PAG Consultancy

Scarcewater Tip
Melbur China Clay Works
St Stephen
Truro
Cornwall
TR2 4EY

WASTE RECOVERY PLAN

For the use of material from IMERYS Minerals and Imported Non-Hazardous Waste

Reference Number IMERYS MELBUR 001 WRP

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1. Introduction

For many years there has been an ongoing programme of land restoration on the China Clay Tips within Cornwall using the *in situ* china clay waste. However, the china clay waste consists predominantly of sands and grits, together with the micaceous material consisting mainly of silt. Due to the mineralogical origin of these materials, the sediment is inherently devoid of plant nutrients and organic matter and is weakly developed with no inherent physical structure. Over the last 10 years, through a series of Environment Agency approved environmental permits, IMERYS Minerals Ltd have successfully moved to a methodology of on-site Tip restoration using a mixture of on-site soil mineral forming materials (*i.e.* sand, grits and micaceous materials) alongside imported wastes materials *e.g.* composts, gypsum, marine dredgings *etc*. The success of this approved method of land restoration is clear to see.

Photo 1. Example of restoration areas at neighbouring IMERYS site at Dubbers.

Scarcewater Tip, part of IMERYS Minerals Ltd workings at the Melbur China Clay Works, has been used for a number of years for the deposit of mineral waste consisting of granite rock and sand resulting from the extraction of China Clay. The site has several detailed planning permissions in place, the last issued by Cornwall County Council on 20th December 2018 (PA18/06494), allows for the "..progressive restoration and landscaping" of the Scarcewater Tip Melbur China Clay Works St Stephen Truro and requires completion by 31st July 2024.

In order to comply with the requirements of their approved planning permission, IMERYS Minerals Ltd intend to use similar methodologies to those used on neighbouring China Clay Tips *e.g.* Dubbers, Carrancarrow and import waste

materials to use with on-site soil mineral forming materials to create topsoil areas suitable for required landscape end-uses namely heathland, pasture, woodland and grass/scrub.

2. Recovery vs Disposal

The Waste Framework Directive along with the guidance on the interpretation of Key provisions of Directive 2008/98/EC on waste comments that the principle result of a recovery activity is defined and described as:

'waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function.'

The proposed project at Scarcewater Tip falls within the WFD definition of a recovery activity as the waste to be used is acting as a replacement to material that would have normally be used to complete the project.

This waste recovery plan proposes the use of waste as a replacement to the importation of virgin topsoil/subsoil materials to complete the project in line with the granted planning permission(s).

3. Purpose of the Works

The application is related to the proposed works to be carried out at Scarcewater Tip within the IMERYS Minerals Melbur China Clay Works which are set out in attached Drawings G-4-1-486_MelburWastePermit, SCR 2-1 Site Location, Scarcewater Tip Cross Section and SCR 3-10 Final Restoration. The following is a brief description of the proposed activities.

3.1 Ecological/Agricultural Benefit Activities

Purpose:

The intention is to use imported waste materials for the creation of topsoil and subsoil suitable for the various areas of the restoration project as opposed to use of non-waste imported soil. The work will be carried out and completed in accordance with the IMERYS Minerals Environmental Management System which is ISO14001:2015 certified (see attached – IMERYS Minerals Ltd – EMS Summary and EMS Structure Document and ISO14001 certificate) and various technical standards held within the EMS *e.g.* mixing and blending, land spreading and deposition, land spreading soil conditioning, and the Ecological/Agricultural Benefit Statement submitted alongside this WRP. The restoration project will use as much on-site stockpiled soil, recovered and stored on site during tip construction, as

possible. However, at this point, the quantity of non-waste soil already on site is unknown due to historical works and soil movements. It is proposed that as this material is found the Environment Agency will be updated through the local officer of the tonnages found on site. The amount of waste material imported will be aligned and reduced accordingly. The areas for ecological/agricultural improvement will be constructed as per the attached documents to allow for maximum improvement and potential crop yields.

Benefits specific to the ecological/agricultural land, beyond those detailed in the ecological/agricultural benefit statement:

Aesthetic

Following discussion with local residents and various officials, including the Environment Agency and the local authority, design briefs used on the scheme are to create finished profiles similar to the surrounding environment so the restoration/landscaping will blend into the general landscape of the area. This was a key consideration for the design and issued planning permission.

Economic

The development is of economic benefit to IMERYS Minerals Ltd and its business activities, while remaining affordable to complete minimising any financial risk to the company. IMERYS Minerals Ltd business development plan supports the importation and use of waste materials to create topsoil/subsoils against the significant costs of importing and using virgin soil materials, which are simply not available in sufficient volumes to complete the required restoration/landscaping programme within the required legal timeframe of four years *i.e.* completion by 31st July 2024.

Environmental

In the current climate of offsetting the effects of climate change and anthropogenic harm to the global environment, sustainability is of vital importance to any project/development. IMERYS Minerals Ltd are keen supporters of recovering materials from waste products, rather than importing naturally formed soils from limited resources. Sustainability is a key Government initiative, and this plan has been produced accordingly in support of recovering and recycling waste materials for ecological/environmental/agricultural benefit. Across the *c.*85 ha of restoration area on Scarcewater Tip it can be calculated *c.* 33,900 tonnes of CO_2 equivalent[1] will be sequestered in the created topsoil/subsoil profiles during the restoration period, this is before consideration is given to the carbon which will be sequestered from the establishment of trees, shrubs and grasses during the period of post soil

[1] Assuming 2500 t/ha @ 30% dry matter and 25% organic matter content, with 2.4 kg CO_2 emitted per litre petrol/diesel – https://www.carbonindependent.org/17.html, this equates to *c.* 141.3 million miles of average car emissions.

creation/restoration. Please refer to the supporting ecological benefit statement for more detailed information surrounding the benefit of the improvements.

Legal

There is a legal obligation for the restoration/landscaping to be completed, as per the attached planning permission issued on 20th December 2018 (Decision Notice PA18 – 06494 Scarcewater Tip Dec 2018).

3.2 Is there a clear benefit from the activity?

There has been an ongoing programme of land restoration within the china clay area for many years using the *in situ* china clay waste. The china clay waste consists predominantly of sands and grits, together with the micaceous material consisting mainly of silt. Due to the mineralogical origin of these materials, the sediment is inherently devoid of plant nutrients and organic matter and weakly developed with no inherent physical structure. The material can, at best, be described as unconsolidated geological material. This means that any landscape formed from this material is susceptible to compaction, soil erosion and run-off.

Prior to the development by IMERYS Minerals Ltd of using waste materials to create topsoil/subsoil horizons in the restoration of china clay tips, land restoration on IMERYS clay tips had focused on establishing acid grassland, heathland and native species woodland either through directly planting into the micaceous materials or through hydroseeding on the surface. These areas of restoration have traditionally been slow to establish and on occasion failed completely. Plant growth and vigour was severely restricted, due to a lack of organic matter, plant available nutrients, structural stability and retained moisture in the china clay waste. Slow establishment of vegetation and lack of root growth also directly resulted in an unstable mineral rich material which encouraged the development of surface rills and gullies. The eroded sediment was then transported in the drainage waters and deposited off-site. The successfully inclusion of organic matter rich waste materials *e.g.* composts and the resulting improvements in the physical structure of the created topsoil and subsoils (*e.g.* structural stability, water infiltration, root elongation, air movements, and water retention *etc*.) has provided significant environmental and economic benefits in meeting the shortfall of required natural soil materials to complete the IMERYS Minerals land restoration requirements/obligations.

3.3 Is the recovered material suitable for its intended use?

China clay waste is severely deficient in any potential plant nutrients and has no form of organic matter present, as a consequence the material is incapable of supporting plant growth. Traditional restoration practices have used inorganic sources of nutrients to establish vegetation, but this requires continuous replenishment and does not address the lack of organic matter, droughtiness and lack of physical stability within the mineral material and simply cannot be classified

as soil, as it does not have basic soil properties. The consequence of not improving/creating crucial soil characteristics *i.e.* soil fertility, physical structure and biological activity results in the very slow establishment of any vegetation, with associated increases in risk/susceptibility of an area to erosion. In some cases restoration of areas have failed due to the lack of any 'soil' creation.

IMERYS china clay waste requires the addition of plant nutrients and organic matter in order to create topsoil/subsoil which encourages the establishment of vegetation and sustain plant growth in the long term, without the need for supplementary additions of inorganic fertiliser. IMERYS Minerals Ltd, with the support of appropriately qualified soil scientists, have developed methods to reprofile land surface and recreate topsoil/subsoils by mixing suitable imported waste materials with the china clay waste. The waste streams which have successfully been used for this process under Environmental Permits issued by the Environment Agency include composts, biosolids, anaerobic digestate, wood chip and paper crumble mixed with inert substances of varying granularity and particle size distribution. These waste streams provide essential ingredients/physical properties to transform the china clay waste into topsoil/subsoil with the desired characteristics for the different ecological/agricultural end uses.

3.4 Is the minimum amount of waste being used to achieve the intended benefit?

The bespoke permit application includes the creation of topsoil and subsoil using a range of materials in combination with the china clay waste. The justification for using these waste materials is based on the need to create topsoil and subsoil with sufficient nutrients and water holding capacity to meet the vegetation requirements.

The minimum recommended depth of soil required for the restoration of amenity grass and heathland is 50cm, while the recommended soil depth for the restored woodland is 100cm[2].

The current methodology for topsoil manufacture combines approximately 75% china clay waste with 25% treated waste organic materials. This soil specification has been successful in the germination and establishment of grassland on neighbouring china clay pit restoration projects. The amount of imported waste materials required per hectare based on this incorporation rate and a total soil depth (topsoil and subsoil) of approximately 75 cm and a bulk density of 1.3 tonnes/m^3 would be circa 2500 tonnes per hectare. Under SR2010No5, a maximum of 5,000 tonnes per hectare of materials can be applied to land providing the materials confer ecological benefit to the site. The actual spreading rate will be determined by the end use, the nutritional and physical characteristics of each waste stream and local conditions.

[2] Bending, McRae & Moffat. Soil Forming Materials: Their Use in Land Restoration. Stationery Office 1999

The establishment of a permeable soil profile colonised by vegetation is the best mechanism to significantly reduce the velocity and amount of water discharged from the site. The enhanced available water holding capacity of the soil will significantly improve the soils ability to absorb and retain water. In addition, the encouragement of deeper rooting depth and more vigorous vegetation growth will increase soil moisture uptake and evapotranspiration. It is highly likely that the total dry matter production of the grassland vegetation will be increased from a very poor dry matter production of *c.*1-2 t/ha/year to approximately 4-6 t/ha/year following the land improvement measures described. The water requirement to produce the increase in plant dry matter, will be approximately 200t of water per tonne of dry matter produced. Therefore, the increase in the annual dry matter production as a direct result of creating a soil profile, will transpire an additional 600-800 t/ha (600,000-800,000 litres) of water.

The increase in water recycling and storage within the soil profile together with increased evapotranspiration are now specifically recognised in Planning Policy Guidance as a result of "climate change" and recent flooding events in areas previously considered not to be at risk of flooding. In particular, intense heavy rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can quickly run off land resulting in potential local flooding.

3.5 Is the waste being used as a substitute for a non-waste material?

The present land restoration programme, wherever possible, utilises local topsoils and subsoils generated from the mineral development process. However, there is a significant short fall of topsoil in the restoration of existing tipping landforms because the original soil profile has been lost.

The importation of natural topsoils and subsoil encourages deeper rooting in the soil profile and help alleviate many of the problems described above. Unfortunately, there is no viable means to procure sufficient quantities of topsoil and subsoil as a commodity, and natural topsoils and subsoils do not become available from development sites in sufficient quantities to meet demand and are often located at distances too far away to make it economically viable to transport the material.

3.6 Will the proposal be completed to an appropriate standard?

The planning consents associated with the China Clay operations are extensive and complex. Under the terms of the Environment Act 1995, new requirements for an initial review and updating of old mineral planning permissions (ROMP) were introduced. Through this process, Imerys Minerals Ltd has submitted ROMP applications and Environmental Statements for a number of areas in the Mid Cornwall Clay District to Cornwall Council. During preparation of the Environmental Statement, consultation has taken place between the industry, the Mineral Planning Authority, Natural England, Environment Agency and other NGO organisations.

Through this consultation process an indicative restoration scheme for the operational area has been developed which will primarily produce a mosaic of acid grassland and mixed deciduous native woodland over the non operational pits and former tips and mica dams. The proposed restoration scheme is a reflection of the existing local landscape and reflects the best form of working and restoration to retain and enhance the landscape character.

The bespoke permit application, proposes to import and recycle materials in the creation of subsoil and topsoil, will not only comply with the objectives of the existing restoration plan, but will also provide and support additional ecological improvement.

4. Waste Descriptions

Core Waste Streams - EWC codes and waste descriptions

Key

MB = Mixing & Blending

LS = land spreading for restoration

SC = land spreading for soil conditioning

EWC code	Waste description	Use
01 04 09	Wastes resulting from mining/quarrying/mineral treatment: Wastes sand and clays	MB, LS
17 05 04	Construction and Demolition Waste: soil, stones and dredging spoil: soil and stones	MB, LS
17 05 06	Construction and Demolition Waste : soil, stones and dredging spoil: dredging spoil	MB, LS, SC
19 05 03	Wastes from Waste Management Facilities: waste from the aerobic treatment of waste: compost from source segregated biodegradable waste.	MB, LS, SC
19 05 99	Wastes from Waste Management Facilities: waste from the aerobic treatment of waste: compost derived from non-source segregated biodegradable waste	MB, LS, SC
19 06 04	Wastes from Waste Management Facilities: waste from the anaerobic treatment of waste: fibre or whole	MB, LS, SC

	digestate from anaerobic treatment of non-source segregated biodegradable waste.	
19 06 06	Wastes from Waste Management Facilities: waste from the anaerobic treatment of waste: fibre or digestate from anaerobic treatment of source segregated biodegradable waste.	MB, LS, SC
19 09 02	Wastes from Waste Management Facilities: waste from the preparation of water intended for human consumption or water for industrial use: sludge from water clarification.	MB, LS, SC
19 13 02	Solid waste from soil remediation other than those in 19 13 01*	MB, LS
20 02 02	Municipal Wastes: garden and park waste: soil and stones	MB, LS

The materials listed in the Table above will not always be available in sufficient quantity to carry out all of the functions for which they are listed. It is also unlikely that every waste stream listed will available for use throughout the entire restoration phase. Consequently, it will not be possible to have a rigid mixing ratio of the different waste materials for each end use. Instead, the materials will be blended to produce a soil with a target nutrient concentration range and organic matter content, based on waste analysis and expert interpretation by a suitably qualified soil scientist *i.e.* Member/Fellow of British Society of Soil Science with appropriate waste management experience *e.g.* WAMITAB qualified with respect to landspreading of waste.

The waste streams listed in the above table all have beneficial properties that will each contribute to enhancing the restoration process and diminishing the risks associated with poor plant establishment and growth, soil erosion, surface water run-off *etc*. Brief descriptions of each waste are given below.

01 04 09 Sand and Clays

Description

The sand and clays wastes consist of sand and clay particulates as a result of mining operations. Sand and clays will be delivered to bunded stores at the restoration site.

Benefits

Sand and Clay wastes will provide benefit due to their varying sand and clay contents. The sands and clays when mixed with the china clay waste will improve

the water infiltration, water holding capacitie and drainage characteristics of the finished soil , and reducing the risk of soil compaction, capping and run-off. The sands and clays will be used in mixing and blending element with soil substitutes from mechanical treatment, subsoils and gypsum, together with organic wastes streams, or applied *in situ.*

Prior to any acceptance on site, suppliers of waste sand and clays will be required to provide appropriate analysis in order for IMERYS to be able to assess the waste as appropriate for use.

Following the use of any imported sand and clay wastes the concentrations of PTEs in the amended/created soils will remain far below maximum permissible concentrations as specified in the Sludge (Use in Agriculture) Regulations (SI, 1989).

17 05 04 Soils from Demolition and Construction waste

Description

This waste stream consists of subsoil derived from construction and other ground work activities.

Benefits

These materials are inert and will either be used as direct subsoil replacements where there is a need for subsoil or mixed with other waste streams to form part of the topsoil. This waste streams, because of their origin, will be thoroughly evaluated before acceptance on site against agreed soil specifications *e.g.* BS8601:2013 to ensure that they are not contaminated with any potentially toxic elements or invasive species elements.

17 05 06 Dredging Spoil

Description

During restoration at neighbouring IMERYS Minerals projects dredging spoil has been derived from dredging operations at Truro, Penzance, Falmouth and Portreath harbours. The dredgings generally have a dry matter content of 40-60 % and contain useful quantities of major plant nutrients as well as clay and silt and fine sand. The dredgings are delivered to bunded stores at the restoration site, where they are allowed to air dry before use.

Benefit

The physical characteristics of the dredgings will increase the water holding capacity of the finished soil when blended with the china clay waste, reducing the risk of soil erosion and run off. The dredgings will be used in the mixing and blending element or applied *in situ* and will be ameliorated with soil substitutes from mechanical treatment, subsoils and gypsum, together with organic wastes streams and waste streams that contain lime. The liming waste streams will offset any potential acidity that could develop within the dredgings. The pH of the dredgings will be monitored to ensure that there is no build-up of acidity.

Prior to any acceptance on site, suppliers of the material will be required to provide appropriate analysis in order for IMERYS to be able to assess the waste as appropriate for use.

Previous experience by IMERYS Minerals Limited in the restoration of neighbouring tips will be used in the assessment and treatment of any Tri-Buty Tin within potential sources of dredgings *i.e.* maximum permissible TBT limits within accepted dredgings will be enforced along with appropriate drying and treatment of materials will be employed prior to dredging use. After application of the dredgings, the concentrations of PTEs in the amended/created soils will remain far below maximum permissible concentrations as specified in the Sludge (Use in Agriculture) Regulations (SI, 1989).

19 05 03 & 19 05 99 Compost

Description

Compost is derived from the composting of either source-segregated or non-segregated organic rich feedstocks, and consists of decomposed organic materials with a consistency similar to peat. It is a source of slowly available major plant nutrients, including Nitrogen (N), phosphate (P_2O_5), potash (K_2O), Magnesium (Mg), sulphur (S) and stabilised organic matter.

Benefits

The organic matter is particularly beneficial for land restoration as it plays a key role in improving and maintaining soil fertility. The majority of the nutrients present in composts is in an organic form and will slowly release these nutrients over a long period of time. The slow release properties, and high carbon contents will minimise the risk of nitrate leaching through encouragement of microbial immobilisation of inorganic N. The amount of P_2O_5 and K_2O applied will ensure that soil P and K status are adequate for supporting plant species such as grass and woodland.

In addition to benefits associated with organic matter and plant nutrients, compost has a high buffering capacity which will help to modulate any potential adverse soil conditions. Compost has a high concentration of stabilised carbon, therefore its re-use through land application helps to sequester carbon back into soil, which supports the policy of management activities to offset the effects of climate change.

Prior to any acceptance on site, suppliers of the material will be required to provide appropriate analysis in order for IMERYS to be able to assess the waste as appropriate for use.

Following the use of compost the concentrations of PTEs in the amended/created soils will remain far below maximum permissible concentrations as specified in the Sludge (Use in Agriculture) Regulations (SI, 1989).

N.B. Non-source segregated compost (EWC 19 05 99) (e.g. CLO -Compost Like Outputs) will not be used in any areas of the restoration programme being restored to

agricultural use – see attached site plans for details of vegetation/site use post restoration.

19 06 04 / 19 06 06; Anaerobic Digestate (AD)

Description

Anaerobic digestate is derived from either source-segregated or non-segregated biodegradable feedstocks. It is a semi solid with a texture similar to sludge cake. It provides major plant nutrients nitrogen (N), phosphate (P_2O_5), potash (K_2O), magnesium (Mg) and sulphur (S), along with trace elements and organic matter.

Benefits

The organic matter and plant nutrient content of anaerobic digestate will confer benefit by improving and maintaining soil fertility. The available N content of AD is relatively high, and its rate of application will be carefully monitored to control the N content of created soil profiles and requirements for vegetation establishment. The P_2O_5 and K_2O applied will ensure that soil P and K status are adequate for supporting plant species such as grass and shrubs.

Prior to any acceptance on site, suppliers of the material will be required to provide appropriate analysis in order for IMERYS to be able to assess the waste as appropriate for use.

Following the use of anaerobic digestate the concentrations of PTEs in the amended/created soils will remain far below maximum permissible concentrations as specified in the Sludge (Use in Agriculture) Regulations (SI, 1989).

N.B. Non-source segregated anaerobic digestates (EWC 19 06 04) will not be used in any areas of the restoration programme being restored to agricultural use – see attached site plans for details of vegetation/site use post restoration.

19 09 02; Clean Water Treatment Sludge

Description

Water treatment works cake is the product of potable water clarification. The sludge is pressed to form a cake with a dry matter content of *c.* 20%. The material has relatively low concentrations of available plant nutrients and trace elements compared to other organic materials. The majority of the N is associated with the organic matter and not immediately available for plant uptake.

Benefits

This material is particularly suitable for the creation of habitats such as heathland that require organic matter and low concentration of nutrients.

Prior to any acceptance on site, suppliers of the material will be required to provide appropriate analysis in order for IMERYS to be able to assess the waste as appropriate for use.

Following the use of water treatment works cake the concentrations of PTEs in the amended/created soils will remain far below maximum permissible concentrations as specified in the Sludge (Use in Agriculture) Regulations (SI, 1989).

19 13 02 Solid Waste from soil remediation

Description

This waste stream consists of soil and stones from the treatment/remediation of soil from municipal sources.

Benefits

The solid waste, which will consist of soil like material, are inert (with the exception of any active organic matter content) and will either be used as direct topsoil/subsoil replacements or mixed with other waste streams to form part of new topsoil/subsoil horizon. This waste stream, because of its origin (soil treatment/remediation), will be thoroughly evaluated before acceptance on site against agreed soil specifications *e.g.* BS3882:2015/BS8601:2013 to ensure they are not contaminated with any potentially toxic elements, hydrocarbons or organic contaminants.

20 02 02 Soil and Stones

Description

This waste stream consists of soil and stones from municipal sources.

Benefits

Soil and stones are inert (with the exception of any active organic matter content) and will either be used as direct topsoil/subsoil replacements or mixed with other waste streams to form part of new topsoil horisons. This waste streams, because of their origin, will be thoroughly evaluated before acceptance on site against agreed soil specifications *e.g.* BS3882:2015/BS8601:2013 to ensure they are not contaminated with any potentially toxic elements or invasive species elements.

5. Quantity of Waste Used

In line with the attached ecological/agricultural benefit statement it has been calculated the proposed tip restoration works, and soil creation activities, will utilise around 2500 t/ha. Therefore, it is calculated *c.* 212,500 tonnes of waste will be required across the restoration area. The proposed activities uses quantities and volumes of waste to establish topsoil/subsoil horizons suitable for the intended land uses/soil requirements in line with IMERYS soil specifications detailed in the benefit statement, which reflect BS3882:2015 and BS8601:2013. The waste recovery operation proposed at Scarcewater tip is designed to replace the need for the importation of virgin topsoil/subsoil (which are simply not available in sufficient quantities), but rather utilise on-site mineral ‘waste’ resulting from china clay extraction along with imported waste streams to create ‘soil’ where soil does not exist. These operations, and methods of working have, and are currently,

successfully being conducted by IMERYS Minerals on neighbouring sites e.g. Lee Moor in Devon and Dubbers Tip restoration in Cornwall. To this effect the tonnages of imported waste do not reflect the tonnages of topsoil/subsoil that would be required to restore the 85ha of Scarcewater Tip, but rather the calculated waste required to create ‘soil’ on the 85ha with on-site mineral materials used as a base for the required topsoil/subsoils.

6. Waste Recovery Activities

Financial Gain over using Non-waste materials

A supply cost is shown as follows, note no taxes such as VAT are included:

Table 1: Cost estimate using imported non-waste materials

Material	Tonnes	Cost (£)	Total (£)
Topsoil material	552,000	- 6.50	3,588,000
Subsoil material	276,250	- 3.50	966,875
Laying out	828,250	- 2.50	2,070,625
			- £6,625,500

Table 2: Cost estimate using recovered waste materials*

Material	Tonnes	Cost (£)	Total (£)
Organic Waste	148,750	+ 9.50	+ 1,413,125
Mineral soil forming materials	63,750	0.00	0
Laying out	212,500	- 4.00	- 850,000
			+ £563,125

* In Table 2, there is an assumption soil mineral forming material are already on site from IMERYS tip formation activities, hence why there appears a significant difference in tonnages between Table 1 (importation of 100% of topsoil/subsoil from offsite for entire soil profiles) and Table 2 (on-site minerals used (*c.* 75% of created soil profiles) with imported wastes (*c.* 25% of created soil profiles)).

From comparison of estimated costs in Tables 1 and 2, there is a clear economic benefit to IMERYS Minerals of using recovered waste over imported non-waste in the region of *c.*£6 Million. This is related to the saving in the cost of importing non-waste soils/soil forming materials and that recovered by using appropriate waste materials, which attract gate fees. The entire programme to complete would depend on market sources and availability of waste for recovery, however, if annual intake of recent years is maintained then the scheme could be completed over a period of between 4 and 5 years, which is compatible with the current planning permission. If the proposed importation and recycling of waste materials were not possible through lack of waste sources (unlikely given the drive to recycle/recover waste rather than disposal) IMERYS Minerals would utilise a combination of product based organic materials *e.g.* PAS100 QP Compost, PAS110 QP Anaerobic Digestates, topsoils/subsoils and hydroseeding techniques in order to complete the restoration of Scarcewater Tip.

The budgets for completing the restoration of Scarcewater tip, using either imported topsoil/subsoil or creating soil profiles using non-waste organic materials and on-site soil mineral forming materials has been costed for, and budgeted, by IMERYS Minerals as part of their planning/restoration obligations with Cornwall County Council. However, the financial gain of using waste materials vrs non-waste

materials are significant plus the use of waste materials has been shown to be successful and more efficient in creating the required soil profiles than traditional methods of land restoration.

7. Other Evidence that waste is suitable

7.1 Demonstration that waste is suitable for the intended purpose

All waste proposed to be used in the completion of the works will be tested by the waste producers and reports reviewed by the proposer before acceptance into the project. Material is also checked upon delivery using visual and olfactory checks and any suspect material is removed from the processing cycle to quarantine, further testing and, dependant on the results of such test, re-included into processing or removed off site to a suitably licensed disposal site. The materials are also assessed by an appropriately qualified soil scientist to ensure the required levels of nutrients/organic matter are present to achieve benefit to the land in question. The assessment will ensure the created soil profiles will support successful establishment and vegetation growth. An ecological/agricultural benefit statement has been produced and is submitted alongside this waste recovery plan.

The EWC codes attributed to the waste to be recovered on site have been detailed within the appropriate sections above.

In addition to the details given within this plan, evidence of the proposed waste recovery activities being suitable for the intended purpose are demonstrated within the attached April 2020 "4R Group Use of Waste Report April 2020", detailing created soil profile analysis following restoration/soil creation at three neighbouring IMERYS restoration sites; success of the IMERYS restoration programme, using waste recovery as detailed within this plan, has been recognised through the 2017 Mineral Planning Association Restoration and Biodiversity Awards Natural England Award for Biodiversity: Landscape Scale[3]; work is supported (i.e. Stuart Gee, Environment Agency, Cornwall) and closely monitored through compliance assessment, and regular site visits by the local Environment Agency team; there is a comprehensive photographic record of work undertaken at neighbouring IMERYS restoration sites, and from above via drone, available to view should the Environment Agency Permitting team wish to visually see the restoration achieved through waste recovery in the way proposed for Scarcewater Tip. N.B. Failure to achieve satisfactory topsoil creation is all to apparent, please see Photo 2, below.

[3] Pg 9 of Attached Mineral_Products_Awards_2017.pdf

Photo 2. China Clay Tip Runoff - without topsoil creation and ecological establishment.

7.2 Demonstration that waste will not cause pollution

All wastes that are to be accepted onto site for creation of topsoil/subsoils undergo strict procedures to ensure they are suitable for use on site and will not cause pollution during soil creation and post restoration activities.

Pre-acceptance Procedures

The pre-acceptance procedures adopted at the site are in accordance with the IMERYS EMS. To ensure any unsuitable wastes are not accepted onto site, the senior management team will be used to ensure that the materials delivered are suitable to be recovered on site. This will be done by checking that the waste being delivered firstly is coded correctly and secondly whether the EWC code is on the list of permitted wastes at site. The site management will also determine whether the waste is likely to be contaminated. This assessment will be visual, olfactory and chemical. If it is deemed that the wastes are not suitable to be recovered on site; they will not be accepted and will be returned to the waste producer.

A pre-acceptance screening procedure will be used to ensure that the wastes that are being proposed for delivery comply with, firstly the requirements of the environmental permit held and secondly, whether the wastes are suitable to be recovered. This process will involve a review of information from the waste producer which may include representative samples of the waste being brought to site before bulk deliveries occur, but will also mean all waste to be utilised within the restoration programme are ‘pre-booked’ for acceptance.

On arrival all wastes will be visually checked to confirm they meet the description and EWC assigned by the waste producer. If not, they will not be accepted on to site for any restoration activities and will be returned to the waste producer.

Waste deliveries will have to have the following information assigned to them:

- How the waste was derived including any variability within the process.
- The EWC code assigned for the waste.
- Chemical analysis (if required) and composition of the waste.
- Quantity of waste delivered.
- Any hazards within the waste.

Acceptance procedures

All wastes that are received at site are visually checked when tipped off.

Duty of care paperwork is checked by the site gate person to ensure the waste is compliant with the EWCs on the permit. It may be the case, as with some larger utilities contracts, that a season ticket is used for wastes that are repeat loads.

All vehicles which are depositing materials onto site will be directed to the most appropriate waste reception area by the site foreman. When a load is tipped off, the contents are visually checked for contaminants and to see if the waste matches that described and coded on the accompanying transfer note. Owing to the sources of some waste streams *e.g.* municipal green waste, there is potential for a degree of contamination *e.g.* plastic or paper, if this occurs a site operative will be employed to remove all contaminants before a waste is batched for storage/use on site.

For all loads received, a detailed record is kept which contains the following information:

- Description of waste
- EWC code
- Date and time of delivery
- Weight of load
- Waste carrier registration number

A monthly and quarterly log is kept (for waste return purposes) of all waste that is accepted on site. This log is checked each month, this ensures that the permitted tonnage will not be breached. If this figure is reached, then waste rejection procedures (detailed below) will be initiated to remain compliant on site (more relevant towards project completion).

Rejection procedures

Waste shall only be accepted at site if it conforms to the list of permitted wastes and if it conforms to the written description of the waste producer.

If, in the unlikely event a waste is accepted onto site that does not comply with the above then the usual site rejection procedures will be enforced:

- The driver of the load will be provided with an explanation why the load has been rejected and instructed to return the load to the waste producer (if not deposited).
- If the waste has been deposited on site, the waste will be separated from any other wastes currently on site and placed into a quarantine area, the waste producer/carrier will be informed and requested to collect the waste and return to the waste producer site.