FINFISH AQUACULTURE SITE AQUACULTURE STEWARDSHIP COUNCIL REPORT WILLIAMSON PASSAGE, MUCHALAT INLET, BC

SITE LICENSE: AQ1705 SURVEY TYPE: ASC SURVEY DATE: JANUARY 24, 2020 REPORT DATE: FEBRUARY 13, 2020

PREPARED **F**OR:

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Summary

This document presents the qualitative and quantitative assessment of sediment obtained during the survey completed at the Williamson Passage finfish aquaculture site operated by Grieg Seafood BC Ltd. in Muchalat Inlet, BC, on January 24, 2020. Sediment was collected and the data analyzed according to the *Aquaculture Activities Regulations* (AAR) and adapted to address Criterion 2.1,4.7 and 5.2 of the Aquaculture Stewardship Council (ASC) Salmon Standard.

The measured and observed characteristics of the sediment collected during the sampling confirmed that the stations outside the Allowable Zone of Effect (AZE) on Transects A, B and C had mean sulphide levels less than the ASC Salmon Standard acceptable limit of 1500 μ m. Redox potential measured in sediment obtained outside the AZE on Transects A, B and C was greater than the ASC Salmon Standard acceptable lower limit of 0 mV.

Mean copper concentrations of the stations outside the AZE on Transects A and C were less than upper limit of 34 μ g/g listed in the requirements of Criterion 4.7 of the ASC and were also less than the means of both the reference stations sampled. The mean copper concentration of the station outside the AZE on Transect B was greater than upper limit of 34 μ g/g listed in the requirements of Criterion 4.7 of the ASC and was also greater than the means of both the reference stations sampled.

As required by Criterion 5.2 of the ASC monitoring for parasiticide residue was completed at the station outside the AZE on Transects A, B and C and at two reference stations. Emamectin benzoate and florfenicol were both below detectable limits in all collected samples.

An assessment and identification of the benthic organisms present in the sediment was not completed to evaluate for potential impacts to habitat, as BC salmon farms have been granted a variance to Indicators 2.1.2 and 2.1.3 and instead rely on the scientifically proven and federally regulated sulfide surrogates (ASC VR224)¹.

¹ http://variance-requests.asc-aqua.org/questions/vr-224-benthic-biodiversity-and-benthic-effects-salmon-v1-0-2-1-2-2-1-3/

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1.0 Introduction

This document presents the marine sediment data collected as part of a benthic study completed at the Williamson Passage finfish aquaculture site operated by Grieg Seafood BC Ltd. (Campbell River, BC). The Williamson Passage site is located in Muchalat Inlet, BC (Figure 1).

The study was completed by adapting the methodology required for operational monitoring of waste dispersion required under *Aquaculture Activities Regulations* (AAR) and comparing the results with the indicators listed in Criterion 2.1 and Criterion 4.7 of the Aquaculture Stewardship Council (ASC) Salmon Standard. Additional analysis of the collected sediment was also completed to address Criterion 5.2 of the ASC.

The purpose of the ASC Salmon Standard is to evaluate concerns of potential environmental impact related to salmon farming. The Standard is based on a combination of requirements and performance levels that must be reached in order to determine if potential impacts are being addressed. Principle 2 of the Standard addresses the "potential impacts from salmon farms on natural habitat, local biodiversity and ecosystem function" (ASC, 2012).

This survey was specifically designed to address Criterion 2.1 within Principle 2 of the ASC Salmon Standard which involved the collection of sediment within and outside of the Allowable Zone of Effect (AZE). Sediment was analyzed for redox potential and sulphide levels to evaluate benthic habitat conditions. An assessment and identification of the benthic organisms present in the sediment was not completed to evaluate for potential impacts to habitat, biodiversity and ecosystem function, as BC salmon farms have been granted a variance to Indicators 2.1.2 and 2.1.3 and instead rely on the scientifically proven and federally regulated sulfide surrogates (ASC VR224). In addition, testing for copper concentration and for parasiticide residue in sediment collected at the two reference stations and at the stations outside the AZE was completed to address Criterion 4.7.4 and Criterion 5.2.1 of the ASC.



Figure 1: An overview map showing the approximate location of the Williamson Passage finfish aquaculture farm site (red dot) in Muchalat, BC.

2.0 Methods

The substrate at the designated sampling locations at the Williamson Passage finfish aquaculture site had not been previously been identified to consist of "soft" sediment. Therefore, the field activities involved the attempted collection of sediment samples for physical and chemical analysis.

2.1 Field Sampling

The locations of sediment sampling stations were provided by Grieg Seafood BC Ltd. Sediment collection was first attempted during a preliminary survey on June 20 and 21, 2019² to identify locations at which sediment could be successfully obtained.

Individual sediment sampling stations were located along three Transects A, B, and C. Stations within the AZE were located 5 m inside the 1 g DEPOMOD contour (Figure 2) for all three transects and also at the perimeter of the containment system for Transects A and B. Stations outside the AZE were located 25 m outside of the 1 g DEPOMOD contour. Additional stations were established at two reference outside the range of 500 m to 1000 m from the aquaculture containment system outlined in the ASC Salmon Standard (Figure 3) due to the difficulty in finding sediment within that area in Muchalat Inlet, BC.

The results of the preliminary assessment concluded that sediment could not be successfully obtained at the station inside the AZE on Transect A. During this survey the collection of sediment could not be completed at the 0m station on Transect B because a generator float had been placed over the sample location (Photo 10).

Sediment was collected using a Petite Ponar sampler. Two sediment samples were collected at each station.

The coordinates of the sample locations were recorded using a Trimble GeoExplorer GeoXT (Firmware v1.05) using TerraSync 3.30 software and equipped with an external Hurricane antenna.

Data filters were set to standards recommended by the Resource Inventory Standards Committee (RISC)³, with at least 15 fixes taken per location, using satellites greater than 15 % above the horizon with signal to noise ratios (SNR) greater than 40 and a horizontal dilution of precision (HDOP) of five. The GPS data was corrected postmission with Pathfinder Office v5.40 software using data from the Ucluelet base station (UCLA).

The Trimble antenna was attached to the grab davit and positional fixes were obtained while the grab was completing the estimated bottom third of its descent. Positional fixes were completed when the grab was on the bottom and the drop line was as close vertical as possible.

 ² Benthic Biodiversity Assessment Williamson Finfish Aquaculture Site. An unpublished report prepared for Grieg Seafood BC Ltd. by Mainstream Biological Consulting Inc. July 8, 2019.
³ Integrated Land Management Bureau. 2008. Province of British Columbia Standards, Specifications and Guidelines for Resource Surveys Using Global Positioning System (GPS) Technology. Release 4.0d.



Figure 2: The locations of the sampling stations for the ASC survey at the Williamson Passage finfish aquaculture site in relation to the pen system and surrounding area on January 24, 2020.



Figure 3: The location of the reference stations (green dots) for the ASC survey at the Williamson Passage finfish aquaculture site in relation to the pen system (red dot) and surrounding area on January 24, 2020.

The time at which each sample was successfully obtained and physical characteristics of the collected sediment were recorded. A digital photograph of each sample was also taken. As per Indicator 2.1.1, levels of free sulphides and redox potential of each sediment sample were measured in the field using an Orion A324 meter and the appropriate ISE probes. A digital thermometer was used to measure the temperature of the sediment.

As per Indicator 4.7.4 and 5.2.1, portions of the grab samples collected at the stations outside the AZE on Transects A, B and C as well as the reference stations were retained for copper analysis and parasiticide residue. Retained samples were stored at 4° Celsius and transported to Bureau Veritas for the analysis of copper concentrations and to SGS Canada Inc for analysis for emamectin benzoate and florfenicol.

2.2 Data Analysis

In order to evaluate if the benthic conditions at and near the Williamson Passage site met the requirements of Criterion 2.1 of the ASC Salmon Standard, the data collected was compared to required levels for indicators of potential finfish farm impacts. These indicators represent a combination of chemical and biodiversity measurements to evaluate the status of benthic health, biodiversity and ecosystem function and to detect potential impacts related to the salmon farm operation. The indicators considered for this assessment are summarized below in Table 1.

Additional analysis of parasiticide residue was completed to fulfill the requirement for monitoring of these chemicals but there is no required level presented in the ASC to compare these results to.

Table 1: Summary of indicators of benthic health, biodiversity and ecosystem function that were considered during the evaluation of the Williamson Passage finfish aquaculture site. The indicators have been adopted from Criterion 2.1 and 4.7 of the ASC Salmon Standard.

Criterion Number	Indicator	ASC Salmon Standard Requirement
2.1.1	Redox potential in sediment outside the AZE ¹ .	>0 millivolts (mV)
2.1.1	Sulphide levels in sediment outside the AZE.	≤1500 microMoles / L (µM)
4.7.4	Copper concentration	Evidence that copper levels are < 34 mg Cu/kg dry sediment weight OR in instances where the Cu in the sediment exceeds 34 mg Cu/kg dry sediment weight, demonstration that the Cu concentration falls within the range of background concentrations as measured at three reference sites in the water body.

1: AZE = Allowable Zone of Effect

3.0 Results and Discussion

Representative photographs of sediment obtained at each sampling station are presented in Appendix 1. Raw data obtained from sediment sampled in the field is presented in Appendix 2 and the summarized data is presented in Appendix 3.

The sediment successfully collected at the Williamson Passage sampling stations was different on each transect. The sediment along the B transect consisted of brown mud with small woody debris, while the sediment at the C transect locations consisted of brown mud inside the AZE and muddy gravel outside the AZE. The 0m station on Transect A consisted of black mud that was off gassing while the station outside the AZE consisted of grey shell hash.

On June 20 and 21, 2019 during a preliminary survey a total of four grab attempts were made inside the AZE on Transects A. All of the attempts were unsuccessful in obtaining sufficient sediment for analysis. The location and results of each of the unsuccessful grab attempts are presented in Table 2.

Table 2:The location and results of each unsuccessful grab attempts at the station
inside the AZE on Transect A at the Williamson Passage finfish aquaculture
site during the preliminary survey on June 20, 2019.

Station	Latitude	Longitude	Sampling Device	Comments
Inside AZE A	49 39.31315	126 26.06161	Ponar	Shell hash, sand, small woody debris.
Inside AZE A	49 39.31181	126 26.06060	Ponar	Tubeworm, shell.
Inside AZE A	49 39.31215	126 26.06013	Ponar	Trace sand, tubeworm.
Inside AZE A	49 39.31273	126 26.06026	Ponar	Empty.

3.1 Redox Potential and Sulphide Levels

Following Criterion 2.1.1 of the ASC Salmon Standard, the results of redox potential and sulphide testing at the station outside the AZE were analyzed to help evaluate if the Williamson Passage facility was meeting the certification requirements (Appendix 3).

The mean sulphide level in sediment collected at the stations outside AZE on Transects A, B and C (35.9 μ M, 203 μ M and 25.8 μ M repsectively) on January 24, 2020 were less than the ASC Salmon Standard sulphide upper limit of 1500 μ M.

Mean redox potential in sediment collected at the stations outside the AZE on Transects A, B and C (155.8 mV, 42.9 mV and 132.9 mV respectively) were greater than the 0 mV minimum requirement cited in Criterion 2.1.1 of the ASC Salmon Standard.

3.2 Copper Concentration

The copper concentrations of the sediment collected from the stations outside the AZE on Transects A, B and C and the two reference stations are shown in Table 3. The sediment collected at the station outside the AZE on Transect A and C had mean copper concentrations (12.0 mg/g and 21.5 mg/g) that were below the background mean concentrations measured at both Reference 1 (36.2 mg/g) and Reference 2 (38.2 mg/g). These two stations meet the ASC Salmon Standard in accordance with Criterion number 4.7.4.

The mean copper concentration measured at the station outside the AZE on Transect B (112 mg/g) was higher than 34 mg/g and greater than both reference stations and therefore the benthic conditions at this location did not meet the ASC Salmon Standard in accordance with Criterion number 4.7.4.

Table 3:	The copper concentrations of collected sediment at the stations outside the
	AZE on Transect A, B and C and the two reference stations at the Williamson
	Passage finfish aquaculture site on January 24, 2020.

Station	Cu (mg/g)	Mean	SD		
Outside AZE A	2.9	12.0	12.9		
Outside AZE A	21.0	12.0	12.0		
Outside AZE B	79.7	110	16 1		
Outside AZE B	145	112	40.1		
Outside AZE C	24.1	21.5	2.69		
Outside AZE C	18.9	21.0	3.00		
Reference 1	34.8	26.2	1.0		
Reference 1	37.5	30.2	1.9		
Reference 2	41.7		4.05		
Reference 2	34.7	30.2	4.95		

3.3 Parasiticide Residue

Analysis of the sediment collected from the stations outside the AZE on Transects A, B and C and the two reference stations for emamectin benzoate and florfenicol are shown in Table 4. The analysis was completed to fulfill the requirement of the ASC Salmon Standard Criterion number 5.2.1. All of the collected sediment samples analyzed had parasiticide residue concentrations less than the laboratory detectable limits.

Table 4:	The parasiticide residue concentration of collected sediment at the stations
	outside the AZE on Transects A, B and C and the two reference stations at the
	Williamson Passage finfish aquaculture site on January 24, 2020.

Station Name	Sample Number	Emamectin Benzoate (ppm)	Florfenicol (ng/g)	Florfenicol Amine (ng/g)
Detection L	imit	1.0	2.00	5.00
Outside AZE A	1	<1.0	<2.00	<5.00
Outside AZE A	2	<1.0	<2.00	<5.00
Outside AZE B	1	<1.0	<2.00	<5.00
Outside AZE B	2	<1.0	<2.00	<5.00
Outside AZE C	1	<1.0	<2.00	<5.00
Outside AZE C	2	<1.0	<2.00	<5.00
Reference 1	1	<1.0	<2.00	<5.00
Reference 1	2	<1.0	<2.00	<5.00
Reference 2	1	<1.0	<2.00	<5.00
Reference 2	2	<1.0	<2.00	<5.00

4.0 References

- Aquaculture Stewardship Council. 2012. ASC Salmon Standard Version 1.3. Available online: www.asc-aqua.org.
- Salas, F., Patrício, J. and Marques, J.C. 2006. Ecological Indicators in Coastal and Estuarine Environmental Quality Assessment - A user friendly guide for practitioners. Imprensa da Universidade de Coimbra.

Appendix 1 – Sample Photographs



Photo 1

Sediment sample collected at the 0m station on Transect A at the Williamson Passage site on January 24, 2020.



Photo 2

Typical missed grab attempt at the station inside the AZE on Transect A at the Williamson Passage site on June 20, 2019.



Photo 3

Sediment sample collected at the station outside the AZE on Transect A at the Williamson Passage site on January 24, 2020.



Photo 4

Sediment sample collected at the station inside the AZE on Transect B at the Williamson Passage site on January 24, 2020.



Photo 5

Sediment sample collected at the station outside the AZE on Transect B at the Williamson Passage site on January 24, 2020.



Photo 6

Sediment sample collected at the station inside the AZE on Transect C at the Williamson Passage site on January 24, 2020.



Photo 7

Sediment sample collected at the station outside the AZE on Transect C at the Williamson Passage site on January 24, 2020.



Photo 8

Sediment sample collected at the Reference 1 station at the Williamson Passage site on January 24, 2020.



Photo 9

Sediment sample collected at the Reference 2 at the Williamson Passage site on January 24, 2020.



Photo 10

The generator float blocking access to the 0m station on Transect B at the Williamson Passage site on January 24, 2020.

Appendix 2 – Williamson Passage Field Data

Reference Information:

Farm site: Williamson Passage

Aquaculture Company: Grieg Seafood BC Ltd.

Field Crew: L Stewardson, E. Cicon

Field Investigator: Mainstream Biological Consulting Inc.

Laboratory: SGS Canada Inc and Bureau Veritas

Geographic Region: Muchalat Inlet, BC

Site Reference #: AQ1705

ransect A, B, C Name	Sampling Station Name	Replicate Number	Transect A, B, C Bearing (Magnetic)	Reference Station (Y/N)	Distance from Pens (m)	Sampling Device Type	Sampling Device Capacity (m2)	Quality Control Replicate (Y/N)	Replicate Analysis Type	Sample Date (YYYY-MM-DD)	Sample Time (24HH:MM)	Sample Latitude (Degrees)	Sample Latitude (Minutes)	Sample Longitude (Degrees)	Sample Longitude (Minutes)	GPS Correction Status	Ocean Depth (m)	Sample Depth (cm)
А	0m	1			0	Petite Ponar	0.02			2020-01-24	11:42:03	49	39.34822	126	25.95649	Postprocessed corrected	96.8	10
А	0m	2			0	Petite Ponar	0.02			2020-01-24	11:48:00	49	39.34825	126	25.95651	Postprocessed corrected	97.0	10
А	Out AZE	1			174	Petite Ponar	0.02			2020-01-24	12:08:02	49	39.31068	126	26.09302	Postprocessed corrected	65.5	6
А	Out AZE	2			174	Petite Ponar	0.02			2020-01-24	12:19:04	49	39.30339	126	26.08705	Postprocessed corrected	65.9	5
В	In AZE	1			123	Petite Ponar	0.02			2020-01-24	9:13:14	49	39.43169	126	25.69798	Postprocessed corrected	148	10
В	In AZE	2			123	Petite Ponar	0.02			2020-01-24	9:23:27	49	39.43689	126	25.7008	Uncorrected	148	8
В	Out AZE	1			153	Petite Ponar	0.02			2020-01-24	9:35:58	49	39.44023	126	25.67991	Postprocessed corrected	143	8
В	Out AZE	1			153	Petite Ponar	0.02	Y	Duplicate	2020-01-24	9:35:58	49	39.44023	126	25.67991	Postprocessed corrected	143	8
В	Out AZE	2			153	Petite Ponar	0.02			2020-01-24	9:41:51	49	39.45098	126	25.68697	Postprocessed corrected	143	9
С	In AZE	1			82	Petite Ponar	0.02			2020-01-24	10:09:00	49	39.32366	126	25.81102	Postprocessed corrected	187	7
С	In AZE	2			82	Petite Ponar	0.02			2020-01-24	10:32:33	49	39.32509	126	25.80727	Postprocessed corrected	187	7
С	Out AZE	1			112	Petite Ponar	0.02			2020-01-24	10:54:04	49	39.31384	126	25.78675	Postprocessed corrected	187	5
С	Out AZE	2			112	Petite Ponar	0.02			2020-01-24	11:14:48	49	39.3064	126	25.80205	Postprocessed corrected	187	5
Ref 1	Ref 1	1			1760	Petite Ponar	0.02			2020-01-24	12:53:10	49	39.22408	126	24.50613	Postprocessed corrected	117	10
Ref 1	Ref 1	2			1760	Petite Ponar	0.02			2020-01-24	13:00:49	49	39.22139	126	24.5021	Postprocessed corrected	114	10
Ref 2	Ref 2	1			1250	Petite Ponar	0.02			2020-01-24	12:33:36	49	39.60103	126	25.00878	Postprocessed corrected	122	10
Ref 2	Ref 2	2			1250	Petite Ponar	0.02			2020-01-24	12:42:13	49	39.59474	126	25.00908	Postprocessed corrected	128	10

Transect A, B, C Name	Sampling Station Name	Replicate Number	Free Sulphide (micromolar)	Sediment Temperature (deg C)	Eh Uncorrected (mV)	Eh Corrected (mV)	Cu (micro-g/g)	Zn (micro-g/g)	Li (micro-g/g)	Gravel Percent	Sand Percent	Mud Percent TVS Percent	Beggiatoa Observed (Y/N)	OPC Observed (Y/N)	Fish Feed Observed (Y/N)	Fish Feces Observed (Y/N)	Odour Rating	Black Sediment Observed (Y/N)	Gas Bubbles Observed (Y/N)
А	0m	1	9420	7.6	-331.5	-115.5								Y	Ν	Y	4	4	Y
А	0m	2	5680	7.7	-333.9	-117.9								Y	Ν	Y	4	4	Y
А	Out AZE	1	34.9	7.5	-58.2	157.8								N	Ν	Ν	0	0	Ν
А	Out AZE	2	36.8	7.5	-62.3	153.7								N	Ν	Ν	0	0	Ν
В	In AZE	1	158	7.5	-119.3	96.7								N	Ν	Ν	0	0	Ν
В	In AZE	2	114	7.5	-193.9	22.1								N	Ν	Ν	0	0	N
В	Out AZE	1	264	7.5	-164.8	51.2								N	Ν	Ν	0	0	N
В	Out AZE	1	220	7.5	-182.7	33.3								N	Ν	Ν	0	0	N
В	Out AZE	2	141	7.5	-181.5	34.5								N	Ν	Ν	0	0	Ν
С	In AZE	1	135	7.4	-189.8	27.2								N	Ν	Ν	0	0	N
С	In AZE	2	64.1	7.4	-182.9	34.1								N	Ν	Ν	0	0	N
С	Out AZE	1	33.7	7.2	-171.3	45.7								N	Ν	Ν	0	0	N
С	Out AZE	2	17.8	7.3	3.0	220								N	Ν	Ν	0	0	Ν
Ref 1	Ref 1	1	67.5	7.8	-189.3	26.7								N	N	N	0	0	N
Ref 1	Ref 1	2	45.0	7.8	-186.0	30								N	N	N	0	0	N
Ref 2	Ref 2	1	60.9	7.9	-191.4	24.6								N	N	N	0	0	N
Ref 2	Ref 2	2	77.3	7.9	-185.2	30.8								N	Ν	N	0	0	N

Table note:

• Odour rating: ranked on a scale of 0 (no odour) to 4 (very strong sulphide odour)

											-
Other Sample Observatio	Sediment Texture Observations	Sediment Colour Observations	Megafauna Observed (Y/N)	Macrophytes Observed (Y/N)	Farm Litter Observed (Y/N)	Terrigenous Material Observed (Y/N)	Shell Hash Observed (Y/N)	Flocculent Organic Material Observed (Y/N)	Replicate Number	Sampling Station Name	Transect A, B, C Name
Off gassing	Mud	Black	N	N	N	N	N	Y	1	0m	А
Off gassing	Mud	Black	Ν	N	N	N	N	Y	2	0m	А
	Shell Hash	Grey	Y	N	N	N	Y	N	1	Out AZE	А
	Shell Hash	Grey	Y	N	N	N	Y	N	2	Out AZE	А
Abundant wood	Mud	Brown	Ν	N	Ν	Y	Y	N	1	In AZE	В
Abundant wood	Mud	Brown	Ν	Ν	Ν	Y	Y	N	2	In AZE	В
One stick	Mud	Brown	Ν	N	Ν	Y	Y	N	1	Out AZE	В
One stick	Mud	Brown	Ν	Ν	Ν	Y	Y	N	1	Out AZE	В
Tubeworms	Mud	Brown	Y	N	N	Y	Y	N	2	Out AZE	В
Tubeworms	Mud	Brown	Y	N	N	N	Y	N	1	In AZE	С
Tubeworms	Mud	Brown	Y	N	Ν	Ν	Y	N	2	In AZE	С
Clam, Hydroi	Gravely mud	Brown	Y	N	N	Ν	Y	N	1	Out AZE	С
Brittle stars	Gravely mud	Grey	Y	N	Ν	Ν	Y	N	2	Out AZE	С
	Mud	Green	Ν	N	Ν	Ν	N	N	1	Ref 1	Ref 1
	Mud	Green	Ν	N	Ν	Ν	N	N	2	Ref 1	Ref 1
	Mud	Green	N	N	N	N	N	N	1	Ref 2	Ref 2
	Mud	Green	N	N	N	N	N	N	2	Ref 2	Ref 2

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Appendix 3 – Williamson Passage ASC Survey Summary

Company:	Grieg Seafood BC Ltd.	Sample date:	January 24, 2020
Farm Site:	Williamson Passage	Field crew:	L Stewardson, E Cicon
Site License #:	AQ1705	Analytical:	SGS Canada Inc and Bureau Veritas
Site Location	Muchalat Inlet, BC		

SULPHIDES Indica					
Station	Rep 1	Rep 2	n	Mean	ASC Criteria Met
0m A	9420	5680	2	7600	
Outside AZE A	34.9	36.8	2	35.9	Yes
Inside AZE B	158	114	2	136	
Outside AZE B	264	141	2	203	Yes
Inside AZE C	135	64.1	2	99.6	
Outside AZE C	33.7	17.8	2	25.8	Yes
Reference 1	67.5	45.0	2	56.3	
Reference 2	60.9	77.3	2	69.1	

REDOX POTENTIAL Indicator 2.1.1 Requirement > 0 mV					
Station	Rep 1	Rep 2	Ν	Mean	ASC Criteria Met
0m A	-115.5	-117.9	2	-116.7	
Outside AZE A	157.8	153.7	2	155.8	Yes
Inside AZE B	96.7	22.1	2	59.4	
Outside AZE B	51.2	34.5	2	42.9	Yes
Inside AZE C	27.2	34.1	2	30.7	
Outside AZE C	45.7	220	2	132.9	Yes
Reference 1	26.7	30.0	2	28.4	
Reference 2	24.6	30.8	2	27.7	