



**Lower Cook Inlet  
3D Seismic Survey  
Mike Dunn, Project Manager**

**Integrity • Urgency • Ownership • Alignment • Innovation**



# Hilcorp Alaska – Our Goals

## OUR GOALS

- Operate safely and environmentally responsibly
- Invest to develop additional oil and gas production and reserves
- Create efficiencies and innovations that extend field life
- Increase asset values over the long term

## BENEFITS

- Provide affordable energy for Alaskans
- Increased royalty payments
- Increase property values and taxes
- Extend the life of existing fields
- More Jobs





# Safety lives in our Values

## INTEGRITY

*Operating safely and maintaining environmental stewardship are the right things to do.*

## URGENCY

*Do the **right thing**, the **right way**, as quickly and **safely** as possible.*

## OWNERSHIP

*We encourage and expect all **employees** and **contractors** to take personal **accountability** and have **ownership** of their own safety and the safety of those around them.*

## ALIGNMENT

*We **all** win when we maintain and encourage safe and environmentally responsible operations.*

## INNOVATION

*We work to **get better every day** in operational safety and environmental monitoring and mitigation*



# Integrity: Do the Right Thing

*Hilcorp recognizes the importance and sensitivities of the Cook Inlet region and our obligation to execute our work in a responsible manner.*

*Our team will be doing all it can to minimize any potential disturbances.*



# Permitting



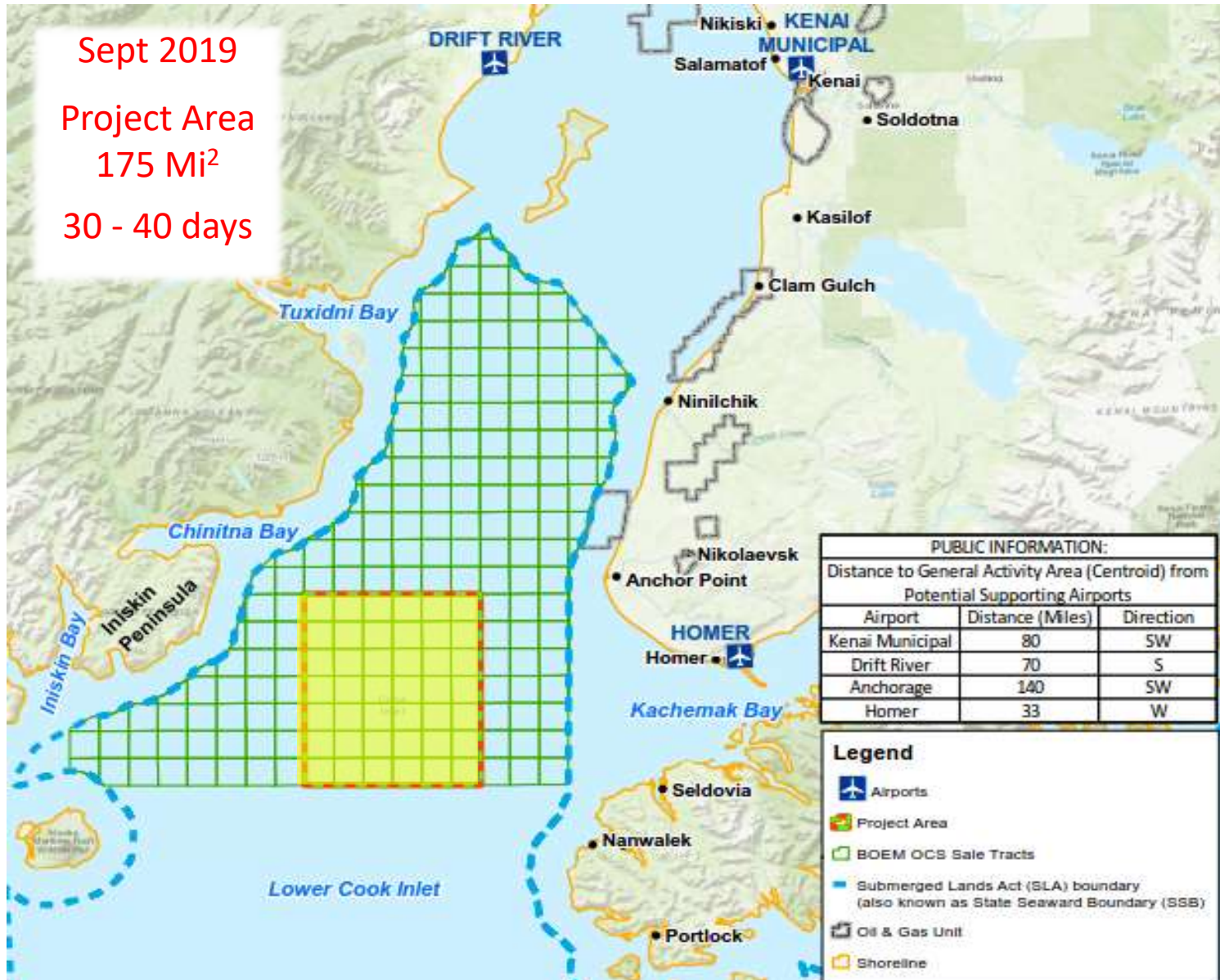


# Survey Area: Lower Cook Inlet

Sept 2019

Project Area  
175 Mi<sup>2</sup>

30 - 40 days





**JASCO**  
APPLIED SCIENCES

Founded in 1981  
JASCO Applied Sciences provides consulting and research services for assessing and mitigating underwater noise.



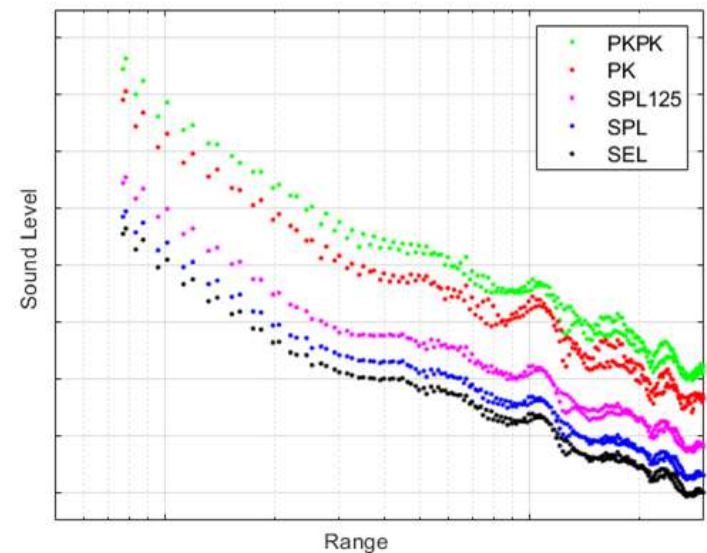
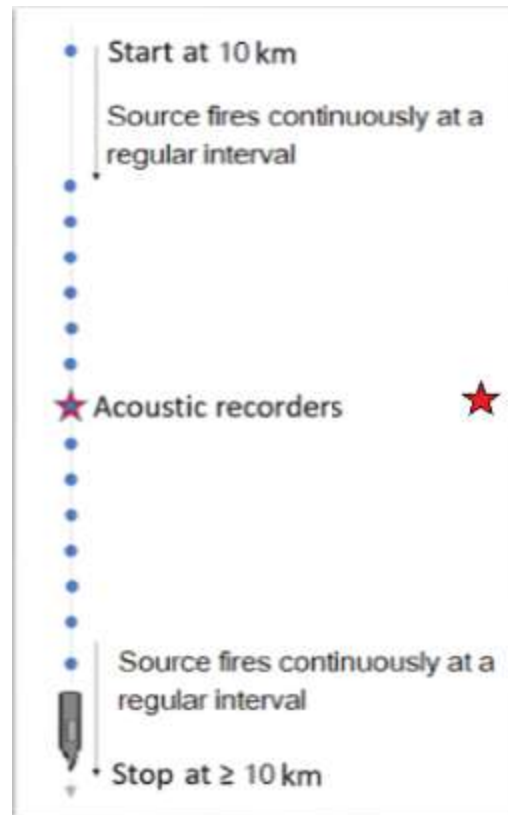
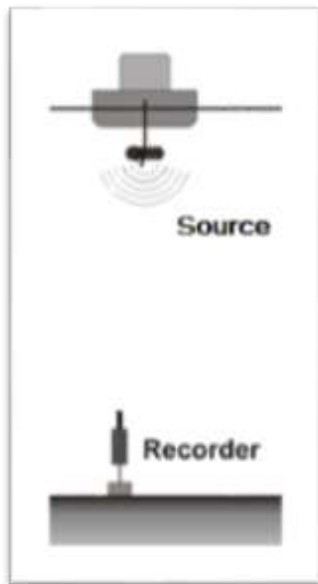
## **SOUND SOURCE VERIFICATION**

Measurements and  
Safety Zones Established  
**BEFORE** Activity Begins



# Sound Source Verification

- Two acoustic recorders will be placed on the seafloor to record underwater sound levels while the survey vessel passes by.
- Sound levels will be measured at multiple distances from the seismic source.
- These data will be used to determine the distance from the source to the sound threshold that defines the marine mammal safety zone.







# Protected Species Observers (PSO)

PSOs WILL BE IN PLACE ON SEISMIC VESSEL, OBSERVATION VESSEL, AND HELICOPTER

- Wildlife and Protected Species Monitoring
- Data Collection



**PSOs HAVE DIRECT COMMUNICATION WITH VESSEL CREWS**

Vessel crews will SHUTDOWN activity if marine mammals are observed within specified distances of work vessels



FAIRWEATHERSCIENCE

The Fairweather Science team is composed of experienced environmental professionals with a proven history of successful operations in Alaska, and a strong commitment to safety, professionalism, and environmental responsibility.





# Seismic Vessel: Polarcus Alima

## 2010 ULSTEIN SX124

- 91 Meter Double Hull Vessel with Helideck
- Diesel-Electric Propulsion
- DNV Clean Design Compliant
- Most advanced commercial seismic technology available





# Towed Seismic Array



- Two Airgun arrays will be deployed
- Eight 2,400 meter (1.5miles) streamers will be towed
- 200 meter spread



# Towed Seismic Array

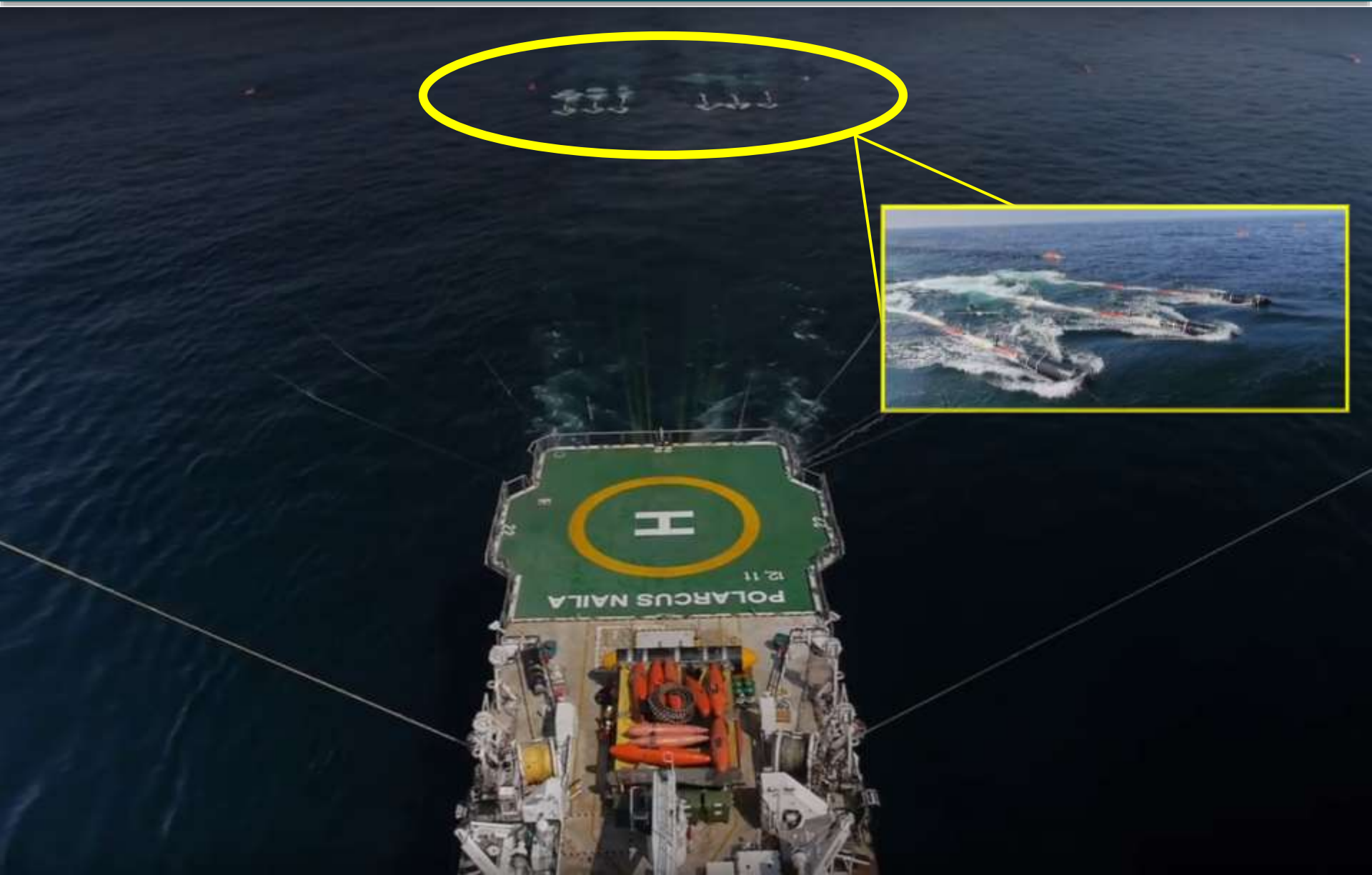


- 3-7hrs per 16 mi. line length dependent on tidal currents
- Vessel speed ~ 4.5 knots
- ~40 days to survey the area



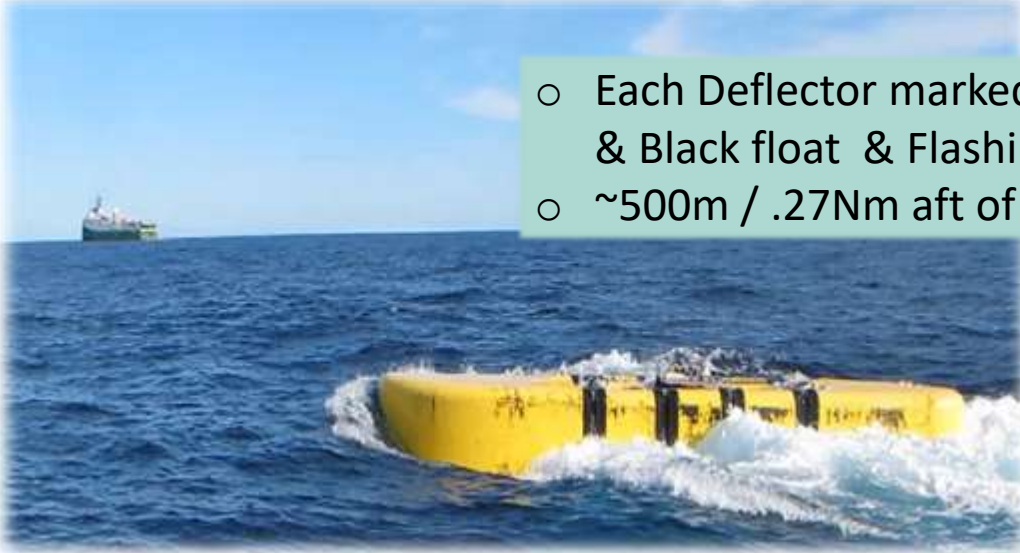


# Towed Seismic Array





# Towed Seismic Array



- Each Deflector marked with Yellow & Black float & Flashing light
- ~500m / .27Nm aft of the vessel

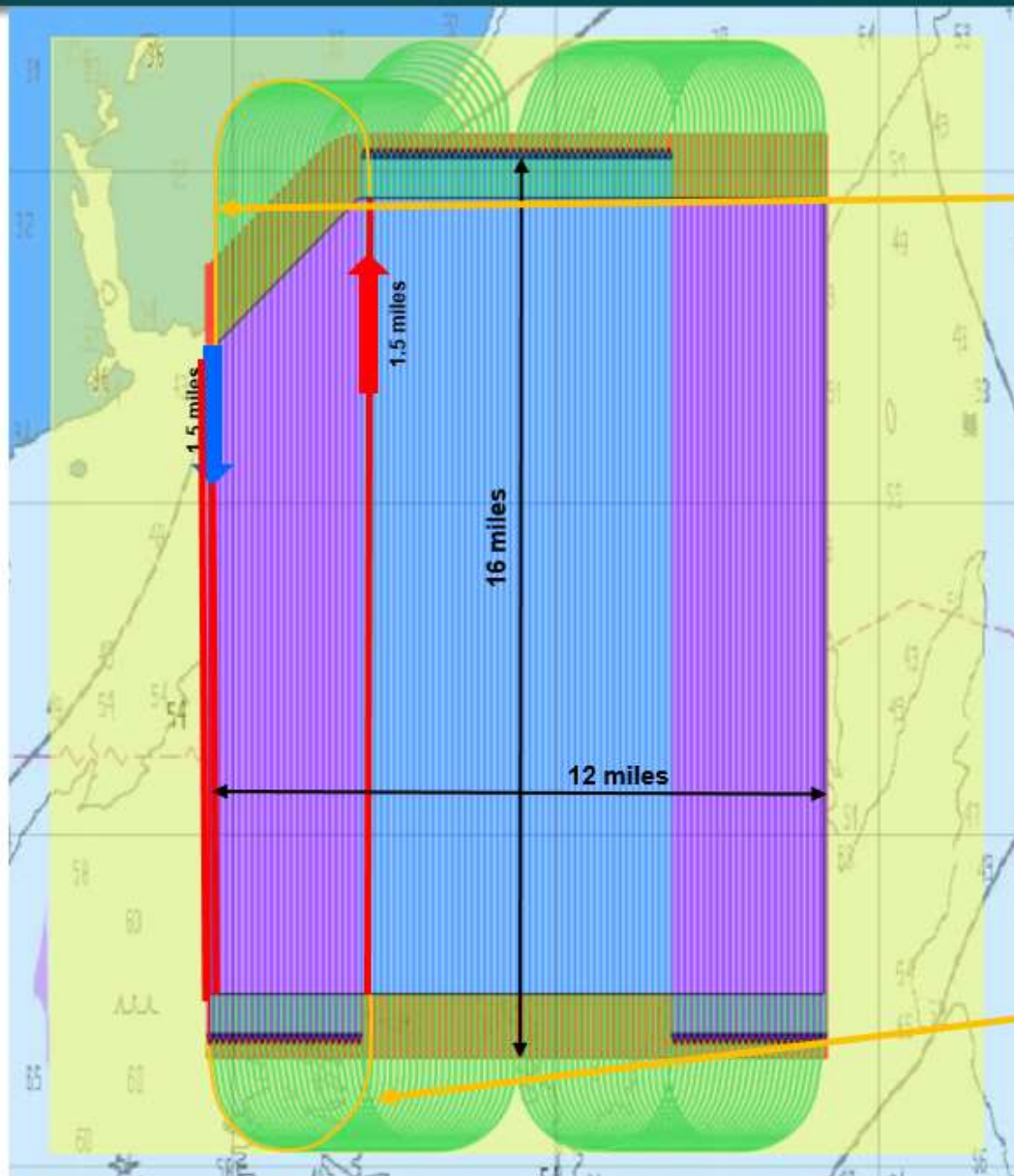
- Each streamer head marked with yellow float
- ~500m / .27Nm aft of vessel

- Each streamer tail marked with yellow navigation buoy- radar reflector, GPS & flashing light
- 2400m / 1.3Nm aft of vessel





# Details of racetrack acquisition & 24 hr look ahead

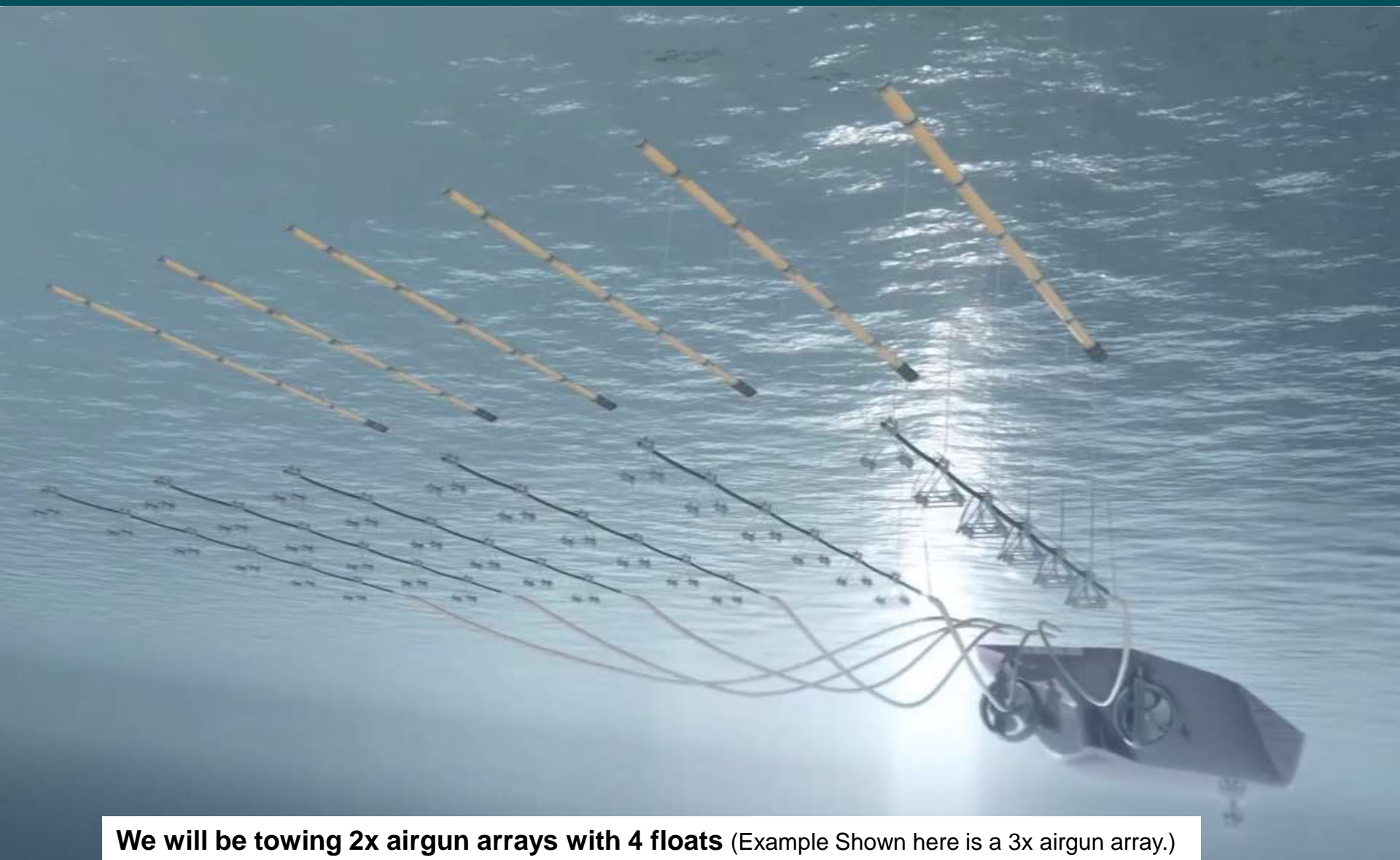


- Typical 24 hour operation area notice
- 4 to 10 hours per 16 mile line length, dependent on tidal currents
- 1:35 minutes per line change on about a 3 mile diameter
- Vessel through water speed of 4.5 knots
- 24 hour production estimated at:
  - 3 lines
  - 2 line changes

Plan Step	Preplot Name	Preplot Start	Preplot End	Azimuth	Duration	Local Time SOI	Local Time EOL
1	1705	015°11'34.609"N, 093°52'6.283"E	014°55'4.413"N, 093°42'59.754"E	208.0°	1:10	Jan 14 04:55	Jan 14 06:10
2	2375	014°54'17.831"N, 093°52'53.600"E	015°16'8.209"N, 094°04'58.478"E	28.0°	5:30	Jan 14 09:25	Jan 14 14:55
3	2365	015°14'11.946"N, 094°01'24.179"E	014°37'55.773"N, 093°41'22.981"E	208.0°	9:05	Jan 14 19:45	Jan 15 04:50
4	2425	014°39'52.248"N, 093°43'9.733"E	015°16'8.234"N, 094°03'11.418"E	28.0°	9:05	Jan 15 10:10	Jan 15 19:15



# Towed Seismic Array: Subsurface



**We will be towing 2x airgun arrays with 4 floats** (Example Shown here is a 3x airgun array.)





# Seismic Reflection

The diagram illustrates the process of seismic reflection in two stages. The top stage, labeled 'Signal Emission', shows a seismic source (a yellow and black structure) on the ocean floor emitting seismic waves (represented by white curved lines) that travel through the water column. The bottom stage, labeled 'Signal Reception', shows the same seismic waves reflecting off a subsurface geological boundary (a red line) and being received by a seismic receiver (a yellow and black structure) on the ocean floor. The background shows a cross-section of the ocean and the seabed with various geological layers.

Signal Emission

Signal Reception



# Subsistence & Community Cooperation

Hilcorp will host a daily call with interested subsistence users and local mariners, to share information on seismic activity for that day.

Our goal is to share information so that all parties can avoid surprises and conflicts.

**Calls will begin September 10 and occur daily until operations are completed**

**Daily call time: 10:00 am**

**Call in Number: 907-777-8599**



A website has been created  
that will provide public  
daily updates during the  
active survey

[www.hilcorp.com/3dsurvey](http://www.hilcorp.com/3dsurvey)



# Thank You

## **GENERAL COMPANY INFORMATION:**

Lori Nelson

Manager, Public Affairs

907-777-8392

[lnelson@hilcorp.com](mailto:lnelson@hilcorp.com)

## **PROJECT INFORMATION:**

Jill Schaefer

JCS Consulting

907-841-8185

[ak3dinfo@hilcorp.com](mailto:ak3dinfo@hilcorp.com)