



Fueling the St. Louis Fleet with LNG from LFG

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For the Vessel Operator

- 25% reduction in fuel cost
- 20% reduction in fuel weight
- Reduced engine maintenance frequency and cost

Vessel Modifications Required

- Diesel engine modification or replacement
- New fuel storage and delivery system

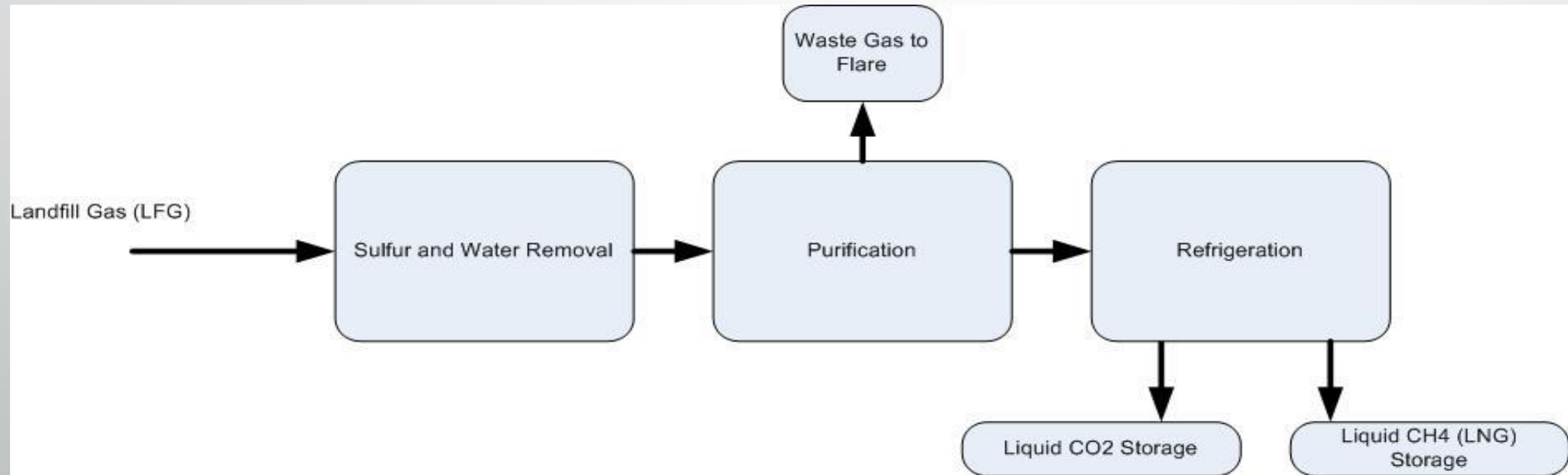
Fuel security

- Liquid Natural Gas (LNG) from Landfill Gas (LFG)
- Backup LNG from Natural Gas (NG)
- Local Fuel Depot
- Fuel Supply Contract

LFG to LNG

- LFG is ~50% methane, 40% carbon dioxide, and 10% other
- NG is ~98% methane, 2% carbon dioxide, water, nitrogen
- LFG is purified to ~99⁺% methane
- Methane is refrigerated to LNG (-260 °F)
- LNG is stored and transported as a cryogenic liquid

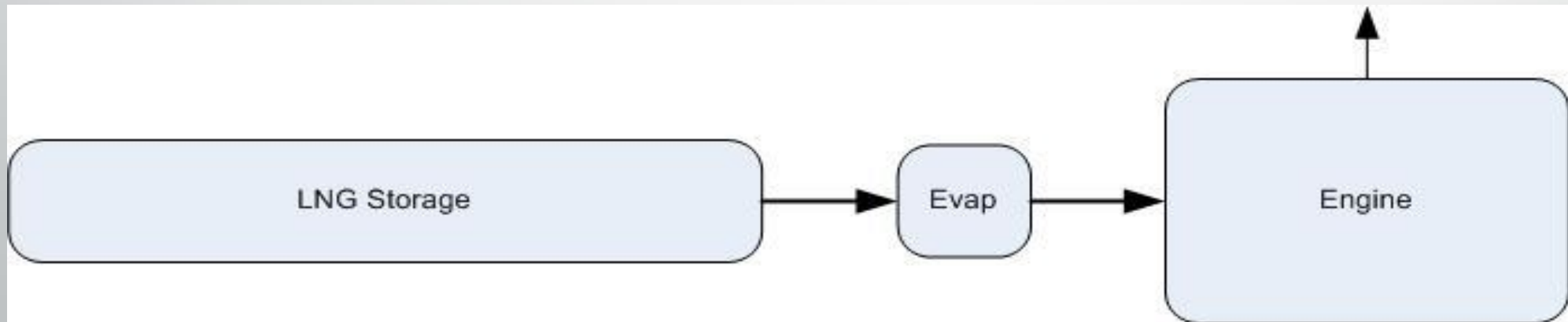
LFG to LNG



LNG use

- LNG is stored in insulated tank(s), above deck in converted vessels
- Methane is evaporated to gas
- Gas is burned in engine
- Engine emissions are reduced

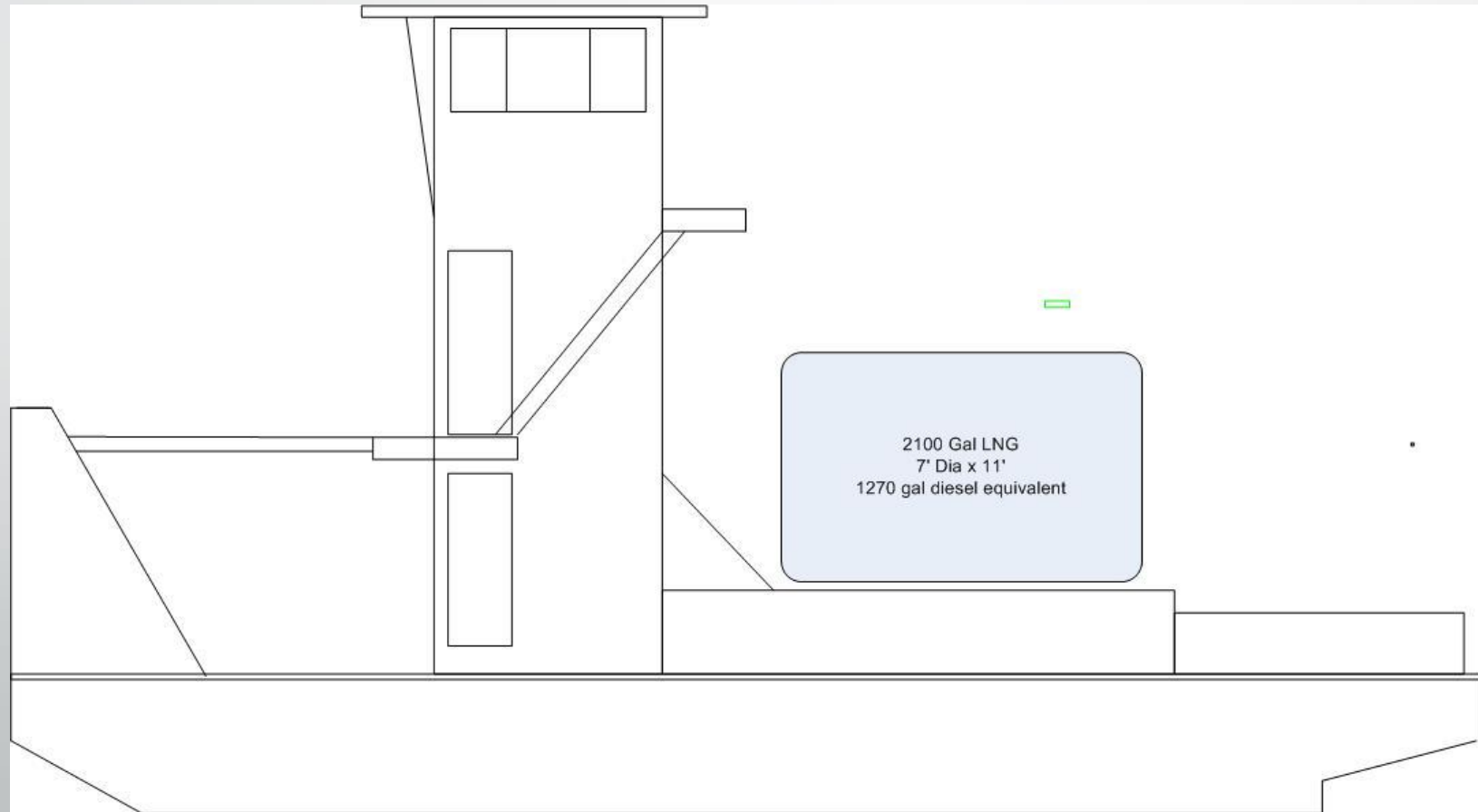
LNG Use



Helen Virginia



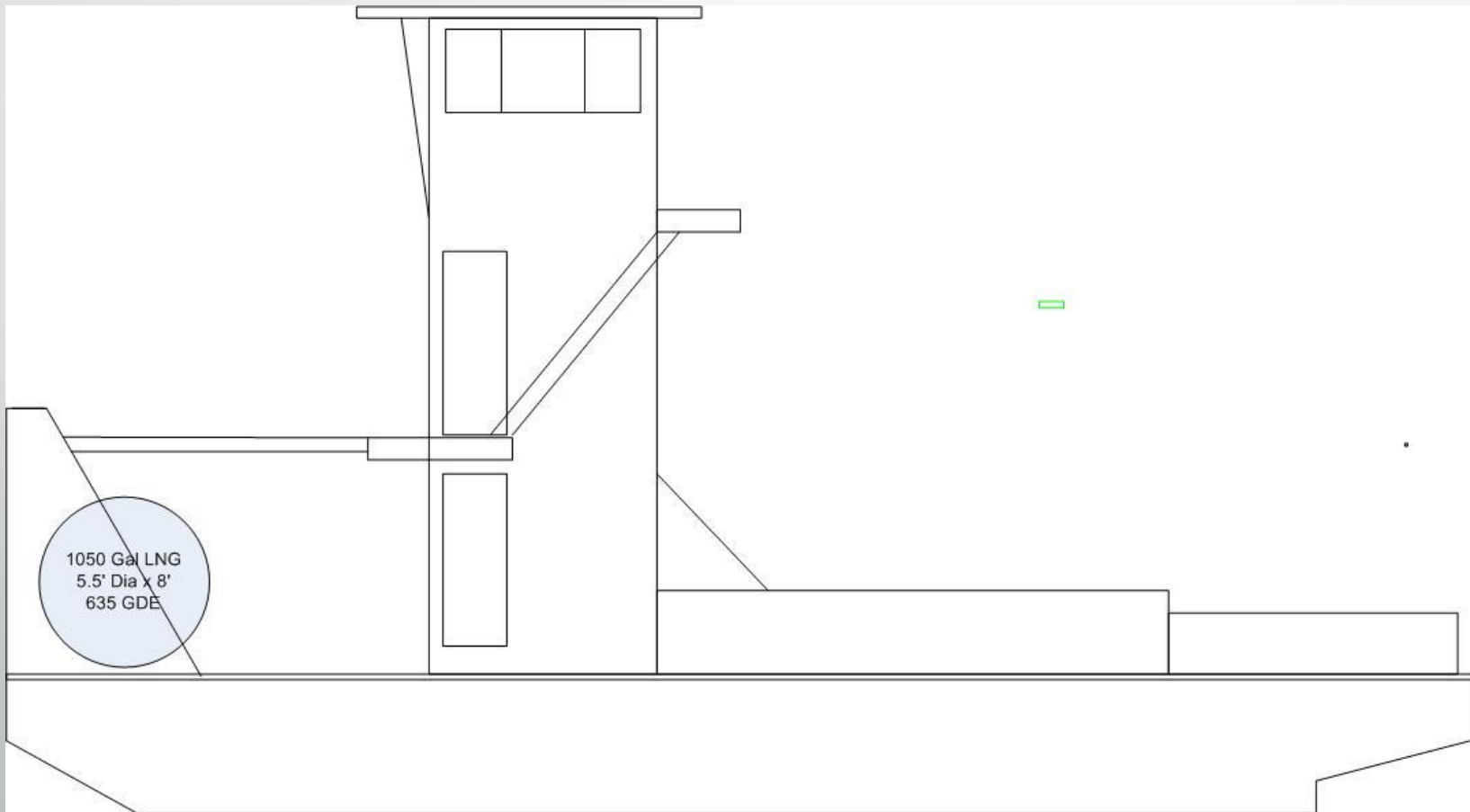
Harbor Tug, 1270 DGE



Harbor Tug, 1270 DGE, Plan



Harbor Tug, 635 DGE



Harbor Tug, 635 DGE, Plan

