

October 12, 2006

CHUCK MOTSON
ISLAND MANAGER
HAT ISLAND COMMUNITY INC
3616 COLBY AVE BOX 335
EVERETT WA 98201

Subject: Hat Island Water System, ID# 31593
Snohomish County
Acute Coliform Response & Routine Sanitary Survey

Dear Mr. Motson:

Thank you, Wayne Orff, and Donovan Sheppard for meeting with Erika Peterson and me on October 6, 2006. The purpose of my visit was primarily to investigate the recent *E.coli* contamination of the water system. I also conducted a routine sanitary survey of the water system.

First, I want to acknowledge your and Wayne's efforts in addressing long-overdue maintenance of the water system facilities. The clean up of each site and organization of records made my visit far more productive. Keep up the good work!

My investigation of the *E.coli* contamination leads me to the following conclusions and action steps for your immediate attention and response:

1. As you suggested, I am not surprised by the *E.coli* sample result after hearing of the building filth and unclean sample tap from which the sample was collected. This result is not likely representative of water quality throughout the distribution system. However, I did find multiple openings in the water system that are pathways to allow bacteriological contamination of the system. Take immediate steps to seal wellhead openings and install screened vents; locate and screen storage tank overflows and verify access hatch seals and vent screens are in tact. Please send photographs showing the repaired seals and screens and those we were unable to observe during my visit (tank access hatches, vents, overflows, etc).

As I write this letter, I understand that you have already distributed public notification of a boil water advisory (afternoon of 10/6), sealed openings at each wellhead (10/7) and have disinfected and flushed the water system (10/7 thru 12). Please continue follow up with my colleague, Carol Stuckey. You are doing a good work!

2. The permanganate greensand filtration system is not operational. The filter vessel provides an attractive environment for bacterial growth. Bypass the filter until upgrades are designed, approved by DOH, and constructed.

3. Prepare and send me a copy of your Coliform Monitoring Plan that identifies sites appropriate for collecting representative bacteriological samples. Visit our website, <http://www.doh.wa.gov/ehp/dw/Programs/coliform.htm>, for guidance on Coliform Monitoring Plans and recommended sampling procedures.

Enclosed are my “Sanitary Survey Notes”, including my observations and recommendations discussed during my visit. Key follow up actions include:

4. Chlorination with a CT of 6 is required following RO treatment. Please activate the installed disinfection facility and ask your engineer to provide calculations to DOH showing how CT 6 will be achieved prior to the first service connection.
5. Send in a monthly Seawater Reverse Osmosis Treatment Plant report to DOH. I understand that the existing control system can produce a daily report on many of the required parameters. Please transfer this data to the enclosed report form and include chlorine residual measurements (once activated).
6. Consult with your engineer and evaluate options to make the well field treatment functional. Note that the arsenic concentration in the groundwater is now above the maximum contaminant level of 10ppb. It may be possible to modify the existing oxidation / filtration facility to remove arsenic as well as iron and manganese. Visit our website, http://www.doh.wa.gov/ehp/dw/our_main_pages/arsenic.htm, for arsenic health effect language and our guidance document on arsenic treatment for small systems.

My Sanitary Survey Notes capture specific issues (in bold type) that we discussed and need to be addressed. Some of the items can and should be addressed as soon as possible, others require time to document or work through with your engineer. I would appreciate a written status report on your progress (or schedule) to address these issues by November 12, 2006.

The Drinking Water Regulations require that all Group A water filtration plants have a routine sanitary survey at least every 3 years and distribution systems every 5 years. In order to receive credit for the survey, a sanitary survey fee must be paid. Enclosed is an invoice for \$495 (5hours @ \$99/hour). Please send your complete payment in the form of a check or money order within thirty days of the date of this letter to: **DOH, Revenue Section, P.O. Box 1099, Olympia, WA 98507-1099**.

Again, thanks to everyone for their time and attention during this *E.coli* investigation and sanitary survey. For any questions, please call me at (253) 395-6763.

Sincerely,

Derek Pell, PE
Assistant Regional Manager

Northwest Office of Drinking Water

Enclosures ó System Inspection Notes, Seawater Reverse Osmosis Treatment Plant Report form,
invoice

cc: Bruce Straughn, Snohomish Health District
Donovan Sheppard
DOH ó Erika Peterson, Brian Boye, Carol Stuckey

SYSTEM INSPECTION / MEETING SUMMARY

Date: 10/6/2006

HAT ISLAND WATER SYSTEM Snohomish County (ID#31593)

Persons Attending:

Chuck Motson . Island Manager, Wayne Orff, Donovan Sheppard . Certified Operator
Derek Pell, Erika Peterson - DOH

Purpose:

Special Purpose Investigation . E.coli, acute MCL violation. Routine sanitary survey (every 5 years).

Last surveyed: 04/17/1996.

Concerns & Recommendations: sea water intrusion and operating system according to design approval.
Utility Response . since the last survey the water system has completed a water system plan, obtained a State Revolving Fund loan, and constructed a new reverse osmosis treatment plant in 2003.

SANITARY SURVEY NOTES

General description:

Hat Island (aka Gedney Island) lies between Whidbey and Camano Islands and is part of Snohomish County. The island is platted with about 1,000 lots. Existing connections range from one room beach cabins to million dollar plus homes. There are currently 21 full-time residential connections and 227 part-time residential connections. The water system design is approved for 461 residential connections based on a peak day demand of 210/gpd/connect. The water system currently has a green operating permit.

The water system consists of 6 groundwater wells (well field) all pumping to a common iron and manganese treatment system + 2 seawater beach wells that pump to a reverse osmosis (RO) plant. Groundwater wells pump directly to Tank G, RO water pumps directly into the distribution system. The majority of the distribution system is pressurized by gravity head provided by the storage tanks. About 10-20 homes around the base of each tank are served by pressure systems.

Field Findings

Bold type indicates items needing attention.

Administration

New Island Manager, Chuck Motson, replaced Leslie (Skip) Stienstra. c.07/2006.

Water Quality . Reference the Annual Water Quality Monitoring Report sent to you by DOH.

Source Monitoring

- **Nitrate:** no detections above background levels. Given island aquifer and on-site sewage disposal, watch for increasing trends . see wellhead protection.
- **Arsenic:** New MCL=10ppb in Jan 2006. Samples from each well in 2000 all >10ppb. Well field sample in 2004 =14ppb. Quarterly monitoring required. Treatment for iron and manganese can reduce arsenic - seek engineering advice on upgrading existing treatment to remove arsenic.
- **IOC:** OK except for arsenic.
- **VOC:** Last well filed sample 2002 . need sample as soon as possible.
- **SOC:** Need RO sample this year.
- **Radionuclide:** Need well field and RO samples this year.

Distribution Monitoring

- **Coliform bacteria:** acute MCL Oct 2006. See below.
- **Chlorine residual:** not chlorinating, but CT=6 required. See below.
- Fluoride: not applicable.
- Lead/copper: below action level. Need sample set before 12/2008.
- Asbestos: not applicable.

Facility Review

S07 - Well Field (Wells 1, 2, 3, 4, 5, 6) and Greensand Filtration (Fe/Mn removal)

Wells draw from shallow, unconfined, sea level aquifer . moderate susceptibility. Subject to sea water intrusion. Well pumping sequence and rates are manually managed striving to maintain chloride concentrations below 100ppm at each well. Wells pump to common pipeline to permanganate-greensand filter then directly to Tank G where water is aerated from a pipe suspended from the ceiling for hydrogen sulfide gas reduction. Wells 1, 2, 3, 5, and 6 are used routinely. Well #4 is exercised daily, but pumped to waste. All wells are metered. **Seal open holes in top of well caps. Install screened vents. Install sample taps appropriate for collecting representative bacteriological samples. Permanganate chemical feed not working, bypass greensand filter until consult with professional engineer and improvements approved by DOH. Need process control measurements when operating treatment to track and make adjustments to optimize performance.**

S08 Beach Wells and Reverse Osmosis Membrane Filtration

2 beach wells draw seawater and pump thru a common line to RO facility . designed to produce 28gpm of treated water. Well pumps designed for 80gpm each but production varies - screens fouled by iron bacteria and must be pulled and cleaned annually (May). 3 parallel pressure filters with graded media (backwashed with raw water). Anti-scalant injected following pressure filters. 2 parallel 5 micron cartridge filters. High pressure pump to 3 RO membranes. Soda ash injected following membranes. 500-gal permeate (filtered water) tank. 2- 28gpm service pumps to distribution. On-site membrane cleaning (every 6 months) with high and low pH solutions, waste water discharged to on-site swale (soon to be replaced with direct seawater outfall). Process control automated; daily reports produced on site. **RO facility is producing less water than designed, International AquaMem technician is scheduled to investigate sometime this month. Beach wells in vault below grade, seal hole in well #2 cap, repair sump pump in vault. Chlorine injection facilities installed, but not in use; need full time disinfection to CT=6. Need monthly treatment plant reports submitted to DOH (reference DOH letter dated 05/10/2006). Need to keep records on instrument calibration.**

150,000-gallon G+ Tank and Pump Station

Concrete storage tank with wooden roof located in the G subdivision. Dedicated line from well field to aeration pipe suspended from ceiling inside tank. External overflow. Single booster pump with 2- bladder tanks serves 10-20 residents. **Need to inspect access hatch seal and vent screen. Cut overflow pipe to make air gap and fit with appropriate screen. Need sample tap suitable for collecting representative bacteriological sample. Booster pump needs to be secured to floor, add second pump for reliability, reports of excess pump cycling during periods of high demand suggest inadequate bladder tank volume – consult with engineer.**

150,000-gallon M+ Tank and Pump Station

Concrete storage tank with wooden roof located in the M subdivision. M Tank has an overflow elevation 4-ft higher than G Tank. Common inlet/outlet. Internal overflow. HydroRanger water level indicator and transmitter helps operator manage source pumping. **Need to inspect access hatch seal and vent screen. Need to identify overflow discharge and install screening to prevent bird / bug access – need to inspect routinely. Add second booster pump for reliability, pressure tank appeared to be air-locked.**

Management & Operations:

- Water System Plan . approved 02/9/1998. Plan submitted in support of State Revolving Fund loan to construct new reverse osmosis treatment plant. 1,000 lots platted, water system design approved for 461 residential connections. Water system is currently serving 248 residential connections. **Need to update the plan as the number of existing residential connections approaches the number of connections established in the approved design. Contact DOH to determine the appropriate level of detail required in a water system plan update.**
- Engineering Design & Capital Improvements . DOH letter dated 06/25/2002 approved the water system for 461 residential connections based on peak day demand of 210 gallons per connection per day. **Need to keep records of peak day water usage and inform DOH if demand exceeds the 210 gallons per connection per day demand assumption. The approved number of connections may be adjusted if demand assumptions are shown to be inaccurate.**
- Water Quality Monitoring Plans . Remember to collect water quality samples following the Water Quality Monitoring Report DOH distributes annually. Apply for monitoring waivers as applicable. **Need to prepare a Coliform Monitoring Plan as described in cover letter.**
- Consumer Confidence Report . annual report to customers. Copy to DOH by July 1st of each year. I like the way you are using the Hat Island View Point newsletter to keep folks informed about the water system.
- O&M Procedures . **It appears that the O&M program outlined in the water system plan has not been historically embraced. With Chuck's new leadership, I look forward to updated procedures and records showing successful implementation at my next sanitary survey.**
- Cross Connection Control Program . I understand that a bylaw has been adopted that gives the water system manager authority to implement a cross connection control program. That is, if a customer's service connection is a risk to cross connection contamination of the community's water distribution system, then the customer may be disconnected from the system if they do not take corrective action. **Need to develop a Cross Connection Control Program that identifies risks of cross connection and ensures that appropriate back flow protection devices are installed, maintained, and inspected. Visit our website http://www.doh.wa.gov/ehp/dw/Programs/cross_connection.htm for specific guidance on developing a small system program.**
- Conservation Program . Since your design capacity is based on a *peak day* water use of 210 gallons per connection per day, you are likely challenged to manage customer demand to achieve this goal. I understand that you have an inclining rate structure and report water use to customers in the newsletter. **Need to develop a detailed plan to reduce distribution leakage, optimize RO plant performance, and manage consumer demand. Visit our website, http://www.doh.wa.gov/ehp/dw/our_main_pages/water_use_efficiency.htm, for specific guidance.**
- Wellhead Protection . I understand that the community owns and can control activities in the areas around each well. Given that the wells draw from a shallow, unconfined aquifer, the activities on the ground surface can directly impact the quality of water you drink. **Need to implement the Wellhead Protection Program in your water system plan by engaging members in contaminant source awareness (maintenance of septic tanks and drainfields, use of herbicides and pesticides, etc.) and having an active response plan.**
- Emergency Response . The recent acute coliform maximum contaminant violation and 24 hour requirement to notify customers of a boil water advisory gives us good insight into what it takes to be prepared for emergency response. **Need to document responsibilities and procedures for responding to a physical emergency and the means to effectively communicate to your customers**

what they need to do to protect themselves in an emergency. Visit our website for specific guidance, http://www.doh.wa.gov/ehp/dw/our_main_pages/emergency_security.htm.