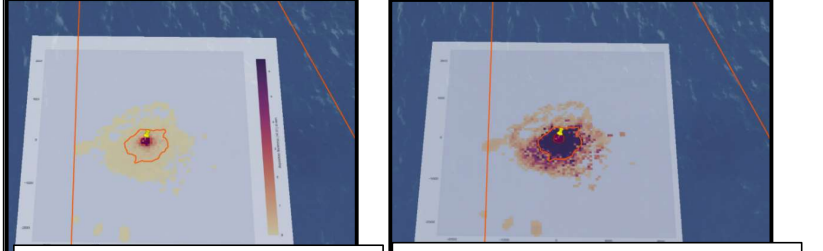
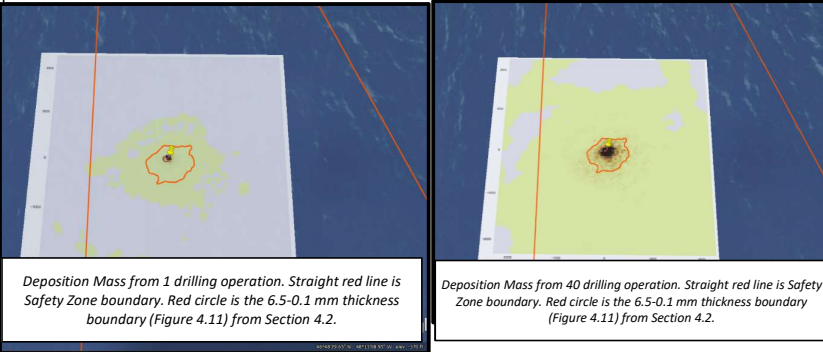


Files: EA Amendment and Responses to Comments
 Operator: Cenovus
 Program: West White Rose Project

Round 2				
Comment #	Section#, Page #; Paragraph/Sentence#	DFO Comment/Clarification Request	Cenovus Response	DFO Comment/Clarification Request
1	EA Amendment	The EA Amendment should discuss results shown in the "West White Rose Project, Far-Field Drill Cuttings Dispersion Modelling" Wood Report, instead of only referencing the SINTEF report. The EA Amendment should present the greatest possible effects from the Project (e.g., 40 wells, greatest extent, maximum thicknesses). Revisions recommended.	See Cenovus General Response and DFO Comment 8 (Round 1)	Response is satisfactory. Recommend EA Amendment be revised to discuss the results from 40 wells instead of 1, as described in the original submission.
2	-	To assist DFO in completing a risk assessment to evaluate effects on fish and fish habitat, it would be helpful to include the total footprint (in m ²) of the drill cuttings deposition (1.5 mm and 6.5 mm thicknesses) for 40 wells. If 1.5 and/or 6.5 mm were not specifically modelled, then the nearest values below those would be fine.	See Cenovus General Response and DFO Comment 9 (Round 1)	Satisfactory
3	EA Amendment; Section 2.4; Page 3; Paragraph 2: <i>"The outcome of the SINTEF modelling predicted that, for SBM cuttings treated with Shaker + Dryer +centrifuge, most (89.4 %) threat comes from oxygen depletion related to biodegradation of chemicals in areas with cuttings deposition > 0.3 g/m2 and that this effect may extend up to 1000 m from the origin for a 40 well program".</i>	Is this statement referring to Figure 6.3 in Section 6.3 (page 53), which illustrates deposition mass from repeated drillings (results from the model postprocessed for repeated drillings)? In Figure 6.3, deposition mass above 0.3 g/m2 (< 1 kg/m2 from the Figure scale) extends 1 km from the center when drilling 1 well was modelled; deposition mass above 0.3 g/m2 extends more than 2 kms from the center for 40 wells. Statement should be updated to indicate which section/figure(s) from the SINTEF modelling report is being referred to and accurately characterize results for a 40 well program. Please include details on why 0.3 g/m2 was selected as the threshold for oxygen depletion in the EA Amendment.	This statement is not referring to SINTEF Figure 6.3 in Section 6.3 (page 53), but rather Section 4.2 Sea Floor Results (page 38) in which Scenario 2 – 5.5% SOC is presented. The following figure superimposes Figure 4.13 – Deposited Mass Over 0.3 g/m ² with Figure 4.17 (t-r) Maximum Risk for Oxygen Depletion. The >5% risk zone for oxygen depletion (total EIF contribution = 89.42%) extends to the perimeter of the 10 to 30 g/m ² sediment deposition zone rather than the >0.3 g/m ² zone as was implied in the original submission. The 10 to 30 g/m ² extends approximately 1,000 m from the platform.	Satisfactory
4	EA Amendment; Section 2.4; Page 3; Paragraph 3: <i>"The results of the SINTEF model are illustrated in Figure 2-1. A cross section through the deposited area shows that the area where the thickness is above the effect limit 0.65 cm is within 175 m of the discharge. The largest impacted area is the 0.1 to 6.5 mm cuttings deposition thickness (red line in Figure 2.1)."</i>	Figure 2-1 of the EA Amendment appears to be modified from Figure 4.11 (Section 4.2, page 38) of the SINTEF report, where the deposited area described is only for a single discharge. In Section 6.2., the deposition thickness above 6.5 mm is within ~500 m of the drill centre for 40 wells. The Wood report also indicates that 6.5mm thickness will be within 500m of the drill center (if considering average +/- standard deviation). If max thickness is considered, it extends to 16 km (Table 5-2, page 27). This statement and associated figure seem to be for 1 well, which should be clearly indicated. The EA Amendment should be updated to include results from 40 wells. Results from the Wood modelling report should be included in the discussion of thicknesses and extent of the discharge. As noted in comment 1, the greatest possible effects (e.g., 40 wells, greatest extent, max thickness) should be described in the EA Amendment. Revisions recommended.	See Cenovus General Response and DFO Comment 1 (Round 1)	Response is satisfactory. If not considering the 0.65 cm as the effect limit, recommend removing this sentence and updating text to reflect 40 wells as oppose to 1.
5	EA Amendment; Section 2.4; Page 3; Paragraph 3 Sentence 6: <i>"The affected area is around the discharge location within a radius of approximately 1 km"</i>	When referring to "affected area", it should be clarified what drill cutting deposition thickness and number of wells were taken into account. As noted above, DFO is interested in the 1.5 and 6.5 mm thresholds for 40 wells. Revisions recommended.	The EA Amendment uses EEM data to determine environmental effects. The affected area, or zone of influence as referred to in an EA and EEM program, is not based on deposition thickness but rather, is based on the extent of effects to the benthic community. Results from the 2022 EEM indicate that there was evidence of project effects on benthic biomass near active drill centres and little to no evidence of effects on total abundance and richness. Decreases in biomass near active drill centre were related, in part, with decreases in the number of larger echinoderms.	Satisfactory

6	<p>EA Amendment; Section 3.3; Page 5; Paragraph 3: <i>"The SINTEF model indicates that the extent of the drill cuttings at 0.1 mm depth do not extend beyond the White Rose Safety Zone (Figure 2.1)"</i></p>	<p>It is possible that drill cutting deposition at 0.1 mm may extend to the boundary or slightly beyond the safety zone after drilling 40 wells (see images below of sections from Figure 6.4, Section 6.2 - page 54 overlain on Google Earth). In the Wood report, considering the mean deposition thickness, 0.7mm extends out to 10-16km (Table 5-2, page 27). This would also be outside of the safety zone.</p> <p>EA Amendment should be revised to reflect a 40 well program (with consideration of results from the Wood report).</p>  <p>Deposition Thickness from 1 drilling operation. Straight red line is Safety Zone boundary. Red circle is the 0.1 - 6.5 mm thickness boundary (Figure 4.11) from Section 4.2</p> <p>Deposition Thickness from 40 drilling operations. Straight red line is Safety Zone boundary. Red circle is the 0.1 - 6.5 mm thickness boundary (Figure 4.11) from Section 4.2</p>	<p>As noted above, DFO is interested in the 1.5 and 6.5 mm thresholds for 40 wells. These thresholds do NOT extend beyond the White Rose Safety Zone and the 0.1 mm only extends to the boundary or slightly beyond the White Rose Safety Zone. The White Rose Field does not contain significant benthic habitat, and there are no corals identified in the area. As such, the PNET of 1.5 mm (pertaining to corals) and 6.5 mm (pertaining to significant benthic habitat) are not applicable to the White Rose Field.</p>	<p>Satisfactory</p>
7	<p>EA Amendment; Section 3.5; Page 7; Final Paragraph: <i>"Given that the spatial extent of drill cuttings from the WWRP is wholly within the White Rose Safety Zone and limited to a radius of approximately 1 km around the discharge location....."</i></p>	<p>The statement seems to apply to a single well; however, the spatial extent of multiple drill cuttings (40) from the WWRP extends further than for a single well (see images below of sections from Figure 6.3, Section 6.2 - page 53). As stated above, the Wood report also shows that drill cuttings that extend outside of the safety zone.</p> <p>EA Amendment should be revised to reflect a 40 well program (with consideration of results from the Wood report).</p>  <p>Deposition Mass from 1 drilling operation. Straight red line is Safety Zone boundary. Red circle is the 6.5-0.1 mm thickness boundary (Figure 4.11) from Section 4.2.</p> <p>Deposition Mass from 40 drilling operation. Straight red line is Safety Zone boundary. Red circle is the 6.5-0.1 mm thickness boundary (Figure 4.11) from Section 4.2.</p>		<p>This comment was not addressed, but has been sufficiently addressed by other comments. Recommend revising the sentence <i>"Given that the spatial extent of drill cuttings from the WWRP is wholly within the White Rose Safety Zone and limited to a radius of approximately 1 km around the discharge location....."</i> in the EA Amendment to reflect 40 well program.</p>

Round 1

Comment #	Report Text	Cenovus Response	DFO Comment/Clarification Request	Cenovus Response	DFO Comment/Clarification Request
8	EA Amendment; Section 2.4 Summary of Updated Modelling: A more detailed description of modelling results would be helpful, such as thicknesses (maximum, average) at various distance ranges from the origin, as was provided for the original drill cuttings deposition model.	<p>SINTEF Ocean AS (SINTEF) has conducted a lifecycle analysis of different methods for handling solids during and after drilling operations (West White Rose Platform Solid Control Drill Cuttings Dispersion Modelling – WH-DAC-RP-0019). SINTEF used the Dose-related Risk and Effects Assessment Model (DREAM) to assess environmental risk in combination with the resulting discharges of the remaining waste</p> <p>DREAM includes tailored modules for modelling transport and fate of the discharged solids and chemicals including nearfield modelling, dispersion, advection, and settling, as well as biodegradation, oxygen depletion, grain size change and burial with resulting restitution time for the sea floor and impacted sediments.</p> <p>Environmental risk is measured in terms of an environmental impact factor (EIF) which is defined as a reference area (seafloor) and volume (water column) where the risk for a negative impact on 5% or more of the most sensitive species is considered above accepted levels and contributes to the EIF.</p> <p>The modelling results show that due to the design geometry of West White Rose Platform (WWRP), the majority of large-particle cuttings will accumulate on the base caisson roof and perimeter cells of the Concrete Gravity Structure (CGS) and not reach the sea floor; however, the remaining sea floor area exhibits risk above accepted levels for oxygen depletion and grain size change in different degrees for the considered cases.</p>	A description of the results outlined in the Wood Modelling Report should be referenced and elaborated on in the EA Amendment, instead of just the SINTEF Report. Please provide thicknesses (max, average) at various distance ranges from the origin, as was provided for the original drill cuttings deposition model.	<p>Cenovus conducted cuttings deposition modelling of 40 wells (Wood 2019). Key results include:</p> <ul style="list-style-type: none"> • Approximately 62 percent of the total cuttings material released is predicted to have settled on the Platform roof and perimeter cells within approximately 100 m of the Platform origin, with another 5.5 percent settling on the seabed out to 1 km. (Table 5-1 from Wood, 2019) • Mean total cuttings thickness values are predicted to be approximately 0.5 mm between 500 m and 1 km away from the Platform origin, approximately 0.9 mm between 1 to 2 km, and approximately 0.5 to 0.7 mm out to 16 km. For distances outside of 5-6km, patches are quite sparsely located and relatively small in size. (Table 5-2 from Wood, 2019) 	Satisfactory
9	EA Amendment; Section 3.0 Environmental Effects Assessment: The Proponent should provide a brief explanation as to why Sensitive and Special Areas and Fisheries VCs do not need to be assessed. Revision recommended.	<p>The maximum extent of the 1.5 mm drill cuttings is entirely within the White Rose Safety Zone (see Figure 2.1 in the Environmental Assessment (EA) Addendum Report).</p> <p>The nearest federally designated Sensitive and Special Areas is a small Significant Benthic Area of small gorgonian corals located 110 km west of the WWRP and spotted wolffish critical habitat located 60 km northeast of the WWRP (Figure 1). The nearest internationally designated Sensitive and Special Area is a shrimp closure area located 15 km from the White Rose Safety Zone (Figure 2).</p> <p>No commercial fishing occurs within the White Rose Safety Zone. While fishing does occur east of the White Rose Safety Zone, there has been no commercial fishing activity in the area of the White Rose Safety Zone for at least the past decade (Figure 3).</p>	The extent of 1.5 mm drill cuttings may extend outside the Safety Zone (see above comments). Otherwise satisfactory.	Wood Figure 5-3 Total Drill Cuttings Deposition, 40 Wells, 16-km view indicates that while 1.5 mm drill cuttings may extend outside the Safety Zone, it is limited and extremely patchy between 5 to 16 km from the well site. Approximately 97% of cuttings material settles within 10km of the platform (see Comment 8 above).	Response is satisfactory. Recommend the sentence "The maximum extent of the 1.5 mm drill cuttings is entirely within the White Rose Safety Zone (see Figure 2.1 in the Environmental Assessment (EA) Addendum Report)" be removed or revised.
10	EA Amendment; Section 3.2 Summary of Existing Conditions: To assist DFO in completing a risk assessment to evaluate effects on fish and fish habitat, we would appreciate if the Proponent could provide a description of the habitat within the updated modelled dispersion area (0.1 mm boundary), as well as in the vicinity. The Proponent has provided information on aquatic species (including species at risk). If there is additional information on species in the updated modelled dispersion area (0.1 mm boundary), that would also be appreciated	<p>Environmental Effects Monitoring (EEM) Stations 21 and WWRP2 are within the 0.1-mm boundary. Particle size analysis characterized Station 21 as 97.9% sand, 3.4% gravel, 0.89% clay, and 0.81% silt. Station WWRP2 was characterized as 96.2% sand, 1.40% gravel, 1.39% silt, and 1.01% clay. This is consistent with the White Rose field as a whole, and as in previous years, sediments collected in 2022 were predominantly comprised of sand. Median gravel content was 0.9%, median organic carbon content was 0.9 g/kg, and median percent fines (i.e., silt and clay fractions combined) content was 1.45% (Cenovus, in prep.)</p> <p>Station 21 has a long / large benthic invertebrate dataset and Station WWRP2 was sampled during the recent (2022) EEM cycle. In 2022, Station 21 recorded a maximum of 172 individuals in 24 taxa and Station WWRP2 recorded 381 individuals in 31 taxa. The majority of individuals were polychaetes, and included Ampharetidae, Cirratulidae, Opheliidae, Orbiniidae, Paraonidae, Spionidae, and Terebellidae (comprising a combined 126 (73%) and 262 (69%) individuals at Stations 21 and WWRP2, respectively) (Cenovus in prep.)</p>	Is this description representative of the updated modelled dispersion area (0.1 mm boundary), as well as in the vicinity, for repeated drillings of 40 wells? If not, please provide additional habitat and species information to assist in DFO's assessment of impacts on fish and fish habitat.	<p>SINTEF reported that the environmental risk for repeated drilling (up to 40) for the shaker/dryer discharge option could extend to 4km². This represents a distance of 1.17km from platform, where the Wood model predicts 67.8% of the cuttings material to have settled to a mean thickness of 0.5mm (see Comment 8 above).</p> <p>One EEM sediment station exists within the SINTEF 0.1mm boundary; WWRP2, whereas an additional five stations are within the 1.17km radius; WWRP1, WWRP3, C3, C4, and 21. To date, there have been no significant differences in the PSA analyses and benthic community composition amongst these stations, and these stations are representative of the habitat within and around the White Rose Field.</p>	Response is satisfactory. Can you confirm how many stations exist within the SINTEF 0.1 mm boundary, as it is unclear for Station 21?
11	EA Amendment; Section 3.3 Assessment of Proposed Project Modifications; Page 5: Recommend that additional justification be provided for the assessment of potential residual adverse environmental effects, especially regarding magnitude and duration. It would be useful if the Proponent described results from other EEM programs in similar environments. Additionally, if there are EEM programs with cuttings volumes that would be comparable to West White Rose, these results should also be discussed.	<p>The Hebron oil field is located offshore Newfoundland and Labrador in the Jeanne d'Arc Basin, approximately 350 km southeast of St. John's. The Hebron Platform is located in water depths of approximately 93 m, approximately 46 km southwest of the White Rose development. Like the White Rose Field (including WWRP), the primary particle size for all stations was sand, with concentrations ranging between 77% to 99%, while secondary particle size varied per sample (ExxonMobil Canada Properties 2023)2. Like the WWRP, the Hebron (and Hibernia) Development (a gravity-base structure) has a single point-source discharge, including drill cuttings. However, Hebron (and Hibernia) only discharges water-based drill cuttings, as synthetic-based mud (SBM) drill cuttings are re-injected.</p> <p>Similar to the EEM results for White Rose, the Hebron EEM results (ExxonMobil Canada Properties 2023) indicated that higher concentrations of barium, >C10-C21 hydrocarbons, and >C21-C32 hydrocarbons were found within 500 m of the drilling platform, aligning with the Hebron EIS drilling waste fate modelling, which predicted highest levels of drill solids deposition to occur within 500 m. Like White Rose, the lowest evenness, and diversity index) were mainly found in the near-field, and like White Rose, polychaetes were the most abundant taxa.</p>	Satisfactory		

12	EA Amendment; Section 4.0 Mitigations/Commitments; Page 7 - Bullet 2: There is no active Fisheries Act Authorization for this project. This bullet should be removed.	Noted and removed.	Satisfactory
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