

SEPA Technical Guidance Note

On-site management of Japanese Knotweed and associated contaminated soils

Background

Introduced to the UK in the mid nineteenth Century, the Japanese Knotweed is an extremely invasive and competitive plant. There are 3 species of invasive knotweed in the UK: Japanese Knotweed (*Fallopia japonica*) – the most widespread and troublesome bank side species; Giant Knotweed (*Fallopia sachalinensis*); and a hybrid Knotweed (*Fallopia x bohemica*).

Since there are no natural pests in the UK, the highly invasive and competitive nature of the plant makes it a problem not only for our native wildlife but also for the built environment and relating infrastructure. Once established, Japanese Knotweed is difficult to control.

Japanese Knotweed:

- grows extremely densely and shades out native plants
- provides poor habitats for insects, birds and mammals
- devalues natural landscape
- increases the risk of riverbank erosion when it dies back in the autumn
- creates a potential flood hazard if dead stems fall into watercourses

The plant produces green shoots in early spring which can reach a height of 3 metres before dying back in autumn. The stem can range between 2-3m in height, is green with red or purple specks and forms dense cane-like clumps. The plant's shoots and leaves, which can be up to 120mm long, cause very dense coverage of colonised areas. The plant spreads underground by means of rhizomes which can extend 7 metres outwards and reach up to 2 metres deep. Rhizome fragments as small as 10mm can produce new plants, however, any seeds produced by the plant are sterile.

The Wildlife and Countryside Act 1981 (WCA) provides the primary controls on the release of non-native species into the wild in Great Britain and it is an offence under the act to 'plant' or 'otherwise cause to grow in the wild' a number of non-native plant species including Japanese Knotweed.

You will not be prosecuted for having Japanese Knotweed growing on your land, however under the Nature Conservation (Scotland) Act 2004, the Scottish National Heritage (SNH) can issue you with a management order, if you are close to or threaten the interest of a SSSI. The main aim of the order is to ensure that the relevant action is being taken to rectify the situation.

SEPA's Responsibilities

SEPA is responsible for regulating waste and has no statutory duty to undertake control of Japanese Knotweed, other than that growing on our own land. Managing Japanese Knotweed is the responsibility of the owner/occupier of a site.

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We may take enforcement action under Wildlife and Countryside Act 1981, but there are also a number of other organisations that can do so, including the Police and Local Authorities. We would not normally use this legislation unless a waste offence had also been committed.

SEPA gives approvals under the Control of Pesticides Regulations 1986 for use of pesticides in or near water.

SEPA does not endorse Japanese knotweed management plans, or endorse companies that do this.

Management Options

This guidance note covers the management of Japanese knotweed and knotweed infested soil on-site and off-site.

On-site Management

Failure to manage Japanese knotweed on a development site may result in eventual structural damage. The plant can easily take advantage of cracks within walls or concrete foundations and is able to grow through tarmac surfaces.

Japanese Knotweed should not be stockpiled within 10 metres of a watercourse.

Any movement of contaminated soil and Japanese Knotweed for treatment within the site boundary, within a designated area, could involve the treatment of waste and may require a waste management licence.

The relevant local SEPA office should be contacted prior to any such movement and treatment of Knotweed material or associated contaminated soil.

Cutting Japanese knotweed canes

Cutting will not eradicate Japanese Knotweed growth and it should be seen as short term management. It is most effective when used in conjunction with herbicide treatment. Cutting could increase the risk of spread.

Pulled stems often have the highly invasive crown material attached to them and must be disposed of in the same way as rhizome. Cut stems are less of a risk, and are safe once they have dried out and turned brown. Stems should be cut cleanly so that they don't create pieces of stem that may spread and regenerate, in addition they should be left where they can dry out fully. If you intend to treat re-growth with herbicide, you should remove cut material from the treatment area to allow the spray to effectively cover the new growth.

Japanese knotweed can regenerate from just a small piece of stem and drying canes should be left on an appropriate membrane surface, not on soil or grass. Once the stems have dried to a deep brown colour they are dead. This is not the case with crown or rhizome material.

Treatment with herbicide

Treatment with herbicide alone can take several years and is unlikely to eradicate the problem completely as the rhizome network may still be viable. If you intend to bury

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any knotweed infested material or dispose of it off-site, you should only use non-persistent herbicides such as glyphosate. Using a non-persistent herbicide could mean that the soil or plant is classified as 'special waste' and would need to be disposed of in a landfill licensed to accept special waste. In addition, it would have to be consigned and managed in accordance with the Special Waste Regulations 1996 (as amended).

As the majority of herbicides rely on the presence of living foliage for them to be effective, it is important to consider whether the knotweed is in leaf or is dormant when choosing a suitable herbicide.

As the majority of herbicides are not effective during the winter dormant stage, the most effective time to apply a non-persistent herbicide, such as glyphosate, is ideally between July and September when the plant is in leaf.

Prior to any treatment with herbicide in or near water or surface water drains, SEPA would expect submission of a "Non-Aerial Herbicide Use in or Near Water" application form, providing details of the method to be employed. Forms are available from SEPA.

Consultation and consent from SEPA (as detailed in the Control of Pesticides Regulations 1986 (as amended)) is required where aerial application of herbicides is adjacent to or within 250 metres of water and in all other cases where water is likely to be affected.

You must apply for approval at least 72 hours before commencing treatment, however as SEPA have to consult with a number of external agencies, application should be made at least three weeks before the date of treatment. Any consent granted from SEPA may have a number of requirements relating to the herbicide treatment such as timing and location of application.

Statutory controls under the Control of Pesticides Regulations 1986 (as amended) and the Plant Protection Products (Basic Conditions) Regulations 1997 also place a number of responsibilities on herbicide users, including:

- Users must take all reasonable precautions to protect the health of human beings, creatures and plants and to safeguard the environment and, in particular, avoid the pollution of water.
- Users must comply with the instructions on the product label or in the published approval for the pesticide. Failure to follow these instructions is an offence.
- All users must be competent in their duties and have received adequate instruction and guidance in the safe, efficient and humane use of pesticides.
- The application of the herbicide must be confined to the area to be treated.

The Scottish Executive consulted in 2006 and 2007 on proposals for control of diffuse pollution from rural land use, including pesticide / herbicide application. The Water Environment (Diffuse Pollution) (Scotland) Regulations 2008 came into force on the 1 April 2008. This amendment contains General Binding Rule 23 which requires that:

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- The preparation of pesticides for application and the cleaning or maintenance of pesticide sprayers must be undertaken so that any spillages, run-off or washings will be prevented from entering the water environment.
- Pesticide spraying equipment must be maintained in a good state of repair;
- Pesticide sprayers must not be filled with water taken from the water environment unless:
 - a device preventing back siphoning is fitted to the system
 - the water is first placed in an intermediate container
- Pesticide-treated plants must not be soaked in any part of the water environment.

Further advice should therefore be sought from your local SEPA office prior to herbicide application.

Burning

You can use controlled burning of stem, rhizome and crown material as part of any on-site management programme. Burning will not eradicate the plant completely however by burning there is less material to bury or dispose of off-site.

Any controlled burning of Japanese Knotweed material must be carried out in accordance with a registered exemption as described in Paragraph 30 of Schedule 3 of the WMLR 1994:

'30.—(1) Burning waste on land in the open if—

(a) the waste consists of plant tissue;

(b) it is agricultural waste or it is produced on land which is operational land of a railway, light railway, tramway, British Waterways, or which is a forest, woodland, park, garden, verge, landscaped area, sports ground, recreation ground, bank of an inland waterway, churchyard or cemetery, or it is produced on other land as a result of demolition work;

(c) it is burned on the land where it is produced; and

(d) the total quantity burned in any period of 24 hours does not exceed 10 tonnes.

(2) Sub-paragraph (1) only applies to the burning of waste by an establishment or undertaking where the waste burned is the establishment or undertaking's own waste.

(3) The storage pending its burning, on the land where it is to be burned, of waste which is to be burned in reliance upon the exemption conferred by sub-paragraph (1).

(4) The treatment of land for the benefit of agriculture or ecological improvement by incorporation into soil of ash from waste which is burned on that land in reliance upon the exemption conferred by sub-paragraph (1).'

For more information on exemptions contact your local SEPA office.

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Note: Burning cannot be exempt where a nuisance such as odour, fumes or smoke is caused. Therefore burning in built up areas should be avoided.

Above Ground Treatment of Knotweed and Knotweed Contaminated Soil

Any above ground treatment of Knotweed or Knotweed contaminated soil may require a Mobile Plant Licence.

Section 35 of the Environmental Protection Act 1990 makes provision for two types of waste management licence:

- relating to the treatment, keeping or disposal of waste in or on specified land
- relating to the treatment or disposal of any specified description of controlled waste by means of specified mobile plant

Mobile plant is defined in Section 29 (9) of Environmental Protection Act 1990 as being 'plant which is designed to move or be moved whether on roads or land'.

Under Regulation 12 of the Waste Management Licensing Regulations 1994, as amended, it is possible to apply for a mobile plant licence for, amongst other things:

- the treatment of waste soil
- the treatment of contaminated material, substances or products for the purposes of remedial action with respect to land or the water environment

A licence will specify the type of mobile plant that can be used for treatment of specified controlled waste.

A single mobile plant licence can cover several pieces of mobile plant and types of treatment on a number of different sites at the same time.

SEPA has taken the view that a mobile plant licence could cover both the treatment and the re-deposition of contaminated material where these activities are both undertaken on the site of waste production if the activity is for the purposes of recovery. This would not however be the case where:

- the waste soil needs to be encapsulated e.g. in a bund
- where technical precautions must be employed to make the waste soil fit for use e.g. capping it to avoid water ingress or to prevent direct contact
- where residual contaminants are likely to be mobilised

Any application for a mobile plant licence should be made to the SEPA office in whose area the operator has their principal place of business. SEPA guidance is relevant to any application where the principal place of business is in Scotland.

Were the principal place of business is in England or Wales the application should be made the relevant Environment Agency office, further guidance and advice should be sought from the Environment Agency.

On-site burial or bunding of knotweed

On-site burial is not considered to be landfill and will be allowed without a licence where the waste is:

- Re-used on site when made safe
- Has an identified use within the site as part of a development plan
- There is no import of waste material for infill purposes

In addition to the above requirements, any on-site burial method must follow the recommended parameters, as listed in Appendix I.

However, as SEPA does not endorse one method over another, other alternatives will be considered. Alternative methods will also be subject to additional controls.

Please refer to appendix II for further guidance on alternative on-site burial techniques.

Movement of Knotweed material or Knotweed Contaminated soil

It is likely that the burial of Knotweed or Knotweed contaminated soil imported from another site for burial/treatment or in order to meet a required burial depth, will present an increased risk of spreading and not meet the requirements of the BPEO, any such action will be classed as a disposal activity and will require a waste management licence or possibly a PPC permit.

Use of tracked machinery

The use of tracked machinery on-site should be limited as much as possible until Japanese knotweed-infested areas have been cleared or cordoned off. If tracked machinery must be used in infested zones, use of a geotextile overlain with hardcore as a base for vehicles to travel on, may be considered.

Vehicles leaving such areas should be cleaned thoroughly at a designated point. However, as there is a risk of Rhizome becoming trapped in and around the wheel, a wheel wash may not be sufficient and a visual inspection of the vehicle should also be carried out to minimize the risk further.

Off-site Management

Irrespective of where the material is deposited pending treatment, any site accepting contaminated soil or Japanese knotweed for treatment will require a waste management licence or PPC permit.

Please contact your local SEPA office for WML/PPC information.

Off-site disposal of Knotweed and soil-containing knotweed

If site licensing conditions do not allow for burying or bunding of contaminated soil on site, it must be disposed of at an appropriately licensed waste management facility. Material containing any infestation of knotweed should be taken to a landfill site or other disposal site, licensed to receive Japanese knotweed and the landfill operator

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must be informed of the nature of the waste so that it can be disposed of appropriately within the site.

Japanese knotweed or any soil containing knotweed which is discarded is a controlled waste and should be accompanied by appropriate waste transfer documentation.

Duty of Care for Waste Holders

Japanese Knotweed is classed as a controlled waste and the duty of care with respect to waste will have to be complied with. You must ensure all waste removed off site is accompanied with a completed transfer note and carried by an authorised person such as a waste carrier registered with SEPA. Transfer notes are required to be kept for a period of at least 2 years and act as evidence the duty of care has been followed.

Any disposal site for the soils would have to hold a waste management licence or PPC Permit issued by SEPA to accept such waste for disposal.

Duty of Care for Hauliers

Hauliers should not accept Japanese Knotweed infested waste unless they can guarantee its appropriate legal disposal. If you are aware of waste producers who are failing to inform their hauliers of the presence of Japanese knotweed, or of hauliers who are knowingly disposing of knotweed infested material in an inappropriate manner, you should inform your local SEPA area office.

Hauliers must also ensure that during the removal of material to a waste management site, vehicles do not carry knotweed-containing soils on the wheels or bodies and that the vehicle is suitably covered or enclosed to prevent escape during transport. For small quantities, this may include sealing the material in black bags. For larger quantities that are being moved in skips or trailers, this will include covering the skip or trailer with sheeting. Where the material is being carried to landfill sites for disposal or where vehicles are involved in movements on the site of production, great care should be taken to clean off material so as not to transport the knotweed elsewhere. Vehicles should be brushed down and inspected for trapped pieces of rhizome.

Landfill operators

Landfill operators dealing with material contaminated with Japanese knotweed must ensure that they are licensed to receive it, and that they have sufficient capacity to ensure the material can be dealt with in accordance with the following:

1. Burial to a depth of at least 5 metres, (immediately covered to 1-2 metres, final depth after 2-4 weeks)
2. Burial at least 7 metres from the margins of the site or any engineering features, e.g. drains or bunds, of the site,
3. Burial at least 5 metres above the base or liner of the landfill.

Appendix I - Recommended parameters for on-site treatment

On-site burial of Knotweed material

The on-site burial of knotweed is only acceptable if the soil is otherwise uncontaminated.

Knotweed is likely to remain viable for many years, depending on the effectiveness of the treatment prior to burial. It is essential that it is not buried in a position where landscaping, erosion from a watercourse or subsequent development will break the dormant state of the rhizome (root-like structure).

On-site burial should be to a depth of at least 5 m. The potentially viable knotweed material should then be covered with a geomembrane layer, such as a dendrobarrier or a heavy gauge polythene sheet prior to infilling.

Where on-site burial is undertaken, the location of the burial site should be recorded, allowing for any re-growth to be monitored and treated, and thus preventing any potential disturbance and subsequent re-infestation.

On-site burial of soil-containing knotweed

Ideally, at least one application of non-persistent herbicide e.g. Glyphosate will have been performed to reduce the vigour of the knotweed. It is important that a non-persistent herbicide is used, as persistent chemicals will be regarded as a contaminant and preclude burial as a treatment option due to the risk of contaminating groundwater.

Soil to a depth of at least 5 m and within a perimeter of 7 m of the plant growth area should be excavated for burial. However as rhizomes have been known to extend beyond these limits a visual inspection of the plant growth area is recommended as a precaution.

Alternatively, a recent infestation may have a limited rhizome system that is shallow and only extends a few metres. Careful rhizome identification is important during the excavation process. The edges of the excavation area should be checked to ensure that all the infective material has been removed.

The bund method

Where burial is not possible, a bund may be created. Consideration will need to be given to this requirement when purchasing a site and planning the building phases. For this method to be used, the site and its proposed development must be capable of allowing for the setting aside of an area for eighteen months to two years for knotweed treatment.

The knotweed infestation should be treated with an appropriate herbicide prior to removal. Please see 'Treatment with herbicide' section for further guidance on herbicide application.

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After allowing at least 1-2 weeks for the herbicide to work, knotweed canes should be cut and removed. The surface of the site should be raked with tines and the crowns and surface material collected. The majority of rhizome is shallow, and care at this stage can isolate much of the viable plant material. If the soil is sandy and not heavily contaminated with stones or other solid material, the rhizomes can be raked to the surface. This material can be placed on top of the dried canes, or spread on top of the completed bund.

Topsoil should be excavated and piled. Approximately 0.5-1 metre depth of soil should be excavated. This material is likely to contain the large majority of the remaining knotweed material. The remaining depth of sub-soil, approximately 2-2.5 metres, can then be removed and used as the base of the bund. This material should contain a minimal amount of rhizome. The excavation should be inspected to ensure no viable rhizomes remain.

Having created the base of the bund, the topsoil can be placed over it. A well-constructed bund should have the majority of the rhizomes near the surface, which will encourage re-growth and render the knotweed more susceptible to herbicides. After one or two herbicide treatments, further re-growth is unlikely. However, it is advisable to disturb the bund, raking potentially dormant rhizome to the surface and allowing this material to re-grow prior to herbicide treatment, to be confident that the bund has been treated effectively. This process cannot guarantee eradication of viable knotweed.

There is a choice of herbicide for the treatment of re-growth upon the bund. Consideration must be given to the eventual use of the bund material. If it is to be used for landscaping around the site avoid herbicides with a long residual activity. It is best to use the material over a distinct area that can be retreated, if any re-growth occurs, rather than spread it across a large area of the site.

Any above ground treatment of Knotweed or Knotweed contaminated soil may require a Mobile Plant Licence, please refer to 'Above Ground Treatment of Knotweed and Knotweed Contaminated Soil' section.

Appendix II - Alternative on-site burial techniques

SEPA does not endorse one method of remediation over another and will consider all remediation techniques, however, any proposed method of on-site burial deviating from the recommended parameters, as detailed in appendix I, will only be allowed if the proposed method:

- ensures that waste is recovered or disposed of without endangering human health and without using processes or methods which could harm the environment and in particular without:
 - risk to water, air, soil, plants or animals; or
 - causing nuisance through noise or odours; or
 - adversely affecting the countryside or places of special interest
- Is the Best Practicable Environment Option (BPEO)

The Royal Commission of Environmental Pollution's (RCEP) 12th report (1988) proposed the following definition for BPEO *"the outcome of a systematic and consultative decision-making procedure.... the option that provides the most benefit and the least damage to the environment [across air, water and land] as a whole, at acceptable cost, in the long term as well as in the short term."*

The BPEO process involves the analysis of alternatives. The process ensures that the preferred option provides the greatest environmental benefit (or cause the least environmental damage) taking account of the environment as a whole (air, land and water). You should note that the term 'practicable' does not only apply to the technical point of view, but also takes account of what is practicable in terms of costs. BPEO will depend on local factors and will vary from site to site or project to project.

In addition to meeting the above criteria, a request may be made for further or supplementary information such as references.

SEPA still retain the right to take enforcement action if the threat to the public or environment is not minimised.

Appendix III - Decision making tool for on-site burial

