



Building a low emissions future

Securing the Australian CCS Project Rollout by Improving Aspects of the GHG Storage Legislation: A Discussion Paper

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Provide	An overview of the opportunities to substantially improve the efficiency of the CCS project roll-out through legislative change
Highlight	The historical interplays between the petroleum and GHG legislative frameworks – and why the petroleum basis for GHG is simply not helpful
Illustrate	Some practical examples in regard to CCS in saline aquifers and in depleted fields
Summarise	Potential improvements to facilitate the CCS project roll-out

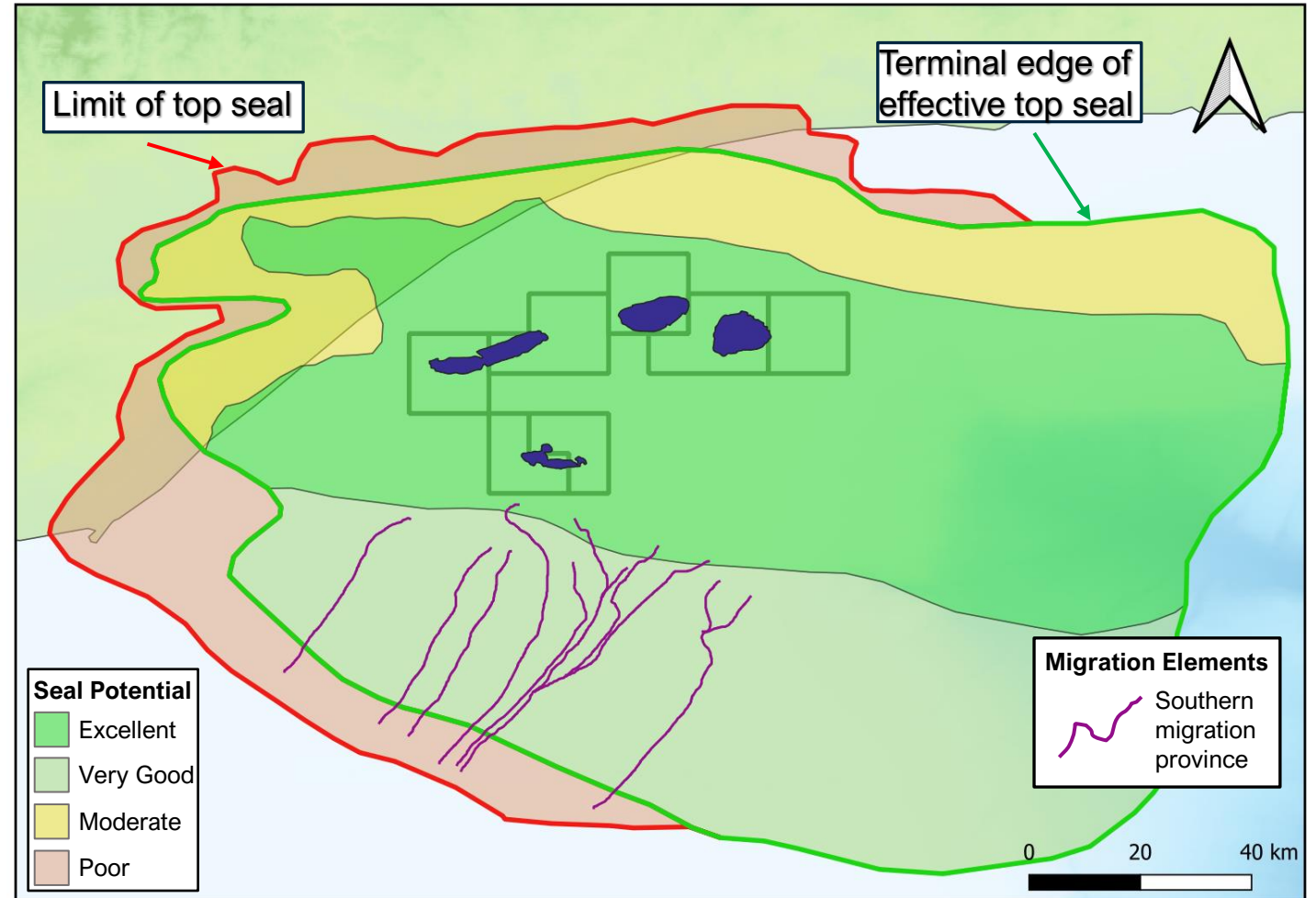


Petroleum and CCS: Compare & Contrast

Petroleum	GHG/CCS	Implications For CCS
<p>Hydrocarbon Pools</p> <ul style="list-style-type: none"> Well-defined legally and spatially and the pool's extent will <i>decrease with time</i> 	<p>CO₂ Plumes</p> <ul style="list-style-type: none"> Not defined legally and the plume's extent and pressure footprint <i>increases through time</i> (modelled; MMV) 	<ul style="list-style-type: none"> How is the extent of a plume defined (saturation, pressure, displaced water)? Basis of MMV (Containment)
<p>Seals</p> <ul style="list-style-type: none"> Do the seals work well enough to trap commercial volumes of hydrocarbons? Might never know the exact mechanism, in some cases 	<p>Containment</p> <ul style="list-style-type: none"> Understand the trapping and sealing mechanisms; the CO₂ plume must not migrate out of the permit or out of the storage formation, vertically or laterally 	<ul style="list-style-type: none"> The boundaries of the permits are absolute "no-go" zones (affects project planning and risking) Not allowing CO₂ plumes to leave GHG permits dramatically limits the effective use of the permit and the pore space

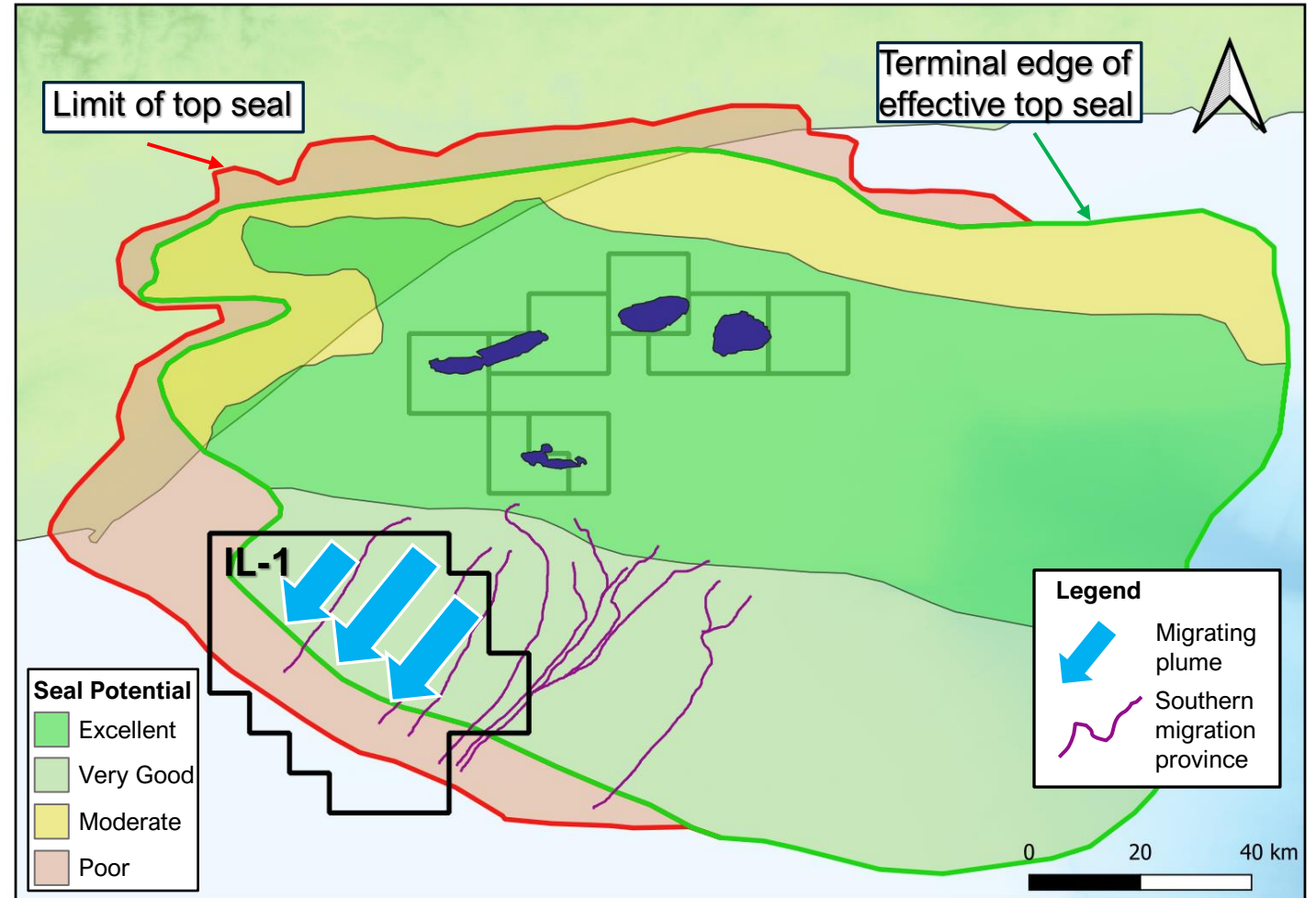
Orchard Basin: Top Seal Potential

- Regional seal has outstanding seal integrity in central basin (fields), poor integrity on the flanks
- Southern province has a strong NE-SW migration vector (migration intersects edge of effective seal, which is the limit of viable storage)



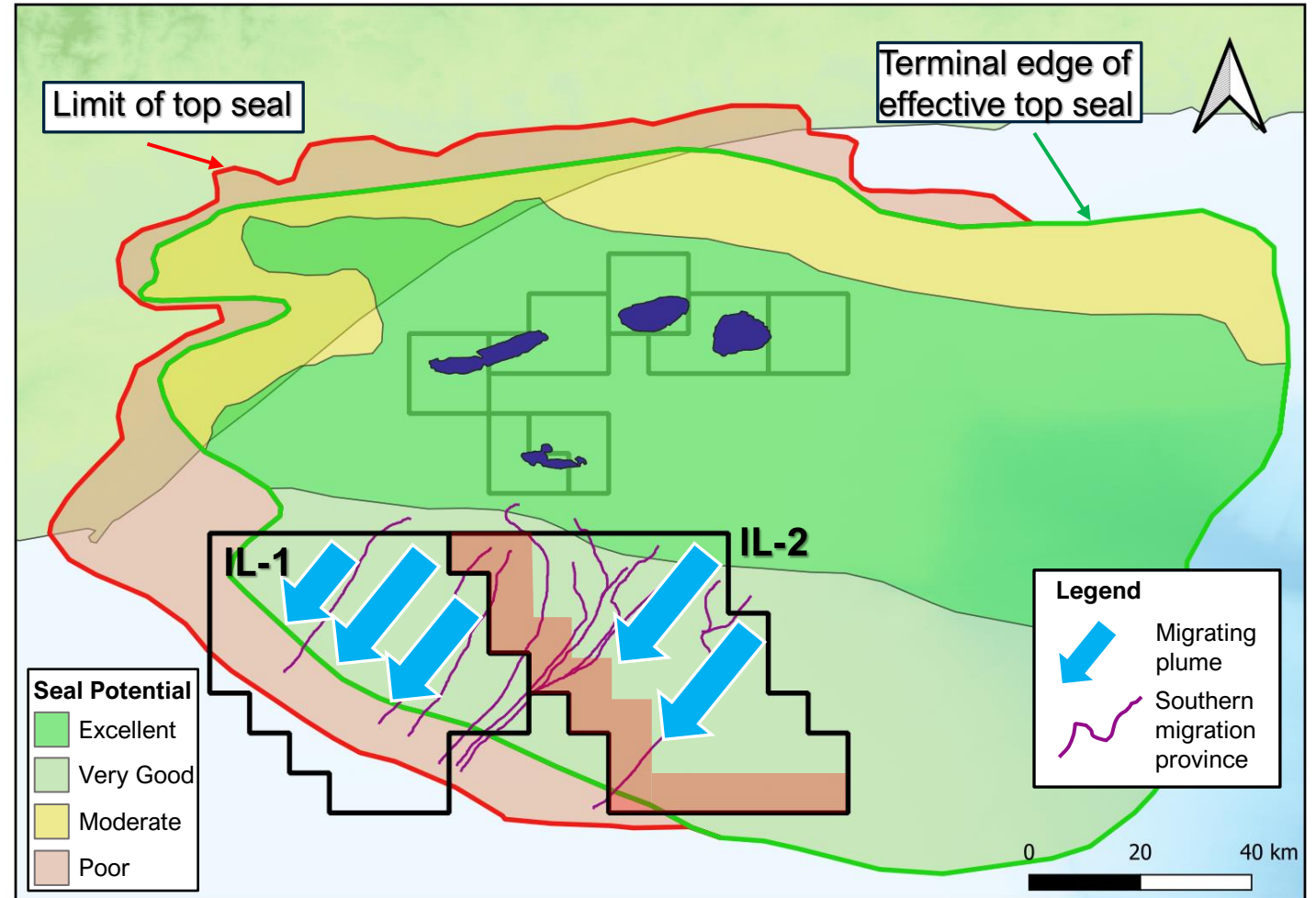
Orchard Basin: Saline Formation Storage

- Only one Injection Licence 1
- Within Injection Licence 1, the plumes' extent and permit's ultimate storage volume is limited by geology



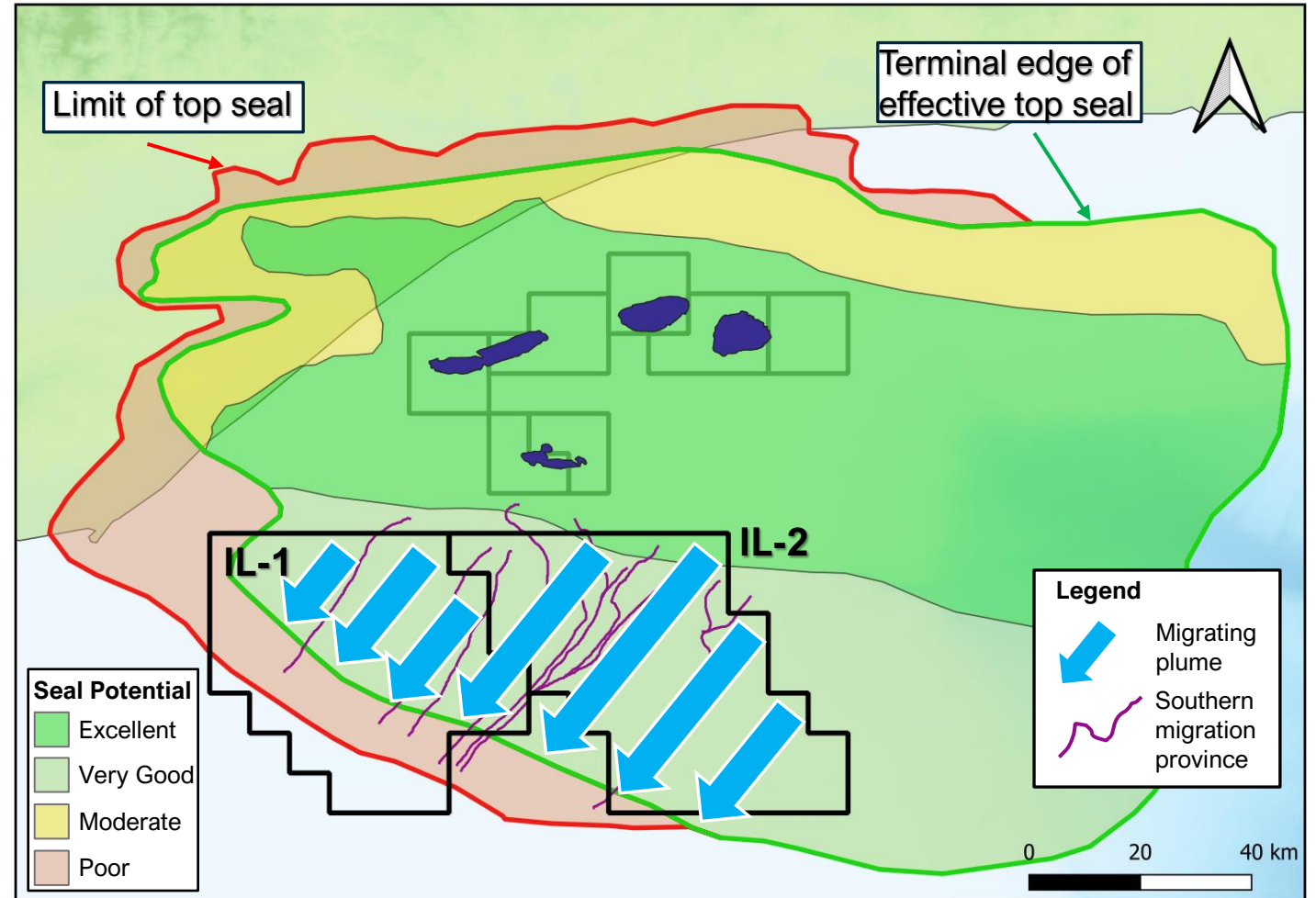
Orchard Basin: Saline Formation Storage

- Two Injection Licences (ILs) with two different operators
- In Injection Licence 2, the plumes' extent and permit's ultimate storage volume is limited principally by risk around permit boundary, not geology

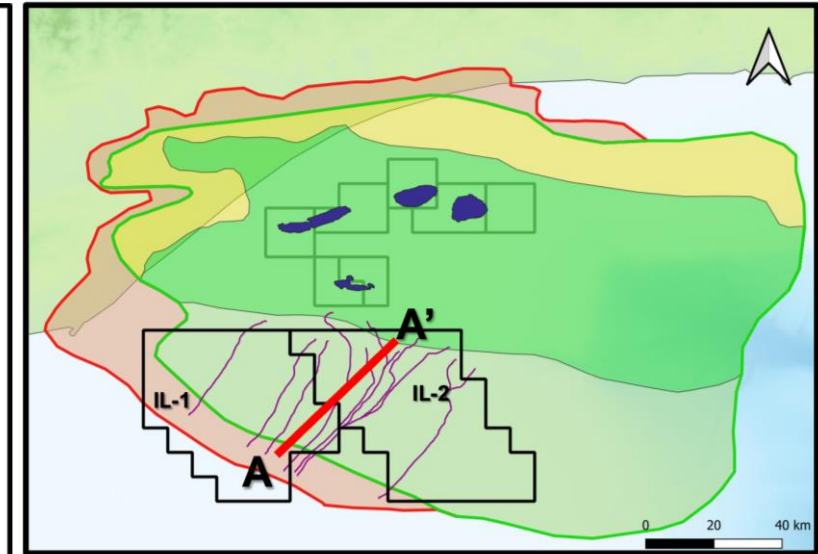
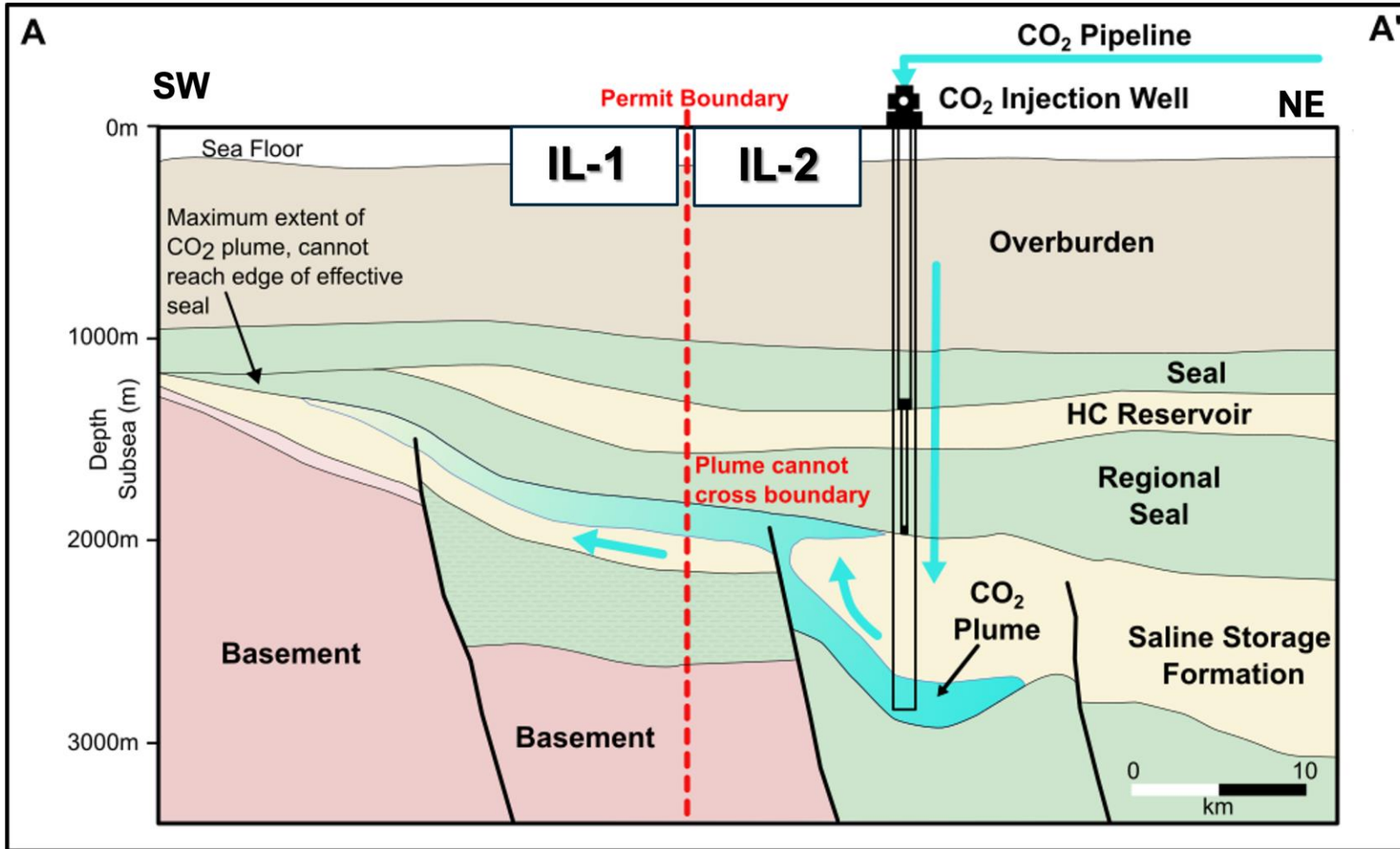


Orchard Basin: Saline Formation Storage

- If plumes could cross permit boundaries, utilisation of the permits and storage volumes could increase enormously
- Unitisation of plumes or the combination of projects would mean that the security of geological storage would be the dominant criteria, not largely arbitrary boundaries

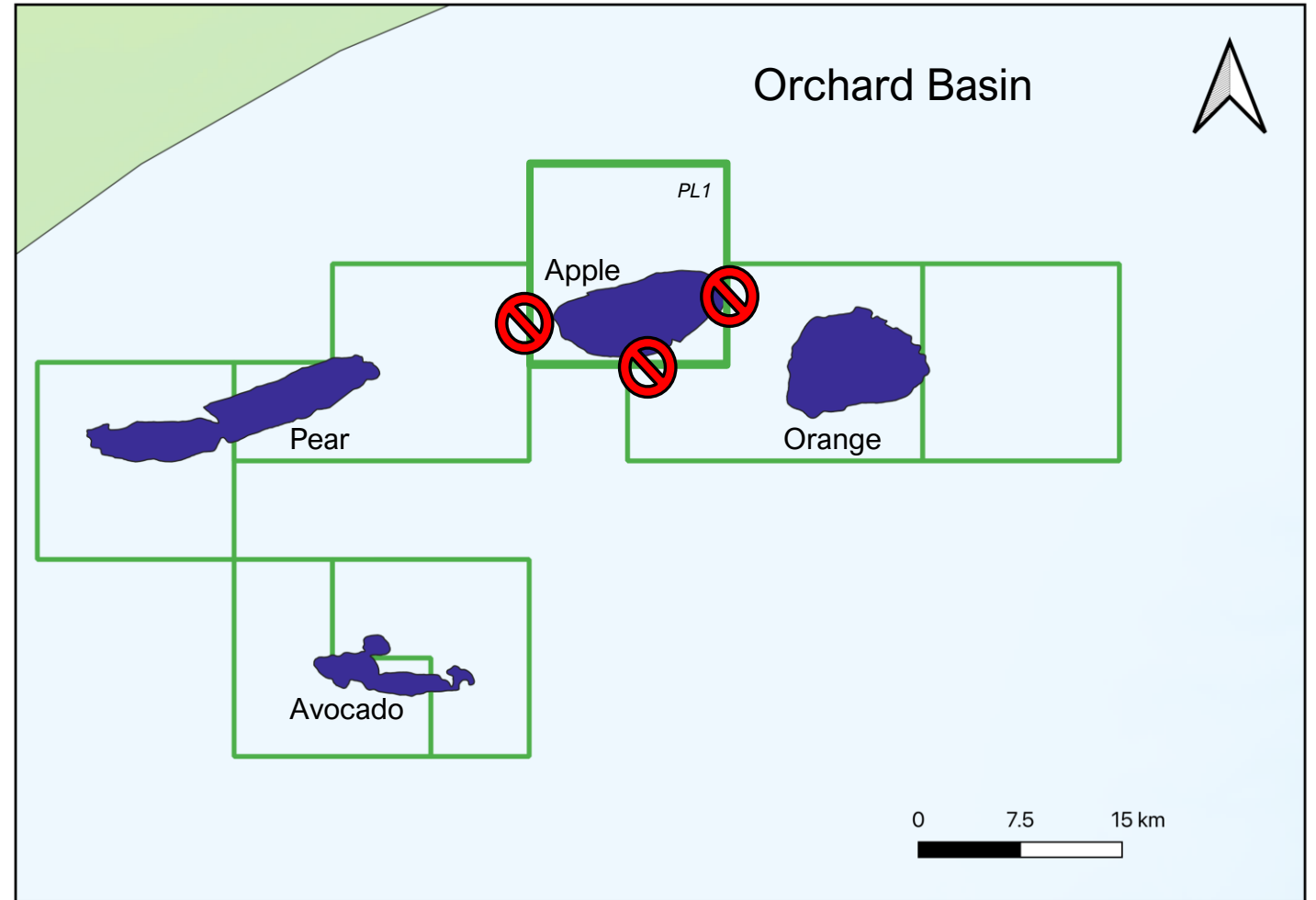


Orchard Basin: Saline Formation Storage



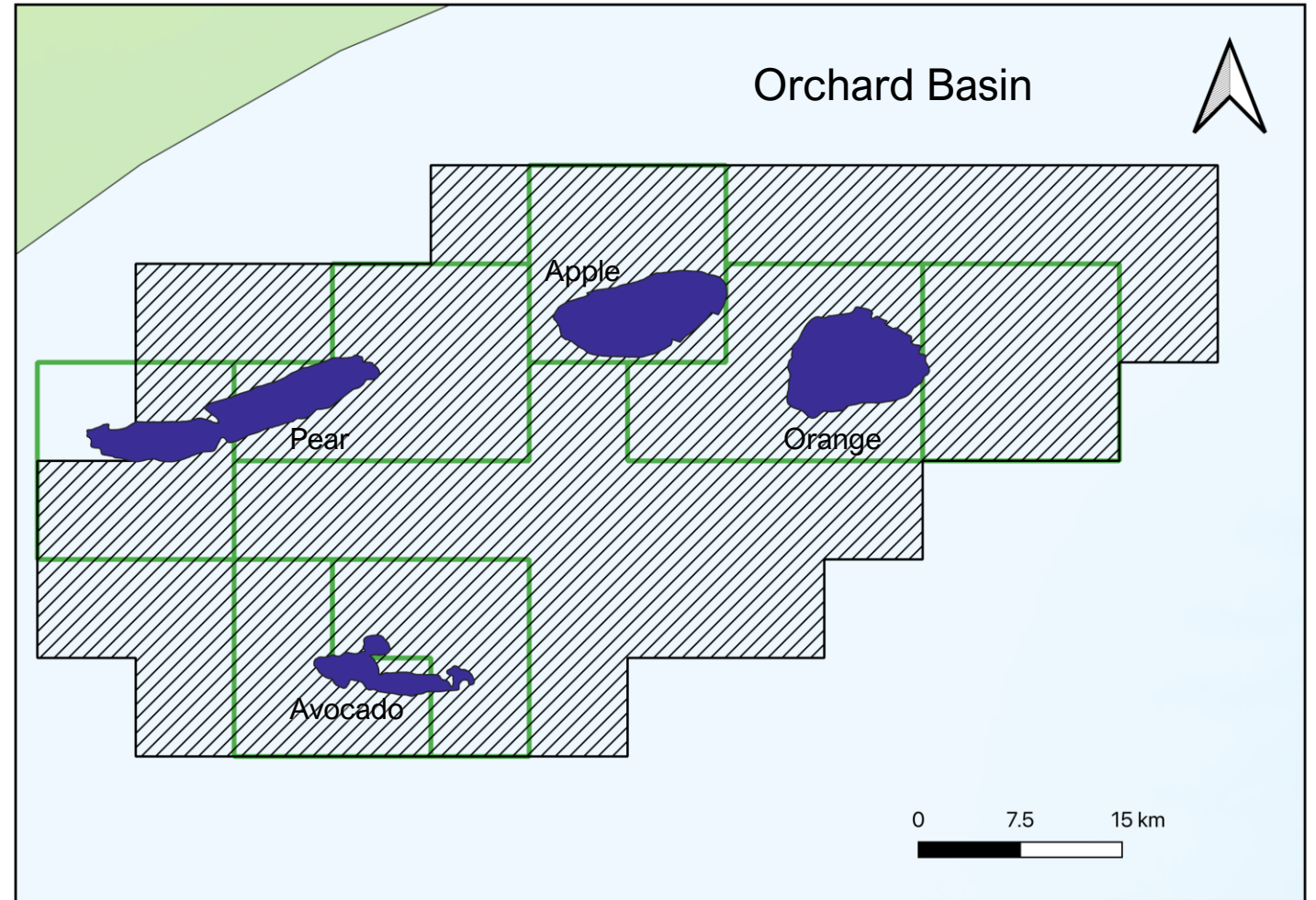
Apple Depleted Field – a Low Hanging Fruit CCS Opportunity

- The Storage Formation/plume will be close to the permit boundaries (Petroleum Location to PL to IL)
- Injected CO₂ cannot cross these boundaries, which limits potential storage volumes substantially and dramatically increases project risk



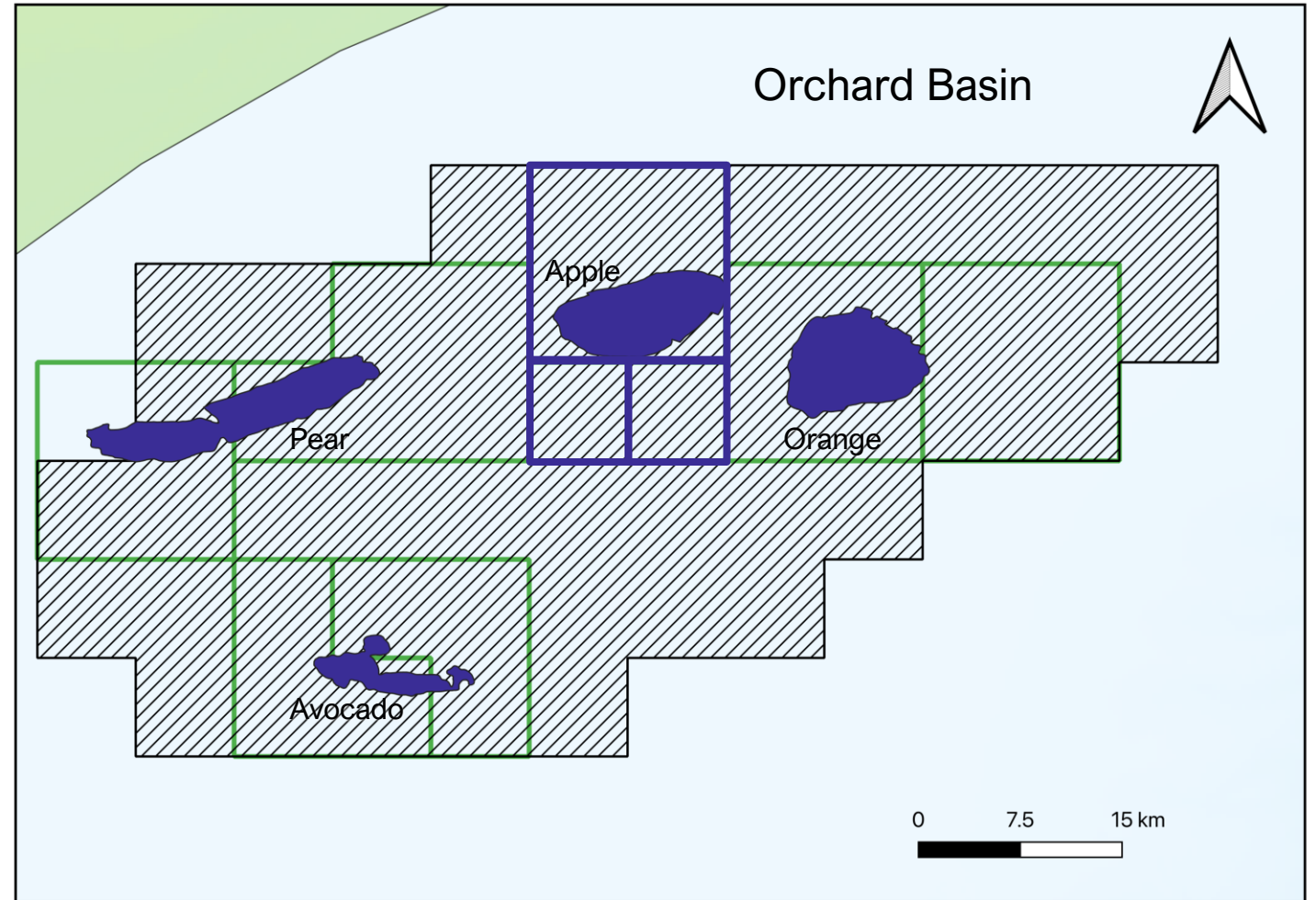
Gazette a large part of the Orchard Basin

- To mitigate the risk of the plume crossing permit boundaries, very large areas are gazetted by government (GHGAP)
- Process could lead to the exclusion of other operators for up to 11 years (6 + 5 renewal)?



Add Graticular Blocks

- Regulatory streamlining could decrease the need for very large GHG AP acreage gazettals by allowing blocks to be added to an existing IL or permitting cross-permit plume migration
- Encourage wider CCS project roll-out in a region



Summary

- The GHG legislation is ~20 years old and predates fundamental changes in CCS project realities (LNG focus) and emissions' policy (net zero, 43% by 2030, Safeguard, Future Gas Strategy, Future Made in Australia, Critical Minerals etc)
- Concept of “Containment” in legislation should entail a risk-based approach which emphasises efficient, permanent carbon removal, the minimisation of deleterious impacts and the effective use of the nation’s available storage systems through time
 - Improve commerciality (risks, costs, unitise, combine) and speed of deployment of saline aquifer and depleted field storage projects

CO2CRC acknowledges and appreciates the strong relationships it has with industry, community, government, research organisations, and agencies in Australia and around the world

