

Esquimalt Graving Dock (EGD) Waterlot Remediation Project

Implementing a Sediment Remediation Mega-Project at the Largest Deep-Sea Shipbuilding and Repair Facility on Canada's Pacific Coast – Challenges of Operational Coordination

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Public Works and
Government Services
Canada

Travaux publics et
Services gouvernementaux
Canada



Presentation Overview

- Site Description and Background
- Project Phases of Work
- Facility Background
- Processes to Minimize Operational Impacts
- Key Operations Coordination Challenges During Construction
- Summary and Lessons Learned

Site Description and Background



CFSA - Canadian Forces Sailing Association
DND - Department of National Defence
EGD - Esquimalt Graving Dock

Site Description and Background (cont.)

- Federal government owned and operated multi-user ship repair and maintenance facility
- EGD established in 1927; historic contamination since 1850s
- Contamination throughout EGD Waterlot including under the South Jetty
- South Jetty requires replacement; timeline undetermined



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Project Phases of Work

- Phase 1 remediation
 - South Jetty sheetpile wall installation
 - Open-water dredging including buffer areas
 - Shoreline stabilization
 - Residuals management cover material placement
 - Habitat compensation
- Phase 2 remediation
 - South Jetty under-pier remediation to be coordinated with future South Jetty redevelopment

Project Phases of Work (cont.)



Source: Google 2011

Phase 1A – Under-Pier Erosion Protection System

- Sheetpile wall contains contaminated sediment in under-pier area
- Constructed November 2012 to April 2013
- Significant coordination with EGD Operations required



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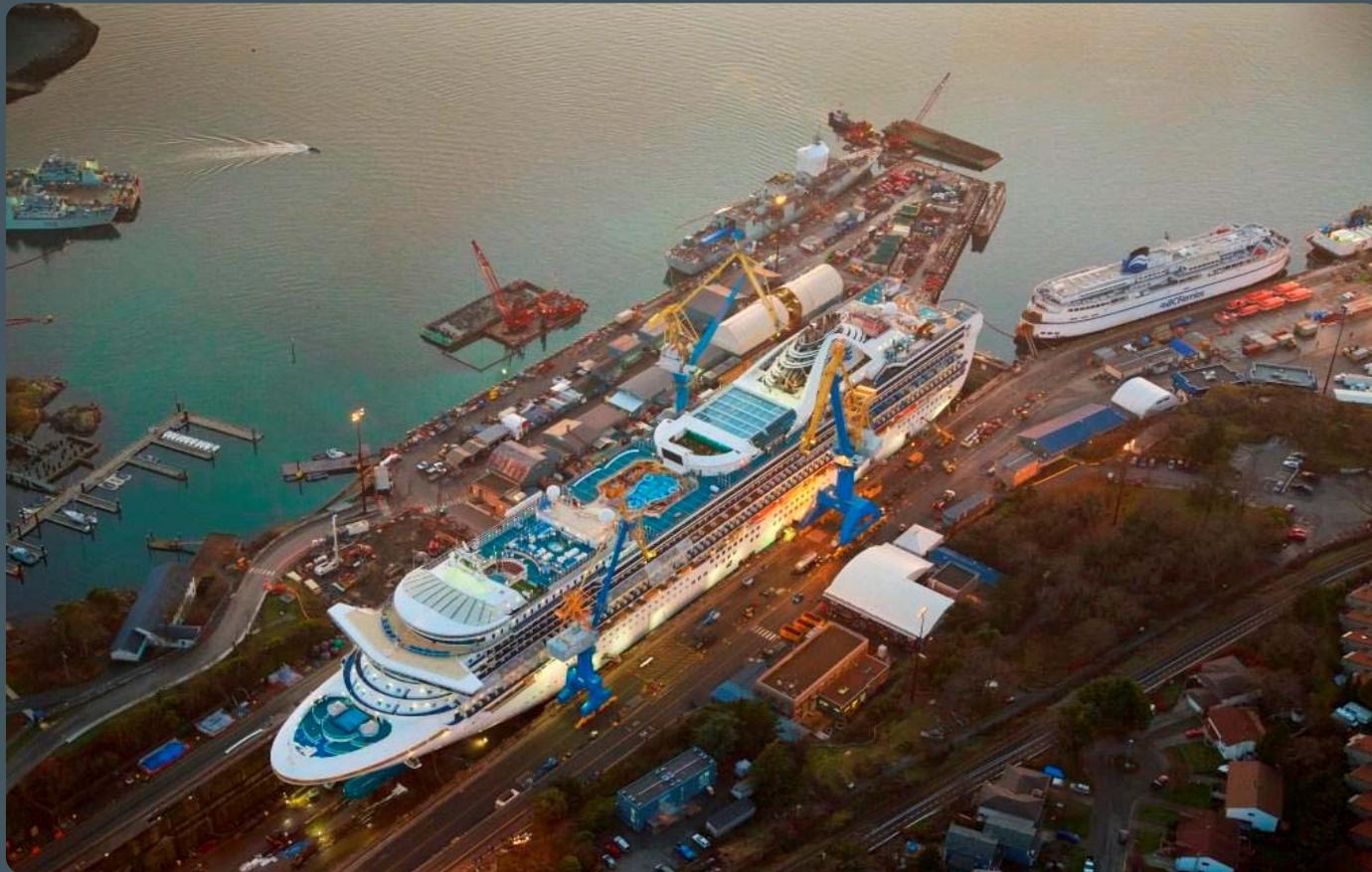
Phase 1B – Open-Water Remediation

- Dredging and disposal
 - 145,600 m³
- In-water slope armoring
 - 22,800 m³
- Residuals management cover placement
 - 45,000 m³
- Structure demolition/temporary relocations
- Construction June 2013 to March 2014
- Significant coordination with EGD Operations required



Facility Background

- Active shipyard/graving dock facility



Photograph courtesy of Heath Moffatt

Facility Background (cont.)

- Vessel berthing space is limited



Photograph courtesy of Heath Moffatt

Processes to Minimize Operational Impacts

- Strategic elements in design
 - Sequencing of work in designated “Zones”
 - Modeling of vessel/equipment locations based on contractor schedule
 - Contractor Directed Moves and Standby Time
 - Use of vessel Booking List to reserve space for remediation
- Project-dedicated staff (Public Works and Government Services Canada [PWGSC] and EGD Operations)
- Stakeholder communication and coordination

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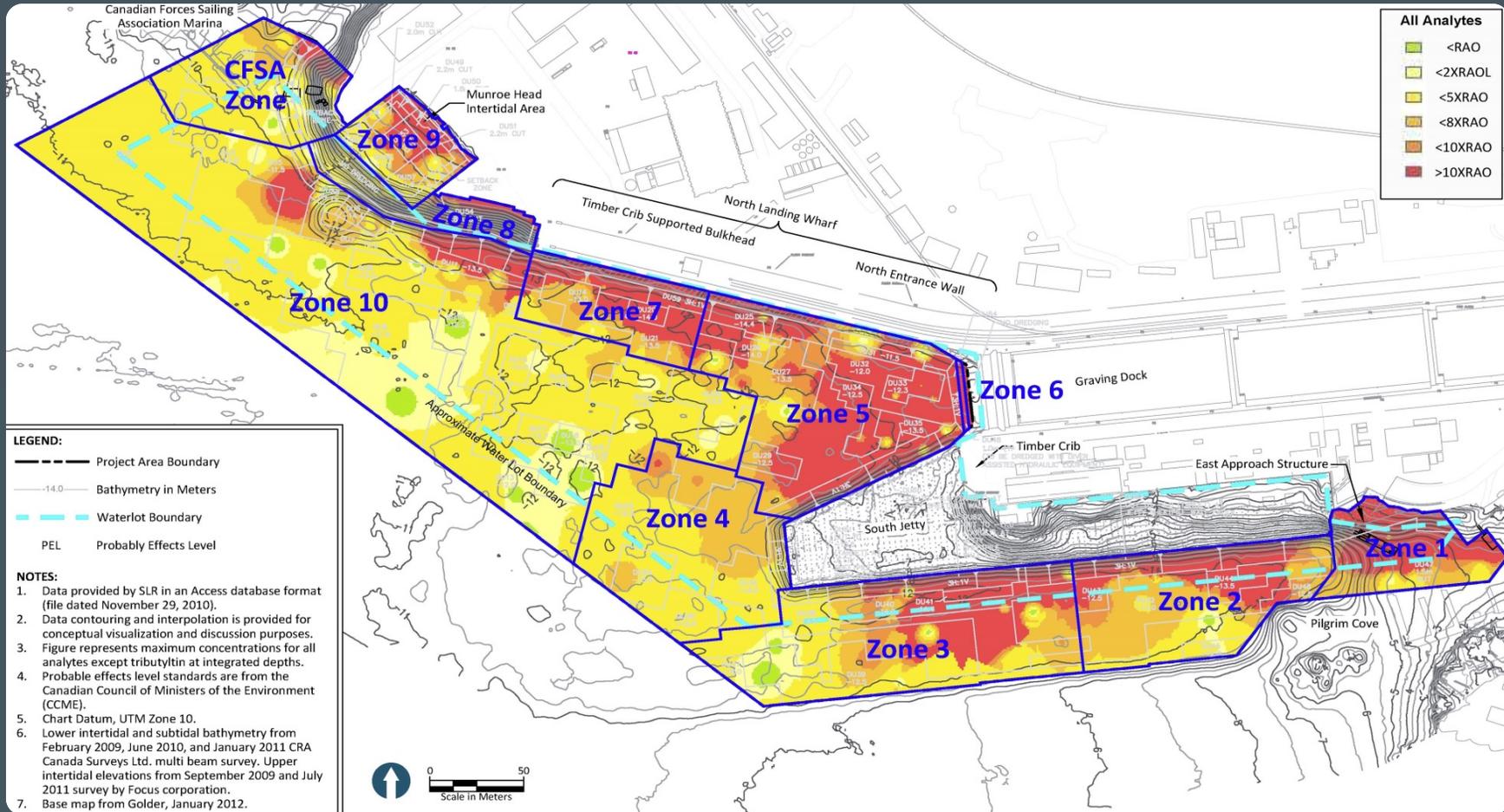
Processes to Minimize Operational Impacts (cont.)

- Progress monitoring and reporting
- Adaptive management
- Conflict resolution process



Photographs courtesy of Heath Moffatt

Processes to Minimize Operational Impacts (cont.)



Processes to Minimize Operational Impacts (cont.)

July 8, 2013 (Divers in Zone 6)

DU = Dredge Unit
MB = Materials Barge
ST = Structural Unit
WTB = Water Treatment Barge



Processes to Minimize Operational Impacts (cont.)

- Contractor Directed Moves
 - Unplanned dockings and vessel arrivals
- Standby Time
 - Vessel movements and EGD Operations requirements
 - Applicable only when no other work could be performed
- Other design elements
 - Requirement to maintain berthing space
 - Requirement to move equipment in set timeframe

Processes to Minimize Operational Impacts (cont.)

- Dedicated staff assigned to project
 - PWGSC Deputy Project Manager
 - EGD Operations primary point of contact
 - Key contact personnel assigned from each facility tenant



Photographs courtesy of Heath Moffatt

Processes to Minimize Operational Impacts (cont.)

- Regular updates to PWGSC senior management
- Project-specific tenant coordination meetings at key points in project
- Weekly coordination meetings with key tenants
- Attend quarterly EGD Joint Users Safety and Environment Committee Meeting
- EGD facility supervisor attend Weekly Construction Progress Meetings
 - Dedicated EGD Operations agenda item

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Processes to Minimize Operational Impacts (cont.)

- Coordination with DND for DND property needs
 - Naden floats and CFSA Marina
- Daily coordination with Queen's Harbour Master (Esquimalt Harbour Authority)
- Public communication and outreach
 - Offloading facility location changes
 - Disposal facilities
 - Trucking routes
- Design and construction oversight team communications

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Processes to Minimize Operational Impacts (cont.)

- Adaptive management during implementation needs to be planned for in design
 - Conflicts will occur; be prepared before they happen
- Utilize intensive on-site construction management support
 - Track day-to-day construction activities
 - Identify potential conflicts before they occur
 - Communicate potential issues to key staff

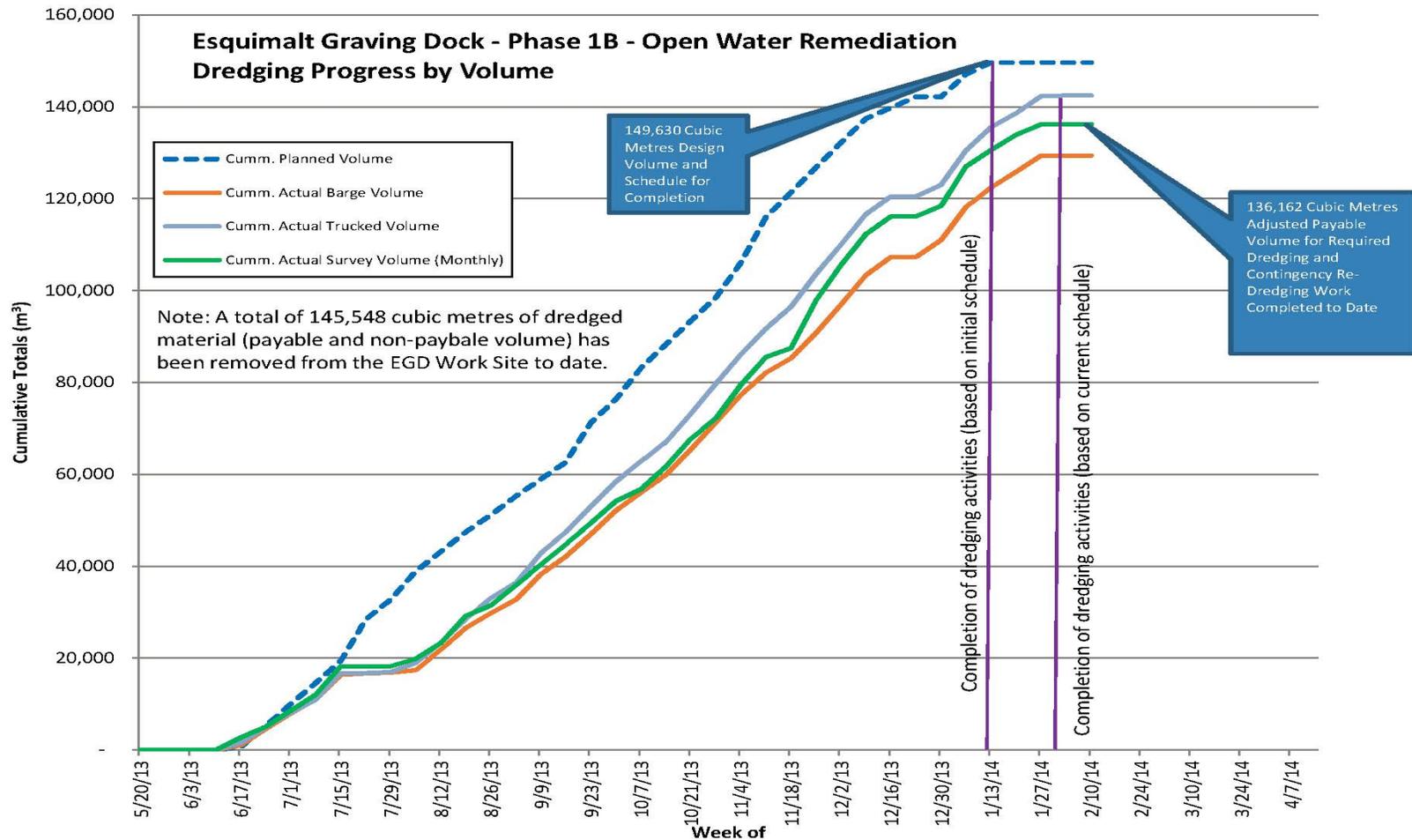
Processes to Minimize Operational Impacts (cont.)

- Conflict resolution
 - Coordinate with EGD Operations, tenants, and tenant clients
 - Pre-construction development of Conflict Resolution Framework
 - Conflict decisions with financial impacts to tenants or EGD were made by EGD management (client)
 - Some booking conflicts result in loss of business

Processes to Minimize Operational Impacts (cont.)

- Incorporate daily/weekly progress monitoring and reporting into inspection/management roles
 - Document daily construction activities
 - Monitor changes in schedule and communicate to facility operations staff
 - Notify remediation contractor in advance of changing operational needs
 - Track quantities of work completed to update progress and schedule for completion of the work

Processes to Minimize Operational Impacts (cont.)



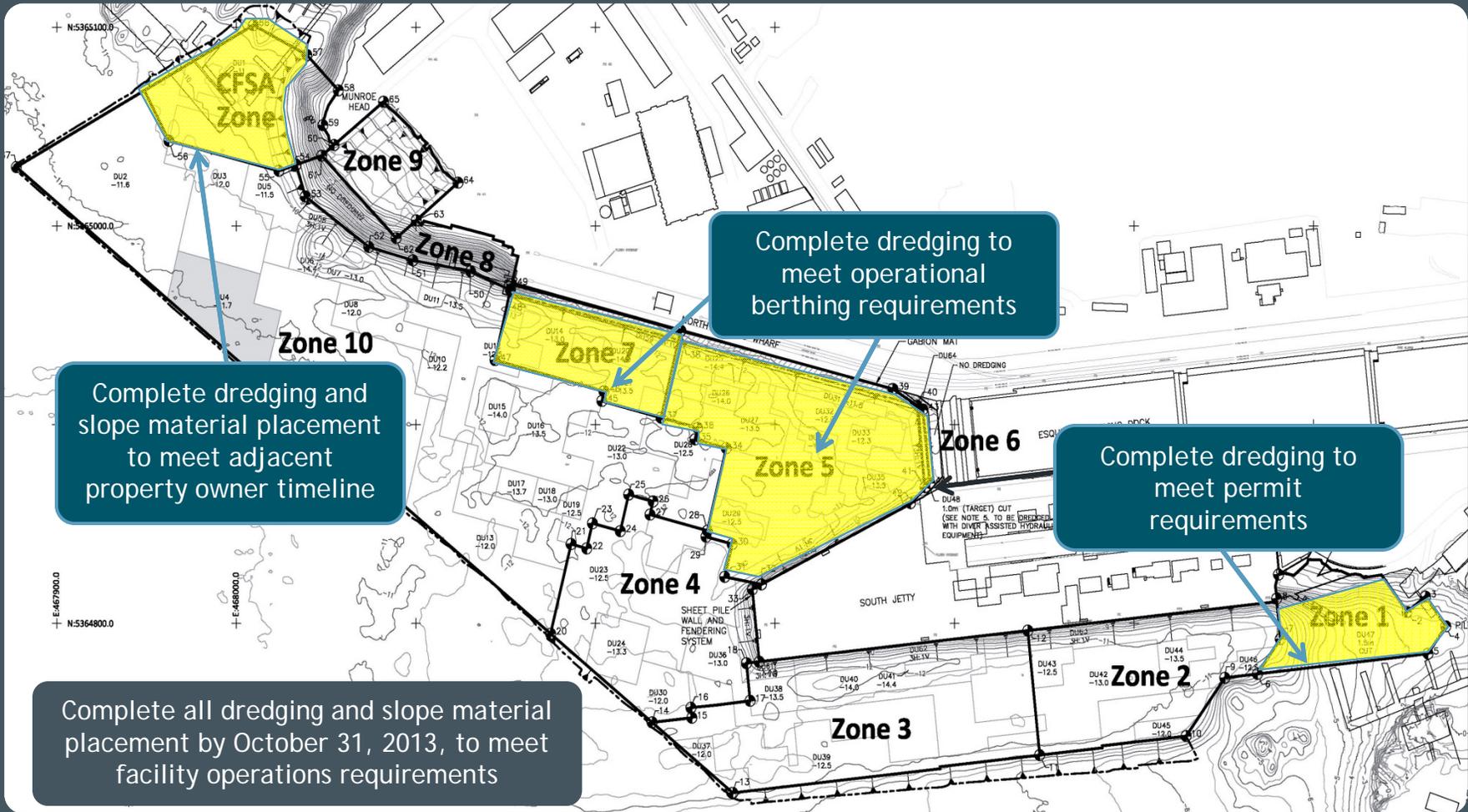
Key Operations Coordination Challenges During Construction

- Evolving EGD booking schedule overlap with remediation schedule
- Contingency re-dredging
- Residuals management implementation
- Meeting Remedial Action Objectives (RAOs) and operational requirements

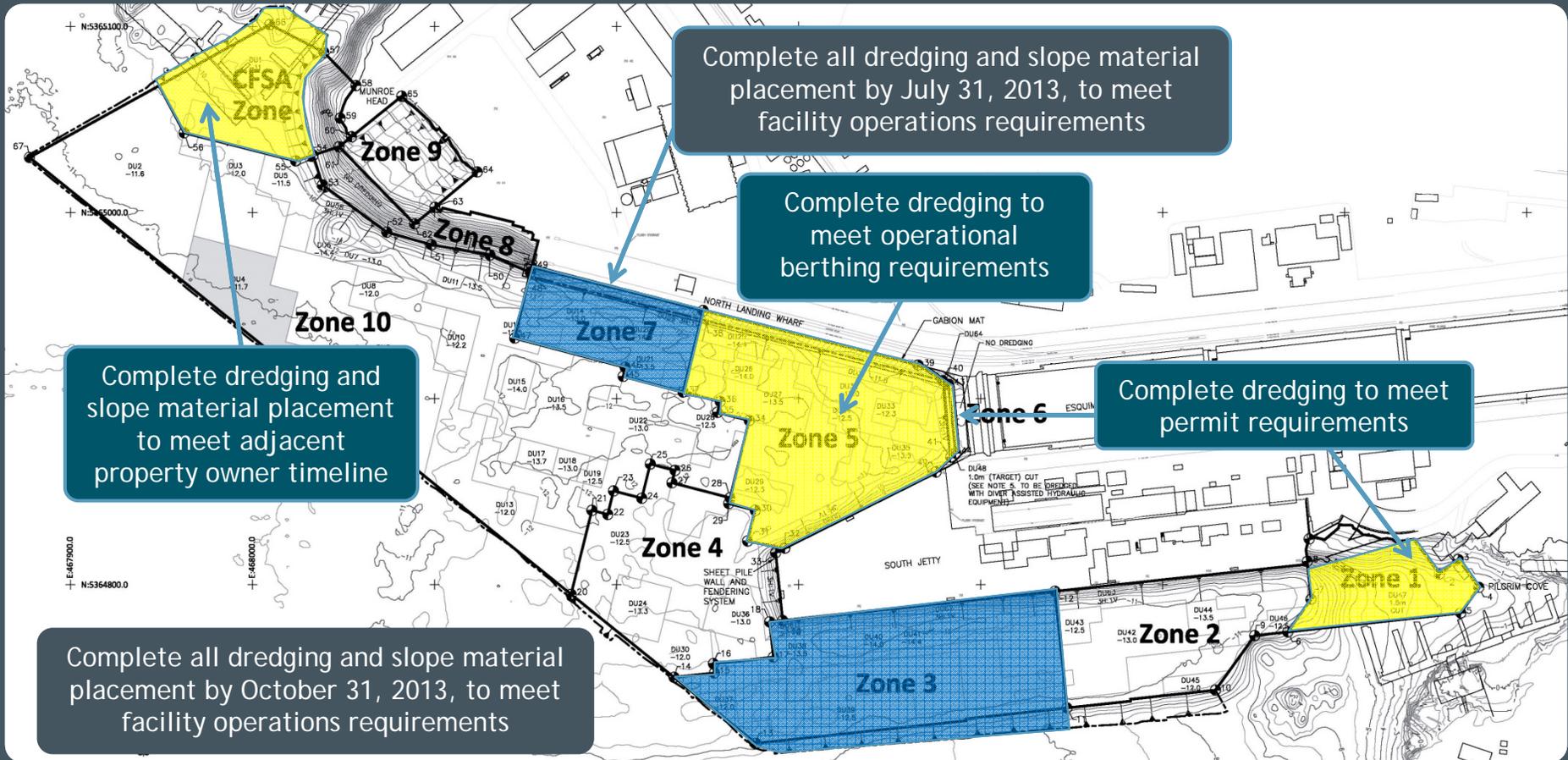


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Key Operations Coordination Challenges During Construction (cont.)



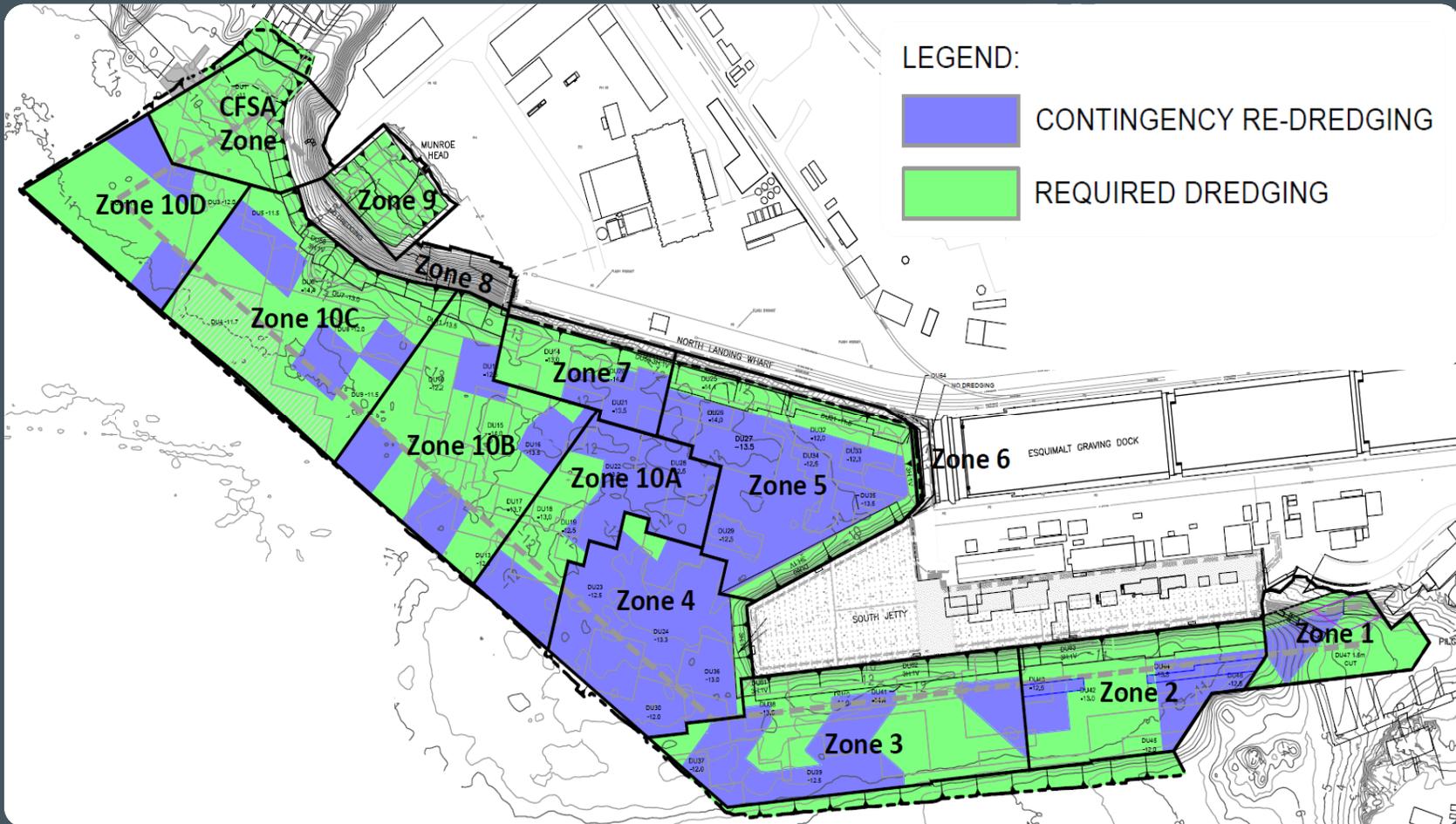
Key Operations Coordination Challenges During Construction (cont.)



Key Operations Coordination Challenges During Construction (cont.)

- Contingency re-dredging was required in many Zones
 - Affects construction schedule and operational use of the facility
 - Required to meet remediation objectives
- Minimize time to collect samples and make re-dredge decisions
 - Remediation schedule dictated these activities
 - Limited lead time for re-dredge decisions

Key Operations Coordination Challenges During Construction (cont.)



Key Operations Coordination Challenges During Construction (cont.)

- Dredge residuals management
 - Placement of clean sand material (where required) in areas where dredging had been completed to ensure RAOs were achieved
 - Placement areas dependent on post-dredge sampling/testing
 - Need to re-visit areas where remediation had been performed and vessels were now moored
 - Residuals management cover placed in nearly 100% of the open-water areas of the EGD Waterlot; even where not required to ensure RAOs were achieved

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Summary and Lessons Learned

- Operational requirements of the project site will govern cleanup
 - Acknowledge that change will occur and plan for it
- Critical ongoing support from EGD Director and site owner was key to success in coordination of work
 - Financial decisions made in consideration of remediation requirements
- Advance planning for schedule coordination critical to project success

Summary and Lessons Learned (cont.)

- Dedicated project team member for EGD Operations coordination
 - Consistent/frequent coordination with tenants and EGD Operations
- Adaptive management principles are essential
 - Provide sufficient level of on-site construction management
 - Observe daily activities and prepare for change before it occurs

Summary and Lessons Learned (cont.)

- Recognize where potential claims may occur due to operational issues
 - Address with contingency planning in design
 - Recognize that claims can also come from facility tenants if business is adversely impacted
 - Keep facility operations involved throughout completion of cleanup project to inform decisions

Questions?



Photograph courtesy of Heath Moffatt