assess and control migration of environmental contamination that may have resulted from past operation of hazardous contaminants. In response to the Resource Conservation and Recovery Act of 1976 (RCRA) and in anticipation of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA or "Superfund"), the DoD issued a Defense Environmental Quality Program Policy Memorandum (DEQPPM) dated June, 1980 (DEQPPM 80-6), requiring identification of past hazardous waste disposal sites on DoD agency installations. The U.S. Air Force implemented DEQPPM 80-6 by message in December, 1980. The program was revised by DEQPPM 81-5 (11 December 1981) which reissued and amplified all previous directives and memoranda on the IRP. The Air Force implemented DEQPPM 81-5 by message on 21 January 1982. The Installation Restoration Program has been developed as a four-phase program as follows:

- Phase I - Problem Identification/Records Search
- Phase II - Problem Confirmation and Quantification
- Phase III - Technology Base Development
- Phase IV - Corrective Action

Only the Phase II Problem Confirmation Stage 1 portion of the IRP effort at McGuire Air Force Base was part of this Task Order.

ES2.0 Scope of Work

McGuire Air Force Base occupies 3,536 acres of land in south central New Jersey, near the community of Wrightstown, Burlington County. Since the start of operations in 1937 as

New Jersey State Library

a single dirt-strip runway, activities at McGAFB in support of operational missions have resulted in the occurrence on the installation of a number of waste disposal sites of special interest.

The field investigation under Task Order 20 included nine areas listed below:

- Zone 1: Landfill 4 (Site No. 1), Landfill 5 (Site No. 9), Landfill 6 (Site No. 11) and the wastewater treatment plant sludge disposal area (Site No. 12).
- Site No. 2, Landfill 2
- Site No. 3, Landfill 3
- Site No. 4, BOMARC Missile Site, JPX Discharge Pit
- Site No. 5, Pesticide Wash Area
- Site No. 6, DPDO Storage Facility
- Site No. 7, Fire Training Area 1
- Site No. 8, Bulk Fuel Storage Area
- Site No. 14, Civil Engineering Compound Drum Burial Site.

Eight of these sites are located on Figure ES-1, Site 4 is located approximately 11 miles to the east of the main Base.

The scope of the investigation included: two soil borings at Site No. 5 and five soil borings at Site No. 6 to recover 21 soil samples for chemical analyses; three stream water and sediment samples for chemical analysis at Site No. 5; a geophysical survey of the C. E. Compound (Site No. 14); and drilling and construction of a total of 17 ground-water monitoring wells at the landfill sites (Zone 1, Site Nos. 2 and 3) and Site Nos. 4, 7, 8 and 14.

All wells were surveyed for elevation and ground-water surface maps were prepared for three sites. One round of ground-water samples for chemical analyses was taken from the wells. All water quality and soil samples were analyzed

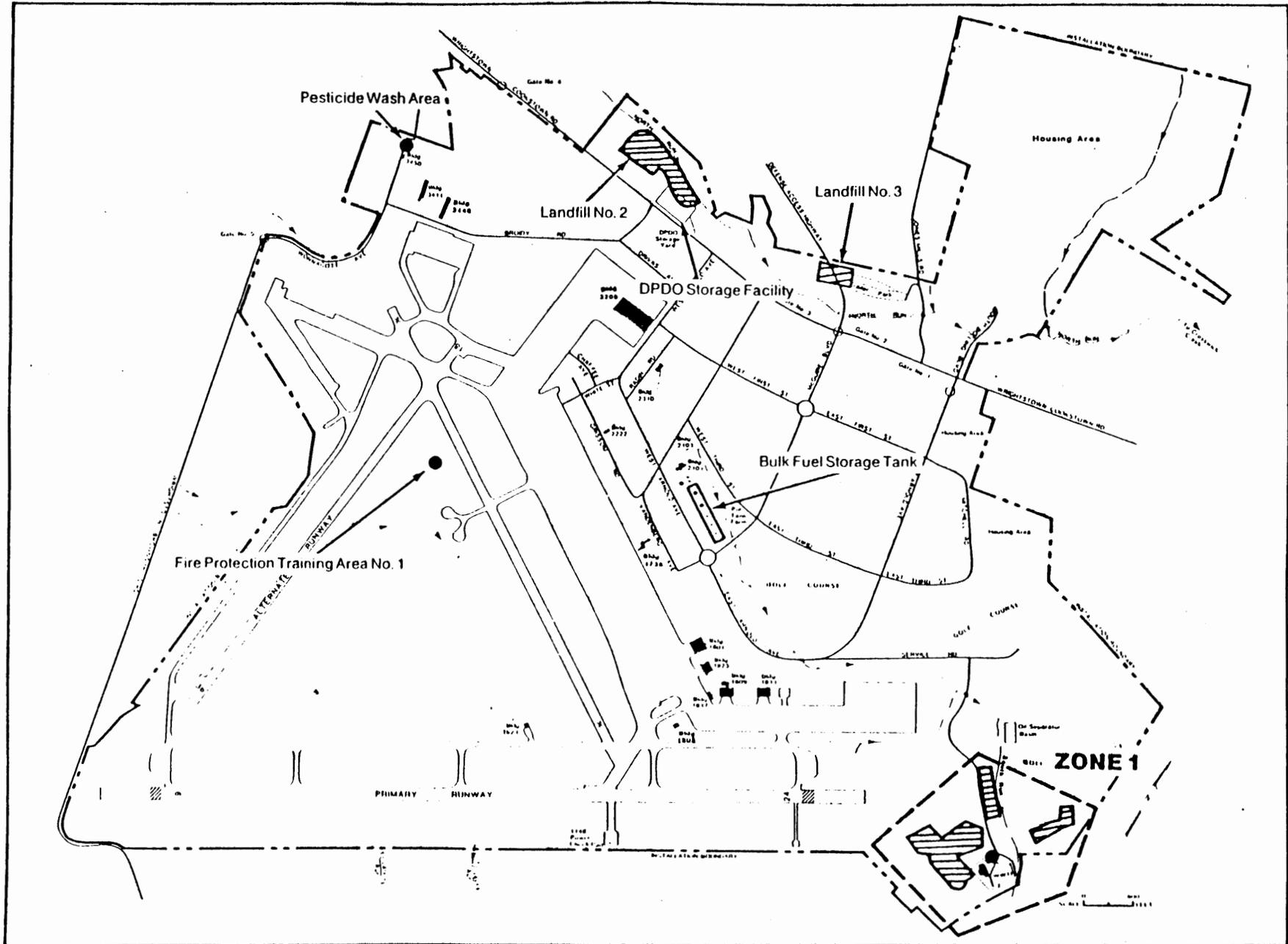


FIGURE ES-1 LOCATION OF ALL PHASE II SITES AT McGUIRE AFB

ES-3
59X

WILSON
GROUP
CONSULTANTS



in WESTON's laboratory in accordance with USEPA Standard Methods.

ES3.0 Major Findings

Based on the analyses performed, levels of contamination were found in soils and ground water that warrant further investigation and possible future action.

The major potential ground-water contaminants indicated by the available data are organic halogens. Total Organic Halogens (TOX) levels ranged from 3.7 to 443.9 mg/l in the 15 wells sampled (wells at the BOMARC Site, Site No. 4, were not sampled for TOX analyses). Four samples exceeded 100 ug/l and five samples had concentrations ranging from 10 to 100 ug/l. Each landfill area (Zone 1, Landfills No. 2 and No. 3) had at least one well with TOX concentrations exceeding 100 ug/l. Monitor Well 12 at the Bulk Fuel Storage Area (Site No. 8) had a TOX concentration of 81.7 ug/l. Wells at Fire Training Area No. 1 (Site No. 7) had the lowest TOX levels - 6.1 and 6.3 ug/l. USEPA water quality criteria for Human Health have been published for numerous compounds falling within the group contributing to TOX levels. Many of these criteria are in the range of 1 ug/l or less. Recommended Maximum Contaminant Levels (RMCLs) were published recently, which also included several of the compounds indicated by TOX data. Thus, TOX concentrations in the well samples from McGuire AFB indicate a high probability that these health criteria are exceeded in the case of one or more compounds.

Oil and grease was found in 13 of the 17 wells and at all of the sites at concentrations above the taste and odor threshold of 0.01 mg/l. In the remaining 4 samples oil and grease was not found at a detection limit for this program of 0.1 mg/l.

The pesticide levels observed in the subsurface soil samples at the Pesticide Wash Area (Site No. 5) are not considered by WESTON to be a factor of concern. The aqueous solubilities of these compounds are low and the impact on ground-water quality beneath the site should be minimal. Levels of chlordane, DDT and DDE in excess of 1,000 ug/kg in the stream sediments, however, show that some off-site migration of contaminated sediments has occurred. The relatively low concentrations of pesticides in the stream water indicates that the contaminants are migrating principally by sediment transport. The farthest downstream sampling point contained significant concentrations of pesticide compounds, so that it was not determined how far downstream the contam-

inated sediments have been carried. The stream that passes the Pesticide Wash Area flows to South Run, which exits the installation to the east.

The distribution of PCB in the soils analyzed from the DPDO Storage Facility (Site No. 6) indicate that PCB only occurs in near-surface samples (1-2 feet) and was not found at depth. PCB was found in 3 of the borings at very low concentrations ranging from 14 to 30 ug/kg: TB-3 in the drum storage area; and TB-5 and TB-7 near the buried tank location in the storage yard, where transformers were stored in the past.

Elevated oil and grease concentrations were found in soils at the DPDO Storage Facility (Site No. 6) at all depths. The highest concentrations were found at depths of 4-5 feet in the buried tank area (16,000 - 234,000 mg/kg) and 1-2 feet at the drum storage area (132 - 6,360 mg/kg). While the PCB in near surface soils appears limited and probably associated with past storage of transformers, the oil and grease appears related to surface drum storage and the buried storage tank. It does not appear that the waste oil from the buried storage tank contained PCB.

The results of the geophysical survey indicate that there is a potential for buried wastes to exist beneath the surface at the Civil Engineering Compound.

ES4.0 Conclusions

Based on the results of the Phase II survey at McGAFB, the following conclusions have been drawn:

1. Ground water directly beneath McGuire AFB and the BOMARC Missile Site occurs under unconfined or water table conditions with the water table occurring between 1 and 25 feet below ground surface. Sediments encountered during the drilling consisted of interbedded fine to medium sands, silts and clays of the Kirkwood and Cohansey Formations.
2. Regional ground water flow in the Cohansey and Kirkwood Formations is generally down formation dip to the southeast. However, most of the flow in the upper aquifer, where the monitoring wells are screened, is lateral to-

ward. local streams where discharge occurs.

3. The fate of contaminants infiltrating from the landfills to the water table is to move laterally toward the streams where discharge occurs. Based upon an estimate of soil permeability, the rate of lateral ground-water flow (seepage velocity) was calculated to be approximately one foot per day. Given the ages of the landfills and their proximity to surface streams, combined with the ground-water seepage velocity, it is apparent that ground-water contaminant plumes, as observed in the well water quality analyses, have already reached the surface water discharge areas.
4. The most immediate potential for migration of contaminants off-Base is from the landfill-generated contaminants reaching North and South Runs through the ground water. These streams both leave Base property a short distance from where they pass the landfills, with Landfill No. 2 situated less than one-half mile from the North Run exit point, and Landfills No. 4, 5 and 6 (Zone 1) are less than 500 feet from the South Run exit point of the Base.
5. Total Organic Halogens (TOX) were found in concentrations in excess of 200 ug/l in at least one well at each of the three landfill sites. TOX concentrations were 18.1 and 81.7 ug/l in the Bulk Fuel Storage Area (Site No. 8) wells, and were 6.1 and 6.3 ug/l in Fire Training Area No. 1 (Site No. 7) wells. These results indicate the possible presence of elevated levels of one or more specific volatile organic priority pollutants in the ground water at these sites.
6. Concentrations of oil and grease in excess of the taste and odor threshold were found at all but 4 wells and at all sites where ground water was monitored.

7. Concentrations of five pesticide compounds were found in soils at the Pesticide Wash Area (Site No. 5). The migration of pesticides vertically into the subsoil appears slight. However, levels of DDT, DDE and chlordane in excess of 1,000 ug/kg were found in the stream sediments downstream of the site. This indicates that off-site migration of pesticides is occurring by surface sediment transport. Pesticide concentrations in surface waters were in excess of 1 ug/l in only one stream sample (SW-2). Because of low solubilities, the compounds are remaining adsorbed in the sediments. The stream flowing past the Pesticide Wash Area is not close to a Base boundary, although the extent of the pesticide occurrence in sediments further down stream is not known.
8. Soil boring samples at three depth intervals from the DPDO Storage Facility (Site No. 8) were analyzed for oil and grease and PCB. PCB was found in the drum storage area and buried tank area in the 1-2 foot depth samples from three borings: TB-3, TB-5, and TB-7. PCB was detected in concentrations of 14-30 ug/kg, well below the USEPA action level of 50 mg/kg.
9. The results of the geophysical investigation of the Civil Engineering Compound, combined with the examination of historical aerial photos, show that areas exist at the site that have been disturbed in the past. Magnetic anomalies associated with these areas indicate that buried drums or other metallic scrap may be present.
10. Based on the limited analyses completed, the ground water quality at Fire Training Area No. 1 (Site No. 7) appears less degraded than the other sites sampled. TOX concentrations were among the lowest of wells tested. Since the

site has not been in use since the 1950's, the data indicate that any contaminants which may have been at the site in the past have been flushed out of the site to a great extent.

ES5.0 Recommendations

Based upon the Phase II Confirmation Study conducted at McGuire Air Force Base, the following recommendations are made by site:

ES5.1 Zone 1 - Recommendations

The following additional work is recommended for the Zone 1 Area (Landfills 4, 5, 6 and the Sludge Disposal Area).

1. An additional round of samples should be taken from existing wells MW-1 through MW-5 to verify the results obtained from the first sampling round. Samples from all five wells should also be analyzed for USEPA Priority Pollutant volatile organic compounds and landfill leachate indicator parameters such as nitrates, iron, ammonia-nitrogen and boron. In addition, samples from MW-3 should be analyzed for USEPA Priority Pollutant acid and base/neutral compounds and pesticide/PCB compounds. Three surface water samples should be taken along South Run upstream of Zone 1, downstream of the small tributary passing by MW-3 and downstream of the waste treatment plant. These samples should be analyzed for the same parameters as the 5 well samples.
2. A Ground Penetrating Radar survey should be performed on Landfill No. 4 to determine boundaries, depth, and possible buried barrel nests. The investigation should be followed by 10 soil borings in Landfill 4 to confirm depth of fill and depth to water.
3. If the results of the above analyses are positive, at least eight additional groundwater monitoring wells should be drilled in the Zone 1 area, including three wells at the locations of borings in Landfill 4 and two upgradient wells, one each above Landfills 4 and 5.

4. The new and existing wells should be sampled for key parameters identified in the previous sampling of the existing wells. In addition, samples from South Run should be taken at locations upstream, opposite the landfills and where the stream crosses the installation boundary and analyzed for a similar suite of key parameters.

ES5.2 Site No. 2, Landfill 2 - Recommendations

The following additional work is recommended for Landfill 2:

1. The existing wells at the site should be re-sampled to verify the results of the first water quality analyses. All samples should also be analyzed for USEPA Priority Pollutant volatile organic compounds.
2. Production Well A, located adjacent to the barrel storage area, should be sampled for the same suite of parameters as above.
3. In addition to the above parameters, MW-7 should be sampled for USEPA Priority Pollutant acid compounds, base/neutral compounds and pesticide/PCB compounds.
4. A Ground Penetrating Radar (GPR) survey should be conducted on the landfill to assess depths to the base of fill and the location of possible barrels. Six soil borings should be completed subsequently to calibrate the GPR results and confirm the depth of fill and the location of the water table.
5. Three additional monitoring wells should be installed to the east of the landfill to define potential groundwater flow in that direction. One well should be adjacent to Production Well "A" and the DPDO barrel storage area.
6. All wells should be sampled for specific contaminants based on the results of the previous sampling round. The list of



analytes should also include landfill leachate parameters such as nitrates, iron, ammonia-nitrogen and boron.

7. Water quality samples should also be collected along North Run upstream from the landfill, downstream, and opposite the landfill, and analyzed for the suite of analytes identified above.

ES5.3 Site No. 3, Landfill 3 - Recommendations

WESTON makes the following recommendations for further investigation at Landfill 3:

1. Resample existing wells to verify the first round of analyses, plus analyze all samples for USEPA Priority Pollutant volatile organic compounds. In addition, MW-9 should be sampled for USEPA Priority Pollutant acid compounds, base/neutral compounds and pesticide/PCB compounds.
2. Three additional monitoring wells should be installed between the landfill and the Base boundary.
3. All wells should be sampled for those key parameters indicated in the previous round of sampling, plus nitrate, ammonia-nitrogen, iron, and boron.
4. Three surface water samples should be taken along North Run; upstream, opposite the landfill, and downstream. These samples should be analyzed for the same parameters as the wells.

ES5.4 Site No. 4, BOMARC Missile Site - Recommendations

WESTON makes the following recommendations for further investigation at the BOMARC Missile Site:

1. Resample existing wells to verify the first round of analyses, plus analyze the samples for USEPA Priority Pollutant volatile organic compounds and xylene.

ES5.5 Pesticide Wash Area - Recommendations

Contamination of stream bed sediments is the principal problem in the Pesticide Wash Area. WESTON, therefore, recommends that the following sampling be completed to determine the extent of this contamination:

1. Sediment and grab samples should be taken at three locations downstream of SS-3 and upstream of the culvert entrance, at three manhole locations along the storm drain system, and at one location upstream of the pesticide wash area. All samples should be analyzed for pesticides.
2. Two-foot core samples should be taken at locations SS-1, SS-2 and SS-3 to obtain samples at depth. Each core should be divided into two depth increments and analyzed for pesticides to determine the depth of the contaminated sediment.

ES5.6 Site No. 6, DPDO Storage Area - Recommendations

WESTON recommends that the following work be completed at the DPDO site to determine the extent of soil and groundwater contamination at the DPDO Storage Area.

1. Surface soil samples should be taken at twelve locations around the drum storage and buried tank areas. Three composite samples should be analyzed for PCB with the remaining portion of the samples stored for possible future analysis.
2. A monitoring well should also be installed between the buried tank area and North Run. This well should be sampled for oil and grease, volatile organic compounds and xylene. The monitoring well recommended in Section 6.1.2, to be located near production well "A", will also monitor the barrel storage area.

ES5.7 Site No. 7, Fire Training Area - Recommendations

WESTON does not consider Fire Training Area 1 to be a high priority site at this time, and recommends only that MW-14

and MW-15 be resampled to verify the original analytical results. Samples should also be analyzed for USEPA Priority Pollutant volatile organic compounds and xylene.

ES5.8 Site No. 8, Bulk Fuel Storage Area -
Recommendations

WESTON recommends that the following work be done at the Bulk Fuel Storage Area:

1. A second round of well samples should be analyzed to confirm initial results. Samples should also be analyzed for USEPA Priority Pollutant volatile organic compounds plus xylene.
2. Approximately twenty soil borings should be completed around the Bulk Fuel Storage Area. Temporary PVC well points should be installed and a groundwater elevation survey completed. Samples from the well points can be visually examined for floating fuel products.
3. Based on the information gathered from the temporary well points, up to six permanent groundwater monitoring wells should be installed in critical locations around the bulk fuel storage area including one upgradient, background location.
4. All wells at the site should be sampled for oil and grease, lead, USEPA Priority Pollutant volatile organic compounds, and xylene.

ES5.9 Site No. 14, Civil Engineering Compound -
Recommendations

Based on the results of the geophysical survey and the examination of historical photographs, WESTON recommends that a subsurface investigation be conducted at the Civil Engineering Compound to confirm whether hazardous materials are buried at the site. WESTON recommends:

1. Backhoe test pits should be completed at those locations identified as potential burial sites by the geophysical survey. The work should be conducted while observing

strict safety procedures, including personal body and respiratory protection. Air quality should be monitored with an organic vapor detector, and soil samples should be obtained in areas where physical appearance or detected vapors indicate contamination.

This excavation activity is to be for the confirmation of whether barrels or contaminated soils are present. If barrels are encountered, they will not be disturbed or sampled. Only suspected contaminated soils will be sampled. All procedures for this investigation will be reviewed prior to the work with appropriate State and Federal regulatory agencies.

2. Selected soil samples should be analyzed for USEPA Priority Pollutant organic compounds and metals.
3. If the results of the chemical analyses of the soils is positive, four groundwater monitoring wells should be placed around the burial site; one well upgradient and three wells downgradient. Groundwater samples should be obtained from these wells and analyzed for key compounds indicated by the soils analyses to determine the impact of the waste on groundwater quality. Appropriate response for remedial action should also be developed.

ES6.0 SUMMARY OF RECOMMENDATIONS

The recommendations which have been made as a result of this Stage 1 Study at McGuire Air Force Base are summarized in Table ES-1.

TABLE ES-1: SUMMARY OF RECOMMENDATIONS

<u>Site</u>	<u>Recommendations</u>	<u>Rationale</u>
Zone 1	Resample and analyze existing monitor wells	Verify Stage 1 results
	Expand suite of analytes	Characterization of contaminants
	Surface water sampling	Assess leachate discharge to adjacent creeks
	Ground Penetrating Radar Survey	Landfill boundary determination, assess presence of drums
	Borings and monitor wells within landfills	Determine if ground-water table is within fill material
	Additional monitor wells	Assess magnitude and extent of contamination
Site 2	Resample and analyze existing monitor wells	Verify Stage 1 results
	Priority Pollutant Scan	Characterize contaminants
	Ground Penetrating Radar Survey	Determine depth of fill and presence of drums
	Additional monitor wells, sampling and analysis	Assess magnitude and extent of contamination
	Sampling and analysis of surface waters	Assess leachate discharge to adjacent creeks
Site 3	Resample and analyze existing monitor wells	Verify Stage 1 results
	Expanded suite of analytes and Priority Pollutant Scan	Characterization of contaminants

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ES-14

TABLE ES-1: SUMMARY OF RECOMMENDATIONS (cont.)

<u>Site</u>	<u>Recommendations</u>	<u>Rationale</u>
	Additional monitor wells, sampling and analysis	Assess magnitude and extent of contamination
	Sampling and analysis of surface waters	Assess leachate discharge to adjacent creeks
Site 4	Resample and analyze existing monitor wells	Verify Stage 1 results
Site 5	Sampling and analysis of additional bottom sediments	Determine extent of downstream contaminant migration
Site 6	Sampling and analysis of additional surface soils	Determine extent of soil contamination
	Additional monitor well, sampling and analysis	Assess magnitude and extent of contamination
Site 7	Resample and analyze existing monitor wells	Verify Stage 1 results
Site 8	Resample and analyze existing monitor wells	Verify Stage 1 results
	Drill and sample soil borings	Determine magnitude and extent of soil contamination
	Additional monitor wells, sampling and analysis	Determine magnitude and extent of ground-water contamination
Site 14	Test pits and target sites identified by Ground Penetrating Radar Survey	Confirm presence or absence of buried drums
	Soil sampling and analysis	Characterization of contaminants
	Installation of monitor wells, sampling and analysis	Determine magnitude and extent of ground-water contamination

ES-15
 7/X

CHAPTER 7

PHASE II STAGE II (DRAFT REPORT-TANK FARM)



EXECUTIVE SUMMARY

ES.1 INTRODUCTION

Roy F. Weston, Inc. (WESTON) has been retained by the United States Air Force Occupational and Environmental Health Laboratory (OEHL), under Basic Ordering Agreement (BOA) Contract No. F33615-80-D-4006, to provide general engineering, hydrogeological, and analytical services. By message dated 4 May 1984, McGAFB requested OEHL assistance in analysis and remediation of a JP-4 spill which had occurred at the Base. In response to this request, by message dated 11 May 1984, OEHL committed to provide assistance. WESTON was directed to proceed to McGAFB, inspect the spill site, and prepare a scope of work for Air Force review and implementation.

McGAFB has identified the source of the spilled fuel as the lines associated with the now inactive railroad off-loading facility. The leak was effectively stopped by permanently disconnecting these lines from the fuel system. Therefore, the following Technical Scope of Work deals only with the second and third aspects of a fuel spill evaluation. The OEHL issued Task Order 3 of this contract dated 20 July 1984, authorizing WESTON to perform an investigation at the Base fuel storage area.

As the primary parameters for evaluation of fuel migration and subsequent groundwater contamination, WESTON used the following analytes:

- U.S. EPA volatile organic and aromatic hydrocarbons (VOA's) that are components of JP-4:
 - Benzene.
 - Toluene.
 - Xylene.
- Oil and grease.

WESTON used these analytes as the primary parameters for evaluation of groundwater contamination. WESTON completed 30 soil borings and installed 8 permanent groundwater monitoring wells. All soils (16 surface soil samples and 43 soil boring samples) were analyzed for oil and grease. All water samples were sampled for analysis of oil and grease and the VOA compounds, benzene, toluene, and xylene. Sampling was accomplished in accordance with U.S. EPA standard protocols, and the analyses

were performed using U.S. EPA Standard Methods 413.2 for oil and grease and 602 for VOA's. Upon completion of these analyses, the data were inspected for those wells and soil borings exhibiting the most degraded soil and water quality. Isoconcentration maps of detected contaminants were prepared to provide an indication of probable magnitude and extent of fuel migration.

Volatile organic compounds were present in association with those wells exhibiting high concentrations of oil and grease. High levels of benzene, toluene, and xylene (BTX) were detected in samples from wells MW-18, MW-19, MW-21, and MW-24, as shown in Table 4-4.

The second round of groundwater samples was collected on 23 and 24 April 1985. At that time no surface water samples were taken, but existing wells MW-12 and MW-13 were sampled. The general distribution of oil and grease and BTX occurrence was the same as the first round, although concentrations were consistently orders-of-magnitude lower except for MW-24. MW-12 had high oil and grease and BTX concentrations, while MW-13 did not.

The obvious explanation for the difference in results between sampling rounds for MW-18, MW-19, and MW-21 was that these wells contained several feet of fuel product. Although the product was not evident immediately after purging the wells, samples at that time probably contained emulsified fuel. Results did not vary so significantly at MW-24, where only traces of free fuel were observed on the water surface.

Except for xylene levels of 11 ug/L (the detection limit is 4.0 ug/L) in the first sample from well MW-22, BTX concentrations in wells MW-20, MW-22, and MW-25, surface water, and sample blanks were below detection limits.

ES.2 SIGNIFICANCE OF FINDINGS

ES.2.1 Groundwater

As a result of the field investigation, four principal areas of groundwater contamination were identified:

- Along the northern boundary of the facility in the vicinity of wells MW-12, MW-19, and MW-21, where the overland flow of fuel collected and subsequently percolated into the water table.

- Along the northern boundary of the facility in the vicinity of well MW-18, where the leaks occurred in the standpipes.
- Along the eastern boundary of the facility in the vicinity of well MW-24, where high dissolved constituents were detected.
- Outside the northwest corner of the facility fence boundary in the vicinity of soil boring 29.

Although the impact of free floating fuels on groundwater is limited, the fuels provide a constant supply of dissolved constituents to the groundwater system. The migration potential for these compounds is closer to the seepage velocity of the groundwater itself.

In the eastern portion of the site there exists a potential for off-site migration of dissolved groundwater contaminants encountered in well MW-24. There is no evidence that the migration of these constituents is limited or contained to the east of the site. The extent of contaminant migration cannot be quantified since this source was found in the outer fringes downgradient of the study area. In order to conclusively determine the extent of migration, additional field investigations pertinent to the source would be necessary.

ES.2.2 Soils

Elevated levels of oil and grease in unsaturated soils occur in the same areas as fuel occurrence in the groundwater, with some exceptions, such as the boring 29 area. Fuel in these soils is flushed to the groundwater by precipitation percolating through the soils, and provides some recharge to the plume.

ES.3 RECOMMENDATIONS

Based on the findings of the field investigation and the identification and preliminary evaluation of remedial alternatives, WESTON recommends a three-step approach for a site restoration program.

- Implementation of an immediate response alternative to recover the floating hydrocarbons.
- Identify additional data needs involving further investigation and definition of the plume of dissolved constituents at the east and southeast portions of the tank farm (MW-24).

- Analysis of the long-term alternatives after immediate response measures have been completed.

ES.3.1 Implementation of Immediate Response Alternative

WESTON recommends the alternative involving recovery of floating hydrocarbons from the groundwater using low production pumping systems installed in the existing monitoring well(s) or additionally constructed recovery well(s). In addition, the recovery operations should be supplemented by a periodic monitoring and sampling program in monitoring wells MW-12, MW-13, MW-18, MW-19, MW-21, and MW-22 to monitor the efficiency of the recovery operation and potential migration of hydrocarbons to South Run.

ES.3.2 Additional Data Needs

The additional data needs identified include:

- Definition of the plume of dissolved hydrocarbon constituents in groundwater towards the east and south-east areas of the tank farm (MW-24).
- Definition of hydrocarbon constituents in soils east and southeast of the tank farm (MW-24).
- Development of clean-up standards and criteria for long-term remediation actions.

ES.3.3 Analysis of Long-Term Alternatives

Upon completion of the immediate response activities involving recovery of floating hydrocarbons, the monitoring wells should be sampled and analyzed to determine the concentrations and extent of dissolved hydrocarbons in groundwater and presence of any residual floating hydrocarbons. In view of this analytical data and the cleanup criteria and standards for long-term remediation, the long-term alternatives should be re-evaluated for technical feasibility, cost-effectiveness, implementation time frame, environmental effectiveness, and capability for implementation and operation using base manpower resources.

CHAPTER 8

ABSTRACT OF OEHL RADIOLOGICAL REPORT

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