



Arrow Energy

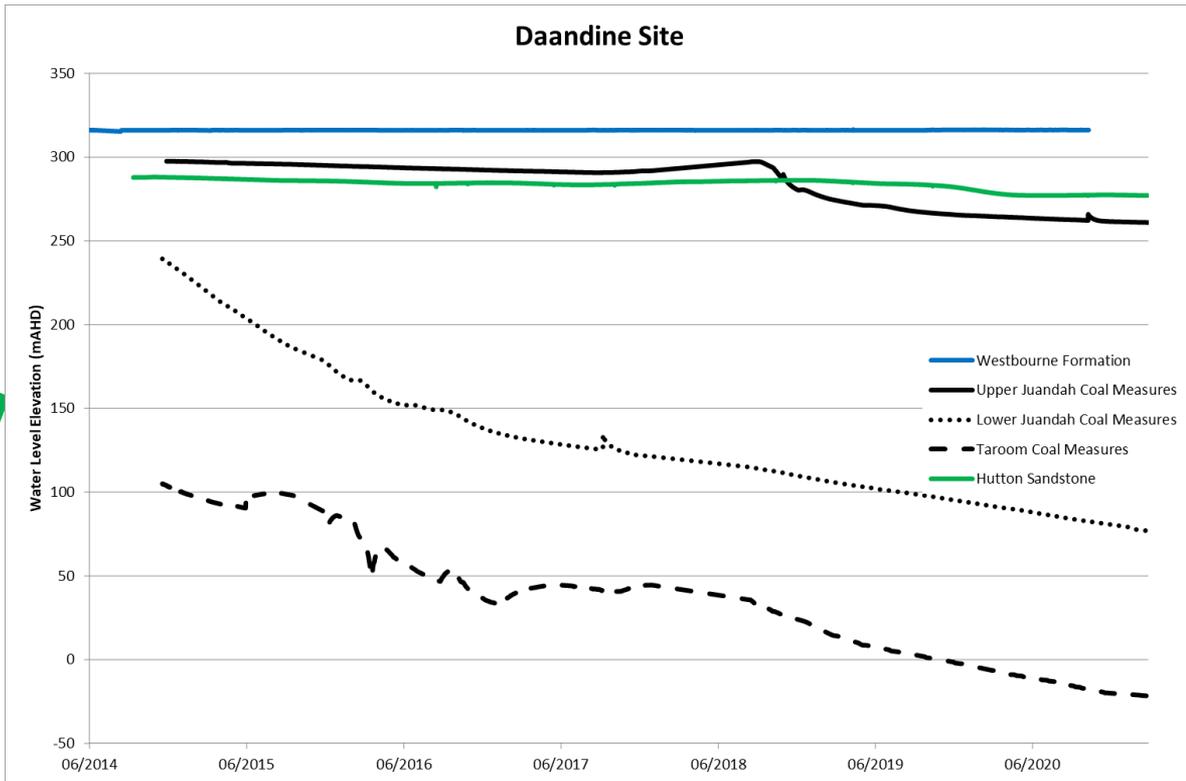
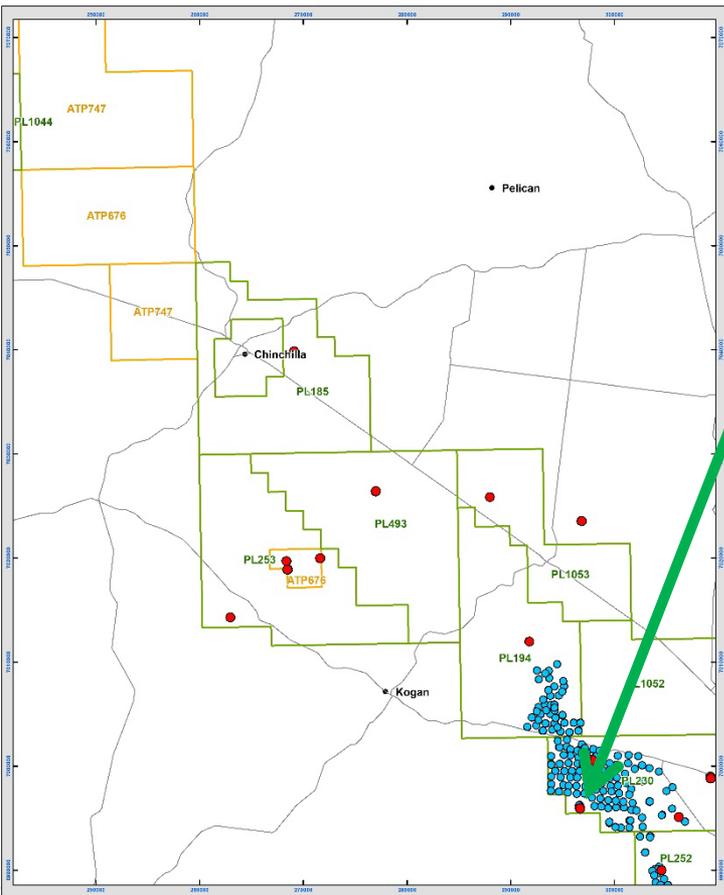
Groundwater Monitoring

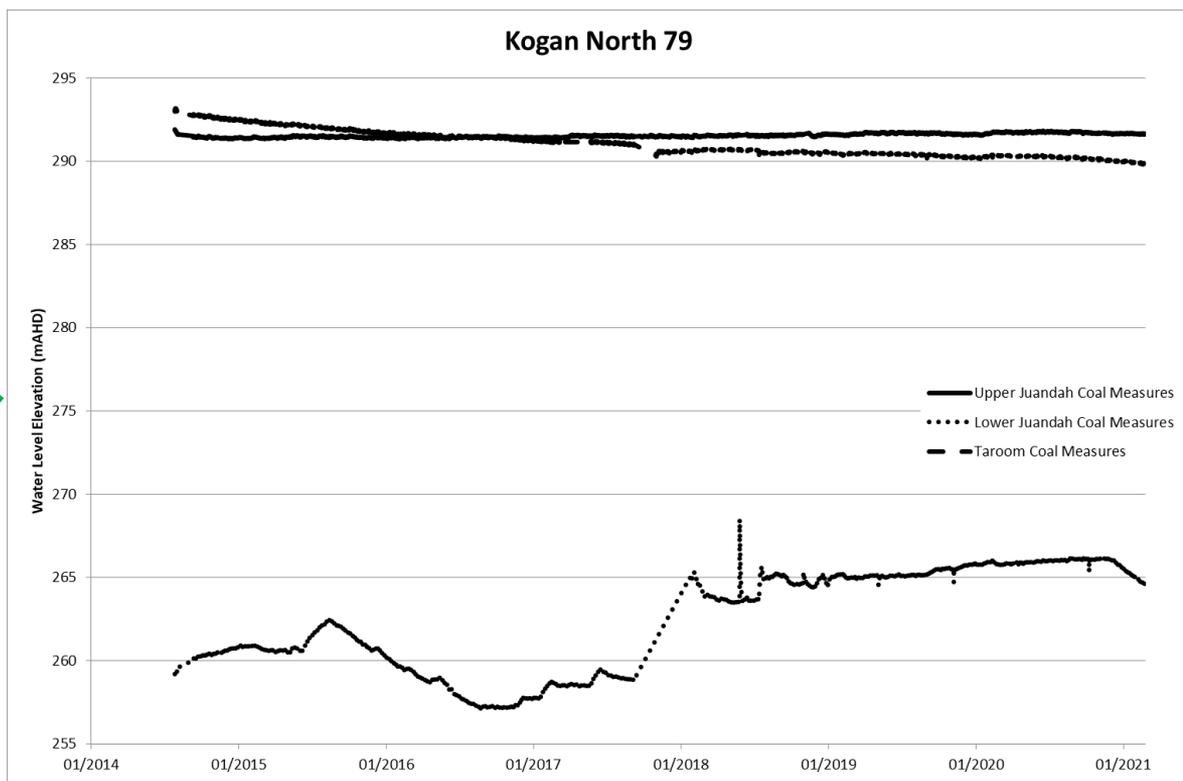
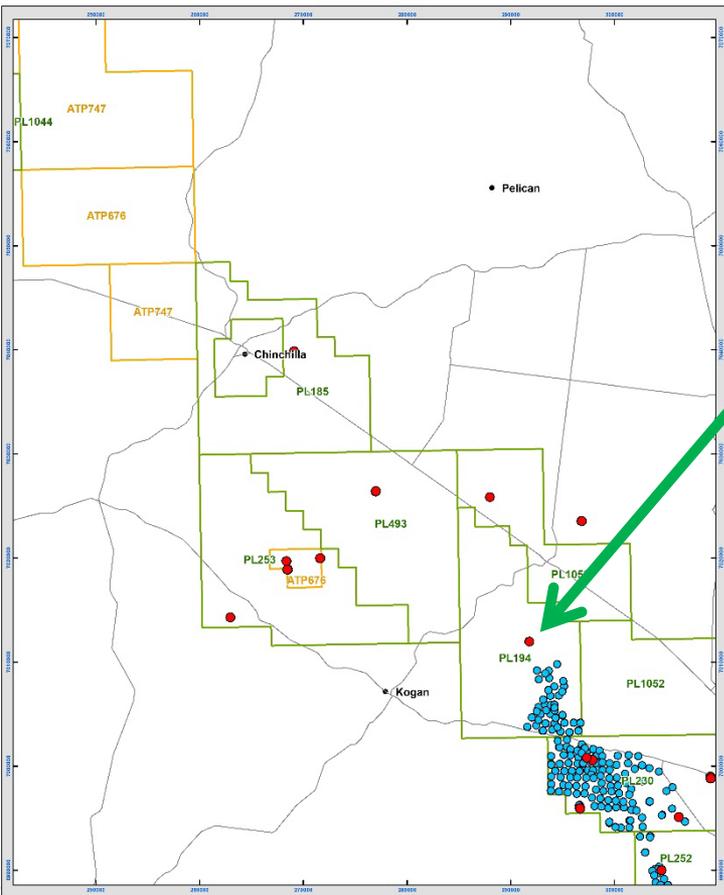
Chinchilla Groundwater Net Area

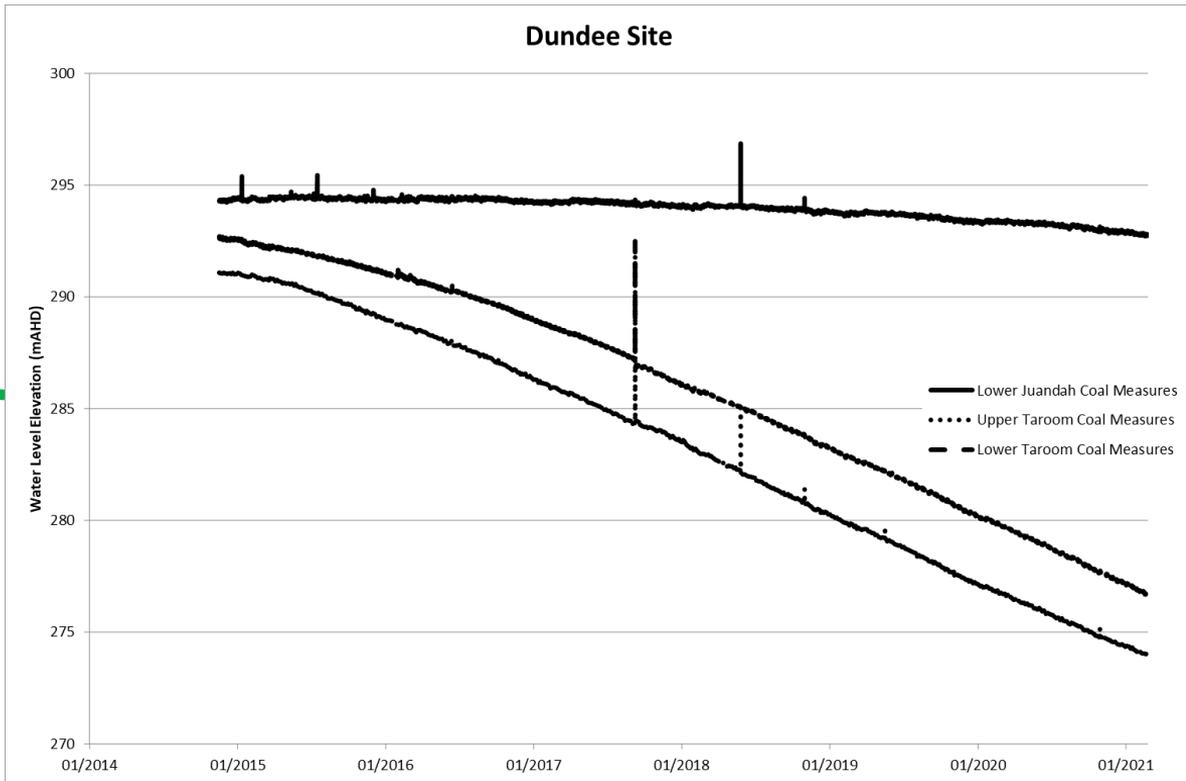
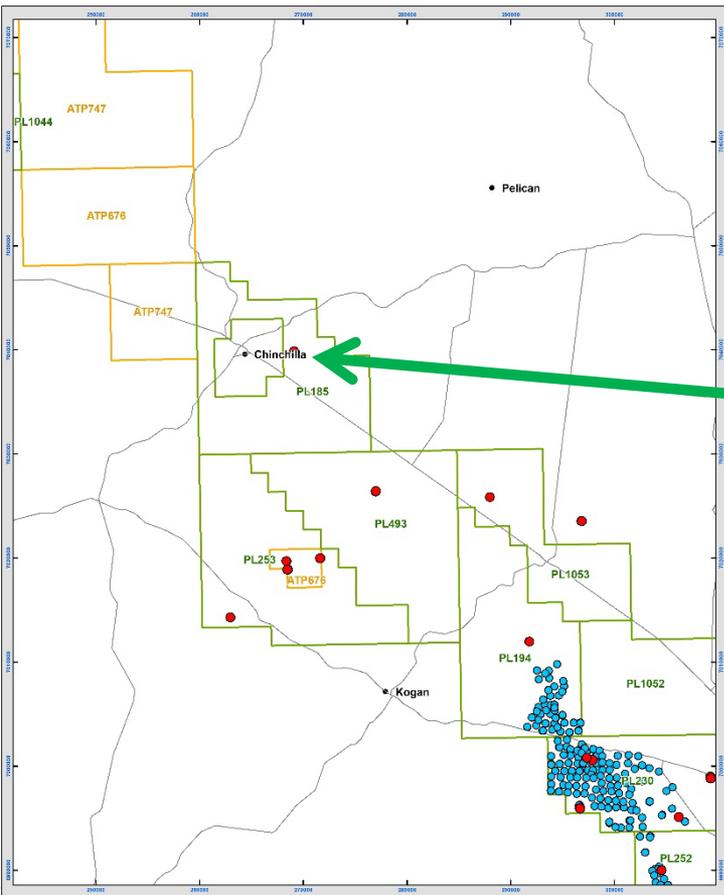
9 June 2021

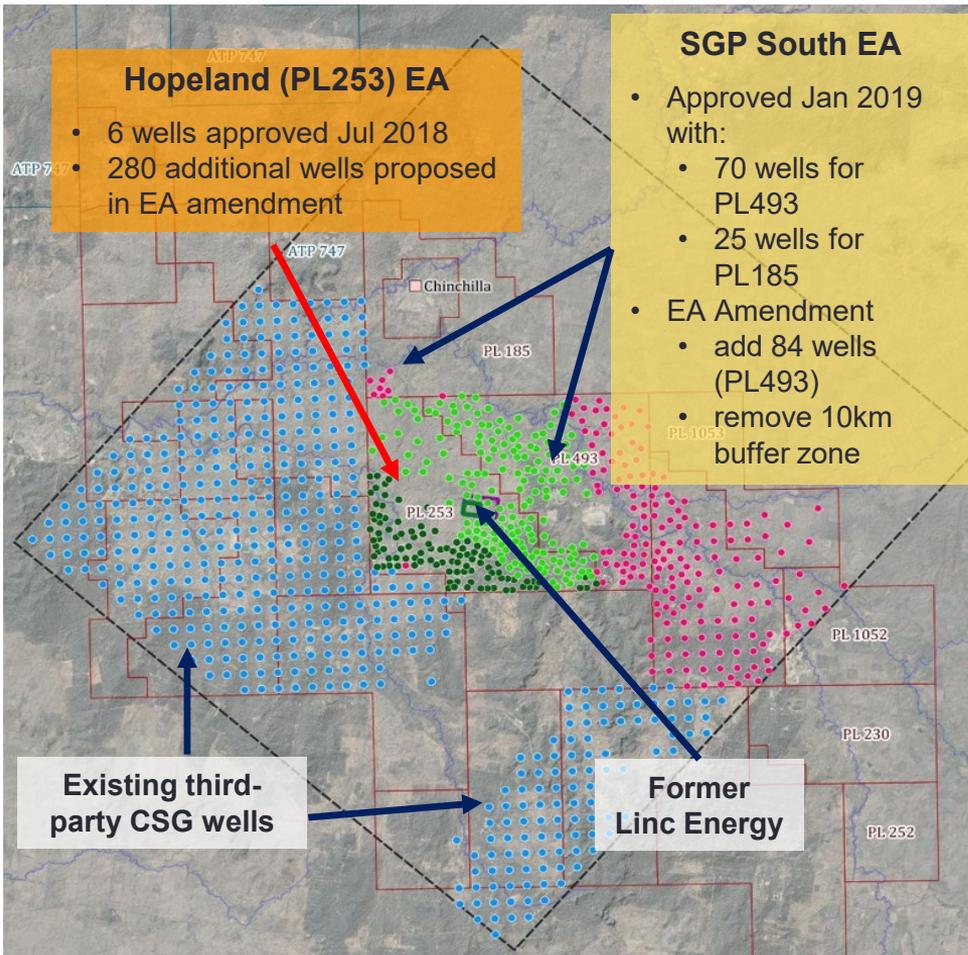
 Safe Work. Strong Business.



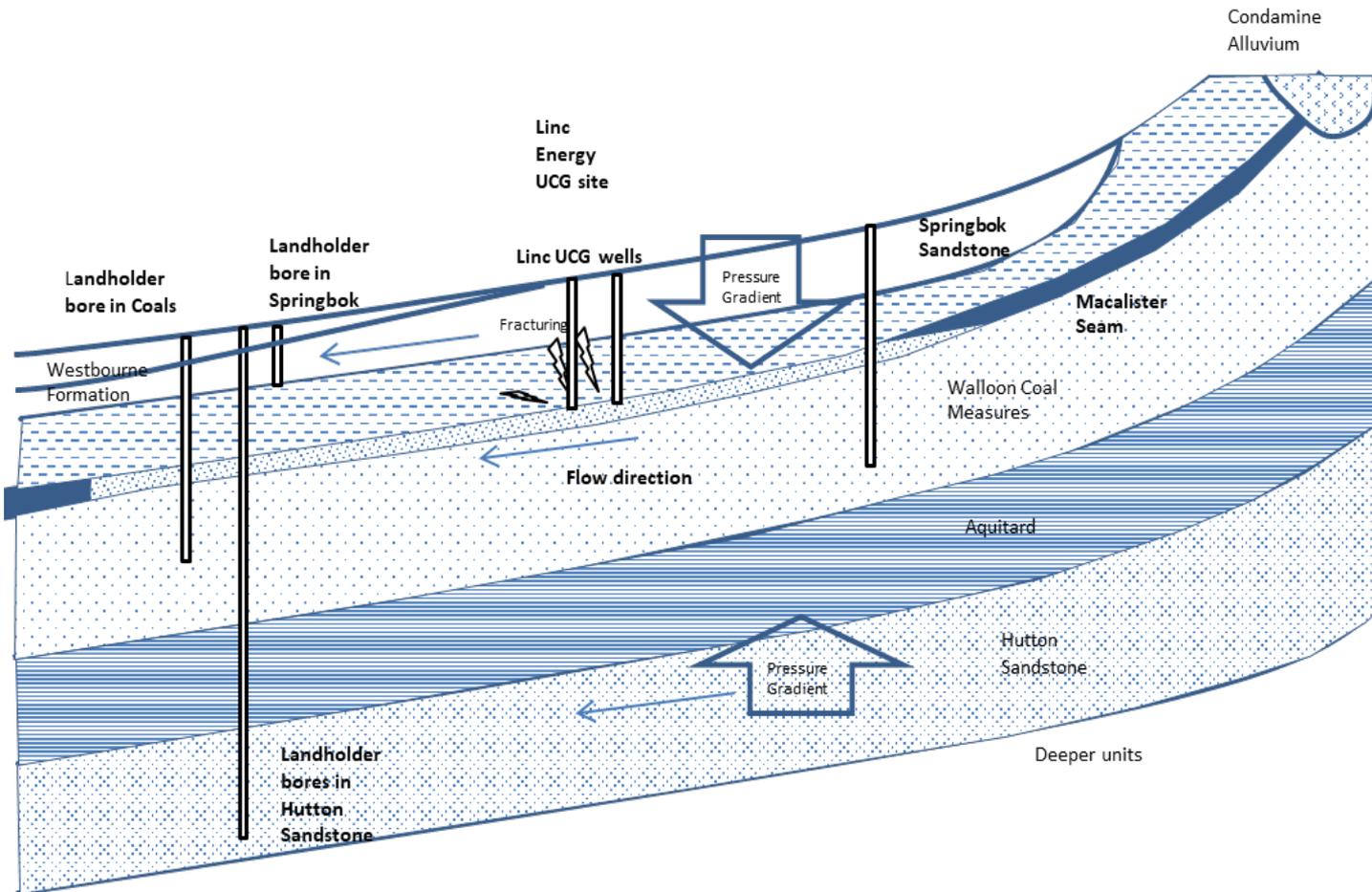








- SGP Phase 1 FID Announced in April 2020 – includes activities on 9 PLs, including PL253
- To meet our Gas Sales Agreement (GSA) commitments, production is required from 2024
- PL253 EA amendment application seeks to:
 - retain current authorised activities
 - add for the SGP:
 - 280 gas wells (green dots on PL253)
 - 440km of gathering pipeline (gas and water)
 - Schedule 2A-3 for impact to Environmentally Sensitive Areas (ESA)

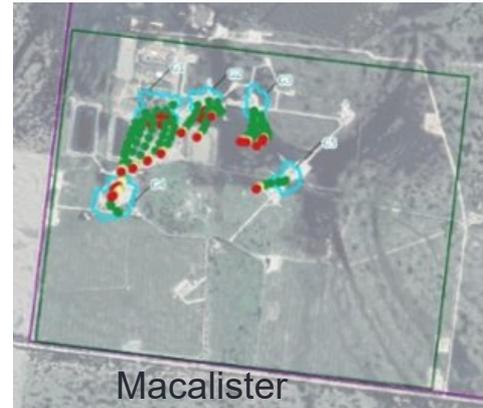


- Groundwater moving less than 1m per year in a NE to SW direction
- Approx. half of the proposed wells will extract water and gas from the full thickness of the Walloon Coal Measures (WCM)
- The other half will only extract from the deeper sections of the WCM (excluding Macalister)

- Current EA condition, commenced mid 2018
- Designed to provide early notification of changes in groundwater flow and quality
- 24 monitoring locations on and around Lot 40 DY85
- Includes:
 - Quarterly monitoring for groundwater level and quality including contaminants of concern, metals, major ions, dissolved gases
 - Notification to DES and investigation procedures in the event of trigger levels
 - Annual calibration of the groundwater model
 - Annual report detailing data collected, updated and calibrated model and changes to GCMP
- All data collected reported to DES and DR (formerly DNRME)
- **2019 to 2021 Arrow monitoring shows no UCG contaminants in bores near the site boundary.**



- Groundwater particles from the former Linc operational area will not reach the site boundary during Arrow's 20 year production period
- Modelling indicates low levels of contaminants on site are already degrading and will be within safe limits within 2.5 to 7.5 years (by end 2027)
- Even when modelled at levels higher than collected data indicates, contaminants will not leave the site within the 20 year development period
- **Any potential impacts are managed through adaptive management, includes early trigger warning system and mitigation response**

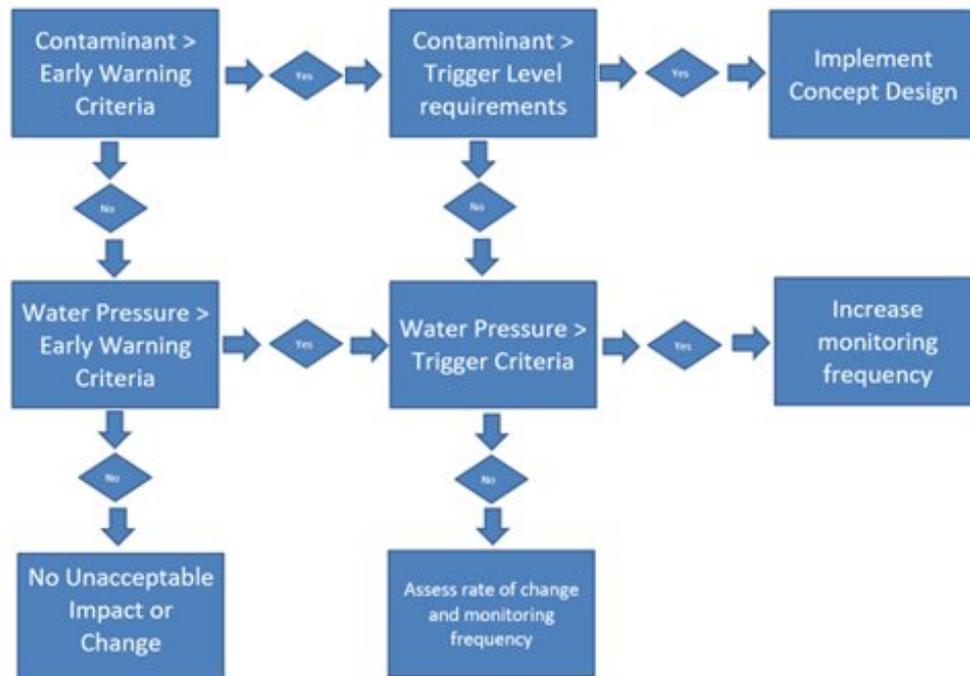


Based upon National Environment Protection Management (NEPM) assessment of site contamination:

1. Implementation of adaptive management
 - monitor against early warning trigger levels
 - annual update of PL253 groundwater model

2. If early warning trigger limit is reached, Arrow notifies DES of results and investigates

3. If monitoring or modelling predicts UCG contaminant impacts, a management plan is developed, eg:
 - intercept wells
 - containment systems



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