

SUMMARY

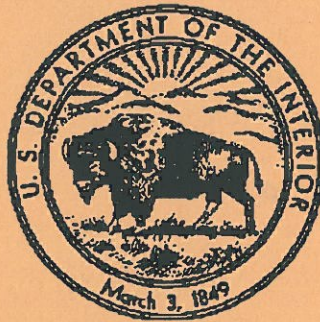
FINAL ENVIRONMENTAL IMPACT STATEMENT

Shell Western E&P Inc.
Miccosukee 3-1 Exploratory Well
Miccosukee Indian Reservation, Broward County, Florida

July 29, 1994



Bureau of Land Management
Eastern States
Jackson District
Jackson, Mississippi



Bureau of Indian Affairs
Eastern Area Office
Arlington, Virginia



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Miami, Florida

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 **DAMES & MOORE**
Boca Raton, Florida

SUMMARY

FINAL ENVIRONMENTAL IMPACT STATEMENT

SHELLL WESTERN E&P INC. MICCOSUKEE 3-1 EXPLORATORY WELL BROWARD COUNTY, FLORIDA

Prepared By

**U.S. Department of the Interior
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July 29, 1994

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FINAL ENVIRONMENTAL IMPACT STATEMENT MICCOSUKEE 3-1 EXPLORATORY WELL BROWARD COUNTY, FLORIDA

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SUMMARY CONTENTS

This is a summary document of the complete FEIS. The complete FEIS includes: an abstract; a summary; five chapters (1 - Introduction, 2 - Alternatives Including the Proposed Action, 3 - Affected Environment, 4 - Environmental Consequences, and 5 - Consultation and Coordination); a glossary; references; an index; a list of acronyms; 25 figures; 11 data tables; and 13 technical appendices. The FEIS is a 722 page document.

This summary document includes the abstract, the summary chapter of the FEIS, excerpts from Chapter 4 - Environmental Consequences and 11 figures which will aid the reader in understanding the proposed action and alternatives and the environmental analysis which has been conducted. The complete contents are listed below.

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ABSTRACT

This Final Environmental Impact Statement (FEIS) analyzes the impacts of the Shell Western E&P Inc. proposal to drill an exploratory well and test the potential hydrocarbon bearing formations at a site located in Section 3, Township 50 South, Range 35 East, near the intersection of Interstate Highway 75 and South Florida Water Management District Canal L-28, on the Miccosukee Indian Reservation located in Broward County, Florida, approximately 40 miles west of the City of Fort Lauderdale.

The Bureau of Land Management and Bureau of Indian Affairs have joint lead responsibility for the preparation of the FEIS. The U.S. Geological Survey, Water Resources Division in Miami is participating in the analysis as a Cooperating Agency.

This FEIS provides the documentation of the analysis of the proposed action and alternatives based on significant issues and concerns identified through the scoping process. Interdisciplinary participation has been provided by the environmental consulting firm of Dames & Moore, Inc., under a third party contract. The FEIS has integrated to the fullest extent possible consultation, surveys and studies required under various Federal laws and executive orders including the Endangered Species Act of 1973, the National Historic Preservation Act of 1966 and Executive Order 11990 (Protection of Wetlands).

The FEIS is being circulated for review and comment to appropriate Federal, State and local agencies, the Miccosukee Tribe, Shell Western E&P Inc. and all individuals and organizations wishing to have a copy. Comments on this FEIS will be accepted until August 29, 1994. A Record of Decision will be prepared following review of the comments on the FEIS. The decision regarding the proposal will be made by the Authorized Officer, Bureau of Land Management, as provided by 43 CFR, Subpart 3161 in consultation with the Bureau of Indian Affairs. The analysis does not indicate that the proposed action would require other Federal permits, licenses, or entitlements. The analysis also indicates that Alternatives B and C may require other Federal permits.

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SUMMARY

S.0 SUMMARY

S.1 Background

This Final Environmental Impact Statement (FEIS) analyzes the impacts of the Shell Western E&P Inc. (SWEPI) proposal to drill an exploratory well and test the potential hydrocarbon (oil and gas) bearing formations at a site located in Section 3, Township 50 South, Range 35 East, near the intersection of Interstate Highway 75 (I-75) and South Florida Water Management District (SFWMD) Canal L-28, on the Miccosukee Indian Reservation located in Broward County, Florida, approximately 40 miles west of the City of Fort Lauderdale (Figures 1-1 and 2-2).

SWEPI, the proponent of the exploratory drilling action, submitted an Application for Permit to Drill (APD) to the Bureau of Land Management (BLM), Jackson District Office, on January 17, 1991. The BLM determined initially that an Environmental Assessment (EA) would be required and proceeded with scoping. Public scoping was conducted from March 1991 through May 1992 to solicit comments on the proposed action. Substantial public concern was expressed regarding the proposal due to the sensitivity of the Everglades and Big Cypress Swamp environments and associated natural resources.

On April 16, 1992, BLM issued a Notice of Intent to prepare an environmental impact statement (EIS). The notice explained that the decision to expand the analysis from an EA to an EIS was not based on any changes in the proposal's anticipated impacts but was made to recognize expressed public concerns and to assure the public that potential environmental impacts of the proposal would be thoroughly analyzed and addressed. The notice further stated that any proposal for additional wells or production would require additional National Environmental Policy Act (NEPA) review and decision documents.

The BLM and Bureau of Indian Affairs (BIA) concluded that an EIS would ensure that the final decision would be based on all relevant factors and that the full NEPA process would result in enforceable mitigation measures, if such were found to be required, through the published Record of Decision (ROD).

The purpose of the FEIS is to provide the agency decision makers (BLM and BIA) with information upon which to base a final decision. It also serves as the means of documenting the analysis, identifying potential environmental impacts and mitigation measures, and informing and involving the public in the analysis process. The BLM and BIA have joint lead responsibility for the preparation of the EIS. BLM has administrative lead responsibility. The U.S. Geological Survey, Water Resources Division (USGS) in Miami is participating in the analysis as a Cooperating Agency.

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This FEIS provides documentation of the analysis of the proposed action and alternatives, based on significant issues and concerns identified through the scoping process and public and agency review of a Draft Environmental Impact Statement (DEIS) completed on March 8, 1993. The evaluation of the proposal and alternatives was accomplished by an interdisciplinary review with representatives from the BLM and BIA. Interdisciplinary participation has been provided by the environmental consulting firm of Dames & Moore, under a third party contract. The FEIS is being circulated for review and comment to appropriate Federal, State and local agencies, the Miccosukee Tribe, SWEPI and all individuals and organizations wishing to have a copy.

The FEIS was prepared following review of the comments on the DEIS. Ninety-five issues were identified and addressed in the FEIS. The decision regarding the APD will be made by the Authorized Officer, BLM, as provided by 43 Code of Federal Regulations (CFR), Subpart 3161 in consultation with the BIA. The ROD is a separate public record that will be issued at least 30 days after the EPA Notice of Availability of the FEIS.

S.2 Proposed Action and Alternatives

S.2.1 Alternative A - Proposed Action

SWEPI Miccosukee 3-1 Well Site and Proposed Access Route

The proposed action includes drill site construction, improvement of existing access roads, exploratory drilling, well evaluation and testing, temporary abandonment (if the well is capable of production) or final abandonment and plugging (if the well is dry) and reclamation.

SWEPI proposes to drill a directional well to a true vertical depth (TVD) of 17,730 feet. The measured depth (MD) of the well would be approximately 18,850 feet, with the bottom hole approximately 4,700 feet east of the surface site. Construction of the drill site would take approximately 30 days. Drilling and evaluation of the well requires an additional 145 days. Testing of oil producing zones (if found) would require up to an additional 30 days. Reclamation would require an additional 120 days.

The proposed drill site is located on pasture land 3 miles east of the Collier-Broward County Line, 1000 feet north of I-75 and immediately west of the L-28 Canal and Water Conservation Area 3A (WCA-3A) (Figure 2-3).

The proposed drill site would occupy approximately five acres of improved pasture. The drilling rig and associated equipment would be located on a specially designed pad. The pad would be constructed of

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select fill material topped with 18 inches of crushed limerock, compacted to 12 inches. The drill site would include a four-foot perimeter berm which would be constructed with three feet of select fill and one foot of crushed limerock to minimize erosion during rainstorms. The berm would encompass the complete drill site and would serve to: 1) contain all stormwater and/or any spilled material, and 2) exclude flood waters that could occur during heavy rainstorms or hurricane events.

The area under the rig equipment would be trenched and a plastic liner installed to minimize the possibility of any contaminants leaching into the soil. The plastic-lined section would have a one-foot berm around it, such that all rain water and fluids normally in contact with the rig, including drilling mud and rig wash down water, would drain to this plastic lined area. The collected fluids would then be pumped to a storage tank and used in the drilling fluid.

Major highway access to the drill site would be provided via I-75 from the east and/or west to the Snake Road (a/k/a Josie Billie Road) interchange, located west of the proposed drill site. Local highway access is via Snake Road to a point about 4 miles north of the I-75 interchange where an existing earth and rock-filled road intersects Snake Road from the east. From this point the route runs east approximately one and one-half miles to the L-28 Canal and then south parallel to the canal on an existing farm road for approximately four miles to the proposed drill site.

The proposed access route from Snake Road is an existing earthen berm approximately 15 feet in width, and consists of a one-lane, rock-filled roadbed. The proposed access route would be topped with crushed limerock to create a smooth road surface capable of handling the traffic of rig and testing equipment. The condition of the crushed limerock roadbed would be evaluated and additional material would be added as necessary. The proposed access route would continue to be a one lane route. Limited widening at selected locations would be required for vehicle turnouts to allow the safe passing of opposing traffic. These 100 foot long vehicle turnouts would be constructed at intervals of between 1/2 to 3/4 mile, resulting in the placement of fill on 0.4 acres of improved pasture. Upon completion of the project, the well site and vehicle turnouts would be reclaimed or left in place if desired by the Miccosukee Tribe.

S.2.2 Alternatives to the Proposed Action

As identified through interdisciplinary review, alternatives to the proposed action that meet the stated geologic objectives are limited by environmental considerations and technological constraints. Two alternative access routes known as the West Access Route and East Access Route have been identified. Alternatives to the proposed well site are limited to the "No Action" Alternative.

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S.2.2.1 Alternative B - West Access Route

This access route originates from the Snake Road interchange and travels north approximately 400 feet to the Miccosukee Service Plaza. From this point the access route travels east, directly north of the I-75 borrow canal for approximately 1.6 miles to the drill site. Because this alternative access route is unimproved, approximately 1.6 miles of new road construction is required. Road construction would require several feet of fill to create a one-lane access road (15 feet top width) and vehicle pullouts. Approximately three acres of pasture including 0.25 acres of marsh would be filled. Placement of fill in the marsh would require a Section 404 permit from the U.S. Army Corps of Engineers (COE). Fill would be hauled to the site from a commercial off-site source. After completion of the project, the road would be reclaimed or left in place if desired by the Miccosukee Tribe.

S.2.2.2 Alternative C - East Access Route

The East Access Route originates from I-75 westbound at the exit ramp to the SFWMD S-140 pump station located east of the L-28 Canal. From that point the access route connects to a private road, maintained by the SFWMD, extending north to a point that is directly across from the drill site and separated by the L-28 Canal. The existing exit ramp and SFWMD road appear in good condition and able to handle project traffic and rig equipment weight. However, a vehicular bridge would have to be constructed across the 100-foot wide L-28 Canal to access the drill site. This bridge would most likely be of pre-cast concrete construction similar to the adjacent I-75 bridges. Only one lane would be required. This alternative would require a Section 404 permit from the COE and a right-of-way use permit from SFWMD and/or the Florida Department of Transportation (FDOT) and approval by the Federal Highway Administration (FHWA). After completion of the project, the bridge could either be dismantled or left in place, if desired by the Miccosukee Tribe. This alternative would not require construction of any new roads or result in additional filled acreage. The FHWA is opposed to use of this access route if other alternatives are practical.

S.2.2.3 No Action Alternative

The third alternative to be analyzed is the No Action Alternative which would result in denial of the APD. This alternative would provide for the continuance of other land management activities presently occurring on the project site.

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S.2.2.4 Alternatives Considered But Not Analyzed in Detail

One of the issues identified through scoping was eliminating the need for the project by utilizing alternative energy sources. This alternative to the proposal is not considered practical or feasible for several reasons as follows: The BLM and BIA do not have any means or authorization to require uses of alternate energy sources as an alternative to the proposal. This alternative would not fulfill the purpose or intent of the proposed action, to determine if hydrocarbons are present in the area of the proposed action, within the Miccosukee Reservation. In addition, this alternative would not be consistent with the intent of the Indian Mineral Development Act of 1982 (IMDA); to allow any Indian tribe to enter into any Minerals Agreement; providing for the exploration of mineral resources. Hence, this alternative is not considered a reasonable alternative to the proposed action and is not within the scope of the analysis.

In addition to Alternatives A, B, C, and the No Action Alternative, other alternatives were considered. However, alternatives that meet the stated purpose and geologic objectives of the proposed action are limited by technological constraints and environmental considerations. Four alternative well sites were identified, but not analyzed in detail for various reasons. These alternatives included:

- Drilling the well from a surface location directly above the Sunniland target. This alternative was eliminated due to the nature of the well as a wildcat exploratory well and the location in WCA-3A.
- Drilling the well from a location 2,000 feet east of the Sunniland target. This alternative was eliminated due to technical limitations of directional drilling (multiple angles in the required directional path) and location of the surface site in WCA-3A.
- Drilling the well from a location 700 feet west, slightly northwest, or slightly southwest of the proposed well site. This alternative was eliminated due to wetland impacts.
- Drilling the well from a location within the circumference of a circle with a radius of 2,600 feet projected from a center located 1,100 feet west of the Sunniland target. This alternative was dismissed due to location in WCA-3A and/or in wetlands, and the nature of the well as a wildcat exploratory well.

S.3 Scope of Analysis

The BLM and BIA have determined that the scope of this FEIS includes the proposed action and reasonable alternatives to the proposed action, including the No Action Alternative and mitigation

SUMMARY

measures. The FEIS includes analysis of the direct, indirect and cumulative impacts of the proposed action and alternatives.

Production of the single well or field development are not proposed or reasonably foreseeable and are not subject to review in this FEIS. However, Appendix A-1 provides a discussion of well and field development including the probability of discovery, field development operations and facilities, impacts associated with typical development in South Florida and the environmental review process used to analyze hydrocarbon development activities.

Public issues and comments regarding the SWEPI proposal were solicited for incorporation into this FEIS through the scoping process and public and agency review of a DEIS. Scoping for the SWEPI Miccosukee 3-1 well proposal was initiated by BLM on March 22-28, 1991, by a Notice of Request for Comments published in seven Florida newspapers. This notice described the proposed action, announced that an EA would be prepared and requested public comments by May 3, 1991. Approximately 350 letters or petitions were received by the BLM in response to the notice. In response to public comments, the BLM issued a Notice of Intent to Prepare an EA and Notice of Public Meeting. The Notice was published in the Federal Register on December 24, 1991, and in the Tallahassee Democrat, Fort Lauderdale News/Sun Sentinel and Palm Beach Post on January 6, 1992. News releases were sent to the Fort Lauderdale News/Sun Sentinel, Palm Beach Post and Miami Herald.

The public scoping meeting was held on January 23, 1992, at the Fort Lauderdale Airport Hilton in Dania, Florida. Approximately 300 people attended the meeting and were invited to comment orally and/or in writing until February 14, 1992.

In response to this notice and public meeting, approximately 312 additional letters were received.

On April 16, 1992, the BLM issued a Notice of Intent to Prepare an EIS in the Federal Register and in the Tallahassee Democrat, Fort Lauderdale News/Sun Sentinel and the Palm Beach Post. News releases were sent to 25 newspapers and 4 television stations. The notice provided for an additional opportunity to comment until May 18, 1992.

In addition to the public notices and news releases issued by BLM, an interested parties list containing approximately 380 individuals and organizations was maintained by BLM, and those individuals or organizations on the list were informed of scoping activities and provided a scoping document. In addition, news releases issued by SWEPI and the Miccosukee Tribe, and media coverage of the proposal and public meeting further informed the public of the scoping process.

SUMMARY

The DEIS was completed on March 8, 1993. The public comment period extended from May 18, 1993 to August 18, 1993. Numerous notices, news releases, and mailed notices to those who participated in the scoping process were issued to advise the public of availability of the DEIS for review and comment. A public hearing and open house was held at the Greater Fort Lauderdale-Broward County Convention Center on April 14, 1993. Fifty-one people provided verbal comments at the hearing. A total of 425 comment letters from individuals, businesses, organizations and government agencies were received by the BLM during the 5 month public comment period.

Significant concerns and issues identified during scoping and DEIS review, in addition to concerns and issues identified by agencies and the interdisciplinary team (IDT), are addressed in detail in this FEIS. Significant issues included:

- 1) Potential impacts to air quality resulting from emissions of process contaminants and/or an oil fire.
- 2) Potential impacts to archeological sites by the well site or access road construction.
- 3) Proper analysis of the economic and/or environmental benefits and environmental risks of developing oil resources in the Everglades ecosystem to determine the feasibility of the project.
- 4) Proper handling and disposal of hazardous material and waste products associated with the project, which may not be directly regulated under the Resource Conservation and Recovery Act of 1976 (RCRA) due to an exemption of certain wastes associated with petroleum exploration and development activities from hazardous waste designation.
- 5) Potential negative and positive impacts to the lifestyle of the Miccosukee Indians.
- 6) Contribution of the proposed project to cumulative environmental impacts to the Everglades ecosystem, which has been adversely impacted by agriculture and urbanization.
- 7) Potential adverse impacts to wildlife, particularly the Florida panther, wood stork, Everglades kite and Everglades mink. Impacts of noise, lights and traffic on fauna.
- 8) Potential impacts to wetlands and native plant communities from well site and access road construction.

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- 9) Potential pollution of groundwater and surface water by well casing leaks, oil spills, spilled brine water, or emissions caused by hurricane or flood damage to rig facilities. Potential impacts to the Biscayne aquifer, WCA-3A and the Everglades National Park (ENP). Contingency plans and bond coverage for such occurrences.
- 10) Potential economic loss if a spill occurs (by reduction in tourism resulting from damage to environment/fishing).
- 11) Cumulative impacts of future actions required for production and/or field development.
- 12) Adequacy of mitigation, monitoring, reclamation, spill response, containment/cleanup plans for the construction and operation of the proposed well.
- 13) Potential effects of the release of hydrogen sulfide (H₂S) gas on wildlife and humans.
- 14) Eliminating the need for the project by utilizing alternative energy sources, developing an energy policy which encourages development of renewable energy resources, and adopting structured energy conservation measures.
- 15) Impacts associated with transportation and increased traffic.
- 16) Relationship of the proposal to State and local laws.
- 17) Safety of technological aspects of the proposal including directional drilling technology and proposed plastic liner under portions of drill site.

Analysis of public and agency comments received during the DEIS review period resulted in the identification of 95 substantive issues. These issues pertain to one of 21 major topics. The major topics and corresponding issues are listed below and discussed in Section 5.1.4 of the FEIS.

Access

- | | |
|---------|---|
| Issue 1 | DEIS does not contain details concerning road construction on berm. |
| Issue 2 | Disagree with acreage of road turnouts. |
| Issue 3 | Recommends more details of Alternative B access road, impact to wetlands. |
| Issue 4 | Highway Department agrees with access from I-75 via Snake Road Interchange. |
| Issue 5 | Questions reasons for FHWA opposition to Alternative C. |

SUMMARY

Affected Environment

Issue 6 DEIS needs to be expanded to include historical Everglades.

Air Quality

Issue 7 DEIS fails to properly evaluate gas flaring procedures, other contaminants and air pollution monitoring.

Alternatives

Issue 8 Improper restriction of No Action Alternative.

Issue 9 DEIS fails to adequately consider alternatives.

Archaeological Resources

Issue 10 Concerns the cultural resource potential of the tree islands.

Issue 11 DEIS adequately addresses state's concerns for archaeological preservation.

Issue 12 Nearby archaeological site should be avoided.

Cumulative Impacts

Issue 13 DEIS fails to evaluate cumulative impacts upon the Everglade ecosystem.

Issue 14 Concerns cumulative impacts, impacts on state land use programs and Everglades restoration plans.

Full Field Development

Issue 15 DEIS fails to consider effects of oil development in area. Contrary to Conner v. Burford.

Issue 16 DEIS does not analyze worst case oil spill.

Issue 17 Requests that agency retain authority to restrict further development based on Sierra Club v. Peterson.

Issue 18 Concerns further drilling and production in Water Conservation Area.

Issue 19 Questions what basis production and field development are not reasonably foreseeable.

Issue 20 DEIS should specify level of analysis for production and/or field development.

Issue 21 DEIS fails to include analysis of oil transport.

Issue 22 DEIS does not consider gain against risk of oil and gas development.

SUMMARY

Issue 23 Concerns that drilling would set a legal precedent.

Hurricane Contingency Plan

Issue 24 Questions adequacy of hurricane contingency plan.

Hydrology

Issue 25 DEIS fail to include analysis of Everglades Restoration Plan.

Issue 26 Data concerning location of Biscayne aquifer is not accurate.

Issue 27 Requests "Sole Source Review".

Issue 28 DEIS does not adequately address wetlands and floodplains under Executive Orders 11990 and 11988.

Issue 29 Concern that the gray limestone aquifer is hydraulically connected to the Biscayne aquifer.

Issue 30 Concerns pertaining to direction of drainage from proposed well site.

Issue 31 Concerns relative to proximity and effects on Biscayne aquifer and Water Conservation Area. DEIS is not based on scientific field studies.

Issue 32 DEIS fails to consider applicability of UIC rules to disposal of drilling fluids.

Issue 33 DEIS does not analyze long term migration of contaminants or monitoring of potential contaminants.

Issue 34 Inadequate evaluation of effects on Floridan and gray limestone aquifer.

Issue 35 Questions adequacy of 4-foot high containment berm.

Issue 36 DEIS fails to analyze spills into canals.

Issue 37 Concerns the lateral migration of contaminated groundwater.

Issue 38 DEIS fails to consider contamination of groundwater due to drilling pressure.

Issue 39 Questions how injected produced water would be prevented from spreading in substrates.

Issue 40 Questions how public would be provided fresh water in case of disaster.

Issue 41 Questions whether Appendix A-6 was included as scientific support for the BLM position.

Issue 42 Concerns that short term use could threaten the Biscayne aquifer.

Jurisdiction

Issue 43 Concerns about the public interest in the proposal.

Issue 44 DEIS does not contain a Coastal Zone Management Act consistency determination.

Issue 45 Claims that the DEIS conflicts with state plans. DEIS should address impact to drinking water and social and economic impacts.

SUMMARY

- Issue 46 States that the South Florida Water Management District Governing Board passed resolution opposing proposal.
- Issue 47 Claims that the state has civil regulatory jurisdiction over the on-reservation drilling activity.
- Issue 48 Concern about right-of-way on levee, berms and canal.
- Issue 49 Proposal has no significant impact on state transportation system and partially satisfies Coastal Zone Management consistency requirements.
- Issue 50 Proposal generally agrees with state's oil and gas development regulations.
- Issue 51 Claims that the water conservation area is state land and not Miccosukee's.

Land Use

- Issue 52 DEIS fails to include discussion of the Florida Executive Order banning development in Water Conservation Areas.

Monitoring and Enforcement

- Issue 53 Recommends adding laboratory analysis of petroleum hydrocarbon to monitoring wells.
- Issue 54 Requests that EPA review plans and monitor disposal of waste by injection.
- Issue 55 Questions adequacy of SPCC plan.
- Issue 56 DEIS does not evaluate financial commitments in case of spill.
- Issue 57 Suggests resistivity and porosity logs be run on open hole conditions before setting casing.
- Issue 58 Questions monitoring of truck speeds, emissions and noise.

NEPA Process

- Issue 59 Requests that decision on proposal be made by the Secretary of the Interior.
- Issue 60 Questions if DEIS provides Federal accountability.
- Issue 61 Questions why EPA was not a Cooperating Agency.
- Issue 62 DEIS does not include a disclosure statement.
- Issue 63 DEIS does not meet NEPA goals of enhancing "quality of the human environment."

Noise

- Issue 64 DEIS does not adequately analyze effect of noise on wildlife.
- Issue 65 DEIS fails to address effect of noise during wading bird breeding periods.

SUMMARY

Socioeconomics

- Issue 66 DEIS fails to address impacts to tourism.
- Issue 67 DEIS fails to address impacts to communities.
- Issue 68 Project is consistent with Department policies to promote economic development in economically distressed areas.

Spills

- Issue 69 Concerns relative to on-site impacts due to leaks before and after exploratory well abandonment.
- Issue 70 Concern that groundwater would be contaminated from previous diesel fuel spill and that water wells would pull fuel into exploratory well.
- Issue 71 Recommends expansion of lined area.
- Issue 72 DEIS fails to show probability of spills and spill record.

Vegetation

- Issue 73 Vegetation report not accurate of true character of area.
- Issue 74 DEIS does not consider vegetation adjacent to Snake Road.

Visual Resources

- Issue 75 DEIS fails to recognize impacts on visual quality and effects on people and wildlife.

Waste Management

- Issue 76 DEIS does not adequately analyze containment, testing, and disposal of wastes.
- Issue 77 Concerns radioactive levels in water and effects on humans and wildlife.
- Issue 78 Questions applicability of offshore surface water discharge standards
- Issue 79 Inconsistent specifications for plastic liner.
- Issue 80 Concerns movement of drill cuttings.
- Issue 81 Insufficient discussion of composition, transport, and storage of drilling fluid components.

SUMMARY

Well Abandonment

- Issue 82 Abandonment of water wells.
Issue 83 Impacts of well and haul road abandonment.
Issue 84 Time limit on exploratory well abandonment.

Wildlife Resources

- Issue 85 Inadequate data on Florida panther telemetry.
Issue 86 DEIS does not evaluate effects of spills on wildlife and habitat.
Issue 87 Inadequate analysis of effects on Florida panther.
Issue 88 Recommends formal Section 7 Consultation and range of Florida panther.
Issue 89 Recommends non-consumptive land use on Reservation because of panther range.
Issue 90 DEIS fails to consider ecological significance of ecotone.
Issue 91 Appendix A-9 fails to address adverse effects on wildlife.
Issue 92 DEIS fails to address impacts of man-made or natural catastrophes on wildlife.
Issue 93 Concerns critical habitat designation for Florida panther. DEIS fails to consider cumulative impacts on panther.
Issue 94 DEIS fails to disclose actual panther activity.
Issue 95 DEIS fails to show importance of area for dispersal of sub-adult panthers.

The DEIS was edited to correct errors and omissions noted in the public and agency comments. The FEIS reflects those changes. The response to many of the comments required clarification or expansion of information provided in the DEIS. The response to some comments required corrections or new information. Significant changes which have been incorporated in the FEIS include the following:

- more comprehensive discussion regarding construction of the proposed access route and alternatives (including the no action alternative) has been added.
- discussion of potential air emissions (including mercury) from gas flaring has been added.
- expansion of the discussion of cumulative impacts.
- the location of the Biscayne aquifer has been corrected to 2.8 miles east of the proposed drill site.

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- a figure depicting the limits of the Biscayne aquifer in Broward County has been added
- a discussion of EPA's determination that the proposed action and alternatives are not subject to the provisions of the Sole Source Aquifer Program is provided.
- updated information regarding the current status of the diesel fuel spill at the S-140 pump station has been added.
- discussion of an updated wetland jurisdictional determination completed by the Corps of Engineers in March, 1994 is included.
- discussion of additional consultation with SFWMD regarding canal right-of-way issues has been included.
- the discussion of Naturally Occurring Radioactive Material has been expanded to include production water sample results from South Florida oil fields.
- a table listing drilling fluid components and the quantities to be used has been added.
- the Florida panther range map has been replaced with a more recent map from the 1994 report entitled Florida Panther Habitat Protection Plan, South Florida Population.

In addition, the following recommended mitigation measures have been added to the FEIS:

- specific procedures for the testing and disposal of drill cuttings, drilling fluids and produced waters could be conducted and reported to BLM.
- fluids disposal program information could be submitted to BLM prior to fluids disposal. BLM could provide the plans monitoring data, and test results to EPA for its information.
- a site specific SPCC plan could be completed and submitted to BLM prior to site operations.
- the drill site liner could be extended to include the 10 ft. by 200 ft. area which connects the drill rig and cutting storage containment area.

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- locking caps could be placed on all water supply and monitoring wells in the event of temporary abandonment.
- testing of monitoring wells for Total Recoverable Petroleum Hydrocarbons could be conducted.

The detailed response to each of the 95 issues can be found in Section 5.1.4 of the FEIS.

S.4 Major Impact Conclusions

Drilling of the proposed SWEPI Miccosukee 3-1 exploratory well would cause short-term disturbance to and displacement of components of the human and natural environments. Potential environmental impacts that could result from implementation of the proposed action or alternatives are detailed in Chapter 4 of the FEIS, with a comparative analysis also included in Chapter 4. Proposed mitigation measures are also presented in Chapter 4. Critical elements of the environment not present or not affected include: wild and scenic rivers; wilderness; farmlands (prime or unique); Areas of Critical Environmental Concern (ACEC); floodplains; and coastal zone management. Summaries of impacts that could occur to elements of the environment are presented in S.4.1 through S.4.13.

S.4.1 Air Quality

Implementation of the proposed action and alternatives would have no significant impact on air quality either in the short or long-term. Impacts on air quality are discussed in greater detail in Sections 3.1 and 4.1.

Possible insignificant impacts could include suspended particulate matter from construction activities, combustion emissions from vehicle traffic and construction machinery, and accidental emissions of pollutants such as H₂S or sulfur dioxide during exploratory drilling or well evaluation and testing activities. No significant impacts would occur, however, with implementation of appropriate prevention and safety measures.

S.4.2 Cultural Resources

No significant impacts to cultural resources are expected to occur from implementation of the proposed action and alternatives. Three archeological sites are known to exist within one mile of the well site. All three areas are located on tree islands (hammocks), as are most archeological sites in the area. All tree islands in the area are avoided by the proposed action and alternatives. If any evidence of

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archeological artifacts or activity is encountered during site construction, all work would cease and the State Division of Historical Resources (DHR) would be notified. Impacts to cultural resources are discussed in detail in Sections 3.3.2 and 4.3.2.

S.4.3 Geology and Soils

No significant impacts on the geologic environment are expected. Geologic hazards (earthquakes, sinkholes) are not likely to impact the proposed project. The location of the proposed well is important to obtaining adequate information about the target geologic structure to assess potential hydrocarbons. Soil impacts would primarily relate to removal and stockpiling of soil and placing fill material over a five-acre area for well site construction. Additional fill areas for access road construction would amount to 0.4 acres for the proposed access route, and 3.0 acres for the West Access Route. The East Access Route would require placement of piles in the bottom of the L-28 Canal to support a vehicular bridge. Upon project completion, the fill areas would be reclaimed to predisturbance conditions or left in place if desired by the Miccosukee Tribe. No significant impacts to soils are expected to occur from implementation of the proposed action and alternatives. Impacts on the geologic and soils environments are discussed in detail in Sections 3.3.3. and 4.3.3.

S.4.4 Health and Safety

No significant impacts from H₂S exposure or the increase in vehicular traffic are expected, provided that best management precautions, applicable mitigation measures, and requirements of Onshore Oil and Gas Operations regulations (43 CFR, Part 3160) and related guidelines are followed. Impacts to health and safety are described in detail in Section 4.3.4 and in Appendix A-3.

S.4.5 Noise

Significant impacts from noise produced by the proposed action and alternatives are not expected to occur. Since residences are not in the area, noise impacts to humans (other than site workers) are not a concern. Short-term noise would be generated by construction and drilling equipment. Noise levels would be in the range of 80 decibels (dB) near the source and < 50 dB at a distance of 800 feet from the source. Some wildlife may be disturbed by the noise, but it should be noted that I-75 and the S-140 pump station are located only 1,000 feet from the drill site. Noise measurements for these facilities are not available, but the types and levels of noises generated by these facilities are expected to be similar to those emitted from the project. Noise impacts would be limited to the duration of the project. The impacts associated with noise are discussed in detail in Sections 3.3.5 and 4.3.5.

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S.4.6 Socioeconomics

No significant negative socioeconomic impacts would result from implementation of the proposed action and alternatives. Positive socioeconomic impacts could be realized by the Miccosukee Tribe through the collection of lease fees and subsequent improvement of Tribal programs. Socioeconomic impacts are discussed in detail in Sections 3.3.6 and 4.3.6.

S.4.7 Transportation

Significant impacts to transportation are not expected. Impacts to the existing transportation network in the vicinity of the proposed project would be limited to a temporary increase in vehicle traffic. Because project traffic is anticipated to be only 10 to 25 vehicles per day (VPD), significant increases in traffic volumes would not occur. I-75 and Snake Road are considered lightly traveled relative to their designed level of service (LOS). Truck weights and sizes would be confined to limitations established by FDOT. Impacts to transportation are described in more detail in Sections 3.3.7 and 4.3.7.

S.4.8 Vegetation

Significant impacts to vegetation are not anticipated. The clearing of vegetation, the disturbance of soils, and the deposition of fill during construction of the five-acre drill site and access road alternatives would directly impact the specific site vegetation. The reduction of areal cover of the affected vegetative community types would be a negligible impact since the communities have a widespread distribution and occur with high frequency within the project area. Vegetation impacts would for the most part be confined to five to eight acres of improved pasture areas. The exception is the impact to 0.25 acres of marsh that would result from access Alternative B. Areas disturbed by construction would be reclaimed to support the preconstruction vegetation or left as fill areas if desired by the Miccosukee Tribe for other purposes. Impacts on vegetation are described in more detail in Sections 3.3.8 and 4.3.8.

S.4.9 Visual Resources

The short-term impacts associated with the construction of the drill site and erection of the drill rig at the drill site would be considered insignificant by most viewers due to the limited viewpoint of the project site from I-75 and the existence of other obstructions including billboards and microwave towers.

The construction and use of access roads would produce additional minor impacts to the visual resource. The impact of the proposed action would not be considered significant due to existing conditions and the

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temporary nature of the project. Impacts to visual resources are described in detail in Sections 3.3.9 and 4.3.9.

S.4.10 Waste Management

The Plan of Operations for the proposed well extensively outlines the management and containment of generated wastes. Produced wastes would include stormwater runoff, drilling muds, drill cuttings, brine water, oil and solvents, solid waste, and domestic waste. If the well is successful (hydrocarbons are discovered), oil spills or oil/brine spills are additional potential wastes. Proper management and disposal of wastes would minimize the risk of environmental contamination by wastes associated with the proposed action. An accident or catastrophic occurrence could disperse wastes, resulting in impacts to the surrounding area. The SWEPI Spill Prevention, Control and Countermeasure Plan (SPCC) (Appendix A-10) would be implemented to minimize the impacts. Impacts related to waste management are discussed in detail in Sections 3.3.10 and 4.3.10.

S.4.11 Water Resources

No significant impact to water resources is expected. Construction and operation of the proposed access road or Alternative B access road could contribute to minor increased sediment input to canals which parallel its route. The potential exists for contamination of surface water by spilled fuels, lubricants, hydraulic fluids, and oil which may be obtained during production testing. Local freshwater aquifers may be contaminated by leakage of drilling fluids or produced oil and by mixing of groundwater between aquifers. The implementation of SWEPI's proposed construction and operational safeguards, best management practices, and the requirements of Onshore Oil and Gas Operations regulations (43 CFR, Part 3160) and related guidelines would greatly reduce the probability of these conditions from occurring.

Important potable groundwater sources such as the Biscayne aquifer, and sensitive surface waterbodies (WCA-3A), are sufficiently protected by distance and/or physical barriers to potential contaminant migration so as to be unaffected by the proposed drilling.

Water use at the site would be approximately 7,500 gallons per day obtained from two shallow on-site wells. Impacts to water resources are discussed in detail in Sections 3.3.11 and 4.3.11.

S.4.12 Wetlands

Significant wetland impacts resulting from the proposed action and alternatives are not expected to occur. The well site and proposed access route would not impact wetlands. The West Access Route (Alternative

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B) would require placement of fill in 0.25 acres of marsh. The East Access Route (Alternative C) would require placement of a vehicular bridge and associated pilings across the L-28 Canal. Wetland impacts are discussed in detail in Sections 3.3.12 and 4.3.12.

S.4.13 Wildlife

Significant direct impacts to wildlife in general are not anticipated for the proposed action and alternatives. Well construction would occur within only five acres of existing disturbed area (pasture). The well site does not support significant populations or taxa of wildlife. Important habitat areas (willow heads, marsh, cypress heads, and hammocks) are avoided by the proposed action and Alternative C. The West Access Route (Alternative B) would impact 0.25 acre of marsh habitat and approximately three acres of pasture area.

Negative impacts to threatened or endangered wildlife species are not anticipated for the proposed action and alternatives. An alligator nest has been known to occur along the west side of the L-28 Canal approximately one mile north of the well site. The nest was utilized in 1989 and 1990 but did not occur in 1991, 1992, or 1993. Construction of the proposed access road would not likely affect the nest area unless activity occurs during critical nesting phases, including nest building and egg laying. Other Federal-listed species that exist in the region but are not known to or expected to utilize the site of the proposed action and alternatives for foraging and/or nesting. These include the Florida panther, Florida black bear, Florida Everglades mink, Everglades snail kite, bald eagle, Eastern indigo snake, Audubon's crested caracara, wood stork, and Southeastern American kestrel. Wildlife impacts are discussed in detail in Sections 3.3.13 and 4.3.13.

S.5 Mitigation and Monitoring

Mitigation measures and monitoring requirements have been identified through the analysis of potential impacts in Chapter 4. These measures and requirements are summarized in Section 4.4. The measures and requirements describe how construction, drilling operations, and reclamation should be managed to assure compliance with the applicable resource limitations identified during the interdisciplinary analysis.

S.6 Agency Preferred Alternative

Alternative B (West Access Route) is the Agency Preferred Alternative.

The BLM authorized officer is authorized and directed to require compliance with lease agreement terms, regulations under 43 CFR and all other applicable regulations; and to require that all lease operations be

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conducted in a manner which protects natural resources, environmental quality, life and property. It is the opinion of the BLM, in consultation with BIA, that the analysis presented in this FEIS shows that Alternative A, the Proposed Action, as well as Alternatives B and C, with recommended mitigation, comply with the terms of the lease agreement and all applicable regulations, and assures protection of natural resources, environmental quality, life and property. Hence, the No Action Alternative is not warranted.

The DEIS identified Alternative A as the Preferred Alternative. However, Alternative B was identified as a second choice, if jurisdictional conflicts relating to access along the berm road west of the L-28 Canal prohibit selection of Alternative A. Following completion of the DEIS, additional consultation was initiated with the SFWMD and the Miccosukee Tribe concerning this issue. This jurisdictional conflict, documented by letters found in Appendix A-12, can be summarized as follows:

The SFWMD asserts a right-of-way for the L-28 component of the Central and Southern Florida Flood Control Project. On May 13, 1993, the Governing Board of the SFWMD adopted Resolution 93-18 opposing the construction of exploratory wells in, adjacent to, or under any Water Conservation Area (WCA) within the Everglades. The Resolution states that the Governing Board is against the use of District's property for the access or transportation facilities that may be required. By letter dated February 18, 1994, SFWMD claims authority to require SWEPI to apply for a permit to utilize any portion of the asserted L-28 right-of-way.

The Miccosukee Tribe disputes the SFWMD position. The Tribe maintains that neither the Tribe nor any of its lessees, including SWEPI, need to obtain a permit from SFWMD for use of the western berm road, as proposed by SWEPI (Alternative A). The Tribe's position is documented in a letter from the law firm Hobbs, Straus, Dean & Wilder dated March 24, 1994.

Based on the conflicting positions of the SFWMD and the Miccosukee Tribe, a jurisdictional conflict exists between two governmental entities concerning the access route under Alternative A. This conflict cannot be resolved through the NEPA process.

The Tribe recommends that the BLM and BIA consider Alternative B (West Access Route) as the Preferred Alternative since this route provides an acceptable route without any jurisdictional conflict.

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Alternative B considers construction of the West Access Road from Snake Road to the well site. Since Alternative B requires construction of a new access road, the DEIS noted that impacts associated with this alternative would be greater than impacts associated with Alternatives A and C. However, the impacts associated with Alternative B were not found to be significant.

The Agencies' selection of this alternative would be subject to the following conditions:

- (a) If a discovery of commercial quantities of hydrocarbons is made, further exploration, production and development in the area of the well would not be considered until an EIS of field development has been completed. In this event, the applicant would be required to submit a conceptual field development plan to the BLM. The conceptual field development plan must describe the extent, location, duration and timing of additional wells and other facilities.
- (b) All mitigation measures and monitoring requirements identified in Chapter 4 would be required.
- (c) SWEPI would provide a road design plan to BLM prior to construction.

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4.3.14 No Action Alternative

No Action would mean the proposed action and alternatives would be denied, resulting in a denial of the APD.

Under this alternative the project area would not be impacted by the proposed action or alternatives considered in this FEIS and would continue to exist as described in Chapter 3. However, should this alternative be selected, several economic impacts could result.

A negative economic impact could be felt on the Miccosukee Reservation as the site would not be explored to determine the potential for hydrocarbons. In this regard the Tribe would not realize revenue from development of the oil and gas lease, or be able to evaluate the potential for future revenue from available hydrocarbons, which could provide economic assistance to existing and future programs and services throughout the Reservation. Furthermore, jobs for some Miccosukees would also not be realized. Given the Miccosukee Tribe unemployment rate of 35 percent, any jobs created by the project would be beneficial in terms of improving employment.

4.3.15 Unavoidable Adverse Impacts

Unavoidable adverse impacts are significant impacts that are unavoidable and cannot be mitigated and, therefore, would remain throughout the duration of the project to some point beyond.

No unavoidable significant adverse impacts would be expected to occur as a result of implementation of the proposed action or alternatives. Impacts that would occur would be insignificant because of their short-term nature and/or their low magnitude of disturbance to the human or natural environment.

Disturbance of the drill site and access route soils and vegetation by fill placement would be temporary, culminating with reclamation upon completion of the proposed action. However, if the Miccosukee Tribe determined that the fill would remain in place, the impact, although minor, would extend beyond the completion of the proposed drill action. The impacts would include five acres of fill within a pasture for the proposed action; three acres of fill within a pasture including 0.25 acres of fill within wetland areas for Access Route B; and a piling supported concrete bridge across the L-28 Canal for Access Route C.

4.3.16 Cumulative Impacts

Cumulative impacts are impacts likely to occur due to the proposed action or alternatives in combination with other past, present and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. For example,

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cutting one acre of a 5,000-acre forest to create a homesite may be an insignificant impact. If the remaining forest has been divided into similar one acre homesites, the cumulative impact of clearing all lots would be great. Four factors are considered in the assessment of cumulative impacts:

- Impacts Which Would Occur as a Result of the Proposed Action,
- Geographic Boundaries of the Impacts,
- Impacts That Have Occurred as a Result of Past Actions, and
- Potential Impacts of Reasonably Foreseeable Future Actions.

Impacts Which Would Occur as a Result of the Proposed Action.

The analysis conducted for the FEIS has resulted in a determination that no significant impacts would occur to the environment as a result of the proposed action or alternatives. Construction and operation of the proposed project or alternatives is not expected to cause significant cumulative impacts to air, cultural, geologic, aesthetic, socioeconomic, transportation, vegetation, water, wetlands, or wildlife resources within the project area. More importantly, in terms of cumulative impact assessment, the minor impacts associated with the proposed action are mostly short-term in nature, lasting 325 days or less. The drill site and access road may not be restored if the Miccosukee Tribe requests that these features remain in place, resulting in the permanent impact of five acres of fill area within the pasture for the drill site; three acres of fill within the pasture including 0.25 acres of fill within wetland areas for Access Route B; and a piling supported concrete bridge across the L-28 Canal for Access Route C.

Geographic Boundaries of the Impacts

In order to evaluate the cumulative impacts of an action, geographic boundaries must be established. Physical boundaries such as watersheds, biological boundaries such as habitats, socioeconomic boundaries such as market areas or regions, and political boundaries such as counties may be appropriate for setting analytical parameters, depending on the specific values affected. For each resource an outer boundary can be determined beyond which the impacts of the proposed action are not extended. In considering the proposed action and alternatives, the geographic boundary of the area of impact ranges from the five-acre drill site to several miles as in the case of visual impacts. The area of impact to soils, vegetation, and wetlands is expected to be limited to the five-acre drill site and access road and areas immediately adjacent to these facilities. The area of impact to air quality, water resources and wildlife may extend several hundred feet from the drill site and access road. The boundary of impacts to transportation,

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noise, and visual resources ranges from several thousand feet to several miles. The area of impact for most resources is the site vicinity discussed and depicted on maps in the FEIS.

Impacts That Have Occurred as a Result of Past Actions

Past actions within the established geographic boundaries for resource evaluation have resulted in impacts to the environment. It is not possible or necessary to quantify and qualify the conditions of the entire Everglades Ecosystem prior to the first impacts of man and identify each subsequent action and its impacts. The region of the proposed action (the Everglades ecosystem) has been significantly altered by water management and land development activities over the past 100 years. These activities have resulted in a well documented general decline in water quality and wildlife resources. Within the geographic boundaries of the area that could be impacted by the proposed action and alternatives, construction of WCA-3A, L-28, and the S-140 pump station have resulted in a hydrological regime in the project area conducive to maintaining a large area of pasture between WCA-3A and the Big Cypress Swamp. The area has been further altered by construction of I-75 and Snake Road. Presently, the main activities on the Miccosukee Reservation are limited to hunting, fishing, and cattle grazing. Facilities in the area that could be impacted by the proposed action and alternatives are limited to three microwave towers, the Miccosukee Service Plaza, billboards, ditches, pasture areas, fencing, primitive roads, the S-140 pump station, public roads, electrical transmission poles and lines.

Potential Impacts of Reasonably Foreseeable Future Actions

Impacts that may accumulate from other reasonably foreseeable actions in the geographic boundaries of consideration must also be considered in the evaluation of cumulative impacts. The FEIS establishes that the proposed action is not likely to lead to future actions (reasonably foreseeable actions) that result as part of the proposed action. The Miccosukee Tribe's future land use plan is general and does not detail reasonably foreseeable development plans for the Reservation. Specific Everglades restoration plans which could potentially impact the Reservation are not in existence at this time.

Conclusion

In considering the four factors, the proposed action and alternatives would be expected to result in short-term and/or insignificant impacts, confined primarily to the immediate project area. The impacts associated with the project will not contribute significantly to past or present impacts within the affected area, and the proposed action and alternatives would not be likely to lead to future actions (reasonably foreseeable actions). Therefore, the project would not be expected to result in significant cumulative impacts.

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4.3.17 Comparative Analysis of Proposed Action and Alternatives

The access routes are the only variable in the proposed action and alternatives.

The proposed access route (Alternative A) requires vehicles to travel approximately 11 miles from the intersection of L-28 and I-75 to reach the well site located only 1,000 feet away. This route requires placement of fill on 0.4 acres of pasture in order to construct vehicle turnouts. The public interchange at I-75 and Snake Road would be utilized. Project traffic would travel over five and one-half miles of remote area on existing berm roads adjacent to canals.

The West Access Route (Alternative B) requires vehicles to travel approximately 3.2 miles from the L-28/I-75 intersection to reach the drill site. This route would require fill placement on three acres including 0.25 acre of wetlands in order to create a new access route. The new route would extend from the Miccosukee Service Plaza east to the drill site, passing closely to hammocks, a cypress head, and marshes. Construction of this route may interrupt the natural sheetflow of runoff even if culverts are placed through the road section at close intervals.

The East Access Route (Alternative C) provides direct access to the site from the intersection of I-75 and L-28. Construction of a new bridge over the manmade L-28 Canal would have minimal impacts. This Alternative would not require the use of the Snake Road/I-75 interchange or Snake Road. The existing access from I-75 to the S-140 pump station appears adequate to support project traffic without disrupting I-75 traffic or access to the pump station by SFWMD personnel.

None of the alternatives would result in significant environmental impacts. The West Access Route is the least desirable in terms of impacts to habitats and surface water flow because it requires a new road. The East Access Route (Alternative C) is the most direct to the well sites limiting the effects of the proposed activity to the immediate well site area. Potential prohibitions to the use of Alternative C and the proposed access route are more related to agency policies than environmental impacts. FDOT and FHWA limits use of nonpublic access points from I-75. FHWA is opposed to the east access alternative if other alternatives are practicable, and SFWMD may have authority over activities in the vicinity of the L-28 Canal, the site of the proposed access route and the bridge required in Access Route C. A binding position from these agencies cannot be obtained without a formal proposal.

A summary of the impacts of the proposed action and each access alternative is presented in Table 4-2.

TABLE 4-2 IMPACT SUMMARY OF PROPOSED ACTION & ALTERNATIVES						
	ALTERNATIVE A					C
	DRILL SITE CONSTRUCTION	EXPLORATORY DRILLING	WELL TESTING	ABANDONMENT & RECLAMATION	PROPOSED ACCESS ROUTE	WEST ACCESS ROUTE
AIR RESOURCES	Minor impacts from fugitive dust and vehicle emissions	Minor impact from drill rig engine emissions	Minor impacts from pump engine emissions and process emissions	Minor impacts from fugitive dust and vehicle emissions	Minor impacts from fugitive dust and vehicle emissions along 5.5 miles	Minor impacts from fugitive dust and vehicle emissions along 1.6 miles
CULTURAL RESOURCES	No impact	No impact	No impact	No impact	No impact	No impact
GEOLOGY/SOILS	Disturbance of soil profile by 5 acres of fill area	No impact	No impact	No impact	Disturbance of soil profile by 0.4 acre of fill area for vehicle pullouts	Disturbance of soil profile for 3 acres of fill area
HEALTH & SAFETY	Minor risk of contaminant release or equipment accident	Minor risk of contaminant release or equipment accident	Minor risk of contaminant release or equipment accident	Minor risk of contaminant release or equipment accident	Minor risk of contaminant release or equipment accident	Minor risk of contaminant release or equipment accident
NOISE	Minor impact by vehicles and equipment	Minor impact by drill rig motors	Minor impact by equipment	Minor impact by vehicles and equipment	Minor impact by vehicles along 5.5 mile route	Minor impact by vehicles along 1.6 mile route
SOCIOECONOMIC	Economic benefits to Micosaukee Tribe through lease fees for exploration	Economic benefits to Micosaukee Tribe through lease fees for exploration	Economic benefits to Micosaukee Tribe through lease fees for exploration	Economic benefits to Micosaukee Tribe through lease fees for exploration	Economic benefits to Micosaukee Tribe through lease fees for exploration	Economic benefits to Micosaukee Tribe through lease fees for exploration
TRANSPORTATION	Increase of traffic by 10 to 25 VPD by vehicles accessing drill site	Increase of traffic by 10 to 25 VPD by vehicles accessing drill site	Increase of traffic by 10 to 25 VPD by vehicles accessing drill site	Increase of traffic by 10 to 25 VPD by vehicles accessing drill site	Minor traffic increases along I-75 and Snake Road	Minor traffic impacts on I-75 and Snake Road interchange
VEGETATION	Filling of 5 acres pasture	No impact	No impact	No impact	Filling of 0.4 acre of pasture for turnouts	Filling of .25 acre -marsh; 2.8 acres - pasture
						No impact

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TABLE 4-2
IMPACT SUMMARY OF PROPOSED ACTION & ALTERNATIVES

	ALTERNATIVE A						B		C	
	DRILL SITE CONSTRUCTION	EXPLORATORY DRILLING	WELL TESTING	ABANDONMENT & RECLAMATION	PROPOSED ACCESS ROUTE	WEST ACCESS ROUTE	EAST ACCESS ROUTE			
VISUAL RESOURCES	Visible from I-75	Visible From I-75	Visible from I-75	Visible from I-75	Visible from I-75 only near well site	Visible from I-75 for 1.6 miles	Visible from I-75 only at well site			
WASTE MANAGEMENT	No impact, minor risk of waste spill	No Impact, minor risk of waste spill	No impact, minor risk of waste spill	No impact, minor risk of waste spill	No impact, minor risk of waste spill	No impact, minor risk of waste spill	No impact, minor risk of waste spill			
WATER RESOURCES	Accidental contaminant release could effect water quality	Accidental contaminant release could effect water quality	Accidental contaminant release could effect water quality	Accidental contaminant release could effect water quality	Accidental contaminant release could effect water quality, runs adjacent to canals for 5.5 miles	Accidental contaminant release could effect water quality, new barrier to NE-SW sheetflow	Accidental contaminant release could effect water quality, crosses L-28 Canal directly to site			
WETLANDS	No impact	No impact	No impact	No impact	No impact	.25 acre wetland fill	No impact			
WILDLIFE	Minor disturbances from humans and noise	Minor disturbances from humans and noise	Minor disturbances from humans and noise	Minor disturbances from humans and noise	Crosses through 5.5 miles of remote area, passes a known alligator nest	Crosses 1.6 miles of pasture adjacent to hammocks, wetlands	Disturbance limited to vicinity of well site			
CUMULATIVE IMPACTS	5 acres of additional fill area if not reclaimed	No impact	No impact	No impact	0.4 acre of additional fill area if not reclaimed	3 acres of fill area including .25 acre of wetland fill if not reclaimed	New bridge over L-28 near I-75			

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4.3.18 Potential Conflicts Between Proposed Action/Alternatives and Plans, Policies and/or Controls

The proposed access route may be within an O&M easement held by SFWMD. The SFWMD asserts that it has the authority to require SWEPI to obtain a permit to use the proposed access route. The Miccosukee Tribe disputes this assertion. There are no potential conflicts between the proposed drill site or Alternative B access route and plans, policies, and/or controls applicable to the site activity. Alternative C would require use of a nonpublic access from I-75. The policies of FDOT and FHWA regarding the particular access proposal appear to be dependent upon the practicability of access alternatives which utilize existing public access from I-75 (see correspondence with FDOT and FHWA, Appendix A-12).

4.3.19 Irreversible and Irrecoverable Commitment of Resources

The term "irreversible commitment of resources" describes the loss of future options. This primarily applies to the effects of using non-renewable resources (e.g., minerals or cultural resources) or to processes or factors (e.g., soil productivity) that are renewable only over long periods of time. The term "irrecoverable commitment of resources" refers to the loss of production, harvest, or use of natural resources. For example, some or all of the timber production from an area is irretrievably lost while an area serves as a agricultural field. The production lost is irretrievable, but the action is not irreversible; if use changes, timber production could resume. The proposed action or alternatives would result in the irretrievable loss of five to eight acres of pasture and 0.25 acres of wetlands that would be converted to well pad and access road. The loss may be temporary, as pasture could be reestablished on the sites upon the completion of the drilling, testing and evaluation. The proposed action or alternatives would not result in any irreversible commitment of resources.

4.3.20 Long-Term Productivity Versus Short-Term Use of Resources

This discussion applies to the proposed action and alternatives and not to field development. Field development is discussed in Appendix A-1. As discussed under each resource element in this chapter, the impacts associated with implementing the proposed action or access alternatives would be short-term impacts. No important irreversible commitment of resources would occur. Any irretrievable commitment would be short-term and reversible. Therefore, the short-term use of resources (i.e., impacts) would not compromise the long-term productivity of the project area.

4.3.21 Energy and Natural Resource Requirements and Conservation Potential

Energy required for this project is limited to fuels required to power equipment and vehicles. Due to the limited duration of the project (325 days total including site preparation and reclamation), the

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requirements for energy are short-term. Natural resource requirements are limited to water use of approximately 7,500 gallons per day for the duration of the project. Site runoff is being circulated into the drilling system as a disposal method which would have the added benefit of water conservation.

4.4 Mitigation Summary and Monitoring

The mitigation and monitoring measures presented in Sections 4.4.1 through 4.4.13 are derived from the analysis of each element in this FEIS and could be included as Conditions of Approval for the SWEPI APD to ensure SWEPI's commitment to prevention of and in response to potential impacts of the proposed action and alternatives.

Specifically, these measures describe how the drilling operations could be managed consistent with the APD, applicable lease conditions, and with applicable Federal and/or State regulations. These measures meet or exceed the applicable monitoring stipulations of the Minerals Management Plan for the Big Cypress Preserve (U.S. Department of the Interior [USDI], 1991).

The BLM Standard Conditions of Approval for Permit to Drill would apply. These conditions are presented in Appendix A-13.

In addition to monitoring and reporting by SWEPI, the BLM compliance staff would inspect the activity for compliance with the drilling permit. The operation would be monitored by BLM through required daily drilling reports and would be subject to inspection at any time during the operation. BLM compliance staff are available 24 hours a day for inspections and emergencies. At a minimum, the following inspections would be conducted:

- The BLM inspectors would meet with Miccosukee Tribal, BIA and SWEPI personnel after site construction and prior to drilling operations to review the location construction for compliance with the approved plan.
- An initial detailed drilling inspection. Witnessing of the cementing of the surface casing and witnessing test of blowout preventer and associated equipment.
- Detailed drilling inspection.
- Detailed drilling inspection and inspection of H₂S equipment.
- Plugging inspection (if dry hole).

ENVIRONMENTAL CONSEQUENCES

- Monitor reclamation work.

4.4.1 Air Quality

To assure that air emissions related to the proposed action are kept to a minimum, the following measures could be implemented:

- Burning of vegetation, construction debris or site-produced wastes would not be allowed.
- Roads would be watered as needed to minimize release of dust and suspended particles from road traffic and construction activities.
- Necessary precautions would be taken to prevent and suppress wildfires. Fire prevention and suppression equipment would be provided on site.

4.4.2 Cultural Resources

The proposed drill site was subject to an archeological survey in February, 1990. The proposed access route and Alternative C, the East Access Route, would utilize existing filled roads. Alternative B, the West Access Route, would require a new road in an area unimpacted by construction. Accordingly, an archeological site survey could be conducted on the West Access Route prior to construction. If SWEPI were to encounter any evidence of archeological artifacts or activity during drill site and access road construction, all work could cease and the Miccosukee Tribe, BLM, BIA and the DHR could be notified.

4.4.3 Geology/Soils

Filled shoulders of the access road and topsoil stockpile areas could be seeded with an appropriate grass seed mixture. Straw mulching using only certified weed-free straw could be completed to protect the seed bed.

Site reclamation could be monitored to assure that the soil profile and site topography is properly reestablished. If the fill areas were left in place at the request of the Miccosukee Tribe, proper stabilization of fill by vegetation could be accomplished and documented. Soil stockpiled during drill site construction could be stabilized to prevent erosion.

CHAPTER FOUR

4.4.4 Health and Safety

In order to decrease the risk of accident resulting from vehicle traffic associated with the proposed action, warning signs could be placed at strategic locations along Snake Road (for the proposed action and Alternative B) or along I-75 (for Alternative C) to alert road users of the project traffic activities. Access routes could be properly signed to indicate maximum speed, turnouts, curves, etc. (as approved by FDOT or the Miccosukee Tribe as appropriate).

Health and safety training of SWEPI employees and contractors on-site could include learning the signs of heat emergencies and first aid measures.

4.4.5 Noise

Mitigation measures for noise abatement would not be required due to the nature and location of the proposed action in relationship to existing sources of noise.

4.4.6 Socioeconomic

The proposed action would not have any adverse social impacts. The SWEPI lease provides for positive economic benefits to the Miccosukee Tribe. Mitigation measures would not be required.

4.4.7 Transportation

Several mitigation measures could be undertaken to minimize the short-term impacts of traffic from the proposed action including: the posting of warning signs to alert other drivers of increased vehicle activity (i.e., trucks entering and exiting highway, trucks turning, etc.); temporarily reducing vehicle speed limits within one mile in each direction along Snake Road; use of escort vehicles for permit loads during construction and dismantling activities; utilization of a single lane for truck traffic associated with the proposed action on a specified portion of I-75 to minimize driver discomfort and accident probability; and installation of a cattle guard and gate at the entrance of the proposed access route from Snake Road to assist the flow of vehicles entering and leaving that access route.

4.4.8 Vegetation

Mitigation measures that would minimize impacts to vegetation include the following actions: SWEPI could provide a qualified inspector on site during all construction activities to ensure construction compliance with approved road and drill site design plans; any new access roads could be designed to conform in general with BLM Road Standards (BLM Manual Section 9113); all vehicles could be

ENVIRONMENTAL CONSEQUENCES

restricted to existing roads, and roads constructed as part of the proposed action or alternatives; reclaimed areas could be monitored for success in terms of reduced erosion and revegetation in accordance with BLM and BIA requirements and the project reclamation plan; the location of vehicle turnouts required for the proposed access route could be inspected by a qualified biologist to assure that State-listed plant species are avoided; wetland impacts that would occur as a result of construction of the West Access Route could be mitigated in accordance with criteria established by the COE.

4.4.9 Visual Resources

Several measures could be undertaken to mitigate visual impacts. Watering of unpaved access roads during dry periods could minimize the visual impact of truck-created dust plumes. The visual appearance of the rig and drill site could be maintained in a clean and orderly manner.

4.4.10 Waste Management

Analysis of the proposed liner system (12 mils thickness) indicated that increasing the thickness to a minimum of 20 mils would provide a significant increase in protection of the groundwater. Additional specifications are also prescribed to assure that the proposed drill rig containment area and cuttings storage area liners perform their intended function of fluid containment. Therefore, the following measures could be required.

General Requirements for Liner Materials:

- Polymer type: not specified, subject to conformance with the other requirements;
- Oil-resistant (hydrocarbon-resistant) properties;
- Minimum thickness 20 mils;
- Ultraviolet-resistant properties;
- One piece with manufacturer's seams certified; documentation showing licensing or other endorsement of installer/fabricator, including qualifications of personnel, and specific experience of on-site superintendent or fabrication superintendent;
- Any field seams would be nondestructively tested and certified by third party; QA test procedures shall be directly observable and/or quantifiable (e.g., vacuum testing or air pressure [HDPE,

CHAPTER FOUR

double wedge] testing); QA consistent with the requirements of FDER Rule 17-701 FAC, Section 17-701.400(7).

Configuration and Cover Requirements

- Liners could be provided continuously throughout the drill rig and cutting storage containment areas (including the 10 ft x 200 ft connecting area), extending at least to the top of the perimeter containment berms, and anchored in accordance with industry standards in a continuous anchor trench, either at the top of the berm, or at the base of the outside of the berm;
- A protective cover layer, at least three-inches in thickness, could be required above all liner materials, consisting of soils that would provide suitable trafficability under all expected weather conditions for vehicular and pedestrian traffic; and
- A cushion layer, above the liner and below the protective cover layer, could consist of a non-woven, needlepunched geotextile, with minimum mass per unit area of 10 ounces per square yard.

SPCC Plan

A site specific SPCC Plan could be submitted to BLM prior to commencement of site operations.

Waste Injection

In order to ensure that the waste disposal activities do not endanger any underground source of drinking water, plans for the injection of waste drilling fluids and excess stormwater into the "boulder zone" could be developed and submitted to BLM prior to the initiation of any disposal operations. BLM could provide the information to EPA.

During disposal activities, SWEPI could provide an activity summary of the disposal operations together with supporting documentation which should include well logs for the shallow portion of the hole, geologic formation tops for the well, if available, well log calculations of the shallow hole to the lowermost source of drinking water, chart recorder of pressures tests documenting cement shoe casing protection of the lowermost underground source of drinking water, pump pressure logs of disposal activities to document that test pressures do not exceed the fracture gradient at the 20-inch casing cement shoe, copies of daily reports for disposal activity, chart recorder of pump pressures for disposal activity, copy of well log and completion report affidavit, and a copy of the plugging affidavit, if appropriate.

ENVIRONMENTAL CONSEQUENCES

The following measures could be implemented to assure that drilling fluids, produced water and drill cuttings are properly analyzed and disposed of in an appropriate manner:

Testing of Drilling Wastes

Prior to disposal, representative samples of the cuttings, drilling fluids, and produced waters would be collected for laboratory analysis. The composite samples collected would be analyzed in accordance with EPA test methods established in the EPA SW 846 Manual (EPA, September, 1986). Samples would be tested for the following metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Drill cuttings would be tested for total metals. If the totals analysis for drill cuttings exceeds maximum allowable concentrations, the TCLP would also be completed. Drilling fluids and produced waters would be tested using the TCLP. In addition, EPA method 8015 (modified) would be used to test for TRPH. The maximum allowable concentrations for the metals would be consistent with the RCRA Hazardous Waste/Criteria, and for State of Florida Clean Soil Criteria, identified in the table below. FAC Rule 17-775.400 does not apply to the proposed action. It is used as a guideline to establish a reasonable threshold since Federal clean soil criteria regulations do not exist at this time.

MAXIMUM ALLOWABLE CONCENTRATIONS

<u>COMPOUNDS</u>	<u>TCLP¹</u> <u>(mg/l)</u>	<u>Total²</u> <u>(mg/kg)</u>
Arsenic	5.0	10
Barium	100.0	4940
Cadmium	1.0	37
Chromium	5.0	50
Lead	5.0	108
Mercury	0.2	23
Selenium	1.0	389
Silver	5.0	353

¹ 40 CFR, Part 261.24, Table 1 and FAC Rule 17-775.400

² FAC Rule 17-775.400

The maximum TRPH concentration for drill cuttings would be ten mg/kg. This threshold is consistent with the criteria of FAC Rule 17-775.400, Criteria for Clean Soil.

CHAPTER FOUR

The maximum TRPH concentration for drilling fluids and produced waters would be five mg/l. This threshold is consistent with the criteria of FAC Rule 17-770, Petroleum Contamination Site Cleanup Criteria. This regulation does not apply to the proposed action and is used only as a guideline to establish a reasonable threshold.

In addition, drill cutting samples would be tested for soluble salts and cationic distributions. Limits for soluble salts and cationic distributions in drill cuttings would be as follows:

- (a) Electrical conductivity (EC-solution phase); < 4 mmhos/cm
- (b) Sodium adsorption ratio (SAR-solution phase): < 12
- (c) Exchangeable sodium percentage (ESP-solid phase): < 15%

The soluble salts and cationic distributions thresholds are consistent with Louisiana regulations for nonhazardous oil field wastes (LAC Title 43: Part XIX). The Louisiana standards are used to establish acceptable maximum concentrations since no Federal or state (Florida) criteria exists. Drilling fluids and produced water would be tested for total chlorides. Limits for chlorides in drilling fluid and produced water would be 20,000 ppm.

Radioactivity Testing

The drill cuttings and drilling fluids would also be tested for NORM. Drill cuttings and drilling fluids would be tested for radium-226 and 228 by gamma spectroscopy. If levels do not exceed five pCi/gram for each, above background, the drill cuttings could be disposed of on the Reservation or at a landfill. This threshold is consistent with Louisiana regulations (LAC Title 33: Part XV.1404) which are currently the most comprehensive NORM regulations in existence. This regulation has been used as a guideline since the Federal government and the State of Florida do not have regulations or guidance documents regarding NORM. If levels in drilling fluids do not exceed 60 pCi/l, the drilling fluids could be disposed of by injection into the "boulder zone." This threshold is consistent with FAC Rule 17-28.120, the State of Florida's Underground Injection Control regulation for industrial and sanitary wastes. This regulation has been used as a guideline since neither the Federal government or the State of Florida has regulations for disposal of drilling fluids from exploratory oil wells.

Disposal of Drilling Wastes

The laboratory results would determine the acceptability of on-site disposal. Drill cuttings that meet the State of Florida clean soil criteria for Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, and TRPH, as outlined in FAC Rule 17-775 (used as a guideline) and meet the soluble salts and cationic distributions and the NORM criteria set forth in the previous section (less than five pCi/gram,

ENVIRONMENTAL CONSEQUENCES

above background of radium-226 or radium-228), may be used as fill material on non-wetland areas of the Reservation. The Miccosukee Tribe would designate an on-reservation non-wetland location for disposal of the drill cuttings.

Drill cuttings that exceed the State of Florida clean soil criteria, but do not exceed the hazardous waste thresholds found in 40 CFR, Part 261 and the NORM criteria set forth in the previous section, would be transported to a Class I landfill for proper disposal. Should the hazardous waste thresholds and/or TRPH analysis exceed the established maximum concentrations, the BLM would determine a proper disposal or treatment procedure.

Drilling fluids which do not exceed the hazardous waste thresholds found in 40 CFR, Part 261 and the total chlorides and UIC radioactive material criteria set forth in the previous section would be disposed of in the "boulder zone." Should the TCLP and/or TRPH analysis exceed established thresholds, the BLM would determine a proper disposal or treatment procedure.

Should drill cuttings exceed 5 pCi/g of radium-226 or radium-228, above background, or drilling fluids exceed 60 pCi/l, these wastes could be disposed of at NORM facilities in Louisiana, or at a low-level radioactive waste disposal facility in South Carolina.

Production waters would be disposed of in the "boulder zone," if the referenced hazardous waste, TRPH, and total chlorides thresholds are not exceeded. If the established thresholds are exceeded, the BLM would determine a proper disposal procedure.

4.4.11 Water Resources

The proposed action allows for potential sediment discharge from access road construction areas into adjacent waters. The use of best management practices for erosion and sediment control (USDA, SCS, 1977, and U.S. Dept. of Transportation, FWHA, 1978) would greatly reduce such sediment impacts.

Control measures and structures, such as silt fences, could be used to control runoff, erosion, and off-site sedimentation. Silt fences could be used at the base of all fill and disturbed areas within 100 feet of waterbodies such as the Miccosukee surface water management canal and L-28 Canal. Silt fences could be constructed following the manufacturer's recommended specifications. All runoff and erosion control measures could be inspected periodically, cleaned out, and maintained in functional condition throughout the construction, drilling and reclamation periods.

CHAPTER FOUR

Filled shoulders of the access road and topsoil stockpile areas could be seeded with an appropriate grass seed mixture. Straw mulching using only certified weed-free straw could be completed to protect the seed bed.

Access road fills other than those on existing embankments could be designed to minimize the disruption of surface water sheet flow. The roadway design could include culverts of appropriate size and spacing to adequately maintain sheet flow patterns.

Existing site-specific groundwater quality data is inadequate. Without an adequate baseline condition, it would be very difficult to verify that the proposed action would not have any significant impacts on water resources. A requirement for the establishment of a pre-drilling water quality baseline and a monitoring program could correct this deficiency and provide the means to quickly detect any drilling-related water quality impacts. The monitoring program could include the following elements:

- SWEPI would design and implement a water quality monitoring program for the projects which would be approved by the BLM and USGS prior to project construction. This program would include the developing of a QA/QC plan for the program, establishing baseline surface and groundwater quality, as well as existing aquatic conditions.
- Care would be taken to protect surface and subsurface water from contamination especially during the drilling phase when large amounts of produced water, drilling fluids, drilling muds, and oil may be in contact with the surface and subsurface waters. Surface and subsurface monitoring stations would be located upgradient and downgradient of the well site to document water quality.
- Each groundwater monitoring station should consist of nested or individual wells, located on the edge of the drill pad, with wells penetrating the two surficial aquifers (in the Fort Thompson and Tamiami Formations) and the intermediate (gray limestone aquifer). One upgradient station and two downgradient stations would be installed and monitored.
- Surface water sampling stations would be established in the L-28-Canal adjacent to the site and in the highway borrow canal adjacent and parallel to I-75.
- Water samples would be collected at surface monitoring stations and from subsurface water monitoring wells at the specified frequency. Insitu measurements of pH, temperature, and specific conductivity would be made with appropriate instruments. Water samples for all other parameters would be prepared for storage/shipping following standard operation procedures and would be analyzed by an EPA certified lab for concentrations of selected water quality indicator

ENVIRONMENTAL CONSEQUENCES

parameters. Indicator parameters are subject to revision by the BLM, depending on the type of proposed operation. Water quality indicator parameters consist of:

- alkalinity
- barium
- benzene
- chlorides
- mercury
- oil and grease
- total petroleum hydrocarbons
- pH
- sodium
- specific conductivity
- temperature
- toluene
- turbidity
- xylene

- Water samples from surface monitoring stations and subsurface monitoring wells would be obtained and analyzed by an EPA certified lab at the following frequency unless otherwise specified by BLM.

Upgradient - monthly before drilling and after APD approval and continuing monthly throughout the drilling operation; and continuing until site reclamation has been completed.

Downgradient - monthly before drilling and after APD approval, continuing twice a month beginning when drilling operations start and continuing through well testing and until site reclamation has been completed.

- If surface or subsurface water contamination is documented that is reasonably attributable to oil and gas operations underway in the vicinity, operations must cease immediately and would be immediately modified to rectify procedures causing contamination. Cleanup and restoration must be started immediately, and monitoring would continue until complete reclamation has been accomplished. Under such circumstances, additional testing for one or more of the following water quality parameters may be required by BLM at a frequency determined by BLM:

CHAPTER FOUR

biochemical oxygen demand (BOD)

calcium

DO (surface water only)

magnesium

metals

sulfates

total dissolved solids (TDS)

- A standardized format would be used to record, list, and display all data.

A report representing the results of the water quality monitoring for each station must be submitted to the BLM upon completion of each analysis (monthly for upgradient stations; bi-monthly for downgradient stations). This report would consist of the following components:

- A summary table that defines sample station, date of collection, and value for each parameter.
- A graphic comparison of the differences between sites for each parameter (each graph should represent one parameter for each site; all data should be plotted as bar graphs, and each graph should give the date, site, and specific parameter).
- An annual report presenting the results of the water quality monitoring for each station would be submitted to the BLM. This report would consist of a summary table that defines the sample station, dates of collection, and unit value for each parameter.
- All data and results of monitoring efforts must be reported to the BLM.
- All produced salt water (brine) must be disposed of in accordance with applicable State and Federal laws and regulations. Brine would not be released on surface lands or waters under any circumstances.

Additional general mitigation recommendations that could be implemented to reduce water resource impacts to non-significant levels include:

- Guide all phases of the project, including road and well site construction, reclamation and abandonment, by applicable regulations of the Clean Water Act.

ENVIRONMENTAL CONSEQUENCES

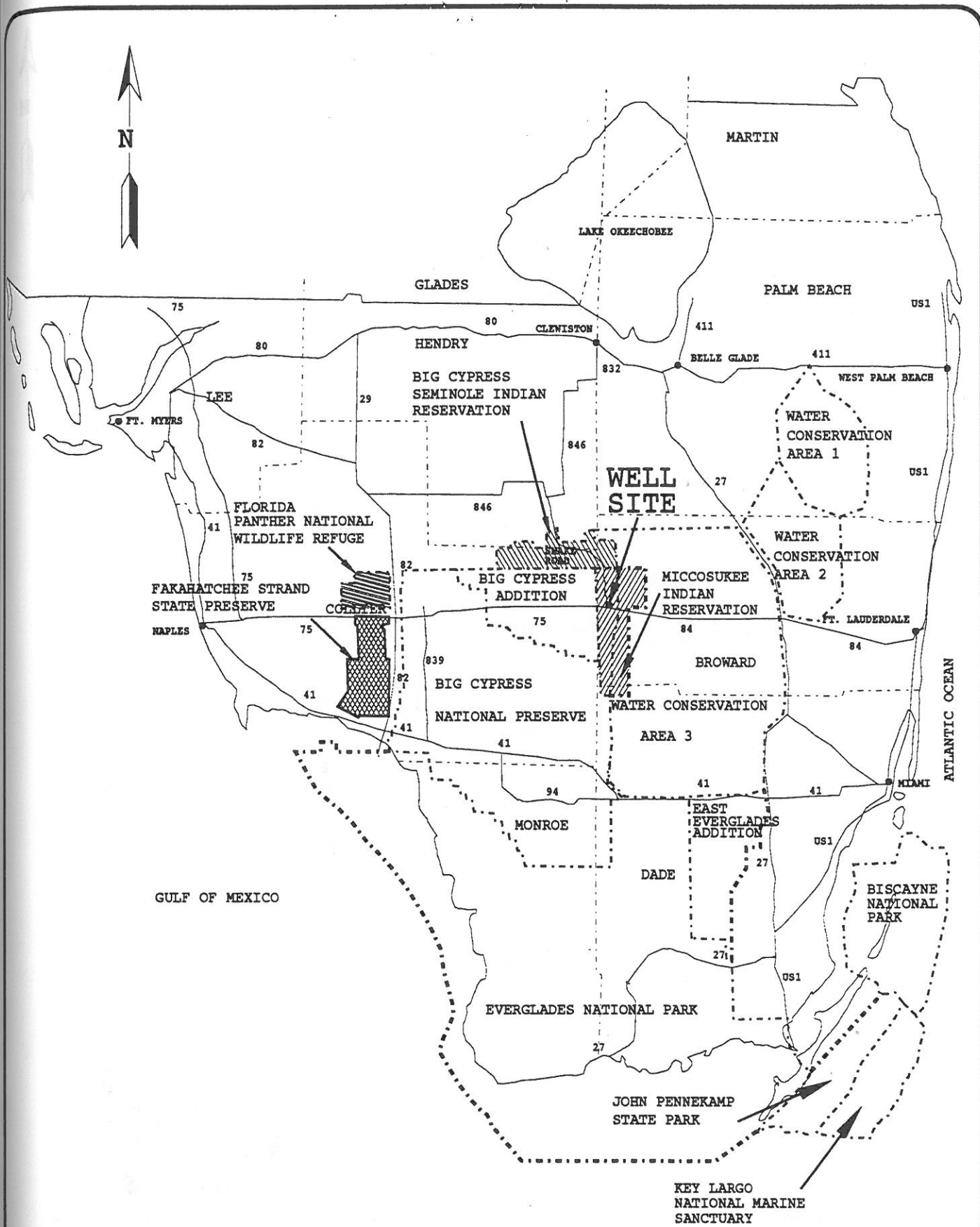
- Minimize the area of disturbance to that absolutely necessary for construction, operation and reclamation to reduce impacts to water resources.
- All water withdrawal and use would comply with applicable Federal and State laws.
- Site wells (i.e., nonproductive, water) would be plugged and capped. The water supply wells would be capped, but not plugged if desired by the Miccosukee Tribe. Well caps would be welded in place, or secured with locks to prevent tampering.

4.4.12 Wetlands

The exact boundaries of the drill site and the west access route could be field staked and inspected by a representative of the COE to prevent and minimize wetland impacts to the extent possible. Wetland mitigation could be completed as required by the COE. Soil removed from the drill site prior to construction could be stockpiled in non-wetland (pasture) area adjacent to the well pad.

4.4.13 Wildlife

Mitigation measures could include limiting vehicle speeds on the access routes, particularly at night to reduce the potential for collisions with wildlife. In addition, site worker shift changes could occur during daylight hours to the maximum extent possible to reduce traffic during night hours.



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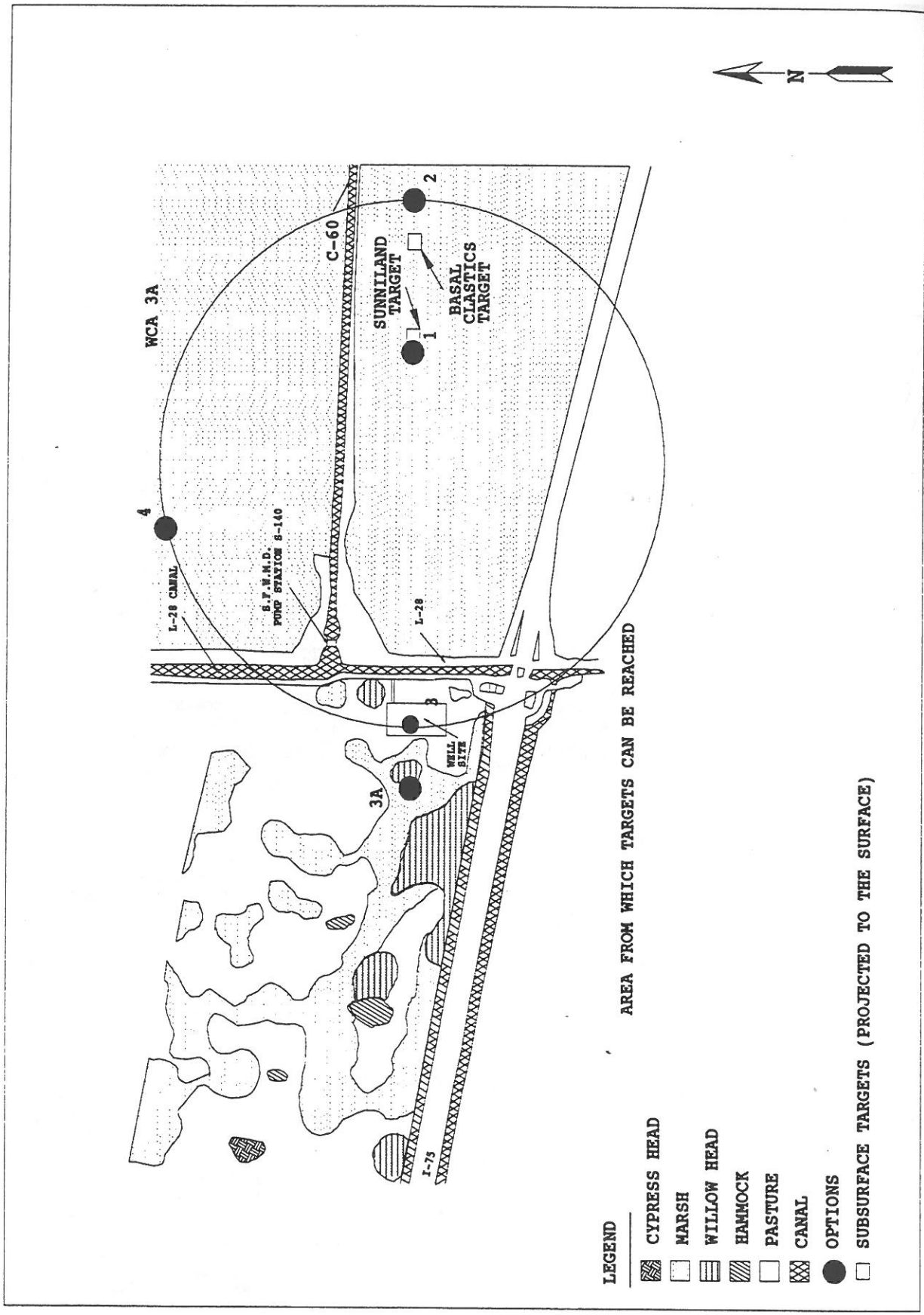
SWEPI MICCOSUKEE 3-1
EXPLORATORY WELL
BROWARD COUNTY, FLORIDA

0 10
MILES
SCALE

REGIONAL
MAP

FIGURE 1-1

DEM JOB No. 13501-072-049
AUTOCAD FILE: FL_CONAR.DWG



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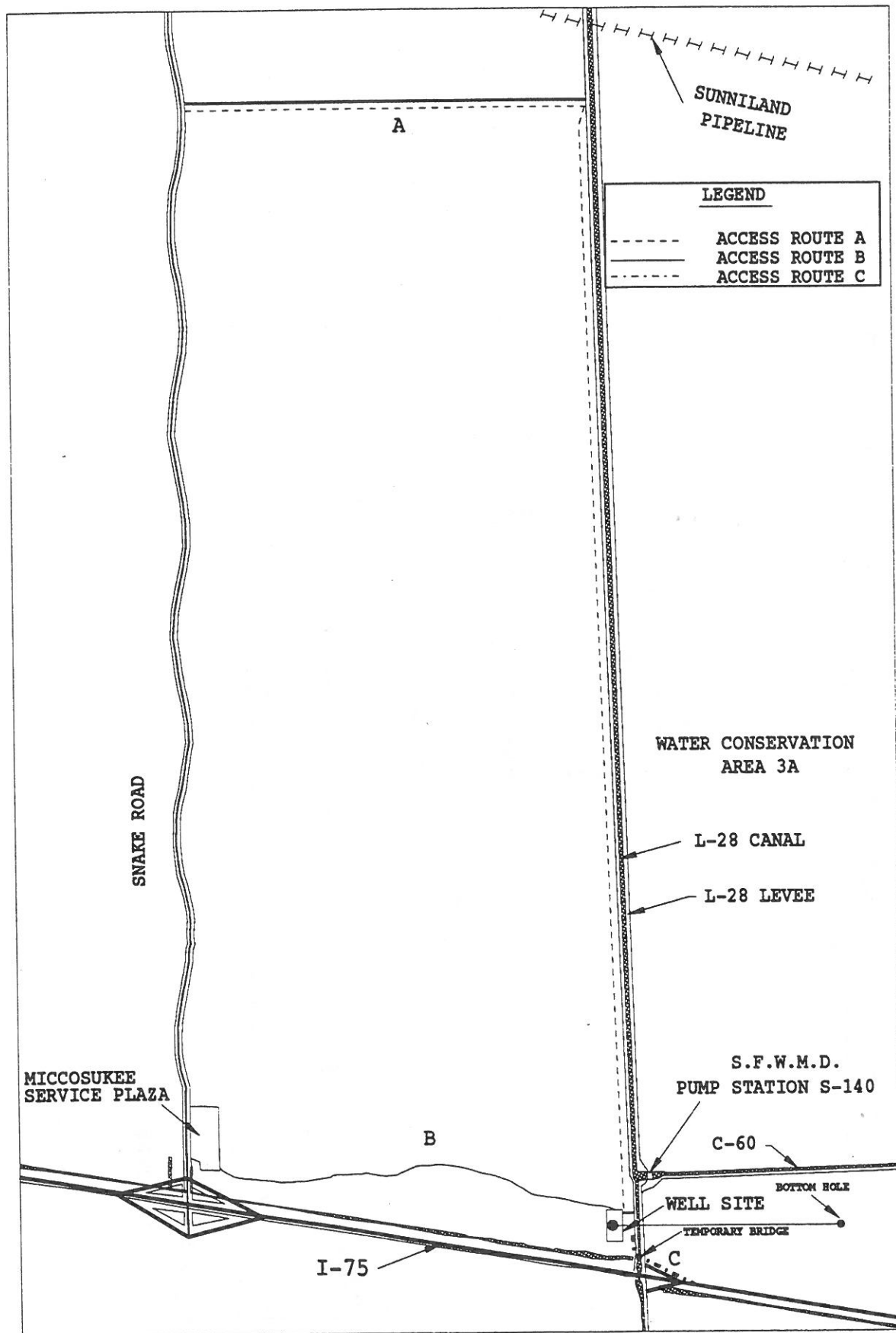
SWEPI MICCOSUKEE 3-1
EXPLORATORY WELL
BROWARD COUNTY, FLORIDA

0 750'
SCALE

WELL
SITE
ALTERNATIVES

FIGURE 2-1

D&M JOB No. 13501-072-049
AUTOCAD FILE: OPTIONS.DWG



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SWEPI MICCOSUKEE 3-1
EXPLORATORY WELL
BROWARD COUNTY, FLORIDA

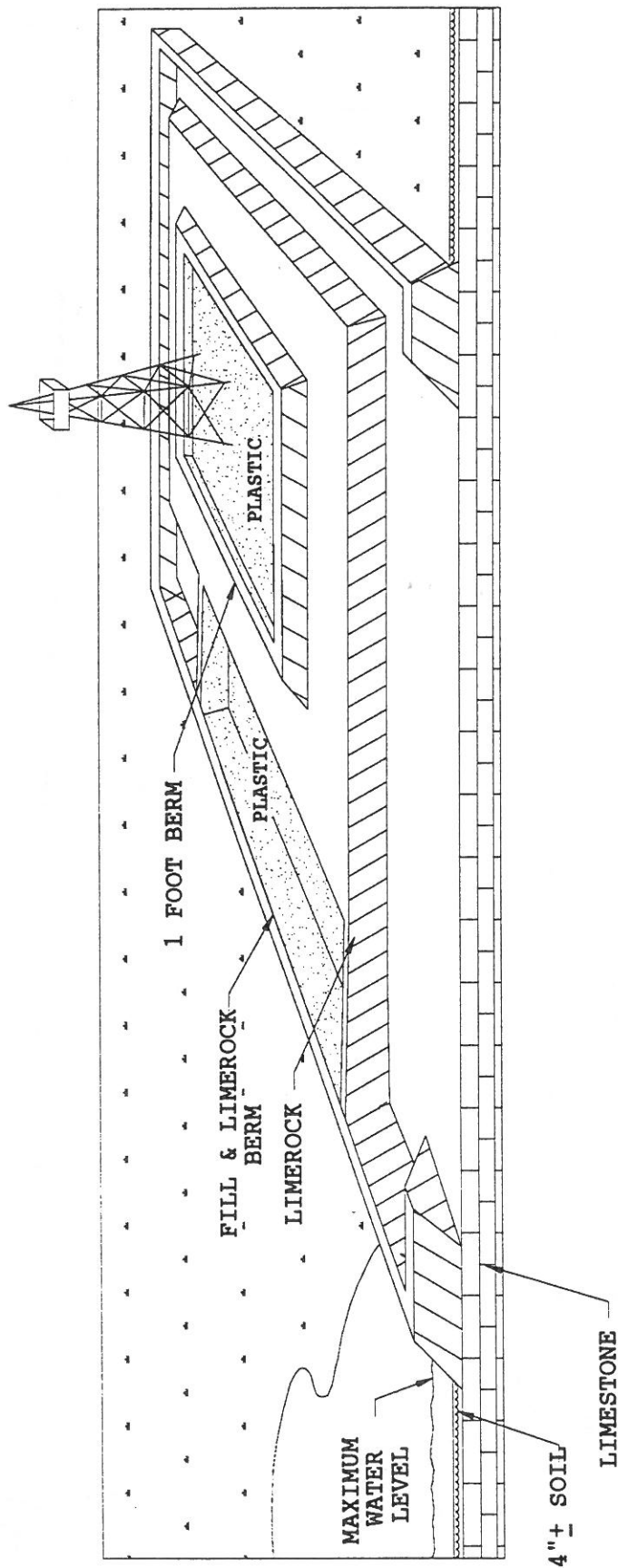
0 1,500'
SCALE

SITE
ACCESS ROUTE
MAP

FIGURE 2-3

D&M JOB No. 13501-072-049
AUTOCAD FILE: ACCESS.DWG

CONCEPTUAL DRILL SITE FEATURES



Dames & Moore

SWEPI MICCOSUKEE 3-1
EXPLORATORY WELL
BROWARD COUNTY, FLORIDA

N.T.S.
SCALE

CONCEPTUAL
DRILL SITE
FEATURES

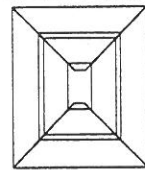
FIGURE 2-4

D&M JOB NO. 13501-072-049
AUTOCAD FILE: SITE.DWG

LOCATION LAYOUT

SWEPI MICCOSUKEE # 3-1

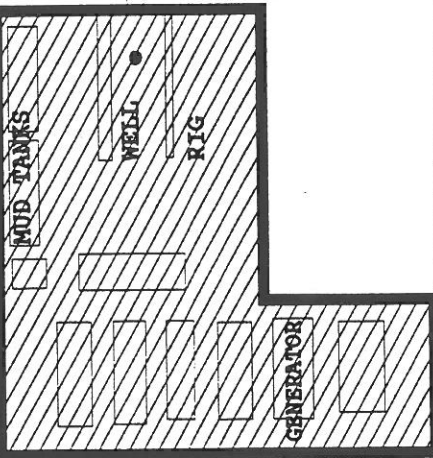
FLARE PIT



OFFICE TRAILERS

EMERGENCY
EQUIPMENT
TRAILER

PIPE RACK



DRILL
CUTTINGS
STORAGE

ACCESS
ROAD

PREVAILING WIND

A

WATER WELLS

A'

WATER RETENTION AREA

A 15'
11'

A'

LEGEND

-  SAFE BRIEFING AREAS
-  PLASTICIZED AREAS
-  EXTENT OF BERM

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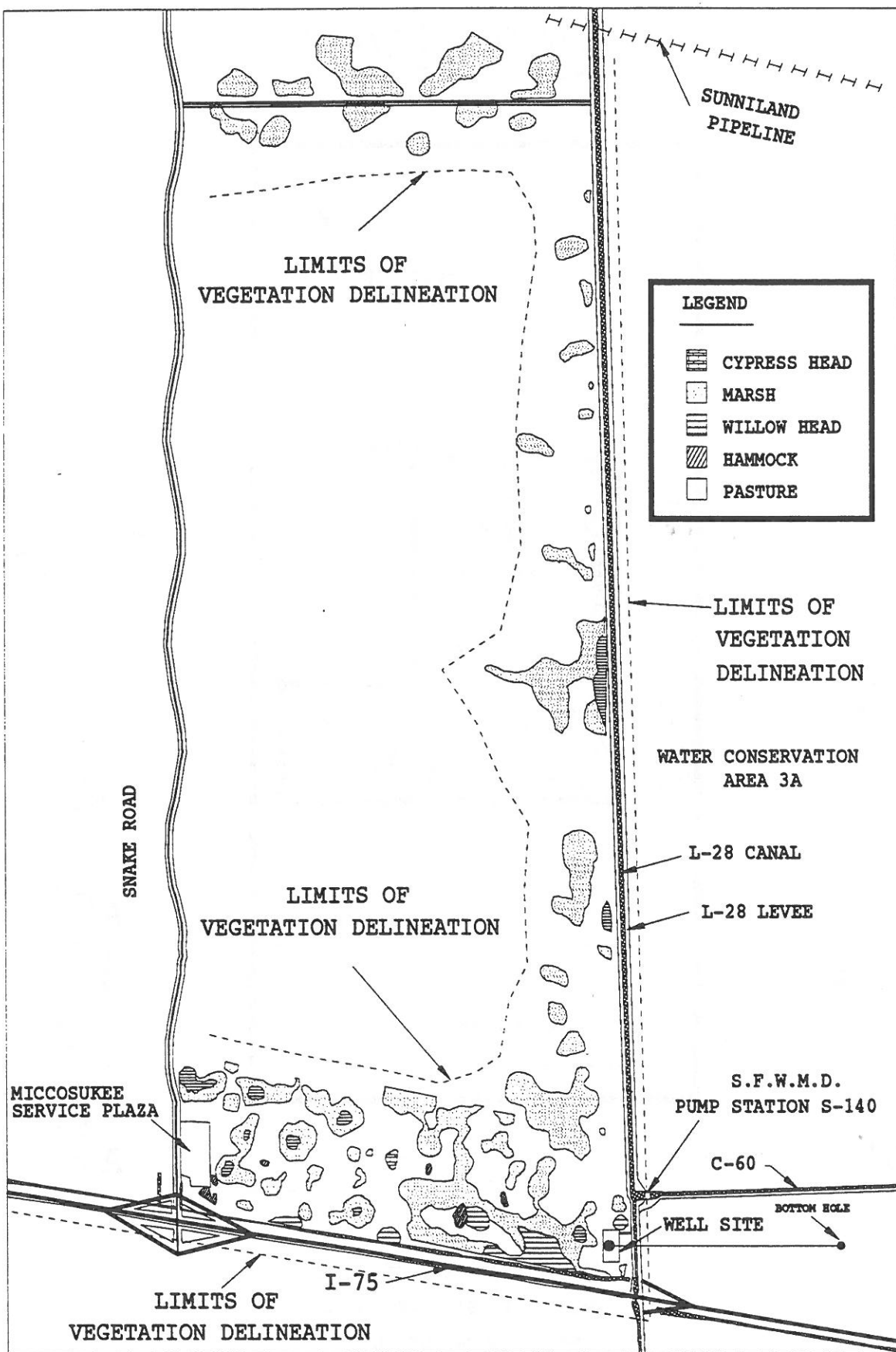
SWEPI MICCOSUKEE 3-1
EXPLORATORY WELL
BROWARD COUNTY, FLORIDA

NOT
TO
SCALE

PROPOSED
WELL SITE
LAYOUT

FIGURE 2-5

D&M JOB No. 13501-072-049
AUTOCAD FILE: LOCATION.DWG



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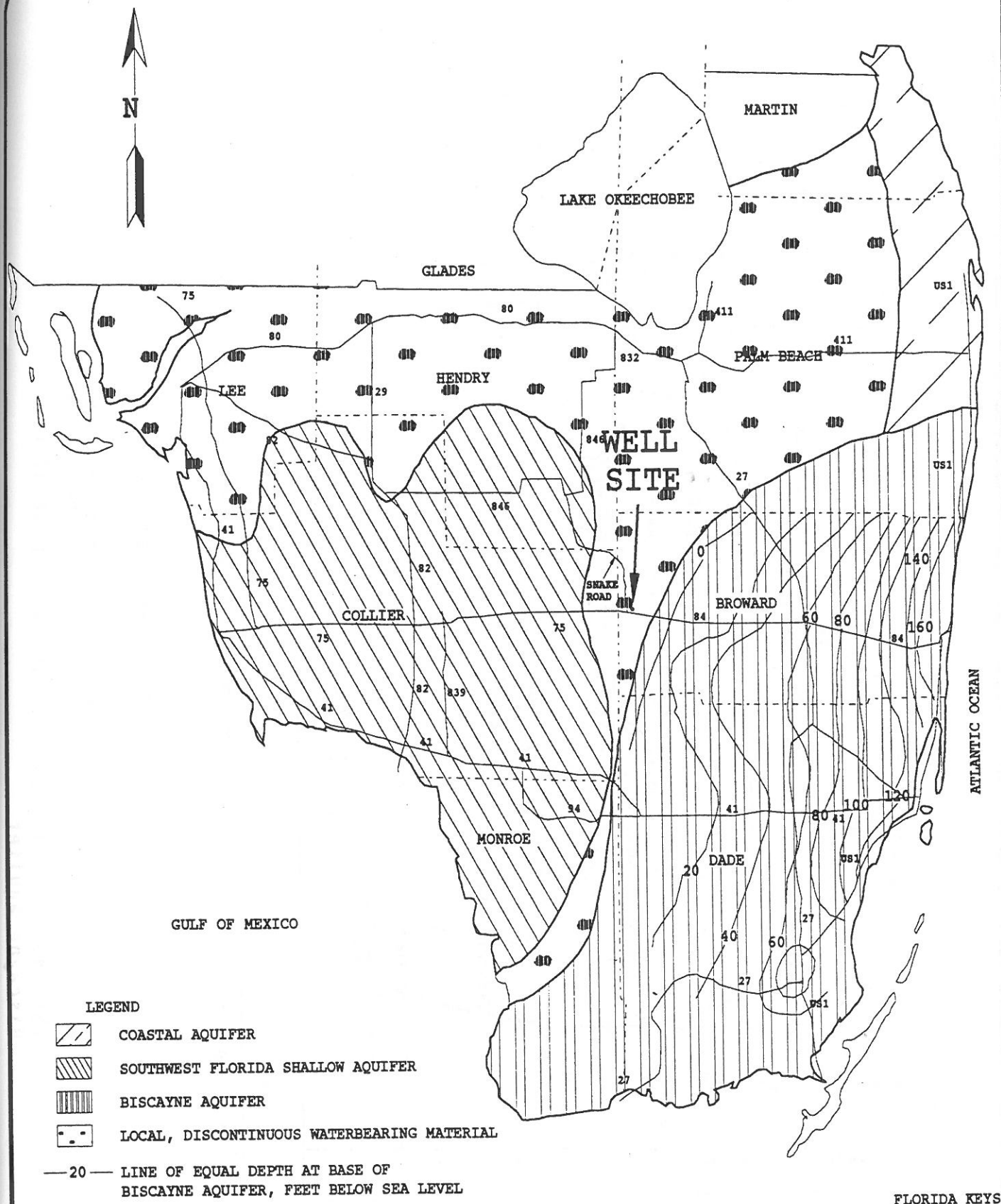
SWEPI MICCOSUKEE 3-1
EXPLORATORY OIL WELL
BROWARD COUNTY, FLORIDA

0 1,500'
SCALE

SITE
VEGETATION
MAP

FIGURE 3-3

D&M JOB No. 13501-072-049
AUTOCAD FILE: VEGETAT.DWG



SOURCE: U.S.G.S., 1978 BISCAYNE AQUIFER, SOUTHEAST FLORIDA
WATER RESOURCE INVESTIGATION 78-107.

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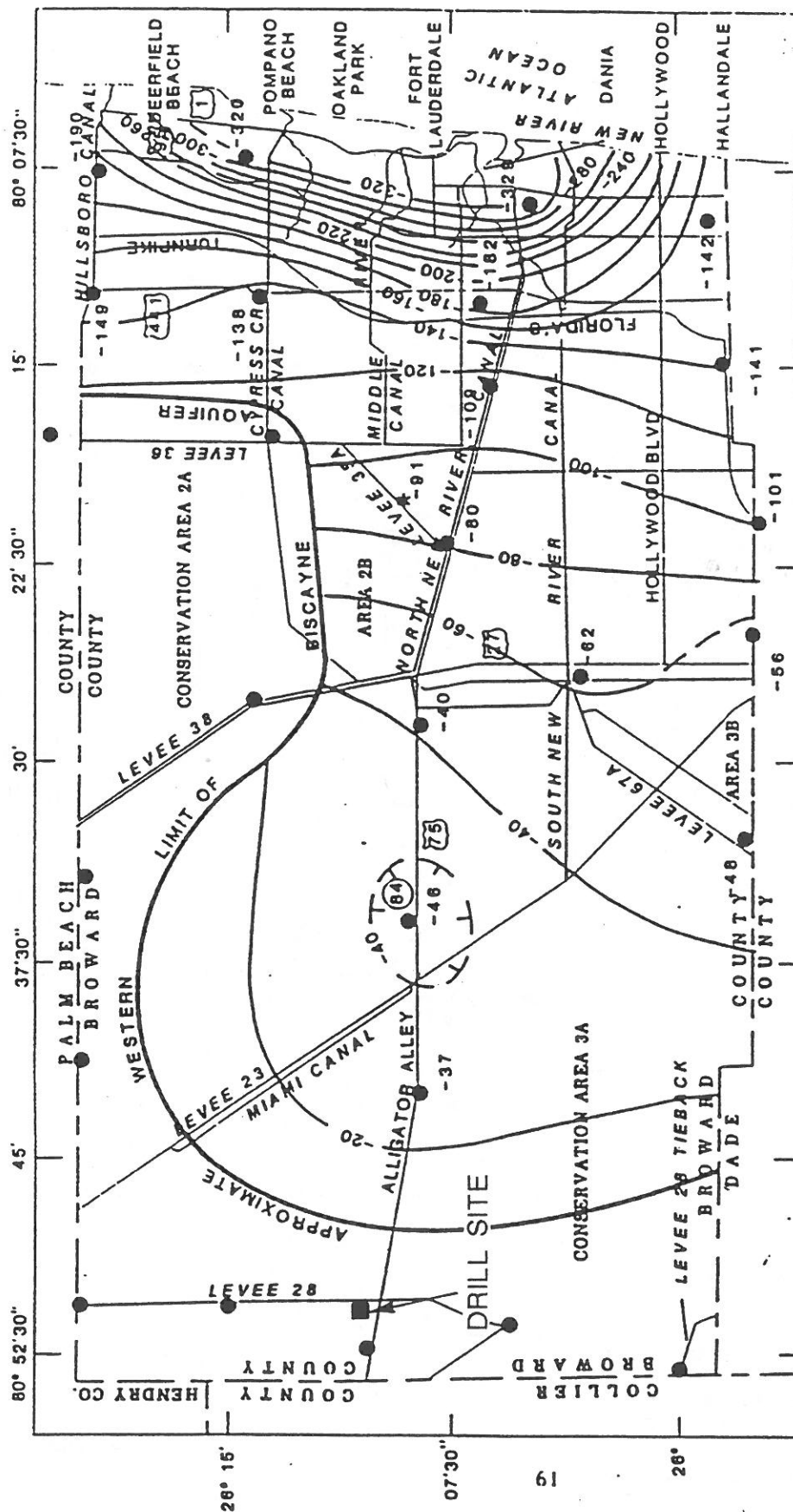
SWEPI MICCOSUKEE 3-1
EXPLORATORY WELL
BROWARD COUNTY, FLORIDA

0 10
MILES
SCALE

REGIONAL
AQUIFER
MAP

FIGURE 3-8A

D&M JOB No. 13501-072-049
AUTOCAD FILE: FL_COUNT7.DWG

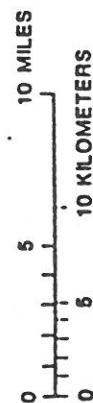


EXPLANATION

— -120 — STRUCTURE CONTOUR— Aquifer Base Elevation in Ft. MSL

• -37 TEST HOLE, FISH STUDY—Aquifer Base Elevation in Ft. MSL.

* -91 TEST HOLE, LOG FROM U.S. GEOLOGICAL SURVEY
FILES—Aquifer Base Elevation in Ft. MSL



Source: Fish, 1988

Thickness to the base and aerial extent of the
Biscayne aquifer

Dames & Moore

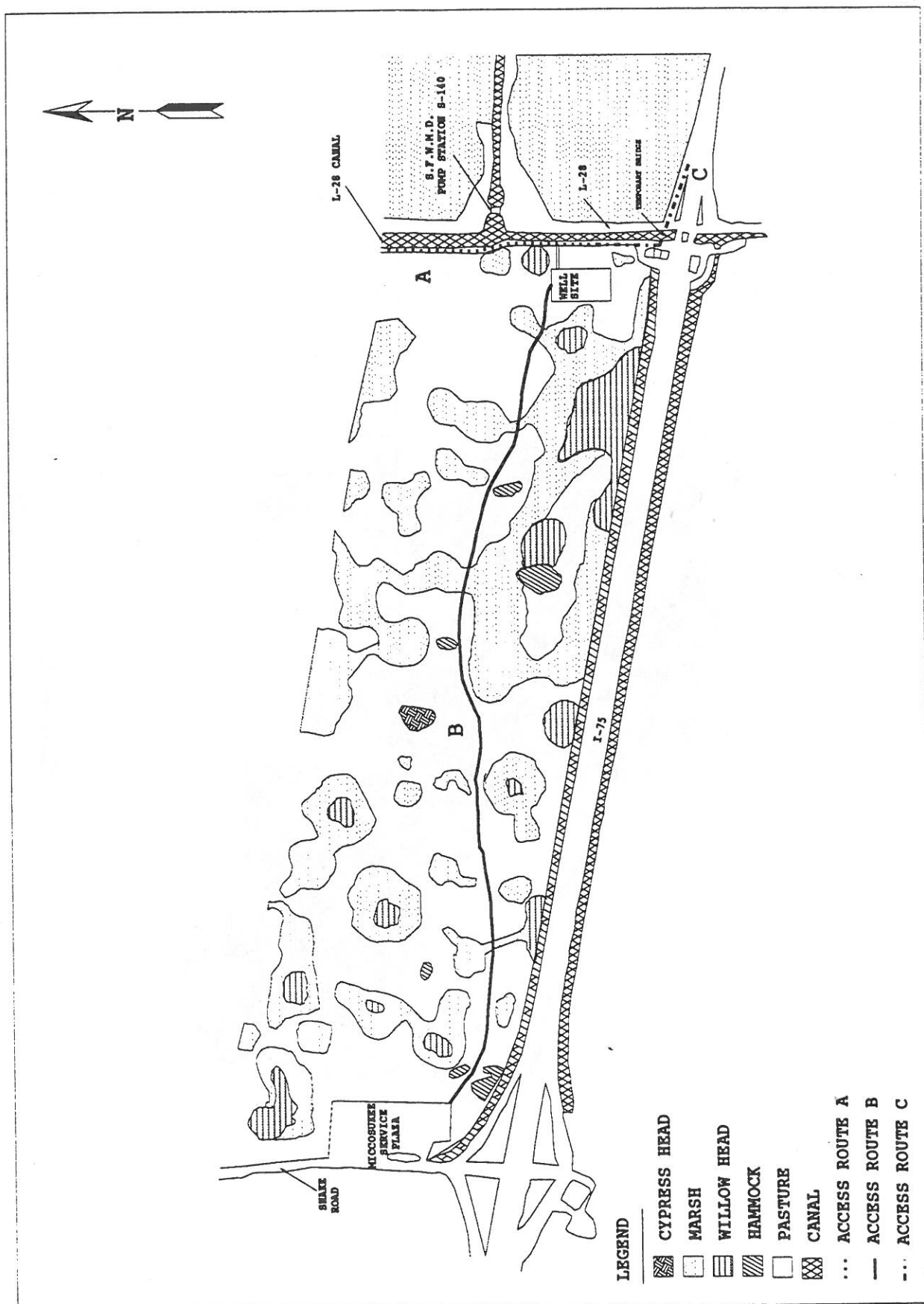
SWEPI MICCOSUKEE 3-1
EXPLORATORY WELL
BROWARD COUNTY, FLORIDA

SCALE

BISCAYNE AQUIFER
LOCATION IN
BROWARD COUNTY

FIGURE 3-8B

DEM JOB No. 13501-072-049



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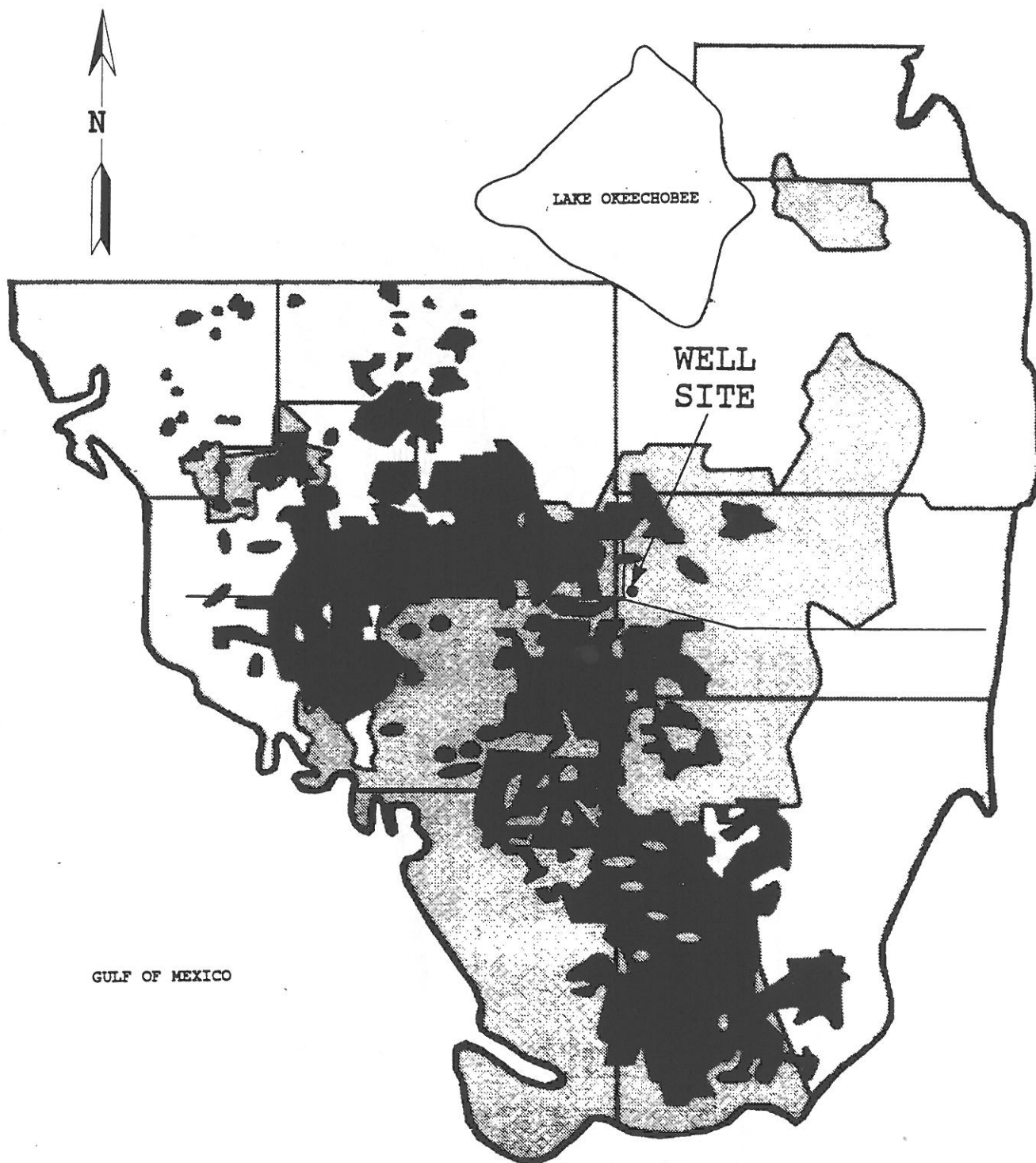
SWEPI MICCOSUKEE 3-1
EXPLORATORY WELL
BROWARD COUNTY, FLORIDA

0 750'
SCALE

ACCESS
ROUTE
DETAILS

FIGURE 3-13

DEM JOB No. 13501-072-049
AUTOCAD FILE: WETLANDS.DWG



LEGEND



PANTHER RADIO LOCATIONS



EXISTING CONSERVATION AREAS

Source: Florida Panther Habitat Preservation Plan, 1994.
 (Figure 1. Radio Telemetry Locations of 43 Panthers, 1981-1991.)

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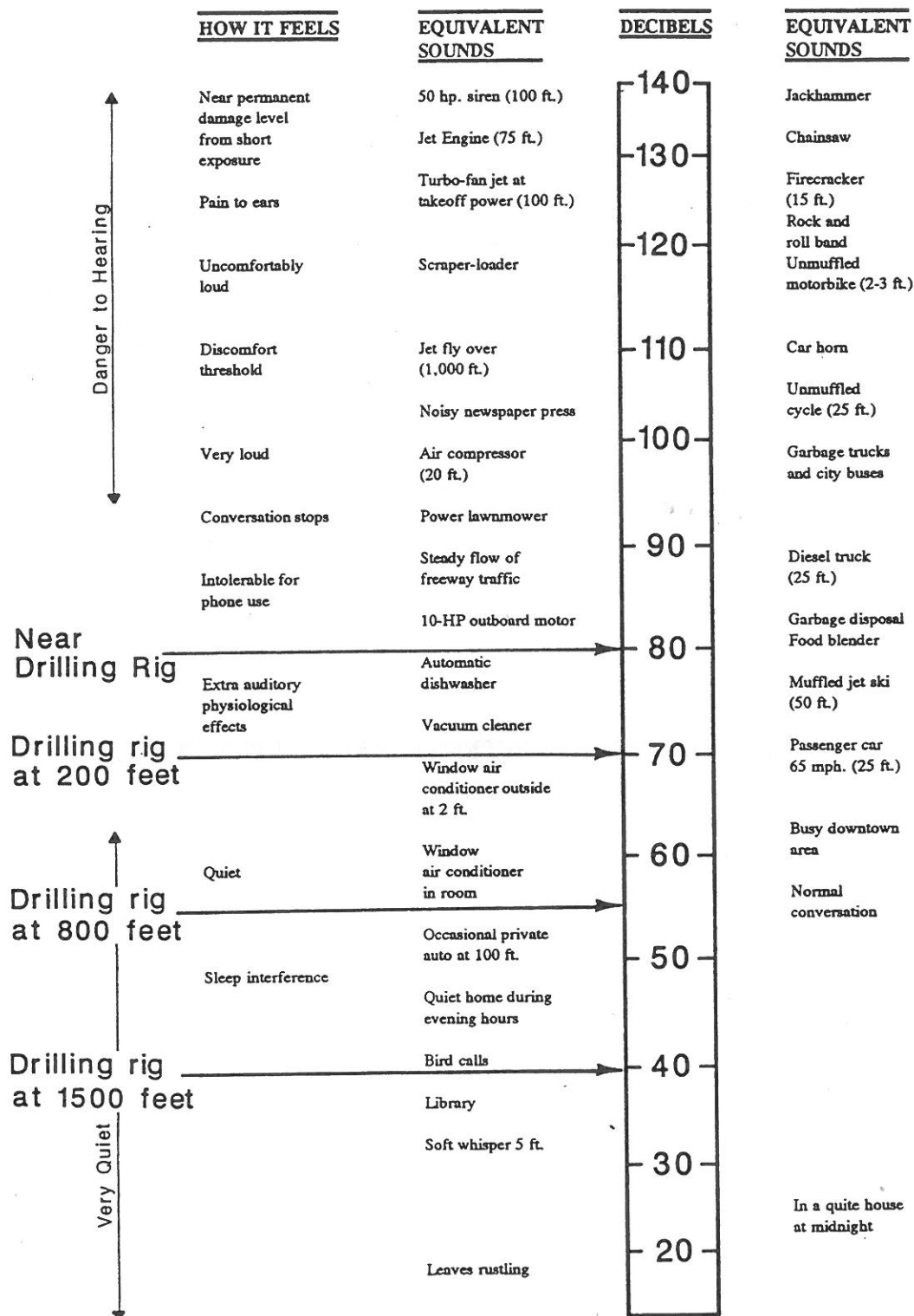
SWEPI MICCOSUKEE 3-1
 EXPLORATORY WELL
 BROWARD COUNTY, FLORIDA

0 10
 MILES
 SCALE

FLORIDA
 PANTHER
 TELEMETRY
 MAP

FIGURE 3-14

D&M JOB No. 13501-072-049
 AUTOCAD FILE: FL_PANT.DWG



Decibel levels of sounds you're most likely to encounter in A-scale numbers.

Figure 4-1 Noise Level Comparison Chart

Note: Modified From Amoco Beartooth Well EA, Dames & Moore, 1985