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Alaska Oil and Gas Conservation Commission Public Hearing
ConocoPhillips Alaska, Inc. Alpine CD1 Gas Release

In Re: Docket Number: OTH-22-012
March 23, 2023

AOGCC Notice of Public Hearing, Agenda Items 1-5

On March 4, 2022, CPAI personnel reported to the AOGCC a natural gas release, which continued for several days, on the Alpine CD1 drillsite. In CPAI's Incident Investigation Report to the AOGCC on May 3, 2022, CPAI stated that the natural gas originated from Colville River Unit well WD-03 (WD-03) during drilling operations and identified findings and causal factors for the gas release. The AOGCC conducted an internal investigation into the Alpine CD1 gas release and called a hearing to address the following:

1) The casing and cementing program for well WD-03 per 20 AAC 25.030 as it relates to confining fluids to the wellbore, preventing the migration of fluids from one stratum to another and protecting significant hydrocarbon zones.
2) The gas disposition from the Alpine CD1 drillsite per 20 AAC 25.235 as it relates to waste of resources.
3) The conduct of operations for well WD-03 per 20 AAC 25.526 as it relates to CPAI's internal Section Plan for the well and communication of pressure limits to the field.
4) The well safety valve systems per 20 AAC 25.265 as they relate to producing natural gas up the outer annulus of well WD-03.
5) The change of an approved program per 20 AAC 25.507 as it relates to submission of an Application for Sundry Approvals form following oral approval from the commission.

CD1 Natural Gas Release Event Timeline

JAN. 2022 | FEB. 2022 | MARCH 2022 | APRIL - MAY 2022

Jan 25th
Disposal well WD-03 spud at CD1

Feb 27-28th
Freeze protection operations (later identified as initiating event)

4th
Detection of intermittent low-pressure gas at surface

7th
Well secured, Rig personnel safely relocated

8th
Gas release stabilized via controlled flow up WD-03 OA to Alpine facilities

8-12th
Surface gas levels reduced

12th
Rig warmup operations begin

21st
Rig acceptance complete by AOGCC

23rd
Gas sample analysis indicates gas source

25th
Logs confirm gas source interval as C10/Halo

29th
Controlled flow stops after pumping kill weight fluid into WD-03

30th
Logs confirm no flow from gas source

April 1st+
Progress cement operations

May 2nd
WD-03 cemented to surface; D142 rig operations complete

Dec 6th
AOGCC acceptance of WD-03 plugged and abandoned

INCIDENT MANAGEMENT TEAM MOBILIZED

Response → Stabilize gas release source → Rig warm up, planning → Logging and source control → Final source remediation

Plate Welded on WD-03, Plug & Abandonment Complete

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Agenda Item 3

The conduct of operations for well WD-03 per 20 AAC 25.526 as it relates to CPAI's internal Section Plan for the well and communication of pressure limits to the field.

20 AAC 25.526 - Conduct of operations

An operator shall carry on all operations and maintain the property at all times in a safe and skillful manner in accordance with good oil field engineering practices and having due regard for the preservation and conservation of the property and protection of freshwater.

Incident Investigation Report Summary

- As a learning organization, ConocoPhillips recognizes that safety cultures improve when we take the time to understand how work gets done and determine if there is a gap between execution in the field and the procedure. In this regard, ConocoPhillips Management selected a multidisciplinary team composed of Subject Matter Experts from outside the Alaska Business Unit to perform a TapRoot investigation of the Alpine CD1 Gas Release.

- ConocoPhillips typically follows the TapRoot process for incident investigations, which is a structured approach for identifying human performance and/or equipment challenges, and the underlying root causes that can then be addressed through corrective measures.

- The team began the investigation on March 28 during ongoing incident response activities. The team reviewed pertinent information and interviewed personnel involved with the planning and execution of WD-03 to determine causal factors and corrective actions that could be taken to reduce the likelihood of recurrence.

- A final report was submitted to the AOGCC on May 3, one day after Doyon 142 rig operations to permanently plug WD-03 with cement to surface were completed.

Doyon 142 on slot 50 at CD1

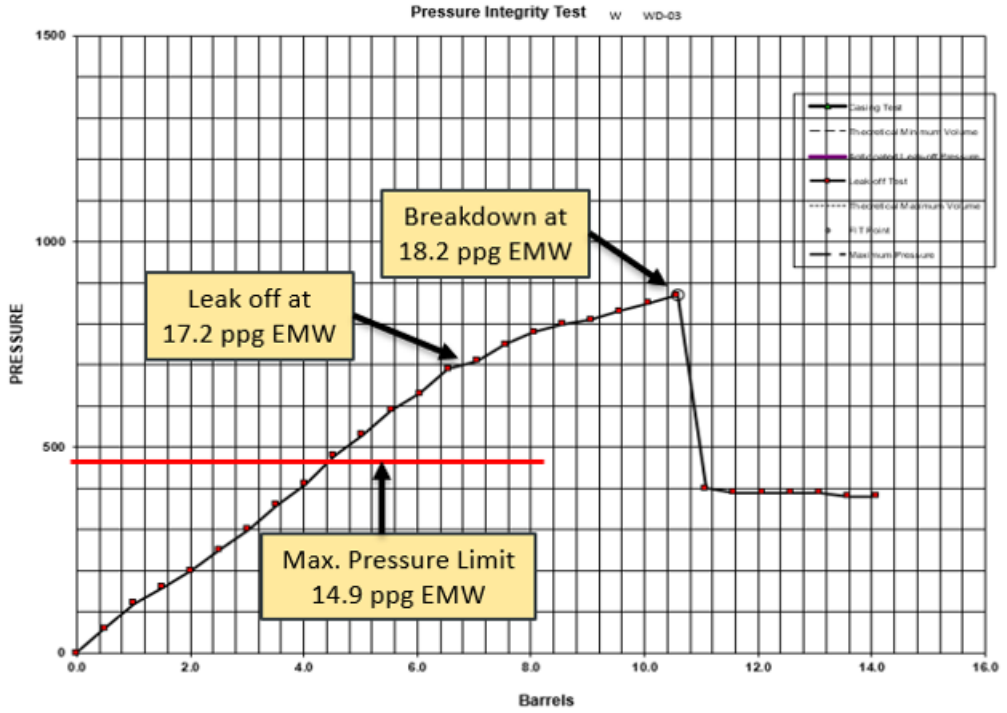
Causal Factor No. 1

Pressure limits were exceeded while performing Annular Leak-Off Test and Freeze Protect operations on the 13 3/8” x 7 5/8” annulus

Exceeding the surface casing shoe LOT of 14.9 ppg EMW by up to 3.3 ppg during the Annular Leak-Off Test and Freeze Protect operations on February 27 most likely broke down the casing shoe and provided an initial pathway for gas migration around the outside of the WD-03 surface casing. Subsequent injection of approximately 300 bbls of water to displace the mud in the OA as part of the freeze protection procedure likely expanded this pathway.

- Corrective Measures
  - Develop a Freeze Protect SOP document for the North Slope with procedures, pressure limits, and contingent solutions when pumping operations reach limits.
  - Recognizing that the Section Plan execution can occur across multiple personnel shift patterns, critical section plan operations should be reviewed with the personnel performing the work prior to execution.

WD-03 Annular LOT Injection #1 – 2/27/2022



Corrective Measure #1: Annular Freeze Protection SOP

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ANNULAR FREEZE PROTECTION
STANDARD OPERATING PROCEDURE

Document No. AK-WMS-4.1.6
Recommended Document Retention Code : ADM220

UNCONTROLLED UNLESS VIEWED VIA ALASKA WELLS WMS SHAREPOINT SIT
https://conocophillips.sharepoint.com/sites/DWMS/SitePages/Home.aspx

Rev	Originators	Reviewed By	Approved By	Description
1	E. Livingston, N. Anderson	C. Brillon, M.Vanderhorst, J. Delsing, E. Davis, K. Bourassa	L. Lawrence	Revision of SOP document following CO4-597 lessons learned and including but not limited to clarified scope, addition of acronym list and RACI cha Note: Subsequent revisions shall be reviewed by Legal.
			DocuSigned by:	
0	N. Anderson, M. Smith, J. Byrne	C. Brillon, E. Livingston	L. Lawrence	New SOP document that covers annu freeze protection operations.
			Aug 4, 2022	

Proprietary Information:

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Causal Factor No. 1 stated that: "Pressure limits were exceeded while performing Annular Leak-Off Test and Freeze Protect operations on the 13 3/8" x 7 5/8" annulus."

Corrective Measure #1: "Develop a Freeze Protect SOP document for the North Slope with procedures, pressure limits, and contingent solutions when pumping operations reach limits."

ConocoPhillips Alaska | ANNULAR FREEZE PROTECTION SOP | Doc. No.: AK-WMS-4.1.6 | Revision: 1 | Date: October 2022 | Page 3 of 14

1 PURPOSE

The purpose of the Annular Freeze Protection Standard Operating Procedure (SOP) is to outline safe and environmentally sound practices for freeze protection operations on the outer most annulus (OA) of a well that is open to overburden formations (i.e., an open OA). This OA is typically the surface casing by intermediate or production casing annulus for wells on the North Slope.

Freeze protection of wells on the North Slope is required by the Alaska Oil and Gas Conservation Commission (AOGCC) 20 AAC 25.030 to maintain well integrity.

2 SCOPE

The Annular Freeze Protection SOP provides requirements for planning and executing annular freeze protection operations by pumping down the OA and displacing fluid into the overburden. Annular freeze protection operations are performed upon initial well construction and throughout the well's life cycle when reloading of freeze protection fluid is necessary with an open OA.

This SOP contains two annular freeze protection procedures – one for Annular Disposal wells and one for wells that do not have Annular Disposal planned.

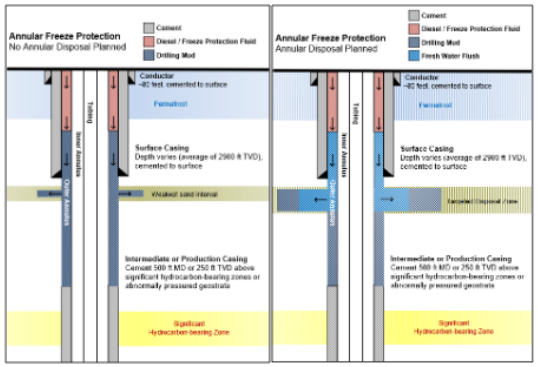


Figure 1. Annular Freeze Protection Diagrams

In Scope: "…provides requirements for planning and executing annular freeze protection operations **by pumping down the OA and displacing fluid into the overburden**."

Split into two SOPs based on Well's Annular Disposal Plans

Key Item: Requires pump schedule to clearly define MAASP, translates the surface shoe FIT/LOT into surface pressures

Contingencies:

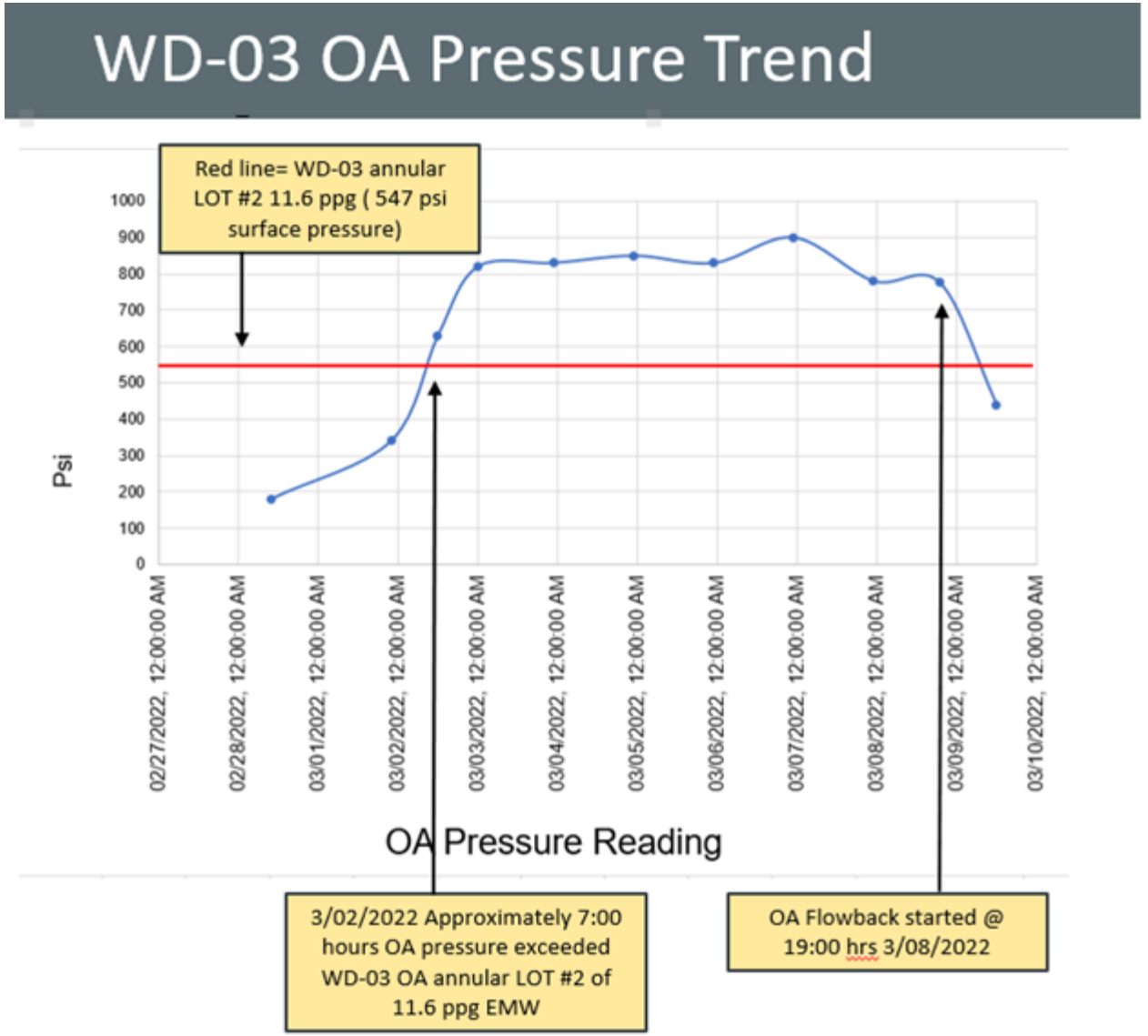
- Work Within MAASP to Obtain Injectivity
- Risk Assessment to Establish Injectivity Outside of MAASP
- Perform Cement Squeeze to Strengthen Shoe Integrity

Causal Factor No. 2

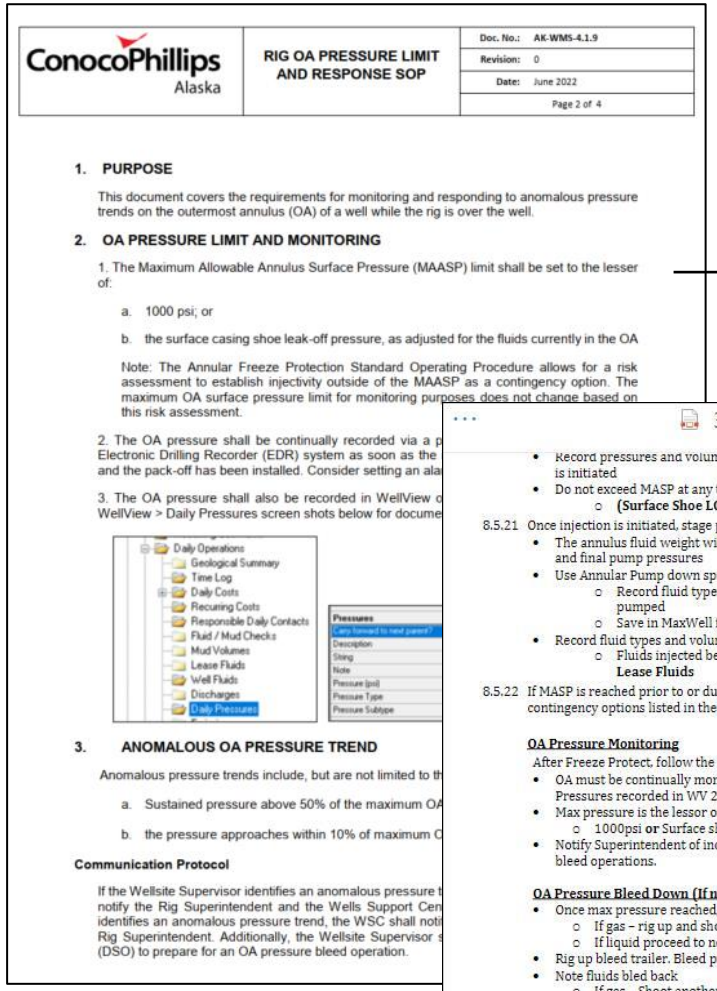
Pressure increases in the WD-03 OA during post-Annular LOT and Freeze Protect operations were not recognized and/or addressed

The pressure increases in WD-03's OA from March 1 to March 3 were not recognized and/or addressed and, accordingly, did not lead to investigation or remedial action during that period. The volume of gas released from the C10/Halo in WD-03 could have been reduced if actions to address the elevated OA pressures had been taken earlier.

- Corrective Measures
  - Develop OA maximum pressure limits in the drilling program, communication protocols to the Wells Support Center, and consider drilling rig OA pressure sensors to allow for alarms/trending.



Corrective Measure #2: Rig OA Pressure Protocol



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RIG OA PRESSURE LIMIT AND RESPONSE SOP	Doc. No.: AK-WMS-4.1.9
	Revision: 0
	Date: June 2022
	Page 2 of 4

1. PURPOSE

This document covers the requirements for monitoring and responding to anomalous pressure trends on the outermost annulus (OA) of a well while the rig is over the well.

2. OA PRESSURE LIMIT AND MONITORING

1. The Maximum Allowable Annulus Surface Pressure (MAASP) limit shall be set to the lesser of:

   a. 1000 psi; or

   b. the surface casing shoe leak-off pressure, as adjusted for the fluids currently in the OA

   Note: The Annular Freeze Protection Standard Operating Procedure allows for a risk assessment to establish injectivity outside of the MAASP as a contingency option. The maximum OA surface pressure limit for monitoring purposes does not change based on this risk assessment.

2. The OA pressure shall be continually recorded via a p
Electronic Drilling Recorder (EDR) system as soon as the
and the pack-off has been installed. Consider setting an ala

3. The OA pressure shall also be recorded in WellView
WellView > Daily Pressures screen shots below for docume

3. ANOMALOUS OA PRESSURE TREND

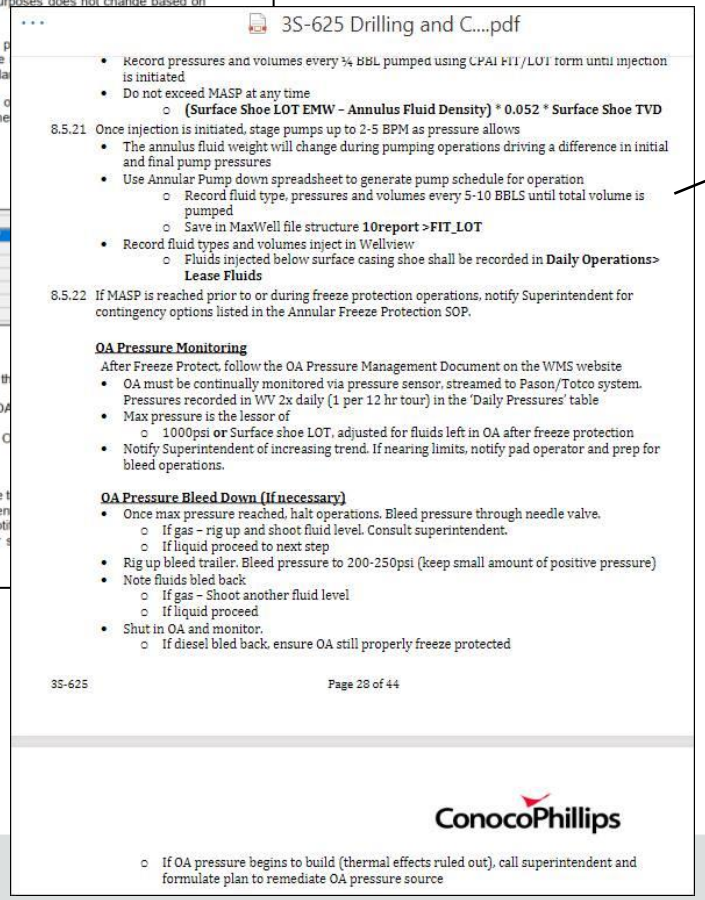
Anomalous pressure trends include, but are not limited to th

a. Sustained pressure above 50% of the maximum OA

b. the pressure approaches within 10% of maximum C

Communication Protocol

If the Wellsite Supervisor identifies an anomalous pressure t
notify the Rig Superintendent and the Wells Support Cen
identifies an anomalous pressure trend, the WSC shall noti
Rig Superintendent. Additionally, the Wellsite Supervisor
(DSO) to prepare for an OA pressure bleed operation.



3S-625 Drilling and C....pdf

- Record pressures and volumes every ¼ BBL pumped using CPAI FIT/LOT form until injection is initiated
- Do not exceed MASP at any time
  - **(Surface Shoe LOT EMW – Annulus Fluid Density) * 0.052 * Surface Shoe TVD**

8.5.21 Once injection is initiated, stage pumps up to 2-5 BPM as pressure allows
- The annulus fluid weight will change during pumping operations driving a difference in initial and final pump pressures
- Use Annular Pump down spreadsheet to generate pump schedule for operation
  - Record fluid type, pressures and volumes every 5-10 BBLS until total volume is pumped
  - Save in MaxWell file structure **10report >FIT_LOT**
- Record fluid types and volumes inject in Wellview
  - Fluids injected below surface casing shoe shall be recorded in **Daily Operations> Lease Fluids**

8.5.22 If MASP is reached prior to or during freeze protection operations, notify Superintendent for contingency options listed in the Annular Freeze Protection SOP.

OA Pressure Monitoring

After Freeze Protect, follow the OA Pressure Management Document on the WMS website
- OA must be continually monitored via pressure sensor, streamed to Pason/Totco system. Pressures recorded in WV 2x daily (1 per 12 hr tour) in the 'Daily Pressures' table
- Max pressure is the lessor of
  - 1000psi **or** Surface shoe LOT, adjusted for fluids left in OA after freeze protection
- Notify Superintendent of increasing trend. If nearing limits, notify pad operator and prep for bleed operations.

OA Pressure Bleed Down (If necessary)
- Once max pressure reached, halt operations. Bleed pressure through needle valve.
  - If gas – rig up and shoot fluid level. Consult superintendent.
  - If liquid proceed to next step
- Rig up bleed trailer. Bleed pressure to 200-250psi (keep small amount of positive pressure)
- Note fluids bled back
  - If gas – Shoot another fluid level
  - If liquid proceed
- Shut in OA and monitor.
  - If diesel bled back, ensure OA still properly freeze protected

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  - If OA pressure begins to build (thermal effects ruled out), call superintendent and formulate plan to remediate OA pressure source

Causal Factor No. 2 stated that: "Pressure increases in the WD-03 OA during post-Annular LOT and Freeze Protect operations were not recognized and/or addressed."

Corrective Measure #2: "Develop OA maximum pressure limits in the drilling program, communication protocols to the Wells Support Center, and consider drilling rig OA pressure sensors to allow for alarms/trending."

Example Drilling and Completion Program with Rig OA Pressure Protocol language included.

Key Changes:

- The OA is continually monitored via pressure sensor tied into the Electronic Data Recording (EDR) on the rig. Additionally, a pressure reading is recorded in WellView once per 12-hour shift.
- Established an OA pressure limit that triggers bleed operations.
- Established a communication protocol.

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Agenda Item 1

The casing and cementing program for well WD-03 per 20 AAC 25.030 as it relates to confining fluids to the wellbore, preventing the migration of fluids from one stratum to another and protecting significant hydrocarbon zones.

20 AAC 25.030 – Casing and cementing

(a) A complete proposed well casing and cementing program must be submitted with an application for a Permit to Drill (Form 10-401). Unless modified or altered by pool rules established under 20 AAC 25.520, a well casing and cementing program must be designed to . . .

(2) **confine fluids to the wellbore**;

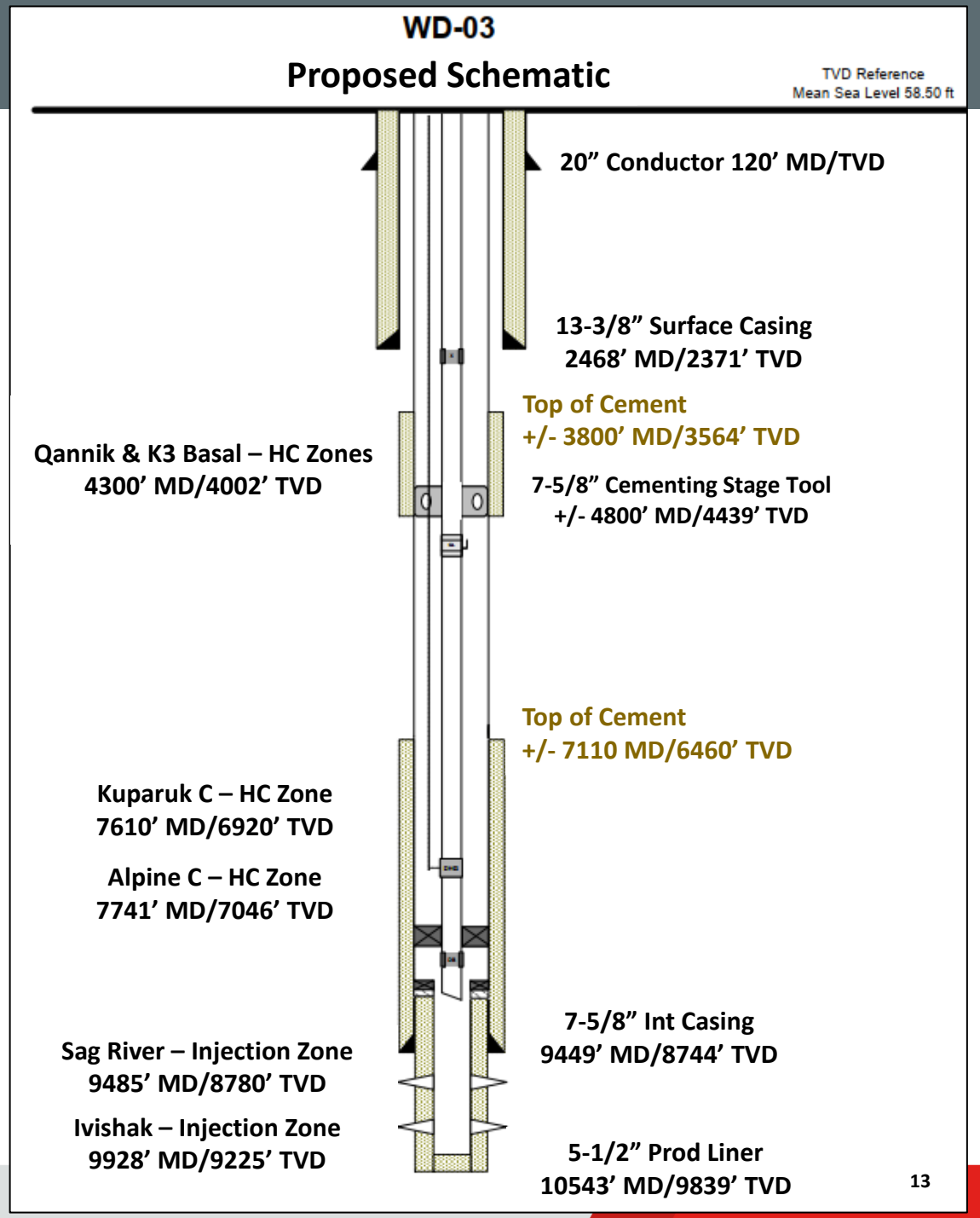
(3) **prevent migration of fluids from one stratum to another**; [and] . . .

(7) **protect significant hydrocarbon zones**

WD-03 Casing & Cementing Design

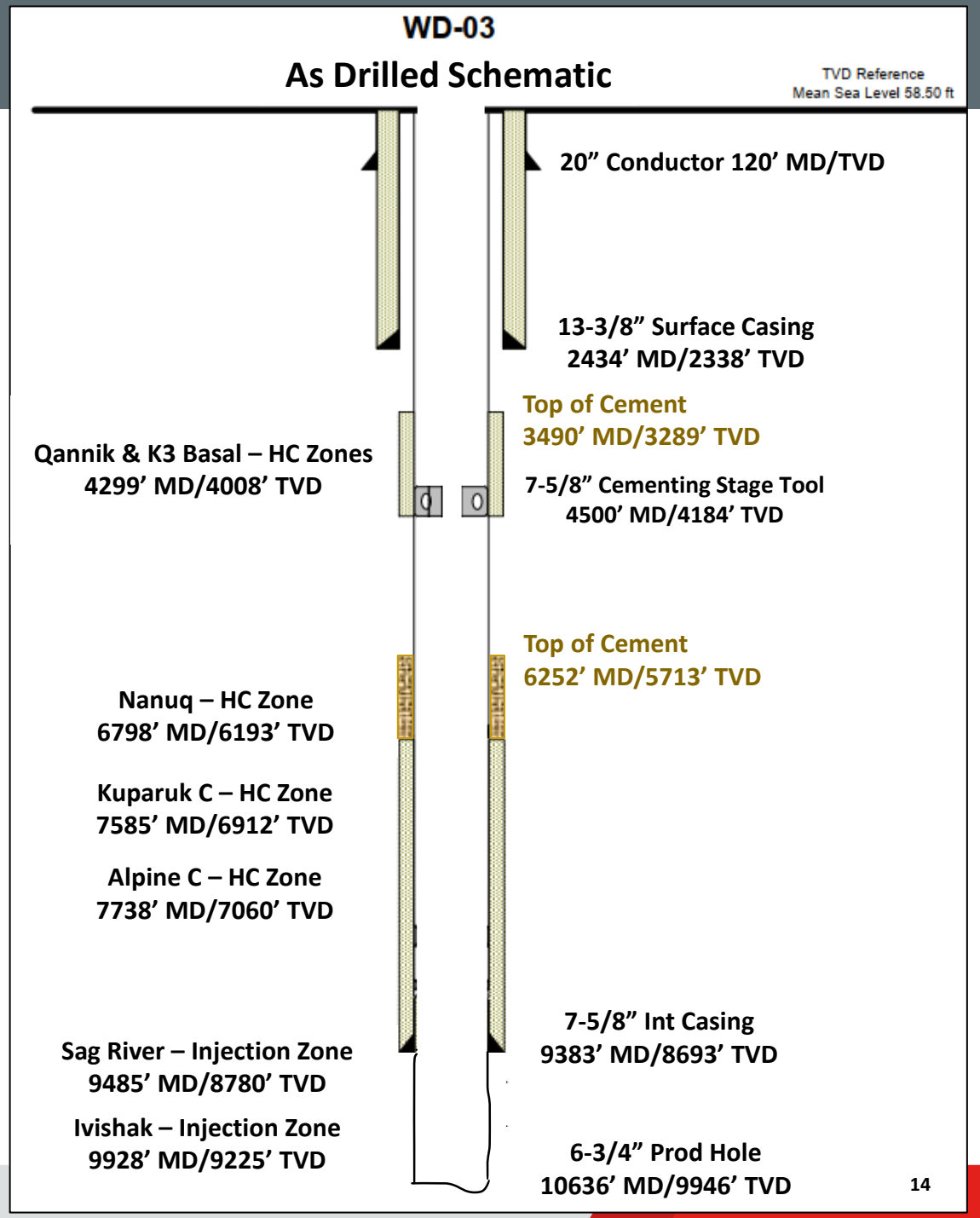
Proven well design process that was used to drill 49 other CD1 wells

- U.S. EPA authorized construction of WD-03 as an Underground Injection Control Class 1 disposal well, in compliance with Safe Drinking Water Act regulations, and the AOGCC approved ConocoPhillips's application for a Permit-To-Drill WD-03, in compliance with AOGCC regulations.
- Well design was not a causal factor identified by the investigation team
- ConocoPhillips uses a multi-disciplinary Well Design and Delivery Process (i.e., Front-End Loading Process)
- Permit-To-Drill submitted to AOGCC for approval
- Drilling & Completion program finalized with any Permit-To-Drill approval requirements
- During execution, the Drilling & Completion Program is used to generate detailed Section Plans that provide step-by-step directions for the rig team to follow



WD-03 Drilling Execution Schematic

- Nanuq formation identified as a “significant hydrocarbon zone” during drilling execution
- As such, the Intermediate 1 primary cement job top was adapted to isolate this zone per regulation.
- In contrast to Nanuq, the investigation report stated that the C10/Halo interval was not determined to be a “significant hydrocarbon zone” in the WD-03 well path during pre-drill planning nor during drilling operations.



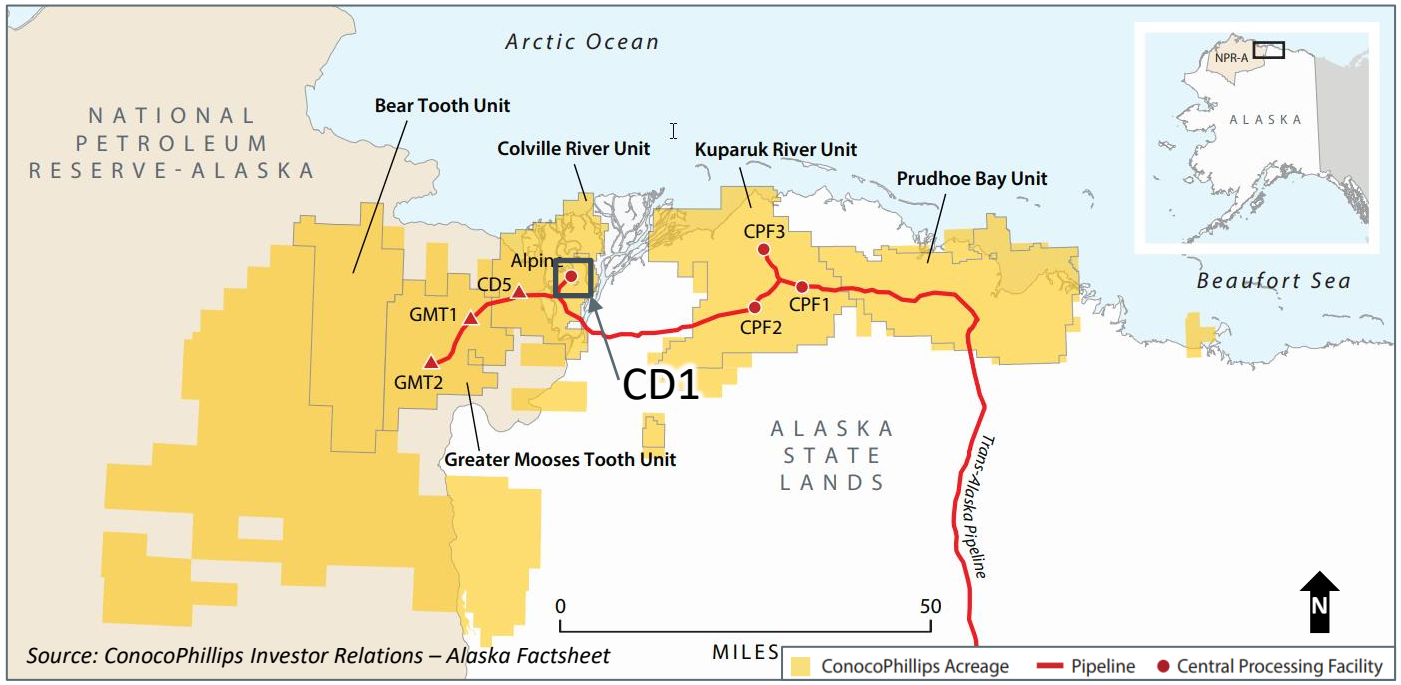
Identification of Significant Hydrocarbon Zones

- **CONDITION NO. 1:** The C10/Halo formation interval at the WD-03 well path was determined not to be a “significant hydrocarbon zone” or “abnormally geo-pressured strata” requiring cement isolation.
  - Based on historical evaluation methods used to successfully drill 49 other CD1 wells, the C10/Halo at the WD-03 well path was determined not to be a “significant hydrocarbon zone” or “abnormally geo-pressured strata” during pre-drill planning and/or during drilling operations. Therefore, no cement isolation was deemed necessary to be in compliance with AOGCC regulations. See 20 AAC 25.030, 25.990.

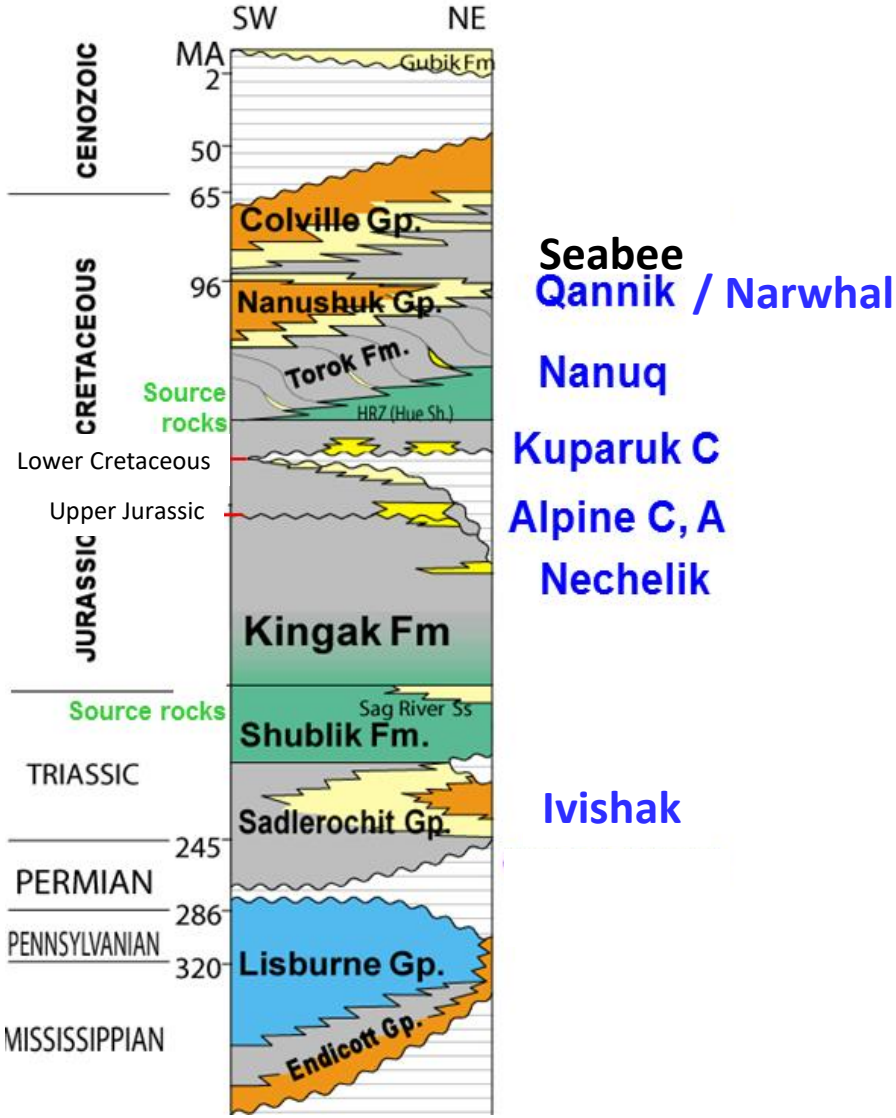
  - Note #1: The CD1-15 well produces gas intermittently from the C10/Halo as necessary to restart the Alpine facility following shutdowns. Thus, in contrast to the C10/Halo formation interval at the WD-03 well path, the C10/Halo formation interval at the CD1-15 well path was determined to be a “significant hydrocarbon zone” and was accordingly isolated with cement as per AOGCC regulations. The CD1-15 C10/Halo interval is located in a seismic bright spot/amplitude approximately 4922 ft NE of the WD-03 C10/Halo location.

- Corrective Measure:
  - Conduct a review of the overburden and adjust the associated log models as necessary to improve identification of drilling risks, flowability assessments, and zones requiring cement isolation.

CD1 Location and Seabee Formation



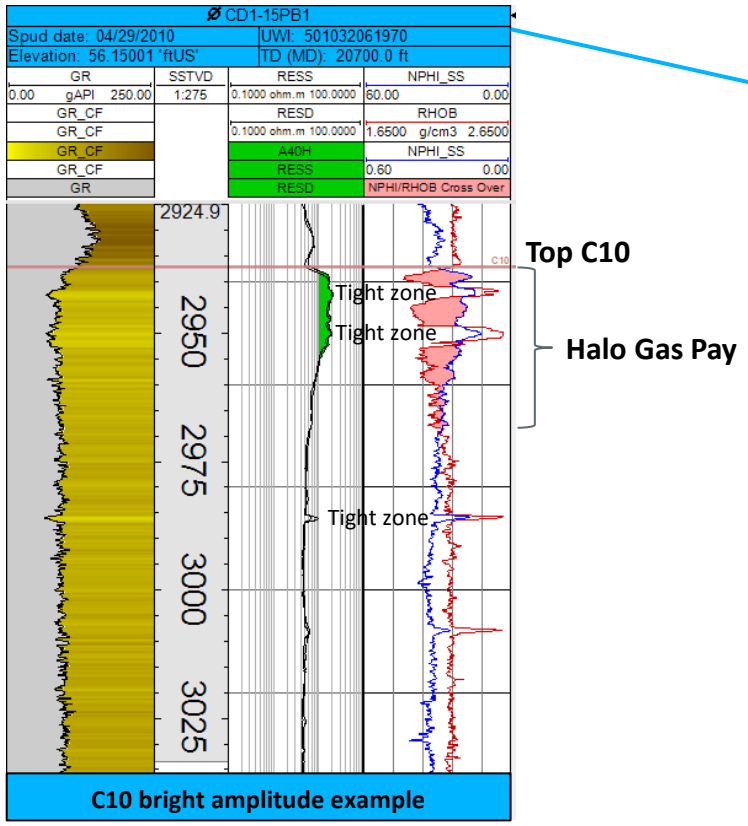
Source: ConocoPhillips Investor Relations – Alaska Factsheet



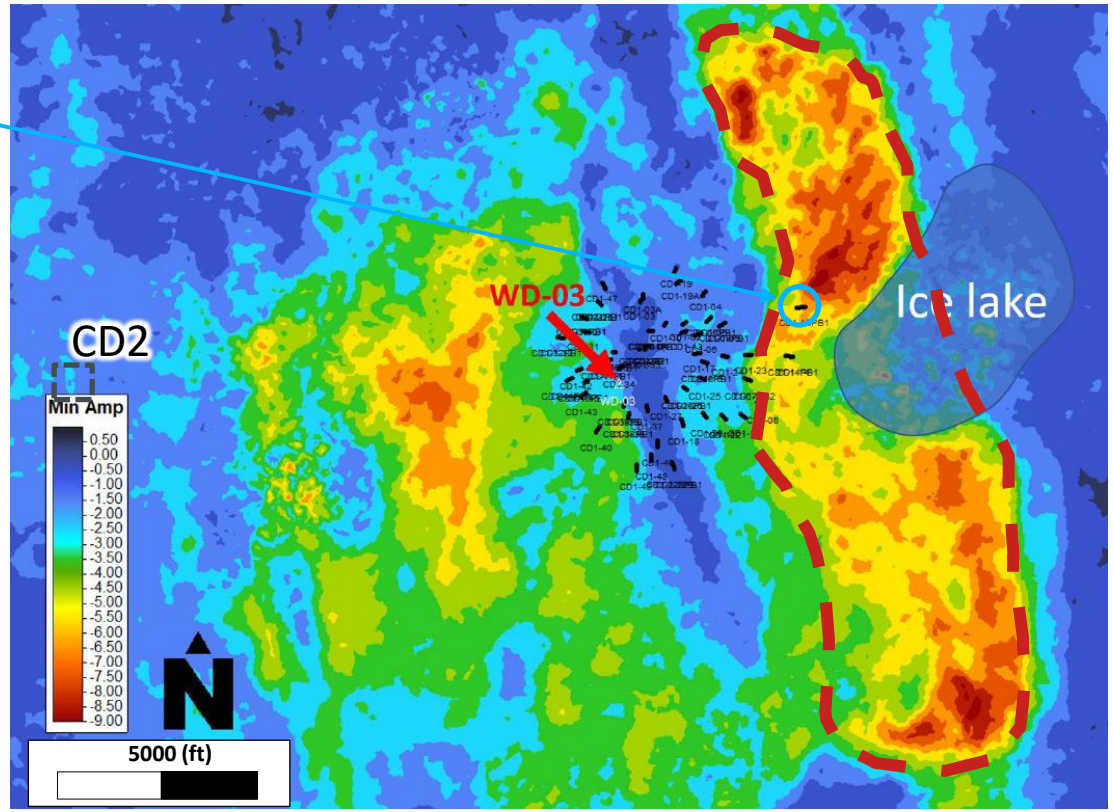
- CD1 located in Eastern Colville River Unit
- Seabee
  - Within Colville Group of Upper Cretaceous; between Nanushuk-Torok and Schrader Bluff Fms
  - Non-marine to marine clays, silts and sands deposited as part of prograding sequence
  - Halo sand, when present in eastern CRU, is within the C10 (lower Seabee) and is intermittently produced at CD1-15

CD1-15: Produces Gas Intermittently From The C10/Halo

CD1-15PB1



Halo Amplitude Map

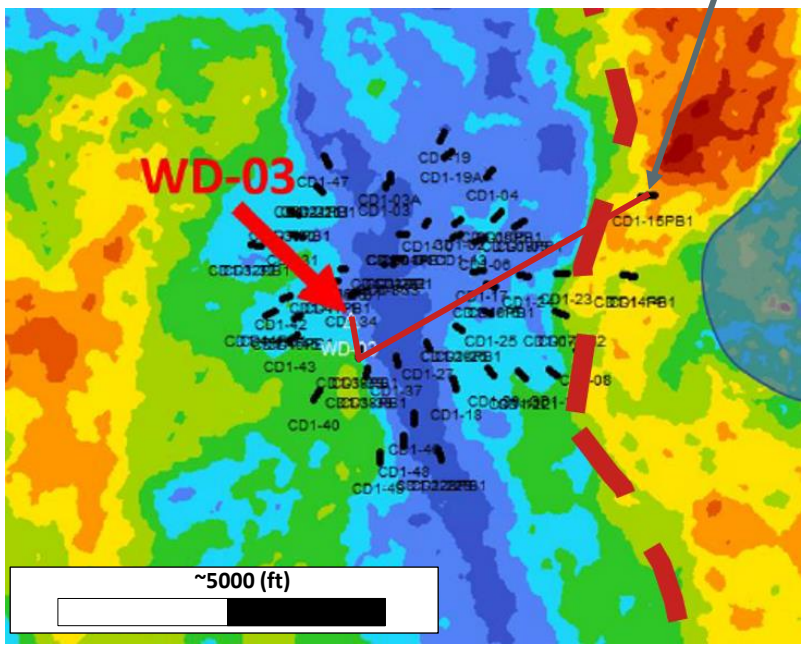


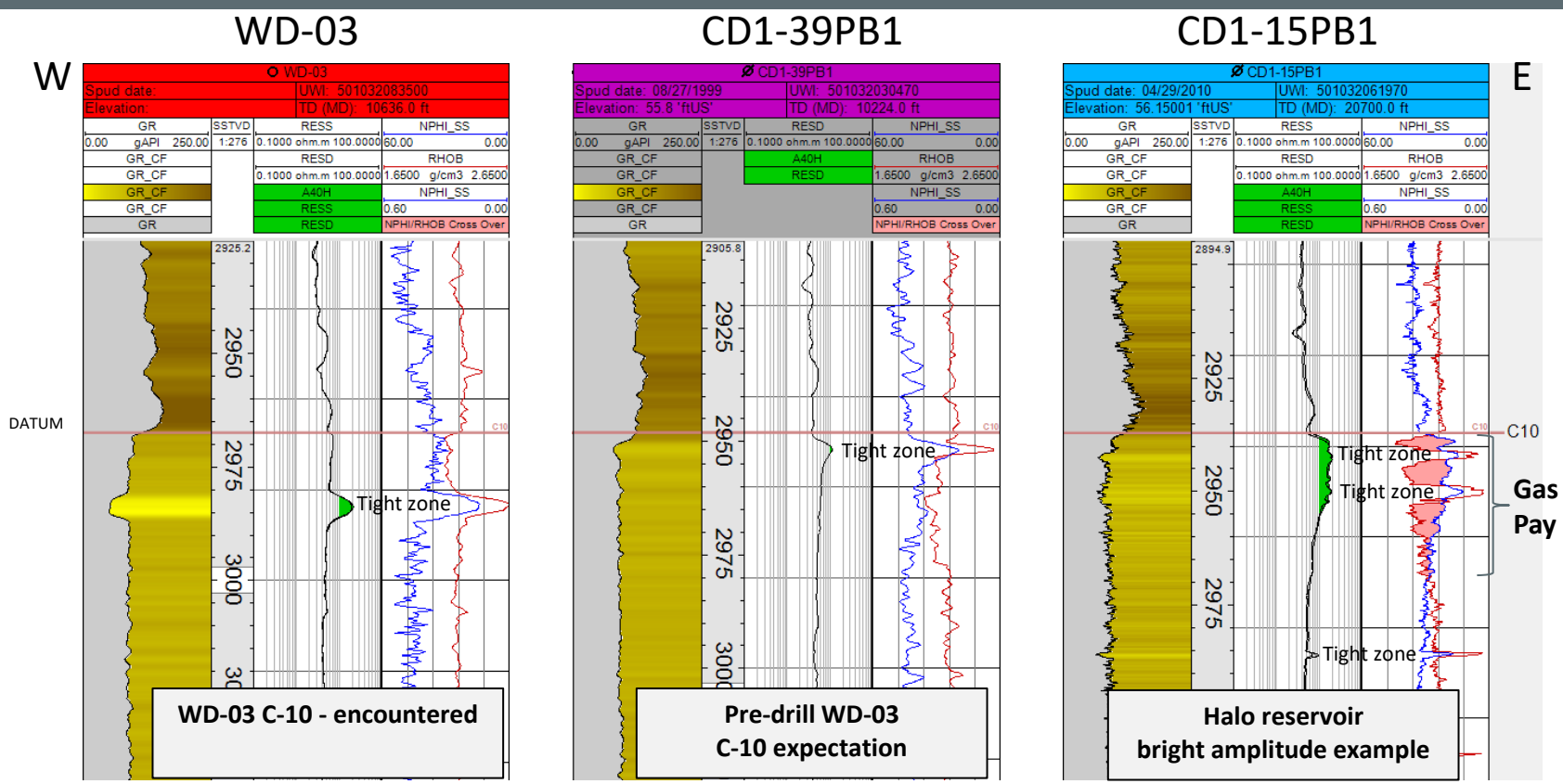
- **Log and seismic response at CD1-15 was pre-drill expectation for Halo pay**
  - Resistivity >10 ohm-m
  - Clear DENS-NEUT crossover on logs (gas pay)
  - Calculates as net pay using Archie Eqn. with traditional Sw cutoffs
  - Within bright amplitude area on seismic

- Within seismic bright spot/amplitude – Previously thought to be extent of the Halo gas reservoir
  - WD-03: Outside of CD1-15 amplitude anomaly and ~ 1 mile away

- **Determined to be a "significant hydrocarbon zone" and was accordingly isolated with cement as per AOGCC regulations.**

WD-03 Signatures Distinct From CD1-15





Based on available data, WD-03 Halo determined not to be significant HC zone during pre-drill planning and/or during drilling operations

- 50th well at CD1
- WD-03 drilled same seismic dim zone as majority of CD1 wells
- WD-03 logs and pre-drill expectation do not look like Halo pay at CD1-15
  - WD-03 log signature similar to nearby wells
  - Resistivity below 8 ohm-m; does not calculate as pay with 60% Sw cutoff
  - No clear density-neutron crossover

- The Alpine CD1 incident shows there is gas pay in the Halo sand at WD-03
  - Likely thin-bedded pay sands that challenge the limits of log resolution.

Corrective Measure #4: Overburden Review and Log Model Adjustment

Incident Investigation:

- **Condition No. 1** stated that: "*the C10/Halo at the WD-03 well path was determined not to be a 'significant hydrocarbon zone' or 'abnormally geo-pressured strata' during pre-drill planning and/or during drilling operations. Therefore, no cement isolation was deemed necessary to be in compliance with AOGCC regulations.*"

- **Corrective Measure #4:** "*Conduct a review of the overburden and adjust the associated log models as necessary to improve identification of drilling risks, flowability assessments, and zones requiring cement isolation.*"

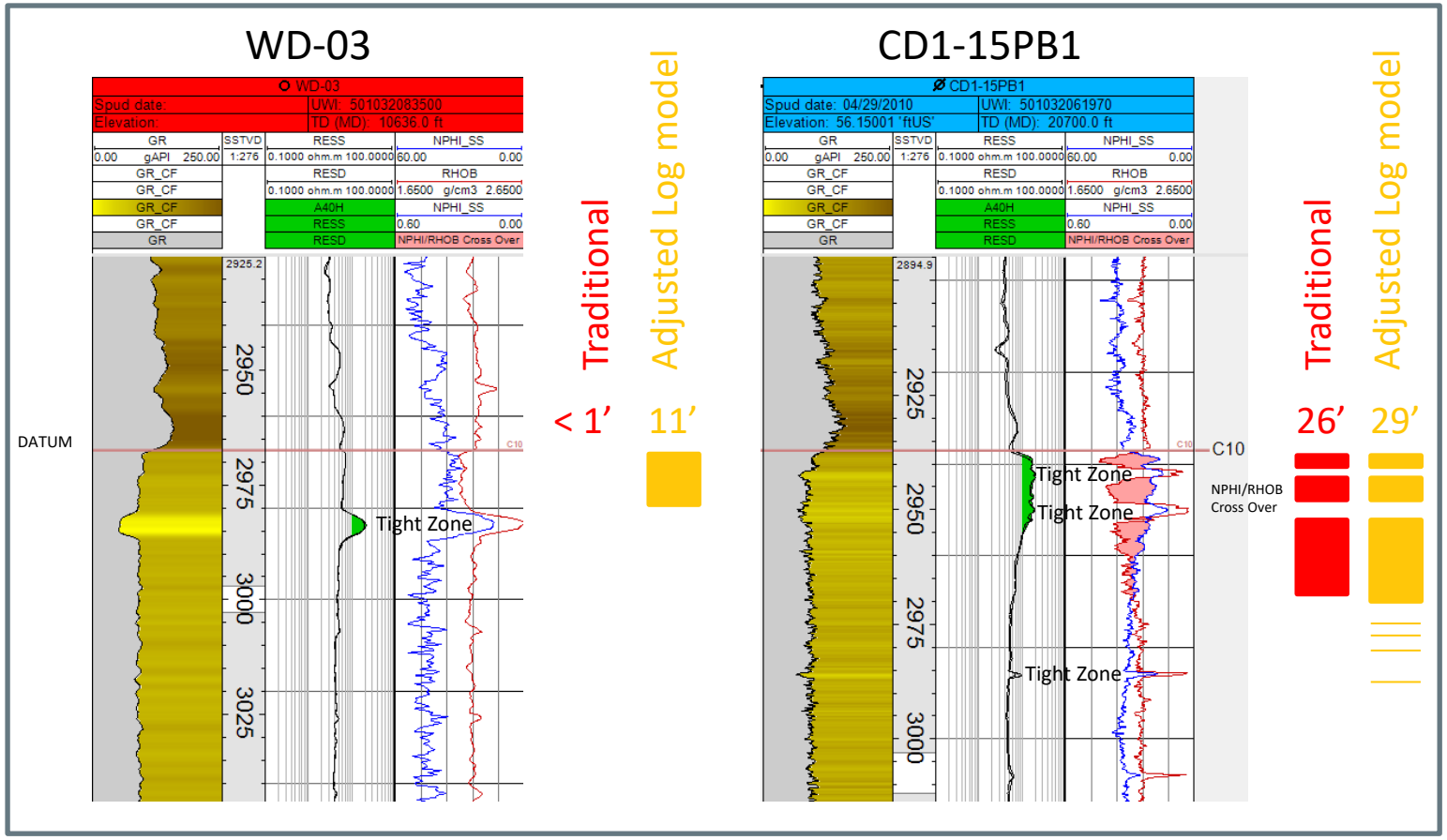
- Summarizes the log model adjustment designed to improve the identification of thin bedded, hydrocarbon-bearing reservoirs in the shallow overburden at CD1 (*e.g.*, Halo and any other potential Seabee sands).

	Calibration Wells
CD1 area	11
CD2 area	2
CD3 area	1
CD4 area	2
Other	2
TOTAL	18

Adjusted Log Model and Summary

Adjusted Log Model – Details described in response to RFI #19

- Detection tool to overcome thin-bed resistivity effects
  - High water saturation cutoff – Likely overpredicts net pay
  - Designed for screening - No core to constrain
  - One input into assessing overburden



Key Results/Findings:

- Adjusted Log model consistently flags Halo net pay in most CD1 wells of study
- Adjusted Log model flags no net pay in the Seabee in WD-03 above Halo
- Adjusted Log model results correlate to seismic amplitudes and used as calibration for Halo map
  - Seismic detection limit ~10-15 ft

Summary:

- Based on the historical evaluation methods used to successfully drill 49 other CD1 wells, the C10/Halo at the WD-03 well path was determined not to be a "significant hydrocarbon zone" or "abnormally geo-pressured strata" during pre-drill planning and/or during drilling operations
  - WD-03 seismic and log signature similar to many successful wells drilled from CD1 (dim zone)
    - Resistivity, DENS-NEUT, & amplitude dim
  - WD-03 data does not look like CD1-15 Halo pay

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Agenda Item 2

The gas disposition from the Alpine CD1 drillsite per 20 AAC 25.235 as it relates to waste of resources.

20 AAC 25.235 – Gas Disposition

(a) For each production facility the operator shall compile and report monthly gas disposition and acquisition on the Facility Report of Produced Gas Disposition (Form 10-422). If a facility's production comes from multiple pools, the operator shall allocate production between each producing pool as a percentage of the total volume of gas that the facility handled for the month. The **operator shall report gas acquisition or disposition by category**, as follows:

(1) gas sold;
(2) gas reinjected;
(3) gas flared or vented;
(4) gas used for lease operations other than flaring or venting;
(5) natural gas liquids (NGLs) produced;
(6) gas purchased;
(7) gas transferred;
(8) other.

(b) Any release, burning, or escape into the air of gas other than incidental de minimis venting as authorized under (d)(4) of this section must be reported as flared or vented on the Facility Report of Produced Gas Disposition (Form 10-422). The operator shall submit a written supplement for any flaring or venting incident exceeding one hour. The supplement must describe why the gas was flared or vented, list the beginning and ending time of the flaring or venting, report the volume of gas flared or vented, and describe actions taken to comply with (c) of this section.

(c) The **operator shall take action in accordance with good oil field engineering practices and conservation purposes to minimize the volume of gas released**, burned, or permitted to escape into the air. . . .

March 2022 Gas Disposition Report

STATE OF ALASKA
ALASKA OIL AND GAS CONSERVATION COMMISSION

FACILITY REPORT OF PRODUCED GAS DISPOSITION

1. Facility Number	2. Facility Name	3. Field	4. Operator	5. Month/Year of Disposition
1030000017	Colville River Unit Processing Facility	Colville River Unit	ConocoPhillips Alaska, Inc.	March-22

Disposition	Volume MCF
6. Sold	29,877
7. Reinjected	3,228,196
8. Flared or vented 1 hour or less	230
9. Flared or vented more than 1 hour (see instr.)	7,200
10. Pilot and Purge	23,661
11. Assist Gas	0
12. Fuel gas used in lease operations.	514,100
13. Other (see instructions)	
14. TOTAL VOLUME (ITEMS 6-13)	**3,803,264**
15. NGL Gas Equivalent	
16. Purchased gas	0
17. Transferred from:	1,609,640
18. Transferred to: (Express as a negative #)	

20. *For production from multiple pools, list contribution of each pool as a percent of Total Volume.*

Pool Name	Pool Code	Percent
ALPINE	120100	90.0%
NANUQ-NANUQ	120175	3.9%
QANNIK	120180	3.1%
OTHER		3.0%
		100.0%

AOGCC Use Only			
Authorization >1 hr:	Safety:		MCF
	Lease Use:		MCF
	Conservation:		MCF
	Waste:		MCF

Reviewed by:

COMMISSIONER

Comm. Comm.

19. Remarks:
Gas sold to Alpine Transportation Company = 17,081
Gas gifted to Village of Nuiqsut = 12,796
Gas sold to GMTU= 0
Gas vented > 1 hr per 4/1/22 letter from Erica Livingston re: Docket No. OTH-22-012 Gas Release

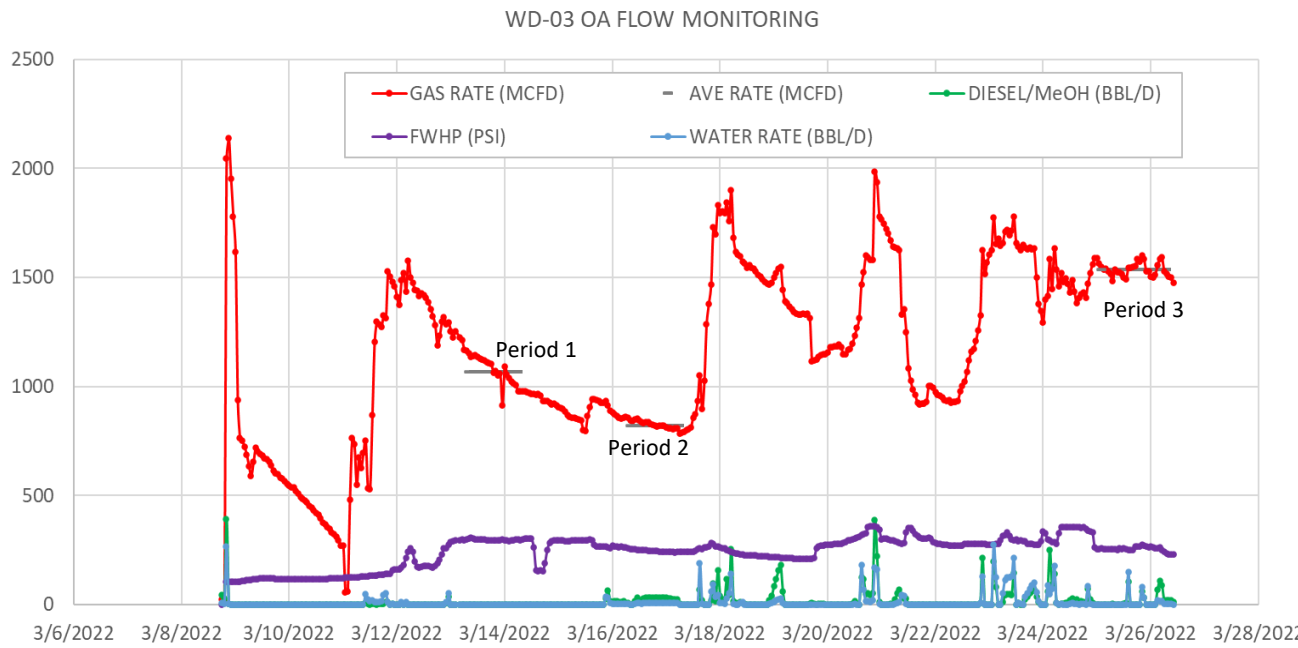
Timeline of Gas Flow

Volume released: 7.2 MMSCF

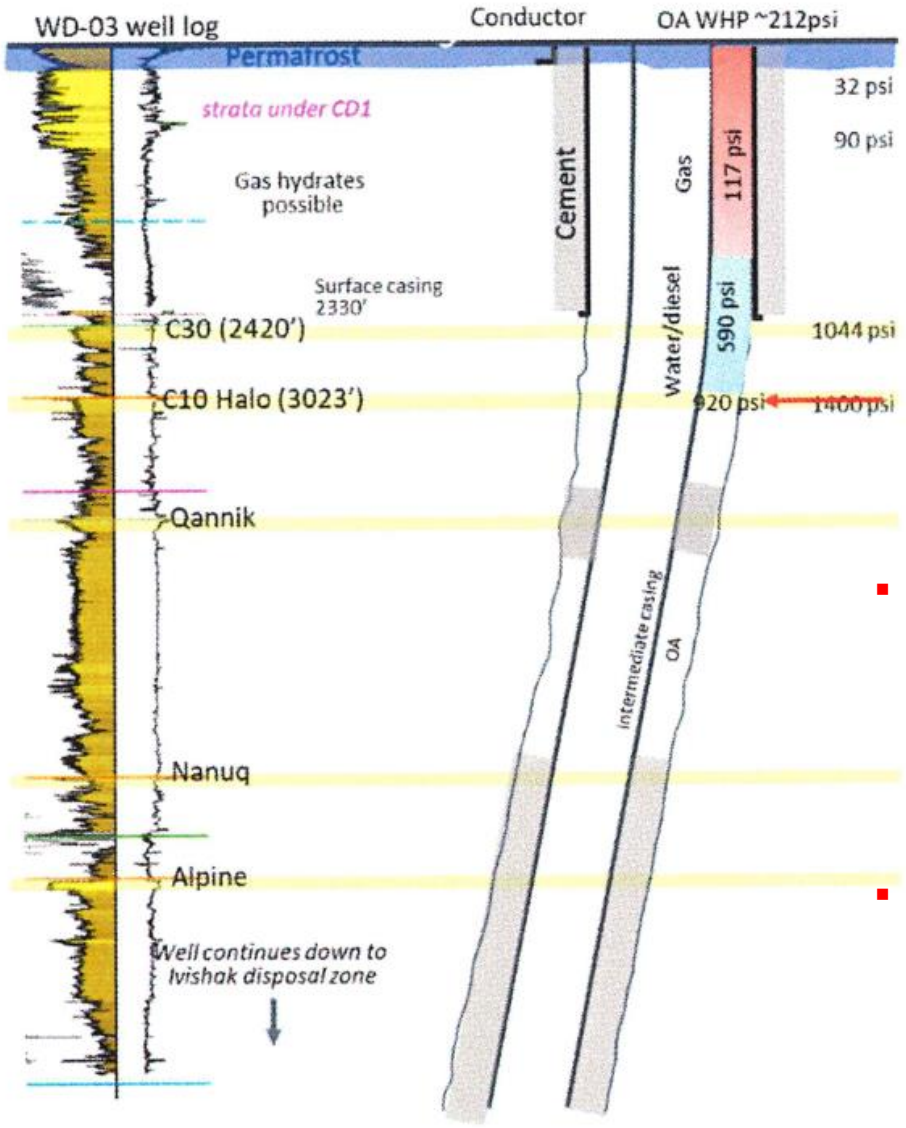
WD-03 OA flow to ACF: 24.3 MMSCF

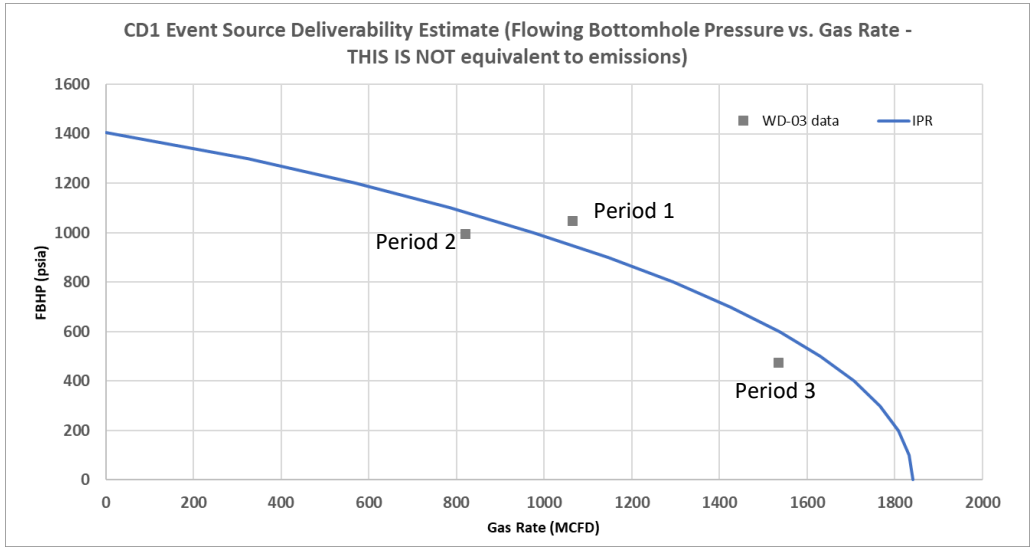
- 2/27 Initiating event; WD-03 surface casing shoe broken down during freeze protect operations
- 2/28 WD-03 gas flow up wellbore begins after WD-03 OA underbalanced with diesel
- 3/4 Gas first detected at surface
- 3/8 Start of WD-03 OA flow captured into ACF
- LELs at surface reduce in subsequent days
- 3/25 Logs confirm C10 Halo as sole source of gas
- 3/29 WD-03 gas flow stops after pumping kill weight fluid
- 3/30 Logs confirm no flow from C10

- 7.2 MMSCF released (to subsurface strata)
  - Volume released estimate provided to AOGCC Apr 1, 2022
  - Assumptions & calculations documented in “CD1 Gas Release Volume Estimation” report; provided to AOGCC on Jun 22, 2022
- 24.3 MMSCF captured to Alpine Central Facility (ACF) process
  - WD-03 OA rates used to inform volume released calculation



Volume Released Methodology





$$q = C\left(p_R^2 - p_{wf}^2\right)^n$$

q = flow rate, MMscfd
C = constant, MMscfd /(psi^2)^n
n = turbulence of flow, dimensionless
p_R = reservoir pressure, psia
p_{wf} = sandface flowing pressure, psia

n = 0.9 (CD1-15 2016 test)
C = 0.004 MCFD/psia^2 (stable periods of WD-03 OA flow)

- Calibration Data:
  - WD-03 OA pressure data before, during, and after gas release
  - Real time flow data from ACF test separator during WD-03 OA flow
  - WD-03 fluid level measurements
  - CD1-15PB1 shut in & flowing conditions
- 7.2 MMSCF estimated as a maximum estimate of release volume
  - Assumes release to subsurface strata once WD-03 OA underbalanced (Feb 28, 11am); incident concludes release to strata only after WD-03 OA pressure reaches 11.6 ppg at shoe (Mar 2, 7am)
  - Assumes productive capability of source is equivalent flowing to subsurface strata or OA
  - Does not attempt to estimate or deduct trace remnant of gas that may be trapped in subsurface strata and not released to surface

Event Response and Volume Captured

- Immediate ramp up of IMT following gas detection on 3/4; mobilized global resources towards response
- Ongoing communication & coordination with agencies (AOGCC, EPA, ADEC, DNR), during & after event
- Downhole diagnostics performed on multiple wells
- Gas & air monitoring installed (FLIR, LEL, drone, VOC)
- Early gas sampling to identify shallow gas source (likely C10-Halo), subsequent isotopic analysis to confirm
- Configured WD-03 to nearby producer to start controlled gas flow up WD-03 OA by 3/8

- Subsequent “hard line” hookup of WD-03 OA to multiple flow paths; 24-hour monitoring of pressure, temperature, flow
- LELs drop in following days; controlled flow enabled safe rig warm up; development of mitigation & contingency plans
- Leveraged gas samples to build hydrate curves; established operating procedure & active chemical management program
- Close monitoring at CD1-15PB1; brought online to evaluate impact on pressure / flow rate
- Acoustic & temperature logging to identify sole source as C10 Halo; run again following kill fluid to confirm stop of flow
- Volume released estimate released shortly after final flow; 7.2 MMSCF estimate of maximum release volume
- **Able to capture gas from 3/8 to 3/29; enabled time to start up rig safely & develop plan to mitigate source**

ConocoPhillips

Agenda Item 4

The well safety valve systems per 20 AAC 25.265 as they relate to producing natural gas up the outer annulus of well WD-03.

ConocoPhillips

Agenda Item 5

The change of an approved program per 20 AAC 25.507 as it relates to submission of an Application for Sundry Approvals form following oral approval from the commission.

20 AAC 25.265 – Well safety valve systems

(a) A completed well must be equipped with a functional safety valve system unless the well is

(1) a water source well;
(2) a disposal injection well;
(3) an observation well;
(4) shut-in; or
(5) suspended.

(b) A safety valve system must have a surface safety valve with an actuator and a low-pressure mechanical or electrical detection device with the capability to shut-in a well when the well's flow line pressure drops below the required system actuation pressure.

(c) A safety valve system must meet the following requirements: . . . .

20 AAC 25.507 – Change of an approved program

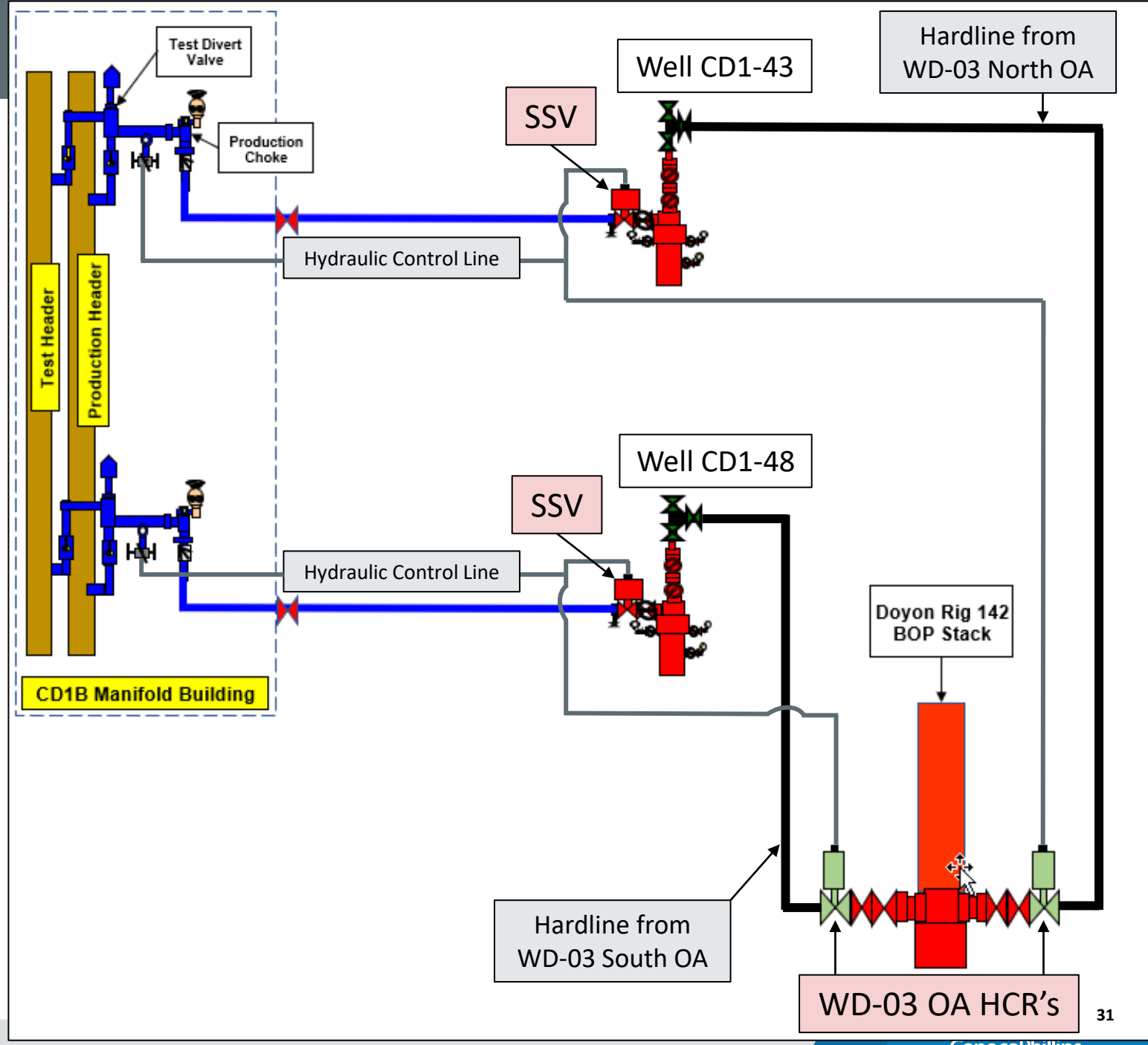
(a) Except as otherwise provided by 20 AAC 25.015, if an operator desires to make a substantive change in a program or activity for which commission approval is required and has been obtained under AS 31.05 or this chapter, complete details of the well's current condition and the proposed change must be submitted to the commission with an Application for Sundry Approvals (Form 10-403). **A change to an approved program or activity may not be undertaken without commission approval**. The commission will condition its approval as the commission considers necessary or appropriate to ensure compliance with the standards on which the original approval was based.

(b) If operational necessity requires prompt action, oral approval of a change may be obtained from the commission. The required Application for Sundry Approvals must be submitted within three days for final approval by the commission. That application must set out the name of the person who provided approval and the date of the oral approval.

WD-03 OA Flow Rig-up

Flowing WD-03 OA to ACF prevented additional release of gas from the C10-Halo to the subsurface strata above the surface casing shoe

- March 8 – WD-03 OA flow began with **verbal approval** from AOGCC in CPAI bldg.
- Mar 11 – AOGCC **written approval** via e-mail
- March 15 – **redundant hardline rigged up** to CD1-43 and CD1-48
- March 18 – AAC 25.265(o)(2) Waiver Request for well safety valve system
- March 22 – AOGCC inspector witnessed BOPE test prior to HCR valves installation
- March 23 – **HCR valves installed**
- March 25 – **AOGCC witnessed function test** of HCR on non-flowing side and SSV on non-flowing side.
- March 29 – **OA flow stopped** when KWF pumped in WD-03 (source controlled)



Closing Remarks