APPLICATION FOR AN ENVIRONMENTAL PERMIT UNDER THE ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2016 (AS AMENDED)

WOOD WASTE REVIEW

PLATTS AGRICULTURE LIMITED,
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS / TERMS USED IN THIS REPORT

EA	Environment Agency
ECL	Environmental Compliance Limited
EPR	Environmental Permitting (England and Wales) Regulations 2016
IED	Industrial Emissions Directive
LOD	Limit of Detection
MDF	Medium Density Fibreboard
PAS	Publicly Available Specification
Platts	Platts Agriculture Limited
SSV	Soil Screening Values

1. INTRODUCTION

1.1. Review of Wood Waste and Analysis

1.1.1. As part of Platts Agriculture Limited ("Platts") application for a bespoke Environmental Permit for a waste wood processing Facility, Environmental Compliance Limited ("ECL") has been commissioned to review the regulations and guidance for wood waste along with the analysis data that has been obtained so far in respect of WM3[1] assessments provided by some of their suppliers.

1.1.2. The Environment Agency ("EA") Regulatory Position Statement 207 ("RPS") stipulates that unless wood waste producers had undertaken a WM3 assessment for their waste then the only disposal routes were to send the material to board manufacturing or send it to an Industrial Emissions Directive ("IED") compliant incinerator.

1.1.3. Regulatory concerns existed in respect of suspected inappropriate end use of certain wood wastes, lack of testing, and lack of appropriate waste coding using the WM3 Technical Guidance[1] to determine whether wood waste was hazardous or not.

1.1.4. In trying to work towards a regulatory compliant position, Platts requested that their suppliers had their wood wastes sampled and analysed in order that WM3 assessments could be undertaken and thereby classify the wood waste streams appropriately and determine whether the waste was hazardous or not. The assessments would provide the correct waste code which should be assigned to the waste streams.

1.1.5. Sample analysis suites of wood waste was developed after discussions with laboratories and covering as wide a range of likely substances that may be present in the wood wastes. The final suite of analysis was as recommended by the laboratories.

1.1.6. Results of analysis to date has been collated and assessed against various other data sets to inform further sampling and analysis, along with interpretation of results. Many substances that were analysed for were below the limit of detection ("LOD") but also a range of analytes referenced in other data sets were not analysed for as at the time consideration for the need to assess certain analytes had not been given. It is considered that further discussions with regulators and interested parties is required to understand the full / necessary range of analysis for wood wastes.

[1] Guidance on the classification and assessment of waste (1st Edition v1.1) Technical Guidance WM3

2. ANALYSIS RESULTS REVIEW PROCESS

In undertaking the review, five documents have been used to assess what potential environmental impacts may be posed by the intended use of the wood waste. These were the wood waste sector PAS111:2012 'Specification for the requirements and test methods for processing waste wood' document, The EA Material Comparator report document for Straw, The EA Material Comparator Report document for Materials Applied to Land in respect of Manufactured Fertilisers, the EA reference document for 'Derivation and use of soil screening values for assessing ecological risks', and finally comparison to the Environmental Permitting (England and Wales) Regulations 2016 ("EPR") Schedule 1, Part 1 references to releases into water.

2.1. PAS111:2012

2.1.1. The Publicly Available Specification document PAS111:2012 (BSI 2012) was developed for the wood waste industry sector to provide advice and guidance on how to deal with wood waste and the methodologies to employ in order to develop appropriate end uses for different wood waste sources. The document specifically refers to animal bedding, which Platt's produce using the clean wood waste streams received.

2.2. Material Comparator – Straw

2.2.1. The EA document 'Material Comparators for end-of-waste decisions, Animal Bedding: Straw (August 2016)' was written to report the findings from a study assessing whether particular waste materials could be suitable for use as an animal bedding material as a direct replacement for straw. It is noted that there was a limited number of suitable pre-existing datasets found during the literature review for the document, and only ten samples of straw were collected from various suppliers from which analysis data were used within the report.

2.2.2. The document can be used to objectively assess whether a waste material can be used as a replacement for a non-waste material and to consider the environmental and human health impacts of doing so.

2.2.3. Reference is made to the Waste Framework Directive and Article 6 case law quoting "*It should be enough that the holder has converted the waste material into a distinct, marketable product, which can be used in exactly the same way as a [non-waste material]. And with no worse environmental effects.*"

2.3. Material Comparator – Manufactured Fertiliser

2.3.1. A further document that was considered may be appropriate to compare results to is the EA document 'Material Comparators for end-of-waste decisions, Materials applied to land: manufactured fertilisers' (August 2016) which is used for assessing whether a particular waste material is suitable for use as a replacement for fertiliser.

2.3.2. The purpose of this comparison is not to determine whether the materials used by Platt's could be used as fertilisers but to have another set of analytes with which to compare results to and objectively assess potential environmental impact from the use of the material.

2.4. Soil Screening Values

2.4.1. The last document referenced was the EA 'Derivation and use of soil screening values for assessing ecological risks' (November 2017).

2.4.2. The reference to the document was not for direct comparison purposes as it is not appropriate to make direct comparison of chemical composition of materials to soil screening values ("SSV's") to determine whether material can be applied to land. This was purely an informative exercise.

2.5. Releases to Water

2.5.1. Consideration to how substances may be released from the wood waste to water has been investigated. However, the wood waste materials supplied to Platts is held within enclosed trailers or other containers prior to being transported to the Facility.

2.5.2. The materials are held within these trailers / containers until the material is ready to be processed, at which point the unloading activity is undertaken within the enclosed loading bay of the process building. All wood waste material remains within enclosed processing equipment up to the point of being packaged as a product where it is then removed on pallets to the external storage area.

2.5.3. There are no stockpiles of wood waste on the ground at any point, and any quarantined material, either processed or unprocessed, would remain in an 'enclosed' state. Areas of the site where wood waste material is held is all on impermeable surfaces.

3. REVIEW OF ANALYSIS DATA

3.1. WM3 Data

3.1.1. The results generated from wood waste samples sent for analysis in relation to undertaking WM3 assessment for the appropriate classification of the waste streams has been collated.

3.1.2. To date, there have been a total of 13 samples analysed, 12 of which were 'treated' wood waste (excluding any treatments relating to the pressure treatment of timber for preservation purposes), and 1 'clean' wood waste sample (sample 13). The analysis undertaken related to the chemical substance composition and the concentrations of those substances present, as advised by the laboratories. The collated results are shown in Tables 1 and 2 below.

Table 1: Collated Laboratory Analysis Results ('Treated')

			Sample Library Number											
Substance / Analyte	**Units**	**LOD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Arsenic	mg/kg	0.2	0.61	0.89	1.69	0.46	< 1.00	3.23	3.70	0.52	0.5	0.64	0.75	0.52
Boron	mg/kg	0.2	7.5	8	1	1	1	< 1.0	14.00	3	2	42	9	3
Cadmium	mg/kg	0.1	0.16	0.22	< 0.10	0.11	< 0.10	0.14	< 0.10	< 0.10	<0.10	0.29	0.18	< 0.10
Chromium	mg/kg	0.15	1.63	9.85	2.25	1.27	19.7	4.97	6.30	0.35	0.25	0.77	0.83	0.31
Copper	mg/kg	0.2	3.53	17.1	3.67	12.4	11.9	11.1	14.40	0.92	0.53	2.57	2.45	1.24
Mercury	mg/kg	0.05	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.05	< 0.05	<0.05	< 0.10	< 0.10	< 0.10
Nickel	mg/kg	1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	<1.00	< 1.00	1.02	< 1.00
Lead	mg/kg	0.3	13.3	11.7	10.7	7.03	15.1	37.3	20.60	0.53	<0.30	0.85	0.45	1.32
Selenium	mg/kg	0.5	< 0.50	< 0.50	< 0.50	< 0.50	0.85	< 0.50	< 0.50	0.93	1.35	< 0.50	< 0.50	< 0.50
Zinc	mg/kg	1	15.3	32	11.2	18.8	9.86	34.9	22.60	6.65	6.46	25	25.7	8.43
2,3,4,6-tetrachlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,3,4-trichlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,3,5,6-tetrachlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,3,5-trichlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,3,6-trichlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,4,5-trichlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,4,6-trichlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,4-dichlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,4-xylenol (2,4-dimethylphenol)	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2,6-dichlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
2-chlorophenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
4-chloro-3-methylphenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.00	< 1.00	< 1.00
acenaphthene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
acenaphthylene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
anthracene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
benzo(a)anthracene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	2.23	0.10	0.1	< 1.00	< 0.50	< 0.10	< 0.50
benzo(a)pyrene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
benzo(b)fluoranthene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50

Table 1: Collated Laboratory Analysis Results ('Treated') (Cont.)

			Sample Library Number											
Substance / Analyte	**Units**	**LOD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
benzo(g,h,i)perylene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
benzo(k)fluoranthene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
chrysene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	2.8	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
chloride	mg/kg	0.1	162	136	210	204	271	272	231.00	58.2	22.4	66.1	318	60.4
dibenzo(a,h)anthracene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
fluoranthene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	1	1.1	5.3	0.93	0.93	< 1.00	< 0.50	< 0.10	< 0.50
fluorene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
indeno(1,2,3-c,d)pyrene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
naphthalene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 0.10	< 1.00	< 0.50	< 0.10	< 0.50
pentachlorophenol (PCP)	mg/kg	0.1	0.4	0.39	0.5	2.12	0.74	0.58	0.67	0.67	< 0.10	< 0.10	< 0.10	< 0.10
phenol	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	41.1	1.12	4.67
phenanthrene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	1.22	0.68	0.68	< 1.00	< 0.50	< 0.10	< 0.50
pyrene	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	5.14	0.62	0.62	< 1.00	< 0.50	< 0.10	< 0.50
dichlorodifluoromethane	ug/kg	1	S/C	S/C	S/C	S/C	S/C	S/C	< 5	< 5	< 10	< 5	< 5	< 5
chloromethane	ug/kg	1	S/C	S/C	S/C	S/C	S/C	S/C	< 5	< 5	20	< 5	< 5	< 5
vinyl chloride	ug/kg	1	S/C	S/C	S/C	S/C	S/C	S/C	< 5	< 5	< 10	< 5	< 5	< 5
bromomethane	ug/kg	1	S/C	S/C	S/C	S/C	S/C	S/C	< 5	< 5	< 10	< 5	< 5	< 5
chloroethane	ug/kg	1	S/C	S/C	S/C	S/C	S/C	S/C	< 5	< 5	< 10	< 5	< 5	< 5
trichlorofluoromethane (freon 11)	ug/kg	1	S/C	S/C	S/C	S/C	S/C	S/C	< 5	< 5	< 10	< 5	< 5	79
1,1-dichloroethene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
dichloromethane (methylene dichloride, DCM)	ug/kg	1	102	< 5	< 5	69	161	< 5	25.00	164	62	44	82	< 50.0
trans-1,2-dichloroethene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,1-dichloroethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
2,2-dichloropropane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
cis-1,2-dichloroethene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
chloroform	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
bromochloromethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,1,1-trichloroethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5

Table 1: Collated Laboratory Analysis Results ('Treated') (Cont.)

			Sample Library Number											
Substance / Analyte	**Units**	**LOD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1,1-dichloropropene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
carbon tetrachloride	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,2-dichloroethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
benzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
trichloroethene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,2-dichloropropane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
bromodichloromethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
dibromomethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
cis-1,3-dichloropropene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
toluene	ug/kg	1	40	34	40	270	52	48	96.00	140	198	95	< 5	< 5
trans-1,3-dichloropropene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,1,2-trichloroethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,3-dichloropropane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
tetrachloroethene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
dibromochloromethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,2-dibromoethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	20	< 5	< 5	< 5
chlorobenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,1,1,2-tetrachloroethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
ethyl benzene	ug/kg	1	7	12	< 5	42	29	< 5	< 5	< 5	< 10	7	< 5	< 5
m-xylene & p-xylene	ug/kg	1	9	22	< 5	62	< 5	< 5	< 5	< 5	< 10	10	< 5	< 5
o-xylene	ug/kg	1	29	24	< 5	60	< 5	< 5	< 5	< 5	< 10	8	< 5	< 5
styrene	ug/kg	1	24	43	19	42	66	13	11.00	11	< 10	67	< 5	< 5
bromoform	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
isopropylbenzene (cumene)	ug/kg	1	S/C	S/C	S/C	S/C	S/C	S/C	S/C	S/C	< 10	8	< 5	< 5
1,1,2,2-tetrachloroethane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,2,3-trichloropropane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
bromobenzene	ug/kg	1	21	9	26	15	34	31	< 5	< 5	50	< 5	< 5	< 5

Table 1: Collated Laboratory Analysis Results ('Treated') (Cont.)

			Sample Library Number											
Substance / Analyte	**Units**	**LOD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
n-propylbenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
2-chlorotoluene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
4-chlorotoluene	ug/kg	1	10	< 5	14	9	19	15	21.00	21	S/C	< 5	< 5	< 5
1,3,5-trimethylbenzene	ug/kg	1	5	< 5	6	< 5	10	7	< 5	< 5	S/C	< 5	< 5	< 5
tert-butylbenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	7.00	7	< 10	< 5	< 5	< 5
1,2,4-trimethylbenzene	ug/kg	1	13	21	13	45	30	12	20.00	20	S/C	< 5	5	< 5
p-isopropyltoluene	ug/kg	1	170	32	157	110	202	175	245.00	29	1210	164	< 5	12
1,3-dichlorobenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
sec-butylbenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,4-dichlorobenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,2-dichlorobenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
n-butylbenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,2-dibromo-3-chloropropane	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,2,4-trichlorobenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
naphthalene	ug/kg	1	39	18	32	91	87	56	57.00	57	S/C	< 5	7	< 5
hexachlorobutadiene (HCBD)	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
1,2,3-trichlorobenzene	ug/kg	1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 10	< 5	< 5	< 5
m-cresol (3-methylphenol)	mg/kg	0.1	S/C	S/C	S/C	S/C	S/C	S/C	S/C	S/C	0.5	< 1.00	< 1.00	< 1.00
o-cresol (2-methylphenol)	mg/kg	0.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.5	< 1.00	< 1.00	< 1.00
p-cresol (4-methylphenol)	mg/kg	0.1	< 1.00	< 1.00	< 1.00	< 1.00	< 0.10	< 1.00	< 1.00	< 1.00	0.5	< 1.00	< 1.00	< 1.00

Table 2: Collated Laboratory Analysis Results ('Clean')

			Sample Library Number
Substance / Analyte	**Units**	**LOD**	**13**
Arsenic	mg/kg	0.2	< 0.25
Boron	mg/kg	0.2	1
Cadmium	mg/kg	0.1	< 0.10
Chromium	mg/kg	0.15	< 0.25
Copper	mg/kg	0.2	908
Mercury	mg/kg	0.05	< 0.10
Nickel	mg/kg	1	< 1.00
Lead	mg/kg	0.3	< 0.30
Selenium	mg/kg	0.5	< 0.50
Zinc	mg/kg	1	4
2,3,4,6-tetrachlorophenol	mg/kg	0.1	< 1.00
2,3,4-trichlorophenol	mg/kg	0.1	< 1.00
2,3,5,6-tetrachlorophenol	mg/kg	0.1	< 1.00
2,3,5-trichlorophenol	mg/kg	0.1	< 1.00
2,3,6-trichlorophenol	mg/kg	0.1	< 1.00
2,4,5-trichlorophenol	mg/kg	0.1	< 1.00
2,4,6-trichlorophenol	mg/kg	0.1	< 1.00
2,4-dichlorophenol	mg/kg	0.1	< 1.00
2,4-xylenol (2,4-dimethylphenol)	mg/kg	0.1	< 1.00
2,6-dichlorophenol	mg/kg	0.1	< 1.00
2-chlorophenol	mg/kg	0.1	< 1.00
4-chloro-3-methylphenol	mg/kg	0.1	< 1.00
acenaphthene	mg/kg	0.1	< 0.50
acenaphthylene	mg/kg	0.1	< 0.50
anthracene	mg/kg	0.1	< 0.50
benzo(a)anthracene	mg/kg	0.1	< 0.50
benzo(a)pyrene	mg/kg	0.1	< 0.50
benzo(b)fluoranthene	mg/kg	0.1	< 0.50
benzo(g,h,i)perylene	mg/kg	0.1	< 0.50
benzo(k)fluoranthene	mg/kg	0.1	< 0.50
chrysene	mg/kg	0.1	< 0.50
chloride	mg/kg	0.1	30.9
dibenzo(a,h)anthracene	mg/kg	0.1	< 0.50
fluoranthene	mg/kg	0.1	< 0.50
fluorene	mg/kg	0.1	< 0.50
indeno(1,2,3-c,d)pyrene	mg/kg	0.1	< 0.50
naphthalene	mg/kg	0.1	< 0.50
pentachlorophenol (PCP)	mg/kg	0.1	< 0.10
Phenol	mg/kg	0.1	< 1.00
phenanthrene	mg/kg	0.1	< 0.50
Pyrene	mg/kg	0.1	< 0.50
dichlorodifluoromethane	ug/kg	1	< 5
chloromethane	ug/kg	1	< 5
vinyl chloride	ug/kg	1	< 5
bromomethane	ug/kg	1	< 5
chloroethane	ug/kg	1	< 5

			Sample Library Number
Substance / Analyte	**Units**	**LOD**	**13**
1,1,1-trichloroethane	ug/kg	1	< 5
1,1-dichloropropene	ug/kg	1	< 5
carbon tetrachloride	ug/kg	1	< 5
1,2-dichloroethane	ug/kg	1	< 5
benzene	ug/kg	1	< 5
trichloroethene	ug/kg	1	< 5
1,2-dichloropropane	ug/kg	1	< 5
bromodichloromethane	ug/kg	1	< 5
dibromomethane	ug/kg	1	< 5
cis-1,3-dichloropropene	ug/kg	1	< 5
toluene	ug/kg	1	< 5
trans-1,3-dichloropropene	ug/kg	1	< 5
1,1,2-trichloroethane	ug/kg	1	< 5
1,3-dichloropropane	ug/kg	1	< 5
tetrachloroethene	ug/kg	1	< 5
dibromochloromethane	ug/kg	1	< 5
1,2-dibromoethane	ug/kg	1	< 10
chlorobenzene	ug/kg	1	< 5
1,1,1,2-tetrachloroethane	ug/kg	1	< 5
ethyl benzene	ug/kg	1	< 5
m-xylene & p-xylene	ug/kg	1	< 5
o-xylene	ug/kg	1	< 5
styrene	ug/kg	1	< 5
bromoform	ug/kg	1	< 5
isopropylbenzene (cumene)	ug/kg	1	< 10
1,1,2,2-tetrachloroethane	ug/kg	1	< 5
1,2,3-trichloropropane	ug/kg	1	< 5
vinyl chloride	ug/kg	1	< 5
bromomethane	ug/kg	1	< 5
chloroethane	ug/kg	1	< 5
trichlorofluoromethane (freon 11)	ug/kg	1	23
1,1-dichloroethene	ug/kg	1	< 5
dichloromethane (methylene dichloride, DCM)	ug/kg	1	< 5
trans-1,2-dichloroethene	ug/kg	1	< 5
1,1-dichloroethane	ug/kg	1	< 5
2,2-dichloropropane	ug/kg	1	< 5
cis-1,2-dichloroethene	ug/kg	1	< 5
chloroform	ug/kg	1	< 5
bromochloromethane	ug/kg	1	< 5
bromobenzene	ug/kg	1	< 5

Table 2: Collated Laboratory Analysis Results ('Clean') (Cont.)

			Sample Library Number
Substance / Analyte	**Units**	**LOD**	**13**
n-propylbenzene	ug/kg	1	< 5
2-chlorotoluene	ug/kg	1	< 5
4-chlorotoluene	ug/kg	1	< 5
1,3,5-trimethylbenzene	ug/kg	1	< 10
tert-butylbenzene	ug/kg	1	< 5
1,2,4-trimethylbenzene	ug/kg	1	< 5
p-isopropyltoluene	ug/kg	1	21
1,3-dichlorobenzene	ug/kg	1	< 5
sec-butylbenzene	ug/kg	1	< 5
1,4-dichlorobenzene	ug/kg	1	< 5
1,2-dichlorobenzene	ug/kg	1	< 5
n-butylbenzene	ug/kg	1	< 5
1,2-dibromo-3-chloropropane	ug/kg	1	< 5
1,2,4-trichlorobenzene	ug/kg	1	< 5
naphthalene	ug/kg	1	< 5
hexachlorobutadiene (HCBD)	ug/kg	1	< 5
1,2,3-trichlorobenzene	ug/kg	1	< 5
m-cresol (3-methylphenol)	mg/kg	0.1	< 1.00
o-cresol (2-methylphenol)	mg/kg	0.1	< 1.00
p-cresol (4-methylphenol)	mg/kg	0.1	< 1.00

3.1.3. The tables list the results for all analytes and the figures in red text represent the highest result for the individual analytes, where relevant.

3.1.4. All results fell below any relevant threshold or limit that would require further investigation for a WM3 assessment, therefore, screening out and identifying that each waste sample was classified as non-hazardous.

3.1.5. It is worth noting that the copper result for clean wood waste in Table 2 for Library Sample Number 13 was the highest copper result of all samples analysed. Clarification was sought that there had been no issues with analytical methods and procedures, and none were recorded.

3.1.6. The fact the result is 53 times higher than the next highest copper result for 'treated' wood waste seems to suggest there are potentials for 'clean' wood waste to contain substances at much higher concentrations than may *normally* occur in treated wood waste. Although, this is likely to be quite rare.

3.2. Comparison to PAS111

3.2.1. The PAS111 document contains a table of suggested upper limits for chemical contamination of wood waste used in panel board manufacture, porous surface applications (excluding agriculture), and non-porous surface applications. Figure 1 below reproduces this table from the PAS111 document. The chemicals are described as 'potentially toxic elements' ("PTEs").

Figure 1: PAS111 Chemical Contamination Upper Limits

Table 1 – Chemical contamination – upper limits

Main contaminants in treated wood	Upper limit for each end use (mg/kg dry matter)		
	Panelboard manufacture [Source: WPIF & EPF Standards]	Porous surface applications (excluding agriculture) [Source: PAS 100]	Non-porous surface applications
PTEs			
Arsenic (As)	25	–	–
Cadmium (Cd)	50	1.5	1.5
Chromium (Cr)	25	100	100
Copper (Cu)	40	200	200
Fluorine (F)	100	–	–
Chlorine (Cl)	1,000	–	–
Lead (Pb)	90	200	200
Mercury (Hg)	25	1.0	1.0
Nickel (Ni)	–	50	50
Zinc (Zn)	–	400	400
Compounds			
Heavy metal compounds (e.g. CCA) and halogenated organic compounds (e.g. Lindane)	4,000 combined	Trace	Trace
Creosote (Benzoapyrene)	0.5	Trace	Trace
Pentachlorophenol (PCP)	5	–	–

3.2.2. Results from the library of analysis have been compared to the upper limits specified in Figure 1 above, where there is comparable data, and this is presented in Table 3 below. The highest result for each relevant analyte has been used for comparison, along with the average result from all treated and the clean wood waste samples to date.

Table 3: Comparison to PAS111

PTEs	Units	Panel board Manufacture	Porous Surfaces	Non-porous Surfaces	Maximum Library Results	Average Library Results
Arsenic	mg/kg	25	-	-	**3.70**	1.21
Cadmium	mg/kg	50	1.5	1.5	**0.29**	0.14
Chromium	mg/kg	25	100	100	**19.7**	4.05
Copper	mg/kg	40	200	200	**17.1** (908)*	6.82
Fluorine#	mg/kg	100	-	-	-	-
Chlorine#	mg/kg	1,000	-	-	-	-
Lead	mg/kg	90	200	200	**20.6**	9.93
Mercury	mg/kg	25	1.0	1.0	**<0.10**	0.09
Nickel	mg/kg	-	50	50	**1.02**	<1.00
Zinc	mg/kg	-	400	400	**34.9**	18.08
Compounds						
Heavy metal compounds (e.g. CCA) and halogenated organic compounds (e.g. Lindane)	mg/kg	4,000 combined	Trace	Trace	**	**
Creosote (Benzoapyrene)	mg/kg	0.5	Trace	Trace	**<LOD**	<LOD
Pentachlorophenol (PCP)	mg/kg	5	-	-	**2.12**	0.54

Notes to table:
Not analysed
*Clean wood waste result
**No samples contained CCA or halogenated organic compounds from pressure treatment

3.2.3. As observed from the results, where analytes have been assessed, both the maximum concentrations found and the average concentrations across the samples **are below** the PAS111 suggested target levels. The exception being the copper result for the clean wood waste sample.

3.2.4. The range of analysis is significantly wider than that suggested should be undertaken by PAS111, and the results confirm that all relevant substances are below the chemical contamination upper limits specified. From a chemical contamination perspective, the materials received by Platts adhere to the PAS111 quality protocol for being deemed as a product, demonstration of which was requested in NRW's letter of 17th April 2020 (NRW Reference WIR 2000440). A further request to evidence against a recognised standard such as PAS111 was made by NRW in a letter dated 1st April 2021 (NRW Reference WIRS2000440).

3.2.5. It should be noted that the material in question is not used as an animal bedding but is a conditioning agent used in very small quantities (one cup full per cubicle at a time) placed to the rear of the cubicle on the rubber matting that is the animal bedding. However, as the material received by Platts meets PAS111 standard then the material supplied on by Platts will also meet the PAS111 and should be deemed as a product.

3.2.6. There are no specific quality protocol criteria for the conditioning agent, therefore other comparisons have been undertaken, as detailed below.

3.3. Comparison to Straw

3.3.1. Table 4 details the maximum and average results for the relevant substances assessed in respect of straw and the range of analyte concentrations obtained from the EA research report. Where units of measurements differ, conversion of results has been provided.

3.3.2. The table only contains the analytes that have been assessed for WM3 purposes with comparison to the EA list within the document, which is more extensive.

Table 4: Comparison to Straw

Analytes assessed for Straw	Units	Straw Results	Maximum Library Results	Units	Avgerage Library Results
Acenaphthene	µg/kg	10.03	< LOD	mg/kg	< LOD
Acenaphthylene	µg/kg	9.0	< LOD	mg/kg	< LOD
Anthracene	µg/kg	200	< LOD	mg/kg	< LOD
Benzo(a)anthracene	µg/kg	200	2.23 (2230)	mg/kg (µg/kg)	<0.70 (<700)
Benzo(a)pyrene	µg/kg	200	< LOD	mg/kg	< LOD
Benzo(b)fluoranthene	µg/kg	200	< LOD	mg/kg	< LOD
Benzo(ghi)perylene	µg/kg	10	< LOD	mg/kg	< LOD
Benzo(k)fluoranthene	µg/kg	200	< LOD	mg/kg	< LOD
Chrysene	µg/kg	300	2.80 (2800)	mg/kg (µg/kg)	<0.84 (<840)
Dibenzo(ah)anthracene	µg/kg	30	< LOD	mg/kg	< LOD
Fluoranthene	µg/kg	200	5.30 (5300)	mg/kg (µg/kg)	1.20 (1200)
Fluorene	µg/kg	90	< LOD	mg/kg	< LOD
Indeno(1,2,3-c,d)pyrene	µg/kg	300	< LOD	mg/kg	< LOD
Naphthalene	µg/kg	90	< LOD	mg/kg	< LOD
Phenanthrene	µg/kg	200	1.22 (1220)	mg/kg (µg/kg)	<0.81 (<810)
Pyrene	µg/kg	200	5.14 (5140)	mg/kg (µg/kg)	<1.12 (<1120)
1,2,3 Trichlorobenzene	µg/kg	7	<10	µg/kg	5.40
1,2,4 Trichlorobenzene	µg/kg	7	< LOD	µg/kg	< LOD
Hexachlorobutadiene	µg/kg	8	< LOD	µg/kg	< LOD
2,3,4,6-Tetrachlorophenol	µg/kg	5000	< LOD	mg/kg	< LOD
2,4,5-Trichlorophenol	µg/kg	5000	< LOD	mg/kg	< LOD
2,4-Dichlorophenol	µg/kg	5000	< LOD	mg/kg	< LOD
4-Chloro-3-methylphenol	µg/kg	5000	< LOD	mg/kg	< LOD
4-Methylphenol (p-cresol)	µg/kg	5000	0.5 (500)	mg/kg (µg/kg)	0.05 (50)
Phenol	µg/kg	5000	41.1 (41100)	mg/kg (µg/kg)	<4.28 (<4280)
Pentachlorophenol	µg/kg	5000	2.12 (2120)	mg/kg (µg/kg)	<0.54 (<540)
1,2-Dimethylbenzene (o-Xylene)	µg/kg	11	60	µg/kg	13.8
Benzene	µg/kg	5	<10	µg/kg	<5.4
Ethylbenzene	µg/kg	5.5	42	µg/kg	11.4
Toluene	µg/kg	33	270	µg/kg	<85.25

3.3.3. The Straw Results column figures are described as target values within the EA document, as opposed to limit values. Maximum and average library results in red text are those identified as exceeding the target values. However, many of the analytes were below the LOD.

3.3.4. The target data in Table 4 would be suitable for comparison to 'clean' wood waste analysis results as it is this material that is used for animal bedding.

3.3.5. The 'treated' material is used as a cubicle conditioner and not as bedding material. Therefore, the target data is informative to the standards that could be aimed for.

3.4. Comparison to Materials Applied to Land

3.4.1. The next comparison reviews materials that are applied to land as a fertiliser which are designed to confer benefit. The document from where the data has been derived illustrates a wide variation in results for some analytes and this has been displayed in Table 5 below. Again, the maximum results from wood waste analysis have been included along with the average result for those analytes where results exist.

Table 5: Comparison to Materials Applied to Land

Analytes	Units	Highest Results	Lowest Results	Maximum Library Results	Average Library Results
Arsenic	mg/kg	18.6	8.6	3.7	1.21
Cadmium	mg/kg	30.6	5.7	0.29	0.14
Cobalt	mg/kg	9.4	0.5	-	-
Chromium	mg/kg	360.3	37.6	19.7	4.05
Copper	mg/kg	55.9	11.6	17.1 (908*)	6.82
Nickel	mg/kg	55.7	7.7	<LOD	<LOD
Lead	mg/kg	34.7	3.6	20.6	9.93
Zinc	mg/kg	637.4	51.9	34.9	18.1

Note to table: *Result for Clean wood waste sample but result not used for the library average.

3.4.2. The results for all 'treated' wood waste samples are below the highest results from the EA document, and it should be noted that many are below the lowest results. The 'clean' wood waste sample results were also below the EA document results, with the exception of the copper result which was significantly higher.

3.5. Comparison to Soil Screening Values

3.5.1. For interest purpose, and to help inform further work, a review of soil screening values ("SSV") was undertaken and comparison against the wood waste WM3 results by way of Table 6, below. It is appreciated that it is not appropriate to make direct comparison as key factors relate to the composition of any receiving soil when trying to ascertain impact potential, and these must be given due consideration. The interaction of any potential substances present with any that may be introduced also requires necessary consideration.

3.5.2. The information is limited in its use as many of the SSV's were not assessed as part of the WM3 assessments and therefore no results exist for many analytes.

Table 6: Comparison to Soil Screening Values

Analytes	Units	SSV (mg per kg DW)	Maximum Library Results	Average Library Result
Antimony	mg/kg	37	-	-
Cadmium	mg/kg	0.6	0.29	0.14
Cobalt	mg/kg	4.2	-	-
Copper	mg/kg	35.1	14.4 (908*)	6.82
Molybdenum	mg/kg	5.1	-	-
Nickel	mg/kg	28.2	<LOD	<LOD
Silver	mg/kg	0.3	-	-
Vanadium	mg/kg	2.0	-	-
Zinc	mg/kg	35.6	34.9	18.1
Benzo(a)pyrene	mg/kg	0.15	<LOD	<LOD
Bis(2-ethylhexyl) phthalate	mg/kg	13	-	-
Hexachlorobenzene	mg/kg	0.002	-	-
Pentachlorophenol	mg/kg	0.6	2.12	0.54
Perfluorooctanoic acid	mg/kg	0.022	-	-
Perfluorooctane sulfonate	mg/kg	0.014	-	-
Polychlorinated alkanes (medium chain)	mg/kg	11.9	-	-
Triclosan	mg/kg	0.13	-	-
Tris(2-chloroethyl) phosphate	mg/kg	1.1	-	-
Tris(2-chloro-1-methylethyl) phosphate	mg/kg	1.8	-	-

Note to table: *Result for clean wood waste sample but result not used for the library average

3.5.3. With the exception of the Pentachlorophenol result (and the 'clean' wood waste copper result), all other results where analytes were assessed are below the SSV provided.

3.6. Impact on Water

3.6.1. The EPR identifies a list of substances, as illustrated in Figure 2 below, that are required to be assessed in terms of contributions to background quantities based on any 12-month period.

3.6.2. Table 7 further below identifies any substances found from the wood waste analysis that are identified in the list of substances detailed in Figure 2 from the EPR.

Figure 2: EPR References to Releases into Water

Substance	*Amount greater than the background quantity (in grams) in any 12-month period*
Mercury and its compounds	200 (expressed as metal)
Cadmium and its compounds	1,000 (expressed as metal)
All isomers of hexachlorocyclohexane	20
All isomers of DDT	5
Pentachlorophenol and its compounds	350 (expressed as PCP)
Hexachlorobenzene	5
Hexachlorobutadiene	20
Aldrin	2
Dieldrin	2
Endrin	1
Polychlorinated Biphenyls	1
Dichlorvos	0.2
1, 2-Dichloroethane	2,000
All isomers of trichlorobenzene	75
Atrazine	350(*)
Simazine	350(*)
Tributyltin compounds	4 (expressed as TBT)
Triphenyltin compounds	4 (expressed as TPT)
Trifluralin	20
Fenitrothion	2
Azinphos-methyl	2
Malathion	2
Endosulfan	0.5

(*) Where both Atrazine and Simazine are released, the figure for both substances in aggregate is 350 grams.

Table 7: Comparison to EPR Water Release Substances

Substance	Quantity (g)	Quantity (mg)	Maximum Library Results	Units	Average Library Results
Mercury	200	200,000	<0.1	mg/kg	<0.09
Cadmium	1,000	1,000,000	0.29	mg/kg	0.14
Pentachlorophenol	350	350,000	2.12	mg/kg	0.54
Hexachlorobutadiene	20	20,000	<10	µg/kg	<5.42
1,2-Dichloroethane	2,000	2,000,000	<10	µg/kg	<5.42
1,2,3-Trichlorobenzene	75	75,000	<10	µg/kg	<5.42
1,2,4-Trichlorobenzene	75	75,000	<10	µg/kg	<5.42

3.6.3. Taking the worst result of pentachlorophenol in Table 7 and using an assumption that all of the pentachlorophenol substance 'leaches' from every single kilogramme of 'treated' waste wood, it would require 165,094kg of the material in a location over any 12-month period to be deemed to impact on releases to water at a quantity greater than the background quantity.

4. CRITICAL REVIEW OF REGULATION AND GUIDANCE

4.1. WM3 and List of Waste Codes

4.1.1. The WM3 Technical Guidance provides a full list of waste codes that should be used appropriately and following sufficient steps to properly classify wastes. Each waste code is accompanied by a description of the materials or substances that are relevant for each individual code.

4.1.2. The codes that are relevant for Platts activities and the waste streams that they process are:

- 02 01 07 Wastes from forestry'
- 03 01 05 Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04' and
- 17 02 01 Wood.

4.1.3. The 03 01 04 code mentioned above relates to sawdust, shavings, cuttings, wood, particle board and veneer containing hazardous substances. This code is written as 03 01 04* denoting hazardous. The only way to determine if wood waste of this composition is hazardous would be to undertake scientific analysis and use the appropriate steps and techniques described in the WM3 guidance.

4.2. EPR 2016

4.2.1. The EPR makes specific reference to wood waste in Chapter 5 of Part 2 of Schedule 1 in relation to the incineration of it as part of waste management activities. Restrictions are placed on the incineration of wood waste in a small waste incineration plant regulated as a Part B activity through excluding wood waste that *may* contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coatings. This is only for the incineration of such material. The only way to determine whether many wood wastes contain such substances would be through scientific analysis.

4.2.2. Wood waste is referenced in Section 2 of Chapter 2 in Schedule 3 of the EPR within Table 2 and 3 in respect of a U1 exemption (Use of waste in construction). The codes referenced are detailed in Table 8 below, along with the WM3 description and the description stated in the EPR 2016.

Table 8: Wood Waste Codes Referenced in U1 Exemption

Waste Code	WM3 Description	EPR Description
03 01 01 & 03 03 01	Waste bark and cork & waste bark and wood	Untreated waste bark, cork and wood only
03 01 05	Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04	Untreated wood including sawdust, shavings, and cuttings from untreated wood only
17 02 01	Wood	Untreated wood only
19 12 07	Wood other than those mentioned in 19 12 06 only	Untreated wood other than those mentioned in 19 12 06 only
20 01 38	Wood other than those mentioned in 20 01 37	Untreated wood other than those mentioned in 20 01 37

4.2.3. The 19 12 06 and 20 01 37 codes mentioned in Table 8 above refer to wood containing hazardous substances. The EPR description for 03 01 05 has removed reference to particle board and veneer.

4.2.4. The U1 has additional specific conditions related to these codes and references 'B' which states *"the waste is only used for the construction of tracks, paths, bridleways or car parks and must be processed into chipped form prior to use*". No detail is provided as to how the wood waste is determined to be untreated.

4.2.5. The next relevant references appear in U8 (Use of waste for a specified purpose) and the relevant codes detailed in Table 9 below.

Table 9: Wood Waste Codes Referenced in U8 Exemption

Waste Code	Specified Use	WM3 Description	EPR Description
03 01 05, 19 12 07	Use in equestrian exercise surfaces	Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04, wood other than those mentioned in 19 12 06	Untreated wood (including shavings, woodchip and sawdust) and oversize compost only
03 01 05, 19 12 07	Use as animal bedding	Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04, wood other than those mentioned in 19 12 06	Untreated wood (including shavings, woodchip and sawdust) and oversize compost only

4.2.6. The EPR description for 03 01 05 has removed reference to particle board and veneer and again no detail is provided as to how the wood waste is determined to be untreated.

4.2.7. Further reference is made in U9 (Use of waste to manufacture finished goods) and the relevant codes detailed in Table 10 below.

Table 10: Wood Waste Codes Referenced in U9 Exemption

Waste Code	Quantity	WM3 Description	EPR Description
03 01 05, 03 03 01, 15 01 03, 19 12 07, 20 01 38	100 tonnes	Sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04 / waste bark and wood / wooden packaging / wood other than those mentioned in 19 12 06 / wood other than those mentioned in 20 01 37	Wood, bark, cork, sawdust, shavings, cuttings, particle board

4.2.8. The U9 has additional specific conditions related to these codes and references 'B' which states "*the waste is stored indoors or in a secure container*".

4.2.9. The next relevant mention of wood waste in the EPR is in respect of a T6 exemption (Treatment of waste wood and waste plant matter by chipping, shredding, cutting, or pulverising). The codes and descriptions used for the T6 are provided below in Table 11.

Table 11: Wood Waste Codes Referenced in T6 Exemption

Waste Code	WM3 Description	EPR Description
02 01 03, 20 02 01	Plant tissue waste,	Plant tissue waste
03 01 01, 03 03 01, 17 02 01	Waste bark and cork / waste bark and wood / wood	Wood
15 01 03	Wooden packaging	Wooden packaging only

4.2.10. Specific conditions for the T6 require that the total quantity of waste treated or stored over any 7-day period does not exceed 500 tonnes, and that no waste is stored for longer than 3 months after treatment.

Discussion

4.2.11. It is considered that the subtle variations of the waste code descriptors used in the EPR are unlikely to be identified and considered by operators, or even possibly regulators. There is a likely rationale behind the specific wordings, however, there is no details or guidance known of elsewhere that would provide the means for operators to fully determine whether any particular wood waste streams they received were treated. Reliance on visual inspection would not be sufficient.

4.3. NRW Standard Rules Permit SR2010 No 13 v5.1

4.3.1. This Standard Rules ("SR") Permit relates to use of waste to manufacture timber or construction products providing a list of waste codes, repeated from the WM3 list of wastes, in Table 2.3 of the document related to waste types that can be accepted. The relevant ones are:

- 20 01 03
- 02 01 07
- 03 01 01
- 03 01 05
- 03 03 01
- 15 01 07
- 17 02 01
- 19 12 07
- 20 01 38
- 20 02 01

4.3.2. The 03 01 05 is given the full description as provided in the WM3 guidance rather than the modified versions used in U1, U8 and U9 exemptions.

4.3.3. Irrespective of whether sites operating under the SR 2010 N0 13 are within or outside of Groundwater Source Protection Zones 1 or 2, the storage and activities undertaken on the wastes listed above must be performed on hard-standing or an impermeable surface with sealed drainage system, as detailed in Table 2.4 of the document. The SR Permit does not restrict the type of timber products that can be produced.

4.4. EA Standard Rules Permit SR2015 No 24

4.4.1. This EA SR permit is effectively the same as the NRW SR2010 No 13 covering the use of waste to manufacture timber or construction products, but importantly does not contain a table of modified waste code descriptions in section 2.4 dealing with operating techniques. These are limited to the use of a Fire Prevention Plan and Groundwater Source Protection Zones.

4.4.2. This could be considered quite significant difference in regulatory controls.

4.5. NRW Standard Rules Permit SR2011 No 4 v5.1

4.5.1. This SR Permit relates to the treatment of wood waste for recovery, which only include sorting, separation, cutting, pulverising, shredding, and chipping. The same lists of waste codes are detailed in Tables 2.3 and 2.4 with the same requirements as specified for SR2010 No 13.

4.5.2. Again, there are no specific restrictions on the type of timber that can be treated (processed), other than the exclusion of hazardous waste wood. There is, however, a requirement that waste shall only be accepted if its chemical, physical, and biological characteristics make it suitable for the intended recovery process. This requirement also applies to SR2010 No 13.

4.5.3. To date, no specific regulatory provided characteristics relating to chemical, physical, or biological composition of wood waste for use as animal bedding or related products has been identified. The nearest such document is the PAS111 which is discussed previously in Section 3.2 above, and further in Section 4.11 below.

4.6. EA Standard Rules Permit SR2015 No 23

4.6.1. This EA SR Permit is effectively the same as the NRW SR2011 No 4 covering the Treatment of wood waste for recovery. Similarly, and importantly, it does not contain a table of modified waste code descriptions in Section 2.4 dealing with operating techniques. These again are limited to the use of a Fire Prevention Plan and Groundwater Source Protection Zones.

4.6.2. There is the same requirement that waste shall only be accepted if its chemical, physical, and biological characteristics make it suitable for the intended recovery process. But the acceptance relies on a visual inspection to ensure that waste material receipts conform to the acceptance criteria. However, it is not possible to identify chemical or biological characteristics through a visual assessment to determine the acceptability for any intended use.

4.7. Animal Welfare Act 2006

4.7.1. The Animal Welfare Act creates a Duty of Care to animals, therefore, anyone responsible for an animal must take reasonable steps to make sure the animals needs are met.

4.7.2. Platts are assisting farmers and others in meeting their duty of care through the provision of high-quality animal bedding, and a conditioning agent, that is used to minimise the moisture and faecal matter, which is placed at the rear of animal cubicles on the rubber bedding mat.

4.7.3. The use of only pre-consumer wood waste also assists with minimising physical contaminant material, particularly in respect of metal, glass, and plastics, and thereby providing high-quality products.

4.7.4. It seems to be generally accepted, and stated in PAS111, that 'Grade A' wood waste can contain some contaminant material as it is impossible to remove all of it. It could be argued that one nail within bedding material that results in injury to an animal is not acceptable.

4.7.5. The benefits of using the conditioning agent have been described in Section 9.5 of the Environmental Permitting Technical Requirements ("EPTR") document (ECL.088.01.01/EPTR) accompanying the Permit application. The benefits for animal health and welfare through the use of the conditioning agent are further examples of how Platts assist farmers and others in delivering their duty of care towards animals.

4.8. Bedding Materials Directory

4.8.1. This document was published by the Agricultural and Horticultural Development Board in 2018 as part of the Better Returns Programme. It provides an overview of various bedding materials and compares the attributes of them and what considerations there are in their use and application.

4.8.2. The document states that treated wood waste materials should not be used for animal bedding, and Platts do not use this type of material for bedding.

4.9. Red Tractor Assurance

4.9.1. A guidance document for the Assurance scheme members was issued in September 2014 titled 'Cattle and Sheep Bedding Materials (Dairy, Beef and Lamb)'. The document details what bedding materials are considered acceptable or can be acceptable with certain criteria. Treated wood chip is deemed unsuitable due to potential contaminants and as it may contain medium density fibreboard ("MDF") and chipboard. Wood Grades B, C and D are referenced which originate from the PAS111.

4.9.2. Untreated wood chip, clean recycled wood from pallets etc. is also referenced. This time Grade A is mentioned, and this type of wood can be suitable with a note saying ensure it is screened for metal and nails. However, as discussed previously, Grade A can contain some contamination according to PAS111. Additionally, pallets can become contaminated if materials / chemicals are spilled on them. This may not be visible contamination, and after chipping, highly unlikely to be visible.

4.9.3. These are references to animal bedding and not the conditioning agent product that Platts supply.

4.10. Alternative Bedding Materials

4.10.1. This document was issued in 2019 by the Farm Advisory Service in Scotland and is the most recent of the documents reviewed. It discusses and compares alternative bedding material to straw and highlights some specific requirements.

4.10.2. Woodchips are mentioned stating they must be from untreated wood and free from contaminants. No definition is provided for contaminants. As trees are natural and grow on land, they have the ability to 'absorb' contaminant material depending on what may be present on the land on which they grow. Therefore, although wood may not have been treated through physical processes and will consequently be classed as untreated, there is the potential for contaminants to still be present. Scientific analysis would be required to determine this.

4.10.3. Woodfines from untreated wood and free from contaminants is then referenced with a description that woodfines come from recycled wood that would have been sent to landfill and consists of finely chopped MDF, offcuts and pallets, etc. which go through an intensive cleaning process using magnets. The use of magnets appears to be the only cleaning process mentioned with more 'intense' cleaning providing a Grade 1 status. This would be a 'type' equivalent to Grade A in PAS111. The description recognises that the

material will not be 100% contaminant free.

4.10.4. This document would appear to accept the use of finely chopped MDF whereas the Red Tractor Assurance excludes the use of MDF.

4.11. PAS111:2012

4.11.1. This Publicly Available Specification document PAS111:2012 (BSI 2012) was developed between Waste & Resources Action Programme, British Standards Institution, trade associations, regulators and other interested parties to establish a framework of guidance and protocols for achieving recycling of wood waste for various purposes. There are a range of proposed measures for implementing recycling mechanisms throughout the document, however, there are a significant number of foot notes, in text notes, and caveats referring the reader to regulatory aspects that must be given consideration for all uses, or potential uses, of wood waste.

4.11.2. The document accepts that it is almost impossible to remove all contamination from wood waste and suggests that samples could be sent to third parties for analysis in order to determine levels of contamination to check suitability for the end use. Platts have developed a sampling regime detailed in Section 4 of the EPTR document (ECL.088.01.01/EPTR) to ensure that the material they accept does not contain substances at concentrations that may cause harm to animals, human health, or the environment and then sent out in the products they supply.

Discussion

4.11.3. As illustrated above, there is inconsistency in the various guidance documents provided by a range of organisations and their interpretation of what is, and is not, acceptable in terms of animal bedding. The term 'treated wood waste' is used frequently, without qualifying or accurately describing what 'treated' actually means. There appears to be an assumption in both regulatory terms and guidance perspectives that any 'treated' wood waste must be harmful in some way. There is also an assumption that visual inspection of wood waste is sufficient to determine whether it is suitable for certain end uses, which is extremely misleading.

4.11.4. Perhaps the most pertinent aspect is that all of the documents reviewed so far make an assumption that animal bedding only consists of natural products. No where has there been a mention of rubber matting being used as the bedding material. The cubicle conditioning product supplied by Platts is only used on top of a bedding mat and is never supplied as the bedding material.

5. SUMMARY

5.1. Potential Environmental Impacts

5.1.1. This review has looked at a wide range of data sources covering various environmental mediums to gain an overview of how the data obtained from WM3 assessment analysis of various wood waste streams may be compared to available data sources.

5.1.2. It is recognised that there are gaps in the analysis of substances and some substances have not been given consideration to data. It is also acknowledged that the data sources are lacking in comprehensive data sets and robust scientifically proven outcomes. However, where data has been obtained and comparisons made (even where comparison is not completely appropriate) the wood waste sample results are, in the majority, below many levels / targets / limits / detailed in the data source documents.

5.1.3. Substantially more data is required to provide greater confidence in results, and the variability of results, across the wood waste streams to help inform judgements about end uses of wood waste. The type of analysis may require expanding to provide appropriate consideration for ultimate disposal and to provide further consideration against data sources.

5.1.4. It is considered that more sampling and analysis of 'clean' wood waste is required to provide confidence that the end uses are appropriate for such material. It is known that pressures on timber supply globally is resulting in illegal logging activities with sources not coming from Forestry Steward Council ("FSC") approved forests.

5.1.5. Platts are proposing to routinely sample all waste streams and pre-assess any new streams. This will improve the audit trail and traceability of the materials. The data library will continually grow and more accurate data on substances will be generated. This will provide opportunities to tackle certain substances through the supply chain potentially eliminating those that pose higher risk.

5.1.6. More detailed data on wood waste composition and substance concentrations will provide a mechanism for identifying what supplies are appropriate and which are not, thereby improving the standards of material for processing and passing on as products for use.

5.2. Regulatory Controls

5.2.1. There are various exemptions, standard rules Permit, and bespoke Permits being used to regulate those involved in the wood waste sector, and to a great extent, basically undertaking similar types of activities to produce similar 'products'. The majority of those involved seem to be receiving post-consumer wood waste along with pre-consumer wood waste and using both within their activities.

5.2.2. Platts do not, and will not, accept post-consumer wood waste. They will only use 'clean' wood waste for their animal bedding products, and pre-consumer 'treated' wood waste for the conditioning agent product.

5.2.3. Whilst every load will be visually inspected, pre-acceptance checks will be performed and a requirement to see a WM3 assessment on existing and any new wastes streams prior to acceptance. Sampling and analysis on waste streams will also be undertaken routinely to ensure that material is fit for use as intended. This is considered to go beyond what many, if any, others in the sector are currently doing.

5.2.4. The various guidance documents relating to animal bedding seem contradictory and suggesting different standards, as do the standard rules Permits. There are a range of limits, thresholds and targets for various considerations in respect of environmental impacts. Some of these are not directly comparable to results obtained so far from substance analysis. Continued sampling will generate a larger data set to inform whether specific levels for certain substances should be set to ensure minimum risk of introducing inappropriate materials for use either as animal bedding or the conditioning agent product.