

# Western New York Nuclear Service Center Background and History

Paul J. Bembia,  
NYSERDA West Valley Program Director

April 27, 2011

# Development of a Civilian Nuclear Industry

The roots of the West Valley facility can be traced back to the federal government programs of the 1950s that were created to develop peaceful uses for nuclear energy.

## Atoms for Peace 1953



## Atomic Energy Act of 1954

# Development of a Civilian Reprocessing Capability

*"The Commission's program," AEC chairman Lewis L. Strauss explained, "is directed toward encouraging development of the uses of atomic energy in the framework of the American free enterprise system."*

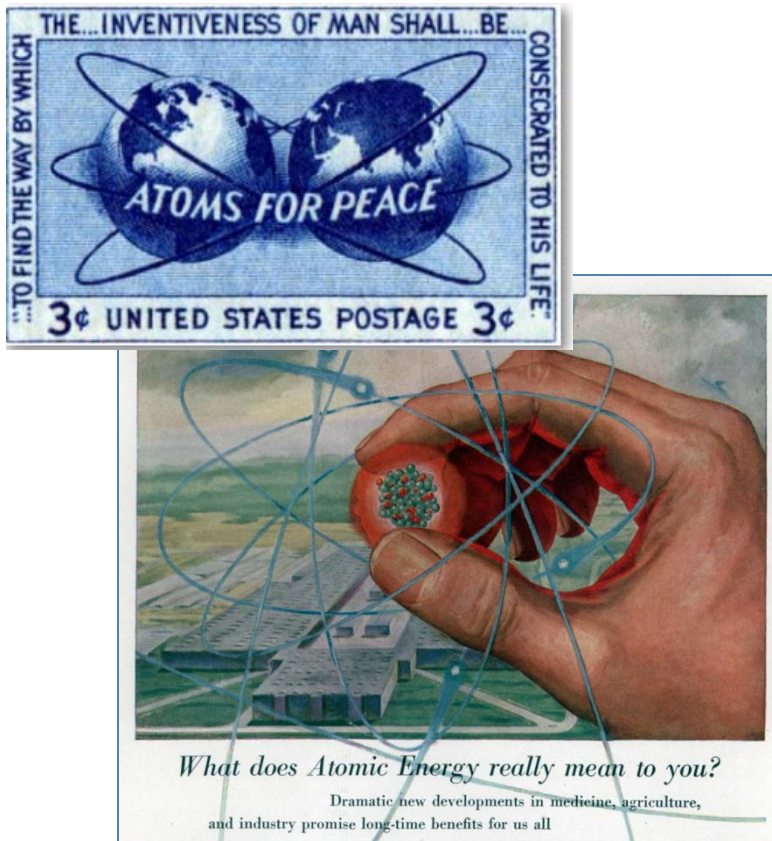


**In 1957, AEC announced that it would:**

- Make AEC technology on reprocessing available to private industry;
- Invite proposals by private industry to design, construct, and operate reprocessing plants; and
- Provide a baseload of fuel from AEC production reactors until the construction of additional commercial power reactors created an adequate demand for spent fuel reprocessing services.



# Development of a Civilian Reprocessing Capability



**New York State became interested in the AEC privatization program as a way to promote industrial development within the State.**

- New York established an Office of Atomic Development in 1956.
- By 1961, the AOD acquired 3,300 acres in the town of Ashford in Cattaraugus County with the intent of establishing a reprocessing facility.



# Western New York Nuclear Service Center is Created

The decision to locate the reprocessing plant in Western New York was greeted as positive economic news for the local community and the region.

“Unlimited possibilities...”

## PORT OF BUFFALO OK'D TO HANDLE NUCLEAR CARGOES

The port of Buffalo will be able to handle nuclear cargoes, the U.S. Coast Guard announced.

Coast Guard said it “complies in all respects with the Coast Guard’s requirements of a community for the handling of nuclear materials.”

## Ashford Residents Cheered By Plans for A-Fuel Plant

Supervisor Fagnan Says This Is First Indication That State Is Negotiating

WEST VALLEY, Jan. 23—The announcement that a leading chemical concern is interested in constructing a \$20 million plant on the state’s proposed Nuclear Service Center site has created a stir among nervous Town of Ashford residents.

Other than token test boring and drilling on the 3331-acre site

be disturbed now until at least June.

He added that the state has come to terms with only four owners of properties that were appropriated June 19, but that none have been paid. Negotiations with the others are stalemated on price.

The official said he expects that “now that the dam has been broken,” there will be

## Approval of AEC Is Asked for WNY Nuclear Fuel Plant

*Buffalo Evening News Bureau*  
WASHINGTON, Aug. 8 — Nuclear Fuel Services Inc. of Baltimore has applied to the Atomic Energy Commission for permission to build a plant to reprocess nuclear fuel at the Western New York Nuclear Service Center.

The AEC informed Reg. Goodell of Jamestown that the chemical plant, to occupy about 500 acres of the 3331-acre site in Cattaraugus County, is planned to cost between \$22 million and \$25 million.

The AEC said that if the licenses are granted, the plant will be the first such privately owned facility in the nation.

The plant would work primarily with the fuel core “burned” in atomic reactors such as those used by electric companies for power and those in research centers.

It still-usable cores, purify and fashion products.

extract radioactive material in medical space re-

proceed, the AEC it plans to next March 1965.

its include: sins, process milk farm, waste

## Springville Is Poised for Many Good Days Ahead Nearby Atomic Plant Powers Way to Prosperity



NEW CONCRETE PLANT RISES ON HENRIETTA RD., 3 MILES FROM SPRINGVILLE

## First Privately Owned Nuclear Plant May Produce Boom Town

By MARIAN REYNOLDS  
Cleveland Times-Herald

Written for The Associated Press  
ASHFORD, N.Y., (AP) — The world’s first privately owned nuclear fuel reprocessing plant may change Ashford from a tiny, rural town into bustling city.

Construction of the \$33-million plant, which will reprocess atomic fuel for peacetime industrial purposes, has begun on a 3,300-acre site in this community of 1,500.

It may take a decade or more, but the State Labor Department unofficially estimates an urban potential population of 24,000.

The prospect of such growth is greeted with characteristic restraint by most residents of the quiet township.

“We’re afraid we will see an end to the beauty of our rural area,” says Marjorie Hollenbeck, a tearoom operator in neighboring West Valley. Her partner, Marie

Jones, is concerned that superhighways, shopping plazas and heavy industry will speed the end of the pastoral life.

But Mark Bobseine, who owns a prize herd of 40 Holstein cattle, intends to “see it through,” and continue to improve his farm, “the same as I have done for 45 years.”

Farmer Elon Zetwick, 70, says

# Western New York Nuclear Service Center is Created

The siting of the facility also resulted in the displacement of some long-time residents of the town of Ashford.

5, 1961

## CATTARAUGUS NOTES

### Residents Have Year to Leave Nuclear Fuel Site

By BERT FREED

Buffalo News Staff Reporter

WEST VALLEY, June 5 —

There will be no mass exodus of families living on the bucolic 3500-acre Cattaraugus County site of the state's proposed nuclear-fuel development.

Supervisor Norman H. Fagnan of the Town of Ashford, the

## Land Owners Vow to Fight Plan for Nuclear Center

State Proposal for WNY Service Facilities Wins High Praise From Business Leaders

Business leaders today hailed the state's plans for a Nuclear Service Center in Northern Cattaraugus County, but owners of the 3500 acres involved vowed to continue their fight against the proposal.

Oliver Townsend, director of the state's Office of Atomic Development, explained the plan in detail at a hastily-convened meeting Friday evening in the

town should . . . help to bring to early accomplishment the plans for a new four-lane expressway south from the Thruway to Springville."

Howard W. Pearce, president, Buffalo Chamber of Commerce — "We regard the decision as a significant milestone in this area's emergence as a major atomic research and development center."

## Farmers Seek Higher Price For Atomic Waste Center Site

Some Value Holdings at \$40,000 to \$50,000; State Expects to Pay \$300,000 for Property

By HAROLD ALSWORTH

Buffalo News Staff Reporter

WEST VALLEY, June 7—Dairy farmers of the scenic Buttermilk Creek Valley seemed resigned today to being displaced by a proposed nuclear service center for atomic wastes. But they are deeply resentful over reports from Albany indicating that the state hopes to acquire between 2500 and 3500 acres of farmland for around \$300,000.

Some of the farmers who say their individual holdings are worth \$40,000 to \$50,000 built up over a lifetime on the soil are deeply resentful at the prospect of losing the homes they love in this hill and valley country.

### Calls State Offer "Peanuts"

Marcus Zefers, operator of a 100-acre farm with neat, modern buildings, has been elected chairman of the hastily-organized Buttermilk Valley Association.

"We realize we can't fight progress," Mr. Zefers told a re-

meadow toward a wooded section of his farm and noted that his water sources were down below those trees.

"The state wants to take half my farm over there and all my water supply," he said.

"I'll be left with my buildings but not enough land to support a farm operation and my herd of 21 pedigreed cows."

### Meeting to Plan Strategy

The Buttermilk Valley Association will meet this evening in the hamlet of Riceville to hire counsel and plan strategy.

Mr. Zefers noted that little definite information has been forthcoming from official sources.

Leo Kowalski, association treasurer, who operates the hill and valley farm owned by his father, Edgar Kowalski, 70, a portrait and landscape painter, said "people are fighting mad" over the way the state has handed this thing.

## Ashford Residents Protest Atom Site At Public Meeting

WEST VALLEY, June 7—The tragedy of a farming community soon to be torn out by its roots in the interest of science dramatized a meeting in West Valley Central School Tuesday evening.

More than 300 persons, including farmers and wives, summer residents and others attended the meeting to learn something about the atomic materials dumping grounds proposed by the state in scenic Buttermilk Creek valley.

Principal speakers in defense of the proposed nuclear service center were Oliver Townsend, director of the State Office of Nuclear Development, and Dr. Ralph F. Lumb, director of the Western New York Nuclear Center at the University of Buffalo.

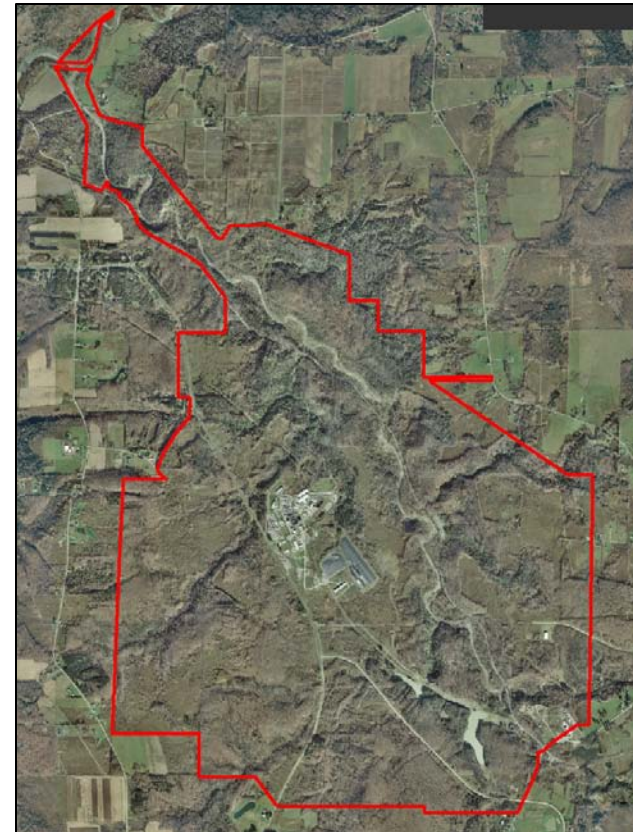
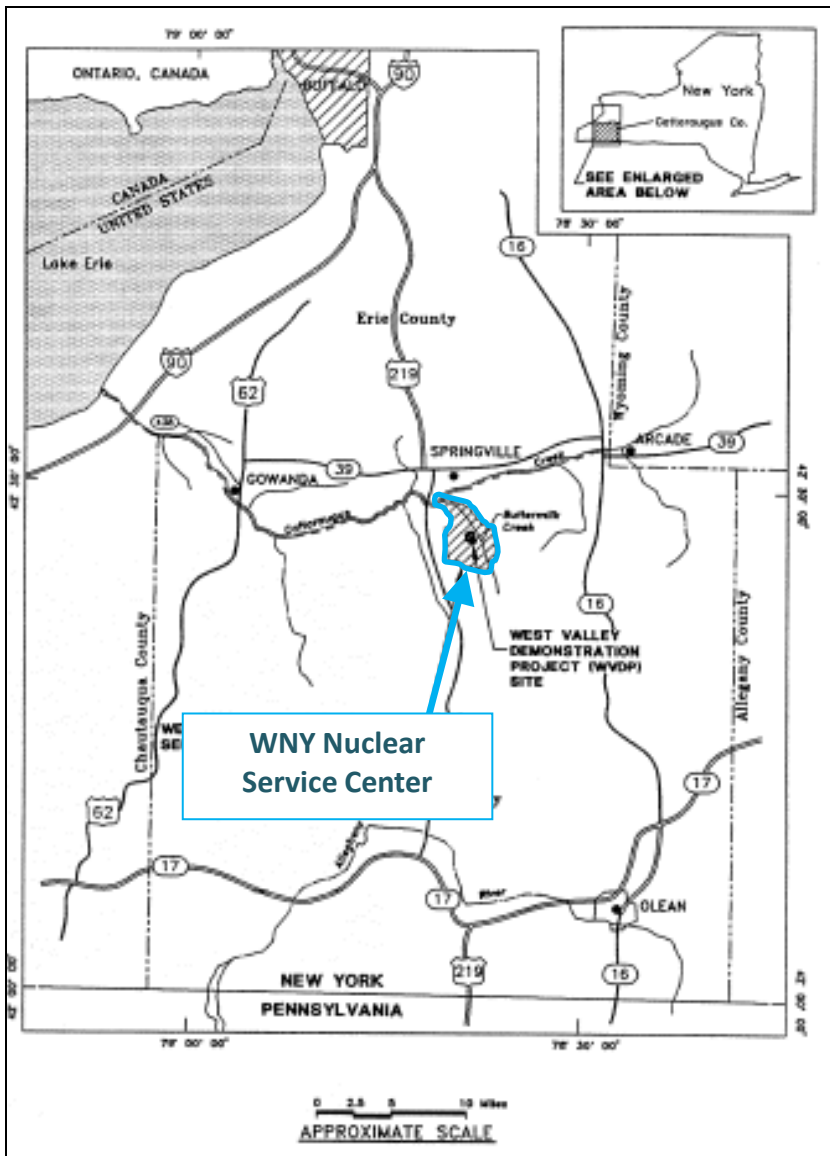
### Polley Criticized

Besides voicing fears of danger from radiation in the area, some in the audience denounced the state's "penurious policy" in proposed payments for land.

One resident advised Mr. Townsend to go back to Albany and get \$900,000 for the land instead of the \$300,000 appropriated.



# Western New York Nuclear Service Center Location



Because the property would be State-owned and tax-exempt, a PILOT was established to defray property tax losses

# Agreements are Reached with Nuclear Fuel Services, Inc. to Build and Operate the Reprocessing Facility

The Davison Chemical Company (which would be bought out by W.R. Grace and Company) and American Machine and Foundry Co. set up Nuclear Fuel Services Inc. (NFS) to pursue the reprocessing venture.

## Nuclear Fuel Services Given Option For Atomic Plant

The State Atomic Research & Development Authority has reached tentative agreement with Nuclear Fuel Services Inc. for construction and operation of a \$22 million project at the Western New York Nuclear Center in Cattaraugus County.

Last Thursday Gov. Rockefeller said an agreement had been signed giving Nuclear Fuel an option to negotiate a lease and facilities contract to build and operate a company-owned plant for reprocessing nuclear fuels and Authority-owned facilities for storing atomic fuel and waste. He said about two-thirds of the \$22 million would go for the reprocessing plant.

Nuclear Fuel, a subsidiary of W. R. Grace & Co., is working on plans for construction of a reprocessing plant with a capacity up to one ton per day to serve the civilian atomic power industry, the governor said.

He said such a plant would be the first in the world to be privately owned and the first in the U. S. to service civilian atomic power stations.

Governor Rockefeller hailed the proposed lease as a "landmark in the long effort to break the federal monopoly over atomic energy." He added:

"Only when competitive and creative forces of private enterprise are fully working in the development and utilization of atomic energy will its benefits become a reality to all of our people. I am especially gratified that this new project proposes to locate in New York State a major segment of the growing nuclear industry."

"The principal purpose of the project will be to take used nuclear fuel elements from atomic power stations and process these chemically to extract from them valuable reusable fuel and byproducts."

Nuclear Fuel will apply to the U. S. Atomic Energy Commission by July 31 for a license to construct and operate the contemplated plant and related facilities.

Nuclear Fuel and the Authority will, during the option period, proceed to complete negotiations, subject to approval by the Authority board and W. R. Grace & Co. for a lease and facilities contract providing for construction and operation of the reprocessing plant and storage facilities. The option is effective for \$25,000 until October 10, 1962, and renewable for an additional \$10,000 until December 31, 1962.

The Authority may, until April 1, 1963, engage Nuclear Fuel to

design and construct a nuclear fuel receiving and storage facility of a site and type suitable to serve the proposed reprocessing plant.

Gov. Rockefeller's office revealed that the Empire State Atomic Development Associates Inc. has agreed to grant \$2,000,000 toward the research and development program for the project when all construction arrangements have been completed.

Empire State Associates is a non-profit group made up of seven utility companies, including Niagara Mohawk Power Corp. and New York State Gas & Electric.

Oliver Townsend, chairman of the State Atomic Research & Development Authority, said Nuclear Fuel Services was selected "because its plans for the construction and operation of a reprocessing and waste complex, as well as its negotiations with the Atomic Energy Commission and the utility industry for a sufficient load to make the project economically feasible, are both substantially more advanced than those of any other company expressing interest in building and operating Authority-owned facilities at the Cattaraugus County site."



Ground was broken in June 1963.

## Governor to Head Guests At Atom Center Ceremonies

Civic, Industrial, Political Leaders to Attend June 13 Groundbreaking in Town of Ashford

By BERT FREED  
WEST VALLEY, June 11—Gov. Rockefeller will head a delegation of top public officials who will attend ground-breaking ceremonies June 13 for the history-making Western New York Nuclear Service Center.

The governor's decision to assume the key role in the 10:30 AM program was announced Friday by his office in Albany.

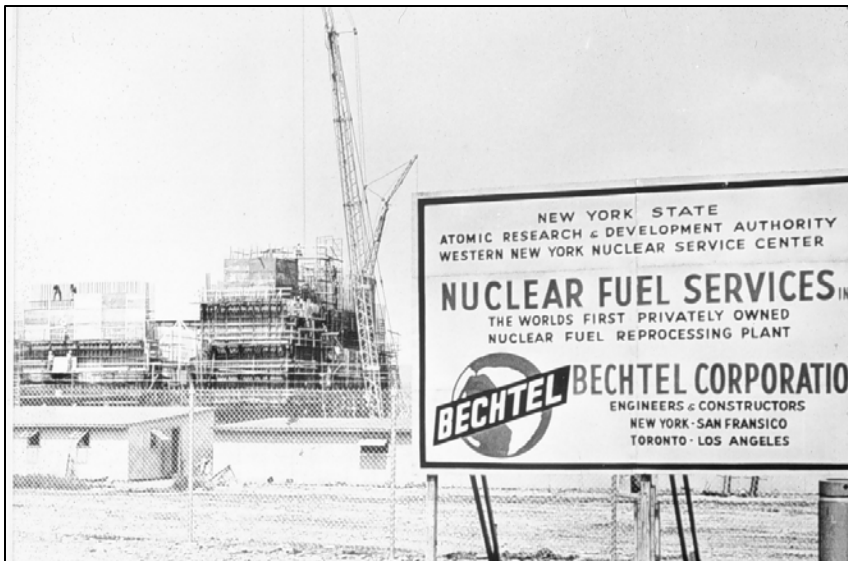
Other participants include officials of NFS and its parent corporations, W. R. Grace Co. and American Machine & Foundry Corp., both of New York City, also members and executives of the Authority, whose chairman is Oliver Townsend.

T. Charles Runion, president, will head the NFS delegation, which will include officials of Bechtel Corp., San Francisco, which holds the engineering and construction contract.



# Reprocessing Operations Begin in 1966

- NFS was licensed under 10 CFR Part 50 as the operator of the facility, and the New York State Atomic Research and Development Authority was licensed as the owner.
- The construction cost was about \$33 million.



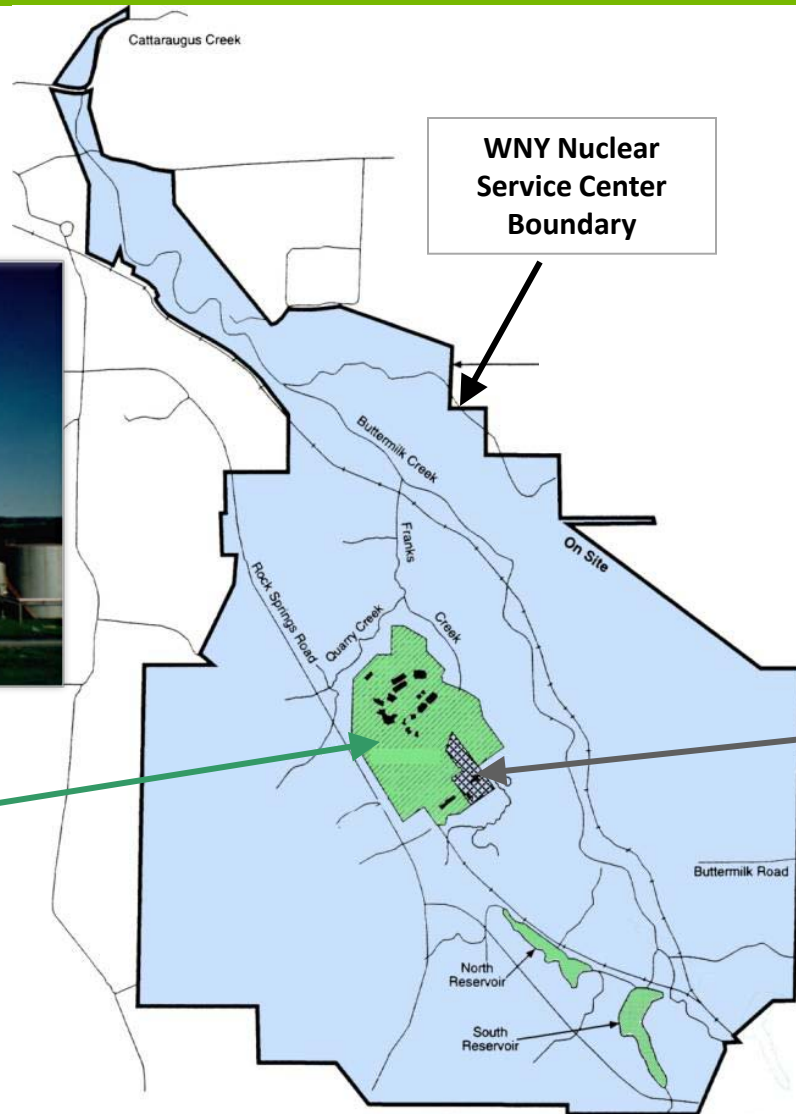
- AEC set the fee structure for reprocessing. NFS could not charge more than 15% above the AEC-published charges based on a conceptual AEC reprocessing plant.
- Construction was completed in 1966, and the AEC granted a provisional operating license for the facility.

# Western New York Nuclear Service Center During Reprocessing



## Reprocessing Facilities

Managed and operated by NFS, Licensed by the AEC (NRC)



WNY Nuclear Service Center Boundary



## State-Licensed Disposal Area

Managed and operated by NFS, Licensed and permitted by NYS

# NFS Ends Reprocessing Operations

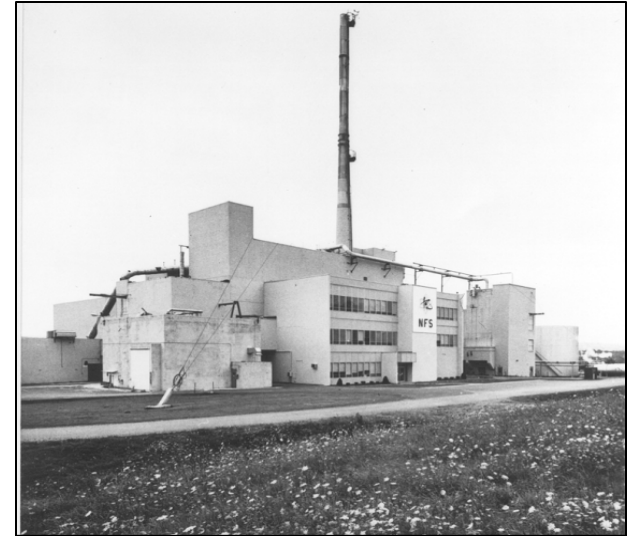
- NFS halted reprocessing after six years of operation to increase capacity, reduce worker dose and reduce radioactivity of effluents.
- NFS expected the modifications to cost \$15 million.
- New requirements were issued by AEC related to earthquake and tornado protection, and waste management.
- NFS estimated that the requirements could cost \$600 million, and said it would not resume reprocessing at West Valley.
- In 1976, NFS informed New York that it intended to turn the facility and its waste over to New York.





# High-Level Waste Demonstration Project

- New York State would not accept the facility and wastes from NFS.
- Congress held hearings, directed the GAO to investigate, and directed DOE to study options for the future of the Center.
- Congress passed the West Valley Demonstration Project Act in 1980.



President Carter Signs the WVDP Act

- The reprocessing facility at West Valley failed to live up to its high expectations.
- A combination of economic factors, technological difficulties, and an evolving regulatory framework led to the failure of the facility.

# Western New York Nuclear Service Center Today



# Western New York Nuclear Service Center

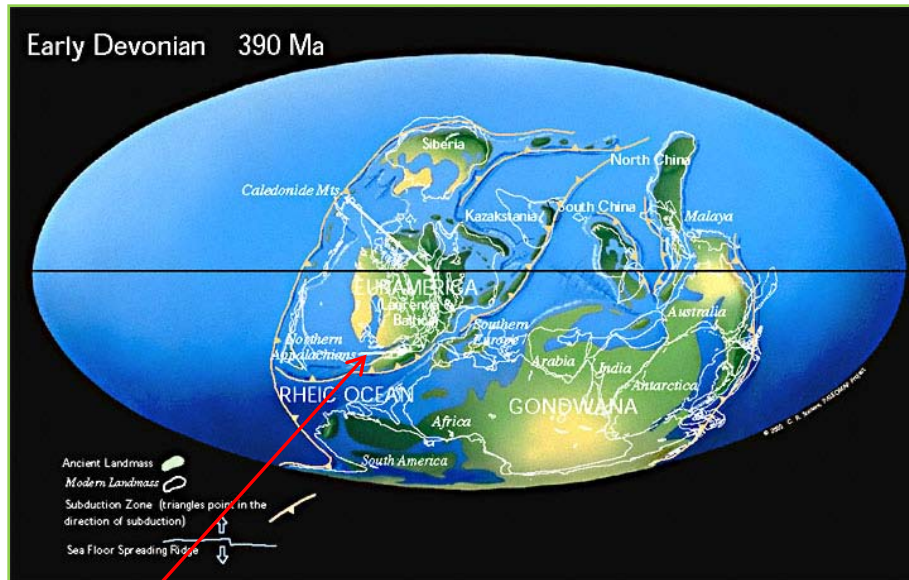
## Geology Overview

Paul J. Bembia  
NYSERDA West Valley Program Director

April 27, 2011

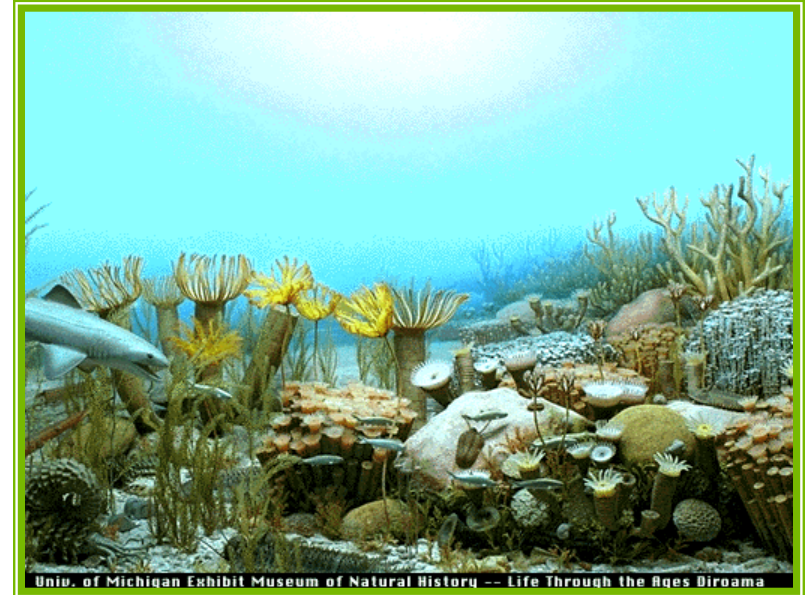


# Formation of Bedrock in Western New York



Modified from Scotese, C.R., 2002,  
<http://www.scotese.com>, (PALEOMAP website).

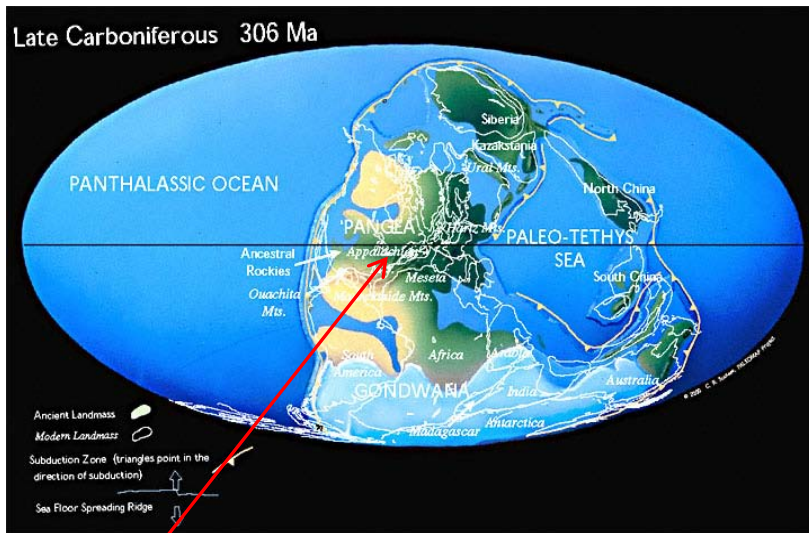
Western New York



<http://seaborg.nmu.edu/earth>.

**400 million years ago, Western New York is covered by a tropical sea, south of the equator.**

# Formation of Bedrock in Western New York



Modified from Scotese, C.R., 2002,  
<http://www.scotese.com>, (PALEOMAP website).

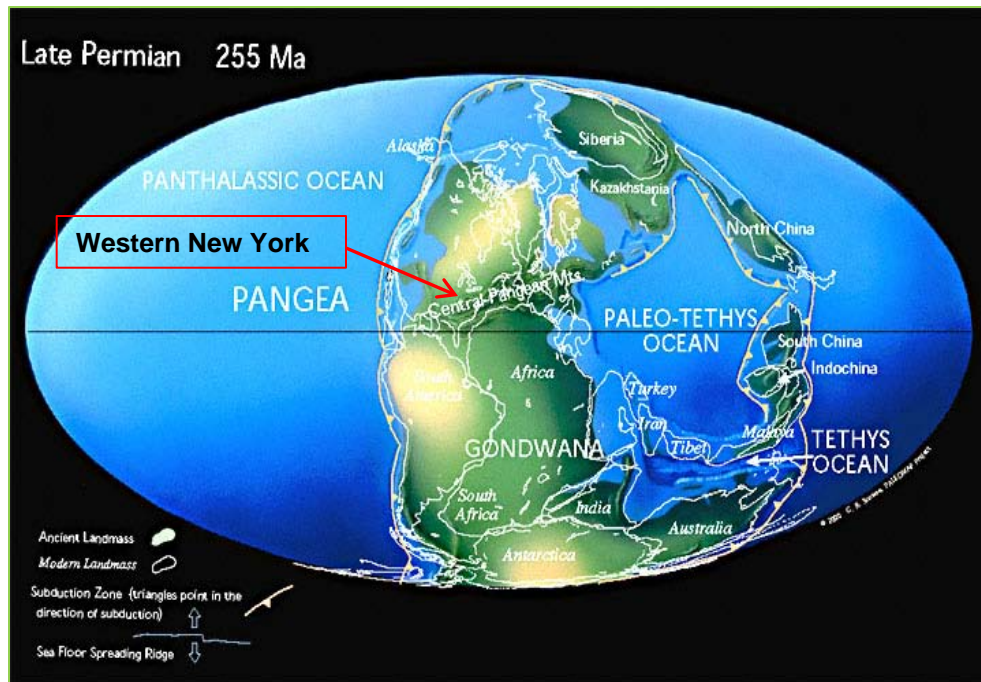
**Western New York**



**300 million years ago, Western New York has emerged from the sea.**



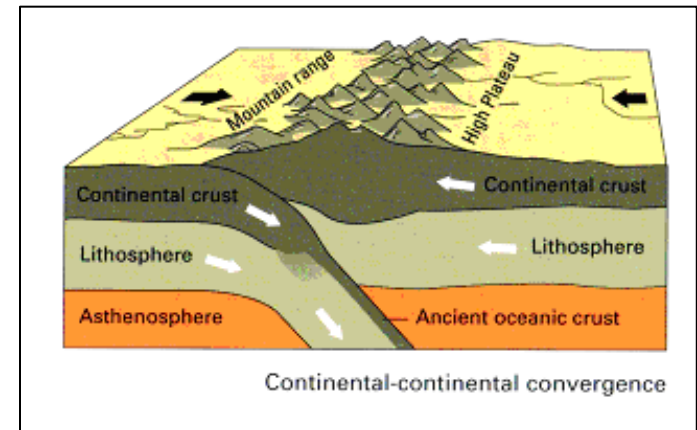
# Erosion and Formation of Bedrock Structures



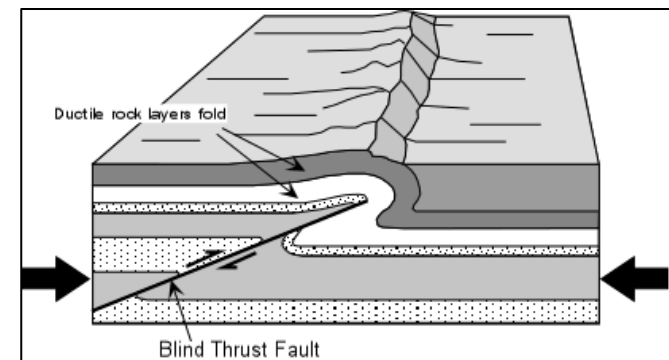
Modified from Scotese, C.R., 2002, <http://www.scotese.com>, (PALEOMAP website).

**250 million years ago, continental collision (North America and Africa) causes rock deformation and mountain building (the Appalachians) to the east.**

## Mountains

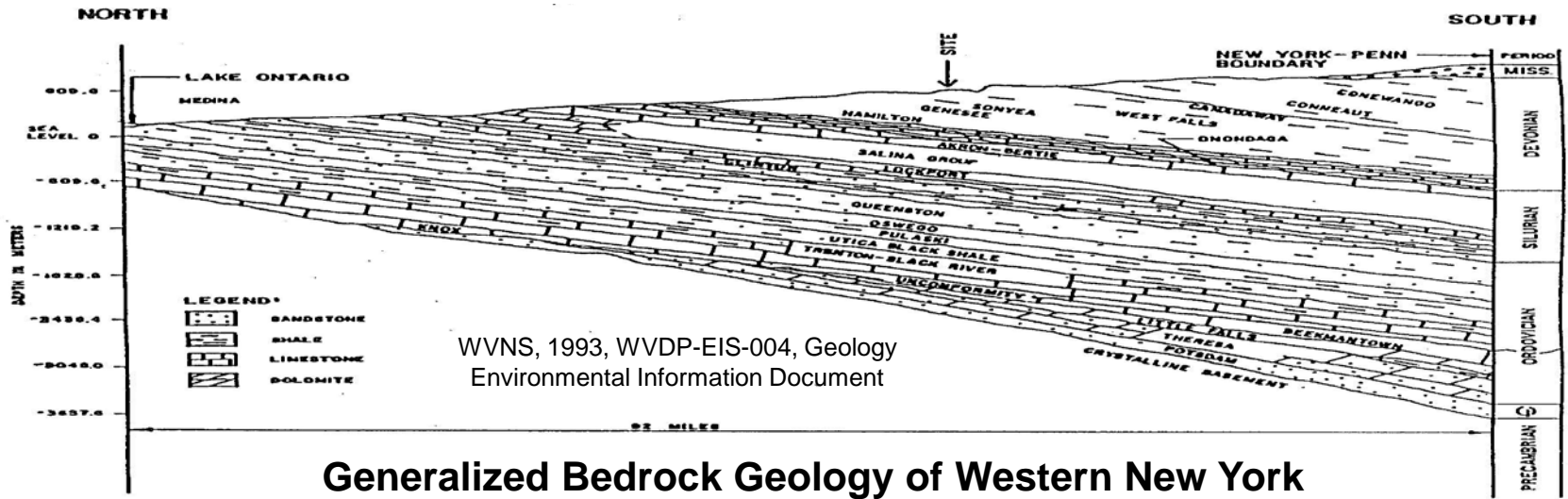


## Faults

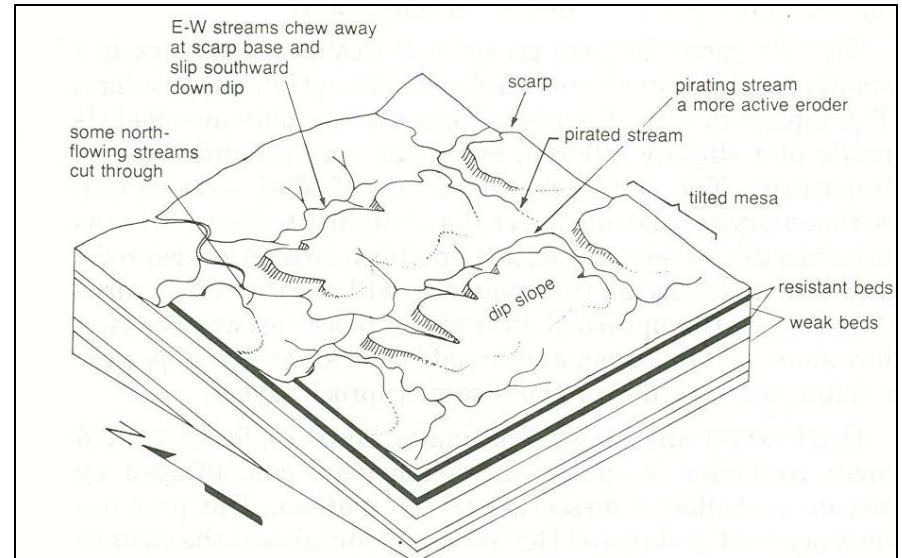




# Bedrock Geology of Western New York



**South-dipping layers of bedrock eroded and produced east-west belts of rock across western and central New York.**



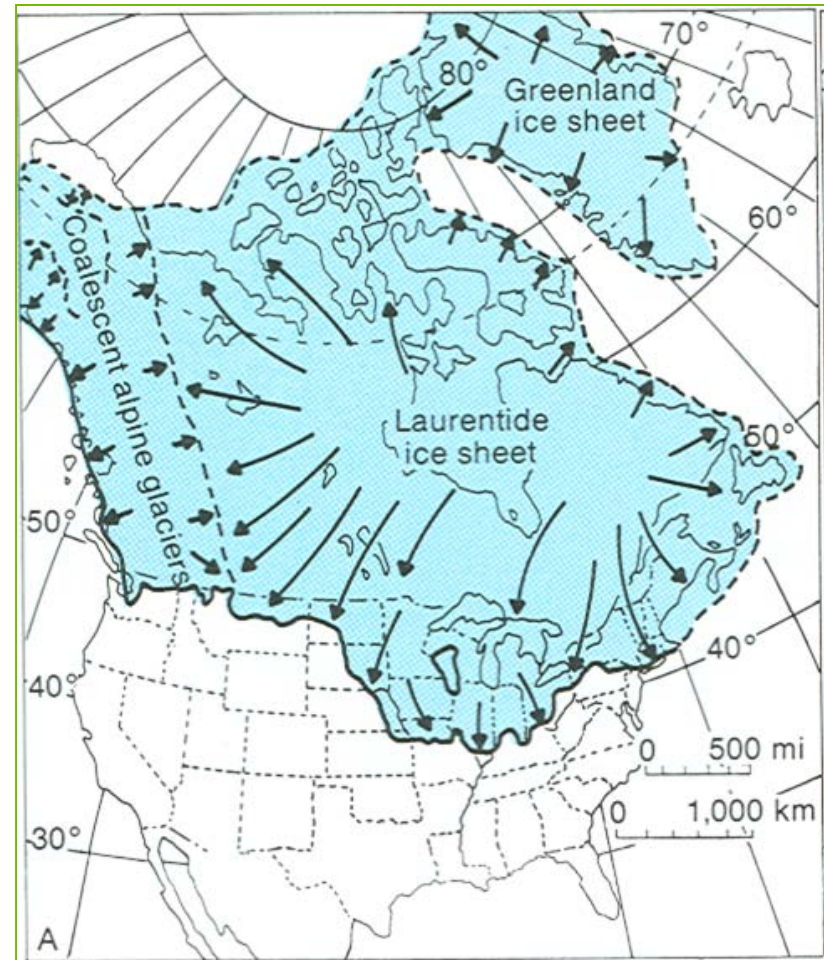
# Glacial Deposits in Western New York

Continental ice sheets covered Western New York during the last ice age – from ~2 million to ~12,000 years ago.



**Arctic Ice Sheet**

[www.krug.com.by/work-archives-arctic.html](http://www.krug.com.by/work-archives-arctic.html)



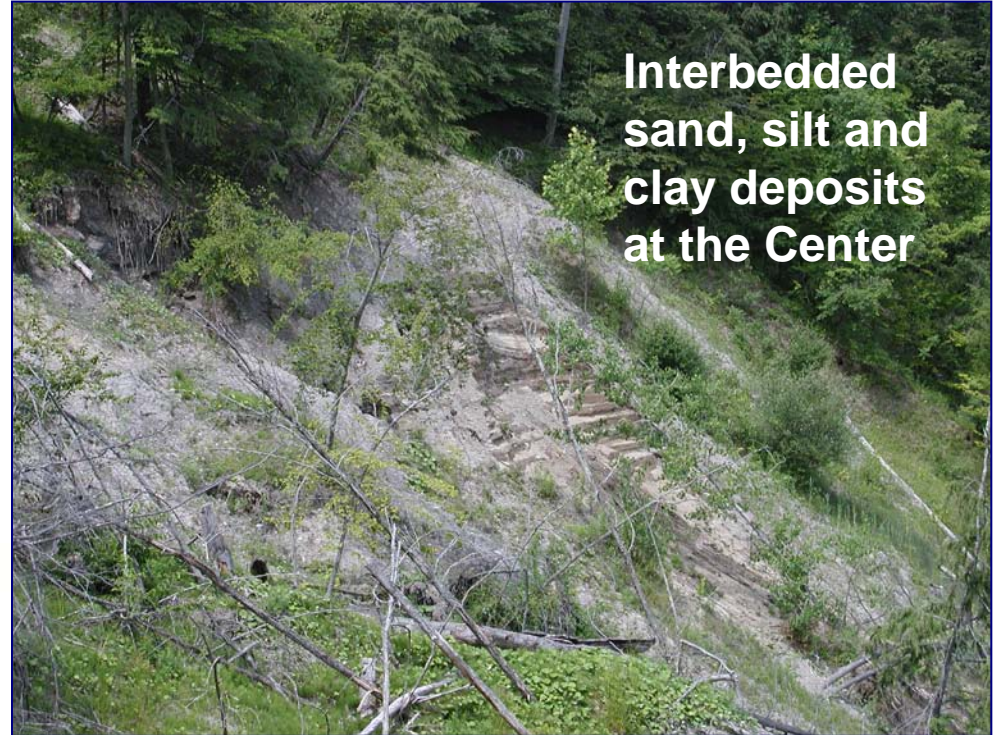
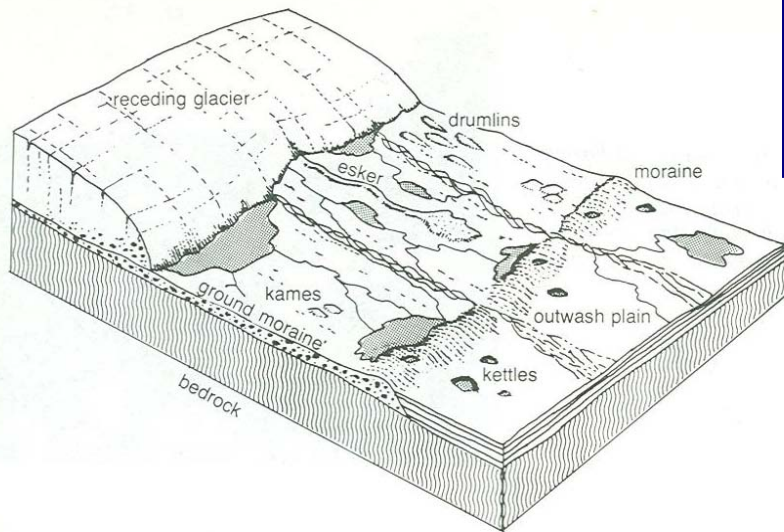
**Limit of Pleistocene Ice Sheets of North America**

Driscoll, FG, 1986, Groundwater and Wells, Second Ed., Johnson Division



# Glacial Deposits at the WNYNSC

**Glaciers carry and deposit large quantities of sediment.**



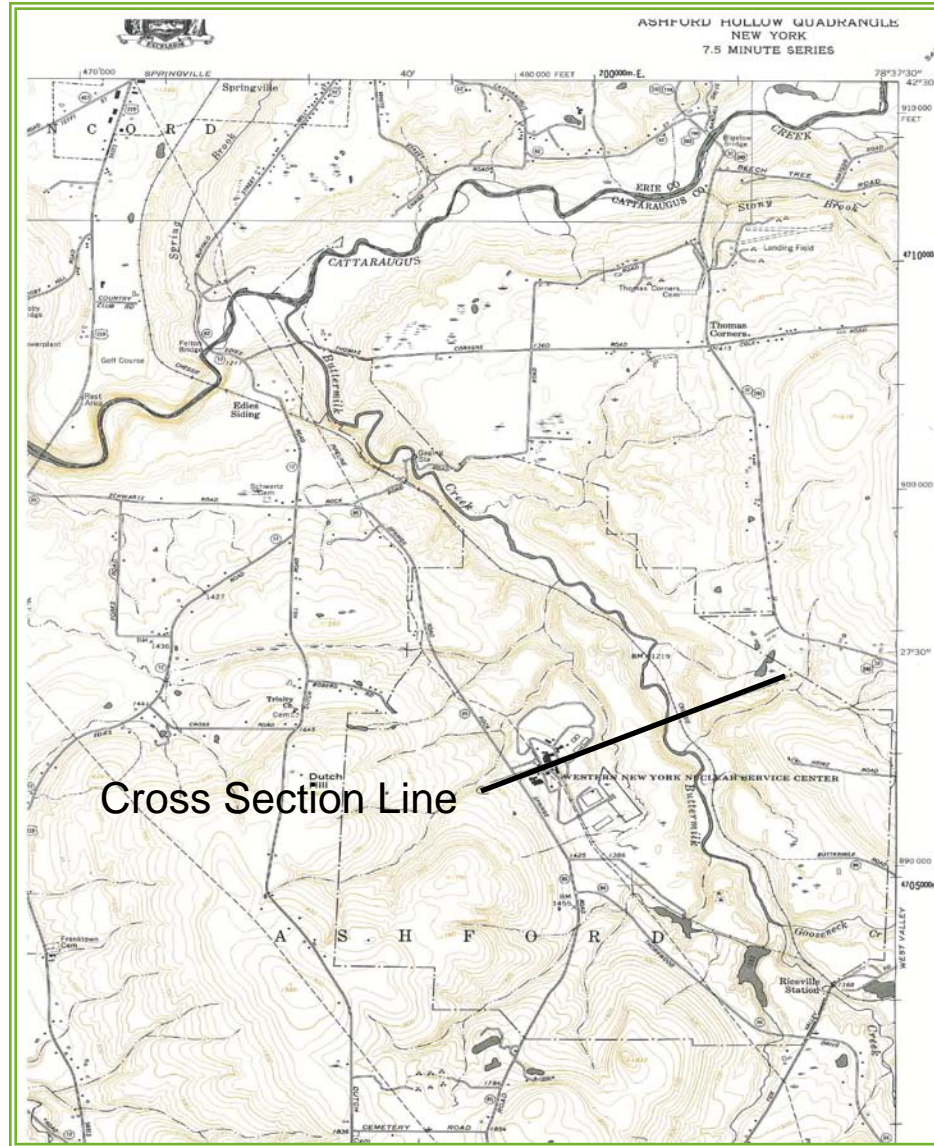
**Interbedded sand, silt and clay deposits at the Center**

**Retreating glaciers leave a complicated sequence of unconsolidated sediments.**

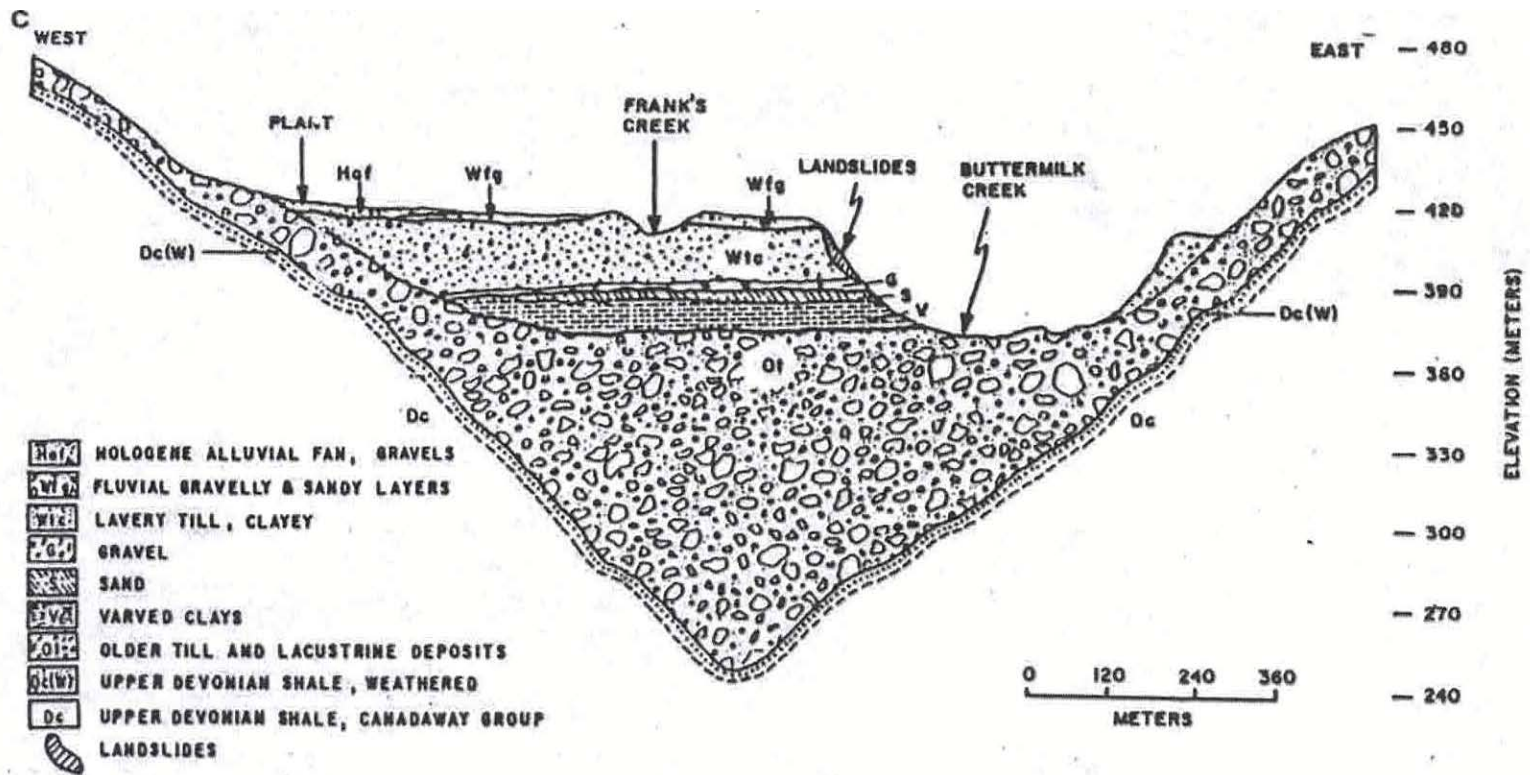


# Western New York Nuclear Service Center

Northeast portion of  
Ashford Hollow, NY  
7.5 Minute  
Quadrangle

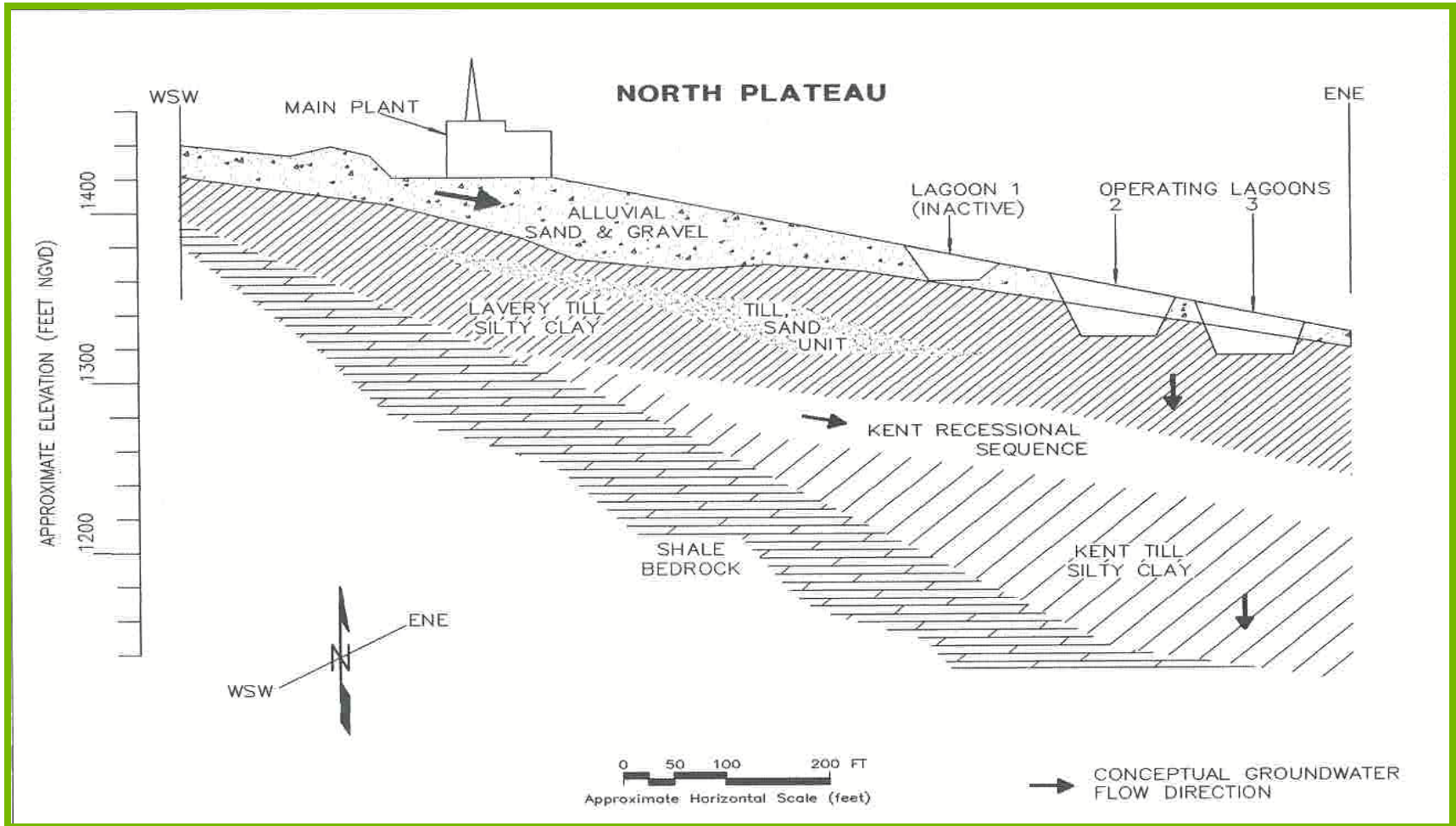


# Geologic Cross Section Through the Developed Areas of the WNYSNC



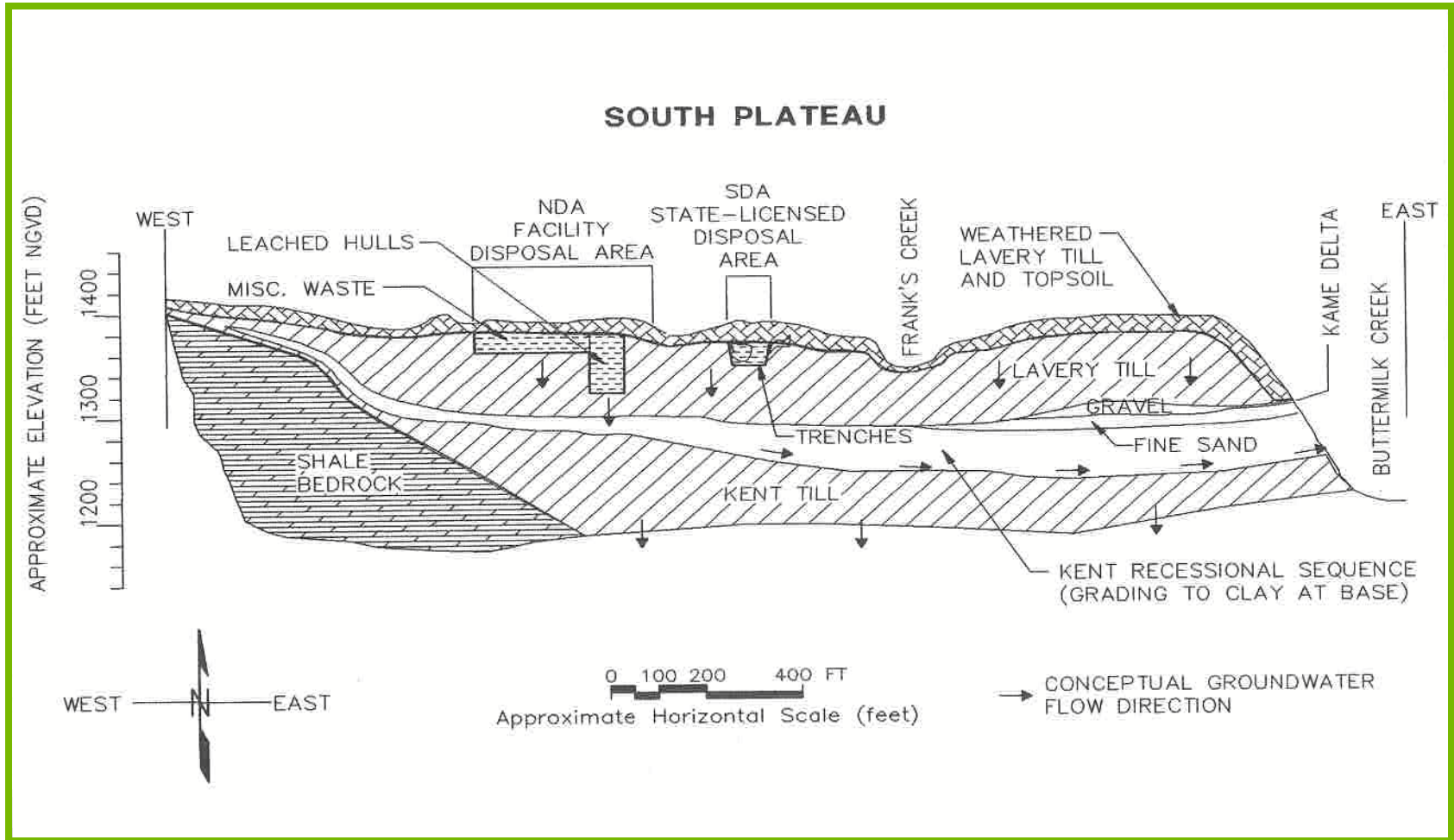
NOTE: Vertical Scale = ¼ horizontal scale.  
Adapted from Dana et al. (1979a)

# North Plateau Subsurface Geology





# South Plateau Subsurface Geology



# Erosion is a Significant Long- and Short-Term Issue

