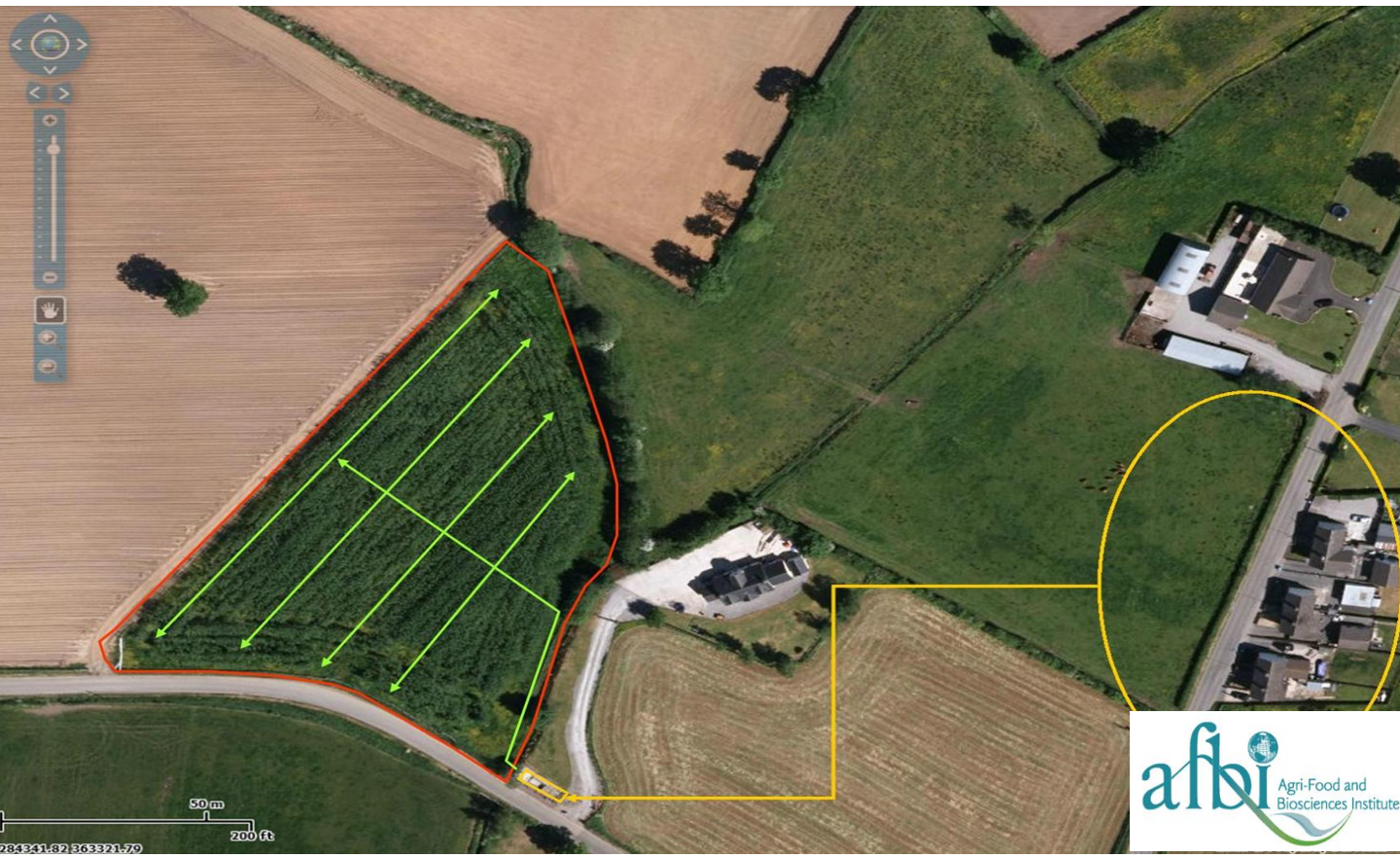
WATERPRO

Strategically positioned SRC willow to manage a point source discharge

Point Source pollution management at Drumkee waste water treatment works



Functionality

- The type of willow used in coppice plantations generally has a fine shallow root system with 80% situated in the top 20 inches of the soil profile.
- This not only improves coppice stand stability but also provides an excellent receptive irrigation surface for the application of effluent.
- Partially-treated wastewater is surface irrigated to the phytoremediation system.
- Phytoremediation is a process where plants are used to break down or remove contaminates in water and soil.
- Fast growing plants such as willow can filter wastewater, breaking down and/or containing nutrients and other contaminates.
- This allows WWTPs to apply significant volumes of effluent to willow plantations.

Monitoring

- Stream water quality is measured upstream and downstream of the plantation and monitored for
  - Biological Oxygen Demand
  - Dissolved Oxygen
  - Total N & Total P
  - pH and suspended solids
- Bore hole water quality is monitored for
  - Nitrate & phosphorus concentrations
- Irrigated and discharged volumes are monitored by daily SCADA uploads
- Biomass yields are measured at harvest time (approximately 3 yearly)
- Site inspected regularly for pipe / valve / pump integrity

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Point Source pollution management at AFBI Hillsborough Research Farm

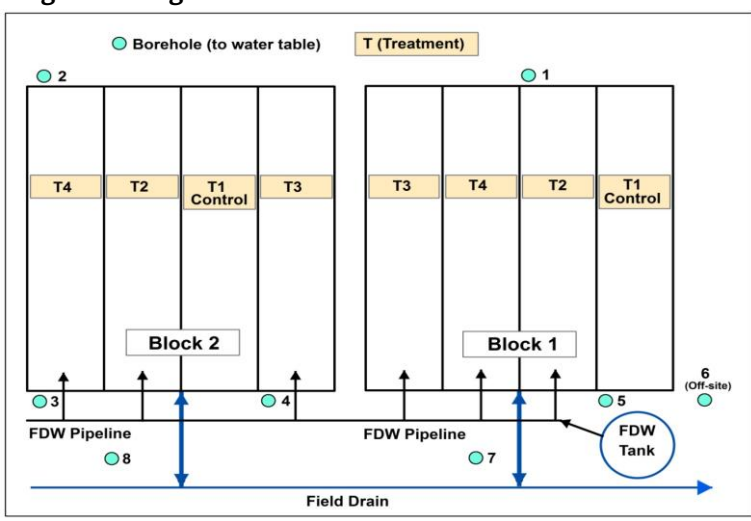
Irrigation of collected Farm Yard Dirty Water

- Soil waters and ground waters were found to be relatively unaffected by the application of the FDW irrigation period,
- A high degree of water remediation resulting from the application of FDW via the irrigation
- The significantly higher EC concentrations found in irrigation affected waters, resulted from the high levels of minor and trace elements from FDW.
- Despite the FDW application, biomass chemistry and yields were found to be almost entirely genotype related and at the lower irrigation rates, biomass yields remained relatively
- Willow genotype was also the dominant factor in nutrient off-take, which was also found to be directly proportional to biomass yield.

Conclusion

- This type of farm effluent, applied at pre-determined rates, can be successfully remediated by irrigation to SRC willow, thereby reducing pollution potential and without adverse affect to local water systems or biomass yields.

Irrigation Design



MORE INFORMATION
Chris Johnston, AFBI Hillsborough, N.Ireland. BT26 6DR
Email: chris.johnston@afbini.gov.uk
https://www.afbini.gov.uk/
https://www.afbini.gov.uk/articles/environment-and-renewable-energy-centre

Northern Periphery and Arctic Programme 2014-2020

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