

Your ref: Hexham LTTSF- RtS Plan
Our ref: 12564230

04 July 2022

Harry Egan
Aurizon Operations Limited
121 Woodstock Street
Mayfield NSW 2304

By email: Harry.Egan@aurizon.com.au

Hexham LTTSF – Assistance for response to submission

Dear Harry

1. Introduction

1.1 Background

GHD Pty Ltd (GHD) prepared a Soil and Water Assessment report on behalf of Aurizon for the development of a depot, warehouse and wagon storage (the Modification Proposal) to support the ongoing operations of the Hexham Long Term Train Support Facility (Hexham LTTSF Project), Hexham (the Hexham LTTSF Site). The Modification Proposal is being undertaken as a modification (under Part 5, Section 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act)) to the Hexham LTTSF Approval (MP07_0171).

The Department of Planning and Environment received a submission from City of Newcastle (CN) in response to a request to CN to provide advice of the Modification Proposal. Aurizon requested that GHD assist in preparing a response to the submission.

1.2 Purpose

The purpose of this letter is to provide a response to specific questions from Aurizon to assist Aurizon in preparing a response to submissions.

1.3 Limitations

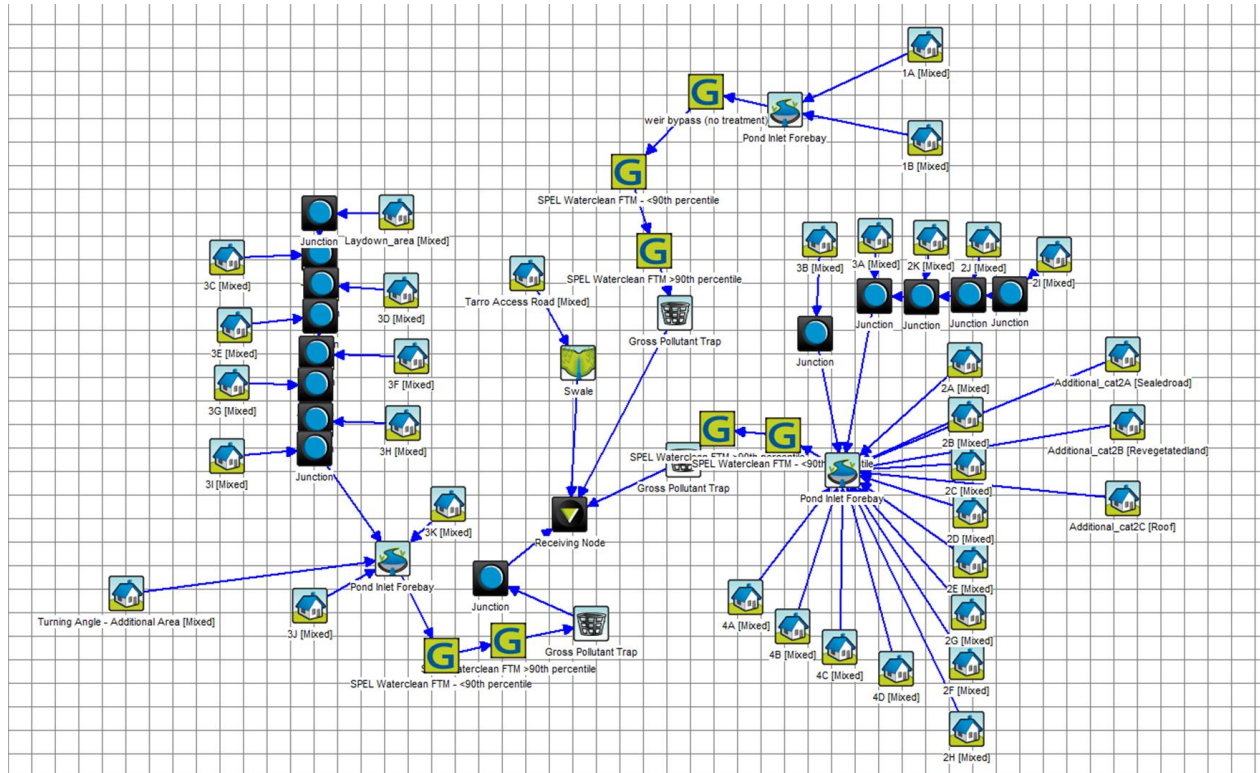
This letter is subject the limitations set out in the Soil and Water Assessment report.

2. Specific responses

MUSIC link report along with a summary of the model and node diagram or similar (for water quality assessment) to be provided.

The model is summarised in Section 4.3.2.1 of the report.

A node diagram is included below. A MUSIC link report is provided in Attachment A.



T.G. Tinkler

Tyler Tinkler
Water Engineer

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Attachment A – MUSIC link report

Attachment 1

MUSIC link report

MUSIC-link Report

Project Details		Company Details	
Project:	Soil and Water Assessment Operational Depot and Long-Term Wagon Storage, Hexham Train Support Facility	Company:	GHD
Report Export Date:	1/07/2022	Contact:	Tyler Tinkler
Catchment Name:	2019-01-30_TOTAL SITE_REV_E_Williamtown_proposed_basin2_JMM	Address:	Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300
Catchment Area:	28.842ha	Phone:	+61 2 4979 9061
Impervious Area*:	93.47%	Email:	tyler.tinkler@ghd.com
Rainfall Station:	61078 WILLIAMTOWN		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1995 - 31/12/2008 11:54:00 PM		
Mean Annual Rainfall:	1125mm		
Evapotranspiration:	1735mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	Newcastle		
Scenario:	Newcastle		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: Receiving Node	Reduction	Node Type	Number	Node Type	Number
Flow	7.87%	Pond Node	3	Urban Source Node	34
TSS	82%	Swale Node	1		
TP	74.3%	GPT Node	3		
TN	68.6%	Generic Node	7		
GP	99.4%				

Comments

Soil and Water Assessment report has been prepared for the development of a depot, warehouse and wagon storage (the Modification Proposal) to support the ongoing operations of the Hexham Long Term Train Support Facility (Hexham LTTSF Project), Hexham (the Hexham LTTSF Site). The Modification Proposal is to be undertaken as a modification (under Part 5, Section 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act)) to the Hexham LTTSF Approval (MP07_0171). A MUSIC model was previously prepared for the detailed design of the LTTSF Project Site and updated for MOD1 assessment. This model was further updated to reflect the proposed changes in catchments due to the Modification Proposal.

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	Gross Pollutant Trap	Hi-flow bypass rate (cum/sec)	None	None	0.5
GPT	Gross Pollutant Trap	Hi-flow bypass rate (cum/sec)	None	None	0.5
GPT	Gross Pollutant Trap	Hi-flow bypass rate (cum/sec)	None	None	0.5
Pond	Pond Inlet Forebay	% Reuse Demand Met	None	None	0
Pond	Pond Inlet Forebay	% Reuse Demand Met	None	None	0
Pond	Pond Inlet Forebay	% Reuse Demand Met	None	None	0
Receiving	Receiving Node	% Load Reduction	None	None	7.87
Receiving	Receiving Node	GP % Load Reduction	90	None	99.4
Receiving	Receiving Node	TN % Load Reduction	45	None	68.6
Receiving	Receiving Node	TP % Load Reduction	65	None	74.3
Urban	1A	Area Impervious (ha)	None	None	0.867
Urban	1A	Area Pervious (ha)	None	None	0
Urban	1A	Total Area (ha)	None	None	0.867
Urban	1B	Area Impervious (ha)	None	None	0.396
Urban	1B	Area Pervious (ha)	None	None	0
Urban	1B	Total Area (ha)	None	None	0.396
Urban	2A	Area Impervious (ha)	None	None	0.563
Urban	2A	Area Pervious (ha)	None	None	0
Urban	2A	Total Area (ha)	None	None	0.563
Urban	2B	Area Impervious (ha)	None	None	0.753
Urban	2B	Area Pervious (ha)	None	None	0
Urban	2B	Total Area (ha)	None	None	0.753
Urban	2C	Area Impervious (ha)	None	None	1.084
Urban	2C	Area Pervious (ha)	None	None	0
Urban	2C	Total Area (ha)	None	None	1.084
Urban	2D	Area Impervious (ha)	None	None	1.511
Urban	2D	Area Pervious (ha)	None	None	0
Urban	2D	Total Area (ha)	None	None	1.511
Urban	2E	Area Impervious (ha)	None	None	1.168
Urban	2E	Area Pervious (ha)	None	None	0
Urban	2E	Total Area (ha)	None	None	1.168
Urban	2F	Area Impervious (ha)	None	None	1.474
Urban	2F	Area Pervious (ha)	None	None	0
Urban	2F	Total Area (ha)	None	None	1.474
Urban	2G	Area Impervious (ha)	None	None	1.511
Urban	2G	Area Pervious (ha)	None	None	0
Urban	2G	Total Area (ha)	None	None	1.511
Urban	2H	Area Impervious (ha)	None	None	1.255
Urban	2H	Area Pervious (ha)	None	None	0
Urban	2H	Total Area (ha)	None	None	1.255

Only certain parameters are reported when they pass validation

NOTE: A successful self-validation check of your model does not constitute an approved model by The City of Newcastle
MUSIC-*link* now in MUSIC by eWater – leading software for modelling stormwater solutions

Node Type	Node Name	Parameter	Min	Max	Actual
Urban	2I	Area Impervious (ha)	None	None	1.095
Urban	2I	Area Pervious (ha)	None	None	0
Urban	2I	Total Area (ha)	None	None	1.095
Urban	2J	Area Impervious (ha)	None	None	0.782
Urban	2J	Area Pervious (ha)	None	None	0
Urban	2J	Total Area (ha)	None	None	0.782
Urban	2K	Area Impervious (ha)	None	None	0.759
Urban	2K	Area Pervious (ha)	None	None	0
Urban	2K	Total Area (ha)	None	None	0.759
Urban	3A	Area Impervious (ha)	None	None	0.794
Urban	3A	Area Pervious (ha)	None	None	0
Urban	3A	Total Area (ha)	None	None	0.794
Urban	3B	Area Impervious (ha)	None	None	1.287
Urban	3B	Area Pervious (ha)	None	None	0
Urban	3B	Total Area (ha)	None	None	1.287
Urban	3C	Area Impervious (ha)	None	None	1.546
Urban	3C	Area Pervious (ha)	None	None	0
Urban	3C	Total Area (ha)	None	None	1.546
Urban	3D	Area Impervious (ha)	None	None	1.073
Urban	3D	Area Pervious (ha)	None	None	0
Urban	3D	Total Area (ha)	None	None	1.073
Urban	3E	Area Impervious (ha)	None	None	0.947
Urban	3E	Area Pervious (ha)	None	None	0
Urban	3E	Total Area (ha)	None	None	0.947
Urban	3F	Area Impervious (ha)	None	None	0.852
Urban	3F	Area Pervious (ha)	None	None	0
Urban	3F	Total Area (ha)	None	None	0.852
Urban	3G	Area Impervious (ha)	None	None	0.697
Urban	3G	Area Pervious (ha)	None	None	0
Urban	3G	Total Area (ha)	None	None	0.697
Urban	3H	Area Impervious (ha)	None	None	0.711
Urban	3H	Area Pervious (ha)	None	None	0
Urban	3H	Total Area (ha)	None	None	0.711
Urban	3I	Area Impervious (ha)	None	None	0.747
Urban	3I	Area Pervious (ha)	None	None	0
Urban	3I	Total Area (ha)	None	None	0.747
Urban	3J	Area Impervious (ha)	None	None	0.449
Urban	3J	Area Pervious (ha)	None	None	0
Urban	3J	Total Area (ha)	None	None	0.449
Urban	3K	Area Impervious (ha)	None	None	0.432

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Node Type	Node Name	Parameter	Min	Max	Actual
Urban	3K	Area Pervious (ha)	None	None	0
Urban	3K	Total Area (ha)	None	None	0.432
Urban	4A	Area Impervious (ha)	None	None	0
Urban	4A	Area Pervious (ha)	None	None	0.546
Urban	4A	Total Area (ha)	None	None	0.546
Urban	4B	Area Impervious (ha)	None	None	0
Urban	4B	Area Pervious (ha)	None	None	0.376
Urban	4B	Total Area (ha)	None	None	0.376
Urban	4C	Area Impervious (ha)	None	None	0
Urban	4C	Area Pervious (ha)	None	None	0.466
Urban	4C	Total Area (ha)	None	None	0.466
Urban	4D	Area Impervious (ha)	None	None	0
Urban	4D	Area Pervious (ha)	None	None	0.401
Urban	4D	Total Area (ha)	None	None	0.401
Urban	Additional_cat2A	Area Impervious (ha)	None	None	0.422
Urban	Additional_cat2A	Area Pervious (ha)	None	None	0
Urban	Additional_cat2A	Total Area (ha)	None	None	0.422
Urban	Additional_cat2B	Area Impervious (ha)	None	None	0.264
Urban	Additional_cat2B	Area Pervious (ha)	None	None	0
Urban	Additional_cat2B	Total Area (ha)	None	None	0.264
Urban	Additional_cat2C	Area Impervious (ha)	None	None	0.203
Urban	Additional_cat2C	Area Pervious (ha)	None	None	0
Urban	Additional_cat2C	Total Area (ha)	None	None	0.203
Urban	Laydown_area	Area Impervious (ha)	None	None	0.545
Urban	Laydown_area	Area Pervious (ha)	None	None	0
Urban	Laydown_area	Total Area (ha)	None	None	0.545
Urban	Tarro Access Road	Area Impervious (ha)	None	None	0.373
Urban	Tarro Access Road	Area Pervious (ha)	None	None	0.092
Urban	Tarro Access Road	Total Area (ha)	None	None	0.466
Urban	Turning Angle - Additional Area	Area Impervious (ha)	None	None	2.4
Urban	Turning Angle - Additional Area	Area Pervious (ha)	None	None	0
Urban	Turning Angle - Additional Area	Total Area (ha)	None	None	2.4

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Failing Parameters					
Node Type	Node Name	Parameter	Min	Max	Actual
Pond	Pond Inlet Forebay	Evaporative Loss as % of PET	75	75	100
Pond	Pond Inlet Forebay	Evaporative Loss as % of PET	75	75	100
Pond	Pond Inlet Forebay	Evaporative Loss as % of PET	75	75	100
Pond	Pond Inlet Forebay	Extended detention depth (m)	0.25	1	0.2
Receiving	Receiving Node	TSS % Load Reduction	85	None	82
Swale	Swale	Bed slope	0.01	0.04	0.0025
Urban	1A	Field Capacity (mm)	40	70	80
Urban	1A	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	1A	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	1B	Field Capacity (mm)	40	70	80
Urban	1B	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	1B	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2A	Field Capacity (mm)	40	70	80
Urban	2A	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2A	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2B	Field Capacity (mm)	40	70	80
Urban	2B	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2B	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2C	Field Capacity (mm)	40	70	80
Urban	2C	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2C	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2D	Field Capacity (mm)	40	70	80
Urban	2D	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2D	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2E	Field Capacity (mm)	40	70	80
Urban	2E	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2E	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2F	Field Capacity (mm)	40	70	80
Urban	2F	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2F	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2G	Field Capacity (mm)	40	70	80
Urban	2G	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2G	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2H	Field Capacity (mm)	40	70	80
Urban	2H	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2H	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2I	Field Capacity (mm)	40	70	80
Urban	2I	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	2I	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	2J	Field Capacity (mm)	40	70	80

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Node Type	Node Name	Parameter	Min	Max	Actual
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Urban	2K	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3A	Field Capacity (mm)	40	70	80
Urban	3A	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3A	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3B	Field Capacity (mm)	40	70	80
Urban	3B	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3B	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3C	Field Capacity (mm)	40	70	80
Urban	3C	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3C	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3D	Field Capacity (mm)	40	70	80
Urban	3D	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3D	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3E	Field Capacity (mm)	40	70	80
Urban	3E	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3E	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3F	Field Capacity (mm)	40	70	80
Urban	3F	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3F	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3G	Field Capacity (mm)	40	70	80
Urban	3G	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3G	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3H	Field Capacity (mm)	40	70	80
Urban	3H	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3H	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3I	Field Capacity (mm)	40	70	80
Urban	3I	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3I	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3J	Field Capacity (mm)	40	70	80
Urban	3J	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3J	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	3K	Field Capacity (mm)	40	70	80
Urban	3K	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	3K	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	4A	Field Capacity (mm)	40	70	80
Urban	4A	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1

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Node Type	Node Name	Parameter	Min	Max	Actual
Urban	4A	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	4B	Field Capacity (mm)	40	70	80
Urban	4B	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	4B	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	4C	Field Capacity (mm)	40	70	80
Urban	4C	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	4C	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	4D	Field Capacity (mm)	40	70	80

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Urban	Additional_cat2A	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	Additional_cat2A	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	Additional_cat2B	Field Capacity (mm)	40	70	80
Urban	Additional_cat2B	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	Additional_cat2B	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	Additional_cat2C	Field Capacity (mm)	40	70	80
Urban	Additional_cat2C	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	Additional_cat2C	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	Laydown_area	Field Capacity (mm)	40	70	80
Urban	Laydown_area	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	Laydown_area	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	Tarro Access Road	Field Capacity (mm)	40	70	80
Urban	Tarro Access Road	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	Tarro Access Road	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	Turning Angle - Additional Area	Field Capacity (mm)	40	70	80
Urban	Turning Angle - Additional Area	Pervious Area Infiltration Capacity exponent - b	3.5	4.7	1
Urban	Turning Angle - Additional Area	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25

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