

Appendix 2: This document compiles the risk assessments for the processes permitted for use with authorised soils under the Department's licence. To be compliant with DEFRA's requirements, these risk assessments have to be much more comprehensive than traditional ones covering work with non-licensed materials, as they must specify biosafety measures and cleaning processes to prevent release of imported soils to the environment (Parker and Milek, 2025).



**Department of Archaeology
DEFRA Licenced Materials**

Risk Assessments and Protocols

Section 1: Environmental Analysis Processes

Soil/sediment Sample Preparation by Drying, Powdering, Sieving and Residue Sorting

Risk Assessment for Work with DEFRA Licenced Materials		Date:	8/8/2024 (revised 21/2/25)
		Review Date:	2/9/2024
Process:		Licenced locations for work:	
Soil/sediment sample preparation by drying, powdering, sieving and residue sorting		D131 – Environmental Archaeology Processing Laboratory D132 – Archaeological Science Laboratory	
Description of Process:			
Samples of soil or sediment are air dried in aluminium trays or gently dried in a warm airing cupboard (<30°C). If soil aggregates are present, the sample is gently powdered with a mortar and pestle. The sample is then passed through a graduated sieve stack and shaken either manually or using the automated sieve shaker. Sieved residues are examined using a magnifying lens or microscope to identify microresidues: artefacts and ecofacts.			
Objectives and Applications of Process:			
- Drying, powdering, and sieving of soil/sediment and manual processing of the sieve residues to identify and quantify micro-artefacts and ecofacts - Applicable to wide range of soil and sediment types (range of application = partially to fully mineral sediments)			
Justification of Use of Process:			
Most soil/sediment analyses used in archaeology require the samples to be prepared first by drying, powdering, and sieving with 1 mm or 2 mm sieves to remove roots and pebbles. Pre-treating samples in this way has the added benefit of allowing archaeologists to recover micro-artefacts and ecofacts such as hammer scale and fish bones, which may not be apparent during field excavation work. Different size fractions recovered in sieves can then be quantified for particle-size analysis and examined under magnification to identify very small artefacts and ecofacts that are associated with the sampled context. The methodology is generally low risk and maximizes recovery of information from samples.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Spillage of licenced material, dust inhalation, contact with contaminated soil (e.g. chemical, diesel, biological hazards, incl. Tetanus/E-Coli/Weil's Disease/Toxoplasmosis/Toxocariasis)			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use of extraction cabinet (D131), fumehood (D132), and microscopes must be carried out before use. For work with licenced soil, the designated licenced trays, sieves, mortars and pestles must be used to avoid contamination of communal equipment.	

material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin.

Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE.

All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required.

Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.

Spillages

Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes.

Refer to *Protocol for Working with DEFRA Licenced Materials* for larger spills

All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.

Cleaning of Equipment

Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll.

Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal.

It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.

Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.

Unlicenced material – all equipment should be cleaned with plastic bottle brush and detergent before rinsing with tap water and air drying.

Licenced material – designated licenced mortars, pestles, sieves, bases, trays and any implements used should be cleaned with a plastic bottle brush and 10% Anigene disinfectant spray before rinsing with tap water and air drying.

Designated licenced mortars, pestles, sieves, bases, trays and any implements used must be cleaned thoroughly with a damp tissue and sprayed and wiped using 10% Anigene disinfectant solution and blue roll.

Disposal

- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company.
- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- Users must consider the likely amount of waste generated in advance of planned work with licenced materials to ensure waste storage capacity is not exceeded.

- The Department's licenced soil catalogue must be updated when materials are disposed of.
- Unlicensed material – used material can either be tipped back into sample container for retention or placed in the bin.
- Licensed material – used sample material can be retained in an appropriately labelled bag if required and returned to licenced soil storage, or placed in the designated sealed DEFRA waste soil bin for disposal.

Soil/Sediment Sample Preparation by Drying, Powdering, Sieving, and Residue Sorting Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment Aluminium trays Mortar and pestle Sieves (1mm, 2mm, or a bigger stack, depending on need) and sieve bases and lids Metal spatula or spoon Plastic trays Sieve brush Brushes and tweezers Funnels Beakers Bags for subsamples Sharpie markers Hand lens or magnifying lamp Microscope	PPE Standard polycotton lab coat covered with plastic apron (which can be wiped clean or sent for offsite disposal) Gloves	Chemicals Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material
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Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1. Open sample bags, pour samples into aluminium trays, label the trays, and either air dry the sample or dry them in a warm airing cupboard (<30°C).	Dust inhalation Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Spillage of licenced material	Staff, students, researchers	Dust inhalation, particularly silica dusts often found in soils can cause long-term serious lung conditions. Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such	4 x 4 High Risk (Known to occur, Major)	All dust-generating sample preparation work must be undertaken under extraction in extraction cabinet (D131). Wear all appropriate PPE and wash hands thoroughly afterwards (especially before eating/drinking). Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and	2 x 2 Low Risk (Not likely, Minor)

			as asthma from dust inhalation. Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis Contamination of equipment and working surfaces with licenced material		wiped with Anigene disinfectant after working. Any spills of licenced material should be cleaned up immediately following the protocols above	
2. If samples are aggregated, gently powder with a designated licenced mortar and pestle	Dust inhalation Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Spillage of licenced material	Staff, students, researchers	Dust inhalation, particularly silica dusts often found in soils can cause long-term serious lung conditions. Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation. Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis Contamination of equipment and working surfaces with licenced material	4 x 4 High Risk (Known to occur, Major)	All dust-generating sample preparation work should be undertaken under extraction in extraction cabinet (D131). Wear all appropriate PPE and wash hands thoroughly afterwards (especially before eating/drinking). Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working. Any spills of licenced material should be cleaned up immediately following the protocols above	2 x 2 Low Risk (Not likely, Minor)
3. Pour 50-100g of sample into a clean 1mm/2mm mesh sieve or a larger nest of sieves with a sieve base (use designated) licenced soil sieves.	Dust inhalation Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Spillage of licenced material	Staff, students, researchers	Dust inhalation, particularly silica dusts often found in soils can cause long-term serious lung conditions Respiratory illness and issues from dust inhalation Possible eyes, nose, throat irritation from dust inhalation	4 x 4 High Risk (Known to occur, Major)	All dust-generating sample preparation work must be undertaken under extraction in extraction cabinet (D131). Wear all appropriate PPE and wash hands thoroughly afterwards (especially before eating/drinking).	2 x 2 Low Risk (Not likely, Minor)

			Aggravation of existing health conditions such as asthma from dust inhalation Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis Contamination of equipment and working surfaces with licenced material		Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above	
4. Agitate the sample by shaking it to allow sample to pass through the sieve.	Dust inhalation Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Spillage of licenced material	Staff, students, researchers	Dust inhalation, particularly silica dusts often found in soils can cause long-term serious lung conditions Respiratory illness and issues from dust inhalation Possible eyes, nose, throat irritation from dust inhalation Aggravation of existing health conditions such as asthma from dust inhalation Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis Contamination of equipment and working surfaces with licenced material	4 x 4 High Risk (Known to occur, Major)	All dust-generating sample preparation work must be undertaken under extraction in extraction cabinet (D131). Wear all appropriate PPE and wash hands thoroughly afterwards (especially before eating/drinking). Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above	2 x 2 Low Risk (Not likely, Minor)
5. Collect the fine residue through a funnel into a small beaker and transfer sieved soil from beaker to a labelled sample bag.	Dust inhalation Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Spillage of licenced material Licenced material	Staff, students, researchers	Dust inhalation, particularly silica dusts often found in soils can cause long-term serious lung conditions Respiratory illness and issues from dust inhalation Possible eyes, nose, throat	4 x 4 High Risk (Known to occur, Major)	All dust-generating sample preparation work must be undertaken under extraction in extraction cabinet (D131). Wear all appropriate PPE and wash hands thoroughly afterwards	2 x 2 Low Risk (Not likely, Minor)

	remaining on equipment		irritation from dust inhalation Aggravation of existing health conditions such as asthma from dust inhalation Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis Contamination of equipment and working surfaces with licenced material		(especially before eating/drinking). Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Carefully follow all equipment cleaning instructions listed above	
6. For residue sorting, sieved residues can be tipped onto clean designated plastic trays and examined for presence of artefacts/ecofacts using either microscope or magnifying lens. Artefacts/ecofacts should be stored in labelled bags as appropriate.	Prolonged sitting at benches/postural problems Prolonged use of microscope Licenced material remaining on equipment	Staff, students, researchers	Pain, discomfort or injury from postural problems (e.g. to hands/arms from overuse, improper use or poorly designed workstation/work environment) Headaches or sore eyes from e.g. overworking, poor lighting Musculoskeletal discomfort, pain and injury from using microscope with improperly adjusted eye pieces and focus for individual use. Eye strain and headaches from prolonged use of microscope and improper adjustment for individual use. Contamination of equipment and working surfaces with	4 x 3 Medium Risk (Known to occur, Moderate)	Use of backed chairs not lab stools for prolonged period of work. Chairs adjusted to correct height/position. Use of proper sitting spaces – not in front of cupboards where you have to twist your legs. Regular breaks from sitting. Workstation Assessment training available to ensure correct seating position Proper adjustment and use of binocular eye pieces and microscope focus. Use of low rather than high light intensities. Regular breaks for eyes – look up and focus eyes at different focal distances.	2 x 2 Low Risk (Not likely, Minor)

			licenced material		Carefully follow all equipment cleaning instructions listed above	
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Internal Guidance/Linked Documents:		Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials, Microscope work RA	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of process (especially if microscope is to be used) and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	8/8/2024	Date:	2/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

 Durham University		COSHH Assessment Form		Serial:	DU/DEPT/COSHH0001	
Date	10/8/24	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015).		Workplace	
					Research	x
					Cleaning/Maintenance	
					Other	
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)				
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?					Yes	No
Substitution: Is it possible to use a less harmful substance to do the work?					Yes	No
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products						
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.		How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)				
Persons at risk		Employees	x	Students	x	Others
						Vulnerable persons
Classification (tick the box next to the appropriate sign)						
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm						
	Very toxic	 	Irritant	 	Highly flammable	
 	Toxic		Compressed gas	 	Extremely flammable	
 	Corrosive		Biological hazard		Serious long term health hazard	
	Harmful	 	Oxidising	 	Dangerous to the environment	x
 	Explosive	 	Flammable			
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/						
 First Aid						
Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.					
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low					

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state				Other state	
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)							
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						<u>Yes</u> No	To EN166 or equivalent					
	Respirator						Goggles						
	<u>Yes</u> No	Nitrile gloves					Yes No						
	Gloves						Overalls						
	Yes No						<u>Yes</u> No	Standard polycotton labcoat					
	Footwear						Other						
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x	Fire Blanket					

							(alcohol resistant)			
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor				Is exposure adequately controlled?	Yes	No	
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) AB Parker 						Date 10/8/24		Review date 5/9/2024		

Soil/sediment Descriptions

Risk Assessment for Work with DEFRA Licenced Materials		Date:	10/8/2024 (revised 21/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Soil/sediment Descriptions		D112 – Archaeomaterials Sample Preparation Laboratory D128 – Palaeoecology Laboratory (Fenwick Laboratory) D131 – Environmental Archaeology Processing Laboratory D132 – Archaeological Science Laboratory D006 – Materials Analysis Laboratory D204 – Teaching Laboratory D136C – Geoarchaeology Laboratory	
Description of Process:			
Using small quantities of soil samples and standard guides such as the Munsell colour chart to identify soil type, colour, texture, inclusions and other relevant features.			
Objectives and Applications of Process:			
- Identify soil type, colour, texture, inclusions and other relevant features. - Applicable to full range of soil and sediment types (peat to fully mineral sediment)			
Justification of Use of Process:			
Soil/sediment descriptions are fundamental and complementary to all other soil analytical procedures. Soil/sediment characteristics improve the understanding the matrix of archaeological sites and off-site samples and inform the use of additional soil analyses to develop interpretations of a site and its environment. It is often done in the field, but sometimes it is necessary to complete soil/sediment descriptions in the laboratory. The methodology is generally low risk and maximises recovery of information from samples.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Exposure to contaminated soils, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Licenced materials - only the Munsell colour chart designated for licenced material is to be used for soil descriptions. Licenced materials – only the marigold gloves designated for licenced material should be used for soil descriptions. Pages used in the licenced material Munsell colour	

material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin.

Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE.

All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required.

Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.

chart and the licenced marigold gloves should be cleaned thoroughly with damp tissue and then sprayed and wiped using Anigene disinfectant solution after use.

All attempts should be made to avoid bringing contaminated soils into the laboratory.

Spillages

Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes.

Refer to Protocol for Working with DEFRA Licenced Materials for larger spills

All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.

Cleaning of Equipment

Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll.

Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal.

It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.

Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.

Pages used in the licenced material Munsell colour chart and the licenced marigold gloves should be cleaned thoroughly with damp tissue and then sprayed and wiped using 10% Anigene disinfectant solution after use.

Disposal

- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company.
- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- Users must consider the likely amount of waste generated in advance of planned work with licenced materials to ensure waste storage capacity is not exceeded.
- The Department's licenced soil catalogue must be updated when materials are disposed of.

- Unlicensed material – used sample material can either be tipped back into sample container for retention or placed in the bin.
- Licensed material – used solid sample material can be retained in an appropriately labelled bag if required and returned to licensed soil storage, or placed in the designated sealed DEFRA waste soil bin for specialist disposal.
- Licensed material – Where slurries have formed from combination of sample with water, slurries must be dried by evaporation in the designated DEFRA authorised imported soil beaker. Dried soil can then be collected and placed in the sealed DEFRA waste soil bin for offsite disposal. The beaker and other equipment used to collect waste soil must be cleaned thoroughly with damp tissue and then disinfected using 10% Anigene solution.

Soil Descriptions Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment Nitrile gloves/designated marigold gloves Designated Munsell colour chart	PPE Nitrile gloves Marigold gloves Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Safety glasses	Chemicals Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licensed material
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Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1. Work a small quantity of soil in the hands (wearing gloves) with water until it reaches its plastic limit, and follow guidelines for the identification of texture.	Spillage of licensed material Contaminated soil chemical, diesel, biological hazards (Tetanus / E-Coli / Weil's Disease / Toxoplasmosis / Toxocariasis)	Staff, students, researchers	Contamination of equipment and working surfaces with licensed material. Illness and potential allergic reactions from handling organic soils or from cross-contamination to food/drink. Development of illness as a result of exposure to pathogens (e.g. Tetanus, E-Coli, Well's	4 x 4 High Risk (Known to occur, Major)	PPE (lab coat, aprons, gloves, safety glasses) must be worn at all times to avoid contact between soil and skin. Wash hands thoroughly afterwards (especially before eating/drinking) Any spills of licensed material should be cleaned up immediately following the guidance/protocols above Slurries should be retained in designated waste	3 x 3 Medium Risk (Could occur, Moderate)

			Disease, Toxoplasmosis, Toxocariasis) Potential for infection through existing cuts/wounds on skin Potential injury and irritation from contact or inhalation of chemical or diesel in liquid or vapour forms (e.g. respiratory tract/eye irritation, dermatitis, aggravation of existing health conditions, etc)		beaker for evaporation. Dried soils must then be collected and put in DEFRA waste soil bin for specialist disposal. All cuts to be covered with waterproof plasters. Appropriate gloves to be provided (nitrile / marigolds). Prior assessment of the soil samples by trained personnel on site to ensure contaminated samples are not sent to the lab. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working.	
2. Use Munsell colour chart and other guides to identify soil colour, texture, inclusions, etc.	Licenced material remaining on equipment after use. Inappropriate disposal of licenced materials.	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material. Release of licenced soil into general waste.	3 x 2 Low Risk (Could occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working. Damp tissue used to clean licenced Munsell colour/other guides and marigold gloves should be retained and disposed of as licenced material in designated	2 x 1 Low Risk (Not likely, Insignificant)

					DEFRA waste soil bin.	
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Internal Guidance/Linked Documents:		Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of process (especially if microscope is to be used) and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	10/8/2024	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5
			Extreme risk	High risk	Medium risk	Low risk	

		COSHH Assessment Form		Serial:		DU/DEPT/COSHH0001	
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015).			Workplace	
						Research	x
						Cleaning/Maintenance	
						Other	
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)					
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products							
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)					
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons
Classification (tick the box next to the appropriate sign)							
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm							
	Very toxic			Irritant			Highly flammable
	Toxic			Compressed gas			Extremely flammable
	Corrosive			Biological hazard			Serious long term health hazard
	Harmful			Oxidising			Dangerous to the environment
	Explosive			Flammable			
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/							
 First Aid							
Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low						

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)							
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						<u>Yes</u> No	To EN166 or equivalent					
	Respirator						Goggles						
	<u>Yes</u> No	Nitrile gloves					Yes No						
	Gloves						Overalls						
	Yes No						<u>Yes</u> No	Standard polycotton labcoat					
	Footwear						Other						
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket					

During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Karen M. Leck</i>					Date 10/8/24		Review date 5/9/2024			

Soil/sediment Subsampling

Risk Assessment for Work with DEFRA Licenced Materials		Date: 15/6/2024 (revised 21/2/25)
		Review Date: 8/9/2024
Process:	Licensed locations for work:	
Soil/sediment subsampling	D112 – Archaeomaterials Sample Preparation Laboratory; D128 – Palaeoecology Laboratory (Fenwick Laboratory); D131 – Environmental Archaeology Processing Laboratory; D132 – Archaeological Science Laboratory; D204 – Teaching Laboratory; D136E – Luminescence Laboratory; D204 – Teaching Laboratory; D006 – Materials Analysis Laboratory; D136C – Geoarchaeology Laboratory	
Description of Process:		
Subsampling of soil or sediment samples originally taken in ziplock polythene bags, metal Kubiena tins (up to 15 cm long), metal monolith tins (up to 50 cm long), hard plastic tubes or polythene core liners (up to 100 cm long). In a licenced laboratory, the original samples are opened on a designated tray to capture any spilled soil, and a small amount of soil or sediment is removed using a pallet knife, trowel, teaspoon, or sample corer, depending on the original sample type and the size and type of subsample needed. The subsample is transferred to a small ziplock polythene bag, vial, or Kubiena tin, carefully sealed, labelled, and stored in a licenced room prior to being analysed using one or more analytical procedures described in other risk assessments.		
Objectives and Applications of Process:		
- To extract a small sample of soil or sediment for one or more analytical procedures (described in other risk assessments). The remainder of the original sample is either kept in storage until it is required again or disposed of in the designated DEFRA soil disposal bin. - Applicable to wide range of soil and sediment types, ranging from peat to partial or fully mineral soils or sediments		
Justification of Use of Process:		
Archaeological soil or sediment samples are often subjected to a wide range of analyses as a part of routine archaeological research. This requires the original sample to be subsampled for a specific analytical method or methods, and then returned to storage. Sometimes the original sample needs to be reduced in size to rationalize storage, and in this case after subsampling the remainder of the original sample is disposed of following the protocols for licenced soil disposal.		
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?	Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?	Yes	<u>No</u>
Most Significant Risk(s):		
Exposure to contaminated soils, spillage of licenced material, inappropriate disposal of licenced material.		
Biosafety – work with DEFRA licenced materials	General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be	PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes All dust-generating soil work must be undertaken under extraction in the designated extraction cabinet (D131).	

undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	Vials, ziplock bags, or Kubiena tins should be securely closed before being moved to prevent spillage. Only equipment designated for use with DEFRA licenced material to be used (e.g. tray, subsampling tools, etc). Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. <i>Refer to Protocol for Working with DEFRA Licenced Materials for larger spills</i> All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i>
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Disposal
• Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. • Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. • Users must consider the likely amount of waste generated in advance of planned work with licenced materials to ensure waste storage capacity is not exceeded. • The Department’s licenced soil catalogue must be updated when materials are disposed of.

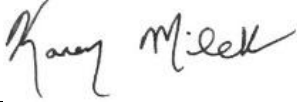
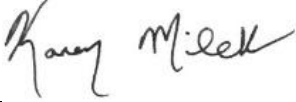
Soil Processing Task-Based Risk Assessment
Equipment required (including PPE, tools, chemicals, etc)

Equipment Tray Subsampling tools: pallet knife, trowel, teaspoon, sample corer Storage container, e.g., ziplock polythene bag, vial with lid, or Kubiena tin tightly wrapped with cling film and packaging tape		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves Safety glasses		Chemicals Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material		
Work Step/ Tasks <i>(Describe the tasks/steps involved in the order of work)</i>	Hazards Identified for each task/step	Those at risk <i>(people who could be harmed)</i>	How could they be harmed? <i>(nature of injuries, damage that could result)</i>	Uncontrolled risk level <i>(level of risk without control)</i>	Required controls <i>(how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)</i>	Controlled risk level <i>(level of risk remaining when controls are in place)</i>
1. Take the original samples out of storage, and, in a licenced lab, one by one place on a tray for subsampling. If the sample is dry, place the tray under extraction (D131 extraction cabinet)	Manual handling Spillage of licenced material during movement	Staff, students, researchers	Musculoskeletal discomfort, pain and injury from manually handling and lifting. Injury from incorrectly lifting, carrying and handling sample bags or cores Injury from tripping over obstacles, whilst handling boxes, bags, or cores Contamination of equipment and working surfaces with licenced material.	4 x 4 High Risk (Known to occur, Major)	Do not carry heavy loads. Divide samples in heavy boxes into smaller boxes if necessary Place samples on the designated tray(s) to capture any spilled soil or sediment. Wear all appropriate PPE and wash hands thoroughly afterwards (especially before eating/drinking). All cuts to be covered with waterproof plasters. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Ensure vials, ziplock bags, or Kubiena tins are securely closed and in good	2 x 2 Low Risk (Not likely, Minor)

					condition before moving them. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working.	
2. Using a clean tool such as a pallet knife, trowel, teaspoon, or sample corer (depending on the type of sample and the size of the subsample needed), remove the necessary quantity of soil or sediment and transfer to another container (e.g. ziplock polythene bag or vial with lid). Label the new storage container.	Dust inhalation Tetanus / E – Coli / Weil's Disease / Toxoplasmosis / Toxocariasis. Glove allergy. Bending for a long time to reach the bucket in a sink leading to back strain. Spillage of licenced material. Inappropriate disposal of licenced material.	Staff, students, researchers.	Dust inhalation, particularly silica dusts often found in soils can cause long-term serious lung conditions. Respiratory illness and issues, and possible eyes, nose, throat irritation from dust inhalation Aggravation of existing health conditions such as asthma from dust inhalation. Illness and potential allergic reactions from handling organic soils directly or from cross-contamination to food/drink. Development of illness as a result of exposure to pathogens (e.g. Tetanus, E-Coli, Well's Disease, Toxoplasmosis, Toxocariasis). Potential for infection through existing cuts/wounds on skin. Allergic reaction to glove material when	4 x 4 High Risk (Known to occur, Major)	All dust-generating sample preparation work should be undertaken under extraction in extraction cabinet (D131). Wear all appropriate PPE and wash hands thoroughly afterwards (especially before eating/drinking). All cuts to be covered with water-proof plasters. Prior assessment of the soil samples by trained personnel on site to ensure contaminated samples are not sent to the lab. Inform staff of any allergies. Ensure work is conducted on a designated tray to contain any spills of licenced material. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with	2 x 2 Low Risk (Not likely, Minor)

			contact made with skin. Musculoskeletal pain, discomfort and injury from prolonged working in the same position and doing repetitive tasks. Contamination of equipment and working surfaces with licenced material.		Anigene disinfectant after working. Equipment used must be thoroughly cleaned with damp tissue and then sprayed and wiped with 10% Anigene solution.	
3. Reseal the original sample and return to storage or dispose	Spillage of licenced material. Inappropriate disposal of licenced material. Spillage of licenced material during movement	Staff, students, researchers	Injury from incorrectly lifting, carrying and handling bagged soil or cores. Injury from tripping over obstacles whilst handling samples or boxes. Contamination of equipment and working surfaces with licenced material.	4 x 3 Medium Risk (Known to occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Ensure work is conducted on a tray to contain any spills of licenced material. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working. Ensure vials, ziplock bags, or Kubiena tins are securely closed and in good condition before moving them.	2 x 2 Low Risk (Not likely, Minor)

Internal Guidance/Linked Documents:	Manual handling risk assessment, Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials	
Competence Requirements:	Training and competence judgement by lab manager/supervisor or technicians as required for new users of process (especially if microscope is to be used) and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:		
Assessment Prepared by		Supervisor/Manager acceptance

Name:	Karen Milek	Name:	Karen Milek
Signature:		Signature:	
Date:	15/6/2024	Date:	8/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form			Serial:		DU/DEPT/COSHH0001		
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015).			Workplace			
					Research		x		
					Cleaning/Maintenance				
					Other				
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)							
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?							Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?							Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products									
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licensed soils and cleaning/containing licensed soil spillages in laboratories and storage areas.			How Long?	How Often?	How Much?		
					30 mins	As needed	600ml max (spray bottle)		
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)							
Persons at risk		Employees	x	Students	x	Others		Vulnerable persons	
Classification (tick the box next to the appropriate sign)									
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm									
	Very toxic			Irritant			Highly flammable		
	Toxic			Compressed gas			Extremely flammable		
	Corrosive			Biological hazard			Serious long term health hazard		
	Harmful			Oxidising			Dangerous to the environment	x	
	Explosive			Flammable					
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/									
 First Aid									
Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.								
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low								

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licensed soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					
	Yes No							<u>Yes</u> No	Standard polycotton labcoat				
	Footwear							Other					

Fire: identify appropriate extinguishers here										
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor			Is exposure adequately controlled?	Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Harry M. Leek</i>						Date 10/8/24	Review date 5/9/2024			

Soil/sediment Flotation and Wet Sieving

Risk Assessment for Work with DEFRA Licenced Materials		Date:	5/7/2024 (revised 21/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Soil/sediment flotation and wet sieving		D131 – Environmental Archaeology Processing Laboratory D132 – Archaeological Science Laboratory	
Description of Process:			
Archaeological soil or sediment is mixed with water to extract (by flotation) charred/desiccated plant macrofossils. Small samples of 200ml or less are weighed and their volume measured. They are then mixed with water in a bucket and the samples are gently disaggregated in the water by hand (wearing gloves). Depending on the sample and what needs to be extracted from it, a frothing agent (liquid detergent) may be added. The fossil plant remains are concentrated at the top of (or above) the water in what is called the 'flot', which is captured by washing it over the lip of the bucket or flotation tank into a fine metal sieve or plastic mesh, into a second bucket. Any suspended clay or silt that is washed over the lip of the bucket is captured in the second trap and is disposed of using the procedures for licenced soils once the water has evaporated and the sample is dried. Fossil plant materials, and occasionally other light materials such as glass beads, small bones and eggshells recovered in the 'flot', are transferred to a drying tray, air-dried or dried in a low-temperature oven (25-30°C), and analysed under stereomicroscopes. Any artefacts found in the heavy fraction (e.g. pottery, iron hammer scale) are re-cleaned with damp tissues and then disinfected, dried, and catalogued. The gravel, sand, and coarse silt fractions (the 'heavy fraction') are washed in this process and sink to the bottom of the bucket. They are then transferred to a drying tray, air-dried or dried in a low-temperature oven (25-30°C), scanned to recover any artefacts, and disposed of following the disposal procedures for licenced soils (see below).			
Objectives and Applications of Process:			
• Separation of plant macrofossils, microfossils, and fossil insect parts from the mineral component of soil to enable them to be identified and quantified using light microscopes • Applicable for wide range of soil and sediment types (peat to fully mineral sediments)			
Justification of Use of Process:			
Identification and quantification of fossilized (usually by charred) plant and wood remains is a critical component of all environmental archaeology studies to provide information about past plant and wood use for food, fuel, and building materials. Flotation in water is the international standard method for separating plant macrofossils from the mineral component of soil prior to archaeobotanical analysis using light microscopes.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Exposure to contaminated soils, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Only the labelled equipment designated for work with licenced soil to be used (i.e. buckets, beaker, sieves/mesh, drying trays, etc.)	

unlicensed materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	When using the low-temperature oven for work with licenced soil, the DEFRA authorised imported soil warning sign must be placed on the outside of the door for the duration of use. Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. <u>Refer to Protocol for Working with DEFRA Licenced Materials for larger spills</u> All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials, and any artefacts found in the heavy fraction, should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and either air dried or dried with blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.</i> <i>Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i>
Disposal - Licensed waste sample suspensions from the flotation process must be dried by evaporation in the designated DEFRA authorised imported soil beaker or bucket. Dried licenced material can then be collected and placed in the sealed DEFRA waste soil bin for offsite disposal. The beaker/bucket and other equipment used to collect waste licenced material must be cleaned thoroughly with damp tissue and then disinfected using 10% Anigene solution. - Disposal of licenced material, including the dried heavy fraction and silt captured in the buckets, is organised by the Technical Team (D203A) and sent for incineration by an external company. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - The Department's licenced soil catalogue must be updated when materials are disposed of.	

Soil Processing Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment Buckets Beaker Sieves/sieve mesh of different sizes Scale and scale tray/container Drying trays Drying ovens (optional)	PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves Marigold gloves Safety glasses	Chemicals Optional: Liquid detergent (frothing agent) Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material
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Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1. Calculate the volume and weight of the sample and record the basic soil descriptions on individual context recording sheet.	Manual handling Contaminated soil chemical, diesel, biological hazards (Tetanus / E-Coli / Weil's Disease / Toxoplasmosis / Toxocariasis) Spillage of licenced material	Staff, students, researchers	Musculoskeletal discomfort, pain and injury from manually handling and lifting. Injury from incorrectly lifting, carrying and handling buckets Injury from tripping over obstacles, whilst handling boxes Mechanical or entrapment injuries from mishandling of buckets. Potential injury and irritation from contact or inhalation of chemical or diesel in liquid or vapour forms (e.g. respiratory tract/eye irritation, dermatitis, aggravation of existing health conditions, etc)	4 x 4 High Risk (Known to occur, Major)	Do not over fill bucket. Only small samples of 200ml or less to be used in this process. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. All cuts to be covered with waterproof plasters. Prior assessment of the soil samples by trained personnel on site to ensure contaminated samples are not sent to the lab. Wash hands thoroughly afterwards (especially before eating/drinking). Any spills of licenced material should be cleaned up immediately following the protocols above.	3 x 3 Medium Risk (Could occur, Moderate)

			Illness and potential allergic reactions from handling organic soils directly or from cross-contamination to food/drink. Development of illness as a result of exposure to pathogens (e.g. Tetanus, E-Coli, Well's Disease, Toxoplasmosis, Toxocariasis) Potential for infection through existing cuts/wounds on skin Contamination of equipment and working surfaces with licenced material.		Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
2. Add water to the soil and mix it to break up lumps, and swirl in a squirt of liquid detergent if needed	Tetanus / E – Coli / Weil's Disease / Toxoplasmosis / Toxocariasis. Cuts from glass/sharp stones, etc. Glove allergy. Bending for a long time to reach the bucket leading to back strain. Spillage of licenced material. Inappropriate disposal of licenced material.	Staff, students, researchers.	Illness and potential allergic reactions from handling organic soils directly or from cross-contamination to food/drink. Development of illness as a result of exposure to pathogens (e.g. Tetanus, E-Coli, Well's Disease, Toxoplasmosis, Toxocariasis). Potential for infection through existing cuts/wounds on skin. Cuts to the skin from visible or concealed sharp stones/glass.	4 x 4 High Risk (Known to occur, Major)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. All cuts to be covered with waterproof plasters. Prior assessment of the soil samples by trained personnel on site to ensure contaminated samples are not sent to the lab. Wash hands thoroughly afterwards (especially before eating/drinking). Do not squeeze soil – just lightly break up lumps with fingers. Wear designated licenced washing	3 x 3 Medium Risk (Could occur, Moderate)

			Potential for infection of cuts if improperly treated. Potential for foreign body or fragment (e.g. sharp stone/glass) to remain within cut. Allergic reaction to glove material when contact made with skin. Musculoskeletal pain, discomfort and injury from prolonged working in the same position and doing repetitive tasks. Contamination of equipment and working surfaces with licenced material. Release of licenced material into general waste.		up gloves – marigold style. Inform staff of any allergies. If necessary, use a wire stand to elevate the bucket to a comfortable height. Ensure work is conducted in either extraction cabinet (D131) or fume cupboard (D132) to contain any spills of licenced material. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
3. Carefully drain water from bucket through 63-500 micron mesh to catch flots into second bucket. Repeat steps 2 and 3 until water runs clean.	Manual handling (bucket, soil and water can be heavy and process time consuming). Spillage of licenced material. Inappropriate disposal of licenced material.	Staff, students, researchers	Musculoskeletal discomfort, pain and injury from manual handling and repetitive actions. Injury from incorrectly lifting, carrying and handling buckets. Injury from tripping over obstacles whilst handling bucket Mechanical or entrapment injuries from mishandling of buckets. Contamination of equipment	4 x 3 Medium Risk (Known to occur, Moderate)	Use a wire stand to elevate the bucket if necessary. Tip water out slowly and carefully using the edge of the wire stand as a support. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Ensure work is conducted in either extraction cabinet (D131) or fume cupboard (D132) to contain any spills of licenced material, and to ensure that	2 x 2 Low Risk (Not likely, Minor)

			and working surfaces with licenced material. Release of licenced material into general waste.		all silt and clay is captured in the designated bucket.	
4. (optional step) put residue remaining in the bucket into a 1mm mesh and rinse into designated bucket or beaker.	Licenced soil remaining on equipment.	Staff, students, researchers	Contamination of equipment with licenced material.	3 x 2 Low Risk (Could occur, Minor)	Designated sieve and mesh to be used with licenced material. Ensure work is conducted in either extraction cabinet (D131) or fume cupboard (D132) to contain any spills of licenced material.	2 x 2 Low Risk (Not likely, Minor)
5. Place residue and flot into designated metal drying trays, label appropriately, and place on air-drying racks or in the low-temperature ovens to dry.	Burns from objects already in the drying ovens as the metal trays can get hot. Spillage of licenced material.	Staff, students, researchers	Burns and other heat-related injuries from metal trays and objects already in oven. Contamination of equipment and working surfaces with licenced material.	4 x 3 Medium Risk (Known to occur, Moderate)	When moving items into or from the drying ovens wear the oven gloves provided. Licenced material – ensure drying trays are labelled appropriately to identify licenced material. Licenced and non-licenced material should not be dried together in the same oven. The DEFRA authorised imported soils warning sign should be placed on the oven door while it is in use to prevent other lab users putting other samples in. Any spills of licenced material should be cleaned up immediately following the protocols above.	2 x 2 Low Risk (Not likely, Minor)

Internal Guidance/Linked Documents:	Manual handling risk assessment, Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials
Competence Requirements:	Training and competence judgement by lab managers/supervisors or technicians as required for new users of process/manual handling and those new to working with licenced materials. Lab users must receive a specialised

		laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>AB Parker</i>	Signature:	<i>Karen Milek</i>
Date:	5/7/2024	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form		Serial:		DU/DEPT/COSHH0001	
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace	
					Research	x	
					Cleaning/Maintenance		
					Other		
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)					
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products							
Describe the activity or work process.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long?	How Often?	How Much?
Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.					30 mins	As needed	600ml max (spray bottle)
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)					
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons
Classification (tick the box next to the appropriate sign)							
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm							
	Very toxic			Irritant			Highly flammable
	Toxic			Compressed gas			Extremely flammable
	Corrosive			Biological hazard			Serious long term health hazard
	Harmful			Oxidising			Dangerous to the environment
	Explosive			Flammable			
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/							
 First Aid							
Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low						

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state				Other state	
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)							
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						<u>Yes</u> No	To EN166 or equivalent					
	Respirator						Goggles						
	<u>Yes</u> No	Nitrile gloves					Yes No						
	Gloves						Overalls						
	Yes No						<u>Yes</u> No	Standard polycotton labcoat					
	Footwear						Other						
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket					

During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences		Minor		Is exposure adequately controlled?		<u>Yes</u>	No	
		Likelihood		Not likely						
		Evaluation phrase		Low Risk						
Signature(s) <i>AB Parker</i> 						Date 10/8/24		Review date 5/9/2024		

Loss on ignition (LOI)

Risk Assessment for Work with DEFRA Licenced Materials		Date:	5/7/2024 (revised 24/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Loss on ignition (LOI)		Preparation: D112 – Archaeomaterials Sample Preparation Laboratory; D131 – Environmental Archaeology Processing Laboratory; D132 – Archaeological Science Laboratory Analysis: D132 – Archaeological Science Laboratory	
Description of Process:			
Use of the muffle furnace to determine the organic matter content of soils and sediments through a Loss on Ignition (LOI) procedure. Samples of soil/sediment are weighed into crucibles, dried at 105°C for 24 hours to remove moisture then heated to 550°C for four hours to combust organic material within sample. After cooling to room temperature, samples are reweighed and mass loss calculated.			
Objectives and Applications of Process:			
- Determine organic matter/carbon content of soils and sediments, defined by mass loss following heating to 550°C for a period of 4 hours - Applicable for wide range of soil and sediment types (peat to fully mineral sediments)			
Justification of Use of Process:			
Quantification of organic matter is a key element in the characterization of soils and sediments. Mass loss during combustion at elevated temperature is a useful proxy for overall organic matter content since organic material is expected to be thermally labile at high temperatures. Selection of an appropriately high combustion temperature and duration (typically 550°C for 4 hours) ensures all organic matter in a sample is removed, allowing calculation of original organic matter content by subtraction. The muffle furnace allows for controlled, contained heating, with smoke, volatile organic matter and other gases removed by mechanical extraction. Multiple samples can be processed in a single furnace run.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Heat related burns, spillage of licenced material, dust inhalation			
Safety Measures			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicensed materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material.		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Heat resistant gloves to be worn any time operator could come into contact with hot equipment/materials. Equipment Safety Notes (full equipment list below) Extraction must be turned on when furnace is in use. Use tray, handle, and metal tongs when loading/removing samples. 4 clean dry bricks/similar plinth used to raise furnace	

Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	and permit air flow if used in fume cupboard. The DEFRA authorised imported soils warning signs must be placed on the furnace and oven doors while in use. Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. <u>Refer to Protocol for Working with DEFRA Licenced Materials for larger spills</u> All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. <i>Ashed soil remaining in crucible after LOI process (i.e. after heating to 550°C for 4 hours) must be tipped into the collection bag for disposal in the sealed DEFRA waste soil bin. Crucibles should be cleaned with a damp tissue that is disposed of in the DEFRA waste soil bin to await offsite disposal.</i> <i>Small spills of material not heated to 550°C for 4 hours should be wiped up using blue roll with Anigene.</i> Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.</i> <i>Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Any weighing equipment used with licenced materials (e.g. metal spatula/spoon) must be cleaned with damp tissues to removal soil and then sprayed and wiped with 10% Anigene disinfectant spray and blue roll.
Disposal - Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. <i>Ashed soil remaining in crucible after LOI process (i.e. after heating to 550°C for 4 hours) must be tipped into the collection bag for disposal in the sealed DEFRA waste soil bin.</i>	

- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- The Department's licenced soil catalogue must be updated when materials are disposed of.

Loss on Ignition Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment	PPE	Chemicals
Muffle furnace Porcelain crucibles Carbolite oven Metal loading tray and detachable handle Sartorius 5 figure balance Metal spatula or spoon 4 clean dry bricks/plinth (if used in fume cupboard) Desiccator	Standard polycotton labcoat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile/vinyl gloves Safety glasses Heat resistant gloves to be worn any time operator could come into contact with hot equipment/materials	Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.

Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1. Weigh empty crucibles using 5-figure Sartorius balance in D132	Crucible breakage	Staff, students, researchers	Cuts and related injuries from broken sherds of ceramic crucibles	4 x 2 Medium Risk (Known to occur, Minor)	Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders	2 x 2 Low Risk (Not likely, Minor)
2. Add sieved soil/sediment sample to crucible under extraction using a clean steel spatula (recommended around 5g). Extraction cabinet in D131.	Spillage of licenced material Dust inhalation Crucible breakage	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Respiratory illness/irritation and potential aggravation of existing conditions/allergies (e.g. asthma)	4 x 4 High Risk (Known to occur, Major)	Dust-generating sample preparation work must be undertaken using the extraction cabinet in D131. Do not overfill crucibles. Ensure enough room is left around the lip to allow crucibles to be moved using tongs and to limit risk of sample lift/escape during combustion.	2 x 3 Low Risk (Not likely, Moderate)

			Dust inhalation (particularly silica dusts often found in soils) can cause long-term serious lung conditions Cuts and related injuries from broken sherds of ceramic crucibles		Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
3. Weigh sample + crucible weight using balance in D132 and record	Spillage of licenced material Crucible breakage	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Cuts and related injuries from broken sherds of ceramic crucibles	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	2 x 2 Low Risk (Not likely, Minor)
4. Connecting and programming the oven and furnace	Electrical shock Damage to equipment from incorrect programming	Staff, students, researchers	Electrical shocks or burns from using faulty electrical equipment Injury resulting from incorrect programming or use of damaged equipment	4 x 4 High Risk (Known to occur, Major)	Furnace and oven are PAT tested for electrical safety annually Inspect oven, furnace and cables before use. Do not use if damage identified (report to technicians in D203A)	2 x 3 Low Risk (Not likely, Moderate)

					Only trained users to adjust furnace and oven settings The DEFRA authorised imported soils warning signs must be placed on the oven and furnace doors while they are in use and contain licenced material.	
5. Drying samples in oven at 105°C. Place crucibles onto the steel tray and load them into the oven. Ensure ventilation hood is running. Leave samples in the oven for 24 hours to dry.	Hot surfaces Heat-related injuries Spillage of licenced material	Staff, students, researchers	Burns and heat-related injuries from contact with hot surfaces and improper use of the oven Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	Turn on ventilation hood before turning oven on Ensure DEFRA authorised imported soils warning sign is on the oven door for duration it is in use. Only trained users to carry out drying process PPE (lab coat, apron, gloves, safety glasses and heat resistant gloves) must be worn at all times. Do not overload oven trays with crucibles to limit risk of spillages and cross-contamination Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Ensure spill kit is available and stocked before commencing work Signage to be posted indicating that the oven is operating (contact name/email, date, duration of oven run, sample code/country of origin)	2 x 3 Low Risk (Not likely, Moderate)
6. Remove the samples from the oven and place them in the designated licenced material desiccator containing freshly	Hot surfaces Heat-related injuries Spillage of licenced material	Staff, students, researchers	Cuts and related injuries from broken sherds of ceramic crucibles Burns and heat-related injuries from contact with hot	4 x 3 Medium Risk (Known to occur, Moderate)	Only trained users to carry out process PPE (lab coat, apron, gloves, safety glasses and heat resistant gloves) must be worn at all times.	2 x 2 Low Risk (Not likely, Minor)

regenerated silica gel using the designated oven tray handle	Crucible breakage		surfaces and improper use of the oven Contamination of equipment and working surfaces with licenced material		Ensure handle is fitted to oven tray correctly before removing samples from the oven Ensure silica gel is prepared/regenerated ahead of drying process Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Ensure spill kit is available and stocked before commencing work Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders Only the labelled desiccator designed for use with licenced material to be used in this process. A sign should be placed nearby/on the desiccator naming person responsible (and contact details), date samples put in desiccator and storage duration, as well as where samples are from (site code and country of origin). Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
7. Once crucibles have cooled, reweigh using the Sartorius balance in D132 to give a “dry” sample weight	Spillage of licenced material Crucible breakage	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Cuts and related injuries from broken sherds of ceramic crucibles	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be	2 x 2 Low Risk (Not likely, Minor)

					reported to and treated by departmental first aiders PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
8. Heating samples to 550°C in muffle furnace for 4 hours. Place crucibles onto the steel tray and load them into the oven using the loading handle. Ensure ventilation hood is running.	Fire (especially burning residues from previous experiments condensed onto flue walls) Inhalation of volatiles (released by heating residues from previous experiments condensed onto flue walls) Hot surfaces/heat-related injuries (especially when doors are open and when unloading samples) Damage to surrounding equipment (e.g. fume hood/cupboard) from high temperature exhaust gases Generation of potentially harmful carbonisation /combustion products	Staff, students, researchers	Significant burns from fire and mishandling equipment Respiratory difficulties and eyes/nose/throat irritation from volatiles inhalation. Potential aggravation of existing respiratory conditions. Potential for central nervous system, organ damage, and cancer depending on type of volatile inhaled Injury resulting from use of damaged equipment Inhalation of potentially harmful carbonisation/combustion products. Potential for respiratory irritation and aggravation of existing health conditions.	4 x 5 High Risk (Known to occur, Severe)	Only appropriately trained, competent users to operate the furnace PPE (lab coat, apron, gloves, safety glasses and heat resistant gloves) must be worn at all times. Before work commences check what material has been heated in previous experiments (log book) and consider likelihood of residue deposition Before work commences, consider make-up of material to be heated, potential combustion products and associated risks Consider an initial “burnoff” furnace run to a temperature beyond the maximum expected during the new experiments Appropriate extraction (hood or cupboard) selected depending on expected releases of volatiles/combustion products during heating. Extraction must be turned on whilst furnace is in use. Ensure DEFRA authorised imported soils warning sign is on the furnace door for duration it is in use.	2 x 4 Medium Risk (Not likely, Major)

					Signage to be posted indicating that the furnace is operating (contact name/email, date, duration of furnace run, site code/country of origin) Furnace temperatures greater than 600°C require additional risk assessment to consider potential damage to extraction systems from high temperature exhaust gases Extraction systems must be left running until the furnace has cooled to below 200°C, or as appropriate depending on experimental risk assessment Do not overload oven trays with crucibles to limit risk of spillages and cross-contamination	
9. Remove the samples from the furnace and place the tray on the thermal brick using the designated tray handle. Transfer crucibles into the designated glass desiccator using steel tongs.	Hot surfaces Heat-related injuries Spillage of licenced material Crucible breakage	Staff, students, researchers	Cuts and related injuries from broken sherds of ceramic crucibles Burns and heat-related injuries from contact with hot surfaces and improper use of the furnace Contamination of equipment and working surfaces with licenced material Heat-related damage to benchtops from contact with hot metal tray	4 x 4 High Risk (Known to occur, Severe)	Only trained users to carry out process The hot tray must be placed on the thermal brick and not directly onto the benchtop to avoid burning damage PPE (lab coat, apron, gloves, safety glasses and heat resistant gloves) must be worn at all times. Ensure handle is fitted to tray correctly before removing samples from the furnace Ensure silica gel is prepared/regenerated ahead of drying process Only the labelled desiccator designed for use with licenced material to be used in this process. A sign should be placed nearby/on the desiccator naming person responsible (and contact details),	2 x 3 Low Risk (Not likely, Moderate)

					date samples put in desiccator and storage duration, as well as where samples are from (site code and country of origin). Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Ensure spill kit is available and stocked before commencing work Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders	
10. Once cool, weigh crucibles to obtain final “ashed” weight using Sartorius balance in D132	Spillage of licenced material Crucible breakage	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Cuts and related injuries from broken sherds of ceramic crucibles	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
11. Calculate loss on ignition. “Dry” minus “ashed” weight, divided by “dry” weight.	No risks	-	-	1 x 1	-	1 x 1

12. Sample disposal and cleaning equipment	Crucible breakage Ashed licenced soil left on communal equipment	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Cuts and related injuries from broken sherds of ceramic crucibles	4 x 2 Medium Risk (Known to occur, Minor)	Ashed soil remaining in crucibles after LOI process (i.e. after heating at 500°C for 4 hours) must be collected into the collection bag and placed in the sealed DEFRA licenced waste bin for offsite disposal. Clean crucibles using damp tissue (this must be disposed of in DEFRA licenced waste bin for offsite disposal with other licenced material) Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Equipment used during weighing procedures should be cleaned with damp tissue then sprayed and wiped with 10% Anigene solution and blue roll. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
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Internal Guidance/Linked Documents:	Basic Furnace RA, experimental protocols and associated RAs, Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials
Competence Requirements	Training and competence judgement by lab manager/supervisor or technicians as required for new users of oven, furnace and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.
Supervisor/Manager Review and Comment:	
Assessment Prepared by	Supervisor/Manager acceptance

Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	5/7/2024	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk



Durham
University

COSHH Assessment Form

Serial:

DU/DEPT/COSHH0001

Date	10/8/24	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)	Workplace	
				Research	x
				Cleaning/Maintenance	
				Other	

Name of the Substance

Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)

Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?

Yes

No

Substitution: Is it possible to use a less harmful substance to do the work?

Yes

No

Before beginning work on the COSHH assessment process ensure you have a copy of the latest **Manufacturers Safety Data Sheet (MSDS) for the substance**. MSDS's are available from suppliers and manufacturers of products

Describe the activity or work process.	Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.	How Long?	How Often?	How Much?
Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		30 mins	As needed	600ml max (spray bottle)

Location of Work

Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)

Persons at risk

Employees

x

Students

x

Others

Vulnerable persons

Classification (tick the box next to the appropriate sign)

For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link:

<http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm>

	Very toxic			Irritant			Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful			Oxidising			Dangerous to the environment	x
	Explosive			Flammable				

Carcinogenic substances must be notified to the University Safety Service, click on this link to notify:

<https://www.dur.ac.uk/healthandsafety.new/contactus/>

First Aid

Skin contact

Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.

Eye contact

If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					
	Yes No							<u>Yes</u> No	Standard polycotton labcoat				
	Footwear							Other					
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket					

During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) ABParker Karey M. Leck					Date 10/8/2024		Review date 5/9/2024			

Magnetic Susceptibility Analysis of Soils/Sediments

Risk Assessment for Work with DEFRA Licenced Materials		Date:	4/8/2024 (revised 24/2/25)
		Review Date:	20/03/2025
Process:		Licenced locations for work:	
Magnetic Susceptibility Analysis of Soils/Sediments		Preparation: D131 – Environmental Archaeology Processing Laboratory; D132 – Archaeological Science Laboratory Analysis: D128 – Palaeoecology Laboratory (Fenwick Laboratory); D131 – Environmental Archaeology Processing Laboratory; D132 – Archaeological Science Laboratory	
Description of Process:			
Use of the Bartington magnetic susceptibility instrument to determine the magnetic susceptibility of soil/sediment samples. Samples of soil/sediment are weighed into plastic sample tubes and inserted into the Bartington magnetic susceptibility instrument for analysis.			
Objectives and Applications of Process:			
- To determine the magnetic susceptibility of soil/sediment samples - Applicable to wide range of soil and sediment types (range of application = peat to fully mineral sediments)			
Justification of Use of Process:			
Presence of magnetic materials within soil or sediment can be indicative of a number of archaeological processes. Direct presence of metallic fragments of “hammer scale” may be indicative of the past use of a site for metalworking and changes to the soil or sediment’s magnetic signature may be indicative of the use of the area as a hearth or similar structure. Direct measurement of magnetic susceptibility is possible by placing samples into the chamber of the Bartington magnetic susceptibility meter and reading off the measurement. The methodology is generally low-risk and provides quick measurements with minimal handling/exposure of lab users and equipment to licenced materials.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Dust inhalation, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicensed materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) All dust-generating soil work should be undertaken under extraction in the extraction cabinet in D131 Lids of plastic pots should be securely closed before being loaded into magnetic susceptibility meter to prevent spills Only trained and competent lab users to use Bartington software on laptop	

material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. <u>Refer to Protocol for Working with DEFRA Licenced Materials for larger spills</u> All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Unlicenced material – plastic pots and glass rods should be cleaned with a plastic bottle brush and liquid detergent before rinsing with tap water and air drying. Licenced material – plastic pots and glass rods should be cleaned thoroughly with damp tissue and then sprayed and wiped using 10% Anigene disinfectant and blue roll.
Disposal • Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. • Unlicenced material – used sample material can either be tipped back into sample container for retention or placed in the bin. • Licenced material – used sample material can be retained in an appropriately labelled bag if required and returned to licenced soil storage, or placed in the designated sealed DEFRA waste soil bin for disposal. • Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. • The Department's licenced soil catalogue must be updated when materials are disposed of.	

Magnetic Susceptibility Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment	PPE	Chemicals
Small plastic pots with lids Glass stirring rods to level soil in plastic pots Magnetic susceptibility meter (MS3) and sensor (MS2B) Laptop Computer (with Bartsoft software) Sartorius 5-figure balance	Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Gloves Face-fitted dust masks (P2) may be required if no extraction is available	Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.

Work Step/ Tasks <i>(Describe the tasks/steps involved in the order of work)</i>	Hazards Identified for each task/step	Those at risk <i>(people who could be harmed)</i>	How could they be harmed? <i>(nature of injuries, damage that could result)</i>	Uncontrolled risk level <i>(level of risk without control)</i>	Required controls <i>(how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)</i>	Controlled risk level <i>(level of risk remaining when controls are in place)</i>
1. Pour 10ml of <2mm powdered soil into a small plastic pot and level the surface with the stirring rod. Do not compact the sample into the pot. Wipe the outside of the plastic pots with a damp tissue to avoid contaminating the sensor.	Spillage of licenced material Dust inhalation Glass breakage	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation. Cuts and physical injury from glass breakage.	4 x 3 Medium Risk (Known to occur, Moderate)	All dust-generating sample preparation work should be undertaken under extraction in extraction cabinet (D131). Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Room extraction to be switched on to maximum Dust masks (P2) suitable for protections against silica dust to be worn if not working under extraction If not working in extraction cupboard fan to be used to direct dust away from workers	2 x 2 Low Risk (Not likely, Minor)

					Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
2. Place the plastic pot into the Bartington magnetic susceptibility sensor and follow the instructions in the software to take the measurement.	Spillage of licenced material Prolonged sitting at benches/postural problems	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Pain, discomfort or injury from postural problems (e.g. to hands/arms from overuse, improper use or poorly designed workstation/work environment) Headaches or sore eyes from e.g. overworking, poor lighting	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Ensure lids of plastic pots are securely closed (without compacting the sample) before loading them into the magnetic susceptibility meter Use of backed chairs not lab stools for prolonged period of work. Chairs adjusted to correct height/position. Use of proper sitting spaces – not in front of cupboards where you have to twist your legs. Regular breaks. Workstation Assessment	2 x 2 Low Risk (Not likely, Minor)

					training available to ensure correct seating position. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
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Internal Guidance/Linked Documents:		Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials, Soil Powdering and Sieving RA	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of magnetic susceptibility meter/software and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance of revised risk assessment	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	4/8/2024	Date:	20/3/2025
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

Probability/ likelihood of risk realisation				
Almost	Not Likely	Could	Known to	Common

Extreme risk	High risk ⁽¹⁾	Medium risk ⁽²⁾	Low risk ⁽⁴⁾

		Health and Safety	of factors would be required for risk to be realised	factors would be required for risk to be realised	additional factors are present otherwise unlikely to occur	but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

 Durham University		COSHH Assessment Form			Serial:	DU/DEPT/COSHH0001		
Date	10/8/24	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace		
					Research	x		
					Cleaning/Maintenance			
					Other			
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)						
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products								
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)	
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)						
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons	
Classification (tick the box next to the appropriate sign)								
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm								
	Very toxic		 	Irritant		 	Highly flammable	
 	Toxic			Compressed gas		 	Extremely flammable	
 	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful		 	Oxidising		 	Dangerous to the environment	x
 	Explosive		 	Flammable				
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/								
 First Aid								
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						

Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)							
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No				Yes No								
	Dust mask				Visor								
	Yes No				<u>Yes</u> No	To EN166 or equivalent							
	Respirator				Goggles								
	<u>Yes</u> No	Nitrile gloves			Yes No								
	Gloves				Overalls								

	Yes No						Yes No	Standard polycotton labcoat			
	Footwear						Other				
Fire: identify appropriate extinguishers here											
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket			
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below											
Not flammable. No hazard expected under normal conditions of use.											
Storage											
Store dilutions in a closed container in a cool, well-ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.											
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)											
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other			
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do not discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.											
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No			
		Likelihood	Not likely								
		Evaluation phrase	Low Risk								
Signature(s) <i>AB Parker</i> <i>Harry Miles</i>						Date 10/8/24		Review date 20/3/2025			

pH and Electrical Conductivity (EC) measurement

Risk Assessment for Work with DEFRA Licenced Materials		Date:	4/8/2024
		Review Date:	3/9/2024 (revised 24/2/25)
Process:	Licenced locations for work:		
pH and Electrical Conductivity (EC) measurement	D128 – Palaeoecology Laboratory (Fenwick Laboratory) D131 – Environmental Archaeology Processing Laboratory D132 – Archaeological Science Laboratory D136C – Geoarchaeology Laboratory D204 – Teaching Laboratory		
Description of Process:			
Samples of soil, sediment or water are diluted to form a suspension/slurry before the measurement of pH and/or electrical conductivity (EC) using an electronic probe in the appropriate mode.			
Objectives and Applications of Process:			
- Determination of soil pH and/or electrical conductivity using electronic probes - To determine the relative acidity/alkalinity (pH) and the soluble salt/nutrient content (EC) of soil/sediment samples - Applicable to wide range of soil, water and sediment types (range of application = partially to fully mineral soils, sediments or waters)			
Justification of Use of Process:			
Soil pH and electrical conductivity are key parameters of archaeological site and soil formation conditions and strongly influence artefact preservation and soil formation processes such as leaching. Samples of soil or water/leachate can be taken from a site and tested in the laboratory using calibrated pH and EC probes. Results are interpreted in conjunction with other contextual information and soil tests. The methodology is relatively low-risk and provides rapid measurements.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Dust inhalation, spillage of licenced materials, inappropriate disposal of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use and calibration of pH/EC meters must be carried out before use. pH/EC meters must be stored appropriately in storage solution to prevent measurement components drying out. Only equipment designated for use with licenced soil to be used in this process (e.g. beakers, stirring rods, etc) Spillages	

material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. Refer to Protocol for Working with DEFRA Licenced Materials for larger spills All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Unlicenced material – equipment (except probes) should be cleaned with a plastic bottle brush and liquid detergent before rinsing with tap water and air drying. The probes should be rinsed thoroughly with DI water before storing in appropriate storage environments. Licenced material – equipment (except probes) should be cleaned thoroughly with damp tissue then sprayed and wiped with 10% Anigene disinfection solution and blue roll. The probes should be wiped with damp tissue to remove soil from surfaces, rinsed thoroughly with DI water into the designated licenced soil beaker, then sprayed and wiped with 10% Anigene solution and blue roll before being stored in the appropriate storage environment. The waste water should be evaporated in the designated beaker and any remaining licenced material should be collected for disposal in the DEFRA waste soil bin before the beaker is cleaned with damp tissue and then disinfected.
Disposal - Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Unlicenced material – sample slurries can be tipped/rinsed into waste beaker using DI water and probes rinsed into the waste beaker using DI water. Once all samples from a batch have been processed, the waste beaker can be emptied down a sink with a sediment trap attached under large dilution (keep the tap running for several minutes). - Licenced material – sample slurries must be dried by evaporated in the designated DEFRA authorised imported soil beaker. Dried soil can then be collected and placed in the sealed DEFRA waste soil bin for	

offsite disposal. The beaker and other equipment used to collect waste soil must be cleaned thoroughly with damp tissue and then disinfected using 10% Anigene solution.

- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- The Department's licenced soil catalogue must be updated when materials are disposed of.

pH and EC Measurement Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment	PPE	Chemicals
Small beakers (e.g. 25 ml) Deionised water Glass stirring rods Plastic squirt bottles Hanna instruments combined pH/EC meters (e.g. Hanna Instruments) Timing device (e.g. lab timer, clock) Measuring cylinders Large beakers for waste (250ml+)	Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Gloves Safety glasses	Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.

Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1. Calibrate the pH/EC probes following the manufacturer's instructions and using manufacturer's calibration solutions. Once calibrated, rinse the probe thoroughly with distilled, deionised water	Exposure to de-ionised water and calibration solutions (e.g. pH 4, 7, EC 1413 µS/cm) Glass breakage	Staff, students, researchers	Cuts and physical injury from glass breakage. Calibration solutions, particularly pH 4, and de-ionised water can cause discomfort and eye damage.	4 x 2 Low Risk (Known to occur, Minor)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be cleaned with running tap water, reported to and treated by departmental first aiders.	2 x 2 Low Risk (Not likely, Minor)
2. Pour 10ml of <2mm soil into a designated small beaker (25 ml or 50 ml)	Spillage of licenced material Dust inhalation	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	All dust-generating sample preparation work must be undertaken under extraction in	2 x 2 Low Risk (Not likely, Minor)

	Glass breakage		Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation. Cuts and physical injury from glass breakage.		extraction cabinet (D131). Any spills of licenced material should be cleaned up immediately following the protocols described above. Room extraction to be switched on to maximum. Dust masks (P2) suitable for protections against silica dust to be worn if not working under extraction. If not working in extraction cupboard/fume hood fan to be used to direct dust away from workers. Any breakages to be reported and handled appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
3. Add 20ml of deionised water, stir for 3 minutes, immerse the calibrated probe into the suspension/slurry and read measurements	Spillage of licenced material in the suspension/slurry Exposure to de-ionised water and soil suspension/	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material. Cuts and physical injury	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the protocols above. Any breakages to be reported and handled	2 x 2 Low Risk (Not likely, Minor)

for pH and/or EC.	slurry in de-ionised water Glass breakage Prolonged sitting at benches, postural problems		from glass breakage. De-ionised water or soil suspension/ slurry in the eye can cause discomfort and eye damage Pain, discomfort or injury from postural problems (e.g. to hands/arms from overuse, improper use or poorly designed workstation/work environment).		appropriately by trained individuals. Any cuts/injuries to be cleaned immediately with running tap water and reported to and treated by departmental first aiders. Use of backed chairs not lab stools for prolonged period of work. Chairs adjusted to correct height/position. Use of proper sitting spaces – not in front of cupboards where you have to twist your legs. Regular breaks. Workstation Assessment training available to ensure correct seating position. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
4. Disposal of sample suspension/ slurry and equipment cleaning	Inappropriate disposal of licenced material Licenced material remaining on equipment Slips and trips Spillage of licenced material	Staff, students, researchers	Release of licenced material into general waste Contamination of equipment and working surfaces with licenced material Physical injury from	4 x 3 Medium Risk (Known to occur, Moderate)	Carefully follow all disposal instructions listed above Carefully follow all equipment cleaning instructions listed above All waste water and slurries generated must be evaporated and	2 x 3 Low Risk (Not likely, Moderate)

			slipping/tripping due to spills		any residue remaining collected for disposal in DEFRA waste soil bin before equipment is cleaned with damp tissue and disinfected. Any spillages to be reported and handled appropriately by trained individuals. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	
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Internal Guidance/Linked Documents:		Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials, Soil powdering and Sieving RA, Hanna instruments pH and EC meter operating instructions and calibration solution COSHH	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of pH/EC meters and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>AB Parker</i>	Signature:	<i>Karen Milek</i>
Date:	4/8/2024	Date:	3/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form			Serial: DU/DEPT/COSHH0001			
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace Research ☒ Cleaning/Maintenance Other		
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)						
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes ☐ No ☒		
Substitution: Is it possible to use a less harmful substance to do the work?						Yes ☐ No ☒		
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products								
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)	
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)						
Persons at risk		Employees	☒	Students	☒	Others	Vulnerable persons	
Classification (tick the box next to the appropriate sign)								
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm								
	Very toxic	☐			Irritant	☐	  Highly flammable	☐
 	Toxic	☐			Compressed gas	☐	  Extremely flammable	☐
 	Corrosive	☐			Biological hazard	☐	 Serious long term health hazard	☐
	Harmful	☐	 		Oxidising	☐	  Dangerous to the environment	☒
 	Explosive	☐	 		Flammable	☐		☐
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/								
 First Aid								
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						

Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)								Short term exposure level (15 mins)					
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						<u>Yes</u> No	To EN166 or equivalent					
	Respirator						Goggles						
	<u>Yes</u> No	Nitrile gloves					Yes No						
	Gloves						Overalls						
	Yes No						<u>Yes</u> No	Standard polycotton labcoat					
	Footwear						Other						
Fire: identify appropriate extinguishers here													

Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences		Minor		Is exposure adequately controlled?		<u>Yes</u>	No	
		Likelihood		Not likely						
		Evaluation phrase		Low Risk						
Signature(s) <i>AB Parker</i> 						Date 10/8/24		Review date 5/9/2024		

Phosphate Analysis

Risk Assessment for Work with DEFRA Licenced Materials		Date: 4/8/2024 (revised 24/2/25)
		Review Date: 3/9/2024
Process:	Licenced locations for work:	
Phosphate analysis by Merck test kit (soil/water phosphate content reflectometry test)	D128 – Palaeoecology Laboratory (Fenwick Laboratory) D131 – Environmental Archaeology Processing Laboratory D132 – Archaeological Science Laboratory D136C – Geoarchaeology Laboratory D204 – Teaching Laboratory	
Description of Process:		
Samples of soil, sediment or water are mixed with de-ionised water to form a suspension/ slurry before the addition of 5 drops of Merck's reagent (0.2M H ₂ SO ₄). The intensity of the blue colour produced in the resulting reaction can be quantified using reflectometry or colorimetry and interpreted to give sample phosphate content.		
Objectives and Applications of Process:		
- To determine the phosphate (PO₄³⁻) content of soil and sediment samples. - Applicable to wide range of soil, water and sediment types (range of application = partially to fully mineral soils, sediments or waters)		
Justification of Use of Process:		
Soil phosphate content can be an indicator of a number of archaeologically significant processes, particularly soil amendment or the presence of human or animal waste deposits. Samples of soil or water/leachate can be taken from site and tested in the laboratory using commercially available test kits to determine phosphate content. Results can be interpreted in conjunction with other contextual information to build up a picture of the site. The methodology is relatively low-risk and provides rapid measurements.		
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?	Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?	Yes	<u>No</u>
Most Significant Risk(s):		
Skin/eye irritations, spillage of licenced materials, inappropriate disposal of licenced material		
Biosafety – work with DEFRA licenced materials	General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates	PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Merck's reagent contains 0.2M sulphuric acid – all work with reagent requires full PPE and use of extraction or working in a well-ventilated room. Training in use of Merck Reflectometer and phosphate test kits must be carried out before use. Only equipment designated for use with licenced materials to be used in this process (e.g. beakers, stirring rods, etc). Spillages Minor spillages of soil/sediment to be cleaned up with	

must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE.

All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required.

Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.

moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes.

Refer to [Protocol for Working with DEFRA Licenced Materials](#) for larger spills

All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.

Cleaning of Equipment

Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll.

Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal.

It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.

Unlicenced material – equipment should be cleaned with a plastic bottle brush and liquid detergent before rinsing with tap water and air drying.

Licenced material – equipment should be cleaned with damp tissue and sprayed and wiped using 10% Anigene disinfectant spray and blue roll.

Disposal

- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company.
- Unlicenced material – sample slurries can be tipped/rinsed into waste beaker using DI water. Once all samples from a batch have been processed, the waste beaker can be emptied down a sink with a sediment trap attached under large dilution (keep the tap running for several minutes).
- Licenced material – sample slurries must be dried by evaporated in the designated DEFRA authorised imported soil beaker. Dried soil can then be collected and placed in the sealed DEFRA waste soil bin for offsite disposal. The beaker and other equipment used to collect waste soil must be cleaned thoroughly with damp tissue and then disinfected using 10% Anigene solution.
- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- The Department's licenced soil catalogue must be updated when materials are disposed of.

Phosphate Analysis Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment Merck RQflex plus 10 Reflectoquant Reflectometer Merck Reflectoquant Phosphate Test kit: 50 test strips + reagent (mixture of sulphuric acid and disodium molybdate) with a measuring range of 5-120mg/l PO ₄ ³⁻ + calibration strip + 20ml plastic beaker Deionised water Glass/plastic stirrers Timing device (e.g. lab timer, clock) Waste beaker (250ml+) Measuring cylinder (for 5ml deionised water)		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Gloves Safety glasses		Chemicals Merck's test kit containing reagent and strips (commercial product, c500 µL/sample) – reagent contains 0.2M H ₂ SO ₄ Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.		
Work Step/ Tasks <i>(Describe the tasks/steps involved in the order of work)</i>	Hazards Identified for each task/step	Those at risk <i>(people who could be harmed)</i>	How could they be harmed? <i>(nature of injuries, damage that could result)</i>	Uncontrolled risk level <i>(level of risk without control)</i>	Required controls <i>(how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)</i>	Controlled risk level <i>(level of risk remaining when controls are in place)</i>
1. For each new batch of Reflectoquant test strips, calibrate the reflectometer using the supplied bar code.	No risk	-	-	1 x 1 Low Risk (Almost impossible, insignificant)	None	1 x 1 Low Risk (Almost impossible, insignificant)
2. Pour 1ml of sample into 20ml plastic beaker and add 5ml of deionised water.	Dust inhalation Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Exposure to de-ionised water and soil suspension/ slurry Spillage of licenced material	Staff, students, researchers	Dust inhalation, particularly silica dusts often found in soils can cause long-term serious lung conditions. Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation.	4 x 4 High Risk (Known to occur, Major)	All dust-generating sample preparation work should be undertaken under extraction in extraction cabinet (D131). PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Wash hands thoroughly afterwards (especially before eating/drinking). Eyes exposed to de-ionised water or soil suspensions/ slurries should be	2 x 2 Low Risk (Not likely, Minor)

			Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis. De-ionised water or a soil suspension/slurry in the eyes can cause irritation and eye damage. Contamination of equipment and working surfaces with licenced material		washed rapidly at an eye wash station and reported to and treated by a qualified first aider. Any spills of licenced material should be cleaned up immediately following the protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
3. Add 500 µl (10 drops) of Merck's reagent to plastic beaker and stir for 2 minutes. Immerse test strip for 2 seconds and at the same time press the START button on the reflectometer to start the 90 second countdown	Exposure to 0.2M sulphuric acid	Staff, students, researchers	Irritation to skin and/or eyes from contact with Merck's reagent (sulphuric acid is corrosive) Irritation of nose, throat and respiratory tract from inhalation of sulphuric acid mist/fumes	4 x 3 Medium Risk (Known to occur, Moderate)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Work with Merck's reagent should be undertaken under fume hood (D132)/extraction cabinet (D131) or in a well-ventilated room.	3 x 3 Medium Risk (Could occur, Moderate)
4. Carefully allow excess liquid to run off the test strip onto an absorbent towel. Approximately 10 seconds before the end of the countdown, insert the test strip all the way into the strip adapter with the reaction zones facing the display. Record the measurement result shown on the display at the end of the countdown.	Exposure to 0.2M sulphuric acid Spillage of licenced materials	Staff, students, researchers	Irritation to skin and/or eyes from contact with Merck's reagent (sulphuric acid is corrosive) Irritation of nose, throat and respiratory tract from inhalation of sulphuric acid mist/fumes Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Work with Merck's reagent should be undertaken under fume hood (D132)/extraction cabinet (D131) or in a well-ventilated room Absorbent towel should be placed on designated licenced soil tray to prevent contamination of working surfaces with licenced material.	3 x 3 Medium Risk (Could occur, Moderate)

					The absorbent towel must be placed in the sealed DEFRA waste soil bin at the end of the process to await offsite disposal. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
5. Collect used samples (solid and liquid) together in a waste beaker and dispose appropriately.	Skin/eye irritation Spillage of licenced material Inappropriate disposal of licenced material Glass breakage Slips and trips	Staff, students, researchers	Irritation to skin and/or eyes from contact with Merck's reagent (sulphuric acid is corrosive) Irritation of nose, throat and respiratory tract from inhalation of sulphuric acid mist/fumes Contamination of equipment and working surfaces with licenced material Release of licenced material into general waste Cuts and physical injury from glass breakage Physical injury from slipping/tripping due to spills	4 x 3 Medium Risk (Known to occur, Moderate)	Carefully follow all cleaning and disposal instructions above. Sample slurries must be evaporated before dried licenced waste can be collected and disposed of in sealed DEFRA waste soil bin for offsite disposal. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Work with Merck's reagent should be undertaken under fume hood (D132)/extraction cabinet (D131) or in a well ventilated room Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Carefully follow all disposal instructions listed above Any breakages to be reported and handled	3 x 3 Medium Risk (Could occur, Moderate)

					appropriately by trained individuals. Any cuts/injuries to be reported to and treated by departmental first aiders. Any spillages to be reported and handled appropriately by trained individuals. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
6. Clean pots between samples using damp tissue to remove soil from surfaces then spray and wipe with 10% Anigene solution and blue roll.	Licenced material remaining on equipment	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material	4 x 2 Low Risk (Known to occur, Minor)	Carefully follow all equipment cleaning instructions listed above	2 x 2 Low Risk (Not likely, Minor)

Internal Guidance/Linked Documents:		Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials, Merck Reflectometer operating instructions, Merck's reagent COSHH form	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of reflectometry kit and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	4/8/2024	Date:	3/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

 Durham University		COSHH Assessment Form			Serial:	DU/DEPT/COSHH0001		
Date		Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace		
						Research		x
						Cleaning/Maintenance		
						Other		
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)						
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products								
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long?	How Often?	How Much?	
					30 mins	As needed	600ml max (spray bottle)	
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)						
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons	
Classification (tick the box next to the appropriate sign)								
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm								
	Very toxic		 	Irritant		 	Highly flammable	
 	Toxic			Compressed gas		 	Extremely flammable	
 	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful		 	Oxidising		 	Dangerous to the environment	x
 	Explosive		 	Flammable				
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/								
 First Aid								
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						

Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state				Other state	
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)								Short term exposure level (15 mins)					
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No								Yes No				
	Dust mask							Visor					
	Yes No								<u>Yes</u> No	To EN166 or equivalent			
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves							Yes No				
	Gloves							Overalls					
	Yes No								<u>Yes</u> No	Standard polycotton labcoat			
	Footwear							Other					
Fire: identify appropriate extinguishers here													

Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences		Minor		Is exposure adequately controlled?		<u>Yes</u>	No	
		Likelihood		Not likely						
		Evaluation phrase		Low Risk						
Signature(s) <i>AB Parker</i> <i>Harvey M. Leek</i>						Date 10/8/24		Review date 3/9/2024		

Pollen Sample Preparation

Risk Assessment for Work with DEFRA Licenced Materials		Date: 5/6/2024 (revised 24/2/25)
		Review Date: 3/9/2024
Process:	Licenced locations for work:	
Pollen Sample Preparation	D132 – Archaeological Science Laboratory D131 – Environmental Archaeology Processing Laboratory	
Description of Process:		
This procedure extracts pollen from soil/sediment samples (often soil or peat cores or monolith samples) and prepares it in a medium that can be mounted on glass slides for analysis under the microscope. Soil/sediment samples are transferred to test tubes and dispersed by mixing them with distilled water, diluted (10%) HCl and NaOH, and placing them in a warm water bath. They are then sieved with 10 um mesh, washed into a test tube with distilled water, mixed on a vortex mixer and centrifuged. Glacial acetic acid is then mixed into the samples, which are centrifuged and the liquid decanted to a waste beaker for evaporation. An acetylation mixture is then added to each tube; the sample is stirred, placed in a boiling water bath for 1 minute, centrifuged, and the liquid decanted away for evaporation. A second round of glacial acetic acid, vortexing, centrifuging and decanting is then followed by vortexing, centrifuging and decanting with distilled water. Sodium polytungstate is then added to each tube, which is vortexed, and centrifuged, and the floating pollen is pipetted off and transferred to new test tubes. These new tubes are vortexed, centrifuged and decanted, and then again with distilled water. Diluted aqueous safranin stain is added to the tubes, which are then vortexed, centrifuged and decanted, and then again with distilled water. Finally, industrial methylated spirits are added to the tubes, which are then vortexed, centrifuged, and decanted, followed by the addition of tetra-butyl alcohol, which is once again vortexed, centrifuged, and decanted. The waste soils and decanted materials are disposed of following licenced soil protocols, while the remaining pollen extract is sterile and is mixed with a silicone fluid, ready for mounting on glass slides.		
Objectives and Applications of Process:		
- Extraction of pollen from soil/sediment samples and production of 'pollen preps' ready for mounting on glass slides and analysing under the microscope. - Applicable for wide range of soil and sediment types (peat, soils, archaeological and organic sediments)		
Justification of Use of Process:		
The microscopic analysis of pollen permits palaeoecologists and environmental archaeologists to examine past vegetation, reconstruct past environments, and learn about a wide range of palaeoecological, palaeoclimatic, and archaeological processes, including past human impacts on the environment and the presence of plant materials on archaeological sites. This pollen sample preparation method enables pollen to be separated from its soil/sediment matrix, which is then disposed of following protocols for licenced soils. The remaining pollen sample in its mounting medium is no longer considered licenced material and falls outside the scope of authorisation.		
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?	Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?	Yes	<u>No</u>
Most Significant Risk(s):		
Exposure to chemicals by skin contact or inhalation; spillage of licenced materials		
Biosafety – work with DEFRA licenced materials	General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams	PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times.	

booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicensed materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	Equipment Safety Notes (full equipment list below) All dust-generating soil work should be undertaken under extraction in the extraction cabinet in D131. Only trained and competent lab users to use equipment involved in process. Full PPE must be worn at all times during process and appropriate care should be taken with hazardous chemicals. COSHH forms should be read before use. Chemical safety awareness course is advised for all users handling potentially harmful substances. Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. <u>Refer to Protocol for Working with DEFRA Licenced Materials for larger spills</u> All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Unlicensed material – equipment should be cleaned with a plastic bottle brush and liquid detergent before rinsing with tap water and air drying. Licensed material – equipment and surfaces should be cleaned thoroughly with a damp tissue to remove soil from surfaces and then sprayed and wiped with 10% Anigene solution and blue roll.
Disposal Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company.	

- **After the pollen sample preparation process is complete (i.e. samples have undergone repeated chemical treatment, including sterilization with industrial methylated spirits tetra-butyl alcohol), they can be treated as non-licenced material**
- Unlicensed material – used sample material can either be tipped back into sample container for retention or placed in the bin.
- Licensed material – waste sample suspensions can be tipped/rinsed into a waste beaker or emptied down the designated licensed soil sink with a sediment trap in D132 under large dilution (keep the tap running for several minutes).
- Licensed material – waste sample suspensions and decanted liquid must be dried by evaporation in the designated DEFRA authorised imported soil beaker. Dried soil and residues can then be collected and placed in the sealed DEFRA waste soil bin for offsite disposal. The beaker and other equipment used to collect waste soil must be cleaned thoroughly with damp tissue and then disinfected using 10% Anigene solution.
- Leftover residues of licensed material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licensed material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- The Department's licensed soil catalogue must be updated when materials are disposed of.

Pollen Prep Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment Falcon tubes water bath lycopodium tables glass stirring rods graduated cylinders hydrometer heater block vortex centrifuge sieve and mesh pipette	PPE safety glasses lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) nitrile gloves fume cupboard	Chemicals Concentrated Sulphuric Acid (H ₂ SO ₄) Glacial Acetic Acid Acetic Anhydride Hydrochloric Acid (10%) (HCl) Sodium Hydroxide Solution (10%) (NaOH) Ethanol (I.M.S) 2-Methyl Propan-2-ol (TBA) Sodium Polytungstate solution Silicone Oil Aqueous safranin stain Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licensed material.
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Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1. Turn on hot water bath to maximum heat (c.1 hour to warm up). Test the density of the Sodium	Soil handling / Bacteria in soil Spillage of licensed material Dust inhalation	Staff, students, researchers	Risk of contamination from bacteria leading to infection and illness Risk of infection if soil makes contact with any cuts or wounds on skin	4 x 3 Medium Risk (Known to occur, Moderate)	PPE (lab coat, apron, nitrile gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Wash hands thoroughly afterwards (especially before eating/drinking).	2 x 3 Low Risk (Not likely, Moderate)

Polytungstate (SPT) using the hydrometer. Label two sets of conical bottom test-tubes. Put 1ml of sediment in each test tube using syringe.			Risk of cross-contamination from handling to e.g. foods, drink, etc Contamination of equipment and working surfaces with licenced material Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation.		Soil inspected by trained personal on site to ensure that contaminated soil doesn't get sampled and sent to the lab. All dust-generating sample preparation work should be undertaken under extraction in extraction cabinet (D131). Any spills of licenced material should be cleaned up immediately following the /protocols above Room extraction to be switched on to maximum Dust masks (P2) suitable for protections against silica dust to be worn if not working under extraction If not working in extraction cupboard/fume hood fan to be used to direct dust away from workers. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
	Glove allergies	Staff, students, researchers	Risk of allergic reaction to glove material	4 x 2 Medium Risk (Known to occur, Minor)	Staff to be informed of any allergies. This point should be implemented throughout this procedure where gloves are required.	2 x 2 Low Risk (Not likely, Minor)
2. Put approx. 1ml of distilled water in each tube + 1ml of 10% HCl to dissolve tablet. Wait for effervescence to stop. Put about 6ml of NaOH 10%	HCl is extremely corrosive, vapour inhalation is harmful, ingestion may be fatal. Can cause severe damage to skin and eyes	Staff, students, researchers	Severe injuries and burns from corrosive action of HCl to eyes, skin and mucous membranes. Irritation to eyes, nose, and respiratory tract from acute inhalation	4 x 5 High Risk (Known to occur, Severe)	Work must be carried out in fume cupboard. PPE (lab coat, apron, nitrile gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	3 x 3 Medium Risk (Could occur, Moderate)

in each tube. Put a glass rod in each tube. Put test tubes in bath for 15 minutes. Stir with glass rods occasionally. Sieve samples (using 10 µm mesh below and 125 µm sieve on top, tripod, funnels and distilled water).			Potential to exacerbate existing conditions (e.g. asthma) Toxic and potentially fatal if ingested			
	NaOH is very corrosive and can cause severe burns. May cause serious permanent eye damage. Very harmful by ingestion. Harmful by skin contact.	Staff, students, researchers	Irritation and/or severe burns to eyes and skin if contact made with high concentrations of NaOH Prolonged or permanent damage to digestive system and/or lungs if inhaled or ingested. Possibility of developing dermatitis from repeated skin contact. Injuries from heat given out when NaOH combined with water May exacerbate existing health conditions (e.g. asthma)	4 x 4 High Risk (Known to occur, Major)	Work must be carried out in fume cupboard. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	3 x 3 Medium Risk (Could occur, Moderate)
	Burns and electrocution from water bath	Staff, students, researchers	Burns from contact with hot water Electrocution of user due to electrical malfunction or using equipment with wet hands Possible fire hazard from overheating Physical injury from manual handling and lifting Mechanical injury to hands and injuries from catching loose hair/clothing in equipment	3 x 3 Medium Risk (Could occur, Moderate)	Work with care to prevent splashes. Do not handle/lift when filled with water. Ensure equipment is not faulty before use. Do not operate with wet hands. Water bath should be safety checked as appropriate. Keep loose clothing/hair away from equipment, especially whilst circulation impeller and/or shaker mechanism in use (use cover where appropriate)	2 x 2 Low Risk (Not likely, Minor)

					PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	
	Spillage of licenced materials	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material	3 x 3 Medium Risk (Could occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the protocols above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Designated sieve and mesh to be used with licenced material Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
3. Transfer pollen from mesh back to the test tubes using distilled water. Make sure the levels are even. Put on the test tube lids and mix on the vortex mixer. Centrifuge tubes for 4 minutes at 3000 rpm, then decant. Add 10 ml of distilled water, mix on vortex, then centrifuge for 4 minutes and decant.	Vortex mechanical mixer and centrifuge Spillage of licenced material Inappropriate disposal of licenced material	Staff, students, researchers	Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels Cuts and injuries from glass breakages Mechanical injuries such as entrapment within rotating parts of equipment Contamination of equipment and working surfaces with licenced material Licenced material entering general waste	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened Long hair to be tied up PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Any spills of licenced material should be cleaned up immediately following the protocols above. Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the dried waste is collected for disposal and the equipment can be cleaned with damp tissues and then disinfected.	2 x 2 Low Risk (Not likely, Minor)

4. Add 10ml glacial acetic acid, mix on vortex. Centrifuge for 4 minutes and decant into large (1000ml) designated licenced material beaker of water in fume cupboard. Allow contents of beaker to evaporate before collecting dried material for offsite disposal and cleaning beaker with damp cloth and disinfecting with 10% Anigene solution.	Glacial acetic acid is harmful and highly corrosive on contact with skin and eyes. Very harmful if swallowed. Flammable	Staff, students, researchers	Skin corrosion/irritation from contact with glacial acetic acid. Serious eye damage/irritation from contact with glacial acetic acid. Potential poisoning, damage to internal organs and even death if ingested. Potential for burns as glacial acetic acid is flammable as both a liquid and vapor.	4 x 4 High Risk (Known to occur, Major)	Work must be carried out in fume cupboard. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Waste water to be evaporated in designated beaker before the dried waste is collected for disposal. Beaker must then be wiped clean with damp tissue and disinfected with 10% Anigene solution.	3 x 3 Medium Risk (Could occur, Moderate)
	Vortex mechanical mixer and Centrifuge Spillage of licenced material	Staff, students, researchers	Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels Cuts and injuries from glass breakages Mechanical injuries such as entrapment within rotating parts of equipment Contamination of equipment and working surfaces with licenced material	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened Long hair to be tied up PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Any spills of licenced material should be cleaned up immediately following the protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
5. Make up acetylation mixture just before it is required. Using a measuring cylinder, mix acetic anhydride and concentrated sulphuric acid in proportions	Acetic Anhydride is anhydrous. Avoid contact with water. Harmful if swallowed or inhaled. Causes severe respiratory irritation. May cause serious irritation or	Staff, students, researchers	Severe respiratory irritation if inhaled or ingested. Serious irritation and burns to eyes and skin if contact made. Potential lung damage and coughing/shortness of breath with high concentration exposure.	4 x 5 High Risk (Known to occur, Severe)	Extreme care taken to avoid contact of Acetic Anhydride with water which would react violently If spilt on the skin flood with water PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing	3 x 4 Medium Risk (Could occur, Major)

9:1 by volume. Measure out 54ml acetic anhydride first, then add (dropwise) 6ml concentrated sulphuric acid carefully, stirring to prevent heat build-up. Stir again just before adding mixture to each tube. Add 8ml of the mixture to each sample. Stir with clean, dry glass rods. Remove the glass rods. Put in boiling water bath for 1 minute. One minute is usually adequate as longer acetylation makes the pollen grains opaque. Switch off water bath. Centrifuge for 4 minutes and decant the tubes into a large (1000ml) beaker of water in fume cupboard. Allow contents of beaker to evaporate before collecting dried material for offsite disposal and cleaning beaker with damp cloth and disinfecting with 10%	burns to the eyes Concentrated sulphuric acid is anhydrous. Avoid contact with water. Extremely corrosive. Highly toxic. Harmful by ingestion, inhalation and skin contact. The Acetylation mixture can cause severe burns if spilt on the skin.		Can cause allergic reaction to skin. Potential for burns as flammable as both a liquid and vapour (heat generated when combined with water). Potential poisoning, damage to internal organs and even death if ingested.		must provide full leg/foot coverage. Work must be conducted in the fume cupboard at all times. Waste water to be evaporated in designated beaker before the dried waste is collected for disposal. Beaker must then be wiped clean with damp tissue and disinfected with 10% Anigene solution. Never leave glass rods in tubes as steam condenses on the rods and runs down into the mixture reacting violently	
Burns and electrocution from water bath	Staff, students, researchers		Burns from contact with hot water Electrocution of user due to electrical malfunction or using equipment with wet hands Possible fire hazard from overheating Physical injury from manual handling and lifting Mechanical injury to hands and injuries from catching loose hair/clothing in equipment	3 x 3 Medium Risk (Could occur, Moderate)	Work with care to prevent splashes. Do not handle/lift when filled with water. Ensure equipment is not faulty before use. Do not operate with wet hands. Water bath should be safety checked as appropriate. Keep loose clothing/hair away from equipment, especially whilst circulation impeller and/or shaker mechanism in use (use cover where appropriate) PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	2 x 2 Low Risk (Not likely, Minor)

Anigene solution.	Centrifuge	Staff, students, researchers	Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels Cuts and injuries from glass breakages Mechanical injuries such as entrapment within rotating parts of equipment	3 x 3 Medium Risk (Could occur, Moderate)	Use centrifuge on stable level surface Ensure test tube lids are securely fastened Long hair to be tied up PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	2 x 2 Low Risk (Not likely, Minor)
	Spillage of licenced material	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material	3 x 3 Medium Risk (Could occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
6. Add 10 ml of glacial acetic acid, mix on vortex, centrifuge and decant. Add 10 ml of distilled water, mix on vortex, centrifuge and decant. Repeat the distilled water step.	Glacial Acetic Acid is harmful and corrosive on contact with skin.	Staff, students, researchers	Skin corrosion/irritation from contact with glacial acetic acid. Serious eye damage/irritation from contact with glacial acetic acid. Potential poisoning, damage to internal organs and even death if ingested. Potential for burns as glacial acetic acid is flammable as both a liquid and vapor.	4 x 4 High Risk (Known to occur, Major)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Work must be undertaken in fume cupboard. Waste water to be evaporated in designated beaker before the dried waste is collected for disposal. Beaker must then be wiped clean with damp tissue and disinfected with 10% Anigene solution.	3 x 3 Medium Risk (Could occur, Moderate)

	Vortex mechanical mixer and centrifuge	Staff, students, researchers	Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels Cuts and injuries from glass breakages Mechanical injuries such as entrapment within rotating parts of equipment	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened Long hair to be tied up PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	2 x 2 Low Risk (Not likely, Minor)
	Spillage of licenced material	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material	3 x 3 Medium Risk (Could occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
7. Add 3ml of Sodium Polytungstate (SPT) to each tube. Use Vortex for 1 minute on each tube to suspend sediment. (Loosen with rods if necessary) Centrifuge tubes for 20 minutes. While waiting, fill new labelled tubes with 10ml of distilled water. Prepare vials with labels. Pipette off floating pollen and transfer to the new tubes	Harmful if swallowed. May damage eyes, long term adverse effects to aquatic organisms	Staff, students, researchers	Acute toxicity from oral ingestion. Serious skin and eye damage/irritation from contact.	4 x 4 High Risk (Known to occur, Major)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the dried waste is collected for disposal. The equipment must be cleaned with damp tissues and then disinfected with 10% Anigene solution. Clean pipettes with damp tissue to remove soil from surfaces and then spray and wipe with 10% Anigene solution. Dispose of pipettes in designated glass waste / sharps box to await offsite disposal	2 x 3 Low Risk (Not likely, Moderate)

(N.B. using different pipette for each sample). Use Vortex for 1 minute on each tube to suspend sediment. Centrifuge tubes for 10 minutes then decant. Add 10 ml of distilled water. Use Vortex. Centrifuge tubes for 4 minutes then decant.					with other licenced material. Ensure test tube lids are securely fastened	
	Vortex mechanical mixer and centrifuge	Staff, students, researchers	Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels Cuts and injuries from glass breakages Mechanical injuries such as entrapment within rotating parts of equipment	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened Long hair to be tied up PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Clean pipettes with damp tissue to remove soil from surfaces and then spray and wipe with 10% Anigene solution. Dispose of pipettes in designated glass waste / sharps box to await offsite disposal with other licenced material.	2 x 2 Low Risk (Not likely, Minor)
	Spillage of licenced material	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material	3 x 3 Medium Risk (Could occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)

8. Add 4 drops of aqueous safranin stain to a large (e.g. 600ml) beaker of distilled water. Add 10 ml of the diluted stain to each of the tubes. Use Vortex. Centrifuge tubes for 4 minutes then decant. Add 10 ml distilled water to each tube. Use Vortex. Centrifuge tubes for 4 minutes then decant.	Aqueous safranin stain can be absorbed through intact skin. May cause blindness if swallowed. May cause liver and kidney damage. May cause skin and respiratory tract irritation.	Staff, students, researchers	Irritation to skin, eyes, and respiratory tract if contact made or inhalation/ingestion occurs. Potential blindness if ingested orally. Potential liver and kidney damage from ingestion/inhalation. May be absorbed through skin in harmful amounts. Potential development of dermatitis from repeated exposure.	4 x 4 High Risk (Known to occur, Major)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Work must be carried out in fume cupboard. Ensure test tube lids are securely fastened	2 x 3 Low Risk (Not likely, Moderate)
	Vortex mechanical mixer and centrifuge	Staff, students, researchers	Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels Cuts and injuries from glass breakages Mechanical injuries such as entrapment within rotating parts of equipment	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened Long hair to be tied up PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	2 x 2 Low Risk (Not likely, Minor)
	Spillage of licenced material Inappropriate disposal of licenced material	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Release of licenced material into general waste	3 x 3 Medium Risk (Could occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the	2 x 2 Low Risk (Not likely, Minor)

					dried waste is collected for disposal and the equipment can be cleaned with damp tissues and then disinfected.	
Step 9: Add 5ml of Industrial methylated spirits (IMS) to each tube. Use Vortex. Centrifuge tubes for 4 minutes then decant.	Industrial methylated spirits (IMS) causes skin and eye irritation. Ingestion can cause nausea, vomiting and inebriation.	Staff, students, researchers	Skin and eye damage from contact with IMS. Nausea, vomiting, inebriation and potential damage to organs from ingestion. Burns as flammable as both liquid and vapor.	4 x 4 High Risk (Known to occur, Major)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Work must be carried out in fume cupboard.	2 x 2 Low Risk (Not likely, Minor)
	Vortex mechanical mixer and centrifuge	Staff, students, researchers	Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels Cuts and injuries from glass breakages Mechanical injuries such as entrapment within rotating parts of equipment	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened Long hair to be tied up PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	2 x 2 Low Risk (Not likely, Minor)
	Spillage of licenced material Inappropriate disposal of licenced material	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Release of licenced material to general waste	3 x 3 Medium Risk (Could occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the dried waste is collected for disposal. The equipment can be cleaned with damp tissues and then disinfected with 10% Anigene solution.	2 x 2 Low Risk (Not likely, Minor)

Step 10: Add 2ml of Tetra-butyl alcohol (TBA) to each tube. Use Vortex. Centrifuge tubes for 4 minutes then decant. Transfer remaining pollen to labelled vials with a little (TBA) using new pipettes for each. Add small amount of Silicone fluid to vials using glass rod. Leave to evaporate in fume cupboard.	Tetra-butyl alcohol (TBA) Highly flammable, harmful by inhalation.	Staff, students, researchers	Skin and eye irritation if contact made. Respiratory tract irritation from inhalation. Significant exposure and inhalation can cause nausea, vomiting, fainting, and potential liver/kidney damage. TBA can pass through the skin. Burns as flammable as liquid or solid.	4 x 4 High Risk (Known to occur, Major)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Work must be carried out in fume cupboard Clean pipettes with damp tissue to remove soil from surfaces and then spray and wipe with 10% Anigene solution. Dispose of pipettes in designated glass waste / sharps box to await offsite disposal with other licenced material.	2 x 2 (Not likely, Minor)
	Vortex mechanical mixer and centrifuge	Staff, students, researchers	Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels Cuts and injuries from glass breakages Mechanical injuries such as entrapment within rotating parts of equipment	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened Long hair to be tied up PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	2 x 2 Low Risk (Not likely, Minor)
	Spillage of licenced material Inappropriate disposal of licenced material	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Release of licenced material to general waste	3 x 3 Medium Risk (Could occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the protocols above Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the dried waste is collected for disposal. The equipment can be cleaned with damp tissues and then disinfected with 10% Anigene solution.	2 x 2 Low Risk (Not likely, Minor)

					Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
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Internal Guidance/Linked Documents:		Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials, Soil Subsampling DEFRA RA, Conc. Sulphuric Acid COSHH, Glacial Acetic Acid COSHH, Acetic Anhydride COSHH, HCl COSHH, NaOH COSHH, Ethanol COSHH, TBA COSHH, Sodium Polytungstate COSHH, Silicone oil COSHH, aqueous safranin stain COSHH, water bath SOP, vortex SOP, heater block SOP, centrifuge SOP	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of chemicals involved in pollen prep process, water bath, hydrometer, heater block, vortex, centrifuge and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	5/6/2024	Date:	3/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form			Serial:		DU/DEPT/COSHH0001		
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace			
						Research		x	
						Cleaning/Maintenance			
						Other			
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)							
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes		No	
Substitution: Is it possible to use a less harmful substance to do the work?						Yes		No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products									
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long?	How Often?	How Much?		
					30 mins	As needed	600ml max (spray bottle)		
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)							
Persons at risk		Employees	x	Students	x	Others		Vulnerable persons	
Classification (tick the box next to the appropriate sign)									
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm									
	Very toxic				Irritant				Highly flammable
		Toxic			Compressed gas				Extremely flammable
		Corrosive			Biological hazard				Serious long term health hazard
	Harmful				Oxidising				Dangerous to the environment
		Explosive				Flammable			
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/									
 First Aid									
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.							
Eye contact		If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low							

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state				Other state	
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)							
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						<u>Yes</u> No	To EN166 or equivalent					
	Respirator						Goggles						
	<u>Yes</u> No	Nitrile gloves					Yes No						
	Gloves						Overalls						
	Yes No						<u>Yes</u> No	Standard polycotton labcoat					
	Footwear						Other						
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket					

During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor	Is exposure adequately controlled?		<u>Yes</u>	No			
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> 				Date 10/8/2024		Review date 5/9/2024				

Fossil Parasite Ova Extraction

Risk Assessment for Work with DEFRA Licenced Materials		Date:	10/5/2024 (revised 25/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Fossil parasite ova extraction		D131 – Environmental Archaeology Processing Laboratory D132 – Archaeological Science Laboratory	
Description of Process:			
Extraction of parasite ova from archaeological soil/sediment samples for analysis using rehydration, dehydration and sieving preparation methods and microscopic analysis methods.			
Objectives and Applications of Process:			
- To extract fossilized parasite ova from archaeological soil/sediment samples for analysis - Applicable to wide range of soil and sediment types, but primarily used for analysing the contents of and grave fills (abdominal cavity) and archaeological cess pits			
Justification of Use of Process:			
Extraction of fossilized parasite ova from archaeological soils/sediment aid in the reconstruction of ancient human hygiene and health and complement palaeopathological studies. It is a fairly low risk process and maximizes recovery of information from samples where fossil parasites are preserved (primarily in waterlogged conditions, which are rare).			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use of sieves and commercial kits required before use. Analysis of fossil parasite ova in archaeological soils or fossil coprolites is safe as eggs do not remain viable in soil for more than three years. Work must be conducted under extraction (fume cupboard – D132, or extraction cabinet – D131) Only micro-sieves designated for work with licenced material to be used. Spillages	

must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. <u>Refer to Protocol for Working with DEFRA Licenced Materials for larger spills</u> All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.
	Cleaning of Equipment
	Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Designated licenced micro-sieves, bases, trays and any measuring/handling equipment (e.g. metal spatula) used should be cleaned thoroughly with damp tissues and then sprayed and wiped using a 10% Anigene disinfectant solution and blue roll.

Disposal
• Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. • Sample slurries and supernatant liquids must be dried by evaporated in the designated DEFRA authorised imported soil beaker. Dried soil can then be collected and placed in the sealed DEFRA waste soil bin for offsite disposal. The beaker and other equipment used to collect waste soil must be cleaned thoroughly with damp tissue and then disinfected using 10% Anigene solution. • Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. • The Department’s licenced soil catalogue must be updated when materials are disposed of.

Parasite Extraction Task-Based Risk Assessment
Equipment required (including PPE, tools, chemicals, etc)

Equipment 15ml centrifuge tubes Centrifuge Microscope slides Commercial kits (Techlab, Blacksburg, Va) Micro-sieves (20µm, 160µm, 300µm) Digital light microscope		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves Safety glasses		Chemicals Trisodium Phosphate (Na_3PO_4) Hydrochloric acid (HCl) Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.		
Work Step/ Tasks <i>(Describe the tasks/steps involved in the order of work)</i>	Hazards Identified for each task/step	Those at risk <i>(people who could be harmed)</i>	How could they be harmed? <i>(nature of injuries, damage that could result)</i>	Uncontrolled risk level <i>(level of risk without control)</i>	Required controls <i>(how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)</i>	Controlled risk level <i>(level of risk remaining when controls are in place)</i>
1. Rehydrate sample and place in 15ml centrifuge tube topped off with 0.5% aqueous solution of trisodium phosphate for disaggregation	Spillage of licenced material Exposure to trisodium phosphate Contact with contaminated soil (e.g. chemical, diesel, biological hazards)	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Trisodium phosphate causes skin, and serious eye irritation. Trisodium phosphate may cause respiratory irritation. Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis	4 x 4 High Risk (Known to occur, Major)	Work must be conducted under extraction (fume cupboard – D132 or extraction cabinet – D131) Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Wash hands thoroughly afterwards (especially before eating/drinking).	2 x 2 Low Risk (Not likely, Minor)
2. After disaggregation into liquid suspension, sieve liquid using stack of designated licenced micro-sieves (mesh sizes of 300µm, 160µm, 20µm).	Spillage of licenced material Contact with contaminated soil (e.g. chemical, diesel, biological hazards)	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis	4 x 4 High Risk (Known to occur, Major)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Only sieves designated for work with licenced material to be used.	2 x 2 Low Risk (Not likely, Minor)

					PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Wash hands thoroughly afterwards (especially before eating/drinking).	
3. Collect material collected on 20µm sieve and mount sample on representative number of microscope slides depending on sample size. View using digital light microscope at 400x magnification to find preserved parasite eggs. Calculate eggs present per gram. Helminth eggs are typically between 25µm-150µm in size and if present, will be trapped in 20µm sieve.	Spillage of licenced material Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Prolonged sitting at benches/postural problems Prolonged use of microscope Licenced material remaining on equipment	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis Pain, discomfort or injury from postural problems (e.g. to hands/arms from overuse, improper use or poorly designed workstation/work environment) Headaches or sore eyes from e.g. overworking, poor lighting Musculoskeletal discomfort, pain and injury from using microscope with improperly adjusted eye pieces and focus for individual use. Eye strain and headaches from prolonged use of microscope and improper adjustment for individual use.	4 x 4 High Risk (Known to occur, Major)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Wash hands thoroughly afterwards (especially before eating/drinking). Use of backed chairs not lab stools for prolonged period of work. Chairs adjusted to correct height/position. Use of proper sitting spaces – not in front of cupboards where you have to twist your legs. Regular breaks from sitting. Workstation Assessment training available to ensure correct seating position Proper adjustment and use of binocular eye pieces and microscope focus. Use of low rather than high light intensities. Regular breaks for eyes – look up and	3 x 2 Low Risk (Could occur, Minor)

					focus eyes at different focal distances. Carefully follow all equipment cleaning instructions listed above	
4. If sample heavily mineralised and does not disaggregate in 0.5% trisodium phosphate, add dilute hydrochloric acid (10%) dropwise to break up carbonates until no reaction is visible and sieve as in step 2.	Spillage of licenced material Exposure to HCl Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Licenced material remaining on equipment	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material HCl causes severe burns and eye damage. HCl may cause respiratory irritation. Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis	4 x 4 High Risk (Known to occur, Major)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Work must be conducted under extraction (fume cupboard – D132 or extraction cabinet – D131) Wear all appropriate PPE and wash hands thoroughly afterwards (especially before eating/drinking). Carefully follow all equipment cleaning instructions listed above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Wash hands thoroughly afterwards (especially before eating/drinking).	2 x 2 Low Risk (Not likely, Minor)
5. Wash sample recovered from 20µm sieve with ultrapure water and centrifuge for 5 minutes at 3500rpm to sediment any eggs from the soil. Remove	Spillage of licenced material Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Centrifuge use	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis	4 x 4 High Risk (Known to occur, Major)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Decant waste from wash into designated	3 x 2 Low Risk (Could occur, Minor)

supernatant and allow to evaporate before collecting dried material for offsite disposal and cleaning equipment with damp tissue and then disinfecting with 10% Anigene solution. Repeat four times to ensure sample pH returned to neutral.	Licenced material remaining on equipment Inappropriate disposal of licenced material		Electric shock from liquid making contact with electrical connections. Unbalanced and/or overloaded centrifuge may explode. Possibly injuries from chemical exposure due to splashed from improperly sealed vessels. Mechanical injuries such as entrapment within machinery. Release of licenced material to general waste		waste beaker for disposal. Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the dried waste is collected for disposal. The equipment can be cleaned with damp tissues and then disinfected with 10% Anigene solution. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Wash hands thoroughly afterwards (especially before eating/drinking). Use centrifuge on a stable level surface. Long hair to be tied up. Ensure centrifuge load is balanced properly before stating run. Ensure centrifuge tube lids are securely fastened. Carefully follow all equipment cleaning instructions listed above	
6. Recover parasite ova samples from finest (top) layer of centrifuged sediment by withdrawing using pipette and wet mount onto microscope slides.	Spillage of licenced material Contact with contaminated soil (e.g. chemical, diesel, biological hazards)	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis	4 x 4 High Risk (Known to occur, Major)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Wash hands thoroughly afterwards	

					(especially before eating/drinking). Pipette tips should be cleaned with damp tissue to remove licenced material from surface then disinfected with 10% Anigene solution. Pipette tips should then be disposed in designated glass waste/sharps box to await offsite disposal with other licenced material.	
7. If sample not heavily mineralised and no disaggregation with diluted HCl needed, conduct enzyme-linked immunosorbent assay (ELISA) test for protozoal parasites using commercial kit.	Spillage of licenced material Contact with contaminated soil (e.g. chemical, diesel, biological hazards)	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis	4 x 3 Medium Risk (Known to occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Wash hands thoroughly afterwards (especially before eating/drinking).	
8. (For ELISA test) Take 1g subsample disaggregated with 0.5% trisodium phosphate and sieved as in step 2. Collect material from 20µm sieve and centrifuge as in step 6 (without wash step).	Spillage of licenced material Licenced material remaining on equipment Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Centrifuge use Exposure to trisodium phosphate	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis Electric shock from liquid making contact with electrical connections. Unbalanced and/or overloaded centrifuge may explode. Possibly injuries from chemical exposure due to splashed from	4 x 4 High Risk (Known to occur, Major)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Carefully follow all equipment cleaning instructions listed above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Wash hands thoroughly afterwards (especially before eating/drinking). Use centrifuge on a stable level surface.	2 x 2 Low Risk (Not likely, Minor)

			improperly sealed vessels. Mechanical injuries such as entrapment within machinery. Trisodium phosphate causes skin, and serious eye irritation. Trisodium phosphate may cause respiratory irritation.		Long hair to be tied up. Ensure centrifuge load is balanced properly before stating run. Ensure centrifuge tube lids are securely fastened. Work must be conducted under extraction (fume cupboard – D132 or extraction cabinet – D131)	
9. After removal of supernatant, c. 2.5ml of sample will be used in each commercial kit. Follow instructions on individual chosen kits to complete ELISA test.	Spillage of licenced material Contact with contaminated soil (e.g. chemical, diesel, biological hazards) Inappropriate disposal of licenced material	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Tetanus, E-Coli, Weil's Disease, Toxoplasmosis, Toxocariasis Licenced material released to general waste	4 x 3 Medium Risk (Known to occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Wash hands thoroughly afterwards (especially before eating/drinking). Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the dried waste is collected for disposal. The equipment can be cleaned with damp tissues and then disinfected with 10% Anigene solution.	2 x 2 Low Risk (Not likely, Minor)

Internal Guidance/Linked Documents:		Anigene COSHH, Trisodium Phosphate COSHH, HCl COSHH, Centrifuge SOP, ELISA test kit protocols/instructions, Protocol for Working with DEFRA Licenced Soils, Microscope work RA	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of centrifuge, microscope work, general process and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>AB Parker</i>	Signature:	<i>Karen Milek</i>
Date:	10/5/24	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk



Durham
University

COSHH Assessment Form

Serial:

DU/DEPT/COSHH0001

Date	10/8/23	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)	Workplace	
				Research	x
				Cleaning/Maintenance	
				Other	

Name of the Substance

Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)

Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?

Yes

No

Substitution: Is it possible to use a less harmful substance to do the work?

Yes

No

Before beginning work on the COSHH assessment process ensure you have a copy of the latest **Manufacturers Safety Data Sheet (MSDS) for the substance**. MSDS's are available from suppliers and manufacturers of products

Describe the activity or work process.	Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.	How Long?	How Often?	How Much?
Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		30 mins	As needed	600ml max (spray bottle)

Location of Work

Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)

Persons at risk

Employees

x

Students

x

Others

Vulnerable persons

Classification (tick the box next to the appropriate sign)

For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link:

<http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm>

	Very toxic			Irritant			Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful			Oxidising			Dangerous to the environment	x
	Explosive			Flammable				

Carcinogenic substances must be notified to the University Safety Service, click on this link to notify:

<https://www.dur.ac.uk/healthandsafety.new/contactus/>



First Aid

Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes														
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid		
Indicate below the route(s) of exposure that the substance takes														
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state	
Workplace Exposure Limits (WELs)														
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)								
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm														
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations														
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary														
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.														
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:														
Oxidising substances Anionics Peroxides Acids														
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)									Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.														
	Yes No						Yes No							
	Dust mask						Visor							
	Yes No						<u>Yes</u> No	To EN166 or equivalent						
	Respirator						Goggles							

	<u>Yes</u> No	Nitrile gloves					Yes No			
	Gloves						Overalls			
	Yes No						<u>Yes</u> No	Standard polycotton labcoat		
	Footwear						Other			
Fire: identify appropriate extinguishers here										
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		<u>Yes</u>	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Karen M. Leek</i>						Date 10/8/23		Review date 5/9/2024		

Phytolith Extraction

Risk Assessment for Work with DEFRA Licenced Materials		Date:	24/2/25
		Review Date:	24/2/26
Process:	Licenced locations for work:		
Phytolith extraction from soils and sediments	D132 – Archaeological Science Laboratory D131 – Environmental Archaeology Processing Laboratory		
Description of Process:			
A multi-step process to separate phytoliths from surrounding soil/sediment matrix			
Objectives and Applications of Process:			
Laboratory techniques for the extraction of phytoliths from sediment samples are aimed largely at the disintegration and dissolution, or otherwise removal of the non-phytolith matrix in the sediment sample. This procedure concentrates the phytoliths in the samples, which should permit accurate identification of the phytoliths encountered. These phytolith-rich samples can then be mounted on a microscope slide and identified and counted to provide a representation of the total population.			
Justification of Use of Process:			
Phytoliths are biogenic silica deposits that form within and between the cells in plant tissues. This is a low risk process used to extract phytoliths from the surrounding soil/sediment matrix for identification and quantification. This technique is used in archaeological and palaeoecological studies to identify assemblages of plant types and plant parts to investigate ancient plant use for purposes such as food, fuel and craft activities. In palaeoenvironmental studies they are used alongside other microfossils to estimate past vegetation cover.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Spillage of licenced material, Hydrochloric Acid, Entellan, Sodium Polytungstate			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) The DEFRA authorised imported soils warning signs must be placed on the oven door while in use. Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. <u>Refer to Protocol for Working with DEFRA Licenced Materials for larger spills</u>	

must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.
	Cleaning of Equipment
	Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.</i> <i>Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i>
Disposal	
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - Users must consider the likely amount of waste generated in advance of planned work with licenced materials to ensure waste storage capacity is not exceeded. - The Department’s licenced soil catalogue must be updated when materials are disposed of.	

Phytolith extraction from soils and sediments Task-Based Risk Assessment						
Equipment required (including PPE, tools, chemicals, etc)						
Analytical balance 0.5 mm sieve Centrifuge Fume hood Glass beakers Glass stirring rods Crucibles Muffle furnace Drying oven		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves Safety glasses		Chemicals Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material. Pre-prepared solutions of HCl 10%, sodium hexametaphosphate, sodium polytungstate Entellan mounting agent		
Work Step/ Tasks <i>(Describe the tasks/steps involved in the order of work)</i>	Hazards Identified for each task/step	Those at risk <i>(people who could be harmed)</i>	How could they be harmed? <i>(nature of injuries, damage that could result)</i>	Uncontrolled risk level <i>(level of risk without control)</i>	Required controls <i>(how the risk can be removed or reduced by for example engineered</i>	Controlled risk level <i>(level of risk remaining when controls</i>

					<i>methods, safe systems of work, training and/ or personal protective equipment)</i>	<i>are in place)</i>
Sub-sampling and weighing of sample: • Weigh a piece of aluminium foil on an analytical balance. Tare the balance. Sieve approximately 800 mg of the sample through a 0.5 mm sieve onto the foil. Record the total mass of the sample in mg.	Spillage of licenced material Soil handling / Bacteria in soil Dust inhalation	Operator	Contamination of equipment and working surfaces with licenced material. Risk of contamination from bacteria leading to infection and illness Risk of infection if soil makes contact with any cuts or wounds on skin Risk of cross-contamination from handling to e.g. foods, drink, etc Contamination of equipment and working surfaces with licenced material Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. Nitrile gloves to be worn. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Wash hands thoroughly afterwards (especially before eating/drinking). Soil inspected by trained personal on site to ensure that contaminated soil doesn't get sampled and sent to the lab. All dust-generating sample preparation work should be undertaken under extraction in extraction cabinet (D131). Room extraction to be switched on to maximum Dust masks (P2) suitable for	2 x 2 Low Risk (Not likely to occur, Minor)

					protections against silica dust to be worn if not working under extraction If not working in extraction cupboard/fume hood fan to be used to direct dust away from workers. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
Carbonate removal with HCl: - Label a 50 ml centrifuge tube and transfer the sample from the paper into the tube. - Work in the fume cupboard. Add a small amount of 10% HCl into the tube using a pipette or small measuring cylinder. Continue to add 10% HCl in small amounts until the sample stops effervescing. The sample stops effervescing when all the carbonate has been removed and usually less than 7.5 ml of HCl is sufficient. - Add distilled water up to 50 ml to dilute the acid; mix the sample using a vortex mixer and centrifuge at 2000 rpm for 5minutes. - Pour off the supernatant into a waste bottle and repeat rinsing two more times. Supernatant must be evaporated before dried material collected for disposal with other licenced material.	Spillage of licenced material	Operator	Contamination of equipment and working surfaces with licenced	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the dried waste is	2 x 2 Low Risk (Not likely, Minor)

					collected for disposal and the equipment can be cleaned with damp tissues and then disinfected.	
	HCl is extremely corrosive, vapour inhalation is harmful, ingestion may be fatal. Can cause severe damage to skin and eyes	Operator, other users in area	Severe injuries and burns from corrosive action of HCl to eyes, skin and mucous membranes. Irritation to eyes, nose, and respiratory tract from acute inhalation Potential to exacerbate existing conditions (e.g. asthma) Toxic and potentially fatal if ingested	4 x 5 High Risk (Known to occur, Severe)	Work must be carried out in the fume cupboard. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	3 x 3 Medium Risk (Could occur, Moderate)
	Vortex mechanical mixer and centrifuge		Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened	2 x 2 Low Risk (Not likely Minor)
Clay removal with distilled water and 5% sodium hexametaphosphate: - Transfer samples to a labelled, tall 400 ml beaker using a small amount of distilled water and add 15-20 ml 5% sodium hexametaphosphate. - Stir vigorously with a glass rod and add distilled water to a height of 8 cm. - Leave samples to settle for 1 hour and 10 minutes (10 minutes being added to	Spillage of licenced material. Licenced material remaining on equipment Inappropriate disposal of licenced material	Operator	Contamination of equipment and working surfaces with licenced material. Release of licenced material into general waste	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. Any decanted liquids and waste water must be	2 x 2 Low Risk (Not likely Minor)

compensate for the slight change in density caused by the addition of sodium hexametaphosphate). - Pipette or pour suspense down to 100 ml. Waste from suspense must be left to evaporate before solid dried waste is collected for disposal with licenced material. Stir vigorously; refill with distilled water to a height of 8cm and leave to stand for one hour. - Repeat until the suspense is clear (usually around six times). If necessary, samples can be left to stand overnight. On resuming work, stir the sample vigorously and leave to stand for 1 hour and 10 minutes before pipetting the suspense down and refilling. In the last iteration, pipette off as much of the suspense as possible. - Label crucibles using a high temperature ink pen. Transfer samples to crucibles using a small amount of distilled water and leave to dry overnight in a drying oven at 50°C.					evaporated in the designated licenced soil beaker before the dried waste is collected for disposal and the equipment can be cleaned with damp tissues and then disinfected. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Ensure DEFRA authorised imported soils warning sign is placed on oven door for duration of use.	
Organic matter removal in muffle furnace: Break up lumps in crucible with a small rod or cocktail stick and place in a muffle furnace for 2 hours at 500°C.	See LOI risk assessment for detailed risks	Operator	See LOI risk assessment for detailed risks	4 x 4 High Risk (Known to occur, Major)	See LOI risk assessment for detailed risks	2 x 3 Medium Risk (Not likely, Moderate)
Removal of non-phytolith mineral material through heavy density separation: Break up lumps in crucible with a small rod or cocktail stick. Add sample to a labelled 15 ml tube; use a cocktail stick if the sample does not transfer easily. Add 3-5 ml of sodium polytungstate solution [Na6(H2W12O40).H2O] (previously calibrated to give a density of 2.3 g/cm3: phytoliths have	Spillage of licenced material Inappropriate disposal of licenced material	Operator	Contamination of equipment and working surfaces with licenced material Release of licenced material into general waste	4 x 3 Medium Risk (Known to occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with	2 x 2 Low Risk (Not likely, Minor)

densities between 2.1 and 2.2 g/cm³). Mix using a vortex mixer. - Centrifuge at 800 rpm for 10 minutes. - After centrifuging, some material will be floating on top of the liquid. This is the material of interest. Pipette or pour off suspense containing the phytoliths into a clean, labelled 15 ml tube. The residue in the other tube must be evaporated and collected when dried for disposal with other licenced material. - Add a few ml of distilled water to the tubes containing the phytoliths to adjust the density and centrifuge at 2000 rpm for 5 mins – the phytoliths are now at the bottom of the tube. - Pipette or pour off suspense containing the sodium polytungstate through a double filter into a wash container for recalibration and reuse - Add distilled water up to 15 ml to the samples remaining in the tubes to wash them. Mix with a vortex mixer and centrifuge at 2000 rpm for 5 mins. Repeat 2-3 times to get rid of any remaining sodium polytungstate. The supernatant must be evaporated and dried waste then collected for					damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Any decanted liquids and waste water must be evaporated in the designated licenced soil beaker before the dried waste is collected for disposal and the equipment can be cleaned with damp tissues and then disinfected.	
	SPT is Harmful if swallowed. May damage eyes, long term adverse effects to aquatic organisms	Staff, students, researchers	Acute toxicity from oral ingestion. Serious skin and eye damage/irritation from contact.	4 x 4 High Risk (Known to occur, Major)	Gloves, lab coat and protective glasses to be worn. Any waste from this process to be disposed of down designated licenced sink (D132)with plenty of water Dispose of pipettes in glass waste / sharps box. Ensure test tube lids are securely fastened	2 x 3 Low Risk (Not likely Moderate)

offsite disposal with other licenced material. Transfer phytoliths into a crucible and dry in a drying oven. Label and weigh a glass vial on an analytical balance. Tare the balance and add the sample to the vial. Record the total mass of the sample in mg.	Vortex mechanical mixer and centrifuge		Injuries from slips caused by spills Electric shock from liquid making contact with electrical connections Possible injuries from chemical exposure due to splashes from improperly sealed vessels	3 x 3 Medium Risk (Could occur, Moderate)	Use vortex and centrifuge on stable level surface Ensure test tube lids are securely fastened	2 x 2 Low Risk (Not likely, Minor)
Weighing and mounting extracted phytoliths: - Work in the fume cupboard. Label a 3 x 1 inch microscope slide and place over a beaker on an analytical balance. Place a few drops of Entellan (Methacrylate/Acrylate resin) mounting agent on the slide. Tare the balance. - Add approximately 3 mg of phytoliths to the slide, recording the exact weight. - Distribute phytoliths evenly over slide by mixing with a tooth pick and add a cover slip (take care not to press too hard and break the cover slip and avoid air bubbles). - Leave slide to dry overnight in the fume cupboard.	Once extracted from the soil matrix, the phytoliths fall outside the scope of authorisation and can be treated as un-licenced material.					
	Entellan is highly flammable, irritant, harmful, toxic to reproduction	Operator		4 x 5 High Risk (Known to occur, Severe)	Work must be carried out in the fume cupboard. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Users must leave a sign/note near their drying samples providing name and contact details, sample information, and duration of drying process.	3 x 3 Medium Risk (Could occur, Moderate)

Internal Guidance/Linked Documents:	Anigene COSHH SOP** - Extraction and analysis of phytoliths SOP** Storage and disposal of hydrochloric acid SOP** Making up and recycling sodium polytungstate solution SOP** Diluting HCl COSHH HCl COSHH sodium hexametaphosphate COSHH sodium polytungstate COSHH Entellan DEFRA Loss on Ignition Risk Assessment			
Competence Requirements:	Training and competence judgement by lab manager/supervisor or technicians as required for new users of phytolith extraction and mounting processes and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.			
Supervisor/Manager Review and Comment:				
Assessment Prepared by			Supervisor/Manager acceptance	
Name:	Lisa-Marie Shillito	Aimee Parker	Name:	
Signature:		<i>ABParker</i>	Signature:	
Date:	24/2/25	26/2/25	Date:	
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work				

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

 Durham University		COSHH Assessment Form		Serial:	DU/DEPT/COSHH0001	
Date		Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)		Workplace	
				Research	x	
				Cleaning/Maintenance		
				Other		
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)				
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?					Yes	No
Substitution: Is it possible to use a less harmful substance to do the work?					Yes	No
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products						
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.		How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)				
Persons at risk		Employees	x	Students	x	Others
		Vulnerable persons				
Classification (tick the box next to the appropriate sign)						
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm						
	Very toxic	 	Irritant	 	Highly flammable	
 	Toxic		Compressed gas	 	Extremely flammable	
 	Corrosive		Biological hazard		Serious long term health hazard	
	Harmful	 	Oxidising	 	Dangerous to the environment	x
 	Explosive	 	Flammable			
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/						
 First Aid						

Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state				Other state	
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)								Short term exposure level (15 mins)					
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		No			
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						Yes No	To EN166 or equivalent					

	Respirator			Goggles	
	<u>Yes</u> No	Nitrile gloves		Yes No	
Gloves			Overalls		
	Yes No			<u>Yes</u> No	Standard polycotton labcoat
Footwear			Other		

Fire: identify appropriate extinguishers here

Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
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During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below

Not flammable. No hazard expected under normal conditions of use.

Storage

Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight.
 Keep away from oxidising substances, anionics, peroxides, and acids.
 No decomposition if stored normally.
 Dilutions have a shelf life of 3 months and must be labelled with date they are made.

Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)

Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
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Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations.
 Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution.
 Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations).
 Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.

Risk evaluation (from matrix)	Consequences	Minor	Is exposure adequately controlled?	<u>Yes</u>	No
	Likelihood	Not likely			
	Evaluation phrase	Low Risk			
Signature(s) <i>ABParker</i>			Date 10/8/23	Review date 10/8/26	

 Durham University		COSHH Assessment Form		Serial:	DU/DEPT/COSHH0001			
Date		Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015).	Workplace				
				Research		x		
				Cleaning/Maintenance				
				Other				
Name of the Substance		Entellan (Acrylate Polymer in Xylene)						
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?					Yes	No		
Substitution: Is it possible to use a less harmful substance to do the work?					Yes	No		
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products								
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Mounting extracted phytoliths onto glass slides for microscopic examination		How Long? 5 mins	How Often? As needed	How Much? 1-2 drops from dropper bottle		
Location of Work		Licenced soil laboratories (D132; D131; D128; D133; D112; D242) and storage areas (D111; D013)						
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons	x
Classification (tick the box next to the appropriate sign)								
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm								
	Very toxic	x		Irritant	x		Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful	x		Oxidising			Dangerous to the environment	x
	Explosive			Flammable	x			
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/								
 First Aid								
Skin contact		Skin irritation should not occur when used as recommended (low hazard). In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.						

Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If inhaled: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

Indicate below which form the substance takes													
Gas		Vapour	x	Mist		Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)							
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H226: Flammable liquid and vapour H332: Harmful if inhaled H304: May be fatal if swallowed and enters airways. H315 Causes skin irritation. H317: May cause an allergic skin reaction H312: Harmful in contact with skin H319: Causes serious eye irritation H335: May cause respiratory irritation H336 May cause drowsiness or dizziness. H361 Suspected of damaging fertility or the unborn child. H373 May cause damage to organs through prolonged or repeated exposure. H412: Harmful to aquatic life with long lasting effects.													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
To be conducted in fume hood ONLY, where slides remain until dry. Keep away from open flames, hot surfaces and sources of ignition. Entellan should not be used by pregnant women. Small quantity of Entellan to be transferred to dropper bottle in fume hood for use. PPE to be worn by all participants throughout until all materials have been cleaned away – safety specs, lab coat and nitrile gloves. Wash hands and face after working with Entellan. Face mask to be worn when working with Entellan outside fume hood. Entellan – stable under standard ambient conditions, avoid warming.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Carbon oxides. Mixture with combustible ingredients. Development of hazardous combustion gases or vapours possible in the event of fire.													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No								Yes No				
	Dust mask								Visor				
	Yes No								<u>Yes</u> No	To EN166 or equivalent			
	Respirator								Goggles				

	<u>Yes</u> No	Nitrile gloves					Yes No			
	Gloves						Overalls			
	Yes No						<u>Yes</u> No	Standard polycotton labcoat		
	Footwear						Other			
Fire: identify appropriate extinguishers here										
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Vapors are heavier than air and may spread along floors. Forms explosive mixtures with air at elevated temperatures.										
Storage										
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do not let product enter drains. Risk of explosion. Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Major		Is exposure adequately controlled?		<u>Yes</u>	No		
		Likelihood	Not likely							
		Evaluation phrase	Medium Risk							
Signature(s)						Date		Review date		

Section 2: Materials Analysis Processes

Soil/sediment Powdering with a Ball Mill

Risk Assessment for Work with DEFRA Licenced Materials		Date:	10/8/2024 (revised 25/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Soil/sediment powdering with a ball mill		D112 – Archaeomaterials Sample Preparation Laboratory D132 – Archaeological Science Laboratory	
Description of Process:			
Grinding down or powdering of a sample using the ball mill			
Objectives and Applications of Process:			
- To use the ball mill to grind down or powder a sample in preparation for analytical processes - Applicable to the preparation of samples a range of soil and sediment types			
Justification of Use of Process:			
This sample preparation method is a necessary precursor to a range of analytical processes involving licenced material across different labs. The method is generally low risk and ensures homogenisation of grain size and sample thickness/consistency.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Prolonged dust inhalation, insecurely clamped grinding bowl, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use of the ball mill must be undertaken before use. All dust-generating work must be undertaken under extraction with HEPA filter units installed. Ball mill safety measures: - Lid must be securely placed onto the grinding bowl before being placed into the ball mill - Ensure the correct number of balls are used depending on sample grain size/consistency - Ensure the grinding bowl and lid are securely clamped through the clamping arrangement before starting the ball mill (always ensure the red sleeve has latched in properly) - Ensure the cover is closed before letting the machine start unattended.	

originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. <u>Refer to Protocol for Working with DEFRA Licenced Materials for larger spills</u> All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> The grinding bowl, lid and balls must be cleaned with damp tissue and then sprayed and wiped with 10% Anigene solution and blue roll before use, between each sample and at the end of the process. If necessary, clean the inside of the ball mill and the clamping arrangement with a damp tissue and then wipe with 10% Anigene solution and blue roll after use.
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Disposal
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Lab users must be aware of the appropriate disposal requirements for the final product produced at the end of sample preparation based on the analytical process that follows. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - The Department's licenced soil catalogue must be updated when materials are disposed of.

Equipment required (including PPE, tools, chemicals, etc)						
Equipment Ball mill Grinding bowl Balls		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Safety glasses Gloves		Chemicals Ethanol Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material		
Work Step/ Tasks <i>(Describe the tasks/steps involved in the order of work)</i>	Hazards Identified for each task/step	Those at risk <i>(people who could be harmed)</i>	How could they be harmed? <i>(nature of injuries, damage that could result)</i>	Uncontrolled risk level <i>(level of risk without control)</i>	Required controls <i>(how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)</i>	Controlled risk level <i>(level of risk remaining when controls are in place)</i>
1. Turn on laboratory extraction (partial enclosure and furnace canopy)	Prolonged inhalation of powdered samples (particularly silica-containing powders)	Staff, students, researchers	Potential for irritation of respiratory tract, skin, eyes and aggravation of existing respiratory health conditions. Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions	4 x 4 High Risk (Known to occur, Major)	All powder/dust-generating must be undertaken under extraction PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	3 x 2 Low Risk (Could occur, Minor)
2. Check the immediate working area around the machine is free of hazards and inspect the electrical cable. Ensure PAT testing is in date. Check the machine and associated equipment (grinding bowl, lid, bowls, clamp) is in working order.	Trips and slips Electrical shock Faulty equipment Damage to equipment from improper use Manual handling/use of heavy equipment (grinding bowl)	Staff, students, researchers	Physical injuries from slips and trips due to unsafe working area. Electrical shocks or burns from using faulty equipment Injury resulting from incorrect use of ball mill and equipment Musculoskeletal pain, injury or discomfort from incorrect handling of heavy equipment	4 x 4 High Risk (Known to occur, Major)	Ensure area is free from slip and trip hazards before using ball mill. Always check equipment before switching on. Report damaged cables. Appropriate user to complete and record PAT test if out of date before use. Do not use if damage to cables or ball mill identified (report to lab manager or technicians in D203A). Report chipped or damaged tools and do not proceed with process until told it is safe to do so.	3 x 2 Low Risk (Could occur, Minor)

					Manual handling training is available if required. Handle the grinding bowl carefully and appropriately, and be aware of fingers before setting it down on surfaces.	
3. Clean equipment (grinding bowl, lid, balls) by running ball mill with sand for 2 minutes (450 rpm) to remove every eventual trace of clay materials. Then wipe equipment with water and ethanol and ensure it is dry before use. This should be undertaken prior to preparing each sample at all stages of the procedure to avoid cross contamination. If licenced material is to be used, the equipment should be additionally cleaned using damp tissue and wiped with 10% Anigene disinfectant solution between samples and after use.	Using ethanol Grinding bowl not securely clamped Prolonged dust inhalation (particularly silica-containing powders) Contamination of equipment with licenced material.	Staff, students, researchers	Ethanol is highly flammable. Ethanol is an irritant and may dry skin if it comes into contact (contact dermatitis, irritation of existing skin conditions) Danger of grinding bowl being hurled out if not clamped securely Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation Licenced material remaining on equipment after process.	4 x 3 Medium Risk (Known to occur, Moderate)	Ethanol should be treated with care when used and should be used under extraction or in well-ventilated space PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Training in use of ball mill must be undertaken before use. Ensure that grinding bowl is securely clamped before closing ball mill. Grinding bowl must be opened under extraction to prevent inhalation of sand dust/powder. Carefully follow all cleaning instructions listed above for work with licenced materials. At start of process, between samples, and at end of process, all equipment should be cleaned thoroughly with damp tissue and then sprayed and wiped with 10% Anigene solution and blue roll. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Ethanol: Spillage/uncontrolled release: ventilate area and remove all	3 x 2 Low Risk (Could occur, Minor)

					sources of ignition; contain and absorb spill with sand and collect in a suitable waste container Fire: extremely flammable; use dry chemical, foam, or carbon dioxide extinguisher Personnel exposure: Treatment to be adopted: Skin contact: Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention. Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention. Ingestion: Do not induce vomiting. Obtain medical attention. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Inhalation: Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Obtain medical attention	
4. Under extraction place the needed amount of sample in the cleaned and dry grinding bowl, insert the balls and close it with the lid.	Prolonged dust inhalation (particularly silica-containing powders) Spillage of licenced material Licenced material remaining on equipment	Staff, students, researchers	Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation Contamination of equipment	4 x 3 Medium Risk (Known to occur, Moderate)	All dust-generating work must be undertaken under extraction. Carefully follow all equipment cleaning instructions listed above. Any spills of licenced material should be cleaned up immediately following protocols above. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10%	3 x 2 Low Risk (Could occur, Minor)

			and working surfaces with licenced material		Anigene disinfectant after working. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	
5. Insert the closed grinding bowl in the ball mill, clamp the bowl through the clamping arrangement and ensure that the red sleeve has latched in properly.	Grinding bowl not securely clamped Spillage of licenced material Licenced material remaining on equipment	Staff, students, researchers	Danger of grinding bowl being hurled out if not clamped securely Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	Training in use of ball mill must be undertaken before use. Ensure that grinding bowl is securely clamped before closing ball mill. Never allow threaded spindle to lie loose in the grinding bowl fixture without the grinding bowls clamped in. Always ensure that the red sleeve has latched in properly. Otherwise the grinding bowl is not securely clamped. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	3 x 2 Low Risk (Could occur, Minor)
6. Close the cover, select the required program and press Start. The program (number of rotations per minute and time) depends on the type of sample – coarser and harder samples may require longer grinding times.	Improperly/not closing the machine Spillage of licenced material Licenced material remaining on equipment	Staff, students, researchers	Danger of grinding bowl being hurled out if not clamped securely Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	Training in use of ball mill must be undertaken before use. Although the machine will not start unless the cover is closed, ensure the cover has been closed properly (indicated by “click” sound) before starting the machine. Any spills of licenced material should be cleaned up	3 x 2 Low Risk (Could occur, Minor)

					immediately following the protocols above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
7. Wait for the “beep” that indicates the program has finished. The cover will automatically release. Open the cover, unclamp the bowl and remove it from the holder.	Manual handling/use of heavy equipment (grinding bowl) Improperly unclamping and releasing the grinding bowl Spillage of licenced material Licenced material remaining on equipment	Staff, students, researchers	Musculoskeletal pain, injury or discomfort from incorrect handling of heavy equipment Possible entrapment injury risk from improperly unclamping and releasing grinding bowl. Contamination of equipment and working surfaces with licenced material.	3 x 3 Medium Risk (Could occur, Moderate)	Manual handling training is available if required. Handle the grinding bowl carefully and appropriately and be aware of fingers before setting it down on surfaces. Take care when unclamping and releasing the grinding bowl to ensure that no articles of clothing get caught in clamping arrangement or inner mechanism or ball mill holder. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
8. Under extraction open the grinding bowl and carefully remove the sample from the grinding bowl.	Prolonged dust inhalation (particularly silica-containing powders) Spillage of licenced material	Staff, students, researchers	Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions Development of allergies/reaction	4 x 3 Medium Risk (Known to occur, Moderate)	All dust-generating work must be undertaken under extraction. Any spills of licenced material should be cleaned up immediately following the protocols above.	3 x 2 Low Risk (Could occur, Minor)

	Licenced material remaining on equipment		and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation Contamination of equipment and working surfaces with licenced material		PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
9. Clean the equipment again in preparation for the next sample and at the end of the process (see step 3)	See step 3	Staff, students, researchers	See step 3	4 x 3 Medium Risk (Known to occur, Moderate)	See step 3	3 x 2 Low Risk (Could occur, Minor)
10. At the end of the process, place the clean and dry closed grinding bowl back into the ball mill's holder and ensure it is clamped securely with the red sleeve latched properly. Close the lid and then switch off the machine.	Manual handling/use of heavy equipment (grinding bowl) Grinding bowl not securely clamped Improperly/not closing the machine	Staff, students, researchers	Musculoskeletal pain, injury or discomfort from incorrect handling of heavy equipment Danger of grinding bowl being hurled out if not clamped securely	3 x 3 (Could Occur, Moderate)	Manual handling training is available if required. Handle the grinding bowl carefully and appropriately and be aware of fingers before setting it down on surfaces. Ensure that grinding bowl is securely clamped before closing ball mill. Never allow threaded spindle to lie loose in the grinding bowl fixture without the grinding bowls clamped in. Always ensure that the red sleeve has latched in properly, otherwise the grinding bowl is not securely clamped. Although the machine will not start unless the cover is closed, ensure the cover has been closed properly (indicated by "click" sound) before starting the machine.	2 x 2 (Not likely, Minor)

Internal Guidance/Linked Documents:	Ethanol COSHH, Anigene COSHH, Ball Mill SOP, Protocol for Working with DEFRA Licenced Materials, Appropriate experimental protocols and risk assessments
Competence Requirements:	Training and competence judgement by lab manager/supervisor or technicians as required for new users of ball mill and those new to working

	with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.		
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>AB Parker</i>	Signature:	<i>Karen Milek</i>
Date:	10/8/2024	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form			Serial:	DU/DEPT/COSHH0001		
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace		
					Research	x		
					Cleaning/Maintenance			
					Other			
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)						
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products								
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)	
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)						
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons	
Classification (tick the box next to the appropriate sign)								
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm								
	Very toxic			Irritant			Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful			Oxidising			Dangerous to the environment	x
	Explosive			Flammable				
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/								
 First Aid								
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						

Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)								Short term exposure level (15 mins)					
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No								Yes No				
Dust mask								Visor					
	Yes No								<u>Yes</u> No	To EN166 or equivalent			
Respirator								Goggles					
	<u>Yes</u> No	Nitrile gloves							Yes No				
Gloves								Overalls					
	Yes No								<u>Yes</u> No	Standard polycotton labcoat			
Footwear								Other					
Fire: identify appropriate extinguishers here													

Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences		Minor		Is exposure adequately controlled?		<u>Yes</u>	No	
		Likelihood		Not likely						
		Evaluation phrase		Low Risk						
Signature(s) <i>AB Parker</i> <i>Kenny M. Leck</i>						Date 10/8/24		Review date 5/9/2024		

Preparation of Fused Beads for XRF Analysis

Risk Assessment for Work with DEFRA Licenced Materials		Date:	10/8/2024 (revised 25/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Preparation of fused beads for XRF Analysis		D112 – Archaeomaterials Sample Preparation Laboratory	
Description of Process:			
Fusing the powdered soil into a bead for XRF analysis			
Objectives and Applications of Process:			
To use the Claisse LeNeo Fluxer to fuse powdered sample and flux together to create a fused bead for XRF analysis			
Justification of Use of Process:			
This sample preparation method enables analysis of materials using x-ray fluorescence (XRF). The sample is mixed with flux (lithium tetraborate) and fused into a glass bead with a specific size and diameter. This bead is then analysed on the XRF machine to determine the elemental composition of the sample material. The use of this method ensures a homogeneous representation of the sample is prepared for analysis for high accuracy measurements.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Dust inhalation, injuries associated with contact with hot surfaces, chemical handling (lithium flux), spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Extraction must be turned on during sample preparation (sample powdering) and when the fluxer is in use. Training in use of ball mill, fluxer and ultrasonic bath must be carried out before use. Flux (lithium tetraborate) – all work with reagent requires full PPE and use of extraction Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. Refer to Protocol for Working with DEFRA Licenced	

area. All material must be clearly labelled to show it has originated from licenced materials.

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required.

Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.

<u>Materials</u> for larger spills All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.
Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Licenced material – ball mill equipment (grinding bowl, lid, balls) should be cleaned as with unlicenced material (2 minute run with sand then wipe clean with water and ethanol) afer an additional clean with damp tissue and then wiped with 10% Anigene disinfectant solution before work begins,between samples, and after work is finished. Any weighing equipment used with licenced materials (e.g. spoons/spatulas) must be cleaned thoroughly with damp tissue and then sprayed and wiped with 10% Anigene disinfectant solution and blue roll.

Disposal
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. <u>After</u> the fusion process is complete (i.e. samples have been heated to 1000°C and fused with flux into glass bead, they can be treated as non-licenced material and now fall out of scope of authorisation. Fused beads should be disposed of as deemed appropriate. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - The Department’s licenced soil catalogue must be updated when materials are disposed of.

Fusing Beads for XRF Analysis Task-Based Risk Assessment		
Equipment required (including PPE, tools, chemicals, etc)		
Equipment Ball mill Crucible Mould Ethanol Sand	PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal)	Chemicals Flux (lithium tetraborate) Citric acid

Microbalance Ultrasonic bath Bead fluxer Mortar and pestle Weighing spoons Weighing paper Balance Mixer Parafilm			Gloves Safety glasses		Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material	
Work Step/ Tasks <i>(Describe the tasks/steps involved in the order of work)</i>	Hazards Identified for each task/step	Those at risk <i>(people who could be harmed)</i>	How could they be harmed? <i>(nature of injuries, damage that could result)</i>	Uncontrolled risk level <i>(level of risk without control)</i>	Required controls <i>(how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)</i>	Controlled risk level <i>(level of risk remaining when controls are in place)</i>
1. Turn on laboratory extraction (partial enclosure and furnace canopy) and turn on ErLab weighing station extraction.	Exposure to flux. Prolonged inhalation of emitted fumes. Prolonged inhalation of powdered samples (particularly silica-containing powders) Using the bead fluxer.	Staff, students, researchers	Flux (lithium tetraborate) is a skin and serious eye irritant, and may cause respiratory irritation. Potential for irritation of respiratory tract, skin, eyes and aggravation of existing respiratory health conditions. Prolonged exposure to emitted fumes may cause irreversible health issues in the future and development of allergies. Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions Minor burns from heat generated	5 x 5 STOP! (Common occurrence, Severe)	All work with flux must occur under extraction in ErLab weighing station. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Lab extraction (furnace canopy) must be turned on at all times whilst bead fluxer is in use. All powder/dust-generating must be undertaken under extraction Training in use of bead fluxer must be undertaken before use. Bead fluxer must reach high temperature for fusion cycle. Do not touch extraction funnel or sides of machine whilst in use. Flux: Dust generation: Provide suction extractors if dust is formed. Do not inhale dust, smoke or mist. Avoid contact with eyes and skin. Prevent formation of dust and aerosols. Use mechanical exhaust or laboratory fume hood to avoid exposure. Fire: use water spray, foam, carbon dioxide or dry powder. Hazardous decomposition products formed under fire conditions (borate/boron	3 x 3 Medium Risk (Could occur, Moderate)

			from bead fluxer.		oxides, lithium oxides and hydrogen iodide). Wear self-contained breathing apparatus for fire fighting if necessary. Personnel exposure: Treatment to be adopted: Skin contact: Immediately wash with water and soap and rinse thoroughly. If skin irritation persists, consult physician. Eye contact: Rinse opened eye thoroughly with plenty of water for at least 15 minutes and consult physician. Ingestion: Rinse out mouth and then drink plenty of water. Do not induce vomiting. If symptoms persist, consult physician. Inhalation: In case of unconsciousness, place patient stably in side position for transportation. Supply fresh air. If required, provide artificial respiration. Keep patient warm. If symptoms persist, consult physician	
2. Clean equipment for powdering (ball mill: grinding bowl, lid, balls) by running ball mill with sand for 2 minutes (450 rpm) to remove every eventual trace of clay materials. Then wipe equipment with water and ethanol and ensure it is due before use. This should be undertaken prior to preparing each sample at all stages of the procedure to avoid cross contamination. If licenced material is to be used, the equipment should be additionally cleaned using damp tissues and wiped with 10% Anigene disinfectant solution before work, between	Using ethanol Grinding bowl not securely clamped Prolonged dust inhalation (particularly silica-containing powders) Contamination of equipment and work surfaces with licenced material	Staff, students, researchers	Ethanol is highly flammable. Ethanol is an irritant and may dry skin if it comes into contact (contact dermatitis, irritation of existing skin conditions) Danger of grinding bowl being hurled out if not clamped securely Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions	4 x 3 Medium Risk (Known to occur, Moderate)	Ethanol should be treated with care when used and should be used under extraction or in well-ventilated space PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Training in use of ball mill must be undertaken before use. Ensure that grinding bowl is securely clamped before closing ball mill. Grinding bowl must be opened under extraction to prevent inhalation of sand dust/powder All equipment used with licenced material must be cleaned with damp tissue to remove soil from surfaces then sprayed and wiped with 10% Anigene solution before work begins, between each sample, and after work is finished.	3 x 2 Low Risk (Could occur, Minor)

samples, and at the end of the work process.			Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation Licensed material remaining on equipment		Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Ethanol: Spillage/uncontrolled release: ventilate area and remove all sources of ignition; contain and absorb spill with sand and collect in a suitable waste container Fire: extremely flammable; use dry chemical, foam, or carbon dioxide extinguisher Personnel exposure: Treatment to be adopted: Skin contact: Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention. Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention. Ingestion: Do not induce vomiting. Obtain medical attention. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Inhalation: Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Obtain medical attention	
3. Powder the sample by placing the required amount in the clean and dry grinding bowl. Insert it in the ball mill, clamp the bowl through the clamping arrangement and ensure the red sleeve has latched properly. Close the cover, select the required program and hit start. The	Grinding bowl not securely clamped Prolonged dust inhalation (particularly silica-containing powders) Spillage of licensed material	Staff, students, researchers	Danger of grinding bowl being hurled out if not clamped securely Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions	4 x 3 Medium Risk (Known to occur, Moderate)	Training in use of ball mill must be undertaken before use. Ensure that grinding bowl is securely clamped before closing ball mill. Grinding bowl must be opened under extraction to prevent inhalation of sample dust/powder Carefully follow all equipment cleaning instructions listed above.	3 x 2 Low Risk (Could occur, Minor)

program (number of rotation per minute and time) depends on the type of sample – coarser and harder samples may require longer grinding times.	Licenced material remaining on equipment		Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation Contamination of equipment and working surfaces with licenced material		Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	
4. Clean equipment for fusing (crucible and mould) and weighing (spoons). Place the crucible and mould in the ultrasonic bath at 50°C for 3 minutes in a glass beaker with a 25% citric acid solution (125g citric acid + 500ml deionised water). Ensure equipment is dry before use (especially the crucible as weight could be affected). Clean weighing spoons with damp tissue and spray and wipe with 10% Anigene solution as an additional step to cleaning with ethanol. This should be undertaken prior to preparing each sample at all stages of the procedure to avoid cross contamination.	Using ethanol Using citric acid Using ultrasonic bath Licenced material remaining on equipment	Staff, students, researchers	Ethanol is highly flammable. Ethanol is an irritant and may dry skin if it comes into contact (contact dermatitis, irritation of existing skin conditions) Citric acid can cause serious eye irritation and may cause skin and respiratory tract irritation with prolonged use If used for prolonged time, the noise of the ultrasonic bath can provoke hearing problems Contamination of equipment and working surfaces with licenced material	3 x 3 Medium Risk (Could occur, Moderate)	Ethanol should be treated with care when used and should be used under extraction or in well-ventilated space PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Citric acid should be used with care and only trained individuals (ideally lab manager/technicians/lab assistants) should make up solution. Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation. Training in use of ultrasonic bath must be undertaken before use. Ultrasonic bath should be turned off when not needed to avoid excessive noise exposure Carefully follow all equipment cleaning instructions listed above. See step 2 for ethanol use Citric Acid: Spillage/uncontrolled release: ventilate area, remove spillage with vacuum cleaner. If not possible, collect spillage with shovel, broom or the like. Flush with plenty of water to clean spillage area. Do not let washing	2 x 2 Low Risk (Not likely, Minor)

					down water contaminate ponds or waterways. Fire: use water spray, foam, dry powder or carbon dioxide. Personnel exposure: Treatment to be adopted: Skin contact: Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing. Eye contact: Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention. Ingestion: Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues. Inhalation: Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.	
5. Weigh and mixing the sample with flux: place the dry, clean crucible on the microbalance and tare. Weigh 600mg of powdered sample and 6000mg of flux (1:10 ratio). Cover crucible with parafilm and mix using the mixer.	Exposure to flux Spillage of licenced material Potential of ejection of sample and flux from crucible during mixing	Staff, students, researchers	Flux (lithium tetraborate) is a skin and serious eye irritant, and may cause respiratory irritation. Potential for irritation of respiratory tract, skin, eyes and aggravation of existing respiratory health conditions. Contamination of equipment and working surfaces with licenced material Inhalation of powdered	3 x 3 Medium Risk (Could occur, Moderate)	All work with flux must occur under extraction in Erlab weighing station. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Ensure spill kit is available and stocked before commencing work Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Ensure parafilm is pulled across crucible and held firmly when using mixer.	2 x 2 Low Risk (Not likely, Minor)

			sample (particularly silica-containing samples) can cause long-term serious lung conditions		Any spills should be reported to lab manager/technician immediately and cleaned appropriately. See step 1 for flux use	
6. Fusing the bead: place the mould in the operating point within the fluxer and select the program and temperature needed according to the specifics of the sample. Place the crucible with the weighed sample and flux in the operating point and start the program. When the program is finished remove the mould and crucible, and place the fused bead in a plastic bag without toughing it with hands to avoid contamination.	Using the bead fluxer Exposure to flux Electric shock Spillage of licenced material Prolonged inhalation of emitted fumes. Prolonged inhalation of powdered samples (particularly silica-containing powders)	Staff, students, researchers	Heat-related and minor burn injuries when placing/removing the crucible and mould. Flux (lithium tetraborate) is a skin and serious eye irritant, and may cause respiratory irritation. Potential for irritation of respiratory tract, skin, eyes and aggravation of existing respiratory health conditions. Electrical shocks or burns from using faulty/damaged equipment Contamination of equipment and working surfaces with licenced material Prolonged exposure to emitted fumes may cause irreversible health issues in the future and development of allergies. Inhalation of powdered sample (particularly silica-containing	4 x 3 Medium Risk (Known to occur, Moderate)	Training in use of bead fluxer required before use. Fluxer should be left to reach required temperature, and extraction funnel and sides should not be touched when in use. SOP for fluxer must be read before use. Once bead fluxer fusion cycle has finished, allow bead to cool before removing from mould. Use caution when removing crucible and mould as surrounding surfaces of fluxer might be hot. Fluxer operates at very high temperatures All work with flux must occur under extraction in Erlab weighing station. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Lab extraction (furnace canopy) must be turned on at all times whilst bead fluxer is in use. Before use of fluxer inspect electrical cable and ensure PAT testing is in date. If damage is visible, do not use and report to lab manager/technicians. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Ensure spill kit is available and stocked before commencing work All powder/dust-generating must be	3 x 2 Low Risk (Could occur, Minor)

			samples) can cause long-term serious lung conditions		undertaken under extraction Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. See step 1 for flux use	
7. Clean all equipment as in steps 2 and 4. If licenced soil is to be used, cleaning with damp tissue and disinfecting with 10% Anigene solution must be used as an additional cleaning step and all soiled blue roll should be retained in the sealed DEFRA waste soil bin for offsite disposal.	See steps 2 and 4 for full hazards Licenced material remaining on equipment		See steps 2 and 4 for full hazards Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	See steps 2 and 4 for full hazards Carefully follow all equipment cleaning instructions listed above.	3 x 2 Low Risk (Could occur, Minor)

Internal Guidance/Linked Documents:		Fluxer SOP, Ultrasonic bath SOP, Citric Acid COSHH, Ethanol COSHH, Flux (Lithium Tetraborate) COSHH, Ball mill SOP, Protocol for Working with DEFRA Licenced Materials, Anigene COSHH form	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of fluxer, ball mill, ultrasonic bath and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	10/8/2024	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form			Serial:		DU/DEPT/COSHH0001		
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace			
					Research		x		
					Cleaning/Maintenance				
					Other				
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)							
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?							Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?							Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products									
Describe the activity or work process.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long?	How Often?	How Much?		
Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.					30 mins	As needed	600ml max (spray bottle)		
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)							
Persons at risk		Employees	x	Students	x	Others		Vulnerable persons	
Classification (tick the box next to the appropriate sign)									
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm									
	Very toxic			Irritant			Highly flammable		
	Toxic			Compressed gas			Extremely flammable		
	Corrosive			Biological hazard			Serious long term health hazard		
	Harmful			Oxidising			Dangerous to the environment	x	
	Explosive			Flammable					
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/									
 First Aid									
Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.								
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low								

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state		Other state			
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					
	Yes No							<u>Yes</u> No	Standard polycotton labcoat				
	Footwear							Other					
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket					

During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Harry M. Leck</i>					Date 10/8/24		Review date 5/9/2024			

Preparation of Pressed Pellets for XRF Analysis

Risk Assessment for Work with DEFRA Licenced Materials		Date:	10/8/2024 (revised 25/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Preparation of pressed pellets for XRF Analysis		D112 – Archaeomaterials Sample Preparation Laboratory	
Description of Process:			
Powdering the sample with the ball mill and pressing the powder into a pellet for XRF analysis. The Herzog pellet press is a hydraulic press which is used to apply force to press a dual component powder to form a pellet for analysis by XRF.			
Objectives and Applications of Process:			
To use the Herzog pellet press to combine powdered sample and binder wax together to create a pressed pellet for XRF analysis			
Justification of Use of Process:			
This sample preparation method enables analysis of materials using x-ray fluorescence. The sample is mixed with binder wax and pressed into a pellet of appropriate thickness. This pellet is then analysed on the XRF machine to determine the elemental composition of the sample material. The use of this method ensures high quality of analytical results compared to analysing loose powders.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Dust inhalation, spillage of licenced material, crushing/entrapment injuries			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers,		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) All dust-generating work must be undertaken under extraction in a unit with HEPA filters. Training in use of ball mill and pellet press must be carried out before use Pellet press safety measures: - The holder and plunger must be aligned centrally under the screw before applying force - Do not exceed the maximum pressure of the pellet holder (620kPa) or the machine maximum (200kPa) - To avoid violent expulsion of material press the plunger into the holder very carefully	

within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required.

Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.

Spillages

Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes.

Refer to [Protocol for Working with DEFRA Licenced Materials](#) for larger spills

All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.

Cleaning of Equipment

Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll.

Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal.

It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.

Licenced material – ball mill equipment (grinding bowl, lid, balls) should be cleaned as with unlicenced material (2 minute run with sand then wipe clean with water and ethanol) after an additional clean with damp tissue and wipe with 10% Anigene disinfectant solution and blue roll before work begins, between samples, and after work is finished.

Licenced material – pellet press equipment (plunger, holder and collar) should be cleaned as with unlicenced material (ethanol) after by an additional clean with damp tissue and wipe with 10% Anigene disinfectant solution and blue roll before work begins, between samples, and after work is finished.

Any weighing equipment used with licenced materials (e.g. spoons/spatulas) should be cleaned with damp tissue to remove soil from surfaces then sprayed and wiped with 10% Anigene disinfectant solution and blue roll.

Disposal

- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company.
- Pressed pellets must always be treated as licenced material and handled, stored and disposed of as such. For disposal of pressed pellets, place in sealed DEFRA waste soil bin with other licenced material to await

offsite disposal.

- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- The Department's licenced soil catalogue must be updated when materials are disposed of.

Pressing Pellets for XRF/XRD Analysis Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment	PPE	Chemicals
Ball mill Sand Balance Herzog pellet press Holder Plunger Collar Deionised water Weighing spoons/spatulas Weighing paper	Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Gloves Safety glasses	Ethanol Binder wax Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material

Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1: Turn on laboratory extraction (partial enclosure and furnace canopy)	Prolonged inhalation of powdered samples (particularly silica-containing powders)	Staff, students, researchers	Potential for irritation of respiratory tract, skin, eyes and aggravation of existing respiratory health conditions. Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions	4 x 4 High Risk (Known to occur, Major)	All powder/dust-generating must be undertaken under extraction PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	3 x 2 Low Risk (Could occur, Minor)
2. Clean equipment for powdering (ball mill: grinding bowl, lid, balls) by running ball mill with sand for 2 minutes (450 rpm) to remove every eventual trace of clay materials.	Using ethanol Grinding bowl not securely clamped Prolonged dust inhalation (particularly silica-containing powders) Contamination of equipment	Staff, students, researchers	Ethanol is highly flammable. Ethanol is an irritant and may dry skin if it comes into contact (contact dermatitis, irritation of existing skin conditions) Danger of grinding bowl	4 x 3 Medium Risk (Known to occur, Moderate)	Ethanol should be treated with care when used and should be used under extraction or in well-ventilated space PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Training in use of ball mill must be	3 x 2 Low Risk (Could occur, Minor)

Then wipe equipment with water and ethanol and ensure it is dry before use. This should be undertaken prior to preparing each sample at all stages of the procedure to avoid cross contamination. If licenced material is to be used, the equipment should be additionally cleaned using damp tissue and wiped with 10% Anigene disinfectant solution before work begins, between samples, and after use.	and workspace with licenced material		being hurled out if not clamped securely Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation Licenced material remaining on equipment		undertaken before use. Ensure that grinding bowl is securely clamped before closing ball mill. Grinding bowl must be opened under extraction to prevent inhalation of sand dust/powder All equipment used in work with licenced material must be cleaned with damp tissue to remove soil from surfaces and sprayed and wiped with 10% Anigene solution and blue roll. Ethanol: Spillage/uncontrolled release: ventilate area and remove all sources of ignition; contain and absorb spill with sand and collect in a suitable waste container Fire: extremely flammable; use dry chemical, foam, or carbon dioxide extinguisher Personnel exposure: Treatment to be adopted: Skin contact: Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention. Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention. Ingestion: Do not induce vomiting. Obtain medical attention. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance. Inhalation: Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth	
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					resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Obtain medical attention	
3. Powder the sample by placing the required amount in the clean and dry grinding bowl. Insert it in the ball mill, clamp the bowl through the clamping arrangement and ensure the red sleeve has latched properly. Close the cover, select the required program and hit start. The program (number of rotation per minute and time) depends on the type of sample – coarser and harder samples may require longer grinding times.	Grinding bowl not securely clamped Prolonged dust inhalation (particularly silica-containing powders) Spillage of licenced material Licenced material remaining on equipment	Staff, students, researchers	Danger of grinding bowl being hurled out if not clamped securely Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	Training in use of ball mill must be undertaken before use. Ensure that grinding bowl is securely clamped before closing ball mill. All dust-generating work must be undertaken under extraction. Grinding bowl must be opened under extraction to prevent inhalation of sample dust/powder. Carefully follow all equipment cleaning instructions listed above. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	3 x 2 Low Risk (Could occur, Minor)
4. Weigh the sample and binder wax. Place weighing paper on the balance and tare. For big pellets, weigh 12g of powdered sample and 3g of wax (wax: sample = 1:4 ratio)	Exposure to the wax Spillage of licenced materials Licenced material remaining on equipment Inhalation of dust (particularly	Staff, students, researchers	Exposure to wax may cause irritation/allergic reaction Contamination of equipment and working surfaces with licenced material Inhalation of powdered sample (particularly silica-containing	3 x 2 Low Risk (Could occur, Minor)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. Any spills of licenced material should be	2 x 2 Low Risk (Not likely, Minor)

	silica-containing powders)		samples) can cause long-term serious lung conditions Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation		cleaned up immediately following the guidance/protocols above Binder wax: Personnel exposure: Treatment to be adopted: General info: immediately remove clothing soiled by product. Skin contact: immediately wash with water and soap, rinsing thoroughly Eye contact: rinse opened eye for several minutes under running water. If symptoms persist, consult physician. Ingestion: rinse mouth. Do not induce vomiting. Carefully follow all equipment cleaning instructions listed above. Any spills of licenced material should be cleaned up immediately following the protocols above All powder/dust-generating should be undertaken under extraction	
5. Mix the weighed sample and the wax with the ball mill. Place the sample and wax into the clean, dry grinding bowl with only 2 balls in the bowl. Clamp the bowl in the ball mill through the clamping arrangement and ensure the red sleeve has latched properly. Close the cover, select the required	Grinding bowl not securely clamped Prolonged dust inhalation (particularly silica-containing powders) Spillage of licenced material Licenced material remaining on equipment	Staff, students, researchers	Danger of grinding bowl being hurled out if not clamped securely Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation	4 x 3 Medium Risk (Known to occur, Moderate)	Training in use of ball mill must be undertaken before use. Ensure that grinding bowl is securely clamped before closing ball mill. Grinding bowl must be opened under extraction to prevent inhalation of sample dust/powder Carefully follow all equipment cleaning instructions listed above. Any spills of licenced material should be cleaned up immediately following	3 x 2 Low Risk (Could occur, Minor)

program (2-5 mins) and hit start. Check the sample is mixed properly, and if not re-run the program. Clean the equipment for powdering as in step 2 above.			Contamination of equipment and working surfaces with licenced material		the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
6. Clean the equipment for pressing (holder and plunger) by wiping with ethanol, ensuring it is dry before use. This step must be carried out prior to preparing each sample at all stages of the procedure to avoid contamination. If licenced material is to be used, the equipment should be additionally cleaned with damp tissue (use ethanol and not water) and wiped with 10% Anigene disinfectant solution before work begins, between samples, and after use.	Using ethanol Handling heavy tools (plunger and holder) Licenced material remaining on equipment	Staff, students, researchers	Ethanol is highly flammable. Ethanol is an irritant and may dry skin if it comes into contact (contact dermatitis, irritation of existing skin conditions) Crushing and entrapment injuries from inappropriate handling/dropping of heavy tools Musculoskeletal pain, discomfort and injury from manually handling heavy tools Contamination of equipment and working surfaces with licenced material	3 x 3 Medium Risk (Could occur, Moderate)	PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Plunger and holder should be cleaned independently, ensuring they are held in a strong grip or where possible placed on a surface to clean Cleaning should be undertaken at the work station to avoid unnecessary carrying of heavy tools Manual handling and lifting training available if required Ensure tools do not exceed safe lifting/handling limits Ensure heavy tools are stored safely to minimise risk of falling Handle tools appropriately and only when required. Do not attempt to handle multiple tools at once Carefully follow all equipment cleaning instructions listed above. As plunger and holder are metal and may rust, do not use water to clean and do not store plunger inside of holder. Surfaces to be cleaned thoroughly with damp blue roll	2 x 2 Low Risk (Not likely, Minor)

					and then sprayed and wiped with 10% Anigene disinfectant after working.	
					See step 2 for ethanol use	
7. Press the pellet. Place the mixed sample and wax into the clean, dry holder. Gently press the plunger down into the holder slightly, ensuring it is straight. Place the holder and plunger under the screw of the pellet press, pump the lever until the pressure reaches maximum 200kN and hold in place for 30 seconds until the gauge needle does not move anymore. Invert the direction of the platform's movement by switching over the valve to permit access to the dies installed. Once the holder can be removed, place it on the collar and place under the screw again. Reverse the direction of movement again by switching the valve and pump the lever until the pellet comes out of the holder. Un-pump the press again in order to	Using the hydraulic press Handling heavy tools (plunger and holder) Inappropriate use of plunger and holder Spillage of licenced material Licenced material remaining on equipment Prolonged dust inhalation (particularly silica-containing powders)	Staff, students, researchers	Musculoskeletal discomfort, pain and injury from repetitive movements and use of heavy tools for prolonged periods. Crushing and entrapment injuries from inappropriate handling/dropping of heavy tools and pellet press Violent expulsion of material from the holder from incorrect insertion of plunger (pushing down too far or too quickly can cause sample to burst out of bottom of holder) Contamination of equipment and working surfaces with licenced material Inhalation of powdered sample (particularly silica-containing samples) can cause long-term serious lung conditions Development of allergies/reaction and aggravation of existing respiratory conditions (e.g. asthma) from dust inhalation	4 x 3 Medium Risk (Known to occur, Moderate)	Training required in use of hydraulic press before use Assess existing health conditions and potential for aggravation through physical exertion before using pellet press Never place hand(s) beneath the screw when operating Always ensure the platform is moving in the right direction by switching the valve in order not to damage yourself or tools Manual handling and lifting training available if required Ensure tools do not exceed safe lifting/handling limits Ensure heavy tools are stored safely to minimise risk of falling Handle tools appropriately and only when required. Do not attempt to handle multiple tools at once Ensure the plunger is straight when inserted into the holder and press down gently Carefully follow all equipment cleaning instructions listed above. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above All powder/dust-generating must be	3 x 2 Low Risk (Could occur, Minor)

remove the dies. Take the pellet without touching the top, in order not to contaminate it, and place in a labelled sample bag. Clean all the equipment as in section 2 and 6 above.					undertaken under extraction PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. The resulting pellet should be stored in an appropriate ziplock sample bag labelled with sample number, site code, country of origin, and contact details for lab user.	
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Internal Guidance/Linked Documents:		Pellet press SOP, Ball mill SOP, Ethanol COSHH, Protocol for Working with DEFRA Licenced Materials, Anigene COSHH	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of pellet press, ball mill and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	10/8/2024	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form			Serial:	DU/DEPT/COSHH0001		
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace		
					Research	x		
					Cleaning/Maintenance			
					Other			
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)						
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products								
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)	
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)						
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons	
Classification (tick the box next to the appropriate sign)								
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm								
	Very toxic			Irritant			Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful			Oxidising			Dangerous to the environment	x
	Explosive			Flammable				
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/								
 First Aid								
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						

Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)								Short term exposure level (15 mins)					
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						<u>Yes</u> No	To EN166 or equivalent					
	Respirator						Goggles						
	<u>Yes</u> No	Nitrile gloves					Yes No						
	Gloves						Overalls						
	Yes No						<u>Yes</u> No	Standard polycotton labcoat					
	Footwear						Other						
Fire: identify appropriate extinguishers here													

Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences		Minor		Is exposure adequately controlled?		<u>Yes</u>	No	
		Likelihood		Not likely						
		Evaluation phrase		Low Risk						
Signature(s) <i>AB Parker</i> <i>Kenny M. Leek</i>						Date 10/8/24		Review date 10/8/24		

Fourier Transform Infrared Spectroscopy (FTIR)

Risk Assessment for Work with DEFRA Licenced Materials		Date:	8/5/2024 (revised 25/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Use of FTIR (Perkin Elmer Spectrum 2)		D242 – Materials Analysis Laboratory	
Description of Process:			
Fourier Transform Infrared Spectroscopy (FTIR) uses infrared light to scan samples and observe their chemical properties and composition.			
Objectives and Applications of Process:			
To spectroscopically investigate chemical properties of samples			
Justification of Use of Process:			
In archaeological applications, FTIR can help to rapidly determine sample composition and chemical make-up. This method of screening of samples is relatively low risk and is used to inform further analysis.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Trips and slips, electric shock, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use of FTIR required before use. Do not open main instrument cover. Keep instrument dry. Avoid spilling liquid onto the instrument. Do not block the ventilation cooling holes under the instrument. Do not cover the power supply adapter. Do not use flammable solvents or samples. Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. Refer to Protocol for Working with DEFRA Licenced	

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	<u>Materials</u> for larger spills All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.
	Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.</i> <i>Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i>

Disposal
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - The Department's licenced soil catalogue must be updated when materials are disposed of.

Use of FTIR Task-Based Risk Assessment						
Equipment required (including PPE, tools, chemicals, etc)						
Equipment		PPE		Chemicals		
Perkin Elmer Spectrum 2 FTIR		Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves		Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.		
Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal	Controlled risk level (level of risk remaining when controls are in place)

					<i>protective equipment)</i>	
1. Check immediate working area	Trips and slips	Operator and people in the vicinity	Associated trip or slip injuries	5 x 5 Extreme Risk (Common Occurrence, Severe)	Ensure area is free from trip and slip hazards	2 x 3 Low Risk (Not likely, Moderate)
2. Inspect electrical cable if fitted and ensure PAT testing is in date.	240v supply	Operator	Electric shock	5 x 5 Extreme Risk (Common Occurrence, Severe)	Always check <u>before</u> switching on, report damaged cables. Complete and record PAT if out of date before use.	2 x 3 Low Risk (Not likely, Moderate)
3. Switch on the computer and ensure it is connected to the instrument. Open the PerkinElmer Spectrum software.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
4. Check the machine is in working order. The crystal must be clean and the arm should not be over the crystal. Choose the metal tip according to your needs (solid or liquid sample)	Damage to equipment or self from use of faulty equipment	Operator	Physical injuries from use of faulty equipment	5 x 5 Extreme Risk (Common Occurrence, Severe)	Report damage and do not continue until issue resolved.	2 x 2 Low Risk (Not likely, Minor)
5. Switch on the machine. The power LED on the instrument should be lit green. The machine is usable within 15 minutes of being switched on.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
6. Record a background spectrum by clicking Background,	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
7. In case of solid sample use a spatula to add a small amount of the sample to the plate, such that the crystal is covered by the sample.	Spillage of licenced material	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses)	2 x 2 Low Risk (Not likely, Minor)

In case of liquid sample use Pasteur pipette to add a drop of the sample such that it covers the crystal.					must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
8. Move the arm so that it locks into place over the crystal. Turn the green handle clockwise until the metal tip is close to the plate	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
9. Click Scan button to obtain a preview of the spectrum and pressure gauge	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
10. Only in case of solid sample: Continue to twist the handle until the force gauge reads between 100 and 120. Doing this creates a uniform disc of the sample.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
11. Click Scan button to obtain final spectrum	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
12. On the right hand toolbar, click Labels to assign wavenumbers to the major peaks, then print the spectrum	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
13. Turn the green handle anticlockwise to raise the metal tip, then return the arm to its original position.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
14. Clean the plate with a tissue to remove all	Spillage of licenced material.	Operator	Contamination of equipment and working surfaces with	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately	2 x 2 Low Risk (Not likely, Minor)

licenced material from surface and then wipe with 10% Anigene solution and blue roll	Licenced material remaining on equipment.		licenced material.		following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	
15. Carefully remove the metal tip and clean it with a tissue and 10% Anigene solution	Spillage of licenced material. Licenced material remaining on equipment.	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
16. Whilst supporting the top of the handle, push the clean tip back into position	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)

Internal Guidance/Linked Documents:		FTIR SOP, Protocol for Working with DEFRA Licenced Materials, Anigene COSHH	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of FTIR and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	8/5/24	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form			Serial:		DU/DEPT/COSHH0001								
Date		10/8/2024		Person(s) involved in risk assessment		Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)		Workplace							
								Research		x					
								Cleaning/Maintenance							
								Other							
Name of the Substance				Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)											
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?										Yes		No			
Substitution: Is it possible to use a less harmful substance to do the work?										Yes		No			
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products															
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.				Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.				How Long? 30 mins		How Often? As needed		How Much? 600ml max (spray bottle)			
Location of Work				Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)											
Persons at risk				Employees		x		Students		x		Others		Vulnerable persons	
Classification (tick the box next to the appropriate sign)															
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm															
		Very toxic						Irritant						Highly flammable	
		Toxic						Compressed gas						Extremely flammable	
		Corrosive						Biological hazard						Serious long term health hazard	
		Harmful						Oxidising						Dangerous to the environment	
		Explosive						Flammable							
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/															
 First Aid															
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.													

Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)							
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)									Yes (refer to Health and Safety service)		<u>No</u>		
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						<u>Yes</u> No	To EN166 or equivalent					
	Respirator						Goggles						
	<u>Yes</u> No	Nitrile gloves					Yes No						
	Gloves						Overalls						

	Yes No						Yes No	Standard polycotton labcoat			
	Footwear						Other				
Fire: identify appropriate extinguishers here											
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket			
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below											
Not flammable. No hazard expected under normal conditions of use.											
Storage											
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.											
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)											
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other			
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.											
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No			
		Likelihood	Not likely								
		Evaluation phrase	Low Risk								
Signature(s) <i>AB Parker</i> <i>Karen M. Lell</i>						Date 10/8/2024		Review date 5/9/2024			

Portable X-ray Fluorescence (pXRF)

Risk Assessment for Work with DEFRA Licenced Materials		Date:	8/5/2024 (revised 25/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
pXRF analysis (Bruker tracer 5i Portable XRF)		D242 – Materials Analysis Laboratory	
Description of Process:			
Geochemical analysis of elemental composition of material by illumination with an X-ray beam using the portable XRF.			
Objectives and Applications of Process:			
To determine the elemental composition of materials			
Justification of Use of Process:			
pXRF (portable x-ray fluorescence) is a surface analytical technique that allows rapid quantitative determination of elements in the analysed material. It requires a small sample quantity and will provide information and geochemical data that can be used to inform further analysis and sample interpretation.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Danger of x-ray exposure, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use of pXRF and radiation safety required before use. Never point the detector towards another person or yourself. Keep a free area of 2 meters when the XRF is operating without the sample shield. Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. Refer to Protocol for Working with DEFRA Licenced Materials for larger spills All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other	

PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	licenced material to await offsite disposal.
	Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.</i> <i>Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i>
Disposal	
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - The Department's licenced soil catalogue must be updated when materials are disposed of.	

Use of pXRF Task-Based Risk Assessment						
Equipment required (including PPE, tools, chemicals, etc)						
Equipment Bruker tracer 5i Portable XRF		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves		Chemicals Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material		
Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)

1. Check immediate working area	Trips and slips	Operator and people in the vicinity	Associated trip or slip injuries	5 x 5 Extreme Risk (Common Occurrence, Severe)	Ensure area is free from trip and slip hazards	2 x 3 Low Risk (Not likely, Moderate)
2. Inspect electrical cable if fitted and ensure PAT testing is in date.	240v supply	Operator	Electric shock	5 x 5 Extreme Risk (Common Occurrence, Severe)	Always check before switching on, report damaged cables. Complete and record PAT if out of date before use.	2 x 3 Low Risk (Not likely, Moderate)
3. Identify on/off switch	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
4. Check the machine is in working order	Damage to equipment or self from use of faulty equipment	Operator	Physical injuries from use of faulty equipment	5 x 5 Extreme Risk (Common Occurrence, Severe)	Report damage and do not continue until issue resolved.	2 x 2 Low Risk (Not likely, Minor)
5. Check the film on the detector is not damaged	Exposing the machine to danger	Operator	Breaking the detector	5 x 5 Extreme Risk (Common Occurrence, Severe)	Report damage and do not continue until issue resolved.	2 x 2 Low Risk (Not likely, Minor)
6. Use the Power Key to turn the instrument on.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
7. Prepare the sample. Place the sample on the sample table. Put the sample shield over the sample. If your sample is too large for the sample shield you need to hold the instrument to the sample for measurement.	Spillage of licenced material	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	If doing handheld measurement make sure there is a space of 2 m while operating. If using the sample table make sure the safety shield is on and correctly set. Any spills of licenced material should be cleaned up immediately following the protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)

8. Select the program according to your needs.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
9. Press the trigger to run the analysis.	X-ray operating	Operator	X-ray exposure	4 x 5 High Risk (Known to occur, Severe)	Ensure the sample shield is in the operating point/ make sure there is a space of 2 m while operating handheld XRF	2 x 3 Low Risk (Not likely, Moderate)
10. Import the data obtained.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
11. Switch off the machine, leave it in operating position and clean the workspace.	Spillage of licenced material. Licenced material remaining on equipment.	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)

Internal Guidance/Linked Documents:		pXRF SOP, Protocol for Working with DEFRA Licenced Materials	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of pXRF and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	8/5/24	Date:	5/9/2024

This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form		Serial:	DU/DEPT/COSHH0001		
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)		Workplace		
					Research	x	
					Cleaning/Maintenance		
					Other		
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)					
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?					Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?					Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products							
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.		How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)	
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)					
Persons at risk		Employees	x	Students	x	Others	
						Vulnerable persons	
Classification (tick the box next to the appropriate sign)							
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm							
	Very toxic			Irritant			Highly flammable
	Toxic			Compressed gas			Extremely flammable
	Corrosive			Biological hazard			Serious long term health hazard
	Harmful			Oxidising			Dangerous to the environment
	Explosive			Flammable			x
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/							
 First Aid							
Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low						

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					
	Yes No							<u>Yes</u> No	Standard polycotton labcoat				
	Footwear							Other					
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket					

During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Karen M. Leck</i>					Date 10/8/24		Review date 5/9/2024			

Scanning Electron Microscopy (SEM)

Risk Assessment for Work with DEFRA Licenced Materials		Date:	9/5/2024 (revised 25/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Use of scanning electron microscope (Hitachi TM3000 SEM with EDX)		D242 – Materials Analysis Laboratory	
Description of Process:			
Producing images of a sample by scanning the surface with a focused beam of electrons using the SEM.			
Objectives and Applications of Process:			
To produce detailed, magnified sample images to better understand sample structure and composition			
Justification of Use of Process:			
The use of the scanning electron microscope produces detailed, magnified images of samples containing information about surface topography and sample composition. It is a relatively low risk process and results can be used to inform further analysis.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Electrical shock, pinching/nipping injuries, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use of SEM required before use. When operating system for long periods, be sure to take a break for 10-15 minutes every hour to prevent eye strain and musculoskeletal discomfort. When changing specimens, securely grasp the handle and use caution so that hands will not be pinched. Turn off SEM immediately if abnormal noise, unusual odor, or generation of fumes occur Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. Refer to Protocol for Working with DEFRA Licenced Materials for larger spills	

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.
	Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i>

Disposal
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - The Department's licenced soil catalogue must be updated when materials are disposed of.

Use of SEM Task-Based Risk Assessment						
Equipment required (including PPE, tools, chemicals, etc)						
Equipment Hitachi TM3000 SEM with EDX		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves		Chemicals Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material		
Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal)	Controlled risk level (level of risk remaining when controls are in place)

					<i>protective equipment)</i>	
1. Check immediate working area	Trips and slips	Operator and people in the vicinity	Associated trip or slip injuries	5 x 5 Extreme Risk (Common Occurrence, Severe)	Ensure area is free from trip and slip hazards	2 x 3 Low Risk (Not likely, Moderate)
2. Inspect electrical cable if fitted and ensure PAT testing is in date.	Electric shock	Operator	Electric shock, heat and burn-related injuries from faulty/damaged equipment	5 x 5 Extreme Risk (Common Occurrence, Severe)	Always check before switching on, report damaged cables. Complete and record PAT if out of date before use.	2 x 3 Low Risk (Not likely, Moderate)
3. Switch on the computer	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
4. Check the machine is in working order	Damage to equipment or self from use of faulty equipment	Operator	Physical injuries from use of faulty equipment	5 x 5 Extreme Risk (Common Occurrence, Severe)	Report damage and do not continue until issue resolved.	2 x 2 Low Risk (Not likely, Minor)
5. Turn on the power switch on the right-hand side of the main unit to start the device. The evacuation will start automatically when the EVAC LED (blue) on the display panel blinks. When the AIR LED (yellow) lights, press the EVAC/AIR switch to start the evacuation. EVAC LED(blue) lights when the evacuation ends.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
6. Take the specimen holder. Place conductive tape on the specimen stub and attach the specimen. In case of water containing samples such as biological, botanical, food and so on, use a paste to stick it on a stub.	Spillage of licenced material	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and	2 x 2 Low Risk (Not likely, Minor)

					then sprayed and wiped with 10% Anigene disinfectant after working.	
7. Adjust the interval between the specimen surface and the height gauge to about 1 mm.	Damage to detector	Operator	Damage to detector from improper adjustment	3 x 3 Medium Risk (Could occur, Moderate)	Care must be taken during adjustment to prevent any damage to machine. Training in use of SEM required before use.	2 x 2 Low Risk (Not likely, Minor)
8. Push the EVAC/AIR switch to introduce the air into the specimen chamber. AIR LED(yellow) blinks. After introducing the air in the specimen chamber, the status of AIR LED (yellow) changes from blinking to lighting. (About 1 minute).	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
9. Draw out the specimen stage slowly and set the specimen holder. Turn the XY knob of the specimen stage and adjust the specimen stage to the center.	Operating the machine Spillage of licenced material	Operator	Injury of being pinched Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	When changing specimens securely grasp the handle and use caution so that your hands will not be pinched Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	2 x 2 Low Risk (Not likely, Minor)
10. Close the specimen stage draw out, making sure the specimen does not touch the upper surface of the specimen chamber.	Spillage of licenced material	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses)	2 x 2 Low Risk (Not likely, Minor)

					must be worn at all times.	
11. Press the EVAC/AIR switch to evacuate the specimen chamber with the specimen stage held lightly. EVAC LED(blue) blinks. When the evacuation ends,the status of EVAC LAD (ble) changes from blinking to lighting. (About 3 minutes).	Spillage of licenced material Licenced soil remaining on equipment	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	2 x 2 Low Risk (Not likely, Minor)
12. Open the program HITACHI TM 3000 on the computer. Click on the start button on the left of the operation window. The auto start function operates and the image is displayed. At this time, the observation magnification is set at x100.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
13. Turn the XY knob of the specimen stage to move the stage and set the required observation view. The position moves to the center of the observation area when double-clicking an arbitrary position of the image observation area.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
14. Adjust Brightness and Contrast by clicking the Auto B/C button. Focus the image by	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)

clicking Auto Focus button and confirm the image.						
15. Click the Save button to capture the image. The Save image dialog is displayed, input the file name and save the image.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
16. Click the stop button on the left of the operation window. The Stop button changes to Start and the observation is finished.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
17. If using EDX: open the SwiftED software. Click on the Point&ID acquisition button, select the point or area required. Click the green play button to start acquisition of a spectrum. Acquisition automatically stops at the end of user defined acquisition time. Click the ID button and save the spectrum.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
18. Once finished measurements, push the EVAC/AIR switch to introduce the air into the specimen chamber. AIR LED (yellow) blinks. After introducing the air in the specimen chamber, the status of AIR LED (yellow) changes from blinking to lighting (about 1 minute)	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)

19. Draw out the specimen stage slowly. Then remove the specimen holder. Close the specimen stage drawn out.	Operating the machine Spillage of licenced material	Operator	Injury of being pinched Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	When changing specimens securely grasp the handle and use caution so that your hands will not be pinched Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	2 x 2 Low Risk (Not likely, Minor)
20. Press the EVAC/AIR switch to evacuate the specimen chamber with the specimen stage held lightly. EVAC LED (blue) blinks. When the evacuation ends, the status of the EVAC LED(blue) changes from blinking to lighting. (About 3 minutes).	Spillage of licenced material Licenced soil remaining on equipment	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	2 x 2 Low Risk (Not likely, Minor)
21. Click the Close button on the right of the operation window, close the TM3000 application and shut down PC.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
22. Turn off the power switch on the right side of main unit and shut down the device. Be sure to execute the evacuation procedure before stopping the device.	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)

Internal Guidance/Linked Documents:

SEM SOP, Protocol for Working with DEFRA Licenced Materials, Anigene COSHH

Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of SEM and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	9/5/2024	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form		Serial:		DU/DEPT/COSHH0001	
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace	
						Research	x
						Cleaning/Maintenance	
						Other	
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)					
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products							
Describe the activity or work process.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long?	How Often?	How Much?
Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.					30 mins	As needed	600ml max (spray bottle)
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)					
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons
Classification (tick the box next to the appropriate sign)							
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm							
	Very toxic			Irritant			Highly flammable
	Toxic			Compressed gas			Extremely flammable
	Corrosive			Biological hazard			Serious long term health hazard
	Harmful			Oxidising			Dangerous to the environment
	Explosive			Flammable			
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/							
 First Aid							
Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low						

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					
	Yes No							<u>Yes</u> No	Standard polycotton labcoat				
	Footwear							Other					
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket					

During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Harvey M. Leck</i>					Date 10/8/24		Review date 5/9/2024			

X-Ray Diffraction (XRD)

Risk Assessment for Work with DEFRA Licenced Materials		Date:	8/5/2024 (revised 26/2/25)
		Review Date:	5/9/2024
Process:		Licenced locations for work:	
Use of XRD (Panalytical Aeris XRD copper tube)		D242 – Materials Analysis Laboratory	
Description of Process:			
Determining sample composition and/or crystalline structure by irradiation of material with incident X-rays using the panalytical aeris XRD copper tube machine.			
Objectives and Applications of Process:			
To determine the composition/crystalline structure of materials.			
Justification of Use of Process:			
XRD (x-ray diffraction) is rapid analytical technique used to determine a sample's composition or crystalline structure. It requires a small sample quantity and will provide information and data that can be used to inform further analysis and sample interpretation.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Exposure to x-rays, exposure to toxic materials, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use of XRD and radiation safety required before use. Always keep room ventilated when XRD is in use. Do not open the lid of the XRD, especially while operating. Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. Refer to Protocol for Working with DEFRA Licenced Materials for larger spills All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other	

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	licenced material to await offsite disposal.
	Cleaning of Equipment
	Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.</i> <i>Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i>
Disposal	
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - The Department's licenced soil catalogue must be updated when materials are disposed of.	

Use of XRD Task-Based Risk Assessment						
Equipment required (including PPE, tools, chemicals, etc)						
Equipment Panalytical Aeris XRD copper tube		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves		Chemicals Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material		
Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)

1. Check immediate working area	Trips and slips	Operator and people in the vicinity	Associated trip or slip injuries	5 x 5 Extreme Risk (Common Occurrence, Severe)	Ensure area is free from trip and slip hazards	2 x 3 Low Risk (Not likely, Moderate)
2. Check the machine is in working order and on	Damage to equipment or self from use of faulty equipment	Operator	Physical injuries from use of faulty equipment	5 x 5 Extreme Risk (Common Occurrence, Severe)	Report damage and do not continue until issue resolved.	2 x 2 Low Risk (Not likely, Minor)
3. Check the X-RAY ON lamp is visible and on	X-Ray operating	Operator	X-Ray exposure	5 x 5 Extreme Risk (Common Occurrence, Severe)	When the X-RAY ON lamps are on, the instrument is generating X-rays. The lamps are part of a safety circuit. If one of the lamps is defective no X-ray can be produced. The user is protected from unexpected exposure to X-rays by the Xsafe safety system assured when the cover is closed	2 x 3 Low Risk (Not likely, Moderate)
4. Check the room is not overheating	Machine overheating	Operator	Damage to equipment and risk of heat-exertion injuries to any lab users	5 x 5 Extreme Risk (Common Occurrence, Severe)	Ensure room is well ventilated when machine is in use.	2 x 2 Low Risk (Not likely, Minor)
5. Prepare the sample. Select the most suitable holder for your sample	Handling of powdered samples Spillage of licenced material	Operator	Dust inhalation Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the protocols above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
6. Place the sample on the loading position on the sample changer. Name the sample	Operating the machine Spillage of licenced material	Operator	Damaging the diffraction system Contamination of equipment and working surfaces with	4 x 3 Medium Risk (Known to occur, Moderate)	Always make sure that the samples are installed safely. Loose samples and sample holders can damage the diffraction system.	2 x 2 Low Risk (Not likely, Minor)

according to your needs			licenced material.		Powders that fall out of a sample can cause contamination of the instrument. Any spills of licenced material should be cleaned up immediately following the protocols above. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times.	
7. Select a measurement program from the drop-down list, or make a measurement program in XRDMP Creator and import the measurement program in the Aeris	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
8. Start the measurement	X-ray operating	Operator	Exposure to X-ray	4 x 5 High Risk (Known to occur, Severe)	Ensure that the lid is closed and locked.	2 x 3 Low Risk (Not likely, Moderate)
9. Collect the data by importing them in the computer	N/A	Operator	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)	N/A	1 x 1 Low Risk (Almost impossible, Insignificant)
10. Remove your sample and clean the sample holder by cleaning it with a damp tissue and wiping with 10% Anigene solution	Licenced material remaining on equipment.	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Cleaning protocols as specified above must be followed for equipment in contact with licenced material. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)

Internal Guidance/Linked Documents:

XRD SOP, Protocol for Working with DEFRA Licenced material, Anigene COSHH

Competence Requirements:		Training and competence judgement by lab manager/supervisor and technicians as required for new users of XRD and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>AB Parker</i>	Signature:	<i>Karen Milek</i>
Date:	8/5/2024	Date:	5/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form		Serial:		DU/DEPT/COSHH0001	
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace	
						Research	x
						Cleaning/Maintenance	
						Other	
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)					
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products							
Describe the activity or work process.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long?	How Often?	How Much?
Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.					30 mins	As needed	600ml max (spray bottle)
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)					
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons
Classification (tick the box next to the appropriate sign)							
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm							
	Very toxic			Irritant			Highly flammable
	Toxic			Compressed gas			Extremely flammable
	Corrosive			Biological hazard			Serious long term health hazard
	Harmful			Oxidising			Dangerous to the environment
	Explosive			Flammable			
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/							
 First Aid							
Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low						

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)						Short term exposure level (15 mins)							
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No						Yes No						
	Dust mask						Visor						
	Yes No						<u>Yes</u> No	To EN166 or equivalent					
	Respirator						Goggles						
	<u>Yes</u> No	Nitrile gloves					Yes No						
	Gloves						Overalls						
	Yes No						<u>Yes</u> No	Standard polycotton labcoat					
	Footwear						Other						
Fire: identify appropriate extinguishers here													
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket					

During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) ABParker Kenny M. Leck					Date 10/8/24		Review date 5/9/2024			

X-Ray CT Scanning

Risk Assessment for Work with DEFRA Licenced Materials		Date:	6/3/25
		Review Date:	6/3/26
Process:	Licenced locations for work:		
Scanning soil and sediment blocks with the Bruker SkyScan 1273	Scanning: D006 – Materials Analysis Laboratory Preparation of blocks: D132, D132, D128, D136C		
Description of Process:			
The SkyScan 1273 is a benchtop micro CT scanner for high resolution imaging of objects and their internal structure. Soil and sediment blocks can be scanned either prior to or after resin impregnation. If scanning after resin impregnation, the sample is considered sterile and does not fall under licenced materials protocols. Non-impregnated blocks must not be taken into the CT suite until they have been wrapped in cling film to avoid any dust contaminating the CT scanner.			
Objectives and Applications of Process:			
XR-CT provides useful information on the structure of samples and objects. It can also be used for quantitative analysis of structural features such as pore space and density.			
Justification of Use of Process:			
Provides useful information on the structure of samples and objects. It can also be used for quantitative analysis of structural features such as pore space and density.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Spillage of licenced materials if sealed wrappings are breached, radiation exposure			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be	

work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials.

To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicensed materials must never be mixed.

Training from a person named on the licence must be undertaken before work commences.

Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin.

Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE.

All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required.

Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.

worn at all times.

Equipment Safety Notes (full equipment list below)

Users must receive induction and training in use of micro CT scanner before work commences.

Users must follow all guidance and instruction from the CT technician when using the scanner.

Users must be aware that the micro CT scanner contains a radioactive source. This cannot be accessed, and the scanner/source will not operate if the scanner door is open, so work can be considered low risk.

All blocks of licenced materials that have not been impregnated with resin must be wrapped in cling film BEFORE they are taken into the CT suite.

Spillages

Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes.

Refer to [Protocol for Working with DEFRA Licenced Materials](#) for larger spills

All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.

Cleaning of Equipment

Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll.

Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal.

It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.

Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.

Users must NOT attempt to clean the CT scanner themselves, and must seek guidance from the CT technician who will help in case of any spillages.

Disposal

- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company.
- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- Users must consider the likely amount of waste generated in advance of planned work with licenced materials to ensure waste storage capacity is not exceeded.
- The Department's licenced soil catalogue must be updated when materials are disposed of.

X-Ray CT Scanning Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment	PPE	Chemicals
Bruker SkyScan 1273	Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves	Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.

Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
Mounting and positioning samples: • All blocks must be wrapped in cling film in another licenced laboratory, prior to transferring to the CT suite for analysis, to remove the risk of any dust getting into the CT. • The maximum sample size that fits in the chamber is 300mm diameter, 500mm height, up to 20 kg. The largest area that can be scanned is 250mm diameter, 250mm length.	Spillage of licenced material	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	All non-impregnated blocks of licenced material must be wrapped in cling film in a licenced laboratory before they are brought into the CT suite. All samples intended to be scanned must adhere to the size restrictions of the scanner. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above – seek guidance from the CT technician in	2 x 2 Low Risk (Not likely, Minor)

• Mounting should ensure the sample does not move and remains stable during the scan. This can also be drying, swelling, relaxing, etc. • Use containers that are as thin as possible, preferably cylindrical in shape with no rims. Pack the containers with e.g. polystyrene peanuts. • Place your sample holder in the collar of the stage. Hold both mount and collar and turn both clockwise to fasten. Do not fasten too tightly. • The bottom cm on top of the stage does not always get scanned. Make sure the sample you want to scan is positioned above the clamps to ensure the entire sample is scanned. • For large samples, the turning table has metal clips that can be used to support samples, as well as carbon fibre pins that can support taller samples. • Close the door by clicking the 'Open/Close Door' button in the toolbar. The stage will rotate to a predefined position. • Fill out the size of the sample to prevent collision with parts of the system. Include the container and sample mount and/or micropositioning stage in your measurement. The system will sound an alarm and stop when the sample					case of spillage of licenced material. Work surfaces must be cleaned thoroughly with damp blue roll and then sprayed and wiped with Anigene disinfectant after working. Cleaning protocols as specified above must be followed for equipment in contact with licenced material. All appropriate PPE must be worn at all times.	
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comes too close. NB if the system does not ask for this automatically, double-click the 'sample size' box in the bottom right corner. • Turn on the X-ray source by clicking on the X-ray icon in the toolbar. • Make sure the 'Live imaging mode' is selected (if not, click the 'Grab Image' icon in the toolbar that looks like a computer screen). Position the sample using the touchscreen on the CT scanner. • Check the sample is fully in the field of view by rotating the sample 360 degrees by clicking on the second 'degree' slider in the status bar at the bottom of the screen, or clicking the number to the right of it to specify a specific rotation. Any part of the sample that moves out of the field of view at any point in the rotation will not be reconstructed.						
Scanning the sample: • Refer to the SOP for details on analytical set up and parameters for scanning different objects. • Scanning must only be done by trained operators who have undertaken radiation safety training.	Use of high intensity X-rays Spillage of licenced material	Operator and others in the vicinity	Radiation exposure, including cell damage, mutation, cancer-risk, and sterilisation Contamination of equipment and working surfaces with licenced material.	3 x 4 Medium Risk (Could occur, Major)	Refer to appropriate SOPs and radiation risk assessments associated with use of the micro CT scanner. In case of spillage of licenced soil within CT scanner due to breach of sealings, users must inform the CT technician and must not attempt to clean the spillage themselves.	1 x 3 Low Risk (Almost impossible, Moderate)

					Users must receive a lab induction and training in use of the micro CT scanner before work commences. Users must follow guidance and instruction from the CT technician whilst using the micro CT scanner. The micro CT scanner contains a sealed radioactive source that cannot be accessed and does not operate whilst the scanner door is open.	
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Internal Guidance/Linked Documents:		Anigene COSHH, Bruker SkyScan 1273 SOP and Radiation Risk Assessment	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or CT technician as required for new users of micro CT scanner and those new to working with licenced materials. Lab users must receive a specialist laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker based on X-Ray CT scanning Risk Assessment prepared by specialist Professor Lisa-Marie Shillito	Name:	
Signature:	<i>ABParker</i>	Signature:	
Date:	6/3/25	Date:	
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

 Durham University		COSHH Assessment Form			Serial:	DU/DEPT/COSHH0001		
Date		Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015).			Workplace		
						Research		x
						Cleaning/Maintenance		
						Other		
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)						
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products								
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long?	How Often?	How Much?	
					30 mins	As needed	600ml max (spray bottle)	
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)						
Persons at risk		Employees	x	Students	x	Others		Vulnerable persons
Classification (tick the box next to the appropriate sign)								
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm								
	Very toxic		 	Irritant		 	Highly flammable	
 	Toxic			Compressed gas		 	Extremely flammable	
 	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful		 	Oxidising		 	Dangerous to the environment	x
 	Explosive		 	Flammable				
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/								
 First Aid								
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						

Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					

	Yes No						Yes No	Standard polycotton labcoat			
	Footwear						Other				
Fire: identify appropriate extinguishers here											
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket			
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below											
Not flammable. No hazard expected under normal conditions of use.											
Storage											
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.											
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)											
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other			
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.											
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		Yes	No			
		Likelihood	Not likely								
		Evaluation phrase	Low Risk								
Signature(s) <i>ABParker</i>						Date 10/8/23		Review date 10/8/26			

Embedding Soil Blocks with Resin

Risk Assessment for Work with DEFRA Licenced Materials		Date:	6/3/25
		Review Date:	6/3/26
Process:		Licenced locations for work:	
Impregnation of soil and sediment blocks with resin		D136C – Geoarchaeology Laboratory, D132 – Archaeological Science Laboratory	
Description of Process:			
Block samples of soil or sediment are impregnated with resin under vacuum as the first step in preparing thin sections.			
Objectives and Applications of Process:			

Sediment blocks impregnated with resin can be cut into 30µm thin sections for detailed inspection under the microscope. During this process it is important that the resin saturates the samples completely, so that no air bubbles get included. This risk assessment outlines how soil and sediment blocks are impregnated with Polylyte 32032-00 resin mixed with acetone and Butanox M50 (methyl ethyl ketone peroxide) catalyst.

Justification of Use of Process:

Thin section micromorphology is used to examine the microstratigraphy and formation processes of soils and sediments. This technique provides information on how materials and sediment were transported, and chemically or physically altered post-deposition as a result of post-depositional processes. It provides information on the precise depositional context for other archaeological and environmental materials contained within the strata, which is crucial for interpreting past human activities and environmental conditions.

Elimination: Is it possible to avoid the need to undertake this process on licenced materials?

Yes

No

Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?

Yes

No

Most Significant Risk(s):

Spillage of licenced material

Biosafety – work with DEFRA licenced materials

Additional requirements are needed for containment and disinfection of materials held under DEFRA licence.

Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials.

To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicensed materials must never be mixed.

Training from a person named on the licence must be undertaken before work commences.

Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin.

Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE.

All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials.

Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required.

Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v)

General Safety

PPE

Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times.

Users must be face-fitted with a half face mask for resin use.

Heat resistant gloves to be worn any time operator could come into contact with hot equipment/materials.

Equipment Safety Notes (full equipment list below)

All work with resin must be undertaken under extraction in a fume cupboard (D132)

Only equipment designated for use with DEFRA licenced material to be used (e.g. beakers, stirring rods, etc.)

Extraction must be turned on when ovens are in use.

The DEFRA authorised imported soils warning signs must be placed on the oven doors while in use.

Spillages

Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes.

Refer to Protocol for Working with DEFRA Licenced Materials for larger spills

All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.

Anigene disinfectant solution and left for 20 minutes.	Cleaning of Equipment
	Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.</i> <i>Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Any glassware or surfaces that come into contact with resin must be cleaned with acetone immediately after use.

Disposal
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - Users must consider the likely amount of waste generated in advance of planned work with licenced materials to ensure waste storage capacity is not exceeded. - The Department's licenced soil catalogue must be updated when materials are disposed of. <i>After the soil/sediment block has been impregnated with resin it can be treated as non-licenced material</i>

Embedding Soil Blocks with Resin Task-Based Risk Assessment						
Equipment required (including PPE, tools, chemicals, etc)						
Equipment		PPE		Chemicals		
Fume cupboard Glass beakers Stirring rod Magnetic stirrer and flea Vacuum oven Drying oven		Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Nitrile gloves Safety glasses Half face mask		Resin (polylite 32032-00) Catalyst (butanox M-50) Acetone Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.		
Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries,	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example	Controlled risk level (level of risk remaining when

			<i>damage that could result)</i>		<i>engineered methods, safe systems of work, training and/ or personal protective equipment)</i>	<i>controls are in place)</i>
Placing the sample block in a container for resin impregnation: - Samples are placed in a close-fitting container to minimise resin wastage. This may be a pre-made container such as a plastic box, or a 'made to measure' container constructed from heavy duty foil - Write the sample number, an indicator arrow of the top and/or bottom of the sample, and the face of the sample on the container with a permanent marker.	Spillage of licenced material	Operator	Contamination of equipment and working surfaces with licenced material.	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
Drying the sediment block: - This risk assessment does not cover waterlogged/peat samples which should not be dried out - Place the box containing the sample onto a tray in the drying oven and dry overnight at low temperature, or until all moisture has been removed	Spillage of licenced material Hot surfaces Heat-related injuries	Operator	Contamination of equipment and working surfaces with licenced material. Burns and heat-related injuries from contact with hot surfaces and improper use of the oven.	4 x 3 Medium Risk (Known to occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Cleaning protocols as specified above must be followed for equipment in contact with licenced material. PPE (lab coat, apron, gloves, safety glasses and heat resistant gloves) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and	2 x 3 Low Risk (Not likely, Moderate)

					wiped with 10% Anigene disinfectant after working. Extraction must be turned on whilst oven is in use. Ensure DEFRA authorised imported soils warning sign is on the oven door for duration it is in use. Only trained users to carry out drying process. Do not overload oven trays with samples to limit risk of spillages and cross-contamination. Ensure spill kit is available and stocked before commencing work. Signage to be posted indicating that the oven is operating (contact name/email, date, duration of oven run, sample code/country of origin)	
Mixing and degassing the resin: - Resin must be used only in a fume cupboard. Users should also wear a fitted half face mask - Calculate the volume of the container by measuring and multiplying the length, width and height of the box - Mix the appropriate ratio of resin/acetone/catalyst according to SOP - Work on a tray or a layer of aluminium foil in the fume cupboard. Put the resin in a 2 l glass beaker with stirrer and large flea. Measure out the acetone in a separate beaker. Place the beaker with the resin	Spillage of resin, exposure to resin and resin fumes	Operator and people in the vicinity	Respiratory and/or skin irritation from resin	4 x 4 High Risk (Known to occur, High)	Any spills should be cleaned up immediately following the guidance/protocols above Risk removed with appropriate use of PPE and working in fume hood See Acetone COSHH See polylite 32032-00 COSHH See butanox M-50 COSHH	2 x 2 Low Risk (Not likely, Minor)

on a stirrer and switch the stirrer on. - With a glass pipette and pipette bulb, add the catalyst. Clean the pipette by pipetting a small amount of acetone into the resin mixture. Slowly pour the rest of the acetone into the resin mixture. Stir for 2 minutes until the mixture is completely combined. - Remove the flea with tweezers - Immediately clean the flea and glassware with acetone. Place the acetone and residue in a glass or acetone-resistant plastic waste container. - Degas the mixed resin by placing the beaker containing the resin mixture in the desiccator and close the door securely. Connect the vacuum pump and turn it on. - Once bubbles stop forming, slowly release the vacuum by slowly turning the valve handle towards the opposite nozzle to return to the normal pressure. Avoid rapid pressure change						
Adding resin to sample in container: - Work must be done in the fume cupboard. Pour the resin into the container slowly and carefully to avoid air bubbles forming in the resin mixture. - NB do NOT pour the resin directly over the sample to avoid the formation of air bubbles in the sample. Instead, pour the resin in the gaps between the sample and the sides of the box. Fill the box to a level just above the sample. You may need to top up with more resin as the resin saturates the sample. Bubbles coming up show displaced air from the sample. - Immediately clean the beaker with acetone. Place the acetone and residue	Spillage of resin, exposure to resin and resin fumes	Operator and people in the vicinity	Respiratory and/or skin irritation from resin	4 x 4 High Risk (Known to occur, High)	Any spills should be cleaned up immediately following the guidance/protocols above Risk removed with appropriate use of PPE and working in fume hood See Acetone COSHH See polylite 32032-00 COSHH See butanox M-50 COSHH	2 x 2 Low Risk (Not likely, Minor)

in a glass or acetone-resistant plastic waste container.						
Degassing and setting the resin impregnated sample: - Place the box containing the sample in the desiccator and close the door securely. Connect the vacuum pump and turn it on. When the maximum vacuum level is achieved, switch the vacuum pump off. Turn the valve handle until it is perpendicular to the nozzle to close it. Check the vacuum gauge for leakage. - Leave the sample in the desiccator under vacuum overnight. Leave the fumehood switched on during this process. - To release the vacuum, slowly turn the valve handle towards the opposite nozzle to return to the normal pressure. Avoid rapid pressure change. Open the desiccator and remove the sample. - Place the sample in the drying oven at 60°C for 24-48 hours, to obtain a complete hardening of the resin. - Remove the sample from the aluminium or plastic box.	Spillage of resin, exposure to resin and resin fumes Hot surfaces Heat-related injuries	Operator and people in the vicinity	Respiratory and/or skin irritation from resin Burns and heat-related injuries from contact with hot surfaces and improper use of the oven.	4 x 4 High Risk (Known to occur, High)	Any spills should be cleaned up immediately following the guidance/protocols above Risk removed with appropriate use of PPE and working in fume hood PPE (lab coat, apron, gloves, safety glasses and heat resistant gloves) must be worn at all times. Extraction must be turned on whilst oven is in use. Only trained users to carry out drying process. Signage to be posted indicating that the oven is operating (contact name/email, date, duration of oven run, sample code/country of origin) Once the soil/sediment block has been impregnated with resin it is no longer considered licenced material and falls outside the scope of authorisation.	2 x 2 Low Risk (Not likely, Minor)

Internal Guidance/Linked Documents:		Anigene COSHH, Acetone COSHH, butanox M-50 COSHH, polylite 32032-00 COSHH, resin impregnation of soil and sediment blocks SOP	
Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of resin embedding process and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by			Supervisor/Manager acceptance
Name:	Aimee Parker, based on Risk Assessment prepared by specialist Professor Lisa-Marie Shillito		Name:

Signature:	ABParker	Signature:	
Date:	6/3/25	Date:	
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk



Durham
University

COSHH Assessment Form

Serial:

DU/DEPT/COSHH0001

Date		Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015).	Workplace	
				Research	x
				Cleaning/Maintenance	
				Other	

Name of the Substance

Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)

Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?

Yes

No

Substitution: Is it possible to use a less harmful substance to do the work?

Yes

No

Before beginning work on the COSHH assessment process ensure you have a copy of the latest **Manufacturers Safety Data Sheet (MSDS) for the substance**. MSDS's are available from suppliers and manufacturers of products

Describe the activity or work process.	Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.	How Long?	How Often?	How Much?
		30 mins	As needed	600ml max (spray bottle)

Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.

Location of Work

Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)

Persons at risk

Employees

x

Students

x

Others

Vulnerable persons

Classification (tick the box next to the appropriate sign)

For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link:

<http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm>

	Very toxic			Irritant			Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful			Oxidising			Dangerous to the environment	x
	Explosive			Flammable				

Carcinogenic substances must be notified to the University Safety Service, click on this link to notify:
<https://www.dur.ac.uk/healthandsafety.new/contactus/>



Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state				Other state	
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)								Short term exposure level (15 mins)					
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)									Yes (refer to Health and Safety service)		<u>No</u>		
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					

	Yes No			<u>Yes</u> No	To EN166 or equivalent				
	Respirator			Goggles					
	<u>Yes</u> No	Nitrile gloves			Yes No				
	Gloves				Overalls				
	Yes No				<u>Yes</u> No	Standard polycotton labcoat			
	Footwear				Other				
Fire: identify appropriate extinguishers here									
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket	
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below									
Not flammable. No hazard expected under normal conditions of use.									
Storage									
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.									
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)									
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other	
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.									
Risk evaluation (from matrix)		Consequences	Minor		Is exposure adequately controlled?		<u>Yes</u>	No	
		Likelihood	Not likely						
		Evaluation phrase	Low Risk						
Signature(s) <i>ABParker</i>					Date 10/8/23		Review date 10/8/26		

Section 3: Luminescence Dating Processes

Heavy Liquid Separation

Risk Assessment for Work with DEFRA Licenced Materials		Date:	2/8/2024 (revised 26/2/25)
		Review Date:	6/9//2024
Process:		Licenced locations for work:	
Heavy Liquid Separation		D136 - Luminescence laboratory	
Description of Process:			
Chemical separation of heavy minerals (incl. zircon) / quartz and plagioclases / alkali feldspars from soils/sediments for luminescence dating			
Objectives and Applications of Process:			
Use of sodium polytungstate to separate heavy minerals from soil/sediment samples in solution			
Justification of Use of Process:			
This method allows rapid and effective mineral separation within a soil/sediment sample using sodium polytungstate, and also ensures efficient recovery of the material after separation. After this preparation technique is conducted, the specific minerals isolated from the bulk sediment can be retrieved, dried and further prepared using HF etching before being analysed using luminescence dating.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Exposure to chemicals, spillage of licenced materials			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) Training in use of centrifuge and oven required before starting process Ensure centrifuge and oven are PAT-tested before use Extraction must be turned on when using sodium polytungstate Spillages Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. Refer to Protocol for Working with DEFRA Licenced Materials for larger spills All consumables used to treat spills (e.g., blue roll,	

originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Any weighing equipment used with licenced materials (e.g. spatulas/spoons, flasks, beakers, etc) should be cleaned with damp tissue and sprayed and wiped with 10% Anigene disinfectant solution and blue roll.
Disposal	
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company. - Sodium polytungstate is harmful to aquatic life and should never be disposed of down the drain. It is recovered and reused once used in the separation process, and should be treated as hazardous waste for final disposal - Separated materials should be disposed of following the licenced material protocol after analysis. They must be placed in the sealed DEFRA waste soil bin with other licenced material to await offsite disposal. - Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity. - The Department's licenced soil catalogue must be updated when materials are disposed of.	

Heavy Liquid Separation Task-Based Risk Assessment		
Equipment required (including PPE, tools, chemicals, etc)		
Equipment Centrifuge tubes Centrifuge Ballast (lead in centrifuge tube, 72g) Glass bottles Conical flask Funnel 10ml volumetric flask (to determine solution density) Filter paper Weighing paper Drying oven	PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Safety glasses Nitrile gloves	Chemicals Sodium Polytungstate (SPT) of required densities Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.

Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1. Preparation of the sodium polytungstate Either: Add solid sodium polytungstate to distilled water. Use the chart supplied with the sodium polytungstate to determine approximate masses of solid and water. As a guide, ~100 ml water plus ~400 g sodium polytungstate makes ~200 ml of liquid of density ~2.65 gcm⁻³. Or: Evaporate water from a solution of sodium polytungstate until required density is reached. But remember that the density decreases with increasing temperature. Or: Add distilled water to a near-saturated solution of sodium polytungstate. Check density using volumetric flask	Exposure to sodium polytungstate	Staff, students, researchers	Sodium polytungstate is harmful if swallowed and causes skin and serious eye damage on contact. Sodium polytungstate is corrosive and an irritant Sodium polytungstate is harmful to aquatic life Sodium polytungstate may cause respiratory irritation, drowsiness, or dizziness Sodium polytungstate is acutely toxic	4 x 3 Medium Risk (Known to occur, Moderate)	Sodium polytungstate should be treated with care when used and should be used under extraction in the fume cupboard Appropriate PPE should be worn at all times in the lab. Clothing must provide full leg/foot coverage. Sodium polytungstate: Spillage/uncontrolled release: ventilate area and keep away from oxidising agents; report spillage to technician in D203A; contain and absorb spill using spill kit and collect in a suitable waste container. Harmful to aquatic life – do not dispose of down sink. Control measures: perform separation in area with adequate mechanical ventilation. Eating, drinking and smoking prohibited in areas where SPT handled, stored and processed. Wear PPE and wash hands after use. Personnel exposure: Treatment to be adopted: Skin contact: Wash immediately with plenty of water for at least 15 minutes. Obtain medical attention. Eye contact: Rinse eyes with water for at least 15 minutes, keeping the lids open. Obtain medical attention. Ingestion: In case of swallowing, clean	2 x 3 Low Risk (Not likely, Moderate)

					mouth with water and drink plenty of water. Symptomatic treatment. Consult a doctor. Inhalation: Move to fresh air. If breathing is difficult, give oxygen. Symptomatic treatment. Obtain medical attention.	
2. Fill half a centrifuge tube with the solution of sodium polytungstate and add sample to the tube	Exposure to sodium polytungstate Spillage of licenced material	Staff, students, researchers	See step 1 for SPT Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	See step 1 for SPT Any spills of licenced material should be cleaned up immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 3 Low Risk (Not likely, Moderate)
3. Centrifuge for 1 minute to encourage 'heavy' material to sink	Electrical shock Reagent spillage Exposure to sodium polytungstate Spillage of licenced material	Staff, students, researchers	Electrical shocks and heat-related/burn injuries from improper use of centrifuge If the centrifuge is not fitted properly, or if it is not balanced/loaded correctly, reagents may spill. Improper loading of centrifugemay cause explosion See step 1 for SPT Contamination of equipment and working surfaces with licenced material	4 x 4 High Risk (Known to occur, Major)	Ensure centrifuge is not damaged and PAT-test is in date before use Ensure centrifuge is loaded and balanced properly before running. Ensure centrifuge lid is fitted correctly before running samples. Training required in use of centrifuge before use. Do not attempt to open centrifuge whilst operational. See step 1 for SPT Any spills of licenced material should be cleaned up immediately following PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must	2 x 3 Low Risk (Not likely, Moderate)

					provide full leg/foot coverage. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
4. Decant suspension of “light material” into a clean test tube	Exposure to sodium polytungstate Spillage of licenced material	Staff, students, researchers	See step 1 for SPT Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	See step 1 for SPT Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	2 x 3 Low Risk (Not likely, Moderate)
5. Dilute sodium polytungstate solution with distilled water	Exposure to sodium polytungstate	Staff, students, researchers	See step 1 for SPT	4 x 3 Medium Risk (Known to occur, Moderate)	See step 1 for SPT	2 x 3 Low Risk (Not likely, Moderate)
6. Centrifuge to allow material to sink	Electrical shock Reagent spillage Exposure to sodium polytungstate Spillage of licenced material	Staff, students, researchers	Electrical shocks and heat-related/burn injuries from improper use of centrifuge If the centrifuge is not fitted properly, or if it is not balanced/loaded correctly, reagents may spill. Improper loading of centrifugemay cause explosion See step 1 for SPT Contamination of equipment and working	4 x 4 High Risk (Known to occur, Major)	Ensure centrifuge is not damaged and PAT-test is in date before use Ensure centrifuge is loaded and balanced properly before running. Ensure centrifuge lid is fitted correctly before running samples. Training required in use of centrifuge before use. Do not attempt to open centrifuge whilst operational. See step 1 for SPT Any spills of licenced material should be cleaned up immediately following	2 x 3 Low Risk (Not likely, Moderate)

			surfaces with licenced material		the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
7. Pour off most of the sodium polytungstate solution into a clean beaker	Exposure to sodium polytungstate Spillage of licenced material	Staff, students, researchers	See step 1 for SPT Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	See step 1 for SPT Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage.	2 x 3 Low Risk (Not likely, Moderate)
8. Repeat steps 5-7 until satisfied that all material has settled out	Electrical shock Reagent spillage Exposure to sodium polytungstate Spillage of licenced material	Staff, students, researchers	Electrical shocks and heat-related/burn injuries from improper use of centrifuge If the centrifuge is not fitted properly, or if it is not balanced/loaded correctly, reagents may spill. Improper loading of centrifugemay cause explosion See step 1 for SPT Contamination of equipment	4 x 4 High Risk (Known to occur, Major)	Ensure centrifuge is not damaged and PAT-test is in date before use Ensure centrifuge is loaded and balanced properly before running. Ensure centrifuge lid is fitted correctly before running samples. Training required in use of centrifuge before use. Do not attempt to open centrifuge whilst operational. See step 1 for SPT Any spills of licenced material should be cleaned up	2 x 3 Low Risk (Not likely, Moderate)

			and working surfaces with licenced material		immediately following the guidance/protocols above PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
9. Rinse the material with deionised water and place in the oven to dry	Heat-related injuries and burns Electrical shock Spillage of licenced material	Staff, students, researchers	Burns and heat-related injuries from contact with hot surfaces and improper use of the oven Contamination of equipment and working surfaces with licenced material	4 x 3 Medium Risk (Known to occur, Moderate)	Turn on ventilation hood before turning oven on Only trained users to carry out drying process Ensure oven is not damaged and PAT-test is in date before use Ensure the DEFRA authorised imported soils warning sign is placed on the oven door for the duration of use. PPE to include (as a minimum) lab coat, apron, safety specs, nitrile gloves, and heat resistant glove Any spills of licenced material should be cleaned up immediately following PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Clothing must provide full leg/foot coverage. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 3 Low Risk (Not likely, Moderate)

Internal Guidance/Linked Documents:	Sodium polytungstate COSHH, Centrifuge SOP, Oven SOP, Anigene COSHH, Protocol for Working with DEFRA Licenced Materials
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Competence Requirements:		Training and competence judgement by lab manager/supervisor or technicians as required for new users of oven, centrifuge and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	2/8/2024	Date:	6/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
		Health and Safety	A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk

		COSHH Assessment Form				Serial:	DU/DEPT/COSHH0001	
Date	10/8/2024	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)			Workplace Research Cleaning/Maintenance Other		x
Name of the Substance		Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)						
Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?						Yes	No	
Substitution: Is it possible to use a less harmful substance to do the work?						Yes	No	
Before beginning work on the COSHH assessment process ensure you have a copy of the latest Manufacturers Safety Data Sheet (MSDS) for the substance . MSDS's are available from suppliers and manufacturers of products								
Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.			How Long? 30 mins	How Often? As needed	How Much? 600ml max (spray bottle)	
Location of Work		Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)						
Persons at risk		Employees	x	Students	x	Others	Vulnerable persons	
Classification (tick the box next to the appropriate sign)								
For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link: http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm								
	Very toxic			Irritant			Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful			Oxidising			Dangerous to the environment	x
	Explosive			Flammable				
Carcinogenic substances must be notified to the University Safety Service, click on this link to notify: https://www.dur.ac.uk/healthandsafety.new/contactus/								
 First Aid								
Skin contact		Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.						
Eye contact		If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low						

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state					Other state
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					
	Yes No							<u>Yes</u> No	Standard polycotton labcoat				
	Footwear							Other					

Fire: identify appropriate extinguishers here										
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor			Is exposure adequately controlled?	Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Karen M. Leck</i>						Date 10/8/2024	Review date 8/9/2024			

Hydrofluoric Acid (HF) Etching

Risk Assessment for Work with DEFRA Licenced Materials		Date:	3/8/2024 (revised 26/2/25)
		Review Date:	3/9/2024
Process:		Licenced locations for work:	
Hydrofluoric Acid (HF) Etching Procedure		Luminescence laboratory (D136)	
Description of Process:			
Immersion of separated granular minerals (quartz or feldspar typ. Ca 100-200 mg) in HF to remove outer layer of grains (ca 10-20 microns)			
Objectives and Applications of Process:			
To use HF to remove outer layer of grains of separated granular minerals for luminescence dating			
Justification of Use of Process:			
This method of wet etching using hydrofluoric acid is capable of etching required materials for luminescence dating at very high etch rates. Once completed, the grains can be treated as non-licenced material.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Hydrofluoric acid (~40%), Hydrochloric acid (~40%), spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicenced materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and		PPE Standard polycotton lab coat Butyl rubber apron (at least 0.5mm thick) Chemical splash goggles Polycarbonate visor Double gloves (surgical and HF acid-resistant) Over-sleeves PVC or PU rubber wellington boots *to be worn at all times* Equipment Safety Notes (full equipment list below) Special first aid procedures exist for HF use. Emergency procedures should be displayed locally at point of use, together with appropriate first aid equipment. HF should <u>not</u> be used without prior agreement of the Departmental Safety Advisor and HF first aiders should be informed of any planned use. Before starting work you must familiarize yourself with the HF first aid materials in the laboratory and the procedures for dealing with spills. All work <u>must</u> be conducted in a fume hood on a tray which will contain any spillage. Take great care not to contaminate any surfaces with HF from gloves.	

PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required.

Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.

Spillages

Minor spillages of soil/sediment to be cleaned up with moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes.

Refer to [Protocol for Working with DEFRA Licenced Materials](#) for larger spills

All consumables used to treat spills of licenced materials (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal.

Spills of HF or material in contact with HF should be treated safely as defined by the appropriate COSHH and MSDS documentation.

Operators must take care not to place themselves at increased risk of HF exposure whilst dealing with spills of licenced materials.

Cleaning of Equipment

Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll.

Residue subjected to the HF etching process and waste HF can be treated as non-licenced material (chemical waste disposal measures should be followed)

Small spills of material prior to HF etching should be cleaned up using damp blue roll and then wiped with 10% Anigene solution.

Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal.

It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis.

Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations.

Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.

Any weighing equipment used with licenced materials should be cleaned with damp tissue and wiped and sprayed with 10% Anigene disinfectant solution and blue roll.

Disposal

- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company.
- Once treated with HF acid, the sample material falls outside the scope of authorisation and can be treated as non-licenced material and disposed of accordingly following chemical waste disposal measures.

- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- The Department's licenced soil catalogue must be updated when materials are disposed of.

HF Etching (licenced material prep and etching) Task-Based Risk Assessment

Equipment required (including PPE, tools, chemicals, etc)

Equipment Distilled water Fume cupboard Polypropylene beakers (glassware should <u>never</u> be used in HF etching procedure) Timer/access to clock	PPE Full safety gear: - Chemical splash goggles - Polycarbonate visor - Double gloves (surgical and HF acid-resistant) - Over-sleeves - Lab coat - Butyl rubber apron (at least 0.5mm thick) - PVC or PU rubber wellington boots	Chemicals Hydrofluoric acid Hydrochloric acid Calcium-hydroxide Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.
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Work Step/ Tasks (Describe the tasks/steps involved in the order of work)	Hazards Identified for each task/step	Those at risk (people who could be harmed)	How could they be harmed? (nature of injuries, damage that could result)	Uncontrolled risk level (level of risk without control)	Required controls (how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)	Controlled risk level (level of risk remaining when controls are in place)
1. Inform trained HF first aider(s) of intention to carry out the HF etching procedure; must be present in building during process.	No risk	-	-	1 x 1 Low Risk	N/A	1 x 1 Low Risk
2. Affix safety notice to fume cupboard ("CAUTION! Hydrofluoric acid etching in progress"). Allow sufficient time for eyes to be dark accustomed. Minimise room occupancy and any sources of potential distraction (e.g., activities in same room).	No risk	-	-	1 x 1 Low Risk	N/A	1 x 1 Low Risk
3. Switch on fume cupboard and mains water tap; remove any unnecessary	No risk	-	-	1 x 1 Low Risk	N/A	1 x 1 Low Risk

items from the fume cupboard						
4. Prepare a calcium-hydroxide slurry in a large (e.g. 500 ml) polypropylene beaker and place inside the fume cupboard for neutralisation of HF and/or for use in the event of an HF spillage. Confirm location of chemical spillage kit and calcium gluconate gel.	Exposure to calcium-hydroxide	HF-trained operator	Calcium Hydroxide is an irritant to skin, eye and the upper respiratory tract. Calcium Hydroxide is corrosive and can cause serious eye damage. Calcium Hydroxide can cause specific target organ toxicity following single exposure. Calcium Hydroxide exposure can cause shortness of breath, nausea and headaches.	4 x 3 Medium Risk (Known to occur, Moderate)	Protective gloves, glasses and lab coat must be worn. Handle carefully and appropriately, avoiding skin and eye contact. Work under extraction in fume cupboard. Calcium Hydroxide: Personnel exposure: Treatment to be adopted: Inhalation: remove exposed individual to fresh air. Seek medical attention if discomfort/irritation persists. If breathing difficult, give oxygen. Skin contact: Wash affected area with soap and water, rinsing thoroughly. Seek medical attention if irritation/discomfort persists. Eye contact: Rinse/flush eyes gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Seek medical attention if irritation persists or if concerned. Ingestion: Rinse mouth thoroughly with plenty of water. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists. Firefighting measures: Do not use carbon dioxide extinguishing agents. Combustion products may include carbon oxides or other toxic vapours. Thermal decomposition can lead to release of irritating gases and vapours. Accidental release measures: Wear PPE. Transfer to disposal container and ensure adequate ventilation. Keep away from ignition sources and protect from heat.	2 x 2 Low Risk (Not likely, Minor)

					Contain spilled material by diking or using inert absorbent. Prevent from reaching drains, sewer or waterway. Avoid dust generation/accumulation due to explosion hazard.	
5. Place sample(s) to be treated into a dry labelled polypropylene beaker (or boiling tubes and polypropylene rack holder). Recommended that no more than 100-200 mg sample is etched at one time. Check that HCl/acetic acid pretreatments have been applied to remove carbonates, if required following a carbonate test. It is recommended that sample beakers are placed on a polypropylene tray to contain any accidental spillages.	Spillage of licenced material	HF-trained operator	Contamination of equipment and working surfaces with licenced material.	4 x 3 Medium Risk (Known to occur, Moderate)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Ensure spill kit is available and stocked before commencing work. All appropriate PPE (listed above) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	2 x 2 Low Risk (Not likely, Minor)
6. Remove the HF acid bottle/dispenser from storage container (typically 40% HF) in acid cupboard and place inside the fume cupboard	HF exposure	HF-trained operator	HF acid is very toxic by inhalation, in contact with skin/eyes and if swallowed. HF acid is corrosive and causes severe burns and eye damage. HF can be fatal if swallowed, inhaled and in contact with skin. HF acid inhalation may cause respiratory irritation, eye irritation, chest	5 x 5 STOP! (Common occurrence, Severe)	Full HF PPE must be worn at all times. Double gloves (standard and outer butyl or equivalent HF resistant), goggles and visor, over-sleeves, lab-coat, butyl rubber apron over lab-coat, rubber boots. Ensure HF bottle is properly closed before lifting and after use. Special first aid procedures exist for HF use. Emergency procedures should be displayed locally at point of use, together with appropriate first aid equipment. HF should not be used without prior agreement	2 x 3 Low Risk (Not likely, Moderate)

			tightness and pulmonary oedema. HF acid ingestion may cause burns to mouth and throat Tissue destruction Effects from exposure may be localised and systemic. Systemic effects include convulsions, CNS depression and cardiac conduction disturbances can occur secondary to electrolyte disturbances.		of the Departmental Safety Advisor and HF first aiders should be informed of any planned use. Before starting work you must familiarize yourself with the HF first aid materials in the laboratory and the procedures for dealing with spills. All work should be conducted in a fume hood on a tray which will contain any spillage. Take great care not to contaminate surfaces with HF from gloves. Hydrofluoric Acid: Personnel exposure: Treatment to be adopted: Skin contact: Remove contaminated clothing. Flood affected area immediately with plenty of water for at least 15 minutes. Apply calcium gluconate gel until at least 15 minutes after pain has been relieved. Immediate medical attention is required. Eye contact: Irrigate immediately with plenty of water (also under eyelids) for at least 15 minutes or until medical attention has been obtained. Ingestion: Do not induce vomiting. Wash out mouth thoroughly with water, ensuring mouth wash is not swallowed. If any acid has been swallowed, give water to drink. Obtain medical attention and call physician or Poison Control Centre immediately. Inhalation: If not breathing, give artificial respiration with aid of pocket mask equipped with one-way valve or other proper respiratory medical device. Do not use mouth-to-mouth method if victim ingested or inhaled the	
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					substance. Give oxygen if suitably trained. Remove casualty from exposure and move to fresh air. Immediate medical attention is required. Fire-fighting measures: May evolve toxic fumes in fire. During combustion substance may give rise to hydrogen gas. Only use water extinguisher. Accidental release/spillage measures: Wear appropriate HF PPE. Inform others to keep at a safe distance, spread calcium hydroxide liberally over spillage, transfer to container and arrange specialist disposal. Wash site of spillage thoroughly. For large spillages liquids should be contained with sand/earth and transferred to appropriate container. Any residues should be treated as for small spillages.	
7. Draw the sash of the fume cupboard down to the lowest practicable working height	No risk	-	-	1 x 1 Low Risk	N/A	1 x 1 Low Risk
8. Remove cap from HF dispenser; invert the cap before placing it on the worksurface inside the fume cupboard	HF exposure	HF-trained operator	HF acid is very toxic by inhalation, in contact with skin/eyes and if swallowed. HF acid is corrosive and causes severe burns and eye damage. HF can be fatal if swallowed, inhaled and in contact with skin. HF acid inhalation may cause respiratory irritation, eye	5 x 5 STOP! (Common occurrence, Severe)	Full HF PPE must be worn at all times. Double gloves (standard and outer butyl or equivalent HF resistant), goggles and visor, over-sleeves, lab-coat, butyl rubber apron over lab-coat, rubber boots. Do not leave HF acid or HF work unattended. Special first aid procedures exist for HF use. Emergency procedures should be displayed locally at point of use, together with appropriate first aid equipment. HF should not be used without prior agreement	3 x 3 Medium Risk (Could occur, Moderate)

			irritation, chest tightness and pulmonary oedema. HF acid ingestion may cause burns to mouth and throat Tissue destruction Effects from exposure may be localised and systemic. Systemic effects include convulsions, CNS depression and cardiac conduction disturbances can occur secondary to electrolyte disturbances.		of the Departmental Safety Advisor and HF first aiders should be informed of any planned use. Before starting work you must familiarize yourself with the HF first aid materials in the laboratory and the procedures for dealing with spills. All work should be conducted in a fume hood on a tray which will contain any spillage. Take great care not to contaminate surfaces with HF from gloves. See Step 1 for HF personnel exposure treatment measures, fire-fighting measures, and accidental release measures.	
9. Carefully pour HF to cover each sample to be etched; this should be done slowly as a strong reaction may occur if there is some residual carbonaceous material (normally removed by sample pre-treatment). Halt the procedure if spillage occurs – to avoid transfer of HF to other surfaces neutralize a small spill before continuing.	HF exposure Spillage of licenced material	HF-trained operator	See above. Contamination of equipment and working surfaces with licenced material.	5 x 5 STOP! (Common occurrence, Severe)	See above. Halt the procedure if spillage occurs – to avoid transfer of HF to other surfaces neutralize a small spill before continuing. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Operators must take care not to place themselves at increased risk of HF exposure whilst dealing with spills of licenced materials. Ensure licenced material spill kit is available and stocked before commencing work.	3 x 3 Medium Risk (Could occur, Moderate)
10. Note the start time of the treatment (timing to the nearest 1-2 mins is sufficient for this procedure). Do not place timing device	No risk	-	-	1 x 1 Low Risk	N/A	1 x 1 Low Risk

inside fume cupboard.						
11. Replace cap on HF dispenser; wash surface of dispensing bottle and then wash gloves thoroughly inside fume cupboard using tap water supply.	HF exposure	HF-trained operator	See above.	5 x 5 STOP! (Common occurrence, Severe)	See above.	3 x 3 Medium Risk (Could occur, Moderate)
12. Draw down the fume cupboard sash fully and leave samples to etch for the appropriate period of time. Check that 'HF acid in use' notice is placed on sash as warning. Normally other lab users should avoid entering the room during the etching procedure.	HF exposure	HF-trained operator	See above.	3 x 4 Medium Risk (Could Occur, Major)	See above. Leave HF notice sign on sash during etching period. Make everyone in the lab aware that HF etching is in progress. Wherever possible, avoid other lab users entering room during etching procedure.	2 x 3 Low Risk (Not likely, Moderate)
13. Sample disposal and cleaning equipment	HF exposure	HF-trained operator	See above.	5 x 5 STOP! (Common occurrence, Severe)	See above. Material treated with HF and associated waste HF can be treated as non-licensed material and disposed of appropriately through chemical waste disposal.	3 x 3 Medium Risk (Could occur, Moderate)
After application of HF to samples, the material can be treated as non-licensed material and the normal risk assessment protocol should be followed						

Internal Guidance/Linked Documents:		HF Acid COSHH, HF acid protocols and associated RAs, Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials	
Competence Requirements:		Training and competence judgement by lab manager/supervisor as required for new users of HF acid and those new to working with licenced materials. Before use of HF, chemical safety awareness course should be undertaken and HF first aid measures must be read and understood. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Aimee Parker	Name:	Prof Karen Milek
Signature:	<i>ABParker</i>	Signature:	<i>Karen Milek</i>
Date:	3/8/2024	Date:	3/9/2024

This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk



Durham
University

COSHH Assessment Form

Serial:

DU/DEPT/COSHH0001

Date	10/8/24	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)	Workplace	
				Research	x
				Cleaning/Maintenance	
				Other	

Name of the Substance	Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)
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Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities?	Yes	No
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Substitution: Is it possible to use a less harmful substance to do the work?	Yes	No
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Before beginning work on the COSHH assessment process ensure you have a copy of the latest **Manufacturers Safety Data Sheet (MSDS) for the substance**. MSDS's are available from suppliers and manufacturers of products

Describe the activity or work process.	Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.	How Long?	How Often?	How Much?
Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.		30 mins	As needed	600ml max (spray bottle)

Location of Work	Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)
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Persons at risk	Employees	x	Students	x	Others		Vulnerable persons	
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Classification (tick the box next to the appropriate sign)

For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link:
<http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm>

	Very toxic			Irritant			Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful			Oxidising			Dangerous to the environment	x
	Explosive			Flammable				

Carcinogenic substances must be notified to the University Safety Service, click on this link to notify:
<https://www.dur.ac.uk/healthandsafety.new/contactus/>

First Aid

Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state				Other state	
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)									Yes (refer to Health and Safety service)		<u>No</u>		
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					
	Yes No							<u>Yes</u> No	Standard polycotton labcoat				
	Footwear							Other					

Fire: identify appropriate extinguishers here										
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor			Is exposure adequately controlled?	Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Kenny M. Leek</i>						Date 10/8/24	Review date 5/9/2024			

Section 4: Isotope Analysis Processes

Isotope Analysis of Soils or Sediments

Risk Assessment for Work with DEFRA Licenced Materials		Date:	6/9/2024 (revised 26/2/25)
		Review Date:	6/9/2024
Process:		Licenced locations for work:	
Isotope analysis of soils or sediments		Preparation: D128 – Palaeoecology Laboratory (Fenwick Laboratory); D131 – Environmental Archaeology Processing Laboratory; D132 – Archaeological Science Laboratory Analysis: D129 – Stable Isotope Biogeochemistry Laboratory (SIBL)	
Description of Process:			
Use of the stable isotope mass spectrometers (ThermoScientific MAT 253 and ThermoScientific Delta V Advantage) for determination of carbon, nitrogen and/or sulphur isotopes in soil/sediment samples. Samples are dried, powdered, and stored in vials before entering the Stable Isotope Biogeochemistry Laboratory (SIBL). The required weight is measured out in a temperature-controlled environment using Mettler Toledo microbalances on a custom-built weighing table. When the desired weight is obtained the tin capsule is folded to encapsulate the soil sample and placed in a 96-well microplate tray. When all samples are weighed the microplate tray is stored in a desiccator until they are analysed. Samples are taken from the microplate and loaded into an elemental analyser carousel and then evacuated with helium. Samples drop individually and are combusted with a small amount of oxygen in a furnace column at 1010 °C-1500 °C. The gas sample is then continuously transported with helium into the stable isotope ratio mass spectrometer for elemental and isotopic analysis.			
Objectives and Applications of Process:			
- To determine the stable isotopes of carbon, nitrogen and/or sulphur of soil/sediment samples to examine palaeoclimatic and palaeoecological processes and impacts of past land use and human activities on soils - Applicable to wide range of soil and sediment types (range of application = peat to fully mineral sediments)			
Justification of Use of Process:			
Presence of stable isotopes of carbon, oxygen, nitrogen and/or sulphur within soil or sediment can be indicative of a number of palaeoecological and palaeoclimatic processes and provide a strong complement to other soil and sediment analyses. The methodology is generally low-risk and provides quick measurements with minimal handling/exposure of lab users and equipment to licenced materials.			
Elimination: Is it possible to avoid the need to undertake this process on licenced materials?		Yes	<u>No</u>
Substitution: Is it possible to gain the same information using a less hazardous process or one that limits exposure to/use of licenced materials?		Yes	<u>No</u>
Most Significant Risk(s):			
Dust inhalation, spillage of licenced material			
Biosafety – work with DEFRA licenced materials		General Safety	
Additional requirements are needed for containment and disinfection of materials held under DEFRA licence. Time must be booked within a licenced laboratory to work with DEFRA materials. Please use the Teams booking page and state that your work involves licenced materials. To prevent cross contamination, no other analysis/prep work is permitted when working with licenced materials within laboratories. Licenced and unlicensed materials must never be mixed. Training from a person named on the licence must be undertaken before work commences. Specific PPE is provided for use with licenced material. Do not remove these items from the lab and dispose of		PPE Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal), safety glasses, and nitrile/vinyl gloves to be worn at all times. Equipment Safety Notes (full equipment list below) All dust-generating soil work must be undertaken under extraction in a licenced laboratory (extraction cabinet in D131). Only trained and competent lab users to use the microbalances and mass spectrometers in SIBL Spillages Minor spillages of soil/sediment to be cleaned up with	

them in the designated licenced material waste bin. Light breaking up of small soil/sediment aggregates must only take place using the designated mortar and pestle kept in the Arch Science Lab (D132). Any powdering must be done under the extraction unit in D131 wearing PPE. All sample material must be stored in sealed containers, within the labelled licenced material desiccator or designated cabinet in D132, the licenced section of the roller racks (D111), or the designated basement storage area. All material must be clearly labelled to show it has originated from licenced materials. Any surplus material, packaging, soiled tissues, and PPE must be placed in the designated licenced material waste container for offsite disposal. Please inform a technician in D203A if disposal is required. Equipment, benches, and work areas should be disinfected after use by cleaning away any soil with a damp tissue and spraying and wiping with 1:100 (v/v) Anigene disinfectant solution and left for 20 minutes.	moist tissue paper and disposed of in the licenced waste container. 1:10 (v/v) Anigene disinfectant solution should be used to disinfect cleaned surfaces where spills have occurred and left for 30 minutes. Refer to Protocol for Working with DEFRA Licenced Materials for larger spills All consumables used to treat spills (e.g., blue roll, wipes, absorbent towels) must be stored in the designated sealed DEFRA waste bin with other licenced material to await offsite disposal. Cleaning of Equipment Equipment used during work with licenced materials should be cleaned thoroughly with damp tissues to remove soil from all surfaces and then sprayed and wiped using 10% Anigene disinfectant solution and blue roll. <i>Residue remaining in column <u>after</u> mass spectrometry (i.e. after heating to 1010 °C-1500 °C) can be treated as non-licenced material.</i> <i>Small spills of material not heated to 1010 °C-1500 °C should be cleaned with damp tissue and wiped using blue roll with 10% Anigene disinfectant solution.</i> Soiled blue roll/tissues must be stored in the designated sealed DEFRA waste soil bin with other licenced materials to await offsite disposal. <i>It is the responsibility of the user to ensure the appropriate spill kit and disinfecting agents are available and in-date before commencing analysis. Cleaning and spill kits for licenced material are kept in D132 and the designated storage locations. Users must bring a kit with them to their planned and authorised work location, and must return the kit once work is completed. Please inform a technician (D203A) if contents of the kit have been used and require replacement.</i> Any weighing equipment used with licenced materials (e.g. vials, microspatulas, tin capsules) should be cleaned with a damp tissue and sprayed and wiped with 10% Anigene disinfectant solution.
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Disposal

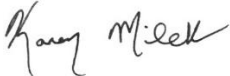
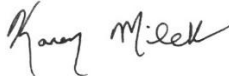
- Disposal of licenced material is organised by the Technical Team (D203A) and sent for incineration by an external company.
- Unlicenced material – used sample material can either be tipped back into sample container for retention or placed in the bin.
- Licenced material – used sample material can be retained in an appropriately labelled bag if required and returned to licenced soil storage, or placed in the designated sealed DEFRA waste soil bin for disposal.
- Leftover residues of licenced material not required for further analysis must be placed in the designated sealed DEFRA waste soil bin (D132) with other licenced material to await offsite disposal. Please inform a technician (D203A) when disposal is required and when the waste bin is approaching capacity.
- The Department's licenced soil catalogue must be updated when materials are disposed of.

Equipment required (including PPE, tools, chemicals, etc)						
Equipment		PPE		Chemicals		
Glass vials Mettler Toledo 5 microbalance Microspatula Tin capsules 96-well microplate tray Desiccator Mass spectrometer (ThermoScientific MAT 253 or ThermoScientific Delta V Advantage)		Standard polycotton lab coat covered with a plastic apron (which can be wiped clean or sent for offsite disposal) Gloves Face-fitted dust masks (P2) may be required if no extraction is available		Pre-prepared solutions of 10% Anigene disinfectant must be available for cleaning after work with licenced material.		
Work Step/ Tasks <i>(Describe the tasks/steps involved in the order of work)</i>	Hazards Identified for each task/step	Those at risk <i>(people who could be harmed)</i>	How could they be harmed? <i>(nature of injuries, damage that could result)</i>	Uncontrolled risk level <i>(level of risk without control)</i>	Required controls <i>(how the risk can be removed or reduced by for example engineered methods, safe systems of work, training and/ or personal protective equipment)</i>	Controlled risk level <i>(level of risk remaining when controls are in place)</i>
1. Weigh sieved soil/sediment into tin capsules using Mettler Toledo 5 microbalance and microspatula	Spillage of licenced material Dust inhalation Prolonged sitting at benches/postural problems	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation. Pain, discomfort or injury from postural problems (e.g. to hands/arms from overuse, improper use or poorly designed workstation/work environment).	4 x 3 Medium Risk (Known to occur, Moderate)	Process involves moving minute amounts of soil, but the procedure should be done carefully with adequate training. Dust masks (P2) suitable for protections against silica dust to be worn. Any spills of licenced material should be cleaned up immediately following the guidance/protocols above. Use of backed chairs not lab stools for prolonged period of work. Chairs adjusted to correct height/position. Regular breaks. Workstation Assessment training available	2 x 2 Low Risk (Not likely, Minor)

					to ensure correct seating position. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
2. Fold tin capsule is to encapsulate the soil sample and placed in a 96-well microplate tray.	Spillage of licenced material Dust inhalation Prolonged sitting at benches/postural problems	Staff, students, researchers	Contamination of equipment and working surfaces with licenced material. Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation. Pain, discomfort or injury from postural problems (e.g. to hands/arms from overuse, improper use or poorly designed workstation/work environment).	4 x 2 Medium Risk (Known to occur, Minor)	Any spills of licenced material should be cleaned up immediately following the guidance/protocols above Ensure samples are fully encapsulated before transferring them to the microplate tray. Use of backed chairs not lab stools for prolonged period of work. Chairs adjusted to correct height/position. Regular breaks. Workstation Assessment training available to ensure correct seating position. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene	2 x 2 Low Risk (Not likely, Minor)

					disinfectant after working.	
3. Store microplate tray containing encapsulated soil samples in a desiccator until they are analysed	No risks	-	-	1 x 1	-	1 x 1
4. Take samples from the microplate and load into an elemental analyser carousel, evacuate with helium, and heat in a furnace in a furnace column to 1010-1500 °C. The gas sample is transported with helium into the stable isotope ratio mass spectrometer for elemental and isotopic analysis.	Exposure to fumes from faulty equipment Electrical shock or burns from faulty equipment	Staff, students, researchers	Electrical shocks or burns from using faulty electrical equipment Injury resulting from incorrect programming or use of damaged equipment	4 x 4 High Risk (Known to occur, Major)	All electrical equipment, including mass spectrometers, PAT tested for electrical safety annually. Inspect instruments and cables before use. Do not use if damage identified (report to Darren Grocke) Only trained users to adjust mass spectrometer settings	2 x 3 Low Risk (Not likely, Moderate)
5. Dispose of any residues remaining in the column	Dust inhalation Inappropriate disposal of licenced material	Staff, students, researchers	Respiratory illness and issues from dust inhalation. Possible eyes, nose, throat irritation from dust inhalation. Aggravation of existing health conditions such as asthma from dust inhalation. Licenced material being released into general waste	4 x 2 Medium Risk (Known to occur, Minor)	Process involves moving minute amounts of soil residue, but the procedure should be done carefully with adequate training. Dust masks (P2) suitable for protections against silica dust to be worn. Any residue remaining in column after heating to 1010-1500 °C can be treated as unlicensed material. Any residues remaining in column must be treated as licenced material and disposed of in the sealed DEFRA waste soil bin to	2 x 3 Low Risk (Not likely, Moderate)

					await offsite disposal. PPE (lab coat, apron, gloves, safety glasses) must be worn at all times. Surfaces to be cleaned thoroughly with damp blue roll and then sprayed and wiped with 10% Anigene disinfectant after working.	
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Internal Guidance/Linked Documents:		Anigene COSHH form, Protocol for Working with DEFRA Licenced Materials, Soil Powdering and Sieving RA	
Competence Requirements:		Training and competence judgement by lab manager/supervisor is required for new users of SIBL and those new to working with licenced materials. Lab users must receive a specialised laboratory and Risk Assessment induction before commencing work on DEFRA authorised imported soil.	
Supervisor/Manager Review and Comment:			
Assessment Prepared by		Supervisor/Manager acceptance	
Name:	Prof Karen Milek	Name:	Prof Karen Milek
Signature:		Signature:	
Date:	6/9/2024	Date:	6/9/2024
This risk assessment should be read by those performing and supervising the work in conjunction with all relevant documentation including method statements and safe systems of work			

Health and Safety Risk Matrix

			Probability/ likelihood of risk realisation				
			Almost Impossible (1)	Not Likely to occur (2)	Could occur (3)	Known to occur (4)	Common occurrence (5)
			A freak combination of factors would be required for risk to be realised	A rare combination of factors would be required for risk to be realised	Could happen when additional factors are present otherwise unlikely to occur	Not certain to happen but an additional factor may result in risk being realised	Almost inevitable that risk will be realised
Potential Consequences	Severe (5)	One or more fatalities. Irreversible health problems	5	10	15	20	25
	Major (4)	Partial or medium-term, disabilities or major health problems	4	8	12	16	20
	Moderate (3)	Lost-time injuries or potential medium-term health problems	3	6	9	12	15
	Minor (2)	Minor, very short-term health concerns on recordable injury cases.	2	4	6	8	10
	Insignificant (1)	Inherently safe, unlikely to cause health problems or injuries	1	2	3	4	5

Extreme risk	High risk	Medium risk	Low risk



Durham
University

COSHH Assessment Form

Serial:

DU/DEPT/COSHH0001

Date	10/8/24	Person(s) involved in risk assessment	Users working with licenced soil in laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and/or storage areas (D111; D013B; D011; D012; D015)	Workplace	
				Research	x
				Cleaning/Maintenance	
				Other	

Name of the Substance Anigene Professional Surface Disinfectant Cleaner – Lavender (10% Dilution)

Elimination: Is it possible to avoid the need to use the hazardous substance and safely dispose of existing quantities? Yes **No**

Substitution: Is it possible to use a less harmful substance to do the work? Yes **No**

Before beginning work on the COSHH assessment process ensure you have a copy of the latest **Manufacturers Safety Data Sheet (MSDS) for the substance**. MSDS's are available from suppliers and manufacturers of products

Describe the activity or work process. Note: Include how long the task will take, how often it will be repeated and how much of the substance is used.	Cleaning work areas after handling licenced soils and cleaning/containing licenced soil spillages in laboratories and storage areas.	How Long?	How Often?	How Much?
		30 mins	As needed	600ml max (spray bottle)

Location of Work Licenced soil laboratories (D006; D112; D128; D129; D131; D132; D133; D136E; D136C; D204; D242; D243) and storage rooms (D111; D013B; D011; D012; D015)

Persons at risk	Employees	x	Students	x	Others		Vulnerable persons	
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Classification (tick the box next to the appropriate sign)

For a fuller understanding of symbols, abbreviations, risk and safety phrases click on this link:

<http://www.hse.gov.uk/chemical-classification/labelling-packaging/index.htm>

	Very toxic			Irritant			Highly flammable	
	Toxic			Compressed gas			Extremely flammable	
	Corrosive			Biological hazard			Serious long term health hazard	
	Harmful			Oxidising			Dangerous to the environment	x
	Explosive			Flammable				

Carcinogenic substances must be notified to the University Safety Service, click on this link to notify:

<https://www.dur.ac.uk/healthandsafety.new/contactus/>

First Aid

Skin contact	Skin irritation should not occur when used as recommended (low hazard). Wash affected area with plenty of water. Refer to GP/A&E unit as appropriate if irritation/rash develops. May cause allergic reaction in susceptible people.
Eye contact	If substance enters eyes, immediately bathe eye with plenty of water (preferably using an eyewash station). Refer to GP/A&E unit if eye irritation persists. Substance considered low

	hazard under normal conditions of use. May cause redness and irritation, and prolonged use may cause abrasive irritation of the eyes.
Ingestion	Rinse mouth with water. Do not induce vomiting. If conscious, give 500ml (c. 1 pint) of water to drink. Refer to GP/A&E as appropriate and if you feel unwell. Never give anything by mouth to an unconscious person. May cause gastro-intestinal disturbances.
Inhalation	Not expected to present a significant inhalation hazard under the anticipated conditions of normal use. If respiratory irritation or allergic reaction occurs, stop use and remove self/casualty to fresh air. Refer to GP/A&E as appropriate.

Indicate below which form the substance takes													
Gas		Vapour		Mist	x	Fume		Dust		Liquid	x	Solid	
Indicate below the route(s) of exposure that the substance takes													
Inhalation	x	Skin	x	Eyes	x	Ingestion		Other state				Other state	
Workplace Exposure Limits (WELs)													
Long term exposure level (8hr TWA)							Short term exposure level (15 mins)						
List the risks to health from exposure to the substance (e.g. hazard statements and signal words). Click here for information: http://www.hse.gov.uk/chemical-classification/labelling-packaging/hazard-precautionary-statements-signal-words.htm													
H317 – May cause an allergic skin reaction. H412 – Harmful to aquatic life with long lasting effects. P102 – Keep out of reach of children. P273 – Avoid release to the environment. P501 – Dispose of contents/container in accordance with national regulations													
Control Measures: List below control measures eg extraction, ventilation, supervision, include additional controls for vulnerable persons where necessary													
Avoid contact with skin and eyes. Do not eat, drink, or smoke when using this product. Respiratory protection and ventilation via extraction not required. Use should be restricted to necessary quantities depending on size of work area/spillage needing to be cleaned. Do not use excessive amounts. Substance is safe to use without supervision, however considerable spills of licenced soil should be reported to technicians in D203A/supervisor/or lab manager.													
Certain substances may react adversely if they come into contact with others. List any compatibility warnings here:													
Oxidising substances Anionics Peroxides Acids													
Is health surveillance or monitoring required? (remember health surveillance may be required for vulnerable persons eg pregnant/young workers those with asthma, dermatitis etc)								Yes (refer to Health and Safety service)		<u>No</u>			
Personal Protective Equipment required. Identify type and specification.													
	Yes No							Yes No					
	Dust mask							Visor					
	Yes No							<u>Yes</u> No	To EN166 or equivalent				
	Respirator							Goggles					
	<u>Yes</u> No	Nitrile gloves						Yes No					
	Gloves							Overalls					
	Yes No							<u>Yes</u> No	Standard polycotton labcoat				
	Footwear							Other					

Fire: identify appropriate extinguishers here										
Dry powder	x	CO ₂	x	Water	x	Foam	x (alcohol resistant)	Fire Blanket		
During combustion, certain substances may give rise to harmful vapours/gasses etc. Detail these below										
Not flammable. No hazard expected under normal conditions of use.										
Storage										
Store dilutions in a closed container in a cool, well ventilated area. Keep out of extreme temperatures and direct sunlight. Keep away from oxidising substances, anionics, peroxides, and acids. No decomposition if stored normally. Dilutions have a shelf life of 3 months and must be labelled with date they are made.										
Disposal route for waste substances and containers (for advice contact ext. 46480 or 46042)										
Hazardous waste	x	General waste		Biological waste		Return to supplier		Other		
Generation of waste product should be minimised. Substance should be disposed of in accordance with local and national regulations. Do no discharge dilutions (>10% concentrate) into drains, water courses or soil without further dilution. Solutions can be disposed of by washing to sewers with at least 10x volumes of water (if appropriate under disposal regulations). Waste should be reported to technicians in D203A and disposed of as hazardous waste to authorised waste collection point.										
Risk evaluation (from matrix)		Consequences	Minor			Is exposure adequately controlled?	Yes	No		
		Likelihood	Not likely							
		Evaluation phrase	Low Risk							
Signature(s) <i>AB Parker</i> <i>Harry M. Leck</i>						Date 10/8/2024	Review date 5/9/2024			