PROPOSAL for a NATIONAL INSPECTION PLAN for DOMESTIC WASTE WATER TREATMENT SYSTEMS
EPA Discussion Document

Reasons for a National Inspection Plan

The Environmental Protection Agency (EPA) is developing a National Inspection Plan for Domestic Waste Water Treatment Systems (to be called the 'Inspection Plan' throughout this document) as required under the *Water Services (Amendment) Act 2012*. Domestic waste water treatment systems can and do cause pollution when they are not properly sited, installed or maintained. This discussion document sets out the general principles which the EPA proposes to use in the Inspection Plan, drawing on experience and best international practice in science and regulation. The EPA invites interested parties and individuals to submit comments for consideration.

Domestic waste water treatment system use in Ireland

One third of houses in Ireland (i.e. almost half a million properties, as recorded in Census 2011) are connected to a domestic waste water treatment system. Most systems use a septic tank, though more advanced waste water treatment systems are also used, which allow for shallower depths of subsoil and a smaller area for distributing discharged effluent than are needed for septic tanks.

All domestic waste water treatment systems are designed to:
- Protect humans from contact with waste water;
- Treat wastewater to minimise contamination of soils, lakes, rivers and groundwaters;
- Keep animals, insects, and vermin from contact with waste water; and
- Minimise the generation of foul odours.

Risks posed by wastewater to human health and the environment

While domestic systems pose much less of a risk to watercourses than public sewerage discharges and agricultural effluents, they can cause localised pollution. Where systems are not properly located, designed, installed, operated or managed they pose a risk to the health of the homeowner, their children and pets (Figure 1) through contamination of water in private wells, or ponding of effluent in gardens. Effluent that reaches watercourses (Figure 2) can result in problems for drinking water, bathing waters, and other amenities.

Figure 1: Example of an exposed waste water distribution pipe and what can happen when a family pet comes in contact with a poorly constructed system. (photo by A. Goggin, Limerick Co. Co.)

There are a number of pollutants in waste water, each of which can cause human health and environmental problems. Microbial pathogens in effluent can cause gastroenteritis, eye infections, polio, hepatitis and meningitis if there is human contact. The presence of *E. coli* bacteria provides evidence of recent faecal contamination from human or animal wastes. Drinking water is tested for the presence of *E. coli* as it is a clear indicator of contamination. Typically there are approximately one million *E. coli* bacteria in one litre of effluent from a septic tank serving a normal household, while the drinking water standard is zero. Phosphorus is another pollutant in domestic waste water. Phosphorus encourages the growth of algae, depletes oxygen, and may cause algal blooms and fish kills in lakes and rivers.

Figure 2: Dye test showing effluent in a watercourse from a septic tank. (photo by A. Goggin, Limerick Co. Co.)

What you need to do

Step 1: Registration

In order to protect health and the environment the owners of properties connected to a domestic waste water treatment system are being asked to register their systems by **1st February 2013**. This is the first step in ensuring that your system does not pose a risk to your family or the local environment and to comply with the *Water Services (Amendment) Act 2012.* You can register online at

www.protectourwater.ie or at local authority offices. You can also complete an application form and post it with the registration fee to Protect Our Water, PO Box 12204, Dublin 7. In the case of a new build, the domestic waste water treatment system should be registered upon occupancy of the house.

Step 2: Operation and Maintenance

Operating and managing your domestic wastewater system well will reduce any potential risk to human health or the environment. Owners of properties that have a domestic waste water treatment system are also obliged by law to ensure that their systems are operating and managed properly and are not creating a risk to human health or the environment.

Inspection Plan – general principles

In developing the Inspection Plan the EPA will adopt a pragmatic, risk-based inspection regime to maximise the protection of human health and the environment from potential impacts of treatment systems. It is proposed that the Inspection Plan will incorporate a twin track approach using citizen engagement strategies as well as the more traditional inspection strategies.

Inspection Plan

Citizen Engagement **Inspections**

Protection of Human Health And the Environment

The aim of the Inspection Plan is to make sure that:
- Engagement takes place with a range of stakeholders to explore effective education strategies;
- Information is available to owners of domestic waste water treatment systems regarding their responsibilities and how to operate and maintain their systems;
- Information is supplied in multiple, easy to understand formats such as leaflets, video and web-based 'frequently asked questions';
- Incentives are used such as lower probability of inspections for registered sites;
- Adequate treatment of domestic waste water is in place;
- Treatment systems are adequately operated and maintained;
- Risks to human health and the environment are identified and managed;
- Wastewater sludges from domestic wastewater treatment systems are managed appropriately.

The Inspection Plan will be carried out for the most part by local authorities (referred to in the legislation as 'Water Services Authorities') under the supervision of the EPA. The plan will commence in 2013, with the initial focus on engagement and incentive strategies. These strategies will involve working closely with householders and other stakeholders to ensure that those who are responsible for domestic waste water treatment systems know how to comply and are encouraged to do so. Risk-based inspections will also commence in 2013 following the close of the registration period. Information on domestic waste water treatment systems captured through inspections will be held electronically for analysis and reporting purposes. We will review our inspection plan periodically and make changes were necessary.

A risk-based approach

Risk-based means putting our resources where the risks are highest to human health and the environment. The Inspection Plan will focus particularly on areas where the potential risk to public health and valuable water resources are higher. Properties connected to systems in these areas which have not been registered by the due date of 1st February 2013 will be more likely to be inspected than those that have been registered.

Our assessment of risk follows a pollution Source–Pathway–Receptor Model and reflects international best practice. In assessing risk, the S_P_R model is used to examine the potential 'Source' of pollution – the septic tank or treatment system; the potential 'Pathway' of pollution – typically the subsoil; and the potential 'Receptor' – the area where any potential impact might happen; for example, a river (Figure 3).

Figure 3: Source–Pathway–Receptor Model for domestic wastewater treatment systems with impermeable subsoil. (graphic sourced from the Water Framework Directive Visual website, SNIFFER, 2007)

The potential risk will be determined by combining data from a number of GIS layers following the S-P-R model. These include details of housing density, the prevailing ground conditions e.g. subsoil permeability, and aquifer classification. Proximity to sensitive receptors such as rivers, lakes, drinking waste abstraction point and bathing water areas will also be taken into account.

Citizen engagement

Raising awareness and working with interested parties

The EPA and local authorities will talk to interested parties and particularly groups that represent the rural community, such as Irish Farmers' Association, Irish Creamery Milk Suppliers Association, Irish Country Women's Association, the National Federation of Group Water Schemes, as well as Non-Governmental Organisations such as Irish Environmental Network, SWAN, An Taisce and others. The EPA will seek ideas for citizen engagement strategies from the individual groups to raise awareness and encourage best practice among their members and the wider community.

The Department of Environment, Community and Local Government, in conjunction with the EPA and local authorities, will also undertake a series of activities to create awareness in order to increase compliance related to the registration, operation and maintenance of domestic waste water treatment systems.
Assistance will include dissemination of information for householders through leaflets, newspaper articles, videos and dynamic website pages. Technical guidance will also be made available on the EPA website.

Inspection

A broad range of inspection types will be employed such as proxy inspections monitoring the local environment, assessment of sewage schemes, analysis of sludge management, inspections resulting from complaints, and on-site inspections of domestic waste water systems (DWWTS).

What to expect from an inspection of a DWWTS

Trained local authority staff will conduct inspections in the following manner.
1. The homeowner will be notified in writing at least 10 days before an inspection will take place.
2. The Inspector will carry identification and will check that the treatment system, as constructed, is fit for purpose.
3. The Inspector will check that untreated waste water, which contains high levels of coliforms, is not escaping into the environment.
4. The inspector will check for the indications of a defective system, for example:

- A smell of sewage from the general area of the system or percolation area;
- Sewage which is backed up at the inlet to the treatment system;
- Ponding of sewage or effluent on the ground near the system or the percolation area;
- Any excess of sludge in the tank;
- Signs that rainwater is entering the system;
- A discharge from the system directly to a drainage channel, ditch or other water body.

5. The owner will be notified about the findings of the inspection within 21 days. If the system poses a risk to either public health or the environment the local authority will issue an Advisory Notice within 21 days which will instruct the homeowner to remedy the problems. The notice will include reason(s) for the failure and may specify measures to be taken. In cases where the homeowner disagrees with the Advisory Notice a follow up inspection can be arranged with the local authority for a fee of €20.

Steps to help you comply with an inspection

The EPA has prepared a series of 'frequently asked questions' (FAQs) about domestic waste water treatment systems and these can be found at www.epa.ie/whatwedo/advice/wastewater/guidance
It is recommended that homeowners should:
- Visually check the system at least every six months.
- Investigate any ponding of effluent, bad smells or discolouration of nearby drains.
- Have the distribution box checked by an appropriate person for blockages and to ensure an even distribution of effluent. (The distribution box is beneath the manhole cover between the wastewater treatment system and the percolation area).
- Have the system desludged at the appropriate intervals by a permitted waste collection contractor.
- For advanced waste water treatment systems, it is recommended to have an on-going maintenance agreement in place with an appropriately qualified person.

- Check to ensure that the electrical components (pump, blower, etc.) are operating correctly. Without a constant air supply such a system cannot treat waste water;

Following these steps will help to protect your health, and that of your neighbour as well as protecting the environment.

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Problem

Effluent from a septic tank trickles under gravity into a percolation area; these low flows have several disadvantages:

- When distributed amongst several trenches the flow is further divided and reduced which compromises even distribution.
- Flows tend not to travel down the length of a percolation pipe, tending to fall through the first few perforations.
- It can cause settlement of unwanted solids and the development of bio-film within the pipe. These issues often result in the failure of the percolation system.

European patent No. 2321479

Solution

• Trinity College Dublin has developed this device to counteract the problems associated with low flow discharges from septic tanks.
• The device collects large volumes of water and distributes this flow evenly under gravity between each trench.
• This ensures adequate flow, preventing solid settlement and bio-film build-up within the pipe.
• The device has been proven in extensive field trials with real on-site wastewater effluent to give even distribution amongst several trenches and also flow along the length of each trench.

Visit Molloy's Percolation Demonstration site in Tullamore to see the Tipper working.

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