Wurtsmith Restoration Advisory Board Meeting

24 April 2019

Matt Marrs
AFCEC/CIB

Wurtsmith RAB Agenda

Welcome

- Introductions
- Stakeholder Updates

Presentations

- EGLE: GSI
- AF: Mission Street PTS

BREAK

- UXO & MMRP overview
- Wurtsmith Hydrogeology

AF Presentations

- Review Action Items
- Highlight OP changes

RAB Business

- Participants provide three-minute verbal comments

Public Comment

Wurtsmith RAB Ground Rules

01	Respect one another and maintain an atmosphere of open dialogue and exchange of ideas.
02	Use our time together efficiently, wisely and respectfully.
03	Speak clearly and succinctly one person at a time; avoid interrupting others.
04	Listen and remain open to differing points of view.
05	Maintain a propensity for progress: prepare, discuss, document and move forward.
06	Share information early, openly and honestly
07	Accurately and objectively relay to others the discussions that occur at board meetings.

Stakeholder Updates

Wurtsmith RAB Stakeholder Updates

Completed

- Conducted biennial MMRP, UXO stakeholder training
- Sampled **15** private DW wells
- Sampled **54** Monitoring Wells
- Submitted proposed plan for full-scale Biowall at **SS-72**
- Monitored transducers recently installed at **16** MWs
- CTS treated more than **62M** gallons of GW = **0.7lbs** of PFOS/PFOA

In progress

- Amending the DSMOA Cooperative Agreement (2018-20) Joint Execution Plan
- Collaborating with new Wurtsmith PM to ensure EGLE receives funding for expedited reviews of AF documents

Wurtsmith RAB Stakeholder Updates

- Welcome to new district ranger, Clint Emerson.
- Memorandum of Understanding with AF
- Initiation of PA/SI work by USFS on land in and around Clark's Marsh
- Beginning discussions on a Natural Resource Damage Assessment

- Discussions with EGLE regarding testing in Township

- EGLE: Michigan Department of Environment, Great Lakes and Energy
- Ongoing dispute resolution discussions
- Evaluating data collected from GW surface water pathway along west side of VE Lake; collecting water elevation info from MW transducers
- Compiling Remedial Investigation Report

Community RAB Members

- Community RAB events, activities and plans
- Improved transparency, timely info sharing w/ Community RAB & public
- D.C. highlights: State of the Union, meetings w/ Deputy Assistant Secretary of Defense for Environment, EPA & legislators
- Community work with MPART

Wurtsmith RAB Stakeholder Updates

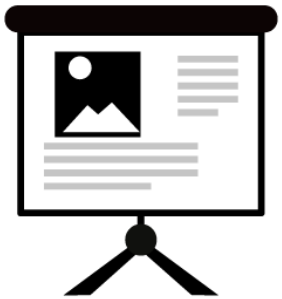
OWA

Oscoda Township Naturally

MDHHS

DHD2

Wurtsmith RAB



Presentations

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Groundwater Surface Water Interface an Introduction

Matt Baltusis

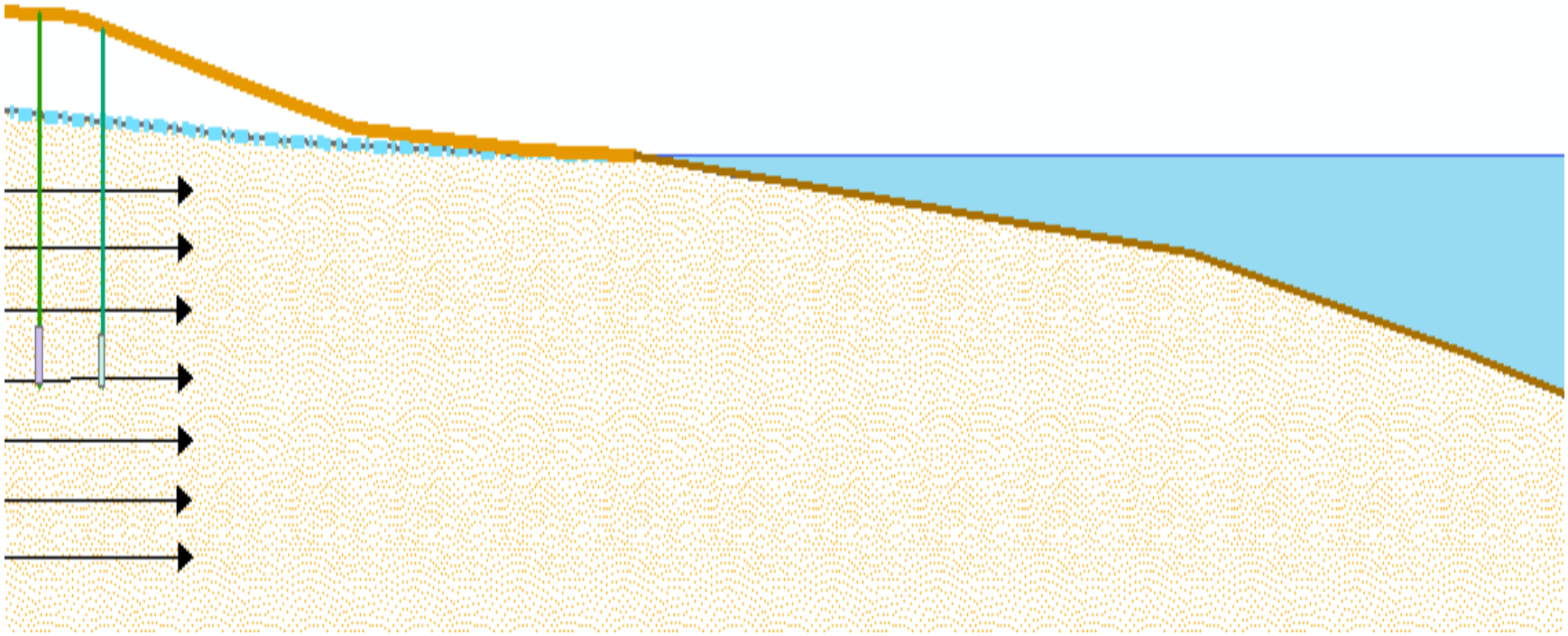
Remediation and Redevelopment

517-897-7524| mbaltusis@michigan.gov

Groundwater Surface Water Interface

- What is GSI?
  - GSI is the location where groundwater enters (vents) to a surface water body.

Groundwater-Surface Water Interface – Conceptual Site Model



Groundwater-Surface Water Interface – An Introduction

"The GSI pathway is relevant when a remedial investigation or application of best professional judgment leads to the conclusion that a hazardous substance in groundwater can be reasonably expected to vent to surface waters of the state in concentrations that exceed the generic GSI criteria currently or in the future."

Groundwater-Surface Water Interface – An Introduction

Criteria used for determining GSI at Van Etten Lake:

- Horizontal flow direction
- Groundwater concentrations above the GSI criteria
  - 12 parts per trillion for PFOS

Example of Monitoring Wells Used for Horizontal Flow Determination

Michigan Department of
Environment, Great Lakes, and Energy

800-662-9278
www.Michigan.gov/EGLE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Wurtsmith RAB
Mission Street

Ion Exchange Resin Treatment System

The Air Force selected an ion exchange resin system to treat GW discharged from Mission Street.

- ✓ Preserves additional treatment capacity at the CTS
- ✓ Quicker installation timeframe = treatment begins sooner
- ✓ Water chemistry allows smaller treatment system to be installed
- ✓ Reuse of existing building reduces construction footprint
- ✓ Ion exchange resin is predicted to last two years before change out

Treatment

200 gallons per minute

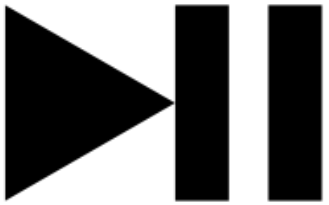
Cost

$1.5 million

Timeline

2019 Summer Construction

Wurtsmith RAB



Break

Munitions Are Dangerous

Follow the 3Rs of Explosives Safety

Recognize - when you may have encountered a munition.

Retreat - do not touch, move or disturb it, but carefully leave the area.

Report - call 911!

What are Munitions?

Munitions include:

Artillery
& Mortar
Rounds

Grenades

Bombs

Small Arms Ammunition

What are UXO?

What are Unexploded Ordnance?

- Munitions (ammo) that failed to function properly;
- Can be of any type;
- May just be a component of a munition (e.g., fuze or exposed explosive fill).

Some Munitions are Hard to Identify

Explosives may be encountered anywhere on an installation from previous military training.

Munitions Vary in Appearance

Munitions are dangerous regardless of appearance:

- Munition type, shape, size, age, or condition don't matter.
- Flares, simulators, and blasting caps are all dangerous.
- War souvenirs can be dangerous.

Artillery Projectile

New

Used

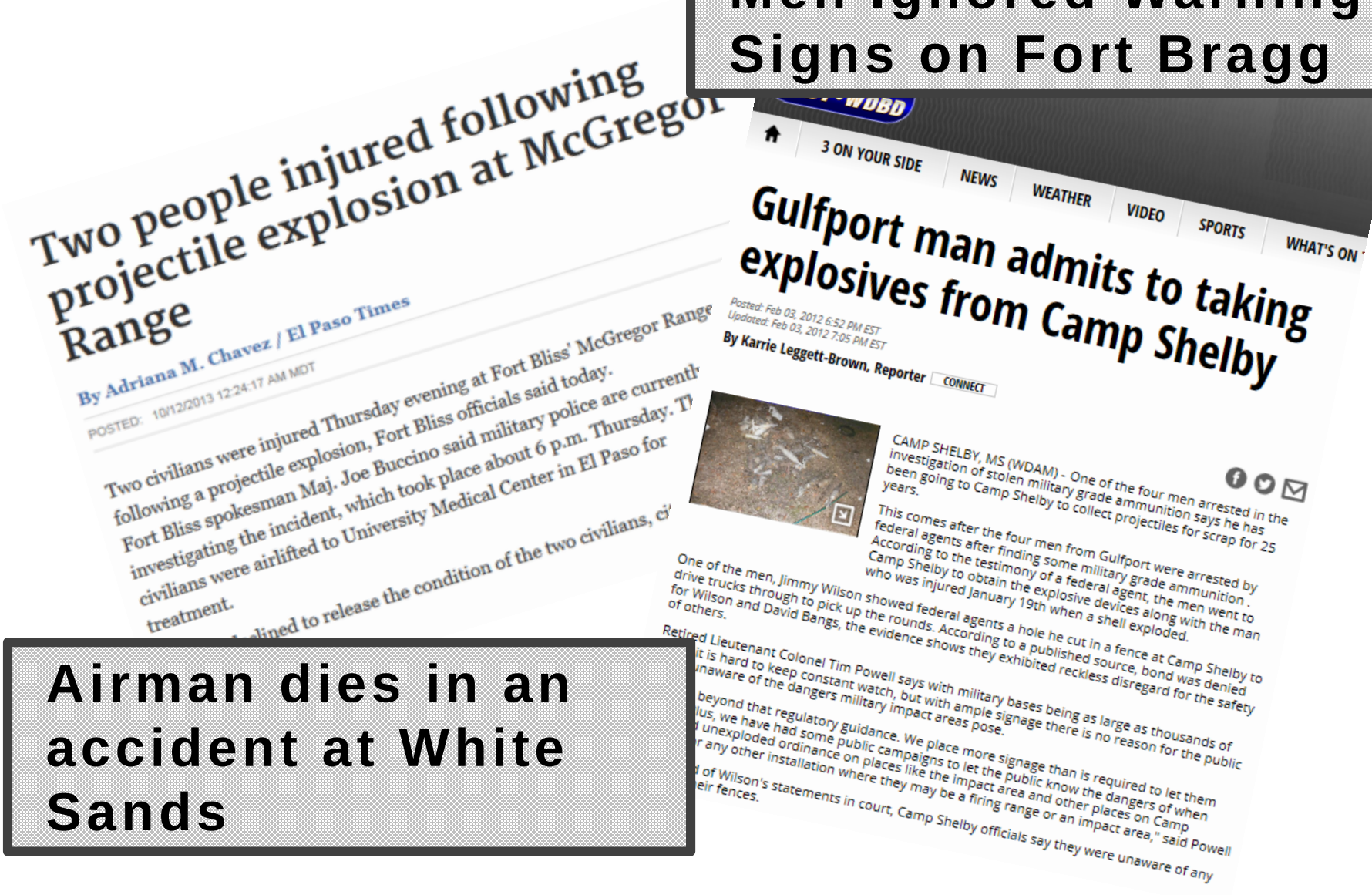
Rockets

New

Used

Recent Munitions Accidents

Men Ignored Warning Signs on Fort Bragg



Two people injured following projectile explosion at McGregor Range

By Adriana M. Chavez / El Paso Times

POSTED: 10/12/2013 12:24:17 AM MDT

Two civilians were injured Thursday evening at Fort Bliss' McGregor Range following a projectile explosion, Fort Bliss officials said today.

Fort Bliss spokesman Maj. Joe Buccino said military police are currently investigating the incident, which took place about 6 p.m. Thursday. The civilians were airlifted to University Medical Center in El Paso for treatment.

...lined to release the condition of the two civilians, ci...

WDBD

3 ON YOUR SIDE | NEWS | WEATHER | VIDEO | SPORTS | WHAT'S ON

Gulfport man admits to taking explosives from Camp Shelby

Posted: Feb 03, 2012 6:52 PM EST
Updated: Feb 03, 2012 7:05 PM EST

By Karrie Leggett-Brown, Reporter CONNECT

CAMP SHELBY, MS (WDAM) - One of the four men arrested in the investigation of stolen military grade ammunition says he has been going to Camp Shelby to collect projectiles for scrap for 25 years.

This comes after the four men from Gulfport were arrested by federal agents after finding some military grade ammunition . According to the testimony of a federal agent, the men went to Camp Shelby to obtain the explosive devices along with the man who was injured January 19th when a shell exploded.

One of the men, Jimmy Wilson showed federal agents a hole he cut in a fence at Camp Shelby to drive trucks through to pick up the rounds. According to a published source, bond was denied for Wilson and David Bangs, the evidence shows they exhibited reckless disregard for the safety of others.

Retired Lieutenant Colonel Tim Powell says with military bases being as large as thousands of ...it is hard to keep constant watch, but with ample signage there is no reason for the public ...unaware of the dangers military impact areas pose.

...beyond that regulatory guidance. We place more signage than is required to let them ...lus, we have had some public campaigns to let the public know the dangers of when ...unexploded ordinance on places like the impact area and other places on Camp ...r any other installation where they may be a firing range or an impact area," said Powell

...of Wilson's statements in court, Camp Shelby officials say they were unaware of any ...eir fences.

Airman dies in an accident at White Sands

Examples of Warning Signs

Trespassing on areas with warning signs or gates:

- may result in injury or death.
- is hazardous and prohibited by law.
- may result in substantial fines.

What to Do if You Encounter Munitions

- **Recognize** that munitions are dangerous

  Munitions may:

  - not look like a bullet or bomb.
  - look harmless, but they are dangerous.
  - be shiny or rusty.
  - be clean or dirty.

  Regardless of whether a munition has been moved, it may still explode. In fact, used munitions can be more dangerous than new.

What to Do if You Encounter Munitions

Retreat

- Do not approach, touch, move, or disturb; carefully leave area the same way you entered.
- In remote surroundings, mark general area where you encountered a munition so local authorities can locate. DO NOT go closer to munition when marking.

Report what you saw and where you saw it.

- Call 911
- Authorities will clear area and contact trained Explosives Ordnance Disposal (EOD) personnel to dispose of items.

DENIX Resources

DENIX
DoD Environment, Safety and Occupational Health Network and Information Exchange

What Is DENIX?

The DoD Environment, Safety & Occupational Health Network and Information Exchange (DENIX) is a collaborative cloud platform used to share and report DoD-specific environment, safety & occupational health (ESOH) information with the public and DOD communities.

3Rs Explosives Safety Education Program website:

https://www.denix.osd.mil/uxo/?p=home

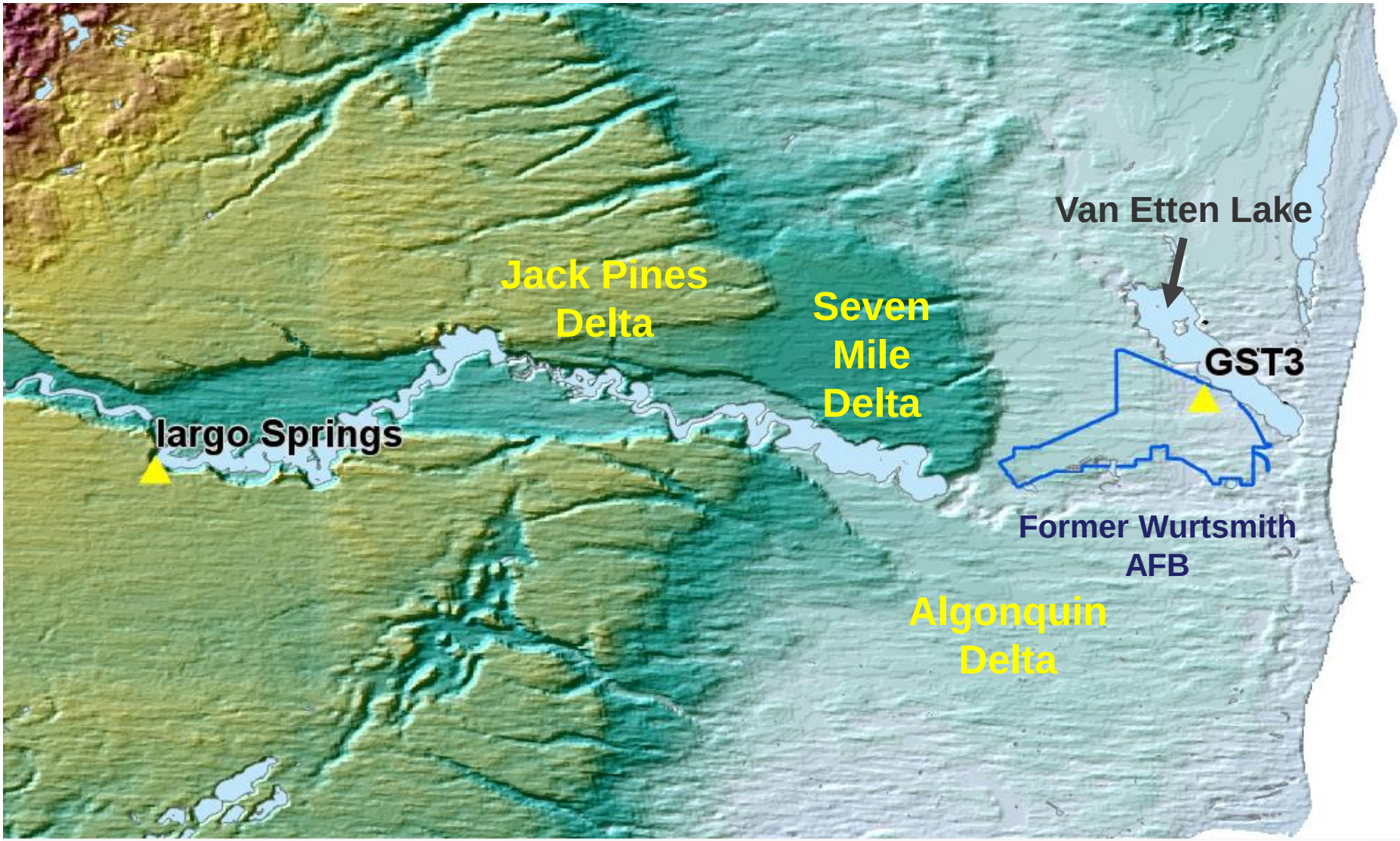
Resources

Coloring Books	Fact Sheets	Foreign Language Translations	Logos
Magnets	Pocket Cards	Posters	Presentations
Safety Guides	Signs	Site Specific Education Resources	Stickers
Temporary Tattoos	Videos		

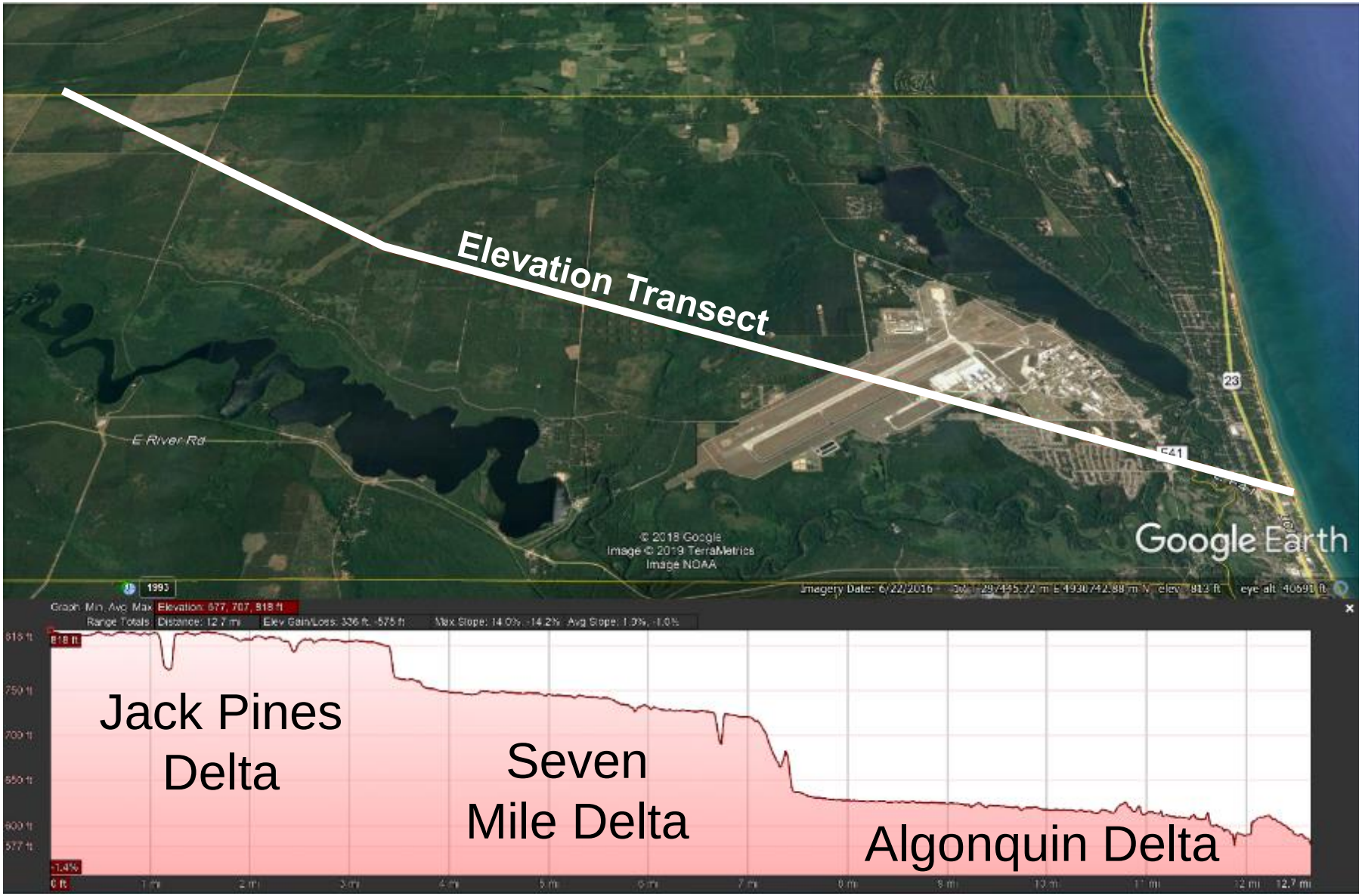
Hydrogeology Near Former Wurtsmith AFB

John Gillespie
AFCEC/CZTE
24 APR 19

Pleistocene Deltaic Formations Near Iosco County, MI



Wurtsmith RAB
Elevation of Deltaic Formations



Wurtsmith RAB
Key USGS Wells Installed in 1979

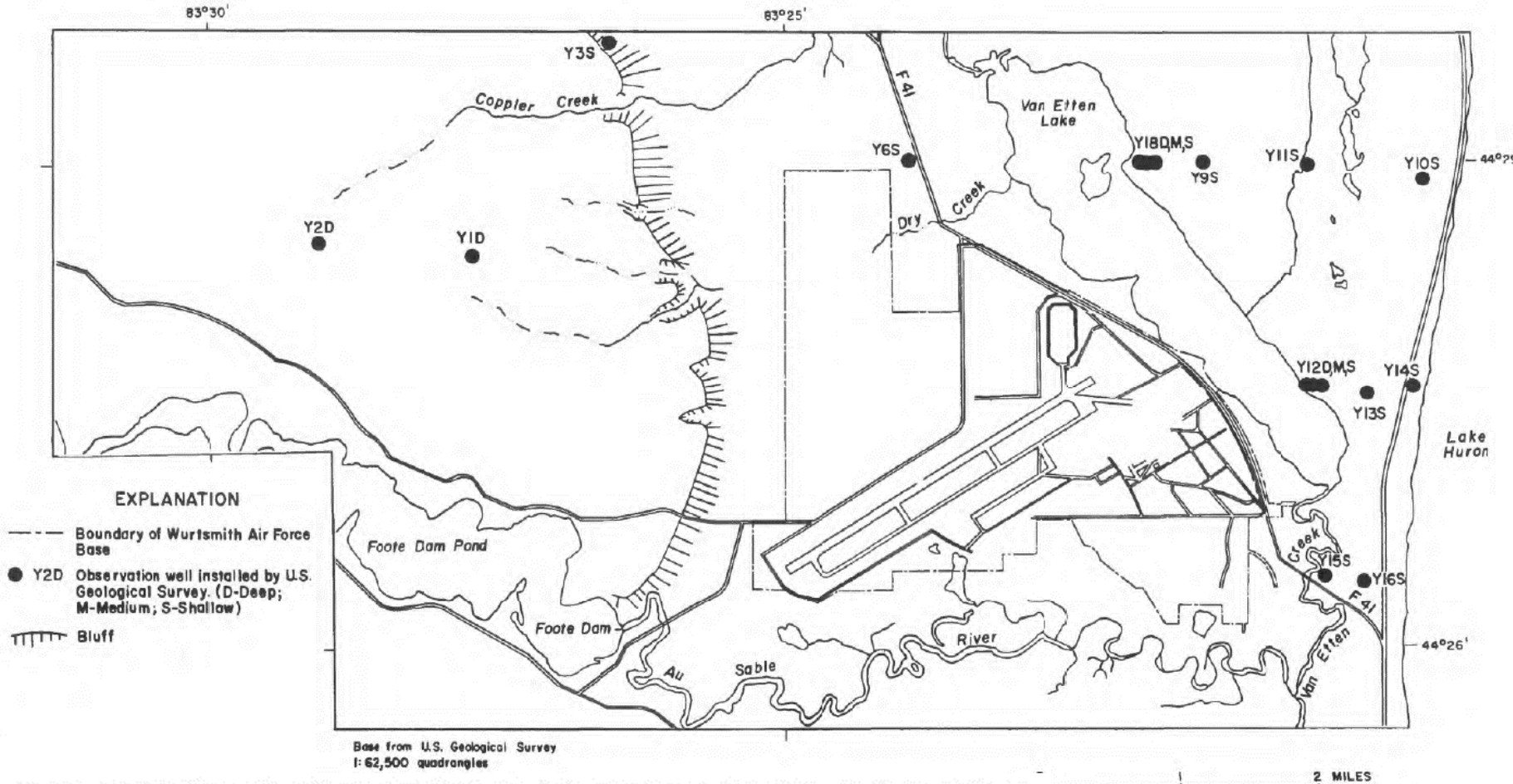


Figure 3.--Location of wells installed by the U.S. Geological Survey in areas surrounding Wurtsmith Air Force Base.

Stark, J.R., Cummings, T.R. Twenter, F.R., 1983, Ground-water contamination at Wurtsmith Air Force Base, Michigan: U.S. Geological Survey Water-Resources Investigations Report 83-4002, 93 p., 1 pl., 43 figs.

Altitude of Water Table and Direction of Groundwater Flow, September 1980

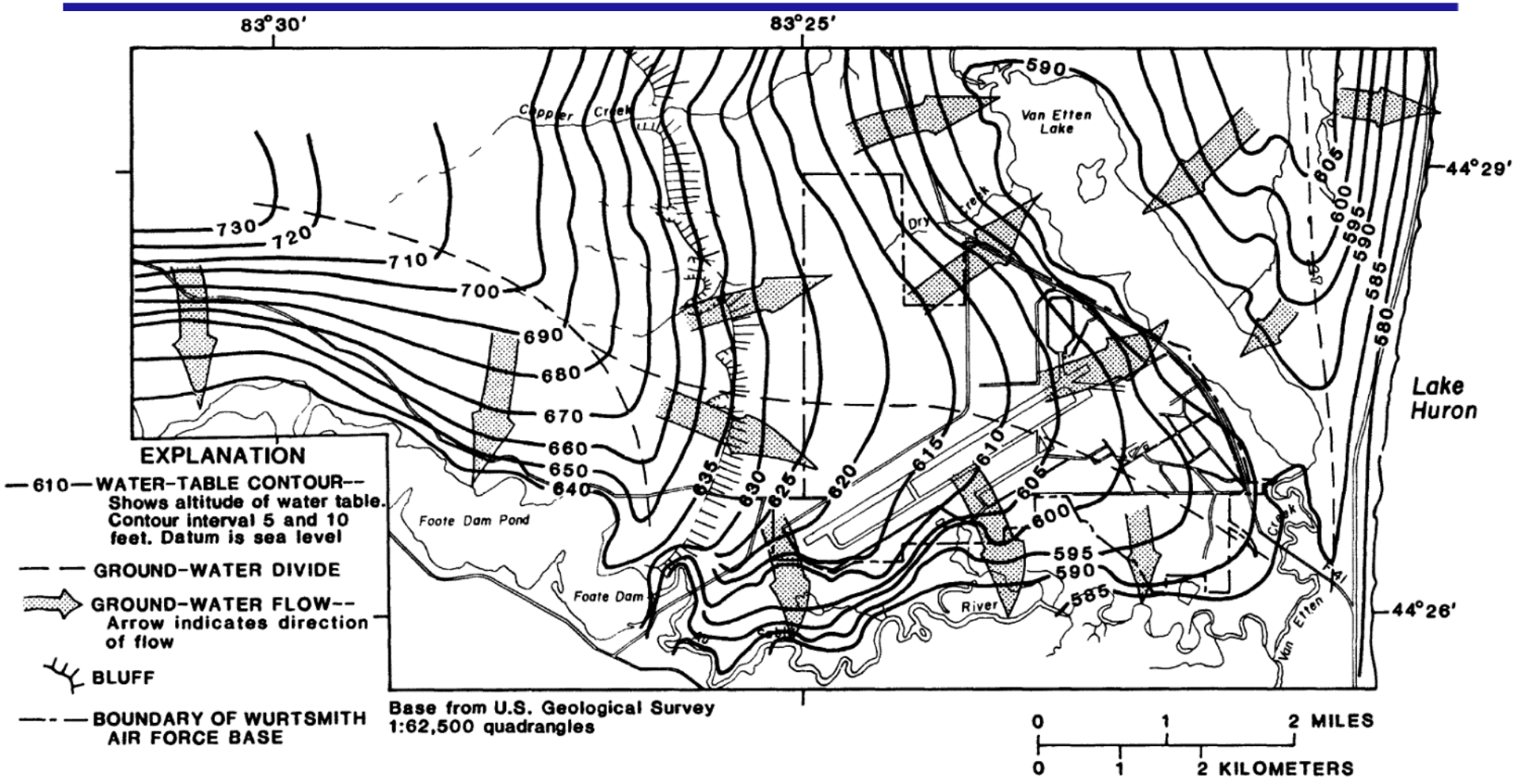


Figure 5.--Altitude of water table and direction of ground-water flow, September 1980.

Cummings, T.R., and Twenter, F.R., 1986, Assessment of ground-water contamination at Wurtsmith Air Force Base, Michigan, 1982-85: U.S. Geological Survey Water-Resources Investigations Report 86-4188, 120 p., 3 pls., 55 figs.

Subsurface Geology near Former Wurtsmith AFB

Published by USGS in 1983

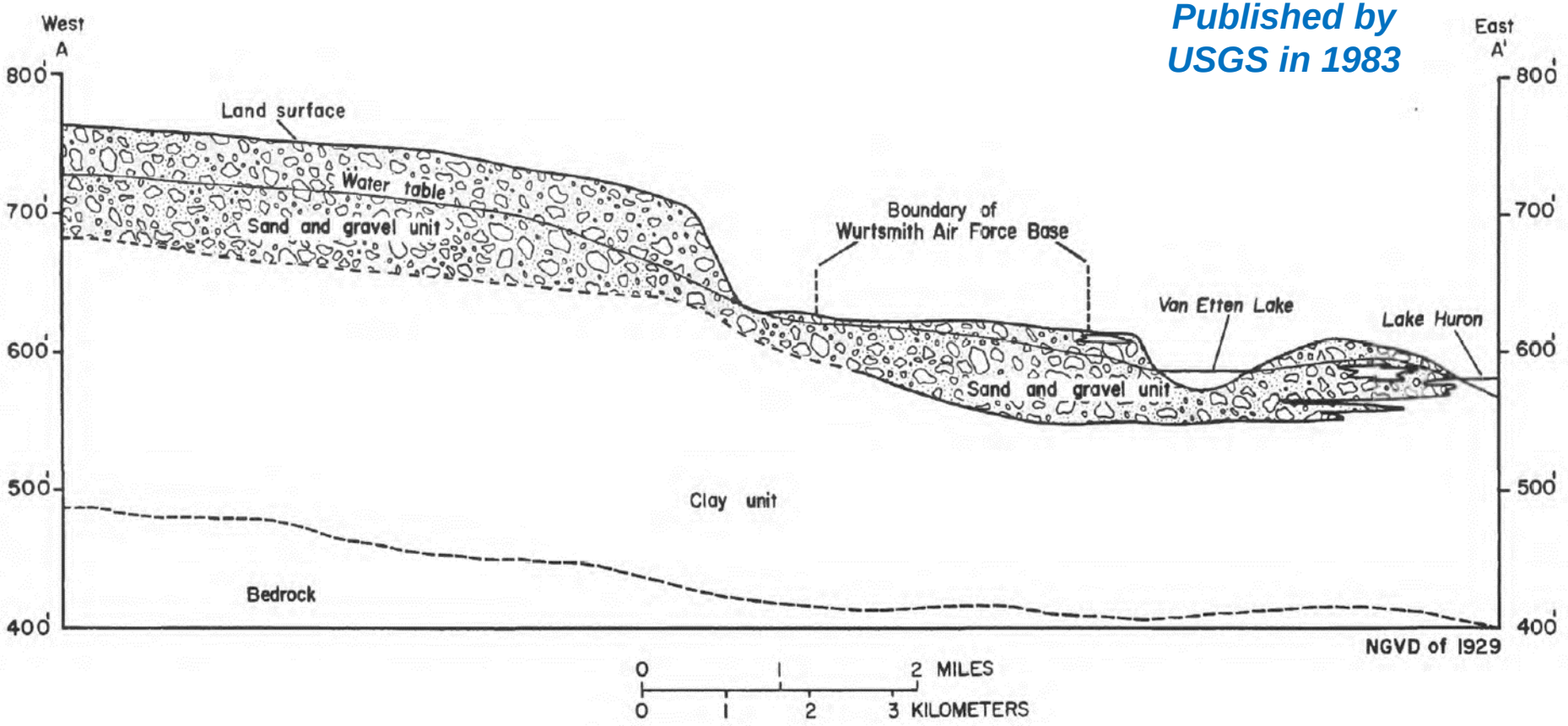
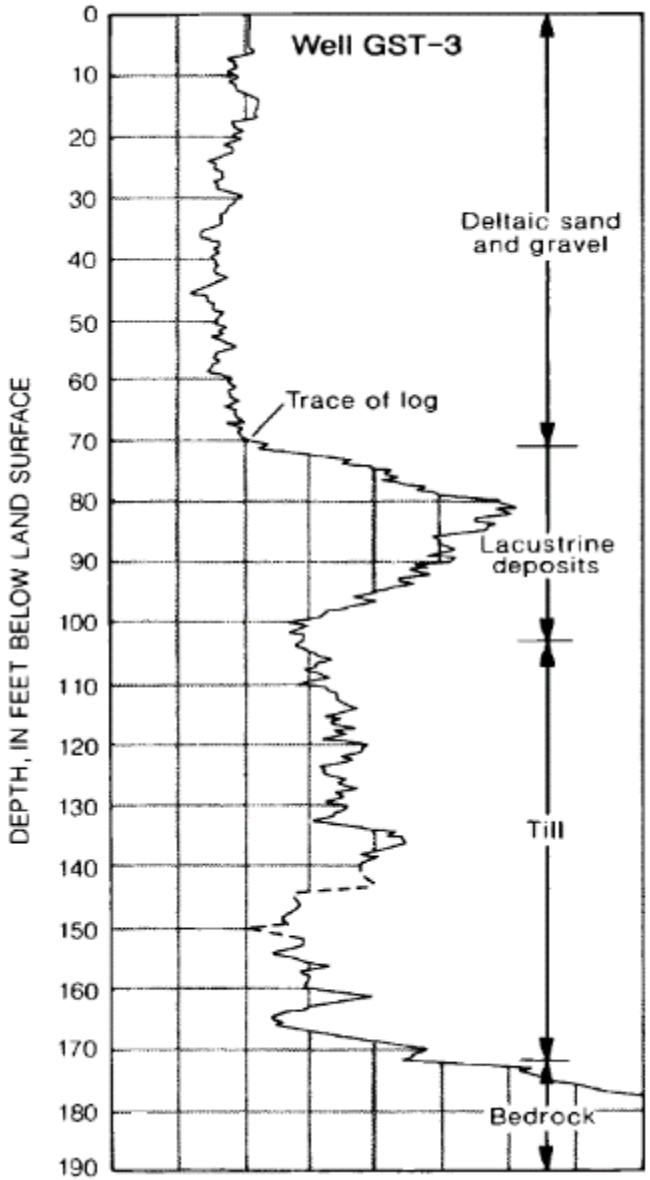


Figure 5.--Generalized geohydrologic section showing relation of sand and gravel unit to clay unit. Line of section shown in figure 4.

Stark, J.R., Cummings, T.R. Twenter, F.R., 1983, Ground-water contamination at Wurtsmith Air Force Base, Michigan: U.S. Geological Survey Water-Resources Investigations Report 83-4002, 93 p., 1 pl., 43 figs.

Wurtsmith RAB
Geophysical Log for Well GST-3

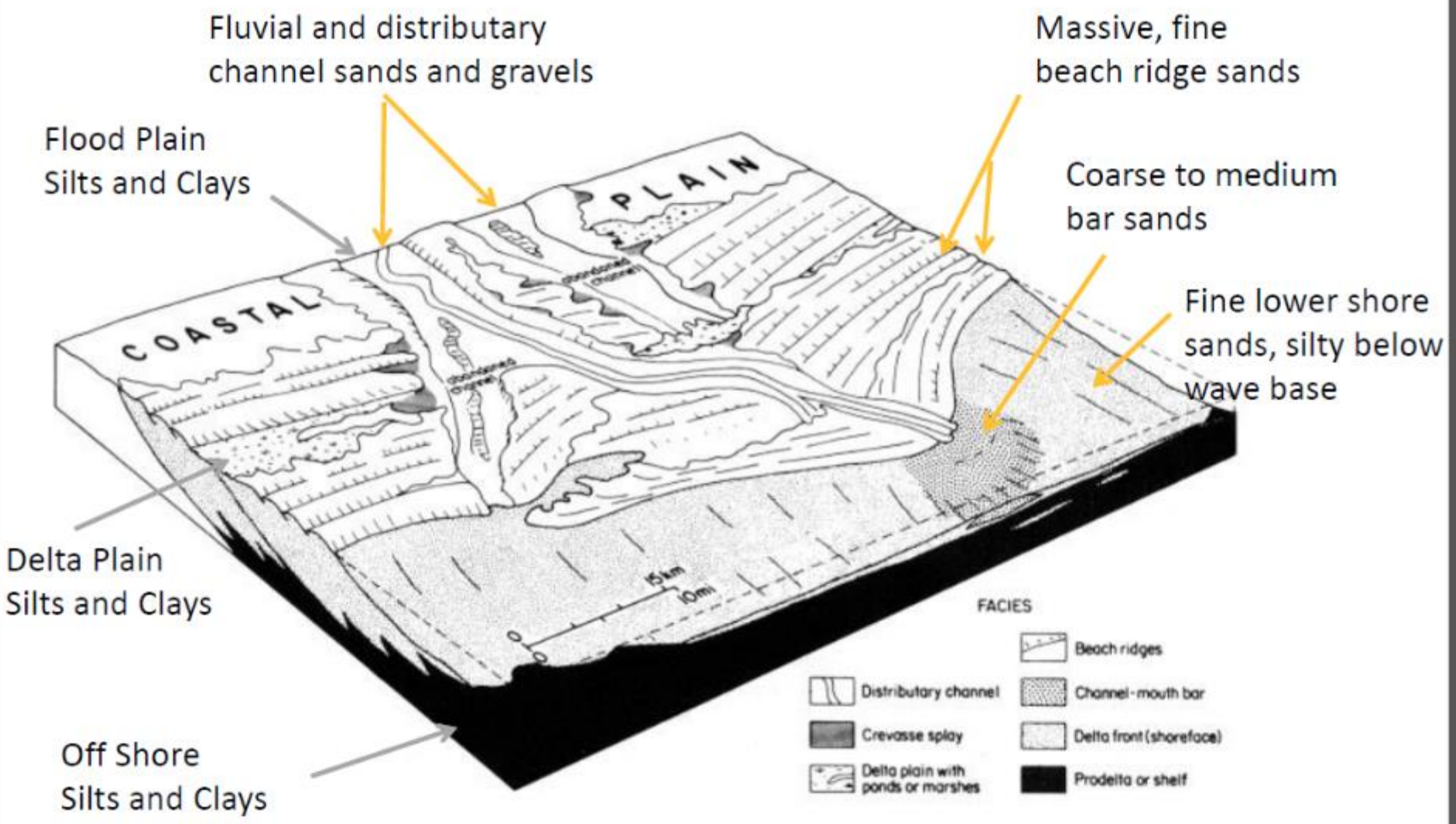


- **Total Dissolved Solids (TDS) >7000 µS/cm**
- **Water level 10 feet higher than water level in surficial aquifer**

Figure 8. – Gamma-ray log of well GST-3 showing stratigraphic breaks between geologic units. (Modified from Cummings and Twenter, 1983, fig. 54.)

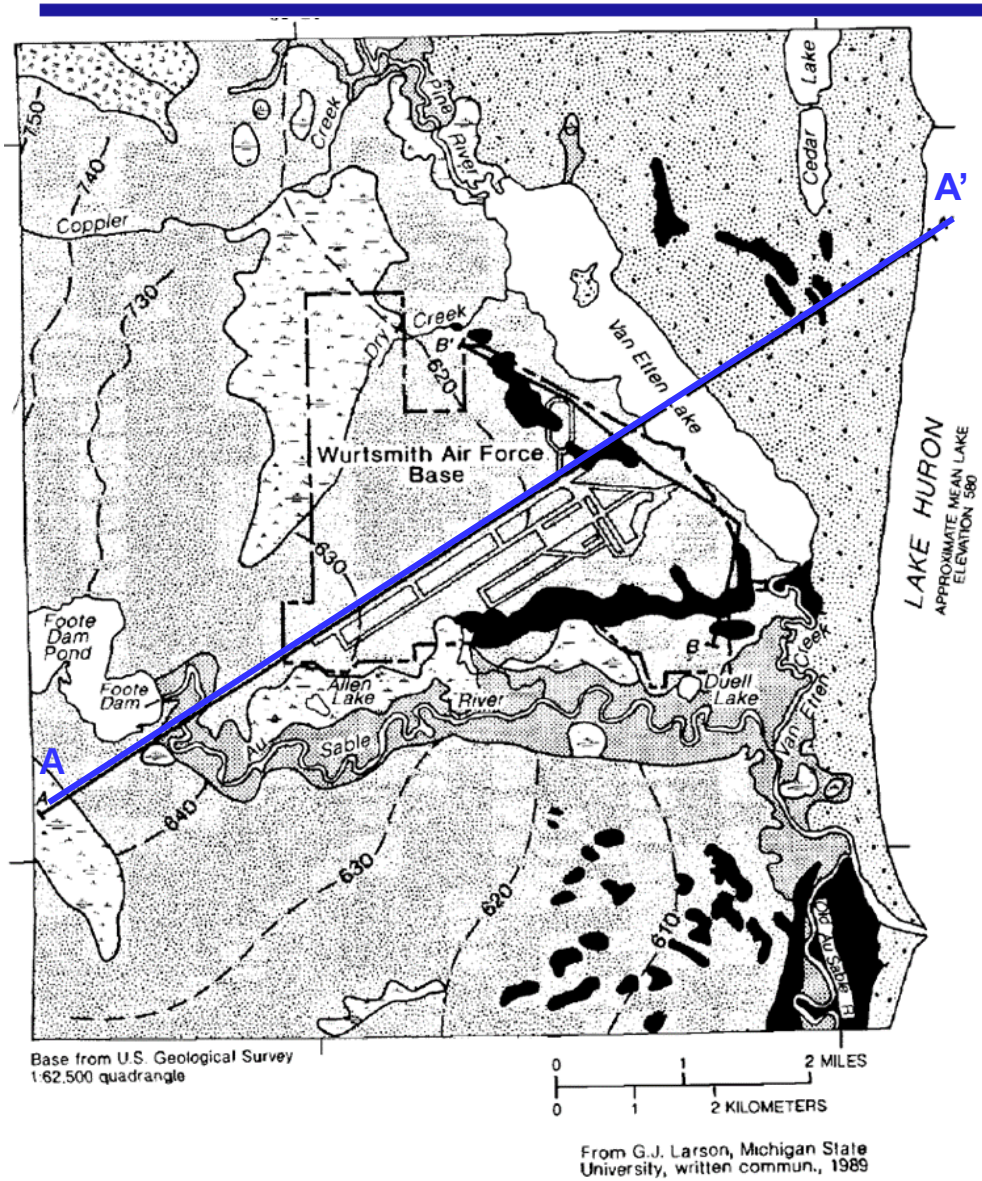
Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey

Figure 2 -Delta: Facies Components



Wurtsmith RAB Hydrogeology

Distribution of Surficial Deposits Near Former Wurtsmith AFB



EXPLANATION

DESCRIPTION OF UNITS

- Marsh and swamp
- Eolian deposits
- Beach deposits
- Alluvial deposits
- Lake bed sand deposits
- Deltaic sand deposits
- Till

--610--RECONSTRUCTED CONTOUR OF DELTA SURFACE

BOUNDARY OF WURTSMITH AIR FORCE BASE

A A' LINE OF GEOLOGIC SECTION

Figure 7.--Areal distribution of surfical deposits.

Geologic Section A-A’

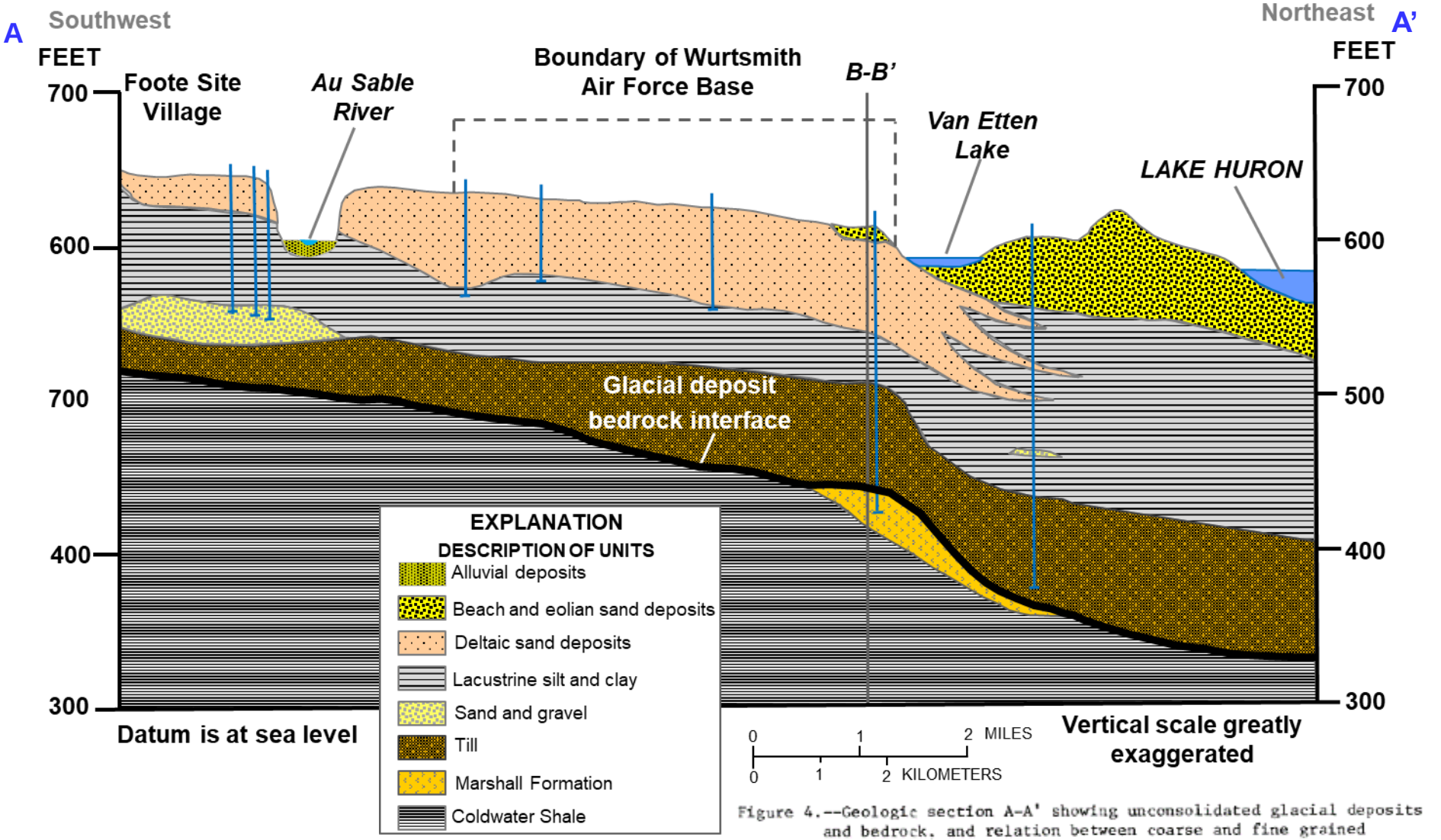
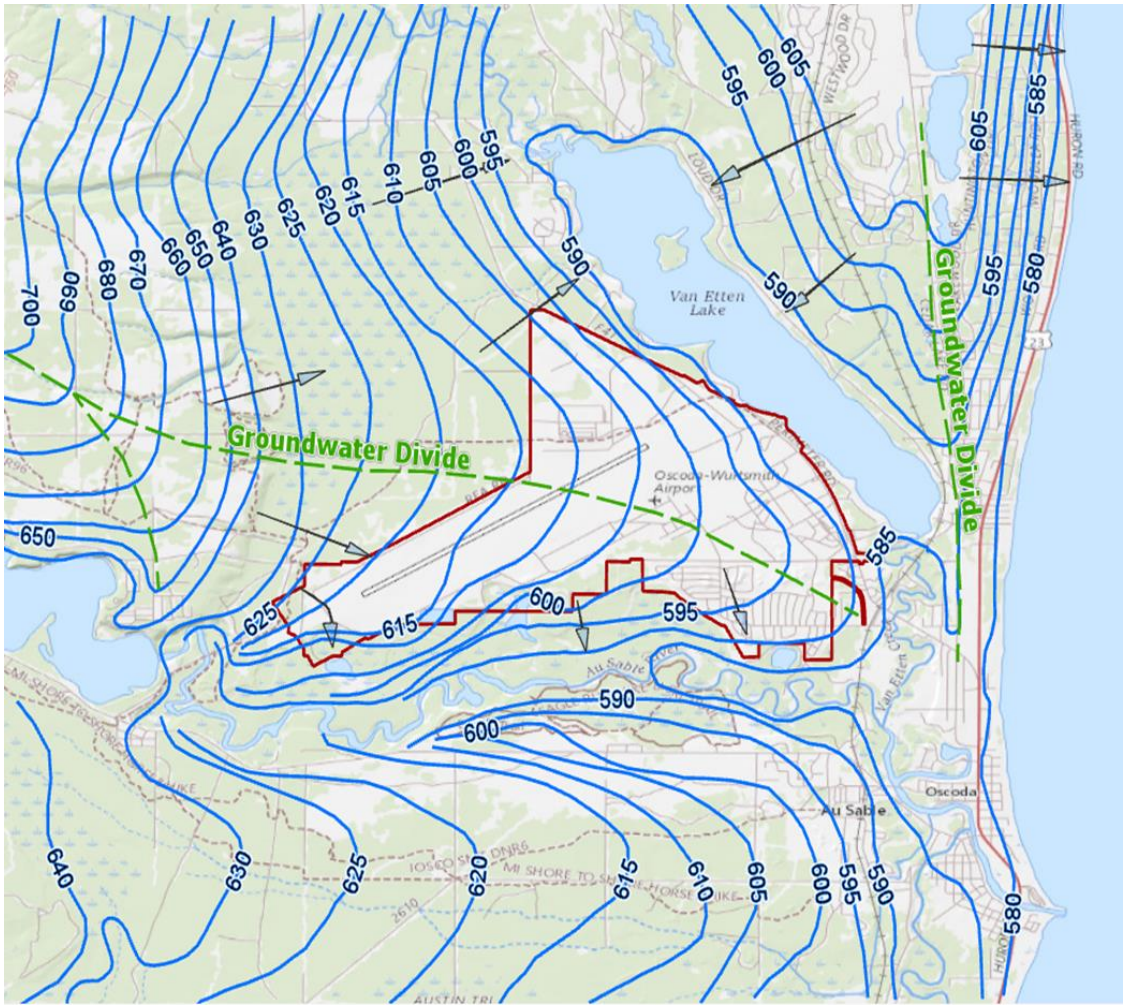


Figure 4.--Geologic section A-A' showing unconsolidated glacial deposits and bedrock, and relation between coarse and fine grained glacial deposits in the study area. (Line of section shown on fig. 7.) (Digitized)

Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey

Wurtsmith RAB Hydrogeology



USGS generalized groundwater flow in vicinity of Former Wurtsmith AFB (published in 1990 report)

EXPLANATION

—600— WATER-TABLE CONTOUR--Shows elevation of water table. Contour interval 5 and 10 feet. Datum is sea level

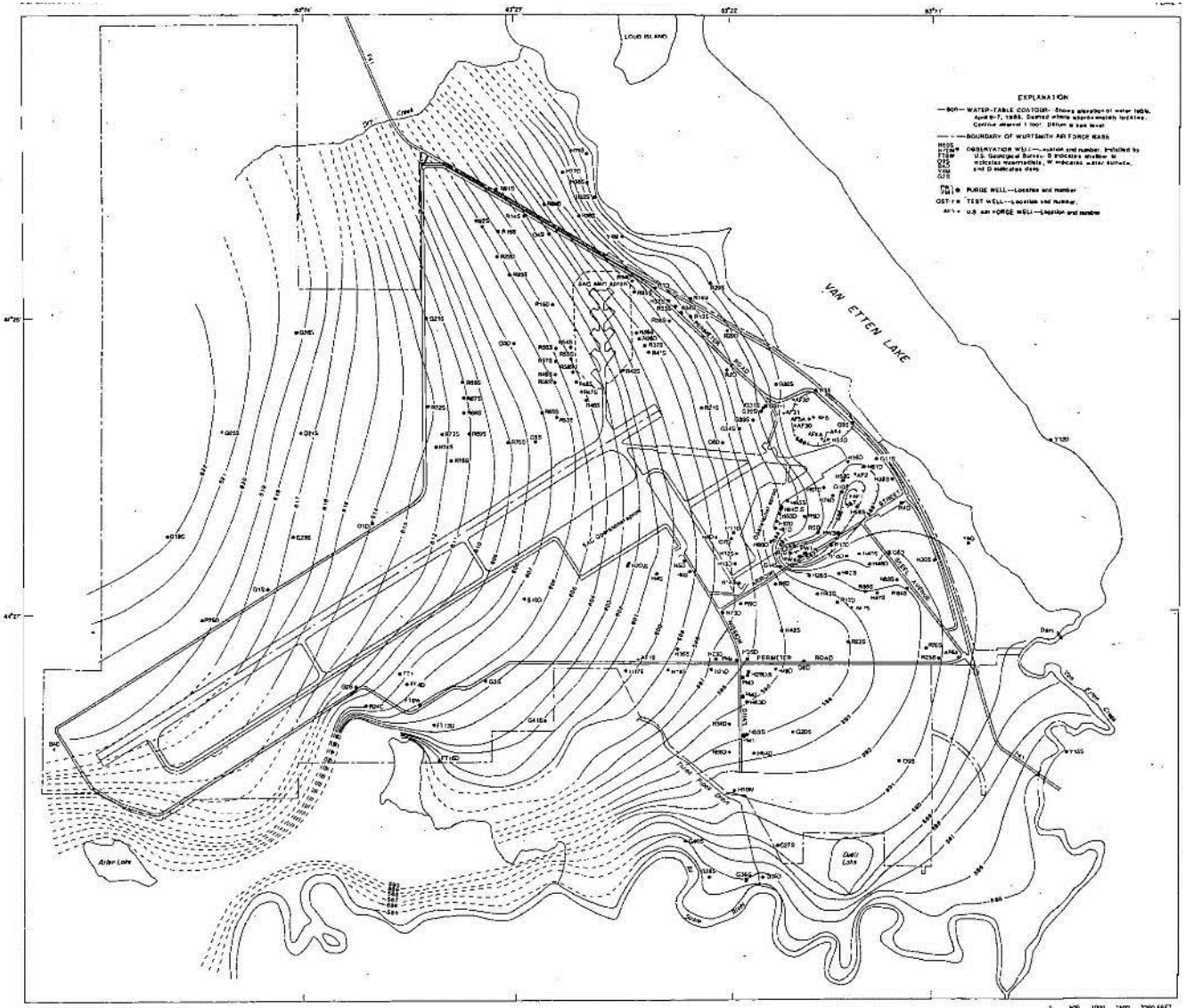
GROUND-WATER DIVIDE

GROUND-WATER FLOW--Arrow indicates direction of flow

Figure 11.--Generalized water table and direction of ground-water flow in study area. (Modified from Stark and others, 1983, fig. 6.) (Digitized)

Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey

Wurtsmith RAB Hydrogeology

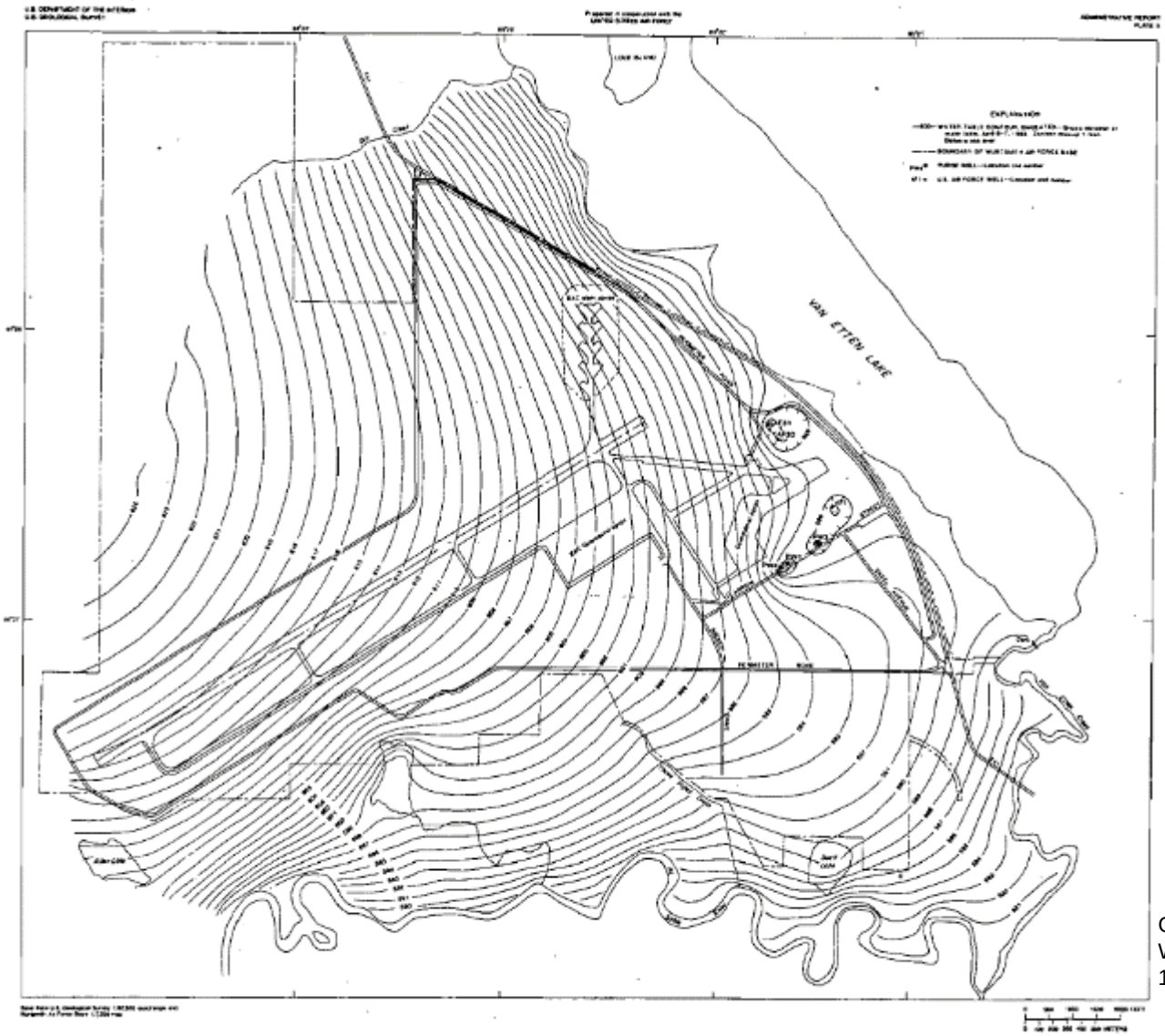


MEASURED WATER TABLE OF THE SURFICIAL SAND AND GRAVEL AQUIFER, APRIL 6-7, 1989, WURTSMITH AIR FORCE BASE, MICHIGAN.

Hand-drawn water table using data measured during USGS 1989 synoptic event

Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey

Wurtsmith
USGS Modeled Water table



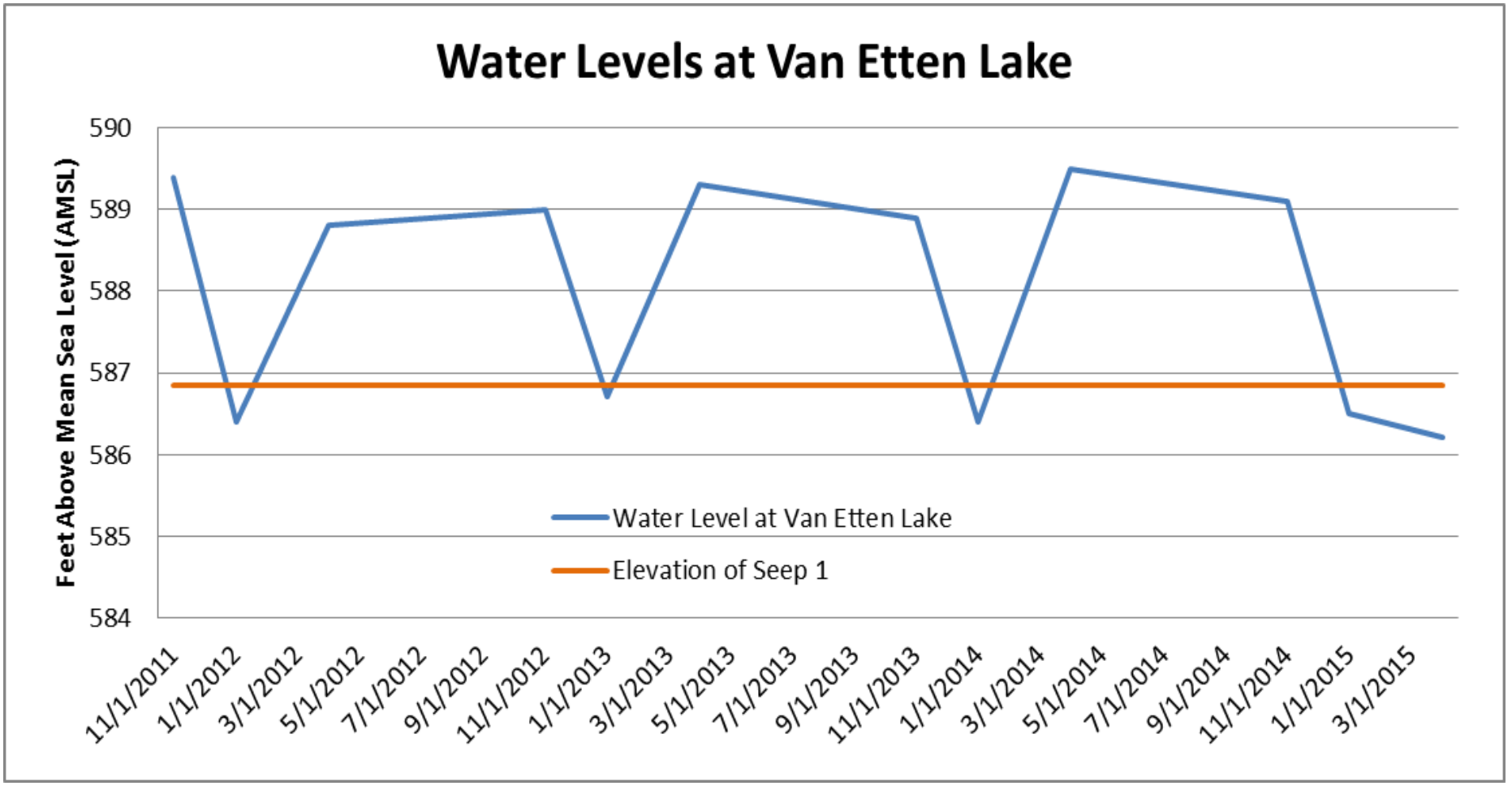
SIMULATED WATER TABLE OF THE SURFICIAL SAND AND GRAVEL AQUIFER, APRIL 6–7, 1989,
WURTSMITH AIR FORCE BASE, MICHIGAN.

Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey

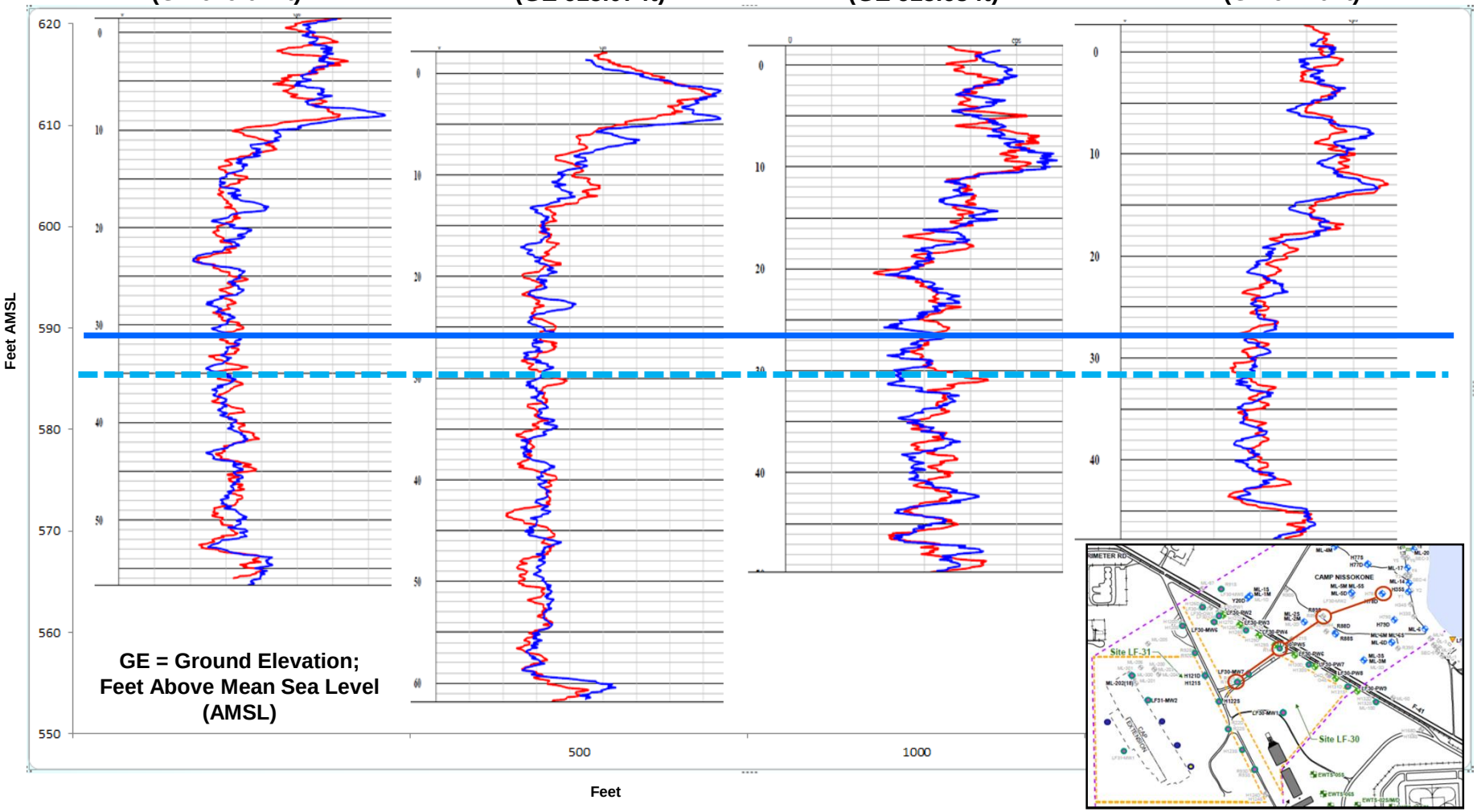
Modeled water table using data measured during USGS 1989 synoptic event

Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey

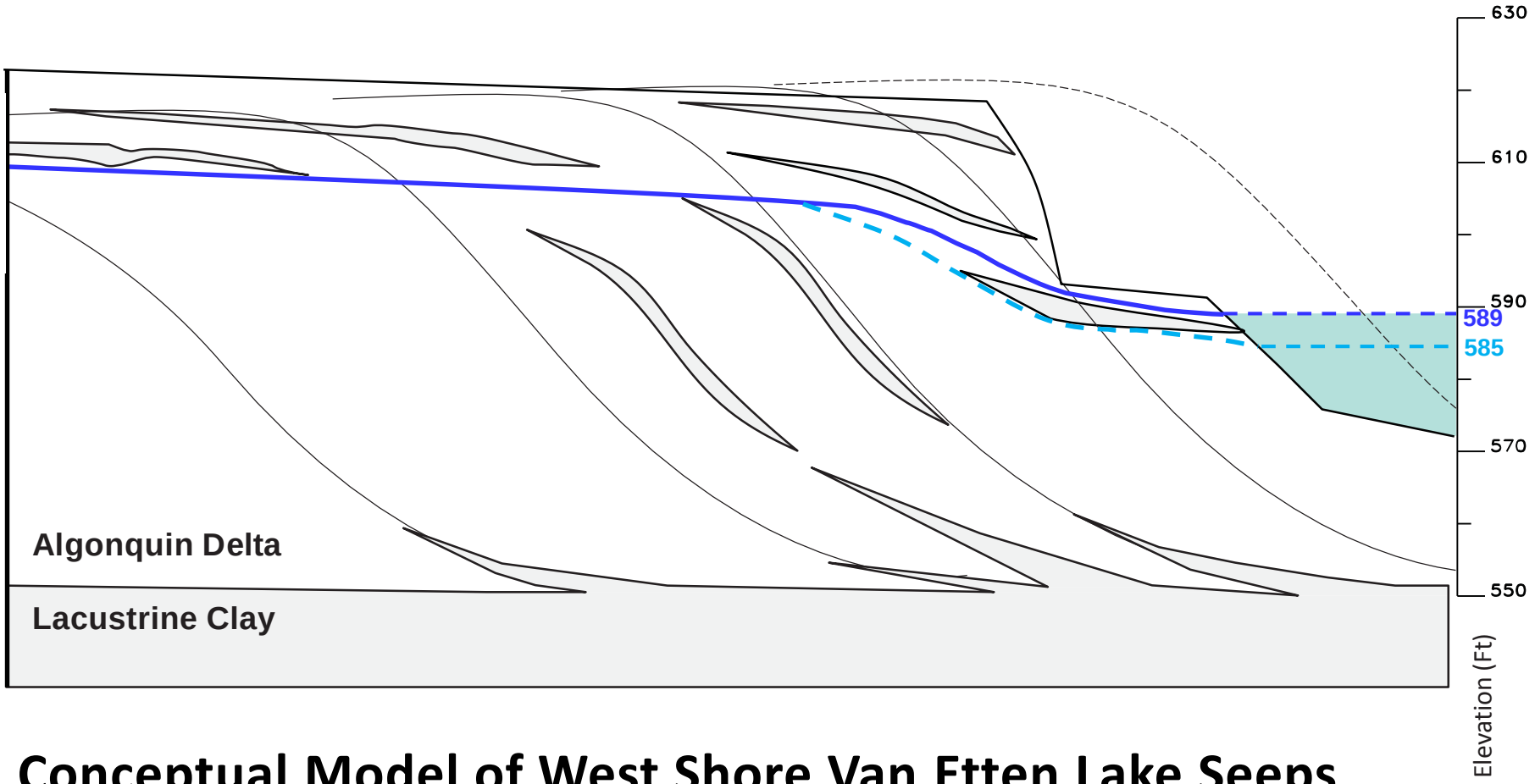
Water Levels at Van Etten Lake Showing Seasonal Lowering of Lake



Geophysical Logs Showing Fine Grain Layers Near Van Etten Lake Coastline



Conceptual Model Showing Fine Grain Layers Causing Seeps During Seasonal Lowering of Van Etten Lake

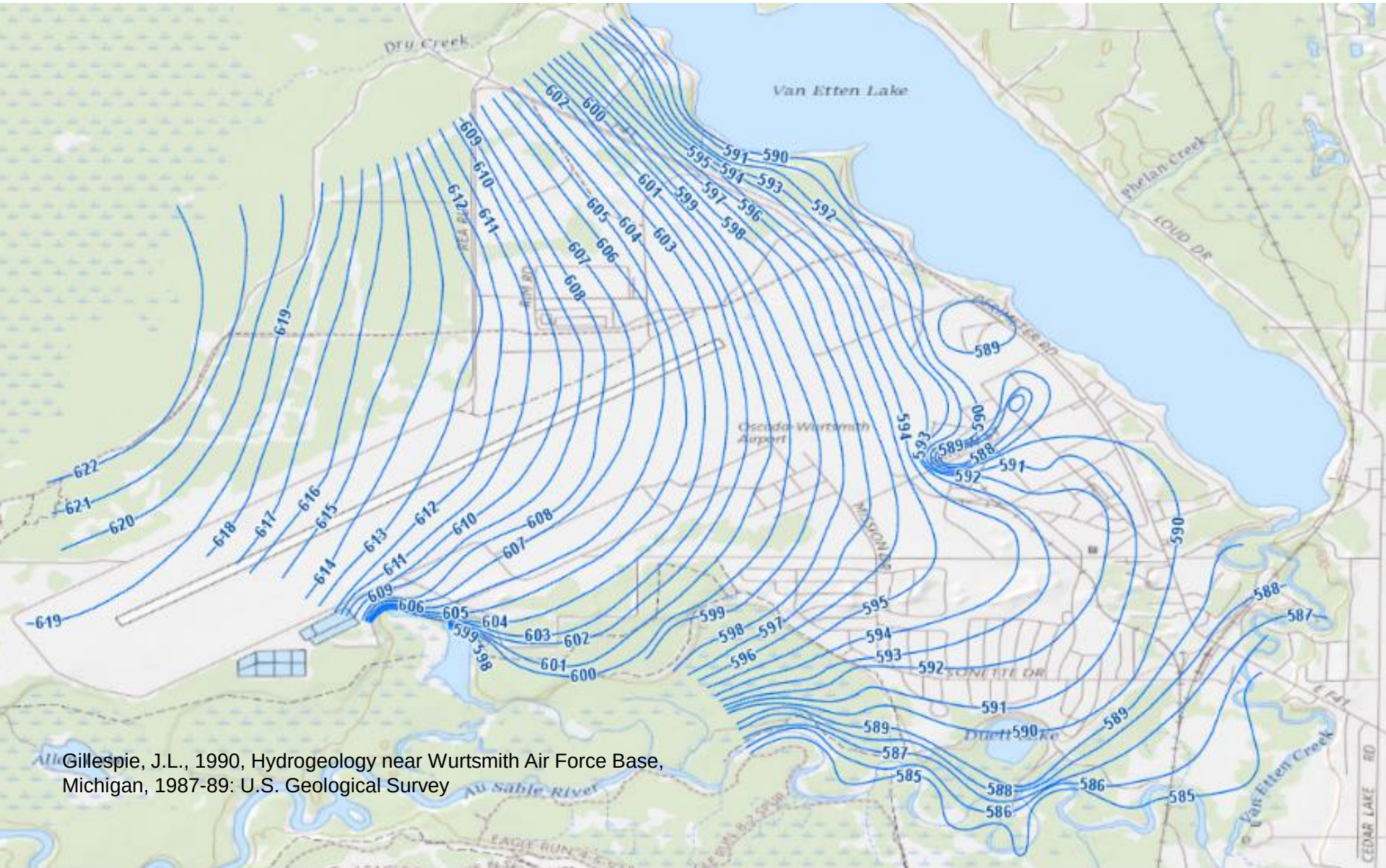


Conceptual Model of West Shore Van Etten Lake Seeps

Wurtsmith RAB
Hydrogeology: Key Points

1. Quaternary glacial deposits are well defined and mapped in the vicinity of Former Wurtsmith AFB
2. Aquifer materials and confining layers are well defined in the vicinity of Former Wurtsmith AFB
3. Hydrogeology showing direction of groundwater flow is well defined and documented near Former Wurtsmith AFB
   a) Groundwater flows from Former Wurtsmith AFB east to Van Etten Lake
   b) Groundwater on the east side of Van Etten Lake flows west towards Van Etten Lake
   c) Groundwater along the southern boundary of AFB flows to the alluvial deposits of ancestral Au Sable River and eventually enters the modern Au Sable River.
   d) Seasonal water level controls on Van Etten Lake expose seeps that are caused by finer grain layers within the deltaic deposits
   e) Alluvial deposits in the ancestral Au Sable River would need better definition to understand groundwater flow through those deposits

Hand Drawn Water Table Using Data Measured During USGS 1989 Synoptic Event



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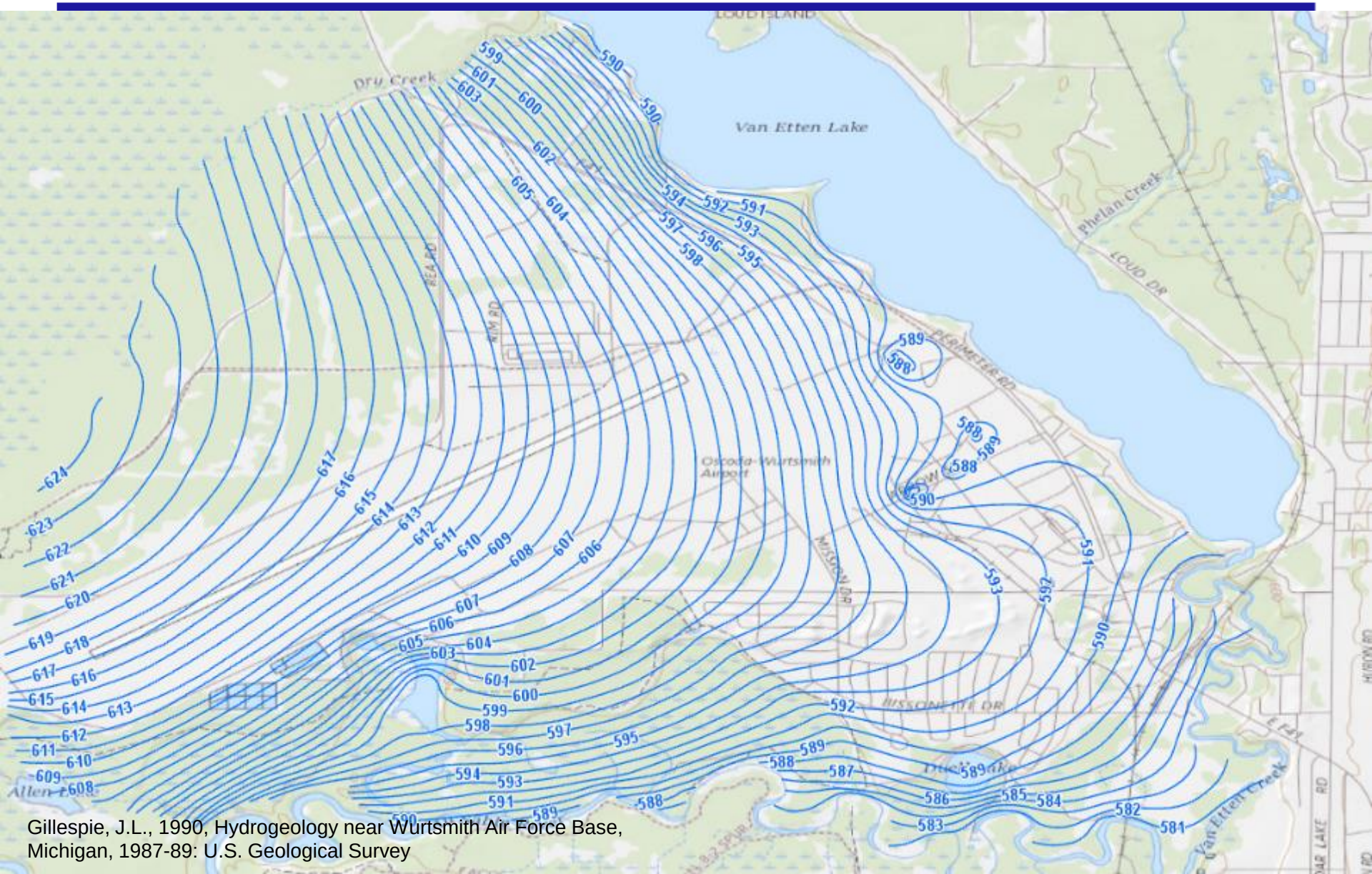
USGS Modeled Water Table Using Data Measured During USGS 1989 Synoptic Event



Gillespie, J.L., 1990, Hydrogeology near Wurtsmith Air Force Base, Michigan, 1987-89: U.S. Geological Survey

Wurtsmith RAB

RAB Business

Wurtsmith RAB
RAB Business

- Action Item Review
- RAB Community Member(s) Appointment Terms
  - ► Two-year terms end August 2, 2019
  - ► Current members may serve additional terms
  - ► Membership Applications: see public affairs or visit https://www.afcec.af.mil/Home/BRAC/Wurtsmith.aspx
- Highlight RAB operations, procedure changes

Wurtsmith RAB

Public Comment

Wurtsmith RAB

Public Comment Period

01	Sign in and write your name on a card
02	Deliver your comments from the front of the room
03	Three minute time limit
04	RAB members will confer after your comment to see if a follow-up action is needed

Conclusion & Adjournment


AIR FORCE CIVIL ENGINEER CENTER