

WATER STEWARDSHIP ASSURANCE SERVICES

Alliance for Water Stewardship (AWS)

Audit Number: AO-000578

SITE DETAILS

Site: Abbott Manufacturing Singapore Private Limited Address: 26 Tuas South Avenue 10, 637437, Singapore, SINGAPORE Contact Person: Zi Yong Teo AWS Reference Number: AWS-000513 Site Structure: Single Site

CERTIFICATION DETAILS

Certification status: Certified Core Date of certification decision: 2023-Jul-31 Validity of certificate: 2026-Jul-31

AUDIT DETAILS

Audited Service(s): AWS Standard v2.0 (2019) Audit Type(s): Initial Audit Audit Start Date: 2023-Jun-26 Lead Auditor: Elizabeth Villezar

Audit team participants: Mia Antoni-Naidoo Elizabeth M. Villezar, Lead Auditor

Site Participants:



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ADDITIONAL INFO

Summary of Audit Findings: A total of 2 findings were raised during the certification audit: 0 major non-conformities, 0 minor non-conformities and 2 observations.

The audit team recommends certification of Abbott Manufacturing Singapore Pte Ltd at the Core level.



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Scope of Assessment: Abbott Manufacturing Singapore Pte Ltd (AMS) is a 16-hectare nutritional manufacturing facility in a reclaimed lot located at 26 Tuas South Avenue 10, Singapore 637437, situated within the Tuas Biomedical Park southwestern region of Singapore that is designated for biomedical manufacturing developed by JTC Corporation. The manufacturing facility is approximately 25 km west of the city center, bordered to the north the Tuas South Avenue 10, Tuas South Avenue 7 to the east, Tuas South Avenue 5 to the west, and Tuas South Avenue 12 to the south. Significant neighboring companies include Amgen Singapore Manufacturing, Energy Alloys Pte Ltd, Eng Kong Logistics Hub, and Halliburton, among others. Jurong West is the nearest urban center, approximately 10 km east of the site.

The facility is located in a water-stressed country (Singapore) wherein natural water resource is limitec along with the limited land available for water storage though rainfall is relatively high, with this in consideration, AMS has planned the facility from the ground up optimizing water usage, earning the Green Mark Gold certification from the Singapore Building and Construction Authority (BCA). The site is accordingly, the largest nutritional investment in Singapore by a single company and has been supporting Asia's growth for the past 13 years through its nutritional products that promote health and well-being for all ages, thus use of water is very much significant in its operations.

The ultimate source of water supply to the AMS site is coming from the four National Taps of Singapore supplied by PUB wherein a specific source can't be determined accordingly. Henceforth, a description of these four National Taps was given. The first source can come from the local catchment areas around Singapore composed of 17 reservoirs either manmade or natural (the ultimate sources are the annual rainfall and drain system within Singapore). The second source can be coming from desalinated water wherein five plants are available within Singapore meeting up to 25% of Singapore's water requirement. The third source can come from the water imported from Johor, Malaysia wherein two long-term water agreements have been signed between the City Council of Singapore and the State of Johor (the first agreement was signed in 1961 and expired in 2011 and the second agreement was signed in 1962 valid until 2061). The last and fourth source can be supplied from the NEWater production of Singapore. This NEWater production recycles treated used water into ultra-clean, high-grade reclaimed water. The water produced from this process meets the standards of the U.S. Environmental Protection Agency (EPA) and World Health Organization (WHO) drinking water standards accordingly. There are two ultimate discharge points within the AMS premises - discharged water from Effluent Treatment Plant is directly pumped to PUB pipes while rainwater is collected and drained off-site via the storm drainage network directly connected to the sea

The site's adherence to stringent international manufacturing standards is demonstrated through the certification it receives for GMP (Good Manufacturing Practices). The site's commitment to protecting the environment is demonstrated by its certification received according to the ISO 14001 and ISO 50001 standards.

The audit was conducted on-site from the 26th to the 28th of June 2023.

The onsite site visit included the assessment of the metered water receiving point (access is limited to PUB representatives only) supplied by the Public Utilities Board (PUB) in two types of water (potable - raw water and NEWater - treated water). PUB is a statutory board under the Ministry of Sustainability and the Environment (MSE). PUB is the national water agency, which manages the water supply of Singapore, water catchment and used water in an integrated way. However, from April 2020, PUB also took on the responsibility of protecting Singapore's coastline from sea-level rise serving as the national coastal protection agency. Site assessment continued tracing the visible water pipelines leading to the tank farm (water storage area) where receiving tank of potable water that can hold up to 300 cubic meters was described by the site representative as directly connected to the underground potable water pipe of PUB. Potable water is then pumped to the Rinse and Ingredient Water System where water treatment is performed to meet the required quality for specific water use (production and laboratory). The used water from Rinse and Ingredient Water System is pumped into the utility area's



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effluent sump before its treated at the Effluent Treatment Plant (ETP) which was within the site and controlled by the site. The final discharge of ETP is then pumped to a PUB pipe for further treatment into NEWater. However, all stormwater drains are directly connected to the sea as there are no ponds, lakes, receptacles/basins, or reservoirs present around the site to hold the stormwater effluent. In addition, the site has no existing rainwater harvesting facility as this is yet to be proposed with the PUB as part of continual improvement activity.

The following external stakeholders were interviewed during the audit:

Waterways Watch Society/Mr. Eugene Heng (the onsite interview was conducted on the 27th of June 2023 after participating in the picking-up of rubbish from Marina Reservoir); on 28th of June 2023 Federal Packaging Industries Pte Ltd/Represented by Mr. Verrick Lim – Senior Account Manager; Mr. Chew FL – General Manager accompanied by Sustainability Consultant Mr. Pyong Lim; Public Utilities Board/ Mr. Roland Chan.

FINDINGS

NUMBER OF FINDINGS PER LEVEL Observation 2 FINDING DETAILS

Finding No:	TNR-005218
Checklist Item No:	1.3.6
Status:	Open
Finding level:	Observation
Checklist item:	On-site Important Water-Related Areas shall be identified and mapped, including a description of their status including Indigenous cultural values.
Findings:	The stormwater network is considered as water infrastructure. It's not a requirement to have an IWRA on-site if there is not any.
Finding No:	TNR-005064
Checklist Item No:	3.5.1
Status:	Open
Finding level:	Observation
Checklist item:	Practices set in the water stewardship plan to maintain and/or enhance the site's Important Water-Related Areas shall be implemented.
Findings:	Actions towards improvement of IWRA in the catchment can be expanded upon.



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Report Details

Value
Elizabeth M. Villezar
Monserrath Zamora
31 July 2023
-

Surveillance

Proposed date for next audit

2024-Jun-26

Comment

A yearly surveillance audit is required for this site (AMS) to complete the three-year audit cycle.

Stakeholder Announcements

Date of publica	ition	Location
02/05/2023		AMS Website: https://dam.abbott.com/en-us/docume nts/pdfs/transparency/Abbott-Singapo re-Public-Stakeholder-Announcement .pdf
05/05/2023		WSAS Website: https://watersas.org/wp-content/uploa ds/2023/05/Abbott-Singapore-StakeA nn-Draft-AWS-000513.pdf
05/05/2023		AWS Website: https://a4ws.org/wp-content/uploads/2 023/05/Abbott-Singapore-StakeAnn-D raft-AWS-000513.pdf
02/05/2023		Abbott Global Website & AMS Sharepoint
20/06/2023		Biopharmaceutical Manufacturers Advisory Council (BMAC) website
Comment	A series of emails were attached describing whe located/posted.	ere the Stakeholders' Announcements were
	All of these websites were verified for this audit.	
Comment	The Stakeholders' interviews were conducted fa three were sampled during this audit, one from t from NGOs.	ce-to-face and via MS Teams (online). Only he public sector, one from suppliers, and one
	Attached herein are the invitations to these Stak	eholders.



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Catchment Information

Catchment Information

Singapore is considered a water-stressed country, thus, it has a diversified supply of water, described as the "Four National Taps" to ensure a sufficient supply for various needs. These "Four National Taps" provide for Singapore's growing demand for water, currently at approximately 1,627 million m3 a day [430 million imperial gallons a day (MIGD)] and expected to increase by almost 50% by 2065.

The first National Tap of Singapore is water from local catchment areas. Singapore heavily relies on annual rainfall and drainage from catchment areas for freshwater since Singapore has neither natural lakes nor aquifers. Accordingly, to maximize the collection of rainwater, two-thirds of Singapore's land area is currently used to capture stormwater runoff which is then stored in 17 reservoirs throughout the island for subsequent use. All major estuaries have been dammed to create reservoirs, and PUB intends to capture water from remaining streams near the shoreline, which will increase Singapore's water catchment area to 90% by 2060. The 17 reservoirs are further divided into two categories - protected and unprotected catchment zones within Singapore. The protected are composed of Upper Peirce, Upper Seletar, Lower Peirce and MacRitchie Reservoirs. The remaining 13 reservoirs are considered unprotected, these are: Tengeh, Poyan, Murai, Sarimbun, Kranji, Jurong Lake, Pandan, Lower Seletar, Marina, Punggol, Serangoon, Bedok and Tekong Reservoirs.

The next Singapore's second National Tap is desalinated water. Currently, Singapore has 5 desalination plants (SingSpring, TuaSpring, Tuas, Marina East and Developing a 5th desalination plant in Jurong Island) that produce enough water to meet up to 25% of Singapore's water needs. The exact processes used in each desalination plant vary slightly, but in general, reverse osmosis is used to remove dissolved salts and minerals through membranes and make seawater drinkable.

Singapore's third National Tap is imported water from Johor (Malaysia). Two long-term water agreements have been signed between the City Council of Singapore and the State of Johor (1961-2011 and 1962-2061). The details of the Johor River Catchment were described on the Handbook.

NEWater is Singapore's fourth National Tap. The NEWater production process recycles treated used water into ultra-clean, high-grade reclaimed water, moving Singapore towards water sustainability. NEWater uses a 3-step approach to recycle water.

Abbott Manufacturing Singapore Pte Ltd (AMS) is not currently located within any of the catchments above. However, since PUB is drawing its water supply from these sources, it is apparent that a description of these is included. There are two ultimate discharge points within the AMS premises - discharged water from Effluent Treatment Plant is directly pumped to PUB pipes while rainwater is collected and drained off-site via the storm drainage network directly connected to the sea.





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Johor River Catchment.png



Public Sewer Network to Reclamation Plants (Simplified).png

36d: NEWater and desalination plant in Singapore



NEWater and Desalination Plants in Singapore.png



Singapore Catchment Areas and Location of the Site.png



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Reservoirs in Singapore.png

Comment

The details of the catchment are described in Section 2.5 of the Abbott Manufacturing Singapore (AMS) Alliance for Water Stewardship (AWS) Handbook Version 3.0.



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Client Description and Site Details

Client/Site Background

Abbott Manufacturing Singapore Pte Ltd (AMS) is a 16-hectare nutritional manufacturing facility in a reclaimed lot located at 26 Tuas South Avenue 10, Singapore 637437, situated within the Tuas Biomedical Park southwestern region of Singapore that is designated for biomedical manufacturing developed by JTC Corporation.

The facility is located in a water-stressed country (Singapore) wherein natural water resource is limited along with the limited land available for water storage though rainfall is relatively high, with this in consideration, AMS has planned the facility from the ground up optimizing water usage, earning the Green Mark Gold certification from the Singapore Building and Construction Authority (BCA). The site is accordingly, the largest nutritional investment in Singapore by a single company and has been supporting Asia's growth for the past 13 years through its nutritional products that promote health and well-being for all ages, thus use of water is very much significant in its operations.

The site's specific processes where water is used, start from Warehouse to FIBC, Wet Process, Liquid Silo Tanks, UHT and Evaporator, Spray Dryer, Finish Goods Silos, Dry Blending and Packaging.



Figure 17 - Satellite Image of AMS Site.png



Figure 1 - Site Location Map.png

Comment

Client description and site details are described in Sections 2.1 to 2.4 and in Section 3 of AMS AWS Handbook Step 1.

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Summary of Shared Water Challenges

Summary of Shared Water Challenges

The site and catchment water challenges (linked to AWS Outcomes) are summarized in Table 40 of the Handbook. There are 8 for good water governance; 9 for sustainable water balance; 4 for good water quality status; 3 for IWRA's and 1 for WASH.

Table 41 lists the shared water challenges and their respective causes while Table 42 details the shared water challenge prioritization rating. Among the identified shared water challenges were the following:

-Water scarcity and sustainability (sustainable water balance) with 4 identified causes. -Keeping wastewater discharge quality within regulatory approval limits (good water quality status) with 3 causes.

-Awareness of the importance of water conservation (good water governance) with 3 causes. -Awareness of good water stewardship (good water governance) with 3 causes.

-A collaboration with a government agency - Public Utilities Board (good water governance) with 2 causes.

-Awareness about sanitation issues among people in Singapore (WASH) with one 1 cause. -Preserving Singapore's reservoirs (IWRA) with 2 causes.

-Use of NEWater for product contact manufacturing processes (sustainable water balance) with 2 causes.

AMS Stakeholder Engagement Database includes Stakeholder's Water-Related Interests & Challenges (Includes challenges specific to the stakeholder and shared with AMS).

Comment Shared Water Challenges in the Catchment level are described in Section 8 of the Handbook and AMS Stakeholder Engagement Database as of 26 June 2023.



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0.1	General Requirements for Single Sites, Multi-Sites and Groups
0.1.1	Eligibility Criteria
0.1.1.1	The site(s) occupy one catchment OR an exception has been granted. Ves
Comment	The facility is located in a water-stressed country (Singapore) wherein natural water resource is limited along with the limited land available for water storage though rainfall is relatively high.
	The site affects and is reliant on two catchments – Singapore Catchment and Johor Catchment.
	AMS depends on two catchments for its water supply. The ultimate water source for the site are the reservoirs located in Singapore and imported water from Johor.
	Singapore: Due to the nature of Singapore's water distribution network with centralised control by PUB, with multiple reservoirs, NEWater and desalination plants throughout Singapore, it is difficult to pinpoint exactly where AMS obtains its water from. Thus, it shall be considered that the site is reliant upon for water from the whole of Singapore, including both catchment zones and zones not in the catchment (Singapore Catchment).
	Johor: The site is reliant upon for water from the whole Johor River catchment (Johor Catchment).
0.1.1.2	The scope of the proposed certification shall be under the control of aImage: Control of asingle management system.Yes
Comment	Abbott Manufacturing Singapore Pte Ltd (AMS) is a single-site facility under the control of a single management system.
0.1.1.3 Comment	The scope of the proposed certification shall be homogeneous with respect to primary production system, water management, product or service range, and the main market structures.VesThe scope of the proposed certification is homogeneous.Yes

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1	STEP 1: GATHER AND UNDERSTAND
1.1	Gather information to define the site's physical scope for water stewardship purposes, including: its operational boundaries; the water sources from which the site draws; the locations to which the site returns its discharges; and the catchment(s) that the site affect(s) and upon which it is reliant.
1.1.1	The physical scope of the site shall be mapped, considering the regulatory landscape and zone of stakeholder interests, including: - Site boundaries; - Water-related infrastructure, including piping network, owned or - Water-related infrastructure, including piping network, owned or managed by the site or its parent organization; - Any water sources providing water to the site that are owned or managed by the site or its parent organization; - Water service provider (if applicable) and its ultimate water source; - Discharge points and waste water service provider (if applicable) and ultimate receiving water body or bodies; - Catchment(s) that the site affect(s) and is reliant upon for water.
Comment	 Site boundaries were described in Section 2 General Context of the handbook and mapped accordingly in the Satellite image in Figure 1. The description of boundaries includes location, facility, site geography, site climate, site hydrology, and ultimate water sources in Singapore. Water-related infrastructure, including the piping network, is owned by AMS and is part of the organization as shown in Figures 16 & 17 of the Handbook Version 3.0. Ultimate water sources are: imported water from Johor (Malaysia), water from local catchments (17 catchments), desalinated water (sea water), NEWater (recycled water within Singapore), and recovered water from air handling units (AHUs) being fed in cooling towers - Figure 31. Discharge points can be in the sea for runoff water flowing through storm drains or through the PUB pipelines directly connected to the final discharge point from the Effluent Treatment Plant (Figures 16 & 17). The whole catchment of Singapore is mapped as per Figures 8, 9, 10, 11, & 13 of the AMS Handbook (Singapore & Johor River Catchments are identified here).
1.2	Understand relevant stakeholders, their water related challenges, and the site's ability to influence beyond its boundaries.
1.2.1	Stakeholders and their water-related challenges shall be identified. The process used for stakeholder identification shall be identified. This process shall: Yes - Inclusively cover all relevant stakeholder groups including vulnerable, women, minority, and Indigenous people; Consider the physical scope identified, including stakeholders, representative of the site's ultimate water source and ultimate receiving water body or bodies; Provide evidence of stakeholder consultation on water-related interests and challenges; - Note that the ability and/or willingness of stakeholders to participate may vary across the relevant stakeholder groups; Identify the degree of stakeholder engagement based on their level of interest and influence.



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Comment	The Stakeholders are identified in Section 4 of the Handbook and grouped into several categories such as Public Water Management, Water Source Management, Regulators and Government Agencies (4 stakeholders); Water Treatment Providers (5 stakeholders); Businesses and Companies (5 stakeholders); Suppliers and Contractors (29 stakeholders); Associations (2 stakeholders); Currently or Previously Certified AWS Companies (1 stakeholder); NGOs and Social Enterprises (5 stakeholders); Neighboring Companies, Residents and Area Management (8 stakeholders); Research Centers and Educational Institutions (9 stakeholders); Vulnerable Women and Minority (2 stakeholders); Farmers (2 stakeholders) and Organizations with Links to the Sea (2 stakeholders).
	Identified stakeholders were described in terms of physical scope, name of stakeholder, the respective representatives (contact information), materiality review, and collaboration level - communication plan (details are described in AMS Stakeholder Engagement Database as of 26 June 2023).
	Evidence of engagement was provided: a sample of survey presented during the audit, the email thread that started on 03 May 2023 up to 11 May 2023 with the subject: Abbott Manufacturing Singapore – Request to Collaborate on Alliance for Water Stewardship addressed to Waterways Watch Society.
1.2.2	Current and potential degree of influence between site and stakeholderImage: Current and considering the site'sshall be identified, within the catchment and considering the site'sYesultimate water source and ultimate receiving water body for wastewater.Yes
Comment	Done through the use of a Stakeholders' Database with a provided sample of Survey presented during the audit.
	The degree of influence between the site and stakeholders has been identified.
1.3	Gather water-related data for the site, including: water balance; water quality, Important Water-Related Areas, water governance, WASH; water-related costs, revenues, and shared value creation.
1.3.1	Existing water-related incident response plans shall be identified.
Comment	Water-related incident response plans have been identified:
	-Site Emergency Preparedness and Response Plan SG02EHS058 includes Water Management Plan (Flood, accidental discharge into the storm drain, other nearby site incidents that may affect AMS, chemical spillage). -Water Management and Pollution Prevention (SG02EHS354) effective 28 May 2021. -Business continuity plan is likewise included in this indicator as part of site's compliance.
1.3.2	Site water balance, including inflows, losses, storage, and outflows shallImage: Site water balance, including inflows, losses, storage, and outflows shallbe identified and mappedYes
Comment	The site has identified and mapped its water balance including: inflows, losses, storage and outflows.
	The site water balance was presented as of November 2022 (actual usage) same data being submitted annually to PUB as part of compliance obligations. This is also described in Section 5.2 of AMS AWS Handbook Step 1 - Water Balance.
	Water balance is measured through invoices received from PUB (potable & NEWater) and metered AHU water recovery - raw data are provided.
1.3.3	Site water balance, inflows, losses, storage, and outflows, including indication of annual variance in water usage rates, shall be quantified. Yes Where there is a water-related challenge that would be a threat to good water balance for people or environment, an indication of annual high and low variances shall be quantified.



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Comment	Water balance is measured through invoices received from PUB (potable & NEWater) and metered AHU water recovery - raw data are provided.
	Total water input equals 821,256.45m3 (Potable, NEWater & AHU) with 158,795.06m3 going to the atmosphere & products while the total discharged to the sewer (PUB pipeline) is 628,653.35m3 with difference of 33,808.04m3 going to stormwater drain.
	Variance in site water balance is due to maintenance activities, but these are still accounted through the Water Balance Chart where boiler and cooling tower blowdowns were described with quantity of water used (Section 5.2 of AMS AWS Handbook Step 1 - Water Balance).
	Sampled were the following:
	Regen losses = 316.46m3; product moisture & evaporation = 32,070.34m3; evaporation/drift losses = 126,724.83m3.
1.3.4	Water quality of the site's water source(s), provided waters, effluent and receiving water bodies shall be quantified. Where there is a Yes water-related challenge that would be a threat to good water quality status for people or environment, an indication of annual, and where appropriate, seasonal, high and low variances shall be quantified.
Comment	The water quality of the site's water sources is managed by the PUB. Quality Parameters for Process Water in AMS are managed by the AMS.
	Effluent quality is tested by the PUB on a weekly basis but does not necessarily disclose results including the periodic testing parameters done prior to the release of the permit.
	Details of water quality of the site's water sources, etc. are described in Section 5.3 of the AMS AWS Handbook Step 1 - Water Quality.
	Variances of different parameters have been quantified.
1.3.5	Potential sources of pollution shall be identified and if applicable,Image: Comparison of the start of the sta
Comment	Potential sources of pollution were identified per area such as in the process, utilities and facilities and other areas (Figure 75 of AMS AWS Handbook Step 1 under Section 5.4 Potential Sources of Pollution). Table 7 Potential Sources of Pollution Onsite details the pollution sources, location, nature, associated risk and the vulnerable water bodies/water abstraction points.
1.3.6	On-site Important Water-Related Areas shall be identified and mapped, including a description of their status including Indigenous culturalQ Obs.values.Obs.
Comment	The IWRA identified in AMS AWS Handbook Step 1 is the stormwater network and details of its environmental importance and economic importance were described. Figure 28 details the network.
	The stormwater network is considered as water infrastructure. It's not a requirement to have an IWRA on-site if there is not any.
1.3.7	Annual water-related costs, revenues, and a description or quantification of the social, cultural, environmental, or economic water-related value generated by the site shall be identified and used to inform the evaluation of the plan in 4.1.2.

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Comment	Table 8 of the AMS AWS Handbook Step 1 shows the Overview of Water-related costs in 2022 such as water supply, water treatment, energy, maintenance of water-related infrastructure, risk mitigation and stakeholder engagement costs.
	It should be noted that AMS is not known to generate any water-related revenues. However, AMS does generate some water-related value in terms of contribution to Singapore's gross domestic product (GDP). AMS employs a total of 409 staff on site, and contributes to Singapore's economy.
1.3.8	Levels of access and adequacy of WASH at the site shall be identified.
Comment	Levels of access and adequacy of WASH at the site were identified in Section 5.7 of AMS AWS Handbook Step 1 - Access and Adequacy of Safe Water, Sanitation and Hygiene (WASH).
	 Table 10 describes the locations and quantities of drinking water dispensers within the site. Table 11 details Locations and quantities of wash basins for food preparation and washing within the site. Figure 76 is a sample photograph of wash basins in common area. Table 12 describes the number of employees onsite. Table 13 shows the recommended number of sanitary facilities based on the number of employees on site. Table 14 describes the locations and number of sanitary facilities on site (due to shifting, number of WASH facilities is enough for AMS employees). The photos of AMS sanitation are included.
1.4	Gather data on the site's indirect water use, including: its primary inputs; the water use embedded in the production of those primary inputs the status of the waters at the origin of the inputs (where they can be identified); and water used in out-sourced water-related services.
1.4.1	The embedded water use of primary inputs, including quantity, qualityImage: Comparison of the start of the sta
Comment	The embedded water use of primary inputs, including quantity, quality, and level of water risks within the site's catchment was identified. There are seven as described in Table 17 of AMS AWS Handbook Step 1 - Identified primary inputs; the following 4 are within the site's catchment:
	-Table 19 - Indirect water use information from ingredient oil. -Table 22 - Indirect water use information from corrugate. -Table 23 - Indirect water use information from cans. -Table 24 - Indirect water use information from bulk chemicals.
1.4.2	The embedded water use of outsourced services shall be identified, and where those services originate within the site's catchment, quantified.Image: Comparison of the service se
Comment	The embedded water use of outsourced services were identified and quantified as described in the AMS AWS Handbook Step 1 tables:
	-Table 25 - Indirect Water Use Information from Laundry Services. -Table 26 - Indirect Water Use Information from 3rd Party Logistics Services.
1.5	Gather water-related data for the catchment, including water governance, water balance, water quality, Important Water-Related Areas, infrastructure, and WASH



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1.5.1	Water governance initiatives shall be identified, including catchment plan(s), water-related public policies, major publicly-led initiatives under way, and relevant goals to help inform site of possible opportunities for water stewardship collective action.	⊘ Yes
Comment	Catchment's Water-Related Data were described in Section 7 of AMS AWS Handbook Step - ensuring supply for all; conserving water resources; planning against water pollution.	1
	-Table 27 - Role of government agencies in water catchment governance describes the authority & division; governance initiatives; opportunity for water stewardship collective actions.	
	-Figure 78 describes the closed loop hydrological cycle in water supply management.	
1.5.2	Applicable water-related legal and regulatory requirements shall be identified, including legally-defined and/or stakeholder-verified customary water rights.	✔Yes
Comment	Applicable water-related legal and regulatory requirements are identified in Table 28 - Summary of water-related regulatory requirements describing legislation, purpose and relevance to site. Details of these are described in Sections 7.2.1 up to 7.2.4 of the Handbook.	
1.5.3	The catchment water-balance, and where applicable, scarcity, shall be quantified, including indication of annual, and where appropriate, seasonal, variance.	✔Yes
Comment	Johor Catchment and Singapore Catchment water balance has been quatified. Scarcity is quantified but the annual variance is confidential because water management is handled by the Government of Singapore through PUB.	
	 -Section 7.3 Catchment water balance details the reservoirs and the corresponding data. -Table 29 shows the data used in Linggiu Reservoir Stock Projection Model with photo of su in Figure 79 and Table 30 for the data used in Linggui Reservoir stock projection model. -Figure 80 describes the stage storage curve of Linggui Reservoir. -Figure 81 describes the Linggui Reservoir stock projection from 2018 to 2027 based on projected average rainfall from 14 climate change scenarios. -Figure 82 describes the Linggui Reservoir stock projection from 2018 to 2027 based on minimum projected rainfall 	ch
	 -Figure 83 describes Harvest and Storage for Linggiu Reservoir Projections (2018-2027) based on the projected average rainfall from 14 Climate Change Scenarios. -Figure 84 describes Harvest and Storage for Linggiu Reservoir Projections (2018 to 2027) based on Projected Minimum Rainfall. -Table 31 describes Storage Capacity of Local Reservoirs totalling to 185.6million cubic meters. -Table 32 describes data on local catchment balance. 	
1.5.4	Water quality, including physical, chemical, and biological status, of the catchment shall be identified, and where possible, quantified. Where there is a water-related challenge that would be a threat to good water quality status for people or environment, an indication of annual, and where appropriate, seasonal, high and low variances shall be identified.	⊘ Yes



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Comment	Section 7.4 of the AMS AWS Handbook Step 1 - Catchment Water Quality details the water quality, including physical, chemical, and biological status, of the catchment.
	-Table 33 details the Department of Environment (DOE) - Malaysia for the Johor River as Class II with required levels of concentration of defined parameters. -Figure 85 describes the locations of water catchment sampling points for Singapore
	catchment.
	-Figure 86 refers to Catchment waters dissolved oxygen monthly mean from 2018 to 2020. -Figure 87 refers to Catchment waters biochemical oxygen demand monthly mean from 2018 to 2020.
	-Figure 88 refers to Catchment waters total suspended solids monthly mean from 2018 to 2020.
	-Figure 89 describes the Locations of Non–Catchment and Seawater Sampling Points. -Figure 90 refers to the Non-catchment waters dissolved oxygen monthly mean from 2018 to 2020.
	-Figure 91 refers to the Non-catchment waters biochemical oxygen demand monthly mean from 2018 to 2020.
	-Figure 92 refers to the Non-catchment waters total suspended solids monthly mean from 2018 to 2020.
	-Figure 93 is the Monitoring Locations and Water Quality Parameters Measured. -Figure 94 is the Coastal waters dissolved oxygen monthly mean from 2018 to 2020. -Figure 95 is the Coastal waters Enterococcus counts monthly mean from 2018 to 2020.
1.5.5	Important Water-Related Areas shall be identified, and where appropriate, mapped, and their status assessed including any threats to Yes people or the natural environment using scientific information and
	through stakeholder engagement.
Comment	Section 7.5 of AMS AWS Handbook Step 1 describes (including the status) the IWRA's in Malaysia (Linggiu Reservoir and Johor River) and the IWRA's in Singapore: reservoirs include rivers system, man-made dams, and modified reservoirs.
	-Figure 96 is the map of Important Water Related Areas within Johor Linggiu River Catchment
	-Table 34 details the Description and Importance of Catchment IWRAs.
	-Figure 97 is the Important Water Related Areas within Local Catchment (Singapore).
	Guidelines about the nature reserves can be found in Figures 98, 99, 100 & 101 respectively.
1.5.6	Existing and planned water-related infrastructure shall be identified,Image: Comparison of the stream o
Comment	Section 7.6 of the AMS AWS Handbook Step 1 describes (including codition and potential risk to extreme events) the Existing and Planned Water Related Infrastructure. PUB controls the data relative to these infrastructure and not available publicly.
	-Table 36 describes the Chronology of Tuas area development. -Table 37 is the Summary of existing and planned water-related infrastructures in Singapore. -Table 38 is the List of Singapore Water Reclamation Plants. -Table 39 lists the Preventive maintenance programme for severage systems and waterways
	-Figure 102 is Sanitation and purification process of Singapore's waters.
1.5.7	The adequacy of available WASH services within the catchment shall <i>O</i> be identified. Yes

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Comment Adequacy of WASH services supported by the 2030 Agenda for Sustainable Development framework

ABC Waters (active, beautiful, clean). The WASH data are run by the Department of Statistics. Section 7.7 of the AMS AWS Handbook Step 1 has the details of such.

-Access to Improved Drinking Water Sources and Sanitation: Singapore has achieved universal access to affordable and high-quality potable water through the "Four National Taps" strategy, 100% of households in Singapore have access to clean and safe drinking water.

- End Open Defecation and Provide Access to Sanitation and Hygiene: Singapore has a fully sewered system with 100% of the population served by modern sanitation. Since 1997, 100% of wastewater in Singapore is collected and treated. Illegal discharges of toxic contaminants to the sewerage systems are strictly prohibited and the sewers are continuously monitored.

-Improve Water Quality, Wastewater Treatment, and Safe Reuse: 100% of the domestic and industrial wastewater flow in Singapore is being treated in a wide network of water reclamation plants, before being recycled into NEWater for reuse purposes.

-Support Local Engagement in Water and Sanitation Management: PUB regularly promotes the value of safe and reliable water and sanitation to all to ensure that water remains a treasured resource in Singapore. One of Singapore's largest projects in water and sanitation was the 10-year clean-up of the Singapore River. The clean-up involved the relocation of thousands of street hawkers, squatters, and polluting industries, and the removal of over 250 tonnes of rubbish that accumulated in the river.

-Raise Standards of Cleanliness and Public Hygiene: To elevate good hygiene practices on a national level, the National Environment Agency together with Enterprise Singapore (ESG), the Early Childhood Development Agency (ECDA), the Singapore Tourism Board (STB), the Ministry of Education (MOE), the Ministry of Transport (MOT), and the Singapore Food Agency (SFA) adopted the "SG Clean" hygiene education and action campaign that rallies various sectors to commit to upholding good sanitation and hygiene practices.

-Burden of Disease Risk Factors: The Singapore Ministry of Health (MOH) conducted a study on the burden of diseases in 2017 to quantify the extent and distribution of health problems in Singapore. On the risk factors affecting health in Singapore, the report establishes a "risk-attributable burden" which is defined as how much of the burden of any given disease was caused by particular risk factors. The burden is measured by disability-adjusted life years (DALYS), which is years of healthy life lost to premature death and disability.

-Figure 103 describes the Location of Deep Tunnel Sewerage System (DTSS) pipelines and water reclamation plants.
-Figure 104 shows the Risk factors contributing to DALYs, Singapore, both sexes, 1990–2017.

- **1.6** Understand current and future shared water challenges in the catchment, by linking the water challenges identified by stakeholders with the site's water challenges.
- **1.6.1** Shared water challenges shall be identified and prioritized from the information gathered.
- Comment Shared Water Challenges in the Catchment level were detailed in Section 8 of the AMS AWS Handbook Step 1.

-Table 40 describes Site and catchment water challenges. -Figure 105 is the Screenshot of Determination of Shared Water Challenges in AWS Stakeholder Engagement Database (Step 1.2). -Table 41 is List of Shared Water Challenges and their respective causes.

- Table 41 is List of Shared Water Challenges and their respective causes
- -Table 42 is the Shared Water Challenge Prioritization Rating. -Figure 106 Refer to Red Box - showing site prioritization of shared water challenges.
- -Table 43 is the Shared Water Related Challenges, in order of priority.

Yes



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1.6.2	Initiatives to address shared water challenges shall be identified.	9 es
Comment	-Figure 107 Refer to Red Box - showing The Water Stewardship Plan Number that is addressing each of the shared water challenges. -Table 44 is the Prioritized Shared Water Challenges and Actions Taken.	
1.7	Understand the site's water risks and opportunities: Assess and prioritize the water risks and opportunities affecting the site based upon the status of the site, existing risk management plans and/or the issues and future risk trends identified in 1.6.	
1.7.1	Water risks faced by the site shall be identified, and prioritized, including likelihood and severity of impact within a given timeframe, potential costs and business impact.	> es
Comment	The site's water risks and opportunities are listed in AMS AWS Risk and Opportunity Assessment dated 26 June 2023.	
	-Risk Score and Criteria is detailed in Table 45 of the Handbook. -Table 46 describes the Risk Prioritization Score Matrix and Risk Priority.	
1.7.2	Water-related opportunities shall be identified, including how the sitemay participate, assessment and prioritization of potential savings, andbusiness opportunities.	9 es
Comment	The site's water risks and opportunities are listed in AMS AWS Risk and Opportunity Assessment dated 26 June 2023. Attachment is the same as for indicator 1.7.1	
	-Table 47 & 48 are the Opportunity Score and Criteria.	
1.8	Understand best practice towards achieving AWS outcomes: Determining sectoral best practices having a local/catchment, regional, or national relevance.	
1.8.1	Relevant catchment best practice for water governance shall be identified.	9 es
Comment	Table 49 of the AMS AWS Handbook Step 1 lists best practices for water governance. Among these are the following:	l
	-Involvement of management and workers at all levels, both in the group and the factory, with sustainable water management	
	-Environmental management culture, as evidenced by Environmental and Energy	
	-High level of qualification and involvement of plant workers in the search for improvements in Sustainable Water Management, especially those in the work team.	
	-Periodically perform comprehensive analysis of current water management, in partnership with external specialized water solution provider/consultant to identify gaps and opportunities for improvement	
	-Operational Control Criteria to be defined and standardized for the management of water consuming processes (Chillers, boilers, osmosis, and softening plants) with automated	
	-Assessment of water-related Risks and Opportunities to develop a Water Stewardship Strategy and Plan.	
	-Contribute to Singapore Water Resilience strategy to diversify ultimate water sources (4 National Taps).	
	 Engagement with relevant stakeholders to address shared water challenges to jointly improve catchment water governance issues. 100% Metering on water supply, usage, and discharge to account for full water balance. 	



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1.8.2	Relevant sector and/or catchment best practice for water balance (either through water efficiency or less total water use) shall be identified.	⊘ Yes
Comment	Table 50 of the AMS AWS Handbook Step 1 lists best practices for water balance. Listed were some but not limited to the following:	
	 -Water usage monitoring infrastructures to continuously monitor the water usage at different points within the site for easy identification of abnormal water use. -The use of NEWater (recycled water) for non-product contact purposes. -Preparation of weekly monitoring reports of the main processes related to water managem (refrigeration, boilers, reverse osmosis, and softening plants). -Setting annual water-saving projects & targets as part of continuous improvement to improsite water balance. -Consumption optimization projects to improve water efficiency (optimization recovery, osmosis rejection, waterless urinals, tap sensors, rainwater harvesting). -Leak detection program to identify, track, and repair leaks. -Recycling of AHU condensate for cooling tower usage. -Best practices In the Clean in Place (CIP) process, based on PUB's Best Practice Guide in Water. Efficiency in the Biomedical Manufacturing Sector. -Best practices for Cooling Tower, based on PUB's Best Practice Guide in Water Efficiency in the Biomedical Manufacturing Sector. -Best practices for toilets, pantries, and domestic use, based on PUB's Best Practice Guide Water Efficiency in the Biomedical Manufacturing Sector. -Best practices for toilets, pantries, and domestic use, based on PUB's Best Practice Guide Water Efficiency in the Biomedical Manufacturing Sector. -Best practices for toilets, pantries, and domestic use, based on PUB's Best Practice Guide Water Efficiency in the Biomedical Manufacturing Sector. -Best practices for toilets, pantries, and domestic use, based on PUB's Best Practice Guide Water Efficiency in the Biomedical Manufacturing Sector. -100% Recycling of wastewater generated on-site, and zero discharge for public sewage system. 	t ent ve in
1.8.3	Relevant sector and/or catchment best practice for water quality shall be identified, including rationale for data source.	⊘ Yes
Comment	Table 51 of the AMS AWS Handbook Step 1 lists best practices for water quality. Some are but not limited to the following:	•
	 -Continuous monitoring of process (Rinse & Ingredient) water quality. -Continuous monitoring of treated effluent discharge into public sewer on important parameters, beyond regulatory requirement. -Emergency response plans on chemical spillage and wastewater emergency. -Approach of an FMEA (Failure Mode Effect & Analysis) related to the management of wastewater. -Adoption of best practices as mentioned in WHO Good Manufacturing Practices: Water for Pharmaceutical Use. -Maintenance work on equipment and vehicles should be done in designated or covered areas where the used water can be collected and disposed of separately. -Drip pans to colleleaks or spills during maintenance activities should be used. -Ascertain zero leakage of underground piping to the ground through inspection, testing, etc. -Best Practices shared by ingredient supplier during stakeholder engagement such as recovering product losses in wastewater as nutrients to improve the soil health in nearby farms that are part of the site's supply chain, etc. -Ascertain zero leakage of underground piping to the ground through inspection, testing, etc. -Ascertain zero leakage of underground piping to the ground through inspection, testing, etc. -Ascertain zero leakage of underground piping to the ground through inspection, testing, etc. -Ascertain zero leakage of underground piping to the ground through inspection, testing, etc. 	ect c.

1.8.4 Relevant catchment best practice for site maintenance of Important Water-Related Areas shall be identified.



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Comment Table 52 of the AMS AWS Handbook Step 1 lists 8 best practices for site maintenance of IWRA's. -Active, Beautiful, Clean (ABC) Waters Programme launched by PUB to improve the water guality of local water bodies as well as to provide additional recreational spaces for the local community to enjoy. -PUB Clean Catchment campaign to promote the implementation of Best Management Practices (BMPs) for farming communities and Clean Waters Begin with You campaign to educate the public on the importance of protecting water catchments. -Management of microalgae in waterbodies by application of ultra-low frequency technology. -Continuous monitoring and upgrading of stormwater drains. -Participation in catchment IWRA preservation activities, e.g. Waterways Clean Up Programmes as part of Corporate Social Responsibility. -Minimize the risk of stormwater contamination on-site through reducing exposure to pollution sources and developing a Stormwater Management Plan. -Perform testing on the guality of stormwater discharged from the site. -Best Practices shared by ingredient supplier during stakeholder engagement (Supporting riparian planting along the Mangapiko Stream with the aim of establishing an ecological corridor from Maungatautari to Priongia). 1.8.5 Relevant sector and/or catchment best practice for site provision of equitable and adequate WASH services shall be identified. Yes Comment Table 53 of the AMS AWS Handbook Step 1 lists the site provision of equitable and adequate WASH services both for site and catchment levels (9 items): -Support Singapore's national SG Clean campaign through the following practices (with several activities such as providing additional hand sanitizer on site to promote good hygiene habits). -Signing of the WASH pledge to provide access to safe water, sanitation, and hygiene at the workplace for employees. -Conduct periodic reviews of the cleaning regime and step-up cleaning and disinfection of frequently touched areas when needed (e.g. during the pandemic). -Ensure that contact information for toilet users to give feedback is easily accessible and ensure that feedback is addressed in a timely manner. -Reduce the number of frequently touched surfaces by using contactless methods such as pedal bins and no-touch door sensors. -Promote good handwashing techniques through step-by-step instructions displayed in handwash stations. -A pilot project by the Singapore Mass Rapid Transit (MRT) North South Line to provide an electronic application to allow the public to locate the nearest restrooms. -Support WASH efforts in the catchment and outside of catchment to improve WASH in the regions.



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2	STEP 2: COMMIT & PLAN - Commit to be a responsible water steward and develop a Water Stewardship Plan
2.1	Commit to water stewardship by having the senior-most manager in charge of water at the site, or if necessary, a suitable individual within the organization head office, sign and publicly disclose a commitment to water stewardship, the implementation of the AWS Standard and achieving its five outcomes, and the allocation of required resources.
2.1.1	A signed and publicly disclosed site statement OR organizational document shall be identified. The statement or document shall include the following commitments: - That the site will implement and disclose progress on water stewardship program(s) to achieve improvements in AWS water stewardship outcomes - That the site implementation will be aligned to and in support of existing catchment sustainability plans - That the site's stakeholders will be engaged in an open and transparent way - That the site will allocate resources to implement the Standard.
Comment	Abbott Singapore Commitment to Water Stewardship signed on 01 Dec 2022 by the Site Director Singapore ANSC posted on the website, in conspicuous areas within the site such as the sustainability board, along with this the energy and BMAC website commitment to water stewardship (joint website for biopharma companies in Singapore (link to the commitment was available): -https://www.bmacsingapore.org/member/abbott/sustainability-at-abbott/ -https://dam.abbott.com/en-us/documents/pdfs/transparency/Abbott-Singapore-Commitment-t
2.2	Develop and document a process to achieve and maintain legal and regulatory compliance.
2.2.1	The system to maintain compliance obligations for water and wastewater management shall be identified, including: Yes - Identification of responsible persons/positions within facility organizational structure Yes - Process for submissions to regulatory agencies. Yes



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Comment	EHS Legal Register per SG02EHS054 (Appendix 3) was available and lists all the applicable environmental legal and statutory requirements for AMS that include water.
	AMS Water Stewardship Governance structure was provided. Figure 1 of AMS AWS Handbook Step 2 describes the AMS Water-Related Governance Structure in a nut shell. Job Descriptions were provided for EHS Manager (manage, develop, administer and implement programs designed to reduce risks and minimize losses associated with employee safety, industrial hygiene, fire protection, environmental issues, and occupational health/ensure compliance with all corporate, divisional, local, state, and federal regulations pertaining to environmental, health and safety).
	The site regularly reviews new or updated regulations at different intervals throughout the year.
	Annually, a documented self-assessment and internal audit is conducted by the site's EHS team. The Head of EHS and Security is responsible to sign off on the completion of the self-assessment. This includes reviewing the site's compliance against relevant government and Abbott regulations.
	In the area of submission to regulatory bodies, the main submissions include:
	-Application for Written Approval of Trade Effluent Discharge (Every 5 years) -Submission of Water Efficiency Management Plan (WEMP) (Every year)
	Records of submissions to various agencies are maintained by the site EHS and Utilities Team in site internal drive and/or Maximo system.
2.3	Create a water stewardship strategy and plan including addressing risks (to and from the site), shared catchment water challenges, and opportunities.
2.3.1	A water stewardship strategy shall be identified that defines the overarching mission, vision, and goals of the organization towards good Yes water stewardship in line with this AWS Standard.
Comment	A water stewardship strategy and plan was identified in Section 3 of AMS AWS Handbook Step 2.
	The water stewardship strategy is in line with the AWS Standard (five outcomes), it includes: mission, vision, values and goals.
2.3.2	A water stewardship plan shall be identified, including for each target: - How it will be measured and monitored Yes - Actions to achieve and maintain (or exceed) it - Planned timeframes to achieve it - Financial budgets allocated for actions - Positions of persons responsible for actions and achieving targets - Where available, note the link between each target and the achievement of best practice to help address shared water challenges and the AWS outcomes.
Comment	The AMS Water Stewardship Plan as of 26 Jun 2023 includes:
	 Objective planning defines how this will be measured and monitored. Implementation & progress defines the actions to achieve and maintain or exceed it. The outcome column defines planned timeframes to achieve it. Budget required defines financial budgets allocated for actions. Positions of persons responsible for actions and achieving targets are defined in the column for Project Lead; Title and Project Team and Titles and Responsible to update. Linkage between each target and the achievement of best practices to help address shared water challenges and the AWS outcomes, as defined in the AMS Water Stewardship Plan.



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2.4	Demonstrate the site's responsiveness and resilience to respond to water risks	
2.4.1	A plan to mitigate or adapt to identified water risks developed in co-ordination with relevant public-sector and infrastructure agencies shall be identified.	⊘ Yes
Comment	A plan to mitigate/adapt to identified water risks developed in co-ordination with relevant public-sector has been identified.	
	The AMS Water Risks and Opportunities Register and Water Stewardship Plan was developed in consultation with the Public Utilities Board (PUB), because the site relies on PUB's utilities infrastructure for water supply and municipal wastewater treatment.	
	-Email dated 22 June 2023 (MOM with PUB) was presented during the audit for the risks associated with shared water risks and challenges.	

-Water Loop Overview of Singapore's Water Management (Figure 6 of AMS AWS Handbook Step 2).

Challenges include: periods of droughts; sudden episodes of intense rainfall and sea level rise.



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3	STEP 3: IMPLEMENT - Implement the site's stewardship plan and improve impacts
3.1	Implement plan to participate positively in catchment governance.
3.1.1	Evidence that the site has supported good catchment governance shallImage: Comparison of the site has supported good catchment governance shallbe identified.Yes
Comment	AMS has supported good catchment governance by engaging Singapore's water authority, the Public Utilities Board (PUB) on water stewardship, shared water challenges and joint initiatives. Engagement with the PUB was conducted via email and online meetings. Some of these projects are done internally on-site, and some through external collaborations. Details are described in Section 1.1 of AMS AWS Handbook Step 3 - Supporting Good Catchment Governance.
	-BMAC Collaboration Opportunities email dated 21.02.2023 was the evidence with PowerPoint presentation available during the audit. -Sustainability work team with an email dated 10.05.2023 (SWA & WTO).
3.1.2	Measures identified to respect the water rights of others includingIndigenous peoples, that are not part of 3.2 shall be implemented.
Comment	Respecting the water rights of others is described in Section 1.2 of MS AWS Handbook Step 3 - Respecting the Water Rights of Others with link provided that water in Singapore is for all https://www.mse.gov.sg/policies/water.
3.2	Implement system to comply with water-related legal and regulatory requirements and respect water rights.
3.2.1	A process to verify full legal and regulatory compliance shall be implemented. Yes
Comment	The site's process for maintaining legal and regulatory compliance is described in the AMS AWS Handbook ("Legal and Regulatory Compliance" Section).
	No findings coming from the regulatory bodies (EHS Legal Register): 100% compliant for Water resources & wastewater management with 42 audits.
	Yearly review of the legal requirements by the global EHS group.
3.2.2	Where water rights are part of legal and regulatory requirements, measures identified to respect the water rights of others includingImage: Second S
Comment	Providing water for all is the main plan of PUB under Sustainability, thus, there are no water rights for any other groups above the others. Everyone is entitled to water rights (Public Utilities Act 2001 as of 27.06.2023).
3.3	Implement plan to achieve site water balance targets.
3.3.1	Status of progress towards meeting water balance targets set in theImage: Comparison of the state



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Comment	Water balance target is set for each of the water balance projects and documented in Water Stewardship Plan (Refer to column "Project Achievements" for Plan 2-1, 2-2, 2-3, 2-4, 2-5 as example).
	The progress of each of these projects are tracked in column "Approximate % Completion" in AMS Water Stewardship Plan. The implementation of water balance improvement projects is reviewed by the AMS Leadership Team during EHS Management Reviews and Energy Management Reviews.
	The total water consumed by the site is divided by the total volume of dryer production. Gemba Walk down was presented and part of the AMS Stewardship Plan includes actual projects completed.
3.3.2	Where water scarcity is a shared water challenge, annual targets to improve the site's water use efficiency, or if practical and applicable, reduce volumetric total use shall be implemented.Ves
Comment	Part of AMS Stewardship Plan numbers 2-3 & 2-4 and described in Section 3.2 of the AMS AWS Implementation Handbook Step 3.
	-Figure 3 describes Water Intensity and Absolute Water Consumption Target and Actual Performance. -Figure 4 describes Weekly, Monthly, Bi-Annual Water Usage Review Examples.
3.3.3	Legally-binding documentation, if applicable, for the re-allocation of water to social, cultural or environmental needs shall be identified.Yes
Comment	AMS does not have any legally-binding documentation for the allocation of water to social, cultural or environmental needs as described in Section 3.3 of AMS AWS Implementation Handbook Step 3.
3.4	Implement plan to achieve site water quality targets
3.4.1	Status of progress towards meeting water quality targets set in the waterImage: Comparison of the state of the
Comment	Project for Water Quality Targets: Numbers 3.2 up to 3.7 of the AMS Water Stewardship Plan:
	 -3-3 Protein in Fat (PIF) Clean in Place (CIP) pre-rinse diversion full implementation in January 2023 (pointed during walk-down). -3-4 Installation of tank level transmitter for a pre-neutralization tank (PNT) and final neutralization tank (FNT) in the effluent treatment plant (ETP) completed in Sep 2022 (pointed during walk-down). -3-6 Installation of effluent autosampler at final inspection chamber for wastewater quality monitoring - completed the installation in June 2022.
3.4.2	Where water quality is a shared water challenge, continual improvementImprovementto achieve best practice for the site's effluent shall be identified andYeswhere applicable, quantified.Yes



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Comment	Conformity to indicator 3.4.2 was demonstrated as presented during the audit, a handbook for this is available.
	The site continually work towards improving quality of its discharge, as well as improving the robustness of it's systems to reduce any risk of exceedance, to achieve best practice for the site effluent discharge.
	 -Figure 6 is the BOD concentration of treated effluent from 2019 to 2022. -Figure 7 is the COD concentration of treated effluent from 2019 to 2022. -Figure 8 is the TSS concentration of treated effluent from 2019 to 2022. -Figure 9 is the Hydrocarbon oil concentration of treated effluent from 2019 to 2022. -Figure 10 is the Non-hydrocarbon oil concentration of treated effluent from 2019 to 2022. -Figure 11 is the Conductivity of treated effluent from 2019 to 2022. -Figure 12 is the pH of treated effluent from 2019 to 2022.
3.5	Implement plan to maintain or improve the site's and/or catchment's Important Water-Related Areas.
3.5.1	Practices set in the water stewardship plan to maintain and/or enhance the site's Important Water-Related Areas shall be implemented.Q Obs.
Comment	Water-Related Area Targets are described in Section 5.1 of the AMS AWS Implementation Handbook Step 3 and the Water Stewardship Plan. Some actions are in progress and others under review. Evidence of implementation has been presented.
	Actions towards improvement of IWRA in the catchment can be expanded upon.
3.6	Implement plan to provide access to safe drinking water, effective sanitation, and protective hygiene (WASH) for all workers at all premises under the site's control.
3.6.1	Evidence of the site's provision of adequate access to safe drinkingImage: Comparison of adequate access to safe drinkingwater, effective sanitation, and protective hygiene (WASH) for allYesworkers onsite shall be identified and where applicable, quantified.Yes
Comment	The AMS AWS Handbook Section 5.7, AMS shows that the site provides all workers with an adequate supply of drinking water at accessible points, and adequate access to sanitation and hygiene.
	-Photographs of toilets, showers, and handwash. -Described in Section 6 of the Handbook Step 3. -Figure 13 is the completed assessment against WASH Pledge.
3.6.2	Evidence that the site is not impinging on the human right to safe water and sanitation of communities through their operations, and that traditional access rights for indigenous and local communities are being respected, and that remedial actions are in place where this is not the case, and that these are effective.
Comment	AMS ensures that its site's operation does not infringe on the human right to safe water and sanitation as witnessed during the walk down during the day of the audit where the audit team was able to witness the water intake and the ultimate discharge including the WASH facilities.
	The water meter connected to the water intake has limited access and PUB is the only authorized entity to do so (a fence secured with the lock was noted).
3.7	Implement plan to maintain or improve indirect water use within the catchment:
3.7.1	Evidence that indirect water use targets set in the water stewardshipImage: Comparison of the starget stewardshipplan, as applicable, have been met shall be quantified.Yes



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Comment	The indirect water use targets are set with each of the stakeholders and are listed in the water stewardship plan.
	Table 1 of the Indirect Water Use Target was available for five stakeholders, all the actions are in progress.
3.7.2	Evidence of engagement with suppliers and service providers, as well as, when applicable, actions they have taken in the catchment as a result of the site's engagement related to indirect water use, shall be identified.
Comment	Section 7.2 of the Handbook Step 3 details the compliance for the indicator 3.7.2, the approach of engagement is:
	-Understanding how water is used in their services/products to AMS. -Understanding water challenges faced by the supplier/service provider. -Share with them on AWS Water Stewardship Program. -Discuss potential collaborations towards reducing water use.
3.8	Implement plan to engage with and notify the owners of any shared water-related infrastructure of any concerns the site may have.
3.8.1	Evidence of engagement, and the key messages relayed withImage: Confirmation of receipt, shall be identified.Ves
Comment	Relationship with PUB is good as evidenced by the email, no concerns about the water-related infrastructure.
3.9	Implement actions to achieve best practice towards AWS outcomes: continually improve towards achieving sectoral best practice having a local/catchment, regional, or national relevance.
3.9.1	Actions towards achieving best practice, related to water governance, as applicable, shall be implemented.Image: Complemented comple
Comment	The PUB Certificate of Appreciation was available and presented during the audit for supporting Singapore World Water Day 2023 with several activities such as Walk for Water, waterway clean-ups, etc. It also includes collaboration with NGO - Waterways Watch Society.
3.9.2	Actions towards achieving best practice, related to targets in terms of water balance shall be implemented.Image: Complexity of the starget shall be implemented.Yes
Comment	Table 3 of the Water Stewardship Implementation Handbook lists the Best Practices for Water Balance (those that are implemented).
	 -NEWater is used for cooling tower operations, irrigation and fire water system, which are non □product contact water usage. Usage of NEWater is shown in Water Balance Chart (attached). -Leak detection program to identify, track, and repair leaks (refer to evidence in indicator 3.9.5).
3.9.3	Actions towards achieving best practice, related to targets in terms of water quality shall be implemented.



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Comment	Table 4 Water Stewardship Implementation Handbook lists Best Practices for Water Qualit (those that are already implemented).	У
	 -Continuous monitoring of treated effluent discharge into public sewers on important parameters, beyond regulatory requirements. -Emergency response plans on chemical spillage and wastewater emergency -Approach of an FMEA (Failure Mode Effect & Analysis) related to the management of wastewater -Installation of automatic effluent sampling devices to perform continuous sampling of wastewater discharge 	
	Correspondence with PUB on Reservoir Water Quality (samples were attached).	
3.9.4	Actions towards achieving best practice, related to targets in terms of the site's maintenance of Important Water-Related Areas shall be implemented.	⊘ Yes
Comment	Table 6 of the Water Stewardship Implementation Handbook lists Best Practices for Site Maintenance of Important Water-Related Areas (those implemented only).	
	-The ETP and stormwater drain improvements were shown. -Photos of waterways clean-up were attached (actual participation of AMS employees - this also part of the site's CSR efforts).	s is
	The site has established Policy (T-12: Water) to minimize the risk of stormwater contamination on-site through the reduction of exposure to pollution sources.	
3.9.5	Actions towards achieving best practice related to targets in terms of WASH shall be implemented.	⊘ Yes
Comment	Table 7 of the Water Stewardship Implementation Handbook lists Site Provision of Equitab and Adequate WASH Services.	le
	-Provision of additional hand sanitizer gels on site to promote good hygiene practices. -Support Singapore's national SG Clean campaign through the following practices.	





WATER STEWARDSHIP ASSURANCE SERVICES

4	STEP 4: EVALUATE - Evaluate the site's performance.
4.1	Evaluate the site's performance in light of its actions and targets from its water stewardship plan and demonstrate its contribution to achieving water stewardship outcomes.
4.1.1	Performance against targets in the site's water stewardship plan and the contribution to achieving water stewardship outcomes shall be Yes evaluated.
Comment	Outcomes of Effectiveness Check defines where the site evaluated the water stewardship outcome. Section 3 of AMS AWS Performance Report Steps 4 & 5 details the Water Stewardship Plan Performance Against Targets.
	For each project in the water stewardship plan that has been completed (i.e. with Approximate % completion at 100%), the project is evaluated for it's:
	-Project Achievement. -Contribution to Water Stewardship Outcome.
4.1.2	Value creation resulting from the water stewardship plan shall beImage: Comparison of the stewardship plan shall beevaluated.Yes
Comment	Section 3 of AMS AWS Performance Report Steps 4 & 5 details the Water Stewardship Plan Performance Against Targets.
	For each project in the water stewardship plan that has been completed (i.e. with Approximate % completion at 100%), the project is evaluated for it's:
	-Value creation to the site.
4.1.3	The shared value benefits in the catchment shall be identified andImage: Comparison of the catchment shall be identified andwhere applicable, quantified.Yes
Comment	For each project in the water stewardship plan that has been completed (i.e. with Approximate % completion at 100%), the project is evaluated for it's:
	-Share value benefits in the catchment.
	Some of the shared value benefits has been quantified.
4.2	Evaluate the impacts of water-related emergency incidents (including extreme events), if any occurred, and determine the effectiveness of corrective and preventative measures.
4.2.1	A written annual review and (where appropriate) root-cause analysis of the year's emergency incident(s) shall be prepared and the site's Yes response to the incident(s) shall be evaluated and proposed preventative and corrective actions and mitigations against future incidents shall be identified.
Comment	No water-related emergency incidents including extreme events (management review is provided as evidence for this dated 19.06.2023). The SOP for Corrective Action Procedure Past Decade analysis was provided.
4.3	Evaluate stakeholders' consultation feedback regarding the site's water stewardship performance, including the effectiveness of the site's engagement process.
4.3.1	Consultation efforts with stakeholders on the site's water stewardshipImage: Consultation of the site's water stewardshipperformance shall be identified.Yes



Alliance for Water Stewardship (AWS)

Comment	Consultation efforts with Stakeholders are described in Table 5 of the Water Stewardship Performance Report.
	-The performance of AMS was sent to Stakeholders (shown Meeting Minutes sent via email dated 07 June 2023 with PUB).
	-The website of PUB includes Abbott as one of the partners for Singapore World Water Day and a certificate was received from them.
	-Sembcorp suggested that AMS conducts training for its employees. -Merck visited the AMS site and shared knowledge on using DI water in the autoclave.
	The site's Water Stewardship Performance report is to be sent to stakeholders and their feedback on that (evaluation of their feedback) will be analyzed.
4.4	Evaluate and update the site's water stewardship plan, incorporating the information obtained from the evaluation process in the context of continual improvement.
4.4.1	The site's water stewardship plan shall be modified and adapted toImage: Composite of the step and these changes shall be identified.Incorporate any relevant information and lessons learned from the step and these changes shall be identified.Yes
Comment	The AMS Water Stewardship Plan is reviewed periodically to incorporate any feedback form stakeholder consultations, evaluation outcome lessons learned from existing projects.
	Feedback and update on the water stewardship plan were captured from the consultation with stakeholders:
	-1-2 AMS Employee Water Stewardship Training dated 15 March 2023. -1-7 Evaluation to tie in the lab water system to autoclave in the media preparation room.

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5	STEP 5: COMMUNICATE & DISCLOSE - Communicate about water stewardship and disclose the site's stewardship efforts
5.1	Disclose water-related internal governance of the site's management, including the positions of those accountable for legal compliance with water-related local laws and regulations.
5.1.1	The site's water-related internal governance, including positions of those accountable for compliance with water-related laws and regulations shall be disclosed.Ves
Comment	Email sent on 10 Feb 2023 to PUB (one of the Stakeholders) to communicate and disclose the water-related internal governance of the site's management wherein introduction of AMS EHS Specialist who is part of AMS AWS Team, was presented.
	Biopharmaceutical Manufacturing Advisory Council (BMAC) website includes the site's water-related related activities (https://www.bmacsingapore.org/member/abbott/sustainability-at-abbott/) disclosing it to the public.
5.2	Communicate the water stewardship plan with relevant stakeholders.
5.2.1	The water stewardship plan, including how the water stewardship planImage: Constributes to AWS Standard outcomes, shall be communicated torelevant stakeholders.Yes
Comment	Email sent on 12 May 2023 to one of the stakeholders - Waterways Watch Society, to communicate & disclose the water stewardship plan and how this plan will contribute to AWS standard outcomes, was presented. It likewise includes the slides presented to the stakeholder during the engagement.
5.3	Disclose annual site water stewardship summary, including: the relevant information about the site's annual water stewardship performance and results against the site's targets.
5.3.1	A summary of the site's water stewardship performance, including quantified performance against targets, shall be disclosed annually at a Yes minimum.
Comment	The site water stewardship plan performance is disclosed in Section 7 of the Annual Performance Report that is shared with the stakeholders.
	Email sent on 22 Jun 2023 was presented as evidence.
5.4	Disclose efforts to collectively address shared water challenges, including: associated efforts to address the challenges;engagement with stakeholders; and co-ordination with public-sector agencies.
5.4.1	The site's shared water-related challenges and efforts made to addressImage: Comparison of the second state of the second
Comment	The shared water challenges and actions taken are shared with external stakeholders in site's Annual Performance Report Section 6.
	Email sent on 22 Jun 2023 to stakeholders to communicate and disclose the site's shared water-related challenges and efforts to address the identified challenges.
5.4.2	Efforts made by the site to engage stakeholders and coordinate and support public-sector agencies shall be identified. Yes



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Comment	Efforts made by the site to engage stakeholders and coordinate and support public-sector agencies have been identified.	
	-Public sector - PUB engagement only (online - 3 meetings and emails were attached).	
5.5	Communicate transparency in water-related compliance: make any site water-related compliance violations available upon request as well as any corrective actions the site has taken to prevent future occurrences.	
5.5.1	Any site water-related compliance violations and associated corrections shall be disclosed.	✔Yes
Comment	No compliance violations on water-related issues (01 Jan 2023 to 16 Jun 2023 period of review).	
	-ETP effluent sampling on 19 June 2023 (sampled by Setsco). -Inspection Audits Summary at the end of the year 2022 email dated 21.06.2023.	
5.5.2	Necessary corrective actions taken by the site to prevent future occurrences shall be disclosed if applicable.	⊘ Yes
Comment	No violations against water-related issues, however, SOP is in place in case of occurrence.	
5.5.3	Any site water-related violation that may pose significant risk and threat to human or ecosystem health shall be immediately communicated to relevant public agencies and disclosed.	⊘ Yes
Comment	The site's water-related violation that may pose significant risk and threat to human or ecosystem health is stated in the handbook and discussed during the audit (SG02EHS052)	



WATER STEWARDSHIP ASSURANCE SERVICES

Alliance for Water Stewardship (AWS)



Rinse & Ingredient Water Tanks.jpg



PUB Water Meter (Water Input).jpg



Hazardous Waste Storage (2).jpg



WATER STEWARDSHIP ASSURANCE SERVICES

Alliance for Water Stewardship (AWS)

Audit Number: AO-000578



Fire Water Tanks.jpg



Ultimate Discharge Point.jpg



Waterway Cleanup Photo after the Cleanup Activity 3.9.4_-_Waterway_Clean_Up_Photo_3.jpg



WATER STEWARDSHIP ASSURANCE SERVICES

Alliance for Water Stewardship (AWS)

Audit Number: AO-000578



Hazardous Waste Storage.jpg



Washing Facility.jpg



Wet process.jpg



WATER STEWARDSHIP ASSURANCE SERVICES

Alliance for Water Stewardship (AWS)

Audit Number: AO-000578



Effluent Treatment Plant.jpg



Production Process Flow.jpg



Storm Drain.jpg



WATER STEWARDSHIP ASSURANCE SERVICES

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Waterway Cleanup Photo before the Cleanup Activity 3.9.4_-_Waterway_Clean_Up_Photo_4.jpg



Drain within Hazardous Waste Storage.jpg



Ingredient Water Treatment System.jpg



WATER STEWARDSHIP ASSURANCE SERVICES

Alliance for Water Stewardship (AWS)

Audit Number: AO-000578



Shower.jpg



Chlorine Generation Plant Panel.jpg



Effluent sampling point.jpg



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Toilet.jpg



Rinse Water.jpg





WATER STEWARDSHIP ASSURANCE SERVICES

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Audit Number: AO-000578

Comment Photos taken during the walk down (site tour) were uploaded (from the water intake to the ultimate discharge point).

It includes the photos of the catchment tour and the participation of the Audit Team and AMS Team in the clean-up activity at Marina Reservoir.

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