

Routes to Successful Phytoremediation: Site Selection and Case Studies

The Practitioners Guide

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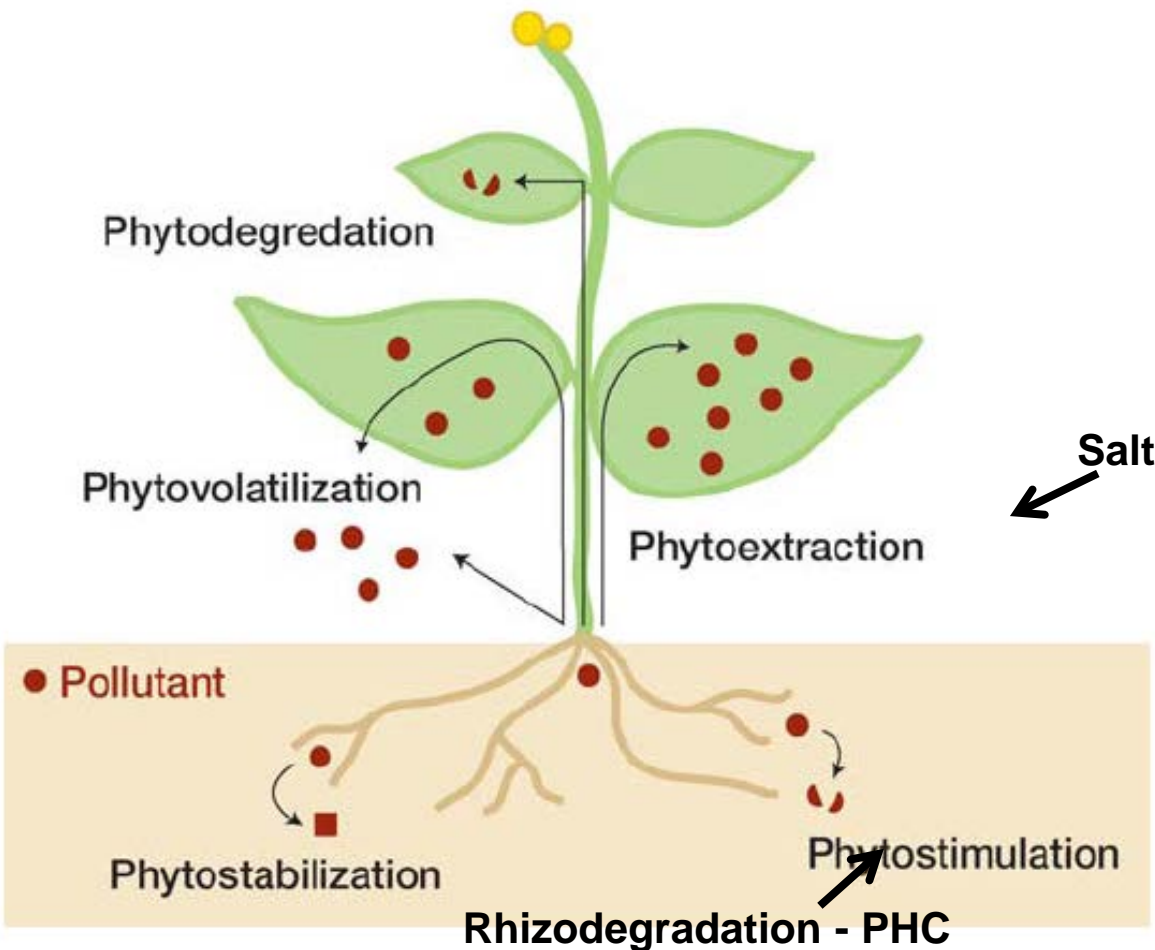
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Outline

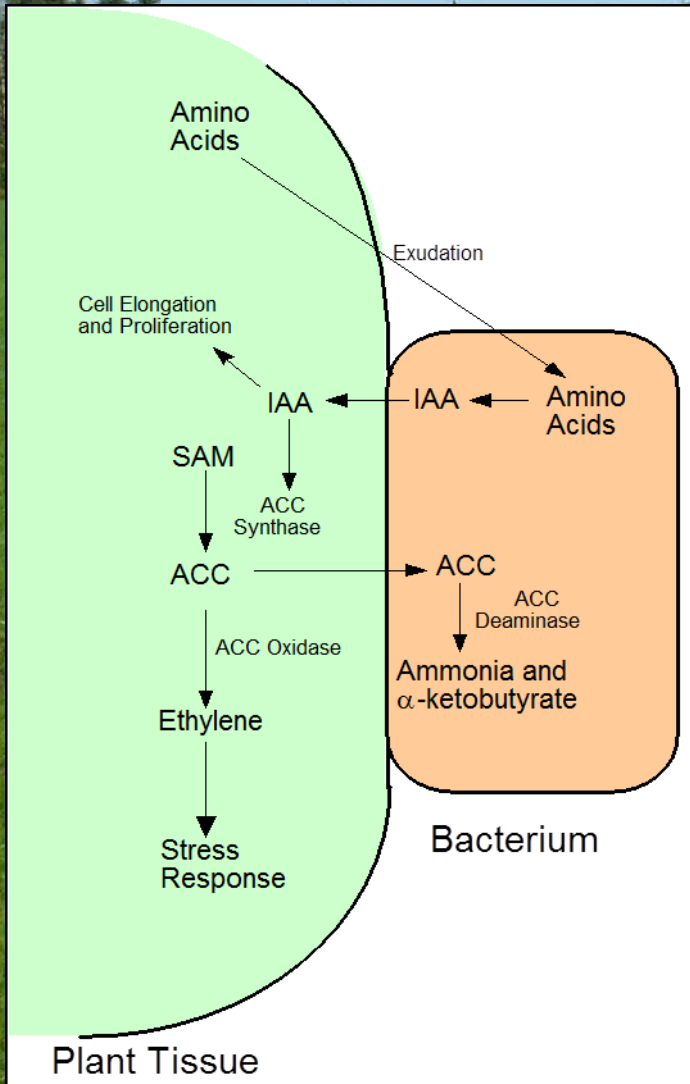
- Phytoremediation
- Case Studies
 - Red Earth Creek (Boreal Mixedwood)
 - Gregg River (Upper Foothills)
- Commonly Asked Questions

How It Works



- Volatilization
- Phytodegradation
- Chelation/compartment in leaves
- Translocation: root symplast → xylem
- Chelation/compartment in roots
- Plant uptake soil → root
- Rhizosphere Processes
- Bioavailability particle → water

How It Works



- Plant growth promoting rhizobacteria (PGPR)
- Natural, non-pathogenic strains of PGPR (usually *Pseudomonads*)
- PGPRs isolated from ON, AB, SK and the NWT
- PGPR are applied to seeds prior to planting

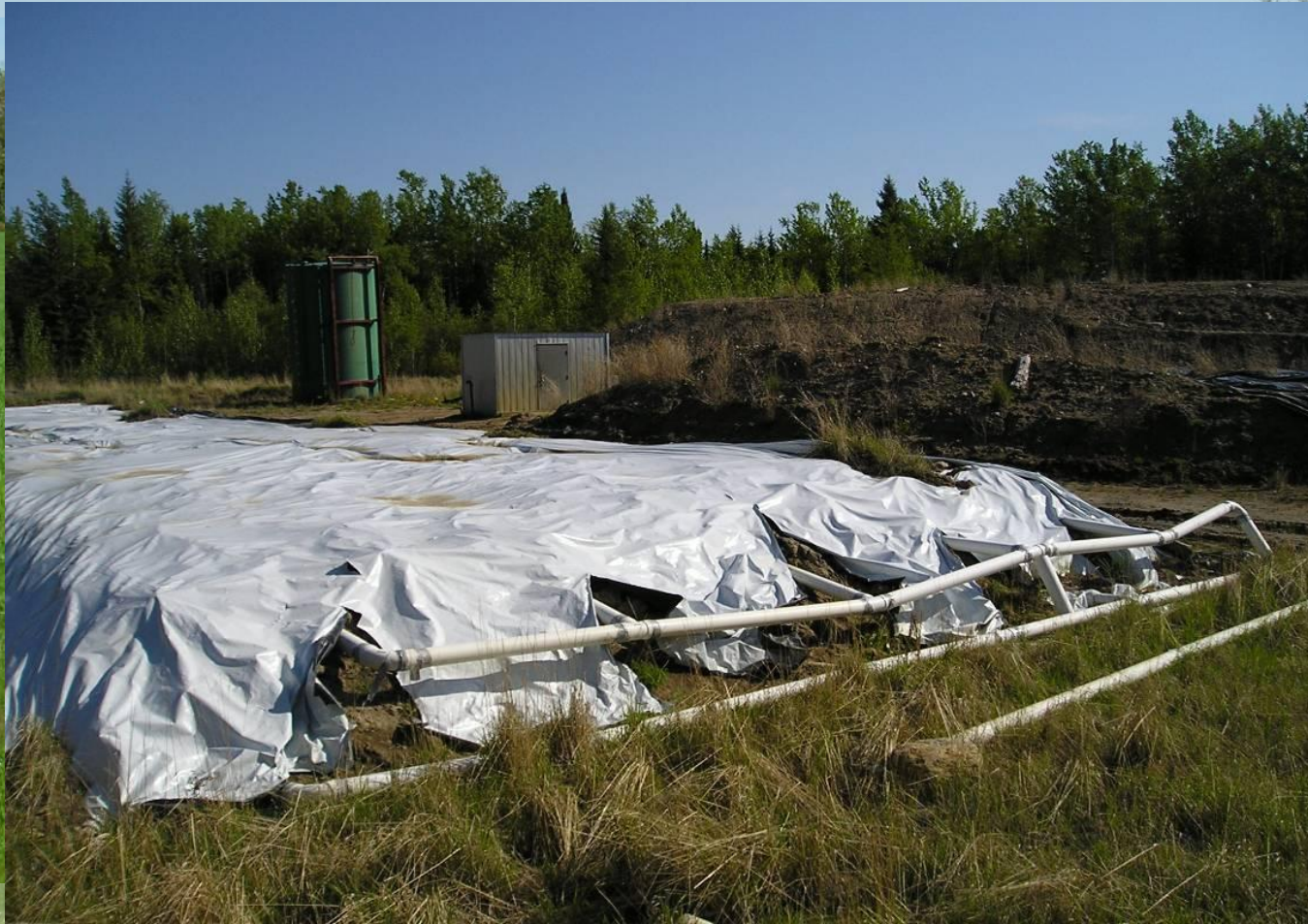
Advantages

- Cost effective alternative (\$80-110 / m³)
- Easily treat remote sites, winter, ATV, Heli access
- Soil remediation in 2-3 years (below criteria)
- Increased safety (no trucking)
- Green technology (no transfer of liability)
- Treatment within various climatic conditions (NWT to the US and harsh growing conditions)
- Minimal treatment area required
- Proven successful alternative

Limitations

- PHC (BTEX, F1-F4's), PAH & Salt impacted soils
- Does not treat immobile metals
- Excavation of soils often required to fully remediate
- Spring and Fall sampling required

Preconstruction



Other engineered systems...

Construction



Topsoil & CWD salvage for
Reclamation

Construction



Treatment areas confined to lease

Construction



Able to work on operating leases

Impacted Soil Placement



No trucking off-site

Seeding & Fertilizing



Year One Growth



Treatment of PHC (BTEX, F1-F4's), PAH
& Salt impacted soils

Harvesting

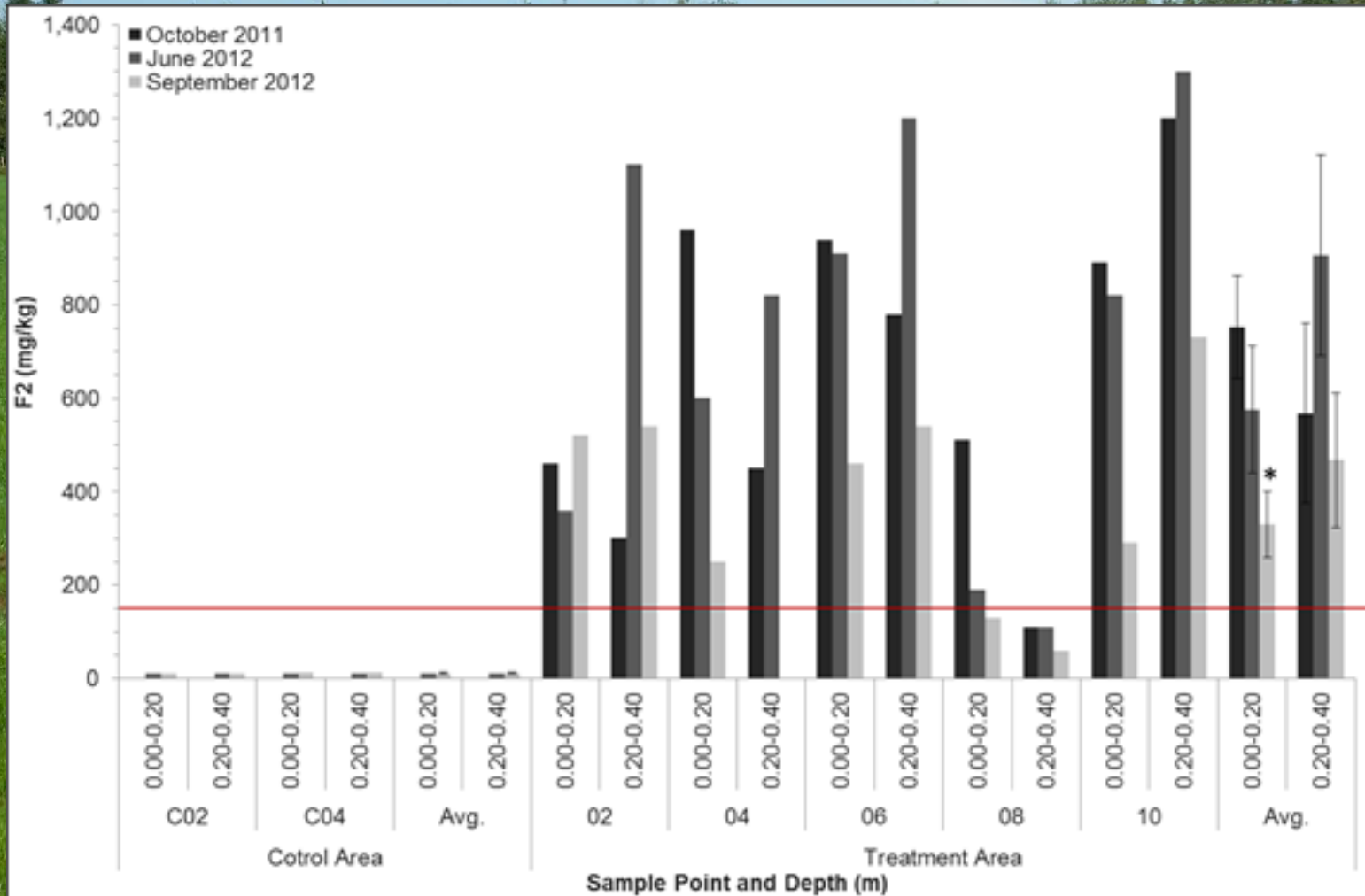


Treatment Area

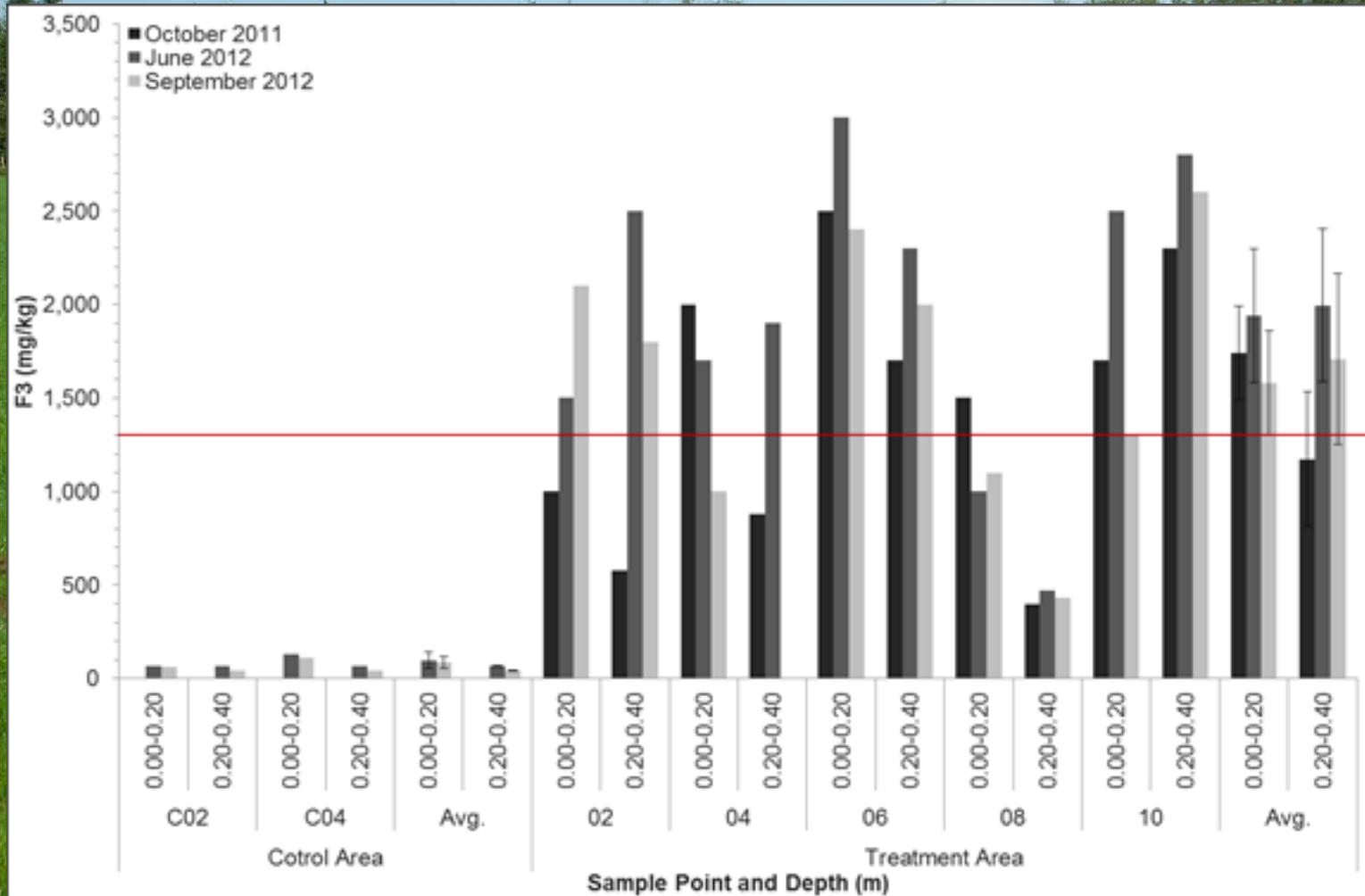


Treatment in remote areas

Results Year One



Results Year One



Background



Excavation



No transfer of liability

Pad Construction



Treat coarse and fine grained soils

Treatment Area



Proven, economical treatment

Seeding & Fertilizing



Work with a broad diversity of clients

Year One Two Growth



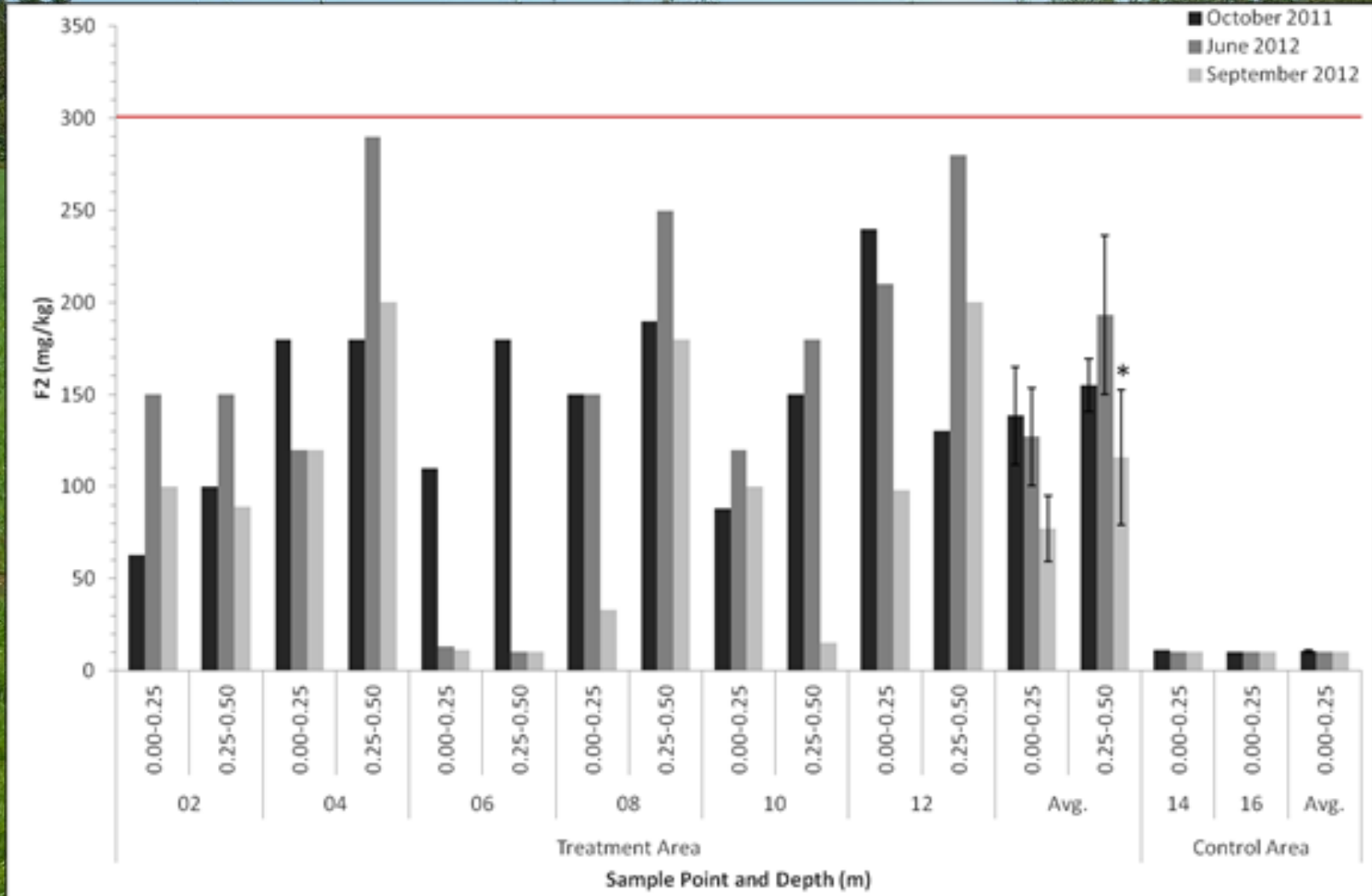
On schedule to remediate in 3 years

Year Two Growth

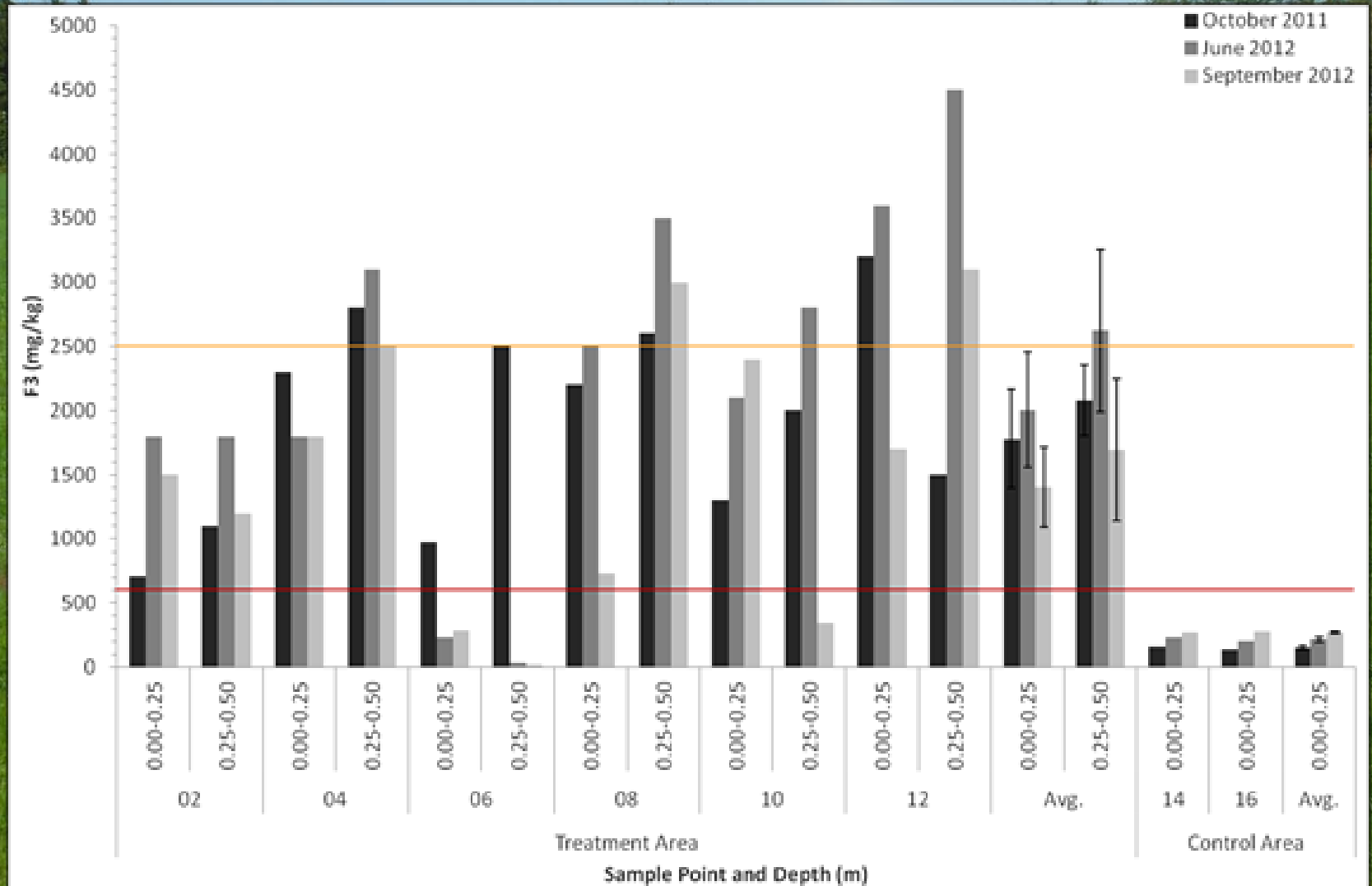


Treatment in harsh climatic
conditions

Results



Results



Questions?

