

# MAYO CREEK RESTORATION

*A NARROW PATH*

Mayo Creek Restoration Committee

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# Mayo Creek



# Some History

- Diked off in 1909, to replace a bridge
- Consequences:
  - Loss of 60 acres of good salt marsh
  - High concentrations of nitrogen & coliform bacteria
    - Restoration part of Town N remediation planning
  - Loss of small bait fish to eat mosquito larvae
- Much marsh filling, mostly after WW II
  - Some abutter yards are below mean harbor high tide
  - But ... a vibrant part of Wellfleet

# Key Restrictions on Restoration

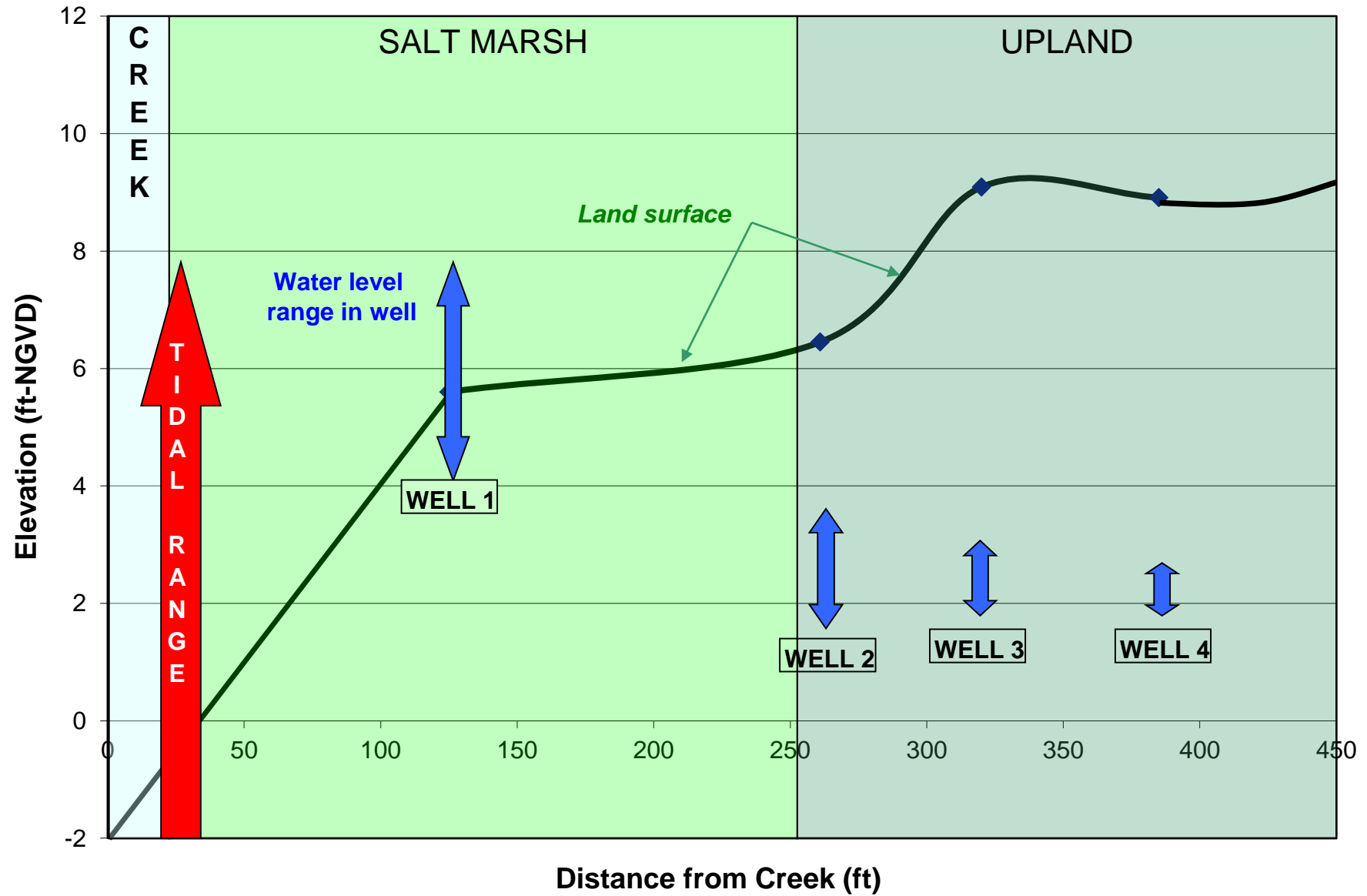
- Constraints ... must be met for all abutters
  - No inundation above level of existing wetlands
  - No impact on waste disposal systems: use or compliance
    - Must keep mean creek tide unchanged
  - Drinking well water quality not impaired

# Limits for New Direction

- Maximum tide in restored marsh
  - +1.3 feet above mean harbor sea level
  - Duckbill doesn't allow control without tidal gate
- Mean tide in restored marsh
  - Cannot exceed current creek level: -1.7 feet
  - Science: Increase would raise adjacent groundwater levels
  - Restoration cannot exceed this limit, without affecting leach field operation & compliance
  - Waste water installations, low-lying properties

# Groundwater Trial – Wellfleet







# Mayo Creek Today ... It Won't Work





# Creek Today

	HARBOR	CREEK AS IS	GOAL
Mean High Tide	5.0	-0.8	<1.3
Mean Tide	0.0	-1.7	-1.7
Mean Low Tide	-5.0	-2.6	-4.7
Tidal Range	10	1.8	

# What did we learn?

- Hydrodynamic modelling
- Current culvert cannot meet project goals
  - Can't balance marsh high tide with needed drainage
    - Opening too narrow
- Poor storm/rain drainage

So ...

- We need a new culvert design
- For guidance, look at unimpeded salt marshes



INLET

Mayo Creek 1848

# Real salt marshes ...

- Do not have a waterfall at the outlet
- Broad and gentle flood plain,  
at or near harbor mean low tide



# New Direction

- Based on new modelling results (WHG/MassBays support)
- Invert - up & down stream - lowered to -5 feet
- 6-ft wide x 7-ft high box culvert
  - Culvert height for safety
- Stream channel dredged to match
  - Side channels in marsh to increase drainage, intricate channels
    - Including storm drainage
  - Compensate for loss of drainage network & narrow entrance
  - Help fish get to mosquito larvae
- Tidal gate for control: *adaptive management*

# New Culvert Gate



# Drainage: Proposed Dredging & Channels

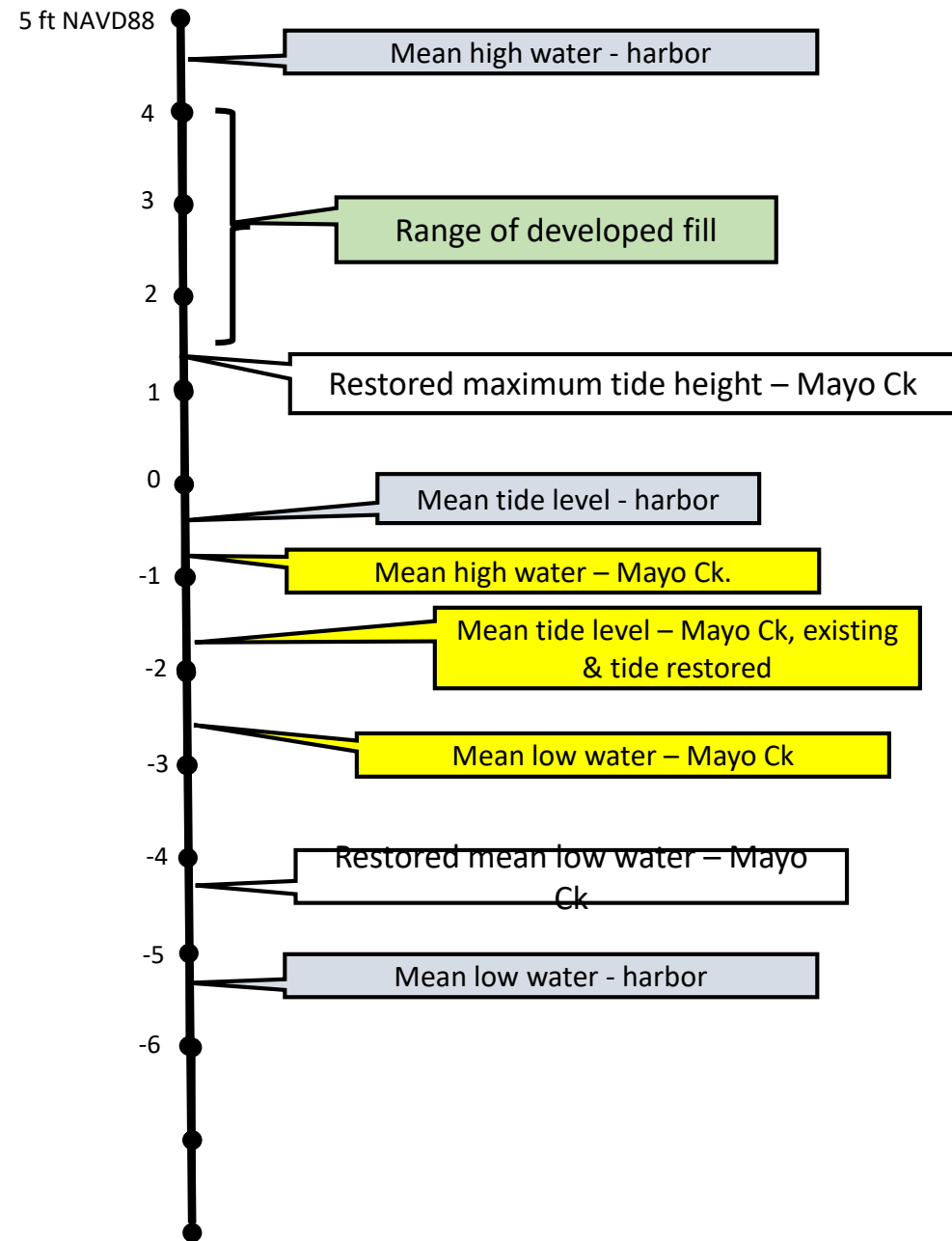


# Result of New Modelling

	Harbor - existing	Mayo Creek - Goal	Mayo – Model Prediction
Maximum High Tide	5.0	<1.5	<b>1.2</b>
Mean Tide	0.0	-1.7	<b>-1.7</b>
Mean Low Tide	-5.0	****	<b>-4.6</b>
Tidal Range	10	maximum	<b>5.8</b>

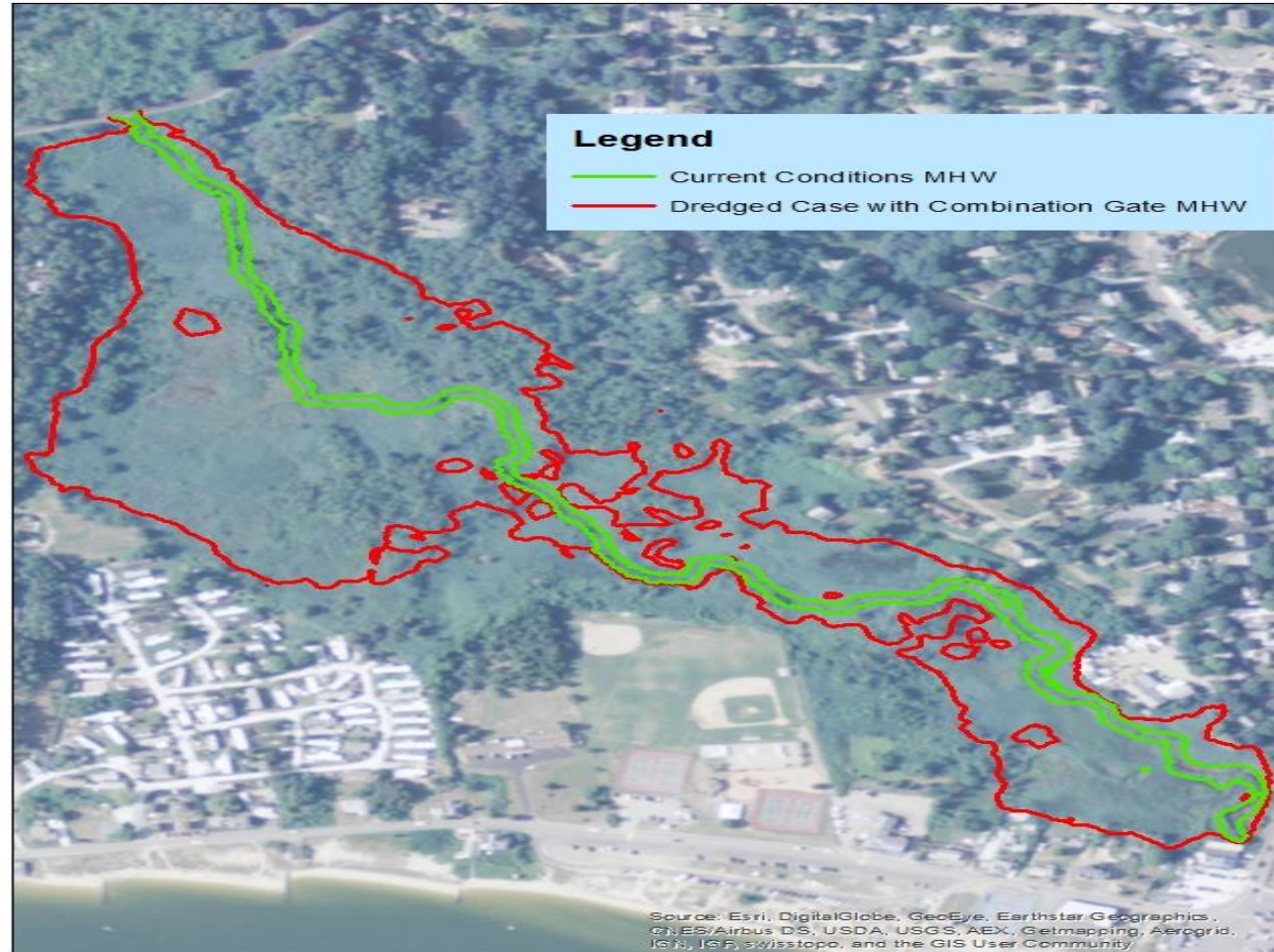
- 23 of 60 acres restored

Note: lowest leachfield base is 6.76 ft-NAVD88





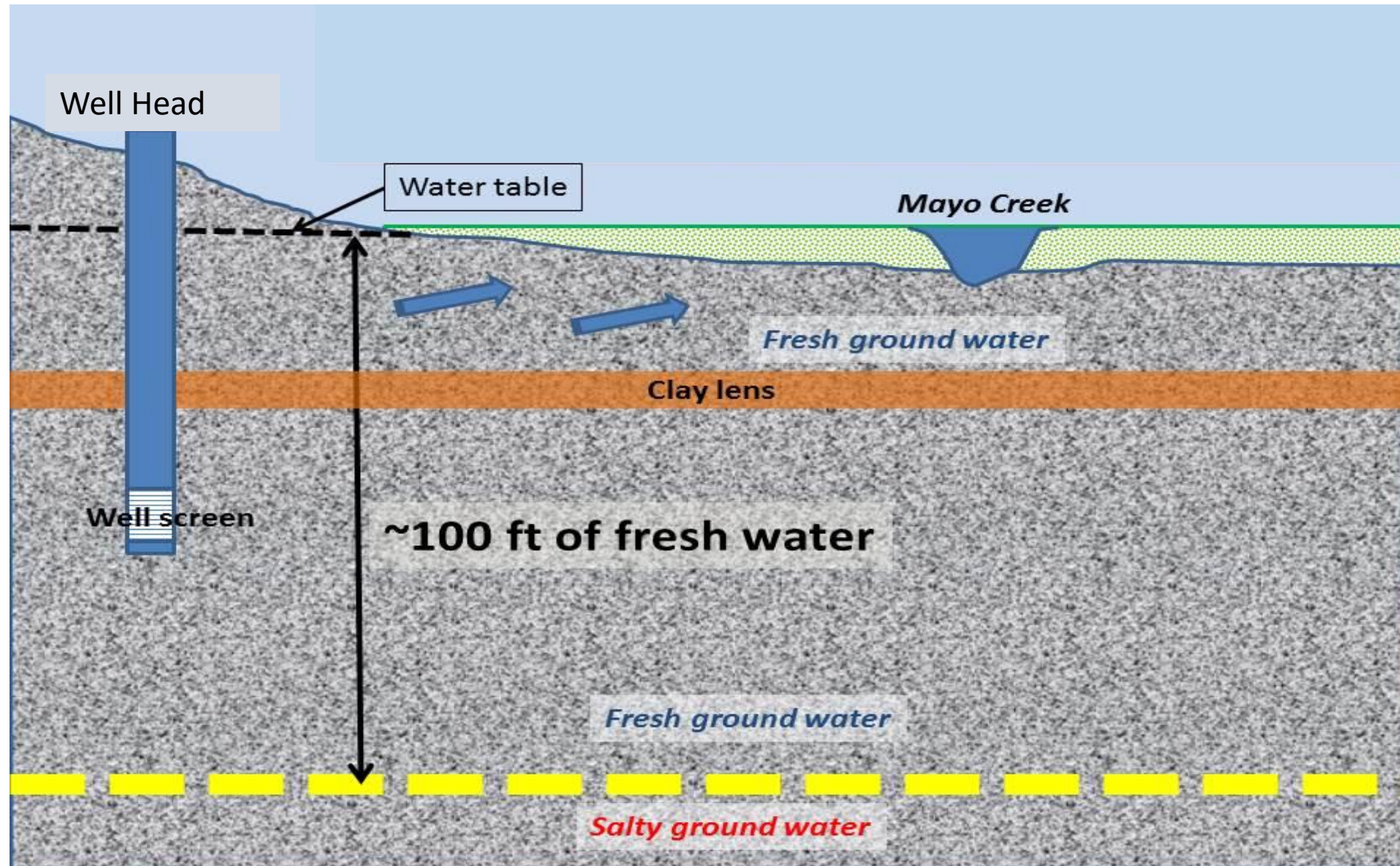
# 23 Acres of Proposed Restoration



# Drinking Water

- Drinking Water Wells
  - Well screens located typically about 50 feet deep in fresh water lens
  - Lens supplied by flow from adjacent uplands
  - Mayo Creek: Thick clay layer under the old marsh bed
  - All well heads are above the maximum 1.3 high tide limit
- Many abutters – but not all - on Town water
- More analysis to follow ...

# Drinking Water Wells



# Important Issues ... Not Forgotten

- Vegetative Management
- Odors
- Mosquitos



# Next steps:

- Hydrology review
- Use best science to examine risks & monitoring needs
  - Waste-water systems
  - Drinking water wells
- Final recommendations to Selectmen by 6/18
- If accepted, need engineering, monitoring plan & permitting before installation