BERING STRAIT NORSEMAN II 2021 MOORING CRUISE REPORT Research Vessel Norseman II, Norseman Maritime Charters

Nome-Nome, 7thJuly to 17th July 2021

Rebecca Woodgate, University of Washington (UW), *woodgate@uw.edu* Jim Johnson, John Guthrie, Laramie Jensen, Katy Christensen, Robert Daniels (2021 Science Team) *Funding from NSF Arctic Observing Network Program PLR-1758565*

Z *Chief Scientist:* Rebecca Woodgate, University of Washington (UW), USA. 1013 NE 40th Street, Seattle WA, 98105 Email: woodgate@uw.edu Tel: +1-206-221-3268;

Co-PI (1758565): Cecilia Peralta-Ferriz, UW

Related Pls:

Marine Mammal Recorders: Kate Stafford, UW, USA Trace Metal/Nutrient Sampling: Laramie Jensen, Randi Bundy, Ryan McCabe, UW

Glider:

Hank Statscewich, University of Alaska Fairbanks (UAF)

As part of the Bering Strait project funded by NSF-AON (Arctic Observing Network), in July 2021 a team of US scientists undertook a \sim 11 day cruise in the Bering Strait and southern Chukchi Sea region on the US vessel Norseman II, operated by Support Vessels of Alaska, Inc..

The primary goals of the expedition were:

1) recovery of 6 moorings carrying physical oceanographic (Woodgate & Peralta Ferriz) and whale acoustic (Stafford) instrumentation. These moorings were deployed in the Bering Strait region in 2019 and 2020 from the Norseman II. The funding for the physical oceanographic components of these moorings comes from NSF-AON.

2) deployment of 3 moorings in the Bering Strait region, carrying physical oceanographic (Woodgate & Peralta-Ferriz) and whale acoustic (Stafford) instrumentation. The funding for the physical oceanographic components of these moorings comes from NSF-AON.

3) collection of trace metal/nutrient water samples using a pumped system at selected CTD casts (Jensen)

4) a set of CTD sections studying water properties in the region (Woodgate & Peralta-Ferriz)

5) collection of accompanying ship's underway data, viz. surface water temperature and salinity, ADCP velocity data and meteorological data (Woodgate & Peralta-Ferriz),

6) deployment of a glider (Statscewich).

The cruise loaded and offloaded gear in Homer, Alaska, and people in Nome, Alaska.

As a Covid precaution, the science team quarantined in Fairbanks for 10 days prior to the cruise and transferred to the ship via a private air charter flight

Key Statistics:

6 moorings recovered, 3 moorings deployed, 276 CTD casts on 14 CTD lines, trace metal/nutrient water samples taken on 41 stations, 1 glider deployed



Research vessel Norseman II during 2019 Nome on-load [Credit: Woodgate].

SCIENCE BACKGROUND

The ~50m deep, ~ 85km wide Bering Strait is the only oceanic gateway between the Pacific and the Arctic oceans.

The oceanic fluxes of volume, heat, freshwater, nutrients and plankton through the Bering Strait are critical to the water properties of the Chukchi [*Woodgate et al.*, 2005a]; act as a trigger of sea-ice melt in the western Arctic [*Woodgate et al.*, 2010]; provide a subsurface source of heat to the Arctic in winter, possibly thinning sea-ice over about half of the Arctic Ocean [*Shimada et al.*, 2006; *Woodgate et al.*, 2010]; are ~ 1/3rd of the freshwater input to the Arctic [*Aagaard and Carmack*, 1989; *Woodgate and Aagaard*, 2005]; and are a major source of nutrients for ecosystems in the Arctic Ocean and the Canadian Archipelago [*Walsh et al.*, 1989]. In modeling studies, changes in the Bering Strait throughflow also influence the Atlantic Meridional Overturning Circulation [*Wadley and Bigg*, 2002] and thus world climate [*De Boer and Nof*, 2004].

Quantification of these fluxes (which all vary significantly seasonally and interannually) is critical to understanding the physics, chemistry and ecosystems of the Chukchi Sea and western Arctic, including sea-ice retreat timing and patterns, and possibly sea-ice thickness. The Bering Strait oceanic heat flux has been found to be the best predictor of Chukchi sea ice retreat [*Serreze et al.*, 2016]. Understanding the processes setting these fluxes is vital to prediction of future change in this region, in the Arctic, and beyond. The Bering Strait is the only Arctic gateway where observations currently show significant interannual change [Østerhus et al., 2019].

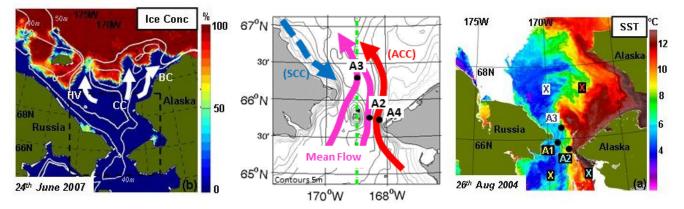


Figure 1: (Left) Chukchi Sea ice concentration (AMSR-E) with schematic topography. White arrows mark three main water pathways melting back the ice edge [Woodgate et al., 2010].

(Middle) Detail of the Bering Strait, with schematic flows and mooring locations (black dots – A2, A3, A4). The main northward flow passes through both channels (magenta arrows). Topography diverts the western channel flow eastward near site A3. The warm, fresh Alaskan Coastal Current (ACC) (red arrow) is present seasonally in the east. The cold, fresh Siberian Coastal Current (SCC) (blue dashed arrow) is present in some years seasonally in the west. Green dashed line at 168°58.7'W marks the US-Russian EEZ (Exclusive Economic Zone) boundary. Note all moorings are in the US EEZ. Depth contours are from IBCAO [Jakobsson et al., 2000]. The Diomede Islands are in the center of the strait, shown here as small black dots on the green dashed line marking the US-Russian boundary.

(Right) Sea Surface Temperature (SST) MODIS/Aqua level 1 image from 26th August 2004 (courtesy of Ocean Color Data Processing Archive, NASA/Goddard Space Flight Center). White areas indicate clouds. Note the dominance of the warm ACC along the Alaskan Coast, and the suggestion of a cold SCC-like current along the Russian coast [Woodgate et al., 2006].

Since 1990, year-round moorings have been maintained almost continually year-round in the Bering Strait region, supported by typically annual servicing and hydrographic cruises [*Woodgate et al.*, 2015; *Woodgate*, 2018]. These data have allowed us to quantify seasonal and interannual change [*Woodgate et al.*, 2005b; *Woodgate et al.*, 2006; *Woodgate et al.*, 2010; *Woodgate et al.*, 2012; *Woodgate*, 2018; *Woodgate and Peralta-Ferriz*, 2021], and assess the strong contribution of the Alaskan Coastal Current (ACC) to the fluxes through the strait [*Woodgate and Aagaard*, 2005; *Woodgate*, 2018]. These data also show that the Bering Strait throughflow increased ~50% from 2001 (~0.7Sv) to 2011 (~1.1Sv), driving heat and freshwater flux increases

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

[Woodgate et al., 2012], with more recent fluxes also being high (e.g., 2014, 1.2Sv, [Woodgate, 2018; Woodgate and Peralta-Ferriz, 2021], see Figure 2).

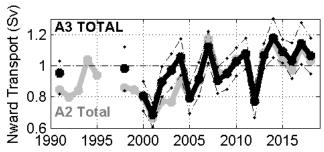
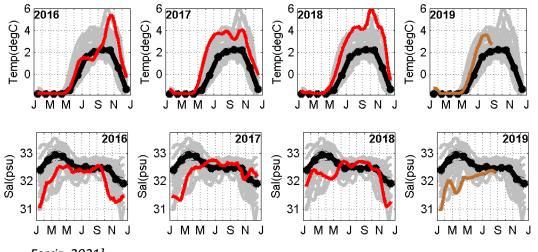


Figure 2: Annual mean (x-axis, time in years) of Bering Strait mooring data from 1991 to 2018, showing transport for the whole strait, as estimated from A2 (grey) or A3 (black).

Analysis [*Woodgate*, 2018] indicates this long term trend is driven by large scale changes between the Pacific and the Arctic oceans, with no significant trends

in the winds in the strait. Thus, satellite-sensed data sets (winds, SST) prove insufficient for quantifying longterm variability, indicating interannual change can still only be assessed by in situ year-round measurements [*Woodgate et al.*, 2012]. The work to be accomplished on this cruise will extend this mooring time-series to mid-2022.

In addition, this cruise aims to provide a high resolution survey of the water properties of the strait and southern Chukchi Sea in early-summer. A particular goal is to quantify the early season heat and salt content of the waters, which have been unusually warm and fresh in the last 4 years (see Figure 3).



3: 30 Figure day smoothed near-bottom A3 temperature (top) and salinity (bottom), data for recent years (columns), showing labeled year in color, climatology [Woodgate et al., 2005b] in black, and all prior years (1990present) in grey. X-axis labels show month (J=January,etc.), [Woodgate and Peralta-

Ferriz, 2021].

The winter freshenings observed are particularly remarkable and suggest Pacific waters are entering the Arctic 50m shallower than before, and no longer refreshing the cold layer which historically protected the sea ice from warmer Atlantic waters below. The impacts of this on Arctic climate are currently unclear.

In addition to physical oceanographic goals, our work also supports long term marine mammal acoustic monitoring in the Strait (PI: Stafford).

International links: Maintaining the time-series measurements in Bering is important to several national and international programs, e.g., the Arctic Observing Network (AON), started as part of the International Polar Year (IPY) effort in 2007; various NSF, ONR and NPRB projects and missions in the region. For several years, the work was part of the RUSALCA (Russian-US Long Term Census of the Arctic). Some of the CTD lines are part of the international Distributed Biological Observatory (DBO) effort. The mooring work also supports regional studies in the area, by providing key boundary conditions for the Chukchi Shelf/Beaufort Sea region (a current focus on ONR Arctic programs); a measure of integrated change in the Bering Sea, and an indicator of the role of Pacific Waters in the Arctic Ocean.

2021 CRUISE SUMMARY:

Since in 2020 no Bering Strait mooring recoveries were done due to the Covid situation, we scheduled our 2021 Bering Strait mooring cruise for July, traditionally a time of few storms, and early in the season, in the hope of avoiding the need to drag for too many of the old moorings.

Even though the Covid vaccination program was well advanced in both Washington and Alaska, anti-Covid precautions were still required for the cruise, and the science team followed a strict pre cruise quarantine consisting of 14 days "Strict social Distancing" in Seattle, a pre flight test, a 10-day isolation quarantine in Fairbanks, another predeparture test, and then a charter flight (rather than a commercial flight) to Nome. The charter flight left Fairbanks early (~ 7:30am) on the first day of the cruise (7th July 2021), and under a special arrangement with Nome, the science team transferred directly to the ship from the airport, without entering the airport building.

To minimize contacts in Nome, science gear was also loaded in Homer (the home port of the ship), rather than Nome, with the ship leaving Homer for Nome on the 29th June 2021. The transit north was used to trouble shoot the underway systems. Three issues were encountered - the seawater intake system not transmitting data (which seemed to resolve itself), the aft GPS providing erroneous dates (this is the GPS week rollover error, and resolved by using a different GPS unit/post processing), and the meteorological package (new this year), not logging (a set up issue). The ship reached Nome on the 6th July and on the am of the 7th July performed a calibration of the meteorological sensors' compass just outside Nome, prior to the arrival of the science party.

The ship sailed from Nome shortly after everyone was on board. The transit to the strait was used to set up science gear, including reporting the CTD termination and doing a test CTD cast.

The 8th July provided good weather for the first day of recoveries. Four mooring recoveries (A2-20, A2-19, A4-20, A4-19) were completed smoothly, with pre-recovery CTD casts. All moorings released as planned with no dragging necessary. It proving too late in the day to transit to A3 in time for working, an underway section across the Alaskan Coastal Current was run while the A2 mooring was prepared for deployment. Mooring A2-20 was deployed, and a post-deployment CTD was taken. The ship then ran underway sections (to BS11, up to NBS10, west along NBS and then up to A3) until the next morning. In the preliminary part of this run, the trace metal/nutrient pumping system was set up and tested.

The 9th July again provided good weather for mooring recoveries. After pre-recovery CTD casts, mooring A3-20 was recovered smoothly. Mooring A3-19 required dragging, an operation which first brought aboard one of our prior anchors (in extremely good condition). The A3-19 mooring was sighted during this operation and safely recovered afterwards. Then mooring A3-21 was deployed, with its accompanying post deployment CTD cast, and the ship steam south running underway lines (S along the DL line, east along BS, west back along BS, east along BS again) to be at A4 for the morning. These underway sections should capture the movement of the ACC under a wind change from southward to northward winds.

During this transit, we became aware that the release system for the iscat had not been installed in the A3 mooring. Thus, to safeguard the most important mooring of our project, we postponed the deployment of A4 until A3 could be recovered, repaired and redeployed, an operation which required better weather than we currently had. Thus, on the 10th July, we instead ran the BS CTD line, with sampling for trace metals/nutrients, continuing N along the DL lines (no trace metals/nutrients) and the A3line (with trace metals/nutrients). This enabled us to return to A3 for the mooring operations at A3 on the morning of the 11th of July. From that operation, we steamed to A4, to deploy A4-21, and then returned north to continue our CTD survey, pausing around the A3 line that evening to deploy the glider.

Starting early on the 12th July, we CTDed (with trace metal/nutrient sampling) the CS line towards Point Hope, although poor weather forced us to suspend operations for ~ 4hrs after CS13, a cast we retook once the weather had calmed to test the continuity of the section. The PH line was started late that night, and run westward to NPH13 only, a time choice to allow timely completion of the other sections, the end location being chosen beyond a chlorophyll maximum found in prior years, but absent this year. Thus on the 13th July, we completed the shortened NPH line, ran the CD line east from CD14, and the LIS line westward with trace metal/nutrient sampling, and started the CCL line heading south towards the NPH line. The initial stations of the

LIS line found remarkably fresh water (~ 25psu) and some surface samples were taken for O18 analysis when back in Seattle.

On the 14th July we repeated the NPH line (this time in full) and the CS line (this time in almost calm). A dead grey whale was spotted around station CS14.5 and reported to NOAA. In the teeth of a poor forecast, we started working south along the CCL line and DL lines late that evening. The bad weather predicted arrived on the 15th July, breaking off CTD operations after cast DL16.5. To retain a chance of repeating the BS line, we continued S into the high winds, attaining the lee of the Diomede islands around 11pm. During the night, we transited back and forward around the north and east sides of Little Diomede hiding from weather.

Early on the 16th July (~0630 ship time), we started the final run of the BS line with trace metal/nutrient sampling, although the winds were still strong (from the south). A small easing of the wind allowed us to accomplish the section, and half the stations on the SBSnn line before turning for Nome around 8:30pm ship time.

As in 2019, the transit to Nome was slowed by strong currents (possibly tidal), but the ship made Nome by around 8am, and was able to tie up alongside a barge, over which the science team was able to disembark gear (for Air Cargo). The science team left the ship around 1045am, catching the lunch time flight back to Anchorage and then onto Seattle. The ship left Nome around 1130 to transit to Homer, arriving in Homer on the 25th July.

Other than the missing weak link on the moorings (also missed on A2, though that could not be recovered and replaced), the cruise went exceptionally smoothly. It is remarkable that only one dragging operation was necessary, although this is in part due to the cruise being so early in the year. The 2019 moorings were deployed in September, after the main summer growing season and thus really only had one summer (2020) in which to biofoul. The 2020 mooring recoveries were remarkably clean. After some teething problems, the CTD operations went smoothly, recording 276 casts. The retermination of the cable was something we were prepared for, but not expecting. The first 10 CTD casts were missing the TS ducting on the CTD, causing a mismatch between T and C data. However as these were calibration casts of the deeper layer (where the timing mismatch was not critical) no special processing has been done to correct for this. Due to driver inattention, the CTD touched bottom on cast 222, but without damage or data loss other than on the oxygen upcast. Vent plugs caused the usual problems, though their impact on the data is minimal due to vigilance of the CTD driver and deck crew, to ensure regular and timely cleaning. The trace metal/nutrient pumping, a first for this cruise, went extremely smoothly, collecting data on 41 stations (33 separate locations). Unresolved issues remain with the meteorological data (new system this year), which we suspect may be reading high on wind speeds, and erroneously on temperature. This requires further investigation. Issues with the Aft-GPS date remained unresolved for the cruise - the aft A-frame GPS was repositioned to the aft rail, but CTD and other systems logged instead the forward GPS data which was correct.

Over all, a set of 14 CTD lines were taken, mostly under northward wind conditions, but through various wind strengths. For full station coverage, see map and listings below. Preliminary results are given in the various sections.

Summary of CTD lines.

BS (*Bering Strait*) (US portion) – the main Bering Strait line, run at the start and at nearly the end of the cruise. This line has been occupied by past Bering Strait mooring cruises. US portion only run here. This line was previously ~ 2nm resolution. On both runnings of this section, we used the more recent station spacing of ~1nm to better resolve the structure in the strait. Previous runnings of this line have included two stations (BS23 and BS24) which fall south of the main line near Prince of Wales, extending the line along (rather than across) isobaths. Neither BS23 and BS24 were taken during this cruise. **Pumped samples for trace metals/nutrients were taken on both runnings of this line in 2021.**

DLS and DLN (Diomede Line) (previously one line DL) – two consecutive lines running north from the Diomede Islands to A3, the southern portion DLS (stations DL1-12) at 1nm spacing, the northern portion DLN (stations DL13-A3) was previously run at 2.5nm spacing, but on this cruise a station spacing of 1.25nm was used. Run both at the start and end of the cruise, although the second running is complete due to bad weather. These lines study the hypothesized eddying and mixing region north of the islands.

AL (A3 Line) (US portion) – another previously-run line (previously run at ~ 1.7nm resolution, run this cruise once at 0.85nm resolution), just north of the Strait, running from the Russian coast, through the mooring site A3, to where the main channel of the strait shallows on the eastern (US) side. US portion only run here, and extended by 6.6nm to map the transition to shallower water. Run with trace metal/nutrient sampling.

CS (*Cape Serdtse*) (US portion) – another cross strait line (~ 3.9nm resolution), run here from the US-Russian convention line (~168° 58.7'W) to Point Hope (US), but originally starting at Cape Serdtse-Kamen, in Russian waters. Also repeated during the cruise, both runnings adding stations to make station spacing ~1.9nm. **First running done with trace metal/nutrient sampling.**

NPH (North Point Hope) (US waters) - a line run before in 2016, and 2019, crossing from north of Point Hope to the WNW, at 1.25nm spacing near the coast, and 2.5nm spacing after NPH5, to chart the Alaskan Coastal Current transformation on its route along the Alaskan Coast. Extended in 2019 to the Convention Line (CCL). Run twice this cruise. First running westward only to station NPH13, second running (eastward) of complete line from CCL.

CD (*Cape Dyer*) (US waters) - a line new in 2016, taken also in 2017 and 2019, running west-east towards the Alaskan Coast, midway between Point Hope and Cape Lisburne, set just south of some apparent topographic irregularities, also to chart the Alaskan Coastal Current transformation on its route along the Alaskan Coast. Extended in 2019 to the Convention Line, but run in 2021 only from CD 14 to the coast.

LIS (*Cape Lisburne*) (US waters) – from Cape Lisburne towards the WNW, a previous RUSALCA line, run by us also in 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 and 2019 and close to the CP line occupied in previous Bering Strait cruises in 2003 and 2004 (station spacing ~ 3.6nm). Note that due to the Quintillion cable, station Lis 9 is replaced by 2 new neighboring stations, Lis 8.5 and 9.5. Run once during the 2021 cruise. Run with trace metal/nutrient sampling

Re-run of NPH (this time from CCL to the east), and CS lines

Parts of **CCL** (*Chukchi Convention Line*) (US waters) – a line running down the convention line from the end of the LIS line towards the Diomedes (also run in 2003, 2004, 2011, 2012, 2013, 2014, 2015, 2016, 2017 and 2018), typically incorporating a rerun of the high resolution DL line at the southern end, run variously at 10nm (typical) or 5nm (rarely) resolution. Run only in parts in 2021.

Re-run of BS line with trace metal/nutrient sampling

SBSnn – a previous line new in 2014, run only in 2014, 2015, 2017 and 2019, and then often only in part, just south of the strait, crossing the Alaskan Coastal Current before it enters the strait proper (previously and this year run at 2.2nm resolution, run in 2019 at 1.1nm resolution). This year run with the same alignment (i.e. from BS22 as used since 2019, and thus denoted SBSnn. (Previous SBS line started at BS24).

Summary of ADCP/Underway data lines

The ship's ADCP recorded for the duration of the cruise, and between lines steams were often positioned to give more useful underway information. The following were targeted underway surveys:

After A4 recovery east to shallow waters and then back to A2

After A2 deployment, west to BS11, then NE to NSB10, back west along the NBS line and then N to A3

See maps for details of these lines.

Prior lines not taken on this cruise:

DLa and DLb – two other high resolution lines (1nm resolution), mapping the eddying/mixing region, parallel to DLS, allowing for a 2-dimensional mapping of the region.

AS – a line sampled only once before (2011) (although sometimes run for underway data), running from the eastern end of AL back towards the western end of the CS line, taken at variously 4nm or 2nm spacing (closer stations over steeper topography).

NNBS (North North Bering Strait) – a new line run only three times before (2015, 2017, 2019) west-east across the eastern strait, south of A3 and north of NBS, run at ~ 1.8nm resolution, to better map the Alaskan Coastal Current north of the Strait proper.

NBS (North Bering Strait) – an east-west cross-strait line ~ 8nm north of the Bering Strait line, run in previous years, with ~ 1.7nm resolution.

MBS (*Mid Bering Strait*) – an east-west cross-strait line ~ 10nm north of the Bering Strait line, run in previous years, with ~ 1.7nm resolution, with higher resolution near the coast

CONTENTS

Cruise Map Science Participants and Norseman II Participants Cruise Schedule

Summary of Science Components

Mooring Operations

Table of Mooring Positions and Instrumentation Schematics of Mooring Recoveries and Deployments Photographs of Recovered Moorings Preliminary Mooring Data Figures

CTD Operations

Notes on CTD Processing CTD operation notes CTD lines Preliminary CTD section plots

Water Sampling Operations (Trace Metals, Nutrients and delta O18)

Underway Data (ADCP, Temperature and salinity, Meteorology) Operations Underway Data Preliminary Plots

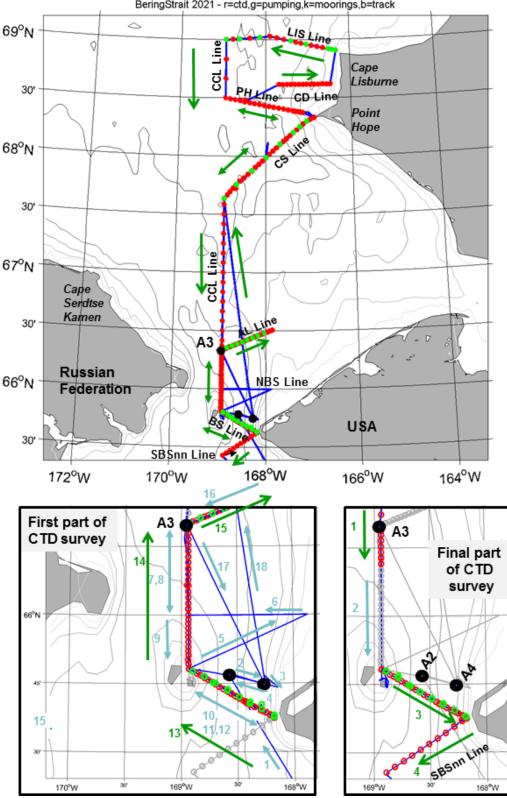
Listing of target CTD positions

References

Event Log

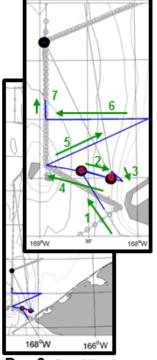
Full Delta O18 processing results

BERING STRAIT 2021 CRUISE MAP: Ship-track, blue. Mooring sites, black. CTD stations, without (red) and with (green) trace metal/nutrient sampling, Consecutively numbered arrows show direction of travel (on this figure, green marking CTDing lines, cyan marking transit). Depth contours every 10m from IBCAO (International Bathymetric Chart of the Arctic Ocean [Jakobsson et al., 2000]. Lower panels give detail of strait region at the start (left) and end (right) of the cruise. (See next page for daily detail.)



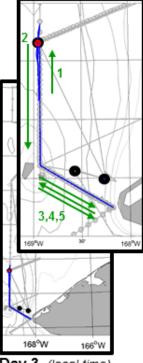
BeringStrait 2021 - r=ctd,g=pumping,k=moorings,b=track

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

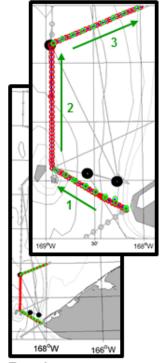


Day 2 (local time) 0500 8th Jul 2021 - 0500 9th Jul 2021

Bering Strait 2021 Mooring Cruise Norseman II



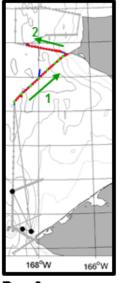
Day 3 (local time) 0500 9th Jul 2021 - 0500 10th Jul 2021



Day 4 (local time) 0500 10th Jul 2021 - 0500 11th Jul 2021



Day 5 (local time) 0500 11th Jul 2021 - 0500 12th Jul 2021



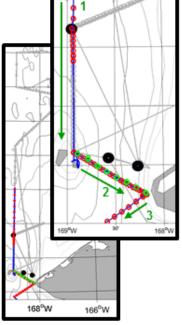
3 4 4 168°W 166°W

Day 6 (local time) 0500 12th Jul 2021 - 0500 13th Jul 2021

Day 7 (local time) 0500 12th Jul 2021 - 0500 14th Jul 2021



Day 8 (local time) 0500 14th Jul 2021 - 0500 15th Jul 2021



Day 9 &10 (local time) 0500 15th Jul 2021 - 0500 17th Jul 2021

BERING STRAIT 2021 SCIENCE PARTICIPANTS

On Shore:

1. Rebecca Woodgate	UW	Chief Scientist and UW PI
2. Cecilia Peralta-Ferriz	UW	Co-Chief Scientist and UW Co-PI
On board:		
1. Jim Johnson (M)	UW	UW lead and chief mooring technician
2. John Guthrie (M)	UW	UW research scientist
3. Laramie Jensen (F)	UW	UW postdoc & lead of trace metal/nutrient sampling
4. Katy Christensen (F)	UW	UW graduate student & lead of CTD measurements
5. Robert Daniels (M)	UW	UW mooring technician

UW – University of Washington, US

Cabin Allocations:

Main deck (Cabin 4) - Jim Johnson Lower deck, starboard aft (Cabin 7) - Laramie Jensen & Katy Christensen Lower deck, port aft (Cabin 8) - John Guthrie Lower deck, starboard forward (Cabin 5) - Robert Daniels

BERING STRAIT 2021 NORSEMAN II CREW

1. Mike Hastings (M)	SVA	Captain
2. Pat Murphy (M)	SVA	Mate
3. Jim Wells (M)	SVA	Boson
4. Dan Hill (M)	SVA	Cook
5. Bryce Walker (M)	SVA	Asst. Cook
6. Kevin Duff (M)	SVA	Engineer
7. Mike Leiffeste (M)	SVA	AB
8. Nathanial Charbonneau (M)	SVA	AB

SVA – Support Vessels of Alaska, Inc. , https://www.supportvesselsofalaska.com

Ship contract arranged by:

CPS Polar Field Services, partner of Battelle ARO Anna Schemper, anna@polarfield.com

BERING STRAIT 2021 CRUISE SCHEDULE (Times: Alaskan Daylight Time (UTC-8), 24hr format) (Wind directions are wind source .. so S Wind = wind from South)

Mid May 2021	Shipment of container of UW equipment to Homer
Mid June 2021	Loading of gear in Homer
Sat 12 th June 2021	UW Science team start period of "Strict Social Distancing" in Seattle
Wed 23 rd June 2021	UW Science team do PCR Covid test in Seattle
Sat 26 th June 2021	UW Science team fly commercial to Fairbanks and start 10-day quarantine at Wedgewood Resort, Fairbanks
Tuesday 29 th June 2021	Norseman2 leaves Homer (~ 0300UTC)
Wednesday 30 th June 2021	Norseman2 at Takli Island
	Tests of underway systems during this transit
Thurs 1 st July 2021	UW Science team do PCR Covid test in Fairbanks
Friday 2 nd July 2021	Norseman2 passes Aleutian Chain east of Unimak Island (1200)
Sunday 4 th July 2021	Norseman2 passes S of Nunivak Island (~0735) Norseman2 passes N of Nunivak Island (~1530)
Monday 5 th July2021	Two of UW Science team retest as test results not back Finally all test results (including duplicates) return negative
	Norseman2 passes St Lawrence Island (~1800)
Tuesday 6 th July 2021	Norseman2 reaches Nome Harbor ($^{\sim}$ 1800) and then waits outside
Wednesday 7 th July 2021	~ 0800 Norseman2 performs Met system calibration off Nome ~ 1130 returns to Harbor for onload of personnel
	UW Science team fly private charter to Nome (~0730-1030), UW science team board Norseman2 in Nome ~ 1130 Safety briefings, Sail ~ 1445 Set up underway, reterminate CTD cable, do test CTD cast.
Thurs 8 th July 2021 (JD 189)	Arrive on site A2 ~ 0630 From 0803 do pre recovery CTDs at A2 0829 Start A2-20 recovery , all on deck 0843 0909 Start, all on deck 0925 Steam to A4

	From 1110 do pre recovery CTDs at A4 1217 Start A4-20 recovery , all on deck 1231 1257 Start A4-19 recovery , all on deck 1310 Start towards A3, then replan as too far for working today Steam towards Alaskan Coast to map ACC Return towards A2, setting up deployment 1654 Start A2-21 deployment run, drop Anchor 1659 1726 A2-21 post deployment CTD cast Steam towards DL1, with trace metal/nutrient (TMN) pumping test Steam underway lines over night (to NBS10, to NBS1, to A3)
Fri 9 th July 2021 (<i>JD 190</i>)	Arrive on site A3 ~ 0715 From 0811 do pre recovery CTDs at A3 0905 Start A3-20 recovery , all on deck 0917 0940 Start A3-19 recovery , required dragging, all on deck 1101 Prepare A3-21 deployment 1600 Start A3-21 deployment , drop Anchor 1605 1620 A3-21 post deployment CTD cast Prepare A2-21 deployment while steaming South overnight Steam S along DL to DL1, Steam SE along BS to BS22 Steam NW along NS to BS11 Steam SE along BS to BS22 During this transit, discover problem with A3-21 deployment
Sat 10 th July 2021 (JD191)	 0752 Start CTDing BS line (from BS22 to NW) with TMN pumping 1438 finish BS line at BS11, steam to DL1 1445 Start CTDing DL line (from DL1 to N) 2043 finish DL line at DL19.5, steam to A3 2051 Start CTDing AL line (from A3 to NE) with TMN pumping
Sun 11 th July 2021 (<i>JD192)</i>	0541 finish AL line at CL27.5, steam to A3 (foggy) 0859 Start A3-21 recovery , all on deck 0914 Prepare A3-21 redeployment 1012 Start A3-21 deployment , drop Anchor 1019 Steam to A4, preparing A4-21 deployment 1517 Start A4-21 deployment , drop Anchor 1518 1529 A4-21 post deployment CTD cast Steam towards CS10, preparing glider on transit 2121 Stop to deploy glider at ~ 66 32.93N, 168 32.72W 2149 Continue on to CS10
Mon 12 th July 2021 (JD193)	0526 Start CTDing CS line (CS10US to NW) with TMN pumping 1055 Break off CTDing at CS13 due to bad weather 1625 Restart CTDing at CS13 as weather improves 2223 finish CS line at CS19, steam to NPH1 2312 Start CTDing NPH line (from NPH1 to NW)
Tues 13 th July 2021 (JD194)	0444 finish NPH line at NPH13, steam to CD14 0709 Start CTDing CD line (from CD14 to E)

1123 finish CD line at CD1, steam to LIS1 1327 Start CTDing LIS line (LIS1, to NW) with TMN pumping +O18 2242 finish LIS line at CCL22n, steam to CCL21 2242 Continue CTDing CCL line S

Wed 14 th July 2021 (<i>JD195)</i>	 0301 Start CTDing NPH line (from CCL19 to SE) 1020 finish NPH line at NPH1, steam to CS19 1118 Start CTDing CS line (from CS19 to SW) 2202 finish CS line at CS10. 2202 Continue CTDing CCL/DL line S, including A3 				
Thurs 15 th July 2021 (JD196)	1519 break off DL line at DL16.5 due to bad weather Make headway south to the Diomedes 2306 arrive near Little Diomede, run arcs around NW side of island				
Friday 16 th July 2021 <i>(JD197)</i>	 0635 Start CTDing BS line (from BS11 to SE) with TMN pumping 1424 finish BS line at BS22 1424 Continue CTDing SBSnn line (from BS11 to SW), halves only 2027 finish SBSnn line at SBSnn10.5 2027 Turn for Nome 				
Sat 17 th July 2021 (JD198)	~0800 Tie up in Nome alongside barge, send CTD to AirCargo 1045 UW Science party leave ship. 1130 Norseman2 leaves Nome for Homer 1255 UW Science party fly from Nome, arriving back in Seattle ~2100PDT				
Sunday 25 th July 2021 	~0620 Norseman2 docks in Homer.				
Bering Strait 2021 Mooring cruise	TOTALS				
9.75 days at sea (away from Nom 10 days on ship (including on/offle					
Moorings recovered: 6 Moorings deployed: CTD casts: Trace metal/nutrient Pumping sta Gliders deployed:	3 276 (including 1 test cast) on 14 lines ntions: 41 1				

SCIENCE COMPONENTS OF CRUISE

The cruise comprised of the following science components:

- Mooring operations - 6 mooring recoveries, 3 mooring deployments (UW moorings)

- **CTD operations** - 276 casts on 14 lines (UW instrumentation, measuring temperature, conductivity, oxygen, fluorescence, and turbidity with pressure)

- Water sampling for trace metals/nutrients - 41 stations where samples taken with pumped system.

- **Opportunistic O18 sampling** - 2 samples taken at start of LIS line due to remarkably fresh waters.

- **Underway sampling** – ship-based equipment of 300kHz hull-mounted ADCP; SBE21 underway Temperature-Salinity recorder, an SBE38 temperature sensor, and some meteorological data (air temperature, pressure, humidity, wind direction and wind speed).

- Moored Marine Mammal Observations (acoustic instruments on the moorings)

All recovered A3 moorings and the deployed A3 mooring carried Marine Mammal Acoustic Recorders from Kate Stafford, UW.

- Marine Mammal Glider Deployment - one glider was deployed for PIs: Hank Statscewich and Seth Danielson (UAF),Kate Stafford (UW) and Mark Baumgartner (WHOI) as part of a project monitoring marine mammal calls in the western Chukchi.

http://dcs.whoi.edu/chukchi0721/chukchi0721 unit 595 html/chukchi0721 unit 595 summary.html

MOORING OPERATIONS (Johnson, assisted by others)

Background: The moorings serviced on this cruise are part of a multi-year time-series (started in 1990) of measurements of the flow through the Bering Strait. This flow acts as a drain for the Bering Sea shelf, dominates the Chukchi Sea, influences the Arctic Ocean, and can be traced across the Arctic Ocean to the Fram Strait and beyond. The long-term monitoring of the inflow into the Arctic Ocean via the Bering Strait is important for understanding climatic change both locally and in the Arctic. Data from 2001 to 2018 suggest that heat and freshwater fluxes are increasing through the strait [*Woodgate et al.*, 2006; *Woodgate et al.*, 2010; *Woodgate et al.*, 2012; *Woodgate et al.*, 2015; *Woodgate*, 2018; *Woodgate and Peralta-Ferriz*, 2021], with 2012 being a year of low flow, but 2013 to 2016 returning to higher flow conditions [*Woodgate*, 2015; *Woodgate et al.*, 2015; *Woodgate*, 2018]. The data recovered this cruise will indicate if recent years show further increase or a return to older conditions.

An overview of the Bering Strait mooring work (including data access) is available at <u>http://psc.apl.washington.edu/BeringStrait.html</u>. Data are also permanently archived at the National Oceanographic Data Center, now renamed the National Centers for Environmental Information (https://www.nodc.noaa.gov/ or https://ncei.noaa.gov).

A map of mooring stations is given above. Six UW moorings were recovered on this cruise. These moorings (all in US waters – A2-19, A4-19, A3-19, and A2-20, A4-20, A3-20) were deployed from the Norseman II in September 2019 and 2020 respectively, with mooring funding from NSF-AON (PIs: Woodgate and Peralta-Ferriz, *PLR1758565*). Due to the Covid situation, the 2020 cruise sailed without a science party and thus no moorings were recovered that year.

Three UW moorings (A3-21, A2-21, A4-21) were deployed on this 2021 Norseman II cruise under funding from the same NSF-AON grant. All these deployments were replacements of recovered moorings at sites occupied since at least 2001 (A4) or 1990 (A2 and A3). Analysis of past data suggests data from these three moorings are sufficient to give reasonable estimates of the physical fluxes of volume, heat and freshwater through the strait, as well as a useful measure of the spread of water properties (temperature and salinity) in the whole strait [*Woodgate et al.*, 2015].

All moorings (recovered and deployed) carried upward-looking ADCPs (measuring water velocity in 2m bins up to the surface, ice motion, and medium quality ice-thickness); lower-level temperature-salinity sensors; and the 2019 and 2021 moorings also carried iscats (upper level temperature-salinity-pressure sensors in a trawl resistant housing designed to survive impact by ice keels). All recovered and deployed moorings also carried marine mammal acoustic recorders. The A3-19 and A3-21 moorings also carried the first prototypes of the "Miscat", a multiple instrument version of the iscat, designed to allow instruments to be lost sequentially from nearer the surface. For a full instrument listing, see the table below.

This coverage should allow us to assess year-round stratification in and fluxes through the strait, including the contribution of the Alaskan Coastal Current, a warm, fresh current present seasonally in the eastern channel, and known to be a major part of the heat and freshwater fluxes [*Woodgate and Aagaard*, 2005; *Woodgate et al.*, 2006; *Woodgate et al.*, 2015; *Woodgate*, 2018]. The ADCPs (which give an estimate of ice thickness and ice motion) allow the quantification of the movement of ice through the strait [*Travers*, 2012]. The marine mammal recording time-series measurements should advance our understanding of the biological systems in the region.

Calibration Casts: Biofouling of instrumentation has been an on-going problem in the Bering Strait. Prior to each mooring recovery, a CTD cast was taken to allow for *in situ* comparison with mooring data. Similarly, CTD casts were taken at each mooring site immediately after deployment. These post-deployment casts will allow us to assess how effective this process is for pre-recovery calibration. Since the strait changes rapidly, and CTD casts are by necessity some 200m away from the mooring and may be as long as 1hr separated in time from the mooring reading, it is inevitable that there will be differences between the water measured by the cast and that measured by the mooring. Action item: On recovery, check the post deployment casts to see how reliable the comparison is.

This year (as in 2017 and 2018 and 2019), an on-deck calibration tank was also used for recovered instruments. This is discussed below.

2021 Recoveries and Deployments: Given that 3 moorings had been in the water for almost 2 years, mooring recoveries were exceptionally smooth this year, with only one of the moorings requiring dragging.

For recoveries, the ship positioned ~ 200m away from the mooring so as to drift towards the mooring site. Ranging was done from the port mid corner of the aft deck of the ship, with the hydrophone connecting to the deck box inside at the aft end of the port laboratory. **Action item: Re check position as regards to ship's propellers.** Once the ship had drifted over the mooring and the acoustic ranges had increased to >70m, the mooring was released. This procedure was followed to prevent the mooring being released too close (or underneath) the ship since in previous years the moorings have taken up to 15min to release. **Action item: Be sure to distinguish between slant and horizontal range during soundings.** As site A3 is ~0.6nm from the Russian border, prior to ranging on A3, the Norseman II's small boat was prepared for launching, to cover the eventuality that if the mooring had to be dragged, the mooring would surface and drift towards Russian waters before the ship was able to recover it. **Action item: Continue to prepare for small boat operations at site A3.**

On all moorings, we use double releases, with springs to assist the mooring release. For the all moorings, although our usual routine is to communicate and range with one release and then attempt to release the other release (to test both instruments), this year the same release was used for ranging and for release. This was successful at bringing the mooring to the surface on all moorings except for A3-19.

On A3-19, although both releases were activated (and confirmed release) the mooring did not surface, but ranges increases as the ship drifted away indicating the mooring was still connected to the anchor. Thus a dragging operation was initiated. Within ~ 30min of dragging the mooring was sighted on the surface, and the drag snagged an anchor, which was brought on board before the mooring could be recovered. On recovery, both releases were found to have released. Biofouling was present on the releases, and it is very possible that an unfortunately placed barnacle was the cause of holding the mooring down. Action items: Investigate better biofouling paint. Ensure all releases are newly painted each year. Continue to use external springs

In all cases, once the mooring was on the surface, the ship repositioned, bringing the mooring tightly down the starboard side of the ship. One boat hook and a pole with a quick releasing hook attached to a line were used to catch the mooring, typically on a pear link fastened to the chain between the float and the ADCP or on eyes welded to the float surface. The line from the hook was then passed back to through the stern A-frame, and tied with a "cat's paw" knot to a hook from the A-frame. This portion of the mooring was then elevated, allowing the second A-frame hook to be attached lower down the mooring chain, and tag lines to be attached if necessary. The iscat, if present, was recovered by hand at a convenient point in this operation, prior to recovery of most of the mooring. (This year, of the 4 iscat instruments that might have been present (only on the Ax19 moorings), the iscat was recovered only from A4-19.) Then the entire mooring was then elevated, using both hooks from the aft A-frame, and recovered onto deck. Recovery work was done by a deck team of 4 crew of the Norseman II – one on the A-frame controls, three on deck with on overhead safety lines ("dog runs") down each side of the deck (one of these working forward of the deck on tag lines), assisted by UW personnel further forward on the aft deck. Once on deck, the moorings were photographed to record biofouling and other issues. Action items: Be sure to add pear-link to the chain between float and ADCP. Prepare loops of line for threading through chain/shackles to provide a lifting point. High A-frame or crane very helpful for recovery. Also helpful to review mooring movies at start of cruise.

The A-frame of the Norseman II is atypically high (~ 26ft less block attachments). While this is extremely useful in fair weather, it allows for swinging of the load in rougher seas. Action item: Continue to use tag line options for recovery in rougher weather.

Good visibility (at least ~1nm) is required for mooring recoveries since the mooring may delay releasing due to biofouling, or the mooring may require dragging, as in previous years. Given the proximity of A3 to the US-Russian border, small boat operations may also be necessary during a dragging operation to prevent the

surfaced mooring drifting out of US waters. For these reasons, it was decided typically not to commence a new mooring operation after 5pm local time. Action item: Continue to include weather days in the cruise plan; plan also for small boat operations (including sending a battery powered release unit), considering especially if small boat operations could be used in fog. Assess causes of foggy conditions, in order to predict best strategy for finding workable visibility.

Biofouling was heavy in the recoveries of the 2019 moorings, but light on the 2020 moorings. On A2-19 and A4-19 the ADCP heads were entirely covered with barnacles, and the A3-19 ADCP was almost entirely covered with barnacles. Salinity cells were only just clear on the Ax19 moorings. Bryozoan growth was limited - instead barnacles were plentiful. The releases had some biofouling, but significantly less than on the rest of the moorings.

In contrast to 2016, when significant damage (hypothesized ice damage) was found on the moorings, this year there was no clear evidence of mechanical damage to the mooring frames in general, although the protective case on the hydrophone of the A3--20 mooring was twisted off. Luckily the hydrophone itself appeared undamaged. It is unclear when this damage occurred. As A3-20 was recovered prior to the dragging operation on A3-19, it was not due to the dragging operation. The only other damage was the loss of the lscats on A3-19 and A2-19. On A2-19 much (all?) of the iscat tether was recovered, suggesting the tether parted at the block below the iscat itself (though the block was not recovered).

Mooring deployments were done through the aft A-frame, using the A-frame hooks for lifting. The height of the Norseman II A-frame was extremely advantageous for these deployments. Lacking such an A-frame, alternative ships might consider lifting the mooring with the crane, rather than the A-frame. The mooring was assembled completely within the A-frame. The ship positioned to steam slowly (~1 to 2knots) into the wind/current, starting between 500m and 600m from the mooring site. Action item: This distance (greater distance in strong current) works well. At the start of the deployment, the iscat was deployed by hand and allowed to stream behind the boat, which steamed at ~ 2knots, fast enough to maintain headway and to trail the mooring behind the ship, but not so fast as to damage the equipment being towed or pull equipment off the deck. Action item: Feed the iscat tether unwound to the person spooling it off the deck. The first pick (from one of the hooks of the aft A-frame) was positioned below the ADCP, except in the case of A4, where the first pick was below the top float. The second pick (from the other hook of the aft A-frame) was lower down on the mooring allowing all the mooring except the anchor to come off the deck during the lift. Then, the A-frame boomed out to lower these instruments into the water. Tag lines were used to control the instruments in the air. Action item: use deck cleats to fair tag lines. Be sure to position the lift point on the float so it does not cause the float to roll off. The first pick was released by a mechanical quick release, which was then repositioned to lift the anchor. (Previous years have shown that if the first pick was insufficiently high, the releases would still be on deck when the first package was in the water. The releases would then slip off the deck inelegantly. It was found that a higher lift of the instruments, and using both hooks of the A-frame, allowed the releases also to be lifted from the deck and then hang nicely behind the ship once the ADCP was placed in the water.) The anchor was lifted into the water just prior to arriving at the site. Positioning of this final pick very close to the anchor prevents the releases being pulled back over the lip of the ship when the anchor is lifted. Action item: Make final pick as close as possible to the anchor. When the ship arrived on site, the anchor was dropped using the mechanical quick release. Positions were taken from a hand-held GPS on the upper aft deck, some 5m from the drop point of the mooring. Action item: Continue to bring own GPS unit. Note that due to mooring fall back, actual mooring position may be ~ 10m from this position in the opposite direction to the steaming **direction during recovery.** This information is noted on the mooring diagrams.

A team of 4-5 crew did the deployments, with one person on the A-frame, 3 on the "dog runs' assisting the instruments up into the air, and other members of the crew/science team assisting with tending the tag lines during lifting.

Action items: design pick points into the moorings for recover; continue to put 2 rings on the anchors for tag lines. Consider using chain, not line for the moorings (saves on splicing and gives extra pick points);

Compute the best pick point, such that the releases are lifted free of the deck, rather than slipped over the edge.

After the deployment of A2-21 and A3-21, it was discovered that the weak link had been omitted from the iscat systems. Without the weak link, the mooring might be dragged by ice. As A3 is near the EEZ line, this was deemed to be too great a risk, and the decision was taken to use the anchor we had recovered during dragging to redeploy A3-21 after a recovery. Thus the deployment of A4-21 was postponed (in case unexpected snags were encountered and equipment from that mooring was needed to complete the new A3-21) and CTD lines were run until the weather and light were possible for mooring recovery. Despite initial fog, the recovery and redeployment of A3-21 (with the weak link installed) went smoothly, and subsequently A4-21 was also safely deployed. This leaves A2-21 deployed without weak link. Typically, iscats are only lost from the moorings in ~ half of the deployments. Thus there is at least a 50% chance the mooring will not be snagged enough to drag it. **Action item: On recoveries in 2022 be aware that A2-21 may have moved position, and survey in the position before attempting recovery.**

Deployment Instrumentation issues: This year, because the cruise was only loading people in Nome, instrumentation was again started in Seattle and shipped to Homer set on delayed start. All instrument starts went smoothly, although it was discovered the SBE37IM would not accept a delayed start longer than 30 days ahead.

Iscat housings and tethers were assembled in Seattle, and ADCPs incorporated into the ADCP frames, leaving the only assembly work to be done at sea the placing of the floats on the ADCP frames and the testing of the releases. Action item: Consider in future if starting instruments in Seattle is a safe way of saving time in Nome. Note that releases could also be deck checked ashore to save time at sea.

Recovered Data and Instrumentation issues: Data recovery on the moorings was generally good, although with some challenges, as detailed below:

- ISCAT SBE37IMS AND LOGGERS: Of the 3 iscats/miscat deployed on the recovered moorings:

- from **A2-19**, the top SBE37 sensor was not recovered, but the logger recorded data until 13th May 2020 and continued to write files until 24th Jan 2021. On recovery the logger battery was dead. This is as expected from an iscat that has been dragged off the mooring.

- from A4-19, the top SBE37 sensor was recovered (the cell was only just clear) and the SBE37 ran until recovery. The logger however had recorded no data. Its clock was still correct and battery voltage was still high. Action item: Investigate

- from **A3-19**, the MISCAT system was not recovered. Both sensors were missing, but the logger returned some data on recovery - from deployment (7th Sept) to 11th Sept for the lower (~ 16m) sensor and longer to 15th Sept for the upper (~8m) sensor, although with increasing numbers of data gaps. Again the logger battery was dead, as expected once the SBE37IMs are lost. **Action item: Investigate, and run a wet test in Seattle.**

Preliminary results (before any correction for biofouling or post cruise calibration) are plotted below.

- **ADCPs:** Of the 6 ADCPs deployed on the recovered moorings, all were running on recovery and gave complete data records, including the 2 year deployments. These instruments were deployed with lithium batteries (and no external battery pack) and a conservative recording schedule and were expected to last the two years. The ice track records have not yet been investigated. **Action item: Check the sea ice data.** : Preliminary results are plotted below.

- SBEs: A SBE16 was recovered from each mooring. None of these instruments were pumped. All instruments were running on recovery and returned full data records with only minor problems, viz. spikes in 2341 on A2-19, and 1700 on A4-19 appears to have lost one data record sometime during the 2 year deployment. Action items: Despike and investigate the instrument header to check the apparent missing record.

Biofouling was extreme on the moorings that had been out for two years, and thus we expect significant salinity drift over the deployment, as is evident in the mismatch of freezing temperatures during the second winter (see plots below). The test tank is designed to elucidate the size of this drift, in conjunction with post deployment calibration. Action item: Investigate drift. Check 0004, which appears to have gone from good agreement in the test tank to poor (0.3psu) agreement.

Preliminary results (before any correction for biofouling or post cruise calibration) are plotted below.

Post recovery tank calibrations: As an addition calibration test, uncleaned post-recovery SBE instruments were placed, for various periods between 8th July 2021 (1715GMT) and 11th Sept July 2021 (~0250GMT) in a large-plastic bin filled with salt water in conjunction with three recently calibrated SBE instruments:

- SBE19 #924, borrowed from the APL equipment pool and last calibrated in Jan/Feb 2018
- SBE16 # 0005, brought as a mooring spare and last calibrated in February 2020
- SB37IM #22408, brought as a mooring spare and last calibrated in September 2020

The intent was to ascertain to what extent cleaning after recovery changes the readings on the SBE instruments. The preliminary test with this system was in 2016, and had significant limitations, likely relating to the instruments being horizontal, trapping air bubbles or biofouling, or coming out of the water on the rolling ship, or possibly due to interactions between instruments. This year, as in 2017 and 2018 and 2019, the tank was designed to a) allow all instruments to be vertical and b) to include a pump to circulate water within the tank.

Once instruments were recovered from the moorings, they were placed in the tank for various periods of several hours, such as to obtain at least 6 readings. Since recovered instrumentation was recording either hourly (SBE16s) or every 5min (SBE37), this allows a good comparison with the calibration CTD, set at 5 second data, and the SBE37 recording every 5min. Instruments were then cleaned and placed again in the tank for at least another 6 readings. Note that at one point the water circulation pump in the test tank was found not to be working. It is unclear how long it was out of action. As the tank was not big enough for all instrumentation at one time, instruments were swapped in and out, and when not in the calibration tank or being cleaned, they were typically placed in a second "holding" tank so the cells did not dry out. The instruments will next be returned to the manufacturer for post cruise calibration.

Overall the methodology worked smoothly in 2021, although we found the SBE19 was consuming batteries at a much faster rate than expected, i.e., 7.75hrs for the first set of batteries, and 20hrs for the second.

Action item: Keep CTD upright. Do test before and after cleaning. Use both mooring spares. Track CTD time (only ~ 28hrs per battery set). Check CTD pump is working.

Preliminary results are shown below, relative to the SBE19 reference CTD. (At the time of writing, the records from the spare mooring instruments are not available for comparison, but these will be added to this document when it is updated with the post cruise calibrations.) **Action item: Add spare data** These records present some curious features:

1) The first soak of the 2020 SBEs show uniform agreement with the calibration CTD, as do most of the second soaks. However A420SBE becomes 0.3psu fresher than the calibration CTD after cleaning. Action item: Investigate SBE16, SN0004.

2) The first soaks of the 2019 SBEs show uniform freshness of 0.1-0.2psu compared to the calibration CTD. This is in line with previous results.

However, it is slightly concerning that

a) cleaning does not improve agreement, but indeed in some cases, makes agreement worse.

b) an initially good agreement (A420) can become 0.3psu off during a subsequent soak. The latter point shows the importance of including the other spare instruments in this analysis and considering all the points of evidence (e.g., agreement with in the water CTD casts and subsequent mooring deployments) before concluding a record is erroneously fresh.

Summary of comparisons to SBE924	4 (grey in plots below	r, accuracy 0.01°C, 0.001S/m, 0.05psu)
----------------------------------	------------------------	--

A2-19SBE	A3-19SBE	A4-19SBE	A4-19ISC	A2-20SBE	A3-20SBE	A420SBE
yellow	cyan	magenta	magenta	green	blue	red
2341	1698	1700	20935	1226	1225	0004
0.01°C	0.01°C	0.01°C	0.002°C	0.01°C	0.01°C	0.01°C
0.001S/m	0.001S/m	0.001S/m	0.0003S/m	0.001S/m	0.001S/m	0.001S/m
0.05psu	0.05psu	0.05psu	0.008psu	0.05psu	0.05psu	0.05psu
Mar2019	Mar2019	Mar2019	Jun2019	Jan2004	Sep2009	Sep2008
-0.2psu,	-0.1psu	-0.23psu	-0.15psu	~0.0psu	~0.0psu	~0.0psu
-0.2psu	-0.13psu	-0.22psu	-0.15psu	-0.02psu	-0.02psu	-0.3psu
	yellow 2341 0.01°C 0.001S/m 0.05psu Mar2019 -0.2psu,	yellow cyan 2341 1698 0.01°C 0.01°C 0.001S/m 0.001S/m 0.05psu 0.05psu Mar2019 Mar2019 -0.2psu, -0.1psu	yellow cyan magenta 2341 1698 1700 0.01°C 0.01°C 0.01°C 0.001S/m 0.001S/m 0.001S/m 0.05psu 0.05psu 0.05psu Mar2019 Mar2019 Mar2019 -0.2psu, -0.1psu -0.23psu	yellow cyan magenta magenta 2341 1698 1700 20935 0.01°C 0.01°C 0.002°C 0.002°C 0.001S/m 0.001S/m 0.0003S/m 0.0003S/m 0.05psu 0.05psu 0.05psu 0.008psu Mar2019 Mar2019 Mar2019 Jun2019 -0.2psu, -0.1psu -0.23psu -0.15psu	yellow cyan magenta magenta green 2341 1698 1700 20935 1226 0.01°C 0.01°C 0.01°C 0.002°C 0.01°C 0.001S/m 0.001S/m 0.001S/m 0.0003S/m 0.001S/m 0.05psu 0.05psu 0.05psu 0.05psu 0.05psu Mar2019 Mar2019 Mar2019 Jun2019 Jan2004 -0.2psu, -0.1psu -0.23psu -0.15psu ~0.0psu	yellow cyan magenta magenta green blue 2341 1698 1700 20935 1226 1225 0.01°C 0.01°C 0.002°C 0.01°C 0.01°C 0.01°C 0.001S/m 0.001S/m 0.0003S/m 0.001S/m 0.001S/m 0.001S/m 0.05psu 0.05psu 0.05psu 0.05psu 0.05psu 0.05psu 0.05psu Mar2019 Mar2019 Mar2019 Jun2019 Jan2004 Sep2009 -0.2psu, -0.1psu -0.23psu -0.15psu ~0.0psu ~0.0psu

(Acc = manufacturer's accuracy for temperature (T), conductivity (C) and thus computed salinity (S))

TT21 ctd=. newmc*sbe=gray.&*; IscatA4=m; SBEsA220=g A320=b A420=r A219=y A319=c A419=m 8.5 8 7.5 7 Temp(degC) 6.5 6 5.5 5 4.5 4 190 190.5 191 191.5 192

JD in 2021

TT21 ctd=. newmc*sbe=gray.&*; IscatA4=m; SBEsA220=g A320=b A420=r A219=y A319=c A419=m 30.8 30.7 30.6 30.5 salt(psu) 30.4 30.3 30.2 30.1 191.5 190 190.5 191 192 JD in 2021

This plot shows all the recovered instruments and the calibration CTD, colors as per the table above.

The plots below are 1 per instrument, as per colors in the table above, with grey being the CTD reference. For each plot, use the temperature record to find when the instrument was in the tank with the reference, and then compare the salinity records to find the approximate offset.

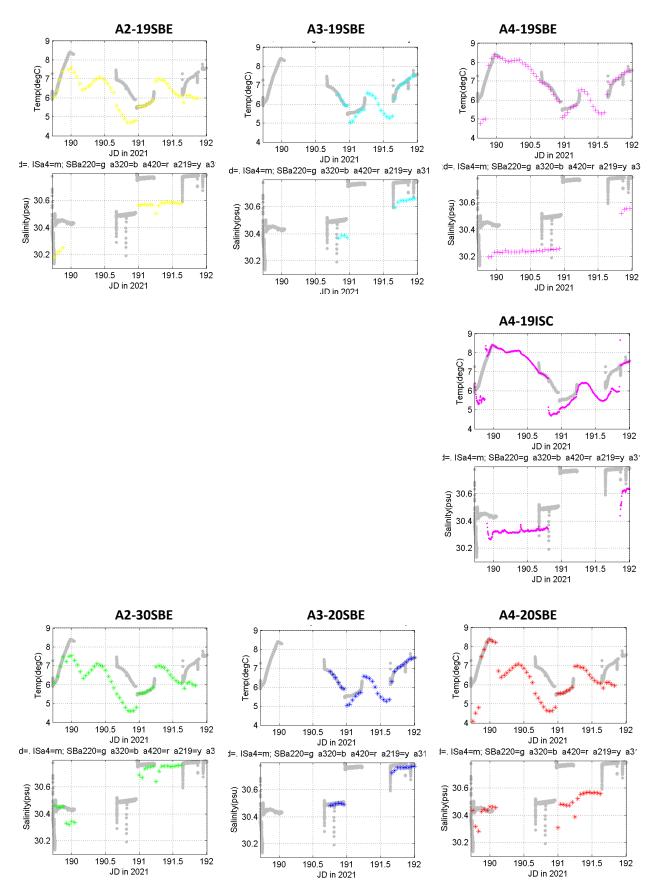
Action item: - return to this once SBEs have been post-cruise calibrated and spare records are available. Revisit test methodology in Seattle to improve reliability. Note that washing can change calibration by 0.1psu. and either the tank may be in error by 0.3pu, or there is some issue with SBE#0004.

Action item: Once all SBEs have been post-cruise calibrated, also do:

- comparison to CTD casts
- comparison to instruments on same moorings

woouyate et al 2021 Denny Strait 2021 worseman il Gruise report - 24 May 2022

TEST TANK RESULTS BY INSTRUMENT



Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

Update May 2022 - checking for salinity calibrations in all moored instrumentation
--

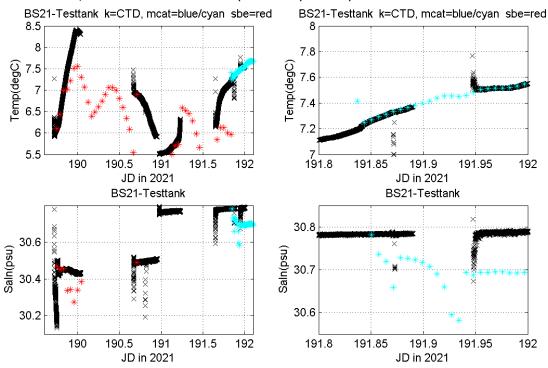
2019	A219sbe	A219isc	A319sbe	A319isc	A419sbe	A419iscat
	2341		1698		1700	20935
Notes	replatinized		replatinized		replatinized	replatinized
SAcc	0.05psu	0.008psu	0.05psu	0.008psu	0.05psu	0.008psu
1) PRE						
Tank - S1	-0.22 psu		-0.1psu		-0.2 psu	-0.1psu
- S2 to CTD	-0.2 psu		-0.13psu		-0.25psu	-0.15psu
- S2 to MC	NA		-0.035 psu or		-0.14 psu	-0.06psu
Rec CTD	-0.23,-0.25		-0.18,-0.18		Unclear	-0.14
Next Year	-0.08psu		-0.05		-0.15	NA
ISCAT/SBE	Too short		Too short		Too fresh	Too salty
Other moor	Unclear		Unclear		Unclear	Unclear
TFreeze	Yr1ok,Yr2TooF		Yr1ok,Yr2TooF		Yr1ok,Yr2TooF	tooF 2 nd yr
2)PPP	0.0941psu		0.3346psu		0.1663psu	0.1072psu
Tank- S1	-0.12psu		+0.2psu		-0.04psu	0.0psu
- S2 to CTD	-0.1psu		+0.28 psu		-0.08psu	-0.05psu
- S2 to MC			+0.2psu		+0.02psu	+0.05psu
Rec CTD	-0.14, -0.16		+0.15,+0.15		unclear	-0.04
Next yr	-0.02psu		+>0.15		-0.08psu	NA
Iscat/SBE	Too short		Too short		ok	ok
Other moor	Unclear		Unclear		Unclear	Unclear
Tfreeze	Ok		tooS 2 nd yr		tooF 2 nd yr	tooF 2 nd yr
CONCLUDE	Use POST cal		PostCal is off		Use POST cal	Use POST cal
	-0.02psu by yr1		Use Precal		-0.04 to -0.08	Tfreeze suggests Yr2
	-0.1 psu by yr2		-0,05psu by yr1		psu off	~0.1fresh, but this not
			-0.1psu by yr2			found in test tank

Discard 2nd Soak in test tank for being unreliable. All unmarked units are PSU

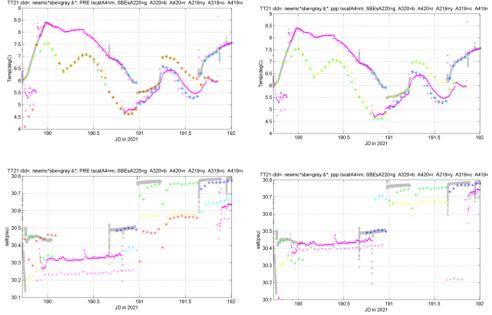
2020	A220sbe	A220iscat	A320sbe	A320iscat	A420sbe	A420iscat
	1226	None	1225	None	0004	None
Notes	Not replat.		Not replat		Too old to cal.	
SAcc	0.05psu	0.008psu	0.05psu	0.008psu	0.05psu	0.008psu
1) PRE						
Tank - S1	0 psu		0 psu		0 psu	
- S2 to CTD	-0.02psu		-0.01		-0.28	
- S2 to MC			+0.08			
Rec CTD	-0.006		0.001,0.005		Not clear	
Next Year	NA		NA		NA	
ISCAT/SBE	NA		NA		ls ok	
Other moor	Not clear		Not clear		Not clear	
TFreeze	TooF perhaps		ok		ok	
2)PPP	-0.0166psu		0.0075psu		NOT CALED	
Tank- S1	0 psu		0 psu		NOT CALED	
Rec CTD	-0.019		0.007, 0.013			
Next yr	NA		NA		NA	
Iscat/SBE	NA		NA		NA	
Other moor	Not clear		Not clear			
Tfreeze	Better		ok			
CONCLUDE	Use postcal, as		Use postcal, to		Use precal, as that is all	
	Tfreeze better,		match previous		we have, but agrees well	
	likely all better		methods. All better		on all tests, so likely ok,	
	than 0.02psu		than errors 0.02psu		better 0.01psu	

FINDINGS:

First check is of all the references in the test tank - the CTD 924, and then two newly calibrated instruments, SBE16-0005 and SBE37(Microcat) 22408)



** This suggests some issues with the test tank towards the end. So put all references on next the plots.

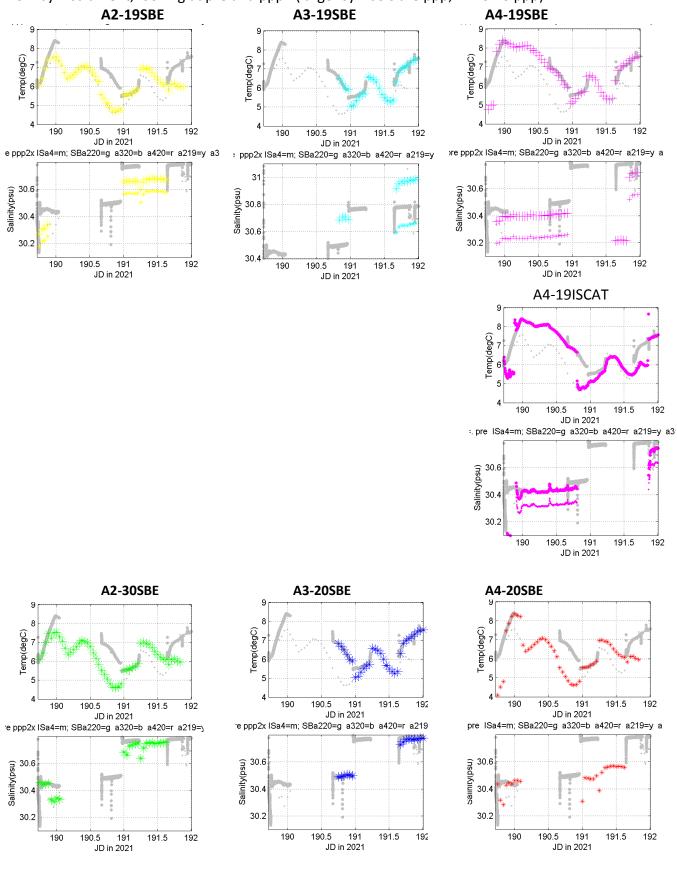


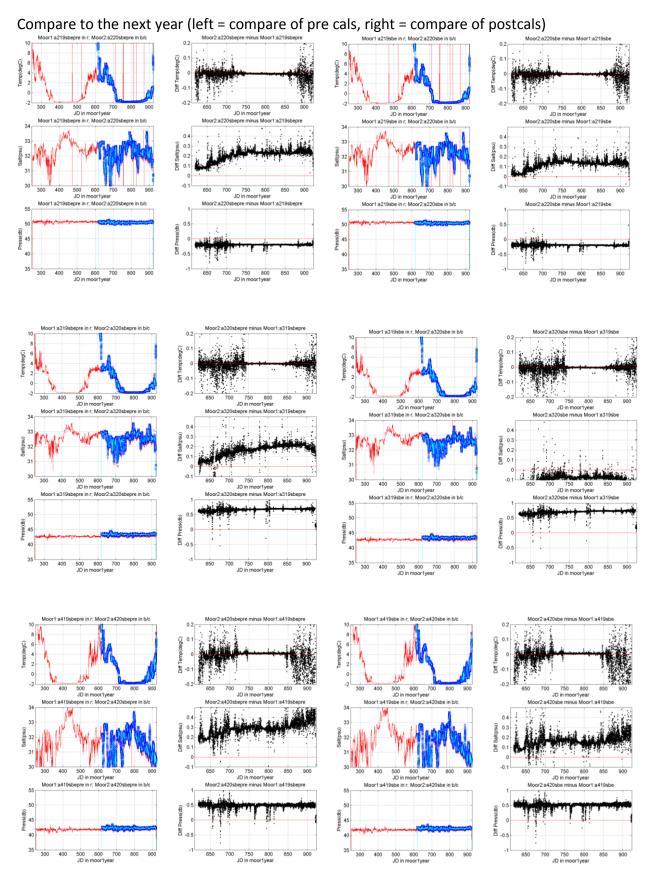
Next look at the entire set (left Pres, right postcals (ppp))

- Postcals generally improve the agreement, other than 1319#1698 where postcal is 0.2 saltier than initial soak.

- 0004 (A4-20) is missing from plots as Seabird did not calibrate it
- second soak appears problematic, with generally worse agreement to first soak.

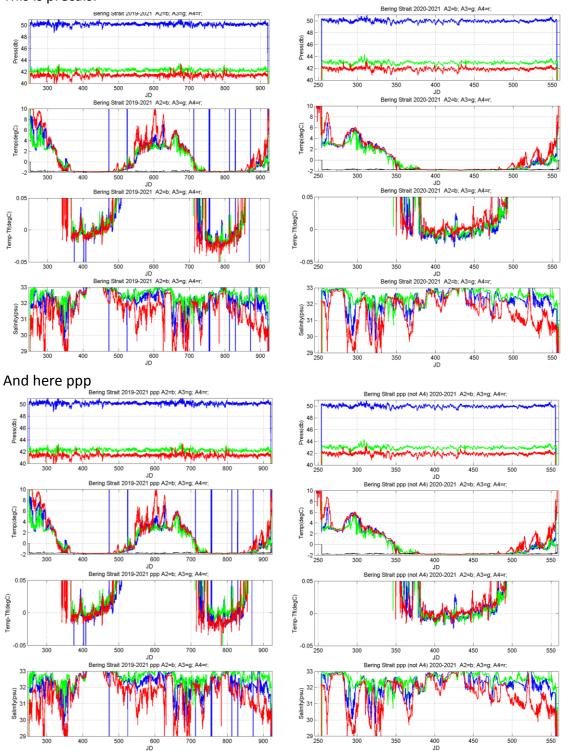
Now by instrument, looking at pre and ppp. (larger symbols are ppp, A420 no ppp).





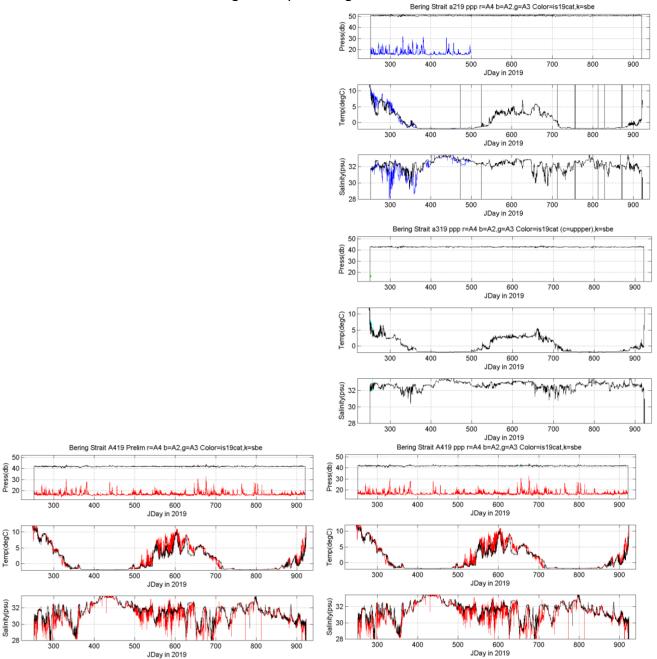
See table for conclusions

Compare freezing points in winter: This is precals:

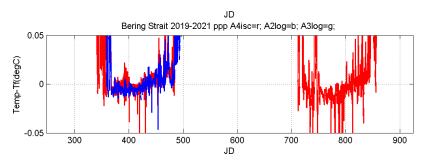


For first winter Ax19s seem ok, but by second winter freezing point is depressed too much.

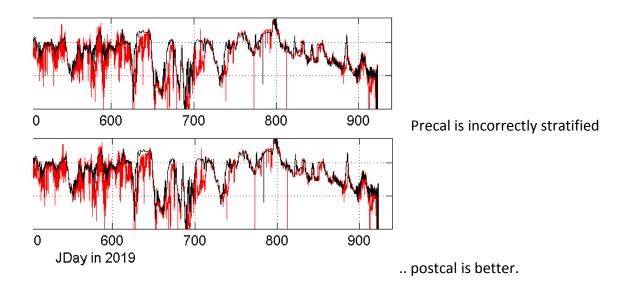
Now look at ISCATS and SBE data together by mooring:



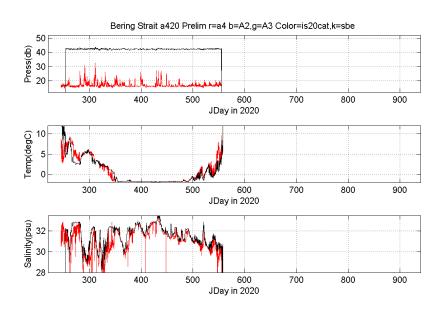
Only A4 has iscat long enough to be useful.



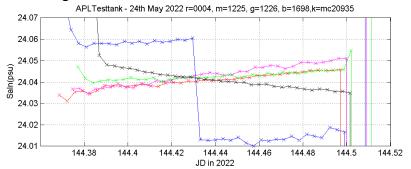
Note that ISCAT winter temperatures suggest year1 salinities ae reasonable, but that A4-19isc salinities may be somewhat too fresh. (0.005degC equivalent to 0.1 psu), Although this is not found in the test tank results



And then A419isc to compare to A420SBE (only precal)



As missing postcal on A4-20 (#0004) check in Seattle against newly calibrated instruments (May 2022) and find agreement within errors.



Other Recovered/Deployed Instrumentation: Other instruments on the moorings were recovered/deployed for other groups. These instruments are:

Recoveries: Aural Marine Mammal Acoustic sensors on both A3 were deployed by Kate Stafford, (UW). This instruments were cleaned and data storage returned to Seattle for analysis. Preliminary analysis suggests the instrument recorded throughout the mooring deployments.

Deployment: *Marine Mammal Acoustic* only 1 sensor (placed on A3) was deployed this year. This instrument is deployed for Kate Stafford, UW.

Details of mooring positions and instrumentation are given below, along with schematics of the moorings, photos of the mooring fouling, and preliminary plots of the data as available.

BERING STRAIT 2021 MOORING POSITIONS AND INSTRUMENTATION

ID	LATITUDE (N) (WGS-84)	LONGITUDE (W) (WGS-84)	WATER DEPTH /m (corrected)	INST.
		2019 Mooring	Recoveries	
A2-19	65 46.855	168 34.070	56	ISCAT, ADCP,
				SBE16
A4-19	65 44.748	168 15.765	48	ISCAT, ADCP,
				SBE16
A3-19	66 19.604	168 57.046	57	MISCAT, ADCP with SBE16,
				MMR

ID	LATITUDE (N) (WGS-84)	LONGITUDE (W) (WGS-84)	WATER DEPTH /m (corrected)	INST.
		2020 Mooring	Recoveries	
A2-20	65 46.86	168 34.60	56	ADCP, SBE16
A4-20	65 44.75	168 16.31	49	ADCP, SBE16
A3-20	66 19.60	168 57.60	59	ADCP with SBE16, MMR

ID	LATITUDE (N) (WGS-84)	LONGITUDE (W) (WGS-84)	WATER DEPTH /m (corrected)	INST.
2021 Mooring Deployments				
A2-21	65 46.849	168 34.089	57	ISCAT, ADCP, SBE16
A4-21	65 44.737	168 15.767	50	ISCAT, ADCP, SBE16
A3-21	66 19.636	168 56.993	59	MISCAT, ADCP with SBE16, new MMR

ADCP = RDI Acoustic Doppler Current Profiler

ISCAT = near-surface Seabird TS sensor in trawl resistant housing, with near-bottom data logger

MISCAT = ISCAT with two near-surface sensors (one at ~ 8m, one at ~ 16m)

SBE16 = Seabird CTD recorder, SBE37 = Seabird CTD recorder

MMR=Marine Mammal Recorder (new=new APL version)

For 2019 deployments, water depths are assuming a ship's draft of 3m.

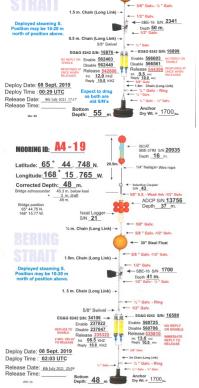
For 2020 and 2021 deployments, water depths are assuming a ship's draft of 4m.

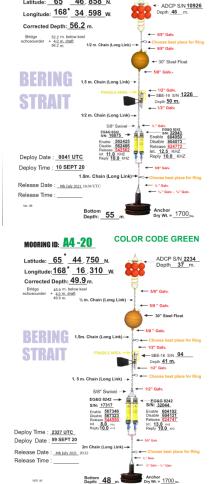
BERING STRAIT 2021 SCHEMATICS OF MOORING RECOVERIES AND DEPLOYMENTS

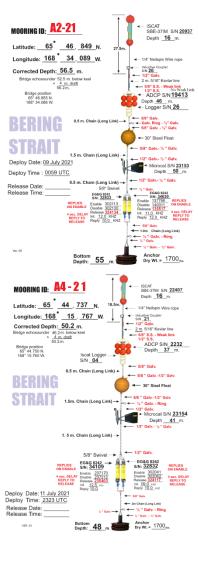
RECOVERED = in the eastern channel of the Bering Strait COLOR CODE RED MOORING ID: A2-20 MOORING ID: A2-19 ISCAT SBE-37IM_S/N 20936 Depth 16 m Latitude: <u>65[°] 46</u>. <u>858</u> N. Latitude: <u>65</u>°<u>46</u>. <u>855</u>N. Longitude: 168° 34 . 598 w. Longitude: 168 34 . 070 w. Corrected Depth: 56.2 m. - 1/4" Neilspin Wire rope Corrected Depth: 56 m. Bridge echosounder 52.5 m. below keel + <u>__3 m. draft</u> 56 m. Bridge 52.2 m. below keel echosounder + <u>4.0 m. draff</u> 56.2 m. ADCP S/N12845 Depth <u>46</u> m. Logger S/N_22 Bridge position 65° 46. 86 N. 168° 34. 07 W. 1/2 m. Chain (Long Link) — 5/8" Galv.

- 5/8" Galy, - 1/" Galy

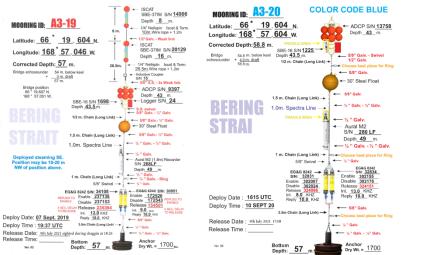
- 30" Steel Float

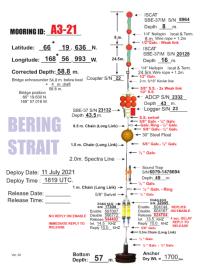






= at the climate site, ~ 60km north of the Strait





DEPLOYED

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

BERING STRAIT 2021 RECOVERY PHOTOS



Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

BERING STRAIT 2021 RECOVERY PHOTOS (continued)



A2-19 Recovery (Bio)





BERING STRAIT 2021 RECOVERY PHOTOS (continued)



Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

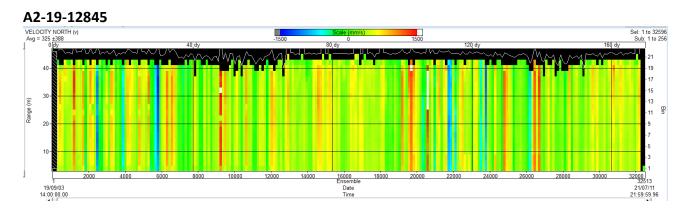
BERING STRAIT 2021 RECOVERY PHOTOS (continued)



Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

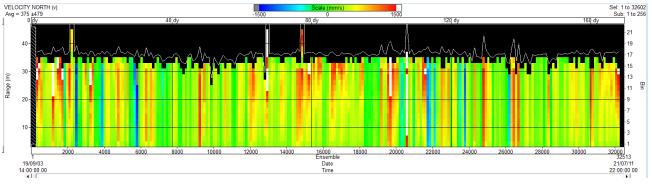
BERING STRAIT 2021 PRELIMINARY ADCP RESULTS

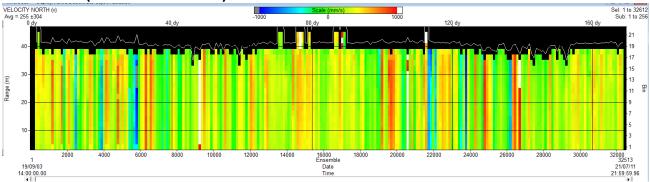
Preliminary plots of northward velocity, and velocity magnitude from the six recovered ADCPS are given below.



NORTHWARD VELOCITY from Bering Strait 2019-2021 ADCPs

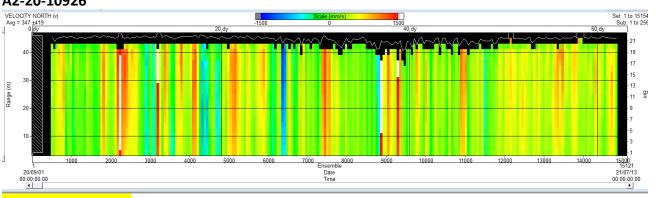
A4-19-13756



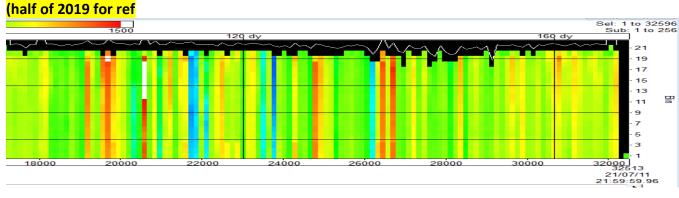


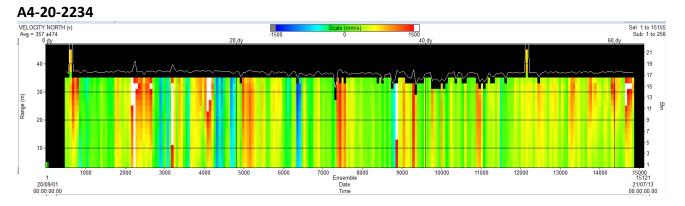
A3-19-9397 (Note different scale)

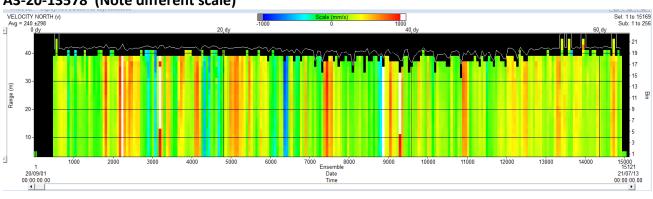
NORTHWARD VELOCITY from Bering Strait 2020-2021 ADCPs



A2-20-10926



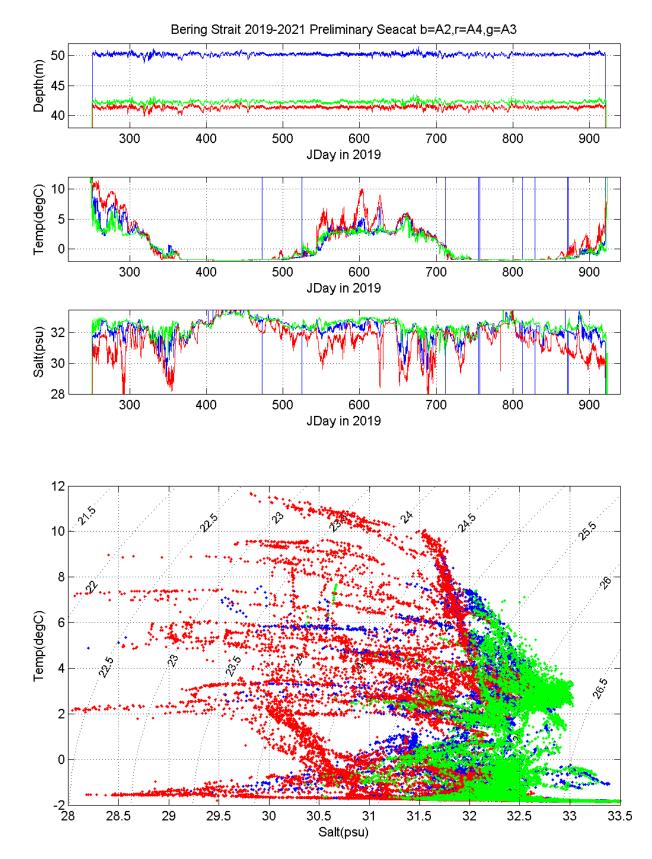




A3-20-13578 (Note different scale)

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

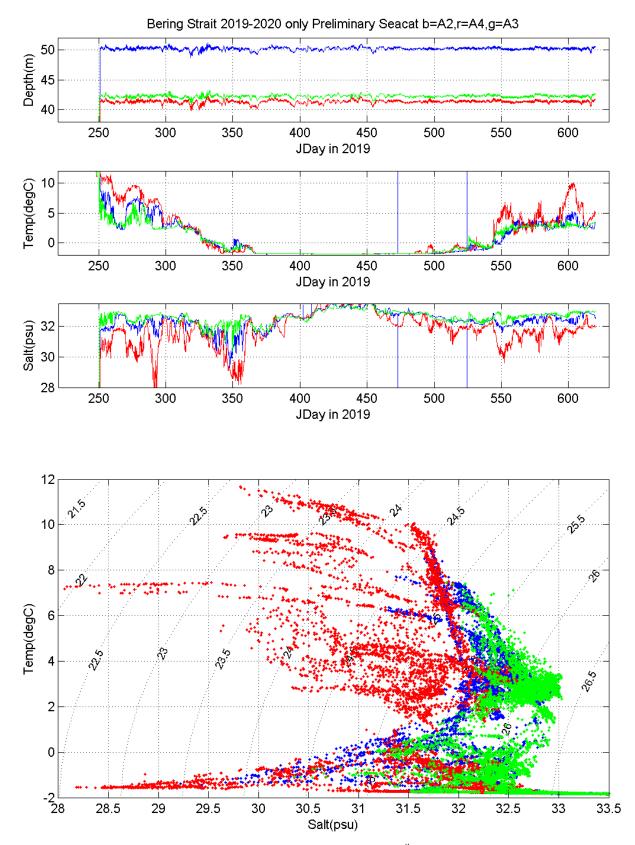
BERING STRAIT 2019-2021 SBE PRELIMINARY RESULTS (2 years, Ax19data)



– all lower level TS Sensors

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

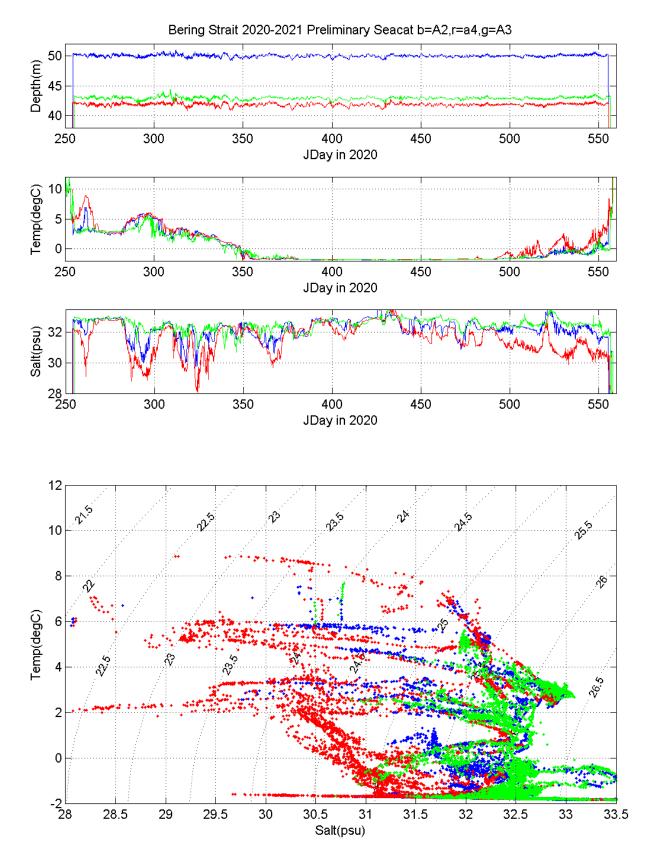
BERING STRAIT 2019-2020 SBE PRELIMINARY RESULTS (Ax19 data)



- all lower level TS Sensors (first year of data only)

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

BERING STRAIT 2020-2021 SBE PRELIMINARY RESULTS (Ax20 data)



– all lower level TS Sensors

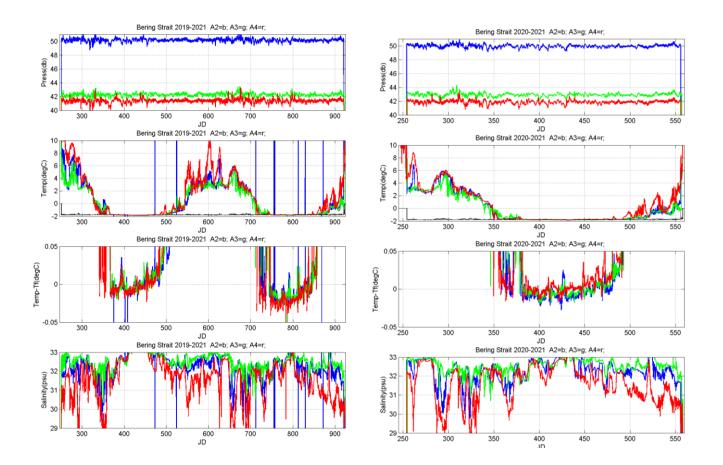
Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

BERING STRAIT 2019-2021 SBE PRELIMINARY RESULTS (2 years, Ax19data)

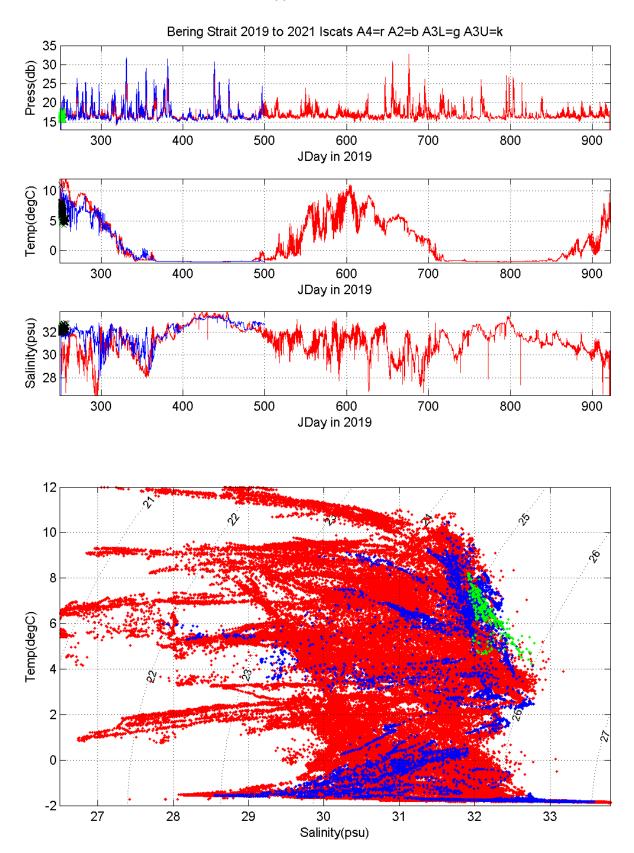
- all lower level TS Sensors

Comparison to freezing temperature

Note the Ax19s have a greater freezing temperature departure in winter, indicating the cumulative effect of biofouling



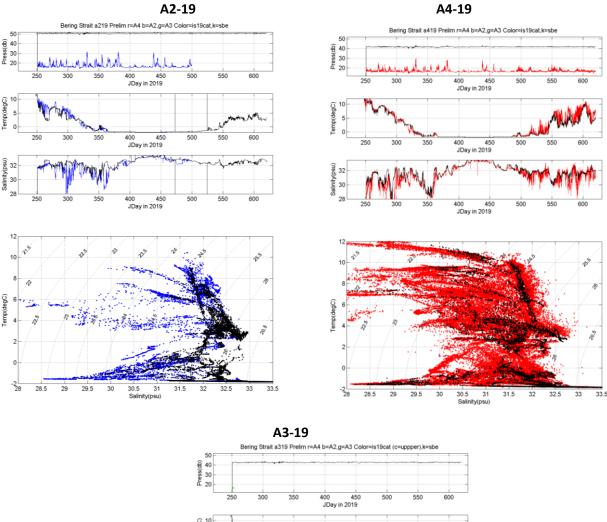
BERING STRAIT 2019-2021 ISCAT PRELIMINARY RESULTS (2 years)



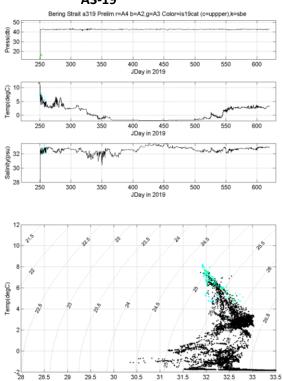
– all upper level TS Sensors

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

BERING STRAIT 2019-2020 ISCAT and SBE PRELIMINARY RESULTS (Ax19data)



-upper and lower TS sensors by mooring



30.5 31 Salinity(psu)

30

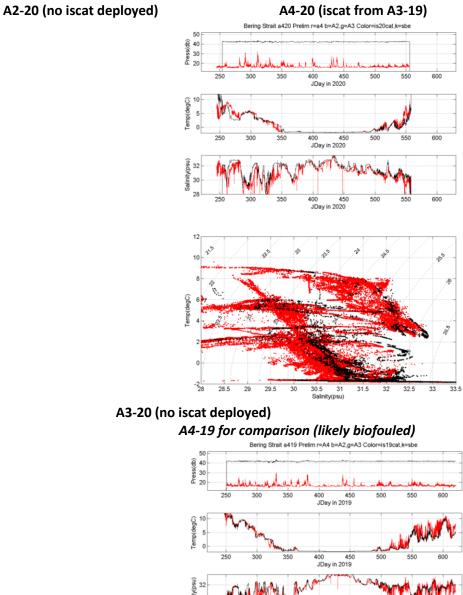
33 33.5

32 32.5

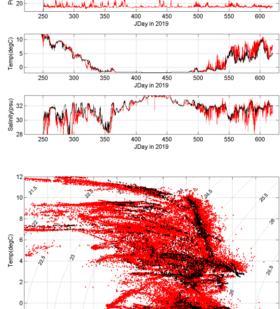
Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

28.5 29 29.5

BERING STRAIT 2020-2021 ISCAT and SBE PRELIMINARY RESULTS (Ax19&Ax20data)



-upper and lower TS sensors by mooring (only A419 iscat still present)



30.5 31 Salinity(psu) 31.5

32 32.5

28.5

29 29.5 30

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

33 33.5

CTD OPERATIONS (On-board lead: Christensen)

As in previous years, in 2021 the moorings were supported by annual CTD sections. This year (as per 2014, 2015, 2016, 2017, 2018 and 2019) these sections were run without taking any bottle samples, although this year a separate pumped system was used to take trace metal and nutrient samples (and two samples for later O18 analysis).

The CTD rosette system used on this cruise was loaned from APL-UW and, was the same set up as in 2016, 2017, 2018 and 2019 (the same set up as in 2014/2015, with the exception of the transponder). The full package consisted of:

one SBE9+ with pressure sensor

(SN26451 – calibration 17th June 2019)

two SBE3 temperature sensors

(T1 = SN0843 - calibration 28th Jan 2021)

(T2 = SN0844 - calibration 28th Jan 2021)

two SBE4 conductivity sensors

 $(S1 = SN0484 - calibration 11^{th} Feb 2021)$

(S2 = SN0485 - calibration 2nd Feb 2021)

two SBE43 oxygen sensors

(Ox1 = SN1753 - calibration 4th Feb 2021)

(Ox2 = SN1754 - calibration 4th Feb 2021)

one Wetlabs FLNTURT fluorescence/turbidity sensor (SN1622 – calibration 11th March 2010)

one Benthos Altimeter (SN50485, repaired spring 2015)

two Seabird pumps (believed to be SN50340, SN55236, but not confirmed)

one EG&G transponder (D-CAT SN31892, Interrogate: 11.0kHz, Reply: 13.5kHz)

The temperature, conductivity and oxygen probes were paired as last year, viz:

	Temperature	Conductivity	Oxygen	Pump
Primary	#843	#484	#1753	SN NA
Secondary	#844	#485	#1754	SN NA



with a y-like connection system, whereby the exit vent of the loop was at the same depth as the intake as per recommendation from the manufacturer. The top of the Y contained a slow leak valve (the vent plug) to keep the system sea-water primed on removal from the water. Tests in Seattle in 2014 showed air in the system was expunged after ~ 45s of emersion in water.

All instruments were housed in one frame (see left, photo from prior cruise), weighted with diving weights to ensure a close-to-vertical cast, as per 2014.

The CTD was connected to a conducting wire winch on the ship. This winch (Rapp Hydema NW, SOW 160 5000m capacity, with 3 conductor 0.322"diameter wire), was new on the Norseman II in 2014. Chris Siani, APL, assisted with wiring and CTD tests of this system while the ship was in Seattle in April 2014. In 2021, we found the termination had been changed to a plug which did not fit our system. Thus a temporary fix was installed for a test cast by Robert Daniels and Jim Johnson, and after the test cast, a more permanent potted connection was installed. **Action item: Check with ship pre cruise re termination.**

The winch was connected to an SBE11 deckbox, which in turn was linked via serial ports and USB-serial connectors to a

dedicated PC, running the software package Seasave v7. Data were recorded in standard hexadecimal SBE format, incorporating NMEA GPS input from the Norseman II forward GPS (since the aft-Aframe GPS was giving the wrong date). Action item: Check the ship is carrying a spare GPS antenna.

An event log (copied attached at the end of this report) was maintained on the CTD computer, including comments on data quality and other issues. The log, the data files, and a screen dump of the end-of-cast Seasave image were copied to a thumb drive as a backup after each cast, and regularly (every few casts) transferred ashore via google drive for analysis. Additionally, as each cast was completed, a WhatsApp photo of the screen shot was sent ashore for cruise/data quality tracking.

The CTD console was set on the port side of the interior lab. The package was deployed through the aft Aframe using a special block supplied by the ship. Although a Pentagon ULT unit had been mounted inside by the CTD console for lowering and raising the CTD, in practice, the winch driving was done by a crew member on deck, directed by the CTD operator using radio commands. This was deemed more efficient given the shortness of the casts (50m or less).

As in previous years, in 2021 the crew operated the winch from a remote console on the deck by the A-frame, and still, as in previous years, winch speed was an issue. The lowering (and raising) rate we seek is ~30 or 40m/min. There is no readout of winch speed at the remote console and winch drivers had to estimate speed either from the sound of the winch or from feedback from the scientist in the lab. Action item: Be sure to calibrate in winch speed early in the cruise, preferably with some scale on the winch so the speed is consistent between operators. Update ship's winch so as to provide a speed readout by the remote console. Also, train CTD driver to check winch speed on read-out beside CTD console both for lowering and raising.

The A-frame was set slightly outboard and not repositioned during the cast - the package was lifted to the height of the aft rail of the ship by the winch, and swung inboard by hand. For the casts done during mooring operations, the CTD was hand-carried forward after each cast to the port-forward corner of the aft-deck, to clear the aft-deck for mooring work. Once all the mooring work was complete, the CTD package was kept at the rail.

Once mooring work was complete, CTD operations were run 24hrs, using a team (per watch) of 1 science team member driving the CTD, and 2-3 personnel on deck - one (ship's crew) driving the winch, and one or two ship's crew/scientists recovering the instrument. This cruise, the science team provided 1 person for deck for 12 hrs a day in good weather and for an extra 12hrs in bad weather, since in bad weather, it was deemed necessary to always have two persons catching the CTD as it came aboard.

The efficiency of the crew made for very speedy CTD operations, and combined with the fast winch speed, resulted in commendably fast times for running lines. Since the CTD system required ~ 1min in the water to allow for the pumps to turn on (initiated by a manual command sent by the CTD driver), the CTD was generally put over the side and down to ~ 7m before the ship had come to a complete stop. Experience allowed the crew to time this such that, by the end of the 1min soak, the ship had come to a sufficient stop. Once the ship was stopped, the CTD pump was on and data were reliable, the CTD package was returned to ~ 1m depth (just below surface) and then was lowered to the sea floor, target depth ~ 3m above bottom, see discussion below. Only a brief (1-2 s) pause was taken at the bottom before the CTD was returned to the surface, and then recovered. If the cast was successful, the ship would start to move away just as the package was being recovered. Note on these stations, taken without any bottles, it was not necessary for the cast to be entirely vertical.

If pumped samples were to be taken, this operation followed on immediately after the CTD cast without the ship repositioning. Action item: Make sure the CTD is recovered and out of the water before the pump system is deployed, otherwise ship's manoeuvrability is compromised.

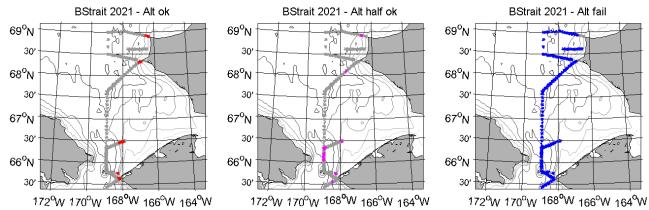
Prior to each cast the turbidity sensor was cleaned by rinsing with soapy water and freshwater and wiping. Action item: Bring syringe with better fit for flushing the CTD cell.

Ship's draft was estimated at 2m, and this should be taken into account in viewing the data. Also given that sea states were often significant and the altimeter on the CTD rarely functioned, some casts stop 5m-6m above the bottom.

Overall, CTD data this year are exceedingly clean, although the following issues were encountered:

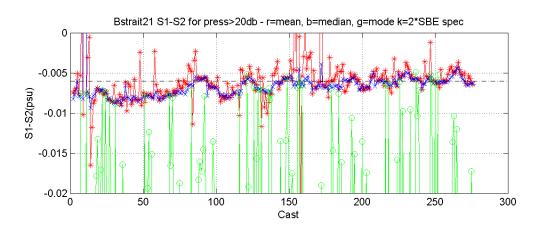
1) For casts up to and including **10.** Significant mismatch was found between the up and down casts in salinity and oxygen, indicative of a timing mismatch between the sensors. (Cast 10 was run with pumps off to check the pumps were working - they were.) Investigation of the system found the TS duct was missing. When this was replaced (for cast 11 onwards), the mismatch became much smaller - almost unnoticeable in salinity, though still present in oxygen. The later was found to be greatly improved by data processing (see below).

2) Altimeter. In previous years, it was found that the altimeter only performed well intermittently, and the pattern of success and failure appeared to be strongly correlated with water temperature. This year, being early the season, the waters were generally colder and the altimeter was primarily useless. On viewing sections, recall bottom 3+m may be unsampled. Actin Item: Next year, reconsider bottom depth decisions in light of warmer waters.

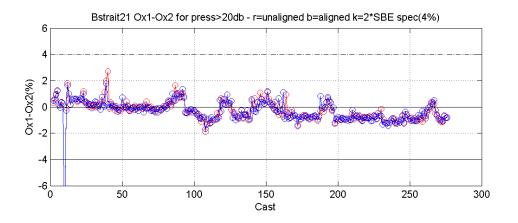


3) Vent plug blocking. As in previous years, the blocking of the vent plug due to impurities in the water was a continual concern. We instigated a cast-by-cast check that the tubes were draining once the CTD was recovered and if either was slow, the plugs would be cleaned with wire. Action item: Continue this check in other years. High vigilance to this issue this year resulted in fewer problems with the data, but data should still be checked for this problem. (Suspect casts: 16, 42, 62, 63, 117, 172(recast as 173)

4) Offset between Salinity sensors. Prior years found an offset in salinity between the two sensors on the CTD. This year, a similar offset was observed (with S1 reading fresher as in prior years). The CTD should be accurate to 0.003psu, and thus discrepancies of < 0.006psu (marked as dashed line on plot) are within specifications. Early in the cruise (and after cast 222, which is suspected to have hit bottom), the sensors were flushed, and at the start of the cruise an airtest test taken which may be used later for information. In general, agreement was just within manufacturer's specifications. Action item: Flush cells with freshwater on deck at start of cruise and at regular intervals.



5) Offset between Oxygen sensors. Once aligned in post processing, differences between oxygen sensors were also within manufacturer's specifications.



6) Other cast issues:

- cast 25 was yoyoed after the main cast to examine the Oxygen maximum. For the archives, a trimmed version of this file has been made (with the original cast number) including the original full down and up cast. The full yoyed cast is retained as "orig".

- cast 114 was aborted as the CTD came out of the water, and recast as cast 115

- cast 172 (end of the LIS line) has an usual midlayer intrusion, worth further investigation

- cast 172 had vent plug issues, and was immediately recast (without recover) as cast 173

- cast 222 contains interesting layering at the surface (and is suspected to have hit bottom, making oxygen data suspect on the upcast.

NOTES ON BERING STRAIT 2021 CTD PROCESSING

For 2021, we have new cals for T, C and Ox, so we are running with:

 Pressure
 17thJune 2019 - this is the new one, and has a new SN of 26451

 T1 (#843)
 28th Jan 2021

 T2 (#844)
 28th Jan 2021

 C1 (#484)
 11th Feb 2021

 C2(#485)
 2nd Feb 2021

 Ox1 (1753)
 4th Feb 2021

 Ox2 (1754)
 4th Feb 2021

 FLNTURT (#1622) - 11th March 2010

These are accurately in the BStrait21nnn.xmlcon files.

SUMMARY OF PROCESSING ISSUES 2021

=== casts 0-10 were done missing TS duct and thus there is significant alignment issue with Conductivity. As these were all calibration casts looking at the deep water, while the issue appeared in the layers above/below a temperature gradient, these casts have not yet been specially processed

== cast 10 was done with pumps off (a repeat of cast 9)

== cast 16 - vent plug issues

== cast 25, as an oxygen test, was yoyoed after the main cast to below the depth of the oxygen maximum and recovered slowly. ... original file is included as 025orig. 025 is trimmed to only the full initial cast

== cast 42 - suspect vent plug issue
== cast 62 - vent plug issues
== cast 63 - vent plug issues

== cast 114 was aborted as CTD came out of water. Recast as 115
== cast 117 - salinity issues

== cast 158 spike in C1

== cast 172 - vent plug issues, Recast as 173

= cast 222 is suspected to have hit bottom. Oxygen data suspicious on up cast.

== many casts struggle with sharpness of thermocline giving spikes in Salinity. - aligning seems to fix this

== Almost all casts show align issues with Oxygen - using Ox34 seems to mostly fix this

Results recorded by cast in master CTD log file **RWnoteson2021BstraitCTDcasts.xls**

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

FULL NOTES ON BERING STRAIT 2021 CTD PROCESSING Rebecca Woodgate (based on 2019)

Start with files from SeaSave for each cast, i.e., Bstrait21nnn.hex and Bstrait21nnn.hdr

Then run through 9 steps (8 of them with SBEDataProcessing program from Seabird).

=== 1) First make up a file to be used for quick plotting. This contains all variables, but is not corrected in any way.

```
IN SBEDATA PROCESSING, RUN: DATA CONVERSION
(PSA file for this = 001_DatCnvBStrait2021_allvars.psa)
Inputs are: BStrait21nnn.hex and BStrait21nnn.hdr
```

*In FILE SETUP

- -- CHECK box on match instrument to configuration file
- -- Choose input file (should be .HEX) and directory
- -- Name append .rw1
- -- Choose output directory
- *In DATA SETUP

-- Convert data from:UP and downcast (Last year we just did down as we were firing no bottles. Here we do both, noting that upcasts may differ because of water being swept up with the CTD.)

- -- Create file types: data (.CNV) only
- ...-Merge Header file
 - -- Select output variables... as in previous years we use
 - -- 1) Pressure, Digiquartz (db)
 - -- 2) Temperature (ITS-90, degC)
 - -- 3) Temperature,2 (ITS-90, degC)
 - -- 4) Conductivity (S/m)
 - -- 5) Conductivity, 2 (S/m)
 - -- 6) Oxygen raw, SBE 43 (Volts)
 - -- 7) Oxygen, SBE 43 (saturation)
 - -- 8) Oxygen raw, SBE 43, 2(Volts)
 - -- 9) Oxygen, SBE 43, 2(saturation)
 - -- 10) Fluorescence WET Labs WET star (mg/m^3)
 - -- 11) Upoly 0, FLNTURT
 - 12) Scan Count % This was done in 2018, but not recorded in the write up
 - -- 13) Salinity, Practical (PSU)
 - -- 14) Salinity, Practical, 2 (PSU)
 - -- 15) Time, NMEA (seconds)
 - -- 16) Latitude (deg)
 - -- 17) Longitude (deg)
 - -- 18) Altimeter (m)
 - -- 19) Pump Status
 - -- Source for start time in output .cnv header: Select NMEA time
 - *In MISCELLANEOUS

-- Keep all defaults. Note the Oxygen is Window size (2s), Apply Tau Correction, Apply Hysteresis.

THIS GIVES files called: BStrait21nnn.rw1.cnv

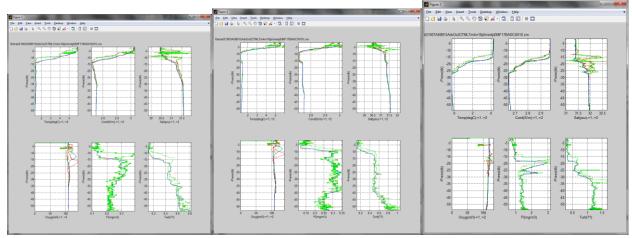
=== 2) Do first basic quality control by plotting everything in Matlab

Matlab master code = testplotsBStrait2018RW.m which calls subroutine CTDQCpump.m Inputs are: BStrait18nnn.rw1.cnv

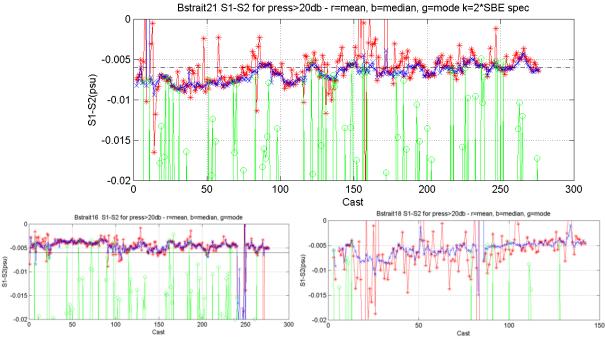
Checks here include:

- --- that the pump comes on
- --- that the altimeter is working
- --- that T1=T2, S1=S2 and Ox1=Ox2
- --- preliminary identification of spikes and other issues.

Running all the processing steps on casts 0-10 did not remove the problem.



Examination of the system found that the TS Duct was missing. Once the TDuct was installed, salinity differences became closer to and finally within manufacturer's specs



Worse than 2016 but on a par with 2018

=== 3) Now work through the 7 steps of SBEDataConversion. Start by applying the calibrations to get the converted files, but this time excluding all the derived variables. IN SBEDATA PROCESSING, RUN: DATA CONVERSION (PSA file for this = DatCnvBStrait2021_CTDforprocess.psa)

Inputs are: BStrait21nnn.hex and BStrait21nnn.hdr

*In FILE SETUP

-- CHECK box on match instrument to configuration file

- -- Choose input file (should be .HEX) and directory
- -- Name append NONE
- -- Choose output directory

*In DATA SETUP

-- Convert data from: UP and downcast (Last year as here, we do both, noting that upcasts may differ because of water being swept up with the CTD.)

-- Create file types: data (.CNV) only

...-Merge Header file

-- Select output variables... for 2018 we use

- -- 1) Pressure, Digiquartz (db)
- -- 2) Temperature (ITS-90, degC)
- -- 3) Temperature,2 (ITS-90, degC)
- -- 4) Conductivity (S/m)
- -- 5) Conductivity, 2 (S/m)
- -- 6) Oxygen raw, SBE 43 (Volts)
- -- 7) Oxygen raw, SBE 43, 2(Volts)
- -- 8) Fluorescence WET Labs WET star (mg/m^3)
- -- 9) Upoly 0, FLNTURT
- -- 10) Scan Count
- -- 11) Time, NMEA (seconds)
- -- 12) Latitude (deg)
- -- 13) Longitude (deg)
- -- 14) Altimeter (m)
- -- 15) Pump Status

-- Source for start time in output .cnv header: Select NMEA time

*In MISCELLANEOUS

-- Keep all defaults. Note the Oxygen is Window size (2s), Apply Tau Correction, Apply Hysteresis.

THIS GIVES files called: BStrait21nnn.cnv

=== 4) Second step of SBEDataProcessing. Apply a time filtering to the data.

This step allows us to time-filter (i.e., smooth) the data. Routine allows us to select two filters, A and B. In 2014, we used A = 0.5 sec and B=0.15 sec, but in 2015 this appeared to remove too much variability. Manual for the SBE9plus suggests to not filter Temperature and Conductivity, but to filter pressure at 0.15s. So set A=0, and B=0.15 and then only filter pressure *(this is now the same as 2015, but different to 2014).*

Note these filters should be applied to the raw data (e.g., Ox voltage, Conductivities), not the derived data (e.g., salinity, oxygen saturation, etc).

IN SBEDATA PROCESSING, RUN: FILTER

(PSA file for this = FilterBStrait2021_CTDforprocess.psa)

Inputs are: BStrait21nnn.cnv

*In DATA SETUP

- -- Lowpass filter A(sec): 0.0 (was 0.5 in 2014, but this seemed too smooth in 2015, so used 0, as here)
- -- Lowpass filter B(sec): 0.15 (This is as per the manual for SBE9plus)
- --> SPECIFY FILTERS
- -- Pressure: Lowpass filter B
- -- Temperature: None
- -- Temperature, 2: None
- -- Conductivity: None
- -- Conductivity,2: None
- -- Oxygen raw: None
- -- Oxygen raw,2: None
- -- All others: None

*In FILE SETUP

```
-- Name append = A00B15 ... this indicates data was filtered (Note: makes only small changes to the data)
```

THIS GIVES files called: BStrait21nnnA00B15.cnv

=== 5) Third step of SBEDataProcessing. Align the timeseries in time.

This step is to compensate for the delay between the water passing the various sensors in the pumped pathway. For the SBE9plus, the manuals suggest that

- the temperature advance relative to pressure =0

- that the salinity advance relative to pressure is 0.073s, but this advance is set in the SBE11plus by

factory settings, and thus for this program we use conductivity advance =0. Action item: Check this is what is set in the SBE11 plus.

- that the oxygen advance should be between +2and +5. This should be done on the Oxygen voltage. **IN SBEDATA PROCESSING, RUN: ALIGN**

(PSA file for this = AlignCTDBStrait2021_CTDforprocessOx34.psa)

Inputs are: BStrait21nnnA00B15.cnv

*In DATA SETUP

--> Enter Advance values

-- Oxygen: 2 (as recommended in SBE9+ manual (2 to 5), and tests suggest in 2014 and 2015)

- -- All others: 0
- *In FILE SETUP

-- Append added = AdvOx5

THIS GIVES files called: BStrait21nnnA00B15AdvOx2.cnv

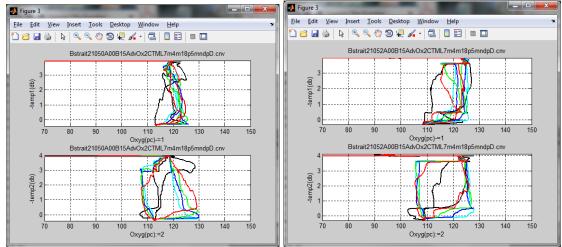
So, of these, it is suggested we investigate the various oxygen options. This we run this step with various values for the oxygen advance (2-5) and, by plotting oxygen against temperature, see which advance value gives the most consistent reading comparing the up and down casts. R=2,g=3,b=4,c=5

Previous years have segregated casts into which colors are good. Here we look at casts up to 30 and spot check beyond that:

Black (0)	Red (2)	Green(3)	Blue (4)	Cyan (5)	Unclear
Primary	10,14,15,20	13,16,18,19,21,22,23	12		
Sensors		24,25,26,27,28,30			
Secondary		19	18,20,21,22,23,24,25	15.16,27	
Senors			,26,29,30		

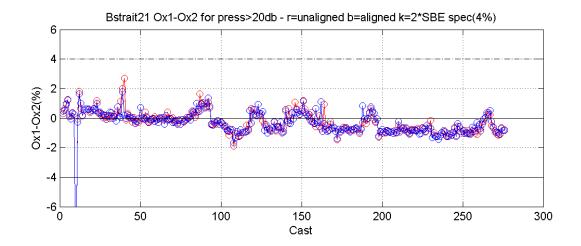
By this tally, Green(3) has the best fit most often is Green (3) for system1 and blue (4) for system 2. Use this here even though previous years have used (2).

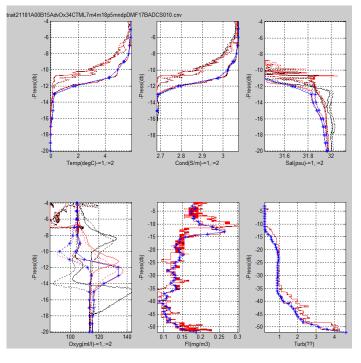
Again show that up and down casts by differ by 5%-10%.



Finally conclude:

- at this stage will use Ox1, as it shows less spread than Ox2.
- alignment is generally best for both as +3 for system 1 and +4 for system 2.
- recognize that up and down casts may differ by 5%-10% .
- agreement between sensors within manufacturer's specs





Check to see how much aligning fixes the problems in S and Ox with sharp T gradient: K = unaligned

> Note S inversion
> Note Ox + and -ve peaks at different depths

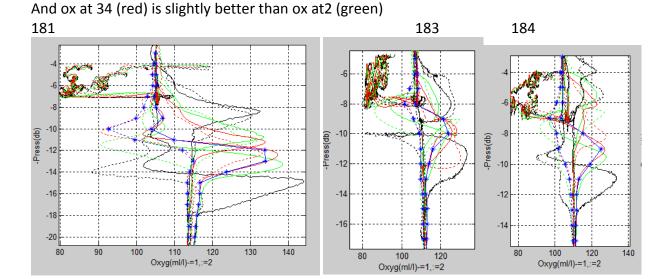
Red = aligned (Ox34) Blue = Bin av down cast.

SO

- has fixed S overrun very effectively

 has moved ox peaks to be about same mag, and all +ve and a reasonable depth given difference in depth on up and down cast.

And this is all well reflected in bin average



184 -- ok with Ox1, less so with ox2

=== 6) Fourth step of SBEDataProcessing. Correct for thermal mass of the cell

This is a standard SBE correction to compensate for thermal mass of the cell. Assumes the pump is at 3000 rpm. *Action item: Check this.* Then manual suggests for SBE9+ Alpha=0.03, 1/beta=7.

IN SBEDATA PROCESSING, RUN: CELL THERMAL MASS

(PSA file for this = CellTMBStrait2021 CTDforprocess.psa)

Inputs are: BStrait21nnnA00B15AdvOx234.cnv

*In DATA SETUP (correct both Primary and Secondary values)

-- Thermal anomaly amplitude [alpha]: 0.03 (suggested for SBE9+)

-- Thermal anomaly time constant [1/beta]: 7 (suggested for SBE9+)

*In FILE SETUP

-- Append added = CTM

THIS GIVES files called: BStrait21nnnA00B15AdvOx34CTM.cnv

== 7) Fifth step of SBEDataProcessing. Remove pressure loops from the casts.

This step is to take out pressure looping, stalls in lowering, and the surface soak. To run this, you must have filtered the pressure first (as we did above). This does not remove any data, it just marks looped data with a bad data flag of -99e-26.

In 2015, we instigated a 5m depth for the initial surface soak, returning after that soak to the surface to start the downcast. Thus the used values were L5m2m6m (soak, min, max) and were used including deck pressure, and that seemed to work well with this routine. Prior years just used a 2m soak depth and that might be less successful with this routine.

In 2016 the soak was about 4m .. checks show this works with this routine and these settings. In 2017, soak is about 7m, but sometimes much deeper. Previous settings (L5m2m6m) did not work well with this data set. After investigation, we learn the following:

- likely best not to include the deck pressure as offset - our system is never on while in air, and thus this will just introduce a non-intuitive offset.

- the max must be deeper than the deepest soak, yet shallower than the maximum depth of the shallowest cast. In 2017, the shallowest casts were (Cast1 and 2, tests, and thus not considered; 113(19.6m), 114(19.6m), 115(19.5m), 117(18.7m). Our deepest soaks were cast 20(18.25m), cast 31(16m). Thus, we set max to be 18.5m

- the min must be deep enough to separate the going-in-the-water oscillations from the soak. 2m and 3m were found to be too shallow in 2017, but by inspection 4m works well.

Finally settings for 2017 were thus: 7m soak, min 4m, max 18.5m. (Note if you specify max and min, the program is not supposed to use soak depth at all.)

In2018 these settings gave a good result and were used without further testing.

In 2021 we again adopted these settings. The only problematic casts are:

Cast 25,.. which was yoyoed because of initial discrepancies in the data.

In preliminary processing, copy the original hex file to 025orig, and take a trimmed version through the processing instead

IN SBEDATA PROCESSING, RUN: LOOP EDIT

(PSA file for this = LoopEditBStrait2021_CTDforprocess.psa)

Inputs are: BStrait21nnnA00B15AdvOx34CTM.cnv

Must run filter on pressure first. Flag surface soak with -9.99e-26...

*In DATA SETUP

-- Minimum ctd velocity (m/s) = 0.25

--> Check box Remove Surface soak

- -- Surface soak depth (m) = 7
- -- Minimum soak depth (m) = 4
- -- Maximum soak depth (m) = 18.5

--> UNCheck box Use deck pressure as pressure offset

--> Check box Exclude scans marked bad

*In FILE SETUP

-- Append added = L7m4m18p5mndp

THIS GIVES files called: BStrait21nnnA00B15AdvOx34CTM L7m4m18p5mndp.cnv

=== 8) Sixth step of SBEDataProcessing. Derive the parameters you want.

This step takes the raw data and calculates derived parameters, such as salinity, density, oxygen values, etc.

IN SBEDATA PROCESSING, RUN: DERIVE

(PSA file for this = DeriveCTDBStrait2021_CTDforprocess.psa)

Inputs are: BStrait21nnnA00B15AdvOx34CTML7m4m18p5mndp.cnv

-- CHECK box on match instrument to configuration file (Prior notes says to check this box, however, in 2016 this crashed if the box was checked, so instead uncheck the box, **BUT MUST MAKE SURE IS USING A CURRENT CALIBRATION FILE**). If ever change sensors during cruise, will have to do something different here. Check these files to make sure the .con files are consistent.

- *In DATA SETUP
 - --> Select derived variables... add:
- -- Salinity (psu)
- -- Salinity,2 (psu)
- -- Salinity difference
- -- Sigma theta (kg/m3)
- -- Sigma theta,2 (kg/m3)
- -- Sigma theta difference
- -- Oxygen, SBE 43 (ml/l)
- -- Oxygen, SBE 43 (saturation)
- -- Oxygen, SBE 43, 2 (ml/l)
- -- Oxygen, SBE 43, 2 (saturation)
- *In FILE SETUP

```
-- Append added = D
```

THIS GIVES files called: BStrait21nnnA00B15AdvOx34CTM L7m4m18p5mndp D.cnv

Could stop here, and use these files, but to be more useful want to have Bin averages and despike, and the combination of the two of those processes. So, first look at the despiking options. SBEDataProcessing includes a file called "Wild Edit", but the manual describes that as "not the faint of heart" and says much trial and error is necessary to get good results. Thus, instead use something more automatic, Window Filter.

=== 9) Twelfth step of SBEDataProcessing. Use Window Filter to despike.

This is an attempt at automatic despiking. If just try so smooth over a spike, you will flatten it, but the bad data will still remain. Here we make one basic attempt, as outlined in the manual. This takes a window of data points, and for each window, replaces the central (?) point with the median of all the points. In some way thus, this is smoothing over the data points, but one that neglects extreme values. Their example suggests 17 points, and we have used that. Sampling rate is 24Hz. Drop rate is ~ 1m/s. So this is roughly equivalent to smoothing at 0.7 sec, or 70cm.

IN SBEDATA PROCESSING, RUN: WINDOW FILTER

(PSA file for this = W_FilterCTDBStrait2021_CTDforprocess_MF17.psa) Inputs are: BStrait21nnnA00B15AdvOx34CTM L7m4m18p5mndp D.cnv

*In DATA SETUP

--> Select Exclude scans marked bad

--> Specify Window Filters:

Type: Median Parameters: 17

For variables: Temp1, Temp2, Cond1, Cond2, Oxraw1, Oxraw2, Fluorescence, Upoly (Turbidity/Transmissivity), Latitude, Longitude, Salinity1, Salinity2, Density1, Density2, Ox1ml/I, Ox1%, Ox2ml/I, Ox2%

-- Append added = MF17

THIS GIVES files called: BStrait21nnnA00B15AdvOx34CTM L7m4m18p5mndpDMF18.cnv

=== 10) Seventh step of SBEDataProcessing. Bin average all the data.

All data files prior to this have been the 24Hz data up and down casts. Here we separate out the downcasts only, exclude the data marked bad by loop edit, and create 1m bin averages. We chose here to create a surface sample, however often the number of scans in that sample is small and in any case surface stirring by the ship must also be considered.

IN SBEDATA PROCESSING, RUN: BIN AVERAGE

(PSA file for this = BinAvgBStrait2021_CTDforprocess.psa)

Inputs are: BStrait21nnnA00B15AdvOx34CTM L7m4m18p5mndp.cnv &

BStrait21nnnA00B15AdvOx34CTM L7m4m18p5mndpDMF17.cnv

- *In DATA SETUP
- -- Bin type = Pressure
- -- Bin size = 1
- --> Select Exclude scans marked bad
- \rightarrow Select include number of scans per bin
- -- Scans to skip over = 0
- -- Cast to process = **Downcast**
- -> Include surface bin 0,1,0

*In FILE SETUP

-- Append added = BADCS010

THIS GIVES files called: BStrait21nnnA00B15AdvOx34CTM L7m4m18p5mndpDBADCS010.cnv & BStrait21nnnA00B15AdvOx34CTM L7m4m18p5mndp DMF17BADCS010.cnv

In 2021 this marks the end of the CTD pre processing.

BERING STRAIT 2021 CTD OPERATION NOTES from end of cruise

- 0. Coming onto station
 - pre fill Event Log (Excel file)
 - In Seasave
 - Real time data, Start, Begin archiving data immediately
 - Select Output Data File Name: Bstrait21nnn.hex, *** NOTE NAME 17, not 2017
 - Start
 - fill in header
 - Ship: Norseman 2, Station name (e.g., BS24), Operator
 - then WAIT
 - Driver to Deck: "clean wetlabs sensor"
 - Deck to Driver: "sensor cleaned"
 - Driver to Deck: "Is transponder in?"
 - Deck to Driver: "Transponder in"
- 1. On station confirmed from bridge "on station",
 - Driver to deck, "Ready to Deploy"

CTD in the water (Deck to Driver: "CTD in water and at 5m") (Driver: double click radio)

- Power on CTD Deck Unit, check get readout of "10" (0110)
- OK on SeaSave header, wait until SeaSave gray windows close
- Real-time Control, Pump on (to turn pump on manually)
- Fill out rest of Event log (Excel file) for deployment (including time).
- Driver to deck, "Please report wave height, air visibility, water visibility"
- WAIT until -"11", "Pump on", Data ok (incl S and position), check #'s agree
- check target depth ~ water depth under keel
- Driver to Deck: "return to surface and go down to xxx meters" (GET SURFACE WIRE OUT)
- Deck to Driver: "Going down"
- Check lower speed (want 30/40 m/min) on winch readout
- 3. CTD lowers
 - watch pressure ... (resist temptation to analyze the cast on the way down) .. focus only on the pressure
 - Driver to Deck: "3 2 1 stop" for target depth
 - Deck to Driver: "CTD stopped" (GET BOTTOM WIRE OUT)
 - wait ~2sec
 - Driver to Deck: "Come to surface" AND CHECK CTD COMES UP
- 4. CTD comes up ** COMPARE SENSOR PAIRS decide if data good enough to leave station

When at surface (Deck to Driver: "At surface") (Driver: double click radio)

- real time control Pump off
- real time data STOP
- Power off CTD Deck Unit
- Driver to deck: "Recover CTD and proceed to next station"
- OR IF may have to recast .. add "We have CTD issues, do not leave after this cast"
- fill in Event Log for up cast (including time), while

- Deck to Driver "CTD recovered, Pipes are/not draining", and default is ship leaves for next station.

5. THEN

- screen dump to paint (Alt-print screen, Cntrl V, save as BStrait21nnn.png); F12 (save as);

- QUIT paint.
- Copy the 4 files (.hex, .hdr, .xmlcon, .png) to USB Backup file directory

(Start event log for next cast)

If leaves CTD for long time, check "transponder is out"

Deck responsibilities every cast:

- checking sensor cleaned and transponder in
- checking depth of surface soak
- watch wire (out aft is ok, under ship is not, far to side near ship not)
- keep winch operator focused
- count CTD as it goes down, listen for 3 2 1 stop and make sure winch stops
- At Bottom, make sure winch comes UP (e.g., watch wheel)
- Watch for tape on way up,
- Observe and report surface issues (e.g., broke surface, ask for repeat soak if out of water for more than 4 sec)
- report clarity of water (max range at which you can see CTD in m)
 - fog
 - wave height if exciting
- report if pipes are draining once CTD is on deck.
 - if not draining, clean vent plugs and report to CTD operator to add to notes.
- report if jelly fish remains on salinity cells
- make sure secure on deck.
- every 50 casts, check all CTD bolts

BERING STRAIT 2021 CTD LINES

A total of 14 CTD lines were run on the cruise.

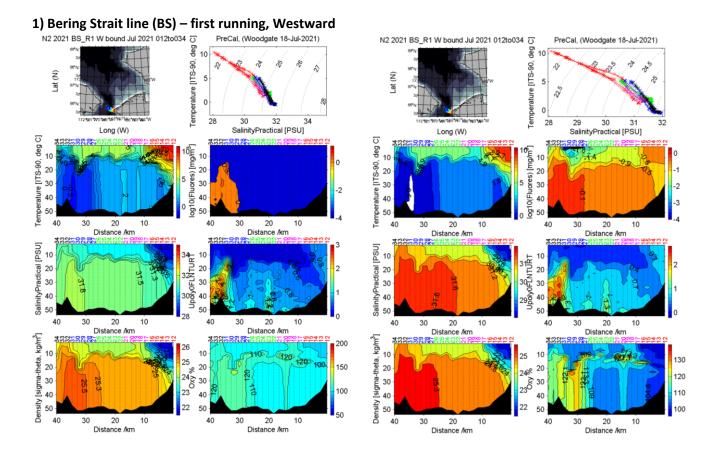
Preliminary sections were plotted using code from An Nguyen from the preliminary processed data, which uses pre-cruise calibrations, and the quality control procedures outlined above to give 1m bin averages for plotting.

The plots below give all 14 sections on the same scales (left) and on a scale for that section (right), presented in order of data acquisition. Note that:

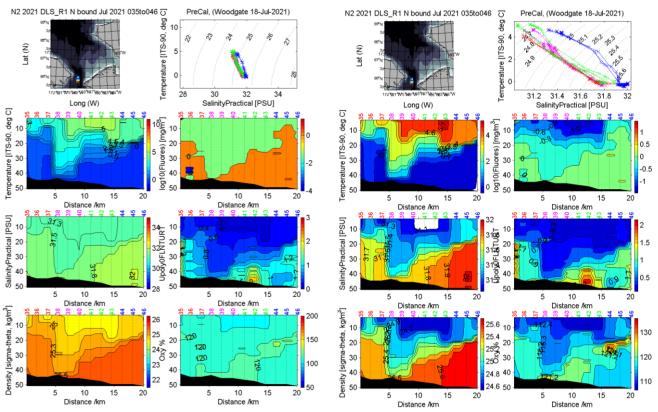
- this uses the S1 and Ox1 data,
- typically stops 2 to 3+ m above the bottom.

Several repeat sections were run on the cruise (see naming below)

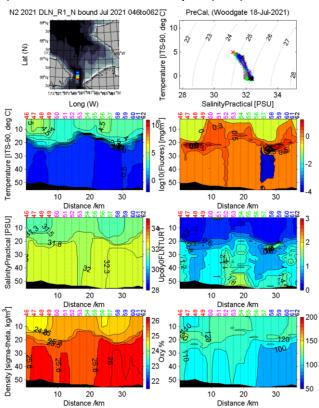
For full positions and times see event log and data file headers.



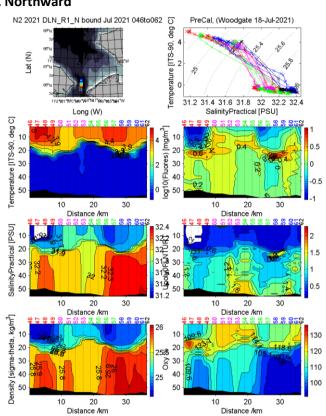
2) Diomede Islands line south part (DLS) - first running, Northward



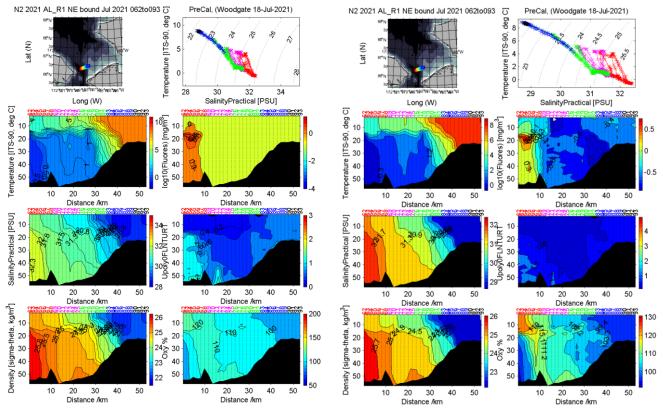
Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022



3) Diomede Islands line north part (DLN) - first running, Northward

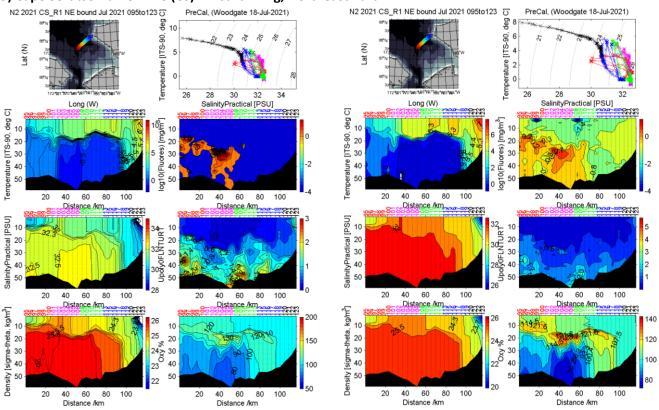


4) A3 line (AL) - first running, Northeastward

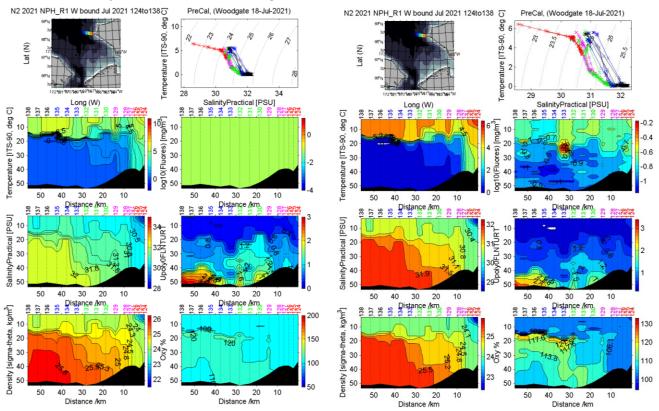


Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

5) Cape Serdtse-Kamen line (CS) - first running, Northeastward

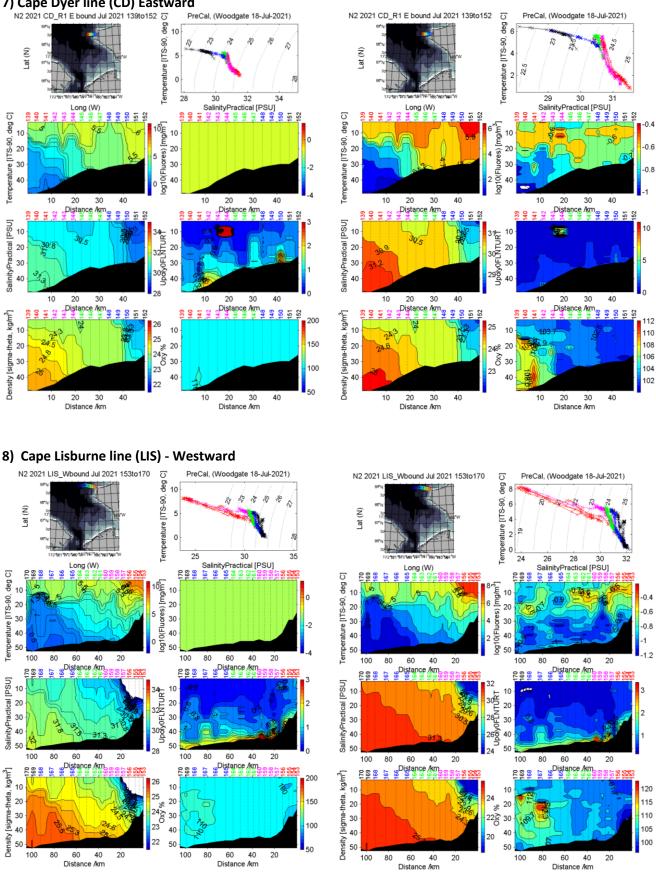


6) North Point Hope line (NPH) - first running, Northwestward

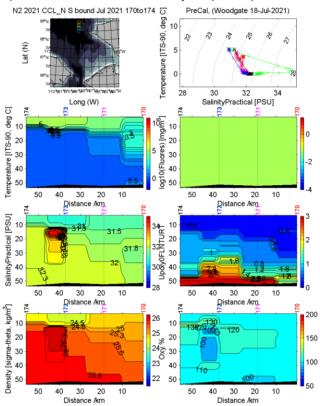


Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

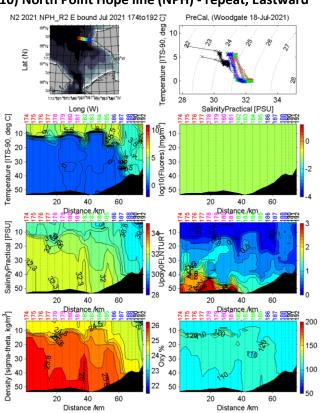


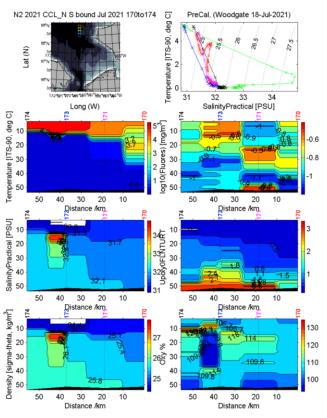


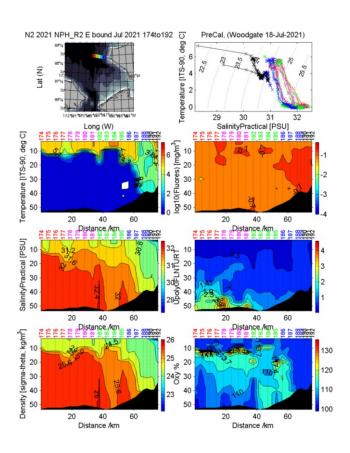
9) Chukchi Central line North part (CCL-N) - southward

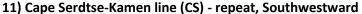


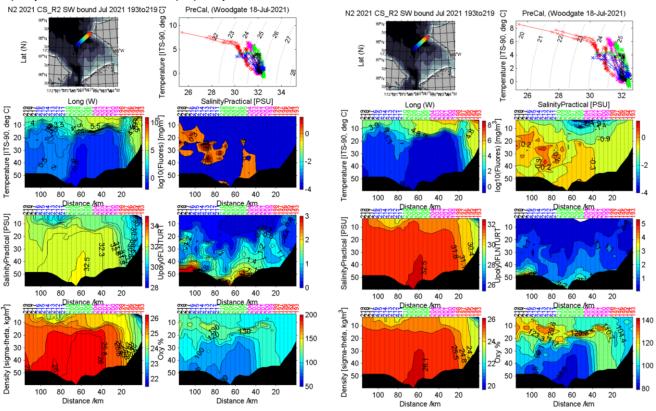
10) North Point Hope line (NPH) - repeat, Eastward



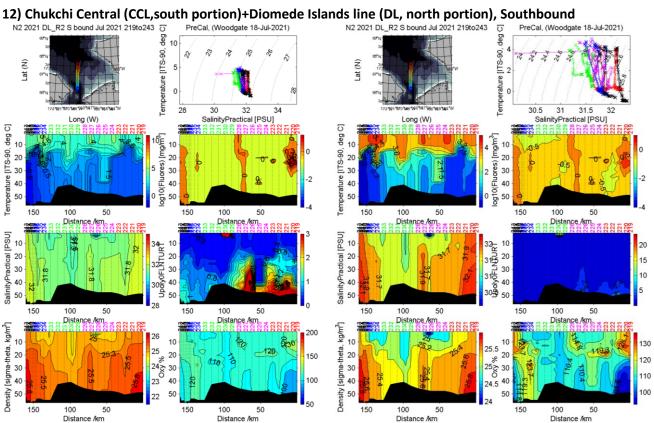


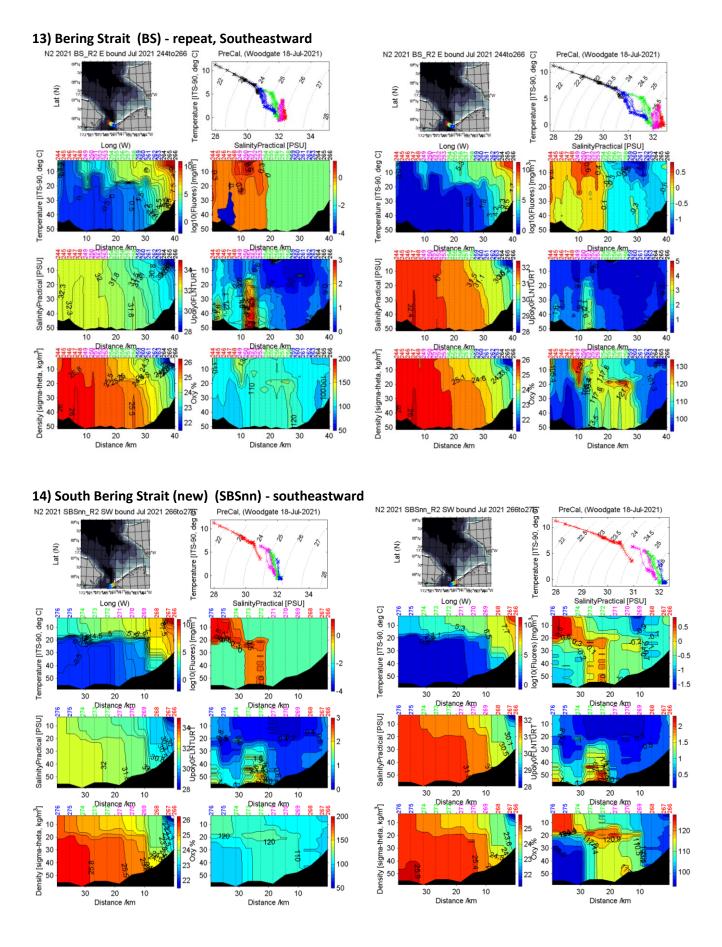






12) Chukchi Central (CCL, south portion)+Diomede Islands line (DL, north portion), Southbound





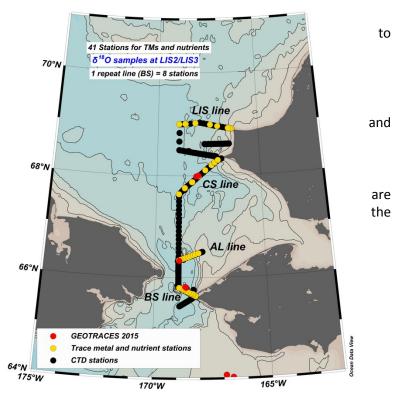
Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

BERING STRAIT 2021 TRACE METAL AND NUTRIENT PUMPING AND DELTA O18 REPORT (Laramie Jensen)

Summary: 41 stations (33 separate locations) were sampled for trace metals and nutrients (yellow dots in map below), 78 trace metal samples and 76 nutrient samples collected at the surface (5m) and lower layer (variable depending on bottom depth), 2 samples for δ^{18} O (LIS2 and LIS3 surface only).

Background: The objective of this sampling is take high quality/high resolution trace metal (iron, zinc, nickel, copper, cadmium, manganese, lead) and macronutrient phosphate, silicate) samples (nitrate, alongside the CTD and mooring temperature salinity sampling. Trace metals (found in small or trace concentrations, ~10⁻⁹mol/L) may be useful in deciphering water mass circulation or provenance. Many, like iron, biologically important for phytoplankton in surface waters. Importantly, the Bering and Chukchi shelves provide a large source of these trace metals to the Western Arctic Ocean.

Moreover, the inventory of these trace metals appears to increase moving from the North Pacific/Bering Sea through the Bering Strait and onto the Chukchi Shelf. Sources for these metals are primarily sediment



resuspension (export of organic matter to the sediments releases trace metals through diagenesis or nonreductive dissolution) or riverine input. Freshwater intrusions (salinity <30psu) were observed frequently through the CTD transects, especially along the Alaskan coast at Stations LIS1-3. Rivers may act as a source or diluent for metals and nutrients. Variations in temperature and salinity indicate the presence of multiple water masses along the CTD lines sampled. The major objective of the high-resolution sampling is to assess if or to what extent trace metals and nutrients vary across these different water masses feeding into the Bering Strait, both spatially and in time. Trace metals could be used to trace water mass movement further north where currents are complicated by bathymetric features and become more difficult to track.

Pump sampling of trace metals: Sampling was done using a trace metal clean PTFE double diaphragm pump (manufacturer: Wilden, see picture below) with a maximum flow capacity of 56 liters/minute using the ship's 125 psi air supply. Tubing both in and out of the water was Grainger 1/2in OD (polyethylene) connected to the pump with PVDF 1/2in compression fittings (all acid cleaned prior to the cruise). Tubing was cut to ~70m and marked with tape up to 60m from the surface and attached along its length to 3/8in Nylon line. An 8lb kettleball weight was attached directly to the Nylon rope and a RBR Concerto³ CTD (measuring temperature, conductivity, pressure and oxygen every 0.125 s) was lashed to the rope below the end of the pipe with Dynacon line (see figure). Thus the end of the tubing sat approximately 1.5m above the kettleball weight. The depth of the end of the tubing in the water was estimated from the length of tube placed in the water, and post-cast, ascertained from the pressure record of the RBR CTD. Typically, the desired "bottom" depth was 5m shallower than the bottom depth as determined by the ship altimeter.

Air was supplied by the ship service air connection on the starboard side and pressure was ultimately controlled using an air regulator (see picture) before entering the pump. Pumping at maximum capacity, the pump cleared the pipe in 60-70 seconds, this being estimated by introducing a bubble before each cast to mark "new water" being sampled. Thus, before each surface and deep sample the pump was flushed for at least 65 seconds at maximum capacity/speed.

At every station the tube/rope/CTD/weight apparatus was lowered to the desired depth and the pump was turned, pushing water through the tubing via the diaphragm pump. After the flush had occurred, the clamps on the C-flex tubing were adjusted such that the flow of seawater from the pump was directed primarily through the Acropak capsule filter (described below). Immediately following collection of the trace metal and nutrient samples (both filtered) the pump was turned off on deck and the tubing apparatus was either recovered or moved to a new depth location (ie after the surface sample at 5m, tubing apparatus was moved directly to the "bottom" depth). After both casts (surface and bottom) the tubing apparatus was recovered back on deck, the pump was turned off, and the filter was placed back into the bag. The entire system was left on deck during a sampling line. Location and times of stations samples are marked Laramie stations in the cruise event log attached to this report.

Water was filtered before collection in sample bottles to remove particulates and organic material. Both the filtered and unfiltered flow were attached to the main Grainger tubing via a plastic Y-split connected to acidcleaned C-flex tubing. Connections along the C-flex were reinforced with zipties and plastic hose clamps. Flow between the two was controlled by opening and shutting plastic snap clamps around the C-flex. Early in the cruise, it was determined that the maximum capacity of the pump would exceed the pressure capacity of the Acropak-200 0.2 μ m filter (shown below). Thus, after flushing the system, pressure was reduced to ~80 psi via the regulator and the filtered flow was only slightly restricted so that the Acropak filter could be filled and flowing enough to sample but not creating significant back pressure. When the filter was significantly clogged (particularly along LIS line) the gas lock of the filter capsule was opened to help alleviate pressure. The filter was stored in two small polybags and another larger poly bag with the rest of the outflow tubing (see figure below) to reduce contamination.

Filtered samples (trace metals (TM) and nutrients (nuts)) were filtered directly into 250 mL (TMs) and 60 mL (nuts) Nalgene bottles (pre-cleaned) following 2-3 10% volume rinses as water budget allowed. Samples were double bagged in poly bags. Nutrient samples were placed in -20°C freezer inside another poly bag within 4 hours of sampling. Trace metal samples were double bagged in poly bags in increments of 12. Nutrient samples remained frozen until they could be analyzed in the Marine Chemistry Lab at the University of Washington. Trace metal samples were all acidified to pH 1.8 using 500 μ L of Optima HCl (12M) under a Class 100 laminar flow hood (OSB 443) on 7/18/2021. Note that volume was estimated for incomplete samples (clearly less than 250 mL volume) and acidification volume was adjusted accordingly (i.e., if only 50 mL of seawater was collected, 100 μ L of Optima HCl was used). This occurred for the following samples: AL18.5 surf, CS12 surf, and BS13 (repeat) surf due to sample loss during sampling/storage.

Trace metal samples will be analyzed at the University of Washington in the Bundy Lab in the Fall of 2021.

O18 samples: Given the remarkable freshness of water around the east end of the LIS line, 2 opportunistic samples were taken for delta O18 analysis. Two samples, both surface, were collected in 250 mL low density polyethylene bottles (Nalgene). The bottles were acid cleaned with hydrochloric and nitric acid (and thoroughly rinsed with MQ water) before the cruise. Samples taken from the surface pumping at LIS2 and LIS3. Bottles were rinsed three times, filled to overflow, and sealed with parafilm, and stored at room temperature. These samples were analyzed by Andy Schauer at the ISOLAB in the Earth and Space Science (ESS) department of the University of Washington and reported below. Data suggests more freshwater in LIS3 surface sample compared to LIS2 but high values overall.

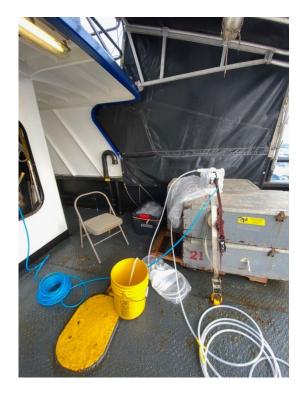
Date of analysis	Sample	Mean H2O (ppmv)	StdDev	Mean dD VSMOW	StdDev	Mean d180 VSMOW	StdDev
8/3/21 22:12	LIS3	19566	166.5983	-33.3819	0.098396	<mark>-4.2915</mark>	0.019424
8/4/21 1:19	LIS2	19574.6	61.476	-23.657	0.16012	<mark>-3.0929</mark>	0.025762
8/4/21 22:03	LIS2	19615	106.066	-23.6629	0.094302	<mark>-3.1141</mark>	0.020107
8/5/21 1:09	LIS3	19544	57.8835	-32.6919	0.21168	<mark>-4.2751</mark>	0.015659
Average	LIS2	19594.8	122.594	-23.65995	0.18582594	<mark>-3.1035</mark>	0.03267984
	LIS3	19555	176.3675	-33.0369	0.23343135	<mark>-4.2833</mark>	0.02494987

The full Delta018 analysis is included as an appendix to this report.

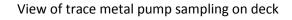
Issues encountered during trace metal/nutrient sampling:

- **Back pressure on filters**: As described above, the max pressure output of 125 psi from the Wilden pump was too high for the Acropak capsule filters.
 - Solution(s) at sea: Reduced pressure to ~80 psi when actively sampling. Also, only slightly closed the unfiltered tubing so that some pressure was relieved via that route. Tubing was reinforced with zipties rather than plastic hose clamps.
 - In the future: Larger capacity capsule filters (1500 vs 200 cm² effective filtration area) will help with this issue as well as stronger tubing that is pre-attached to the Y-split mechanism so time does not have to be spent changing the tubing and reinforcing the joints.
- Filters clogging: The Acropak capsule filters "took on color" and became noticeably clogged sometimes after only ~1L of water was passed through. This meant that the back pressure on the filter was increased causing the tubing to disconnect or form a pocket of seawater resembling a water balloon. Only four 200 size capsule filters were brought and every one of them was used. This problem was especially noticeable on the BS (repeat) and LIS lines.
 - **Solution(s) at sea:** Sometimes the airlock on the Acropak capsule filter was opened to help relieve the back pressure. Likewise, the unfiltered side was also opened to prevent the C-flex tubing from swelling. Filter use was budgeted for the most important lines.
 - In the future: Larger capacity Acropak filters, while expensive, make more sense for this environment. Decreasing the pressure on the pump further may also help.
- End of tubing staying clean: The ship's crew did an excellent job of making sure the end of the tubing attached to the Nylon rope did not hit the side of the ship upon recovery. However, this meant that when recovering the weight/CTD/end of the tubing one must lean out over the side of the ship and not use the ship railing as a counterbalance.
 - In the future: As suggested by a crewmember, consider building some sort of plastic cage/enclosure to have on the very end so that the tubing could remain protected during recovery.
- Hauling in the apparatus: One 8lb weight plus the 1.5 kg (3.3 lbs) RBR CTD was about at the limit for one person to haul in comfortably and repeatedly However, sometimes the weight was not enough to get the tubing down to the desired depth.
 - **In the future:** Reconsider using a block and A-frame for tubing sampling. This may not be possible for quick deployment/recovery purposes, and may in any case squash the tubing.
- **Trace metal cleanliness:** Ideally, sampling would be done in a clean, positive pressure environment, but this was not available on this ship. Occasionally, filter apparatus and sample bottles were exposed to seaspray, water on the deck, surfaces inside the ship, or ungloved hands.
 - **Solutions at sea:** Using plastic bags and gloves as much as possible to protect samples from potential contamination.

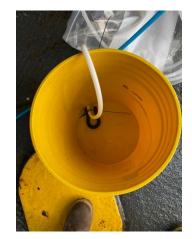
• In the future: Trying to set up a small environment on the ship where samples could be rebagged or sorted in a clean way. Even better, creating a way for the entire sampling process to be done indoors in a clean space. Some ideas for this include having the tubing go through a window or other opening and sampling into the sink in a small "bubble" environment.



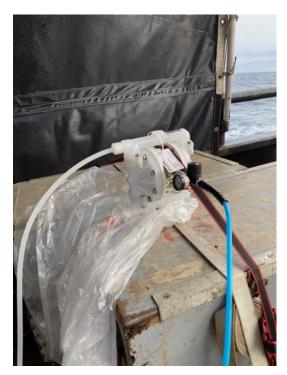
View of trace metal pump sampling on deck







View of coiled rope and tubing with tape markings (left) and mini RBR CTD (red, white, black). Bucket used to collect unfiltered flow during flushing with shackle attached to restrict the "bouncing" of the white C-flex tubing that occurs due to the pump pressure.



Close up of pump with air regulator and air hose (blue) sitting on the mooring release pallets. It was necessary to use a ratchet strap to stabilize the pump so it did not move during sampling. Plastic bags were used as an extra precaution against contamination.



Clogged/used Acropak 200 (0.2um) filter. Top is the barbed connection that would be attached to the white C-flex tubing. To the right is the air valve that was opened during flushing to prevent bubbles from clogging the filter. Note that the folded Supor filter inside the capsule is dark green/brown after sampling.

BERING STRAIT 2021 UNDERWAY DATA REPORT – Woodgate (UW)

Underway CTD, ADCP and some meteorological data were collected during the cruise using the Norseman II's ship-based systems. These systems are set up by the Norseman II crew at the start of the cruise. Action item: Pre-cruise, develop checksheets for the setup of these instruments to ensure settings are as desired. Check the setups as soon as the ship leaves port.

ADCP: This year, as last year, we collected data from the Norseman II's Teledyne RD Instruments 300kHz Workhorse Mariner ADCP (SN 19355), which is equipped with high accuracy bottom tracking. The ADCP is mounted 3m below the water line. This system was operational for the cruise, running with 1m bins and bottom track. The following file types are available for processing (file information copied from http://po.msrc.sunysb.edu/SBI/Healy_ADCPs.htm)

*.ENR – raw binary ADCP data which contains every ping

*.ENS – Binary ADCP data after the data has been preliminarily screened for backscatter and correlation

*. ENX - Binary ADCP data after screening and rotation to earth coordinates

*.STA - Binary ADCP ensemble data that has been averaged into short term averages

*.LTA - Binary ADCP ensemble data that has been averaged into long term averages

*.N1R - Raw NMEA ASCII data from the primary navigation source

*.N2R - Raw NMEA ASCII data from the secondary navigation source, if available, and which should include Ashtech heading data

*.NMS - Binary screened and averaged navigation data

*.VMO - This ASCII file is a copy of the *.ini options file that was used during the data collection

*.LOG - ASCII file containing a log of any errors the ADCP detected during the session

Preliminary data plots will be added to this report once available. Bottom track data was logging during this deployment. Action item: Ensure that bottom tracking is turned on. Process ADCP data. Note also that since heading information is given by the ship's GPS position, it is not necessary to correct for magnetic declination. Action item: Check prior data for magnetic declination issue.

MET DATA: The Norseman2 had South Central Radar install a new Meteorological sensor package this year, as the previous sensors failed. The new version is an Airmar 220WX instrument Weather caster 153 (https://www.airmar.com/weather-description.html?id=153, https://www.airmar.com/uploads/InstallGuide/17-461-01.pdf) running WeatherCaster 3 software. Although the system was not logging data on the transit from Homer to Nome, by Nome logging of the 1s NMEA string was enabled. On the morning of the 7th July 2021 (before the science party arrived), the Norseman2 performed a compass calibration of the system off Nome. This calibration calls for calm seas, which were not available, but is believed to have delivered a direction calibration good to about 10deg. The system is designed to provide apparent and theoretical (i.e. true?) wind speed and direction, air and wind chill temperature, pressure and (optional but included) humidity, using acoustic sensors and its own 3D compass. This information is sent in the NMEA \$IMDA string. Since the navigation NMEA strings are also stored, it should be possible to extract this information in conjunction with ship's motion information.

From the hourly observations of wind, the consensus on the ship was that the speed readings may be too high. Also, temperature and wind chill temperature were always the same, suggesting some problem in these data streams. Further investigation was not possible at sea.

Action items: Extract desired information from stored NMEA strings. Quality control especially wind speed and temperature data where possible (e.g., where ship changes direction). Compare against weather prediction models.

For most of the cruise with brief exceptions during the AL and LIZ lines, the winds appeared to be mostly from the south, with extreme weather experienced during the CS line, before the final BS line and during the final BS and SBSnn lines and on the transit back to Nome at the end of the cruise.

Action item: Add meteorological data plots to this report.

AFT A-FRAME GPS: Two issues were encountered with the Aft Aframe GPS;

a) wiring to the Aframe was faulty, Thus early in the cruise the GPS was remounted on the aft rail of the O1 deck.

b) the GPS unit was reporting dates in November 2001 instead of 2021. This appears to be the GPS week number roll over issue, viz. an ambiguity in date because of the GPS week counter is only stored to a certain number of digits. Thus, for most systems (CTD, and underway), the forward GPS position was used.

UNDERWAY TEMPERATURE AND CONDUCTIVITY DATA: The Norseman II used an Seabird SBE21 temperature conductivity sensor mounted 3.4m below the water line (slightly to port of the ship's ADCP, in the center of the ship) to collect underway data throughout the cruise, also logging position information and depth. A separate temperature sensor (SBE38) is placed closer to the intake to measure the temperature (recorded as temperature 2) before it is warmed by the ship. Action item: Ensure depth is always logged in this file. An hourly watch was kept on these data to ensure no loss of data. Action item: Continue hourly monitoring of underway data while at sea. Check the temperature and salinity data to the CTD casts.

During the transit to Nome, when the system was originally turned on, the SBE38 data stream appeared to be all dummy values. However, without making any apparently significant change, the data stream appeared to correct itself and was being correctly recorded for the main cruise period. Action item: Investigate.

As for some of the transit to Nome this system used the aft-GPS, correction must be made on those data for the GPS week number roll over issue. Additionally, at times the system time was not set to UTC. However this string is only recorded in the header file of the data - the timestamp of the data is taken from the NMEA string, which always had the correct UTC time, but sometimes the wrong date. Action item: Correct calibrated data for clock issues.

The calibration file used was the December 2016 calibration. Action item: Ensure the most recent calibration is used in the field. Data were logged every 3 seconds.

Preliminary plots of the underway temperature and salinity data are given below.

It is very important to remember when interpreting these data, that they are taken over the many days of the cruise, and the oceanographic conditions change significantly during this time, as is evidenced by the plots of the various crossings of the Bering Strait also shown below. Action item: Examine surface salinities and temperatures, especially in conjunction with prior data.

For dates and times, see cruise schedule at start of report.

BERING STRAIT 2021 METEOROLOGICAL DATA PLOTS

Preliminary analysis (and comparison to ERA, JRA and NCEPdata suggests in this year are reading:

- too high for wind speed (by about 2m/s on average, i.e., about 4 knots)

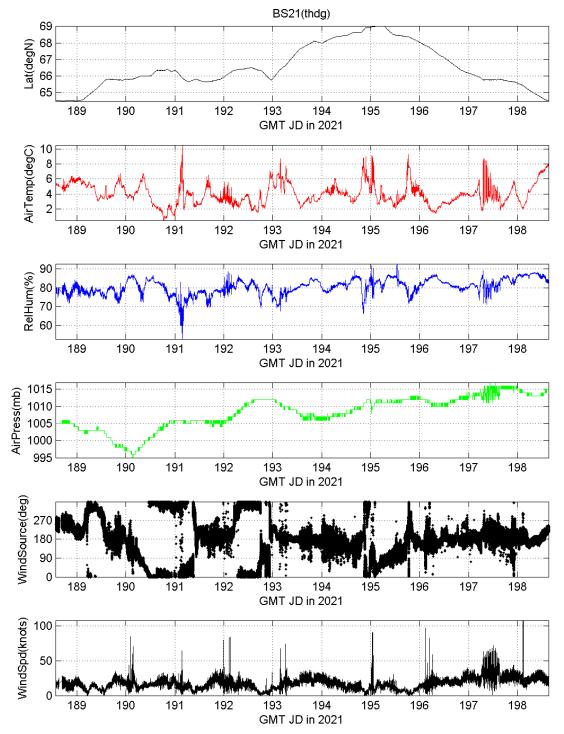
- too low for temperature (by about 2degC on average)

- too low for pressure (by ~ 2hPa).

These differences are all greater than the stated accuracy of the sensor https://www.airmar.com/weather-

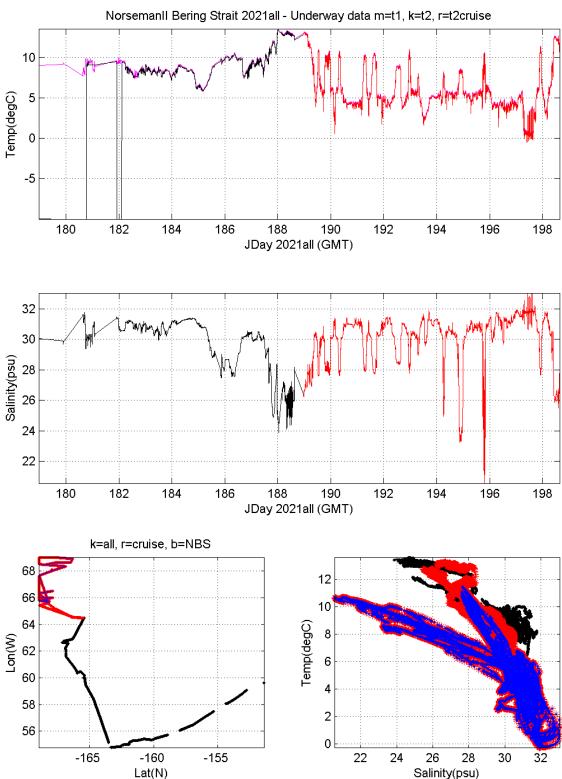
description.html?id=153 (0.5m/s for speed; 1.1degC for temperature, 0.5hPa for pressure).

Note the nstrument calculates true wind direction and speed (and this is not reproducible exactly from relative wind and ship heading



Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

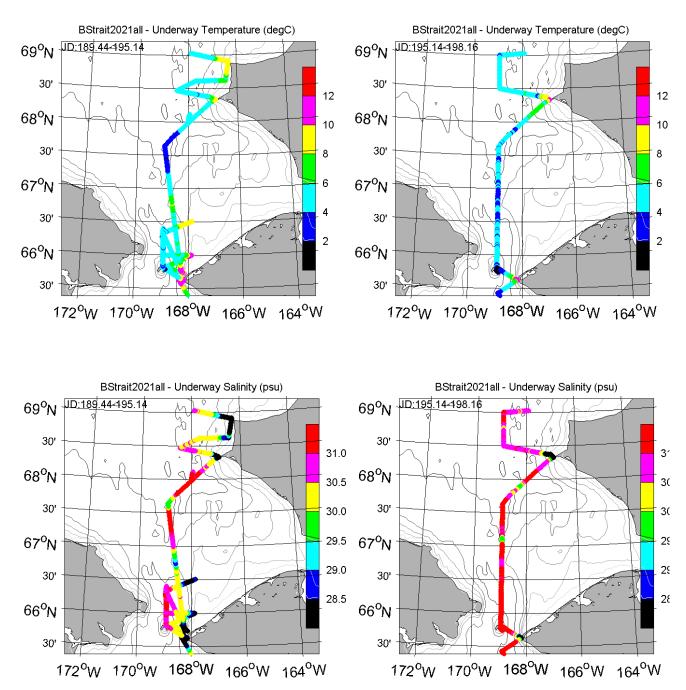
BERING STRAIT 2021 UNDERWAY TEMPERATURE SALINITY DATA



Including data from transit from Homer

BERING STRAIT 2021 UNDERWAY TEMPERATURE SALINITY DATA (continued)

(Note multiple runnings of the Bering Strait (and other) lines are masked in these plots.)



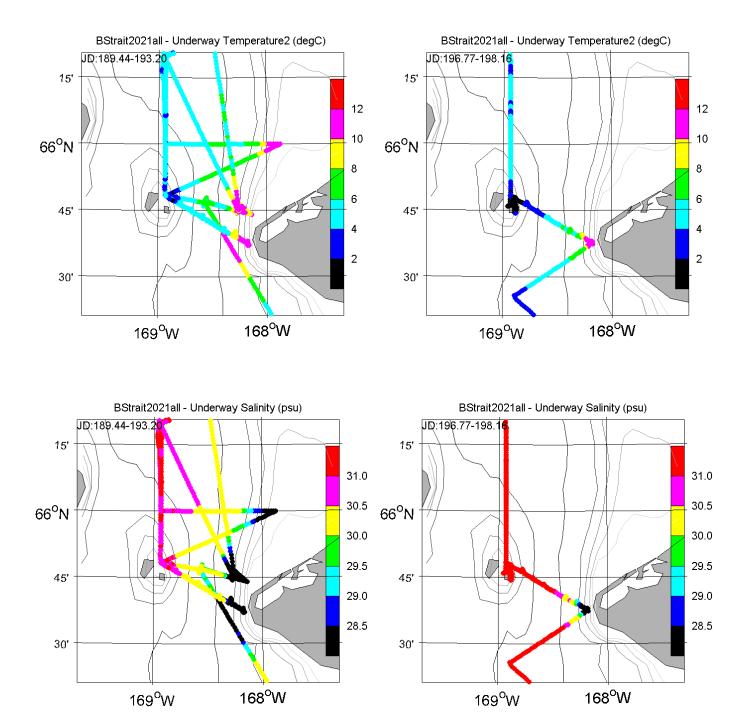
First Half

Second half

Focus on the strait only

First Half





BERING STRAIT 2021 TARGET CTD POSITIONS

% Stations for BStrait Mooring Cruise 2021 NorsemanII % Vers: 25th July 2021 % % US-Russian convention line is at 168deg 58.7'W. % All stations in this file are in US waters. % (Let me know if any points are too close to border for you.) % % Time estimates are based on the 2013 NorsemanII cruise. % INCLUDING NEW LINES FROM 2017 CRUISE, viz % - higher res DL north % - higher res A3L % - higher res SBS % - LIS redone to avoid cable at LIS9 % ***** MOORING POSITIONS ***** % In likely order of servicing, i.e., % - recoveries from east to west in strait, then northern site; % - deployments northern site, the west to east in strait. % == 3 moorings to recover % == 3 moorings to deploy %-----% RECOVERIES of moorings deployed in 2019 %-----%NAME Lat(N) Long (W) Water Top deg min deg min depth Float % % A3-19 66 19.604 168 57.046 57m 8m % A2-19 65 46.855 168 34.070 56m 16m % A4-19 65 44.748 168 15.765 48m 16m %-----% RECOVERIES of moorings deployed in 2020 %-----%NAME Lat(N) Long (W) Water Top deg min deg min depth Float % % A3-20 66 19.604 168 57.604 57m 43m % A2-20 65 46.858 168 34.598 56m 46m % A4-20 65 44.750 168 16.310 50m 37m %-----% DEPLOYMENTS for this 2021 cruise %-----% Target same as 2012 positions. %NAME Lat(N) Long (W) Water deg min % deg min depth % A3-21 66 19.61 168 57.05 58m % A2-21 65 46.86 168 34.07 56m

% A4-21 65 44.75 168 15.77 49m % %-----% INTERMOORING DISTANCES %-----% A2 - A4 ~ 8nm %-----% To A3 from %-----% A2 - 34nm % A4 - 39nm %-----% To Nome from %-----% A4 - 120nm % CS1 - 200-220nm % % ***** HISTORIC CTD SECTIONS ***** % There are 14 historic CTD lines here. % These are the same positions as suggested in 2017, with % the addition of 3 lines run in 2017 and the moving of % one line (a change also made on the 2017 cruise). % We may not have time for all of these, in which case % we will do a subset. But I've included % them all, so you have the positions in advance. % If operations/science dictate, then there % might be different lines proposed while at sea. % % Naming is based on historic data. % "+net" also refers to historic operations and % is not relevant for this cruise. % "no bottles" refers to historic operations and % is not relevant for this cruise. (No bottles % will be taken on any CTD casts of this cruise.) % Known Hazards are indicated. % % Stay a safe distance (300m?) from all deployed % moorings. % % Except for around moorings or for mooring work, % within 200m is ok for positions. % % BS = Bering Strait Line (US portion) % - 15 stations % - station spacing generally ~ 2nm

% Distances: - BS11-BS22 21.7nm % - BS22-BS24 3.1nm % Total length 24.8nm %---% Time from NorsemanII, 6 hrs running W, 5 hrs running E % Time from Khromov 10.5hrs %_____ % Lat (N) Long (W) Lat (N) Long (W) Name deg min deg min % 65.805 168.933 65 48.31 168 55.96 % BS11 65.788 168.860 65 47.26 168 51.62 % BS12 65.772 168.794 65 46.33 168 47.64 % BS13 65.755 168.721 65 45.28 168 43.29 % BS14 65.739 168.663 65 44.35 168 39.80 % BS15 65.722 168.591 65 43.29 168 35.46 % BS16 + net 65.704 168.521 65 42.23 168 31.28 % BS17 65.695 168.486 65 41.70 168 29.16 % BS17S 65.686 168.449 65 41.18 168 26.94 % BS18 65.672 168.391 65 40.35 168 23.44 % BS19 65.655 168.318 65 39.29 168 19.09 % BS20 65.642 168.250 65 38.53 168 14.97 % BS21 65.625 168.177 65 37.48 168 10.63 % BS22 + net 65.599 168.161 65 35.96 168 9.66 % BS23 65.582 168.117 65 34.91 168 7.00 % BS24 % %This might also be run at the extra high resolution % of 2014, viz: 65.805 168.933 65 48.31 168 55.96 % BS11 65.797 168.897 65 47.79 BS11.5 168 53.79 % 65.788 168.86 65 47.26 168 51.62 % BS12 46.8 65.780 168.827 65 168 49.63 % BS12.5 65.772 168.794 46.33 47.64 % 65 168 BS13 65.764 168.758 65 45.81 168 45.47 % BS13.5 65.755 168.721 65 45.28 168 43.29 % BS14 65.747 168.692 65 44.82 168 41.55 % BS14.5 65.739 168.663 44.35 39.8 65 168 % BS15 43.82 37.63 65.731 168.627 65 168 % BS15.5 65.722 168.591 65 43.29 168 35.46 % BS16 65.713 168.556 65 42.76 168 33.37 % BS16.5 65.704 168.521 65 42.23 168 31.28 % **BS17** 65.695 168.486 65 41.7 168 29.16 % BS17.5 41.18 65.686 168.449 65 168 26.94 % **BS18** 65.679 168.42 65 40.77 168 25.19 % BS18.5 40.35 65.672 168.391 65 168 23.44 % BS19 65.664 168.355 65 39.82 168 21.27 % BS19.5 65.655 168.318 65 39.29 168 19.09 % BS20 65.649 168.284 65 38.91 168 17.03 % BS20.5 168 65.642 168.25 65 38.53 14.97 % BS21 65.634 168.214 38.01 65 168 12.8 % BS21.5 37.48 65.625 168.177 65 168 10.63 % BS22

65.599 168.161 65 35.96 168 9.66 % **BS23** 65.582 168.117 65 34.91 168 7 % **BS24** % % % AL = A3 Line (US portion) % Hazards on this line: % == First station on this line is at mooring A3-17, so exact % position needs to be altered to be a safe distance (300m?) % from mooring A3-17 site. %-----% - 13 stations including cast at A3mooring site % - station spacing ~ 1.9nm % Distance: - A3 to AL24 = 22.2nm % ---% Time from NorsemanII ~5.5hrs % Time from Khromov ~9hrs %-----% Lat (N) Long (W) Lat (N) Long (W) Name % deg min deg min 66.327 168.951 66 19.61 168 57.05 % A3-17 % *** Adjust this first position to be safe distance (300m?) from A3-17 66.340 168.895 66 20.39 168 53.71 % AL13 66.352 168.823 66 21.09 168 49.40 % AL14 66.363 168.752 66 21.80 168 45.09 % AL15 66.375 168.680 66 22.51 168 40.78 % AL16 66.387 168.608 66 23.21 168 36.47 % AL17 + net 66.399 168.536 66 23.92 168 32.16 % AL18 66.410 168.464 66 24.63 168 27.84 % AL19 66.422 168.392 66 25.33 168 23.53 % AL20 66.434 168.320 66 26.04 168 19.22 % AL21 66.446 168.249 66 26.75 168 14.91 % AL22 + net 66.458 168.177 66 27.45 168 10.60 % AL23 66.469 168.105 66 28.16 168 6.29 % AL24 % % % CS = Cape Serdtse Kamen to Point Hope Line (US portion) % Hazards on this line: % == Final station CS19 is shallow. Check on % modern charts to see if deep enough for NorsemanII. % (this station was too shallow for the Khromov, but % was ok for the NorsemanII in 2013). %-----% - 16 or 17 stations % - station spacing ~ 5nm in the central Chukchi, ~ 2.2nm near the coast % % Distances: - CS10US to CS18 60.8nm

% - CS18 to CS19 2.2nm

```
%---
% Time from NorsemanII (toCS19) ~ 10.5 hrs
% Time from Khromov (toCS18) ~12hrs
%-----
% Lat (N) Long (W)
                    Name
% deg min deg min
0 0 67 38.1 168 56.0 % CS10US + net
0 0 67 41.7 168 48.1 % CS10.5 - no bottles
00 67 45.3 168 39.9 % CS11
0 0 67 48.9 168 29.4 % CS11.5 - no bottles
0 0 67 52.5 168 18.8 % CS12 + net
0 0 67 55.9 168 9.1 % CS12.5 - no bottles
0 0 67 59.3 167 59.4 % CS13
00 68 2.7 167 49.7 % CS13.5 - no bottles
00 68 6.1 167 39.9 % CS14 + net
00 68 9.1 167 30.7 % CS14.5 - no bottles
0 0 68 12.1 167 21.4 % CS15
0 0 68 13.6 167 16.8 % CS15.5 - no bottles
0 0 68 15.0 167 12.2 % CS16
00 68 16.6 167 7.6 % CS16.5 - no bottles
0 0 68 18.0 167 2.9 % CS17 + net
00 68 18.9 166 57.6 % CS18
0 0 68 19.9 166 52.3 % CS19 *** SHALLOW **
%
        CS19 too shallow for Khromov.
%
%
% DL = Diomede Line (US only, 1nm east of border)
% This line is to map eddying area north of the Diomedes
% - 19 stations
% - station spacing ~ 1nm in South,
         ~ 2.5nm in north
%
% Distance: - DL1 to DL19 28.7nm
%---
% Time from NorsemanII - 5.5 hrs running N; 9hrs running S
% Time from Khromov to DL19 ~10hrs
%-----
% Lat (N) Long (W) Name
% deg min deg min
0 0 65 49.28 168 56.2 % DL1
0 0 65 50.26 168 56.2 % DL2
0 0 65 51.23 168 56.2 % DL3
0 0 65 52.21 168 56.2 % DL4 + net
0 0 65 53.18 168 56.2 % DL5 - no bottles
0 0 65 54.15 168 56.2 % DL6
0 0 65 55.13 168 56.2 % DL7 - no bottles
0 0 65 56.10 168 56.2 % DL8
0 0 65 57.08 168 56.2 % DL9 - no bottles
```

0 0 65 58.05 168 56.2 % DL10 0 0 65 59.03 168 56.2 % DL11- no bottles 0 0 66 0.00 168 56.2 % DL12 0 0 66 2.55 168 56.2 % DL13- no bottles 0 0 66 5.10 168 56.2 % DL14 0 0 66 7.65 168 56.2 % DL15- no bottles 0 0 66 10.19 168 56.2 % DL16 0 0 66 12.74 168 56.2 % DL17- no bottles 0 0 66 15.29 168 56.2 % DL18 0 0 66 17.84 168 56.2 % DL19- no bottles % % % DL A and B lines (Diomede A and B lines) % These lines, with DL, form a grid to map % eddying N of the Diomedes. % - each line 12 stations % - station spacing ~ 1nm % Distances: - each line ~ 11nm %---% Estimate for NorsmanII for each line ~3.5hrs % Time from Khromov for each line ~5hrs %-----% Lat (N) Long (W) Name % deg min deg min % Northbound leg 00 65 49.30 168 52.2 % DLa 1 0 0 65 50.27 168 52.2 % DLa 2 0 0 65 51.25 168 52.2 % DLa 3 00 65 52.22 168 52.2 % DLa 4 00 65 53.19 168 52.2 % DLa 5 0 0 65 54.16 168 52.2 % DLa 6 00 65 55.14 168 52.2 % DLa 7 0 0 65 56.11 168 52.2 % DLa 8 00 65 57.08 168 52.2 % DLa 9 0 0 65 58.05 168 52.2 % DLa 10 0 0 65 59.03 168 52.2 % DLa 11 0 0 66 0.00 168 52.2 % DLa 12 % Southbound leg 0 0 66 0.00 168 48.2 % DLb 12 0 0 65 59.03 168 48.2 % DLb 11 0 0 65 58.05 168 48.2 % DLb 10 0 0 65 57.08 168 48.2 % DLb 9 00 65 56.11 168 48.2 % DLb 8 0 0 65 55.14 168 48.2 % DLb 7 00 65 54.16 168 48.2 % DLb 6 0 0 65 53.19 168 48.2 % DLb 5 00 65 52.22 168 48.2 % DLb 4 0 0 65 51.25 168 48.2 % DLb 3

0 0 65 50.27 168 48.2 % DLb 2 00 65 49.30 168 48.2 % DLb 1 % % % AS = from AL to CS Line % Across-topography line linking Al line with CS % - 20 stations (counting first of CS line) % - station spacing % AS1-7 at ~ 4nm spacing. % AS7-14 at 2nm spacing, % A14 to end 4nm % Distances: - AS1 to CS10 64.7nm %---% Time from Khromov (12casts, odds+2&18) ~11hrs % Estimate for NorsmanII 20 casts ~ 12hrs % Estimate for Khromov 20 casts ~ 14hrs %-----Lat (N) Long (W) % Name % deg min deg min 00 66 41.47 167 38.86 % AS 1 0 0 66 45.01 167 43.78 % AS 2-no bottles 00 66 48.55 167 48.70 % AS 3 0 0 66 52.09 167 53.62 % AS 4-no bottles 0 0 66 55.63 167 58.55 % AS 5 0 0 66 59.17 168 3.47 % AS 6-no bottles 00 67 2.71 168 8.39 % AS 7 % (2nm spacing over slope) 0 0 67 4.48 168 10.85 % AS 8-no bottles 00 67 6.25 168 13.31 % AS 9 0 0 67 8.02 168 15.77 % AS 10-no bottles 0 0 67 9.78 168 18.23 % AS 11 0 0 67 11.55 168 20.69 % AS 12-no bottles 00 67 13.32 168 23.15 % AS 13 0 0 67 16.86 168 28.07 % AS 14 % (back to 4nm spacing) 0 0 67 20.40 168 32.99 % AS 15-no bottles 0 0 67 23.94 168 37.92 % AS 16 0 0 67 27.48 168 42.84 % AS 17-no bottles 0 0 67 31.02 168 47.76 % AS 18 00 67 34.56 168 52.68 % AS 19-no bottles 0 0 67 38.10 168 56.00 % CS10US % % % LIS = Cape Lisburne Line % - 17 stations (including first of CCL line) % - station spacing ~ 2nm near coast,

% ~ 3nm and ~ 5nm away from coast % Distances: - LIS1 to CCL22 57.2nm %---% Time from NorsemanII, ~ 10hrs % Time from Khromov ~11hrs %-----% Lat (N) Long (W) Name deg min deg min % 0 0 68 54.40 166 19.80 % LIS 1 + net 0 0 68 54.80 166 25.15 % LIS 2 0 0 68 55.20 166 30.51 % LIS 3 0 0 68 55.80 166 38.54 % LIS 4 00 68 56.40 166 46.57 % LIS 5 0 0 68 57.00 166 54.60 % LIS 6 + net 0 0 68 57.60 167 1.95 % LIS 6.5 - no bottles 00 68 58.20 167 9.30 % LIS 7 0 0 68 58.80 167 16.65 % LIS 7.5 - no bottles 0 0 68 59.40 167 24.00 % LIS 8 0 0 69 0.60 167 38.70 % LIS 9 0 0 69 1.80 167 53.40 % LIS 10 + net 0 0 69 1.35 168 7.95 % LIS 11 0 0 69 0.90 168 22.50 % LIS 12 0 0 69 0.45 168 37.05 % LIS 13 0 0 69 0.23 168 46.62 % LIS 14n + net 0 0 69 0.00 168 56.00 % CCL22n % was 56.2 % % % CCL = Chukchi Convention Line % Hazards on this line: % == First station on this line is the same as last station % included in the LIS line above. It does not need to be % repeated. % == Last station on this line is at mooring A3-14, so exact % position needs to be altered to be a safe distance (300m?) % from mooring A3-14 site. % == There are 2 JAMSTEC moorings ~ 3nm east of station % CCL16 on this line. Those positions are: % SCH13 68 2.002N 168 50.028W % SCH13w 68 3.006N 168 50.003W %-----% Line running from northern most point % due south, ~ 1nm US side of conventionline % - 20 stations (counting arriving at A3-14) % - station spacing ~ 10nm until CCL8, then reducing to ~5nm and ~2.5nm % % Distances: - CCL22 to A3-13 ~ 161nm %---% Time from NorsemanII, 21.5hrs

% Time from Khromov ~26hrs %-----% Lat (N) Long (W) Name % deg min deg min 0 0 69 0.0 168 56.0 % CCL22 0 0 68 50.0 168 56.0 % CCL21 0 0 68 40.0 168 56.0 % CCL20 0 0 68 30.0 168 56.0 % CCL19 00 68 20.0 168 56.0 % CCL18 + Net 0 0 68 10.0 168 56.0 % CCL17 168 56.0 % CCL16 0 0 68 00.0 0 0 67 50.0 168 56.0 % CCL15 00 67 38.1 168 56.0 % CCL14 (same as CS10US) + Net + Prod % 0 0 67 30.0 168 56.0 % CCL13 0 0 67 20.0 168 56.0 % CCL12 0 0 67 10.0 168 56.0 % CCL11 0 0 67 00.0 168 56.0 % CCL10 + Net 0 0 66 50.0 168 56.0 % CCL9 0 0 66 40.0 168 56.0 % CCL8 % - spacing now 5nm 0 0 66 35.0 168 56.0 % CCL7 0 0 66 30.0 168 56.0 % CCL6 0 0 66 25.0 168 56.0 % CCL5 % - spacing now 2.5nm 0 0 66 22.3 168 56.0 % CCL4 0 0 66 19.61 168 57.05 % A3-17 % *** Adjust this position to be safe distance (300m?) from A3-17 % % Higher RES CCL Line S from CS10US % (halves from 8.5 to 13.5 are new) % 73nm .. 00 67 35.0 168 56.0 % CCL13.5 00 67 30.0 168 56.0 % CCL13 0 0 67 25.0 168 56.0 % CCL12.5 0 0 67 20.0 168 56.0 % CCL12 0 0 67 15.0 168 56.0 % CCL11.5 0 0 67 10.0 168 56.0 % CCL11 0 0 67 05.0 168 56.0 % CCL10.5 0 0 67 00.0 168 56.0 % CCL10 + Net 0 0 66 55.0 168 56.0 % CCL9.5 0 0 66 50.0 168 56.0 % CCL9 00 66 45.0 168 56.0 % CCL8.5 0 0 66 40.0 168 56.0 % CCL8 % - spacing now 5nm 00 66 35.0 168 56.0 % CCL7 0 0 66 30.0 168 56.0 % CCL6 0 0 66 25.0 168 56.0 % CCL5

% - spacing now 2.5nm 0 0 66 22.3 168 56.0 % CCL4 0 0 66 19.61 168 57.05 % A3-17 % *** Adjust this position to be safe distance (300m?) from A3-17

%

```
% NBS - North Bering Strait line
% Hazards on this line:
% == Section crosses shallow waters.
% Beware of shallows from NBS9 and eastwards.
% (Helix diverted N to avoid shallows between
% stations NBS10 and NBS11)
% == Consider terminating line at NBS9
%-----
% Another cross strait line, run previously
% at lower resolution (i.e. without the 0.5 stations).
% - stations 9 (NBS1-9) to 16 (NBS1-9 with 0.5s)
% to 21 (full section, including shallows).
% - station spacing (with 0.5s) ~ 1.7nm
% Distance: - NBS1-9 25.8nm
%
      - NBS1-14 44.1nm
%---
% Time from Helix to NBS9, 9 casts ~5.5hrs
% - Estimate for NorsemanII to NBS9, 9 casts, 6hrs
% - Estimate for NorsemanII to NBS9, 16 casts, 7.5hrs
% - Estimate Khromov to NBS9, 9 casts ~6.5hrs
% - Estimate Khromo to NBS9, 16 casts ~8hrs
% Time from Helix to NBS14, 14 casts ~8.5hrs
% - Estimate for NorsemanII to NBS14, 14 casts, 9hrs
% - Esimate for NorsemanII to NSB14, 21 casts, 10.5hrs
% - Estimate Khromov to NBS14, 14 casts ~10hrs
% - Estimate Khromov to NBS14, 21 casts ~13hrs
%-----
   Lat (N)
             Long (W) Name
%
%
    deg min deg min
00 66 0.0 168 56.0 % NBS1 % was 58.1
00 66
       0.0 168 53.0 % NBS1.5
00 66
       0.0 168 49.9 % NBS2
00 66
        0.0 168 45.8 % NBS2.5
00 66
        0.0 168 41.6 % NBS3
00 66
        0.0 168 37.4 % NBS3.5
        0.0 168 33.2 % NBS4
00 66
00 66
        0.0 168 29.1 % NBS4.5
00 66
        0.0 168 25.0 % NBS5
00 66
        0.0 168 20.7 % NBS5.5
        0.0 168 16.4 % NBS6
00 66
00 66
        0.0 168 12.4 % NBS6.5
        0.0 168 8.4 % NBS7
00 66
```

00 66 0.0 168 4.2 % NBS7.5 00 66 0.0 168 0.0 % NBS8 - 34m water 0 0 66 0.0 167 55.1 % NBS9 - 20m water % (consider terminating line here) 00 66 0.0 167 52.0 % NBS10 - 12m water % (Helix diverted N to avoid shallows between these stations) 00 66 0.0 167 40.1 % NBS11 - 15m water 00 66 0.0 167 29.1 % NBS12 - 18m water 00 66 0.0 167 18.1 % NBS13 - 13m water 0 0 66 0.0 167 10.2 % NBS14 - 10m water % % % MBSn = Mid Bering Strait line % Just north of the Bering Strait line % - 14 stations % - station spacing 1.7nm, less near coast % Distance: - 21.0nm total %---% Time from Helix (8casts only) ~2.5hrs % - Estimate NorsemanII (8 casts only) ~ 4hrs % - Estimate NorsemanII (14 casts) ~ 6hrs % - Estimate Khromov (8casts only)~5.5hrs % - Estimate Khromov (14casts) ~7hrs %-----Lat (N) Long (W) % Name % deg min deg min 00 65 52.1 168 56.0 % MBSn1 % was 57.0 00 65 52.0 168 52.5 % MBSn1.5 0 0 65 51.9 168 49.1 % MBSn2 0 0 65 51.8 168 45.0 % MBSn2.5 00 65 51.7 168 40.9 % MBSn3 00 65 51.6 168 36.4 % MBSn3.5 00 65 51.5 168 31.9 % MBSn4 % was 51.6 00 65 51.4 168 27.5 % MBSn4.5 0 0 65 51.3 168 23.0 % MBSn5 % was 51.4 0 0 65 51.2 168 18.5 % MBSn5.5 0 0 65 51.1 168 13.9 % MBSn6 00 65 51.1 168 10.4 % MBSn6.5 168 6.9 % MBSn7 0 0 65 51.0 0 0 65 50.9 168 5.0 % MBSn8 % % % North North Bering Strait Line (NNBS) % A section across the ACC and main flow between % the A3L line and the NBS line. % With the 0.5s, at 1.76nm spacing

```
% 22.8nm length
%-----
% Run for the first time in 2015 - check water depths on
% the eastern (NNBS7.5) end)
% Dovetails with DL line. NNBS1 is the same as DL16
66.170 168.937 66 10.19 168 56.20 %NNBS1
66.170 168.865 66 10.19 168 51.88 %NNBS1.5
66.170 168.793 66 10.19 168 47.55 %NNBS2
66.170 168.721 66 10.19 168 43.23 %NNBS2.5
66.170 168.648 66 10.19 168 38.91 %NNBS3
66.170 168.576 66 10.19 168 34.58 %NNBS3.5
66.170 168.504 66 10.19 168 30.26 %NNBS4
66.170 168.432 66 10.19 168 25.94 %NNBS4.5
66.170 168.360 66 10.19 168 21.62 %NNBS5
66.170 168.288 66 10.19 168 17.29 %NNBS5.5
66.170 168.216 66 10.19 168 12.97 %NNBS6
66.170 168.144 66 10.19 168 8.65 %NNBS6.5
66.170 168.072 66 10.19 168 4.32 %NNBS7
66.170 168.000 66 10.19 168 0.00 %NNBS7.5
%
% Two new lines to map the ACC as and after it rounds Point Hope
%
% NPH - North Point Hope Line
%-----
% Crossing from Point Hope to the ENE roughly.
% - 11 stations,
% from 1-5 and 1.25nm spacing
% for the rest of the line at 2.5nm
% - Distance 21nm
% - new in 2016
% - ** CHECK DEPTH OF SHALLOWEST NPH1
%
% Run from east (NPH1) to west (NPH11)
% - estimate 3hrs 15min
%-----
% Lat (N) Long (W) Name
% deg min deg min
00 68 22.40 167 07.93 % NPH1
0 0 68 22.64 167 11.31 % NPH2
00 68 22.87 167 14.68 % NPH3
00 68 23.11 167 18.06 % NPH4
00 68 23.35 167 21.44 % NPH5
0 0 68 23.83 167 28.19 % NPH6
0 0 68 24.30 167 34.95 % NPH7
00 68 24.77 167 41.71 % NPH8
```

0 0 68 25.25 167 48.46 % NPH9 0 0 68 25.73 167 55.22 % NPH10 0 0 68 26.20 168 01.97 % NPH11 % % % CD- Cape Dyer %-----% Crossing east west, midway between Point Hope % and Cape Lisburne (near Cape Dyer) and trying % to avoid some topographic irregularites just % N of the line on the charts. % - 14 stations, 2nm spacing % - Distance 26nm % - new in 2016 % - ** CHECK DEPTH OF SHALLOWEST CD1 %-----% Lat (N) Long (W) Name % deg min deg min 0 0 68 37.00 167 41.0 % CD14 0 0 68 37.00 167 35.5 % CD13 0 0 68 37.00 167 29.9 % CD12 0 0 68 37.00 167 24.4 % CD11 0 0 68 37.00 167 18.8 % CD10 0 0 68 37.00 167 13.3 % CD9 0 0 68 37.00 167 7.8 % CD8 0 0 68 37.00 167 2.2 % CD7 0 0 68 37.00 166 56.7 % CD6 0 0 68 37.00 166 51.2 % CD5 0 0 68 37.00 166 45.6 % CD4 0 0 68 37.00 166 40.1 % CD3 0 0 68 37.00 166 34.5 % CD2 0 0 68 37.00 166 29.0 % CD1 % DL = Diomede Line EXTRAS(US only, 1nm east of border) % This line is to map eddying area north of the Diomedes % - 19 stations % - station spacing ~ 1nm in South, % ~ 2.5nm in north % Distance: - DL1 to DL19 28.7nm %---% Time from NorsemanII - 5.5 hrs running N; 9hrs running S % Time from Khromov to DL19 ~10hrs % % (The info about is withOUT the 0.5)******** %-----Lat (N) Long (W) Name % % deg min deg min

0 0 66 0.00 168 56.2 % DL12 0 0 66 1.28 168 56.2 % DL12.5 0 0 66 2.55 168 56.2 % DL13 0 0 66 3.83 168 56.2 % DL13.5 0 0 66 5.10 168 56.2 % DL14 0 0 66 6.38 168 56.2 % DL14.5 0 0 66 7.65 168 56.2 % DL15 0 0 66 8.92 168 56.2 % DL15.5 0 0 66 10.19 168 56.2 % DL16 0 0 66 11.47 168 56.2 % DL16.5 0 0 66 12.74 168 56.2 % DL17 0 0 66 14.02 168 56.2 % DL17.5 0 0 66 15.29 168 56.2 % DL18 0 0 66 16.57 168 56.2 % DL18.5 0 0 66 17.84 168 56.2 % DL19 0 0 66 18.73 168 56.2 % DL19.5 % % % AL = A3 Line (US portion) - with extras % Hazards on this line: % == First station on this line is at mooring A3-17, so exact % position needs to be altered to be a safe distance (300m?) % from mooring A3-15 site. %-----% - 13 stations including cast at A3mooring site % - station spacing ~ 1.9nm % Distance: - A3 to AL24 = 22.2nm % --% Time from NorsemanII ~5.5hrs % Time from Khromov ~9hrs % (The info about is withOUT the 0.5)******* % %-----% Lat (N) Long (W) Lat (N) Long (W) Name % deg min deg min % 66.3270 168.9510 66 19.6100 168 57.0500 % A3-17 % *** Adjust this first position to be safe distance (300) from A3-17 66.3335 168.9230 66 20.0000 168 55.3800 % new AL12.5 66.3400 168.8950 66 20.3900 168 53.7100 % AL13 66.3460 168.8590 66 20.7400 168 51.5550 % new AL13.5 66.3520 168.8230 66 21.0900 168 49.4000 % AL14 66.3575 168.7875 66 21.4450 168 47.2450 % new AL14.5 66.3630 168.7520 66 21.8000 168 45.0900 % AL15 66.3690 168.7160 66 22.1550 168 42.9350 % new AL15.5 66.3750 168.6800 66 22.5100 168 40.7800 % AL16

```
66.3810 168.6440 66 22.8600 168 38.6250 % new AL16.5
 66.3870 168.6080 66 23.2100 168 36.4700 % AL17
 66.3940 168.5657 66 23.6400 168 33.9400 % new AL17.5 % AND MOVED OFF Q CABLE
 66.3990 168.5360 66 23.9200 168 32.1600 % AL18
 66.4045 168.5000 66 24.2750 168 30.0000 % new AL18.5
 66.4100 168.4640 66 24.6300 168 27.8400 % AL19
 66.4160 168.4280 66 24.9800 168 25.6850 % new AL19.5
 66.4220 168.3920 66 25.3300 168 23.5300 % AL20
 66.4280 168.3560 66 25.6850 168 21.3750 % new AL20.5
 66.4340 168.3200 66 26.0400 168 19.2200 % AL21
 66.4400 168.2845 66 26.3950 168 17.0650 % new AL21.5
 66.4460 168.2490 66 26.7500 168 14.9100 % AL22
 66.4520 168.2130 66 27.1000 168 12.7550 % new AL22.5
 66.4580 168.1770 66 27.4500 168 10.6000 % AL23
 66.4635 168.1410 66 27.8050 168 8.4450 % new AL23.5
 66.4690 168.1050 66 28.1600 168 6.2900 % AL24
%
%Then these are new
 66.4745 168.0690 66 28.5150 168 4.1350 % new AL24.5
 66.4800 168.0330 66 28.8700 168 1.9800 % AL25
 66.4855 167.9970 66 29.2250 167 59.8200 % new AL25.5
 66.4910 167.9610 66 29.5800 167 57.6650 % AL26
 66.4965 167.9250 66 29.9350 167 55.5100 % new AL26.5
 66.5020 167.8890 66 30.2900 167 53.3550 % AL27
 66.5075 167.8530 66 30.6450 167 51.2000 % new AL27.5
%
% LIS = Cape Lisburne Line (redone to avoid Qcable at Lis9)
% - 18 stations (including first of CCL line)
% - station spacing ~ 2nm near coast,
%
       ~ 3nm and ~ 5nm away from coast
% Distances: - LIS1 to CCL22 57.2nm
%---
% Time from NorsemanII, ~ 10hrs
% Time from Khromov ~11hrs
%
% Times different now added stations
%-----
  Lat (N)
            Long (W)
                      Name
%
%
   deg min
             deg min
 0 0
         68 54.40 166 19.80 % LIS 1 + net
 0 0
         68 54.80 166 25.15 % LIS 2
         68 55.20 166 30.51 % LIS 3
 0 0
 0 0
         68 55.80 166 38.54 % LIS 4
 0 0
         68 56.40 166 46.57 % LIS 5
 0 0
         68 57.00 166 54.60 % LIS 6 + net
 0 0
         68 57.60 167 1.95 % LIS 6.5 - no bottles
 0 0
         68 58.20 167 9.30 % LIS 7
 0
         68 58.80 167 16.65 % LIS 7.5 - no bottles
   0
```

0 0 68 59.40 167 24.00 % LIS 8 69.0033 167.5633 69 00.20 167 33.8 % NEW ** LIS 8.5 % %DO NOT DO LIS 9 % 0 0 69 0.60 167 38.70 % LIS 9 ** on Q cable - do not do %DO NOT DO LIS 9 % 69.0167 167.7267 69 1.00 167 43.60 % NEW ** LIS 9.5 0 0 69 1.80 167 53.40 % LIS 10 + net 0 0 69 1.35 168 7.95 % LIS 11 0 0 69 0.90 168 22.50 % LIS 12 0 0 69 0.45 168 37.05 % LIS 13 0 0 69 0.23 168 46.62 % LIS 14n + net 0 0 69 0.00 168 56.00 % CCL22n % was 56.2 % % - South Bering Strait section % First ran in 2014 and 2015 and then only partly % Run in full in 2017 % % To catch ACC before it enters the strait % % 22.5nm long % 21 stations including halves %-----% Lat(N) Lon (W) Lat (N) Lon (W) NAME % decdeg decdeg deg min deg min 34.91 168 65.5818 168.1167 7.00 65 % SBS1 = BS24 65.5736 168.1571 65 34.42 168 9.43 % SBS1.5 65.5655 168.1975 33.93 168 11.85 % SBS2 65 65.5573 168.2379 65 33.44 168 14.28 % SBS2.5 65.5491 168.2784 65 32.95 168 16.70 % SBS3 65.5409 168.3188 65 32.45 168 19.13 % SBS3.5 65.5327 168.3592 65 31.96 168 21.55 % SBS4 31.47 168 65.5245 168.3997 23.98 % SBS4.5 65 30.98 168 26.40 % SBS5 65.5163 168.4401 65 65.5081 168.4805 65 30.49 168 28.83 % SBS5.5 65.5000 168.5209 65 30.00 168 31.26 % SBS6 65.4918 168.5614 65 29.51 168 33.68 % SBS6.5 65.4836 168.6018 65 29.02 168 36.11 % SBS7 65.4754 168.6422 28.52 168 38.53 % SBS7.5 65 65.4672 168.6826 65 28.03 168 40.96 % SBS8 65.4590 168.7231 27.54 168 43.38 % SBS8.5 65 65.4508 168.7635 65 27.05 168 45.81 % SBS9 65.4426 168.8039 65 26.56 168 48.24 % SBS9.5 65.4345 168.8444 65 26.07 168 50.66 % SBS10 25.58 65.4263 168.8848 65 168 53.09 % SBS10.5 65.4181 168.9252 65 25.09 168 55.51 % SBS11

% CS = Cape Serdtse Kamen to Point Hope Line (US portion) % - with extras. % Hazards on this line: % == Final station CS19 is shallow. Check on % modern charts to see if deep enough for NorsemanII. % (this station was too shallow for the Khromov, but % was ok for the NorsemanII in 2013). % == NOAA mooring at: % 67 54.712N, 168 11.628W %-----% - 27 stations % - station spacing ~ 2.5nm in the central Chukch (0.25 stations) ~ 2.2nm near the coast % % Distances: - CS10US to CS18 60.8nm % - CS18 to CS19 2.2nm % Time from NorsemanII (toCS19) ~ 11hrs %-----% Lat (N) Long (W) Name % deg min deg min 0 0 67 38.1 168 56.0 % CS10US + net 0 0 67 39.9 168 52.0 % new CS10.25 00 67 41.7 168 48.1 % CS10.5 - no bottles 0 0 67 43.5 168 44.0 % new CS10.75 00 67 45.3 168 39.9 % CS11 0 0 67 47.1 168 34.6 % new CS11.25 0 0 67 48.9 168 29.4 % CS11.5 - no bottles 0 0 67 50.7 168 24.1 % new CS11.75 0 0 67 52.5 168 18.8 % CS12 + net 0 0 67 54.2 168 13.9 % new CS12.25 0 0 67 55.9 168 9.1 % CS12.5 - no bottles 0 0 67 57.6 168 4.2 % new CS12.75 0 0 67 59.3 167 59.4 % CS13 00 68 1.0 167 54.5 % new CS13.25 0 0 68 2.7 167 49.7 % CS13.5 - no bottles 0 0 68 4.4 167 44.8 % new CS13.75 0 0 68 6.1 167 39.9 % CS14 + net 0 0 68 7.6 167 35.3 % new CS14.25 00 68 9.1 167 30.7 % CS14.5 - no bottles 0 0 68 10.6 167 26.0 % new CS14.75 0 0 68 12.1 167 21.4 % CS15 00 68 13.6 167 16.8 % CS15.5 - no bottles 0 0 68 15.0 167 12.2 % CS16 00 68 16.6 167 7.6 % CS16.5 - no bottles 00 68 18.0 167 2.9 % CS17 + net 00 68 18.9 166 57.6 % CS18 0 0 68 19.9 166 52.3 % CS19 *** SHALLOW **

% North North Bering Strait Line (NNBS)

%_____ % % Add a shallower station to NNBS ... % A section across the ACC and main flow between % the A3L line and the NBS line. % With the 0.5s, at 1.76nm spacing % 22.8nm length %-----% Run for the first time in 2015 - check water depths on % the eastern (NNBS7.5) end) % Dovetails with DL line. NNBS1 is the same as DL16 66.170 168.937 66 10.19 168 56.20 %NNBS1 66.170 168.865 66 10.19 168 51.88 %NNBS1.5 66.170 168.793 66 10.19 168 47.55 %NNBS2 66.170 168.721 66 10.19 168 43.23 %NNBS2.5 66.170 168.648 66 10.19 168 38.91 %NNBS3 66.170 168.576 66 10.19 168 34.58 %NNBS3.5 66.170 168.504 66 10.19 168 30.26 %NNBS4 66.170 168.432 66 10.19 168 25.94 %NNBS4.5 66.170 168.360 66 10.19 168 21.62 %NNBS5 66.170 168.288 66 10.19 168 17.29 %NNBS5.5 66.170 168.216 66 10.19 168 12.97 %NNBS6 66.170 168.144 66 10.19 168 8.65 %NNBS6.5 66.170 168.072 66 10.19 168 4.32 %NNBS7 66.170 168.000 66 10.19 168 0.00 %NNBS7.5 66.170 168.000 66 10.19 167 55.70 %NNBS8 *** NEW % NPH - North Point Hope Line (Extended) %-----% Crossing from Point Hope to the ENE roughly.

% ====== 2019 % - updated to add an extra 20nm and 8 stations,

% with extras at 2.5nm space to CCL

% - now have 19 stations, and 40nm

%

% Run from east (NPH1) to west (NPH11)

% - estimate 3hrs 15min to NPH11 and then another

% - 4 hrs for the rest

 0 0 68 24.30 167 34.95 % NPH7 00 68 24.77 167 41.71 % NPH8 0 0 68 25.25 167 48.46 % NPH9 0 0 68 25.73 167 55.22 % NPH10 0 0 68 26.20 168 01.97 % NPH11 % NEW 0 0 68 26.68 168 08.72 % NPH11.5 0 0 68 27.15 168 15.47 % NPH12 00 68 27.63 168 22.23 % NPH12.5 00 68 28.10 168 28.98 % NPH13 0 0 68 28.58 168 35.74 % NPH13.5 0 0 68 29.05 168 42.49 % NPH14 00 68 29.53 168 49.25 % NPH14.5 0 0 68 30.00 168 56.00 % CCL19 %End of new

% CD- Cape Dyer (extended)

%_____

% Crossing east west, midway between Point Hope % and Cape Lisburne (near Cape Dyer) and trying % to avoid some topographic irregularites just % N of the line on the charts. % - 27 stations, 2nm spacing % - first 14 due west to match 2016 line, now % then angles to meet CCL20 at the Convention line % - Distance 54nm % - 27 stations % - ** CHECK DEPTH OF SHALLOWEST CD1 %-----% Lat (N) Long (W) Name % deg min deg min 0 0 68 40.00 168 56.0 % CCL20 %**NEW 0 0 68 39.79 168 50.6 % CD27 0 0 68 39.57 168 45.3 % CD26 0 0 68 39.36 168 39.9 % CD25 0 0 68 39.14 168 34.6 % CD24 0 0 68 38.93 168 29.2 % CD23 0 0 68 38.71 168 23.9 % CD22 0 0 68 38.50 168 18.5 % CD21 0 0 68 38.29 168 13.1 % CD20 0 0 68 38.07 168 7.8 % CD19 0 0 68 37.86 168 2.4 % CD18 0 0 68 37.64 167 57.1 % CD17 0 0 68 37.43 167 51.7 % CD16 0 0 68 37.21 167 46.4 % CD15 %*END OF NEW, carry on with 2016 stations

0 0 68 37.00 167 41.0 % CD14 0 0 68 37.00 167 35.5 % CD13 0 0 68 37.00 167 29.9 % CD12 0 0 68 37.00 167 24.4 % CD11 0 0 68 37.00 167 18.8 % CD10 0 0 68 37.00 167 13.3 % CD9 0 0 68 37.00 167 7.8 % CD8 0 0 68 37.00 167 2.2 % CD7 0 0 68 37.00 166 56.7 % CD6 0 0 68 37.00 166 51.2 % CD5 0 0 68 37.00 166 45.6 % CD4 0 0 68 37.00 166 40.1 % CD3 0 0 68 37.00 166 34.5 % CD2 0 0 68 37.00 166 29.0 % CD1 % SAS = S extension of AS line % Adding another 8 stations at 4nm spacing south % from AS1 to the coast. %---% Estimate for NorsemanII 8 casts ~ 4hrs % Not run vet %-----% Lat (N) Long (W) Name % deg min deg min 0 0 66 37.91 167 34.00 % SAS 1 0 0 66 34.35 167 29.14 % SAS 2 0 0 66 30.79 167 24.29 % SAS 3 0 0 66 27.23 167 19.43 % SAS 4 0 0 66 23.68 167 14.57 % SAS 5 0 0 66 20.12 167 9.72 % SAS 6 0 0 66 16.56 167 4.86 % SAS 7 0 0 66 13.00 167 0.00 % SAS 8 % - South Bering Strait section redone - SBSnn % First ran in 2014 and 2015 and then only partly % Run in full in 2017 % Re aligned in 2019 to start from BS22 % 2019 stations slightly off this (SBSn) % % To catch ACC before it enters the strait % % 22.5nm long % 21 stations including halves %-----% Lat(N) Lon (W) Lat (N) Lon (W) NAME % decdeg decdeg deg min deg min

```
65.625 168.177
               65 37.48
                         168 10.63 % SBSnn1 = BS22
65.614 168.215
               65 36.86
                         168 12.87 % SBSnn1.5
65.604 168.252
              65 36.24
                         168 15.12 % SBSnn2
65.594 168.289
               65 35.62
                         168 17.36 % SBSnn2.5
65.583 168.327
               65 35.00
                         168 19.61 % SBSnn3
               65 34.38
                         168 21.85 % SBSnn3.5
65.573 168.364
65.563 168.402
              65 33.76
                         168 24.09 % SBSnn4
65.552 168.439
               65 33.14
                         168 26.34 % SBSnn4.5
65.542 168.476
               65 32.52
                         168 28.58 % SBSnn5
65.532 168.514
               65 31.90
                         168 30.83 % SBSnn5.5
65.521 168.551
               65 31.29
                         168 33.07 % SBSnn6
65.511 168.589
              65 30.67
                         168 35.31 % SBSnn6.5
               65 30.05
                         168 37.56 % SBSnn7
65.501 168.626
65.490 168.663
               65 29.43
                         168 39.80 % SBSnn7.5
65.480 168.701
               65 28.81
                         168 42.05 % SBSnn8
65.470 168.738
              65 28.19
                         168 44.29 % SBSnn8.5
                         168 46.53 % SBSnn9
              65 27.57
65.459 168.776
65.449 168.813 65 26.95
                         168 48.78 % SBSnn9.5
                         168 51.02 % SBSnn10
65.439 168.850
               65 26.33
65.428 168.888
               65 25.71
                         168 53.27 % SBSnn10.5
65.418 168.925
               65 25.09
                         168 55.51 % SBSnn11
%
% NCD - North Cape Dyer Line
% 2nm near the coast NCD1-16
% 2.5nm on out to CCL21 (which is NCD 26)
%-----
% Length to CCL21 is 55.4nm
%-----
% Lat(N) Lon (W) Lat (N)
                         Lon (W)
                                  NAME
% decdeg decdeg deg min deg min
68.753 166.422 68 45.20 166 25.30 %NCD1
68.757 166.513 68 45.39
                         166 30.78 %NCD2
68.760 166.604 68 45.59
                         166 36.26 %NCD3
68.763 166.696 68 45.78
                         166 41.74 %NCD4
               68 45.97
                         166 47.22 %NCD5
68.766 166.787
68.769 166.878
              68 46.17
                         166 52.70 %NCD6
68.773 166.970
               68 46.36
                         166 58.18 %NCD7
68.776 167.061
               68 46.55
                         167 3.66 %NCD8
68.779 167.152
               68 46.75
                         167 9.14 %NCD9
                         167 14.62 %NCD10
68.782 167.244
               68 46.94
                         167 20.10 %NCD11
68.786 167.335
               68 47.13
               68 47.33
                         167 25.58 %NCD12
68.789 167.426
68.792 167.518
               68 47.52
                         167 31.06 %NCD13
68.795 167.609
               68 47.71
                         167 36.54 %NCD14
               68 47.91
                         167 42.02 %NCD15
68.798 167.700
68.802 167.792
               68 48.10
                         167 47.50 %NCD16 2nm up to here, 2.5nm after
68.805 167.906
               68 48.29
                         167 54.35 %NCD17
68.808 168.020
               68 48.48
                         168 1.20 %NCD18
```

Woodgate et al 2021 Bering Strait 2021 Norseman II Cruise report – 24th May 2022

68.811 168.134	68	48.67	168	8.05 %NCD19
68.814 168.248	68	48.86	168	14.90 %NCD20
68.817 168.363	68	49.05	168	21.75 %NCD21
68.821 168.477	68	49.24	168	28.60 %NCD22
68.824 168.591	68	49.43	168	35.45 %NCD23
68.827 168.705	68	49.62	168	42.30 %NCD24
68.830 168.819	68	49.81	168	49.15 %NCD25
68.833 168.933	68	50.00	168	56.00 %NCD26

REFERENCES

- Aagaard, K., and E. C. Carmack (1989), The role of sea ice and other fresh water in the Arctic circulation, J. Geophys. Res., 94(C10), 14485-14498.
- De Boer, A. M., and D. Nof (2004), The Bering Strait's grip on the northern hemisphere climate, *Deep-Sea Res., Part I, 51*(10), 1347-1366, doi: 10.1016/j.dsr.2004.05.003.
- Jakobsson, M., C.Norman, J.Woodward, R. MacNab, and B.Coakley (2000), New grid of Arctic bathymetry aids scientists and map makers, *Eos Trans.*, *81*(9), 89, 93, 96.
- Østerhus, S., R. Woodgate, H. Valdimarsson, B. Turrell, L. de Steur, D. Quadfasel, S. M. Olsen, M. Moritz, C. M. Lee, K. M. H. Larsen, S. Jónsson, C. Johnson, K. Jochumsen, B. Hansen, B. Curry, S. Cunningham, and B. Berx (2019), Arctic Mediterranean exchanges: a consistent volume budget and trends in transports from two decades of observations, *Ocean Sci.*, *15*(2), 379-399, doi: 10.5194/os-15-379-2019.
- Serreze, M. C., A. D. Crawford, J. Stroeve, A. P. Barrett, and R. A. Woodgate (2016), Variability, trends, and predictability of seasonal sea ice retreat and advance in the Chukchi Sea, J. Geophys. Res. -Ocean, 18pp, doi: 10.1002/2016jc011977.
- Shimada, K., T. Kamoshida, M. Itoh, S. Nishino, E. Carmack, F. McLaughlin, S. Zimmermann, and A. Proshutinsky (2006), Pacific Ocean inflow: Influence on catastrophic reduction of sea ice cover in the Arctic Ocean, *Geophys. Res. Lett.*, 33, L08605, doi: 10.1029/2005GL025624.
- Travers, C. S. (2012), Quantifying Sea-Ice Volume Flux using Moored Instrumentation in the Bering Strait, 85 pp, University of Washington, available at http://psc.apl.washington.edu/HLD.
- Wadley, M. R., and G. R. Bigg (2002), Impact of flow through the Canadian Archipelago and Bering Strait on the North Atlantic and Arctic circulation: an ocean modelling study, *Quarterly Journal of the Royal Meteorological Society*, 128(585), 2187-2203.
- Walsh, J. J., C. P. McRoy, L. K. Coachman, J. J. Goering, J. J. Nihoul, T. E. Whitledge, T. H. Blackburn, P. L. Parker, C. D. Wirick, P. G. Shuert, J. M. Grebmeier, A. M. Springer, R. D. Tripp, D. A. Hansell, S. Djenidi, E. Deleersnijder, K. Henriksen, B. A. Lund, P. Andersen, F. E. Müller-Karger, and K. Dean (1989), Carbon and nitrogen cycling within the Bering/Chukchi Seas: Source regions for organic matter effecting AOU demands of the Arctic Ocean, *Prog. Oceanogr.*, 22(4), 277-259, doi: 10.1016/0079-661(89)90006-2.
- Woodgate, R. A. (2015), 25 years (1990-2015) of year-round measurements in the Bering Strait what do we know, and what do we still NOT know?, paper presented at Arctic Observing Network Meeting, available at http://psc.apl.washington.edu/BeringStrait.html, Seattle, November 2015.
- Woodgate, R. A. (2018), Increases in the Pacific inflow to the Arctic from 1990 to 2015, and insights into seasonal trends and driving mechanisms from year-round Bering Strait mooring data, *Prog. Oceanogr.*, *160*, 124-154, doi: 10.1016/.pocean.2017.12.007.
- Woodgate, R. A., and K. Aagaard (2005), Revising the Bering Strait freshwater flux into the Arctic Ocean, *Geophys. Res. Lett.*, 32(2), L02602, doi: 10.1029/2004GL021747.
- Woodgate, R. A., and C. Peralta-Ferriz (2021), Warming and Freshening of the Pacific Inflow to the Arctic From 1990-2019 Implying Dramatic Shoaling in Pacific Winter Water Ventilation of the Arctic Water Column, *Geophys. Res. Lett.*, 48(9), e2021GL092528, doi: 10.1029/2021GL092528.
- Woodgate, R. A., K. Aagaard, and T. J. Weingartner (2005a), A year in the physical oceanography of the Chukchi Sea: Moored measurements from autumn 1990-1991, *Deep-Sea Res., Part II*, 52(24-26), 3116-3149, doi: 10.1016/j.dsr2.2005.10.016.
- Woodgate, R. A., K. Aagaard, and T. J. Weingartner (2005b), Monthly temperature, salinity, and transport variability of the Bering Strait throughflow, *Geophys. Res. Lett.*, *32*(4), L04601, doi: 10.1029/2004GL021880.
- Woodgate, R. A., K. Aagaard, and T. J. Weingartner (2006), Interannual Changes in the Bering Strait Fluxes of Volume, Heat and Freshwater between 1991 and 2004, *Geophys. Res. Lett.*, *33*, L15609, doi: 10.1029/2006GL026931.
- Woodgate, R. A., T. J. Weingartner, and R. W. Lindsay (2010), The 2007 Bering Strait Oceanic Heat Flux and anomalous Arctic Sea-ice Retreat, *Geophys. Res. Lett.*, *37*, L01602, doi: 10.1029/2009GL041621.
- Woodgate, R. A., T. J. Weingartner, and R. Lindsay (2012), Observed increases in Bering Strait oceanic fluxes from the Pacific to the Arctic from 2001 to 2011 and their impacts on the Arctic Ocean water column, *Geophys. Res. Lett.*, *39*(24), 6, doi: 10.1029/2012gl054092.
- Woodgate, R. A., K. M. Stafford, and F. G. Prahl (2015), A Synthesis of Year-Round Interdisciplinary Mooring Measurements in the Bering Strait (1990–2014) and the RUSALCA Years (2004–2011), *Oceanography*, *28*(3), 46-67, doi: 10.5670/oceanog.2015.57.

N N	% Bering Strait	2021 N	ORSEMAN	2 log CTD														
Number of the second	%Date Ti	me	1 Cast N	D Dov Depth	(ı Lat (deg)	Lat (min)	Lon (deg	;) Lon(mir	n) Altin	neter%	StationID			Windspe	eWind (per:Fog	Wat	erCliComments
									0=bad	1=go %				knots		0 = 0	cle0=c	ear, 1=noclear
Num Num <td></td> <td></td> <td></td> <td></td> <td></td> <td>and one line fo</td> <td>or the end</td> <td>i</td> <td></td> <td>%</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						and one line fo	or the end	i		%								
Mathema of all all all all all all all all all al					5=Pumping of	cast for Trace	Metals		Altin							Fog	Wat	rclarity
				it event type														
										%								
							w keel, ke	el is 3m (1	.0ft)	~								
Number of the second																		
Non-strain Non-str																		
Number of the second			n/s; WD=\	Vind directior	n from bridge	2												
			den indir	ates wire out	for net													
						ngs, 1 if good	both up a	and down										
Sector Sector<					Ĩ					%				KNOTS				
Subsci v V V V											. ,							
Sheet No. Vis. Vis. Vis. Vis. <																	NEX	R R VISIBLE
Network Network Note of the sector												-						RStrait14020.hdr file: out Station=RS20.hv mistake, should be Station=RS18 as shown here in StationID
Image: State Image: State<												Wire Ou	t	10.0	10-7 0			
State I I I I			SMT															
Difference Set												Surf E	ot				Clar	
NUMBER VI I I I I <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td></td>				-												-		
Norm Norm <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Just a soak (5-10m, not going to depth) to test the termination; took a long moment for the pump to turn on, but otherwise an clear</td></th<>																		Just a soak (5-10m, not going to depth) to test the termination; took a long moment for the pump to turn on, but otherwise an clear
Description Use of a large and large												218	268				0 5m	pre-mooring recovery cast, A2-20; also the first full cast
Bit II II II II II II III IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII										-						-		
Distribution Use I A I A Constraint Distribution Distribu												217	267				0 5m	pre-mooring recovery cast, A2-19; moved in small increments down at bottom to get below 51m
System System<												217	270				0.1m	are mading receiving cast. At 20: adjusted computer time to bottor match LICC prior to this cast (provingely a 242c offset)
Start Start <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>217</td><td>270</td><td></td><td></td><td></td><td>0 1111</td><td>pre-mouning recovery cast, x4+20, adjusted computer time to better match one prior to this cast (previously a 1435 offset)</td></th<>												217	270				0 1111	pre-mouning recovery cast, x4+20, adjusted computer time to better match one prior to this cast (previously a 1435 offset)
Just 10 11 1<												217	299				0 1m	pre-mooring recovery cast, A4-19; lots of line paid out, strong current. Speed was slightly slow.
22010 10 1 6 1 1 6 1 6 1 1 0 1 <td></td> <td> / /</td> <td></td> <td></td> <td>24</td> <td></td> <td></td> <td></td> <td></td>											/ /			24				
Description 10 2 6 2 3 6 4.21 able from test												247	267			-	0.5	
Description Set 0 0 0 0 0 </td <td></td> <td>217</td> <td>267</td> <td>21</td> <td></td> <td></td> <td>0 5 m</td> <td>some discrepancy in oxygen sensors and strangeness in salinity; cleaned vent plugs and ran HW through C cell again</td>												217	267	21			0 5 m	some discrepancy in oxygen sensors and strangeness in salinity; cleaned vent plugs and ran HW through C cell again
Description 10 1 7 1 5 6 10.8 7 2 10.8 7 2 10.8 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td>40</td><td></td><td></td><td></td><td>-</td><td>rainy and windy, test cast was done during transit from A2 to A3, pumped roughly 2.5 Gal to the surface. Just a downcast included here, will do upcasts as well in th</td></th<>												0	40				-	rainy and windy, test cast was done during transit from A2 to A3, pumped roughly 2.5 Gal to the surface. Just a downcast included here, will do upcasts as well in th
Description 1 8 1 5 6 9 6 2 <th2< th=""> 2 <th2< td=""><td>20210709</td><td>1611</td><td>1 7</td><td>1 55.</td><td>1 66</td><td>19.581</td><td>16</td><td>58 57.6</td><td>18 (</td><td>) %</td><td>A3-20 recovery precast A</td><td>217</td><td>265</td><td>20</td><td>342 8</td><td>с</td><td>0 3m</td><td></td></th2<></th2<>	20210709	1611	1 7	1 55.	1 66	19.581	16	58 57.6	18 () %	A3-20 recovery precast A	217	265	20	342 8	с	0 3m	
2010 10 1 9 1 <td></td>																		
220109 167 1 5 6 9 157 18 5.88 0 N A1 30 recove precist 21 16 0 m premoting recovery ast A1 99, and A19, month dupu leel 201099 166 1 5.3 6 15,54 16 5 6 13,97 15 6 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97 16 31,97												217	267				0 3m	Second cast to diagnose CTD pump problems on upcast; same protocol as previous cast
1 1 1 2 5.5. 6 9.51. 6 7.52. 6 7.52. 6 7.52. <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>217</td> <td>272</td> <td></td> <td></td> <td></td> <td>0 3m</td> <td>pre-mooring recovery cast A3-19: moved b2 temperature sensor up slightly to match output level</td>										-		217	272				0 3m	pre-mooring recovery cast A3-19: moved b2 temperature sensor up slightly to match output level
2021070 16 1 2 5 6 1 1 1 1 2 5 6 1<																		0
2022070 0 1 1 1 5.48 66 19.63 168 57.22 N A3.1 calibration 1 18 20.00 1 11 1 1.5 5.48 66 19.63 168 57.22 N A3.1 calibration 1 18 50.0 1 18 20.00 10.00												217	266				0 3m	pre-mooring recovery cast A3-19 B; ran cast without pump for sensor diagnostics
202107 36 1 2 5.8 6 10.8 17.8 80/6 17.8 80/6 180/6 <												24.0	200				2	
2021070 1552 1 2 2 2 5 9 822 100 8322 100 8322 100 8322 100 11 200000 100 1 1 2 25 10 15 1 2 25 10 15 1 2 25 10 15 100												218	269				2m	A-21 post deployment calibration cast, replumbed C1D as well for connecting 1 and C.
2021070 100 15 1 1 2.89 6.5 3.03 10.81 N 8224arame N Istarame cat 2021070 103 1 3.0 1 3.0 10.8												214	255				3m	BS22 - time is just an estimate, forgot to write it down
2021071 1012 5 1 2 2.8 6 8.80.5 10.6 10.5 10.6 <td></td> <td>14.2</td> <td></td> <td></td> <td></td> <td></td>														14.2				
2021071 6/20 1 13 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 2 3 6 38.53 168 18.462 % 821.5 1 37.5 6 13.86 1 38.65 18.86 18.86 18.86 18.86 18.86 18.86 18.86 18.86 18.86 18.86 18.86 18.86 19.86																	3m	1st Laramie cast
202107 163 1 10 2 37 66 38.78 168 12.233 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 6 53.75 63.75 63.75 63.75 63.75 63.75 63.75 63.75 63.75 63.75 63.75 63.75 63.75 63.75 63.75 73												214	254	14			4.00	ith Jaco
2021071 631 1 14 1 102 65 38.53 168 14.862 % 621 175 916 175 917 917 917 917 917 917 917 917 917 917 917 917 <td></td> <td>214</td> <td>204</td> <td></td> <td></td> <td></td> <td>411</td> <td>An ogo</td>												214	204				411	An ogo
1 1												217	244				4m	
20210710 1673 1 15 2 44.3 65 39.34 168 17.023 % 8520.5 1 1 1 1 1 1 4 7 65 39.344 168 17.088 % 8520.5 1																		
20210710 1714 5 2 1 447 65 39.34 168 17.08 × BS20.5 Laramie P												216	262					Cleaned vent plugs before cast
1000000 1714 5 2 4 7 5 40.36 1731 1 6 10.30 10.3														20.6				2nd Laramie Cast
20210710 173 1 16 1 468 65 39.258 188 18.92 % B200 28 26 18.8 19.3 G B 20210710 173 1 16 2 46.9 65 39.99 168 19.006 % B200 20 50 1 4m																		
107010 174 1 177 1 48.7 65 39.79 168 21.29 % 819.5 21.3 2014 418 1 10 1 174 1 18 1 503 65 39.79 168 21.278 % 819.5 21.2 201 201 18 1 503 65 40.223 168 23.47 % 819.5 21 201 181 1 503 65 40.223 168 23.46 % 819.9 21 171 6 50 20210710 175 1 8 2 50.1 65 40.23 168 23.46 % 819.9 21 171 6 40 20210710 1813 5 3 1 50 40.59 168 23.59 % 819.4 1 171 6 40 20210710 1821 1 15.1 65 40.81 168 25.84 7 818.8 1 21 28 1 16 182 1 <td>20210710</td> <td>1729</td> <td>1 16</td> <td>1 46.</td> <td>8 65</td> <td>39.258</td> <td>16</td> <td>58 18.9</td> <td>82</td> <td>%</td> <td>BS20</td> <td>218</td> <td>265</td> <td>18.8</td> <td>193 J</td> <td>G</td> <td>0 3m</td> <td></td>	20210710	1729	1 16	1 46.	8 65	39.258	16	58 18.9	82	%	BS20	218	265	18.8	193 J	G	0 3m	
20210710 174 1 17 2 4.8.8 65 39.948 168 21.178 % B19.5 2 20.9 20.8 1 10.0 </td <td>20210710</td> <td>1733</td> <td>1 16</td> <td></td> <td></td> <td>39.495</td> <td>16</td> <td>58 19.0</td> <td>06</td> <td>%</td> <td>BS20</td> <td></td> <td></td> <td>19.5</td> <td>230 J</td> <td>G</td> <td></td> <td></td>	20210710	1733	1 16			39.495	16	58 19.0	06	%	BS20			19.5	230 J	G		
1020170 1757 1 18 1 50.3 65 40.23 168 23.487 0 % 819 210 181 6 5m 20210710 1757 1 18 2 50.1 65 40.39 168 23.487 0 % B19 210 1 5 3 2 50.1 65 40.59 8 B19 1 1 6 4m 20210710 1813 5 3 2 50.4 65 40.59 168 23.35 % B19 1amie - - - - 6 4m 20210710 1813 1 19 1 51 65 40.81 168 23.35 % 8 151.5 217 67 25 168 10 5m - 20 188 1 5m - 1 188 1 188 1 188 1 188 1 5m - 20 188 1 5m 5m 5m 5m <												218	263			-	4m	sss chunky vis
20210710 187 1 180 2 50.1 65 40.39 168 23.46 % 8519 1 17 16 4 20210710 1802 5 3 1 50.7 65 40.59 168 23.51 % 8519 Laranic 1 2 12 5 3 1 50.7 65 40.59 168 23.51 % 8519 Laranic 1 2 2 1 50.4 65 40.63 168 23.51 % 8519 Laranic 1 2 2 51.2 65 40.63 168 25.28 % 8518.5 21 26 7 7 7 7 7 8 18.10 1 8 1 8 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1 18.10 1												217	265				Em	
20210710 1802 5 3 2 50.4 65 40.559 168 23.53 % BS 19 Laramie % G 4 4 6 4 4 6 4 4 6 4 4 6 4 4 6 12.3 268 10 6 4 4 6 158 23.55 % 8 519 2 158 10 6 4 4 6 158.5 217 267 25 158 10 18 1 19 1 51 6 40.81 168 25.38 % 8518.5 217 267 25 18 10 18 1 19 1 51.7 6 41.21 168 25.38 % 8518.5 217 26 18 10 18 1 1 51.4 168 25.38 % 8518 217 28 18 10 18 1 1 51.4 168 26.81 18 168 128 18 10 18 1												217	200				211)	
20210710 1813 5 3 2 5.0 6.5 40.68 1.68 23.35 % 810 laramie 1 28.13 28.810 5 20210710 1824 1 19 2 5.12 6.5 40.681 168 25.284 % 8518.5 - - 20 18 10 1.51 6 41.01 168 25.36 % 8518.5 - - 20 18 10 1.51 6 41.01 168 25.36 % 8518.5 - - 20 18 10 - - 20210710 1834 1 2 2 41.21 168 25.36 % 8518.5 - 20 18 10 - - 20210710 1834 1 2 2 41.21 168 25.36 % 8518.5 - 2 22 18 10 - 20210710 1844 1 2 2 41.45 1.68 29.27 % 8517.5 27.7 7.5 12 19 1 20210710 1844 1 1 12 5.2 4.16 1.68 29.25																	4m	
20210710 182 1 9 2 5.1 65 40.81 1.68 25.38 % 818.5 % 1840 5m 2021070 1834 1 5 41.215 168 25.38 % 818.6 % 12 18 ND 5m 2021070 1834 1 2 1.5 1.65 41.215 1.68 25.35 % 818.6 % 22 18 ND 5m 2021070 1844 1 2 1.5 1.65 41.215 1.68 26.35 % 817.5 21 12 19 ND 12 19 ND <t< td=""><td></td><td></td><td></td><td></td><td>4 65</td><td>40.984</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>					4 65	40.984												
20210710 1832 1 51.7 65 41.126 168 25.93 % BS18 21 280 2.2 181 RU 5m 20210710 1834 1 20 2 5.1 65 41.215 168 25.855 % BS18 2 21 18 RU 5m 20210710 1844 1 15 2.6 41.66 29.217 % BS17.5 12 17 17 18 1 12 2.6 41.66 29.217 % BS17.5 12 17 17 16 16 29.216 18 RU 16 16 817.5 16 18 1.6 16 817.5 16												217	267				5m	
20210710 184 1 20 52 52.1 65 41.215 168 26.865 % BS18 2 22 186 RD 20210710 1844 1 52.1 65 41.65 29.217 % BS17.5 217 75 12 179 RD 20210710 1848 1 12 52.5 65 42.15 % BS17.5 tramie 5 18 RD 20210710 1848 1 51.9 65 42.023 % BS17.5 tramie 5 8 18												217	200				Em	
20210710 184 1 21 1 52.1 65 41.62 168 29.217 % 817.5 21 17 81 12 12 52.1 65 41.62 168 29.217 % 817.5 21 17 81 12 18 10 10 168 29.216 % 817.5 21 17 810 158 18 12 18 10 18 13 15.9 65 41.08 29.255 % 817.5 taramic 16												217	200				511	
20210710 1848 1 21 22 52.2 65 41.81 168 29.263 % BS17.5 20 158 RJ 20210710 1850 5 42 1 51.9 65 42.023 168 29.265 % BS17.5 Laramie JG												217	275					
	20210710	1848	1 21							%	BS17.5				158 F	JD		
20210/10 1857 5 4 2 51.7 55 42.167 168 29.143 % 8517.5 //																		
	20210/10	1821	5 4	2 51.	/ 65	42.167	16	29.1	43	%	8517.5				l	3		

20210710	1907	1	22 1	52.9	65	42.154	168	31 224	0.5	% BS17	217	278	70	200 JG	0 5m	
	1907		22 1 22 2		65	42.154	168	31.224		% BS17 % BS17	21/	278		161 JG	0.511	
20210710			23 1		65	42.719	168	33.379		% BS16.5	217	276		183 JG		
20210710	1922	1	23 2	50.1	65	42.868	168	33.253	0	% BS16.5			21	192 JG	0	
20210710					65	43.233	168	35.534		% BS16	218	270		150 RJD	0 5m	
	1936		24 2		65	43.325	168	35.547		% BS16				153 RJD	0	
			5 1 5 2		65 65	43.478 43.734	168 168	35.475 35.244		% BS16 Laramie % BS16 Laramie			20	161 RJD RJD	0 5m 0	
20210710					65	43.754	168	37.516		% BS15.5	218	270	31	. 181 RJD	0 5m	
			25 2		65	43.858	168	37.468		% BS15.5	210	270		188 RJD	0	
			26 1		65	44.242	168	39.791		% BS15	218			170 RJD	0 5m	
	2033		26 2		65	44.353	168	39.795		% BS15				170 RJD	0	
	2040		27 1		65	44.774	168	41.58		% BS14.5	218	281		171 RJD	0 5m	
20210710			27 2		65	44.911	168	41.595		% BS14.5				170 RJD	0	
20210710 20210710			6 1 6 2		65 65	45.106 45.21	168 168	41.666 43.171		% BS14.5 Laramie % BS14.5			24	160 RJD RJD	0 5m 0	Recovery time missing
20210710					65	45.387	168	43.365		% BS14.5	217	271	21	. 181 RJD	0 5m	Vent plugs cleaned
20210710			28 2		65	45.387	168	43.365		% BS14				180 RJD	0	
20210710	2116	1	29 1	51.3	65	45.781	168	45.505		% BS13.5	217	275	18		0 5m	
20210710		-	29 2		65	45.9	168	45.999		% BS13.5				190 RJD	0	
20210710					65	46.198	168	47.563		% BS13	218	282		208 RJD	0 5m	Vent plugs cleaned
			30 2 7 1		65 65	46.366 46.545	168 168	47.695 47.546		% BS13 % BS13 Laramie				171 RJD 185 RJD	0 0 5m	
			7 1 7 2		65	46.545	168	47.546		% BS13 Laramie % BS13 Laramie			21	. 185 KJD RJD	0 5m	
20210710					65	46.802	168	49.702		% BS12.5	217	277	22	200 RJD	0 5m	Vent plugs cleaned
20210710			31 2		65	46.949	168	49.864		% BS12.5				200 RJD	0	
20210710			32 1		65	47.178	168	51.611		% BS12	217	261		180 RJD	0 4m	
20210710			32 2		65	47.251	168	51.785		% BS12				175 RJD	0	
20210710					65	47.673	168	53.816		% BS11.5	217	265		165 RJD	0 4m	Vent plugs cleaned
20210710 20210710			33 2 8 1		65 65	47.682	168 168	53.855 53.89		% BS11.5 % BS11.5 Laramie				170 RJD 172 RJD	0	
			8 2		65	47.702	168	53.89		% BS11.5 Laramie				210 RJD	0	Recovery postion missing - set to be same as deploy
20210710					65	48.196	168	55.863		% BS11	217	270		181 RJD	0 2m	record hostion working action or anticat
20210710			34 2		65	48.25	168	55.905		% BS11				180 RJD	0	
20210710	2245	1	35 1	46.3	65	49.211	168	56.095		% DL1	217	268	30) 181 RJD	0 4m	Vent plugs cleaned
20210710			35 2		65	49.436	168	56.189		% DL1				184 RJD	0	
20210710			36 1		65	50.154	168	56.381		% DL2	217	262		172 RJD	0 3m	
20210710 20210710			36 2 37 1		65 65	50.289 51.188	168 168	56.5 56.12		% DL2 % DL3				180 RJD 171 RJD	0 0.3m	
20210710			37 1 37 2		65	51.328	168	56.213		% DL3				171 NJD 188 RJD	0	
			38 1		65	52.097	168	56.291		% DL4	217	256	26.6		0 3m	Vent plugs cleaned
			38 2		65	52.14	168	56.299		% DL4				190 KC		
20210710					65	53.064	168	56.185		% DL5	217	258		5 168 KC	0 3m	
	2334		39 2		65	53.093	168	56.159		% DL5				190 KC		
20210710 20210710					65 65	54.092	168 168	56.205 56.158		% DL6 % DL6	21/	258		181 KC	0 4m	Vent plugs cleaned
20210710			40 2 41 1		65	54.136 55.169	168	56.238		% DL7	217	260		189 KC	0 5m	
20210710			41 2		65	55.23	168	56.227		% DL7	217	200		199 KC	0 511	
20210711	6	1	42 1	48.7	65	56.112	168	56.219	0	% DL8	217	261	17.7	174 KC	0 6m	Vent plugs cleaneed; arge hysteresis on downcast in oxygen; keeping an eye on it for the next cast
20210711	10	-	42 2		65	56.169	168	56.209	-	% DL8				198 KC		
20210711			43 1		65	57.046	168	56.233		% DL9	218	263	24.2		0 7m	Vent plugs cleaned; still mismatch between oxygens on the downcast
20210711			43 2 44 1		65	57.112 58.042	168 168	56.187		% DL9	217	262		180 KC	0 4m	
20210711 20210711	30 34		44 1 44 2		65 65	58.042 58.089	168 168	56.273 56.307		% DL10 % DL10	21/	263		215 KC	0 4m	
20210711	41		44 2 45 1		65	58.983	168	56.133		% DL11	217	264		195 KC	0 4m	
20210711	45		45 2		65	59.071	168	56.151		% DL11	217			214 KC		
20210711	53		46 1	51.3	65	59.983	168	56.203	0	% DL12	216	264	22.9		0 4m	
20210711			46 2		66	0.061	168	56.227		% DL12				214 KC		
20210711	105		47 1	51	66	1.236	168	56.205		% DL12.5	217	264		181 KC	0 4m	Huge spike in fluorescence; mislabeled in station name for seasave (DL13 rather than DL12.5)
20210711	111		47 2 48 1		66	1.471	168	56.212		% DL12.5	240	264		212 KC	0.4-	
20210711 20210711		-	48 1 48 2		66 66	2.524 2.603	168 168	56.212 56.178		% DL13 % DL13	218	261		182 KC	0 4m	New winch driver: extremely fast for the first part of down cast (15m in 2 sec), asked to slow down and speed seemed okay; data seemed okay too - move on to ne
20210711			48 2 49 1		66	3.805	168	56.202		% DL13.5	218	266	18.5		0 4m	
20210711			49 2		66	3.885	168	56.174		% DL13.5				179 KC		
20210711	148		50 1		66	5.065	168			% DL14	217	266		167 KC	0 3m	
20210711	152		50 2		66	5.176	168	56.254		% DL14				185 KC		
20210711	209		51 1		66	6.432	168	56.103		% DL14.5	217	260		5 190 RJD	0 2m	Went equal speeds on upcast and downcast, resolved difference in measurements
20210711			51 2 52 1		66	6.526	168	56.928		% DL14.5	217	267		208 RJD 189 KC	0.2 5m	Araja, aqual segonde on un and down
20210711 20210711			52 1 52 2		66 66	7.636 7.711	168 168	56.269 56.225		% DL15 % DL15	21/	267		189 KC 188 KC	0 2.5m	Again, equal speeds on up and down
20210711	243		52 2 53 1		66	8.911	168			% DL15.5	217	267		178 KC	0 3m	Attempting 1.5x speed on up compared to down - works well, implementing from this point. Cleaned vent plugs after this cast.
20210711			53 2		66	9.986	168	56.178		% DL15.5				204 KC		
20210/11	258	1	54 1	54.2	66	10.157	168	56.263	0.5	% DL16	217	267	29.4		0 2m	
20210711			54 2		66	10.245	168	56.215		% DL16				203 KC		
20210711 20210711			55 1		66	11.437	168	56.213		% DL16.5	217	268		191 KC	0 2m	Vent plugs cleaned before this cast
20210711 20210711 20210711	313				66	11.518	168	56.208	0	% DL16.5				205 KC		
20210711 20210711 20210711 20210711	313 318	1	55 2 56 1		60	12 704	100	EC 100	0.5	0/ DI17	247					
20210711 20210711 20210711 20210711 20210711	313 318 327	1	56 1	56.2	66 66	12.704	168 168	56.189 56.13		% DL17 % DL17	217	269		180 KC	0 2m	
20210711 20210711 20210711 20210711	313 318 327 332	1	56 1 56 2	56.2 56.3	66 66 66	12.704 12.777 13.99	168 168 168	56.189 56.13 56.206	0.5	% DL17 % DL17 % DL17.5		269 269	18.6	180 KC 202 KC 177 KC	0 2m 0 2m	

20210711 357 1 58 1 56.3 66 20210711 402 1 58 2 56.3 66	15.257 168 50 15.325 168 50		% DL18 % DL18	216 269		196 KC 201 KC	0 2m	
20210711 402 1 58 2 50.5 66 20210711 412 1 59 1 55.9 66			% DL18.5	217 268		201 KC	0 3m	
20210711 416 1 59 2 55.7 66			% DL18.5			236 KC		
20210711 426 1 60 1 55.6 66			% DL19	217 268		210 KC	0 3m	
20210711 431 1 60 2 55.5 66			% DL19			241 KC		
20210711 439 1 61 1 55.7 66 20210711 443 1 61 2 55.6 66		56.189 0.5 56.101 0.5	% DL19.5 % DL19.5	216 267		210 KC 226 KC	0 3m	End of the DL line
20210711 443 1 61 2 55.6 66 20210711 451 1 62 1 55.3 66			% A3 mooring site	216 268		226 KC 223 KC	0 3m	
20210711 456 1 62 2 55.4 66			% A3 mooring site	210 200		243 KC	0 5111	
20210711 504 1 63 1 55.5 66		55.296 0	% AL12.5	216 268		240 KC	0 3m	
20210711 508 1 63 2 55.4 66			% AL12.5			260 KC		
20210711 510 5 9 1 55.4 66 20210711 518 5 9 2 55.3 66		55.255 55.288	% AL12.5 Laramie % AL12.5 Laramie	5 45		264 KC 312 KC		Starting to record amount of piping that is put into the water in tht ewire in/out columns here. Surface is where the surface sample is taken, Bot is where the bottor
20210711 518 5 5 2 55.5 00 20210711 527 1 64 1 55.4 66			% AL13	216 269		292 KC	0 3m	
20210711 532 1 64 2 55.5 66			% AL13			311 KC		
20210711 541 1 65 1 53.9 66		51.488 0.5		216 265		302 KC	0 3m	
20210711 546 1 65 2 53.8 66			% Al13.5			302 KC		
20210711 554 1 66 1 54.3 66 20210711 559 1 66 2 54.2 66			% AL14 % AL14	216 267		301 KC 300 KC	0 3m	
20210711 535 1 66 2 54.2 66 20210711 600 5 10 1 54.3 66			% AL14 Laramie	5 45		293 KC		
20210711 608 5 10 2 54.3 66			% AL14 Laramie			302 KC		
20210711 618 1 67 1 54.3 66			% AL14.5	218 266		295 KC	0 3m	
20210711 623 1 67 2 54.2 66			% AL14.5	217 255		307 KC	0.2	
20210711 631 1 68 1 46.4 66 20210711 635 1 68 2 46.2 66			% AL15 % AL15	217 259		311 KC 316 KC	0 3m	
20210711 635 1 68 2 46.2 66 20210711 644 1 69 1 50.9 66			% AL15 % AL15.5	217 263		316 KC 320 KC	0 3m	
20210711 649 1 69 2 50.9 66			% AL15.5			327 KC		
20210711 650 5 11 1 50.8 66	22.211 168 42	12.999	% AL15.5 Laramie	5 45	10.2	317 KC		
20210711 658 5 11 2 50.8 66			% AL15.5 Laramie	246		8.3 KC	0.5	
20210711 709 1 70 1 56.7 66 20210711 712 1 70 2 56.5 66			% AL16 % AL16	216 270		314 JG 323 IG	0.5 3m	
20210711 712 1 70 2 56.5 66 20210711 723 1 71 1 56.4 66			% AL16.5	216 270		343 JG	0.5 3m	
20210711 728 1 71 2 56.5 66			% AL16.5			336 JG		
20210711 737 1 72 1 54.8 66			% AL17	217 268		336 JG	0 3m	
20210711 742 1 72 2 55 66			% AL17		18	346 JG		
20210711 743 5 12 1 55.1 66 20210711 750 5 12 2 55 66			% AL17 Laramie % AL17 Laramie	5 45		JG JG		
20210711 759 1 73 1 54.3 66			% AL17.5	216 268	19.3	322 JG	0 3m	
20210711 804 1 73 2 54.5 66			% AL17.5			350 JG		
20210711 815 1 74 1 52.6 66								
			% AL18	217 267	14.3	359 JG	0 3m	
20210711 820 1 74 2 52.7 66	23.9 168 33	32.306 0	% AL18		14.3 14.1	359 JG 1.9 JG		
20210711 820 1 74 2 52.7 666 20210711 830 1 75 1 53 666	23.9 168 3 24.256 168 2	32.306 0 29.86 0	% AL18 % AL18.5	217 267 216 267	14.3 14.1 13.4	359 JG 1.9 JG 19 JG	0 3m 0 3m	
20210711 820 1 74 2 52.7 666 20210711 830 1 75 1 53 666 20210711 834 1 75 2 52.9 666	23.9 168 3 24.256 168 2 24.207 168	29.86 0 29.89 0	% AL18 % AL18.5 % AL18.5	216 267	14.3 14.1 13.4 7	359 JG 1.9 JG 19 JG 12.7 JG		
20210711 820 1 74 2 52.7 66 20210711 830 1 75 1 53 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 666	23.9 168 3 24.256 168 3 24.207 168 3 24.207 168 3 24.202 168 3	32.306 0 29.86 0 29.89 0 29.925 0	 % AL18 % AL18.5 % AL18.5 % AL18.5 Laramie 		14.3 14.1 13.4 7	359 JG 1.9 JG 19 JG 12.7 JG JG		
20210711 820 1 74 2 52.7 66 20210711 830 1 75 1 53 66 20210711 834 1 75 2 52.9 66 20210711 836 5 13 1 53 66 20210711 843 5 13 2 53.1 66 20210711 843 5 13 2 53.4 66 20210711 854 76 1 53.3 66	23.9 168 3: 24.256 168 2: 24.207 168 2: 24.202 168 2: 24.209 168 2: 24.203 168 2:	32.306 0 29.86 0 29.89 0 29.925 29.94 27.852 0	 % AL18 % AL18.5 % AL18.5 % AL18.5 Laramie % AL18.5 Laramie 	216 267	14.3 14.1 13.4 7 15.6	359 JG 1.9 JG 19 JG 12.7 JG JG JG 337 JG		
20210711 820 1 74 2 52.7 666 20210711 830 1 75 1 53 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 666 20210711 836 5 13 1 53 666 20210711 845 5 13 2 53.1 666 20210711 845 1 76 1 53.3 666 20210711 858 1 76 1 53.3 666 20210711 858 1 76 2 53.3 666	23.9 168 33 24.256 168 32 24.207 168 32 24.209 168 32 24.209 168 32 24.203 168 32 24.623 168 22	32.306 0 29.86 0 29.89 0 29.925 29.94 27.852 0 27.974 0	% AL18 % AL18.5 % AL19 % AL19	216 267 5 45 217 267	14.3 14.1 13.4 7 15.6 15.4	359 JG 1.9 JG 19 JG 12.7 JG JG JG 337 JG 350 JG	0 3m 0 4m	
20210711 820 1 74 2 52.7 66 20210711 830 1 75 1 53 66 20210711 834 1 75 2 52.9 66 20210711 836 5 13 1 53 66 20210711 836 5 13 2 53.1 66 20210711 834 1 76 1 53.3 66 20210711 854 1 76 1 53.3 66 20210711 854 1 76 2 53.3 66 20210711 854 1 76 2 53.3 66 20210711 908 1 77 1 52.4 66	23.9 168 3: 24.256 168 2: 24.207 168 2: 24.202 168 2: 24.202 168 2: 24.203 168 2: 24.204 168 2: 24.623 168 2: 24.624 168 2: 24.625 168 2: 24.626 168 2:	32.306 0 29.86 0 29.89 0 29.925 2 27.852 0 27.974 0 25.587 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19 % AL19.5 % AL19.5	216 267 5 45	14.3 14.1 13.4 7 15.6 15.4 13.8	359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 350 JG 7.4 JG	0 3m	
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 66 20210711 836 5 13 1 53 66 20210711 836 5 13 2 53.1 66 20210711 854 1 76 1 53.3 66 20210711 858 1 76 2 53.3 66 20210711 858 1 76 2 53.3 66 20210711 858 1 76 1 52.4 66 20210711 908 1 77 1 52.1 666 20210711 912 1 77 2 52.5 66	23.9 168 32 24.256 168 32 24.207 168 32 24.202 168 32 24.202 168 32 24.203 168 32 24.628 168 32 24.628 168 32 24.628 168 32 24.624 168 32 24.624 168 32 24.624 168 32 24.624 168 32 36.61 36 36 37.61 36 36 38.61 36 36 39.61 36 36 39.75 36 36 39.76 36 36 39.76 36 36 39.76 36 36 39.76 36 36 39.76 36 36 39.76 36 36 39.76 36	32.306 0 29.86 0 29.89 0 29.925 2 27.852 0 27.774 0 25.587 0 25.658 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5	216 267 5 45 217 267	14.3 14.1 13.4 7 15.6 15.4 13.8 18	359 JG 1.9 JG 19 JG 12.7 JG JG JG 337 JG 350 JG 7.4 JG 2 JG	0 3m 0 4m 0 4m	
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 66 20210711 836 5 13 1 53 66 20210711 836 5 13 2 53.1 66 20210711 854 1 76 1 53.3 66 20210711 858 1 76 2 53.3 66 20210711 858 1 76 2 53.3 66 20210711 858 1 76 1 52.4 66 20210711 908 1 77 1 52.1 666 20210711 912 1 77 2 52.1 666	23.9 168 3: 24.255 168 : 24.202 168 : 24.202 168 : 24.202 168 : 24.623 168 : 24.628 168 : 24.628 168 : 24.996 168 : 25.316 168 :	32.306 0 29.86 0 29.89 0 29.925 0 27.852 0 27.974 0 25.587 0 25.587 0 25.585 0 23.516 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19 % AL19.5 % AL19.5	216 267 5 45 217 267	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4	359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 350 JG 7.4 JG	0 3m 0 4m	
20210711 820 1 74 2 52.7 666 20210711 830 1 75 2 52.9 666 20210711 834 1 75 2 52.9 666 20210711 836 5 13 1 53 666 20210711 836 5 13 2 53.1 666 20210711 854 1 76 1 53.3 666 20210711 858 1 76 2 53.3 666 20210711 858 1 77 1 52.4 666 20210711 908 1 77 2 52.1 666 20210711 922 1 78 1 52.3 666 20210711 922 1 78 2 52.1 666 20210711 922 1 78 2 52.2 666 20210711	23.9 168 3: 24.256 168 2: 24.207 168 2: 24.202 168 2: 24.623 168 2: 24.623 168 2: 24.623 168 2: 25.941 168 2: 25.315 168 2: 25.302 168 2: 25.302 168 2: 25.301 168 2:	32.306 0 29.86 0 29.87 0 29.925 0 29.94 0 27.974 0 25.587 0 25.558 0 23.556 0 23.556 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20	216 267 5 45 217 267	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4	359 JG 1.9 JG 12.7 JG JG JG 337 JG 350 JG 7.4 JG 2 JG 354 JG 352 JG JG	0 3m 0 4m 0 4m	
20210711 820 1 74 2 52.7 66 20210711 830 1 75 1 53 66 20210711 834 1 75 2 52.9 66 20210711 836 5 13 1 53 66 20210711 836 5 13 2 53.1 66 20210711 843 5 13 2 53.3 66 20210711 843 5 1 76 2 53.3 66 20210711 98 1 76 2 53.3 66 20210711 998 1 77 2 52.4 66 20210711 922 1 78 1 52.3 666 20210711 927 1 78 2 52.1 666 20210711 925 5 14 1 52.2 666 20210711	23.9 168 3. 24.256 168 2. 24.207 168 2. 24.402 168 2. 24.02 168 2. 24.02 168 2. 24.623 168 2. 24.623 168 2. 25.996 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.393 168 168	32.306 0 29.86 0 29.89 0 29.925 2 29.94 0 27.952 0 27.974 0 25.587 0 23.556 0 23.554 2 23.554 2	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20.4 % AL20 % AL20 Laramie % AL20 Laramie	216 267 5 45 217 267 216 265 5 45	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5	359 JG 1.9 JG 12.7 JG JG JG 337 JG 350 JG 7.4 JG 2 JG 354 JG 352 JG JG JG	0 3m 0 4m 0 4m 0 4m	
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 66 20210711 836 5 13 1 53 66 20210711 834 5 13 1 53.3 66 20210711 854 1 76 1 53.3 66 20210711 854 1 77 1 52.4 66 20210711 908 1 77 1 52.4 66 20210711 902 1 78 2 52.1 666 20210711 927 1 78 2 52.1 666 20210711 928 5 14 1 52.2 666 20210711 928 5 14 1 52.2 666 20210711 102	23.9 168 3 24.256 168 2 24.207 168 2 24.202 168 2 24.623 168 2 24.623 168 2 24.623 168 2 25.941 168 2 25.316 168 2 25.301 168 2 25.301 168 2 25.301 168 2 25.301 168 2 25.665 168 2	32.306 0 29.86 0 29.89 0 29.925 2 29.94 2 27.852 0 25.587 0 23.556 0 23.556 0 23.556 0 23.556 0 23.554 0 23.554 0 23.533 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL19.5 % AL20.5 % AL20.2 % AL20 Laramie % AL20 Laramie % AL20.5	216 267 5 45 217 267 216 265	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 18.5	359 JG 1.9 JG 12.7 JG JG JG 337 JG 337 JG 350 JG 2 JG 354 JG 352 JG JG JG 13.6 JG	0 3m 0 4m 0 4m	
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 666 20210711 836 5 13 1 53 666 20210711 836 5 13 1 53 666 20210711 854 1 76 1 53.3 666 20210711 858 1 76 2 53.3 666 20210711 858 1 77 1 52.4 666 20210711 988 1 77 2 52.1 666 20210711 922 1 78 2 52.1 666 20210711 922 1 78 1 52.2 666 20210711 928 5 14 1 52.2 666 20210711 <td< td=""><td>23.9 168 3: 24.256 168 2: 24.202 168 2: 24.202 168 2: 24.202 168 2: 24.623 168 2: 24.623 168 2: 25.941 168 2: 25.316 168 2: 25.302 168 2: 25.931 168 2: 25.931 168 2: 25.931 168 2: 25.931 168 2: 25.931 168 2: 25.793 168 2: 25.793 168 2: 25.7 168 2:</td><td>32.306 0 29.86 0 29.975 0 29.992 0 29.94 0 27.852 0 25.567 0 25.568 0 23.556 0 23.556 0 23.554 2 21.283 0 11.184 0</td><td>% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL20.5</td><td>216 267 5 45 217 267 216 265 5 45 216 263</td><td>14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 7 12.9 16</td><td>359 JG 1.9 JG 19 JG JG JG 337 JG 337 JG 335 JG 2 JG 352 JG 352 JG 13.6 JG 359 JG</td><td>0 3m 0 4m 0 4m 0 4m 0 3m</td><td></td></td<>	23.9 168 3: 24.256 168 2: 24.202 168 2: 24.202 168 2: 24.202 168 2: 24.623 168 2: 24.623 168 2: 25.941 168 2: 25.316 168 2: 25.302 168 2: 25.931 168 2: 25.931 168 2: 25.931 168 2: 25.931 168 2: 25.931 168 2: 25.793 168 2: 25.793 168 2: 25.7 168 2:	32.306 0 29.86 0 29.975 0 29.992 0 29.94 0 27.852 0 25.567 0 25.568 0 23.556 0 23.556 0 23.554 2 21.283 0 11.184 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL20.5	216 267 5 45 217 267 216 265 5 45 216 263	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 7 12.9 16	359 JG 1.9 JG 19 JG JG JG 337 JG 337 JG 335 JG 2 JG 352 JG 352 JG 13.6 JG 359 JG	0 3m 0 4m 0 4m 0 4m 0 3m	
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 66 20210711 836 5 13 1 53 66 20210711 834 5 13 1 53.3 66 20210711 854 1 76 1 53.3 66 20210711 854 1 77 1 52.4 66 20210711 908 1 77 1 52.4 66 20210711 902 1 78 2 52.1 666 20210711 927 1 78 2 52.1 666 20210711 928 5 14 1 52.2 666 20210711 928 5 14 1 52.2 666 20210711 102	23.9 168 3. 24.256 168 2. 24.207 168 2. 24.202 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.941 168 2. 25.316 168 2. 25.301 168 2. 25.301 168 2. 25.465 168 2. 25.665 168 2. 25.7 168 2. 26.036 168 168	32.306 0 29.86 0 29.89 0 29.925 0 29.947 0 25.587 0 23.556 0 23.556 0 23.554 0 23.554 0 21.184 0 09.211 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL19.5 % AL20.5 % AL20.2 % AL20 Laramie % AL20 Laramie % AL20.5	216 267 5 45 217 267 216 265 5 45	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9	359 JG 1.9 JG 12.7 JG JG JG 337 JG 337 JG 350 JG 2 JG 354 JG 352 JG JG JG 13.6 JG	0 3m 0 4m 0 4m 0 4m	
20210711 820 1 74 2 52.7 66 20210711 830 1 75 2 53 66 20210711 834 1 75 2 52.9 66 20210711 834 5 13 2 53.1 66 20210711 834 5 13 2 53.1 66 20210711 843 5 13 2 53.3 66 20210711 843 5 76 2 53.3 66 20210711 98 1 76 2 53.3 66 20210711 928 1 77 2 52.4 66 20210711 922 1 78 1 52.3 666 20210711 928 5 14 1 52.1 666 20210711 1025 1 79 2 50.7 666 20210711 1024	23.9 168 3. 24.256 168 3. 24.207 168 3. 24.202 168 2. 24.202 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.996 168 2. 25.301 168 2. 25.302 168 2. 25.303 168 2. 25.304 168 2. 25.305 168 2. 25.306 168 2. 25.307 168 2. 25.308 168 2. 25.739 168 2. 25.73 168 2. 26.036 168 11. 26.045 168 11. 26.045 168 11. 26.426 168 11.	32.306 0 29.86 0 29.97 0 29.98 0 29.94 0 27.974 0 25.567 0 23.556 0 23.556 0 23.556 0 23.553 0 11.184 0 19.294 0 17.022 0	% AL18 % AL18.5 % AL19.5 % AL20 % AL20 % AL20 Laramie % AL20.5 % AL20.5 % AL21 % AL21.5	216 267 5 45 217 267 216 265 5 45 216 263	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6	359 JG 1.9 JG 12 JG JG JG 337 JG 337 JG 337 JG 354 JG 354 JG 354 JG 13.6 JG 13.6 JG 5.8 JG 5.8 JG	0 3m 0 4m 0 4m 0 4m 0 3m	
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 66 20210711 834 5 13 1 53 66 20210711 843 5 13 2 53.1 66 20210711 843 5 13 2 53.3 66 20210711 984 76 2 53.3 66 20210711 985 1 76 2 53.3 66 20210711 908 1 77 1 52.4 66 20210711 902 1 78 2 52.1 66 20210711 925 14 1 52.2 66 20210711 925 1 79 1 50.8 66 20210711 1020 1 79 </td <td>23.9 168 3. 24.256 168 2. 24.207 168 2. 24.202 168 2. 24.202 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.996 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.7 168 2. 26.035 168 11 26.045 168 11 26.045 168 12 26.36 168 11 26.426 168 12</td> <td>32.306 0 29.88 0 29.92 29.93 27.852 0 27.854 0 25.567 0 23.556 0 23.556 0 23.556 0 23.553 0 21.283 0 11.184 0 19.241 0 17.022 0 17.026 0</td> <td>% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20 Laramie % AL20.5 % AL20.5 % AL21.5 % AL21.5</td> <td>216 267 5 45 217 267 216 265 217 267 216 263 216 263 216 261 217 256</td> <td>14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6</td> <td>359 JG 1.9 JG 12.7 JG JG 337 JG 337 JG 3350 JG 7.4 JG 2 JG 354 JG 352 JG JG JG JG JG JG JG JG JG JG</td> <td>0 3m 0 4m 0 4m 0 4m 0 3m</td> <td></td>	23.9 168 3. 24.256 168 2. 24.207 168 2. 24.202 168 2. 24.202 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.996 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.7 168 2. 26.035 168 11 26.045 168 11 26.045 168 12 26.36 168 11 26.426 168 12	32.306 0 29.88 0 29.92 29.93 27.852 0 27.854 0 25.567 0 23.556 0 23.556 0 23.556 0 23.553 0 21.283 0 11.184 0 19.241 0 17.022 0 17.026 0	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20 Laramie % AL20.5 % AL20.5 % AL21.5 % AL21.5	216 267 5 45 217 267 216 265 217 267 216 263 216 263 216 261 217 256	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6	359 JG 1.9 JG 12.7 JG JG 337 JG 337 JG 3350 JG 7.4 JG 2 JG 354 JG 352 JG JG JG JG JG JG JG JG JG JG	0 3m 0 4m 0 4m 0 4m 0 3m	
20210711 820 1 74 2 52.7 666 20210711 830 1 75 2 52.9 666 20210711 836 5 13 1 53 66 20210711 836 5 13 1 53 66 20210711 836 5 13 2 53.1 66 20210711 854 1 76 2 53.3 66 20210711 854 1 76 2 53.3 66 20210711 988 1 77 1 52.4 66 20210711 922 1 78 2 52.1 66 20210711 922 1 78 2 52.1 66 20210711 928 5 14 1 52.2 66 20210711 1025 1 79 1 50.8 66 20210711 1026 </td <td>23.9 168 3. 24.256 168 2. 24.207 168 2. 24.202 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.316 168 2. 25.310 168 2. 25.301 168 2. 25.665 168 2. 25.67 168 1. 26.494 168 11 26.451 168 11 26.451 168 11 26.451 168 11 26.451 168 11 26.451 168 11 26.452 168 11 26.451 168 11 26.452 168 11 26.452 168 12</td> <td>32.306 0 22.86 0 29.89 0 29.94 0 29.94 0 27.974 0 25.558 0 23.516 0 23.554 0 23.554 0 21.1283 0 21.1283 0 17.028 0</td> <td>% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20.4 % AL20.2 % AL20.1 % AL20.5 % AL20.5 % AL21.4 % AL21.5 % AL21.5</td> <td>216 267 5 45 217 267 216 265 5 45 216 263 216 261</td> <td>14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6</td> <td>359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 337 JG 350 JG 354 JG 352 JG 352 JG 13.6 JG 13.6 JG 5.8 JG 354 JG 354 JG 354 JG 355 JG JG 13.6 JG 354 JG 354 JG 355 JG JG 13.6 JG 354 JG 354 JG 355 JG 13.6 JG 354 JG 355 JG 13.6 JG 355 JG 13.6 JG 355 JG 13.6 JG 13.6 JG 13.6 JG 13.6 JG 13.6 JG 13.5 JG 15.5 JG</td> <td>0 3m 0 4m 0 4m 0 4m 0 3m</td> <td></td>	23.9 168 3. 24.256 168 2. 24.207 168 2. 24.202 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.316 168 2. 25.310 168 2. 25.301 168 2. 25.665 168 2. 25.67 168 1. 26.494 168 11 26.451 168 11 26.451 168 11 26.451 168 11 26.451 168 11 26.451 168 11 26.452 168 11 26.451 168 11 26.452 168 11 26.452 168 12	32.306 0 22.86 0 29.89 0 29.94 0 29.94 0 27.974 0 25.558 0 23.516 0 23.554 0 23.554 0 21.1283 0 21.1283 0 17.028 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20.4 % AL20.2 % AL20.1 % AL20.5 % AL20.5 % AL21.4 % AL21.5 % AL21.5	216 267 5 45 217 267 216 265 5 45 216 263 216 261	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6	359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 337 JG 350 JG 354 JG 352 JG 352 JG 13.6 JG 13.6 JG 5.8 JG 354 JG 354 JG 354 JG 355 JG JG 13.6 JG 354 JG 354 JG 355 JG JG 13.6 JG 354 JG 354 JG 355 JG 13.6 JG 354 JG 355 JG 13.6 JG 355 JG 13.6 JG 355 JG 13.6 JG 13.6 JG 13.6 JG 13.6 JG 13.6 JG 13.5 JG 15.5 JG	0 3m 0 4m 0 4m 0 4m 0 3m	
20210711 820 1 74 2 52.7 66 20210711 834 1 75 2 52.9 66 20210711 834 1 75 2 52.9 66 20210711 836 5 13 1 53 66 20210711 836 5 13 2 53.1 66 20210711 843 5 13 2 53.3 66 20210711 845 1 76 1 53.3 66 20210711 98 1 77 1 52.4 66 20210711 922 1 77 2 52.1 66 20210711 922 1 78 1 52.2 66 20210711 93 5 14 1 52.2 66 20210711 1025 1 79 2 50.7 666 20210711 1025 <td>23.9 168 3. 24.256 168 3. 24.207 168 2. 24.202 168 2. 24.023 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.916 168 2. 25.041 168 2. 25.302 168 2. 25.303 168 2. 25.304 168 2. 25.305 168 2. 25.306 168 2. 25.7 168 2. 26.036 168 11 26.045 168 11 26.451 168 11 26.451 168 11 26.451 168 11 26.452 168 11 26.452 168 11 26.452 168 11 26.557</td> <td>32.306 0 29.86 0 29.89 0 29.92 29.89 29.92 29.92 27.92 0 27.852 0 27.954 0 25.658 0 23.556 0 23.556 0 21.354 0 21.184 0 19.224 0 17.028 0 17.028 0</td> <td>% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5</td> <td>216 267 5 45 217 267 216 265 216 263 216 263 216 263 216 261 217 256 5 40</td> <td>14.3 14.1 13.4 7 15.6 15.4 13.8 20.4 18.5 20.4 18.5 12.9 16 7.9 15 10.6 14</td> <td>359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 335 JG 350 JG 354 JG 354 JG 354 JG 354 JG 354 JG 354 JG JG JG 354 JG JG JG JG JG JG JG JG JG JG</td> <td>0 3m 0 4m 0 4m 0 4m 0 3m 0 3m</td> <td></td>	23.9 168 3. 24.256 168 3. 24.207 168 2. 24.202 168 2. 24.023 168 2. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.916 168 2. 25.041 168 2. 25.302 168 2. 25.303 168 2. 25.304 168 2. 25.305 168 2. 25.306 168 2. 25.7 168 2. 26.036 168 11 26.045 168 11 26.451 168 11 26.451 168 11 26.451 168 11 26.452 168 11 26.452 168 11 26.452 168 11 26.557	32.306 0 29.86 0 29.89 0 29.92 29.89 29.92 29.92 27.92 0 27.852 0 27.954 0 25.658 0 23.556 0 23.556 0 21.354 0 21.184 0 19.224 0 17.028 0 17.028 0	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5	216 267 5 45 217 267 216 265 216 263 216 263 216 263 216 261 217 256 5 40	14.3 14.1 13.4 7 15.6 15.4 13.8 20.4 18.5 20.4 18.5 12.9 16 7.9 15 10.6 14	359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 335 JG 350 JG 354 JG 354 JG 354 JG 354 JG 354 JG 354 JG JG JG 354 JG JG JG JG JG JG JG JG JG JG	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m	
20210711 820 1 74 2 52.7 666 20210711 830 1 75 2 52.9 666 20210711 836 5 13 1 53 66 20210711 836 5 13 1 53 66 20210711 836 5 13 2 53.1 66 20210711 854 1 76 2 53.3 66 20210711 854 1 76 2 53.3 66 20210711 988 1 77 1 52.4 66 20210711 922 1 78 2 52.1 66 20210711 922 1 78 2 52.1 66 20210711 928 5 14 1 52.2 66 20210711 1025 1 79 1 50.8 66 20210711 1026 </td <td>23.9 168 3. 24.256 168 3. 24.207 168 3. 24.202 168 3. 24.202 168 3. 24.623 168 2. 24.623 168 2. 24.996 168 2. 25.316 168 2. 25.301 168 2. 25.302 168 2. 25.301 168 2. 25.665 168 2. 26.036 168 11 26.045 168 12 26.045 168 12 26.045 168 12 26.045 168 12 26.462 168 12 26.462 168 12 26.462 168 12 26.565 168 12 26.565 168 12 26.565 168 12 26.565<td>22.306 0 22.86 0 29.89 0 29.92 29.93 27.932 0 27.952 0 27.954 0 25.658 0 23.535 0 23.535 0 23.535 0 11.184 0 19.2211 0 17.022 0 17.026 0 16.99 16.99</td><td>% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20.4 % AL20.2 % AL20.1 % AL20.5 % AL20.5 % AL21.4 % AL21.5 % AL21.5</td><td>216 267 5 45 217 267 216 265 217 267 216 263 216 263 216 261 217 256</td><td>14.3 14.1 13.4 7 15.6 15.4 13.8 20.4 18.5 20.4 18.5 12.9 16 7.9 15 10.6 14</td><td>359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 337 JG 3350 JG 2 JG 350 JG 2 JG 354 JG 354 JG JG 13.6 JG 354 JG 355 JG 355 JG 356 JG 357 JG 358 JG</td><td>0 3m 0 4m 0 4m 0 4m 0 3m</td><td></td></td>	23.9 168 3. 24.256 168 3. 24.207 168 3. 24.202 168 3. 24.202 168 3. 24.623 168 2. 24.623 168 2. 24.996 168 2. 25.316 168 2. 25.301 168 2. 25.302 168 2. 25.301 168 2. 25.665 168 2. 26.036 168 11 26.045 168 12 26.045 168 12 26.045 168 12 26.045 168 12 26.462 168 12 26.462 168 12 26.462 168 12 26.565 168 12 26.565 168 12 26.565 168 12 26.565 <td>22.306 0 22.86 0 29.89 0 29.92 29.93 27.932 0 27.952 0 27.954 0 25.658 0 23.535 0 23.535 0 23.535 0 11.184 0 19.2211 0 17.022 0 17.026 0 16.99 16.99</td> <td>% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20.4 % AL20.2 % AL20.1 % AL20.5 % AL20.5 % AL21.4 % AL21.5 % AL21.5</td> <td>216 267 5 45 217 267 216 265 217 267 216 263 216 263 216 261 217 256</td> <td>14.3 14.1 13.4 7 15.6 15.4 13.8 20.4 18.5 20.4 18.5 12.9 16 7.9 15 10.6 14</td> <td>359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 337 JG 3350 JG 2 JG 350 JG 2 JG 354 JG 354 JG JG 13.6 JG 354 JG 355 JG 355 JG 356 JG 357 JG 358 JG</td> <td>0 3m 0 4m 0 4m 0 4m 0 3m</td> <td></td>	22.306 0 22.86 0 29.89 0 29.92 29.93 27.932 0 27.952 0 27.954 0 25.658 0 23.535 0 23.535 0 23.535 0 11.184 0 19.2211 0 17.022 0 17.026 0 16.99 16.99	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20.4 % AL20.2 % AL20.1 % AL20.5 % AL20.5 % AL21.4 % AL21.5 % AL21.5	216 267 5 45 217 267 216 265 217 267 216 263 216 263 216 261 217 256	14.3 14.1 13.4 7 15.6 15.4 13.8 20.4 18.5 20.4 18.5 12.9 16 7.9 15 10.6 14	359 JG 1.9 JG 19 JG 12.7 JG JG 337 JG 337 JG 3350 JG 2 JG 350 JG 2 JG 354 JG 354 JG JG 13.6 JG 354 JG 355 JG 355 JG 356 JG 357 JG 358 JG	0 3m 0 4m 0 4m 0 4m 0 3m	
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53.3 666 20210711 843 5 13 2 53.1 666 20210711 843 5 13 2 53.3 666 20210711 988 1 76 2 53.3 666 20210711 992 1 77 1 52.4 666 20210711 992 1 78 1 52.3 666 20210711 992 1 78 1 52.2 666 20210711 993 5 14 1 52.2 1 666 20210711 1030 1 79 1 50.8 666 <td< td=""><td>23.9 168 3. 24.256 168 3. 24.207 168 2. 24.202 168 3. 24.4202 168 3. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.91 168 2. 25.316 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.036 168 11 26.045 168 12 26.036 168 11 26.426 168 11 26.462 168 12 26.765 168 12 26.765 168 12 26.792 168 12 26.792 168 12 26.792 168 12 26.792<td>32.306 0 223.86 0 229.89 0 29.92 29.93 27.92 0 27.852 0 27.852 0 23.556 0 23.556 0 23.3554 - 21.283 0 11.184 0 19.224 0 17.022 0 17.058 0 14.930 0 14.936 0 12.224 0 12.124 0 17.058 0</td><td>% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22 % AL22.5</td><td>216 267 5 45 217 267 216 265 216 263 216 263 216 263 216 261 217 256 5 40</td><td>14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6 14 9.8 16 17</td><td>359 JG 1.9 JG 19 JG JG JG 337 JG 337 JG 337 JG 350 JG 2 JG 354 JG 354 JG 354 JG 359 JG 359 JG 358 JG 354 JG 355 JG 354 JG 355 JG 354 JG 355 JG 355 JG 355 JG 355 JG 355 JG 355 JG 356 JG 357 JG 358 JG 358 JG 358 JG 357 JG 357 JG 358 JG 358 JG 357 JG 356 JG 357 JG 357 JG 358 JG 358 JG 358 JG 356 JG 357 JG 357 JG 358 JG 358 JG 358 JG 358 JG 357 JG 357 JG 357 JG 358 JG 3</td><td>0 3m 0 4m 0 4m 0 4m 0 3m 0 3m</td><td></td></td></td<>	23.9 168 3. 24.256 168 3. 24.207 168 2. 24.202 168 3. 24.4202 168 3. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.91 168 2. 25.316 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.036 168 11 26.045 168 12 26.036 168 11 26.426 168 11 26.462 168 12 26.765 168 12 26.765 168 12 26.792 168 12 26.792 168 12 26.792 168 12 26.792 <td>32.306 0 223.86 0 229.89 0 29.92 29.93 27.92 0 27.852 0 27.852 0 23.556 0 23.556 0 23.3554 - 21.283 0 11.184 0 19.224 0 17.022 0 17.058 0 14.930 0 14.936 0 12.224 0 12.124 0 17.058 0</td> <td>% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22 % AL22.5</td> <td>216 267 5 45 217 267 216 265 216 263 216 263 216 263 216 261 217 256 5 40</td> <td>14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6 14 9.8 16 17</td> <td>359 JG 1.9 JG 19 JG JG JG 337 JG 337 JG 337 JG 350 JG 2 JG 354 JG 354 JG 354 JG 359 JG 359 JG 358 JG 354 JG 355 JG 354 JG 355 JG 354 JG 355 JG 355 JG 355 JG 355 JG 355 JG 355 JG 356 JG 357 JG 358 JG 358 JG 358 JG 357 JG 357 JG 358 JG 358 JG 357 JG 356 JG 357 JG 357 JG 358 JG 358 JG 358 JG 356 JG 357 JG 357 JG 358 JG 358 JG 358 JG 358 JG 357 JG 357 JG 357 JG 358 JG 3</td> <td>0 3m 0 4m 0 4m 0 4m 0 3m 0 3m</td> <td></td>	32.306 0 223.86 0 229.89 0 29.92 29.93 27.92 0 27.852 0 27.852 0 23.556 0 23.556 0 23.3554 - 21.283 0 11.184 0 19.224 0 17.022 0 17.058 0 14.930 0 14.936 0 12.224 0 12.124 0 17.058 0	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22 % AL22.5	216 267 5 45 217 267 216 265 216 263 216 263 216 263 216 261 217 256 5 40	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6 14 9.8 16 17	359 JG 1.9 JG 19 JG JG JG 337 JG 337 JG 337 JG 350 JG 2 JG 354 JG 354 JG 354 JG 359 JG 359 JG 358 JG 354 JG 355 JG 354 JG 355 JG 354 JG 355 JG 355 JG 355 JG 355 JG 355 JG 355 JG 356 JG 357 JG 358 JG 358 JG 358 JG 357 JG 357 JG 358 JG 358 JG 357 JG 356 JG 357 JG 357 JG 358 JG 358 JG 358 JG 356 JG 357 JG 357 JG 358 JG 358 JG 358 JG 358 JG 357 JG 357 JG 357 JG 358 JG 3	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m	
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 666 20210711 834 5 13 1 53 666 20210711 843 5 13 2 53.1 666 20210711 843 5 13 2 53.3 666 20210711 908 1 76 2 53.3 666 20210711 908 1 77 1 52.4 666 20210711 922 1 78 2 52.1 666 20210711 927 1 78 2 52.1 666 20210711 1020 1 79 1 50.8 666 20210711 1020 1 79 1 50.8 666 20210711	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 22.368 0 29.89 0 29.94 - 29.94 - 27.974 0 25.558 0 23.551 0 23.555 0 23.554 - 21.134 0 19.2211 0 17.026 0 17.028 0 17.028 0 14.993 0 16.99 - 16.29 - 12.668 0 12.225 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20.0 % AL20.120 % AL20.120 % AL20.120 % AL20.120 % AL20.120 % AL20.120 % AL21.5 % AL22.5 % AL22.5	216 267 5 45 217 267 216 265 217 216 218 263 219 263 210 263 2117 256 5 40 217 253 216 250	14.3 14.1 13.4 7 15.6 15.4 13.8 18.8 20.4 18.5 12.9 16 7.9 15 10.6 14 9.8 16 17 7 20.3	359 JG 1.9 JG 19 JG JG JG 337 JG 337 JG 350 JG 351 JG 354 JG 354 JG 352 JG 354 JG 355 JG 354 JG 355 JG 354 JG 355 JG 45 JG 354 JG 354 JG 354 JG 355 JG 354 JG 354 JG 355 JG 354 JG 354 JG 354 JG 354 JG 355 JG 354 JG 354 JG 355 JG 354 JG 355 JG 354 JG 354 JG 355 JG 354 JG 355 JG 354 JG 354 JG 355 JG 355 JG 354 JG 355 JG 355 JG 355 JG 355 JG 356 JG 357 JG	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m	
20210711 820 1 74 2 52.7 66 20210711 834 1 75 2 52.9 66 20210711 834 5 13 1 53 66 20210711 834 5 13 1 53 66 20210711 834 5 13 2 53.1 66 20210711 843 5 13 2 53.3 66 20210711 843 5 76 1 53.3 66 20210711 98 1 76 2 53.3 66 20210711 921 1 77 2 52.4 66 20210711 922 1 78 1 52.3 66 20210711 922 1 78 1 52.1 66 20210711 1025 1 79 2 50.7 66 20210711 1036	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 229.86 0 229.87 0 229.89 0 29.92 29.92 27.852 0 27.852 0 27.854 0 25.558 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 12.353 0 12.1284 0 17.052 0 17.058 0 14.903 0 14.4958 0 12.44958 0 12.44958 0 12.44958 0 12.44958 0 12.725 0	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20.0 ramie % AL20.1 caramie % AL20.5 % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5	216 267 5 45 217 267 216 265 216 263 216 263 216 261 217 256 5 40 217 253	14.3 14.1 13.4 7 5.6 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6 14 9.8 16 14 9.8 16 17 20.3 14.2	359 JG 1.9 JG 19 JG 12.7 JG JG JG 337 JG 3350 JG 7.4 JG 354 JG 355 JG 354 JG 355 JG 359 JG 354 JG 355 JG 354 JG 355 JG 354 JG 355 JG 354 JG 355 JG 354 JG	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m 0 3m	forgot to turn pump on, cast delayed slightly
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 666 20210711 834 5 13 1 53 666 20210711 834 5 13 1 53.3 666 20210711 854 1 76 2 53.3 666 20210711 908 1 77 1 52.4 666 20210711 908 1 77 1 52.4 666 20210711 902 1 78 2 52.1 666 20210711 902 1 79 1 50.8 666 20210711 1020 1 79 1 50.8 666 20210711 1036 1 80 1 47.4 666 20210711	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	22.306 0 22.386 0 29.89 0 29.89 0 29.289 0 29.29.29 - 27.852 0 27.852 0 27.852 0 25.658 0 23.316 0 23.355 0 12.3554 0 12.3254 0 12.128 0 17.022 0 17.026 0 17.026 0 17.026 0 17.026 0 17.026 0 12.225 0 12.225 0 12.725 0 10.4267 1	% AL18 % AL18.5 % AL19 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 Laramie % AL20 Laramie % AL20.5 % AL21.5 % AL22.5 % AL22.5 % AL23	216 267 5 45 217 267 216 265 217 267 218 263 219 263 210 263 211 263 215 261 216 263 217 256 3 40 217 253 216 250 216 250 216 250	14.3 14.1 13.4 7 7 15.6 15.4 13.8 18.5 20.4 18.5 12.9 16 7.9 15 10.6 14 9.8 16 17 7 20.3 14.2 13.4	359 /G 1.9 /G 19 /G 10 /G 337 /G 337 /G 337 /G 337 /G 337 /G 350 /G 350 /G 354 /G 355 /G 6 /G 354 /G 355 /G 354 /G 355 /G 354 /G 35	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m	forgot to turn pump on, cast delayed slightly
20210711 820 1 74 2 52.7 66 20210711 830 1 75 2 52.9 66 20210711 834 1 75 2 52.9 66 20210711 834 5 13 1 53 66 20210711 834 5 13 2 53.1 66 20210711 843 5 13 2 53.3 66 20210711 984 1 76 2 53.3 66 20210711 992 1 77 1 52.4 66 20210711 922 1 78 1 52.3 66 20210711 922 1 78 1 52.3 66 20210711 1025 1 79 2 50.7 66 20210711 1035 1 80 1 47.3 66 20210711 1045<	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 29.86 0 29.89 0 29.94 0 29.952 29.94 27.872 0 27.974 0 55.587 0 23.556 0 23.556 0 23.556 0 23.556 0 23.554 0 12.353 0 12.353 0 12.354 0 12.423 0 17.058 0 16.99 - 14.4903 0 12.688 0 12.688 0 12.688 0 12.688 0 12.725 0 10.327 1	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20.1aramie % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL23 % AL23 % AL23	216 267 5 45 217 267 216 265 217 216 218 263 219 263 210 263 2117 256 5 40 217 253 216 250	14.3 14.1 13.4 7 7 15.6 15.4 13.8 18.5 20.4 18.5 12.9 16 7.9 15 10.6 14 9.8 16 17 7 20.3 14.2 13.4	359 JG 1.9 JG 19 JG JG JG 337 JG 337 JG 3350 JG 7.4 JG 2 JG 354 JG 354 JG 355 JG 13.6 JG 355 JG 355 JG 354 JG 355 JG 354 JG 354 JG 355 JG 354 JG 354 JG 354 JG 354 JG 355 JG 354 JG 354 JG 355 JG 354 JG 355 JG 354 JG 355 JG 354 JG 355 JG 354 JG 354 JG 354 JG 355 JG 354 JG 355 JG	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m	forgot to turn pump on, cast delayed slightly
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 29.86 0 29.89 0 29.89 0 29.92 - 29.92 - 27.74 0 25.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 23.55 0 1.128 0 17.028 0 16.99 1 10.327 1 10.327 1 10.327 1 10.328 0	% AL18 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL23.4 % AL23.4 % AL23.4 % AL23.5	216 267 5 45 217 267 216 265 217 267 218 263 219 263 210 263 211 263 215 261 216 263 217 256 3 40 217 253 216 250 216 250 216 250	14.3 14.1 13.4 7 15.6 15.4 18.8 18.8 20.4 18.5 10.9 15 10.6 14 17 9.8 16 17 9.8 16 17 20.3 14.2 13.4	359 /G 19 /G 19 /G 17 /G 16 337 /G 337 /G 337 /G 337 /G 337 /G 354 /G 16 354 /G 354 /G 354 /G 16 354 /G 354 /G 354 /G 16 354 /G 354 /G 3	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m	forgot to turn pump on, cast delayed slightly
20210711 820 1 74 2 52.7 66 20210711 834 1 75 2 52.9 66 20210711 834 5 13 1 53 66 20210711 834 5 13 2 53.1 66 20210711 834 5 13 2 53.1 66 20210711 843 5 13 2 53.3 66 20210711 984 1 76 2 53.3 66 20210711 98 1 77 2 52.4 66 20210711 927 1 78 1 52.3 66 20210711 927 1 78 1 52.1 66 20210711 1025 1 79 2 50.7 66 20210711 1035 1 80 1 47.4 66 20210711 1056 </td <td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td> <td>32.306 0 223.86 0 229.89 0 29.92 29.93 29.92 29.94 27.852 0 27.852 0 27.852 0 27.558 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 21.134 0 12.138 0 12.138 0 17.052 0 17.052 0 17.058 0 12.266 0 12.275 0 10.327 1 10.327 1 10.327 1 10.328 1</td> <td>% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20.caranie % AL20.caranie % AL20.5 % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL23.5 % AL23.5</td> <td>216 267 5 45 217 267 216 265 217 267 216 265 217 263 218 261 217 256 30 217 253 40 217 253 216 250 215 30 217 240</td> <td>14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6 14 7.9 15 10.6 14 20.3 14.2 13.4 14.2 13.4</td> <td>359 JG 1.9 JG 19 JG JG JG JS59 JG JS54 JG JS54 JG JS54 JG JS6 JG JS6 JG JG JG</td> <td>0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m 0 3.5m 0 3.5m</td> <td>forgot to turn pump on, cast delayed slightly</td>	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 223.86 0 229.89 0 29.92 29.93 29.92 29.94 27.852 0 27.852 0 27.852 0 27.558 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 21.134 0 12.138 0 12.138 0 17.052 0 17.052 0 17.058 0 12.266 0 12.275 0 10.327 1 10.327 1 10.327 1 10.328 1	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20.caranie % AL20.caranie % AL20.5 % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL23.5 % AL23.5	216 267 5 45 217 267 216 265 217 267 216 265 217 263 218 261 217 256 30 217 253 40 217 253 216 250 215 30 217 240	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 15 10.6 14 7.9 15 10.6 14 20.3 14.2 13.4 14.2 13.4	359 JG 1.9 JG 19 JG JG JG JS59 JG JS54 JG JS54 JG JS54 JG JS6 JG JS6 JG JG JG	0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m 0 3.5m 0 3.5m	forgot to turn pump on, cast delayed slightly
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53 666 20210711 834 5 13 2 53.1 666 20210711 834 5 13 2 53.3 666 20210711 845 5 76 1 53.3 666 20210711 985 1 76 2 53.3 666 20210711 992 1 78 1 52.4 666 20210711 992 1 78 1 52.2 666 20210711 992 1 79 1 50.8 666 20210711 1020 1 79 1 50.8 666 20210711 1030 1 80 1 47.4 666 20210711	23.9 168 3. 24.256 168 3. 24.207 168 3. 24.202 168 3. 24.4202 168 3. 24.623 168 2. 24.623 168 2. 24.623 168 2. 25.91 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 2. 25.301 168 1. 26.465 168 1. 26.036 168 1. 26.462 168 1. 26.462 168 1. 26.765 168 1. 27.113 168 1. 27.493 168 1. 27.594 168 1. 27.594 168 1. 27.979 <td>32.306 0 223.86 0 229.89 0 29.92 9 27.852 0 27.874 0 25.558 0 23.556 0 23.556 0 23.556 0 23.3554 - 21.283 0 11.184 0 19.224 0 17.026 0 17.058 0 12.225 0 17.058 0 12.225 0 12.022 0 17.058 0 12.225 0 10.4328 0 12.725 0 10.4328 0 12.725 0 10.323 - 8.495 0 10.323 -</td> <td>% AL18 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL23 % AL23 % AL23 % AL23 % AL23 % AL23 %<td>216 267 5 45 217 267 216 265 217 267 216 263 217 253 216 250 216 250 216 250 216 250 216 250 216 250 216 250 216 250 216 250</td><td>14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 16 7.9 15 5 10.6 14 9.8 16 17 7 20.3 14.2 13.4 10.4 10.4</td><td>359 /G 1.9 /G 19 /G 10 /G 337 /G 337 /G 337 /G 337 /G 337 /G 337 /G 350 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 8.4 /G 8.4 /G 8.4 /G 349 /G 6.4 /G 349 /G 6.1 /G 349 /G 6.1 /G 349 /G 6.1 /G 349 /G 16 /G 17 /A /G 16 /G 17 /G</td><td>0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m 0 3m</td><td>forgot to turn pump on, cast delayed slightly</td></td>	32.306 0 223.86 0 229.89 0 29.92 9 27.852 0 27.874 0 25.558 0 23.556 0 23.556 0 23.556 0 23.3554 - 21.283 0 11.184 0 19.224 0 17.026 0 17.058 0 12.225 0 17.058 0 12.225 0 12.022 0 17.058 0 12.225 0 10.4328 0 12.725 0 10.4328 0 12.725 0 10.323 - 8.495 0 10.323 -	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL23 % AL23 % AL23 % AL23 % AL23 % AL23 % <td>216 267 5 45 217 267 216 265 217 267 216 263 217 253 216 250 216 250 216 250 216 250 216 250 216 250 216 250 216 250 216 250</td> <td>14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 16 7.9 15 5 10.6 14 9.8 16 17 7 20.3 14.2 13.4 10.4 10.4</td> <td>359 /G 1.9 /G 19 /G 10 /G 337 /G 337 /G 337 /G 337 /G 337 /G 337 /G 350 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 8.4 /G 8.4 /G 8.4 /G 349 /G 6.4 /G 349 /G 6.1 /G 349 /G 6.1 /G 349 /G 6.1 /G 349 /G 16 /G 17 /A /G 16 /G 17 /G</td> <td>0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m 0 3m</td> <td>forgot to turn pump on, cast delayed slightly</td>	216 267 5 45 217 267 216 265 217 267 216 263 217 253 216 250 216 250 216 250 216 250 216 250 216 250 216 250 216 250 216 250	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 16 7.9 15 5 10.6 14 9.8 16 17 7 20.3 14.2 13.4 10.4 10.4	359 /G 1.9 /G 19 /G 10 /G 337 /G 337 /G 337 /G 337 /G 337 /G 337 /G 350 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 8.4 /G 8.4 /G 8.4 /G 349 /G 6.4 /G 349 /G 6.1 /G 349 /G 6.1 /G 349 /G 6.1 /G 349 /G 16 /G 17 /A /G 16 /G 17 /G	0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m 0 3m	forgot to turn pump on, cast delayed slightly
20210711 820 1 74 2 52.7 66 20210711 830 1 75 2 52.9 66 20210711 834 1 75 2 52.9 66 20210711 834 5 13 2 53.1 66 20210711 834 5 13 2 53.3 66 20210711 843 5 13 2 53.3 66 20210711 984 1 76 2 53.3 66 20210711 992 1 77 1 52.4 66 20210711 922 1 78 1 52.3 66 20210711 922 1 78 1 52.3 66 20210711 1025 1 79 2 52.1 66 20210711 1025 1 79 2 50.7 66 20210711 1035	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 229.86 0 229.87 0 229.89 0 29.92 29.93 27.92 0 27.934 0 27.974 0 25.558 0 23.354 0 23.354 0 23.353 0 12.353 0 12.354 0 19.211 0 19.211.40 0 19.211.44 0 19.211.44 0 12.268 0 12.268 0 12.268 0 12.268 0 10.327 1 10.328 1 10.328 1 0.328 1 0.328 1 0.328 1 0.328 1	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20.1aramie % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL23.4aramie % AL23.4aramie % AL23.4aramie % AL23.5 % AL23.5 % AL23.5 % AL23.5 % AL23.5 % AL23.5 % AL24	216 267 5 45 217 267 216 265 217 267 216 265 217 263 218 261 217 256 30 217 216 250 217 240 217 240	14.3 14.1 13.4 7 5.5 15.6 15.4 13.8 20.4 18.5 10.6 14 9.8 16 17 20.3 14.2 13.4 13.4 10.4 10.4 10.4	359 JG 1.9 JG 19 JG JG JG 337 JG 337 JG 337 JG 350 JG 354 JG 352 JG JG 13.6 JG 354 JG 355 JG 4.5 JG 354 JG 354 JG JG 354 JG 354 JG 356 JG 356 JG 356 JG 356 JG 356 JG 356 JG 356 JG 356 JG 356 JG 357 JG 356 JG 357 JG 356 JG	0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3	forgot to turn pump on, cast delayed slightly
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 1 75 2 52.9 666 20210711 834 1 75 2 53.3 666 20210711 834 1 76 1 53.3 666 20210711 854 1 76 1 53.3 666 20210711 985 1 77 1 52.4 666 20210711 992 1 77 2 52.1 666 20210711 992 1 78 2 52.1 666 20210711 935 5 14 1 52.2 666 20210711 1025 1 79 2 50.7 666 20210711 1031 1 80 2 47.3 666 20210711	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 223.86 0 229.89 0 29.92 29.93 27.92 0 27.852 0 27.852 0 27.854 0 23.556 0 23.556 0 23.3554 0 23.3554 0 21.184 0 19.234 0 17.058 0 17.058 0 17.058 0 12.266 0 12.267 0 10.327 1 10.327 1 10.327 1 10.328 0 4.8495 0 6.238 1 6.238 1	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL23 % AL23 % AL23 % AL23 % AL23 % AL23 % <td>216 267 5 45 217 267 216 265 217 267 216 265 217 263 218 261 217 256 30 217 216 250 216 250 215 30 217 240</td> <td>14.3 14.1 13.4 7 15.6 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 9 15 10.6 14 17 7 20.3 16 17 7 20.3 14 16 17 17 20.3 16 10.4 16.6 17.1 13.6</td> <td>359 /G 1.9 /G 1.9 /G 1.27 /G 1.6 337 /G 337 /G 337 /G 337 /G 350 /G 7.4 /G 2 /G 1.6 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 1.6 5.8 /G 354 /G 1.6 6.4 /G 1.6 6.1 /G 6.1 /G 6.1 /G 7.2 /G 1.6 6.4 /G 1.7 /G 1.6 6.4 /G 1.7 /G 1.6 6.1 /G 7.2 /G 1.6 6.1 /G 7.2 /G 1.6 6.1 /G 7.2 /G 1.6 6.1 /G 7.2 /G 1.6 6.1 /G 7.2 /G 1.7 /G 1.6 6.1 /G 7.2 /G 1.7 /G 1.6 6.4 /G 7.4 /G 1.7 /G 1.6 6.4 /G 7.4 /G 1.7 /G 1.6 6.4 /G 1.7 /G 1.6 6.4 /G 1.1 /G 1.7 /G 1.6 6.4 /G 1.7 /G 1.7 /G 1.6 6.4 /G 1.7 /G 1.7 /G 1.6 6.4 /G 1.7 /G</td> <td>0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m 0 3.5m 0 3.5m</td> <td>forgot to turn pump on, cast delayed slightly</td>	216 267 5 45 217 267 216 265 217 267 216 265 217 263 218 261 217 256 30 217 216 250 216 250 215 30 217 240	14.3 14.1 13.4 7 15.6 15.6 15.4 13.8 18 20.4 18.5 12.9 16 7.9 9 15 10.6 14 17 7 20.3 16 17 7 20.3 14 16 17 17 20.3 16 10.4 16.6 17.1 13.6	359 /G 1.9 /G 1.9 /G 1.27 /G 1.6 337 /G 337 /G 337 /G 337 /G 350 /G 7.4 /G 2 /G 1.6 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 354 /G 1.6 5.8 /G 354 /G 1.6 6.4 /G 1.6 6.1 /G 6.1 /G 6.1 /G 7.2 /G 1.6 6.4 /G 1.7 /G 1.6 6.4 /G 1.7 /G 1.6 6.1 /G 7.2 /G 1.6 6.1 /G 7.2 /G 1.6 6.1 /G 7.2 /G 1.6 6.1 /G 7.2 /G 1.6 6.1 /G 7.2 /G 1.7 /G 1.6 6.1 /G 7.2 /G 1.7 /G 1.6 6.4 /G 7.4 /G 1.7 /G 1.6 6.4 /G 7.4 /G 1.7 /G 1.6 6.4 /G 1.7 /G 1.6 6.4 /G 1.1 /G 1.7 /G 1.6 6.4 /G 1.7 /G 1.7 /G 1.6 6.4 /G 1.7 /G 1.7 /G 1.6 6.4 /G 1.7 /G	0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3.5m 0 3.5m 0 3.5m	forgot to turn pump on, cast delayed slightly
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 223.86 0 229.89 0 29.92 29.93 29.92 29.94 27.852 0 27.852 0 27.854 0 25.558 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 12.353 0 12.124 0 17.052 0 19.224 0 17.058 0 12.668 0 12.725 0 0.323 1 0.323 1 0.328 0 10.327 1 0.328 1 0.4298 1 0.233 1 0.4298 1 0.233 1 0.233 1 0.233 1	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20.1aramie % AL20.5 % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL23.5 % AL23.5 % AL23.5 % AL23.5 % AL24 % AL24.5 % AL24.5	216 267 5 45 217 267 216 265 217 267 216 265 217 263 218 261 217 256 30 217 216 250 217 240 217 240	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 1.5 4 18.5 18.5 18.5 18.5 18.5 18.5 18.5 18.5	359 //G 1.9 //G 19 //G 16 //G 337 //G 3350 //G 337 //G 3350 //G 337 //G 355 //G 354 //G 355 //G 354 //G 355 //G 354 //G 36 //G 36 //G 36 //G 37 //G 36 //G 37 //G 37 //G 37 //G 37 <t< td=""><td>0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3</td><td>forgot to turn pump on, cast delayed slightly</td></t<>	0 3m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3	forgot to turn pump on, cast delayed slightly
20210711 820 1 74 2 52.7 666 20210711 834 1 75 2 52.9 666 20210711 834 1 75 2 52.9 666 20210711 834 5 13 1 53.3 666 20210711 843 5 13 2 53.1 666 20210711 843 5 177 1 52.4 666 20210711 902 1 78 1 52.3 666 20210711 902 1 78 1 52.4 666 20210711 902 1 78 1 52.3 666 20210711 927 1 78 2 50.7 666 20210711 1020 1 79 1 50.8 666 20210711 1030 1 80 2 47.4 666 20210711	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 223.86 0 229.89 0 29.92 29.93 27.92 0 27.852 0 27.852 0 27.854 0 23.556 0 23.556 0 23.3554 0 21.283 0 11.184 0 19.224 0 17.022 0 17.058 0 12.225 0 14.958 0 12.225 0 10.327 1 10.327 1 10.323 0 12.725 0 10.323 0 4.958 0 8.495 0 6.298 1 4.078 1 1.967 1	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20 % AL20 % AL20 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL23.4 % AL23.4 % AL23.5 % AL23.5 % AL24.4 % AL24.5 %	216 267 5 45 217 267 216 265 217 263 216 261 217 256 5 40 217 253 216 250 217 253 216 250 217 240 217 241 217 241 217 241	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 1.5 4 18.5 18.5 18.5 18.5 18.5 18.5 18.5 18.5	359 IG 1.9 JG 19 IG 16 IG 337 IG 350 IG 354 IG 355 IG 5.8 IG 354 IG 36 IG IG IG IG IG IG IG	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m	forgot to turn pump on, cast delayed slightly
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	32.306 0 229.86 0 229.87 0 29.92 29.93 27.934 0 27.974 0 25.558 0 23.556 0 23.556 0 23.556 0 23.556 0 23.556 0 23.557 0 23.558 0 23.554 0 11.283 0 11.283 0 11.284 0 12.668 0 12.268 0 12.2725 0 10.323 - 10.323 - 10.323 - 2.2755 0 2.238 1 0.238 - 1.329 1 1.327 1 1.967 1 1.986 -	% AL18 % AL18.5 % AL19.5 % AL19.5 % AL20 % AL20 % AL20 % AL20.1aramie % AL20.5 % AL20.5 % AL20.5 % AL21.5 % AL21.5 % AL21.5 % AL22.5 % AL22.5 % AL22.5 % AL22.5 % AL23.5 % AL23.5 % AL23.5 % AL23.5 % AL24 % AL24.5 % AL24.5	216 267 5 45 217 267 216 265 217 263 216 261 217 256 5 40 217 253 216 250 217 253 216 250 217 240 217 241 217 241 217 241	14.3 14.1 13.4 7 15.6 15.4 13.8 18 20.4 18.5 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 4 7.9 16 1.5 4 18.5 18.5 18.5 18.5 18.5 18.5 18.5 18.5	359 //G 1.9 //G 19 //G 16 //G 337 //G 3350 //G 337 //G 3350 //G 337 //G 355 //G 354 //G 355 //G 354 //G 355 //G 354 //G 36 //G 36 //G 36 //G 37 //G 36 //G 37 //G 37 //G 37 //G 37 <t< td=""><td>0 3m 0 4m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m</td><td>forgot to turn pump on, cast delayed slightly</td></t<>	0 3m 0 4m 0 4m 0 4m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m 0 3m	forgot to turn pump on, cast delayed slightly

20210711 1250 1 89	1			29.114	167	59.853		% AL25.5	217 23		.3 6.2 JG	0 2m	
20210711 1254 1 89		21.9		29.066	167	59.794		% AL25.5			.2 357 JG		
20210711 1302 1 90		21.5		29.454	167	57.663		% AL26	216 23		.4 10.6 JG	0 2m	
20210711 1306 1 90		21.5		29.443	167	57.571					.2 354 JG		
20210711 1314 1 91		21.6	66	29.776	167	55.508		% AL26.5	216 23		.8 19.8 JG	0 2m	
20210711 1317 1 91	2	21.4	66	29.75	167	55.419	0.5	% AL26.5		14	.4 11.7 JG		
20210711 1325 1 92	1	22	66	30.115	167	53.33	0	% AL27	216 23	36 14	.1 15.9 JG	0 2m	
20210711 1328 1 92	2	22	66	30.068	167	53.262	0	% AL27		14	.6 22.8 JG		
	1 2	22.1	66	30.439	167	51.187	0	% AL27.5	216 23	36 8	.3 16 JG	0.5 3m	
20210711 1341 1 93	2	22.1	66	30.409	167	51.255	0	% AL27.5		1	4 18.5 JG		
20210711 2329 1 94	1 4	45.8	65	44.921	168	15.558	0.5	% A4-21 post-deployment c	alil 216 26		2 201 KC	0 2.5m	before cast, raised system two's pump ~1 cm
20210711 2334 1 94	2 4	45.5	65	45.066	168	15.38	0.5	% A4-21 post-deployment c	alibration	11	.3 227 KC		
20210712 1326 1 95	1	49	67	38.057	168	56.002	0	% CS10US	217 26	64 26	.1 214 JG	0 4m	
20210712 1330 1 95	2 4	48.9	67	38.153	168	55.982	0	% CS10US		23	.4 184 JG		
20210712 1332 5 18	1 4	48.9	67	38.184	168	55.991		% CS10US Laramie	5 4	45	JG		
20210712 1338 5 18	2 4	48.9	67	38.32	168	56.018		% CS10US Laramie			JG		
20210712 1357 1 96	1 4	48.5	67	39.859	168	52.058	0	% CS10.25	217 26	64 24	.2 197 JG	0 4m	
20210712 1401 1 96	2 4	48.6	67	39.929	168	51.997	0	% CS10.25			JG		
20210712 1430 1 97	1 4	48.4	67	41.552	168	48.235	0	% CS10.5	218 26	65 24	.9 206 JG	0 3m	
20210712 1434 1 97	2 4	48.7	67	41.64	168	48.211	0	% CS10.5		22	.1 193 JG		
20210712 1452 1 98	1 4	48.4	67	43.381	168	43.952	0	% CS10.75	218 26	65 24	.7 174 JG	0 3m	
20210712 1458 1 98	2 4	48.6	67	43.526	168	43.795		% CS10.75			.4 161 JG		
20210712 1513 1 99	1 4	48.5	67	43.301	168	39.945	0	% CS11	217 26		7 200 RJD	0 4m	Vent plug cleaned
20210712 1520 1 99	2 4	48.9	67	45.258	168	39.73	0	% CS11		2	4 190 RJD		
20210712 1520 5 19	1 4	48.5	67	45.245	168	39.725		% CS11 Laramie	5		6 198 RJD	0 4m	
20210712 1532 5 19	2 4	48.7		45.701	168	39.325		% CS11 Laramie		2	4 185 RJD		
20210712 1549 1 100		48.5		47.065	168	34.596		% CS11.25	218 26		2 200 RJD	0 4m	
20210712 1552 1 100		48.8		47.147	168	34.533		% CS11.25			1 175 RJD		
20210712 1611 1 101	1 4	48.9	67	48.746	168	29.589	0	% CS11.5	218 26	67 3	2 209 RJD	0 5m+	
20210712 1616 1 101		49.1		48.953	168	29.122		% CS11.5			3 171 RJD		
20210712 1634 1 102		51.5		50.632	168	24.162		% CS11.75	218 26		5 198 RJD	0 5m+	
20210712 1638 1 102	2	51.6	67	50.744	168	23.949	0	% CS11.75		2	3 178 RJD		
20210712 1655 1 103		54.9	67	52.27	168	18.186		% CS12	217 26		4 202 RJD	0 5m	
20210712 1701 1 103		55.1		52.393	168	19.13		% CS12			8 204 RJD		
20210712 1702 5 20		55.2		52.416	168	19.138		% CS12 Laramie	5		6 198 RJD	0 5m	
20210712 1719 5 20		55.4		52.556	168	18.045		% CS12 Laramie	2		5 177 RJD	0.5111	
20210712 1713 1 104		56.8		54.151	168	13.825		% CS12.25	218 26		4 197 RJD	0 5m	
20210712 1736 1 104		56.7		54.254	168	13.767		% CS12.25	210 20		5 181 RJD	0 5111	
20210712 1754 1 105		57.5		55,779	168	9.093		% CS12.5	217 2		8 212 RID	0 5m+	
20210712 1757 1 105	2	57		55.929	168	8.937	-	% CS12.5			2 170 RJD	0 5111	
20210712 1816 1 106	-	60.2		57.496	168	4.317		% CS12.75			190 RJD	0 5m	
	2 1	60.1		57 601								0 5111	
20210712 1821 1 106		60.1 53.6	67	57.601	168	4.287	0	% CS12.75	217 26	2	25 172 RJD		
20210712 1840 1 107	1 !	53.6	67 67	59.224	168 167	4.287 59.388	0	% CS12.75 % CS13	217 26	2 64 2	25 172 RJD 211 RJD	0 5m	
20210712 1840 1 107 20210712 1845 1 107	1	53.6 53.3	67 67 67	59.224 59.35	168 167 167	4.287 59.388 59.287	0 0 0	% CS12.75 % CS13 % CS13		64 2 2	25 172 RJD 21 211 RJD 28 177 RJD	0 5m	Stonned operations due to sea state
20210712 1840 1 107 20210712 1845 1 107 20210712 1846 5 21	1 : 2 : 5 :	53.6 53.3 53.1	67 67 67 67	59.224 59.35 59.353	168 167 167 167	4.287 59.388 59.287 59.273	0 0 0	% CS12.75 % CS13 % CS13 % CS13 Laramie	217 26	64 2 64 2 2 45 2	 172 RJD 211 RJD 211 RJD 177 RJD 190 RJD 		Stopped operations due to sea state Recovery option missing - set to be same as deploy - did base long at 167.59.33
20210712 1840 1 107 20210712 1845 1 107 20210712 1846 5 21 20210712 1855 5 21	1 2 5 5	53.6 53.3 53.1 53.1	67 67 67 67 67	59.224 59.35 59.353 59.353	168 167 167 167 167	4.287 59.388 59.287 59.273 59.273	0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13 Laramie	5 4	64 2 45 2 2	172 RJD 1 211 RJD 18 177 RJD 19 187 RJD	0 5m 0 5m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23
20210712 1840 1 107 20210712 1845 1 107 20210712 1846 5 21 20210712 1855 5 21 20210713 25 1 108	1 2 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	53.6 53.3 53.1 53.1 53.9	67 67 67 67 67 67	59.224 59.35 59.353 59.353 59.353 59.242	168 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.273 59.43	000000000000000000000000000000000000000	% CS12.75 % CS13 % CS13 Laramie % CS13 Laramie % CS13 Laramie		64 22 45 22 65 26	172 RJD 1 211 RJD 18 177 RJD 190 RJD 191 187 RJD 101 187 RJD	0 5m	
20210712 1840 1 107 20210712 1845 1 107 20210712 1846 5 21 20210712 1855 5 21 20210713 25 1 108 20210713 25 1 108 20210713 28 1 108	1 2 5 5 1 2	53.6 53.3 53.1 53.1 53.9 53.5	67 67 67 67 67 67 67	59.224 59.35 59.353 59.353 59.242 59.318	168 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.43 59.43	000000000000000000000000000000000000000	% CS12.75 % CS13 % CS13 % CS13 Laramie % CS13 Laramie % CS13	217 26	64 22 45 22 65 26 22	172 RJD 1 211 RJD 18 177 RJD 15 190 RJD 19 187 RJD 1 201 KC 15 211 KC	0 5m 0 5m 0 5m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23
20210712 1840 1 107 20210712 1845 1 107 20210712 1846 5 21 20210712 1845 5 21 20210713 25 1 108 20210713 28 1 108 20210713 28 1 108 20210713 47 1 109	1 2 5 5 1 2 1	53.6 53.3 53.1 53.9 53.5 51.1	67 67 67 67 67 67	59.224 59.35 59.353 59.353 59.242 59.318 0.904	168 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.273 59.43	0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie	5 4	64 22 45 22 65 26 63 29	172 RJD 1 211 RJD 11 211 RJD 12 177 RJD 15 190 RJD 19 187 RJD 1 201 KC 15 211 KC 1 195 KC	0 5m 0 5m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23
20210712 1840 1 107 20210712 1845 1 107 20210712 1846 5 21 20210712 1855 5 21 20210713 255 1 108 20210713 28 1 108 20210713 47 1 109 20210713 55 1 109	1 2 5 5 1 2 1 2	53.6 53.3 53.1 53.9 53.5 51.1 51.3	67 67 67 67 67 67 67 68 68 68	59.224 59.35 59.353 59.353 59.242 59.318 0.904 0.976	168 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.43 59.424 54.613 54.626	0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13 Laramie % CS13 % CS13 % CS13 % CS13 % CS13 % CS13 % CS13.25	217 26 217 26	64 22 45 22 65 26 63 29 25	172 RJD 1 211 RJD 11 211 RJD 12 177 RJD 15 190 RJD 19 187 RJD 1 201 KC 15 211 KC 11 195 KC 14 170 KC	0 5m 0 5m 0 5m 0 5m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird)
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210712 1855 5 1 20210713 28 1 108 20210713 28 1 108 20210713 47 1 109 20210713 10 109 20210713 10	1 2 5 1 2 1 2 1	53.6 53.3 53.1 53.9 53.5 51.1 51.3 52.7	67 67 67 67 67 67 67 68 68 68 68 68	59.224 59.35 59.353 59.353 59.242 59.318 0.904 0.976 2.63	168 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.43 59.424 54.613 54.626 49.819	0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13 Laramie % CS13 Laramie % CS13 % CS13 % CS13.25 % CS13.5	217 26	64 22 45 22 65 26 63 29 25 67 22	172 RJD 1 211 RJD 13 177 RJD 15 190 RJD 19 187 RJD 11 201 KC 15 195 KC 1 195 KC 1 195 KC 1 195 KC 1 219 KC	0 5m 0 5m 0 5m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 47 1 109 20210713 51 1 109 20210713 11 109 20210713	1 2 5 5 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1	53.6 53.3 53.1 53.9 53.5 51.1 51.3 52.7 53.1	67 67 67 67 67 67 68 68 68 68 68 68	59.224 59.35 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.273 59.273 59.43 59.424 54.613 54.626 49.819 49.82	0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.5	217 26 217 26 217 26 218 26	64 22 45 22 65 26 63 29 25 67 22 21	172 RJD 1 211 RJD 11 211 RJD 12 177 RJD 15 190 RJD 19 187 RJD 12 201 KC 15 201 KC 1 195 KC 4 170 KC 1 219 KC 1 219 KC 1 214 KC	0 5m 0 5m 0 5m 0 5m 0 5m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird)
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 25 1 108 20210713 28 1 108 20210713 28 1 108 20210713 47 1 109 20210713 101 109 20210713 109 20210713 109 1 110 20210713 103 1 110 20210713 132 1 111	1 2 2 5 5 5 1 2 5	53.6 53.3 53.1 53.9 53.5 51.1 51.3 52.7 53.1 52.6	67 67 67 67 67 67 67 68 68 68 68 68 68 68	59.224 59.35 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.273 59.273 59.43 59.424 54.613 54.626 49.819 49.82 44.873	0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13.25 % CS13.25 % CS13.55 % CS13.75	217 26 217 26	64 22 45 22 65 26 63 29 25 67 22 21 66 24	172 RJD 11 211 RJD 12 211 RJD 18 177 RJD 15 190 RJD 15 190 RJD 1 201 KC 1 201 KC 1 195 KC 4 170 KC 1 219 KC 3 184 KC 8 189 KC	0 5m 0 5m 0 5m 0 5m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird)
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 47 1 109 20210713 47 1 109 20210713 11 100 20210713 110 20210713 132 1 110 20210713 132 1 111 20210713 132 1 111	1 2 5 5 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	53.6 53.3 53.1 53.9 53.5 51.1 51.3 52.7 53.1 52.6 53	67 67 67 67 67 67 68 68 68 68 68 68 68 68	59.224 59.35 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.424 54.613 54.626 49.819 49.82 44.873 44.854	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 % CS13 Laramie % CS13 % CS13 % CS13 % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.5 % CS13.75	217 26 217 26 218 26 217 26	64 22 45 22 65 26 63 29 25 67 22 21 66 24 26	172 RJD 11 211 RJD 12 11 RJD 18 177 RJD 15 190 RJD 19 187 RJD 12 11 KC 13 104 KC 14 170 KC 15 194 KC 16 170 KC 17 195 KC 18 180 KC 19 184 KC 10 124 KC	0 5m 0 5m 0 5m 0 5m 0 5m 0 4m 0 3m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird)
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 25 1 108 20210713 25 1 108 20210713 25 1 109 20210713 109 100 20210713 20210713 113 1 110 20210713 132 1 111 20210713 132 1 111 20210713 132 1 111 20210713 132 1 111 20210713 132 1 111 20210713 135 1 111 20210713 135 1 111 20210713 135 1 112	1 2 5 5 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	53.6 53.3 53.1 53.9 53.5 51.1 51.3 52.7 53.1 52.6 53.1 52.6 53 51.7	67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.061	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.424 54.613 54.626 49.819 49.82 44.873 44.854 40.058	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13 Laramie % CS13 % CS13 % CS13 % CS13 % CS13 % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS13.75 % CS14	217 26 217 26 217 26 218 26	64 22 245 22 65 26 67 22 21 66 24 26 66 24 26 65 24	15 172 RJD 11 211 RJD 12 211 RJD 18 177 RJD 15 190 RJD 19 187 RJD 1.1 201 KC 15 211 KC 15 211 KC 16 195 KC 1.4 170 KC 1.3 184 KC 1.8 189 KC 2.1 174 KC 1.2 174 KC	0 5m 0 5m 0 5m 0 5m 0 5m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird)
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 131 109 20210713 20210713 109 1 110 20210713 132 1 111 20210713 132 1 111 20210713 136 1 111 20210713 136 1 111 20210713 136 1 111 20210713 136 1 111 20210713 159 1 122	1 2 5 5 5 1 2 5 1 2 1 2 1 2 1 2 1 2 1 2	53.6 53.3 53.1 53.9 53.5 51.1 51.3 52.7 53.1 52.6 53 51.7 51.6	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.353 59.354 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.158	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.43 59.424 54.613 54.626 49.819 49.82 44.873 44.854 40.058	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.5 % CS13.5 % CS13.5 % CS13.75 % CS14	217 26 217 26 218 26 217 26 217 26 217 26	2 64 2 45 2 65 26 22 2 63 29 25 67 66 24 66 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 27	15 172 RJD 11 211 RJD 12 121 RJD 18 177 RJD 15 190 RJD 19 187 RJD 12 201 KC 13 184 KC 14 170 KC 15 121 KC 16 170 KC 17 184 KC 18 189 KC 2 174 KC 14 126 KC 15 16 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 3m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird)
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 37 1 109 20210713 109 1 110 20210713 113 1 110 20210713 136 1 111 20210713 155 1 112 20210713 155 1 112 20210713 155 1 112 20210713 155 1 112 20210713 159 1 122 20210713 205 2 2	1 2 2 5 5 5 1 2 5 1 2 2 1 2 1 2 1 2 1 2	53.6 53.3 53.1 53.9 53.5 53.5 51.1 51.3 52.7 53.5 52.6 53 51.7 51.6 51.2	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.35 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.158 6.171	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.273 59.273 59.43 59.424 54.613 54.626 49.819 49.82 44.873 44.854 40.058 40.072 40.079	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14 % CS14 Laramie	217 26 217 26 218 26 217 26	2 64 2 45 2 65 26 25 66 20 25 67 22 66 24 66 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 25 24 26 25 24 26 27 45 22	15 172 RJD 11 RJT RJD 18 177 RJD 15 190 RJD 19 187 RJD 11 201 KC 12 211 KC 13 184 KC 14 170 KC 15 198 KC 16 170 KC 17 188 KC 18 189 KC 19 174 KC 11 196 KC 12 174 KC 13 184 KC	0 5m 0 5m 0 5m 0 5m 0 5m 0 4m 0 3m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird)
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 25 1 108 20210713 25 1 109 20210713 109 1010 20210713 109 20210713 109 110 20210713 111 20210713 136 1 111 20210713 155 1 112 20210713 155 1 112 20210713 205 2 2	1 2 2 5 5 5 1 2 5 1 2 2 1 2 1 2 1 2 1 2	53.6 53.3 53.1 53.1 53.1 53.1 53.5 51.1 52.7 53.1 52.7 53.1 52.6 53 51.7 51.6 51.6 51.6 51.6 51.5 51.6 51.5 51.7 51.6 51.6 51.6 51.6 51.7 51.6 51.7 51.6 51.7 51.7 51	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.158 6.171 6.37	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.424 59.424 59.424 59.424 49.819 49.82 44.873 44.854 40.072 40.058	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS14.75 % CS14 % CS14 Laramie % CS14 Laramie	5 4 217 26 217 26 218 26 217 26 217 26 217 26 217 26 217 26 217 26	22 64 22 245 22 65 266 25 67 22 21 66 24 66 24 26 22 21 26 22 21 66 24 26 25 67 22 21 21 24 26 65 24 26 27 45 22 18 18	155 172 RJD 11 211 RJD 12 11 RJD 12 11 RJD 15 107 RJD 15 107 RJD 15 107 RD 1 195 KC 4 170 KC 3 184 KC 8 189 KC 2 174 KC 1 216 KC 1 196 KC 1 216 KC 1 196 KC 1 196 KC 1 196 KC 1 196 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 3m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on I Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 109 1 110 20210713 109 1 110 20210713 132 1 111 20210713 132 1 111 20210713 136 1 111 20210713 155 1 122 20210713 155 1 122 20210713 205 2 2 20210713 205 2 2 20210713 205 2 2 20210713 205 2 2 20210713 225 1 13	1 2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	533.6 53.3 53.1 53.1 53.1 53.5 51.1 53.5 55.7 53.1 52.7 53.1 52.6 53 51.7 51.6 51.2 50.5 49.2	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.342 59.342 59.348 0.904 2.63 2.72 4.339 2.72 4.339 4.4417 6.061 6.158 6.171 6.37 7.54	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.424 59.424 59.424 59.424 49.82 49.82 44.873 44.854 40.058 40.072 40.059 40.165 35.371	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14 % CS14 Laramie % CS14 Laramie % CS14 Laramie % CS14 Laramie	217 26 217 26 218 26 217 26 217 26 217 26	64 2 64 2 245 2 65 26 63 29 65 21 66 24 265 22 66 24 265 24 265 24 265 24 265 24 27 22 188 19	172 RD 11 211 RJD 12 11 RJD 12 11 RJD 13 17 RJD 15 190 RJD 19 187 RJD 11 201 KC 15 211 KC 11 95 KC 13 195 KC 14 170 KC 15 184 KC 16 184 KC 174 KC 184 KC 195 KC 11 196 KC 120 KC 13 193 KC 13 193 KC 13 193 KC 13 193 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 3m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird)
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210712 1855 5 21 20210713 25 1 108 20210713 25 1 109 20210713 109 110 20210713 132 1 111 20210713 132 1 111 20210713 136 1 111 20210713 135 1 112 20210713 155 1 122 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 200 1 13 20210713 200	1 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	53.6 53.3 53.1 53.1 53.5 53.5 53.5 51.1 51.3 52.7 53.1 53.1 53.5 53.1 53.5 53.1 53.5 53.1 53.5 53.1 53.5 53.1 53.5 53.1 53.5 53.1 53.5 53.1 53.5 53.1 53.5 53.5 53.5 53.1 53.5	67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.353 59.324 59.318 0.904 0.976 2.72 4.339 4.417 6.0618 6.158 6.171 6.37 7.54	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.43 59.424 54.613 54.626 49.819 49.82 44.873 44.854 40.058 40.072 40.079 35.371 35.4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14 % CS14 Laramie % CS14 Laramie % CS14 Laramie % CS14.25	5 2 217 2 217 2 218 2 217 2 217 2 217 2 217 2 218 2 217 2 218 2 218 2	22 64 2 245 2 65 26 265 26 27 2 66 29 67 22 66 24 66 24 265 24 265 24 265 24 265 24 265 24 266 27 445 22 18 61 199 20	15 172 RJD 11 211 RJD 12 180 RJT RJD 15 190 RJD RJD 15 190 RJD RJD 15 101 KC RJD 15 121 KC RJD 1 195 KC RJD 1 195 KC RJD 1 195 KC RJD 1 195 KC SJD 1 195 KC SJD 1 195 KC SJD 1 195 KC SDD 1 195 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 3m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 132 1 110 20210713 132 1 111 20210713 132 1 111 20210713 136 1 111 20210713 135 1 112 20210713 155 1 112 20210713 205 2 20210713 20210713 205 2 2 20210713 205 1 113 20210713 236 1 113 20210713 236 1 113 20210713 246 1 14	1 2 5 5 5 1 2 5 1 2 1 2 1 2 1 2 1 2 1 2	53.6 53.3 53.1 53.9 53.5 51.1 51.1 51.3 52.7 53.1 52.7 53.1 52.6 53 51.7 51.6 51.6 51.2 50.5 48.9 47.8	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.35 59.353 59.353 59.353 59.342 59.318 0.904 0.976 2.63 2.72 4.339 4.417 2.72 4.339 4.417 6.061 6.158 6.061 6.158 6.37 7.54 7.624 9.049	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.424 54.613 54.626 49.819 49.82 44.873 44.854 40.058 40.072 40.079 40.165 35.371 35.43 30.863	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 Laramie % CS14.25	5 4 217 26 217 26 218 26 217 26 217 26 217 26 217 26 217 26 217 26	64 22 45 22 45 22 65 26 67 22 67 22 66 24 26 26 26 27 45 22 18 61 19 20 22 21	Simple T2 RID 11 211 RID 18 177 RID 15 190 RID 19 187 RID 1 201 KC 15 190 RID 15 201 KC 15 191 KC 1 195 KC 4 170 KC 8 189 KC 2 174 KC 1 195 KC 4 170 KC 4 196 KC 5 193 KC 5 193 KC 5 193 KC 5 194 KC 4 166 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 3m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on I Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 47 1 109 20210713 103 1 110 20210713 132 1 111 20210713 132 1 111 20210713 155 1 122 20210713 155 1 112 20210713 205 5 22 20210713 205 5 22 20210713 225 1 113 20210713 230 1 113 20210713 230 1 113 20210713 240 1 114	1 2 5 5 5 1 2 5 1 2 1 2 1 2 1 2 1 2 1 2	53.6 53.3 53.1 53.9 53.5 51.1 51.1 52.6 53 51.7 51.6 51.2 50.5 54.2 50.5 54.2 50.5 54.2 50.5 54.2 55.5 55.5 55	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.354 59.354 59.354 59.354 59.354 59.354 59.354 59.354 59.354 59.354 59.354 59.354 59.354 6.051 6.051 6.051 6.171 7.54 7.524 9.0495	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.273 59.273 59.43 59.424 54.613 54.626 49.819 49.82 44.873 44.873 44.854 40.072 40.079 40.165 35.371 35.4 30.863 30.945	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14 % CS14 Laramie % CS14 Laramie % CS14.25 % CS14.25	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24 217 25	64 22 64 22 45 22 65 266 263 29 661 29 665 244 666 24 665 244 666 27 445 22 188 61 19 20 22 21 20 22	Size 122 RD 11 211 RUD 8 12 211 RUD 8 12 121 RUD 8 15 190 RD 9 12 187 RUD 19 11 195 KC 10 12 195 KC 12 13 148 KC 12 14 170 KC 1 15 193 KC 12 14 170 KC 1 15 193 KC 14 10 KC 139 KC 12 176 KC 139 13 165 KC 147	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe.
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 2 5 3 5 3 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4	53.6 53.3 53.1 53.1 53.3 53.5 53.5 51.1 51.3 52.7 53.3 51.7 51.6 51.2 50.5 51.2 50.5 51.2 48.9 47.8	67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.35 59.353 59.353 59.342 59.318 0.904 0.904 0.904 0.904 0.904 2.63 2.72 4.339 2.72 4.339 2.63 2.72 4.339 7.64 9.049 9.049 9.095	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.273 59.273 59.43 59.424 54.613 54.626 49.819 49.82 44.873 44.854 40.072 40.079 40.165 35.371 35.4 30.863 30.945	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 % CS13 Laramie % CS13 Laramie % CS13 % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.5	5 2 217 2 217 2 218 2 217 2 217 2 217 2 217 2 218 2 217 2 218 2 218 2	64 22 64 22 45 22 65 26 22 21 66 29 25 66 20 21 66 24 26 20 21 20 22 21 20 20 61 20 22 21 20 61	Size 122 RID 11 211 RID 18 177 RID 15 190 RID 19 187 RID 1 201 KC 1 195 KC 3 184 KC 2 174 KC 1 216 KC 1 195 KC 2 174 KC 1 196 KC 9 203 KC 5 203 KC 5 203 KC 5 193 KC 4 465 KC 3 45 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 3m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 132 1 110 20210713 132 1 111 20210713 132 1 111 20210713 132 1 111 20210713 132 1 111 20210713 135 1 112 20210713 205 1 112 20210713 205 1 113 20210713 255 1 113 20210713 255 1 114 20210713 246 1 114 20210713 245 1 114 20210713 </td <td>1 2 2 3 5 3 1 2 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 4 2 4 1 4 2 4 1 4 2 4</td> <td>53.6 53.3 53.1 53.1 53.1 53.1 53.1 53.1 53.1</td> <td>67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68</td> <td>59.224 59.353 59.353 59.353 59.242 59.318 0.904 0.976 0.976 2.63 2.72 4.339 4.417 6.061 6.158 6.171 7.54 7.54 9.095 9.095 9.095 9.095 9.214</td> <td>168 167 167 167 167 167 167 167 167 167 167</td> <td>4.287 59.388 59.287 59.273 59.424 54.626 49.819 49.82 44.854 40.058 40.072 40.079 40.055 35.371 35.4 30.863 30.945 30.945</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14 % CS14 Laramie % CS14 Laramie % CS14.25 % CS14.5 % CS14.5 % CS14.5 % CS14.5 % CS14.5</td> <td>5 4 217 24 217 24 217 24 217 24 217 24 217 24 217 24 218 217 218 24 217 24 218 24 218 24 218 24 217 25 218 24 217 25</td> <td>2 44 2 45 2 65 26 27 63 29 66 24 26 27 63 28 29 18 61 20 22 21 20 22 20 61 20 19</td> <td>5 172 RID 11 211 RID 18 177 RID 15 190 RID 19 187 RID 10 187 RID 11 195 KC 12 11 RC 13 148 KC 14 170 KC 15 214 KC 16 121 KC 17 121 KC 18 189 KC 2 174 KC 14 105 KC 15 193 KC 15 203 KC 16 203 KC 17 176 KC 18 189 KC 195 KC 208 KC 195 KC 345 KC 145 KC 145 KC </td> <td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m</td> <td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe.</td>	1 2 2 3 5 3 1 2 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 4 2 4 1 4 2 4 1 4 2 4	53.6 53.3 53.1 53.1 53.1 53.1 53.1 53.1 53.1	67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.353 59.242 59.318 0.904 0.976 0.976 2.63 2.72 4.339 4.417 6.061 6.158 6.171 7.54 7.54 9.095 9.095 9.095 9.095 9.214	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.424 54.626 49.819 49.82 44.854 40.058 40.072 40.079 40.055 35.371 35.4 30.863 30.945 30.945	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14 % CS14 Laramie % CS14 Laramie % CS14.25 % CS14.5 % CS14.5 % CS14.5 % CS14.5 % CS14.5	5 4 217 24 217 24 217 24 217 24 217 24 217 24 217 24 218 217 218 24 217 24 218 24 218 24 218 24 217 25 218 24 217 25	2 44 2 45 2 65 26 27 63 29 66 24 26 27 63 28 29 18 61 20 22 21 20 22 20 61 20 19	5 172 RID 11 211 RID 18 177 RID 15 190 RID 19 187 RID 10 187 RID 11 195 KC 12 11 RC 13 148 KC 14 170 KC 15 214 KC 16 121 KC 17 121 KC 18 189 KC 2 174 KC 14 105 KC 15 193 KC 15 203 KC 16 203 KC 17 176 KC 18 189 KC 195 KC 208 KC 195 KC 345 KC 145 KC 145 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe.
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 2 20210712 25 1 108 20210713 28 1 108 20210713 25 1 109 20210713 109 1 100 20210713 109 1 110 20210713 132 1 111 20210713 155 1 112 20210713 155 1 122 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 201 1 13 20210713 201 1 13 20210713 245 1 14 20210713 249 1 14 20210713 249 </td <td>1 2 5 3 1 2 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 4 2 4 1 4 2 4 1 4 2 4 1 4 1 4</td> <td>53.6 53.3 53.1 53.1 53.1 53.1 53.1 53.5 53.5 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.7 53.6 53.7 54.9 5</td> <td>67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68</td> <td>59.224 59.353 59.353 59.353 59.353 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.0518 6.158 6.158 9.049 9.095 9.095 9.095 9.095 9.214 10.564</td> <td>168 167 167 167 167 167 167 167 167 167 167</td> <td>4.287 59.388 59.273 59.273 59.43 59.424 59.433 59.424 59.433 59.424 49.82 49.82 49.82 49.82 40.058 40.0</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS14.75</td> <td>5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24</td> <td>64 2 2 2 245 2 63 29 63 29 66 24 27 21 66 24 27 21 66 24 27 21 61 19 20 22 21 20 22 21 20 22 21 20 22 21 20 22 21 20 22 21 20 22 21 20 22 21 20 21 21 20 22 21 20 21 21 20 22 21 20 21 21 20 22 21 21 20 21</td> <td>5 172 RID 11 211 RID 18 177 RID 15 190 RID 19 187 RID 11 201 KC 12 19 RIP RID 13 184 KC 14 170 KC 15 196 KC 16 1470 KC 17 126 KC 18 188 KC 2 174 KC 1 196 KC 9 203 KC 5 193 KC 5 203 KC 7 179 KC 7 179 KC 7 1345 KC 3 145 KC 3 145 KC 4 198 KC</td> <td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m</td> <td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe.</td>	1 2 5 3 1 2 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 3 2 3 1 4 2 4 1 4 2 4 1 4 2 4 1 4 1 4	53.6 53.3 53.1 53.1 53.1 53.1 53.1 53.5 53.5 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.6 53.7 53.7 53.6 53.7 54.9 5	67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.353 59.353 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.0518 6.158 6.158 9.049 9.095 9.095 9.095 9.095 9.214 10.564	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.273 59.273 59.43 59.424 59.433 59.424 59.433 59.424 49.82 49.82 49.82 49.82 40.058 40.0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS14.75	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24	64 2 2 2 245 2 63 29 63 29 66 24 27 21 66 24 27 21 66 24 27 21 61 19 20 22 21 20 22 21 20 22 21 20 22 21 20 22 21 20 22 21 20 22 21 20 22 21 20 21 21 20 22 21 20 21 21 20 22 21 20 21 21 20 22 21 21 20 21	5 172 RID 11 211 RID 18 177 RID 15 190 RID 19 187 RID 11 201 KC 12 19 RIP RID 13 184 KC 14 170 KC 15 196 KC 16 1470 KC 17 126 KC 18 188 KC 2 174 KC 1 196 KC 9 203 KC 5 193 KC 5 203 KC 7 179 KC 7 179 KC 7 1345 KC 3 145 KC 3 145 KC 4 198 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe.
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1845 5 21 20210713 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 109 1 110 20210713 132 1 111 20210713 132 1 111 20210713 135 1 112 20210713 155 1 112 20210713 205 5 22 20210713 205 5 22 20210713 205 1 113 20210713 205 2 2 20210713 246 1 114 20210713 249 1 114 20210713 2	1 2 5 5 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 2 1 2 2 2	53.6 53.3 53.1 53.5 51.1 52.6 53 53.5 51.1 52.6 53.5 51.1 53.5 53.5 53.1 53.5 53.1 53.5 53.1 53.5 53.5 53.5 53.7 53.1 53.5 53.5 53.7 53.1 53.5 53.5 53.5 53.5 53.5 53.5 53.5 53.7 53.6 53.5 53.5 53.7 53.6 53.5 53.7 53.6 53.5 53.7 53.1 53.7 53.6 53.5 53.7 53.6 53.5 53.7 53.2 53.5 53.7 53.2 53.7 53.2 53.7 53.2 53.7 53.2 53.7 53.2 53.7 53.2 53.7 53.2 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.9 54.9 54.7 54	67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.323 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.158 6.171 7.524 9.049 9.049 9.095 9.214 10.566	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.267 59.273 59.43 59.424 54.613 54.626 49.819 49.82 44.873 44.873 44.873 44.873 44.873 40.058 40.072 40.079 40.165 35.371 35.4 30.945 30.945 30.945 30.945	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.75 % CS14 Laramie % CS14 Laramie % CS14.25 % CS14.5 % CS14.75	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 218 24 217 22 218 24 217 24 218 24 218 24 218 24	2 64 2 2 2 45 2 665 266 67 22 66 24 66 24 26 26 27 26 28 26 29 20 61 19 20 61 20 61 20 61 20 61 20 61	Size 122 RD 11 211 R107 R10 12 121 R177 R10 15 190 R17 R10 15 190 R17 R10 15 190 RC R17 10 101 KC 15 211 11 201 KC 170 RC 11 219 KC 121 KC 12 14 KC 121 KC 13 148 KC 121 KC 14 170 KC 13 KC 15 193 KC 195 KC 19 203 KC 195 KC 10 145 KC 145 KC 14 166 KC 145 KC 14 154 KC 155 KC	0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 47 1 109 20210713 103 1 110 20210713 103 1 111 20210713 132 1 111 20210713 155 1 122 20210713 155 1 112 20210713 205 5 22 20210713 205 5 22 20210713 230 1 113 20210713 246 1 114 20210713 245 1 114 20210713 246 1 114 20210713	1 2 5 3 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 1 4 1 4 4 4 4 4 </td <td>53.6 53.3 53.3 53.9 53.9 53.9 53.5 51.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 54.9 54.9 54.9 54.9 54.9 55.9 54.9 54.9 54.9 55.9 5</td> <td>67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68</td> <td>59.224 59.353 59.353 59.353 59.324 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 2.63 2.72 4.339 4.417 6.051 6.158 6.171 6.37 7.54 7.54 9.095 9.095 9.214 10.564 10.669</td> <td>168 167 167 167 167 167 167 167 167 167 167</td> <td>4.287 59.388 59.273 59.275 59.273 59.275 59.</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.5 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS14.75 % CS14.75 % CS14.75 <</td> <td>5 4 217 24 217 24 217 24 217 24 217 24 217 24 217 24 218 217 218 24 217 24 218 24 218 24 218 24 217 25 218 24 217 25</td> <td>2 64 2 2 2 2 2 65 26 63 29 25 26 64 2 66 24 66 24 66 24 65 24 18 20 20 20 61 19 9 20 19 20 10 20 11 20 12 21 14 21 161 17</td> <td>Size 122 RID 11 211 RID 18 177 RID 18 177 RID 19 177 RID 19 187 RID 19 187 RID 11 118 KC 11 195 KC 12 174 KC 13 184 KC 14 170 KC 12 174 KC 12 174 KC 12 174 KC 13 195 KC 5 208 KC 9 203 KC 5 208 KC 7 179 KC 4 166 KC 3 145 KC 6 145 KC 4 166 KC 3 145 KC 6 145 KC 7 151 KC 1 156 KC</td> <td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m</td> <td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe.</td>	53.6 53.3 53.3 53.9 53.9 53.9 53.5 51.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 54.9 54.9 54.9 54.9 54.9 55.9 54.9 54.9 54.9 55.9 5	67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.353 59.324 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 59.342 2.63 2.72 4.339 4.417 6.051 6.158 6.171 6.37 7.54 7.54 9.095 9.095 9.214 10.564 10.669	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.273 59.275 59.273 59.275 59.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.5 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS14.75 % CS14.75 % CS14.75 <	5 4 217 24 217 24 217 24 217 24 217 24 217 24 217 24 218 217 218 24 217 24 218 24 218 24 218 24 217 25 218 24 217 25	2 64 2 2 2 2 2 65 26 63 29 25 26 64 2 66 24 66 24 66 24 65 24 18 20 20 20 61 19 9 20 19 20 10 20 11 20 12 21 14 21 161 17	Size 122 RID 11 211 RID 18 177 RID 18 177 RID 19 177 RID 19 187 RID 19 187 RID 11 118 KC 11 195 KC 12 174 KC 13 184 KC 14 170 KC 12 174 KC 12 174 KC 12 174 KC 13 195 KC 5 208 KC 9 203 KC 5 208 KC 7 179 KC 4 166 KC 3 145 KC 6 145 KC 4 166 KC 3 145 KC 6 145 KC 7 151 KC 1 156 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe.
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 2 2 3 1 2 1 2 1 2 1 2 1 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 1 2 1 2 1 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4	53.6 53.3 53.1 53.1 53.1 53.1 53.1 53.1 53.1 53.1 51.3 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 53.5 53.5 51.1 53.5 54.1 54.2 55.5 55.5 55.5 54.2 55.5	67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.37 7.54 9.095 9.095 9.095 9.214 10.669 12.39	168 167 167 167 167 167 167 167 167 167 167	4.287 59.288 59.273 59.275 59.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 Laramie % CS14 Laramie % CS14.25 % CS14.25 % CS14.5 % CS14.5 % CS14.5 % CS14.5 % CS14.5 % CS14.75 % CS14.75 % CS14.75 % CS14.75 % CS15	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 217 22 218 24 218 24 218 24 218 24	2 64 2 2 2 2 2 65 26 67 22 21 26 65 24 66 24 65 24 66 27 45 22 20 18 61 19 200 61 202 21 200 61 21 20 61 19 20 61 21 20 61 21 61 17 19 19	5 172 RID 11 211 RID 18 177 RID 15 190 RID 19 187 RID 11 201 KC 12 187 RID 13 187 KC 14 170 KC 15 193 KC 201 KC 193 KC 21 174 KC 1 196 KC 193 RC 203 KC 5 193 KC 5 193 KC 5 193 KC 6 145 KC 4 166 KC 3 145 KC 4 198 KC 23 145 KC 4 198 KC 24 193 KC 3 155 KC 4 198 KC	0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 1845 5 1 108 20210713 28 1 108 20210713 28 1 109 20210713 135 1 110 20210713 132 1 111 20210713 132 1 111 20210713 136 1 111 20210713 136 1 112 20210713 159 1 112 20210713 205 5 22 20210713 205 1 113 20210713 255 1 113 20210713 246 1 114 20210713 245 1 114 20210713 245 1 115	1 2 5 3 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 2 1 2 2 2 1 4 2 2 1 4 2 2 1 4 2 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4	53.6 53.3 53.1 53.9 53.5 51.1 53.5 51.1 53.5 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.7 51.7 51.7 51.7 51.7 51.7 51.7	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.342 59.348 59.342 59.342 59.342 59.342 59.342 59.343 59.342 59.342 59.342 59.342 59.342 59.342 39.343 4.339 4.339 4.339 4.339 4.339 4.339 4.339 4.339 4.339 4.339 4.347 7.54 7.54 9.049 9.095 9.214 10.564 10.669 12.349 12.145	168 167 167 167 167 167 167 167 167 167 167	4.2878 4.2878 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.2747 59.274 59.274 59.274 59.274 59.274 59.274 59.274 59.274 59.274 5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14.5 % CS14.4 % CS14 Laramie % CS14.25 % CS14.25 % CS14.5 % CS14.5 % CS14.5 % CS14.5 % CS14.5 % CS14.5 % CS14.75 % CS14.75 % CS15 % CS15 % CS15	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 218 24 217 22 218 24 217 24 218 24 218 24 218 24	2 64 2 2 2 2 2 65 26 63 29 21 2 66 24 66 24 66 24 66 24 66 24 66 24 66 24 67 20 22 21 861 19 20 20 61 20 22 21 61 20 61 20 61 20 61 20 61 20 61 14 21 11 61 17 19 45 45 17	5 172 RID 11 211 RID 18 177 RID 15 190 RID 19 187 RID 10 187 RID 11 195 KC 12 11 KC 13 148 KC 14 170 KC 15 217 KC 16 121 KC 17 195 KC 10 196 KC 10 196 KC 11 195 KC 12 146 KC 13 145 KC 14 170 KC 15 198 KC 145 KC 145 KC 15 198 KC 15 156 KC 15 158 KC 15 158 KC 15 155 KC 155 KC 156 KC 156 KC	0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 2 20210713 25 1 108 20210713 28 1 108 20210713 28 1 109 20210713 109 1 100 20210713 109 1 110 20210713 132 1 111 20210713 135 1 112 20210713 155 1 122 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 201 1 13 20210713 201 1 13 20210713 201 1 14 20210713 249 1 114 20210713	1 2 5 3 1 2 2 3 1 2 2 3 1 2 2 3 1 3 2 3 1 3 2 3 1 3 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4	53.6 53.3 53.3 53.3 53.1 53.1 53.1 53.1 53.5 53.1 53.5 53.1 52.7 53.5 51.1 51.1 52.6 53 51.7 51.6 51.2 50.5 50.5 549.2 448.9 47.8 47.8 47.8 47.8 47.3 47.1 47 46.9 46.8	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.324 59.333 59.342 59.342 59.343 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.158 6.071 7.524 9.095 9.095 9.095 9.095 9.054 10.569 12.054 12.301	168 167 167 167 167 167 167 167 167 167 167	4.2877 59.388 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.273 59.274 59.273 59.274 59.273 59.274 40.079 50.273 59.274 40.079 50.573 50.573 50.575 50	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.75 % CS13.75 % CS14 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.5 % CS15 % CS15 % CS15 % CS15 Laramie	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 217 24 218 24 217 24 218 24 218 24 218 24 218 24 218 24	2 64 2 2 2 2 2 65 2.65 265 2.66 2 2 265 2.67 21 2 265 2.64 27 21 266 2.2 21 20 22 2.1 20 2.2 21 2.0 22 2.1 20 2.0 21 2.0 22 2.1 20 2.2 21 2.0 22 2.1 20 2.0 21 2.0 22 2.1 20 2.1 21 2.0 22 2.1 23 2.1 24 2.1 25 2.2 26 1.1 27 1.3 245	IF 172 RID 11 211 RID 18 177 RID 18 177 RID 19 187 RID 10 187 RID 11 201 KC 12 187 RID 13 184 KC 14 170 KC 15 217 KC 16 121 KC 17 126 KC 18 188 KC 2 174 KC 12 174 KC 13 145 KC 5 208 KC 7 179 KC 4 166 KC 3 145 KC 6 145 KC 7 151 KC 1 156 KC 13 145 KC 4 188 KC 2 197 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 135 1 110 20210713 132 1 111 20210713 135 1 112 20210713 155 1 112 20210713 205 5 22 20210713 205 5 22 20210713 206 5 22 20210713 209 5 22 20210713 249 1 114 20210713 249 1 115 20210713 318 1 116 20210713	1 2 5 3 5 3 5 3 1 2 1 2 1 3 2 3 1 2 1 3 2 3 1 4 2 3 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4	53.6 53.3 53.1 53.1 53.1 53.1 53.1 53.1 53.5 53.1 53.1	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.323 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.158 6.171 7.54 7.624 9.095 9.095 9.095 9.095 9.214 10.569 12.309 12.149 12.143 13.548	168 167 167 167 167 167 167 167 167 167 167	4 287 59.287 59.273 59.424 59.273 59.424 59.577 55.377 55.377 55.377 55.377 55.377 55.377 55.377 55.377 55.377 55.377 55.377 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.377 55.424 55.444		% CS12.75 % CS13 % CS13 Laramie % CS13 Laramie % CS13 Laramie % CS13 Laramie % CS13 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14.75 % CS14 Laramie % CS14 Laramie % CS14.25 % CS14.25 % CS14.5 % CS15 % CS15 % CS15 % CS15 % CS15 Laramie % </td <td>5 4 217 24 217 24 218 24 217 24 217 24 217 24 218 24 217 24 218 24 217 21 218 24 218 24 218 24 218 24</td> <td>2 64 2 2 2 45 2 65 26 63 29 63 29 66 24 26 26 66 24 26 26 27 21 66 24 26 24 27 21 20 20 61 20 22 21 14 21 20 20 61 20 20 20 61 20 20 20 61 21 99 45 17 18 56 17</td> <td>IP 172 RD 11 211 RJD 12 211 RJD 13 121 RJD 15 190 RJD 15 190 RJD 12 187 RJD 13 124 KC 1 215 KC 1 121 KC 1 218 KC 2 174 KC 1 195 KC 2 174 KC 1 195 KC 2 193 KC 5 193 KC 5 193 KC 6 145 KC 3 145 KC 3 145 KC 3 145 KC 3 145 KC 4 198 KC 7 151 KC 1 158 KC 1 138 KC 1 138 KC 1 158 KC</td> <td>0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m</td> <td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before</td>	5 4 217 24 217 24 218 24 217 24 217 24 217 24 218 24 217 24 218 24 217 21 218 24 218 24 218 24 218 24	2 64 2 2 2 45 2 65 26 63 29 63 29 66 24 26 26 66 24 26 26 27 21 66 24 26 24 27 21 20 20 61 20 22 21 14 21 20 20 61 20 20 20 61 20 20 20 61 21 99 45 17 18 56 17	IP 172 RD 11 211 RJD 12 211 RJD 13 121 RJD 15 190 RJD 15 190 RJD 12 187 RJD 13 124 KC 1 215 KC 1 121 KC 1 218 KC 2 174 KC 1 195 KC 2 174 KC 1 195 KC 2 193 KC 5 193 KC 5 193 KC 6 145 KC 3 145 KC 3 145 KC 3 145 KC 3 145 KC 4 198 KC 7 151 KC 1 158 KC 1 138 KC 1 138 KC 1 158 KC	0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 1845 5 1 108 20210713 28 1 108 20210713 109 1 20210713 132 1 110 20210713 132 1 111 20210713 132 1 111 20210713 132 1 111 20210713 132 1 111 20210713 159 1 112 20210713 135 1 112 20210713 135 1 113 20210713 205 5 22 20210713 225 1 113 20210713 230 1 113 20210713 246 1 114 20210713 245 1 114 20210713 1 115	1 2 2 3 5 3 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4	53.6 53.3 53.3 53.9 53.9 53.5 51.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.1 52.7 53.9 53.5 51.3 52.7 53.9 53.5 54.9 55.3 55.3 55.3 55.3 55.3 55.3 55.3 55.3 55.3 55.3 55.3 55.4 55.3 55.7 55.4 55.2 55.3 55.7 55.4 55.2	67 67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.158 6.171 7.54 7.54 9.095 9.095 9.095 9.095 9.214 10.564 10.669 12.439 12.435 13.548	168 167 167 167 167 167 167 167 167 167 167	4 287 59 288 59 287 59 287 40 297 40 297 40 297 40 297 40 297 40 297 40 40 40 40 40 40 40 40 40 40 40 40 40		% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS14.5 % CS14 % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS15 % CS15 % CS15 % CS15 % CS15.5 %	5 4 217 24 217 24 218 2 217 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 217 25 218 24 217 25	2 64 2 2 2 2 2 65 2.65 67 2.25 67 2.22 66 2.41 265 2.62 66 2.41 266 2.11 20 2.21 18 1.19 9 1.20 9 1.9 61 1.9 9 61 1.00 1.9 9 61 1.17 1.9 9 56 1.7 1.8 56 1.7 1.65 1.7	Size 122 RD 11 211 RUD 8 12 121 RUD 8 12 121 RUD 9 12 137 RUD 9 13 91 R7 RUD 12 91 R7 RUD 13 91 R7 RUD 14 170 KC 1 15 191 KC 2 2 174 KC 1 2 174 KC 1 2 174 KC 1 2 174 KC 1 3 145 KC 2 4 166 KC 3 145 3 145 KC 4 168 4 168 KC 1 183 4 158 KC 1 183 5 179 KC 1 <t< td=""><td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m</td><td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before</td></t<>	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 109 100 20210713 20210713 132 1 111 20210713 135 1 112 20210713 155 1 112 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 240 1 114 20210713 244 1 116 20210713<	1 2 5 3 5 3 1 2 2 4 1 2 2 3 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4	53.6 53.3 53.3 53.3 53.1 53.1 53.1 53.1 53.5 53.5	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.324 59.323 59.324 59.338 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.171 6.37 7.524 9.049 9.095 9.214 10.669 12.439 12.439 12.431 13.548 13.653	168 167	4 287 59.287 59.273 59.273 59.273 59.424 59.424 59.424 49.812 40.072 40.072 40.072 40.073 40.85 35.371 35.452 60.853 30.945 30.9		% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS14.75 % CS15 % CS15 % CS15 % CS15 % CS15 % CS15 % CS15.5 %	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 217 24 218 24 217 24 218 24 218 24 218 24 218 24 218 24	64 2 2 2 2 2 45 265 66 2 67 22 21 265 265 24 265 24 265 24 265 24 266 24 27 18 661 19 200 61 202 21 200 61 200 19 61 17 18 56 17 18 556 17 61 17 16 17 16 17 16 17 56 17 61 11	5 172 RID 11 211 RID 18 177 RID 15 190 RID 10 187 RID 11 201 KC 12 191 RC 13 187 KC 14 170 KC 15 195 KC 16 145 KC 17 176 KC 19 203 KC 10 203 KC 11 196 KC 12 174 KC 13 184 KC 14 166 KC 15 173 KC 14 165 KC 13 145 KC 14 198 KC 15 KC 15 155 KC 188 KC 174 KC 188 KC 175 KC 188 KC 175 KC 188 KC 174 KC 188 KC 174 KC	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 130 1 110 20210713 132 1 111 20210713 132 1 111 20210713 135 1 112 20210713 155 1 112 20210713 205 5 22 20210713 205 5 22 20210713 2405 1 114 20210713 249 1 114 20210713 318 1 116 20210713 318 1 117 20210713 <td>1 2 2 3 5 3 1 2 2 3 1 2 2 3 1 2 1 2 1 2 1 2 1 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4</td> <td>53.6 53.3 53.1 53.1 53.9 53.5 53.1 53.5 53.1 53.7 53.1 52.7 53.1 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.7 55.7 51.6 48.9 47.8 47.8 47.8 47.8 47.8 47.8 44.9 46.9 46.9 46.9 46.9 46.8 44.4 43.3 53.5 53.7 53.1 53.7 53.1 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.7 55.7 54.7 55.7 54.7 55.7 54.7 55.7</td> <td>67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68</td> <td>59.224 59.353 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.158 6.171 6.37 7.54 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.566 12.39 12.145 13.548 13.553 14.955 15.09</td> <td>168 167</td> <td>4 287 59 388 59 273 59 273 50 273 50 273 50 273 50 273 50 273 50 275 50 275 50 50 275 50 275 50 275 50 2750</td> <td></td> <td>% CS12.75 % CS13 % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 % CS14 % CS14.25 % CS14.25 % CS14.5 % CS14.75 % CS15 % CS15 % CS15 % CS15 % CS15 % CS15 %</td> <td>5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 217 25 217 25 217 26 217 26 218 217 217 25 217 26 217 26 217 26 217 26 217 26 217 26</td> <td>2 64 2 2 2 2 2 65 26 63 29 63 29 63 29 66 24 26 26 27 21 66 24 26 22 61 19 20 20 61 20 961 20 101 17 12 21 131 14 211 17 12 11 131 18 56 17 56 17 161 16 161 16</td> <td>5 172 RID 11 211 RID 18 177 RID 15 190 RID 15 190 RID 12 187 RID 12 187 RID 12 187 RID 13 184 KC 14 170 KC 15 211 KC 16 121 KC 17 121 KC 18 129 KC 203 KC 500 KC 5 208 KC 7 179 KC 4 166 KC 3 445 KC 6 45 KC 6 45 KC 15 154 KC 15 155 KC 16 485 KC 17 151 KC 18 185 KC 19 155 KC 10 135 KC 11 135 KC 12 148 KC 13 145 KC 14 185 KC 15<!--</td--><td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m</td><td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before</td></td>	1 2 2 3 5 3 1 2 2 3 1 2 2 3 1 2 1 2 1 2 1 2 1 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4	53.6 53.3 53.1 53.1 53.9 53.5 53.1 53.5 53.1 53.7 53.1 52.7 53.1 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.7 55.7 51.6 48.9 47.8 47.8 47.8 47.8 47.8 47.8 44.9 46.9 46.9 46.9 46.9 46.8 44.4 43.3 53.5 53.7 53.1 53.7 53.1 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.7 55.7 54.7 55.7 54.7 55.7 54.7 55.7	67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.158 6.171 6.37 7.54 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.566 12.39 12.145 13.548 13.553 14.955 15.09	168 167	4 287 59 388 59 273 59 273 50 273 50 273 50 273 50 273 50 273 50 275 50 275 50 50 275 50 275 50 275 50 2750		% CS12.75 % CS13 % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 % CS14 % CS14.25 % CS14.25 % CS14.5 % CS14.75 % CS15 % CS15 % CS15 % CS15 % CS15 % CS15 %	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 217 25 217 25 217 26 217 26 218 217 217 25 217 26 217 26 217 26 217 26 217 26 217 26	2 64 2 2 2 2 2 65 26 63 29 63 29 63 29 66 24 26 26 27 21 66 24 26 22 61 19 20 20 61 20 961 20 101 17 12 21 131 14 211 17 12 11 131 18 56 17 56 17 161 16 161 16	5 172 RID 11 211 RID 18 177 RID 15 190 RID 15 190 RID 12 187 RID 12 187 RID 12 187 RID 13 184 KC 14 170 KC 15 211 KC 16 121 KC 17 121 KC 18 129 KC 203 KC 500 KC 5 208 KC 7 179 KC 4 166 KC 3 445 KC 6 45 KC 6 45 KC 15 154 KC 15 155 KC 16 485 KC 17 151 KC 18 185 KC 19 155 KC 10 135 KC 11 135 KC 12 148 KC 13 145 KC 14 185 KC 15 </td <td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m</td> <td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before</td>	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 2 20210713 25 1 108 20210713 25 1 108 20210713 25 1 109 20210713 109 1 110 20210713 132 1 111 20210713 132 1 111 20210713 135 1 112 20210713 155 1 122 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 201 1 113 20210713 201 1 114 20210713 249 1 115 20210713 314 1 16 20210713	1 2 2 3 5 3 1 2 1 2 2 3 1 2 2 3 1 2 2 3 1 3 2 3 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4	53.6 53.3 53.3 53.1 53.1 53.1 53.5 53.5 53.5	67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.324 59.323 59.324 59.338 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.171 6.371 7.524 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.569 12.039 12.301 13.563 13.653 14.955 15.09	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.423 59.424 49.812 44.854 40.052 40.079 40.165 35.3717 35.4 30.945 30.945 30.945 30.945 20.186 21.543 21.165 16.686 21.543 21.1657 16.6706 12.324 12.514		% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS15.5 % CS15.5 % CS15.5 % CS16 % CS16 %<	5 4 217 24 217 24 218 2 217 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 217 25 218 24 217 25	2 64 2 2 2 2 2 65 2.65 265 2.66 2 2 265 2.67 21 2 265 2.62 21 26 265 2.62 21 20 22 2.11 200 20 22 2.11 200 2.1 200 2.2 21 2.00 22 2.01 200 2.02 21 2.00 22 2.11 200 2.02 21 2.00 22 2.01 200 2.01 21 2.00 22 2.01 245 1.7 18 16 14 1.17 40 2.00	5 172 RID 11 211 RID 18 177 RID 15 190 RID 10 187 RID 11 187 RID 12 187 RID 13 187 RID 14 101 KC 15 190 KC 16 171 RID 170 RC 171 RID 184 KC 201 KC 195 KC 203 KC 10 203 KC 10 203 KC 11 116 KC 12 174 KC 14 160 KC 13 145 KC 14 166 KC 13 145 KC 14 168 KC 154 KC 145 KC 155 KC 178 KC 14 185 KC 15 178 KC 154 KC 154 KC 154 KC 154 KC 154 KC 154 KC 154 KC 154 KC 154 KC 1	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 1855 5 21 20210713 28 1 108 20210713 24 1 109 20210713 109 1 110 20210713 132 1 111 20210713 132 1 111 20210713 135 1 112 20210713 155 1 112 20210713 205 5 22 20210713 205 5 2 20210713 205 1 113 20210713 249 1 114 20210713 249 1 114 20210713 318 1 116 20210713 334 1 116 20210713 <td>1 2 2 3 5 3 1 2 2 3 1 2 2 3 1 2 1 2 1 2 1 2 1 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4</td> <td>53.6 53.3 53.1 53.1 53.9 53.5 53.1 53.5 53.1 53.7 53.1 52.7 53.1 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.7 55.7 51.6 48.9 47.8 47.8 47.8 47.8 47.8 47.8 44.9 46.9 46.9 46.9 46.9 46.8 44.4 43.3 53.5 53.7 53.1 53.7 53.1 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.7 55.7 54.7 55.7 54.7 55.7 54.7 55.7</td> <td>67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68</td> <td>59.224 59.353 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.158 6.171 6.37 7.54 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.566 12.39 12.145 13.548 13.553 14.955 15.09</td> <td>168 167 167 167 167 167 167 167 167 167 167</td> <td>4 287 59 388 59 273 59 273 50 273 50 273 50 273 50 273 50 273 50 275 50 275 50 50 275 50 275 50 275 50 2750</td> <td></td> <td>% CS12.75 % CS13 % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 % CS14 % CS14.25 % CS14.25 % CS14.5 % CS14.75 % CS15 % CS15 % CS15 % CS15 % CS15 % CS15 %</td> <td>5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 217 25 217 25 217 26 217 26 218 217 217 25 217 26 217 26 217 26 217 26 217 26</td> <td>2 64 2 2 2 2 2 65 26 63 29 63 29 63 29 66 24 26 26 66 24 26 26 61 20 20 61 20 61 20 61 20 61 20 61 14 21 15 17 16 17 40 20 21 11 20 16 17 18 56 17 40 20 20 16 14 21 17 40</td> <td>Size 122 RD 1 211 RUD 1 211 RUD 1 211 RUD 1 211 RUD 15 190 RUD 1 187 RUD 1 191 KC 1 195 KC 1 211 KC 1 214 KC 2 174 KC 1 215 KC 2 174 KC 3 148 KC 7 179 KC 4 196 KC 7 179 KC 4 166 KC 1 155 KC 1 158 KC 1 183 KC 1 183 KC 1 184 KC 1 187 KC 1 187 <t< td=""><td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m</td><td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before</td></t<></td>	1 2 2 3 5 3 1 2 2 3 1 2 2 3 1 2 1 2 1 2 1 2 1 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4	53.6 53.3 53.1 53.1 53.9 53.5 53.1 53.5 53.1 53.7 53.1 52.7 53.1 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.7 55.7 51.6 48.9 47.8 47.8 47.8 47.8 47.8 47.8 44.9 46.9 46.9 46.9 46.9 46.8 44.4 43.3 53.5 53.7 53.1 53.7 53.1 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 53.7 54.7 55.7 54.7 55.7 54.7 55.7 54.7 55.7	67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.353 59.242 59.318 0.904 0.976 2.63 2.72 4.339 4.417 6.158 6.171 6.37 7.54 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.566 12.39 12.145 13.548 13.553 14.955 15.09	168 167 167 167 167 167 167 167 167 167 167	4 287 59 388 59 273 59 273 50 273 50 273 50 273 50 273 50 273 50 275 50 275 50 50 275 50 275 50 275 50 2750		% CS12.75 % CS13 % CS13.25 % CS13.25 % CS13.5 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 % CS14 % CS14.25 % CS14.25 % CS14.5 % CS14.75 % CS15 % CS15 % CS15 % CS15 % CS15 % CS15 %	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 217 25 217 25 217 26 217 26 218 217 217 25 217 26 217 26 217 26 217 26 217 26	2 64 2 2 2 2 2 65 26 63 29 63 29 63 29 66 24 26 26 66 24 26 26 61 20 20 61 20 61 20 61 20 61 20 61 14 21 15 17 16 17 40 20 21 11 20 16 17 18 56 17 40 20 20 16 14 21 17 40	Size 122 RD 1 211 RUD 1 211 RUD 1 211 RUD 1 211 RUD 15 190 RUD 1 187 RUD 1 191 KC 1 195 KC 1 211 KC 1 214 KC 2 174 KC 1 215 KC 2 174 KC 3 148 KC 7 179 KC 4 196 KC 7 179 KC 4 166 KC 1 155 KC 1 158 KC 1 183 KC 1 183 KC 1 184 KC 1 187 KC 1 187 <t< td=""><td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m</td><td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before</td></t<>	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 109 110 20210713 20210713 132 1 111 20210713 135 1 110 20210713 155 1 112 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 201 113 20210713 249 1 114 20210713 340 1 117 20210713 3	1 2 5 3 5 3 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4	53.6 53.3 53.3 53.1 53.1 53.1 53.5 53.5 53.5	67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.324 59.323 59.324 59.338 0.904 0.976 2.63 2.72 4.339 4.417 6.061 6.171 6.371 7.524 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.569 12.039 12.301 13.563 13.653 14.955 15.09	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.423 59.424 49.812 44.854 40.052 40.079 40.165 35.3717 35.4 30.945 30.945 30.945 30.945 20.186 21.543 21.165 16.686 21.543 21.1657 16.6706 12.324 12.514		% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.75 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS15.5 % CS15.5 % CS15.5 % CS16 % CS16 %<	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 217 25 217 25 217 26 217 26 218 217 217 25 217 26 217 26 217 26 217 26 217 26	2 64 2 2 2 2 2 65 26 63 29 63 29 63 29 66 24 26 26 66 24 26 26 61 20 20 61 20 61 20 61 20 61 20 61 14 21 15 17 16 17 40 20 21 11 20 16 17 18 56 17 40 20 20 16 14 21 17 40	5 172 RID 11 211 RID 18 177 RID 15 190 RID 10 187 RID 11 187 RID 12 187 RID 13 187 RID 14 101 KC 15 190 KC 16 171 RID 170 RC 171 RID 184 KC 201 KC 195 KC 203 KC 10 203 KC 10 203 KC 11 116 KC 12 174 KC 14 160 KC 13 145 KC 14 166 KC 13 145 KC 14 168 KC 154 KC 145 KC 155 KC 178 KC 14 185 KC 15 178 KC 154 KC 154 KC 154 KC 154 KC 154 KC 154 KC 154 KC 154 KC 154 KC 1	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1855 5 21 20210713 28 1 108 20210713 28 1 108 20210713 28 1 109 20210713 109 100 20210713 20210713 109 100 20210713 20210713 132 1 111 20210713 155 1 12 20210713 155 1 12 20210713 155 1 12 20210713 200 5 22 20210713 200 5 22 20210713 230 1 114 20210713 249 1 144 20210713 314 1 16 20210713 314 1 16 202	1 2 2 3 5 3 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 2 2	53.6 53.3 53.3 53.3 53.3 53.3 53.1 53.1 53.1 53.1 53.5 51.1 51.1 52.7 53.5 51.1 52.6 53 51.7 51.6 51.2 51.2 50.5 51.2 51.2 51.2 51.2 51.2 50.5 51.2 65.9 44.8 47.8 47.1 47.8 47.1 47.8 44.4 45.1 33.3 343.5 34.3 40.4 40.4	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.324 59.333 59.342 59.342 59.342 59.342 59.342 59.343 59.242 59.342 59.343 59.242 59.343 59.242 59.343 59.242 59.342 59.342 59.342 50.071 6.37 6.37 6.37 7.54 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.669 12.149 12.149 12.149 12.149 13.548 13.548 13.548 13.509 15.106 15.302 16.572	168 167 167 167 167 167 167 167 167 167 167	4 287 59 388 59 287 59 287 59 287 59 287 59 287 59 287 59 273 59 43 59 273 59 43 59 424 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 400 819 400 400 400 4000 40000000000000000000		% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.75 % CS14 Laramie % CS14 Laramie % CS14.25 % CS14.25 % CS14.5 % CS14.5 % CS14.5 % CS14.75 % CS14.75 % CS14.75 % CS15 Laramie % CS15 Laramie % CS15 Laramie % CS16 Laramie % CS16 Laramie % CS16 Laramie % CS16.5	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 218 24 218 24 219 218 210 218 217 24 218 24 219 217 210 217 217 24 217 24 217 24 217 24 217 24 217 24 217 24	2 64 2 2 2 2 2 65 2.6 2 2 65 2.6 2 21 66 2.4 265 2.6 27 21 66 2.4 20 20 21 20 20 19 61 19 20 11 20 12 61 17 45 17 18 16 17 18 56 17 61 17 40 200 21 15 52 15	Size 122 RD 11 211 RD 12 211 RD 12 12 RD 15 190 RD 15 190 RD 11 201 KC 12 195 KC 13 184 KC 14 170 KC 15 201 KC 10 203 KC 11 196 KC 12 174 KC 13 145 KC 14 166 KC 15 KC 19 14 166 KC 13 145 KC 14 188 KC 15 175 KC 14 188 KC 15 175 KC 14 187 KC 15 175 KC 14 147	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
20210712 1840 1 107 20210712 1845 1 107 20210712 1845 5 21 20210712 1845 5 21 20210713 25 1 108 20210713 25 1 108 20210713 25 1 108 20210713 25 1 109 20210713 109 110 20210713 20210713 132 1 111 20210713 155 1 112 20210713 155 1 112 20210713 200 5 22 20210713 200 5 22 20210713 200 5 22 20210713 249 1 114 20210713 340 1 117 20210713 318 1 116 20210713 347 5 23 20210713	1 2 2 3 5 3 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 2 2	53.6 53.3 53.3 53.1 53.1 53.1 53.1 53.1 53.5 51.1 51.1 51.1 53.5 51.1 51.6 51.7 51.6 51.7 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.6 51.7 51.7 54.8 9.9 48.9 9.2 47.8 47.8 47.8 47.3 46.9 46.8 44.4 45.1 43.5 43.5 43.5 43.5 40.4 40.4	67 67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.324 59.323 59.324 59.324 59.324 59.324 59.324 59.324 59.324 59.328 59.324 59.324 59.324 6.37 6.158 6.158 6.171 6.618 6.37 7.54 7.54 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.564 10.564 13.548 13.548 13.548 13.548 13.548 13.548 13.548 13.548 15.09 15.006 15.302 <td>168 167 167 167 167 167 167 167 167 167 167</td> <td>4.287 59.388 59.287 59.273 59.273 59.424 59.273 59.424 59.273 59.424 40.079 40.165 46.121 49.812 49.812 49.812 49.812 49.812 49.812 49.812 49.812 40.079 40.</td> <td></td> <td>% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.5 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS15.5 % CS15.5 % CS15.5 % CS16.5 % <tdcs16.5< td=""> </tdcs16.5<></td> <td>5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 218 24 218 24 219 218 210 218 217 24 218 24 219 217 210 217 217 24 217 24 217 24 217 24 217 24 217 24 217 24</td> <td>2 64 2 2 2 2 2 65 2.6 2 2 65 2.6 2 21 66 2.4 265 2.6 27 21 66 2.4 20 20 21 20 20 19 61 19 20 11 20 12 61 17 45 17 18 16 17 18 56 17 61 17 40 200 21 15 52 15</td> <td>Size 122 RD 11 211 RUD 12 121 RUD 12 121 RUD 12 127 RUD 12 187 RUD 12 187 RUD 12 187 RUD 13 131 KC 14 170 KC 15 131 KC 203 KC 195 12 196 KC 13 195 KC 14 170 KC 15 193 KC 14 196 KC 15 195 KC 14 196 KC 15 145 KC 15 153 KC 16 145 KC 17 151 KC 18 154 KC 19 KC 177 10</td> <td>0 5m 0 5m 0 5m 0 5m 0 4m 0 4m</td> <td>Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before</td>	168 167 167 167 167 167 167 167 167 167 167	4.287 59.388 59.287 59.273 59.273 59.424 59.273 59.424 59.273 59.424 40.079 40.165 46.121 49.812 49.812 49.812 49.812 49.812 49.812 49.812 49.812 40.079 40.		% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.5 % CS14 % CS14 Laramie % CS14.25 % CS14.25 % CS14.25 % CS14.25 % CS14.5 % CS15.5 % CS15.5 % CS15.5 % CS16.5 % <tdcs16.5< td=""> </tdcs16.5<>	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 217 24 218 24 218 24 218 24 218 24 218 24 218 24 218 24 218 24 219 218 210 218 217 24 218 24 219 217 210 217 217 24 217 24 217 24 217 24 217 24 217 24 217 24	2 64 2 2 2 2 2 65 2.6 2 2 65 2.6 2 21 66 2.4 265 2.6 27 21 66 2.4 20 20 21 20 20 19 61 19 20 11 20 12 61 17 45 17 18 16 17 18 56 17 61 17 40 200 21 15 52 15	Size 122 RD 11 211 RUD 12 121 RUD 12 121 RUD 12 127 RUD 12 187 RUD 12 187 RUD 12 187 RUD 13 131 KC 14 170 KC 15 131 KC 203 KC 195 12 196 KC 13 195 KC 14 170 KC 15 193 KC 14 196 KC 15 195 KC 14 196 KC 15 145 KC 15 153 KC 16 145 KC 17 151 KC 18 154 KC 19 KC 177 10	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 2 5 3 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 3 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4 2 4 1 4	53.6 53.3 53.3 53.3 53.3 53.3 53.1 53.1 53.1 53.1 53.5 51.1 51.1 52.7 53.5 51.1 52.6 53 51.7 51.6 51.2 51.2 50.5 51.2 51.2 51.2 51.2 51.2 50.5 51.2 65.9 44.8 47.8 47.1 47.8 47.1 47.8 44.4 45.1 33.3 343.5 34.3 40.4 40.4	67 67 67 67 67 67 68 68 68 68 68 68 68 68 68 68	59.224 59.353 59.353 59.324 59.333 59.342 59.342 59.342 59.342 59.342 59.343 59.242 59.342 59.343 59.242 59.343 59.242 59.343 59.242 59.342 59.342 59.342 50.071 6.37 6.37 6.37 7.54 9.095 9.095 9.095 9.095 9.095 9.095 9.214 10.669 12.149 12.149 12.149 12.149 13.548 13.548 13.548 13.509 15.106 15.302 16.572	168 167 167 167 167 167 167 167 167 167 167	4 287 59 388 59 287 59 287 59 287 59 287 59 287 59 287 59 273 59 43 59 273 59 43 59 424 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 49 829 49 819 400 819 400 400 400 4000 40000000000000000000		% CS12.75 % CS13 % CS13 Laramie % CS13.25 % CS13.25 % CS13.5 % CS13.75 % CS14.75 % CS14 Laramie % CS14 Laramie % CS14.25 % CS14.25 % CS14.5 % CS14.5 % CS14.5 % CS14.75 % CS14.75 % CS14.75 % CS15 Laramie % CS15 Laramie % CS15 Laramie % CS16 Laramie % CS16 Laramie % CS16 Laramie % CS16.5	5 4 217 24 217 24 218 24 217 24 217 24 217 24 217 24 218 24 217 22 218 24 218 24 218 24 218 24 218 24 218 24 218 24 218 24 219 218 210 217 217 22 217 24 218 24 217 22 217 24 217 25 217 21 217 21 217 21 217 21	2 64 2 2 2 2 2 65 26 63 29 63 29 63 29 64 26 63 29 63 29 64 26 22 21 61 10 20 20 61 20 961 20 101 17 1161 17 150 17 161 16 161 16 17 16 17 16 17 16 17 17 18 56 17 17 101 21 17 13 49 20	Size 122 RD 11 211 RD 12 211 RD 12 12 RD 15 190 RD 15 190 RD 11 201 KC 12 195 KC 13 195 KC 14 170 KC 15 201 KC 10 203 KC 11 196 KC 12 174 KC 13 145 KC 14 166 KC 15 KC 19 14 166 KC 13 145 KC 14 156 KC 15 175 KC 14 183 KC 15 175 KC 14 187 KC 15 175 KC 14 147	0 5m 0 5m 0 5m 0 5m 0 4m 0 4m	Recovery postion missing - set to be same as deploy did have lon at 167 59.23 Operations are back on! Repeat station for CS13. Placed zip ties on exhaust end of SBE 43 system 2 to secure them better (as per suggested by Seabird) Had one of the larger rolls we've seen in the cruise so far (knocked a viny float out of the wire basket on the 01 deck, could hear it rolling around from the lab). No e Swell seems to be shrinking a bit; hopeful the trend will continue CTD came out of the water before going down. Returned to soak depth and started a new cast to be safe. Data seems all good even after surface breach in cast before CTD moved a bit under the stern, but we couldn't "bump forward" since the pumping sample had already started.

20210713 523 5 25	1 36.7	68	18.021	167	3.066		% CS17 Laramie	5	35	17.5	139 KC	0 3m	
20210713 531 5 25	2 37.2	68	18.161	167	3.105		% CS17 Laramie	5	55		137 KC	0.511	
	1 32.4	68	18.854	166	57.823		% CS18	216	247		151 KC	0 2m	
	2 33	68	18.902	166	58.159		% CS18				144 KC		
	1 25.7 2 26.2	68 68	19.873 19.928	166 166	52.483 52.843		% CS19 % CS19	21/	241		134 KC 148 KC	0 1.5m	
	1 35.4	68	22.411	167			% NPH1	217	250		137 JG	0 2m	
	2 35.7	68	22.555	167	8.235	0	% NPH1			22	179 JG		
	1 40	68	22.662	167	11.275		% NPH2	217	256		175 JG	0 2m	
	2 39.7 1 39.8	68 68	22.791 22.871	167 167	11.28 14.595		% NPH2 % NPH3	247	256		141 JG 148 IG	0.2	
	1 39.8 2 39.6	68	22.8/1 22.952	167	14.595	-	% NPH3 % NPH3	21/	256		148 JG 141 JG	0 3m	
	1 40.1	68	23.11	167	18.024		% NPH4	217	256		136 JG	0 3m	
	2 39.6	68	23.218	167	18.001	0	% NPH4				178 JG		
	1 41.8	68	23.357	167	21.527		% NPH5	216	258		129 JG	0 3m	
	2 41.2 1 46	68 68	23.49 23.804	167 167	21.5 28.167		% NPH5 % NPH6	217	263		172 JG 138 JG	0 3m	
	2 46.1	68	23.882	167	28.26		% NPH6	217	205		166 JG	0 511	
	1 49.1	68	24.284	167	34.963		% NPH7	216	264		145 JG	0 4m	
	2 49.3	68	24.36	167	35.104		% NPH7				137 JG		
	1 51.3 2 51.2	68 68	24.768 24.885	167 167	41.723 41.719		% NPH8 % NPH8	217	267		135 JG 186 JG	0 3m	Wildfire smoke most of the morning
	2 51.2 1 52.5	68	24.885	167	41.719	-	% NPH8 % NPH9	217	268		186 JG 140 JG	0 4m	
	2 52.7	68	25.274	167	48.549		% NPH9	217	200		128 JG	0	
20210713 1036 1 133	1 52.7	68	25.728	167	55.204	0	% NPH10	217	268		143 JG	0 4m	
	2 53	68	25.851	167	55.151		% NPH10				120 JG		
	1 52.1 2 51.8	68 68	26.229 26.306	168 168	1.927 1.867		% NPH11 % NPH11	217	267		169 JG 153 JG	0 4m	
	2 51.8 1 51	68	26.306	168	8.796		% NPH11 % NPH11.5	217	265		153 JG 154 JG	0 4m	Vent plug for T1/C1 didn't drain. Cleaned both after Cast 135
	2 50.7	68	26.809	168	8.682		% NPH11.5	/	200		161 JG		
20210713 1151 1 136	1 50.7	68	27.132	168	15.598	0	% NPH12	217	264	4.9	121 JG	0 4m	Vent plug drained after cleaning
	2 50.4	68	27.181	168	15.76		% NPH12				138 JG		
	1 51.3 2 51.2	68 68	27.596 27.672	168 168	22.217 22.235		% NPH12.5 % NPH12.5	217	264		111 JG 121 JG	0 4m	
	1 50.7	68	28.948	168			% NPH12.5	216	264		141 JG	0 4m	
	2 50.6	68	28.997	168	28.173		% NPH13				123 JG		
	1 50.8	68	37.036	167	40.988		% CD14	217	262		135 RJD	1 2M	
	2 50.8	68	37.121	167	40.991		% CD14	240	261		162 RJD 157 RJD	1 3m	
	1 49.4	68	36.884	167	35.696	0	% CD13	218					
		69	26 904	167	25 6 4 1	0			201			1 5111	
	2 49.3 1 47.5	68 68	36.894	167 167	35.641 29.911		% CD13 % CD12	218		8	153 RJD		
20210713 1553 1 141	2 49.3 1 47.5 2 47.8		36.894 36.96 37.027	167 167 167		0	% CD13 % CD12 % CD12	218	261	8 11		1 3m	
20210713 1553 1 141 20210713 1557 1 141 20210713 1613 1 142	1 47.5 2 47.8 1 45.1	68 68 68	36.96 37.027 36.961	167 167 167	29.911 29.902 24.435	0 0 0	% CD12 % CD12 % CD11			8 11 12 10	153 RJD 148 RJD 131 RJD 137 RJD		
20210713 1553 1 141 20210713 1557 1 141 20210713 1613 1 142 20210713 1618 1 142	1 47.5 2 47.8 1 45.1 2 45.1	68 68 68 68	36.96 37.027 36.961 37.012	167 167 167 167	29.911 29.902 24.435 24.501	0 0 0 0 0	% CD12 % CD12 % CD11 % CD11	218	261 257	8 11 12 10 11	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD	1 3m 1 2m	
20210713 1553 1 141 20210713 1557 1 141 20210713 1613 1 142 20210713 1613 1 142 20210713 1634 1 143	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3	68 68 68 68 68	36.96 37.027 36.961 37.012 37.011	167 167 167 167 167	29.911 29.902 24.435 24.501 18.65	0 0 0 0	 % CD12 % CD12 % CD11 % CD11 % CD10 	218	261	8 11 12 10 11 12	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD	1 3m	
20210713 1553 1 141 20210713 1557 1 141 20210713 1613 1 142 20210713 1618 1 142 20210713 1618 1 142 20210713 1614 1 143 20210713 1640 1 143	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1	68 68 68 68	36.96 37.027 36.961 37.012 37.011 37.001	167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54	0 0 0 0 0 0	 % CD12 % CD12 % CD11 % CD10 % CD10 % CD10 	218	261 257 254	8 11 12 10 11 12 13	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD	1 3m 1 2m 1 3m	
20210713 1553 1 141 20210713 1555 1 141 20210713 1613 1 142 20210713 1618 1 142 20210713 1634 1 143 20210713 1634 1 143 20210713 1654 1 143	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3	68 68 68 68 68 68 68	36.96 37.027 36.961 37.012 37.011	167 167 167 167 167	29.911 29.902 24.435 24.501 18.65	0 0 0 0 0 0 0	 % CD12 % CD12 % CD11 % CD11 % CD10 	218	261 257	8 11 12 10 11 12 13 13	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD	1 3m 1 2m	
20210713 1553 1 141 20210713 1555 1 141 20210713 1613 1 142 20210713 1613 1 142 20210713 1614 1 143 20210713 1640 1 143 20210713 1654 1 144 20210713 1654 1 144 20210713 1654 1 144 20210713 1713 1 145	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1	68 68 68 68 68 68 68 68 68 68 68	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98	167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749	0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD11 % CD10 % CD10 % CD9 % CD9 % CD9 % CD9 % CD9	218 218 218	261 257 254	8 11 12 10 11 12 13 13 13 13 12	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 18 RJD 151 RJD	1 3m 1 2m 1 3m	
20210713 1553 1 141 20210713 1557 1 141 20210713 1613 1 142 20210713 1618 1 142 20210713 1618 1 143 20210713 1640 1 143 20210713 1654 1 144 20210713 1658 1 144 20210713 1658 1 144 20210713 1658 1 145 20210713 1718 1 145	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 36.1	68 68 68 68 68 68 68 68 68 68 68 68	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98 37.05	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 7.182	0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD9 % CD8 % CD8	218 218 218 218 218	261 257 254 252 249	8 11 12 10 11 12 13 13 13 13 12 10	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 18 RJD 151 RJD 120 RJD	1 3m 1 2m 1 3m 1 2m 1 2m	
20210713 1553 1 141 20210713 1557 1 141 20210713 1613 1 142 20210713 1613 1 142 20210713 1618 1 142 20210713 1634 1 143 20210713 1634 1 143 20210713 1658 1 144 20210713 1558 1 144 20210713 1713 1 145 20210713 1773 1 1465	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 36.1 1 34.7	68 68 68 68 68 68 68 68 68 68 68	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98 37.05 36.962	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 7.182 2.269	0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD9 % CD8 % CD8 % CD8 % CD7	218 218 218 218 218	261 257 254 252	8 11 12 10 11 12 13 13 13 13 12 10 10	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 18 RJD 151 RJD 120 RJD 167 RJD	1 3m 1 2m 1 3m 1 2m	
20210713 1553 1 141 20210713 1557 1 141 20210713 1613 1 142 20210713 1618 1 142 20210713 1618 1 143 20210713 1640 1 143 20210713 1654 1 144 20210713 1654 1 144 20210713 1718 1 145 20210713 1718 1 145 20210713 1718 1 146 20210713 1773 1 146	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 36.1	68 68 68 68 68 68 68 68 68 68 68 68 68	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98 37.05	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 7.182	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD9 % CD8 % CD8	218 218 218 218 218 218	261 257 254 252 249	8 11 12 10 11 12 13 13 13 13 13 12 10 10 10 12	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 18 RJD 151 RJD 120 RJD	1 3m 1 2m 1 3m 1 2m 1 2m	
20210713 1553 1 141 20210713 1557 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1618 1 142 20210713 1634 1 143 20210713 1634 1 144 20210713 1658 1 144 20210713 1718 1 145 20210713 1718 1 145 20210713 1718 1 146 20210713 1713 1 146 20210713 1731 1 146 20210713 1733 1 146 20210713 1735 1 147	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 36.1 1 34.7 2 34.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98 37.05 36.962 37.027	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 7.182 2.269 2.058		% CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD10 % CD19 % CD9 % CD8 % CD7 % CD7	218 218 218 218 218 218	261 257 254 252 249 246	8 11 12 10 11 12 13 13 13 13 13 12 10 10 10 12 9	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 151 RJD 151 RJD 120 RJD 167 RJD 142 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m	
20210713 1553 1 141 20210713 1555 1 141 20210713 1613 1 142 20210713 1618 1 142 20210713 1618 1 142 20210713 1634 1 143 20210713 1654 1 144 20210713 1713 1 145 20210713 1713 1 145 20210713 1713 1 145 20210713 1713 1 146 20210713 1735 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 147 20210713 1810 1 148	47.5 47.8 45.1 45.1 42.3 42.1 38.8 39 36.1 34.7 33.4 33.4 32.4	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98 37.02 36.98 37.02 36.962 37.027 36.958 37.006 36.982	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 51.13		% CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD9 % CD9 % CD8 % CD7 % CD6 % CD5	218 218 218 218 218 218 218	261 257 254 252 249 246	8 11 12 10 11 12 13 13 13 13 12 10 10 10 10 2 9 12 2 12	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 18 RJD 151 RJD 151 RJD 167 RJD 142 RJD 145 RJD 170 RJD 178 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m	
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1614 1 143 20210713 1634 1 143 20210713 1658 1 144 20210713 1558 1 144 20210713 1718 1 145 20210713 1731 1 146 20210713 1735 1 146 20210713 1735 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 147 20210713 1754 1 148 20210713 1814 1 148	47.5 47.8 2 45.1 1 42.3 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 34.7 1 33.4 2 32.3	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98 37.05 36.962 37.027 36.958 37.006 36.958 37.006	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913		% CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD9 % CD9 % CD8 % CD7 % CD6 % CD6 % CD5 % CD5	218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 248 245	8 11 12 10 11 12 13 13 13 13 13 12 10 10 10 12 9 9 2 12 12 7	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 151 RJD 151 RJD 120 RJD 151 RJD 120 RJD 142 RJD 145 RJD 170 RJD 178 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 36.1 1 36.1 2 34.7 1 33.4 2 32.4 2 32.4 32.4 32.4 1 31.8	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98 37.05 36.962 37.027 36.958 37.005 36.958 37.006 36.982	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.49		% CD12 % CD11 % CD11 % CD10 % CD9 % CD8 % CD7 % CD6 % CD5 % CD4	218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248	8 11 12 10 11 12 13 13 13 13 13 13 12 10 10 10 12 9 9 212 12 7 7	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 155 RJD 154 RJD 151 RJD 151 RJD 167 RJD 142 RJD 145 RJD 145 RJD 170 RJD 178 RJD 121 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m	
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1618 1 142 20210713 1634 1 143 20210713 1654 1 144 20210713 1658 1 144 20210713 1718 1 145 20210713 1718 1 145 20210713 1731 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 147 20210713 1750 1 148 20210713 1810 1 148 20210713 1814 1 148 20210713 1833 1 149 20210713 1833 1 149	47.5 47.8 2 45.1 1 42.3 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 34.7 1 33.4 2 32.3	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.98 37.05 36.962 37.027 36.958 37.006 36.958 37.006	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913		% CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD9 % CD9 % CD8 % CD7 % CD6 % CD6 % CD5 % CD5	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 248 245	8 11 12 10 11 12 13 13 13 13 13 13 13 13 12 10 00 10 10 12 9 9 12 12 7 7 5 8	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 151 RJD 151 RJD 120 RJD 151 RJD 120 RJD 142 RJD 145 RJD 170 RJD 178 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 45.1 1 42.3 2 42.1 38.8 39 1 36.1 2 36.1 3.47 34.7 2 33.4 2 33.4 1 32.4 2 32.3 1 31.8 2 31.6	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 36.982 37.025 36.962 37.027 36.956 37.006 36.962 37.006 36.982 37.032 36.982	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.129 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.49 45.175		% CD12 % CD11 % CD11 % CD10 % CD3 % CD8 % CD7 % CD7 % CD6 % CD5 % CD5 % CD4 % CD4	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 245 246	8 11 12 10 11 12 13 13 13 13 12 10 10 10 10 10 12 9 9 12 12 7 7 15 8 8 13 12	153 RJD 148 RJD 131 RJD 137 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 174 RJD 174 RJD 120 RJD 178 RJD 142 RJD 178 RJD 121 RJD 128 RJD 178 RJD 180 RJD 180 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m	
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1614 1 143 20210713 1634 1 143 20210713 1658 1 144 20210713 1558 1 144 20210713 1718 1 145 20210713 1738 1 145 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 148 20210713 1750 1 148 20210713 1814 1 148 20210713 1823 1 148 20210713 1824 1 148 20210713 1823 1 149 20210713 1823 1 149	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 1 36.1 2 34.7 1 33.4 2 33.4 2 32.3 1 31.8 2 31.1 2 31.1 3 30.1	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 36.946 37.024 36.946 37.024 36.986 37.025 36.962 37.027 36.982 37.026 37.027 36.982 37.022 36.982 37.022 36.982 37.024 37.024 37.001 37.082	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749 2.058 56.7 56.491 51.13 50.913 45.49 45.175 40.022 39.619		% CD12 % CD11 % CD11 % CD10 % CD9 % CD8 % CD7 % CD6 % CD6 % CD5 % CD5 % CD4 % CD3 % CD3 % CD2	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 245 246	8 11 12 10 11 12 13 13 13 13 13 12 10 10 10 12 9 12 27 7 15 8 13 13 29 9	153 RJD 148 RJD 131 RJD 137 RJD 137 RJD 155 RJD 120 RJD 154 RJD 151 RJD 151 RJD 151 RJD 151 RJD 167 RJD 167 RJD 178 RJD 178 RJD 180 RJD 180 RJD 160 RJD 160 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 36.946 37.024 36.982 37.024 36.982 37.027 36.982 37.027 36.982 37.026 36.982 37.024 37.024 37.004 37.002 36.975 36.975	167 167 167 167 167 167 167 167 167 166 166	29.911 29.902 24.435 24.501 18.65 18.54 13.286 13.129 7.749	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD9 % CD8 % CD8 % CD7 % CD7 % CD6 % CD6 % CD5 % CD4 % CD4 % CD3 % CD2	218 218 218 218 218 218 218 218 218 218	261 257 254 249 246 248 245 246 246 246 245	8 11 12 10 11 12 13 13 13 13 13 12 10 10 10 2 9 12 2 7 7 15 8 13 13 2 9 10	153 RJD 148 RJD 131 RJD 137 RJD 140 RJD 155 RJD 120 RJD 174 RJD 174 RJD 151 RJD 151 RJD 152 RJD 167 RJD 178 RJD 160 RJD 160 RJD 190 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 37.02 37.02 36.982 37.025 36.982 37.025 36.982 37.027 36.982 37.022 36.982 37.024 37.001 37.024	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 13.24 13.286 13.129 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.49 45.49 45.175 40.022 39.619 34.521 34.174 29.025	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD3 % CD3 % CD2 % CD2 % CD1	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 246	8 11 12 10 11 12 13 13 13 13 13 12 10 0 10 12 9 12 12 12 12 12 13 13 13 13 13 13 13 12 10 10 10 10 10 10 10 10 10 10	153 RJD 148 RJD 131 RJD 131 RJD 140 RJD 155 RJD 120 RJD 120 RJD 120 RJD 151 RJD 151 RJD 167 RJD 142 RJD 142 RJD 147 RJD 170 RJD 178 RJD 178 RJD 178 RJD 178 RJD 178 RJD 180 RJD 180 RJD 167 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m	
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1614 1 143 20210713 1634 1 143 20210713 1640 1 143 20210713 1658 1 144 20210713 1718 1 145 20210713 1731 1 146 20210713 1735 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 148 20210713 1814 1 148 20210713 1814 1 148 20210713 1823 1 149 20210713 1825 1 150 20210713 1825 1 150	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 34.7 1 33.4 2 32.3 1 31.8 2 31.6 1 31.1 2 30.1 2 20.1 2 30.1 2 26.8	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 36.946 37.024 36.98 37.024 36.982 37.027 36.982 37.027 36.982 37.027 36.982 37.005 36.982 37.005 36.982 37.024 37.024 37.021 36.982 37.024 37.021 37.024 37.024 37.021	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.91 51.13 50.913 45.175 40.022 39.619 34.521 34.174 29.022 88.727	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD9 % CD8 % CD7 % CD6 % CD6 % CD5 % CD5 % CD4 % CD3 % CD2 % CD2 % CD1 % CD1	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 246 245 245	8 11 12 10 11 13 13 13 13 13 13 10 10 10 10 12 9 12 12 12 12 13 13 13 13 13 13 13 13 13 13	153 RJD 148 RJD 148 RJD 131 RJD 155 RJD 155 RJD 155 RJD 120 RJD 174 RJD 151 RJD 151 RJD 151 RJD 167 RJD 142 RJD 142 RJD 145 RJD 145 RJD 145 RJD 145 RJD 178 RJD 180 RJD 160 RJD 160 RJD 160 RJD 167 RJD 180 RJD 167 RJD 180 RJD 170 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m	
20210713 1553 1 141 20210713 1557 1 141 20210713 1613 1 142 20210713 1618 1 142 20210713 1618 1 143 20210713 1658 1 143 20210713 1658 1 144 20210713 1658 1 144 20210713 1713 1 145 20210713 1738 1 145 20210713 1731 1 146 20210713 1735 1 146 20210713 1756 1 147 20210713 1814 1 148 20210713 1814 1 148 20210713 1845 1 149 20210713 1845 1 168 20210713 1845 1 150 20210713 1850 1 151	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 34.7 1 33.4 2 32.3 1 31.8 2 31.0 1 30.1 2 30.1 2 26.8	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 37.02 37.02 36.986 37.027 36.988 37.005 36.982 37.027 36.988 37.006 36.982 37.022 36.982 37.024 37.001 37.024	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 24.501 18.65 13.24 13.286 13.129 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.49 45.49 45.175 40.022 39.619 34.521 34.174 29.025	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD3 % CD3 % CD2 % CD2 % CD1	218 218 218 218 218 218 218 218 218 218	261 257 254 249 246 248 245 246 246 246 245	8 11 12 10 11 13 13 13 13 13 13 10 10 10 10 12 9 12 12 12 12 13 13 13 13 13 13 13 13 13 13	153 RJD 148 RJD 131 RJD 131 RJD 140 RJD 155 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 121 RJD 127 RJD 127 RJD 127 RJD 128 RJD 128 RJD 128 RJD 129 RJD 140 RJD 157 RJD 157 RJD 157 RJD 150 RJD 150 RJD 157 RJD 177 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m	
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1614 1 143 20210713 1658 1 144 20210713 1658 1 144 20210713 1658 1 144 20210713 1738 1 145 20210713 1731 1 145 20210713 1733 1 146 20210713 1733 1 146 20210713 1733 1 147 20210713 1750 1 147 20210713 1814 1 148 20210713 1829 1 149 20210713 1845 1 150 20210713 1806 1 151 20210713 1902 1 151	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 37.012 37.011 37.001 36.946 37.024 36.98 37.025 37.027 36.982 37.027 36.982 37.027 36.982 37.026 37.024 37.022 36.982 37.024 37.021 36.982 37.021 37.021 37.021 36.982 37.021 37.021 37.021 36.982 37.021 37.0	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 51.13 45.49 45.175 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.037	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD9 % CD8 % CD7 % CD7 % CD6 % CD6 % CD5 % CD5 % CD3 % CD2 % CD2 % CD1 % CD1 % LIS1 % LIS1 Laramie	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 246 245 245	8 8 111 12 112 113 133 113 112 112 110 112 112 112 112 112 112 112	153 RJD 148 RJD 131 RJD 131 RJD 140 RJD 155 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 121 RJD 121 RJD 121 RJD 127 RJD 124 RJD 127 RJD 128 RJD 127 RJD 128 RJD 127 RJD 160 RJD 160 RJD 160 RJD 160 RJD 177 RJD 177 RJD 177 RJD 177 RJD 177 RJD 177 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m	Put out 30m of tubing by mistake, hit the bottom. Pulled up to 25m before turning on pump
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1618 1 142 20210713 1634 1 143 20210713 1654 1 144 20210713 1658 1 144 20210713 1718 1 145 20210713 1731 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 147 20210713 1750 1 148 20210713 1830 1 148 20210713 1833 1 149 20210713 1835 1 150 20210713 1835 1 151 20210713 1920 1 151	1 47.5 2 47.8 1 45.1 1 45.1 1 42.3 2 42.1 1 38.8 2 39.1 1 36.1 2 34.7 2 34.7 2 34.7 2 34.7 2 31.2 3 31.2 2 30.1 2 30.1 2 30.1 2 30.1 2 26.7 2 26.7 2 26.7 2 26.7 2 26.5 2 26.4	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 37.025 37.025 36.982 37.025 37.025 36.982 37.027 36.988 37.006 36.982 37.024 37.001 37.024 37.	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 45.49 45.175 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.037 20.051 20.051	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD10 % CD3 % CD5 % CD4 % CD3 % CD2 % CD1 % CD1 % CD1 % LS1 Laramie % LS1 Laramie	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 245 246 246 245 246 245 242 240 25	8 8 111 12 100 111 121 133 133 132 100 100 100 122 17 7 7 7 133 132 134 133 135 133 122 133 133 33 333 33	153 RJD 148 RJD 131 RJD 131 RJD 140 RJD 155 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 127 RJD 145 RJD 145 RJD 147 RJD 148 RJD 178 RJD 178 RJD 178 RJD 178 RJD 178 RJD 180 RJD 178 RJD 160 RJD 160 RJD 167 RJD 167 RJD 177 RJD 178 RJD 177 RJD 177 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJD 178 RJD 177 RJD 178 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJD 178 RJD 178 RJD 177 RJD 178 RJD 178 RJD 178 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJD 177 RJD 178 RJ	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m	Put out 30m of tubing by mistake, hit the bottom. Pulled up to 25m before turning on pump
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1613 1 143 20210713 1634 1 143 20210713 1640 1 143 20210713 1658 1 144 20210713 1718 1 145 20210713 1731 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 148 20210713 1750 1 148 20210713 1824 1 148 20210713 1823 1 148 20210713 1825 1 150 20210713 1825 1 150 20210713 1902 1 151	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 36.946 37.024 36.98 37.027 36.982 37.027 36.982 37.027 36.982 37.023 36.982 37.023 36.982 37.024 37.024 37.024 37.024 37.024 37.024 37.025 37.024 37.024 37.025 37.024 37.025 37.046 37.025 37.025 37.046 37.025 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.055 37.04537.045 37.045 37.045 37.04537.0	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.075 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.031 20.051 20.011 24.958	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD10 % CD2 % CD3 % CD3 % CD2 % CD1 % CD1 % CD1 % CD1 % LIS1 % LIS1 Laramite % LIS2	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 246 246 246 245 242	8 8 111 12 100 11 12 13 13 13 141 12 15 12 12 12 12 12 12 12 12 12 13 13 13 3 3 3 3 3 3 3 4 4	153 RJD 148 RJD 148 RJD 131 RJD 155 RJD 155 RJD 155 RJD 150 RJD 151 RJD 151 RJD 151 RJD 151 RJD 154 RJD 154 RJD 167 RJD 142 RJD 142 RJD 145 RJD 145 RJD 145 RJD 145 RJD 160 RJD 160 RJD 160 RJD 160 RJD 177 RJD 44 RJD 16 RJD 14 RJD 16 RJD 17 RJD 44 RJD 16 RJD 17 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m	Put out 30m of tubing by mistake, hit the bottom. Pulled up to 25m before turning on pump
20210713 1553 1 141 20210713 1553 1 141 20210713 1563 1 142 20210713 1613 1 142 20210713 1614 1 143 20210713 1664 1 143 20210713 1658 1 144 20210713 1658 1 144 20210713 1758 1 144 20210713 1731 1 145 20210713 1731 1 146 20210713 1750 1 147 20210713 1750 1 147 20210713 1814 1 148 20210713 1829 1 149 20210713 1825 1 150 20210713 1825 1 151 20210713 1906 1 151 20210713 1923 1 152		68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 37.012 37.011 37.001 36.946 37.024 36.982 37.027 36.982 37.027 36.982 37.027 36.982 37.026 37.024 37.146 54.374 54.374 54.374	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 45.49 45.175 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.037 20.051 20.051	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD9 % CD9 % CD0 % CD0 % CD7 % CD7 % CD6 % CD6 % CD5 % CD3 % CD2 % CD1 % LIS1 % LIS1 % LIS1 Laramie % LIS2 % LIS2	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 245 246 245 242 240 25 244	8 8 11 12 10 11 12 13 13 13 12 10 10 10 10 10 12 12 12 12 12 12 12 12 13 3 14 4 4 2	153 RJD 148 RJD 131 RJD 131 RJD 140 RJD 155 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 1274 RJD 1274 RJD 1274 RJD 142 RJD 142 RJD 142 RJD 170 RJD 178 RJD 180 RJD 178 RJD 180 RJD 190 RJD 190 RJD 177 RJD 147 RJD 14 RJD 14 RJD 340 RJD 14 RJD 340 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 36.946 37.024 36.98 37.027 36.982 37.027 36.982 37.027 36.982 37.023 36.982 37.023 36.982 37.024 37.024 37.024 37.024 37.024 37.024 37.025 37.024 37.024 37.025 37.024 37.025 37.046 37.025 37.025 37.046 37.025 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.045 37.055 37.04537.045 37.045 37.045 37.04537.0	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.286 13.129 2.058 56.7 56.491 51.13 45.49 45.175 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.037 20.051 20.011 24.958	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD10 % CD2 % CD3 % CD3 % CD2 % CD1 % CD1 % CD1 % CD1 % LIS1 % LIS1 Laramite % LIS2	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 245 246 245 246 245 242 240 25 244 5	8 8 11 12 10 11 12 13 13 13 12 10 10 10 10 10 12 12 12 12 12 12 12 12 13 3 14 4 4 2	153 RJD 148 RJD 148 RJD 131 RJD 155 RJD 155 RJD 155 RJD 150 RJD 151 RJD 151 RJD 151 RJD 151 RJD 154 RJD 154 RJD 167 RJD 142 RJD 142 RJD 145 RJD 145 RJD 145 RJD 145 RJD 160 RJD 160 RJD 160 RJD 160 RJD 177 RJD 44 RJD 16 RJD 14 RJD 16 RJD 17 RJD 44 RJD 16 RJD 17 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 1 2m	Put out 30m of tubing by mistake, hit the bottom. Pulled up to 25m before turning on pump 018 water sample as well as a nutrient/trace metal sample.Laramie/Rebecca Surface sample as no finish position
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1618 1 142 20210713 1634 1 143 20210713 1654 1 144 20210713 1658 1 144 20210713 1718 1 145 20210713 1731 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 147 20210713 1750 1 148 20210713 1750 1 148 20210713 1833 1 149 20210713 1835 1 150 20210713 1835 1 151 20210713 1906 1 151	1 47.5 2 47.8 1 45.1 1 45.1 1 42.3 2 42.1 1 38.8 2 39.1 36.1 2 34.7 2 34.7 2 34.7 2 34.7 2 34.7 2 34.7 2 34.7 2 31.3 2 30.1 2 2 31.1 2 30.1 2 30.1 2 30.1 2 30.1 2 30.1 2 26.7 2 26.8 1 31.2 2 26.5 2 26.5 2 31.3 0 31.3 0 31.3 0 31.3 32.4	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 37.012 37.011 37.001 36.946 37.024 37.02 37.02 37.027 37.027 37.05 36.982 37.027 37.027 36.982 37.027 37.027 37.024 37.001 37.024 37.025 37.024 37.024 37.025 37.024 37.025 37.024 37.025 37.024 37.025 37.024 37.025 37.024 37.025 37.024 37.025 37.024 37.025 37.024 37.025 37.024 37.025 37.024 37.025	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.65 18.54 13.129 7.749 7.749 7.749 7.749 7.749 7.749 2.058 56.7 56.491 51.13 50.913 45.175 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.051 20.051 20.051 20.051 20.051 20.051 20.051 25.138 25.138 25.138	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD9 % CD8 % CD7 % CD6 % CD5 % CD5 % CD4 % CD3 % CD2 % CD1 % CD1 % LIS1 % LIS1 % LIS2 % LS2 Laramite % LS2 Laramite + water sample % LS2 Laramite + water sample % LS2	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 246 245 246 246 245 246 245 242 240 25 244 5	8 8 11 12 12 10 11 12 13 13 13 12 13 13 13 12 10 10 12 12 7 7 5 12 2 7 7 5 12 12 2 7 3 3 3 3 3 4 4 4 2 2 2 2 2 4 4	153 RJD 148 RJD 131 RJD 131 RJD 140 RJD 155 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 127 RJD 120 RJD 167 RJD 178 RJD 178 RJD 178 RJD 178 RJD 178 RJD 180 RJD 178 RJD 180 RJD 180 RJD 180 RJD 190 RJD 167 RJD 180 RJD 180 RJD 177 RJD 17 RJD 17 RJD 17 RJD 17 RJD 14 RJD 340 RJD 27 RJD 27 RJD 27 RJD 277 RJD 277 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m 0 1m	018 water sample as well as a nutrient/trace metal sample.Laramie/Rebecca
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1613 1 143 20210713 1640 1 143 20210713 1654 1 144 20210713 1658 1 144 20210713 1718 1 145 20210713 1718 1 145 20210713 1735 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1754 1 147 20210713 1835 1 148 20210713 1835 1 148 20210713 1835 1 150 20210713 1902 1 152 20210713 1905 1 151	1 47.5 2 47.8 1 45.1 1 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 36.1 3.3.4 33.4 1 32.3 1 31.8 2 31.1 3.0 31.3 2 30.1 1 26.5 2 26.7 1 26.5 2 26.7 1 31.2 31.2 21.2 2 30.1 1 26.5 2 26.7 1 31.2 2 31.3 0 31.3 1 31.4 3 31.3 1 32.4	68 68 68 <	36.96 37.027 36.961 37.012 37.001 36.946 37.024 36.982 37.027 36.982 37.027 36.982 37.027 36.982 37.023 36.982 37.023 36.982 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.025 36.975 37.046 37.024 37.024 37.024 37.024 37.025 37.024 37.025 37.024 37.027 37.046 37.022 37.046 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.027 37.026 37.027 37.026 36.982 37.027 37.026 37.027 37.026 36.982 37.027 37.026 36.982 37.027 37.026 37.027 37.026 36.982 37.027 37.026 37.027 37.026 37.027 37.027 37.026 37.027 37.027 37.026 37.027 37.026 37.027 37.027 37.026 37.027 37.	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.229 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.175 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.051 20.051 20.051 24.958 25.138 25.138 25.138	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD10 % CD2 % CD8 % CD7 % CD6 % CD5 % CD5 % CD3 % CD2 % CD1 % CD2 % LS1 % LIS1 % LIS2 % LIS2 % LIS2 % LIS3 % LIS3 % LIS3	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 246 246 246 246 245 242 240 25 242 240 25 244	8 8 11 12 12 13 13 13 12 10 13 13 12 10 10 10 12 12 13 13 14 13 15 8 8 9 9 9 10 12 13 3 3 3 3 3 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3	153 RJD 148 RJD 148 RJD 131 RJD 155 RJD 155 RJD 120 RJD 151 RJD 151 RJD 151 RJD 157 RJD 167 RJD 142 RJD 167 RJD 142 RJD 142 RJD 142 RJD 148 RJD 170 RJD 177 RJD 170 RJD 170 RJD 170 RJD 177 RJD 14 RJD 16 RJD 177 RJD 277 RJD 277 RJD 277 RJD 277 RJD 277 RJD 277 RJD	1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m 0 1m 0 1m 0 1m	018 water sample as well as a nutrient/trace metal sample.Laramie/Rebecca Surface sample, so no finish position
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1614 1 143 20210713 1658 1 144 20210713 1658 1 144 20210713 1658 1 144 20210713 1713 1 145 20210713 1731 1 146 20210713 1731 1 146 20210713 1750 1 147 20210713 1751 1 147 20210713 1814 1 148 20210713 1814 1 148 20210713 1825 1 149 20210713 1845 1 150 20210713 1906 1 151 20210713 1923 1 152	1 47.5 2 47.8 1 45.1 2 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 34.7 1 32.4 2 32.3 1 31.4 2 32.4 2 32.4 2 32.4 2 30 1 30.1 30.1 30.1 2 26.8 1 20.5 2 26.8 1 26.5 2 26.6 1 31.2 0 31.3 0 31.3 0 31.3 0 31.3 0 31.3 1 32.4 2 32.4 2 31.3 32.4 2.4	68 68 68 <	36.96 37.027 36.961 37.012 37.011 36.946 37.024 36.982 37.027 36.982 37.027 36.982 37.026 37.027 36.982 37.026 37.024 37.024 37.023 37.024 37.146 54.374 55.145 55.145 55.145	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.286 13.129 7.749 7.182 2.269 2.058 56.7 56.491 51.13 45.49 45.175 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.037 20.051 28.727 19.948 20.037 20.011 24.958 25.138 25.138 25.138 30.505 30.505	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD11 % CD11 % CD10 % CD2 % CD5 % CD5 % CD4 % CD2 % CD2 % CD1 % LIS1 % LIS1 % LIS2 % LIS2 Laramie + water sample % LIS2 Laramie+watersample	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 245 246 245 246 245 242 240 25 244 5 5	8 8 11 12 12 10 0 11 12 12 13 13 13 13 13 13 13 10 0 10 0 9 9 12 2 12 2 12 2 12 2 12 2 12 3 3 3 3 3 3 3 3 4 4 4 4 2 2 2 2 2 2 2 7 7 7 7 7 7 7 7 7	153 RJD 148 RJD 131 RJD 131 RJD 140 RJD 155 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 1274 RJD 1274 RJD 127 RJD 127 RJD 127 RJD 128 RJD 121 RJD 128 RJD 120 RJD 127 RJD 227 RJD 227 RJD 227 RJD 227 RJD 227 RJD 227 RJD 227 RJD 227 RJD 200 RJD 200 RJD 200 RJD	1 3m 1 2m 1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m 0 1m	018 water sample as well as a nutrient/trace metal sample.Laramie/Rebecca
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1618 1 142 20210713 1614 1 143 20210713 1640 1 143 20210713 1658 1 144 20210713 1718 1 145 20210713 1718 1 145 20210713 1731 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1810 1 148 20210713 1833 1 149 20210713 1833 1 149 20210713 1850 1 150 20210713 1902 1 151 20210713 1919 1 152	1 47.5 2 47.8 1 45.1 1 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 36.1 3.3.4 33.4 1 32.3 1 31.8 2 31.1 3.0 31.3 2 30.1 1 26.5 2 26.7 1 26.5 2 26.7 1 31.2 31.2 21.2 2 30.1 1 26.5 2 26.7 1 31.2 2 31.3 0 31.3 1 31.4 3 31.3 1 32.4	68 68 68 <	36.96 37.027 37.012 37.011 37.001 36.966 37.024 37.024 36.982 37.027 36.982 37.027 36.982 37.027 36.982 37.024 37.032 36.982 37.024 37.032 36.982 37.024 37.032 36.982 37.024 37.023 37.024 37.023 37.024 37.024 37.024 37.024 37.024 37.024 37.025 37.046 54.374 54.374 55.146	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 13.229 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.175 40.022 39.619 34.521 34.174 29.025 28.727 19.948 20.051 20.051 20.051 24.958 25.138 25.138 25.138	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD10 % CD2 % CD8 % CD7 % CD6 % CD5 % CD5 % CD4 % CD3 % CD2 % CD1 % CD2 % LS1 % LS1 % LS2 % LS2 % LS2 % LS3 % LS3 % LS3	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 246 246 246 246 245 242 240 25 242 240 25 244	8 8 11 12 12 13 13 13 13 13 13 13 13 13 13 13 13 13	153 RJD 148 RJD 148 RJD 131 RJD 155 RJD 155 RJD 120 RJD 151 RJD 151 RJD 151 RJD 157 RJD 167 RJD 142 RJD 167 RJD 142 RJD 142 RJD 142 RJD 148 RJD 170 RJD 177 RJD 170 RJD 170 RJD 170 RJD 177 RJD 14 RJD 16 RJD 177 RJD 277 RJD 277 RJD 277 RJD 277 RJD 277 RJD 277 RJD	1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m 0 1m 0 1m 0 1m	018 water sample as well as a nutrient/trace metal sample.Laramie/Rebecca Surface sample, so no finish position
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1613 1 143 20210713 1634 1 143 20210713 1658 1 144 20210713 1558 1 144 20210713 1718 1 145 20210713 1731 1 145 20210713 1735 1 146 20210713 1735 1 146 20210713 1750 1 147 20210713 1814 1 147 20210713 1814 1 148 20210713 1823 1 149 20210713 1823 1 149 20210713 1902 1 151 20210713 1923 1 152	1 47.5 2 47.8 1 45.1 1 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 36.1 3.4 33.4 1 31.8 2 31.1 3.0.1 2.31.6 2 31.1 1 30.1 2 30.1 2 30.1 2 30.1 2 26.5 2 26.5 2 26.5 2 26.5 2 26.5 2 26.5 2 26.5 31.3 3 32.4 3.2.4 32.3 3.3 32.4 3.3 32.4 3.2.7 32.2 32.6	68 68 68 <	36.96 37.027 36.961 37.012 37.011 36.946 37.024 36.982 37.027 36.982 37.027 36.982 37.026 37.027 36.982 37.026 37.024 37.024 37.023 37.024 37.146 54.374 55.145 55.145 55.145	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.65 18.54 13.229 7.749 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.175 40.022 39.619 34.521 34.174 29.619 34.521 34.174 20.051 20.051 20.051 20.051 25.138 25.138 30.365 30.525	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD10 % CD2 % CD8 % CD7 % CD6 % CD5 % CD5 % CD4 % CD3 % CD2 % CD1 % CD2 % LS1 % LS1 % LS2 % LS2 % LS2 % LS3 % LS3 % LS3	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 245 246 245 246 245 242 240 25 244 5 5 241 2	8 8 11 12 12 11 12 13 13 13 14 14 15 15 16 10 12 12 12 12 12 12 12 12 12 12 13 3 3 3 3 3 4 4 2 2 2 2 2 2 3 7 7 7 7 7	153 RJD 148 RJD 148 RJD 131 RJD 140 RJD 155 RJD 120 RJD 155 RJD 120 RJD 151 RJD 151 RJD 151 RJD 167 RJD 167 RJD 178 RJD 177 RJD 177 RJD 17	1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m 0 1m 0 1m 0 1m 0 1m 0 1m	018 water sample as well as a nutrient/trace metal sample.Laramie/Rebecca Surface sample, so no finish position
20210713 1553 1 141 20210713 1553 1 141 20210713 1513 1 142 20210713 1613 1 142 20210713 1640 1 143 20210713 1640 1 143 20210713 1654 1 144 20210713 1558 1 144 20210713 1718 1 145 20210713 1718 1 145 20210713 1731 1 146 20210713 1750 1 147 20210713 1754 1 147 20210713 1833 1 148 20210713 1834 1 148 20210713 1835 1 150 20210713 1902 1 151 20210713 1902 1 152 20210713 2130 1 152	1 47.5 2 47.8 1 45.1 1 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 34.7 1 33.4 1 32.4 2 31.6 2 31.1 30.1 30.1 2 30.1 31.2 31.1 20.6.7 26.5 2 26.7 2 26.7 2 26.7 2 26.7 31.2 20.7 31.2 20.7 31.3 31.3 0 31.3 1 32.4 31.3 32.4 31.3 32.7 2 32.7 2 32.7 3.97 39.7 2 39.7 2 <	68 68 68 <	36.96 37.027 36.961 37.012 37.001 37.001 36.946 37.024 37.027 36.982 37.005 36.982 37.006 36.982 37.002 36.982 37.006 36.982 37.003 36.982 37.004 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.024 37.025 35.4394 55.145 55.145 55.145	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.54 18.65 18.54 13.129 7.749 7.749 7.182 2.269 2.058 56.7 56.491 51.13 50.913 45.175 40.022 39.619 34.521 34.521 34.521 34.521 34.521 20.051 20.051 20.051 20.051 24.958 25.138 25.138 25.138 30.505 30.505 30.525 30.505 38.374 38.374 38.374 38.374	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD10 % CD2 % CD8 % CD6 % CD5 % CD4 % CD3 % CD2 % CD1 % CD1 % LS1 % LS1 taramie % LS2 % LS2 % LS2 taramie + water sample % LS3 tarami+water sample % LS3 taramie+water sample % LS4 taramie + water sample % LS4 % LS4	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 245 246 245 246 245 242 240 25 244 5 5 241 2	8 8 11 12 12 13 13 13 13 13 10 10 12 2 7 7 7 7 13 13 14 2 15 5 16 7 17 7 18 8 19 9 9 9 12 13 3 3 3 3 4 4 2 2 2 2 13 13 3 3 3 3 4 4 4 4 4 5 7 6 2 2 13.6 6	153 RJD 148 RJD 148 RJD 131 RJD 153 RJD 155 RJD 120 RJD 155 RJD 120 RJD 151 RJD 151 RJD 151 RJD 157 RJD 157 RJD 167 RJD 142 RJD 142 RJD 145 RJD 178 RJD 178 RJD 178 RJD 178 RJD 178 RJD 178 RJD 178 RJD 160 RJD 167 RJD 17 RJD 10 RJD 10 RJD 10 RJD 10 RJD 10 RJD 11 RJD 111	1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 3m 1 3m 1 3m 1 3m 1 3m 0 1m 0 1m 0 1m 0 1m 0 1m 0 1m	018 water sample as well as a nutrient/trace metal sample.Laramie/Rebecca Surface sample, so no finish position
20210713 1553 1 141 20210713 1553 1 141 20210713 1613 1 142 20210713 1613 1 142 20210713 1634 1 143 20210713 1634 1 143 20210713 1654 1 144 20210713 1658 1 144 20210713 1718 1 145 20210713 1713 1 145 20210713 1735 1 146 20210713 1750 1 147 20210713 1750 1 147 20210713 1800 1 183 20210713 1834 1 148 20210713 1834 1 148 20210713 1835 1 150 20210713 1906 1 151 20210713 1906 1 151	1 47.5 2 47.8 1 45.1 1 45.1 1 42.3 2 42.1 1 38.8 2 39 1 36.1 2 34.7 1 33.4 1 32.4 2 31.6 2 31.1 30.1 30.1 2 30.1 31.2 31.1 20.6.7 26.5 2 26.7 2 26.7 2 26.7 2 26.7 31.2 20.7 31.2 20.7 31.3 31.3 0 31.3 1 32.4 31.3 32.4 31.3 32.7 2 32.7 2 32.7 3.97 39.7 2 39.7 2 <	68 68 68 68 68 68 68 68 68 68 68 68 68 6	36.96 37.027 36.961 37.012 37.011 37.001 36.946 37.024 37.02 37.025 37.025 37.025 37.025 37.025 37.025 37.025 37.026 37.022 36.982 37.022 37.024 37.021 37.022 37.024 37.021 37.024 37.021 37.022 37.024 37.021 37.024 37.021 37.024 37.021 37.025 37.024 37.022 37.024 37.022 37.024 37.021 37.025 37.024 37.025 37.0	167 167 167 167 167 167 167 167 167 167	29.911 29.902 24.435 18.65 18.54 13.229 2.058 56.7 7.749 7.749 7.749 7.749 7.749 7.749 2.058 56.7 56.491 51.13 50.913 45.175 40.022 39.619 34.521 34.574 29.025 28.727 19.948 20.037 20.051 20.051 20.051 20.051 25.138 25.138 25.138 25.138 30.365 30.503 30.525 30.515 38.374	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CD12 % CD12 % CD11 % CD10 % CD10 % CD10 % CD10 % CD10 % CD10 % CD2 % CD8 % CD7 % CD6 % CD5 % CD5 % CD4 % CD3 % CD2 % CD1 % LIS1 % LIS1 % LIS1 % LIS2 % LIS2 % LIS3 % LIS3 % LIS3 % LIS4	218 218 218 218 218 218 218 218 218 218	261 257 254 252 249 246 248 245 246 245 246 245 244 245 242 242 25 244 5 5 241 25 5 241	8 8 11 12 12 13 13 13 13 13 10 10 12 2 7 7 7 7 13 13 14 2 15 5 16 7 17 7 18 8 19 9 9 9 12 13 3 3 3 3 4 4 2 2 2 2 13 13 3 3 3 3 4 4 4 4 4 5 7 6 2 2 13.6 6	153 RJD 148 RJD 148 RJD 131 RJD 140 RJD 155 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 120 RJD 127 RJD 121 RJD 138 RJD 138 RJD 138 RJD 138 RJD 144 RJD 144 RJD 146 RJD 147 RJD 147 RJD 147 RJD 148 RJD 177 RJD 180 RJD 180 RJD 177 RJD 177 RJD 177 RJD 177 RJD 177 RJD 177 RJD 177 RJD 177 RJD 177 RJD 27 RJD 27 RJD 277 RJD	1 3m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 2m 1 3m 1 2m 0 1m 0 1m 0 1m 0 1m 0 1m 0 1m	018 water sample as well as a nutrient/trace metal sample.Laramie/Rebecca Surface sample, so no finish position

11111 11111 1111 1111 1111 1111 1111 1111 1111 1111 1111 11111 1111 1111 1111 1111 11111 11111 111111 111111 111111														
Bind Bind <th< td=""><td>20210713 2344 1 158 1</td><td>L 44.7</td><td>68</td><td>56,992</td><td>166</td><td>54,588</td><td>0</td><td>% LIS6</td><td>217</td><td>259</td><td>9.9</td><td>79.2 KC</td><td>1 2m</td><td>Spike in one of the oxygen sensor on the way down. The rest of the data seemed fine. Pumps were draining fine after.</td></th<>	20210713 2344 1 158 1	L 44.7	68	56,992	166	54,588	0	% LIS6	217	259	9.9	79.2 KC	1 2m	Spike in one of the oxygen sensor on the way down. The rest of the data seemed fine. Pumps were draining fine after.
Altern Altern<														
Subs Subs <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>217</td><td>261</td><td></td><td></td><td>1.2m</td><td></td></th<>									217	261			1.2m	
Sector Sector<									217	201			1 2111	
Network Network <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>							0							
Sector Sector<									5	40			1 2m	Started pouring rain at the end of the cast, pretty much cleared up during transit to next cast
Symbol V <td>20210714 23 5 29 2</td> <td>2 45.2</td> <td>68</td> <td>57.712</td> <td>167</td> <td>2.29</td> <td></td> <td>% LIS6.5 Laramie</td> <td></td> <td></td> <td>19.3</td> <td>118 KC</td> <td></td> <td></td>	20210714 23 5 29 2	2 45.2	68	57.712	167	2.29		% LIS6.5 Laramie			19.3	118 KC		
constraint constraint <thconstraint< th=""> constraint constrai</thconstraint<>	20210714 42 1 160 1	L 45.1	68	58.186	167	9.285	0	% LIS7	217	261	11.3	114 KC	1 2m	
constraint constraint <thconstraint< th=""> constraint constrai</thconstraint<>		45.3												
Symple Symple<									217	261			1 2m	
Sympositic Symposi									217	201			1 2111	
Norm Norm <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>														
Internet Interne Internet Internet									217	259			1 2m	
Same Part Part Part Part Part Part Part Part	20210714 134 1 162 2	2 46.2	68	59.41	167	23.975	0	% LIS8			9.1	108 KC		
Same Part Part Part Part Part Part Part Part	20210714 135 5 30 1	L 45.9	68	59.409	167	23.981		% LIS8 Laramie	5	40	9.5	115 KC	1 2m	
BADDE Sinter Sinter </td <td></td> <td>45.9</td> <td></td> <td></td> <td></td> <td>24.023</td> <td></td> <td>% LIS8 Laramie</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		45.9				24.023		% LIS8 Laramie						
Sector Sector<	20210714 211 1 163 1	46.7	69	0 1 9 7	167	33 762	0	% 1158.5	217	261	5.4	344 KC	1 3m	Skinning LIS9 for the O cableLIS8 5 and LIS9 5 instead
Sector Sector<									217	201			1 5111	Suppling Liss for the Q cable List.s and List.s instead
Sector Sector<														
Same Same <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>21/</td><td>261</td><td></td><td></td><td>1 3m</td><td></td></th<>							-		21/	261			1 3m	
Sympo is														
JUNDEN Mat Mat<	20210714 317 1 165 1	L 47.9	69	1.808	167	53.397	0	% LIS10	217	260	16.2	50.3 KC	1 3.5m	
Junc Junc <th< td=""><td>20210714 321 1 165 2</td><td>2 47.8</td><td>69</td><td>1.85</td><td>167</td><td>53.464</td><td>0</td><td>% LIS10</td><td></td><td></td><td>18.5</td><td>44.3 KC</td><td></td><td></td></th<>	20210714 321 1 165 2	2 47.8	69	1.85	167	53.464	0	% LIS10			18.5	44.3 KC		
Junc J <thj< th=""> J <thj< th=""> <thj< th=""></thj<></thj<></thj<>	20210714 401 1 166 1	48.7	69	1.334	168	7.942	0	% [1511	216	261	18.4	43.5 KC	0.5 2m	
Sector Sector<														
Support Support <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>~</td><td></td><td></td><td>45</td><td></td><td></td><td>0.5.2m</td><td></td></t<>							~			45			0.5.2m	
Description 40 1 10 1 40 1 40 1 40 1 40 1 40 1 40 1 40 10									S	40			0.5 ZIII	
STOP S														
Distry 40 7 80 8 7 80 8 7 80 83 7 80 80 7 80 80 7 80 80 7 80 80 7 80 80 7 80 80 7 80 80 7 80 80 7 80 80 7 80 80 <									216	262			0.5 4m	Noticed the upcast was about equal speed (or slower) to downcast. When asked to speed up a bit, the winch seemed resistant to the idea. There was a slight hiccup
JUDD Mode Mode <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>														
JUND I	20210714 535 1 168 1	L 50.6	69	0.431	168	37.034	0	% LIS13	217	263			0 4m	Fog has cleared up into a fairly nice evening. Cast shows a nice cold/salty/turbid bottom layer in the last 5m or so.
Image: Note in the integrate of th	20210714 540 1 168 2	2 50.5	69	0.485	168	37.18	0	% LIS13			14.8	71 KC		
Sector Sector<	20210714 541 5 32 1	50.6	69	0,489	168	37,204		% LIS13 Laramie	5	5			0 4m	Filter tubing kept coming off when trying to sample at the surface, aborted bottom cast. No nutrient samples. Course of action: reattach same filter (to preserve a fi
Bottom Add B<									-					······································
Description Image							0		217	265			0.4-	Still a nice little bottom layer chowing up
Description 647 1 78 6 1 78 6 7							-		217	205			0 411	Sun a nice little bottom layer showing up.
No. 1 No. 1 No. 0 No. 0 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>														
Dep 10 min M									216	265			0 4m	Interesting warm, salty bump around 20m; looking at coordinates, it seems we sampled at the old CCL22 location (168deg 56.2')
Dotation 64 69 9 9 9 9							0							
District Bit Bi	20210714 649 5 33 1	L 51.3	69	0.042	168	56.344		% CCL22n Laramie	45	45	17.6	75.7 KC	0 4m	Bottom sample only
Description Bit 1 10 2 2 6 9.99 10 1 10 <	20210714 654 5 33 2	2 51.3	69	0.065	168	56.553		% CCL22n Laramie			18.9	74.6 KC		
D20274 B I D2 I D2 I D2 I D2 D2 <thd2< th=""> D2 <thd2< th=""> <thd2< th=""></thd2<></thd2<></thd2<>	20210714 811 1 171 1	L 51.8	68	49.939	168	55.852	0	% CCL21	217	265	15.9	99.9 JG	1 4m	
D22071 99 1 127 0 99 149 140	20210714 816 1 171 2	2 52	68	49.944	168	55.948	0	% CCL21			15.5	77.9 JG		
Data Part Part Part Part Part Part Part P	20210714 930 1 172 1	1 51.7	68	39.99	168	55.975			217	264	15	107 IG	1 4m	Fishy cast but cleared up on the upcast, Redid CTD cast at station. Next cast looks much cleaner. Missed a screenshot of 172
D2017 97 1 10 10 1 10 1 10 1 10	20210714 935 1 172 2	51.0												
Data 2 1 2 2 5 6 9 9 1 0 0 0 0 <td></td> <td></td> <td>68</td> <td>39,993</td> <td>168</td> <td>55,984</td> <td>0</td> <td></td> <td></td> <td>204</td> <td></td> <td></td> <td></td> <td></td>			68	39,993	168	55,984	0			204				
202174 101 1 14 1								% CCL20	217		11.9	98.9 JG		T/C 1 not draining. Cleaned yent olive after this sast
1000000000000000000000000000000000000	20210714 937 1 173 1	1 51.8	68	39.995	168	56.046	0	% CCL20 % CCL20 redo	217		11.9 9.6	98.9 JG 90.7 JG		T/C 1 not draining. Cleaned vent plug after this cast.
D202107 1110 1 52.4 68 25.5 168 43.56 7 87.6 74.10 1 5.2 5.6 14.5 157.6 1 52.0 68 25.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0 1 5.0 10.0	20210714 937 1 173 1 20210714 943 1 173 2	L 51.8 2 51.6	68 68	39.995 39.992	168 168	56.046 56.261	0	% CCL20 % CCL20 redo % CCL20 redo		264	11.9 9.6 8.6	98.9 JG 90.7 JG 86.4 JG	1 4m	T/C 1 not draining. Cleaned vent plug after this cast.
12107 134 1 15 1 15 1 15	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1	L 51.8 2 51.6 L 53.6	68 68 68	39.995 39.992 29.989	168 168 168	56.046 56.261 56.019	0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19		264	11.9 9.6 8.6 14.1	98.9 JG 90.7 JG 86.4 JG 112 JG	1 4m	T/C 1 not draining. Cleaned vent plug after this cast.
1 1 1 1 5 0 2 0 N NM14 217 2 1 3 1 5 0 N NM14 21 2 9 10 1 5 0 N NM15 2 7 2 50 0 N NM15 2 0 N NM15 2 0 N N<15	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 2	L 51.8 2 51.6 L 53.6 2 53.8	68 68 68 68	39.995 39.992 29.989 30.011	168 168 168 168	56.046 56.261 56.019 56.06	0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19	217	264 266	11.9 9.6 8.6 14.1 8.5	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG	1 4m 1 4m	T/C 1 not draining. Cleaned vent plug after this cast.
1 1 1 1 1 2 5 2 5 2 5 2 5	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1105 1 174 2 20210714 1129 1 175 1	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4	68 68 68 68 68	39.995 39.992 29.989 30.011 29.54	168 168 168 168 168	56.046 56.261 56.019 56.06 49.368	0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5	217	264 266	11.9 9.6 8.6 14.1 8.5 9.6	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG	1 4m 1 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2201000 127 1 51.1 68 28.6 185 57.7 0 N NPH15 27 2 50.0 1 78 1 50.6 68 28.00 18 27 2 50.0 N N 20100 125 1 78 1 50.6 68 28.00 18 20100 125 1 50.6 68 28.00 18 17 2 50.6 68 28.00 18 17 17 15 68 27.00 18 17 18 17 18 18 17 18	20210714 937 1 173 1 20210714 943 1 173 2 20210714 101 1 174 1 20210714 1105 1 174 2 20210714 1105 1 174 2 20210714 1105 1 174 2 20210714 1129 1 175 1 20210714 1134 1 175 2	L 51.8 2 51.6 L 53.6 2 53.8 L 52.4 2 52.3	68 68 68 68 68 68 68	39.995 39.992 29.989 30.011 29.54 29.564	168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579	0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5	217	264 266 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG	1 4m 1 4m 1 4.5m	T/C 1 not draining. Cleaned vent plug after this cast.
1 1 1 2 5 2 6 2 6 8 7 6 7 6 7	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1105 1 174 2 20210714 1105 1 174 2 20210714 1125 1 176 1 20210714 1134 1 175 2 20210714 1136 1 176 1	L 51.8 2 51.6 L 53.6 2 53.8 L 52.4 2 52.3 L 52	68 68 68 68 68 68 68 68	39.995 39.992 29.989 30.011 29.54 29.564	168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57	0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5	217	264 266 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG	1 4m 1 4m 1 4.5m	T/C 1 not draining. Cleaned vent plug after this cast.
2202104 1250 1 10 0 68 28.05 0 N NP13 26 5 5 67.8 0 N 2202104 135 1 178 2 55 7.8 48.16 0 N 2202104 135 1 179 2 51.3 68 27.67 18 22.160 18 18 18 15 18 22.160 18	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1105 1 174 1 20210714 1129 1 175 1 20210714 1134 1 175 2 20210714 1134 1 175 2 20210714 1136 1 176 2 20210714 1201 1 176 2	L 51.8 2 51.6 L 53.6 2 53.8 L 52.4 2 52.3 L 52 2 52	68 68 68 68 68 68 68 68	39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099	168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753	0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14	217 217 217	264 266 265 266	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 99.8 JG 94.7 JG	1 4m 1 4m 1 4.5m 1 4.5m	T/C 1 not draining. Cleaned vent plug after this cast.
2202104 125 1 19 2 0.0 68 22.00.0 68 29.00.0 68 87.00.0 68 87.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 68 19.00.0 19.00.0 19.00.0 <td< td=""><td>20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1105 1 174 1 20210714 1129 1 175 1 20210714 1134 1 175 2 20210714 1134 1 175 2 20210714 1136 1 176 2 20210714 1201 1 176 2</td><td>L 51.8 2 51.6 L 53.6 2 53.8 L 52.4 2 52.3 L 52 2 52</td><td>68 68 68 68 68 68 68 68 68 68</td><td>39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099</td><td>168 168 168 168 168 168 168 168</td><td>56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753</td><td>0 0 0 0 0 0 0 0 0</td><td>% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14</td><td>217 217 217</td><td>264 266 265 266</td><td>11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7</td><td>98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 99.8 JG 94.7 JG</td><td>1 4m 1 4m 1 4.5m 1 4.5m</td><td>T/C 1 not draining. Cleaned vent plug after this cast.</td></td<>	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1105 1 174 1 20210714 1129 1 175 1 20210714 1134 1 175 2 20210714 1134 1 175 2 20210714 1136 1 176 2 20210714 1201 1 176 2	L 51.8 2 51.6 L 53.6 2 53.8 L 52.4 2 52.3 L 52 2 52	68 68 68 68 68 68 68 68 68 68	39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099	168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753	0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14	217 217 217	264 266 265 266	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 99.8 JG 94.7 JG	1 4m 1 4m 1 4.5m 1 4.5m	T/C 1 not draining. Cleaned vent plug after this cast.
2202004 316 1 9 1 51.3 68 27.63 1.68 1.27.207	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1125 1 175 2 20210714 1134 1 175 2 20210714 1134 1 176 1 20210714 1201 1 176 2 20210714 1223 1 177 1	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52 2 52 1 52 2 52 1 51.1	68 68 68 68 68 68 68 68 68 68 68 68	39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099 28.6	168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755	0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH14	217 217 217	264 266 265 266	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2	98.9 JG 90.7 JG 86.4 JG 112 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG	1 4m 1 4m 1 4.5m 1 4.5m	T/C 1 not draining. Cleaned vent plug after this cast.
2202004 316 1 9 1 51.3 68 27.63 1.68 1.27.207	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1105 1 174 1 20210714 1105 1 176 2 20210714 1134 1 175 2 20210714 1156 1 176 1 20210714 1223 1 177 1 20210714 1223 1 177 1 20210714 1223 1 177 2	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52 2 52 1 52 2 52 1 51.1 2 51.2	68 68 68 68 68 68 68 68 68 68 68	39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099 28.6 28.681	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779	0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH14 % NPH13.5	217 217 217 217 217	264 266 265 266 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 99.7 JG 150 JG 121 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 1321 1 17 2 5.3 68 27.77 188 2.266 0 N PM12. 1 <td>20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1221 1 177 2 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1250 1 178 1</td> <td>1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52 2 52 1 51.1 2 51.2 1 50.6</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68</td> <td>39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099 28.6 28.681 28.045</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5</td> <td>217 217 217 217 217</td> <td>264 266 265 266 265</td> <td>11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5</td> <td>98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 121 JG 67.8 JG</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4m</td> <td>T/C 1 not draining. Cleaned vent plug after this cast.</td>	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1221 1 177 2 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1250 1 178 1	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52 2 52 1 51.1 2 51.2 1 50.6	68 68 68 68 68 68 68 68 68 68 68 68 68	39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099 28.6 28.681 28.045	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5	217 217 217 217 217	264 266 265 266 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 121 JG 67.8 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4m	T/C 1 not draining. Cleaned vent plug after this cast.
202074 138 1 100 1 50. 68 20.09 138 154.8 0 54 PP12 20 24 24 12 0 202074 140 1 51.8 25.43 158 154.8 0 5 PP12 25 7.3 142.6 0 202074 143.5 1 51.8 25.73 158 87.10 5 PP112 25 6 2 157.6 2 157.6 2 157.6 2 158.8 1 97.1 55.8 6 2 158.8 1 97.1 77.4 117.6 5 166.6 2 158.6 0 5 PP110 2 2 5 6 2.57.8 167.8 167.8 17.4 117.6 7 118.00 5 7 148.00 5 7 148.00 5 7 148.00 5 167.8 147.00 5 147.00 5 <td>20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1125 1 175 2 20210714 1134 1 175 2 20210714 1120 1 176 2 20210714 1223 1 177 1 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1229 1 177 1 20210714 1250 1 178 1 20210714 1250 1 178 2</td> <td>1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52 2 52 1 51.1 2 51.2 1 50.6 2 50.6</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td> <td>39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099 28.6 28.681 28.045 28.045</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5</td> <td>217 217 217 217 217 217 217</td> <td>264 266 265 265 265 265</td> <td>11.9 9.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8</td> <td>98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 99.8 JG 94.7 JG 94.7 JG 150 JG 121 JG 67.8 JG 145 JG</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m</td> <td>T/C 1 not draining. Cleaned vent plug after this cast.</td>	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1125 1 175 2 20210714 1134 1 175 2 20210714 1120 1 176 2 20210714 1223 1 177 1 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1229 1 177 1 20210714 1250 1 178 1 20210714 1250 1 178 2	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52 2 52 1 51.1 2 51.2 1 50.6 2 50.6	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099 28.6 28.681 28.045 28.045	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5	217 217 217 217 217 217 217	264 266 265 265 265 265	11.9 9.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 99.8 JG 94.7 JG 94.7 JG 150 JG 121 JG 67.8 JG 145 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 138 1 100 2 5.04 6.8 2.7.37 168 15.68 0 N NH12 0 7 106.76 0 N 2021074 1415 1 13 15.87 168 8.710 0 N NH15 7 265 7.3 142.6 0 M 2021074 1415 1 182 15.31 68 26.37 168 N NH11<	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1129 1 175 1 20210714 1126 1 176 1 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 177 2 20210714 1229 1 177 2 20210714 1229 1 178 2 20210714 1250 1 178 2 20210714 1356 1 178 1 20210714 1356 1 178 1	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52 2 52 1 51.1 2 51.1 2 51.2 1 50.6 2 50.6 1 51.3	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.54 29.069 29.099 28.6 28.681 28.045 28.045 28.045 28.045	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.57 42.753 35.755 35.779 29.082 29.338 22.181		% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5	217 217 217 217 217 217 217	264 266 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9	98.9 JG 90.7 JG 86.4 JG 112 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 121 JG 67.8 JG 145 JG 148 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 141 1 150 6 26673 168 8.7 0 N <nh15< td=""> 27 265 7.3 1266 0 N 2021074 143 1 182 1 518 68 26777 168 10 N<nh15< td=""> 27 265 51 165 100 N 2021074 141 1 182 1 518 68 2578 16 159 0 N<nh1< td=""> 27 26 52 163 140 0 N N<nh1< td=""> 27 26 51 16</nh1<></nh1<></nh15<></nh15<>	20210714 937 1 173 1 20210714 943 1 173 2 20210714 101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1129 1 175 2 20210714 1134 1 175 2 20210714 1136 1 176 2 20210714 1223 1 176 2 20210714 1223 1 177 1 20210714 1223 1 177 1 20210714 1223 1 177 1 20210714 1250 1 178 1 20210714 1255 1 178 1 20210714 1316 1 179 1 20210714 1321 1 179 2	1 51.8 2 51.6 1 53.6 2 52.4 2 52.3 1 52 2 52 1 51.1 2 52 1 51.2 2 52 2 51.2 2 50.6 2 50.6 2 51.3 2 51.3	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.564 29.069 28.069 28.681 28.045 28.045 28.046 27.613 27.677	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338 22.181 22.266		% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13 % NPH13 % NPH13 % NPH12.5	217 217 217 217 217 217 217 217	264 266 265 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 121 JG 67.8 JG 145 JG 148 JG 105 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 141 15 15 68 25.72 68 25.72 16 8 0 5 100.6 0 0 2021074 143 1 122 2 5 8 25.72 16 8 0 5 0 0 2021074 143 1 122 2 5 140 0 5 140 0 5 140 0 5 140 0 5 140 0 5 140 0 5 140 0 5 140 0 5 140 0	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1105 1 174 2 20210714 1125 1 176 2 20210714 1134 1 176 2 20210714 1221 1 176 2 20210714 1223 1 177 1 20210714 1223 1 177 1 20210714 1225 1 177 1 20210714 1225 1 177 2 20210714 1250 1 178 2 20210714 1255 1 178 2 20210714 1325 1 179 2 20210714 1321 1 179 2 20210714<	1 51.8 2 51.6 1 53.8 2 52.4 2 52.3 1 52.4 2 52 2 52 1 51.1 2 52.1 2 51.2 1 50.6 2 50.6 2 51.3 2 51.3 1 50.3	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.069 29.099 28.6 28.681 28.045 28.046 27.613 27.677 27.096	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418		% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13 % NPH13 % NPH13 % NPH12	217 217 217 217 217 217 217 217	264 266 265 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2	98.9 JG 90.7 JG 86.4 JG 112 JG 122 JG 244 JG 99.8 JG 94.7 JG 94.7 JG 150 JG 121 JG 67.8 JG 148 JG 148 JG 105 JG 112 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 435 1 182 1 518 68 25.17 168 1947 0 % NPH1 27 26 6.2 168,6 0	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1129 1 175 1 20210714 1126 1 176 1 20210714 1201 1 176 2 20210714 1221 1 177 2 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1250 1 178 1 20210714 1325 1 178 1 20210714 1326 1 179 1 20210714 1321 1 179 1 20210714 1343 1 180 1 20210714<	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.2 1 51.1 2 51.2 1 50.6 2 50.6 1 51.3 2 50.3 2 50.3 2 50.4	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099 28.6 28.681 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.096 27.137	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.57 42.753 35.759 29.082 29.338 22.181 22.266 15.418 15.681		% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12	217 217 217 217 217 217 217 217 217	264 266 265 266 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 7.9 4.8 4.2 7	98.9 JG 90.7 JG 86.4 JG 112 JG 204 JG 101 JG 99.8 JG 99.8 JG 94.7 JG 99.8 JG 94.7 JG 150 JG 121 JG 67.8 JG 67.8 JG 148 JG 105 JG 112 JG 112 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 435 1 182 1 518 68 25.17 168 1947 0 % NPH1 27 26 6.2 168,6 0	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 2 20210714 1136 1 176 2 20210714 1126 1 176 2 20210714 123 1 177 1 20210714 1231 1 176 2 20210714 1223 1 177 1 20210714 1229 1 177 1 20210714 1229 1 177 2 20210714 1250 1 178 1 20210714 1321 1 179 2 20210714 1321 1 179 2 20210714 1348 1 180 1 20210714 </td <td>1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.1 2 51.2 1 50.6 2 51.3 2 50.4 1 50.3 2 50.4 4 50.7</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td> <td>39.995 39.992 29.989 30.011 29.54 29.564 29.069 28.66 28.681 28.045 28.045 28.045 28.045 27.613 27.677 27.037 27.037 26.673</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.06 49.368 49.579 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7</td> <td></td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5</td> <td>217 217 217 217 217 217 217 217 217</td> <td>264 266 265 266 265 265 265 265</td> <td>11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7,3</td> <td>98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 150 JG 150 JG 67.8 JG 145 JG 148 JG 105 JG 112 JG 106 JG JG</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m</td> <td>T/C 1 not draining. Cleaned vent plug after this cast.</td>	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.1 2 51.2 1 50.6 2 51.3 2 50.4 1 50.3 2 50.4 4 50.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.564 29.069 28.66 28.681 28.045 28.045 28.045 28.045 27.613 27.677 27.037 27.037 26.673	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7		% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5	217 217 217 217 217 217 217 217 217	264 266 265 266 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7,3	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 150 JG 150 JG 67.8 JG 145 JG 148 JG 105 JG 112 JG 106 JG JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 1441 1 182 2 519 68 2633 168 1.833 0 % NP11 0 % 5.6 134 /G 0 4.5m 1(G) nput 10.5 as the SBE header. It's NP110. 2021074 150 1 83 1 5.31 68 25.75 107 5.18 0 % NP10 0 7.4 134 /G 0 5.6 134 /G 0 5.6 14/5 14/5 1 15.7 68 25.25 167 48.41 0 % NP10 0 5.6 142 R0 0 5.6 147 R0 0 5.6 147 R0 0 5.6 141 R0 0 5.6 147 R0 0 5.6 147 R0 0 5.6 147 R0 0 5.6 141 R0 0 5.6 141 R0 0 5.6 147 R0 0 % NP17 28 26 6 127 R0 0 5.6 148 R0 5.6 148 R0 0 5.6 148 R0 0 5.6 148 R0 148 R0 168 127	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 2 20210714 1136 1 176 2 20210714 1126 1 176 2 20210714 123 1 177 1 20210714 1231 1 176 2 20210714 1223 1 177 1 20210714 1229 1 177 1 20210714 1229 1 177 2 20210714 1250 1 178 1 20210714 1321 1 179 2 20210714 1321 1 179 2 20210714 1348 1 180 1 20210714 </td <td>1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.1 2 51.2 1 50.6 2 51.3 2 50.4 1 50.3 2 50.4 4 50.7</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td> <td>39.995 39.992 29.989 30.011 29.54 29.564 29.069 28.66 28.681 28.045 28.045 28.045 28.045 27.613 27.677 27.037 27.037 26.673</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.06 49.368 49.579 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7</td> <td></td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5</td> <td>217 217 217 217 217 217 217 217 217</td> <td>264 266 265 266 265 265 265 265</td> <td>11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7,3</td> <td>98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 150 JG 150 JG 67.8 JG 145 JG 148 JG 105 JG 112 JG 106 JG JG</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m</td> <td>T/C 1 not draining. Cleaned vent plug after this cast.</td>	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.1 2 51.2 1 50.6 2 51.3 2 50.4 1 50.3 2 50.4 4 50.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.564 29.069 28.66 28.681 28.045 28.045 28.045 28.045 27.613 27.677 27.037 27.037 26.673	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7		% CCL20 % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5	217 217 217 217 217 217 217 217 217	264 266 265 266 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7,3	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 150 JG 150 JG 67.8 JG 145 JG 148 JG 105 JG 112 JG 106 JG JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 1501 1 183 1 53.1 68 25.75.1 167 55.285 0 % NPH10 20 7.4 117 117 117 117 118 1 52.7 68 25.258 167 55.245 0 % NPH9 2 7.4 117 0 5 1 51 1 51 5 1 51 5 2.5 68 25.258 167 48.372 0 % NPH9 2 7 1118 0 5 2021074 155 1 85 2 68 25.258 167 48.372 0 % NPH8 0 5 5 1 55 15 8 24.872 167 48.479 % NPH8 0 5 6 147.870 5 147.870 % NPH7 10 8 141.870 5 8 147.870 5 8 177.870	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1101 1 175 1 20210714 1129 1 175 1 20210714 1126 1 176 1 20210714 1261 1 176 1 20210714 1201 1 176 1 20210714 1201 1 176 1 20210714 1223 1 177 2 20210714 1225 1 178 2 20210714 1356 1 179 1 20210714 1343 1 180 1 20210714 1343 1 180 1 20210714 1348 1 180 1 20210714<	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52 2 52 1 51.1 2 51.2 1 50.6 2 50.6 2 50.6 2 50.3 2 50.3 2 50.4 2 50.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.069 29.099 28.66 28.61 28.045 28.045 28.045 28.045 28.046 27.677 27.096 27.137 26.673	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.06 49.368 49.579 42.57 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7 8.611		% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH13.5 % NPH13.5 % NPH13 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5	217 217 217 217 217 217 217 217 217 217	264 266 265 265 265 265 265 265 264 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7 7.3 6.5	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 150 JG 121 JG 67.8 JG 145 JG 145 JG 145 JG 145 JG 112 JG 105 JG 112 JG 112 JG 1145 JG 145 JG 145 JG 145 JG 145 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m	T/C 1 not draining. Cleaned vent plug after this cast.
2021071 1506 1 180 2 52.0 6.8 25.85 1.0 9.8 NPH0 0 7.4 117.0 5 2021074 155 1 180 2 52.6 6.8 25.28 1.67 48.32 0 % NPH0 2 6 1.28 0 5 2021074 155 1 188 2 5.0 6.8 24.72 167 48.32 2 6 14.28 0 5 2021074 162 1 185 1 18 2 5.0 6.8 24.72 167 44.87 0 % NPH6 2 6 13.78 0 5 2021074 162 1 187 1 45.7 68 24.39 167 24.8 NPH6 2 6 13.78 0 5 3 10.5 3 23.9 167 23.89 NPH6 2 10 19.78 <td>20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 177 2 20210714 1250 1 178 1 20210714 1321 1 179 1 2 20210714 1348 1 180 2 2 20210714 1348 1 180 2 2 20210714 1348 1 181</td> <td>1 51.8 2 51.6 1 53.6 53.8 52.4 2 52.3 1 52.4 2 52 2 51.2 1 50.6 2 51.3 2 50.4 5 50.3 2 50.4 2 50.4 2 50.7 2 50.7 2 50.7 5 50.7</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td> <td>39.995 39.992 29.989 30.011 29.54 29.069 29.069 28.66 28.681 28.045 28.045 28.046 28.045 28.045 27.613 27.677 27.057 27.037 26.757 26.757</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.06 49.368 49.579 42.573 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.481 8.7 8.611 1.947</td> <td></td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5</td> <td>217 217 217 217 217 217 217 217 217 217</td> <td>264 266 265 265 265 265 265 265 264 265</td> <td>11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7 7.3 6.5 6.2</td> <td>98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 121 JG 125 JG 122 JG 121 JG 67.8 JG 145 JG 145 JG 145 JG 105 JG 112 JG 106 JG 142 JG 130 JG</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m</td> <td>T/C 1 not draining. Cleaned vent plug after this cast.</td>	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 177 2 20210714 1250 1 178 1 20210714 1321 1 179 1 2 20210714 1348 1 180 2 2 20210714 1348 1 180 2 2 20210714 1348 1 181	1 51.8 2 51.6 1 53.6 53.8 52.4 2 52.3 1 52.4 2 52 2 51.2 1 50.6 2 51.3 2 50.4 5 50.3 2 50.4 2 50.4 2 50.7 2 50.7 2 50.7 5 50.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.069 29.069 28.66 28.681 28.045 28.045 28.046 28.045 28.045 27.613 27.677 27.057 27.037 26.757 26.757	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.06 49.368 49.579 42.573 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.481 8.7 8.611 1.947		% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5	217 217 217 217 217 217 217 217 217 217	264 266 265 265 265 265 265 265 264 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7 7.3 6.5 6.2	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 121 JG 125 JG 122 JG 121 JG 67.8 JG 145 JG 145 JG 145 JG 105 JG 112 JG 106 JG 142 JG 130 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m	T/C 1 not draining. Cleaned vent plug after this cast.
2021074 1525 1 164 1 52.7 68 22.32 167 48.41 0 % MPH9 2 2 6 42.42 0 % MPH9 2 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7 7 111100 7	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1134 1 177 1 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1229 1 177 1 20210714 1229 1 178 1 20210714 1255 1 178 1 20210714 1321 1 179 2 20210714 1324 1 180 1 20210714 1343 1 180 1 20210714<	1 51.8 2 51.6 1 53.6 53.8 52.4 2 52 1 51.2 1 50.6 2 52 5 50.6 5 50.6 2 51.3 2 50.4 5 50.4 2 50.7 2 50.7 2 51.9	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.569 29.069 28.661 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.096 27.137 26.673 26.752 26.177	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.06 49.368 49.579 42.753 35.755 35.779 29.032 29.338 22.181 22.266 15.418 8.7 8.611 1.947 1.873	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL10 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5 % NPH11.5	217 217 217 217 217 217 217 217 217 217	264 266 265 265 265 265 265 265 264 265 266	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7 7.3 6.5 6.2 5.6	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 99.8 JG 99.7 JG 150 JG 121 JG 67.8 JG 145 JG 145 JG 145 JG 112 JG 105 JG 112 JG 105 JG 112 JG 105 JG 112 JG 114 JG 114 JG 113 JG 168 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m	
20210714 1355 1 184 2 52.6 68 25.258 107 48.372 0 % NPH9 1 1 N 20210714 1555 1 185 1 55 68 24.787 167 41.604 0 % NPH8 0 5m 20210714 1525 1 186 1 48.5 68 24.872 167 41.604 0 % NPH8 0 5m 20210714 1522 1 186 1 48.5 68 24.872 167 41.877 0 % NPH7 218 26 6 137 RD 0 % 20210714 1627 1 187 2 48.8 68 23.871 167 23.883 0 % NPH7 218 25 6 137 RD 0 % 20210714 1657 1 187 2 45.7 68 23.871 167 23.683 0 % NPH5 218 25 6 163 RD 0 3m 20210714 174 1 188 1 40.9 68 23.496 167 12.650 %	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1105 1 174 1 20210714 1126 1 175 1 20210714 1126 1 175 1 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1223 1 177 2 20210714 1225 1 178 1 20210714 1226 1 178 1 20210714 1326 1 179 1 20210714 1343 1 180 1 20210714 1343 1 180 2 20210714 1434 1 182 2 20210714<	1 51.8 2 51.6 1 53.6 2 53.8 4 52.4 2 52.3 4 52.4 2 52.2 1 51.3 2 51.3 2 51.3 2 50.4 5 50.7 1 51.8 2 50.7 2 51.9 5 51.3 2 50.4 5 50.7 2 51.8 2 51.9 5 51.3	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.54 29.564 29.069 29.099 28.66 28.681 28.045 28.045 28.045 28.045 27.613 27.613 27.673 27.096 27.137 26.6752 26.177 26.2575	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.57 42.753 35.779 29.082 29.082 29.082 29.082 29.082 22.181 15.611 8.7 8.611 1.947 1.847 1.847 1.847 1.847	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11 % NPH10	217 217 217 217 217 217 217 217 217 217	264 266 265 265 265 265 265 265 264 265 266	11.9 9.6 8.6 14.1 8.5 9.6 6.3 7 7.2 10.7 5 8.8 8.7.9 4.8 4.2 7.3 4.8 4.2 7.3 6.5 2 5.6 6.3	98.9 JG 90.7 JG 88.4 JG 112 JG 120 JG 120 JG 2244 JG 101 JG 99.8 JG 94.7 JG 99.8 JG 94.7 JG 99.8 JG 94.7 JG 150 JG 1121 JG 135 JG 145 JG 145 JG 106 JG 112 JG 106 JG 112 JG 112 JG 112 JG 113 JG 130 JG 134 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m	
2021074 155 1 168 1 155 1 155 1 155 1 155 1 155 1 155 2 50.9 68 24.872 167 41.64 0 % NPH8 2 2 8 141.87 0 % NPH7 2 2 6 127.80 0 % NPH7 2 2 6 127.80 0 % NPH7 2 2 6 127.80 0 % NPH6 0 5m 0 % NPH6 0 3m 0 3m 0 3m 0 3m <td>20210714 937 1 173 1 20210714 943 1 173 2 20210714 101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1129 1 175 2 20210714 1129 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1223 1 177 2 20210714 1250 1 178 1 20210714 1350 1 179 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1343 1 181 2 20210714 1445 1 181 2 20210714<!--</td--><td>1 51.8 2 51.6 2 53.8 2 52.4 2 52.3 1 52.4 2 52.3 1 52.4 2 52.3 1 51.1 2 51.2 50.6 50.6 2 50.6 2 50.4 50.3 2 2 50.7 2 50.7 2 51.9 2 51.9 2 51.9 2 51.3</td><td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td><td>39.995 39.992 39.989 29.564 29.564 29.069 28.66 28.681 28.046 27.613 27.677 27.096 27.137 26.673 26.575 26.177 26.238 25.751</td><td>168 168 168 168 168 168 168 168 168 168</td><td>56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7 8.611 1.947 1.873 55.188</td><td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11 % NPH11 % NPH11 % NPH11 % NPH11 % NPH10</td><td>217 217 217 217 217 217 217 217 217 217</td><td>264 266 265 265 265 265 265 265 264 265 266 266</td><td>11.9 9.6 8.6 14.1 9.6 9.6 10.7 6.3 7 7 5 8.8 7.9 4.8 7.9 4.8 4.2 7 7.3 6.5 6.5 6.5 6.5 6.3 7.4</td><td>98.9 JG 90.7 JG 90.7 JG 86.4 JG 112 JG 120 JG 2244 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 150 JG 150 JG 150 JG 151 JG 145 JG 145 JG 148 JG 105 JG 112 JG 106 JG 130 JG 130 JG 134 JG 134 JG</td><td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 4.5m</td><td></td></td>	20210714 937 1 173 1 20210714 943 1 173 2 20210714 101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1129 1 175 2 20210714 1129 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1223 1 177 2 20210714 1250 1 178 1 20210714 1350 1 179 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1343 1 181 2 20210714 1445 1 181 2 20210714 </td <td>1 51.8 2 51.6 2 53.8 2 52.4 2 52.3 1 52.4 2 52.3 1 52.4 2 52.3 1 51.1 2 51.2 50.6 50.6 2 50.6 2 50.4 50.3 2 2 50.7 2 50.7 2 51.9 2 51.9 2 51.9 2 51.3</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td> <td>39.995 39.992 39.989 29.564 29.564 29.069 28.66 28.681 28.046 27.613 27.677 27.096 27.137 26.673 26.575 26.177 26.238 25.751</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7 8.611 1.947 1.873 55.188</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11 % NPH11 % NPH11 % NPH11 % NPH11 % NPH10</td> <td>217 217 217 217 217 217 217 217 217 217</td> <td>264 266 265 265 265 265 265 265 264 265 266 266</td> <td>11.9 9.6 8.6 14.1 9.6 9.6 10.7 6.3 7 7 5 8.8 7.9 4.8 7.9 4.8 4.2 7 7.3 6.5 6.5 6.5 6.5 6.3 7.4</td> <td>98.9 JG 90.7 JG 90.7 JG 86.4 JG 112 JG 120 JG 2244 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 150 JG 150 JG 150 JG 151 JG 145 JG 145 JG 148 JG 105 JG 112 JG 106 JG 130 JG 130 JG 134 JG 134 JG</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 4.5m</td> <td></td>	1 51.8 2 51.6 2 53.8 2 52.4 2 52.3 1 52.4 2 52.3 1 52.4 2 52.3 1 51.1 2 51.2 50.6 50.6 2 50.6 2 50.4 50.3 2 2 50.7 2 50.7 2 51.9 2 51.9 2 51.9 2 51.3	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 39.989 29.564 29.564 29.069 28.66 28.681 28.046 27.613 27.677 27.096 27.137 26.673 26.575 26.177 26.238 25.751	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7 8.611 1.947 1.873 55.188	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11 % NPH11 % NPH11 % NPH11 % NPH11 % NPH10	217 217 217 217 217 217 217 217 217 217	264 266 265 265 265 265 265 265 264 265 266 266	11.9 9.6 8.6 14.1 9.6 9.6 10.7 6.3 7 7 5 8.8 7.9 4.8 7.9 4.8 4.2 7 7.3 6.5 6.5 6.5 6.5 6.3 7.4	98.9 JG 90.7 JG 90.7 JG 86.4 JG 112 JG 120 JG 2244 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 150 JG 150 JG 150 JG 151 JG 145 JG 145 JG 148 JG 105 JG 112 JG 106 JG 130 JG 130 JG 134 JG 134 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 4.5m	
2021074 1602 1 1602 1 1602 2 50.9 68 24.29 167 41.457 0 % NPH7 2 6 137 RD 0 % NPH7 6 127 RD 6 137 RD 0 % NPH7 6 127 RD 6 128 RD 10 190 RD 0 5 6 137 RD 0 % NPH6 28 29 10 190 RD 0 5 6 163 RD 0 5	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1101 1 175 1 20210714 1126 1 176 1 20210714 1136 1 176 1 20210714 1261 1 176 1 20210714 1221 1 177 2 2 20210714 1223 1 177 2 2 2 2 177 1 20210714 1225 1 178 2 2 2 177 1 2 2 10714 136 1 179 1 2 1 178 2 2 2 1333 1 179 1 2 2 2 1343 1 180 1	1 51.8 2 51.6 1 53.6 2 53.8 1 52.4 2 52.2 2 52.2 2 52.1 1 51.1 2 51.2 1 51.2 2 50.6 2 50.6 2 50.3 2 50.4 1 50.7 2 50.7 2 51.9 1 51.1 2 50.4 2 50.4 2 50.7 2 51.9 2 51.9 2 51.9 2 52.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.889 30.011 29.554 29.564 29.069 28.66 28.681 28.046 27.613 27.677 27.096 27.137 27.096 27.137 26.673 26.673 26.752 26.177 26.238 25.751 25.234	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.57 42.753 35.779 29.082 29.082 29.082 29.388 22.181 22.266 15.418 15.681 8.7 8.611 1.947 1.873 55.245 48.441	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14 % NPH13.5 % NPH14.5 % NPH15.5 % NPH15.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH10 % NPH10 % NPH9	217 217 217 217 217 217 217 217 217 217	264 266 265 265 265 265 265 265 264 265 266 266	11.9 9.6 8.6 14.1 9.6 9.6 10.7 6.3 7 2 10.7 5 8.8 8 7.9 4.8 7.9 4.8 7.3 6.5 6.2 5.6 6.3 6.3 7.4 6 5	98.9 JG 90.7 JG 90.7 JG 112 JG 120 JG 244 JG 111 JG 244 JG 110 JG 94.7 JG 150 JG 94.7 JG 150 JG 150 JG 145 JG 145 JG 145 JG 145 JG 145 JG 112 JG 130 JG 168 JG 134 JG 134 JG 134 JG 134 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 4.5m	
20210714 1627 1 186 1 48.5 68 24.299 167 34.87 0 % NPH7 218 262 6 137 RD 0 5m 20210714 1677 1 48.6 68 24.322 167 34.751 0 % NPH7 218 26 6 137 RD 6 5m 20210714 1677 1 457 68 23.871 167 24.83 0 % NPH6 218 29 10 10 RD 0 5m 20210714 150 1 88 1 40.9 68 23.369 167 21.82 2 6 16 RD 0 3m 20210714 174 1 188 2 40.7 68 23.46 167 21.85 0 % NPH5 28 25 6 16 RD 0 3m 20210714 174 1 189 1 40.1 68 23.468 167 14.807 % NPH4 0 3m	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1126 1 175 1 20210714 1134 1 175 1 20210714 1134 1 176 2 20210714 1221 1 177 2 20210714 1229 1 177 2 20210714 1229 1 178 1 20210714 1229 1 178 1 20210714 1321 1 179 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1435 1 182 1 20210714<	1 51.8 2 51.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.3 1 51.1 2 51.2 50.6 50.6 2 51.3 2 50.4 50.7 50.7 2 51.8 2 51.9 1 53.1 2 51.2 50.7 50.7 1 51.8 2 51.9 1 52.7 2 52.9 1 52.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 39.999 30.011 29.564 29.564 29.069 28.66 28.661 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.617 26.057 26.177 26.288 25.751 25.85 25.234	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.461 8.611 1.947 1.947 1.947 1.947 1.947 1.947 1.947 1.947	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH10 % NPH10 % NPH10 % NPH19	217 217 217 217 217 217 217 217 217 217	264 265 265 265 265 265 265 265 264 265 266 266 267 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7 7.3 6.5 6.5 6.2 5.6 6.3 7.4 6.5 6.2 5.6 6.3 7,4 7,4 7,5 6.3 7,7 7,2 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7 7,2 10.7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 120 JG 120 JG 120 JG 99.8 JG 94.7 JG 99.8 JG 94.7 JG 99.8 JG 94.7 JG 135 JG 135 JG 145 JG 145 JG 145 JG 148 JG 148 JG 130 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m 0 4.5m 0 5m	
20210714 167 186 2 48.8 68 24.372 167 34.751 0 % NPH7 1 6 127 ND N 20210714 1647 1 187 1 45.7 68 23.847 167 24.083 0 % NPH6 0 M 20210714 176 2 45.1 68 23.847 167 24.063 0 % NPH6 0 M 20210714 176 1 186 2 40.7 68 23.847 167 21.962 0 % NPH6 0 M 20210714 178 1 188 2 40.7 68 23.48 167 21.962 0 % NPH5 218 25 6 163 RD 0 3m 20210714 174 1 189 2 40.7 68 23.081 167 12.982 0 % NPH4 12 25 8 20.887D 0 3m 20210714 174	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1126 1 175 1 20210714 1134 1 175 1 20210714 1134 1 176 2 20210714 1221 1 177 2 20210714 1229 1 177 2 20210714 1229 1 178 1 20210714 1229 1 178 1 20210714 1321 1 179 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1435 1 182 1 20210714<	1 51.8 2 51.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.3 1 51.1 2 51.2 50.6 50.6 2 51.3 2 50.4 50.7 50.7 2 51.8 2 51.9 1 53.1 2 51.2 50.7 50.7 1 51.8 2 51.9 1 52.7 2 52.9 1 52.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 39.999 30.011 29.564 29.564 29.069 28.66 28.661 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.617 26.057 26.177 26.288 25.751 25.85 25.234	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.753 35.755 35.779 29.082 29.338 22.181 22.266 15.418 15.461 8.611 1.947 1.947 1.947 1.947 1.947 1.947 1.947 1.947	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH10 % NPH10 % NPH10 % NPH19	217 217 217 217 217 217 217 217 217 217	264 265 265 265 265 265 265 265 264 265 266 266 267 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 4.2 7 7.3 6.5 6.5 6.2 5.6 6.3 7.4 6.5 6.2 5.6 6.3 7,4 7,4 7,5 6.3 7,7 7,2 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7,2 10.7 7 7 7,2 10.7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 120 JG 120 JG 120 JG 99.8 JG 94.7 JG 99.8 JG 94.7 JG 99.8 JG 94.7 JG 135 JG 135 JG 145 JG 145 JG 145 JG 148 JG 148 JG 130 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m 0 4.5m 0 5m	
20210714 167 186 2 48.8 68 24.372 167 34.751 0 % NPH7 0 % NPH6 0 % % NPH6 0 % % NPH6 0 % % NPH6 0 % % NPH6<	20210714 937 1 173 1 20210714 943 1 173 2 20210714 101 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1136 1 176 2 20210714 1223 1 176 2 20210714 1223 1 177 1 20210714 1223 1 177 1 20210714 1223 1 177 1 20210714 1250 1 178 1 20210714 1316 1 179 1 20210714 1343 1 180 1 20210714 1343 1 180 2 20210714 1343 1 182 1 20210714 </td <td>1 51.8 2 51.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52 1 51.2 1 50.6 2 52 2 52 2 52 2 50.6 3 51.3 2 50.4 2 50.7 2 51.9 3 51.1 2 50.7 2 51.9 3 51.2 2 51.9 3 51.2 2 52.7 2 52.6 5 51</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td> <td>39.995 39.992 39.989 29.584 29.564 29.069 28.66 28.661 28.046 27.613 28.045 27.677 27.096 27.137 26.673 26.752 26.177 26.238 25.751 25.254 25.254 25.254</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.019 49.569 42.57 35.755 35.779 29.082 29.338 22.181 15.641 15.641 1.947 1.873 55.245 48.441 48.372</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5 % NPH10 % NPH10 % NPH9 % NPH9 % NPH9 % NPH9</td> <td>217 217 217 217 217 217 217 217 217 217</td> <td>264 265 265 265 265 265 265 265 264 265 266 266 267 265</td> <td>11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 7.9 4.8 7.3 6.5 6.2 7 7.3 6.5 6.5 6.3 7.4 6.3 7.4 8 8</td> <td>98.9 JG 90.7 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 101 JG 99.8 JG 112 JG 150 JG 121 JG 150 JG 145 JG 145 JG 145 JG 112 JG 106 JG 112 JG 106 JG 112 JG 130 JG 168 JG 134 JG 134 JG 134 JG 137 JG 134 JG 134 JG 137 JG 134 JG 134 JG 137 JG 134 JG 134 JG 137 JG 134 JG 134 JG 134 JG 137 JG 134 JG 134</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m 0 4.5m 0 5m</td> <td></td>	1 51.8 2 51.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52 1 51.2 1 50.6 2 52 2 52 2 52 2 50.6 3 51.3 2 50.4 2 50.7 2 51.9 3 51.1 2 50.7 2 51.9 3 51.2 2 51.9 3 51.2 2 52.7 2 52.6 5 51	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 39.989 29.584 29.564 29.069 28.66 28.661 28.046 27.613 28.045 27.677 27.096 27.137 26.673 26.752 26.177 26.238 25.751 25.254 25.254 25.254	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.019 49.569 42.57 35.755 35.779 29.082 29.338 22.181 15.641 15.641 1.947 1.873 55.245 48.441 48.372	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5 % NPH10 % NPH10 % NPH9 % NPH9 % NPH9 % NPH9	217 217 217 217 217 217 217 217 217 217	264 265 265 265 265 265 265 265 264 265 266 266 267 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 7.9 4.8 7.9 4.8 7.3 6.5 6.2 7 7.3 6.5 6.5 6.3 7.4 6.3 7.4 8 8	98.9 JG 90.7 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 101 JG 99.8 JG 112 JG 150 JG 121 JG 150 JG 145 JG 145 JG 145 JG 112 JG 106 JG 112 JG 106 JG 112 JG 130 JG 168 JG 134 JG 134 JG 134 JG 137 JG 134 JG 134 JG 137 JG 134 JG 134 JG 137 JG 134 JG 134 JG 137 JG 134 JG 134 JG 134 JG 137 JG 134	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 1 4m 0 4m 0 4m 0 4m 0 5m 0 5m 0 4.5m 0 5m	
20210714 167 1 187 1 187 1 187 1 187 1 187 1 187 1 187 1 187 1 187 1 187 1 187 1 187 1 187 1 187 1 187 2 28.37 167 28.083 0 % NPH6 218 2 6 16.8 RD 0 3m<	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1101 1 175 1 20210714 1126 1 175 1 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1226 1 176 2 20210714 1226 1 177 2 20210714 1226 1 178 1 20210714 1361 1 179 1 20210714 1348 1 180 1 20210714 1343 1 181 2 20210714 1435 1 182 2 20210714<	1 51.8 2 51.6 2 53.8 1 52.4 2 52.2 2 52 2 52 2 52 5 50.6 2 51.2 1 50.6 2 51.3 2 51.3 2 50.4 5 50.7 1 50.7 2 51.8 2 51.1 2 52.9 1 53.1 2 52.9 1 52.9 2 52.9 2 52.6 5 51 2 50.9	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.564 29.564 29.564 29.069 28.66 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.137 26.673 26.757 26.177 26.238 25.751 25.234 25.258 25.258 25.258 24.872	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.06 49.368 49.579 42.57 42.57 35.775 35.779 29.082 29.338 22.181 22.266 15.418 15.681 8.7 8.611 1.947 1.873 55.188 55.245 48.441 48.372 41.654	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH14 % NPH13 % NPH13 % NPH13 % NPH13 % NPH12 % NPH12 % NPH11.5 % NPH11.5 % NPH11 % NPH11 % NPH11 % NPH10 % NPH9 % NPH8	217 217 217 217 217 217 217 217 217 217	264 265 265 265 265 265 265 265 265 266 265 266 265 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 6.3 7 7.2 10.7 5 8.8 8.8 7.9 4.8 7.9 4.8 7.9 4.8 7.7 7.3 6.5 6.2 7 7.3 6.5 6.3 7.4 6.5 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 7.9 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 94.7 JG 150 JG 94.7 JG 150 JG 1121 JG 150 JG 1121 JG 145 JG 1	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m	
20210714 16 1 187 2 45.1 68 23.847 167 27.961 0 % NP6 10 191 RD 1 20210714 1709 1 188 1 40.0 68 23.369 167 21.362 0 % NP6 0 3m 20210714 1714 1 188 2 40.0 68 23.348 167 21.362 0 % NP6 0 3m 20210714 1724 1 189 2 39.6 68 23.148 167 17.892 0 % NP14 218 23 8 208 RD 0 3m 20210714 1724 1 189 2 39.6 68 23.14 167 17.892 0 % NP14 218 23 8 208 RD 0 3m 20210714 1741 1 198 8 82.028 10 7 129 RD 0 2m 20210714 1744 1 198 8	20210714 937 1 173 1 20210714 943 1 173 1 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1120 1 175 1 20210714 1129 1 175 2 20210714 1126 1 176 2 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1250 1 178 1 20210714 1325 1 178 1 20210714 1325 1 178 1 20210714 1331 1 180 2 20210714 1343 1 180 2 20210714 1343 1 182 1 20210714 1435 1 181 2 20210714<	1 51.8 2 51.6 53.8 53.6 2 52.4 2 52.4 2 52.2 1 52.4 2 52.2 1 51.2 5 50.6 2 50.6 2 50.7 2 50.7 2 51.9 2 52.9 2 52.9 2 52.9 4 50.7 2 50.7 5 5.3.1 2 52.9 3 5.1.9 3 5.1.9 4 5.5.1 2 50.9 4 48.5	68 68 68 68 68 68 68 68 68 68	39.995 39.992 39.989 29.564 29.564 29.069 28.66 28.681 28.046 27.613 27.613 27.677 27.096 27.613 27.677 26.673 26.673 26.752 26.177 26.288 25.751 25.285 25.285 25.234 25.258	168 168 168 168 168 168 168 168 168 168	56.046 56.019 56.019 49.368 49.579 42.573 35.755 35.792 29.082 29.388 22.181 15.681 8.7 8.611 1.947 1.873 55.188 55.245 48.372 41.604 41.457 34.87	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH10 % NPH9 % NPH8 % NPH8 % NPH8 % NPH7	217 217 217 217 217 217 217 217 217 217	264 265 265 265 265 265 265 265 265 266 265 266 265 265	11.9 9.6 8.6 14.1 14.1 15.7 7 7.2 10.7 7 5 8.8 8.8 7.9 4.8 7.9 4.8 7.7 5 6.2 7.3 6.5 6.2 5.6 6.3 7,4 7 7 8 8.8 6 3 7 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9.6 6 8 8 9.6 6 8 9.6 6 8 9.6 6 8 9.6 6 8 9.6 7 7 7 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8	98.9 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 101 JG 99.8 JG 112 JG 150 JG 112 JG 105 JG 112 JG 105 JG 1145 JG 1142 JG 1130 JG 134 JG 13	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m	
20210714 1708 1 188 1 40.9 68 23.369 167 21.362 0 % NPH5 218 25 6 163 RD 0 3m 20210714 1714 1 188 2 40.7 68 23.345 167 21.265 0 % NPH5 5 144 RD 5 144 RD 5 144 RD 0 3m 20210714 1724 1 189 2 3.6 68 23.14 167 17.892 0 % NPH4 218 25 8 208 RD 0 3m 20210714 174 1 190 1 39.8 68 23.14 167 17.892 0 % NPH4 218 25 2 197 RD 0 2m 20210714 174 1 190 1 39.9 68 23.023 167 14.631 0 % NPH2 2 29.7 0 2m 20210714 174 1 191 1 39.9 68	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1126 1 176 1 20210714 1136 1 176 1 20210714 1136 1 176 1 20210714 1223 1 177 2 2 20210714 1225 1 178 2 2 177 2 20210714 1326 1 179 1 2 1 178 2 2 1 178 1 179 1 2 1 179 1 2 1 180 1 2 1 181 1 2 1 181 1 2 1 1 1	1 51.8 2 51.6 2 53.8 4 52.4 2 52.2 1 51.1 2 52.2 2 51.2 1 50.6 2 51.2 2 51.2 2 51.3 2 50.4 2 50.4 2 51.9 2 51.1 2 50.4 50.3 53.1 2 52.9 1 52.1 2 52.9 2 52.4 51.1 2 2 51.9 2 52.9 2 51.9 2 50.9 4 8.8 2 48.8	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.995 29.989 30.011 29.564 29.564 29.069 28.661 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.613 27.677 27.036 27.137 26.675 26.177 26.675 26.177 26.528 25.751 25.284 25.258 25.284 25.258 24.872 24.872 24.872	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.019 49.368 49.579 42.753 35.775 35.775 35.779 29.082 29.338 22.181 22.266 15.418 15.418 15.481 8.511 1.947 1.873 55.188 55.245 48.441 48.372 41.604	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % VPH14.5 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH13.5 % NPH14.5 % NPH15.5 % NPH15.5 % NPH11.5 % NPH10 % NPH10 % NPH9 % NPH8 % NPH7	217 217 217 217 217 217 217 217 217 217	264 265 265 265 265 265 265 265 266 265 266 267 265 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 6.3 7 7 7.3 6.5 6.5 6.5 6.5 6.5 6.3 7.4 6 6.3 7.4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	98.9 JG 90.7 JG 90.7 JG 112 JG 120 JG 244 JG 111 JG 244 JG 110 JG 94.7 JG 150 JG 150 JG 150 JG 150 JG 150 JG 150 JG 145 JG 145 JG 145 JG 145 JG 145 JG 145 JG 111 JG 166 JG 145 JG 112 JG 130 JG 168 JG 134 JG 134 JG 113 JG 114 ZND 114 ZND 114 RD 113 RD 127 RD	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m 0 5m	
20210714 174 1 188 2 40.7 68 23.48 167 21.265 0 % NPH5 m 5 144 RD m	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1105 1 174 2 20210714 1126 1 175 1 20210714 1126 1 176 1 20210714 1201 1 176 1 20210714 1220 1 177 2 20210714 1220 1 177 2 20210714 1220 1 178 1 20210714 1220 1 178 1 20210714 1321 1 179 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1435 1 182 1 20210714<	1 51.8 2 51.6 53.6 53.6 2 53.8 1 52.2 2 52 2 51.2 1 50.4 2 52.2 5 51.1 2 51.2 5 51.3 2 50.7 2 50.7 2 50.7 2 50.7 2 50.7 2 52.9 1 52.1 2 52.9 1 52.7 2 50.9 4 48.5 2 50.9	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.564 29.564 29.069 28.66 28.661 28.045 29.045 29.045 29.045 29.045 29.045 29.045 29.045 29.045 28.045 28.045 28.045 28.045 27.613 27.617 26.035 27.517 26.035 25.255 26.247 26.255 27.517 26.38 25.755 25.258 24.487 25.558 25.258 24.487 25.558 25.258 24.487 25.558 25.258 24.487 25.558 25.258 24.487 25.558 25.258 24.487 25.558 25.258 24.487 25.558 25.258 24.487 25.558 25.258 24.487 25.258 25.258 24.487 25.258 25.258 24.487 25.258 25.258 24.487 25.258 25.258 24.487 25.258 25.258 24.487 25.258 24.487 25.258 24.487 25.258 25.258 24.487 25.258 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.258 24.487 25.288 24.487 25.288 24.487 25.288 24.487 25.288 24.487 25.288 24.487 25.288 24.487 25.288 24.487 25.288 24.487 25.288 24.487 25.288 24.487 25.288 25.288 24.487 25.288 25.287 25.288 25.287 25.288 25.287 25.2	168 168 168 168 168 168 168 168 168 168	56.046 56.019 56.019 49.368 49.579 42.573 35.775 35.775 35.775 29.082 29.082 29.388 22.181 22.266 15.418 15.681 15.681 15.681 1.947 1.873 55.188 55.245 48.372 48.372 41.604 41.457 34.873 34.8751 28.083		% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14 % NPH13.5 % NPH14 % NPH15.5 % NPH11.5 % NPH11.5 % NPH10 % NPH10 % NPH10 % NPH3 % NPH4 % NPH5 % NPH7 % NPH7 % NPH7 % NPH7	217 217 217 217 217 217 217 217 217 217	264 265 265 265 265 265 265 265 266 265 266 267 265 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 6.3 7 7 2 10.7 5 8.8 8 7.9 4.8 4.2 7 7 5 6.2 5.6 6.2 7.4 6 6.3 7.4 6 8 8 8 8 6 6 3 7 7 7 8 8 8 8 8 6 6 3 7 7 7 8 8 8 8 8 6 10.7 10.7 7 8 9.6 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7	98.9 JG 90.7 JG 86.4 JG 112 JG 120 JG 2244 JG 101 JG 99.8 JG 94.7 JG 150 JG 99.8 JG 150 JG 150 JG 112 JG 135 JG 145 JG 145 JG 145 JG 145 JG 136 JG 134 JG 137 JG 142 ZU 137 JG 142 ZU 137 ZU 137 RD 127 RJD 127 RJD	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m 0 5m	
20210714 1724 1 189 1 40.1 68 23.088 167 18.037 0 % NPH4 218 253 8 208 RD 0 3m 20210714 1729 1 189 2 39.6 68 23.114 167 17.892 0 % NPH4 7 192 RD 0 20210714 1741 1 198 68 23.023 167 16.7 17.892 0 % NPH4 218 25 2 2 197 RD 0 maintain the set of the set o	20210714 937 1 173 1 20210714 943 1 173 1 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1201 1 177 2 20210714 1250 1 178 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1343 1 181 2 20210714 1343 1 182 2 20210714<	1 51.8 2 51.6 53.6 53.6 2 52.4 2 52.2 1 51.2 1 51.2 2 52.2 2 52.2 1 51.2 2 50.6 2 50.6 5 51.3 2 50.7 2 50.7 5 51.9 2 52.7 2 52.7 2 52.7 2 52.7 2 52.4 4 51.9 1.2 51.9 1.2 52.7 2 52.6 5.1 2 2 52.7 2 52.6 5.1 2 2 52.6 2 52.7 2 52.7 2 52.7 2 52.4	68 68 68 68 68 68 68 68 68 68	39.995 39.992 39.989 30.011 29.564 29.564 29.069 28.66 28.681 28.045 27.613 27.613 27.677 27.096 27.613 26.777 26.38 25.751 26.377 26.38 25.752 25.284 25.258 25.234 27.637 27.238 27.237 27.238 27.237 27.238 27.237 27.238 27.237 27.238 27.237 27.238 27.237 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.2387 27.238777 27.238777 27.2387777777777777777777777777777777777	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.019 49.579 42.573 35.755 35.779 29.082 29.338 22.161 15.418 15.681 1.947 1.873 55.188 55.245 48.441 48.372 41.604 41.457 34.87 34.751 28.083 27.961	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH13 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH10 % NPH10 % NPH3 % NPH4 % NPH5 % NPH7 % NPH6	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218	264 266 265 265 265 265 265 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 3.7 7 10.7 5 8.8 8.7 7 7.3 6.5 7 7.3 6.5 6 6.3 7.4 6 6 7 7 8 8 8 8 8 8 8 6 6 6 6 10 10 7 10.7 10.7 10.7 10.7 10.7 10.7 1	98.9 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 111 JG 120 JG 93.8 JG 121 JG 150 JG 121 JG 150 JG 112 JG 150 JG 112 JG 105 JG 112 JG 105 JG 112 JG 105 JG 112 JG 105 JG 114 JG 130 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 137 RD 137 RD 127 RD 127 RD 199 RD	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m	
202107/4 174 1 189 2 39.6 6.8 23.14 167 17.892 0 % NPH4 - - 7 192.810 - 20210714 174 1 190 2 39.9 6.8 22.040 167 14.631 0 % NPH3 0 2 29.79 RD 0 2 20210714 174 1 99.9 6.8 22.002 167 14.631 0 % NPH3 0 2 2 197 RD 0 2 20210714 1744 1 91.9 6.8 22.002 167 14.631 0 % NPH3 0 2 4 2 0 2 20210714 1754 1 91.9 6.8 22.005 167 11.354 0 % NP12 2 2 14 0 1 2021074 1861 1 149.2 1 149.8 1 149.8 1 149.8 1 149.8 1 149.8 1 149.8 1 149.8 1	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1126 1 175 1 20210714 1126 1 175 1 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1226 1 178 1 20210714 1226 1 178 1 20210714 1326 1 178 1 20210714 1336 1 180 1 20210714 1343 1 180 1 20210714 1343 1 182 2 20210714 1435 1 183 1 20210714<	1 51.8 2 51.6 53.6 53.6 2 53.8 1 52.4 2 52.2 1 51.1 2 52.2 2 51.1 2 51.2 5.0.6 51.3 2 51.3 2 50.7 2 50.7 2 51.8 2 51.2 5.3.1 2 2 52.9 2 52.0 2 50.2 2 50.2 3.1 2 2 52.9 2 50.2 2 50.2 2 50.9 4 48.5 2 48.8 4 45.7 2 45.1	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.564 29.564 29.564 29.069 28.66 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.036 27.137 26.673 26.751 25.234 25.751 25.238 25.751 25.238 24.787 25.258 24.787 24.872 24.872 24.872 24.871 23.867	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.019 49.368 49.579 42.573 35.779 29.082 29.082 29.38 22.181 22.266 15.418 8.77 8.611 15.418 8.7 8.611 1.947 1.873 55.188 55.245 48.441 48.372 41.604 41.457 34.751 28.083 27.961 21.362		% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH13 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH10 % NPH10 % NPH3 % NPH4 % NPH3 % NPH4 % NPH7 % NPH6 % NPH6 % NPH5	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218	264 266 265 265 265 265 265 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 6.3 7 7 7.3 6.5 7.9 4.8 4.2 7 7.3 6.5 6.2 7 7.3 6.5 6.3 7.4 6 6.3 7.4 6 6 6 3 7.4 6 6 6 6 10 0 7 7 7 7 7 8 8 8 8 8 8 8 6 6 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7	98.9 JG 99.7 JG 90.7 JG 120 JG 120 JG 120 JG 120 JG 121 JG 94.7 JG 150 JG 94.7 JG 150 JG 150 JG 150 JG 151 JG 153 JG 145	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m	
20210714 1744 1 190 1 39.8 68 22.966 167 14.631 0 % NPH3 21 97 0 0 20 20210714 1744 1 190 2 39.9 68 23.023 167 14.645 0 % NPH3 21 20 20 0 20 20 20 14 10 0 % NPH3 21 25 2 197 RD 0 2m 20210714 1754 1 191 2 39.9 68 22.05 167 11.464 0 % NPH3 21 25 2 197 RD 0 2m 20210714 1754 1 19 2 20.5 167 11.40 0 % NPH2 0 1 4 149 RD 1 1 18 2.3 167 14.00 1 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 <td< td=""><td>20210714 937 1 173 1 20210714 943 1 173 1 20210714 1001 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1129 1 175 1 20210714 1126 1 176 1 20210714 1221 1 176 2 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1225 1 178 1 20210714 1326 1 178 1 20210714 1336 1 180 1 20210714 1348 1 180 2 20210714 1343 1 182 1 20210714 1441 1 182 1 20210714<</td><td>1 51.8 2 51.6 53.6 53.6 2 53.8 1 52.4 2 52 2 52 2 52 2 52 2 52 2 52 3 51.1 2 51.2 5.0.6 51.3 2 50.7 2 50.7 2 50.7 2 52.9 1 53.1 2 52.9 2 52.9 3 53.1 2 50.7 2 50.9 3 53.1 2 50.9 48.5 48.5 2 48.5 2 45.1 40.9 2</td><td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td><td>39.995 39.992 39.999 29.564 29.564 29.564 29.069 28.66 28.681 28.046 28.046 28.046 27.613 27.677 27.096 27.137 26.752 26.177 26.288 25.751 25.285 25.234 25.258 24.787 24.879 24.872 24.872 24.871 23.861 23.847 23.847 23.846</td><td>168 168 168 168 168 168 168 168 168 168</td><td>56.046 56.019 56.019 49.368 49.579 42.573 35.755 35.759 29.082 29.082 29.388 22.181 22.266 15.418 15.681 8.7 8.61 1.947 1.873 55.188 55.245 48.421 48.372 41.604 41.457 34.87 34.751 28.083 27.961 21.362</td><td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH14 % NPH15 % NPH16 % NPH5 % NPH7 % NPH6 % NPH5</td><td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218</td><td>264 266 265 265 265 265 265 264 265 266 266 267 265 266 263 263 263 263 263 265 259</td><td>11.9 9.6 8.6 14.1 8.5 9.6 3.3 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 5.6 6.3 7.9 7.3 6.5 6.2 5.6 6.3 7.4 7.8 8.8 8.8 8.8 8.8 8.8 8.8 9.6 6.3 7.2 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.3 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8</td><td>98.9 JG 99.7 JG 90.7 JG 88.6 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 99.8 JG 99.8 JG 101 JG 99.8 JG 112 JG 150 JG 150 JG 150 JG 112 JG 167.8 JG 112 JG 165 JG 114 JG 105 JG 116 JG 116 JG 116 JG 113 JG 134 JG 137 JD 141 RJD 127 RJD 127 RJD 190 RJD 191 RJD 193 RJD 193 RJD</td><td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m</td><td></td></td<>	20210714 937 1 173 1 20210714 943 1 173 1 20210714 1001 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 1 20210714 1129 1 175 1 20210714 1126 1 176 1 20210714 1221 1 176 2 20210714 1229 1 177 2 20210714 1229 1 177 2 20210714 1225 1 178 1 20210714 1326 1 178 1 20210714 1336 1 180 1 20210714 1348 1 180 2 20210714 1343 1 182 1 20210714 1441 1 182 1 20210714<	1 51.8 2 51.6 53.6 53.6 2 53.8 1 52.4 2 52 2 52 2 52 2 52 2 52 2 52 3 51.1 2 51.2 5.0.6 51.3 2 50.7 2 50.7 2 50.7 2 52.9 1 53.1 2 52.9 2 52.9 3 53.1 2 50.7 2 50.9 3 53.1 2 50.9 48.5 48.5 2 48.5 2 45.1 40.9 2	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 39.999 29.564 29.564 29.564 29.069 28.66 28.681 28.046 28.046 28.046 27.613 27.677 27.096 27.137 26.752 26.177 26.288 25.751 25.285 25.234 25.258 24.787 24.879 24.872 24.872 24.871 23.861 23.847 23.847 23.846	168 168 168 168 168 168 168 168 168 168	56.046 56.019 56.019 49.368 49.579 42.573 35.755 35.759 29.082 29.082 29.388 22.181 22.266 15.418 15.681 8.7 8.61 1.947 1.873 55.188 55.245 48.421 48.372 41.604 41.457 34.87 34.751 28.083 27.961 21.362	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH14 % NPH15 % NPH16 % NPH5 % NPH7 % NPH6 % NPH5	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218	264 266 265 265 265 265 265 264 265 266 266 267 265 266 263 263 263 263 263 265 259	11.9 9.6 8.6 14.1 8.5 9.6 3.3 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 5.6 6.3 7.9 7.3 6.5 6.2 5.6 6.3 7.4 7.8 8.8 8.8 8.8 8.8 8.8 8.8 9.6 6.3 7.2 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.3 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8.8 8	98.9 JG 99.7 JG 90.7 JG 88.6 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 99.8 JG 99.8 JG 101 JG 99.8 JG 112 JG 150 JG 150 JG 150 JG 112 JG 167.8 JG 112 JG 165 JG 114 JG 105 JG 116 JG 116 JG 116 JG 113 JG 134 JG 137 JD 141 RJD 127 RJD 127 RJD 190 RJD 191 RJD 193 RJD 193 RJD	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m	
20210714 174 1 19 2 39.9 68 23.023 167 14.645 0 % NPH3 (4 205 RD 20210714 1754 1 19 2 30.5 68 22.605 167 11.354 0 % NPH2 2 0 M 2021074 18/16 1 19 2 40.5 68 22.607 167 11.354 0 % NPH2 0 M 2021074 18/16 1 19 2 40.5 68 22.607 167 11.354 0 % NPH2 0 M 2021074 18/16 1 18/16 1 18/16 1 18/16 1 18/16 1 18/16 1 18/16 167 7.816 0 % NPH2 218 25 4 233 RD 0 2M	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1126 1 176 1 20210714 1136 1 176 1 20210714 1261 1 176 1 20210714 1223 1 177 2 20210714 1225 1 178 2 20210714 1326 1 179 1 20210714 1331 1 179 1 20210714 1333 1 180 1 20210714 1343 1 181 1 20210714 1345 1 181 2 20210714 1435 1 182 2 20210714<	1 51.8 2 51.6 2 53.8 2 52.3 4 52.2 5 51.1 2 52.2 5 51.1 2 51.2 5 50.6 5 50.3 2 51.3 2 50.4 5 50.3 2 51.2 5 5.1.1 2 50.4 5 5.3.1 2 52.9 1 51.1 2 50.9 4 48.5 2 48.5 2 44.5 2 40.1 1 40.9 2 40.7 40.1 40.1	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.995 39.999 30.011 29.564 29.564 29.564 29.069 28.661 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.036 27.137 26.752 26.177 26.675 26.238 25.751 25.258 25.258 25.258 25.258 25.258 25.258 24.872 24.872 24.872 24.871 23.8971 23.8971 23.8971 23.8971 23.8971	168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167	56.046 56.261 56.019 56.019 49.368 49.579 42.753 35.779 29.082 29.338 22.181 22.266 15.418 15.418 15.481 8.51 1.947 1.873 55.188 55.245 48.441 41.857 34.871 34.751 28.083 27.961 21.362 21.362 21.362	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % VPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH14.5 % NPH15.5 % NPH16.5 % NPH17 % NPH3 % NPH4 % NPH3 % NPH4	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218	264 266 265 265 265 265 265 264 265 266 266 267 265 266 263 263 263 263 263 265 259	11.9 9.6 8.6 14.1 9.6 9.6 9.6 9.7 7 7.2 10.7 5 8.8 8 4.2 7 7 3 6.5 6.5 6.5 6.5 6.3 7.4 6 6 3 7.4 6 6 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 9.6 9.6 9.6 9.6 9.6 9.6 9.6 9.6 9.6 9.6	98.9 JG 90.7 JG 90.7 JG 90.7 JG 112 JG 120 JG 244 JG 111 JG 94.7 JG 150 JG 150 JG 150 JG 150 JG 150 JG 148 JG 105 JG 148 JG 105 JG 148 JG 105 JG 112 JG 112 JG 113 JG 127 ZG 127	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m 0 5m	
20210714 1754 1 191 1 39.9 68 22.605 167 11.354 0 % NP12 218 25 3 214 RD 0 1M 20210714 1816 1 192 2 40.5 68 22.775 167 11.402 0 % NP12 218 25 4 194 RD 20210714 1816 1 192 1 35.7 68 22.375 167 11.402 0 % NP11 218 25 4 238 RD 0 2M	20210714 937 1 173 1 20210714 943 1 173 2 20210714 101 1 174 1 20210714 1101 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 1 20210714 1126 1 176 1 20210714 1201 1 176 1 20210714 1220 1 177 1 20210714 1220 1 177 1 20210714 1220 1 178 1 20210714 1220 1 178 1 20210714 1343 1 180 1 20210714 1343 1 180 2 20210714 1435 1 181 2 20210714 1525 1 184 1 20210714 </td <td>1 51.8 2 51.6 53.6 53.6 2 53.8 1 52.2 2 52 2 51.2 1 50.4 2 52.2 2 51.2 1 50.4 2 50.6 2 50.7 2 50.7 2 50.7 2 52.7 2 52.7 2 50.9 4.48.5 2 4.8.7 2 50.4 3.1 50.2 5.2.7 2 2 50.9 4.48.5 4.8.7 2 4.0.7 2 40.7 2 40.7 2 39.6</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td> <td>39.995 39.992 39.999 30.011 29.564 29.564 29.069 28.66 28.661 28.645 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.617 27.037 27.037 26.032 26.375 26.238 25.751 25.85 25.258 25.258 25.258 25.258 25.258 25.258 25.258 25.258 24.877 25.857 25.258 24.877 23.847 23.847 23.847 23.346 23.048 23.0486 23.0487 23.0496 23.0487 23.0497 23.0497 23.0497 23.0497 24.0497 25.0497 25.0497 25.0497 26.0497 27.0477 27.0477 26.0487 27.0477 27.0477 27.0477 26.0487 27.0477 27.0477 27.0477 26.258 25.2587 24.4777 25.2587 24.4777 24.4777 24.4777 24.4777 25.2587 25.2587 24.4777 25.2587 25.2577 25.2577 25.25777 25.257777777777</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.019 49.368 49.579 42.573 35.775 35.775 35.775 29.082 29.082 29.388 22.181 22.266 15.418 15.648 15.648 15.448 15.648 1.947 1.873 55.245 48.471 34.872 34.872 34.873 35.8753 35.8753 35.8753 35.8753 35.8753 35.8753 35.85</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH13 % NPH13 % NPH13 % NPH13 % NPH12 % NPH12 % NPH11.5 % NPH11.5 % NPH11 % NPH10 % NPH10 % NPH10 % NPH3 % NPH4 % NPH5 % NPH7 % NPH5 % NPH5 % NPH4</td> <td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218</td> <td>264 266 265 265 265 265 265 264 265 266 265 265 265 263 265 263 265 265 265 265 265 265 265 265 265 265</td> <td>11.9 9.6 8.6 14.1 8.5 9.6 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 7.3 6.5 6.5 6.5 6.5 6.3 7.4 6.5 8 8 8 8 8 6.5 7 7 8 8 8 8 7 9.6 6.5 8 7.9 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2</td> <td>98.9 JG 99.7 JG 90.7 JG 86.4 JG 112 JG 120 JG 121 JG 130 JG 94.7 JG 150 JG 121 JG 150 JG 121 JG 67.8 JG 121 JG 67.8 JG 121 JG 174 JG 177 JG 174 JG 177 JG 17</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m</td> <td></td>	1 51.8 2 51.6 53.6 53.6 2 53.8 1 52.2 2 52 2 51.2 1 50.4 2 52.2 2 51.2 1 50.4 2 50.6 2 50.7 2 50.7 2 50.7 2 52.7 2 52.7 2 50.9 4.48.5 2 4.8.7 2 50.4 3.1 50.2 5.2.7 2 2 50.9 4.48.5 4.8.7 2 4.0.7 2 40.7 2 40.7 2 39.6	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 39.999 30.011 29.564 29.564 29.069 28.66 28.661 28.645 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.617 27.037 27.037 26.032 26.375 26.238 25.751 25.85 25.258 25.258 25.258 25.258 25.258 25.258 25.258 25.258 24.877 25.857 25.258 24.877 23.847 23.847 23.847 23.346 23.048 23.0486 23.0487 23.0496 23.0487 23.0497 23.0497 23.0497 23.0497 24.0497 25.0497 25.0497 25.0497 26.0497 27.0477 27.0477 26.0487 27.0477 27.0477 27.0477 26.0487 27.0477 27.0477 27.0477 26.258 25.2587 24.4777 25.2587 24.4777 24.4777 24.4777 24.4777 25.2587 25.2587 24.4777 25.2587 25.2577 25.2577 25.25777 25.257777777777	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.019 49.368 49.579 42.573 35.775 35.775 35.775 29.082 29.082 29.388 22.181 22.266 15.418 15.648 15.648 15.448 15.648 1.947 1.873 55.245 48.471 34.872 34.872 34.873 35.8753 35.8753 35.8753 35.8753 35.8753 35.8753 35.85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH13 % NPH13 % NPH13 % NPH13 % NPH12 % NPH12 % NPH11.5 % NPH11.5 % NPH11 % NPH10 % NPH10 % NPH10 % NPH3 % NPH4 % NPH5 % NPH7 % NPH5 % NPH5 % NPH4	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218	264 266 265 265 265 265 265 264 265 266 265 265 265 263 265 263 265 265 265 265 265 265 265 265 265 265	11.9 9.6 8.6 14.1 8.5 9.6 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 10.7 7.2 7.3 6.5 6.5 6.5 6.5 6.3 7.4 6.5 8 8 8 8 8 6.5 7 7 8 8 8 8 7 9.6 6.5 8 7.9 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2	98.9 JG 99.7 JG 90.7 JG 86.4 JG 112 JG 120 JG 121 JG 130 JG 94.7 JG 150 JG 121 JG 150 JG 121 JG 67.8 JG 121 JG 67.8 JG 121 JG 174 JG 177 JG 174 JG 177 JG 17	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m	
20210714 1754 1 191 1 39.9 68 22.605 167 11.354 0 % NP12 218 25 3 214 RD 0 20210714 1816 1 192 2 40.5 68 22.775 167 11.402 0 % NP12 218 25 4 194 RD 20210714 1816 1 192 1 35.7 68 22.375 167 11.402 0 % NP14 218 25 4 238 RD 0 2M	20210714 937 1 173 1 20210714 943 1 173 1 20210714 100 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1223 1 177 2 20210714 1223 1 177 2 20210714 1250 1 178 1 20210714 1321 1 179 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1435 1 181 1 20210714 1506 1 183 2 20210714 </td <td>1 51.8 2 51.6 2 53.6 2 52.4 2 52.4 2 52.4 2 52.2 1 51.2 2 52.2 2 52.2 2 52.2 3 51.3 2 50.6 5 51.3 2 50.7 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.6 4 53.1 2 50.9 4 45.7 2 40.7 2 40.7 2 40.7 2 39.8 39.9.8 </td> <td>68 68 68 68 68 68 68 68 68 68</td> <td>39.995 39.992 39.989 29.564 29.564 29.069 28.66 28.681 28.045 27.613 27.677 27.096 27.613 27.677 27.096 27.613 26.777 26.673 26.777 26.385 25.258 26.177 26.385 25.258 24.787 25.258 24.787 24.872 24.872 24.872 24.872 24.872 23.847 23.847 23.846 23.088 23.148 23.966</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.019 49.579 42.573 35.755 35.779 29.082 22.181 22.266 15.418 15.681 22.266 15.418 15.681 1.947 1.873 55.245 48.441 48.372 41.604 41.457 34.873 34.873 34.751 28.063 27.961 21.265 18.037 17.892 14.631</td> <td></td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH13 % NPH14 % NPH15 % NPH16 % NPH3 % NPH4 % NPH5 % NPH5 % NPH5 % NPH4 % NPH4 % NPH4 % NPH4 <td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218</td><td>264 266 265 265 265 265 265 264 265 266 265 265 265 263 265 263 265 265 265 265 265 265 265 265 265 265</td><td>11.9 9.6 8.6 14.1 14.1 9.6 9.6 9.6 7 7 7.2 10.7 5 8.8 8.8 4.2 7 7 7 3 6.5 6.5 6.3 7.4 6 6 6 6 7 7 8 8 8 8 8 8 8 8 7 7 2 8 8 8 7 7 7 8 8 8 8</td><td>98.9 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 111 JG 121 JG 121 JG 121 JG 130 JG 145 JG 112 JG 106 JG 144 JG 130 JG 168 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 137 ND 127 RJD 127 RJD 127 RJD 129 RJD 12</td><td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m</td><td></td></td>	1 51.8 2 51.6 2 53.6 2 52.4 2 52.4 2 52.4 2 52.2 1 51.2 2 52.2 2 52.2 2 52.2 3 51.3 2 50.6 5 51.3 2 50.7 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.6 4 53.1 2 50.9 4 45.7 2 40.7 2 40.7 2 40.7 2 39.8 39.9.8	68 68 68 68 68 68 68 68 68 68	39.995 39.992 39.989 29.564 29.564 29.069 28.66 28.681 28.045 27.613 27.677 27.096 27.613 27.677 27.096 27.613 26.777 26.673 26.777 26.385 25.258 26.177 26.385 25.258 24.787 25.258 24.787 24.872 24.872 24.872 24.872 24.872 23.847 23.847 23.846 23.088 23.148 23.966	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.019 49.579 42.573 35.755 35.779 29.082 22.181 22.266 15.418 15.681 22.266 15.418 15.681 1.947 1.873 55.245 48.441 48.372 41.604 41.457 34.873 34.873 34.751 28.063 27.961 21.265 18.037 17.892 14.631		% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH13 % NPH14 % NPH15 % NPH16 % NPH3 % NPH4 % NPH5 % NPH5 % NPH5 % NPH4 % NPH4 % NPH4 % NPH4 <td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218</td> <td>264 266 265 265 265 265 265 264 265 266 265 265 265 263 265 263 265 265 265 265 265 265 265 265 265 265</td> <td>11.9 9.6 8.6 14.1 14.1 9.6 9.6 9.6 7 7 7.2 10.7 5 8.8 8.8 4.2 7 7 7 3 6.5 6.5 6.3 7.4 6 6 6 6 7 7 8 8 8 8 8 8 8 8 7 7 2 8 8 8 7 7 7 8 8 8 8</td> <td>98.9 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 111 JG 121 JG 121 JG 121 JG 130 JG 145 JG 112 JG 106 JG 144 JG 130 JG 168 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 137 ND 127 RJD 127 RJD 127 RJD 129 RJD 12</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m</td> <td></td>	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218	264 266 265 265 265 265 265 264 265 266 265 265 265 263 265 263 265 265 265 265 265 265 265 265 265 265	11.9 9.6 8.6 14.1 14.1 9.6 9.6 9.6 7 7 7.2 10.7 5 8.8 8.8 4.2 7 7 7 3 6.5 6.5 6.3 7.4 6 6 6 6 7 7 8 8 8 8 8 8 8 8 7 7 2 8 8 8 7 7 7 8 8 8 8	98.9 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 111 JG 121 JG 121 JG 121 JG 130 JG 145 JG 112 JG 106 JG 144 JG 130 JG 168 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 137 ND 127 RJD 127 RJD 127 RJD 129 RJD 12	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m	
20210714 180 1 191 2 40.5 68 22.775 167 11.402 0 % NPH2 4 194 RJD 20210714 1816 1 192 1 35.7 68 22.316 167 7.816 0 % NPH1 218 255 4 233 RJD 0 2M	20210714 937 1 173 1 20210714 943 1 173 1 20210714 100 1 174 1 20210714 1101 1 174 1 20210714 1129 1 175 1 20210714 1129 1 175 2 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1223 1 177 2 20210714 1223 1 177 2 20210714 1250 1 178 1 20210714 1321 1 179 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1435 1 181 1 20210714 1506 1 183 2 20210714 </td <td>1 51.8 2 51.6 2 53.6 2 52.4 2 52.4 2 52.4 2 52.2 1 51.2 2 52.2 2 52.2 2 52.2 3 51.3 2 50.6 5 51.3 2 50.7 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.6 4 53.1 2 50.9 4 45.7 2 40.7 2 40.7 2 40.7 2 39.8 39.9.8 </td> <td>68 68 68 68 68 68 68 68 68 68</td> <td>39.995 39.992 39.989 29.564 29.564 29.069 28.66 28.681 28.045 27.613 27.677 27.096 27.613 27.677 27.096 27.613 26.777 26.673 26.777 26.385 25.258 26.177 26.385 25.258 24.787 25.258 24.787 24.872 24.872 24.872 24.872 24.872 23.847 23.847 23.846 23.088 23.148 23.966</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.261 56.019 56.019 49.579 42.573 35.755 35.779 29.082 22.181 22.266 15.418 15.681 22.266 15.418 15.681 1.947 1.873 55.245 48.441 48.372 41.604 41.457 34.873 34.873 34.751 28.063 27.961 21.265 18.037 17.892 14.631</td> <td></td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH13 % NPH14 % NPH15 % NPH16 % NPH3 % NPH4 % NPH5 % NPH5 % NPH5 % NPH4 % NPH4 % NPH4 % NPH4 <td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218</td><td>264 266 265 265 265 265 265 264 265 266 265 265 265 263 265 263 265 265 265 265 265 265 265 265 265 265</td><td>11.9 9.6 8.6 14.1 14.1 9.6 9.6 9.6 7 7 7.2 10.7 5 8.8 8.8 4.2 7 7 7 3 6.5 6.5 6.3 7.4 6 6 6 6 7 7 8 8 8 8 8 8 8 8 7 7 2 8 8 8 7 7 7 8 8 8 8</td><td>98.9 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 111 JG 121 JG 121 JG 121 JG 130 JG 145 JG 112 JG 106 JG 144 JG 130 JG 168 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 137 ND 127 RJD 127 RJD 127 RJD 129 RJD 12</td><td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m</td><td></td></td>	1 51.8 2 51.6 2 53.6 2 52.4 2 52.4 2 52.4 2 52.2 1 51.2 2 52.2 2 52.2 2 52.2 3 51.3 2 50.6 5 51.3 2 50.7 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.9 2 52.6 4 53.1 2 50.9 4 45.7 2 40.7 2 40.7 2 40.7 2 39.8 39.9.8	68 68 68 68 68 68 68 68 68 68	39.995 39.992 39.989 29.564 29.564 29.069 28.66 28.681 28.045 27.613 27.677 27.096 27.613 27.677 27.096 27.613 26.777 26.673 26.777 26.385 25.258 26.177 26.385 25.258 24.787 25.258 24.787 24.872 24.872 24.872 24.872 24.872 23.847 23.847 23.846 23.088 23.148 23.966	168 168 168 168 168 168 168 168 168 168	56.046 56.261 56.019 56.019 49.579 42.573 35.755 35.779 29.082 22.181 22.266 15.418 15.681 22.266 15.418 15.681 1.947 1.873 55.245 48.441 48.372 41.604 41.457 34.873 34.873 34.751 28.063 27.961 21.265 18.037 17.892 14.631		% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH13 % NPH14 % NPH15 % NPH16 % NPH3 % NPH4 % NPH5 % NPH5 % NPH5 % NPH4 % NPH4 % NPH4 % NPH4 <td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218</td> <td>264 266 265 265 265 265 265 264 265 266 265 265 265 263 265 263 265 265 265 265 265 265 265 265 265 265</td> <td>11.9 9.6 8.6 14.1 14.1 9.6 9.6 9.6 7 7 7.2 10.7 5 8.8 8.8 4.2 7 7 7 3 6.5 6.5 6.3 7.4 6 6 6 6 7 7 8 8 8 8 8 8 8 8 7 7 2 8 8 8 7 7 7 8 8 8 8</td> <td>98.9 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 111 JG 121 JG 121 JG 121 JG 130 JG 145 JG 112 JG 106 JG 144 JG 130 JG 168 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 137 ND 127 RJD 127 RJD 127 RJD 129 RJD 12</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m</td> <td></td>	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218	264 266 265 265 265 265 265 264 265 266 265 265 265 263 265 263 265 265 265 265 265 265 265 265 265 265	11.9 9.6 8.6 14.1 14.1 9.6 9.6 9.6 7 7 7.2 10.7 5 8.8 8.8 4.2 7 7 7 3 6.5 6.5 6.3 7.4 6 6 6 6 7 7 8 8 8 8 8 8 8 8 7 7 2 8 8 8 7 7 7 8 8 8 8	98.9 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 111 JG 121 JG 121 JG 121 JG 130 JG 145 JG 112 JG 106 JG 144 JG 130 JG 168 JG 134 JG 134 JG 134 JG 134 JG 134 JG 134 JG 137 ND 127 RJD 127 RJD 127 RJD 129 RJD 12	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m	
20210714 1816 1 192 1 35.7 68 22.316 167 7.816 0 % NPH1 218 255 4 233 RD 02M	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 175 1 20210714 1120 1 175 1 20210714 1126 1 176 1 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1201 1 176 2 20210714 1220 1 177 2 20210714 1225 1 178 2 20210714 1316 1 179 1 20210714 1334 1 180 1 20210714 1343 1 180 2 20210714 1343 1 182 2 20210714 1435 1 183 1 20210714<	1 51.8 2 51.6 53.6 53.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.2 1 50.6 2 51.1 2 51.2 1 50.3 2 50.7 2 50.7 2 51.3 2 50.7 2 51.2 5 50.7 2 51.2 5 51.2 2 52.9 1 52.2 2 50.7 2 50.2 5 51 2 50.9 4 48.5 2 48.8 4 40.7 4 40.7 2 39.6 3 39.9	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.564 29.564 29.564 29.069 28.66 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.096 27.137 26.673 26.752 26.177 26.673 26.751 25.254 25.254 25.258 25.258 24.787 25.258 24.372 25.258 24.372 23.847 23.369 23.436 23.028 23.023	168 167 167	56.046 56.261 56.019 56.019 49.368 49.579 42.573 35.779 29.082 29.082 29.38 22.181 22.266 15.418 8.7 8.611 15.418 8.7 8.611 1.947 1.873 35.5188 55.245 48.441 48.372 41.604 41.457 34.87 34.751 28.847 34.751 21.265 18.037 27.961 21.362 21.265 18.037 17.892 14.631		% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % PVH14.5 % NPH14.5 % NPH14 % NPH14 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH1.5 % NPH3 % NPH5 % NPH5 % NPH5 % NPH4 % NPH4 <td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218 218 218</td> <td>264 266 265 265 265 265 265 265 265 266 265 266 267 263 263 263 263 263 253 253</td> <td>11.9 9.6 8.6 14.1 10.7 6.3 7 7.2 10.7 7 5 5 8.8 7.9 4.8 4.2 7 7.3 6.5 7 7.3 6.2 5.6 6.3 6.2 5.6 6 3.7.4 6 6 5 5 8.8 8 8 8 8 8 6 7 7 7 8 8 8 8 7 7 7 7 8 9 6 7 8 7 8 9 6 8 8 8 8 8 7 8 9 6 8 8 8 8 8 8 8 9 6 8 8 8 8 8 8 8 8</td> <td>98.9 JG 90.7 JG 90.7 JG 90.7 JG 112 JG 120 JG 244 JG 111 JG 94.7 JG 150 JG 94.7 JG 150 JG 94.7 JG 150 JG 151 JG 151 JG 150 JG 145 JG 144 JG 134 JG 127 JD 127 JD 12</td> <td>1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m</td> <td></td>	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218 218 218	264 266 265 265 265 265 265 265 265 266 265 266 267 263 263 263 263 263 253 253	11.9 9.6 8.6 14.1 10.7 6.3 7 7.2 10.7 7 5 5 8.8 7.9 4.8 4.2 7 7.3 6.5 7 7.3 6.2 5.6 6.3 6.2 5.6 6 3.7.4 6 6 5 5 8.8 8 8 8 8 8 6 7 7 7 8 8 8 8 7 7 7 7 8 9 6 7 8 7 8 9 6 8 8 8 8 8 7 8 9 6 8 8 8 8 8 8 8 9 6 8 8 8 8 8 8 8 8	98.9 JG 90.7 JG 90.7 JG 90.7 JG 112 JG 120 JG 244 JG 111 JG 94.7 JG 150 JG 94.7 JG 150 JG 94.7 JG 150 JG 151 JG 151 JG 150 JG 145 JG 144 JG 134 JG 127 JD 127 JD 12	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m	
	20210714 937 1 173 1 20210714 943 1 173 1 20210714 101 1 174 1 20210714 1101 1 174 1 20210714 1105 1 174 2 20210714 1129 1 175 1 20210714 1134 1 175 1 20210714 1126 1 176 1 20210714 1228 1 177 2 20210714 1228 1 177 2 20210714 1228 1 178 1 20210714 1321 1 179 1 20210714 1331 180 2 2 2 20210714 1343 1 180 2 2 20210714 1343 1 180 2 2 2 183 1 2 1 1	1 51.8 2 51.6 53.6 53.6 2 52.3 1 52.4 2 52 1 51.2 1 50.4 2 52 1 51.2 1 50.4 2 51.3 2 51.3 2 50.7 2 50.7 2 50.7 2 50.7 2 50.7 2 50.7 2 50.7 2 50.7 2 50.7 2 50.7 2 50.9 4 52.7 2 50.9 48.5 48.5 2 40.7 2 40.7 40.7 39.6 3 39.9 39.9 39.9	68 68 68 68 68 68 68 68 68 68	39.995 39.992 39.999 30.011 29.564 29.564 29.069 28.66 28.661 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.096 27.63 27.677 27.096 27.63 27.63 26.757 26.38 25.751 25.85 25.238 25.751 25.85 25.258 24.877 25.258 24.872 24.872 24.872 24.872 24.872 24.872 23.369 23.3436 23.088 23.3144 22.966 23.023 23.605	168 167 167 167 167 167 167 167 167 167 167 167 167 167	56.046 56.019 56.019 56.019 49.368 49.579 42.573 35.755 35.775 29.082 29.082 29.38 22.181 22.266 15.418 15.681 8.77 8.611 1.947 1.873 55.188 55.245 48.411 1.947 48.372 41.604 41.457 21.365 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 18.037 17.892 21.265 21		% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % CCL19 % NPH14.5 % NPH14.5 % NPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH14 % NPH15 % NPH16 % NPH5 % NPH5 % NPH5 % NPH5 % NPH4 % NPH4 % NPH4	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218 218 218	264 266 265 265 265 265 265 265 265 266 265 266 267 263 263 263 263 263 253 253	11.9 9.6 8.6 14.1 9.6 9.6 7 7 2.2 8.8 8.9 6.7 9 7,3 7 7 7 3 8.8 8 4.2 7 7 7.3 6.5 6.5 6.2 6.3 7,4 6.5 6.3 7,4 6.5 8.6 7 7 8 8 8 8 8 7 7 7 2 2 4 3 8 7 7 7 7 2 2 7 8 8 8 8 7 8 7 8 8 8 8 8	98.9 JG 90.7 JG 90.7 JG 90.7 JG 90.7 JG 91.7 JG 112 JG 120 JG 244 JG 101 JG 99.8 JG 99.8 JG 99.8 JG 99.8 JG 99.7 JG 150 JG 172 JG 175 JG 175 JG 172 JG 175 JG 174 JG 175 JG 174 JG 176 JG 176 JG 176 JG 176 JG 176 JG 176 JG 173 JG 176 JG 173 JG 176 JG 174 J	1 4m 1 4m 1 4.5m 1 4.5m 1 4.5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m	
	20210714 937 1 173 1 20210714 943 1 173 2 20210714 1101 1 174 1 20210714 1101 1 175 1 20210714 1120 1 175 1 20210714 1126 1 176 1 20210714 1126 1 176 1 20210714 1201 1 176 1 20210714 1221 1 177 2 20210714 1223 1 177 2 20210714 1225 1 178 2 20210714 1316 1 179 1 20210714 1333 1 180 1 20210714 1343 1 181 1 20210714 1435 1 181 2 20210714 1435 1 182 2 20210714<	1 51.8 2 51.6 2 53.8 2 52.3 4 52.2 51.1 2 2 51.2 51.1 50.6 2 51.2 51.1 50.6 2 51.2 50.6 51.3 2 51.3 2 50.4 50.3 53.1 2 52.9 1 51.9 2 52.6 51.1 2 2 51.2 50.9 48.5 4.45.7 2 2 40.7 1 40.9 2 40.7 2 39.6 39.8 39.9 2 30.9 2 39.9 2 40.5	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 29.989 30.011 29.564 29.564 29.564 29.069 28.661 28.045 27.137 26.752 26.177 26.238 25.258 24.787 24.872 24.872 24.871 23.8872 23.8871 23.8871 23.8872 23.8871 23.8872 23.8871 23.8872 23.8872 23.8871 23.8872 23.8722 23.8722 23.8722 23.8722 23.8722 23.8722 23.8722 23.8722 23.8722 24.872	168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 168 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167 167	56.046 56.261 56.019 56.06 49.368 49.579 42.573 35.775 35.775 35.775 35.779 29.082 29.338 22.181 22.266 15.418 15.418 15.418 15.418 15.418 15.418 15.418 35.1188 55.245 48.441 41.457 34.87 34.751 21.362 21.265 18.037 7.7892 14.631 14.645 11.354		% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % VPH14.5 % NPH14.5 % NPH13.5 % NPH13.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH12.5 % NPH13.5 % NPH14.5 % NPH15.5 % NPH14.5 % NPH15.5 % NPH14.5 % NPH15.5 % NPH14.5 % NPH14.5 % NPH7 % NPH6 % NPH4.5 % NPH4.5 %	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218 218 218	264 266 265 265 265 265 265 265 266 265 266 265 266 265 266 265 266 265 265	11.9 9.6 8.6 14.1 18.5 9.6 10.7 7 .2 2 10.7 7 .5 8.8 4.2 7 7.3 7.9 4.8 4.2 7 7.3 5 6.2 6.2 6.3 7.4 6.5 6.3 7.4 6 6 6 6 6 3 7,4 8 8 8 8 8 6 6 7 7 7 7 9 8 8 8 8 7 9 7 9 8 8 8 9 6 8 9 6 8 9 6 8 9 6 8 9 6 8 8 8 9 6 8 8 8 9 6 8 9 6 8 8 8 9 6 8 9 6 8 9 6 8 9 6 7 7 7 7 7 8 8 8 8 8 8 8 8 8 8 9 6 8 9 6 8 9 6 8 9 6 7 7 7 7 7 7 7 7 7 8 8 8 8 8 9 8 9 8 9 8	98.9 JG 90.7 JG 90.7 JG 90.7 JG 112 JG 120 JG 244 JG 101 JG 94.7 JG 150 JG 121 JG 150 JG 121 JG 145 JG 112 JG 112 JG 113	1 4m 1 4m 1 4,5m 1 4,5m 1 4,5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m	
	20210714 937 1 173 1 20210714 943 1 173 2 20210714 101 1 174 1 20210714 1101 1 174 1 20210714 1126 1 175 1 20210714 1128 1 175 1 20210714 1126 1 176 2 20210714 1201 1 176 2 20210714 1220 1 177 2 20210714 1220 1 178 1 20210714 1226 1 178 1 20210714 1326 1 179 1 20210714 1336 1 180 1 20210714 1343 1 180 2 20210714 1343 1 180 2 20210714 1433 1 182 2 20210714 </td <td>1 51.8 2 51.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.2 2 51.1 2 52.2 2 51.2 5.1.1 50.6 2 50.6 5.1.3 50.3 2 50.7 2 50.7 2 50.7 2 51.8 2 51.9 5.3.1 52.7 2 52.9 1 52.7 2 50.6 5 51.2 2 50.9 4 48.5 4 40.7 4 40.7 4 39.9 2 39.9 2 39.9 2 39.7 2 39.7 2 39.7 2 39.7</td> <td>68 68 68 68 68 68 68 68 68 68 68 68 68 6</td> <td>39.995 39.992 39.999 30.011 29.564 29.564 29.564 29.069 28.66 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.096 27.137 26.673 26.777 26.277 26.277 26.277 26.2751 25.258 25.258 24.372 24.372 24.327 23.349 23.346 23.023 23.346 23.023 23.114 22.966 23.023 23.114 22.965 22.375</td> <td>168 168 168 168 168 168 168 168 168 168</td> <td>56.046 56.019 56.019 56.019 49.368 49.579 42.573 35.755 35.775 29.082 29.082 29.388 22.181 22.266 15.418 8.77 8.611 1.947 1.873 55.188 55.245 48.372 48.372 48.372 41.604 41.457 34.751 28.083 27.961 21.362 21.265 18.037 7.892 14.631 14.643 11.354 11.354 11.354 11.354</td> <td></td> <td>% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH13 % NPH13 % NPH13 % NPH13 % NPH13 % NPH12 % NPH12 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH1.5 % NPH1.5 % NPH1.5 % NPH1.5 % NPH1.5 % NPH2 % NPH3 % NPH4 % NPH4 % NPH3 % NPH4 <td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218 218 218</td><td>264 266 265 265 265 265 265 265 266 265 266 265 266 265 266 265 266 265 265</td><td>11.9 9.6 8.6 14.1 1.8.5 9.6 6.3 7 7 7.2 8 8 7.9 4.8 7.9 7.3 7 8 8 8 6.5 6.3 7.4 6.5 6.3 7.4 6.5 6.3 7.4 7 8 8 8 6 6 6 3 7 7 7 7 2 2 4 8 8 8 7 7 7 7 9 9 8 8 8 8 8 8 8 8 8 8 8</td><td>98.9 JG 99.7 JG 90.7 JG 120 JG 120 JG 120 JG 121 JG 94.7 JG 150 JG 94.7 JG 150 JG 150 JG 151 JG 150 JG 151 JG 153 JG 145 JG 144 JG 134 JG 137 JD 137 RD 127 RD 190 RD 191 RD 192 RD 194 RD 194 RD 194 RD 194 RD 194 RD</td><td>1 4m 1 4m 1 4,5m 1 4,5m 1 4,5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m</td><td></td></td>	1 51.8 2 51.6 2 53.8 1 52.4 2 52.3 1 52.4 2 52.2 2 51.1 2 52.2 2 51.2 5.1.1 50.6 2 50.6 5.1.3 50.3 2 50.7 2 50.7 2 50.7 2 51.8 2 51.9 5.3.1 52.7 2 52.9 1 52.7 2 50.6 5 51.2 2 50.9 4 48.5 4 40.7 4 40.7 4 39.9 2 39.9 2 39.9 2 39.7 2 39.7 2 39.7 2 39.7	68 68 68 68 68 68 68 68 68 68 68 68 68 6	39.995 39.992 39.999 30.011 29.564 29.564 29.564 29.069 28.66 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 28.045 27.613 27.677 27.096 27.137 26.673 26.777 26.277 26.277 26.277 26.2751 25.258 25.258 24.372 24.372 24.327 23.349 23.346 23.023 23.346 23.023 23.114 22.966 23.023 23.114 22.965 22.375	168 168 168 168 168 168 168 168 168 168	56.046 56.019 56.019 56.019 49.368 49.579 42.573 35.755 35.775 29.082 29.082 29.388 22.181 22.266 15.418 8.77 8.611 1.947 1.873 55.188 55.245 48.372 48.372 48.372 41.604 41.457 34.751 28.083 27.961 21.362 21.265 18.037 7.892 14.631 14.643 11.354 11.354 11.354 11.354		% CCL20 % CCL20 redo % CCL20 redo % CCL20 redo % CCL20 redo % CCL19 % NPH14.5 % NPH14.5 % NPH14 % NPH14 % NPH13 % NPH13 % NPH13 % NPH13 % NPH13 % NPH12 % NPH12 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH11.5 % NPH1.5 % NPH1.5 % NPH1.5 % NPH1.5 % NPH1.5 % NPH2 % NPH3 % NPH4 % NPH4 % NPH3 % NPH4 <td>217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218 218 218</td> <td>264 266 265 265 265 265 265 265 266 265 266 265 266 265 266 265 266 265 265</td> <td>11.9 9.6 8.6 14.1 1.8.5 9.6 6.3 7 7 7.2 8 8 7.9 4.8 7.9 7.3 7 8 8 8 6.5 6.3 7.4 6.5 6.3 7.4 6.5 6.3 7.4 7 8 8 8 6 6 6 3 7 7 7 7 2 2 4 8 8 8 7 7 7 7 9 9 8 8 8 8 8 8 8 8 8 8 8</td> <td>98.9 JG 99.7 JG 90.7 JG 120 JG 120 JG 120 JG 121 JG 94.7 JG 150 JG 94.7 JG 150 JG 150 JG 151 JG 150 JG 151 JG 153 JG 145 JG 144 JG 134 JG 137 JD 137 RD 127 RD 190 RD 191 RD 192 RD 194 RD 194 RD 194 RD 194 RD 194 RD</td> <td>1 4m 1 4m 1 4,5m 1 4,5m 1 4,5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m</td> <td></td>	217 217 217 217 217 217 217 217 217 218 218 218 218 218 218 218 218 218 218	264 266 265 265 265 265 265 265 266 265 266 265 266 265 266 265 266 265 265	11.9 9.6 8.6 14.1 1.8.5 9.6 6.3 7 7 7.2 8 8 7.9 4.8 7.9 7.3 7 8 8 8 6.5 6.3 7.4 6.5 6.3 7.4 6.5 6.3 7.4 7 8 8 8 6 6 6 3 7 7 7 7 2 2 4 8 8 8 7 7 7 7 9 9 8 8 8 8 8 8 8 8 8 8 8	98.9 JG 99.7 JG 90.7 JG 120 JG 120 JG 120 JG 121 JG 94.7 JG 150 JG 94.7 JG 150 JG 150 JG 151 JG 150 JG 151 JG 153 JG 145 JG 144 JG 134 JG 137 JD 137 RD 127 RD 190 RD 191 RD 192 RD 194 RD 194 RD 194 RD 194 RD 194 RD	1 4m 1 4m 1 4,5m 1 4,5m 1 4,5m 0 4m 0 4m 0 4m 0 4m 0 5m 0 5m	

20210714 1918 1	193	1 25	7 68	8 19.978	166	52.175	1	% CS19	218	241	5	270 RJD	0 1m	
20210714 1923 1	193	2 25	3 68	8 19.672	166	52.425	1	% CS19			7	270 RJD		
20210714 1937 1	194	1 32	3 68	8 18.852	166	57.479	1	% CS18	217	250	4	307 RJD	0 1m	
20210714 1941 1		2 32			166	57.862	1	% CS18				275 RJD		
20210714 1956 1		1 36			167	2.872		% CS17	218	251		226 RJD	0 1m	
20210714 1050 1		2 36			167	2.968	0	% CS17	210	2.51		237 RJD	0 1111	
									240	257				
20210714 2016 1		1 40			167	7.602		% CS16.5	218	257		197 RJD	0 1m	
20210714 2020 1		2 40			167	7.837	0	% CS16.5			-	198 RJD		
20210714 2038 1		1 43			167			% CS16	218	259		181 RJD	0 3m	
20210714 2042 1		2 43			167	11.94	0	% CS16				192 RJD		
20210714 2100 1	198	1 44			167	16.953	0	% CS15.5	218	259		186 RJD	0 5m+	
20210714 2104 1	198	2 44	9 68	3 13.549	167	16.927	0	% CS15.5			8	200 RJD		
20210714 2122 1	199	1 46	5 68	3 12.146	167	21.48	0	% CS15	218	261	4	156 RJD	0 3m	
20210714 2128 1		2 46			167	21.498	0	% CS15			8	182 RJD		
20210714 2146 1		1 4			167		0	% CS14.75	218	261		170 RJD	0 5m+	Mislabeled in Seasave header: CS14.5 instead of CS14.75
20210714 2149 1		2 46			167	26.04	0	% CS14.75	210	201		195 RJD	0 5111	Dead whale (grey?) spotted around this/the next station
20210714 2145 1 20210714 2222 1		1 40			167	30.722	0	% CS14.75	218	261		147 RJD	0 5m	Visiabeled in Seasave header: CS14 instead of CS14.5
									210	201			0 5111	Wisiabeled in Seasave fieduet. CS14 instead of CS14.5
		2 47			167	30.852	0	% CS14.5				159 RJD		
20210714 2245 1		1 48			167	35.272	0	% CS14.25	218	262		168 RJD	0 5m+	Mislabeled in Seasave header: CS13.5 instead of CS14.25
20210714 2250 1		2 48			167	35.249	0	% CS14.25				184 RJD		
20210714 2310 1	203	1 51	3 68	6.068	167	40.028	0	% CS14	218	265	8	167 RJD	0 5m+	Mislabeled in Seasave header: CS13 instead of CS14
20210714 2315 1	203	2 51			167	39.986	0	% CS14				168 RJD		
20210714 2334 1	204	1 52	5 68	3 4.371	167	44.941	0	% CS13.75	218	267	9.4	164 KC	0 5m	
20210714 2338 1	204	2 52			167	44.963	0	% CS13.75				178 KC		
20210714 2356 1		1 52			167			% CS13.5	219	267		159 KC	0 5m+	Lovely fluorescence peak
	205	2 52			167	50.035	0	% CS13.5				163 KC		
					167	54.724			210	260		155 KC	0.5	
20210715 19 1								% CS13.25	219	200			0 5m+	
20210715 24 1					167	54.894	0	% CS13.25		267		151 KC	0.5	
20210715 44 1		1 53			167	59.464		% CS13	219	269	13.5		0 5m	
20210715 49 1		2 53			167	59.612	0	% CS13				140 KC		
20210715 108 1	208	1 59	7 6	7 57.562	168	4.343	0	% CS12.75	218	275	11.3	154 KC	0 5m+	
20210715 113 1	208	2 6	0 6	7 57.58	168	4.431	0	% CS12.75			13.6	148 KC		
20210715 133 1	209	1 57	4 6	7 55.819	168	9.321	0	% CS12.5	220	272	13.7	155 KC	0 5m+	
20210715 138 1		2 57			168	9.425	0	% CS12.5			13.4	147 KC		
20210715 156 1		1 56			168	14.015			210	276		143 KC	0.5 4m	
20210715 150 1		2 56			168	14.013	0	% CS12.25	215	270		145 KC	0.5 411	
20210715 227 1		1 54			168			% CS12	219	269		137 KC	1 4m	Fog is rollin' in
20210715 232 1		2 54			168	18.908	0	% CS12				142 KC		
20210715 256 1		1 51			168	24.154	0	% CS11.75	218	267		119 KC	1 5m	
20210715 301 1	212	2 51	3 6	7 50.7	168	24.188	0	% CS11.75			14.1	97.1 KC		
20210715 323 1	213	1 49	4 6	7 48.87	168	29.482	0	% CS11.5	218	264	10.4	185 KC	1 5m	
20210715 328 1	213	2 49	5 6	7 48.859	168	29.515	0	% CS11.5			7.1	198 KC		
20210715 349 1	214	1 48	8 6	7 47.13	168	34.612	0	% CS11.25	218	263	10.6	160 KC	0 5m	Fog has blown out around this station
20210715 354 1		2 48			168	34,699	0	% CS11.25				164 KC		
20210715 418 1		1 48	5 6	7 45.274	168	39.846	0	% CS11	218	263	17	155 KC	1 5m	Fog is back in, interesting moving between banks of fog through here
20210715 423 1		2 48			168	39.85	0	% CS11				158 KC		
20210715 444 1		1 48			168	44.083		% CS10.75	210	263		137 KC	1 5m	
							-		218	203			1 200	
20210715 448 1		2 48			168	44.089	0	% CS10.75				144 KC		
20210715 508 1		1 48			168			% CS10.5	218	263		145 KC	1 5m	
20210715 513 1		2 48			168	48.241	0	% CS10.5				150 KC		
20210715 532 1	218	1 48	6 6	7 39.857	168	51.877	0	% CS10.25	218	264	14.4		1 5m	
20210715 536 1	218	2 48	6 6	7 39.936	168	51.81	0	% CS10.25			19.4	137 KC		
20210715 557 1	219	1 48	8 6	7 38.101	168	55.819	0	% CS10	218	263	16.4	182 KC	1 5m	
20210715 602 1		2 48			168	55.74		% CS10				148 KC		
20210715 628 1		1 48			168			% CCL13.5	217	264		172 KC	1 4m	Fog is thickening even more now
20210715 633 1		2 48			168	55.823	0	% CCL13.5				163 KC		
20210715 714 1		1 48			168	56.017		% CCL13	210	264		185 JG	1 5m	Fog sucks
20210715 714 1 20210715 719 1		2 48			168	55.987	0	% CCL13	215	204		183 JG	1.511	
			-						210	264			1450	Catalans to bottom and an additional poly of finance and any World T/C increasing at here of mind laws in all any in all the state of t
20210715 803 1		1 48			168			% CCL12.5	218	264		169 JG	1 4.5m	Got close to bottom, sensors and everything looked fine on recovery. Weird T/S inversion at base of mixed layer in all sensors down and upcasts. Flushed T1/C1 up t
20210715 808 1		2 48			168	55.984	0	% CCL12.5				155 JG		
20210715 859 1		1 48			168	56.008		% CCL12	217	264		163 JG	0 5m	Flushed T/C cells up past oxygen with FW multiple times after this cast. Didn't notice anything obvious. Cleaned vent plugs.
20210715 903 1		2 48			168	56	0	% CCL12				154 JG		
20210715 955 1		1 47			168	56.031	0	% CCL11.5	217	264		167 JG	0 4m	
20210715 959 1		2 47			168	56.051	0	% CCL11.5			21.5	167 JG		
20210715 1051 1		1 47	1 6		168	55.963	0	% CCL11	217	264		198 JG	0 5m	brief pause after cast to muck about in the engine room. Issue with air compressor for gear controls. Began motor to next station at 1123
20210715 1055 1		2 47			168	55.861	0	% CCL11				211 IG		
20210715 1055 1 20210715 1217 1		1 46	-		168	55.98	-	% CCL10.5	218	263		190 JG	0 4m	Vent plug didn't drain on T2/C2. Cleaned vent plugs. Passed over a 1.2 PSU less fresh front at 1200 UTC via underway data
			7 6				0		210	200			0 -111	
20210715 1222 1					168	55.903		% CCL10.5	247	262		215 JG		
20210715 1315 1		1 46			168	55.987	0	% CCL10	218	262		186 JG	0 4m	
20210715 1320 1		2 46			168	55.943	0	% CCL10				203 JG		
20210715 1408 1		1 45			168	55.997		% CCL9.5	219	261		194 JG	0 2m	
20210715 1413 1		2 44			168	55.916	0	% CCL9.5				173 JG		
20210715 1457 1	229	1 43	4 60	5 49.959	168	56.017	0	% CCL9	218	258	15.9	177 JG	0 2m	
20210715 1501 1		2 43			168	56.029	0	% CCL9				183 JG		
		1 41			168			% CCL8.5	218	255		171 RJD	0 3m	
20210715 1549 1		2 41			168	56.067	0	% CCL8.5			18			
20210715 1549 1									210	250			0.2-	
20210715 1554 1				5 39.945	168	56.067	0	% CCL8	218	256		186 RJD	0 3m	
20210715 1554 1 20210715 1645 1	231	1 4			400	56 4 0 7	0	o/ cci o						
20210715 1554 1 20210715 1645 1 20210715 1649 1	231 231	2 41	9 60	5 40.013	168	56.107	0	% CCL8				173 RJD		
20210715 1554 1 20210715 1645 1	231 231 232		9 60 5 60	5 40.013 5 34.937	168 168 168	56.046	0	% CCL8 % CCL7 % CCL7	218	256	20	173 RJD 171 RJD 179 RJD	0 3m	

20210715 1834 1 2	233 1	55	66	29.922	168	56.052 0) s	% CCL6	218	269	18	185 RJD	0 3m	
20210715 1841 1 2			66	29.92	168			% CCL6				205 RJD		
20210715 1926 1 2	234 1	55.1	66	24.964	168	56.038 0) :	% CCL5	217	269	18	184 RJD	0 3m	
20210715 1933 1 2	234 2	55	66	24.99	168	56.124 0) (% CCL5			18	162 RJD		
20210715 2000 1 2	235 1	54.3	66	22.25	168	56.121 0	o :	% CCL4	217	270	15	171 RJD	0 3m	Vent plug clean pre-cast
20210715 2006 1 2	235 2	54	66	22.315	168	56.163 0) (% CCL4			16	169 RJD		
20210715 2034 1 2	236 1	54.8	66	19.739	168	57.015 0) :	% A3-21	219	270	25	160 RJD	0 3m	CTD file has "A3-17" as name in header
20210715 2039 1 2	236 2	54.8	66	19.813	168	57.063 0) s	% A3-21				RJD		
20210715 2053 1 2	237 1	55.5	66	18.71	168	56.231 0) s	% DL19.5	218	271	17	168 RJD	0 2m	
20210715 2059 1 2	237 2	55.2	66	18.799	168	56.275 0) :	% DL19.5			18	164 RJD		
20210715 2113 1 2	238 1	55.2	66	17.809	168	56.286 0) :	% DL19	218	271	25	140 RJD	0 3m	
20210715 2119 1 2	238 2	55.3	66	17.89	168	56.304 0) :	% DL19				165 RJD		
20210715 2136 1 2	239 1	55.5	66	16.576	168	56.223 0) s	% DL18.5	218	272	26	167 RJD	0 3m	
20210715 2142 1 2		55.7	66	16.671	168	56.23 0		% DL18.5				171 RJD		
20210715 2203 1 2	240 1	56.5	66	15.247	168	56.246 0) s	% DL18	218	271	24	164 RJD	0 3m	
20210715 2208 1 2		56.1	66	15.332	168			% DL18				165 RJD		
20210715 2228 1 2		56	66	13	168			% DL17.5	218	270	29	155 RJD	0 3m	
20210715 2232 1 2	241 2	55.3	66	14.052	168	56.231 0)	% DL17.5			16	170 RJD		
20210715 2250 1 2			66	12.715	168	56.241 0) s	% DL17	218	271		172 RJD	0 2m	
20210715 2254 1 2			66	12.795	168	56.235 0)	% DL17			26	175 RJD		
20210715 2315 1 2		54.7	66	11.433	168	56.218 0			220	269		204 KC	0 2m	Winds are even higher now, calling it for a while after this station
20210715 2319 1 2		54.6	66	11.595	168			% DL16.5				195 KC		
20210716 1435 1 2			65	48.233	168			% BS11	221	264		188 JG	0 1m	
20210716 1439 1 2			65	48.404	168			% BS11				217 JG		
20210716 1450 1 2		46	65	47.722	168			% BS11.5	221	264		223 JG	0 1m	
20210716 1455 1 2		47	65	47.818	168			% BS11.5				230 JG		
20210716 1456 5		47.5	65	47.858	168	53.667		% BS11.5 Laramie	5			235 RJD	0 1m	
	34 2	47	65	48.032	168	53.521		% BS11.5 Laramie	5			227 RJD		
20210716 1515 1 2			65	47.169	168			% BS12	218	258		210 RJD	0 1m	
20210716 1520 1 2		43.2	65	47.197	168	51.599 0		% BS12				198 RJD		
20210716 1531 1 2		48.3	65	46.706	168		-	% BS12.5	218	261		215 RJD	0 1m	
20210716 1536 1 2		48.8	65	46.737	168	49.442 0		% BS12.5				201 RJD		
20210716 1546 1 2			65	46.252	168			% BS13	218	265		215 RJD	0 1m	
20210716 1551 1 2		50.6	65	46.352	168			% BS13	210	205		211 RJD	0 1111	
20210716 1550 5			65	46.467	168	47.134		% BS13 Laramie				198 RJD	0 1m	
	35 2	51.0	65	46.937	168	46,999		% BS13 Laramie				188 RID	0 1111	
20210716 1625 1 2		51.2	65	45.771	168			% BS13.5	218	265		189 RJD	0 1m	
20210716 1629 1 2		51.2	65	45.799	168	45.424 0		% BS13.5	210	205		189 RJD	0 1111	
20210716 1639 1 2		51.2	65	45.213	168	43.181 (% BS14	218	265		185 KJD	0 1.5m	
	250 2	51.4	65	45.257	168	43.078 0		% BS14	210	205		216 RJD	0 1.511	
20210716 1651 1 2			65	44.768	168	41.62 0		% BS14.5	218	264		206 RJD	0 1m	
20210716 1655 1 2			65	44.708	168	41.516 0		% BS14.5	210	204		200 RJD 217 RJD	0 1111	
20210716 1656 5		50.4	65	44.758	168	41.428		% BS14.5 Laramie				217 RJD 214 RJD	0 1.5m	
	36 2	50.4	65	44.601	168	41.420		% BS14.5 Laramie				183 RID	0 1.5111	
20210716 1703 3 2			65	44.001	168	40.40		% BS15	210	265	20	108 RJD	0 1m	
	252 2		65	44.357	168	39.581 0		% BS15	210	205		190 RJD	0 1111	
20210716 1732 1 2		50.1		43.817	168	37.746 0		% BS15.5	210	264		190 RJD 187 RJD	0 1.5m	
20210716 1732 1 2 20210716 1736 1 2			65 65	43.817	168	37.651 0		% BS15.5 % BS15.5	218	204		220 RJD	0 1.5m	
20210716 1730 1 2		50.2	65	43.831	168			% BS16	210	264		220 RJD 207 RJD	0 1m	
20210716 1747 1 2 20210716 1752 1 2		49.9	65	43.345	168			% BS16	210	204		182 RID	0 1111	
20210716 1752 5		50	65	43.414	168	35.408		% BS16 Laramie	217	267		208 RJD	0 2m	
	37 1 37 2	50.2	65	43.414	168	35.29		% BS16 Laramie	21/	207	20	208 RJD RID	0 2111	
20210716 1800 5 20210716 1813 1 2		50.2	65	43.293	168			% BS16.5	219	265	22	187 RJD	0 2m	
20210716 1818 1 2			65	42.727	168	33.382 (% BS16.5	210	205		212 RJD	0 2111	
20210716 1818 1 2 20210716 1828 1 2		53.1	65	42.774	168	31.292 0		% BS10.5 % BS17	210	264		184 RID	0 3m	
20210716 1828 1 2 20210716 1832 1 2		53.1	65	42.191 42.281	168	31.292 (% BS17 % BS17	216	204		184 RJD 206 RJD	0.311	
20210716 1843 1 2		52.3	65	41.657	168			% BS17.5	219	263		187 RJD	0 2.5m	
20210716 1843 1 2		51.9	65	41.057	168	29.248 0		% BS17.5 % BS17.5	210	205		187 RJD 197 RID	0 2.311	
20210716 1847 1 2 20210716 1828 5		51.9		41.74	168	29.251 (-					214 RJD	0 2m	
			65 65	41.748	168	29.253		BS17.5 Laramie BS17.5 Laramie				214 RJD 141 RJD	0 2111	
20210716 1857 5 20210716 1909 1 2		52.1 52	65	41.953	168			% BS17.5 Laramie % BS18	210	268		141 RJD 197 RJD	0.2m	
	258 1 258 2	52	65 65	41.11 41.189	168 168	26.86 (% BS18 % BS18	218	268		197 RJD 217 RJD	0 2m	
									217	264			0.4m	
20210716 1923 1 2		50.9	65	40.673	168	25.183 0		% BS18.5	217	264		211 RJD	0 4m	
20210716 1927 1 2		51.1	65	40.747	168	25.111 0		% BS18.5	210	267		207 RJD	0.5 m	
20210716 1952 1 2		50.5	65	40.341	168			% BS19	218	267		200 RJD	0 5m	
20210716 1956 1 2		50.3	65	40.439	168			% BS19				197 RJD	0.5	
20210716 1957 5			65	40.533	168	23.169		% BS19 Laramie				201 RJD	0 5m+	
	39 2		65	40.827	168	23.091		% BS19 Laramie				198 RJD		
20210716 2020 1 2		49	65	39.811	168			% BS19.5	218	265		201 RJD	0 5m+	
20210716 2024 1 2			65	39.894	168	21.218 0		% BS19.5				211 RJD		
20210716 2037 1 2		46.9	65	39.245	168			% BS20	218	263		217 RJD	0 5m	
20210716 2041 1 2		46.7	65	39.309	168	18.888 0		% BS20				202 RJD		
20210716 2051 1 2			65	38.958	168			% BS20.5	218	263		206 RJD	0 5m	Mistakenly named BS20 in cast header file
20210716 2055 1 2		44.1	65	39.082	168	17.02 0		% BS20.5				204 RJD		
20210716 2056 5		44.2	65	39.271	168	17.002		% BS20.5 Laramie				200 RJD	0 5m	
	40 2	44	65	39.302	168	17		% BS20.5 Laramie				195 RJD		
20210716 2124 1 2		40.4	65	38.536	168			% BS21	218	266		240 RJD	0 2m	
20210716 2128 1 2		40.9	65	38.725	168	15.717 0		% BS21				299 RJD		
	265 1	37.1	65	38.027	168	12.858 1	1 9	% BS21.5	218	262		191 RJD	0 3m	
20210716 2149 1 2														
20210716 2149 1 2 20210716 2154 1 2		37.2	65	38.168	168	12.832 1	1	% BS21.5			24	111 RJD		

20210716 2208 1	266	1	29.9	65	37.431	168	10.657	1	% BS22	218	254	25	170 RJD	0 4m	
20210716 2212 1	266	2	30.5	65	37.644	168	10.81	1	% BS22			30	215 RJD		
20210716 2214 5	41	1	30.2	65	37.77	168	10.922		% BS22 Laramie			30	111 RJD	0 4m	
20210716 2224 5	41	2	31.5	65	37.978	168	11.354		% BS22 Laramie			28	120 RJD		
20210716 2240 1		1	37.1	65	36.86	168	13.078	0	% SBSnn1.5	218	258	28	240 RJD	0 2m	Cast named SBSnn2 in header, but is SBSnn1.5
	267	2	37.5	65	37.177	168	13.36	0	% SBSnn1.5				210 RJD		
20210716 2306 1	268	1	44	65	35.628	168	17.385	0	% SBSnn2.5	219	259	28.7	203 KC	0 2m	
	268	2	44.1	65	35.778	168	17.379	0	% SBSnn2.5			24.4	150 KC		
	269	1	47.2	65	34.268	168	21.924	0	% SBSnn3.5	219	263		216 KC	0 4m	
	269	2	47.6	65	34.383	168	21.932	0	% SBSnn3.5				186 KC		
20210716 2356 1		1	50.2	65	33.089	168			% SBSnn4.5	219	265		204 KC	0.5 4m	
	270	2	50.1	65	33.204	168	26.222	0.5	% SBSnn4.5				192 KC		
	271		58.4	65	31.867	168	30.817	0	% SBSnn5.5	219	274		210 KC	1 3m	
20210717 26 1			56.8	65	31.986	168	30.772		% SBSnn5.5				194 KC		
	272	1	54.9	65	30.634	168	35.292	0	% SBSnn6.5	219	271		212 KC	1 2m	
	272	2	54.6	65	30.732	168	35.229	0	% SBSnn6.5				197 KC		
20210717 110 1		1	55	65	29.375	168	39.846	0	% SBSnn7.5	220	272		208 KC	1 2m	
20210717 114 1		2	54.2	65	29.46	168	39.8	0	% SBSnn7.5				201 KC		
	274	1	58	65	28.152	168	44.286	0	% SBSnn8.5	220	274		203 KC	1 2m	
	274	2	58.2	65	28.253	168	44.236	0	% SBSnn8.5				200 KC		
	275	1	54.9	65	26.887	168	48.945	0	% SBSnn9.5	219	272		184 KC	1 1m	
	275	2	55.7	65	26.978	168	49.002	0	% SBSnn9.5				203 KC		
	276	1	56.7	65	25.661	168	53.421		% SBSnn10.5	219	272		186 KC	1 1m	
20210717 227 1	276	2	56.9	65	25.725	168	53.466	0	% SBSnn10.5			18.3	198 KC		

FILE FORMAT

This is a TAB delimited text file created by MATLAB 9.6.0.1072779 (R2019a). It is readily opened / imported using any text editor, MS Excel, Open Spreadsheet platform (XML), or other software package of your choosing. It is written in plain text.

LABORATORY

IsoLab, Department of Earth and Space Sciences, University of Washington 206.543.6327 * isolab@uw.edu * https://isolab.ess.washington.edu/

METHOD

Your samples were analyzed on a Picarro - sn(HIDS2064) - named Abel. You can read more about our implementation of this method on our website here: https://isolab.ess.washington.edu/laboratory/water-dD-d180.php or here https://isolab.ess.washington.edu/SOPs/abel.php

ANALYSIS

Start Time of Analysis: 2021/08/03 08:12:53 Original Filename: HIDS2064_IsoWater_20210803_150950_combined.csv Reduced Filename: HIDS2064_IsoWater_20210803_150950_combined_reduced.txt Run comments:

REFERENCE MATERIALS

All internationally recognized reference material accepted values can be found at the CIAAW (http://www.ciaaw.org/). All IsoLab in-house reference material accepted values can be found at https://isolab.ess.washington.edu/resources/standards.php#water. For this particular analysis, the accepted values are from the MATLAB script Water Standards: 190723. Reference Waters in this run and their accepted values:

Reference Water Accepted d Accepted d180 (vs VSMOW)

KD	0.65	0
BW	-156.87	-20.01
SW	-75.63	-10.55

RUN INFORMATION

Number of Injections per vial: 10 Number of Injections discarded from beginning of each vial: 5 dD memory estimate: 0.84899 d180 memory estimate: 0.92273

Individual reference water vial raw measurement

TrayPos Reference | RawMean | RawStdDev RawMean (RawStdDev RawMean (RawStdDev d180

2 SW	20097.8	131.6613	-71.2606	0.065286	-6.6102	0.009365	
4 RW	19693	214.5355	-14.6118	0.046949	8.9794	0.019604	
6 KD	19829.4	144.1676	5.4224	0.11311	4.015	0.02487	
8 BW	19702.4	155.9336	-152.178	0.07681	-16.1366	0.033254	
14 RW	19885	286.256	-13.7372	0.10722	9.159	0.01239	
16 BW	19936.2	190.0071	-152.29	0.1061	-16.1022	0.024489	
18 KD	19824	91.2469	5.4064	0.15733	3.992	0.020396	
20 SW	19864.8	35.8636	-70.4502	0.49765	-6.5546	0.054427	
26 BW	19864.4	43.6268	-152.412	0.056116	-16.0962	0.018363	
28 SW	19708.2	29.853	-70.9318	0.082433	-6.5984	0.01274	
30 KD	19945.8	90.2258	5.5374	0.05513	3.9972	0.01429	
32 RW	19795	72.6567	-13.7266	0.15068	9.1486	0.026651	
34 USGS45	20004.4	181.4561	-5.6562	0.10175	1.746	0.030992	
35 USGS45	19995.4	31.2698	-5.4624	0.11373	1.7776	0.02122	

Reference Water Mean_H2C StdDev_H2 Mean_dD_ StdDev_dD Mean_d18 StdDev_d1 n									
raw KD	19866.4	68.8154	5.4554	0.071463	4.0014	0.012062	3		
raw BW	19834.33	119.7648	-152.294	0.11693	-16.1117	0.0218	3		
raw SW	19890.27	196.0445	-70.8809	0.40759	-6.5877	0.029295	3		
corrected KD			0.65	0.087577	5.92E-16	0.014941	3		
corrected BW			-156.87	0.10233	-20.01	0.019222	3		
corrected SW			-75.5766	0.41998	-10.5347	0.02772	3		

Accuracy and Precision Information from SW

	Accuracy	Precision
dD	0.053382	0.41998
d180	0.015324	0.02772

Reference Waters

Date	TrayPos	Reference M	lean_H2CS	StdDev_H2 N	/lean_dD_	StdDev_dD	Mean_d18	StdDev_d18O
8/3/2021 9:47	T1-02	SW	20097.8	131.6613	-75.9793	0.065286	-10.5525	0.009365
8/3/2021 12:53	T1-04	RW	19693	214.5355	-19.4102	0.046949	4.9569	0.019604
8/3/2021 16:00	T1-06	KD	19829.4	144.1676	0.59782	0.11311	0.017232	0.02487
8/3/2021 19:06	T1-08	BW	19702.4	155.9336	-156.769	0.07681	-20.0321	0.033254
8/4/2021 9:38	T1-14	RW	19885	286.256	-18.5209	0.10722	5.1325	0.01239
8/4/2021 12:44	T1-16	BW	19936.2	190.0071	-156.868	0.1061	-20.0004	0.024489
8/4/2021 15:50	T1-18	KD	19824	91.2469	0.60107	0.15733	-0.00935	0.020396
8/4/2021 18:56	T1-20	SW	19864.8	35.8636	-75.1412	0.49765	-10.5027	0.054427
8/5/2021 4:15	T1-26	BW	19864.4	43.6268	-156.973	0.056116	-19.9975	0.018363
8/5/2021 7:21	T1-28	SW	19708.2	29.853	-75.6093	0.082433	-10.5488	0.01274
8/5/2021 10:27	T1-30	KD	19945.8	90.2258	0.75111	0.05513	-0.00788	0.01429
8/5/2021 13:33	T1-32	RW	19795	72.6567	-18.4815	0.15068	5.1166	0.026651
8/5/2021 16:39	T1-34	USGS45	20004.4	181.4561	-10.4197	0.10175	-2.2488	0.030992
8/5/2021 18:12	T1-35	USGS45	19995.4	31.2698	-10.2246	0.11373	-2.2177	0.02122

Sample Information:

Date	Tray-Pos	Sample Na N	lean_H2C S	StdDev_H2 N	Mean_dD_	StdDev_dD I	Mean_d18	StdDev_d18O
8/3/2021 22:12	T1-10	LIS3	19566	166.5983	-33.3819	0.098396	-4.2915	0.019424
8/4/2021 1:19	T1-12	LIS2	19574.6	61.476	-23.657	0.16012	-3.0929	0.025762
8/4/2021 22:03	T1-22	LIS2	19615	106.066	-23.6629	0.094302	-3.1141	0.020107
8/5/2021 1:09	T1-24	LIS3	19544	57.8835	-32.6919	0.21168	-4.2751	0.015659

Processed with: abel.m - 210601