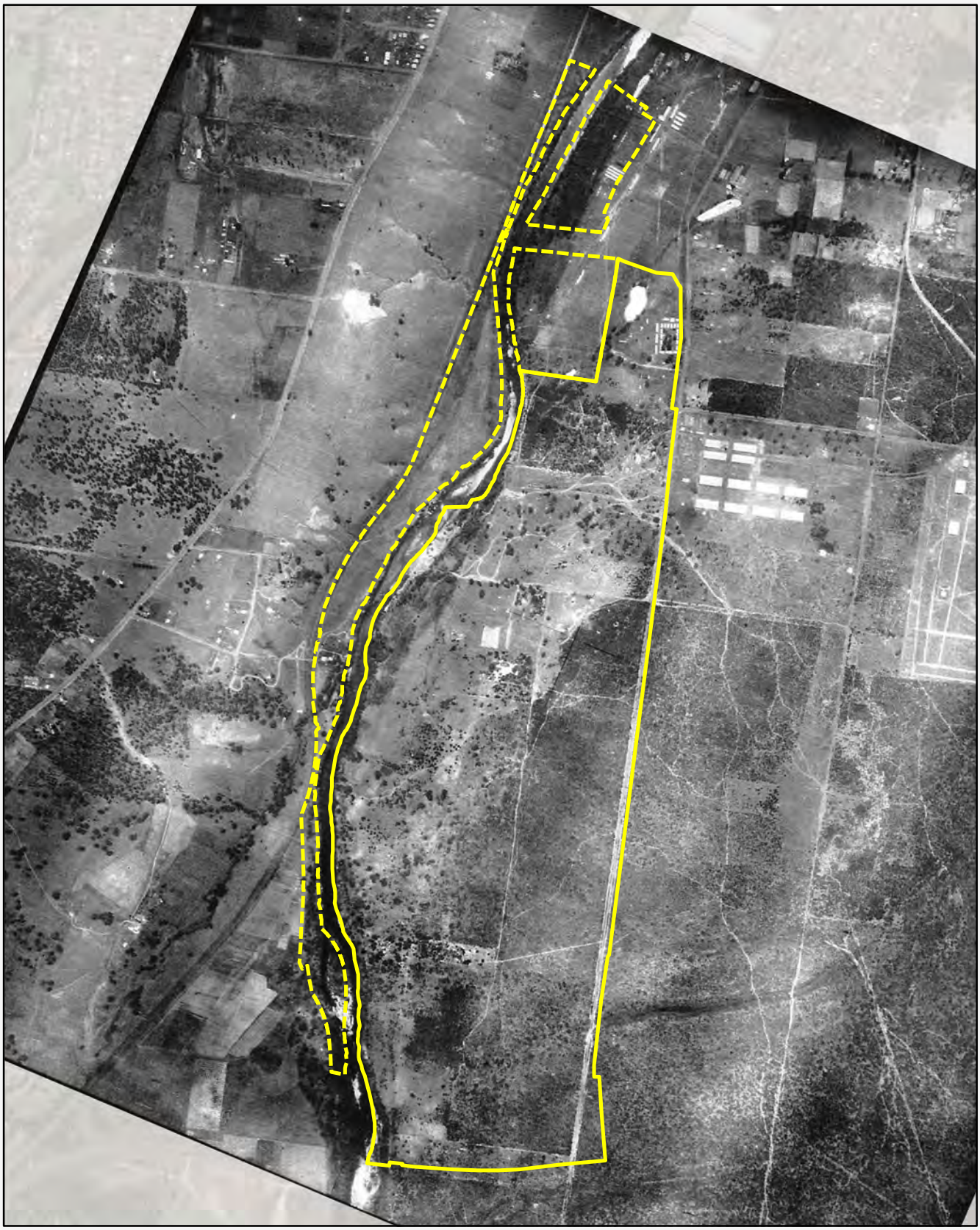
Appendix H

Aerial photographs





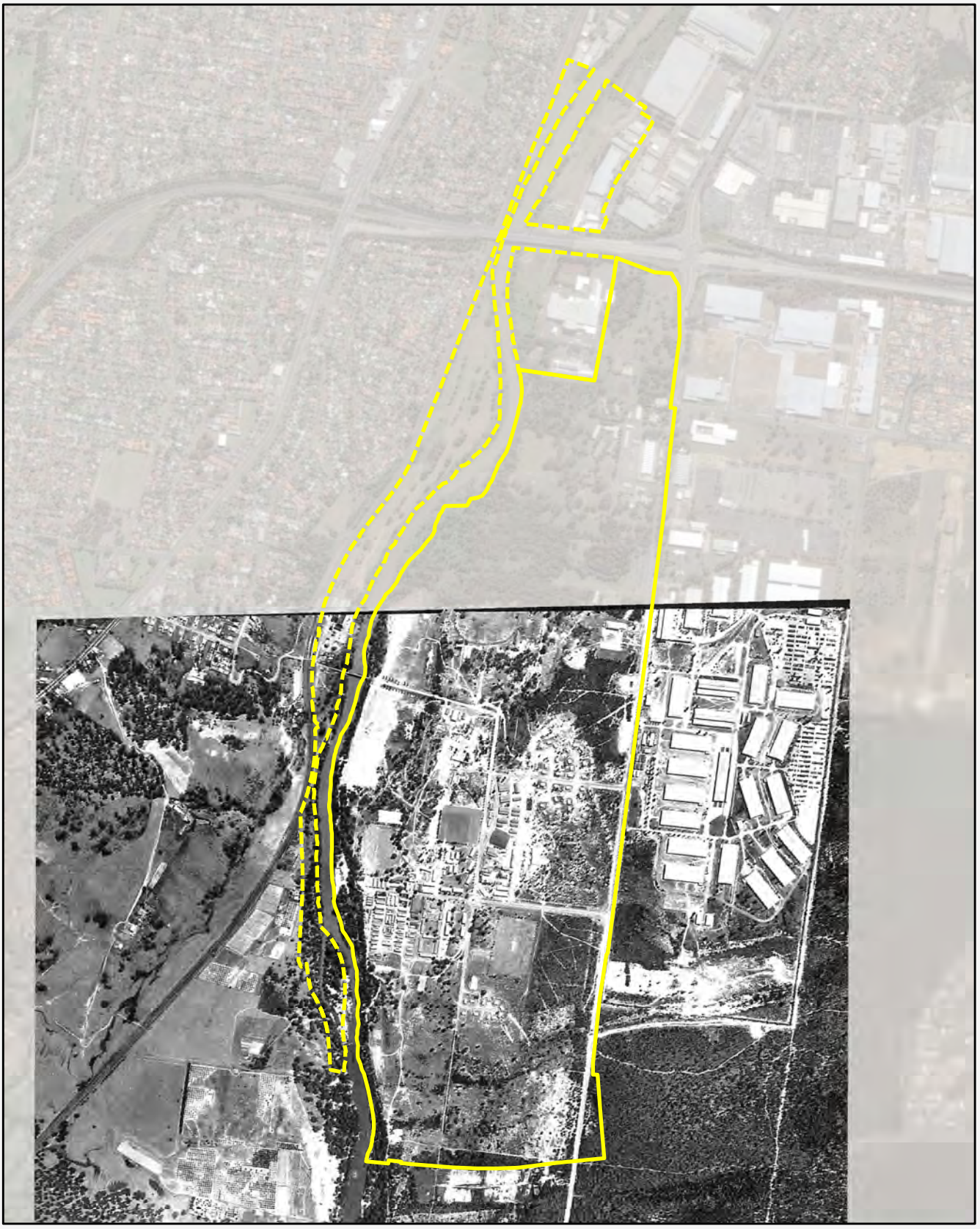
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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(1930)**



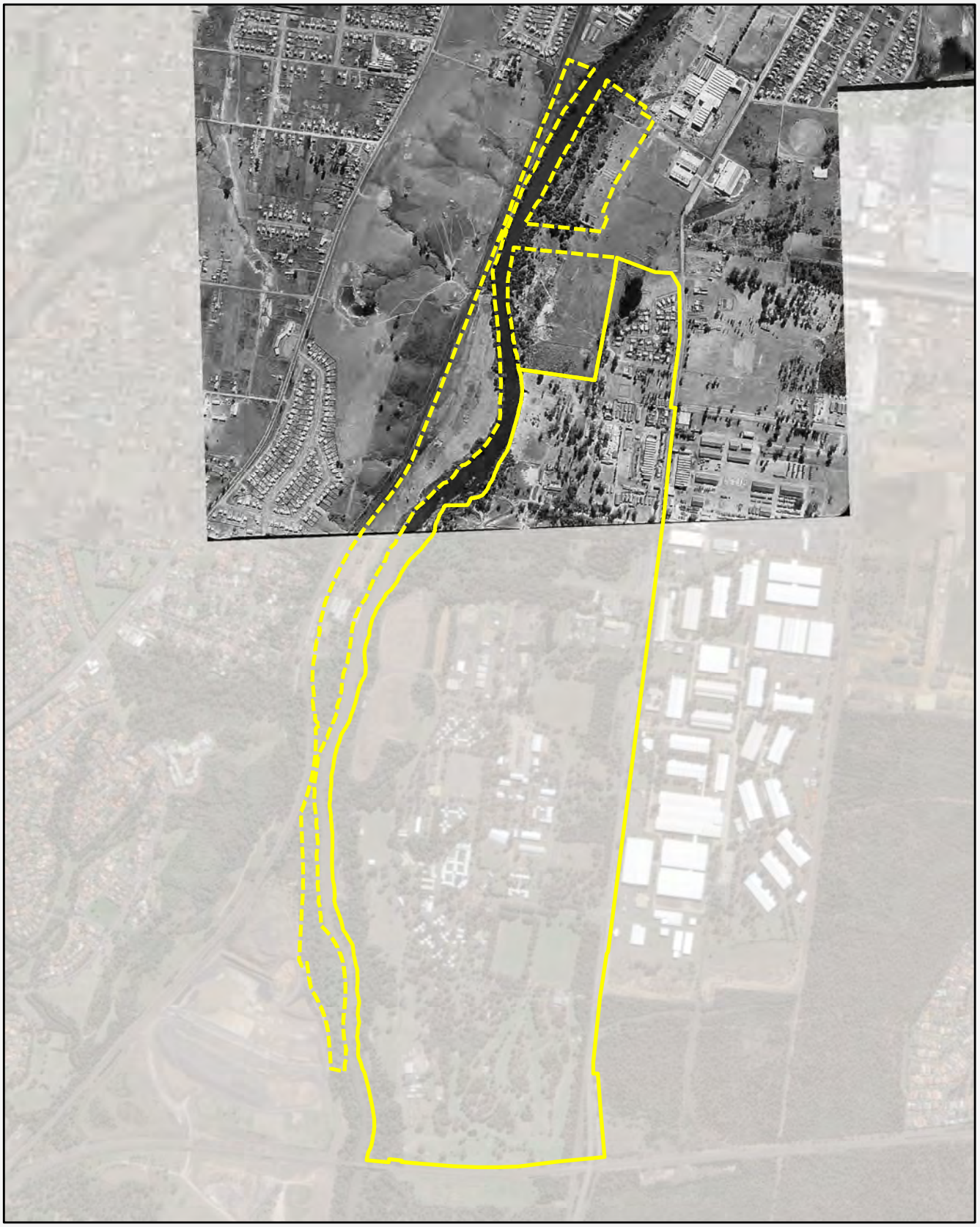
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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(1956)**



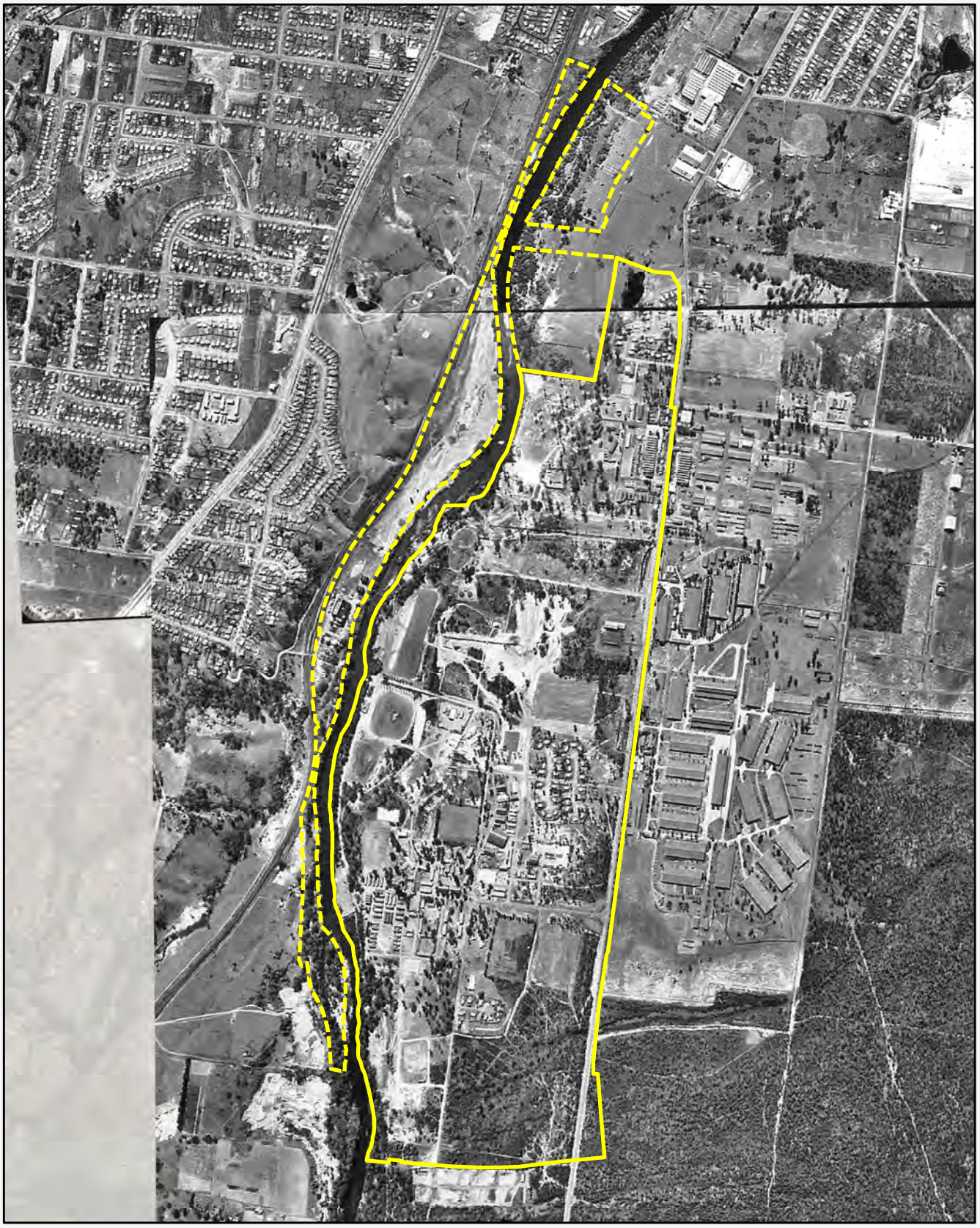
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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(1961)**



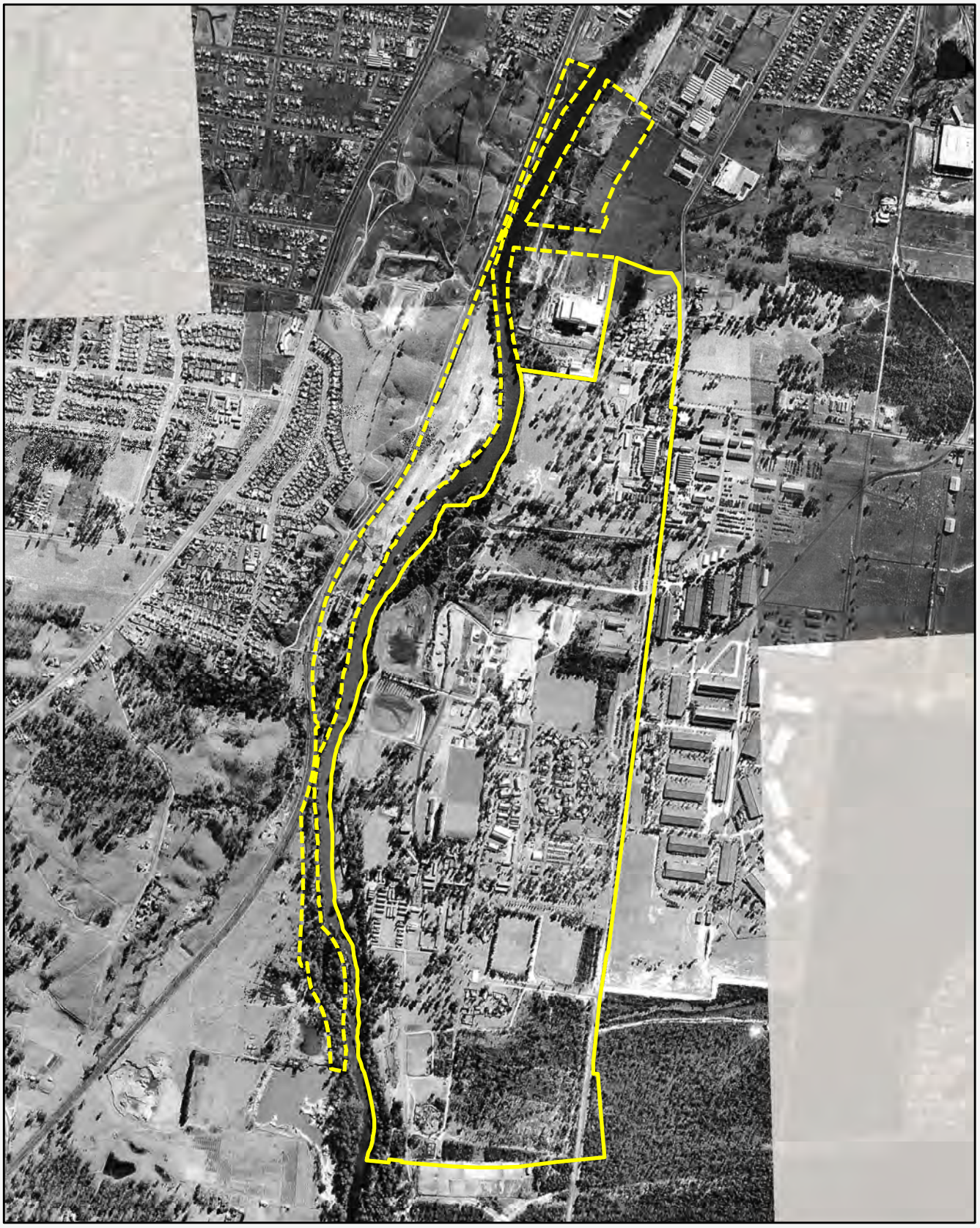
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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(1965)**



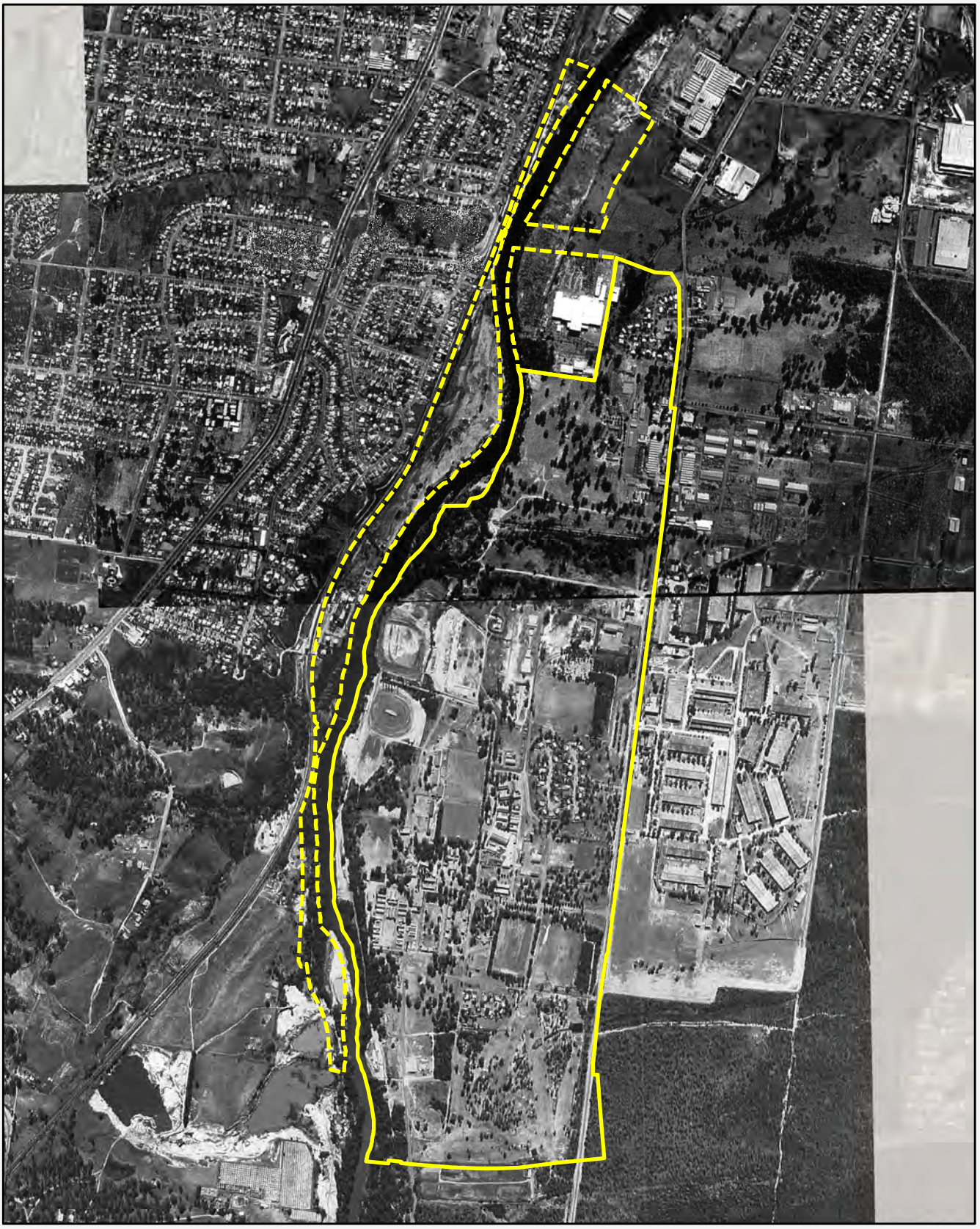
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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(1970)**



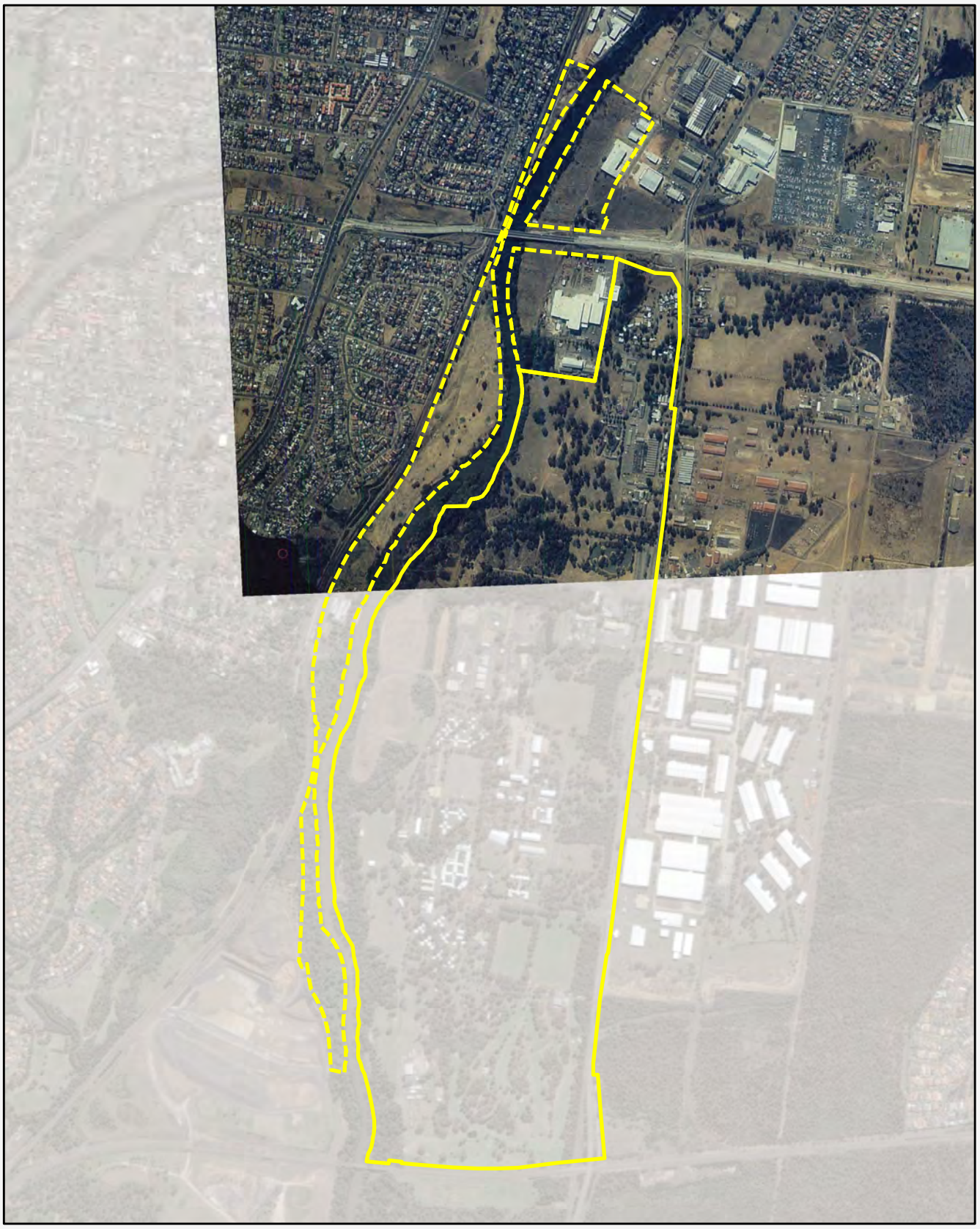
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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(1978)**



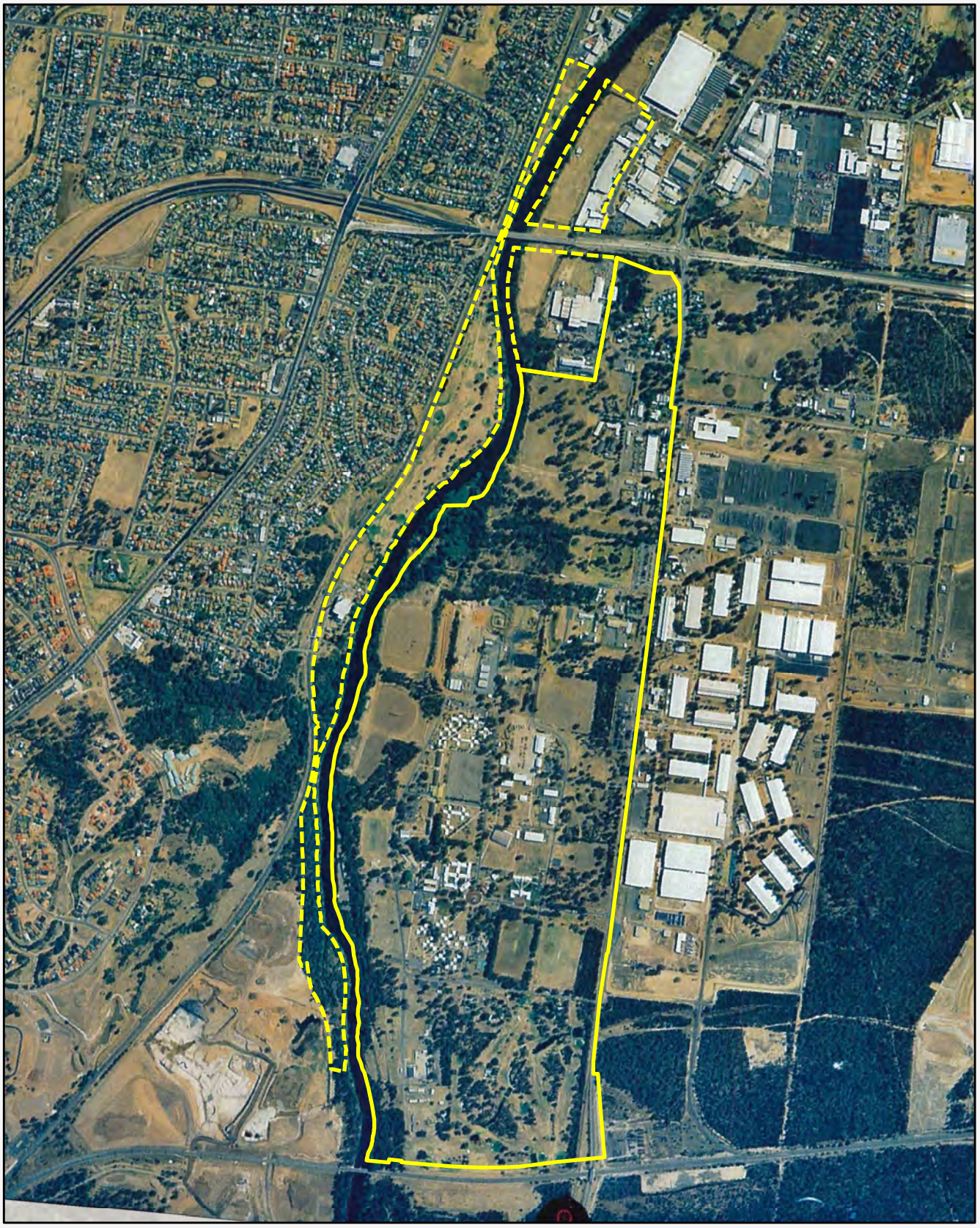
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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(1986)**



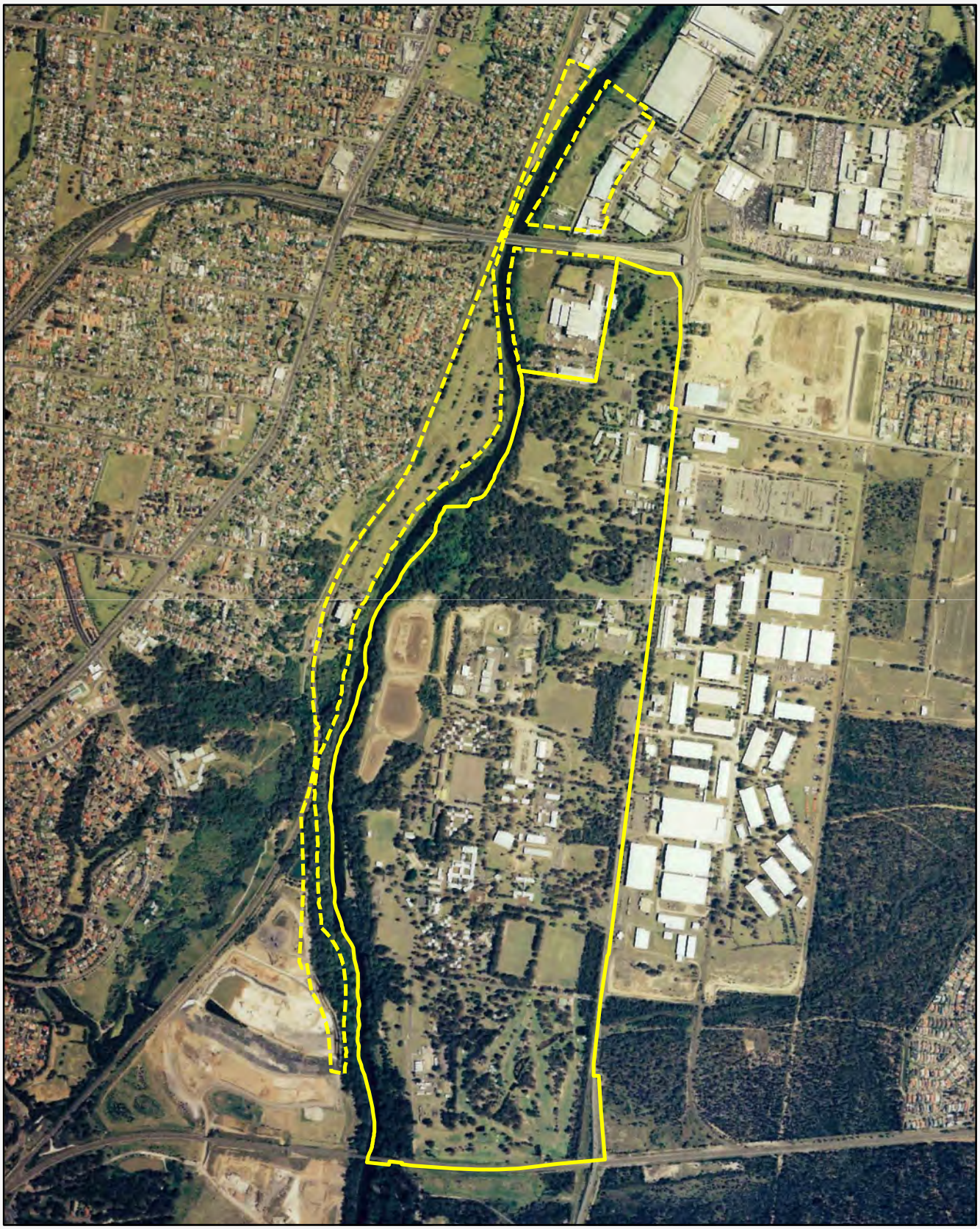
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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(1994)**



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Moorebank Intermodal Terminal boundary

Additional Phase 1 area

Historical aerial **(2005)**

Appendix I

Site photographs



Photograph 1: View south from Chatham Avenue.



Photograph 2: Soil mound on the edge of grassed area near Chatham Avenue.



Photograph 3: View east towards Moorebank golf course.



Photograph 4: Moorebank golf club house.



Photograph 5: Storage shed near golf course.



Photograph 6: Shipping container storage in the south of Steele Barracks.



Photograph 7: View south towards Moorebank golf course.



Photograph 8: Earth bunds around the former jacqinot court area.



Photograph 9: Steel training shed in former Jacquinot Court area.



Photograph 10: Steel training shed in former Jacquinot Court area.



Photograph 11: Former residential building in Jacquinot Court area which is known to containa asbestos. The structure is currently used for training excersises.



Photograph 12: empty drums and containers in the vivinity of the forer Jacqinot Court training area.



Photograph 13: Building in Jacquinot Court area which is known to containa asbestos. The structure is currently used for training excersises.



Photograph 14: Gravelled area used for training exercises in the south of Steele barracks



Photograph 15: Timber storage area in the south west of Steele Barracks.



Photograph 16: Combat Engineering (CE) store



Photograph 17: Explosives confidence training area (to the south of the study area)



Photograph 18: Training obstacles in the south west of the Steele Barracks



Photograph 19: Hummocky ground in the south west of Steele barracks (suspected waste stockpiles potentially containing asbestos)



Photograph 20: Hummocky ground in the south west of Steele barracks (suspected waste stockpiles potentially containing asbestos)



Photograph 21: Existing Monitoring well (Earthtech 2006).



Photograph 22: View west towards Georges River in the south west of Steele Barracks.



Photograph 23: Drainage structures in south west of Steele Barracks



Photograph 24: : View west towards Georges River from lower river terrace in the central area of Steele Barracks.



Photograph 25: Water pumping station adjacent to the Georges River.



Photograph 26: View of George's river looking northwards on the lower terrace in the central area of Steele Barracks.



Photograph 27: Dust bowl area used for training on earth moving plant and machinery.



Photograph 28: Plant storage in dust bowl area adjacent to Georges River.



Photograph 29: Stockpiles in the north of the dust bowl area.



Photograph 30: empty tank in the north of the dust bowl area.



Photograph 31: Bunded explosives magazine.



Photograph 32: Bunded explosives magazine.



Photograph 33: Bridging yard**.**



Photograph 34: Drum storage in Bridging yard.



Photograph 35: Fuel storage in Bridging yard area.



Photograph 36: Drum storage in Bridging yard area.



Photograph 37: Bridging training area.



Photograph 38: Storage near bridging yard.



Photograph 39: Plants, roads and airfields (PRA) Yard.



Photograph 40: Diesel bowser in PRA Yard.



Photograph 41: PRA workshop.



Photograph 42: Drum storage in PRA yard.



Photograph 43: PRA workshop.



Photograph 44: View of wash bay area and plant storage area in PRA yard.



Photograph 45: Oil/water interceptor pits in PRA yard.



Photograph 46: Oil/water separator pit, PRA Yard.



Photograph 47: Lake Sisinyak adjacent to dog training compound.



Photograph 48: Playing field in the northern area of Steele Barracks.



Photograph 49: Military museum.



Photograph 50: Military museum.



Photograph 51: View of dustbowl from central area of Steele Barracks looking west.



Photograph 52: Central area of Moorebank Barracks.



Photograph 53: Residential dwellings in Moorebank Barracks area.



Photograph 54: Concrete lined drain transecting the site from east to wast located in the Moorebank Barracks area.



Photograph 55: Former Pickles Auction yard, currently used for vehicle parking and as a maintenance workshop.



Photograph 56: Rear of former Pickles Auction yard.



Photograph 57: Officers mess building know to contain asbestos located in Moorebank Barracks area.



Photograph 58: residential dwellings in Moorebank Barracks area.



Photograph 59: View north towards ABB Transmissions facility in the north western corner of Moorebank Barracks.



Photograph 60: Existing monitoring well in north western corner of Moorebank Barracks.



Appendix J

Contaminants of concern risk matrix



DRAFT: Preliminary Risk Matrix for Land Use Characterisation and Areas of Potential Environmental Concern – Moorebank Intermodal Terminal						
Number	**Area Description**	**Location Description**	**Details**	**Potential Contaminants of Concern based on Preliminary review of information**	**Contaminants of Concern Previously Identified in the area**	**Risk Rating**
1	**ABB Power Transmissions boundary area**	Grassland area with mature trees in the north west corner of Moorebank Barracks on the eastern bank on the Georges River and south of the ABB Power Transmissions Pty Ltd building.	Eight notices have been identified for the ABB facility via contaminated land public registers that state that the ABB premises are contaminated by chemical wastes including PCBs.	TCE, DCE, PCBs, Hydrocarbons	TCE/CIS1, 2, DCE and elevated metals have been detected in groundwater wells in the north west corner of the Moorebank site during previous investigations. Earth Tech (2006) recommended that the further investigations will be required to identify the source of the TCE plume to inform remediation and responsibility.	High
2	**Vehicle storage/ maintenance area (**former Pickles auction house)	Asphalt paved area and warehouse buildings in the north east corner of Moorebank Barracks immediately west of Moorebank Avenue.	Potential contamination of soil/groundwater associated with vehicle and plant maintenance/storage. A vehicle wash bay and associated drainage pit exists in the area. Anecdotal evidence suggested that a UST may have been present in this area historically.	TPH, BTEX, VOC, PAHs	TPH C_{10}-C_{36} identified in unsealed area along southern boundary to 1.0mbgl. Extensive hydrocarbon staining of the hard stand was observed during the Earth Tech 2006 investigation and that a spill of approximately 300L of hydraulic oil and diesel is known to have occurred at the Pickles Auction House previously.	High
3	**Drainage line outflow**	A large concrete lined drain extends from the DNSDC site to the east and transects the site from west to east across the Moorebank Barracks to a large concrete gross pollutant trap (GPT) which discharges to an outlet on the Georges River terrace. The western half of the drain is surrounded by dense woodland.	Potential area of buried demolition wastes containing asbestos in the vicinity of the drainage line outlet. Possible PCB and DCE contamination from upgradient drainage pathways	Asbestos, TPH, Metals, PCBs, TCE, DCE	An estimated volume of 1,100 m^3 of fill material comprising building rubble, plastics, metal, glass and asbestos has been identified in previous investigations near the drainage outlet in the area of the George River eastern terrace. Laboratory analyses of samples reported positive results for TPH, zinc and asbestos in soil samples collected from the waste fill. (This area was not accessible during 2006 Earth Tech investigation so no further delineation of the fill extent has been undertaken)	Medium
4	**Former sewage treatment plant (STP)**	Currently bushland area in the north west corner of the Steele Barracks, north of the dust bowl. It is understood that the STP was demolished in the 1980s.	Stockpiles of demolition rubble overgrown by grass associated with the demolished STP with two depressions suspected of being sewage sludge disposal pits are present and are now contain water. It is likely that ACM would be present within the rubble.	Asbestos and metals, elevated nutrients, pathogens (E-coli and faecal coliforms)	A 3 inch diameter buried asbestos cement pipe associated with the former STP was identified in this area. Nickel, zinc and mercury previously detected in soil and sediment samples but not in groundwater samples. TPH was also reported in sediment samples. Elevated coliforms and nutrients were also reported in soils.	Medium
5	**Bomb disposal training area**	Grassed area with some stores in the north eastern corner of Steele Barracks	Bomb shells are buried in this area for the purpose of training soldiers in the detection, location and removal of UXO. Although ordnance removal occurs after training exercises this process has not been fully documented historically so it may be that unrecorded shells (not with detonators of explosives) or other explosive ordnance waste (EOW) may be present in this area.	Waste fill, metals and UXO	UXO targets previously identified by subsurface imaging were excavated and found to be harmless metal fragments. Various heavy metals were detected in soil samples analyzed but compounds associated with explosives were not detected. Various elevated heavy metals were also detected in groundwater. The maximum extent of test pits was 2mBGl and this did not extend to natural ground so deeper fill may be present in this area. It was recommended that a comprehensive program of UXO clearance be undertaken in this area.	Medium
6	**Dog agility training area**	Grassed area with kennels and storage buildings in the north eastern corner of Steele Barracks	This is in the vicinity of the former lake Sisinyak which has been partially filled. Auger holes and disposal pits in this area have historically been used for the disposal of medical supplies. Buried fill, waste metal and ACM may be present in fill. Anecdotal evidence suggested that an asbestos waste disposal pit may be present in this area.	Asbestos, metals and UXO	The Earth Tech 2006 investigation identified elevated zinc in soil and dissolved copper, nickel and zinc in groundwater. The depth of fill extended beyond the maximum extent of test pits.	Medium
7	**Bunded explosives magazine**	Central northern area of Steele Barracks	Bund wall may contain contaminated fill material	Asbestos, metals, UXO	No previous testing has been undertaken in this area	Medium
8	**Bridging yard**	Central portion of the northern part of Steele Barracks	A grit blasting and spray painting facility exists in this area as well as an historical disposal pit consisting of a 2m deep trench that is understood to have been filled with general waste during the 1970s. The area is currently used for the storage of plant/ bridge training equipment and training personnel in the construction of bridge structures	TPH, Metals, BTEX, PAH, VOC and asbestos	Fill has been identified in this area during previous investigations but the burial pits were not identified by subsurface imaging or intrusive investigations. Elevated TPH C_{10}-C_{36} concentrations were reported in soil samples taken in the unsealed area along southern boundary of the yard.	Medium
9	**Fuel / oil storage area** (within bridging yard)	Within the bridging yard area in the central northern area of Steele Barracks	Unbunded storage of fuels, lube oils and degreasers was observed during PB site walkover. One operational UST is present.	TPH, PAH, Pb and ACM	Elevated TPH C_{10}-C_{36} concentrations were reported in soil samples taken in the unsealed area along southern boundary of the bridging yard. Two underground waste oil storage pits were identified in this area in Earth Tech 2006 Report with a recommendation for removal and offsite disposal. It is not known whether these structures were removed.	High
10	**Museum storage yard**	Gravel and road base hardstand area in the north western area of Steele Barracks immediately west of the bridging yard.	Outside area used for the storage, repair and restoration of historical military vehicles and equipment with some contained storage of oils, lubricants and paints.	Metals, TPH, BTEX, PAH	The Earth Tech 2006 report identified elevated metals in Soil and elevated metals in groundwater.	Low
11	**Bomb demonstration, dust bowl and former fire training areas**	Reworked bare ground located in the western area of Steele Barracks on the eastern bank of the Georges River	Historical fill potentially present in this area. Current operations involve earth moving training using heavy plant and machinery.	TPH, PAH and Metals	None except zinc in groundwater	Medium
12	**Maintenance workshop and vehicle wash bay** (within PRA yard)	Area of hardstand in the central area of Steele Barracks within the PRA Yard	Four wash bays exist in this area with a sediment trap and oil/water separator.	TPH, anionic surfactants and metals	TPH contamination previously identified in soils at 1.0 and 2.1 mBGL around the maintenance workshop.	Medium
13	**Plants, roads & air fields yard (PRA)** (including diesel UST & bowser)	Area of hardstand in the central part of Steele Barracks	This area is used for the maintenance and refueling of all plant and equipment used at the Steele Barracks. There is a single bowser with one 22kL diesel UST, three other USTs and one operational AST.	TPH, BTEX, PAH and metals	Staining of hardstand has previously been identified in this area. In addition to the known diesel UST, Earth Tech (2006) identified three underground waste oil storage pits and recommended these be removed. It is not known whether these structures were removed. TPH contamination previously identified in soils at 1.0 and 2.1 mBGL around the workshop.	High

Preliminary

DRAFT: Preliminary Risk Matrix for Land Use Characterisation and Areas of Potential Environmental Concern– Moorebank Intermodal Terminal						
Number	**Area Description**	**Location Description**	**Details**	**Potential Contaminants of Concern based on Preliminary review of information**	**Contaminants of Concern Previously Identified in the area**	**Risk Rating**
14	**Former Chatham Village**	Central eastern area of Steele Barracks	An historical asbestos dump is believed to be present in the former footprint of Chatham Village which was demolished in the early 1990s.	Asbestos and metals	Minor arsenic contamination identified in soils sampled from buried demolition rubble. No asbestos fill was visually identified and anecdotal evidence that the waste fill had been removed from site although no reports of information pertaining to remediation/removal are available. Further intrusive investigation in this area may be warranted.	Medium
15	**Field engineering store**	Gravel hard stand and grassed area in the western edge of Steele Barracks at the end of Chatham Avenue and 100m from the Georges River	Hardstand area used for the storage of metal sheeting, containers and structural metal objects.	Metals	Previous investigation (2006) identified minor concentrations of metals in soil and slightly elevated dissolved zinc in groundwater.	Low
16	**Former NBC store / bunker / HQ**	Fenced enclosure at the western edge of Steele Barracks at the end of Chatham Avenue and 100m from the Georges River	Various chemical have been stored in this are previously. Based on previous information, radioactive materials have not been stored here since 1990 and in a surface radiological survey undertaken in 2006 no radioactive sources or contaminants were found.	Solvents, formaldehyde, delousing agents DS2 and CS gas	Formaldehyde has previously been detected in groundwater (2006),	Low
17	**Practice mine field & bomb disposal area**	Sparse woodland area south of the western portion of the Steele barracks at the southern end of Jacquinot Road	This area is used as a practice mine area where plastic mines that release smoke or dye are triggered. Anecdotal evidence suggests bomb shells may also be present in this area.	Metals and UXO	Based on the results of previous investigations, no adverse contamination impacts were identified in this area although UXO was identified (2006). The extent of the investigation was limited to 4 test pits in this area so further intrusive works was recommended in relation to potential presence of UXO.	Medium
18	**Former Jacquinot court** (now training area)	Centre of Steele Barracks north west of the golf course.	Formerly the married quarters of the SME, the area is currently used for training exercises. There are two old buildings where asbestos has previously been identified within the building fabric. No active explosives are used in this area	Asbestos and metals	Metals have previously been detected in soils. No asbestos was detected in any of the samples analysed although demolition rubble from previous buildings may be present in this area. Groundwater was not assessed in this area.	Medium
19	**Golf course**	South eastern portion of Steele Barracks	No previous investigations undertaken in this area.	Metals, TPH, BTEX, VOC, PAHs.	None. Investigation may be required to provide good site coverage to adequately characterize sub surface materials and groundwater conditions in the central area of the site.	Low
20	**Former fire training area**	Grassed area in the south western corner of Steele Barracks and immediately east of the Georges River.	Area was historically used to establish fires fuelled by various hydrocarbon ignition sources in car bodies, pans or above ground storage tanks for firefighting training. Since cessation of this training, it is understood that the top 1m of soil has been removed and replaced with imported fill. The area is currently grassed with sparse trees.	TPH, PAH, metals and anionic surfactants	Elevated TPH C_{10}-C_{36} and metals have previously been detected in soils (2006) but not in groundwater.	High
21	**Small arms range**	Wooded area in the south western corner of Steele Barracks, immediately west of the former fire training area and east of the Georges River.	Area used for general training purposes including the firing of blank bullets.	TPH, BTEX, VOC, PAH, anionic surfactants and metals	Metal fill has previously been identified to 1.5 mBGL across the entire area (2006). A sub surface imaging survey identified empty blank bullet casings and other ferrous waste. Fill was encountered in all test pits. Elevated metals were detected in soils and groundwater (2006) and anionic surfactants were reported in groundwater.	High
22	**Combat engineering store**	South western area of Steele Barracks	Currently understood that water purification chemicals and equipment are stored here. Historically, two bunded storage sheds were used for the storage of oils and fuels with anecdotal information suggesting that a number of spills had occurred in this area in the past.	Metals, TPH, BTEX, VOC, PAH, VOCs and caustics	One waste oil UST was located north of building 141 UST. Previous investigations identified that other chemicals were stored in this area including decontamination agents, Portland cement, hydrated lime, chlorine, ammonium chloride, formaldehyde solution, hydrochloric acid, bleaching powder, surfactants, tripolyphosphate and aluminum sulfate powder. Elevated TPH C_{10}-C_{36} and metals have previously been reported in soils with dissolved copper and zinc detected in groundwater.	Medium
23	**Parade ground**	Concrete hardstand in the central area of Steele barracks	Deemed to be a low risk area based on current and historical land use.	-	Investigation may be required to provide good site coverage to adequately characterize sub surface materials and groundwater conditions	Low
24	**Military museum**	Building in the central area of Steele barracks	Deemed to be a low risk area based on current and historical land use.	-	Investigation may be required to provide good site coverage to adequately characterize sub surface materials and groundwater conditions	Low
25	**Administration & accommodation**	Central area of Steele barracks	Deemed to be a low risk area based on current and historical land use.	-	Investigation may be required to provide good site coverage to adequately characterize sub surface materials and groundwater conditions	Low
26	**Playing fields**	Central area of Steele barracks	Deemed to be a low risk area based on current and historical land use.	-	Investigation may be required to provide good site coverage to adequately characterize sub surface materials and groundwater conditions	Low
27	**Non operational UST**	North of the car park located north of the intersection of Birr Cross Road and Chatham Avenue.	No information regarding the size or the contents of the UST was forthcoming.	Metals, TPH, BTEX, VOC	The location of the UST was shown on a figure complied by HLA in June 2005. No sampling has been historically undertaken in this area.	High
28	**Pre-existing buildings, north east corner**	The north east corner of the site, west of ABB Transmissions	From historical aerial photographs, the area appears to be historically used as barracks. None of the infrastructure observed in the historical photograph is present today.	Asbestos and metals	No investigations have been previously undertaken in this area.	Medium
-	**Additional Phase 1 study area**	West Bank of Georges River	Defence land on the western bank of the Georges River includes the Casula Railway station and a strip of land east of the Glenfield waste services landfill. These areas would be considered high risk in terms of contamination potential. The remainder of the land has been characterised as low risk as no known potentially contaminating land uses have been identified in this area in the preliminary review.	Metals, TPH, BTEX, VOC,	This area will be assessed further in the Phase 1 investigation but is outside of the current scope of work for the Phase 2	Low to High

Preliminary