

## **Section 15 Groundwater**

## 1.0 LOCATION AND MAPS

The Maine GenLead 115-kilovolt transmission line corridor is located across nine U.S. Geological Survey quadrangles (quad): Oakfield, Meduxnekeag Lake, Monument Brook, Alder Brook, Reed Pond, Molunkus Lake, Mattawamkeag Lake, Mattaseunk Lake, and Lincoln Center. A Maine Geological Survey Significant Sand and Gravel Aquifer Map is available for each quad with the exception of Meduxnekeag Lake; the Maine Geological Survey reports that while field mapping was conducted for this quad, no significant aquifers were found and therefore the map was not published. The only significant sand and gravel aquifer in the general vicinity of the project is located along the Mattawamkeag River on the Monument Brook quad (see Figure 15-1). It is approximately 800 to 2,500 feet wide and runs along the Mattawamkeag River. Based on the morphology of the aquifer, it is interpreted to be of moderate to good potential for ground-water yield and consists primarily of glacial sand and gravel. The transmission line runs across the aquifer for just over one-third of a mile (approximately 1,584 feet).

There are no known public drinking water supply wells in the area within 100 feet of the proposed transmission line, and no public or private water wells are located in the corridor along the entire length of the proposed transmission right-of-way (ROW). There are no U.S. Environmental Protection Agency-designated sole source aquifers located in the project area (USEPA 2010).

## 2.0 QUANTITY

No wells will be established within the ROW.

## 3.0 SOURCES OF CONTAMINATION

The potential sources of groundwater contamination during construction will be fuel and hydraulic and other lubricating oils used in the operation of vehicles and construction equipment. Any spills of these materials from the vehicles or equipment are typically small and of very short duration. Spills that are properly cleaned up would not pose any risk to groundwater quality. Procedures for handling these materials and preventing spills are detailed below. The basic elements of these respective plans provide descriptive procedures for safe storage and handling of materials in order to prevent spills, as well as spill reporting procedures, emergency contact telephone numbers (including state and federal environmental agencies), and oil spill cleanup guidelines. In the event of an oil or hazardous material spill, employees are trained to promptly contain, report, and clean up the spill in accordance with these procedures. In addition, as a standard operating procedure, operational vehicles carry an oil spill kit that contains material for conducting initial containment and clean-up of spills.

### General Requirements:

- Contractors/subcontractors will store, transport, and use oil, hazardous materials, and wastes in accordance with all applicable local, state, and federal regulations and these requirements.
- At a minimum, contractors/subcontractors will follow Best Management Practices when storing, transporting, or using oil, hazardous materials, and wastes.
- Vehicles and equipment containing petroleum that are in use on the ROW will be inspected daily for leaks or signs of deterioration that could cause a leak or spill. Leaking or deteriorated conditions will be repaired prior to use.
- Contractors/subcontractors will take care not to cause an uncontrolled spill or release of oil or hazardous materials to the environment.
- Contractors/subcontractors will provide and maintain on-site sufficient spill cleanup and containment supplies (e.g., absorbent pads, containment booms, protective clothing, debris containers) to control releases of oil, hazardous materials, or wastes. In addition, operational vehicles carry an oil spill kit that contains material for conducting initial containment and clean-up of spills.
- Contractors/subcontractors will remove oils, hazardous materials, wastes, and unused materials from the work site at the completion of the job. This includes full and partially full containers of waste material such as, but not limited to, rags, gloves, trash, scrap material, and empty containers.
- Within six months after the beginning of facility operations, a Spill Prevention Control and

Countermeasure Plan associated with turbine operation, the Operation and Maintenance building, and electrical substation will be completed in accordance with 40 CFR 112 and filed with the Maine Department of Environmental Protection (MDEP) upon completion.

#### Storage and Handling Requirements:

- Contractors/subcontractors will store only the minimal amount of material (at each work site) necessary to complete the work.
- Handling and application of pesticides and herbicides shall only be in accordance with regulations under the Maine Pesticide Control Act of 1975, as amended, Title 7 M.R.S.A., Section 601.
- Petroleum products and other hazardous materials will not be stored or transferred, including fueling of vehicles and equipment, within 100 feet of waterbodies, wetlands, rare plant or unique natural community locations, and not within at least 200 feet from water supply wells.
- Overnight parking of equipment will not occur within 100 feet of waterbodies, wetlands, rare plant or unique natural community locations, and not within at least 200 feet from water supply wells.
- Petroleum products will be stored in Maine Department of Transportation approved containers or approved tanks in areas not considered to be environmentally sensitive.
- Containers will be kept closed unless material is being transferred.
- Contractors/subcontractors will ensure that all transferring operations are monitored and not left unattended.
- Containers will not be stored on the ground, but will be stored in cabinets or on a firm working surface such as a portable trailer bed or other secure decking.
- If at any time a contractor/subcontractor needs to store oil including, but not limited to, fuel oil, petroleum products, sludge, and oil refuse in excess of an aggregate amount of 1,320 gallons (excluding 55-gallon or less containers) that is located near a pathway to navigable waters, the federal requirements for oil pollution prevention (40 CFR Part 112) must be met. Contractor/Subcontractor Spill Prevention Control and Countermeasure plans must be approved by a licensed, professional engineer, and a copy must be sent to Maine GenLead, LLC no later than one week prior to the commencement of the oil storage activities.
- Storage and handling of flammable and combustible liquids, including gasoline and diesel fuel, will be in accordance with rules developed under Title 25 M.R.S.A., Section 2441 (Fire Prevention and Fire Protection), as amended (See also Code of Maine Rules 16-219 Chapter 317). These regulations include, but are not limited to, bonding and grounding during transfer operations, fire protection requirements, storage quantity limitations, and spacing and location requirements.
- Gasoline and fuel storage tanks with greater than a 25-gallon capacity must have secondary containment constructed of an impervious material and be capable of holding 110 percent of tank capacity.
- Handling and disposal of hazardous wastes will be in accordance with MDEP Hazardous Waste Management rules (06-096 Chapters 850 through 857) developed pursuant to Title 38 M.R.S.A., Section 1301 et. seq., and U. S. Environmental Protection Agency regulations (40 CFR 260 through 272). Handling and disposal of waste oil will be in accordance with MDEP Waste Oil Management Rules (06-096 Chapter 860) and U. S. Environmental Protection Agency regulations (40 CFR 279).

#### Spill Reporting Requirements:

- Spill reporting requirements are the responsibility of the contractor/subcontractor. As required by Title 38 M.R.S.A., Section 543 and MDEP regulations (06-096 Chapters 600 4.B and 800 4.1), spills of oil or hazardous materials in any amount and under any circumstances must be reported to the MDEP within two hours from the time the spill was discovered at **1-800-482-0777**.
- As required by the federal Clean Water Act (40 CFR Part 110.4), a discharge of oil "which causes a sheen upon the surface of the water or adjoining shore line or oily sludge deposits beneath the surface of the water" must be reported within 24 hours to the National Response Center at **1-800-424-8802**.
- The need to report spills to the National Response Center of hazardous materials other than oil will be determined by the contractor/subcontractor by consulting the Comprehensive Environmental Response, Compensation, and Liability Act list of hazardous substances and reportable quantities

(40 CFR Table 302.4). Any spills that involve a reportable quantity of any hazardous substance must be reported to the National Response Center by the contractor/subcontractor.

- The contractor/subcontractor must also report all spills immediately to Maine GenLead, LLC, the Project and/or Construction Manager, and Local emergency response officials.

#### Spill Cleanup Requirements:

- It is the responsibility of the contractor/subcontractor to ensure and oversee immediate and complete cleanup of all spills involving oil or hazardous materials in accordance with state and federal requirements. The contractor/subcontractor is also responsible for all health and safety issues related to the cleanup of oil or hazardous materials. The contractor/subcontractor is also responsible for expediting the appropriate disposal of spill debris waste and restoring the site to its original condition.
- If the spill cannot be safely handled by personnel on site, the contractor will immediately arrange for a licensed spill response contractor to contain, clean up, and perform required sampling and disposal of spilled materials and debris and comply with applicable reporting requirements.

#### Personnel Training Requirements:

Prior to construction, the contractor will instruct construction personnel on the operation and maintenance of construction equipment to prevent the accidental discharge or spill of fuel, oil, and lubricants. Personnel will also be made aware of the pollution control laws, rules, and regulations applicable to their work. During construction, spill prevention refresher briefings with the construction crew will be conducted monthly. These briefings will highlight the following:

- Precautionary measures to prevent spills;
- Potential sources of spills, such as equipment failure or malfunction;
- Standard operating procedures in case of a spill, including applicable notification requirements;
- Equipment, materials and supplies available for clean-up of a spill; and
- A list of known spill events.

## **4.0 MEASURES TO PREVENT DEGRADATION**

The multiple methods, plans, and procedures to prevent groundwater degradation during construction of the proposed transmission line and wind turbines are incorporated in the erosion control requirements (Section 14), and the oil and hazardous material contingency plan described above. These procedures establish a set of minimum requirements for spill prevention and response during construction. The procedures incorporate measures developed and fine-tuned from experience during other transmission line and wind turbine construction projects, including input from the MDEP and other review agencies. The procedures incorporated into the plan have proven successful for preventing spills and for addressing spills if they occur. Both the contractors' and environmental inspectors will ensure that all personnel working on the ROW follow these procedures.

## **5.0 GROUNDWATER PROTECTION PLAN**

The project will not significantly alter existing surface water drainage characteristics, as provided by the stormwater management plan developed for the project (Section 12). Temporary impacts to surface water drainage may occur during construction. The use of herbicides, petroleum, and other hydrocarbon products during construction and operation represent a potential threat to groundwater quality. Measures to be utilized to address potential impacts are included in the procedures found in Section 10, Section 14 and this Section. These documents and adherence to the design and procedural requirements they contain represent the groundwater protection and monitoring plans for the project. Accordingly, the construction or operation of the project is not expected to adversely affect groundwater resources.

## **6.0 GROUNDWATER PROTECTION DURING OPERATIONS**

The proposed ROW will be maintained to keep vegetation a safe distance from electrical components. In addition to hand or mechanical cutting of vegetation that poses a safety or reliability hazard to the lines, low volume, foliar application of herbicides using a backpack with a directional, hand-held sprayer will be conducted as necessary. In addition, herbicides may be applied to cut stumps and surfaces of larger trees. All herbicides used are low toxicity products registered with the U.S. Environmental Protection Agency and approved by the Maine Board of Pesticide Control for the control of woody plants on ROWs. Application of any herbicide will be carried out by licensed professionals in accordance with approved guidelines, as described in the Post-Construction Vegetation Management Plan. This Plan is provided in Section 10 of this application. Application of approved herbicides in accordance with their label specifications and guidelines is designed to prevent adverse impact on groundwater quality.

## **7.0 REFERENCES**

USEPA, Designated Sole Source Aquifers in EPA Region 1. [Online] URL:  
[http://www.epa.gov/region01/eco/drinkwater/pc\\_solesource\\_aquifer.html](http://www.epa.gov/region01/eco/drinkwater/pc_solesource_aquifer.html)  
(Accessed June 21, 2010)

Maine Geological Survey, Online Significant Sand and Gravel Aquifers Maps. [Online] URL:  
<http://www.maine.gov/doc/nrimc/mgs/pubs/online/aquifers/aquifers-ad.htm>  
(Accessed June 21, 2010)

**Figure 15-1**

# Mattawamkeag Quadrangle, Maine

Compiled by  
**Lauren E. Foster and Troy T. Smith**  
 Preliminary aquifer boundaries mapped by  
**Glenn C. Prescott, Jr.**

Digital cartography by:  
**Michael E. Foley**

Robert G. Harrimaney  
 State Geologist

Cartographic design and editing by:  
**Robert D. Tucker**

Funding for the preparation of this map was provided in part by the  
 Maine Department of Environmental Protection and the U. S. Geological Survey.

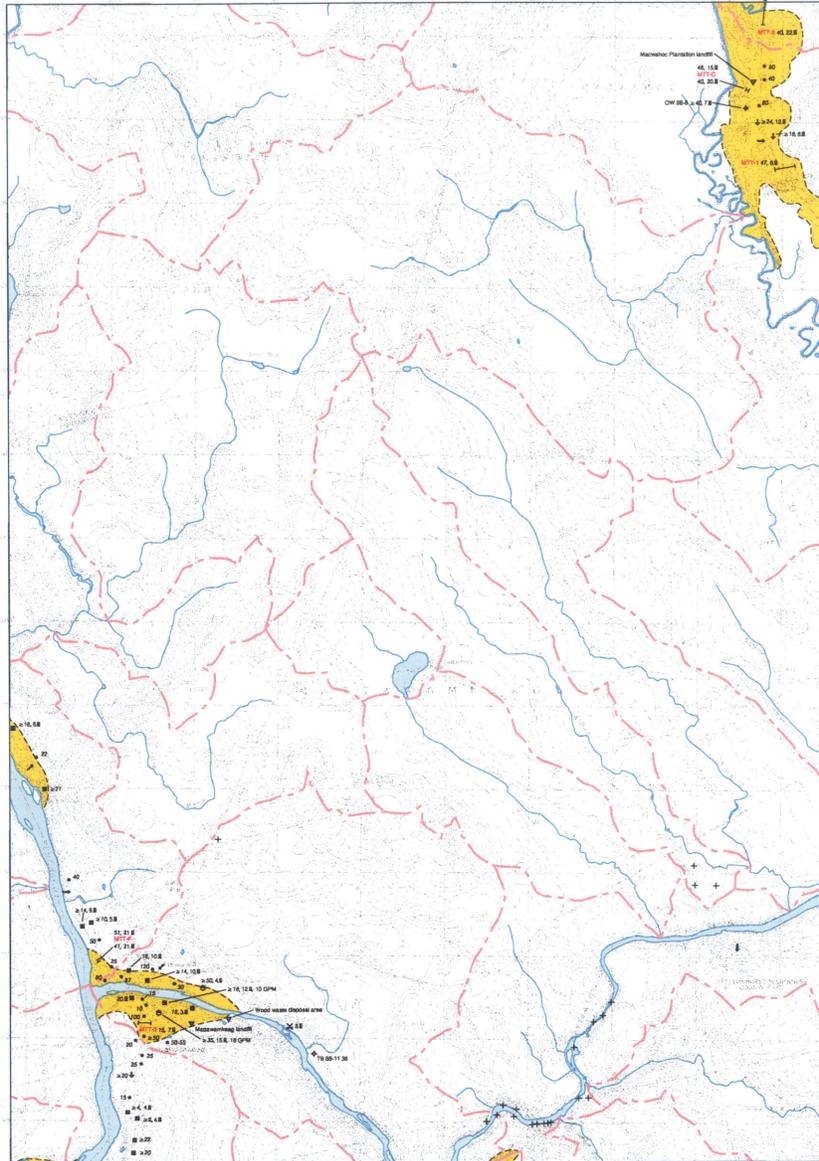


**Maine Geological Survey**

Address: 22 State House Station, Augusta, Maine 04333  
 Telephone: 207-287-2001 E-mail: mgsl@maine.gov  
 Home page: http://www.maine.gov/doc/mgs/mgs.htm

Open-File No. 01-147  
 2001

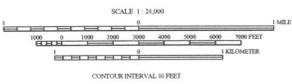
## Significant Sand and Gravel Aquifers



Aquifer boundaries modified from: Edman, A. J., and Lancher, J. M., 1991. Sand and Gravel Aquifer Map #9. Maine Geological Survey, Open-File Map #1-77, scale 1:50,000.

Well inventory data collected by Maine Geological Survey, field assistants during the 1998 field season.

Drainage basin boundaries compiled by U.S. Geological Survey, Water Resources Division, Augusta, Maine, with tracing from the Maine Flood-level Redevelopment Authority.



Topographic base (from U.S. Geological Survey Mattawamkeag quadrangle, scale 1:25,000) using state plane U.S. Geological Survey map projection (NAD 83).

The use of graphic data and field measurements in this map is the best practice possible and does not constitute a warranty by the U.S. Geological Survey for the accuracy of the information.

### SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)

- Approximate boundary of surficial deposits with significant saturated thickness where potential ground-water yield is moderate to excellent.
- Surficial deposits with good to excellent potential ground-water yield (with generally greater than 10 gallons per minute in a properly constructed well). Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone; yields may exceed 50 gallons per minute in deposits that are thickly connected with surface-water bodies, or in extensive deposits where subsurface data are available.
- Surficial deposits with moderate to good potential ground-water yield (with generally greater than 10 gallons per minute in a properly constructed well). Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone; yields may exceed 50 gallons per minute in deposits that are thickly connected with surface-water bodies, or in extensive deposits where subsurface data are available.

### SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS (yields less than 10 gallons per minute)

- Areas with moderate to low or no potential ground-water yield (includes areas underlain by till, massive deposits, certain deposits, alluvium, terraces, thin glacial sand and gravel deposits, or bedrock); yields in surficial deposits generally less than 10 gallons per minute in a properly constructed well.

### SEISMIC-LINE INFORMATION

Profiles for 12-channel seismic lines are shown in Appendix 7 of Open-File Report 92-2 (Neil and others, 1992). Length of 12-channel seismic lines is shown on the map in its scale. All single-channel lines traced from this map are shown in its scale.

- Depth to bedrock, in feet below land surface.
- Depth to bedrock, in feet below land surface.
- Depth to bedrock, in feet below land surface.
- Depth to water level, in feet below land surface.
- Two-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line identifier box refer to the northern end of the seismic line.
- Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line identifier box refer to the northern end of the seismic line.
- Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line identifier box refer to the northern end of the seismic line.

The 3-letter identifier for a line is an abbreviation for the topographic quadrangle. If the 3-letter identifier for the line is followed by a number (ex. MAP-7, MAP-1), the line is a 12-channel line. If the identifier is followed by a letter (ex. MAP-7, MAP-P), the line is a single-channel line. Single-channel seismic interpretations by T. T. Smith and C. D. Neil. Two-channel seismic interpretations by J. J. Sledge.

### GEOLOGIC AND WELL INFORMATION

- Depth to bedrock, in feet below land surface.
- Penetration depth of boring, a symbol refers to maximum depth to bedrock based on boring depth or refusal.
- Depth to water level in feet below land surface (observed in well, spring, lost boring, pit, or concrete lined).
- Gm of pit (overburden thickness noted in feet, e.g. 5-12').
- Quarry.
- Yield (flow) of well or spring in gallons per minute (GPM).
- Spring, with general direction of flow.
- Drilled overburden well.
- Dig well.
- Observe water well (project well if labeled, nonproject well if unlabeled).
- Test boring (project boring if labeled, nonproject boring if unlabeled).
- Div on point.
- Test pit.
- Drilled bedrock well.
- Potential point source of ground-water contamination.
- Bedrock outcrop.
- Surface-water drainage-channel boundary; surface-water divides generally correspond to ground-water divides. Horizontal direction of ground-water flow generally is away from divides and toward surface-water bodies.

### OTHER SOURCES OF INFORMATION

1. Neil, C. D., Steger, J. I., and Wadde, T. K., 1992. Hydrogeology and water quality of significant sand and gravel aquifers in parts of Ansonia, Hancock, Penobscot, Piscataquis, and Washington Counties, Maine. Maine Geological Survey, Open-File Report 92-2, 77 p.
2. Prescott, G. C., Jr., 2001. Surficial materials of the Mattawamkeag quadrangle, Maine. Maine Geological Survey, Open-File Map 01-147.
3. Newman, W. A., and Holland, W. R., 1981. Reconnaissance surficial geology of the Mattawamkeag 15' quadrangle, Maine. Maine Geological Survey, Open-File Map 81-47.
4. Cornell, W. B., 1987. Ground water handbook for the state of Maine, Second Edition. Maine Geological Survey Bulletin 79, 135 p.
5. Thompson, W. B., 1979. Surficial geology handbook for coastal Maine. Maine Geological Survey, 86 p. (not dated).
6. Thompson, W. B., and Burns, H. W., Jr., 1985. Surficial geology map of Maine. Maine Geological Survey, scale 1:50,000.

# Molunkus Lake Quadrangle, Maine

Compiled by:  
Craig D. Neill and Daniel B. Locke  
Preliminary aquifer boundaries mapped by:  
Daniel B. Locke

Digital cartography by:  
Michael E. Foley

Robert G. Marvinney  
State Geologist

Cartographic design and outline by:  
Robert D. Tucker

Funding for the preparation of this map was provided in part by the  
U. S. Geological Survey.

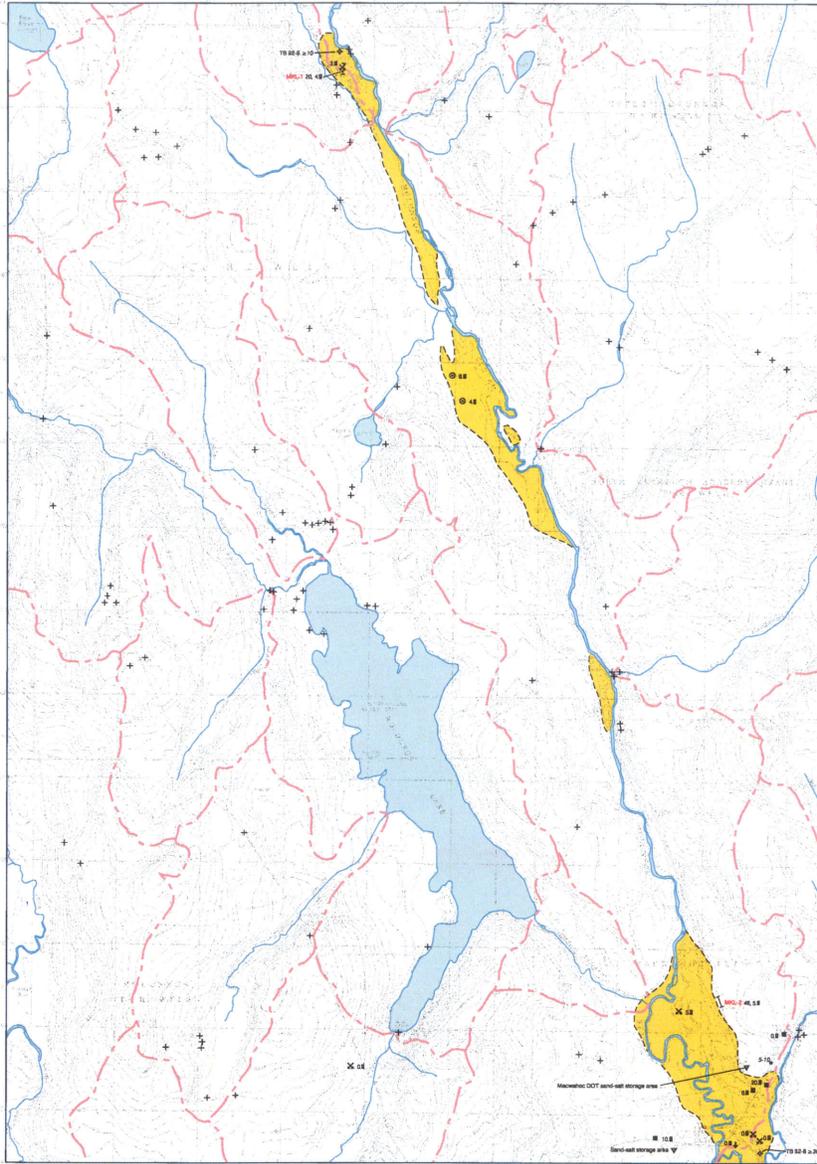


## Maine Geological Survey

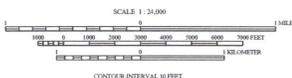
Address: 22 State House Station, Augusta, Maine 04333  
Telephone: 207-287-2801 E-mail: mgsl@maine.gov  
Home page: http://www.maine.gov/doc/mgsl/mgsl.htm

Open-File No. 01-161  
2001

# Significant Sand and Gravel Aquifers



Aquifer boundaries modified from: Irvine, A. J., and Locke, D. B., 1991, Sand and Gravel Aquifer Map #2, Maine Geological Survey, Open-File Map #01-001.  
Well inventory data collected by Maine Geological Survey, field workers during the 1997 field season.  
Drainage basin boundaries compiled by: U.S. Geological Survey, Maine River Basin Division, Augusta, Maine, with funding from the Merit 1-on-1 and Reauthorized Youth Authority.



Topographic base from U.S. Geological Survey, Molunkus Lake quadrangle, scale 1:25,000 using standard U.S. Geological Survey topographic projections.  
The use of symbols, lines, or block government names on this map as the location of any well does not constitute any responsibility for any ground or potential effects of the well's operation.

### SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)

- Approximate boundary of surficial deposits with significant unmineralized thickness where potential ground-water yield is moderate to excellent.
- Orange box: Surficial deposits with good to excellent potential ground-water yield. Yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone. Yield zones are based on subsurface data where available, and may vary from mapped extent in areas where data are unavailable.
- Yellow box: Surficial deposits with moderate to good potential ground-water yield. Yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone. Yields may exceed 10 gallons per minute in deposits lithologically connected with surface-water bodies, or in calcareous deposits where subsurface data are available.

### SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS (yields less than 10 gallons per minute)

- White box: Areas with moderate to low or no potential ground-water yield (includes areas underlain by till, marine deposits, carbon deposits, siltstone, or clays). These glacial sand and gravel deposits, or bedrock, yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

### SEISMIC-LINE INFORMATION

- Profiles for 12-channel seismic lines are shown in Appendix 7 of Open-File Report 97-1 (Locke and others, 1997). Length of 12-channel seismic lines is shown on the map in a scale. 12 single-channel lines ranged from 80 to 300 feet long and are not shown to scale.
- 83: Depth to bedrock, in feet below land surface.
  - 83: Depth to bedrock, exceeds depth shown (based on calculations).
  - 12: Depth to water level, in feet below land surface.
  - 19 02 0 15, 19 02 0 18, 19 02 0 19, 19 02 0 20, 19 02 0 21, 19 02 0 22, 19 02 0 23, 19 02 0 24, 19 02 0 25, 19 02 0 26, 19 02 0 27, 19 02 0 28, 19 02 0 29, 19 02 0 30, 19 02 0 31, 19 02 0 32, 19 02 0 33, 19 02 0 34, 19 02 0 35, 19 02 0 36, 19 02 0 37, 19 02 0 38, 19 02 0 39, 19 02 0 40, 19 02 0 41, 19 02 0 42, 19 02 0 43, 19 02 0 44, 19 02 0 45, 19 02 0 46, 19 02 0 47, 19 02 0 48, 19 02 0 49, 19 02 0 50, 19 02 0 51, 19 02 0 52, 19 02 0 53, 19 02 0 54, 19 02 0 55, 19 02 0 56, 19 02 0 57, 19 02 0 58, 19 02 0 59, 19 02 0 60, 19 02 0 61, 19 02 0 62, 19 02 0 63, 19 02 0 64, 19 02 0 65, 19 02 0 66, 19 02 0 67, 19 02 0 68, 19 02 0 69, 19 02 0 70, 19 02 0 71, 19 02 0 72, 19 02 0 73, 19 02 0 74, 19 02 0 75, 19 02 0 76, 19 02 0 77, 19 02 0 78, 19 02 0 79, 19 02 0 80, 19 02 0 81, 19 02 0 82, 19 02 0 83, 19 02 0 84, 19 02 0 85, 19 02 0 86, 19 02 0 87, 19 02 0 88, 19 02 0 89, 19 02 0 90, 19 02 0 91, 19 02 0 92, 19 02 0 93, 19 02 0 94, 19 02 0 95, 19 02 0 96, 19 02 0 97, 19 02 0 98, 19 02 0 99, 19 02 0 100: Two-channel seismic line, with depth to bedrock and depth to water shown at the midpoint of the line, in feet below land surface.
  - 89, 12: Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface.
  - 72, 12: Single-channel seismic line, with depth to bedrock and depth to water shown at one end of the line, in feet below land surface.
- The letter identifier for a line is an abbreviation for the topographic quadrangle. If the letter identifier for the line is followed by a number (ex. MAP-1, MAP-2), the line is a 12-channel line. If the identifier is followed by a letter (ex. MAP-P, MAP-P1), the line is a single-channel line. Single-channel seismic interpretations by E. B. Lewis. Two-channel seismic interpretations by C. D. Neill.

### GEOLOGIC AND WELL INFORMATION

- 80: Depth to bedrock, in feet below land surface.
- 81: Penetration depth of boring, in feet below land surface to bedrock based on boring depth or refusal.
- 82: Depth to water level in foot below land surface (observed in well, spring, test boring, pit, or seismic line).
- X: Gray pit (or overburden thickness noted in feet, e.g. 5-12).
- Q: Quarry.
- 4 GPM: Yield (flow) of well or spring in gallons per minute (GPM).
- ↓: Spring, with general direction of flow.
- ⊕: Drilled overburden well.
- : Dig well.
- ⊕: Observation well (inspect well if labeled, noninspect well if unlabeled).
- ⊕: Test boring (inspect boring if labeled, noninspect boring if unlabeled).
- ⊕: Deviation point.
- ⊕: Test pit.
- ⊕: Drilled bedrock well.
- ⊕: Potential point source of ground-water contamination.
- ⊕: Bedrock outcrop.
- ⊕: Surface-water drainage-basin boundary, surface-water divides generally correspond to ground-water divides. Directional direction of ground-water flow generally is away from divide and toward surface-water bodies.

### OTHER SOURCES OF INFORMATION

1. Locke, D. B., Neill, C. D., and Nichols, W. J., Jr., 1997, Hydrogeology and water quality of significant sand and gravel aquifers in parts of a section, Penobscot and Washington Counties, Maine. Maine Geological Survey, Open-File Report 97-41, 91 p.
2. Locke, D. B., 2001, Surficial materials of the Molunkus Lake quadrangle, Maine. Maine Geological Survey, Open-File Map #01-161.
3. Neuman, W. A., and Holland, W. R., 1981, Reconnaissance surficial geology of the Maine making 1:50,000 scale, Maine. Maine Geological Survey, Open-File Map #1-43.

4. Caspell, W. B., 1987, Ground-water handbook for the state of Maine, Second Edition. Maine Geological Survey, Bulletin 39, 115 p.
5. Thompson, W. B., 1979, Surficial geology handbook for central Maine. Maine Geological Survey, 69 p. (not for sale).
6. Thompson, W. B., and Lewis, H. W., Jr., 1985, Surficial geologic map of Maine. Maine Geological Survey, scale 1:50,000.

# Reed Pond Quadrangle, Maine

Compiled by  
Craig D. Neil and Daniel B. Locke  
Preliminary aquifer boundaries mapped by  
Daniel B. Locke

Digital cartography by  
Susan S. Tolman

Robert G. Marvinney  
State Geologist

Cartographic design and editing by  
Robert D. Tucker

Funding for the preparation of this map was provided in part by the  
U. S. Geological Survey.

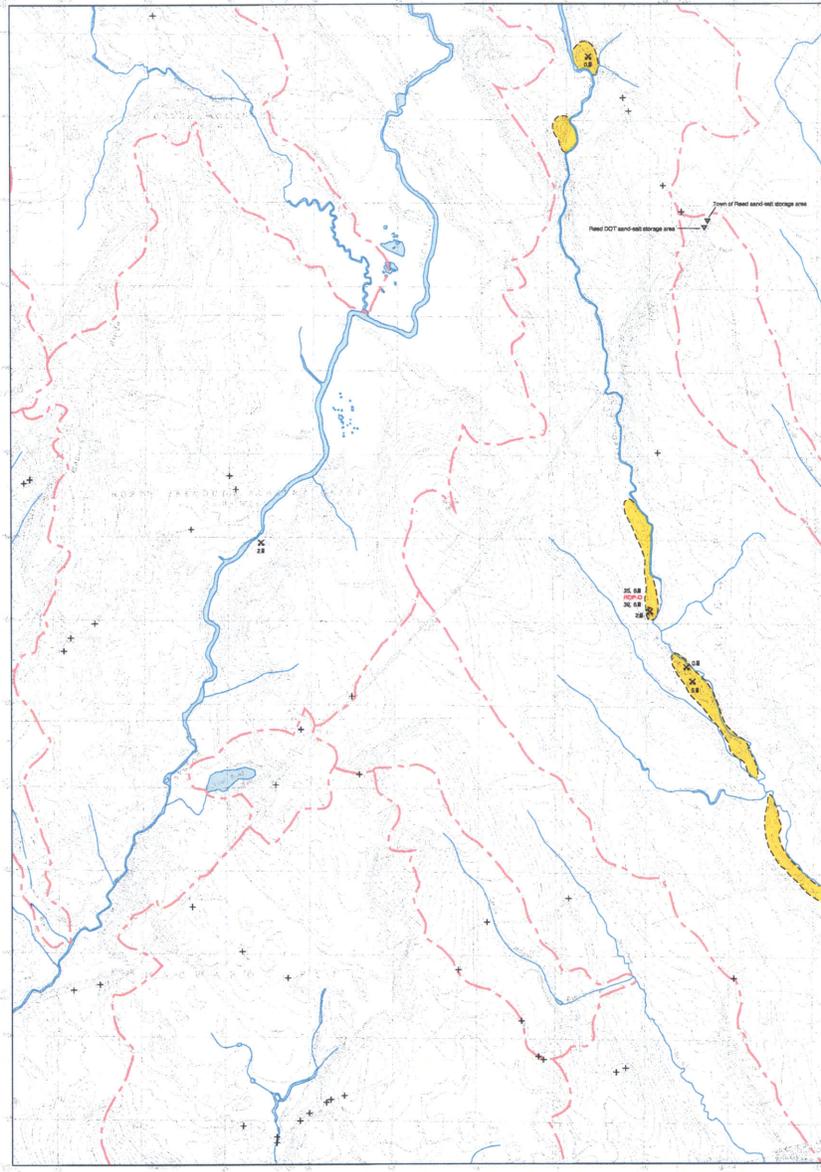


## Maine Geological Survey

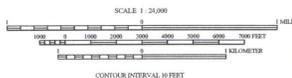
Address: 22 State House Station, Augusta, Maine 04333  
Telephone: 207-287-2001 E-mail: mgd@maine.gov  
Home page: http://www.maine.gov/boc/nrm/renr/mc.htm

Open-File No. 01-216  
2001

# Significant Sand and Gravel Aquifers



Aquifer boundaries modified from: Bohlen, A. J., and Locke, D. B., 1991, Sand and Gravel Aquifer Map #27, Maine Geological Survey, Open-File Map #27, scale 1:50,000.  
Well inventory data collected by Maine Geological Survey field assistants during the 1992 field season.  
Quadrangle base boundaries compiled by U.S. Geological Survey, Maine Resource Inventory, Augusta, Maine, with funding from the Mineral Lands and Reclamation Work Authority.



Topographic base from U.S. Geological Survey, Reed Pond quadrangle, scale 1:25,000 map, dated 1953. Contour interval 20 feet.  
The use of arbitrary lines or local government names on this map is for location purposes only and does not constitute any representation by any person or organization as to the validity of such names.

- ### SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)
- Approximate boundary of surficial deposits with significant saturated thickness whose potential ground-water yields in meadows to cropland.
  - Surficial deposits with good to excellent potential ground-water yield; yields generally greater than 50 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone; yield areas are based on subsurface data where available, and may vary from mapped extent in areas where data are unavailable.
  - Surficial deposits with moderate to good potential ground-water yield; yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone; yields may exceed 50 gallons per minute in deposits hydraulically connected with surface-water bodies, or in calcareous deposits where subsurface data are available.
- ### SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS (yields less than 10 gallons per minute)
- Areas with moderate to low or no potential ground-water yield (includes areas underlain by till, moraine deposits, rotten deposits, siltstone, ironstone, thin glacial sand and gravel deposits, or bedrock); yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

- ### SEISMIC-LINE INFORMATION
- Profiles for 13-channel seismic lines are shown in Appendix 2 of Open-File Report 97-4 (Locke and others, 1997). Length of 13-channel seismic lines is shown on the map in its scale. All single-channel lines ranged from 90 to 700 feet long and are not shown to scale.
- 82 Depth to bedrock, in feet below land surface.
  - 83 Depth to bedrock, exceeds depth shown (based on calculations).
  - 12 Depth to water level, in feet below land surface.
  - MAP-7 131, 123 Two-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface.
  - 69, 12 99, 12 9 Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line identifier box refers to the northern end of the seismic line.
- The 3-letter identifier for a line is an alpha series for the topographic quadrangle; if the 3-letter identifier for the line is followed by a number (e.g., MAP-7, MAP-1), the line is a 13-channel line. If the identifier is followed by a letter (e.g., MAP-12, MAP-P), the line is a single-channel line. Single-channel seismic interpretation by E. B. Lewis. Two-channel seismic interpretation by C. D. Neil.

- ### GEOLOGIC AND WELL INFORMATION
- 50 Depth to bedrock, in feet below land surface.
  - 60 Penetration depth of boring, a symbol refers to maximum depth to bedrock based on boring depth or refusal.
  - 6 W Depth to water level in feet below land surface (observed in well, spring, test boring, pit, or stream bed).
  - X Great pit (overburden thickness stated in feet, e.g., 5-12).
  - Q Quarry.
  - 4 GPM Yield (flow) of well or spring in gallons per minute (GPM).
  - S Spring, with general direction of flow.
  - D Drilled overburden well.
  - W Dig well.
  - O Observation well (project well if labeled, nonproject well if unlabeled).
  - W Test boring (project boring if labeled, nonproject boring if unlabeled).
  - D Data point.
  - T Test pit.
  - D Drilled bedrock well.
  - W Potential point source of ground-water contamination.
  - W Bedrock outcrop.
- Surface-water drainage-basin boundary; surface-water divides generally correspond to ground-water divides. Directional direction of ground-water flow generally is away from divides and toward surface-water bodies.

### OTHER SOURCES OF INFORMATION

- Locke, D. B., Neil, C. D., and Nichols, W. J., Jr., and Hinkle, T. R., 1997, Hydrogeology and water quality of significant sand and gravel aquifers in parts of Ansonia, Penobscot, and Washington Counties, Maine. Maine Geological Survey, Open-File Report 97-4, 9 p.
- Locke, D. B., 2001, Surficial materials of the Reed Pond quadrangle, Maine. Maine Geological Survey, Open-File Map#01-217.
- Holland, W. R., 1986, Reconnaissance surficial geology of the Wiscasset 15' quadrangle, Maine. Maine Geological Survey, Open-File Map#01-27.
- Conrad, W. D., 1987, Ground-water handbook for the state of Maine. Second Edition. Maine Geological Survey, Bulletin 91, 115 p.
- Thompson, W. R., 1979, Surficial geology handbook for central Maine. Maine Geological Survey, 69 p. (not for sale).
- Thompson, W. R., and Brown, H. W., Jr., 1985, Surficial geologic map of Maine. Maine Geological Survey, scale 1:50,000.



## Alder Brook Quadrangle, Maine

Compiled by  
**Craig D. Neil and Daniel B. Locke**  
Preliminary aquifer boundaries mapped by  
**Daniel B. Locke**

Digital cartography by  
**Michael E. Foley**

Cartographic design and editing by  
**Robert G. Harvitzney**  
Stacy Cartographer  
**Robert D. Tucker**

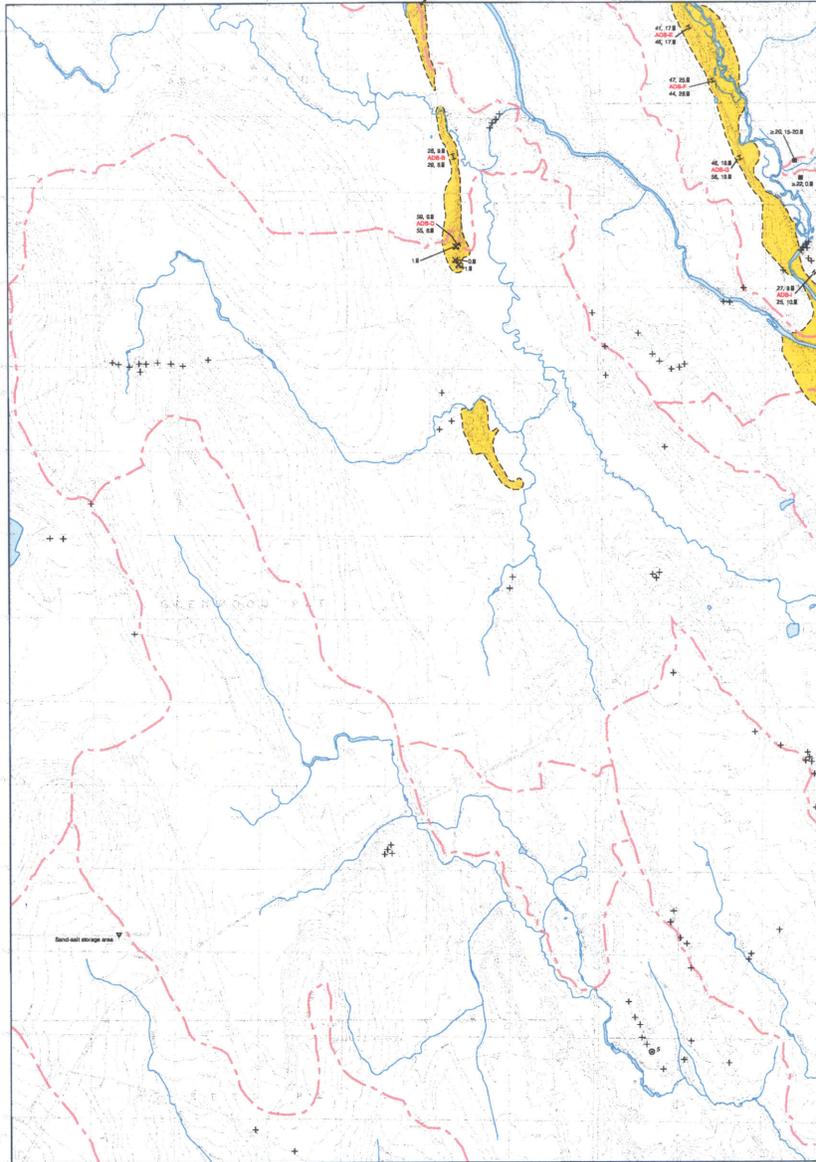
Funding for the preparation of this map was provided in part by the  
U. S. Geological Survey.



**Maine Geological Survey**  
Address: 22 State House Station, Augusta, Maine 04333  
Telephone: 207-287-2001 E-mail: mgsl@maine.gov  
Home page: http://www.maine.gov/oc/mgsl/mgsl.html

**Open-File No. 01-1  
2001**

# Significant Sand and Gravel Aquifers



Aquifer boundaries modified from: Esham, A. L., and Locke, D. B., 1991, Sand and Gravel Aquifers Map 43, Maine Geological Survey, Open-File Map MGSL-43, 1:50,000.

Well inventory data collected by Maine Geological Survey field assistants during the 1992-2001 season.

Topographic base from U.S. Geological Survey, Water Resources Division, Augusta, Maine, with reading from the Maine 7.5-Minute Quadrangle, Water Authority.

SCALE 1:24,000

0 1000 2000 3000 4000 5000 6000 7000 FEET

0 1 2 3 4 5 6 KILOMETER

CONTour INTERVAL IN FEET

Quadrangle Location

Topographic base from U.S. Geological Survey, Alder Brook Quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of aquifer, well, or bedrock information on this map is for locating purposes only and does not constitute a warranty of accuracy or a statement of fact.

### SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)

Approximate boundary of surficial deposits with significant saturated thickness where potential ground-water yield is moderate to excellent.

Surficial deposits with good to excellent potential ground-water yield yields generally greater than 50 gallons per minute in a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone. Yield areas are based on subsurface data where available, and may vary from mapped extent in areas where data are unavailable.

Surficial deposits with moderate to good potential ground-water yield yields generally greater than 10 gallons per minute in a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone. Yields may exceed 50 gallons per minute in deposits that are hydraulically connected with surface-water bodies, or in extensive deposits where subsurface data are available.

### SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS (yields less than 10 gallons per minute)

Areas with moderate to low or no potential ground-water yield includes areas underlain by till, massive deposits, certain deposits, alluvium, terraces, thin glacial sand and gravel deposits, or bedrock. Yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

### SEISMIC-LINE INFORMATION

Profiles for 12-channel seismic lines are shown in Appendix 2 of Open-File Report 97-4 (Locke and others, 1997). Length of 12-channel seismic lines is shown on the map in its scale. All single-channel lines exceed from 50 to 100 feet long and are not shown on scale.

53 Depth to bedrock, in feet below land surface.

55 Depth to bedrock, exceeds depth shown (based on calculations).

12 \* Depth to water level, in feet below land surface.

1-2-3-4 \* 12-Channel seismic line: with depth to bedrock and depth to water shown at the midpoint of the line, in feet below land surface.

69-12 \* Single-channel seismic line: with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line-identifier box refer to the northern end of the seismic line.

The 3-letter identifier for a line is in above cases for the topographic quadrangle. If the 3-letter identifier for the line is followed by a number (on MAP 7, MAP 1), the line is a 12-channel line. If the identifier is followed by a letter (on MAP 1, MAP-P), the line is a single-channel line. Single-channel seismic interpretations by E. D. Lewis. Twelve-channel seismic interpretations by C. D. Neil.

### GEOLOGIC AND WELL INFORMATION

56 Depth to bedrock, in feet below land surface.

510 Penetration depth of boring, a symbol refers to minimum depth to bedrock based on boring depth or refusal.

6 \* Depth to water level in feet below land surface (observed in well, spring, test boring, etc. or estimated).

X Core of pebbles (or other debris) thickness noted in feet, e.g., 5-12'.

X Quarry.

4 GPM Yield (flow) of well or spring in gallons per minute (GPM).

↓ Spring, with general direction of flow.

○ Drilled overbore well.

● Dug well.

⊕ Open-shaft well (project well if labeled, intercept well if unlabeled).

⊕ Test boring (project boring if labeled, nonproject boring if unlabeled).

○ Ditch or post.

○ Test pit.

○ Drilled bedrock well.

▼ Potential point source of ground-water contamination.

⊕ Bedrock outcrop.

↖ Surface-water drainage-basin boundary: surface-water divides generally correspond to groundwater divides. Reversal direction of groundwater flow generally is away from divides and toward surface-water bodies.

### OTHER SOURCES OF INFORMATION

1. Locke, D. B., Neil, C. D., and Nichols, W. J., and Thibault, T. E., 1997, Hydrogeology and water quality of significant sand and gravel aquifers in part of Ansonia, Foxcroft, and Washington Counties, Maine. Maine Geological Survey, Open-File Report 97-44, 11 p.
2. Locke, D. B., 2001, Surficial materials of the Alder Brook quadrangle, Maine. Maine Geological Survey (Open-File Map 01-1).
3. Newman, W. A., 1986, Reconnaissance surficial geology of the Maine-ontario Lake 17 quadrangle, Maine. Maine Geological Survey, Open-File Map 80-16.
4. Corwell, W. B., 1987, Ground water handbook for the state of Maine, Second Edition. Maine Geological Survey, Bulletin 79, 115 p.
5. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine. Maine Geological Survey, 68 p. (not for sale).
6. Thompson, W. B., and Brown, H. W., Jr., 1983, Surficial geologic map of Maine. Maine Geological Survey, scale 1:50,000.

# Haynesville Quadrangle, Maine

Compiled by  
Craig D. Neil and Daniel B. Locke  
Preliminary aquifer boundaries mapped by  
Daniel B. Locke

Digital cartography by  
Michael E. Foley

Robert G. Marvinney  
State Geologist

Cartographic design and editing by  
Robert D. Tucker

Funding for the preparation of this map was provided in part by the  
U. S. Geological Survey.

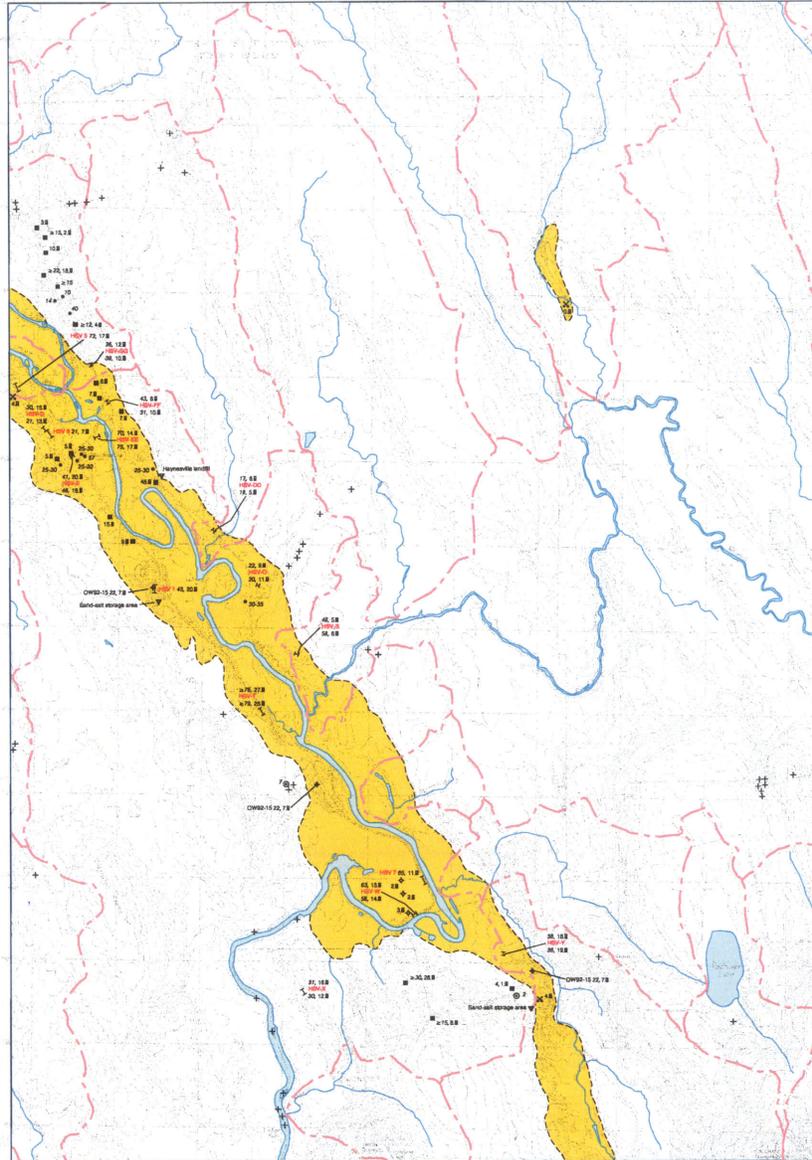


## Maine Geological Survey

Address: 22 State House Station, Augusta, Maine 04333  
Telephone: 207-287-2001 E-mail: mgso@maine.gov  
Home page: <http://www.maine.gov/soctm/mgso.htm>

Open-File No. 01-90  
2001

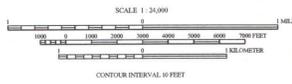
# Significant Sand and Gravel Aquifers



Aquifer boundaries modified from: Johnson, S. J., and Locke, D. B., 1991, Sand and Gravel Aquifer Map of the Haynesville Quadrangle, Maine, Open-File Map MA-90-1, 1:24,000.

Well inventory data collected by Maine Geological Survey field assistants during the 1972 field season.

Quadrangle base hydrostratigraphic map compiled by U.S. Geological Survey, Maine Resource Assessment, Augusta, Maine, with funding from the Mineral Lands Level Reauthorization, Wash. Authority.



Topographic base from U.S. Geological Survey 1:250,000 contour map, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of symbols, lines, or text government names on this map is for location purposes only and does not constitute an endorsement by any process or product, effective in the United States.

- ### SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)
- Approximate boundary of surficial deposits with significant saturated thickness where potential ground-water yield is moderate to excellent.
  - Surficial deposits with good to excellent potential ground-water yield; yields generally greater than 30 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone; yields may be based on subsurface data where available, and may vary from mapped extent to areas where data are unavailable.
  - Surficial deposits with moderate to good potential ground-water yield; yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone; yields may exceed 30 gallons per minute to deposits that are hydraulically connected with surface-water bodies, or in extensive deposits where subsurface data are available.
- ### LESS FAVORABLE AQUIFER CHARACTERISTICS (yields less than 10 gallons per minute)
- Areas with moderate to low or no potential ground-water yield (includes areas underlain by till, marine deposits, other deposits, siltstone, clays, thin glacial sand and gravel deposits, or bedrock); yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

- ### SEISMIC-LINE INFORMATION
- Profiles for 12-channel seismic lines are shown in Appendix 2 of Open-File Report 97-11 (Locke and others, 1997). Length of 12-channel seismic lines is shown on the map in its scale. All single-channel lines ranged from 50 to 150 feet long and are not shown to scale.
- 83 Depth to bedrock, in feet below land surface.
  - 253 Depth to bedrock, cross-bed depth shown (based on calculations).
  - 12.8 Depth to water level, in feet below land surface.
  - 1-87, 12.2 Two-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface.
  - 49, 12.2 Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line identifier box refers to the northern end of the seismic line.
  - 72, 12.2
- The 1-kilometer identifier for a line is an abbreviation for the topographic quadrangle; if the 1-kilometer identifier for the line is followed by a number (e.g., MAP-7, MAP-1), the line is a 12-channel line. If the identifier is followed by a letter (e.g., MAP-7, MAP-7A), the line is a single-channel line. Single-channel seismic interpretation by E. P. Levin. Two-channel seismic interpretation by C. D. Neil.

- ### GEOLOGIC AND WELL INFORMATION
- 50 Depth to bedrock, in feet below land surface.
  - 122 Penetration depth of boring, or symbol refers to minimum depth to bedrock based on boring depth or refusal.
  - 62 Depth to water level in feet below land surface (observed in well, spring, test boring, pit, or ocean line).
  - X Grav pit (overburden thickness noted in feet, e.g., 5-12').
  - 4 Quarry.
  - 4 GPM Yield (flow) of well or spring in gallons per minute (GPM).
  - Spring, with general direction of flow.
  - Drilled overburden well.
  - Dug well.
  - Observation well (project well if labeled, nonproject well if unlabeled).
  - Test boring (project boring if labeled, nonproject boring if unlabeled).
  - Dirt core post.
  - Test pit.
  - Drilled bedrock well.
  - Potential point source of ground-water contamination.
  - Bedrock outcrop.
  - Surface-water drainage-basin boundary; surface-water divides generally correspond to ground-water divides. Directional direction of ground-water flow generally is away from divides and toward surface-water bodies.

### OTHER SOURCES OF INFORMATION

- Locke, D. B., Neil, C. D., and Nichols, W. J., Jr., and Madala, T. K., 1997, Hydrogeology and water quality of significant sand and gravel aquifers in parts of Ansonia, Penobscot, and Washington Counties, Maine. Maine Geological Survey, Open-File Report 97-11, 1 p.
- Locke, D. B., 2001, Surficial sands of the Haynesville quadrangle, Maine. Maine Geological Survey, Open-File Map 01-90-2.
- Beeson, T., 1988, Reconnaissance surficial geology of the Anson 15' quadrangle, Maine. Maine Geological Survey, Open-File Map 88-2.
- Cornell, W. B., 1987, Ground water handbook for the state of Maine, Second Edition. Maine Geological Survey, Bulletin 19, 133 p.
- Thompson, W. B., 1979, Surficial geology handbook for coastal Maine. Maine Geological Survey, 56 p. (not of print).
- Thompson, W. B., and Brown, H. W., Jr., 1985, Surficial geology map of Maine. Maine Geological Survey, scale 1:50,000.

# Ten-Mile Lake Quadrangle, Maine

Compiled by:  
Craig D. Neil and Daniel B. Locke  
Preliminary aquifer boundaries support by:  
Daniel B. Locke

Digital cartography by:  
Susan S. Tolman

Robert G. Marvinney  
State Geologist

Cartographic design and editing by:  
Robert D. Tucker

Funding for the preparation of this map was provided in part by the  
U. S. Geological Survey.

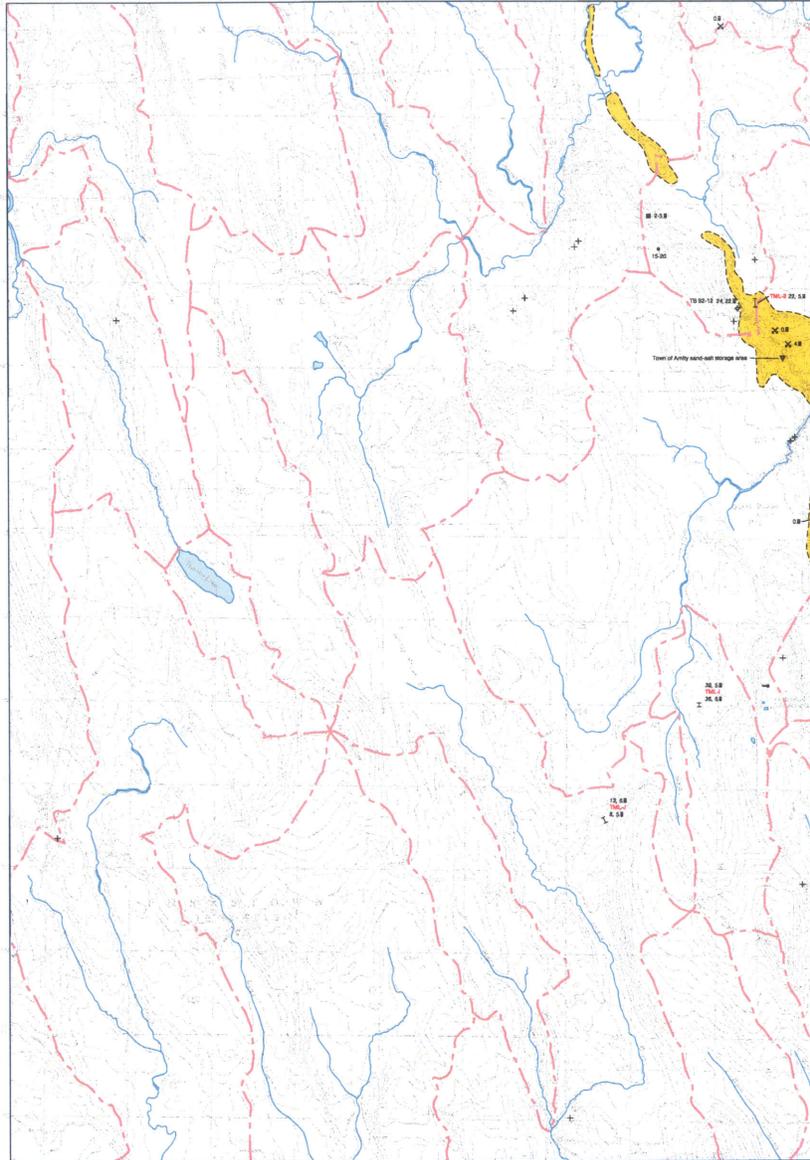


## Maine Geological Survey

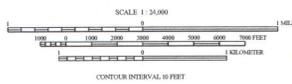
Address: 22 State House Station, Augusta, Maine 04333  
Telephone: 207-287-2901 E-mail: mgps@maine.gov  
Home page: http://www.maine.gov/boc/mr/mgms.htm

Open-File No. 01-252  
2001

# Significant Sand and Gravel Aquifers



Aquifer boundary modification from: Edman, A. J., and Lockett, J. M., 1991. Revised Geologic Map of Maine Geological Survey, Open-File Map 97-14, scale 1:50,000.  
Well location data collected by Maine Geological Survey, field assistants during the 1992 field season.  
Drainage basin boundaries compiled by U.S. Geological Survey, Water Resources Division, Augusta, Maine, with funding from the Maine and Great Lakes Water Authority.



Topographic base from U.S. Geological Survey, Ten-Mile Lake quadrangle, scale 1:25,000, using standard U.S. Geological Survey topographic map symbols.  
The use of industry data, or local government sources on this map is for reference purposes only and does not constitute any public responsibility for any present or potential effects on the natural environment.

- ### SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)
- Approximate boundary of surficial deposits with significant saturated thickness where potential ground-water yield is moderate to excellent.
  - Surficial deposits with good to excellent potential ground-water yield (yields generally greater than 50 gallons per minute to a properly constructed well). Deposits consist primarily of glacial sand and gravel, but can include some of sandy silt and siltstone; yield rates are based on subsurface data where available, and may vary from mapped extent to areas where data are unavailable.
  - Surficial deposits with moderate to good potential ground-water yield (yields generally greater than 10 gallons per minute to a properly constructed well). Deposits consist primarily of glacial sand and gravel, but can include some of sandy silt and siltstone; may exceed 50 gallons per minute in deposits hydraulically connected with surface-water bodies, or in extensive deposits where subsurface data are available.
- ### SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS
- (Yields less than 10 gallons per minute)
- Areas with moderate to low or no potential ground-water yield (includes areas underlain by till, massive deposits, carbonaceous siltstone, or areas where glacial sand and gravel deposits are bedrock yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well).

- ### SEISMIC-LINE INFORMATION
- Profiles for 13-channel seismic lines are shown in Appendix 7 of Open-File Report 97-14 (Locke and others, 1997). Length of 13-channel seismic lines is shown on the map. All single-channel lines range from 80 to 160 feet long and are not shown to scale.
- 59 Depth to bedrock, in feet below land surface.
  - 59 Depth to bedrock, exceeds depth shown (based on calculations).
  - 12 Depth to water level, in feet below land surface.
  - MAP-1 137, 23 Two-channel seismic line, with depth to bedrock and depth to water shown at midpoint of the line, in feet below land surface.
  - 49, 12 Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line-alongshore box refers to the northern end of the seismic line.
- The 3-letter identifier for a line is an abbreviation for the topographic quadrangle; if the 3-letter identifier for the line is followed by a number (e.g., MAP-1), the line is a 13-channel line. If the identifier is followed by a letter (e.g., MAP-1A), the line is a single-channel line. Single-channel seismic interpretation by E. B. Lewis. Two-channel seismic interpretation by C. D. Neil.

- ### GEOLOGIC AND WELL INFORMATION
- 59 Depth to bedrock, in feet below land surface.
  - 13 Penetration depth of boring, as a symbol refers to minimum depth to bedrock based on boring depth or refusal.
  - 6.0 Depth to water level in feet below land surface (observed in well, spring, test boring, pit, or seepage line).
  - X Grav pit (on overburden thickness noted in feet, e.g., 5-12').
  - Q Quarry.
  - 4 GPM Yield (flow) of well or spring in gallons per minute (GPM).
  - Spring, with general direction of flow.
  - Drilled overburden well.
  - Dug well.
  - Observation well (project well if labeled, nonproject well if unlabeled).
  - Ten boring (project boring if labeled, nonproject boring if unlabeled).
  - Den on peak.
  - Test pit.
  - Drilled bedrock well.
  - Potential point source of ground-water contamination.
  - Bedrock outcrop.
- Surface-water drainage-basin boundary; surface-water divides generally conform to ground-water divides. Directional direction of groundwater flow generally is away from divides and toward surface-water bodies.

### OTHER SOURCES OF INFORMATION

- Locke, D. B., Neil, C. D., and Nichols, W. J., Jr., and Waddle, T. K., 1997. Hydrogeology and water quality of significant sand and gravel aquifers to parts of Ansonia, Freeborn, and Washington Counties, Maine. Maine Geological Survey, Open-File Report 97-14, 19 p.
- Locke, D. B., 2001. Surficial materials of the Ten-Mile Lake quadrangle, Maine. Maine Geological Survey Open-File Map 01-251.
- Price, T., 1986. Reconnaissance surficial geology of the Amy 15' quadrangle, Maine. Maine Geological Survey, Open-File Map 86-2.
- Cornell, W. B., 1987. Ground water handbook for the state of Maine, Second Edition. Maine Geological Survey, Bulletin 19, 135 p.
- Thompson, W. B., 1979. Surficial geology handbook for coastal Maine. Maine Geological Survey, MP (not for sale).
- Thompson, W. B., and Brown, W. W., Jr., 1985. Surficial geologic map of Maine. Maine Geological Survey, scale 1:50,000.



# East Winn Quadrangle, Maine

Compiled by  
Lauren E. Foster and Troy T. Smith  
Preliminary aquifer boundaries mapped by  
Glenn C. Prescott, Jr.

Digital cartography by  
Michael E. Foley

Robert G. Marvinney  
State Geologist

Cartographic design and editing by  
Robert D. Tucker

Funding for the preparation of this map was provided in part by the  
Maine Department of Environmental Protection and the U. S. Geological Survey.

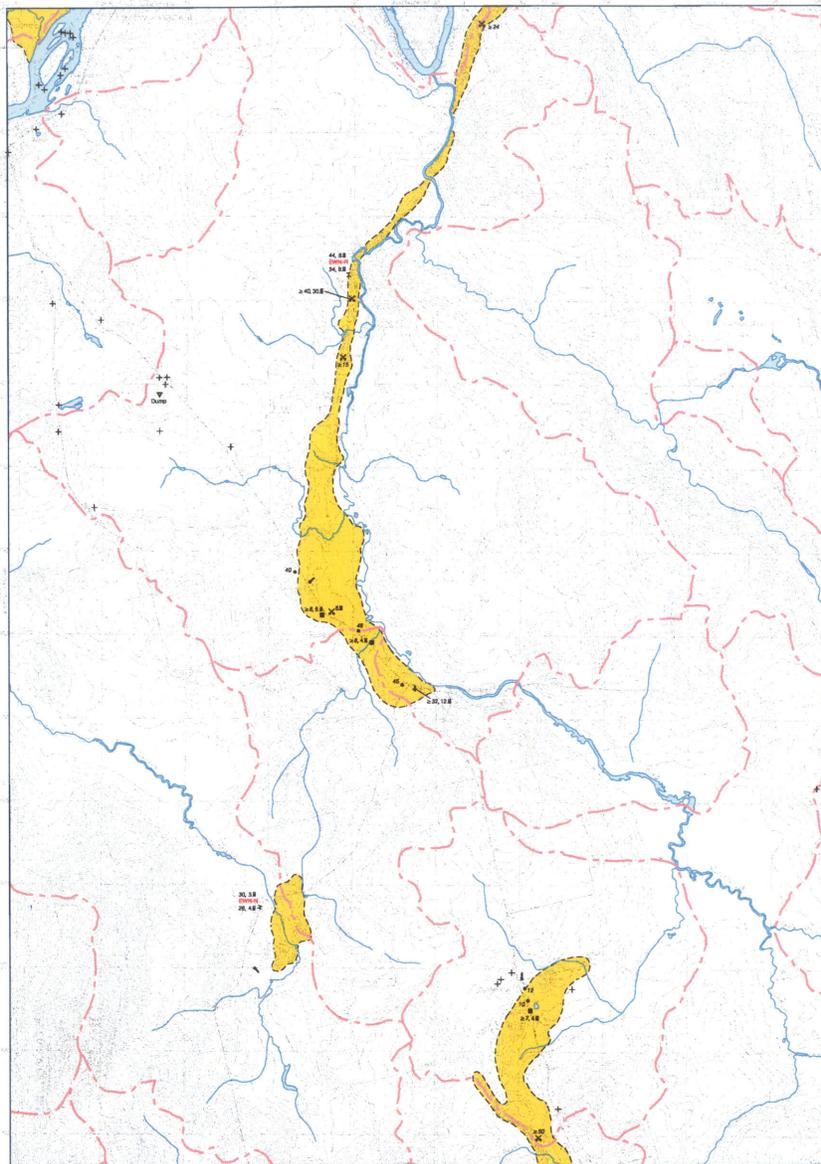


## Maine Geological Survey

Address: 22 State House Station, Augusta, Maine 04333  
Telephone: 207-287-2001 E-mail: mgd@maine.gov  
Home page: http://www.maine.gov/soe/nrm/mcrr/mcrr.htm

Open-File No. 01-62  
2001

# Significant Sand and Gravel Aquifers



Acquifer boundaries modified from: Adams, A. J., and Smith, J. M. 1991. Sand and Gravel Aquifer Map #9. Maine Geological Survey, Open-File Map #1-77, scale 1:50,000.  
Well locations data collected by Maine Geological Survey field assistants during the 1985 field season.  
Drainage basin boundaries compiled by U.S. Geological Survey, Maine Resource Division, Augusta, Maine, with borrow from the Maine Land and Water Use Inventory Authority.  
Quadrangle Location

SCALE 1:25,000  
CONTOUR INTERVAL: 10 FEET

Topographic lines from U.S. Geological Survey, East Winn quadrangle, scale 1:50,000 using contour 1:5. Geological Survey topographic map symbols.  
The use of symbols, lines, or block patterns on this map as the bearing primary only and does not constitute any guarantee for any purpose or represent effects of the natural resources.

- SIGNIFICANT SAND AND GRAVEL AQUIFERS**  
(yields greater than 10 gallons per minute)
- Approximate boundary of surficial deposits with significant saturated thickness where potential ground-water yield is moderate to excellent.
  - Surficial deposits with good to excellent potential ground-water yield. Yields generally greater than 50 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone; yield areas are based on subsurface data where available, and may vary from mapped extent in areas where data are unavailable.
  - Surficial deposits with moderate to good potential ground-water yield. Yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and siltstone; yields may exceed 10 gallons per minute in deposits that are hydraulically connected with surface-water bodies, or in extensive deposits where subsurface data are available.
- SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS**  
(yields less than 10 gallons per minute)
- Areas with moderate to low or no potential ground-water yield (includes areas underlain by till, moraine deposits, rotten deposits, siltstone, ironstone, thin glacial sand and gravel deposits, or bedrock); yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

- SEISMIC-LINE INFORMATION**
- Profiles for 12-channel seismic lines are shown in Appendix 2 of Open-File Report 02-2 (Neil and others, 1992). Length of 12-channel seismic lines is shown on the map in scale. All single-channel lines ranged from 90 to 100 feet long and are not shown to scale.
- 80 Depth to bedrock, in feet below land surface.
  - 85 Depth to bedrock, exceeds depth shown (based on calculations).
  - 12 Depth to water level, in feet below land surface.
  - MAP-1 121.22 Two-channel seismic line, with depth to bedrock and depth to water shown at the midpoint of the line, in feet below land surface.
  - 89.12 Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Uppercase letters indicate data shown above the line; lowercase letters refer to the northern end of the seismic line.
  - 72.12 The 1-line identifier for a line is an abbrev. series for the topographic quadrangle; if the 3-letter identifier for the line is followed by a number (ex. MAP-1 MAP-1), the line is a 12-channel line. If the identifier is followed by a letter (ex. MAP-1 MAP-P), the line is a single-channel line. Single-channel seismic interpretations by T. T. Smith and C. D. Neil. Two-channel seismic interpretations by J. I. Sloggin.

- GEOLOGIC AND WELL INFORMATION**
- 80 Depth to bedrock, in feet below land surface.
  - 81 Penetration depth of boring, a shaded prefix to minimum depth to bedrock based on boring depth or refusal.
  - 82 Depth to water level in feet below land surface (observed in well, spring, test boring, pit, or casing line).
  - X Gravel pit (or overburden thickness noted in feet, e.g. 5-12)
  - Q Quarry
  - 4 GPM Yield (flow) of well or spring in gallons per minute (GPM)
  - S Spring, with general direction of flow
  - D Drilled overburden well
  - Dug well
  - Observation well (proper well if labeled, nonproper well if unlabeled)
  - Test boring (proper boring if labeled, nonproper boring if unlabeled)
  - Driveway
  - Test pit
  - Drilled bedrock well
  - Potential point source of ground-water contamination
  - Bedrock outcrop
  - Surface-water drainage-basin boundary; surface-water divides generally correspond to ground-water divides. Horizontal direction of ground-water flow generally is away from divides and toward surface-water bodies.

**OTHER SOURCES OF INFORMATION**

- Neil, C. D., Suter, J. L., and Wade, T. K., 1995. Hydrogeology and water quality of significant sand and gravel aquifers in parts of Ansonia, Hancock, Penobscot, Piscataquis, and Waldo Counties, Maine. Maine Geological Survey, Open-File Report 92-2, 7p.
- Prescott, G. C., Jr., 2001. Surficial geology of the East Winn quadrangle, Maine. Maine Geological Survey, Open-File Map #1-62.
- Holland, W. R., 1981. Reconnaissance surficial geology of the Winn 15' quadrangle, Maine. Maine Geological Survey, Open-File Map #1-29.
- Connell, W. D., 1987. Ground water handbook for the state of Maine, Second Edition. Maine Geological Survey, Bulletin 9, 115p.
- Thompson, W. B., 1979. Surficial geology handbook for coastal Maine. Maine Geological Survey, 8p. (not dated)
- Thompson, W. B., and Brown, H. W., Jr., 1985. Surficial geologic map of Maine. Maine Geological Survey, scale 1:50,000.