Field Improvement Record

Program Year:	**2025**
Name of Initiative:	**Boom Chevron Testing**
Anticipated Budget or Actual Spend (if applicable):	**~ $1,500 - connector and drift anchors**

Issue (Background):

Briefly describe the initial situation (context) and the problem/issue addressed by the project, initiative or work activity. Summarize Previous studies conducted, if information is available.

Protecting additional infrastructure can be challenging with a single boom set. There are situations where in-channel features need to be protected and there is a boom set in place, but it is protecting a different asset. Being able to install a “Y” connector between boom sections, using the main boom as an anchor, and incorporating features such as “Drogue” or drift anchors may provide the needed coverage.

Equipment required and/or used:

List both WCSS and other supplied/rented equipment required for the program and state where it came from (include costs if known).

- Main boom set of 150’ including anchors, chains, paravanes, boom deflectors.
- “Y” connector
- Secondary 100’ of boom
- Handline bridles
- 5 - Drift anchors (20”, 28”, 36”, 44”, 54”)

Location and Site Conditions at time of assessment:

Describe the location, setting, weather, and environmental conditions during the program.

Location:	**Devon Lions Park boat launch**
Weather:	**Clear, cold**
Setting:	**Mid Channel of North Saskatchewan River**
Other:	**Current noted at approximately 5-6 knots**

Strategy and Implementation:

Describe the strategy used and how it was implemented. This should link to the issue outlined above and highlight the main steps taken in implementing the strategy.

The strategy of this session is to set out a main boom line and then run a Chevron off it to protect infrastructure in the water so such as water intakes water discharges or sensitive areas

The implementation for this experiment involved running a rake anchor, to an anchor chain, and the anchor chain to at 25 ‘rope which connected to a marker buoy as in our typical boom setup. Then we ran a 50-foot rope to a tow paravane. Off the back of the tow paravane we ran Y splitter, and then we ran two boom sets (Pic 1).

Each boom set consisted of the following equipment:

- An initial single section of 50’ of fast water boom.
- An initial single boom deflector with the wing to the inside of the boom set.
- A second single section of 50’ fast water boom.
- A second single boom deflector with the wing to the inside of the boom set.
- A third/trail end single section of 50’ fast water boom.

The variations in the set that we tested included:

- Moving the second boom deflector to the end of the third boom set.
- Installing various sized drift anchors to tension the boom.
- Setting the boom deflector wing at max and partial deflection.

Progress and/or Result:

In summary (2-3 paragraphs), describe the progress and any verified results (using qualitative and/or quantitative evidence) in implementation. Please describe factors that enabled or hindered the progress, and any shortfalls.

The boom deflectors were set up so that the wings were on the inside of the boom sets. This ensured that the booms were pushed away from each other forming a calm and protected area that could be used to isolate a strategic feature.

When the team was ready to deploy the set, the boats approached and opened the wings of the boom deflectors (Pic 2). The river current pushed on the deflection wings forcing both sets of boom away from the other. When the boom deflectors were set at their maximum wing

deployment, we noticed a maximum spread of the third booms of about 50 feet. Throughout the testing, this distance was noted as the widest separation the boom deflectors could provide with approximately 5 to 6 knots of current (Pic 3).

To test configurations and setups, the team attached two drift anchors to the ends of both boom sets (28” & 36”). We used the middle 2 sizes of drift anchors, to see how they boom would react. The boom reacted well, everything straightened out, however, the pull of the drift anchors un-set the rake anchor and the entire set moved approximately 500 m down river. At this point the rake anchor reset in the bottom of the river and the testing continued (Pic 4).

The next variation moved boom deflectors from the middle of the boom down to the very end of the set (100’ of boom between boom deflectors). We changed the configuration and allowed it time to settle so we could evaluate the set. With this configuration, we noted that the protected area was about ½ of the width of the previous set.

At this time, we noted that there was curving of the boom set just upstream of all the boom deflectors. The drift anchors were then attached to the end of the set (off the boom deflectors) to see if the additional pull would straighten out the sets. It made a significant improvement in the lay of the booms, straightening out the set, but not making it much wider (Pic 5). When the team was confident that no further changes were happening to the boom, they removed the drift anchors and returned the boom deflectors to their original location. Once this was done, the drift anchors were also reattached at the end of the boom to provide pull on the boom to remove the “J” in the booms.

The final test that we conducted was changing the amount of sideways force being applied to the booms by the boom deflectors. All 4 boom deflectors had their wings pulled ½ way back to neutral and we allowed the boom set to re-establish itself. Closing the boom deflectors halfway had the effect of collapsing the boom and smoothing the water flow coming from the boom deflectors (Pic 6).

Lessons Learned:

Describe in summary, the lesson(s) learned. Please limit this to 1-2 major findings that will leave the reader with an overall picture of the learning(s), why it’s important and the value it adds. Include information on both what worked and what didn’t.

4 Boom Deflectors are required to maintain this type of set.

Boom deflectors need to be closely spaced (1 boom set between) as our testing showed that 2 boom sets was too great a span. The boom deflectors at the end of the 3rd boom set were limited in the spread they could reach due to the pressure of the moving water on the 2 boom sections ahead of it.

Drift anchors put significant force on a boom set. We used the middle ones on this test which caused the anchor set to fail. We never did deploy the 44” and 54” drift anchors.

Use Drift anchors with the built in recovery lines to ensure the anchor collapses as you remove it from the water. Pulling the anchor out of the water by the leading edge would not be successful base on the design of the anchors.

Drift anchors are strong enough to un-set a single anchor set. A 2-anchor set is minimum requirement, and this will have to be evaluated based on stronger river flows and larger diameter drift anchors.

Potential Applications:

Describe briefly the potential application of the lesson learned to current WCSS and/or Member Operations or work activities. What are the issues that need to be considered?

Very quick to establish in a flowing river situation.

Can be used to divert oil from a sensitive area such as sensitive habitat, sensitive structure, or a water intake.

The entire team agreed that this was a definite tool to keep in mind when facing a moving oil spill and trying to protect sensitive features.

Next Steps:

Describe any planned next steps in implementation and highlight any changes in strategy due to progress or results to date.

Build a better “y” connector that provides more room for connections.

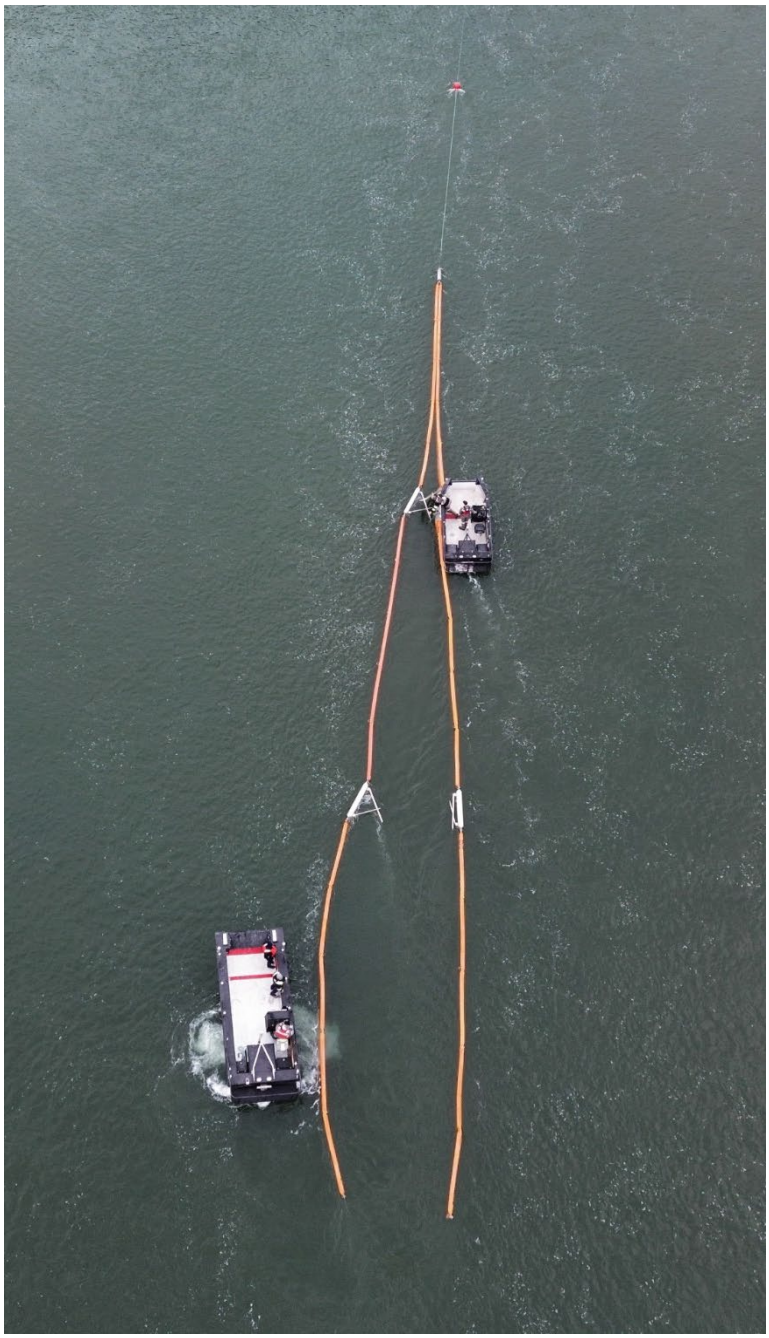
Start to teach and or demonstrate this process as requested or as needed.

Photo Log or Video Link Location:

Insert photos and include a brief description of what the picture is showing. Pictures can be changed by right clicking the picture and choosing *Change Picture*.

Please be mindful of picture size so the file can still be saved and emailed.

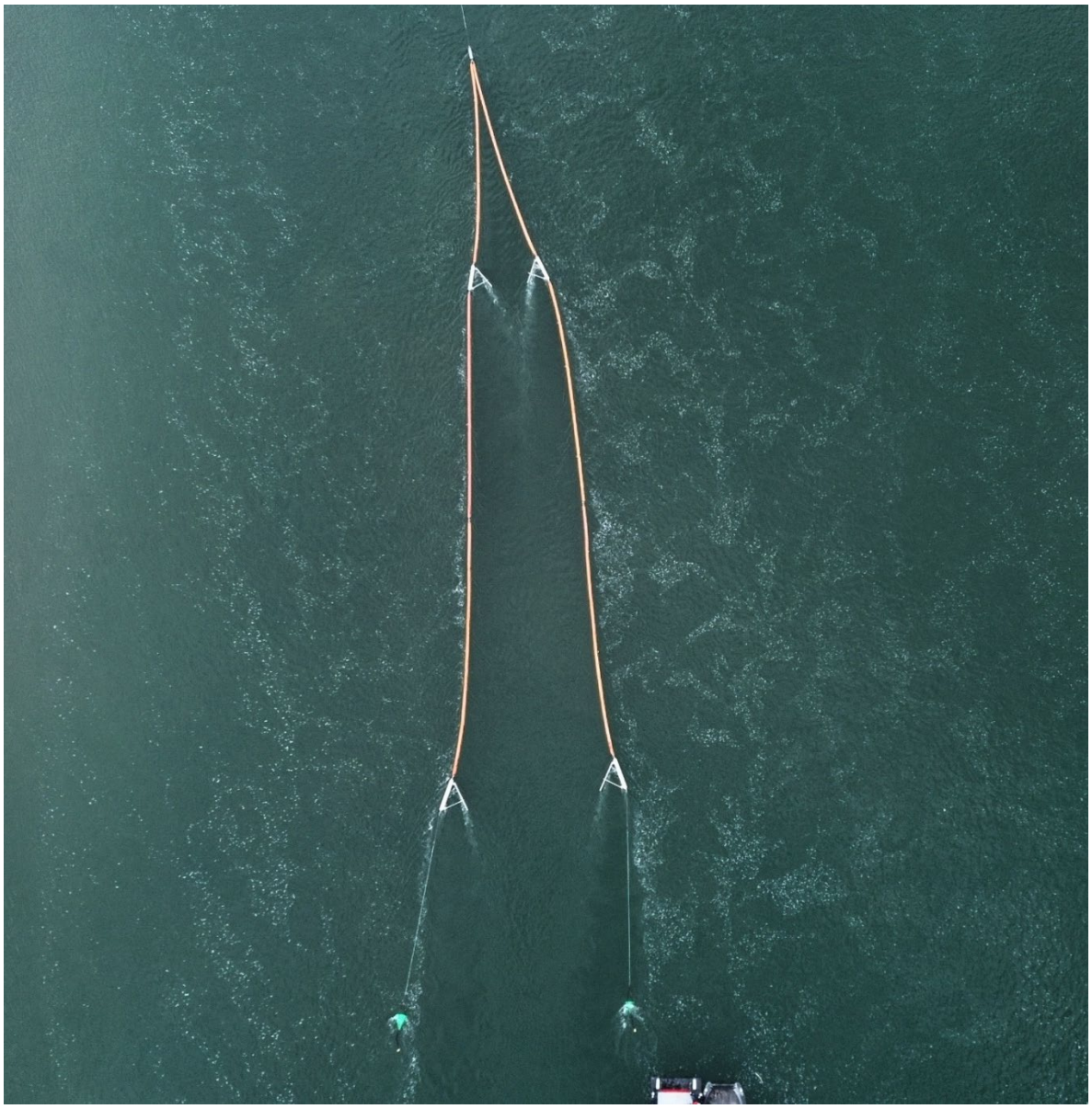
Pic 1 – Initial set up



Pic 2 – Deploying Boom Vanes

Pic 3 – Open boom set with curving booms (not ideal)

Pic 4 – Same boom set with drift anchors added (straighter boom set)



Pic 5 – Boom deflectors moved, and drift anchors installed

Pic 6 – Boom deflector wings set ½ out