

13th February 2025

Mrs Sylvia Whittingham/Mr Lee Beveridge
Planning Advisor/Technical Specialist
Environment Agency



CC: Sally Shaw at Bury Council

Dear Sylvia/Lee

PFAS TESTING IN CONCRETE AT FORMER MONDI/HOLCOMBE MILL, BRIDGE STREET, RAMSBOTTOM, BURY, BL0 0BS

Please note that since the submission of the original report, the EA have since provided Betts Geo with the information requested under the FOI Act and this has made no changes to the below risk assessment.

Following our teams meeting on the 11th February 2025, it was verbally requested by the EA that additional PFAS testing is undertaken on the concrete in the main site area at the former Mondri/Holcombe Mill site in Ramsbottom, Bury before the site can be conditioned accordingly.

It was also discussed that the main site area can be treated separately to the former landfill area to the south of site, as this has been deemed a higher risk area, and conditions phased as such.

Initial EA Comments – 9th October 2024.

Betts Geo received the following comments from the EA in relation to concrete testing in their response SO/2024/124364/01-L01:

“The hardstanding which is also present will need assessment as we are aware that PFAS can contaminate floor materials such as concrete leading to them also being adversely affected.”

These EA comments were issued before the CIRIA guidance on PFAS was published in November 2024 and as such Betts Geo did not have any guidance to work from.

Betts Geo responded to the EA with the below on the 13th November 2024 after an extensive review of the newly published CIRIA guidance:

“Since the submission of the Betts Geo SI & Rem Strat report for the site, CIRIA have released new guidance on PFAS in soils and the water environment (CIRIA C819 – London 2024). This guidance states that *“a detailed understanding of the processes that operated on a site or that generated wastes suspected of containing PFAS is essential in ensuring an analytical strategy that is focused on relevant PFAS and that can help identify the need or otherwise for remediation. A detailed understanding of how PFAS may have been used on a site is important in developing the CSM and in formulating a reasonable sampling and analytical strategy.*

Establishing the history of land use including the details of any industrial processes on a site is an essential prerequisite of developing a conceptual site model. An understanding of how PFAS have been used and what specific activities were carried out on site can help inform the CSM and shape the sampling and analytical strategies.”

To enhance the conceptual site model and lines of evidence, Betts Geo researched the sites history more extensively and identified that the mill’s function was to produce paper;



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casings and wrappings from old bagging, jute and manila ropes, and quality paper from woodpulp, straw and rags. There was no known use of PFAS on site other than the potential recycling of paper in its later life. There was also no evidence of any recycling of PFAS containing greaseproof/retardant paper (but might be a possibility all be it very small). Betts Geo concluded that at least 80% of the site is therefore unlikely to be at any risk from PFAS at all (main site area).

Further guidance by the EA & WRC (An Investigation of PFAS Emissions from UK Paper Mills – Report ref: UC16743.3 – 20th June 2023) states that *“paper mills are a discharge point of a small amount of PFOS, PFOA and PFHxS. Based on the dataset, the PFOS, PFOA and PFHxS originate in the input water rather than the recycled paper waste stream and may be concentrated into effluent and crumb during the process.”* This suggests a lesser risk profile again.

It is important to note that PFAS went into large scale production during the 1930's followed by commercial use in bulk quantities. Legacy foams were mainly manufactured from the 1960's & 1970's onwards. The real risk from PFAS therefore originates from process on site that occurred circa 1960's or later. Any filter beds made redundant on site prior to this date are deemed low risk.

The remaining 20% of site (former landfill area) may be a possible source of PFAS if significant recent paper waste is identified.” Recent investigation identified positive occurrences of PFAS in one borehole in this location (both soils and waters – WS302). In agreement with the EA & the CLO, the landfill area is deemed to be a higher risk and is to be treated separately to the main site area.

Full details on Betts Geo's response can be seen in letter report ref: 19ECH016/MJF/JS/EAResponse1 dated 13th November 2024.

The CIRIA guidance also states the following in relation to PFAS in concrete: ‘there is also evidence that the surface of concrete can represent a long-term source of amphiphilic PFAS, which slowly releases during precipitation events (Baduel et al 2015, Thai et al, 2022)’. If this was the case for the concrete on site, we would anticipate that PFAS would have been picked up in the groundwater monitoring wells/surface water course during the testing undertaken to date – which it hasn't been. As such we therefore suggest the risk is lessened on this fact.

Betts Geo received no further response to these comments until the teams meeting held on the 11th February 2025 where further concerns were raised.

Teams Meeting with EA – 11th February 2025

In a teams meeting held between Betts Geo, Eccleston Homes, Urban Regen, Bury Council and the EA on the 11th February 2025, the EA stated that further PFAS testing was required in the concrete areas across the main site area and referred Betts Geo to sections 6.5, 6.6 & 6.7 of the CIRIA guidance for industry standards of how to undertake such testing.

The sections of the guidance referred to above (6.5, 6.6 & 6.7) relate to concrete testing, however generally refers to fire fighting training areas (high risk sites) and not lower risk paper mill sites and therefore may not be fully applicable to this site. The guidance also states the following:

“PFAS leach from concrete over time, acting as a long term secondary source of contamination via site run off.”

The guidance is very vague without any detailed methodology.

Betts Geo would like to highlight that if run off was a concern across the main site area, then elevated PFAS would have been identified in the groundwater/surface water testing already undertaken. The main production areas of the former paper mill have been exposed to the elements for 10 - 15 years

due to the demolition of the main site buildings circa 2010 – 2014. As such reducing the risk potential further.

It is also important to note that no definitive numeric values are given within this guidance to categorically assess the risk of PFAS in concrete.

The EA referred Betts Geo to Australian EPA Guidance – Betts Geo believe that non UK Guidance is not deemed relevant nor can it be legally relied upon within the UK. As such we will not reference nor utilise these none UK guidance.

Proposed Additional PFAS Testing of Concrete in Possible PFAS Risk Areas

At the request of the EA, Betts Geo have extensively reviewed all the former building areas of site do further risk asses the site (information taken from ‘A Historic Environment Desk-Based and Buildings Assessment of the Former Mondi Site, Holcombe Mill, Bridge Street, Ramsbottom dated 1983’ – available online at

<https://pad-planning.bury.gov.uk/AnitelM.WebSearch/Document/ViewDocument?id=2FB54D5EE22611EAB97F8ECA3252CC4D>)

According to existing guidance, all be it very scarce, we propose to test the top layers (200mm – 300mm) of concrete in areas deemed to be the most likely to have had any contact with PFAS based on lines of evidence provided below.

As agreed with yourselves, It is generally accepted that if the increased risk / probability areas do not have any significantly elevated occurrences of PFAS (although no guidance exists to define what counts as significantly elevated) then the rest of the site can be deemed as low risk.

As previously mentioned in this letter report, the potential risk from PFAS originates from process on site that occurred circa 1960's or later. This has been taken into account then determining the possible PFAS risk areas at this site.

Note: Following discussions with the labs re PFAS testing in concrete, it was confirmed that the testing results obtained would not be accredited.

Lines of Evidence - Possible PFAS Risk Areas in Concrete at Paper Mills

1. Production and Processing Areas

Source: PFAS-treated coatings and additives used in paper manufacturing.

Risk: Spills, splashes, and residue from PFAS-containing chemicals can soak into concrete floors and equipment bases. Note: no records of using PFAS containing materials on site have been obtained other than potential recycling processes.

2. Wastewater Treatment Systems

Source: Effluent from paper production contains PFAS from processing chemicals, leading to contamination of concrete tanks, pipes, and basins.

Risk: PFAS accumulate over time, making it difficult to remove from concrete infrastructure.

3. Chemical Storage and Mixing Areas

Source: Storage of fluorinated coatings, wetting agents, and other PFAS-based chemicals used in paper processing.

Risk: Leaks and spills allow PFAS to penetrate concrete flooring, creating persistent contamination.

It is proposed to take 2 PFAS tests per red area so eight (8 No) in total.

Zoning is suggested for the testing areas, with materials quarantined in separate areas of site until the test results are available.

Conclusion

The recently published CIRIA guidance puts an emphasis on the conceptual site model and a detailed understanding of how PFAS may have been used on a site is important in developing the CSM and in formulating a reasonable sampling and analytical strategy.

Included in Betts Geo's response to the EA in November 2024, Betts Geo presented a number of lines of evidence that concluded that the risk of PFAS across the main site area was unlikely and deemed that no further PFAS sampling was required as a result.

The EA did not provide any further comments to this response until February 2025 in a teams meeting, where concerns were raised in regards to PFAS in concrete. The original EA letter asked us to consider concrete but this was prior to release of the Ciria document and as such we believe we were being asked to undertake something which was not in the public domain as guidance.

The EA has directed Betts Geo back to the CIRIA guidance which highlighted the main risk of PFAS in concrete to come from fire fighting training zones with no mention of paper mills.

The CIRIA guidance also states there is a risk of run off from concrete – but no PFAS has been encountered in groundwater/surface water testing to date (in the main site area) and the main production areas of the former paper mill have been left exposed to the elements for 10 - 15 years due to the demolition of the main site buildings circa 2010 – 2014.

Regardless, at the request of the EA, Betts Geo proposed to undertake a number of PFAS samples of the concrete in the possible PFAS risk areas (targeted by the CSM) at 4 locations on the main site area to appease the EA's concerns.

It is generally accepted that if the higher probability areas do not have any significantly elevated occurrences of PFAS (although hard to define what counts as significantly elevated) then the rest of the site can be deemed as low risk.

To forward development and remediation, we propose that the site can be zoned accordingly, lifted concrete from these areas segregated until their status can be determined subject to concrete testing results, Allowing the proposed site turnover to be undertaken whilst this exercise is undertaken and MMP to be implemented.

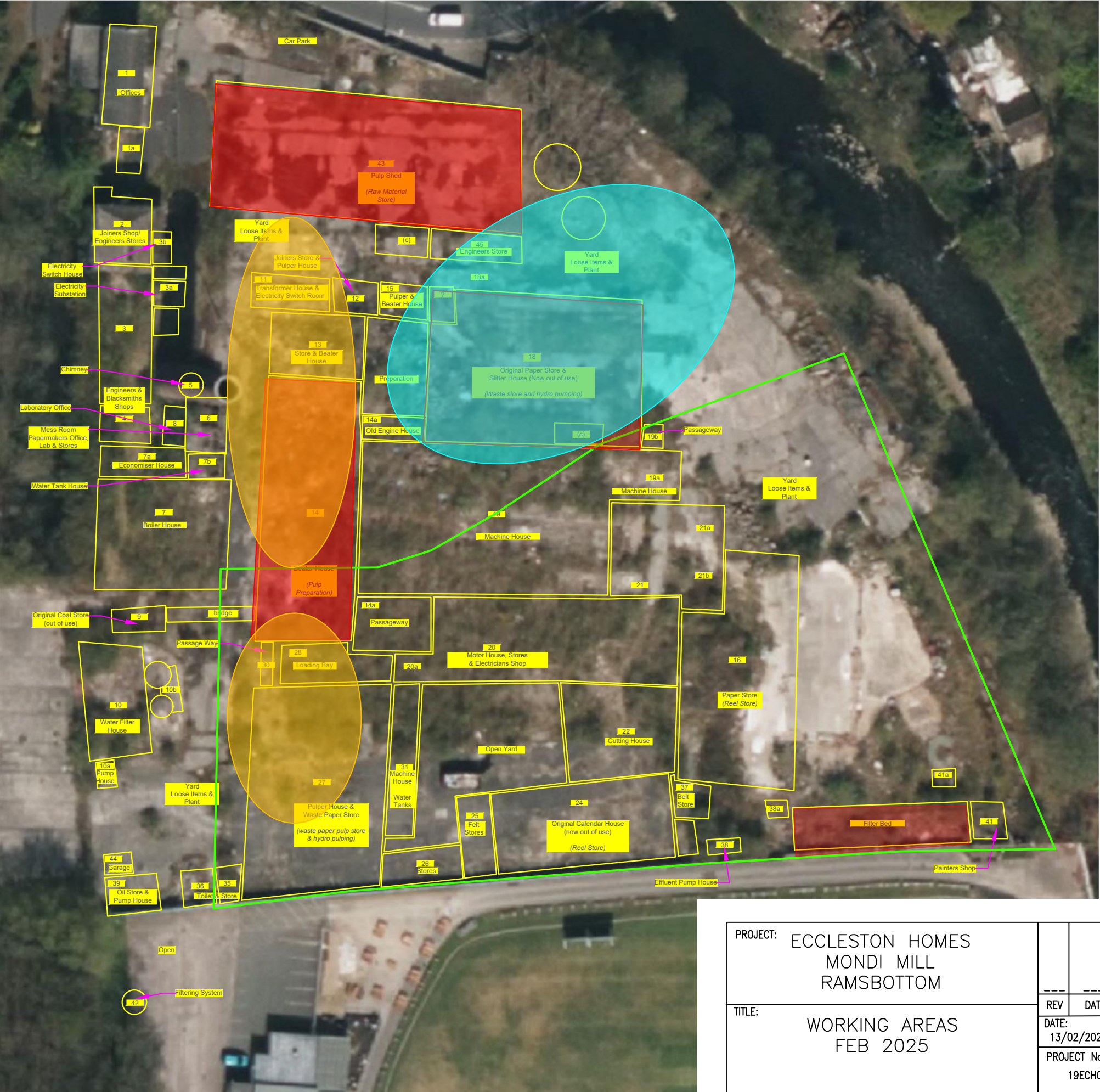
The discussions for the landfill remediation are to continue separate to the main site area.

I trust you will find the above of assistance.

Yours sincerely

Jenny Skues
Senior Geo-Environmental Engineer
BETTS GEO ENVIRONMENTAL

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APPENDIX 1: HOLCOMBE PAPER MILL INVENTORY & VALUATION 1965-84

INDEX OF BUILDINGS DEPICTED ON 1983 PAPER MILL PLAN

No. on Plan	Description	No. on Plan	Description	No. on Plan	Description
1	Offices	14	Beater House	30	Passageway
2	Joiners' Shop & Engineers' Stores	14A	Old Engine House	31	Water Tanks
3 & 4	Engineers' & Blacksmiths' Shops	14B & 18pt.A	Passageway	32	Submerged Pump
3A	Electricity Substation	15	Pulper & Beater House	33	Water Pump
3B	Electricity Switch House	16	Paper Store	34	Store
5	Chimney	17	Cardboard Tube Store	35 & 36	Toilets & Store
6 & 6B	Mess Room, Papermaker's Office, Laboratory & Stores	18	Original Paper Store & Slitter House (now out of use)	37	Belt Store
7	Boiler House	19B	Passageway	38	Effluent Pump House
7A	Economiser House	19, 19A & 31	Machine House	39	Oil Store & Pump House
7B	Water Tank House	20	Motor House, Stores & Electricians' Shop	40	Open Shelter
8	Laboratory Office	22	Cutting House	41	Painters' Shop
9	Original Coal Store (now out of use)	23	Passageway	42	Filtering System
10	Water Filter House	24	Original Calendar House (now out of use)	43	Pulp Shed
10A	Pump House	25	Felt Stores	44	Garage
11	Transformer House & electricity Switch Room	26	Stores	45	Engineers' Store
12	Joiners' Store & Pulper House	27	Pulper House & Waste Paper Store	46	Railway Weighbridge House
13	Store & Beater House	28	Loading Bay	-	Loose Items and Plant in Yards
13A	Dump Chests	29	Electrical Lift		

Legend	
	Denotes Current Working Area Provided by Urban Regen 12/02/25
	Denotes Made Ground / Brick Rubble Stockpiles Data Provided by Urban Regen 12/02/25
	Denotes Existing Concrete Stockpile Data Provided by Urban Regen 12/02/25
	Possible PFAS risk area based on site history

PROJECT: ECCLESTON HOMES MONDI MILL RAMSBOTTOM	REV	DATE	BY	DESCRIPTION	CHK	DRAWING STATUS: DRAFT
TITLE: WORKING AREAS FEB 2025	DATE: 13/02/2025	SCALE: 1:100	SIZE: NTS	DRAWN: AG	CHECKED: JS	 Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk
	PROJECT No: 19ECH016	DRAWING No: WORKINGAREA001	REV: -			



APPENDIX 1: ECCLESTON HOMES MONDRI MILL INVENTORY & VALUATION 1992-94

INDEX OF BUILDINGS DEPICTED ON 1983 PAPER MILL PLAN

No. on Plan	Description	No. on Plan	Description	No. on Plan	Description
1	Offices	14	Beater House	30	Passageway
2	Joiners' Shop & Engineers' Stores	14A	Old Engine House	31	Water Tanks
3 & 4	Engineers' & Blacksmiths' Shops	14B & 18pt.A	Passageway	32	Submerged Pump
3A	Electricity Substation	15	Pulper & Beater House	33	Water Pump
3B	Electricity Switch House	16	Paper Store	34	Store
5	Chimney	17	Cardboard Tube Store	35 & 36	Toilets & Store
6 & 6B	Mess Room, Papermaker's Office, Laboratory & Stores	18	Original Paper Store & Slitter House (now out of use)	37	Belt Store
7	Boiler House	19B	Passageway	38	Effluent Pump House
7A	Economiser House	19, 19A & 31	Machine House	39	Oil Store & Pump House
7B	Water Tank House	20	Motor House, Stores & Electricians' Shop	40	Open Shelter
8	Laboratory Office	22	Cutting House	41	Painters' Shop
9	Original Coal Store (now out of use)	23	Passageway	42	Filtering System
10	Water Filter House	24	Original Calendar House (now out of use)	43	Pulp Shed
10A	Pump House	25	Felt Stores	44	Garage
11	Transformer House & electricity Switch Room	26	Stores	45	Engineers' Store
12	Joiners' Store & Pulper House	27	Pulper House & Waste Paper Store	46	Railway Weighbridge House
13	Store & Beater House	28	Loading Bay	-	Loose Items and Plant in Yards
13A	Dump Chests	29	Electrical Lift		

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REV	DATE	BY	DESCRIPTION	CHK
DRAWING STATUS: DRAFT				
 Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk				
PROJECT: ECCLESTON HOMES MONDI MILL RAMSBOTTOM				
TITLE: BUILDING USE LAYOUT AND LEGEND				
DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:	
12/02/25	NTS	AJG	BL	
PROJECT No:	DRAWING No:	REV:		
19ECH016	BUILDINGUSE001	-		