

COMMONWEALTH OF MASSACHUSETTS
ENERGY FACILITIES SITING BOARD
EFSB 17-05/D.P.U. 18-18; 18-19

DIRECT TESTIMONY OF HANS KEIJSER

Q. Please state your name, position, and employer.

A. Hans Keijser, Supervisor, Hyannis Water Supply Division, Department of Public Works, Town of Barnstable.

Q. On whose behalf are you testifying?

A. The Town of Barnstable.

Q. Please tell us about your education and professional background.

A. My resume is attached.

Q. What is the purpose of your testimony?

A. As the Supervisor of the Hyannis Water Supply Division of the Town of Barnstable, I am very familiar with the Hyannis Water System and the challenges it faces and the risks that the Vineyard Wind project in Independence Park pose to the water system. I have been asked to examine this project and provide evidence to the Siting Board.

Q. Have you previously testified before the Energy Facilities Siting Board and the D.P.U.?

A. Yes. I testified in D.P.U. 13-64 regarding the expansion of an NSTAR substation that added a third transformer to an existing substation in the immediate vicinity of the proposed Vineyard Wind substation where NSTAR agreed to

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48 provide full containment below both its existing transformers and the proposed
49 third transformer. I also testified in EFSB-02-2B/EFSB 07-8 concerning Cape
50 Wind's proposal to expand the NSTAR substation in Independence Park, Hyannis
51 with respect to the risks to the public water supply and the need to provide
52 adequate containment to control any release of dielectric fluids.

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54 Q. What is the current overall health of the Hyannis Water system?

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56 A. It is precarious. The system has been impacted by infiltration of the chemical
57 1,4 dioxin that has caused one of three wells to be shut down at the Maher
58 wellfield, which is downstream from the Mary Dunn wellfield. A second Maher
59 well is above the limit but is being diluted with water from Yarmouth. The third
60 Maher well is also affected but currently at levels below the health advisory.

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62 Meanwhile, a chemical in fire-fighting foam, PFOS/PFOA, has migrated
63 downstream from the County fire-fighting academy and has been detected in all
64 three Maher wells, causing a second Maher well to be closed. PFOS has also been
65 detected in our Hyannis Port well and our Simmons Pond well, but not to a level
66 that currently mandates treatment. Our Straightway well is also above allowable
67 PFOS limits and is shut down.

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69 Because of these shutdowns, the Hyannis system has no reserve capacity during
70 high-draw conditions. If we lose the supplemental supply from Yarmouth, it will
71 cause further shutdowns and our capacity will fall below our regular demand
72 parameters.

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74 Q. What is the risk posed by the Vineyard Wind substation proposal?

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76 A. As discussed by Ann Marie Petricca in her testimony, the proposed substation
77 sits atop the sole-source groundwater supply which is directly upstream from the
78 Mary Dunn wellfield. If there is a release of dielectric fluids to the groundwater at
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88 the substation, it will flow downstream and be drawn into the Mary Dunn wellfield
89 in as little as 7 days from entering groundwater. Such a release could also be drawn
90 into the Yarmouth water supply shortly after reaching the Mary Dunn wells.
91 Because the allowable limit of dielectric fluid in a public water supply is so tiny, a
92 shutdown of the Mary Dunn wells would be quick to follow.

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94 Q. Given water flow direction in the area, are the other Hyannis wells at risk from
95 a spill at the proposed Vineyard Wind substation?

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97 A. Yes. The Maher wellfield would likely be contaminated within a couple of days
98 after the Mary Dunn wells. Also, depending on results of detailed water flow
99 studies and pumping conditions, the Hyannis Port, Straightway, and/or Simmons
100 Pond wells could also be affected and closed.

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102 Q. If even one additional well must be shut down because of contamination, could
103 the Hyannis system meet its demand requirements?

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105 A. The loss of one well would likely cause either the full shutdown of the Hyannis
106 system or require us to pump water that exceeds the maximum contaminant levels
107 mandated by MADEP.

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109 Q. We have been discussing current conditions. Is there an additional circumstance
110 that may further limit the capacity of the Hyannis system?

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112 A. Yes. I understand that DEP is considering reducing even further the standard for
113 maximum allowable concentration of PFOS/PFOA in public drinking water
114 supplies from .07 ppm to .02 ppm, a 71% reduction from an already low threshold.
115 That event would implicate the viability of several additional wells which would
116 require installing filtration equipment; however, it is not clear whether it is possible
117 with existing filtration technology to attain the reduced concentration levels of
118 PFOS/PFOA that are being considered by DEP.

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Q. In light of these developments, what is your view of the proposed VW substation project?

A. Frankly, I would prefer that the substation not be built in Independence Park or the Town of Barnstable. The risks to groundwater are simply too great. But, if it must be built, I would want to see robust containment that has been carefully peer-reviewed by the Town in advance of a building permit being issued.

I would also require that Vineyard Wind relocate upstream at its cost all wellheads that are at risk of impact from a release of dielectric fluids from the proposed substation. That is the only way to assure that the Hyannis system can remain viable and out of harm's way.

Q. The risk of a release to groundwater is relatively small. What would happen if a release of dielectric caused a loss of one or more Hyannis wells for an indefinite period?

A. As discussed above, a loss of even one well would be catastrophic. VW has not identified the selection of dielectric fluid that will be used in its four transformers. We do not know the chemical content and how those chemicals might affect groundwater. We do not know how quickly the fluid would pass through the ground below the substation and therefore we don't know how much time we have from a release until it reaches groundwater. Indeed, we don't even know the depth to groundwater at the substation.

Most importantly, we don't know how easily and thoroughly the dielectric fluid would mix with water. Therefore, we don't know whether there are any available technologies that could filter out the fluids and how long that would take before the water could be returned to potable status, if ever.

There is simply no alternative to getting this right. The wells must be moved.

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Q. To your understanding, where does groundwater flow after it reaches the Mary Dunn and Maher well systems?

A. We believe that it continues to flow generally east, southeast, and south depending on what wells are actively drawing from groundwater from time to time.

Once water passes our well heads, groundwater flows towards Town of Yarmouth wells and then into streams and water bodies further downgradient. From that point, the streams deposit fresh water directly into Lewis Bay and then to Nantucket Sound, or directly into Nantucket Sound from streams that do not flow into Lewis Bay.

Q. To your knowledge, have there been any studies to calculate the environmental effects of mixing fresh water contaminated with dielectric fluid with the salt water of either Lewis Bay or Nantucket Sound.

A. I am unaware of such studies but those should certainly be conducted before this project is permitted. It only stands to reason that if a maximum contaminant level of 1 part per 5,000,000 parts is the DEP limit for potable water, injection of such fresh water into the saltwater environment cannot under any circumstances be other than extremely harmful and of great environmental concern.

Q. When PFOS and PFOA from the Fire Training Academy were found in Mary Dunn wellheads, how did the Town respond? What costs were incurred?

Because of the health concerns announced by the EPA and DEP, Barnstable immediately closed the affected wells. The Town then purchased carbon treatment equipment to filter the water and contracted with the Town of Yarmouth to provide additional water flow in order to assist with diluting the Maher well water to acceptable limits.

The cost of those efforts to date exceeds \$12,000,000 and is expected to continue indefinitely.

Vineyard Wind, LLC
EFSB 17-05/D.P.U. 18-18, 18-19
Exhibit TOB-HK-1
Date: September 5, 2018
Presiding Officer: Kathryn Sedor
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Barnstable also spent about \$350,000 to supply bottled water to its Hyannis residents and businesses until filtration equipment came online. An additional \$100,000 was spent for labor to distribute the bottled water.

Q. How many customers would be affected by a shutdown of the Hyannis water system if the Town was unable to supply water to them?

A. There are currently about 5,889 residential accounts servicing about 14,398 year-round residents, and thousands more in the summer months. There are about 1,259 commercial and business accounts that include Cape Cod Hospital and much of the medical infrastructure for the Cape and Islands including doctors' offices, testing facilities, labs, etc. Also included is the Cape Cod Mall and innumerable other businesses which, combined, employ a reported 20,117 paid employees.

Q. Does this conclude your testimony?

A. Subject to rebuttal testimony, the SDEIR MEPA filing, and further discovery, it does.

Signed under the pains and penalties of perjury at Barnstable this 11th day of September, 2018.


Hans Keijser

Hans Keijser
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Forestdale, MA 02644
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SUMMARY A 22 year career utilizing my Civil & Architectural Engineering Degrees.

Areas of expertise,

- Public Water Supply Systems
- Municipal bidding and procurement processes.
- Site, Personnel management & logistics
- Roads, highways, commercial, industrial structures
- Marina-bulkheads, dikes, dams, dredging, erosion control
- Septic systems, perc tests, wetland surveying, wellheads
- Cost estimating, quantity take-off.
- Architectural research, historic restoration
- Environmental sustainability, green building design
- Renewable energy, efficiency and management programs
- Laws & regulations(Federal, State, Municipal)
- Municipal budget process, funding allocation for operating and capital budgets
- Revenue management and ratesetting analysis

WORKHISTORY

Supervisor

2005-Present *Water Supply Division, Department of Public Works, Town of Barnstable, MA*

-Responsible for planning, directing, managing the operations of the Water Supply Division with the use of a contract operator, an operating budget of 3.1 million dollars and a capital budget of \$200,000.

-All matters regarding contract administration, operating and capital budgets, developing rules and regulations and the integration of a new division within the DPW and municipal administrative structures

-Responsible for the development of a capital improvement plan, rate and fee structures and revenues.

-Develop and explain the issues related to Public Water Supply Systems within the municipal process and to the governing Hyannis Water Board with regards to public safety, physical plant and water operator responsibilities, project planning, contract administration, preventive maintenance programming and improving customer-relations.

2001-2005 *General Foreman, Structures & Grounds Division, Department of Public Works, Town of Barnstable, MA*

-Responsible for planning and managing the operations of the Structures & Grounds Division with 35 full-time employees and an operating budget of 2.6 million dollars.

-All matters regarding contracting, operating and capital budgets, personnel, reorganization and future development of the Division

- Responsible for the Facility Management of town-buildings, ice skating rink, marinas, beaches, parks & cemeteries throughout the seven villages of the Town
- Develop and instruct the foremen with regards to project planning, personnel-management, preventive maintenance programming and improving customer-relations

Accomplishments

- Received award from the Hyannis Chamber of Commerce
- Chosen to be featured in the Northeast Energy Efficiency Partnerships Newsletter
- Awarded a free AC-chiller for the Town of Barnstable over competition from the Fleet Center & Tufts University
- Granted for three years a free lease to test drive a proto-type electric car from GM/Saturn
- Applied & received a total of \$60,000.00 in MTC Grants.
- \$80,000.00 in efficiency rebates, equipment & labor returned back to the Town
- Invited to be part of the technical peer-review team overseeing the renewable energy study for the Cape Cod Commission's model by-law proposal regarding land-based wind turbines.

1988-2001
1986

Supervisor of Site Development, Construction & Maintenance-team
Prindle Pond Conference Center (Nature's Classroom), Charlton, MA

- Designed and constructed new buildings, roads and drainage systems on campus of environmental education center
- Utilize green building design, energy efficiency and the use of recycled & renewable resources
- Oversee design and operation of Public Water Supply System and Semi-public Pool
- Member of the development-team for Greylock Management Associates, chosen by Governor Jane Swift for the development of Greylock Lodge in Adams, Massachusetts; an environmental education center based on principles of environmental sustainability and green building design

1988-Present

Consultant

COX ENVIRONMENTAL ENGINEERING INC., Charlton, MA (1/90-12/90)
PARA SURVEYING, Southbridge, MA (90-91)
STEVENS CONSTRUCTION COMPANY INC. (7/88-Present)

- Property surveys, plot plans, topographic mapping and perc tests for septic systems
- Cost estimating, bidding and layout on jobs
- Plan & construct septic systems, building-foundations, drainage, roads and well installations

CHARLTON HISTORIC SOCIETY, Charlton, MA (2/88-10/01)

- Research architecture and advise Restoration Commission
- Assisted with restoration of the interior of a historic tavern

1986-1987

Technical Documentation Clerk

105th HEAVY-PONTOON BRIDGE CO. 1st ENGINEERING-DIVISION, ROYAL DUTCH ARMY, Wezep, The Netherlands.

-Maintained technical documentation files and coordinated logistics of pontoon bridging operations

1983-1984

Junior Engineer (Intern)

MURRAY & ROBERTS ENGINEERING (2/84-8/84), Johannesburg, Republic of South Africa

-Wastewater treatment plant in a paper mill extension project
-Water purification plant, assisted with site development and construction coordination

VAN OORD WERKENDAM, Werkendam, The Netherlands (8/83-1/84)

-Assisted with dike construction along the Waal-river, Bulkhead-construction in Rotterdam-harbor, a multi-lane highway reconstruction project in Brabant and dredging activities related to the expansion of the Zuid Beveland Canal

EDUCATION SUFFOLK UNIVERSITY, Frank Sawyer School of Management, Public Administration Department, Boston, Massachusetts.

2007- present Part of the Town of Barnstable Cohort program working toward a Masters in Public Administration degree

1991-1992 WORCESTER POLYTECHNIC INSTITUTE, Worcester, MA
EIT course, Evaluation of Educational Credentials, awarded B.S. degrees

1985-1986 AMSTEL INSTITUTE OF TECHNOLOGY (POLYTECHNIC INSTITUTE)
Amsterdam, The Netherlands, awarded the Ing. title

1981-1985 **B.S. Architectural Engineering**

BS Civil Engineering

TRAINING & LICENSES Water Operator Licenses; T-2 and D-3, Public Water Supply Systems
Massachusetts Certified Public Purchasing Official.
Building Operator Certification #2 (BOC2), Advanced training
Building Operator Certification #1 (BOC1), Basic Training
Massachusetts Construction Supervisors License, Unrestricted
Pool Operators License, Public & Semi-public Pools
ICMA Supervisory Skill Building Program
Sensitive & Difficult Communication, Professional Writing, Negotiation & Conflict Resolution, Meeting Management

PROFESSIONAL

SKILLS Computer, Internet, Microsoft Outlook, Word, Excel, Project, PowerPoint, Capital Asset Management Programs (TMA), Auto-CAD & Microstation
Foreign languages, Dutch, German, Afrikaans

MEMBERSHIPS

New England Water Works Association, Holliston, MA
North East Sustainable Energy Association (NESEA), Greenfield, MA
Cape & Islands Self-Reliance, Waquoit, MA

COMMUNITY INVOLVEMENT

Nature's Classroom Inc., Charlton, MA, Board of Directors, member