



Sirius Planning

Land Off Goat Mill Road, Merthyr Tydfil

JAPANESE KNOTWEED MITIGATION STRATEGY

September 2021

FPCR Environment and Design Ltd

Registered Office: Lockington Hall, Lockington, Derby DE74 2RH

Company No. 07128076. [T] 01509 672772 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

This report is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of FPCR Environment and Design Ltd.

Rev	Issue Status	Prepared / Date	Approved/Date
-	Draft 1	KO / 29.10.20	MEL / 02.12.2020
A	Final Issue	TEP/ 0.09.21	MEL / 09.09.2021

CONTENTS

1.0 INTRODUCTION 2

2.0 RELEVANT LEGISLATION 3

3.0 METHODOLOGY 3

4.0 SURVEY RESULTS..... 3

5.0 RECOMMENDATIONS..... 5

FIGURES

Figure 1: Japanese Knotweed Location Plan

1.0 INTRODUCTION

- 1.1 The following report has been prepared by FPCR Environment and Design Ltd on behalf of Sirius Planning Ltd. It provides details of the location of Japanese knotweed *Fallopia japonica* present on-site at Land Off Goat Mill Road Merthyr Tydfil, and recommendations for its disposal, treatment and remediation.
- 1.2 Land Off Goat Mill Road, Merthyr Tydfil (Central Grid: SO062069) hereafter referred to as the Site, is located to the east of Merthyr Tydfil town centre. The main area of the site is a mosaic of grassland and scrub, whilst the boundaries are dominated by groups of plantation woodland interspersed with self-seeded tree stock.
- 1.3 The site has been subject to ecological survey work since summer 2019, with a number of surveys being completed across the site. A site walkover was undertaken on 20th May 2020 specifically to ascertain the presence of invasive species, in particular Japanese knotweed.
- 1.4 This strategy can be read in conjunction with the Knotweed Code of Practice¹. Although this code was withdrawn by the Environment Agency (EA) in 2017, as they no longer provide best practice guidance, content remains relevant.

Japanese Knotweed

- 1.5 Japanese knotweed is a rhizomatous perennial plant introduced to cultivation in the late 19th century and has since become a major issue in the urban and rural environment. It has distinctive branching, hollow bamboo-like stems covered in purple speckles often reaching 2-3 metres high.
- 1.6 The plants flower from August to October with small creamy-white flowers hanging in cluster from the leaf axils. The rhizomes are extensive, thick and when broken they reveal a bright orange centre that may be described as carrot-like. The ability of Japanese knotweed to reproduce vegetatively by means of these resilient rhizomes, either directly by rhizome extension or by earth transportation containing rhizome fragments, enables large stands to develop.
- 1.7 The rhizome system can extend up to 7 m away from the parent plant and 2 m deep and is primarily responsible for the spread of the plant within sites with stands potentially spreading at a rate of several metres per year. The movement and use of soil contaminated by fragments of rhizomes is the primary method of spread between sites, however, the plant is also able to spread by transfer of cut stem material.

¹ Japanese Knotweed – a Code of Practice, Environment Agency, 2013

2.0 RELEVANT LEGISLATION

- 2.1 The presence of Japanese Knotweed on-site presents a constraint to the proposed development. This species is listed under Section 14, Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)², which makes it an offence to plant or otherwise cause Japanese knotweed to grow in the wild. It is also an offence to let this invasive species knowingly grow onto adjoining property and a duty of care should be implemented.
- 2.2 Under the Environmental Protection, (Duty of Care) Regs. 1991³ and Environmental Protection Act 1990 Sect 34⁴, soil contaminated with Japanese is classed as 'controlled waste' and can only be disposed of in a registered landfill site.
- 2.3 Other relevant legislation includes:
- Town & Country Planning Act 1990 Pt VIII, Chapter II, Sects 215 – 219⁵
 - Prevention of Damage by Pests Act 1949⁶
 - Highways Act 1980, Sect 154, Section 100 (9)⁷
 - Environment Protection Act 1980, Section 80⁸
 - Infrastructure Act 2015⁹
 - Water Resources Act 1991¹⁰ – care needs to be taken when spraying or treating knotweed in the presence of a watercourse (whether occasionally dry or otherwise). Under section 221 of the Act watercourses are deemed to be “rivers, streams, ditches, drains, cuts, culverts, dykes, sluices, sewers and passages through which water flows in”.

3.0 METHODOLOGY

- 3.1 A systematic walkover across the site was undertaken on 22nd August 2019 to ascertain the extent of Japanese knotweed (JK) stands within the site boundary. This survey was updated on 20th May 2020. The location and approximate extent of all stands was recorded and mapped (Refer *Figure 1*).

4.0 SURVEY RESULTS

- 4.1 A total of seven viable stands were identified throughout the site (JK0#) (*Table 1*), all of which appeared to have been previously treated with some showing signs of regrowth. The dense nature of the scrub in this area has made mapping of these stands difficult, however, the approximate areas and locations are displayed in *Figure 1*.
- 4.2 Four of the stands were located within a dry ditch (JK01, JK03, JK04, and JK06), three of which were the largest, with JK03 measuring 4m x 22m, JK04 measuring 8m x 59m and JK06 measuring 8m x 62m. Dispersal of these stands was likely facilitated by water and spread downstream during times of flooding. All four stands appeared to have been previously treated, however, regrowth was developing within each of the stands likely as a result of their positioning within the watercourse.

² <http://www.legislation.gov.uk/ukpga/1981/69/section/14> (last visited 01/12/2020)

³ <http://www.legislation.gov.uk/uksi/1991/2839> (last visited 01/12/2020)

⁴ <http://www.legislation.gov.uk/ukpga/1990/43/section/34> (last visited 01/12/2020)

⁵ <http://www.legislation.gov.uk/ukpga/1990/8/part/VIII/chapter/II> (last visited 01/12/2020)

⁶ <http://www.legislation.gov.uk/ukpga/Geo6/12-13-14/55/contents> (last visited 01/12/2020)

⁷ <http://www.legislation.gov.uk/ukpga/1980/66/section/154> (last visited 01/12/2020)

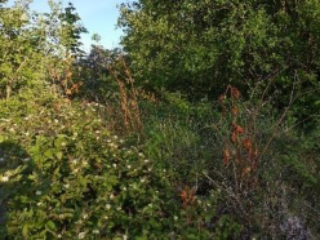
⁸ <http://www.legislation.gov.uk/ukpga/1990/43/section/80> (last visited 01/12/2020)

⁹ https://www.legislation.gov.uk/ukpga/2015/7/pdfs/ukpga_20150007_en.pdf (last visited 01/12/2020)

¹⁰ <http://www.legislation.gov.uk/ukpga/1991/57/contents> (last visited 01/12/2020)

- 4.3 A further two stands were identified on the banks of dry ditches, also likely to have been spread by the water course during times of heavy flooding. These stands included JK02 measuring 1m x 6m and JK05 measuring 3m x 6m. Both stands appeared to have been previously treated with dead stems and leaves.
- 4.4 JK07 was located on land in scrub bordering broadleaved woodland and was composed of three small patches measuring 1m x 1m each. All three patches within the stand appeared to have been previously treated.

Table 1. Japanese Knotweed descriptions and locations

Reference	Details	Latitude	Longitude
	JK01 5m x 6m, located within a dry ditch surrounding a footbridge. The stand appeared to have been previously treated with some plants having dead fragments on the stem and leaves.	51.750275	- 3.359853
	JK02 1m x 6m, located along the top of the bank adjacent to the footpath amongst surrounding woodland and scrub. Area consisted of some sparse plants all of which appeared to have been previously treated.	51.750612	- 3.360039
	JK03 4m x 22m, located along a dry ditch bordering a thin treeline of woodland. Area appeared to have been previously treated with mature plants having dead foliage. New growth was developing under the previously treated stands.	51.749569	- 3.360427
	JK04 8m x 59m, this vigorous stand extended 4m either side of a dry ditch. Most of the mature plants appeared to have been previously treated but new growth had developed underneath the majority of the area.	51.749857	- 3.360665
	JK05 3m x 6m, located along the top of a bank, away from any water within the ditch. The stand had been previously treated and all leaves and stems appeared dead.	51.749872	- 3.360582

Reference	Details	Latitude	Longitude
	JK06 8m x 62m, this extensive area of growth varied from 2m-6m in width and stretched along a dry ditch. The vigorous stand appeared to have been previously treated, with some plants showing fresh green growth and others died back.	51.750164	- 3.360503
	JK07 Three small patches measuring 1m x 1m each and extend around a patch of dense scrub. All three sections had been treated and plants leaves and stems were dead.	51.750575	- 3.360333

5.0 RECOMMENDATIONS

Approach to remove Japanese knotweed

- 5.1 The following strategy details the removal of all stands of knotweed identified within Table 1. Due to the nature of the scheme it is considered that chemical treatment or manual control cannot be effectively undertaken. Consequently, excavation and storage in a treatment bund followed by on-site burial of the JK is considered the best practicable option.
- 5.2 The following sections address the below key actions and it is recommended that a specialist either undertakes all works or supervises each stage providing advice where necessary:

Key actions

1. Exclusion zone fencing
2. Excavation
3. Storage and chemical treatment bund
4. Burial cell creation and sealing
5. Perimeter root barrier installation
6. Decontaminating machinery
7. Ongoing monitoring of the site area

Exclusion zone fencing

- 5.3 A fence that can clearly be seen and robust enough to deter site machinery should mark out the areas of contamination. In general Heras fencing on rubber feet, double-clipped and appropriately braced is sufficient to act as a barrier. Signs should warn site operatives that there is the risk of potential JK contamination, the area of which is generally considered to be 7m horizontally from

the nearest above ground growth of JK. The fence should therefore be located at least this distance from the stand extremities.

Excavation

5.4 The below points outline best working practices for excavation:

- Prior to any clearance works the area will be checked by a suitably qualified ecologist for signs of use or presence of any protected species with appropriate measures taken where necessary.
- Dedicated haul roads will be used from the excavation zones to the storage bund.
- Haul roads will be inspected at the end of each working day for evidence of spilled material and any spilled material dealt with appropriately.
- Excavation will be undertaken by a mechanical excavator and dumper truck / haulage lorry.
- Where viable JK is to be excavated, vegetation clearance should begin where possible 7m from the leading edge and work inwards toward the stand. Topsoil should be cleared by mechanical excavator in a step-wise manner to a depth of around 10 cm under supervision of an experienced JK specialist, to establish the likely furthest extent of rhizome growth.
- Using this technique excavators and dump trucks/ lorries should not need to track in contaminated soil.
- Good working practice will ensure that excavator buckets and dumpers / lorries should only be half-filled during excavation and transportation to burial cells to avoid spillages which could result in further contamination.
- If at any point excavators or dumpers / lorries track in contaminated soil they will be decontaminated before leaving the contaminated areas (see below).
- Once the lateral rhizome extent has been established excavation will then occur to the depth of the rhizome growth. Excavation is likely to be in a graded manner, as growth will be deeper closer to the centre of the stand.
- Bulk excavation can be undertaken using a toothed digging bucket with a toothless ditching bucket used to clean the base and sides allowing clear inspection to identify rhizome extent.
- The excavation must be made safe to allow the JK specialist to enter the excavation through the use of an appropriate batter.
- In accordance with best practice guidance a further 0.5m will be excavated around the perimeter of the cut after the full extent of rhizome has been removed as a further precaution.
- Clean the rear of dumper trucks / lorries after transporting contaminated spoil to the receptor cell or storage bund to prevent contamination of haul routes.
- Excavators will be decontaminated at the end of each working day if they are to leave the working area.
- All machinery to be decontaminated at completion of operation to ensure no rhizome material is transported off site.
- Boot cleaning facilities must be provided and will be used by all operatives when exiting the contaminated area.

Storage and chemical treatment bund

- 5.5 Storage of contaminated soil, rhizomes and vegetative material will take place within a designated stock-pile area or storage bund unless; materials are to be immediately buried or, transported directly off-site under agreement and any necessary licenses to an approved tip.
- 5.6 The below points outline the best working practices for a storage and chemical treatment bund
- A bund will be formed around the extent of required area to demark the storage area and lined with the root barrier membrane.
 - This area will be fenced and be clearly signed.
 - The storage area needs to be lined with a root barrier membrane (see below for specification), onto which the contaminated soil will be placed.
 - The membrane should be blinded with a layer of sand to prevent damage from dumpers / lorries.
 - The contaminated soil needs to be spread out to around 0.5m in depth to prevent rhizomes becoming dormant and re-growing once disturbed.
 - The material should then be treated with an appropriate herbicide in accordance with the product guidance and monitored until no signs of regrowth, or capped and buried in accordance with the following section.

Burial cell creation and sealing

- 5.7 Prior to moving the contaminated material from the storage and treatment bund, a burial cell will be created.
- 5.8 The cell will be excavated to such a depth as to allow the total volume of contaminated soil and plant material to be buried a minimum of 5m below the final ground level. Calculations will need to include the extent of underground spread from the visible edge of the stand and possible downward spread of each stand (generally considered to be up to 2m). It is proposed that the cell be created beneath a substantial landscape bund providing well in excess of the 5m minimum fill depth above the cell.
- 5.9 Once the cell has been filled it will be sealed with an impermeable root barrier membrane and back-filled with clean material.
- 5.10 A root barrier membrane physically protects a structure or clean soil. It must be made of a material that is fit for purpose which can be:
- a) Used without damage;
 - b) Provided in large sizes, to minimise the need for seals;
 - c) Sealed securely where necessary with any joins overlapped and sealed with 300mm wide adhesive tape
 - d) Remain intact for at least 50 years;
 - e) Resist UV damage if it is exposed to sunlight.
- 5.11 Potentially suitable barrier membranes include: DENDRO-SCOTT™ Root Barrier, GreenBlue Urban ReRoot 2000, Hy-Tex Root Barrier C3

Perimeter root barrier

5.12 Stands JK04 and JK05 are located adjacent to the site boundary and may extend onto third party land. To prevent further spread the JK should be excavated to the site boundary and a root barrier installed. It must be made of a material that is fit for purpose and in accordance with the requirements for the capping material specified above. JK will tend to break through holes or joins in the fabric, so it is essential that the integrity of the root barrier membrane is maintained, and there is a minimum number of seams. The key points for barrier installation are outlined below:

- The root barrier should be installed at the full depth of the excavation created to remove the JK rhizomes.
- The root barrier should line the side of the trench nearest the JK with back-filling to the backside only.
- The root barrier should be installed vertically and as taut as possible. To aid this a wooden frame can be used to hold the membrane in place (an appropriate non-piercing method of affixing the membrane to the frame should be chosen (if such fixing is deemed necessary)).
- To prevent rhizomes growing over the top, the root barrier should finish at 50mm above ground level with the membrane supported by wooden posts.
- When back-filling the excavated trench, care must be taken that any sharp stones or debris, which would be capable of puncturing the root barrier should be removed. The back-filling should be carried out with continual compaction to prevent settlement.
- As back-filling takes place, the root barrier can, in some circumstances, be dragged down during consolidation. It is important, that this is allowed for to prevent the finished level being below what is required.
- Where the soil contains flint, sharp stone or any other sharp object these should be removed from the face of the trench, which is to be lined with root barrier. If this is not practicable consideration should be given to lining both sides of the root barrier with plywood or some other suitable material.
- Ensure that the presence of the root barrier membrane is recorded and is not disrupted by future developments and landscaping.

Decontaminating machinery

5.13 The decontamination of vehicles is a critical element of JK control operations. The below points outline the key measures:

- Clean all vehicles before using them to move Japanese knotweed.
- Clean the rear of dumper trucks and lorries after transporting contaminated spoil to the receptor cell to prevent contamination of haul routes.
- Use a pressure washer and stiff-haired brushes to clean the vehicles, making sure that any areas that might retain rhizomes are thoroughly scoured.
- On dumper trucks and excavators, particular attention should be paid to buckets, quick hitches, the rear of dumpers, caterpillar tracks, tyre treads and wheel arches.

- On lorries, particular attention should be paid to the loading area, undercarriage, mud guards, mud flaps, tyre treads and wheel arches.
- Any material dislodged during this process must be included within the JK waste.
- This process must only be undertaken over a root barrier membrane layer or hard surface that can contain and collect the material washed off.
- This material must not be allowed to contaminate drains, ditches or watercourses.
- People who are appropriately trained in rhizome identification should do the cleaning.
- A thorough inspection should be carried out before the vehicle is used for other duties.

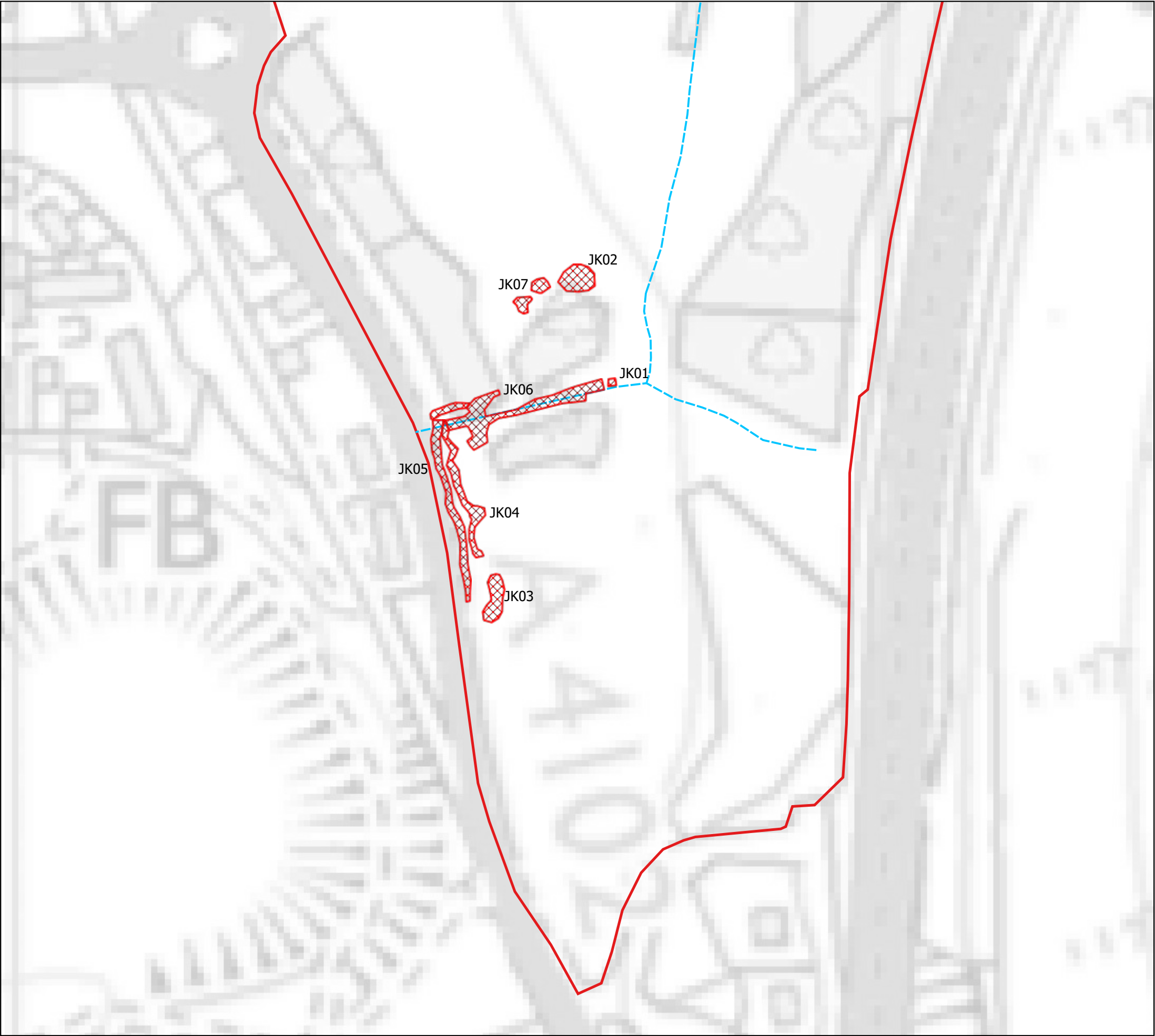
Monitoring

- 5.14 Monitoring of the receptor area for the JK contaminated material and the area from which the JK has been removed should be undertaken twice yearly for a period of five years by a suitably qualified JK specialist. If at any time signs of JK regrowth are noted immediate treatment should be undertaken. The scope of the treatment should be informed by a JK specialist.

This page has been left blank intentionally

FIGURES

This page has been left blank intentionally



This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material - Crown Copyright. All rights reserved.
Licence Number: 100019980

Key

-  Site Boundary
-  Japanese Knotweed (with reference)

This page has been left blank intentionally