Hood Canal Regional Pollution Identification and Correction

Guidance Document

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Introduction

Pollution Identification and Correction (PIC) Programs have been used by Puget Sound counties to find and remove bacteria sources that threaten human health in areas where people harvest shellfish and enjoy other forms of water recreation. PIC programs can be a valuable tool for restoring shellfish growing areas and counties have used PIC methods to respond to shellfish bed closures and reverse declining water quality trends. PIC was originally designed to find, correct, and prevent fecal pollution sources. The adaptive management methodology used by PIC programs links identification of pollution sources through monitoring and investigation with corrective actions. Corrections are primarily achieved through education and voluntary compliance. This guide focuses on bacteria sources, but much of the information can be adapted to address other pollutants including nutrients, sediment, and temperature.

This PIC Protocol is based substantially on the Washington State Department of Health (WSDOH) PIC Guidance Document.

PIC Protocol Manual Goals and Objectives

The purpose of this manual is to provide detailed information to coordinate regional pollution identification and correction efforts in the Hood Canal Action Area to investigate, identify, and correct fecal pollution sources.

The goals of this regional protocol manual are to:

- Assess fecal pollution of Hood Canal Action Area surface waters;
- Protect the public from waterborne illness related to fecal pollution of surface waters, storm water, and shellfish;
- Protect shellfish beds and swimming beaches from water quality related closures;
- Address or assist with federal, state and county water quality mandates as required.

Objectives are to:

- Determine fecal pollution levels in fresh water discharges;
- Identify fecal pollution “hotspots” and prioritize for correction;
- Investigate pollution “hotspots”;
- Investigate public complaints and reports about potential fecal pollution sources;
- Correct fecal pollution sources;
- Prevent fecal and nutrient pollution sources through education and outreach;
- Enforce correction of fecal pollution sources when necessary;
- Respond to Washington State Department of Health commercial shellfish harvest; classification downgrades, threats or concerns;
- Coordinate with other agencies to ensure that efforts are not duplicated.

Project Preparation

The project development phase is crucial to project success and securing grant funding. Washington State Department of Ecology (Ecology) has developed funding guidance for PIC projects.

PIC Grant and 319 (4B) Funding Guidance

The following nine (9) key elements have been identified by Ecology for agencies seeking PIC program funding. Ecology anticipates providing additional guidance for each element. While additional guidance is being developed, lead agencies should work with Ecology to design a program that meets the intent of each element. Program funding applications will be assessed based on the criteria set forth by these nine elements.

Nine (9) Key Elements for PIC funding:

1. Identify/prioritize areas (problem watersheds) for PIC investigations.
    a. Identify a set of criteria to rank watersheds for investigations.
    b. Focus on a limited geographic scope for implementation.

2. Identify the causes and sources of pollution.
    a. Identify sources by parcel on a map.
    b. Gather background information on the PIC site(s).
    c. Describe methods used to identify pollution problems (source identification monitoring, shoreline surveys, dye tests etc.) Monitoring must follow an approved quality assurance project plan (QAPP).

3. Describe the best management practices (BMPs) that will be used to correct sources.
    a. Specify the suite of BMPs that will be used to address sources. Only BMPs that are known to be effective for achieving compliance with water quality standards will be funded. Ecology and the Environmental Protection Agency (EPA) are develop detailed guidance on eligible BMPs for livestock management. Contact Ecology and EPA for the most current requirements.
    b. Provide site specific instructions to the landowner including BMP types, how and where they will be installed, and how they will be operated and maintained.
    c. Lead agency will be responsible to ensure implementation of BMPs by partners.

4. Include an information and education component to help landowners understand water quality problems, the purpose of the program, how they can be better stewards of their property, and how to protect their property investment and prevent water pollution.

5. Describe the technical and financial assistance that will be provided to landowners.
    a. Provide one or more follow up visits to assist the landowner with any problems and ensure that they have implemented and are maintaining the BMPs.

6. Describe a schedule for implementing corrections.
    a. Include a schedule specifying the amount of time landowners have to correct problems before enforcement is used.
    b. Describe participating agencies' enforcement authority and, if this is not possible, work with Ecology to provide regulatory authority.

7. Describe milestones for implementing corrections.
    a. Examples include: number of inspections that will be conducted, percentage of corrective actions implemented by a certain date, etc.

8. Monitor to evaluate effectiveness by determining whether water quality is improving.
    a. Describe effectiveness monitoring, parties responsible, and sampling and reporting schedule.

9. Obtain sustainable funding.
    a. Include a plan for sustainable funding if local resources are not currently adequate.

Quality Improvement in Public Health

Quality improvement in public health is the use of a deliberate and defined process, like Plan-Do-Check-Act, in a continuous and ongoing effort to achieve measurable improvements in efficiency, effectiveness, performance, accountability, outcomes and other quality indicators to improve the health of the community and the environment. (Source: Riley et al, "Defining Quality Improvement in Public Health", JPHMP, 2010, 16(10), 5-7).

Successful PIC programs use a quality improvement process. The Plan part of the process includes developing standard PIC procedures to collect and analyze water quality data and prioritize areas for PIC work based on water quality impairments. PIC methods are implemented in the Do segment of the cycle. Project results, post corrective monitoring data, and operation and maintenance inspections are Checked during and at the conclusion of a project. This determines which Actions are needed to improve program effectiveness.

The use of this process improves PIC methods, provides evidence for prioritizing water cleanup projects, and shows positive outcomes like upgrades of shellfish harvest areas.

Creating a prioritized work plan

The Hood Canal regional PIC program is a collaborative effort between the five Hood Canal Action Area jurisdictions: Jefferson County, Kitsap County, Mason County, the Port Gamble S'Klallam Tribe, and the Skokomish Tribe. A regional PIC team, formed from the Hood Canal Action Area jurisdictions during the Hood Canal regional PIC planning phase, put together a draft list of pollution problem areas in the Hood Canal Regional PIC Five-Year Priority Area Work Plan (see **Appendix A**). These areas were identified based on the following elements:

- Washington State Department of Health (WSDOH) shellfish program data; particularly closure areas, threatened areas, and areas of concern;
- WSDOH BEACH data marine swimming beach closures and areas of concern;
- Local areas of concern identified by local jurisdictions;
- Onsite sewage system (OSS) Geographic Information System (GIS) map data.

The work area list was developed by working with WSDOH shellfish program. Local jurisdictions reviewed the proposed areas and added a few areas of concern.

A pilot guidance group will be developed from the regional PIC team to provide implementation oversight to the regional PIC program and technical assistance to the jurisdictions. This group will develop strategies to implement and fund regional PIC work and will update the regional work area list as water quality concerns are resolved and as new areas are identified. The list will be ranked for PIC work implementation, as funding becomes available, by the following criteria:

- Public health risk (human risk potential) – this is a key criteria;
- Demonstrated water quality problem (results exceed state water quality standard);
- Demonstrated habitat problem (low dissolved oxygen – nutrients, erosion, stormwater runoff, toxics, invasive weeds contributing to dissolved oxygen and/or temperature problems);

- Resource risk (threat to commercial and recreational resources – shellfish, swimming, fishing);
- Builds on existing program (resource constraints and capacity to proceed);
- Public involvement or awareness;
- Fits funding constraints and/or criteria.

Project Area Evaluation
A project area evaluation is initiated once a priority watershed has been identified. This includes:

- Project area details and history;
- Water quality data;
- Initial project area visit.

Project area details and history
Conduct an evaluation of the project area to review available data and background information before visiting the area or conducting work. Examples of data include area maps, public access areas, water quality monitoring data, project area soil conditions, sewer maps, stormwater maps, OSS GIS maps, areas of concern, farm inventories, stormwater maps, and WSDOH shellfish areas and reports.

Grant-funded projects typically require a project scope of work and/or Quality Assurance Project Plan (QAPP). These documents specify the project components, commitments, timeline, and field and laboratory methodologies to be used.

Background information is gathered and organized into project files which include: property parcel information, water quality monitoring data, maps, project QAPP, grant requirements, etc. This information is needed during a project to prepare public notification, meetings, door-to-door inspections, press releases, and the final report.

Water quality data
Gather and evaluate available water quality monitoring data to determine water quality problem areas, to focus PIC efforts in areas where bacteria levels are elevated.

Initial project area visit (a.k.a "ground truthing")
Conduct an initial project area visit to determine the following:

- Identify and confirm water quality problem areas based on water quality data;
- Identify surface waters, such as streams, marine water, and public access areas;
- Confirm stormwater drainage patterns such as roadside ditches, collection systems, and pipe discharges;
- Look for potential fecal pollution sources in the area, including OSS, pet and livestock waste, food and grease waste;

- Determine drainage segments that need investigative monitoring;
- Determine project boundaries and note road segments to be inspected, along with property addresses.

Education and Outreach

Non-point pollution resulting from landowner practices can be best addressed through community engagement and outreach and education. The power of consistent messaging, and coordinated information and resources from diverse and local outreach groups helps landowners adopt water quality improving practices.

The Hood Canal Action Area is fortunate to have an outreach network that has been active for more than a decade. The Hood Canal Water Education Network (HCWEN) is comprised of local agencies in the Hood Canal region including: WSU Extension, UW SeaGrant, local health departments, local public works, local conservation districts and non-profit groups such as the Hood Canal Coordinating Council and Hood Canal Salmon Enhancement Group. HCWEN provides a network for members, coordinates regional outreach messaging, and facilitates implementation of grant-funded outreach projects. HCWEN is part of the Puget Sound Partnership's Education, Communication and Outreach Networks (ECO Nets), the twelve regional networks working to help save Puget Sound.

Successful education and outreach programs prevent pollution by developing approaches that result in measurable adoption of specific behaviors. The social marketing process uses marketing principles and techniques to develop education and outreach that result in public behaviors that protect and improve Puget Sound.

An example is the pet waste campaign developed and conducted by the West Sound Stormwater Outreach Group (WSSOG). The group, made up of Kitsap County and the Cities of Poulsbo, Bremerton, Port Orchard, Gig Harbor, Bainbridge Island and Port Angeles, is an active participant of Puget Sound's Stormwater Outreach for Regional Municipalities (STORM). WSSOG conducted a baseline public opinion survey in 2008 to identify a baseline of behaviors, attitudes, and stormwater awareness. The WSSOG selected pet waste pick-up and adequate disposal as a key behavior for evaluating awareness and behavior changes. Two programs were developed, using social marketing principles, and implemented in 2009: the Backyard Pet Waste Pilot Campaign and the Community Mutt Mitt Program. Both programs have been very effective: the Backyard Pet Waste Pilot Campaign was expanded in 2010-2012 and delivered to more than 25,000 residents with lots of .5 acres or less; and the Community Mutt Mitt Program resulted in 294 Mutt Mitt stations installed and maintained by volunteer community groups. In 2012 alone, over 540,000 pet waste disposal bags were used, representing over 89 tons of dog waste diverted from Kitsap County surface waters (http://www.kitsapgov.com/sswm/pdf/Regional_Educational_Activities_Report_2012.p

df). A follow-up WSSOG survey in 2011 demonstrated increases in public awareness about stormwater messages.

Another local example is the Oakland Bay Clean Water District Watershed Social Marketing Plan that was developed from October 2008 through June 2009 for the Education Sub-Committee of the Oakland Bay Cleanwater District and the Squaxin Island Tribe. The plan identified two key audiences (septic owners and livestock owners) and recommended behavior changes (septic system maintenance and livestock manure management). Random sample telephone interviews were conducted in the watershed to identify and rank barriers, potential motivators, media channels, most credible messengers, and to develop a participant vs. non-participant profile. The plan summarized internal strengths and weaknesses and external opportunities and threats to the desired behavior change outcome.

The Hood Canal regional PIC Work Plan proposed the following essential education tasks. Regional partners will research and utilize existing outreach campaigns and behavior change measurements that were developed using social marketing to realize cost efficiencies. The Hood Canal regional pilot guidance group will work with HCWEN, WSU Extension, and other local educators to develop a local education and outreach approach to identify priority audiences and behaviors, target behavior changes that prevent and reduce pathogen and nutrient pollution, and determine the best vehicles for public notification and education and outreach delivery. The selected audiences and behaviors will be prioritized based on local water quality studies, research, prevalence and experience. A suite of priority behaviors will be chosen and a social marketing approach implemented to determine motivators and barriers for each priority behavior.

The idea is to develop a regional outreach campaign that incorporates motivators and addresses barriers for the priority audience to make the selected behavior changes. A pilot outreach campaign will be conducted in the region including measuring the adoption of the selected behaviors. The approach will be refined, based on the degree of behavior change, and implemented on a larger scale.

The refined education and outreach campaign will be utilized during PIC door-to-door surveys, and will determine which outreach delivery methods are the most useful tools for this region.

Public Notification and Information

Public notification is an important task to inform and engage project area residents about PIC projects. After the project area evaluation, water quality evaluation and initial project area visit are complete, the next step is to notify the public within the proposed project area of the lead agency's intent to conduct a PIC project. It is also recommended to notify and explore cooperative relationships with other local agencies like public works, cities, public utility districts, and county departments.

Public notification can be accomplished by various methods that are selected depending on what works best in the region. The education and outreach plan will evaluate and recommend methods that may include: hosting public meetings, distributing press releases, direct mailing to households, distributing project fact sheets, and submitting articles for local news media and/or publications. The information presented should be direct, concise, and complete and should contain the following items:

- Why and where the PIC project is being conducted;
- Applicable water quality results;
- Who is doing the PIC project, and by what authority;
- How and when the PIC project will be conducted;
- Possible sources of fecal pollution;
- Who to contact for answers to questions.

Examples of a press release and a project fact sheet are found in **Appendix B**.

Public Meetings and/or OSS Workshops

Public meetings can be held to launch a PIC project, provide an update on an existing project, and/or to host nonpoint pollution workshops including: how to protect your onsite sewage system investment, pet and livestock waste management, natural yard care, natural cleaning products and natural stormwater controls. Conservation District annual plant sales can also provide opportunities to educate landowners about how to prevent pollution.

Press releases, targeted postcard mailing, advertising, and give-aways like water conservation kits, sink strainers, and green cleaning buckets, have been effective methods to draw public meeting audiences. Kitsap Public Health District (KPHD) has successfully partnered with Kitsap Public Works to present nonpoint pollution workshops. Appendix B contains a summary report of 2013 Septic Sense Workshops and participant evaluation.

Public meetings are held at a convenient location as close as possible to the project area. The elements of the public meeting include a short presentation about the FC pollution problem and water quality data, an introduction to the project including goals and objectives, why the area was chosen, and who to contact for more information. It is helpful to include specific information about potential fecal and/or nutrient pollution sources, ways to get the most life from septic systems, how to prevent fecal and nutrient pollution, and resources available to the public, and any financial resources that may be available. Allot sufficient time for the public to ask questions.

Invite project area property owners and residents, funders, and local government representatives. Work with project partners like local Conservation Districts, stormwater departments, Ecology, WSDOH, EPA, and local community groups in the project area to determine and address local concerns (e.g. Friends of Miller Bay, a local community group interested in restoring shellfish harvest to Miller Bay). It may be useful to hold a public

meeting in conjunction with a regularly scheduled meeting of a community group. Consider holding two meetings, one during daylight and one after work hours.

Parcel Surveys

A considerable amount of project education and outreach is conducted during door-to-door property inspections. Staff utilize a PIC property inspection form (**Appendix** C) as a checklist for water quality topics to cover and distribute project specific fact sheets and informational brochures. The topics presented are tailored to site-specific practices like: inspecting every three years, conserving water, reducing waste strength, and diverting surface and roof water to protect septic systems; picking up pet waste and storing animal manure under cover to prevent fecal and nutrient pollution; and using natural landscaping.

Follow-up Mailings to Landowners

Consider sending a thank you letter immediately after a parcel survey, like Pierce County Health field staff do, expressing gratitude for the property owner's participation and sharing any sampling results. Once all the surveys in a drainage or neighborhood are completed, Pierce County distributes a summary letter to all property owners in the survey area, outlining the number of surveys completed, number of failures identified and repaired, and any updates on water quality in the area.

Education Committee

The Hood Canal regional pilot guidance group will develop an education committee comprised of partner agencies including: local health districts and public works, conservation districts, park districts, local school districts, HCWEN, Washington State University Extension, and University of Washington SeaGrant. This committee will provide recommendations to the regional guidance group and assist the development of a coordinated education and outreach plan.

Sample Collection and Testing

Field Preparation & Safety

Personal safety in the field is extremely important. The key to a safe field inspection is preparation. The amount of preparation will depend on the kind of inspection. Preparation may include obtaining required training, familiarity and application of related policies and procedures, confirming or acquiring additional information, and gathering necessary supplies, equipment, and protective clothing.

Field staff should carry safety equipment and supplies including identification badge and business cards, digital camera, cell phone and emergency contact numbers, appropriate personal protective equipment (field boots, disposable waterproof gloves), maps, and educational materials. Other optional items like dog treats and pepper spray may be useful.

Inform supervisors and colleagues about fieldwork locations and coordinate with other inspectors in the area. Inspectors are encouraged to request a partner if they are uncomfortable visiting a particular property alone or if they want assistance to assess a possible problem or violation. There are circumstances when a partner is not necessary, including consecutive visits (with owner/renter permission) to a property undergoing a dye test. Use your best professional judgment to determine whether you need a partner.

When conducting a site visit it is recommended park your vehicle in a manner that does not interfere with the movement of other vehicles but provides you with the opportunity for a quick exit (if needed).

Cut a site visit short if the owner or resident shows any signs of hostility. If an individual makes threats or threatening gestures towards you, leave the property immediately. Drive away and find a safe location to note the details on an inspection form. Inform your project lead, field supervisor or program manager immediately.

Appendix D contains Kitsap Public Health District's Water PIC Program Field Safety Protocol and a list and description of the standard and specialized equipment necessary to conduct property inspections and investigations.

Monitoring & Identification of pollution sources

PIC programs use various types of monitoring to identify pollution sources. Many counties have established monitoring stations to assess baseline water quality in a watershed. Sampling routinely takes place near confluences of freshwater flows to marine waters and at selected upstream locations on tributaries. The Hood Canal Regional Pollution Identification and Correction Monitoring Plan (HCPIC Monitoring Plan) includes a summary of existing and proposed monitoring, investigation, and pollution source identification (http://hccc.wa.gov/AquaticRehabilitation/Regional+PIC/default.aspx). Sites with FC counts equal to or exceeding 200 cfu/100 ml, or 100 cfu/100 ml for E. coli (EC) are re-sampled 1-2 times to confirm. A geometric mean value of the sample results is calculated and further investigation is conducted when the results exceed a threshold of 500cfu/100ml for FC or 320cfu/100ml for EC.

Monitoring Station Locations

Trend monitoring plans are very useful to evaluate ongoing water quality and locate problem areas. The number of active monitoring stations may vary from year to year and are determined through review and consideration of the following:

- Geographical and hydrological characteristics of each watershed;
- Waterbodies on the state 303(d) List;
- Water quality results and findings from earlier watershed assessment projects;
- Types, locations, and densities of land uses within each watershed;

- Locations of public parks and recreational shellfish beaches;
- Monitoring station locations from other monitoring efforts (Puget Sound Assessment and Monitoring Program, (PSAMP), Public Utility Districts, etc.).

Precision, comparability, and reproducibility of station locations are achieved through the identification and documentation of major landmarks and road crossings (visual and descriptive), on-water triangulation, and identification of Geographic Positioning System (GPS) coordinates of latitude and longitude. Monitoring plans contain detailed sampling station lists, descriptions, GPS coordinates, photographs, and maps to ensure consistency in locating the sampling stations. The HCPIC Monitoring Plan includes a list of proposed fresh water monitoring stations and lake monitoring stations.

Marine Water Stations

The majority of marine water stations are located in near shore areas adjacent to potential sources of pollution such as:

- Stream mouths;
- Major stormwater outflows;
- Wastewater treatment plant outfalls or combined sewer overflows;
- Marinas.

The purpose of siting marine water stations in these near shore areas is to assess water quality and public health impacts to the areas most accessed by residents and visitors. Offshore marine water stations are also established to provide background data for each major waterbody.

The Hood Canal Regional PIC project will utilize the ongoing and robust marine water monitoring program conducted by WSDOH.

Stream Stations

The HCPIC Monitoring Plan contains a proposed stream monitoring plan. The list of proposed streams was developed based on the WRIA 16/14B and WRIA 17 monitoring plans (http://www.co.mason.wa.us/health/environmental/WRIA/team_documents/Recommendations%20for%20Funding%20and%20Data%20Management%20for%20Implementation%20of%20the%20HC%20Monitoring.pdf; and http://www.ejwc.org/pdf/FINAL_W17_W_QUAL_MONITORING_PLAN.pdf). Most of the stream stations are located at, or near, the mouths of streams prior to their discharge to the marine environment. The purpose of siting stream stations at the mouths is to assess the cumulative impacts of the stream basin on overall stream water quality.

Stream mouths with elevated FC or EC can be investigated by siting strategic segments upstream of the mouth station, at major tributaries, and/or near the headwaters of the stream. Segment stations help to assess an individual segment's contribution to overall stream water quality to identify pollution problem areas. It is preferable to locate stream

sample stations in public access areas, such as road right-of-ways, to ensure unlimited and continued access to these sites over the long term.

PIC project areas are delineated or refined based on which stream segments are pollution "hotspots" based on stream monitoring data. This process helps focus PIC efforts into the areas where they are needed the most.

Stormwater

Stormwater runoff is generated when rain flows off impermeable surfaces such as rooftops, roads, highways, and parking lots. As water runs off these surfaces, it can pick up pollutants such as human and animal waste, oil, fertilizers, pesticides, soil, and trash. Pollutants may be discharged to water bodies through illegal discharges, dumping, spills or poor housekeeping practices. Examples include: sewage connected into storm systems; fundraiser car wash water; muddy water from water main flushing; and washing restaurant mats or dumping mop water into outdoor drains. These non-stormwater polluting discharges are then transported by the stormwater conveyance system to surface waters.

There are several systems of permits and efforts, nationally and locally, to reduce and prevent stormwater pollution impacts to surface waters.

The Federal Water Pollution Control Act of 1948, as amended in 1972 (Clean Water Act), requires National Pollutant Discharge Elimination System (NPDES) permits for point sources that discharge pollutants into waters of the United States. Point sources include conveyances such as pipes or man-made ditches.

The NPDES stormwater program regulates discharges to surface waters from municipal separate storm sewer systems (MS4), construction activities, and industrial operations. Washington State urban areas meeting population and density requirements are required to obtain MS4 permits from Ecology, as delegated by the United States Environmental Protection Agency (USEPA). The USEPA established two phases for the municipal stormwater permit program, based on population from the 1990 census. In the Hood Canal Action Area, only Kitsap County is issued a Phase II NPDES stormwater permit at this time.

The Hood Canal regional PIC team developed a stormwater PIC strategy based on local and regional implementation of the NPDES permitting program and on-the-ground experience (http://hccc.wa.gov/AquaticRehabilitation/Regional+PIC/default.aspx). This strategy has three main sub-strategies: prevent, remove, and retrofit. Illicit Discharge Detection and Elimination (IDDE) programs prevent and remove non-stormwater discharges to MS4s.

KPHD conducted a regional IDDE grant project from 2008 through 2011. The Kitsap Regional Illicit Discharge Detection and Elimination Clean Runoff Project was a

cooperative multi-jurisdictional approach to perform IDDE in the cities of Bainbridge Island, Bremerton, Port Orchard, Poulsbo, and unincorporated Kitsap County (http://www.kitsappublichealth.org/environment/files/reports/Kitsap_Regional_IDDE_Clean_Runoff_Final_Report.pdf).

KPHD coordinated the development of a county-wide IDDE approach with the help of the Center for Watershed Protection's Illicit Discharge Detection Elimination Guidance Manual[1]. Interlocal agreements were developed with partnering agencies to update and complete stormwater system mapping; produce or refine written IDDE procedures; develop regulatory mechanisms to prevent illicit discharges to stormwater; and perform outfall screening of high priority areas. These requirements, outlined in the NPDES Phase II permits for the municipalities, were satisfied by all permitees through the project. In addition to NPDES Phase II requirements, joint commercial property inspections were conducted and were successful in identifying neglected stormwater systems and illicit discharges.

There were several "lessons learned" from the implementation of this regional IDDE approach:

- Small Phase II communities did not have trained and experienced staff to track and conduct IDDE activities like outfall screening and commercial inspections. Larger, more experienced jurisdictions can provide mentoring for smaller jurisdictions including technical, field, and administrative assistance.
- Regional workshops assist stormwater staff by providing reference materials and effective educational materials from successful IDDE projects and stormwater system inspection programs. Incorporating field visits to stormwater system infrastructure quickly orients workshop participants. Reference compact disks were a very helpful tool for smaller jurisdictions.
- Commercial inspections were an effective method of finding illicit discharges and stormwater deficiencies, although most jurisdictions were not staffed to lead these inspections.
- Some of the illicit discharges found were repeat offenses, mainly from garbage bins and compactors, grease bins, and carwashes. Many were located in close proximity to stormwater systems. Food source control problems were prevalent in all partner jurisdictions. Food waste attracts and concentrates urban wildlife and has been found to result in excessive FC concentrations from the wildlife and food waste.
- Focus inspections on targeted businesses that have a higher potential for an illicit discharge.

[1] Center for Watershed Protection, Illicit Discharge Detection and Elimination Guidance Manual. http://www.cwp.org/online-watershed-library/cat_view/64-manuals-and-plans/79-illicit-discharge-detection-and-elimination (October 2004)

Conducting Shoreline Surveys

A shoreline survey is the inventory and bacterial assessment of all flowing fresh water discharges to the shoreline within a project area. Most project areas require both wet and dry weather shoreline surveys. Wet weather season surveys are conducted from Oct. 1 through April 30. Dry weather season surveys occur from May 1 through Sep 30.

Dry weather events can identify problems in areas where stormwater masks FC sources or where residences are only occupied in the summer. Wet weather assessments can identify OSS failures caused by high seasonal groundwater and surface water drainage issues. Wet weather conditions are met when water is flowing off parcels and stormwater is flowing in roadside ditches or storm systems.

The following checklist will help staff prepare and gather the necessary equipment and supplies to conduct shoreline surveys.

Shoreline Survey field preparation checklist

__ Check tides (http://www.protides.com/washington) and weather conditions

__ In the office, determine the length of shoreline to be surveyed and map potential "start" and "end" access points. The County's Assessor database and Washington State Department of Ecology's shoreline aerial photos can help to determine potential public access points. Visit the area ahead of time to determine "start" and "end" accessibility. Access points can be a public access area like a public boat launch, or a property parcel where consent has been granted to access the shoreline.

__ Determine whether you will need a shoreline survey partner. Partners are recommended when the area is unknown or unusually soggy, muddy or marshy or when distances or tasks can be more efficiently conducted with a partner. Always err on the side of caution, while using resources carefully and wisely. When working in pairs, park one vehicle at the "start" access point and one at the "end" point.

__ Estimate the number and type of samples to be collected and coordinate with the laboratory specified in the QAPP. Become familiar with the sample holding time, and be sure that the samples will be delivered within the required time.

__ Gather field supplies:

- Personal protective equipment: boots, rain gear, hat, gloves;
- Sampling wand*, bottles, cooler, ice packs;
- Field notebook, pen(s) and/or pencil(s), permanent marker, wrist watch or stop watch;
- GPS, camera, cell phone;
- First Aid Kit & hand sanitizer;
- Fact sheet about the project/shoreline area being surveyed;

- Business cards, identification badge;
- Dog treats, pepper spray.


*sampling wand, made from an extendable paint pole with a cut Nalgene bottle attached at the end with electrical tape, holds a 100 ml sample bottle

__ Work out a sampling strategy and nomenclature system for labeling the samples ahead of time. There are several ways to name sampling stations. It is important to choose carefully because you will need to track data collected from each sampling station over the course of the project. Some examples are shown in the following table.

Project Area	Naming Description	Sampling Station Identifier
Hood Canal 2 growing area	Hood Canal 2 may be abbreviated HC2 followed by sequential number	HC2.1,2,3….
Murden Cove	MUR followed by sequential number	MUR 1, 2, 3

Conducting the shoreline survey

When you arrive at the "start" access point, park your vehicle safely and in a manner that will not obstruct traffic. Place your business card, with cell phone number, on the dashboard or inside the driver's side window, to provide contact information. Inspectors are responsible for knowing local rules for property access and consent.

Proper technique for collecting, labeling, and transporting samples is critical to ensure that sampling data is valid. To be representative, water samples should be collected from free falling surface water flow when possible. Sediments and surface bacteria can skew results.

Collecting water samples:

- Check the QAPP and/or laboratory to determine and whether temperature blanks, sample blanks or duplicates are required;

- Wear disposable, waterproof gloves for your safety;
- Collect water samples from all flowing discharge points including stormwater outfalls, yard drains, bulkhead drains, pipes, drainage ditches, seeps, and sheet flow;
- If necessary, a composite sample may be collected when there are multiple small discharges that appear to emanate from one parcel and/or are close together, (e.g. a bulkhead that has several discharge points but clearly all come from the same property);
- Sometimes discharges are too small to sample without capturing underlying sediment - try to minimize the amount of sediment collected;
- Note and document in the field notebook any unusual odors, matting, vegetative growth, laundry lint, food waste, temperature, animal tracks, animal waste, or any other characteristics that may indicate a sewage or laundry source at or near the sample location;
- Wash hands and/or use hand sanitizer as soon as possible after sampling and before you eat.

<u>Labeling and Recording samples:</u>

- Print the project name at the top of the field notebook page, start/end locations and direction of travel, date, staff members, and weather and tide conditions;
- Use a black permanent marker to label 100 milliliter sample bottles with the sample identifier, date, and time the sample was collected;
- Clearly record the sample name, collection time, location, drainage size, pipe diameter, and pipe material (if applicable) in the field notebook;
- Enter the sample location information in the field notebook. Record detailed, parcel-oriented descriptions so that outfalls can easily be found for re-sampling. Note any characteristics that will help distinguish the property when accessed from upland so that the associated property address can be identified, if necessary;
- Record GPS latitude and longitude coordinates of the discharge in the field notebook and enter the sample identifier into the GPS unit. This information can be downloaded to an office computer and added to a parcel map to match the sample site to a property parcel if needed. Entering the sampling station to the GPS also facilitates relocating the sample site on subsequent shoreline surveys.
- Take a digital photograph of the sampling location. Be sure to include distinguishing features that will help identify the location, for example, if the sample location is a beach seep next to a house, be sure to include a portion of the house in the photograph. In some instances more than one photo may be necessary to re-identify the location for subsequent surveys.

An example of the field notebook entry is shown below.

Hood Canal Shoreline Survey Staff Initials DATE Weather and tide conditions, *e.g. Rain, 50F, wind S at 10 mph, Low tide 2.1' at 10:22* Start: Address and/or landmark and approximate distance					
Sample ID	Time	Latitude	Longitude	Description	Comments
HC2.1	10:15	xx.xxxxx	xx.xxxxx	6 in black flex in bulkhead	Matting at base of bulkhead
HC2.2	10:25	xx.xxxxx	xx.xxxxx	Beach seep	Raccoon tracks
HC2.3	10:43	xx.xxxxx	xx.xxxxx	4 in pvc pipe under dock	Suds
HC2.4	11:02	xx.xxxxx	xx.xxxxx	Stormwater diffuser on hillside	

Transporting samples
When water samples are collected they should be transported in coolers with enough ice packs to meet the temperature holding requirement of 10 degrees Celsius, as detailed in *APHA Standards Methods*.

Chain of custody
Water samples are analyzed by an accredited contract laboratory pursuant to the project QAPP. Following the collection of all water samples, a chain of custody form must be completed. Check the QAPP to verify whether samples should be analyzed for FC or EC. A chain of custody form is also submitted when additional analytical sampling is needed, *e.g.* ammonia, nutrients, etc.

Sample results and data organization
Water quality sample results are reported by the contract laboratory according to the laboratory contract. Check the appropriate turnaround time on the chain of custody.

Water sample results are entered into a water quality database. There are a variety of databases and/or spreadsheets that can be used to record and organize data. Water quality monitoring data from lakes, beaches, marine and stream trend monitoring, and shoreline surveys are entered into the database.

Ecology projects use the EIM database and EPA projects use the Storet database. KPHD uses a Microsoft Access database developed by KPHD Information Technology and water quality staff.

Confirmation sampling
Shoreline discharge samples with results 200 FC/100ml or greater or 100 EC/100ml or greater are re-sampled 1-2 times to confirm pollution "hotspots". Re-sampling should occur as soon as possible and must be collected within the same sampling season, e.g. if

the samples were collected as part of a wet season event, then confirmation samples must also be collected during the wet season. This is important because a discharge can be a "hotspot" during the dry season, or during the wet season, or during both seasons.

The geometric mean value (GMV) of the 2-3 results is calculated. The drainage is confirmed as a bacterial "hotspot" that needs investigation when the GMV is 500 FC/100ml or greater or 320 EC/100ml or greater.

Discharges that have two high bacterial samples are potential threats to public health. Fecal source investigation should begin as soon as possible, instead of waiting for a third sample.

Typically there will be several confirmed "hotspots" within a project area. Rank these according to the GMV and initiate investigation of the "hotspots" with the greater GMVs first.

"Hotspot" Investigation Process

STEP 1	Confirm "hotspot" during dry or wet season by collecting a minimum of 2-3 samples for GMV calculation.
STEP 2	Create map of the area within 200 feet of the "hotspot".
STEP 3	Conduct reconnaissance to assess # of homes, proximity to drainage, presence of livestock, possible access points for segment sampling, etc.
STEP 4	If # homes ≤10, review onsite sewage system (OSS) records for all homes and inspect them.
STEP 5	If # homes >10, conduct segment sampling, starting at the discharge and collecting samples uphill toward the source. Collect minimum 3 sampling events and calculate geometric mean for each segment. Note that segment sampling must occur during the same season that "hotspot" was confirmed. ✓ if drainage is high throughout, conduct OSS record search and inspect all homes within 200 feet. ✓ if drainage is not high throughout, conduct OSS record search and inspect all homes within 200 feet of the "hotspot" segment(s).

An investigation package or file is assembled for each "hotspot". This file includes photos, maps, segment sampling when applicable, and building and OSS records for nearby residences. Potential fecal pollution sources are evaluated and identified through property inspections and segment sampling.

When collecting samples at a property, try to find a location in a road right of way or some other public area or request the property owner's permission to sample. Take photographs at the same time that samples are collected to document location and physical observations.

The distance of potential fecal sources to surface water is considered the most critical factor, as shown in the following parcel inspection prioritization.

PRIORITY 1	Homes with no OSS records and livestock present.
PRIORITY 2	Homes with no OSS records
PRIORITY 3	Homes with OSS and deficient inspection report
PRIORITY 4	Homes with gravity OSS ≥25 years old
PRIORITY 5	Homes with gravity OSS and livestock present
PRIORITY 6	Homes with gravity OSS 10 – 24 years old
PRIORITY 7	All other OSS with no current monitoring/maintenance/pump report

Water Quality Parameter Interpretation[2]

Pierce County collects data on a variety of water quality parameters. Their PIC manual states:

> "Fecal coliform data interpreted outside the context of water quality can lead to a limited understanding of potential impacts. Additional data parameters such as temperature, pH, and conductivity provide a more robust interpretation of the sample. Pierce County has invested in portable water quality probes which have facilitated their collection of accurate water quality data."

The following is a description of these additional parameters from Ecology:

Temperature affects the solubility of oxygen in water, the rate of photosynthesis by algae and higher plants, the metabolic rates of aquatic organisms, and the sensitivity of organisms to toxic wastes, parasites, and diseases. Many of the physical, biological, and chemical characteristics of a surface water system are directly affected by temperature. Fecal coliform bacteria are considered mesophiles and as such their optimum temperature range is generally considered to be in the 10-40° C range.[3]

pH, or potential for hydrogen, is a general measure of the acidity or alkalinity of a water sample. The pH of water, on a scale of 0 to 14, is a measure of the hydrogen ion concentration. A higher pH means there are more hydronium ions available. Too low or too high of a pH can inhibit bacterial growth. The preferred range of pH for many aquatic organisms, including most fecal coliform bacteria, is 6.5 to 8.5. Changes in pH can be caused by atmospheric deposition, surrounding rock, and wastewater discharge. Solubility and bio-availability are also determined by pH. Generally speaking, a lower pH will increase the solubility of such things as oxygen, metals, and nutrients. As these constituents are dissolved in the water, they become more available to aquatic organisms.

Because polluted conditions are typically correlated with increased photosynthesis in stream conditions, pollution may cause a long-term increase in pH. A common concern is a change in natural pH levels caused by the discharge of municipal or industrial effluents. Most effluent pH is fairly easy to control, and all discharges in Washington State are required to have a pH between 6.0 and 9.0, a range that protects most aquatic life. Although these discharges could have a measurable impact on pH, it would be unusual (except in the case of treatment plant malfunction) for pH to extend beyond the range for safety of aquatic life. Due to its influence on the availability and solubility of all chemical forms in the stream, small changes in pH can have many indirect impacts on a stream.

Conductivity is a measure of the ability of water to pass an electrical current. Conductivity in water is affected by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, and phosphate anions (ions that carry a negative charge) or sodium, magnesium,

[2] Washington State Department of Ecology, A Citizens Guide to Understanding and Monitoring Lakes and Streams
[3] Dictionary of Biology, Definition of Mesophillic, http://www.encyclopedia.com (August 1, 2012).

calcium, iron, and aluminum cations (ions that carry a positive charge). Organic compounds like oil, phenol, alcohol, and sugar do not conduct electrical current very well and therefore have a low conductivity when in water. Conductivity is also affected by temperature: the warmer the water, the higher the conductivity. For this reason, conductivity is reported as millisiemens/centimeter (mS/cm) at 25 degrees Celsius (25° C).[4]

Conducting Property OSS Inspections

Property inspections are conducted as part of a PIC project, an Illicit Discharge Detection Elimination (IDDE), or complaint inspection. The inspections are designed to identify fecal and nutrient pollution sources on the parcel and to provide property owners and residents with education, information, and technical assistance related to controlling pollution sources (failing OSS, pet waste, run-off from agricultural and livestock pastures). Financial assistance information such as OSS repair loans and cost share for livestock BMPs are also provided during property inspections.

Property Parcel Inspection Preparation

Before conducting property inspections, staff prepare PIC inspection forms **(Appendix C**), and OSS records and check assessor records, and OSS monitoring and maintenance records, for each individual property parcel in the project area.

In some cases, project areas include residential properties served by sewer. Sewer billing departments can confirm which properties are served by sewer. Inspectors may make a courtesy site visit to sewered properties to inform them about the fecal pollution problem and potential sources including sewage leaks, pet and livestock waste, and food and grease waste. Local Conservation Districts may be able to provide information about farms in the project area.

Conducting the property inspection

Property parcel inspections consist of:

- Contacting the property owner/occupant to conduct the informational interview;
- Obtaining access and consent to perform a field inspection of the property including an inspection of the OSS components and animal waste management practices;
- Evaluating discharges leaving the property during wet weather conditions;
- Making site-specific recommendations to reduce stress to the OSS;
- If a problem is suspected, the OSS is tested with a tracer dye to determine if the system is failing.

[4] United States Environmental Protection Agency, Water: Monitoring & Assessment – Fecal Bacteria. http://water.epa.gov/type/rsl/monitoring/vms511.cfm (August 1, 2012).

Health inspectors have the legal right to approach a property via the normal access route to the front door. When there is "No Trespassing" sign, inspectors leave a door hanger at a gate or fence post. Door hangers should not be placed in or on mailboxes, since mailboxes are legally reserved for U.S. Postal Service only.

Information collected during inspections can only be used as evidence if inspectors follow local property access and consent policy. **Appendix D** contains an example from KPHD.

It is very important that the inspector be confident, cordial, well-organized, and professional when conducting property inspections. The job of inspecting private properties to identify pollution sources is much easier when the public perceives the inspector as an objective and trustworthy professional. Developing a good relationship and trust with the owner/occupant is the key to a successful site visit.

Door Hangers

When property owners/occupants are not home, inspectors leave door hangers with a brief description for the purpose of the visit and their contact information.

It is recommended to make three attempts to contact each property owner/occupant by door hangers left at the door, one attempt on a Saturday. Note dates, type of contact, and results of contact attempts on the PIC inspection form or complaint form.

Handling Dogs

Dogs can be a major threat in the field. It is strongly recommended that field staff carry dog treats and pepper spray when conducting property inspections.

When entering a property, look for signs of dogs, such as doghouses or leashes and listen for barking. Stay in the car when dogs are present and assess whether the dogs are

friendly or aggressive. Stay near the car with the door open for a minute or rattle a fence or gate and call out a friendly greeting with your name and affiliation several times to draw attention to yourself and listen for barking. If you feel confident that there is no immediate threat, continue to follow the main path to the front door.

Use your best professional judgment to decide if a dog is friendly or not. If the dog is friendly, continue with your approach to the front door. If not, wait a few minutes to give the resident time to notice the dog barking and come to the door. Note the dog on the survey form and if possible, note the owner's or resident's name to try to make phone contact to schedule an appointment. You can also leave your business card or door hanger at the door or gate with the date and time you were on the site.

Following no response at the front door, it is also acceptable to follow the main access route to the back door. Call out a greeting in case someone is working outside and knock on a side or back door, provided this does not infringe on the curtilage of the property. Curtilage is the land immediately surrounding and associated with the home and is described in Appendix D.

Meeting the owner/occupant

If the owner or occupant (must be over 18 to provide consent) is there, provide a brief introduction about your visit, whether it be the reasons for the PIC project, the problem alleged in a public complaint, or deficiencies noted in a maintenance report.

The PIC inspection form includes a checklist of topics that the inspector should address during the property inspection. Using this form, provide the owner or occupant with a copy of their OSS records (when available). This is used to provide an overview of their system. Ask whether they have been experiencing problems with odors, soggy spots, or backups. Make site-specific suggestions that the owner/occupant can use to protect their OSS investment (i.e. conserve water, route surface or ground water away from components, reduce waste strength and avoid using harmful chemicals, and prevent physical damage).

It is important that the inspector get consent from the owner or occupant to walk over the drainfield during the PIC site inspection. Use this as an opportunity to educate the owner/occupant about the location of the OSS components and how to protect them, signs of OSS problems and failure, and what a properly functioning drainfield should look like.

If the owner/occupant is aware of the approximate location of unpermitted (unknown) OSS, make a rough sketch of the components on the PIC property inspection form and note "per recollection of the" owner or occupant. This information will be added to local permit records. The 2020 target in the Puget Sound Action Agenda is to document all OSS in marine recovery areas and other designated areas with 95% of system inspections current and all deficient systems repaired or replaced.

Identify on the survey form whether the property is upland, streamside, on a marine shoreline, drains to storm water systems, or has potential FC sources. Following the inspection, PIC staff assign a rating to the OSS. An OSS rating example is provided in **Table 1**.

Property parcels where the owner/resident denies access to inspect the drainfield are rated "Denied Access." These properties are evaluated by reviewing OSS records, noting other potential FC sources, and determining the proximity of surface waters to the property. Those parcels draining to surface waters are investigated during wet weather conditions by collecting FC or EC water samples leaving the property. In the event the water samples show elevated bacteria levels that are impacting surface water, the inspector will contact the property owner to request a dye test.

State and local agencies are able to pursue administrative searches when implementing their civil enforcement authority, where specifically authorized by statute In the event the owner remains unresponsive, a search warrant can be explored through the local prosecuting attorney's office pursuant to Chapter 70.118 RCW.

Table 1. KPHD Rating classification for OSS inspection results

Rating	Criteria for Meeting Classification	Action
No Apparent Problems	• Completed/signed Sewage Disposal Permit on file at local health jurisdiction, or provided by owner at time of inspection and entered into record. • No illegal repairs or alterations performed on OSS. • All applicable setbacks and conditions in effect at the time of permitting are in place.	None
No Records	• No completed/signed Sewage Disposal Permit on file at local health jurisdiction, or provided by owner/occupant. • No Concern, Suspect or Failure conditions were observed.	None
Concern	Concerns include, but are not limited to: • System with no records and drainfield less than 50 feet from surface waters or wells • Improper use of designated reserve area • Vehicular traffic and/or pavement on OSS components • Roof drains or other drainage/infiltration systems potentially impacting the OSS • Unpermitted expansion or modification of existing structure(s), or addition of new structures, or recreational vehicle connections, that impacts the OSS • Unpermitted work conducted on the OSS • Excavation or excess fill within the OSS area, or a cut down slope of the OSS that has the potential to impact the performance of the OSS.	For unpermitted alterations, expansions, repairs, connections or new construction, consult Program Manager regarding enforcement options. Not property records
Suspect	• Drainfield area is saturated. • Collected water sample results from bulkhead drains, curtain drains, or other pipes or seeps, **at or above 500 FC/100 ml (or 406 EC/100ml) and a positive non visual dye test** confirmed by Ozark Underground Laboratories • Collected water sample results from bulkhead drains, curtain drains, or other pipes or seeps, **less than 500 FC/100 ml (or 406 EC/100ml) and positive visual dye-test**.	Mail Suspect Letter Follow up with wet season dye trace Note property records

Rating	Criteria for Meeting Classification	Action
Failure	• Sewage on the surface of the ground • Sewage discharged directly to surface water or upon the surface of the ground unless the discharge is under permit from Ecology. • Sewage backing up into, or not draining out of a structure caused by slow soil absorption of septic tank effluent. • Sewage leaking from a septic tank, pump tank, holding tank, or collection system. • Any component of an onsite sewage system or public sewer connection found to be broken, in disrepair, or not functioning as intended. • Inadequately treated sewage effluent contaminating ground or surface water. • Collected water sample result from bulkhead drains, curtain drains, or other pipes or seeps, at or above 500 FC/100 ml (or 406 EC/100ml) **and** positive visual dye-test results. • Cesspools or seepage pits where evidence of ground water or surface water quality degradation exists, or inadequately treated effluent contaminating ground or surface water • Non compliance with standards stipulated on the permit, with the regulations in effect at the time the system was approved for use, or with the regulations in effect at the time the structure was constructed or modified. • Straight discharge (greywater or blackwater) from any indoor plumbing, including recreational vehicles, is observed and documented	Enforcement Note property records. Notify WSDOH shellfish program is failure discharges to shellfish beds.

Conducting Property Animal Waste Inspections

Assessment of Non-OSS FC Pollution Sources (PET WASTE)

State and many local regulations require that pet waste not be discarded in areas where it may pollute surface or ground water. KPHD's and Jefferson County Public Health's (JCPH) solid waste regulations require that pet owners pick up pet waste at least weekly, or more often as necessary, double bag, and dispose in a sealed trash container.

Staff review local pet waste disposal requirements with owners or occupants on properties with pets during the PIC property inspection. West Sound Stormwater Outreach Group produced an informational brochure for distribution to pet owners.

Assessment of Non-OSS FC Pollution Sources (FARMS)

KPHD's and JPHD's solid waste regulations (Kitsap County Board of Health Ordinance 2010-1 Solid Waste Regulations) require that animal waste, which includes manure from livestock, be managed properly. According to the solid waste regulations, "animal manure shall not be deposited, or allowed to accumulate, in any ditch, gulch, ravine, river, stream, lake, pond, marine water or upon the surface of the ground, or on any highway or road right of way, where it may become a nuisance or menace to health or pollution of water."

It is important to start livestock and agricultural animal PIC inspections early in a project since the investigation and correction can be time consuming and challenging.

Counties are responsible for enforcing ordinances related to critical or sensitive areas as required under the state's Growth Management Act. KPHD has an interlocal agreement (**Appendix F)** and memorandum of understanding for agricultural and livestock sites with the Kitsap Conservation District (KCD). KCD often works as a partner in PIC projects. They conduct an agricultural inventory and generate a list of high priority farms for investigation.

Kitsap CD offers and provides free technical assistance for livestock and agricultural animal waste management, mud management, and other farm challenges. Kitsap CD provides information for BMP cost shares and techniques for farm management. The Washington Conservation Commission, National Estuary Program and other programs may provide financial assistance to help landowners implement water quality BMPs.

PIC property inspections involving farms

Conduct initial project area visit

The success of animal waste management projects can be greatly enhanced through early determination of extent and type of animal waste present in the area of concern. The goal is to assess the size of the problem and the likelihood it will impact water quality and public health.

An initial project area visit is conducted as a tool to determine the following:

- Identify surface waters (drainage in roadside ditches, pipe discharges, streams, and marine water) for fecal pollution segment monitoring to assist in identifying priority areas. Determine project boundaries and note road segments to be inspected, along with property addresses.
- Determine/confirm storm water drainage patterns of the PIC area.
- Look for potential fecal sources in the area, including pet, livestock and agricultural animal waste, grease, and food waste.

Contact local conservation districts, WSDOH, and Ecology to gather any available farm inventory or ranking information. Conservation District agricultural inventories are performed using windshield surveys, ground observations and aerial photography. Site conditions are noted including: number and type of animals, acreage, pasture conditions, waste management, livestock confinement, barns and outbuildings, topography and proximity of land use activity to surface waters.

Kitsap uses the following 1-5 rating scale, based on potential to pollute, to evaluate properties. Parcels ranked "1" and "2" are considered high priority and are investigated.

1: High Priority	Pasture in poor condition. Livestock have access to surface water and/or there is a high probability of contaminated runoff due to topography sloping toward water body. Visual evidence of contamination problem.
2: Medium-High Priority	Pasture in poor condition. Some reason to believe degraded conditions are seasonal or could get worse seasonally. Some areas on property reflect higher levels of management
3: Medium Priority	Pasture is in fair condition. Open water in vicinity of the property but with limited access or evidence of use. A moderate probability of runoff.
4: Medium-Low Priority	Pasture in good condition. No open water in vicinity and/or a low probability of contaminated runoff reaching surface water.
5: Low Priority	Visual inspection from roadside indicates historic or recent past farming activity. Pastures not utilized by livestock. No livestock currently on site. Old barns and/or farm equipment evident.

Project Partnerships

Partnerships with local agencies and community groups can increase project effectiveness. Many state and federal funding sources encourage project partnerships. Project partners work together to determine potential animal waste sources and develop effective parcel-specific educational information (e.g. natural landscaping). Potential partners for pet waste problems include Washington State University County Extension offices, University of Washington SeaGrant, local stormwater utilities, and local Health District solid waste department.

Potential partners for livestock or agricultural animal waste are local Conservation Districts, Ecology, Washington Department of Agriculture, Washington State University Extension offices, University of Washington SeaGrant, and local storm water utilities.

Local Conservation Districts are valuable resources for livestock and agricultural waste management. They can conduct prioritized farm inventories in the project area, contact high priority farms, help develop investigation and correction strategy, conduct project area outreach, and provide free technical assistance to plan and install BMPs. Conservation Districts also facilitate available BMP funding programs.

When performing PIC inspections involving agricultural properties follow the same procedure as described in conducting the property inspection section, but add the following items:

__Identify the property parcel boundaries (with the owner's permission) to document and sample any flowing surface waters that leave the property

__Photograph potential fecal pollution sources to the sampling points such as

- Accumulated animal waste (pets, livestock, and agricultural animals);
- Non-vegetated, heavily used or muddy pastures or animal holding areas draining to surface waters
- Animals with uncontrolled access to surface waters
- Discharge pipes or ditches
- Stormwater systems
- Inadequate grease or food waste management which can attract wildlife

__Include a parcel sketch on the PIC inspection form, with a map showing the sampling locations, surface waters (marine water, lakes and ponds, streams, wetlands, and storm water) originating on or running through or contiguous to the parcel, outfall material and diameter. number and locations of animals or birds at time of inspection, animal waste observed, curtain drains or outfalls to surface water, stormwater system components, stream access points for livestock, and fencing.

__Collect at least three (3) water samples from the same location(s) on different days to best represent field conditions. Sampling during wet weather conditions is recommended.

When the GMV for three samples is equal to, or exceeds, 500 FC /100 ml or 320 EC/100ml, across the property, FC source correction will be needed.

Inform the owner/resident of the fecal pollution and require that they remediate the problem. They can choose to voluntarily work with the local conservation district to help them develop and implement a waste management plan. Ask the property owner or resident if you can have a Conservation District representative contact them via telephone and/or email.

When KPHD or Skagit County find an obvious and serious pollution problem during a site visit to a farm, inspectors require that the property owner implement a short term solution to abate the problem.

- For livestock with unfettered access to water courses, the landowner can be required to move the animals to another location temporarily or put up emergency exclusion fencing.

In the event the owner/resident refuses assistance from the local Conservation District, and/or does not want to address/correct the fecal pollution issue, PIC staff will need to take enforcement action and utilize appropriate legal authority. If the county doesn't have legal authority, Ecology can be contacted for assistance.

Assessment of Non-OSS FC Pollution Sources (Wildlife)

Wildlife can be a serious fecal pollution source, especially in areas where outdoor pet feeding occurs or garbage and/or grease is inadequately managed. PIC staff should inform residents about this issue, and encourage them to keep sources of food inaccessible to wildlife. For example, during a shoreline "hotspot" investigation, PIC staff found a large raccoon latrine adjacent to a shellfish growing area. Washington State Department of Fish and Wildlife has information on how to safely remove raccoon latrines.

Investigate discharges at least three times, ideally within a one month period, from a property where human activity is attracting wildlife. Look for grease and food waste management or evidence of feeding.

Property Inspection Data Management

It is important to have property inspection data managed in a manner that allows it to be useful for inspection follow-ups, reporting, and subsequent projects.

Kitsap enters the information from PIC property site visits, including parcel ratings, dye tests, number of occupants, whether water conservation materials were distributed, and any site-specific concerns or recommendation into an Access database. An example of Kitsap's PIC property inspection form is found in **Appendix C**.

The PIC database was developed to track PIC inspections and associated information. Completed inspections are entered into the database. It is a useful tool that provides information for follow up and reporting.

Pollution Source Correction

Voluntary Correction

Partner collaborations and referral

One of the keys to a successful PIC program is actively collaborating with a variety of partners. KPHD's partners include KCD, Kitsap County Public Works Surface and Stormwater Management Program, Washington State University Extension, a variety of local volunteer groups and non-profit agencies, the University of Washington and local municipalities.

KPHD has an interlocal agreement (**Appendix** F) with KCD that outlines the scope of the work to be completed during various projects. This agreement also includes a reporting process to ensure continuous communication and reporting on progress made during PIC projects.

It is important for a county or tribal agency that takes the lead on a PIC program to see that referrals are followed up with corrective action in a timely manner. An example of a

site inspection protocol that describes the referral process between Skagit County Public Works and the Skagit Conservation District is available in **Appendix G**.

Education and Outreach

PIC staff perform most of the education and outreach for projects during door-to-door property inspection as noted in the Education and Outreach section above.

Technical and Financial Assistance

PIC staff provide technical assistance to property owners regarding the mitigation of a variety of fecal pollution sources. The most common assistance is provided to property owners with OSS issues. Typically prior to initiating enforcement actions, PIC staff work with property owners to assist with identifying the cause(s) of the OSS problem and offer suggestions for mitigation. Also, when a Notice and Order to Correct Violation (NOCV) (**Appendix** H) letter has been issued, PIC staff will work with the owner to ensure that the repair process remains on track and the owner has the information and resources to comply with the order and correct the problem.

Often residents are unable to make repairs to their septic systems for financial reasons. Low interest loan programs, if available, offer a valuable resource to residents that they otherwise may not have. Financial assistance information is provided to residents by PIC staff during the site visits as well as in cases when enforcement action has been initiated.

Craft3 is a non-profit community development financial institution with a mission to strengthen economic, ecological and family resilience in Pacific Northwest communities. They do this by providing loans and assistance to individuals who may not have access to financing. One of the products Craft3 offers are low interest loans to residents of Kitsap, Mason and Jefferson counties for the repair and/or replacement of onsite septic systems. Some counties manage their own low-interest loan programs. Additional financial assistance may be available to qualified residents through the US Department of Agriculture, Indian Health Service and in Kitsap County a local Self-Help program.

Enforcement

Enforcement is conducted, when voluntary correction has not been achievable, under the authority of the local jurisdiction or referred to the state when no local authority is available.

The following tools are used by Jefferson, Kitsap, and Mason Counties when enforcement actions are necessary.

Notice and Order to Correct Violation (NOCV) Letter

A Notice and Order to Correct Violation (NOCV) letter (**Appendix** H) is issued when conditions exist that are in violation of either the onsite sewage system and/or solid waste

regulations. The NOCV is issued pursuant to local onsite sewage system or solid waste ordinances.

For a failing OSS, the NOCV requires the owner/operator to contact a licensed designer or professional engineer within an appropriate time period - typically 30 days, although a 7 or 14 day time period may be used in cases where there is a threat to public health, (e.g. surfacing sewage). PIC staff may issue a pump-out order for properties with failing OSS, as part of the NOCV. A pump-out order means that the tank is pumped as often as is necessary to keep sewage off the ground surface and from backing up in the residence. The owner/occupants are required to conserve water to prevent untreated sewage from surfacing and flowing into surface, ground or into storm water.

The NOCV must be served on the person to whom it is directed by mailing the order via certified and regular mail to the individual's last known address, typically noted in the local assessors' database. After the deadline specified in the written notice has been reached, the status of the violation must be determined. If a violation still exists, further enforcement options may be appropriate. Under normal circumstances, failure to comply with an NOCV is followed by a Notice of Civil Infraction (ticket).

Notice of Civil Infraction (Ticket)

The notice of civil infraction procedures, also known as the "ticket writing" procedures, are referenced in Section 19(4)(2) of the onsite sewage regulations and Section 950(6)(b) of the solid waste regulations and described in Chapter 7.80 Revised Code of Washington (RCW), Civil Infractions. An example of a completed ticket is provided in **Appendix H**.

In most cases, tickets are issued following failure to comply with the NOCV. However, an NOCV is not required prior to issuing a ticket. A ticket can be issued to a defendant during the initial site inspection or any other time the inspector has reasonable cause to believe that the person has violated the regulations; typically in a manner that is egregious, for example, piping surfacing sewage effluent away from the drainfield and into a ditch, or surface water.

Dismissal Order

A ticket can be dismissed if the infraction is corrected prior to the court date. The court evaluates reduced fee requests, as appropriate.

The inspector may dismiss any ticket pending against a first time violator if the violator complies with the NOCV prior to the court date. A Stipulated Order can be filed with the court prior to the court date, in which the defendant agrees that the violation was committed and agrees to a set of required conditions.

Hearing Examiner

Mason County Health has the option to request the Hearings Examiner issue a non-compliance notice to title for, or place a lien on, a property with a failing OSS.

Search Warrants

In Washington State, an administrative search warrant can be obtained to conduct a dye test of an OSS if data shows the OSS may be polluting fresh or marine waters of the state. Administrative search warrants to address suspected OSS failures are only used after all other options are exhausted. The decision to pursue an administrative search warrant is made in coordination with local managers, directors, and the local prosecuting attorney's office. A description of the administrative search warrants follows, and is taken from the Private Property Access and Consent Policy found in **Appendix E**.

"Administrative Search Warrant: State and local agencies are allowed to conduct administrative searches when implementing their civil enforcement authority, where specifically authorized by statute (Chapter 70.118 RCW).

The local health officer may apply for an administrative search warrant to identify failing septic tank drainfield systems. The administrative warrant application may be based on specific evidence of an existing violation or on a general inspection program based on reasonable legislative or administrative standards for conducting an area inspection. The agency may apply for the warrant only after the local health officer has requested inspection of the person's property under a specific administrative plan and that the person refused the health officer access to the property.

The specific administrative plan is developed in response to pollution in commercial or recreational shellfish harvesting area or pollution in freshwater. The plan must include: the overall goal of the inspection; the location and address of the properties being authorized for inspection; requirements for notifying the owner or resident of the plan and its provisions and times of any inspections; the survey procedures to be used in the inspection; the criteria that would be used to define an onsite sewage system failure; and the follow-up actions that would be pursued when an onsite sewage system failure is confirmed.

The local health officer develops and submits the plan to the court as part of the justification for the warrant, along with specific evidence showing that it is reasonable to believe pollution is coming from the septic system on the property to be accessed for inspection. The court official may issue the warrant upon probable cause."

The administrative search warrant process has been very effective in Kitsap County. The process begins after three contact attempts have been made (at least one on a Saturday) with no response. Kitsap's prosecuting attorney's office sends a letter requesting a voluntary dye test before beginning the formal process of requesting the dye test pursuant to a court-ordered search warrant. The prosecuting attorney's letter results in permission to dye test most of the time.

Reporting and Follow-up

Reporting and follow-up are an important part of any successful PIC project. Reporting is a required component of grant agreements and the quality of reporting will determine future funding. Accurate record-keeping is essential to ensure accurate reporting.

Follow-up is also a crucial part of successful PIC projects. Public cooperation depends heavily on whether participants feel that the rules are fairly applied to everyone.

Appendix A: Hood Canal Regional PIC Five-Year Priority Area Work Plan

Appendix B: Examples of Public Notification & Educational Materials

News Release

FOR IMMEDIATE RELEASE CONTACT: Name
February 19, 2011 Tel

Health District to Kick Off Shellfish Restoration & Protection Project and Offer Onsite Septic System Workshop

Seabeck - The Kitsap County Health District will hold a public meeting on Wednesday, February 16th, 2011, from 6:30 p.m. to 8:00 p.m., at the Seabeck Conference Center, 15395 Seabeck Highway, Seabeck WA. The purpose for the meeting is to present information about the Shellfish Restoration and Protection project and provide education about septic systems.

The goal for the project is to restore and protect shellfish growing areas by identifying and correcting sources of fecal pollution through a routine shoreline monitoring program. Attendees

will also learn about septic systems and what they can do to help maximize the life of their systems. A wide variety of printed information will be available, including Health District homeowner's manuals for septic systems. Kitsap Conservation District staff will also be present to share information about rain gardens and best management practices for livestock waste. Water conservation items, such as low-flow shower heads, will also be made available upon request.

The Health District will be working with the Kitsap Conservation District and the Kitsap County Surface and Stormwater Management Program, to conduct this project, which is being funded through a grant by the Environmental Protection Agency.

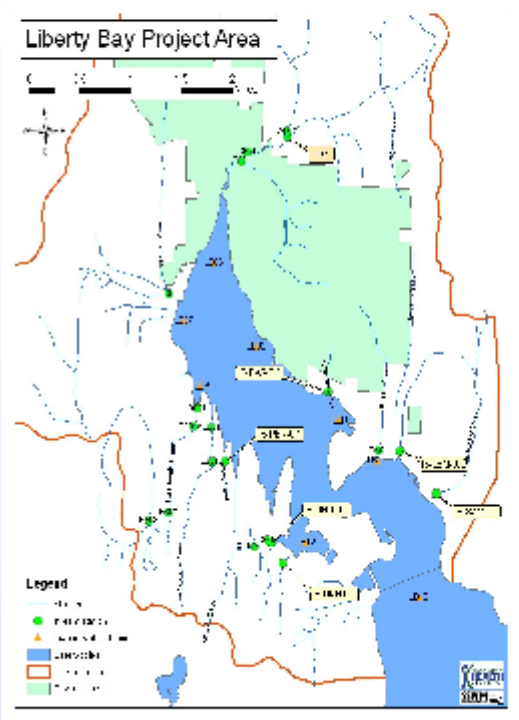
For more information, please contact Name at Telephone or email

Liberty Bay Watershed Restoration Project

Protecting Public Health and Improving Water Quality

Background

- Liberty Bay is 4 miles long and includes approximately 15 miles of shoreline with numerous streams that drain into the Bay. It is listed on the WA State Department of Ecology list of impaired waters for elevated fecal bacteria.
- Freshwater streams monitored by the Health District that do not meet water quality standards include: Dogfish Creek (south fork), Big Scandia, Little Scandia, Bjorgen and Daniels creek.
- Fecal pollution is an indicator of the presence of bacteria and viruses that can make people sick, impair water quality and adversely affect marine life. To reduce this pollution, the Health District received a grant from the Washington State Department of Ecology to conduct a pollution identification and correction project in Liberty Bay from 2009-2014.



Pollution Identification and Correction

The purpose for this project is to identify and correct sources of fecal pollution. These sources may include failing onsite sewage systems, public sewer systems, pet waste & livestock waste and inadequate management of storm water systems.




INTRODUCTION

Three Septic Sense workshops were held in the fall of 2013 to educate Kitsap County residents about proper care and maintenance of their septic systems. The workshop series was a joint effort between Kitsap County Public Works Surface and Stormwater Management (SSWM) and Kitsap Public Health District (KPHD) staff, with additional presentations provided by Kitsap County Solid Waste Division staff and a WSU Extension volunteer. This report summarizes the workshop logistics and promotion methods, results of the pre & post-test evaluation, discusses the effectiveness of various advertising strategies, and offers conclusions and recommendations for future septic workshops.

WORKSHOP LOGISTICS & PROMOTION METHODS

The North Kitsap workshop was held at the Poulsbo Library on October 15. The South Kitsap workshop was held in the Long Lake Community Room on October 24. The Central Kitsap workshop was held in the Silverdale Water District Commissioner's Chambers on November 7. All workshops were in the evening, from 6:30 to 8:30 p.m.

Workshop postcards (Figure 1) were sent to almost 7,000 households across North, Central, and South Kitsap. KPHD staff provided details on priority areas to target for mailing, based on Pollution Identification and Correction (PIC) project work. SSWM staff then used GIS and County Assessor data to provide a valid address list of homes in the priority areas, excluding those serviced by the sanitary sewer system. Additional nearby neighborhoods were added to the mailing list based on density and proximity to waterways, in order to reach approximately 2,000 – 2,500 homes in each of the three Commissioner Districts.

Figure 1. Direct mail postcard to residents.

The workshops were also promoted via online advertising and print ads in the Kitsap Sun newspaper. Two print advertisements were placed in the Arts & Entertainment section, with an estimated 22,000 impressions each. Additionally, online advertising on Facebook and Yahoo accounted for approximately 621,067 impressions.

Registration for the workshop was handled by Kitsap 1 staff. Residents could register either by calling Kitsap 1 or by registering online on the SSWM website. A total of 110 people registered to attend one of the three workshops. During registration, residents had the option of

obtaining a copy of their septic records. Those requests were sent directly to KPHD. When asked how they heard about the workshop, 55% mentioned the postcard mailer to their home, 28% referred to the Kitsap Sun print ads, 7% mentioned the online ads, and the remaining 10% said it was through email, referral/friend, or other (Figure 2).

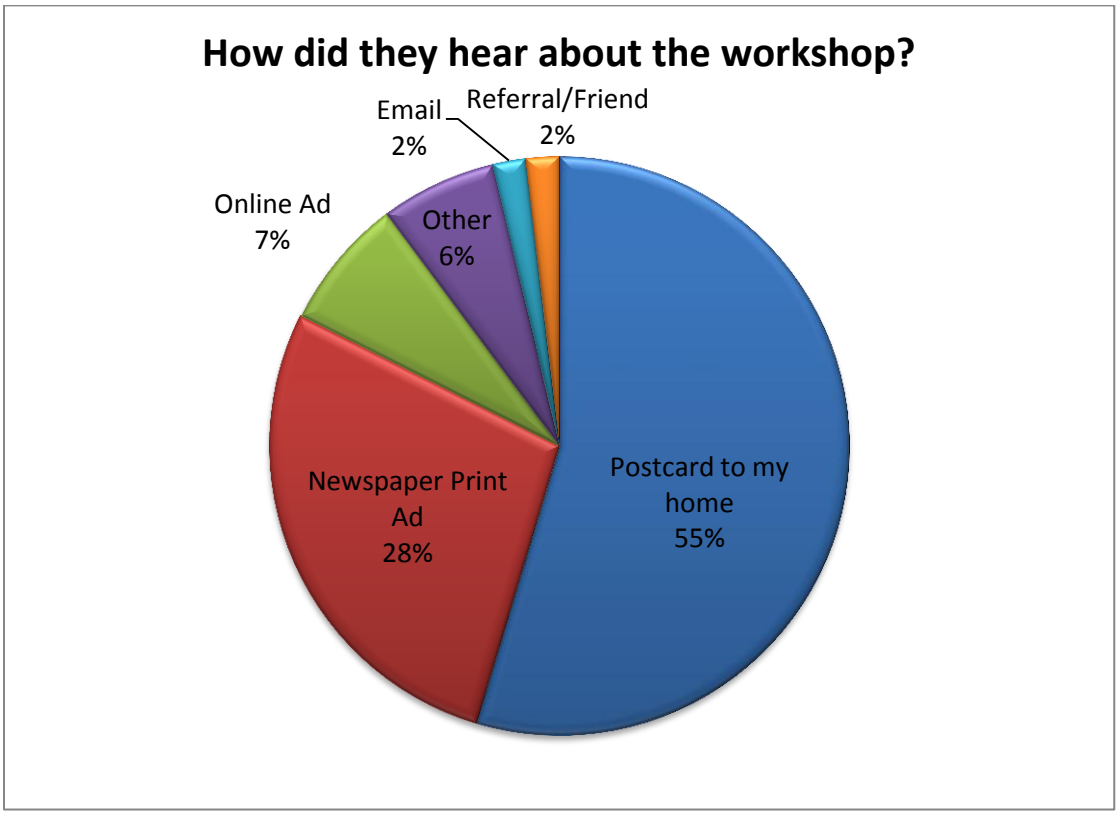


Figure 2. Success rates of workshop advertising strategies.

Of the 110 people who registered, a total of 98 (89%) attended one of the three workshops. There were 28 attendees at each of the North and South Kitsap workshops, and 42 at the Central Kitsap workshop (Figure 3). Some of those who registered did not show up, while several other attendees had not pre-registered. As they entered, workshop participants were handed an agenda, along with a pre-workshop test and a post-workshop test/survey. Upon completing the pre-test, participants were given a Green

Figure 3. North Kitsap workshop participants.

Cleaning Kit assembled by KCPW Solid Waste Division staff. They were offered light refreshments and encouraged to peruse the information tables and displays.

The workshop agenda included a Welcome & Project Overview (KPHD staff), Septic Presentation (KPHD staff), Green Cleaning Demonstration (KCPW – Solid Waste Division staff), Landscaping Your Drain Field & Natural Yard Care (WSU Kitsap Extension volunteer), and Final Questions & Closing Comments (all speakers).

EVALUATION

The workshop was evaluated using the pre/post test method where participants were asked the same questions before and after the workshop. Among the 98 attendees, 72% filled out a pre-workshop survey (71 total) and 53% completed the post-workshop survey (52 total). The average pre-test score was 90.8% and the average post-test score was 95.6%, representing a 4.8% average increase in knowledge. Scores for individual workshops are provided below in Table 1. Central Kitsap had the highest scores and South Kitsap had the greatest percent increase in knowledge.

Table 1. Pre-workshop and post-workshop test results.

Workshop Location	Pre-test Responses	Average Score	Post-test Responses	Average Score	% Increase
Poulsbo (NK)	21	90.9%	14	95.7%	4.8%
Long Lake (SK)	21	87.6%	12	93.3%	5.7%
Silverdale (CK)	29	93.8%	26	97.7%	3.9%

The pre-test questions that were most commonly incorrect were:

- "Sewage from a failing septic system ends up:"
    - Five people thought that sewage from a failing septic system ends up traveling through the sanitary sewer system to an ocean outfall; 3 provided other incorrect responses or left it blank.
- "You have noticed that your pipes are draining slowly and you're concerned about a problem with your septic system. What should you *NOT* do?"
    - Four people thought that you should not walk around the drainfield to look for soggy soil or puddles of stinky grey liquid, and 3 thought you should not call a septic inspector or the Health District.
- "You can help maintain a healthy bacteria community in your septic tank by:"
    - Four people thought additive septic tank products would help maintain a healthy bacteria community in their septic tank; 1 thought flushing pet waste would help and 1 left it blank.

The post-test questions that were most commonly incorrect were:

- "You have noticed that your pipes are draining slowly and you're concerned about a problem with your septic system. What should you *NOT* do?"
  - Three people answered "Call a septic inspector or the Health District". *NOTE: this appears to be an error of people reading the question incorrectly as "what SHOULD you do?" This is evidenced by notes about having learned who to call for help.*
- "Sewage from a failing septic system ends up:"
  - There was still confusion about the correct answer among four people.

For the majority of the workshop participants (73%), the information presented was qualified as "Familiar to me but presented in more depth." However, for one quarter of the participants, the information was new. Only 2% claimed to already know the information (Figure 4).

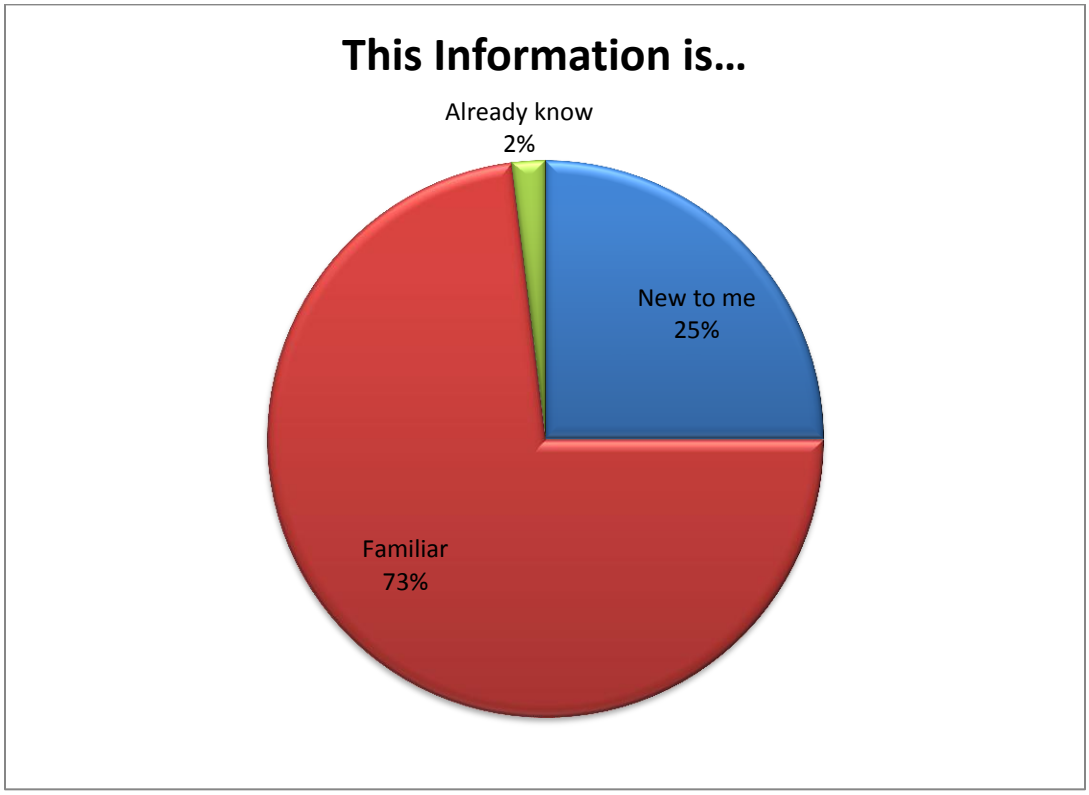


Figure 4. Familiarity of information presented.

When asked about 3 new things they learned, responses on the post-test included:

- 21 people learned what they should and should not put into their septic systems. Specific things they mentioned learning not to put into their systems included wipes (even flushable), grease, septic additives, powdered detergents, drain cleaners, fabric softener, and wet food waste. Many also learned not to use their garbage disposal.
- 19 people wrote about different aspects of the green cleaning demonstration, including recipes for inexpensive and easy to use non-toxic cleaning alternatives, uses of vinegar and baking soda,

steam cleaning, pumice stone and zip it. One person even said that the green cleaning procedures were the "main thing I came for."

- 14 people mentioned landscaping practices, such as no pesticides or weed & feed, and good vs. poor choices for planting on and near the drain field. One person called these "excellent suggestions."
- 13 people gained a better understanding of the entire septic process, including the components and mechanics of the system, different types of systems, the 3 layers in the septic tank, the cleanout, and how the drain field works. Several mentioned needing to check on whether they have a filter on the outlet of their septic tank. Upon learning about how the drain field works, one person realized that they "need to adjust some of our processes."
- 7 people mentioned the importance of regular inspections and maintenance, every 3-5 years, and to fill the septic tank with water after pumping.
- 5 people found out about the impacts of water usage in the home, including spacing out laundry, dishwashing, and how to use food coloring to check for toilet leaks.
- 5 people referred to concerns about septic failure, including how to identify signs of a failure such as gurgling drains and walking around to check on the drain field.
- 3 people learned about one on one help from KHPD. They found out that the "health dept. will help and advise me" and "we can ask for help from Kitsap Public Health in determining if there's a problem."
- 2 people said they learned about water quality, including sources of pollution and the Dyes Inlet Monitoring Project.
- 2 people discovered that the average lifespan of the system is 30 years.
- 2 people mentioned keeping downspouts away from the drain field.
- 1 person found out that low-interested loans are available.
- 1 person learned the location of the hazardous waste facility.
- 1 simply stated "I knew nothing about septic."

When asked "What was of most interest or concern to you?" responses included:

- 8 people mentioned how the septic system works, including how to care for it and when to have it pumped.
- 8 people were most concerned about septic maintenance, including "what not to put in the septic system".
- 4 people said "Everything!" "All information discussed was valuable" "Every part was necessary" "Entire session; all good"
- 4 people referred to landscaping ideas for on and around the drain field.
- 2 people had specific septic system concerns or were worried about "squishy ground".
- 2 people mentioned learning about the green cleaning alternatives.
- 2 were most interested in preserving the longevity of the system and how to maximize the septic life span.
- 1 person mentioned the septic loan program.

- 1 person stated "illness from water contamination; why systems fail; why it's so important that septic works correctly."

When asked "What did you learn that will be the most helpful in protecting water quality where you live?" responses included:

- 9 people referred to being more careful about household cleaning products and using non-toxic green cleaning alternatives.
- 7 people mentioned alternative lawn care, limiting fertilizers, no weed & feed, and selecting appropriate plant cover for the drain field.
- 6 people thought regular septic system inspections and maintenance would be most helpful in protecting water quality where they live. Specifically, people mentioned:
    - "making sure you are proactive in keeping your septic in good working order"
    - "preserving the integrity of the drain field"
    - "to keep up on my septic system; to make it a habit to check on it"
- 6 people mentioned good septic care practices, such as spacing water usage, using less or no bleach/anti-bacterial soaps, and not flushing food down the toilet.
- 1 person mentioned "watching animal feces."
- 1 person summarized by saying "I have clearer understanding of how and why my septic system works, and how to avoid system failure; I need to take a closer look at my landscaping practices."

When asked which behaviors participants planned to change after attending the workshop, the majority indicated that they would replace some of their household products with less toxic alternatives (86%). This shows the power of actually distributing the supplies, and demonstrating their use and effectiveness, on aiding behavior change. Over half (57%) of attendees said they planned to start spacing their laundry throughout the week. Figure 5 shows the responses to all behavior change options.

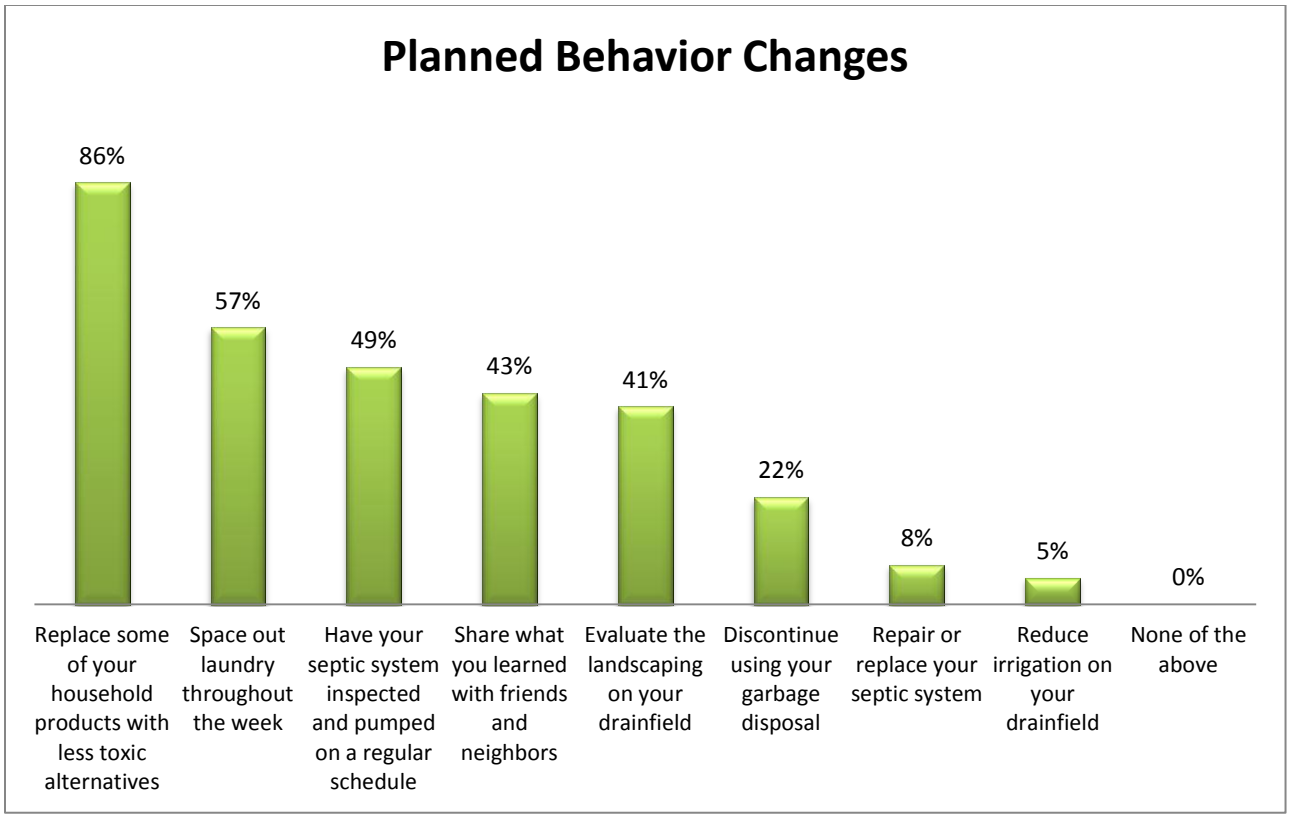


Figure 5. Behaviors planned to change or adopt to improve septic system health and functioning.

The majority of participants rated the workshop as "excellent" (87%). A rating of "good" was given by %13. No one qualified the workshop as "average" or "not very interesting or informative" (Figure 6).

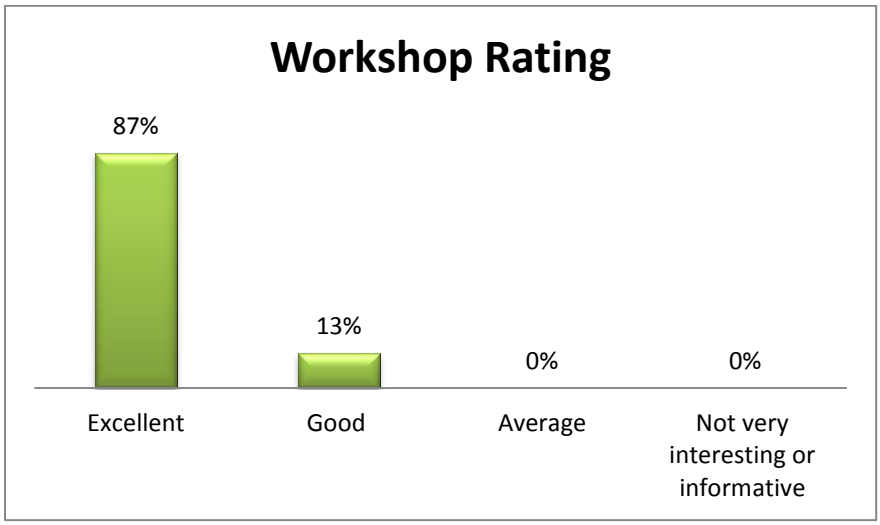


Figure 6. Workshop quality ratings.

When asked if there is anything participants would change about the workshop, the majority of respondents responded "Thank You" or echoed this sentiment: "No, I feel it was smooth flowing and the info was made easy for me to follow and understand." However, there were several who craved more information. Several suggestions/comments included:

- more time
- some design and operation factors
- the flyer included Craft 3 (loan program) but not covered
- more examples of alternative septic systems and their complexity and needed maintenance
- the new installs seemed minimal
- the first part didn't have enough specifics for me to understand my septic system
- What to do if there is a natural disaster
- Thank you - very well done. I just wish I had been taught all this when I bought my house in 2005. Maybe you could incorporate a policy for new home owners attendance - at least if they purchase waterfront?

Additional comments about the workshop included this encouraging feedback:

"Very informative and I feel welcome to call if there are any questions."

"I was surprised at the large variety of topics covered. Thanks to each presenter."

"Great, enthusiastic speakers and materials - easily understandable."

"This was so helpful - thank you!"

DISCUSSION

Table 2 below shows the costs and effectiveness of various promotional methods employed to encourage workshop attendance. When determining how successful each advertising medium was, it is important to clarify the primary objective and any other peripheral benefits. The primary objective was to notify people of the workshop and encourage them to attend. A side effect of these advertising efforts is the number of impressions, or opportunities for the public to come into contact with our workshop ads, and therefore our program and materials. This peripheral benefit results in a greater understanding of our work and who they con contact for more information.

In terms of registration, the direct mail postcard was the most effective advertising method, resulting in 59 registrations. However, it was also the most expensive in terms of cost per impression, at $0.50 per household. It was moderately expensive in terms of cost per person registered, at $59. The next highest number of registrations can be attributed to the print ads, which cost only $0.01 per impression. This method was also the least costly per person registered, at $22. Interestingly, the combined online (Facebook and Yahoo) advertising efforts resulted in only 8 people registering, at a costly $136 each. However, the online ads delivered over 621,000 impressions, each costing only a fraction of a cent. These resulted in almost 300 people who "clicked through" the ad to our website to find out more. Therefore, the number of people who received some information about the workshop or our program totaled three times the number of people who came to the workshop. Using an advertising suite that is a hybrid blend of several media types seems to be an effective strategy to both educate residents directly at workshops and passively via online content.

Table 2. Costs and Effectiveness of various advertising methods.

Item	Amount	Impressions	Clicks	# Registered*	# Impressions per Registrant	Cost per Impression	Cost per Registration
Direct Mailer (postcard)	$3,487	6,928	N/A	59	117 postcards	$0.50	$59
Print Ads (A&E Section)	$652	44,000	N/A	30	1,467 impressions	$0.01	$22
Online Ads (Facebook)	$543	574,012	210	4	143,503 impressions	$0.00	$136
Online Ads (Yahoo)	$543	47,055	89*	4	11,764 impressions	$0.01	$136
TOTAL	**$5,225**	**671,995**	**299**	**97**	N/A	N/A	N/A

*Of the 89 Yahoo clicks, 75 or 84% of them were from mobile users rather than desktop. See Appendix A.

CONCLUSIONS & RECOMMENDATIONS

The workshop was viewed as a great success by both the residents who participated and the staff who organized and presented. Post-workshop survey results indicate that participants learned much about septic functioning and maintenance, reducing the use of toxic chemicals by replacing them with green alternatives, proper drain field landscaping, and the impacts of failing septic systems on local waterways. Everyone who submitted a post-workshop survey indicated that they planned to change at least one household behavior, with the most popular being the use of green cleaning products. This is likely due to the fact that the behavior change was facilitated by putting both the products and the knowledge about how to use them in the hands of the workshop attendee.

While the post-workshop survey questions provided valuable feedback, the use of the pre- and post-test multiple choice questions appears less valuable. The pre-workshop knowledge levels are already high (around 90%) and the increase in knowledge is only around 5%. This could be due to the questions being too easy, since 25% of attendees did classify the workshop content as new information. If the pre and post-test format is continued in future workshops, the questions should be made more challenging to get a better sense of the learning that is occurring.

It was observed during this workshop series that one of the biggest challenges in disseminating this information is reaching the audience that is likely to be stressing their septic systems the most – families with children in the home. A qualitative assessment of workshop participants indicated that most appear to be retired, with only 1-2 adults in the home. Attending an evening workshop without having provisions for childcare is likely to be a barrier for many families who need to learn this information. It is recommended that solutions to engaging younger audiences be investigated. Several potential avenues to explore include offering childcare at the workshops (such as making arrangements with the YMCA or other such venue); experimenting with alternative workshop times (such as a weekend day); and/or producing additional online materials that cover the workshop content. This could come in the form of breaking the presentation into short video segments that could be accessed online 24/7. The video medium is additionally advantageous because segments could be shot in a variety of settings, such as during an inspection, install, or failure investigation, thereby benefitting both visual and audio learners.

Appendix A

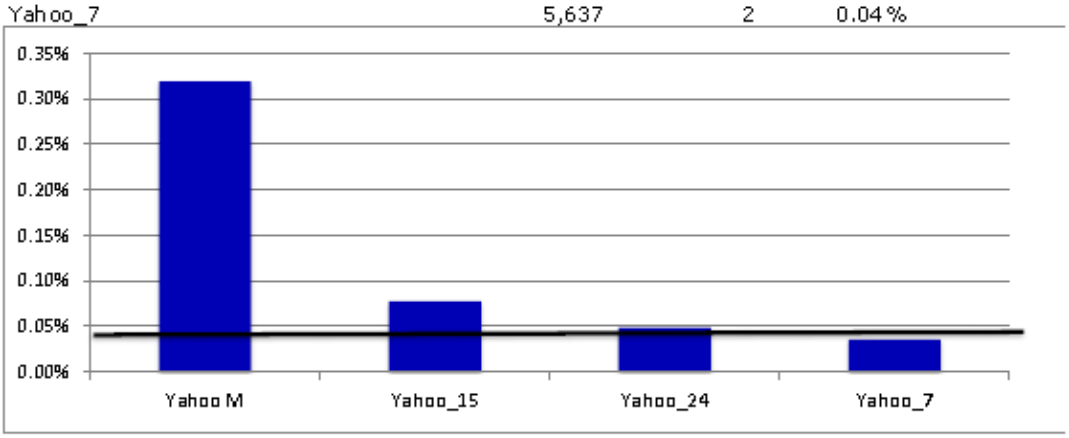
Post-Advertising Campaign Yahoo and Facebook Reports

KitsapSun
kitsapsun.com

Kitsap CO Solid Waste: Campaign Performance Summary

Run Dates:	10/1/2013-10/31/2013
Total Imps Delivered	47,055
Total Clicks:	89
Campaign CTR %	0.19%

Campaign Performance Stats		Imps Delv.	Total Clicks	CTR %
Yahoo	10/1-10/31	23,518	14	0.06%
Yahoo Mobile	10/1-10/31	23,537	75	0.32%
Creative Peformance Stats				
Yahoo M		23,534	75	0.32%
Yahoo_15		11,665	9	0.08%
Yahoo_24		6,212	3	0.05%
Yahoo_7		5,637	2	0.04%



Click To Register

facebook

Kitsap County SSWM

Month	Impressions	Social Impression	Clicks	Social Clicks	Actions	Page Likes	Total Budget Spend
October	574,012	n/a	210	n/a	n/a	n/a	$500

Best Performing Ad in Your Campaign

Definitions:

Impressions: Number of times your ad was displayed on Facebook

Social Impressions: Number of times an ad was displayed on Facebook with a Friends name

Clicks: Number of times someone clicked on your ad to go to your Facebook page or website

Social Clicks: Number of times a friends name was clicked on in your ad

Actions: Tracks Page Likes, App Installs, and Event RSVPs that originate from your ads

Page Likes: The number of times a user "likes" the advertiser's Facebook page

Total Budget Spent: Amount of your budget that was spent for this reports time period

E.W. SCRIPPS

Appendix C: Property Survey Form

PROPERTY TAX ID:

PROJECT AREA	**ADDRESS**
OWNER NAME	**PHONE**
OCCUPANT NAME	

PROPERTY INFORMATION:

Occupancy type __ Commercial __ Single family __ Multi-family	System type __Standard gravity __Pressure __Drip irrigation __Glendon __Other _____ __M & M contract	Records on file __BSA __Permit __As built	#Bedrooms #Occupants	 __Marine shoreline __Fresh shoreline __Upland Distance to OSS
Survey date(s)	Staff	OSS rating	Farm rating	Date last pumping
Roof drains __ OK __ needs improvement	Curtain drains __ OK __ needs improvement	Bulkhead drains __ OK __ needs improvement	Pets present (# and type)	Livestock present (# and type)

Animal waste management: ___ OK ___ Needs improvement ___ Violation

Notes/Comments on OSS and/or other property conditions

OSS EDUCATION CHECKLIST:

___ Water usage: (hydraulic loading, plumbing leaks, laundry, garbage grinder, low flow fixtures, runoff, sprinklers)

___ Waste strength: (use of additives, chemical drain cleaners, bleach, fabric softener, meds, fats/oils/greases)

___ Physical damage: (driving over drainfield, bldgs/structures, heavy equipment etc.)

___ Inspect system regularly (pump/inspect frequency, warning signs of failing OSS, purpose for reserve area)

___ Educational materials provided circle 1 or more (Fact Sheet, OSS manual, Repair brochure, Pet waste)

ANIMAL WASTE CHECKLIST:

___ Pet waste

___ Manure from livestock

___ Referral to Kitsap Conservation District _____

If Flows from this Property are Potentially Impacting Water Quality, <u>or if there no As built</u>.

Complete the Following:

In the box below, indicate sources/areas of animal waste, surface water flows, locations of OSS and where samples/dye tests were collected/placed on the property. For consistency, indicate distances and directions on the drawing (Not To Scale). **IF, No As built, draw OSS per owner's information.**

N

Notes:_____
_____
_____

Dye Test Date:					**Dye Used:**							
Location Number	**Control (BAC)**			**Pack Week #1**			**Pack Week #2**			**Pack Week #3**		
	Placed	Retrieved	Result	Placed	Retrieved	Result	Placed	Retrieved	Result	Placed	Retrieved	Result
1												
2												
3												

<u>WATER SAMPLE DATA</u>: (**FC per 100mL**)
Water Sample Taken: Date:_____ Inspector:____ Result:_____ Location:_____
Water Sample Taken: Date:_____ Inspector:____ Result:_____ Location:_____
Water Sample Taken: Date:_____ Inspector:____ Result:_____ Location:_____
Water Sample Taken: Date:_____ Inspector:____ Result:_____ Location:_____

Appendix D: Field Safety Protocol and Field Equipment List

KITSAP PUBLIC HEALTH DISTRICT
WATER PIC PROGRAM
FIELD SAFETY PROTOCOL

OBJECTIVE:
To provide PIC program field staff with protocols that will enable them to have the training and equipment needed to work safely and protect themselves in the field.

RATIONALE:

Safety is the number one concern to PIC Management. Delineating a protocol that deals with basic safety in the field is a necessary part to keeping staff safe. This protocol won't cover every situation but will be adapted and added to over time to ensure we are dealing with "real time" issues.

PROTOCOL:

Field Inspection/Field Visit Preparation

The key to a safe field inspection is preparation. The amount of preparation will depend on the kind of inspection being done. Preparation may include obtaining required training, familiarity and application of related policies and procedures, confirming or acquiring additional information, and gathering necessary supplies, equipment, and protective clothing.

1. **Training (ALL PIC FIELD STAFF)**

Field staff training includes the following:

- **Personal Protective Equipment (PPE)**
- **Harassment and Discrimination Prevention**
- **First Aid/CPR/AED**
- **Basic Seamanship**
- **Probationary field training including sample collection/handling, moving over/through difficult terrain, operating and working on a boat, etc.**

Staff are encouraged to look for other training opportunities including the following:

- **Dog Safety**
- **Site Entry and Search**
- **Pepper Spray (training required if you are carrying in field)**
- **Dealing with combative people**
- **Risk communication**

Other training will be periodically provided. Staff is encouraged to recommend any other training opportunities or needs which would improve field safety.

2. **Applicable Policies and Procedures**

Staff should become familiar with KPHD policies and procedures (and amendments). There are located on the ANET for review.

3. **Supplies and Equipment**

The supplies and equipment listed below are required and recommended items for PIC fieldwork. KPHD will provide all required items and MAY supply or reimburse for some of the optional item listed below. Field staff is required to have the following items:

- **KPHD identification badge**
- **KPHD business cards**
- **Digital camera**
- **Cell phone/emergency contact phone numbers**
- **Appropriate PPE (field boots, latex gloves, etc.)**
- **Kitsap County map**
- **Appropriate educational materials**

The following items are optional but may be useful:

- **Dog biscuits**
- **Pepper spray and holder (training required if carrying this)**

4. **Field Clothing and Personal Protective Equipment**

Appropriate attire for conducting field activities is required. In some cases basic PPE is necessary. Dress appropriately for the weather. Wear clothes that make it easy for you to move fast, and are suitable for the type of encounters that may arise such as berry bushes, muddy sites, and other obstacles. For stream monitoring and shoreline surveys it is highly recommended you wear boots with good ankle support as the topography may be somewhat uneven. Good traction and water proof material is also highly suggested. KPHD will reimburse (see policy on ANET) you if you need to purchase new field boots. It is also recommended that rain gear be included in your PPE as work occurs year round and in adverse conditions. Again, the district will reimburse (see policy on A-NET) for these purchases and different employees prefer different types of equipment.

- **ANSI rated safety toe and/or pierce resistant field boots are required at all times when working in the field.**
- **Lifejackets are required to be available in the boat per US Coast Guard regulations. One life jacket per person is required.**

5. **Site Visit Procedures**

Plan Ahead:
Before conducting a site visit, it is highly recommended that staff gather as much information about the property that is being visited. Check available databases to see if there are any prior complaints or information that might be of use. Often times other field staff will put comments in the database addressing if there are dangerous people or animals on the site. A more detailed review of historic cases may be warranted if previous violations are identified. It is important to list all pertinent information on the inspection form. This may include information you find while preparing for the inspection.

Carry only what's needed:
Take only the items you will need for your site visit. Women should conceal their purse securely in the vehicle or trunk. Have the materials organized and ready to go in a briefcase or other carrying device.
IF YOU DO NOT FEEL COMFORTABLE GOING TO A SITE ALONE DO NOT GO!! FOLLOW YOUR INSTINCTS!!!
Trust your instincts. If you are feeling uncomfortable, cancel the visit, reschedule or bring another person with you.

Approaching the dwelling/building:
Minimize the time you sit in the car and prepare materials. Do your preparation away from the dwelling if you can. As you near the structure you can announce your presence by saying "Hello, Kitsap Public Health….." This will alert the owner/occupants if they are outside that you are approaching and alert any dogs that might be lose or in the yard. If no one responds proceed to the front door. Knock and ring the doorbell while announcing yourself. Step back from the door while waiting to make sure there is a comfortable distance between you and the door. Have your ID badge visible and a business card. When the door opens introduce yourself, hand them your business card, state why you are there, and ask if they are available to talk for a few minutes. If they say "yes" then proceed with your business. Be concise in conveying information. Answer questions and offer to call with information if you don't have the answers. If they say "no" ask if there is a better time to come back or if a phone call would be better.

Leaving the visit:
When the visit is done thank the person for allowing you to interview them. Gather all your belongings. Have your car keys ready in your hand. Try not to sit at the property and take notes or make calls. Try to leave immediately and go to a safe place to jot down site visit details you were not able to write down during the visit.

6. **Dealing with hostile people or animals:**

If at any time during your site visit you feel uncomfortable, you are threatened, or the person becomes hostile LEAVE IMMEDIATELY. DO NOT ENGAGE IN CONFRONTATION. Go to a safe place. Contact your manager or field supervisor to report the incident. If you are attacked or threatened you have the right to defend yourself. How you choose to defend yourself will depend on the circumstances of the assault and your abilities. If you have been assaulted, and you're able to get to a safe place, call 911.

Reporting an emergency to 9-1-1

- **Briefly state the nature of the emergency**
- **Let the dispatcher ask the questions**
- **Be prepared with the address or cross street where help is needed**
- **Stay on the line until advised to hang up**

If the person will not let you leave the property the use of defensive OC (pepper) spray is authorized.
If you encounter a hostile animal on the property or feel an attack is imminent leave the property immediately and notify your manager or field supervisor. If the animal is not allowing you to leave and the owner/occupant is unwilling or unable to provide assistance, the use of defensive pepper spray is authorized. After the spray is discharged leave the property and notify your manager or field supervisor.

7. **After Hours Work**

When working after hours or on weekends, staff must notify the Program Manager or Field Supervisor ahead of time with an email or text. After completing the work, staff must send email or text that they are finished and on their way home. This includes returning from a boat run, if returning to the office later than close of business (4:30 pm).

Summary:
Unexpected violence can occur at any time. You can significantly reduce the chance of being a victim by being aware of your surroundings at all times.

Sampling/Testing Equipment

100ml sterile plastic water sample bottles. Used to collect water samples for FC or EC analysis.
Sample wand. Telescoping wand used to collect water samples.
Cooler with ice and/or ice pack(s). Used to store samples until delivered to lab.
Digital camera. Used to document violations/items of interest. All inspectors are issued a digital camera in the Pollution Identification and Correction Program.
GPS unit; used for shoreline surveys, trend and impact monitoring.
Dye tracers. Ready-for-use individual liquid dye mixtures in 500 ml Nalgene® bottles stored separately from other PIC supplies in a water proof container. Used to dye-test OSS.
Charcoal packs. Used during dye tests to "catch" dye. Packs are available in the storage cabinet located in the office and in a separate location from the dye tracers.
Whirl-Pak™ bags. Used for storage of individual control and dye packs retrieved from sampling sites.
Water proof markers, e.g. "Sharpie". Used to write on water sampling bottles for identification purposes.
Rubber bands and plastic bags. Used to post and protect written materials left for property owners/occupants.

Paperwork

OSS permit records. Used to assist inspectors locate the OSS on a specific property.
OSS monitoring and maintenance records. Used to determine if the alternative OSS on the property has been properly maintained through the monitoring and maintenance program.
PIC property inspection form. Used to record needed information regarding the property being inspected.
PIC door hanger. Used to inform area residents that a Health Inspector visited that property, and to provide information regarding the purpose of this visit.
"Rite-in-the-Rain" notebook. Used to map sampling locations.

Safety Equipment

Identification badge. Used to identify yourself to property owners. Badges are issued to the inspector.

Business card. Used in conjunction with badge to identify yourself to property owners. Cards are issued to the inspector.

Cellular phone. Inspectors are issued a cellular phone for use while conducting business, or they may use a personal cell phone.

Pepper spray. Used for self-defense. Inspectors are trained annually in the use of pepper spray. Pepper spray containers are issued by the Health District after completion of the training.

Disposable latex gloves. Used to protect an inspector from pathogenic organisms that are associated with sewage.

Personal Protective clothing includes; steel toe or safety toe boots and rain gear (jacket and rain pants). These items are provided to staff according to the Collective Bargaining Agreement.

Hand-wipes/sanitizer. Used to clean hands. Always use a hand-wipe after collecting water samples or charcoal packs.

Chlorine bleach solution. Used for cleaning-up spilled dye. Wear gloves while handling.

Appendix E: Private Property Access and Consent Policy

This discussion of search and seizure law and access procedures is intended to provide guidance only. Search and seizure analysis is very fact-intensive and inspectors are cautioned to discuss field conditions with their supervisors and to seek legal counsel where appropriate. This Private Property Access and Consent information is provided by the Kitsap County Prosecuting Attorney's office. The basis for the guidelines comes from interpretation from State Law cases and so should be transferrable to other Counties, however Kitsap recommends that Counties check with their legal contacts before adopting these guidelines.

Private Property Access and Consent

Site Entry and Searches

Inspectors must enter private property while conducting inspections or surveys. Because the state and federal constitutions prohibit unreasonable searches, an inspector must decide whether he or she may legally enter a particular property to conduct an inspection. In all cases, an inspection can occur only if (1) the inspector makes observations from a place where the inspector may legally be without consent, or (2) after obtaining consent from a responsible party (owner or tenant). To assist you in determining whether you may enter a property some basic constitutional doctrines are discussed below:

Reasonable Expectation of Privacy: There are two components to a reasonable expectation of privacy. The first is a subjective component: Does the person have a subjective expectation of privacy in a particular object or location? The second is an objective component: Is this expectation one that society recognizes as reasonable? Generally, a person has a reasonable expectation of privacy in his home, in the area immediately adjacent to the home, and in areas where he/she has taken steps to exclude the public and shield the area from the public's view.

Residence: A person always has a reasonable expectation of privacy in his/her home. You may not enter a person's home, except with the resident's consent.

Curtilage: The land immediately surrounding and associated with the home, i.e., that area associated with the intimate activity of a home and the privacies of life. Curtilage receives the highest level of protection under both the federal and state constitutions. You may not enter the curtilage without a resident's consent, except as explained below. To help determine if an area is within the curtilage, answer these questions:

Q: How close is the area you want to inspect to the house?
A: The closer the area you want to inspect is to the house, the more likely it will be considered within the curtilage.

Q: Is there a fence or other enclosure that surrounds the house *and* the area you want to inspect?
A: A fence that surrounds the house suggests the limits of the curtilage. Accordingly, where a house is situated on a standard lot and the lot is fenced, that is the limit of the curtilage. On a larger piece of property there may be a fence around the perimeter of the property, and an inner fence enclosing the house. In that case, the interior fence would indicate the limits of the curtilage. A clearing or maintained

area has the same effect. Thus, on a larger piece of property that is forested, the cleared area surrounding the house would indicate the limits of the curtilage.

Q: What is the area you want to inspect used for?
A: The concept of the curtilage is to protect those activities normally associated with the home and the privacies of life. Thus, if an area near the house is used for family or personal activities (e.g., play area, patio, garage), then it is probably within the curtilage. However, if the area is used for activities not associated with home life, especially illegal activities, then it probably will not be considered within the curtilage. You may use evidence you observe from the road or a neighbor's property, or information a neighbor gives you, to determine if an area is being used for an activity associated with the home or some other activity.

Q: Has the resident taken any steps to protect the area you want to inspect from observation of passersby?
A: If a fence -- especially a sight-obstructing fence -- or hedge shields the view of the house from the street and neighboring properties, then the area within the fence or hedge will probably be considered within the curtilage.

Q: Can an inspector ever enter the curtilage?
A: Yes. You may enter the curtilage to contact the resident. In doing so, however, you may use only a recognizable access route, such as a driveway, walkway, or path. Approach the house as any reasonably respectful citizen would. Normally, you should not enter a side or back yard. You may, however, call out or try to get someone's attention if you see or hear something that leads you to believe the resident is in a side or back yard.

Other factors to consider when conducting an inspection of private property:

<u>No Trespassing Signs:</u> A "No Trespassing" or "No Solicitors" sign does not prohibit you from approaching a residence using a recognized access route for the purpose of contacting the resident.

<u>Open Fields:</u> Areas that are outside the curtilage are considered "open fields" and do not always receive the same high level of constitutional protection that the curtilage does. In an urban area, you may not find any open fields. In outlying areas, however, you are likely to encounter them. An open field doesn't need to be either "open" or a "field." It could be a thickly wooded area or a beach. Generally, an open field is any unoccupied or undeveloped area outside the curtilage.

In many instances, you will be able to enter open fields without the permission of the owner. However, you need to consider whether the owner has manifested an "expectation of privacy" in the area you want to enter. Some manifestations of an expectation of privacy are: 1) a long driveway; 2) "No Trespassing" signs; 3) fences, especially sight-obstructing fences, or maintained hedges; 4) a locked gate; or 5) the area cannot be seen from a road or neighboring property.

Each situation is different, so it is not possible to provide a blanket rule for entering open fields. It may be best to consult with a supervisor before entering.

<u>Open View:</u> If you are in a place you may legally be, such as a roadway, public property, a neighboring property that you have permission to be on, or are approaching the residence via a recognized access

route, then you can base an enforcement action on anything you can see from that vantage point. Accordingly, if a person allows you in his/her backyard, and you can see illegally stored solid waste on the neighbor's patio, you can write a notice and order to correct the violation or a notice of civil infraction, based on what you can see from the neighbor's property. As long as you remain on the property you have permission to be on, you can climb a ladder to see over a fence, or use binoculars. You may take photographs from a place you may legally be.

Plain View: The plain view doctrine applies when you have entered a property with the resident's consent. The plain view doctrine allows you to use anything that you see inadvertently as you walk through the area. The object must be in plain view; you may not move anything. You may not remove a lid on a trash container to see inside. Plain view works the same way when the resident has given you permission to look around. If you want to see inside or under something, ask the resident if it's okay.

Consent: An inspector obtains valid consent to inspect when he or she asks the resident for permission to conduct an inspection and receives an affirmative response through words or action.

When seeking consent to access a property, it is important to set the property owner's or user's expectations. Explain the purpose of your entry into a residence or curtilage and explain the scope of consent you are requesting. Document the consent in field notes, including from whom it was requested and obtained, and any limitations on time, location, and repeat visits.

Avoid statements like "I'm going to look around," or "I have to inspect the property". A person who submits to an inspection after such a statement has not necessarily given his/her consent to the inspection and a court could suppress anything that is found during the inspection. A civil enforcement inspector need not inform a person of his/her right to refuse an inspection but, if the person asks whether he/she may refuse, the inspector must tell the person that he/she may refuse (or may limit the scope of the inspection).

Where two or more persons may claim a reasonable privacy interest in a particular dwelling or premises, consent given by one individual may be valid only as to common areas and to the specific area over which the giver of consent has authority or control.

Administrative Search Warrant: State and local agencies are allowed to conduct administrative searches when implementing their civil enforcement authority, where specifically authorized by statute.

The local health officer may apply for an administrative search warrant to identify failing septic tank drainfield systems. The administrative warrant application may be based on specific evidence of an existing violation or on a general inspection program based on reasonable legislative or administrative standards for conducting an area inspection. The agency may apply for the warrant only after the local health officer has requested inspection of the person's property under a specific administrative plan and that the person refused the health officer access to the property.

The specific administrative plan is developed in response to pollution in commercial or recreational shellfish harvesting area or pollution in freshwater. The plan must include: the overall goal of the inspection; the location and address of the properties begin authorized for inspection; requirements for notifying the owner or resident of the plan and its provisions and times of any inspections; the survey procedures to be used in the inspection; the criteria that would be used to define an onsite sewage system failure; and the follow-up actions that would be pursued when an onsite sewage system failure is confirmed.

The local health officer shall develop and submit the plan to the court as part of the justification for the warrant, along with specific evidence showing that it is reasonable to believe pollution is coming from the septic system on the property to be accessed for inspection. The court official may issue the warrant upon probable cause.

INTERLOCAL AGREEMENT

BETWEEN KITSAP PUBLIC HEALTH DISTRICT AND KITSAP CONSERVATION DISTRICT

CONCERNING INVESTIGATION AND CORRECTION PROCEDURES FOR LIVESTOCK WASTE HANDLING VIOLATIONS

1.0 **Purpose and Applicability.** This Interlocal Agreement (hereinafter referred to as the "Agreement") is between the Kitsap Conservation District (hereinafter referred to as the "Conservation District") and the Kitsap Public Health District (hereinafter referred to as the "Health District"). Recognizing the need to carry out the responsibilities for which each is charged under State law and under the Kitsap County Surface and Storm Water Management Program, the Conservation District and the Health District consent to enter into this Agreement. This Agreement serves as the foundation for an enduring, cooperative working relationship for the purpose of protecting public health, improving water quality, and promoting agriculture stewardship through the investigation, identification and correction of inadequate livestock waste handling practices that are found to be causing a nuisance or menace to health. For the purposes of this agreement, livestock waste sources are typically manures generated by animals that are stabled, pastured, or otherwise managed, whether for private or business reasons. In addition, a "nuisance or menace to health" includes but is not limited to the pollution of water, harboring of rodents and breeding of flies. Pollution of water is defined as violations or exceedances of Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC, as amended) or Water Quality Standards for Ground Waters of the State of Washington (Chapter 173-200 WAC, as amended).

This Agreement specifically addresses the Health District's investigative response procedures and technical assistance referrals to the Conservation District related to livestock waste handling practices. Through this Agreement, inadequate livestock waste handling practices will be investigated by the Health District in response to public complaints or as part of a Pollution Identification and Correction project (hereinafter referred to as "PIC project") undertaken by the Health District.

2.0 **Background.** The Conservation District is a non-regulatory agency that works cooperatively with landowners under guidelines established by Washington State Conservation District Law (Chapter 89.08 RCW) and standards established by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The Conservation District compiles farm status inventory information from targeted areas, and prioritizes agricultural operations based on standardized rating criteria. The Conservation District provides technical assistance to small farm owners and develops Farm Plan elements specifically designed and implemented to provide best management practices (BMP) for land supporting livestock or under cultivation. These BMPs address the potential loss of protective vegetation adjacent to streams, severe soil erosion, and pollution of ground and surface water by manure and agricultural chemicals.

The Health District is responsible for regulating animal waste handling under the authority provided in Kitsap County Board of Health Ordinance Number 2010-1 "Solid Waste Regulations", (Solid Waste Regulations) as amended. These regulations provide minimum standards for the safe handling of animal wastes, including, but not limited to, manure, dead animals, and agricultural wastes. The Health District coordinates with the Conservation District when conducting PIC projects or responding to complaints involving livestock wastes.

3.0 Livestock Waste Handling Complaint Response Procedures. The Health District and the Conservation District agree to undertake the following steps to respond to complaints of inadequate livestock waste handling practices filed with the Health District.

3.1 The The Pollution Identification and Correction Program (PIC) will respond to livestock waste handling complaints in PIC project areas. The Solid & Hazardous Waste Program responds to livestock waste handling complaints outside of PIC project areas.

3.2 The Health District will make an initial phone call to the complainant to verify information related to the complaint and, if needed, to collect additional information needed to respond to the complaint. Next, the Health District will conduct a site visit to confirm the livestock waste handling violation. In order to document a violation, the Health District must collect evidence (surface and/or drinking water samples, photographs, etc.) that livestock handling practices are creating (or may create) a "nuisance or menace to health" through the pollution of water (surface or ground water), harboring of rodents, or breeding of flies, etc. If a violation is confirmed, the Health District will present the collected findings to the landowner, and refer them to the Conservation District for the development and implementation of a Waste Management Plan (WMP). (If the violator refuses to work with the Conservation District, the Health District will give the violator the option of developing their own waste management plan. They will be given no more than 60 days to implement the plan and contact the Health District for an inspection (and follow up sampling if possible). If the violation represents an imminent threat to public or environmental health, the Health District proceeds to Section 3.4. If the violation does not present such risk, the Health District proceeds to Section 3.3. If the Health District is unable to confirm a violation, it may proceed to Section 3.8 or 3.9, or abate the complaint.

3.3 If the disposition of the livestock waste does not represent an imminent threat to public or environmental health (e.g., contamination of drinking water, the potential for direct public contact with contaminated runoff, contamination of shellfish resources, potential impacts to endangered species), the Health District will ensure correction of the violation in one of two ways:

Compliance Agreement

The landowner signs a "Compliance Agreement" with the Health District. The Compliance Agreement carries the full force and effect of an NOCV and establishes a timeline for the mitigation of the violation and development/implementation of the WMP. The landowner is responsible for mitigating the violation within ten (10) days, completing a waste management plan within 60 days, and fully implementing the waste management plan within 90 days . If any of these tasks are not completed within the specified time frame , the Health District will proceed to Section 3.6. If both of these items are complied with, the Health District will proceed to Section 3.5.

Verbal Agreement

If the landowner has demonstrated a strong level of commitment and ability to correct the violation, the Health District may reach a verbal agreement with the landowner regarding correction of the violation and development of a WMP with the Conservation District. This verbal agreement will be formalized with a letter from the Health District specifying the agreement and associated timelines – the Conservation District will receive a copy of this letter. The landowner is responsible for mitigating the violation as soon as practical, completing a waste management plan within 60 days, and fully implementing the waste management plan within 90 days If any of these tasks are not completed within the specified time frame a Notice and Order to Correct Violation (NOCV) letter will be sent (as specified in Section 3.4). If both of these items are complied with, the Health District will proceed to Section 3.5.

3.4 If the disposition of the livestock waste represents an imminent threat to public or environmental health, or if the landowner fails to adhere to the verbal agreement discussed above, the Health District will send the landowner a Notice and Order to Correct Violation (NOCV) letter. The letter will be sent by certified mail requesting that they mitigate the violation within five (5) days of receipt of the NOCV, complete a waste management plan within 60 days, and fully implement the waste management plan within 90 days. (KCHD may require a shorter compliance period for completion of corrective actions if required to protect public health.). In addition to including all items required in the Solid Waste Regulations, the NOCV will explain the nature of the complaint and document the public health nuisance associated with current livestock waste handling practices.

3.6 If the requirements of a Compliance Agreement or NOCV are not adhered to, the Health District may issue a civil infraction notice as specified in the Solid Waste Regulations.

3.7 The Health District will terminate all complaints for cooperative landowners after verifying that the violations have been corrected. Verification will require a written notice from the Conservation District that the Waste Management Plan has been implemented, a Health District field inspection, and water quality monitoring (if feasible).

3.8 The Health District may refer owners of properties with **potential** livestock waste handling violations to the Conservation District by sending a copy of a letter to the landowner detailing the potential sources and **recommending** that they contact the Conservation District within ten (10) working days. The purpose of such a referral is to formally notify the landowner that a **potential** violation exists, giving them an opportunity to proactively correct the problem(s) before a Health District investigation proves a violation. Therefore, the letter will be written so that the landowner both understands the problem and the potential impacts, and how he/she can fix the problem voluntarily by cooperating with the Conservation District. Either the Pollution Identification and Correction Program Manager or the Pollution Identification and Correction ProgramSupervisor must review such letters before they are mailed. A "blind" copy of the letter will be sent to the Conservation District for their reference. The Conservation District will notify the Health District when the landowner has made contact with them. If the landowner contacts the Conservation District within ten (10) days, the Health District will postpone its investigation pending development and implementation of a WMP and elimination of the potential source(s). However, if the landowner is uncooperative in taking corrective actions and does not contact the Conservation District within this time frame, the Health District will initiate an investigation.

3.9 The Health District may refer owners of properties that have no proven or suspected livestock waste handling violations to the Conservation District. These will not be considered formal referrals to the Conservation District and they are not required to notify the Health District if contact is made.

4.0 **Livestock Waste Handling PIC Procedures.** The Health District and Conservation District use procedures specified in both Section 3.0 of this document and the Health District's "Manual of Protocol: Fecal Coliform Bacteria Pollution Identification and Correction" (Version Ten, 2011 or subsequent revisions) to correct livestock waste handling violations in PIC areas. However, due to the fact that the express purpose of a PIC project is to address bacterial contamination of surface waters (which can subsequently lead to contamination of ground waters), the Health District and the Conservation District will place highest priority on sites where animal waste management practices are causing surface and/or ground water pollution. The Conservation District will contact all "high priority" agricultural sites identified in PIC areas either by telephone or by conducting a visit to the property. Sites not classified as "high priority" need only be contacted by mailing. The Conservation District will track all high priority farm contacts in PIC areas and will report this information to the Health District on a quarterly basis.

5.0 **Indemnity.** The Health District agrees to hold the Conservation District, its agents, officers and employees, harmless for all losses, claims and damages caused by the sole negligence of the Health District, its agents, officers and employees which arise directly or indirectly out of or in consequence of the Health District's or its agents' or officers' or employees' performance under this Agreement. The Conservation District agrees to hold the Health District, its agents, officers and employees, harmless for all losses, claims and damages caused by the sole negligence of the Conservation District, its agents, officers and employees which arise directly or indirectly out of or in consequence of the Conservation District's or its agents' or officers' or employees' performance under this Agreement.

6.0 **Dispute Resolution.** The parties to this agreement shall first attempt to resolve disputes informally at the staff level. In the event that the dispute cannot be resolved informally at the staff level, a dispute resolution procedure shall be followed. Each party to this agreement shall appoint one member to the Dispute Board. The members so appointed shall jointly appoint an additional member to the Dispute Board. The Dispute Board shall review the facts, terms, and applicable statutes and rules and make a determination of the dispute. The determination of the Dispute Board shall be binding on parties hereto. Each party to this agreement shall be responsible for paying for its own costs resulting from a dispute. Any additional costs resulting from resolution of a dispute shall be shared equally by both parties.

7.0 **Modifications of this Agreement.** Modifications to this Agreement shall only be made in writing and with the written consent of both parties.

8.0 **Review of the Agreement.** The parties agree to review the Agreement, its provisions and procedures at least once each year. The review will consist of a meeting of the parties, or their

designated representatives, whether by telephone or otherwise to review and evaluate the continued necessity of the Agreement and to recommend any modifications thereto.

9.0 **Termination.** This Agreement will continue in full force and effect until such time as it is terminated by one of the parties. Either party can terminate this Agreement by notifying the other party in writing at least thirty (30) days in advance of such termination.

10.0 **Signatures.** The undersigned representatives accept the provisions of this Agreement. This Agreement shall be in effect when signed by both parties.

KITSAP CONSERVATION DISTRICT	KITSAP COUNTY BOARD OF HEALTH
_____	_____
District Board of Supervisors	Chair

Appendix G: Skagit County Integrated Pollution Identification & Correction (PIC) Protocol for Site Inspections

Clean Samish Initiative Protocol for Site Inspections

Data Analysis

- Analysis of water quality will determine area of focus.

Property Evaluations

- Initial evaluation of properties will be completed through drive-by assessments conducted by the Planning Department's Critical Areas Ordinance inspector or Public Work's property inspector hired as a part of the NEP PIC grant. These inspectors will complete an inspection form for each property (attached). This form will include information on Protected Critical Areas, onsite and aerial photo land use observation, nearby streams or waterbodies, buffer widths, suspected discharge source, and whether an inspection is required. If an inspection is required, a notification of site visit will be mailed to the property owner.

Notification of Site Visits

- Property owners will be sent a letter of introduction, stating that their neighborhood and/or area has been identified as having chronic fecal coliform water quality problems and that their property in particular was noted as having a potential fecal coliform source.
- If there is no response after **2 weeks,** the County will send out a letter that there will be an unannounced site visit within **30 days** by Skagit County Public Health (SCPHD) and Skagit County Planning & Development Services (SCPDS)..
- If, 30 days after the second site visit request, contact with property owner has not been made or owner is refusing access to the property, the County will attempt to get another agency to request a visit, contingent upon availability.

Initial Site Visit:

- Both human and animal sources of fecal loading will be investigated.
- A follow-up letter within **2 weeks of the visit** will be sent confirming conditions noted at the site visit. A copy of the letter will be sent to the agency to which the landowner is being referred.
    - If there are no fecal coliform sources, a thank you letter will be sent to the landowner.
    - If potential fecal coliform sources are identified, the landowner will be informed of these potential sources and the County will refer the landowner to the appropriate agency(ies). A copy of the inspection form will also be sent to the appropriate agency(ies).

Referrals to Resources Agencies

- Skagit Conservation District -- farm plan and BMPs
    - County will inform SCD of landowners referred to SCD within two days of completing a site visit

        - Landowners will contact SCD within 10 business days of receiving referral letter from the County.
        - Following landowner contact, SCD will schedule a joint site visit with the County and will inform the County in writing within five business days of the actions recommended to the landowner.
        - If there are egregious violations occurring, SCD will work with landowner to quickly implement immediate action BMPs to eliminate sources of pollution within five business days. Other BMPs will follow if needed; all referrals will receive a farm plan.
        - SCD will provide the County with a list of the water quality-related BMPs included in the Farm Plan as well as an implementation timeline. County inspector will monitor on the ground-progress as outlined in Tracking section below**.
    - If the property owner does not contact SCD within **10 days** of referral**,** SCD will notify the County.County will turn to SCPH, SCPDS, or Ecology to investigate potential septic issues, Critical Areas ordinance violations, or file an ERTS as outlined below *****.**
- Skagit County Planning & Development Services (SCPDS) regarding Critical Areas Ordinance (CAO). The Skagit County CAO is very site-specific. The zoning of a parcel dictates the areas of the CAO the property owner needs to meet.
    - SCPDS will follow-up within 30 days.
    - **FOLLOW CAO PROTOCOL.**
- Skagit County Public Health Department regarding septic systems.
    - **FOLLOW HEALTH DEPARTMENT PROTOCOL.**
- Washington State Department of Ecology regarding potential to pollute or water pollution not covered above.
    - ERTS system. Ecology will keep the County informed of progress on a **monthly basis**.

*****Tracking Progress***

- Follow-up visits will be made by County personnel to ascertain progress. If progress is being made as indicated by actions taken by the property owner (e.g. contacting a septic system designer, working with SCD on a farm plan, or building fences to keep animals out of the water), additional follow-up visits will be scheduled as appropriate. Property owners preparing farm plans will be provided with information regarding the Conservation Reserve Enhancement Program (CREP), Natural Resource Stewardship Program (NRSP), and Agricultural Best Management Practices Funds as appropriate.
- Dates by which certain actions are to be completed by the property owner can be negotiated to help ensure progress continues. A letter from the County outlining this agreed upon progress schedule will be sent to the property owner. The schedule will direct subsequent site visits to the property.
- If the property owner does not meet the agreed upon schedule for improvements/enforcement actions will be taken.

Interim Solution

If there is an obvious source of fecal contamination, the property owner is responsible for implementing a short-term solution to abate the fecal contamination source.

- If it is an on-site sewage system (OSS) failure, a Health Officer order can be issued to plug the outlet baffle of the septic tank and have the tank pumped regularly until the OSS is repaired.
- If it is a water quality violation, the interim solution will be dependent upon the type and extent of the violation, but will typically result in an Immediate Action Plan (IAP). Examples include:
    - Livestock have unfettered access to the water course – moving the livestock to another location temporarily.
    - SCD deploys emergency exclusion fencing

*****If no response following two letters and final site visit attempt**

On Site Sewage: *On site sewage (OSS):* Skagit County Code 12.05, *On Site Sewage Systems* in Marine Recovery Areas have the same inspection requirements as OSS systems elsewhere. Conventional systems are to be inspected once every three years and more complicated systems require annual inspections. If these inspections are not completed, a $75 per day fine can be issued to the property owner. If an inspection is not forthcoming and the fine accumulates to $5,000; the file is turned over a collection agency if there is no evidence that the system is failing.

If the OSS system is failing, Health Department personnel are authorized under WAC 246-272A, and SCC 12.05 to order a repair and issue a fine. Past experience has shown this to be effective in getting repairs completed once a failing OSS system is identified.

Critical Areas: Skagit County's Critical Areas Ordinance is very site specific. The zoning of a particular parcel will determine what portions of the CAO need to be met. If a property owner does not allow access to the property, field staff will make their best effort to view areas of the property from public access points and/or neighboring properties where access has been granted.

1. If an obvious CAO violation is observed, it is then reported as a Request for Investigation (RFI) to PDS. RFIs regarding water quality within the Samish Watershed will be investigated within 2 working days.
2. If a potential CAO violation is observed, it will be documented and the property will be noted in the County's tracking system as needing seasonal follow up.

Ecology: Incidents will be reported to Ecology via ERTS if pollution of waters of the State are observed, or there is a substantial potential to pollute, and there is no progress on the part of the property owner to remedy the cause of the pollution.

Appendix H: Examples**:** Enforcement Letter and Citation

Notice and Order to Correct Violation Letter

SENT REGULAR AND CERTIFIED MAIL

DATE
ADDRESSEE

RE: SEPTIC SYSTEM FAILURE AT ADDRESS, TAX ID XXXXXXXXXX

Dear
A violation of Kitsap County Board of Health Ordinance 2008A-01 "Onsite Sewage System and General Sewage Sanitation Regulations" has been identified at the above referenced property owned or occupied by you.

On **SPECIFIC DATE**, an authorized representative of the Health Officer determined that sewage effluent was discharging onto the surface of the ground from the above referenced property. This determination was made by visual observation of the sewage on the ground, water testing of a sample from the discharge and a positive dye test. Discharging sewage effluent to the surface of the ground or to waters of the State violates the following provisions of said regulations:

2008-01 Sections 6.B.2 - "Discharge of Sewage Effluent" ; and
2008A-01 Section 6.C, 6.D - "Insanitary Conditions"

The Health District hereby gives you notice to correct the violations identified above within **thirty days** of receiving this notice by doing the following:

Immediately prevent sewage from discharging to the ground surface and becoming a public health nuisance. To protect public health, hire a licensed designer to evaluate the system as soon as possible. **By specific date**; Submit a building site application developed by an Onsite Wastewater Treatment Designer licensed under Chapter 18.210 RCW, or a Professional Engineer licensed under Chapter 18.43 RCW, and; Obtain a Sewage Disposal Permit from the Health District pursuant of Section 6.F of said regulations.

Failure to comply with this notice and order to correct violation will result in the issuance of a civil infraction notice to you pursuant to section 19.B of said regulations. The civil infraction notice may result in a fine of up to $524.00 per violation per day to be assessed to you.

Please note that pursuant to Section 20.A. of the above regulations that any person aggrieved by the contents of a notice and order to correct violation issued under this regulation, or by any inspection or enforcement action conducted by the Health District under this regulation, may submit a completed application for appeal with the applicable fee to the Health Officer within 10 business days of the action appealed.
Please call me at (360) 337-xxxx, Monday through Friday from 8 a.m. to 4:30 p.m. if you have any questions or comments regarding this matter.

Name, Title of Inspector

Example of Kitsap County Citation

2811 **MICRO DATA** OLYMPIA (360) 570-8400

INFRACTION ☐ **TRAFFIC** ☐ **NON-TRAFFIC** I 202728

IN THE [X] DISTRICT ☐ MUNICIPAL COURT OF KITSAP COUNTY , WASHINGTON
☐ STATE OF WASHINGTON ,PLAINTIFF VS. NAMED DEFENDANT
☐ COUNTY OF KITSAP HEALTH DISTRICT
☐ CITY/TOWN OF

L.E.A. ORI #: WA0180000 COURT ORI #: WA018013J

THE UNDERSIGNED CERTIFIES AND SAYS THAT IN THE STATE OF WASHINGTON

DRIVER'S LICENSE NO. | STATE | EXPIRES | PHOTO I.D. ON PERSON ☐ YES ☐ NO

NAME: LAST | FIRST | MIDDLE

ADDRESS | ☐ IF NEW ADDRESS ☐ PASSENGER

CITY | STATE | ZIP CODE | EMPLOYER | LOCATION

DATE OF BIRTH | RACE | SEX | HEIGHT | WEIGHT | EYES | HAIR

RESIDENTIAL PHONE NO. ( ) | CELL / PAGER NO. ( ) | WORK PHONE NO. ( )

VIOLATION DATE MONTH DAY YEAR TIME | ☐ INTERPRETER NEEDED
ON OR ABOUT 24 HOUR LANG:
AT LOCATION M.P. CITY / COUNTY OF

DID OPERATE THE FOLLOWING VEHICLE/MOTOR VEHICLE ON A PUBLIC HIGHWAY AND

VEHICLE LICENSE NO. | STATE | EXPIRES | VEH. YR. | MAKE | MODEL | STYLE | COLOR

TRAILER #1 LICENSE NO. | STATE | EXPIRES | TR. YR. | TRAILER #2 LICENSE NO. | STATE | EXPIRES | TR. YR.

OWNER/COMPANY IF OTHER THAN DRIVER

ADDRESS | CITY | STATE | ZIP CODE

ACCIDENT NO NR R I F | COMMERCIAL VEHICLE ☐ YES ☐ NO | HAZARD PLACARD ☐ YES ☐ NO | EXEMPT VEHICLE ☐ FARM ☐ R.V. ☐ FIRE ☐ OTHER

DID THEN AND THERE COMMIT EACH OF THE FOLLOWING OFFENSES

1. VIOLATION/STATUTE CODE | VEHICLE SPEED | IN A ZONE | ☐ SMD ☐ PACE ☐ AIRCRAFT

2. VIOLATION/STATUTE CODE

3. VIOLATION/STATUTE CODE

PENALTY U.S. $

RELATED # | DATE ISSUED

WITHOUT ADMITTING TO HAVING COMMITTED EACH OF THE ABOVE OFFENSE(S), BY SIGNING THIS DOCUMENT I ACKNOWLEDGE RECEIPT OF THIS NOTICE OF INFRACTION AND PROMISE TO RESPOND AS DIRECTED ON THIS NOTICE.

X
DEFENDANT'S SIGNATURE

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF WASHINGTON THAT I HAVE ISSUED THIS ON THE DATE AND AT THE LOCATION ABOVE, THAT I HAVE PROBABLE CAUSE TO BELIEVE THE ABOVE NAMED PERSON COMMITTED THE ABOVE OFFENSE(S), AND MY REPORT WRITTEN ON THE BACK OF THIS DOCUMENT OR ATTACHED TO THIS INFRACTION IS TRUE AND CORRECT.

OFFICER #
OFFICER #

I 202728

INFRACTION

ABSTRACT OF JUDGMENT

INF	RESPONSE	DISPOSITION	PENALTY	SUSPENDED	SUB-TOTAL
1	C NC	C NC D P DF	$	$	$
2	C NC	C NC D P DF	$	$	$
3	C NC	C NC D P DF	$	$	$
					TOTAL COSTS $

FNDG/JDGT DATE
ABSTRACT MLD TO OLYMPIA

WASHINGTON UNIFORM COURT DOCKET - COURT COPY January 2003
WASHINGTON UNIFORM COURT DOCKET - DOL COPY January 2003
WASHINGTON UNIFORM COURT DOCKET - DEFENDANT COPY January 2003
WASHINGTON UNIFORM COURT DOCKET - LEA COPY January 2003

- ✓ Check Non-Traffic
- ✓ County of Kitsap Health District

Complete as much information as available. Be certain it is accurate.

DO NOT FILL IN THIS BOX

Include the Kitsap County Board of Health Ordinance and associated sections regarding the violation(s).

- ✓ Include the Penalty
- ✓ Date Issued
- ✓ Your name
- ✓ Inspector number
- ✓ Your signature

IT IS IMPORTANT TO COMPLETELY AND ACCURATELY FILL OUT INFORMATION WHEN WRITING A TICKET.

Appendix I: Successful PIC Projects

Kitsap County

Dyes Inlet Restoration Project. (Ecology grant $525,925 (2005-2009).
This project was completed in 2009 with a final technical report submitted and approved by Ecology. The project plan was exceeded with the expansion of shoreline surveyed. 22 miles were surveyed (instead of the 6 miles originally planned) without the need for additional funding. The goals of the Dyes Inlet Restoration project were met. Water quality improvements in Clear Creek, Chico Creek, Ostrich Bay Creek, and Phinney Bay Creek, Enetai Creek, Kitsap Mall Creek, and Strawberry Creek between 2005 and 2009, were shown through monitoring data. 120 acres of shellfish growing areas in Chico Bay were upgraded from Restricted to Approved in 2007.

Yukon Harbor Restoration Project (Ecology grant $333,000 (2001-2007))
The final technical report for this project was submitted and approved. The goals and objectives of this project were also exceeded with six full shoreline surveys conducted instead of the contracted two. As a result of the successful completion of this project the shellfish growing area in Yukon Harbor, (including 935 acres) were upgraded to Approved by DOH.

Jump Off Joe, Vinland, Lofall Pollution Identification and Correction Project (Ecology grant $331,000 (2007-2011))
This grant is expected to be completed as contracted in 2011. Quarterly program reports have been submitted on time. Staff have completed 84% of the property surveys and found 4 failing onsite sewage systems. The closure at the mouth of Jump Off Joe was removed by DOH in 2009.

Henderson Inlet, Thurston County

Thurston County created the Henderson Inlet shellfish protection district in 2001 after Washington Department of Health downgraded part of the shellfish growing area in 2000. Subsequent studies showed that onsite sewage systems were contributing to the water quality program. A stakeholder committee recommended adoption of rigorous inspection and maintenance requirements for the 6000+ onsite sewage systems within the watershed. In 2007, a risk-based onsite sewage system operation and maintenance program went into effect as part of a marine recovery area designation by the Thurston County Board of Health. Routine inspections have led to the discovery of tens of leaking sewage tangs and failing systes, hundreds of minor repairs needed, and thousands of tanks overdue for pumping. Dye testing helped identify failing systems along the marine shoreline. Over 2, 100 homeowners attended classes to learn how to maintain and inspect their systems. The outcome of the Henderson O&M program, along with significant stormwater, agriculture, and pet waste improvements, was measureable water quality improvement in Henderson Inlet and its tributaries. The improvement was significant enough to warrant upgrades of 240 acres of shellfish growing area in 2010 and another 100 acres in 2012. Thurston County's website provides more information about this work: http://www.co.thruston.wa.us/planning/natural-res/shellfish-home.htm.

Oakland Bay, Mason County

Oakland Bay is very important to the shellfish industry and to Mason County, providing numerous shellfish industry jobs and over $10 million in product to the market. Oakland Bay is the largeset producer of Manila clams in the country.

When a shellfish growing area experiences poor water quality forcing a downgrade or closure of the harvest area, the local government must form a shellfish protection district by law. The Oakland Bay Clean Water District Advisory Committee was formed in 2007 in response to a downgrade in Oakland Bay. The committee worked together to improve water quality through pooling resources and expertise and has been recognized at the state and national level as a successful model of partnering to achieve a common goal. As a result of this work, 750 acres were upgraded in 2012. More information about this program can be found on Mason County's website:
http://www.co.mason.wa.us/health/environmental/water_quality/oakland_bay_grants_reports.php