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#72

4th Field Survey Squadron

Operation MIZMAZE 95

Operation Report



**A field completion operation conducted in the
Ashton, Mount Elizabeth regions of
Western Australia and the
Darwin, Katherine regions of the
Northern Territory**

May - June 1995



Distribution List

LHQAUST
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DSVY-A
16 AD Regt
Army Svy Regt
144 Sig Sqn
1 Avn Regt
161 Recce Sqn
173 Survl Sqn
1 BASB
Darwin Log Bn
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EXECUTIVE SUMMARY

1. Operation MIZMAZE 95 was a field completion operation conducted by 4 Fd Svy Sqn in the Mitchell Plateau region of Western Australia, Mount Bunday Training Area, Darwin, Katherine, and Delamere regions of the Northern Territory during the period of 10 May to 15 Jun 95. Operations were based from 321 Air Base Wing (ABW) in Darwin, Northern Territory with a forward base established at Drysdale River Homestead, Western Australia. During the Operation aircraft were based at 321 ABW.
2. The aim of Op MIZMAZE 95 was to field complete 72 1:50 000 maps in the aforementioned regions and capture supplementary photography as required. Secondary tasking included capturing vital asset protection photography of selected sites and map integrity points for the map sheets surrounding Darwin.
3. The completion of the Operation in the time provided was difficult given the lack of preparation of map sheets requiring revision in the Darwin AO. The weather was an additional problem, with one of the most severe wets in recent times recorded this year. Late rainfalls caused a temporary halt to operations in the Drysdale River AO and restricted operations in the Darwin AO.
4. Operation MIZMAZE 95 saw the successful field completion of 72 1:50 000 topographic line maps.

OP MIZMAZE 95 (FIELD COMPLETION)
POST OPERATION REPORT

References:

- A. HQADF MPO 86-26470 Tasking Directive 1/93 Survey Operations FY 93/94 dated 21 Apr 1993
- B. DSVY-A Op MIZMAZE 95 - Technical Directive to OC 4 Fd Svy Sqn dated 05 Apr 95
- C. LHQAUST OPORD 21/95 Op MIZMAZE 95 dated 302200Z Apr 95
- D. LHQAUST Op MIZMAZE 95 (Field Completion) Mounting Instruction dated 1 May 95
- E. LHQAUST SIC JQK SVY 150/95 Op MIZMAZE 95 Additional Tasking DTG 020500Z MAY 95
- F. 1 Topo Svy Sqn Fax 1Topo 198/95, Req for Air and Ground Photog - RAAF Tindal Area dated 09 May 95
- G. LHQAUST Min SVY 165/95, Map Integrity Checks - Op MIZMAZE 95 dated 09 May 95
- H. HQ 1 DIV Min 10117/95, Lease of Cessna Titan 404 dated 11 Apr 95
- I. 4 Fd Svy Sqn Convoy Orders - Op MIZMAZE 95 dated 13 Apr 95

INTRODUCTION

1. Operation MIZMAZE 95 was a field completion operation conducted in the Mitchell Plateau region of Western Australia, Mount Bunday Training Area, Darwin, Katherine, and Delamere regions of the Northern Territory in response to References A, B, C and D.

MISSION

2. Priority Task. Priority task was to field check 72 x 1:50 000 maps in the following areas and capture supplementary photography as required:
 - a. SD 52 - 04 Darwin, 15 x 1:50 000 map sheets;
 - b. SD 53 - 09 Katherine, 4 x 1:50 000 map sheets;
 - c. SD 52 - 16 Delamere, 4 x 1:50 000 map sheets;
 - d. Mount Bunday Training Area, 1 x 1:50 000 special;
 - e. SD 5213 Ashton, 24 x 1:50 000; and

f. SE 521 Mount Elizabeth, 24 x 1:50 000.

3. Additional Tasks. Additional tasking included capturing Vital Asset Protection Photography (VAPP) within the AO, as per References E and F. Collection of Map Integrity Points (MIPs) was required for field verification of accuracy statements on the maps in the Darwin AO as per Reference G.

AREA OF OPERATIONS

4. A diagram showing the position of the AO is contained at Annex A.

CONDUCT OF OPERATIONS

General Outline

5. To achieve the mission the Operation was planned and conducted in three phases as follows:

- a. Phase One - Deployment to the AO.
- b. Phase Two - Commence field completion and other tasks.
- c. Phase Three - Extraction from the AO.

6. Field check packages were compiled by 4 Fd Svy Sqn prior to departure. The Army Svy Regt updated the map sheets of Darwin requiring revision utilising a heads up display technique. Details of the technical requirements are provided in Annexes B and C.

Sequence of Events

7. Op MIZMAZE 95 was conducted in accordance with the sequence of events contained in Annex D. Significant events are discussed in more detail in the following paragraphs.

8. Reconnaissance. A reconnaissance of the AO was conducted prior to deployment. MAJ P. Demaine and WO2 P. Hammer conducted the reconnaissance between 17-20 Oct 94. A reconnaissance report was not produced as information was provided to Operations Support Troop, 4 Fd Svy Sqn by informal briefing.

9. Issue of Orders and Instructions. Orders and instructions for the Operation were issued as per References A, B, C, E and H.

10. Phase One - Deployment to the AO. Phase One involved the following:

- a. Convoy. A daily routine was established for the convoy to the AO. The convoy was able to travel up to 730 kilometres per day. Time was saved in the preparation of meals and the cleaning of utensils by paying personnel meal element of Travel and Subsistence Allowance. An administrative vehicle was sent forward to finalise arrangements at the caravan parks utilised for overnight camp sites.

- b. Darwin. Main Base was established on 321 ABW with the assistance of Facilities Flight. Four demountable buildings were utilised as the Operations Centre and accommodation was supplied in the transit lines. Liaison visits were made to various local military, Government and civilian organisations to finalise any outstanding business and make personal introductions for later dealings. At this stage accounts were opened at a number of businesses. These initial visits proved to be invaluable in creating an atmosphere of cooperation between all concerned.
- c. Drysdale River. Forward Base was established at Drysdale River Homestead utilising a combination of tentage and rooms. Liaison visits were made to Kununurra businesses to finalise arrangements for procurement of fuel and rations.
- d. Katherine. The Katherine detachment established a base camp at 322 ABW utilising the transit accommodation available. The accommodation and messing provided was found to be of a very high standard.
- e. Fixed Wing Support. The Titan flew into 321 ABW with SGT Longbottom on 26 May 95.

11. Phase Two - Commence Field Completion and Other Tasks. Phase Two involved the following:

- a. Field Completion. Field Completion commenced on the 16 May 95 in the NT AO and the 17 May 95 in the WA AO. The field completion process was conducted as per the respective technical reports contained at Annexes B and C. Field completion reports for the respective AO's are contained at Annexes E and F. After completion of their area the Katherine detachment was redeployed to Delamere from whence it again redeployed to Darwin.
- b. Aerial Photography Capture. Vital Asset Photography was captured as much as was practicable during supplementary photography missions. A report on the air camera operations is contained at Annex G.
- c. Map Integrity Point Capture. As per Reference G, map integrity points for the map sheets surrounding Darwin were obtained using the Trimble Scout GPS. The points were captured predominantly while field check parties were conducting ground checks of their respective areas.

12. Phase Three - Extraction. Phase Three involved the following:

- a. WA AO. The Drysdale River detachment finalised operations prior to the planned completion date and departed via road convoy for Adelaide on 4 Jun 95 and arrived in Adelaide on 9 Jun 95. The FRT vehicle and one Landrover were driven to Darwin by the FRT personnel. This was made necessary by a Kiowa accident which resulted in two Drysdale River detachment personnel being flown home via civilian air, leaving the detachment short of drivers. The decision proved valuable as the vehicle mechanics assisted in the repair of vehicles before departure from Darwin.
- b. Fixed Wing Support. The Titan flew to Canberra with SGT Longbottom on 10 Jun 95, where it was handed back to Vee H. Aviation after having the

RC-10 camera removed. SGT Longbottom then proceeded to Adelaide via civilian air and arrived on 13 Jun 95.

- c. NT AO. The Darwin detachment, including personnel from Katherine, departed the AO on 11 Jun 95 and arrived in Adelaide on 15 Jun 95.

Issues of Concern

13. Field Completion. Issues raised are noted in Annexes E and F.
14. Aerial Photography. Issues raised are noted in Annex G.

OPERATIONAL RESULTS

Field Completion

15. All areas tasked to be field completed during Op MIZMAZE 95 were achieved. The field completion reports are located at Annexes E and F.
16. The hiring of a civilian helicopter was made necessary for the Forward Base due to the unseasonable weather closing the roads to most traffic. 161 Recce Sqn LOH were not available at this stage for at least another nine days which would have stagnated the WA operations and caused a problem with the available air assets later in the Operation. The decision to hire the helicopter was based upon safety and operational requirements which proved to be justified at the completion of the Operation with LOH being utilised up to the final hour in Darwin in order to complete the tasking.

Aerial Photography

17. All the supplementary photography and the majority of VAPP required for the Operation was successfully captured. Details are contained in the Aerial Photography report located at Annex G.

ADMINISTRATION AND LOGISTICS

Operation Manning

18. A list of personnel who participated in the Operation is located at Annex H.

Support

19. Support provided during the Operation included:
 - a. Army. The Army provided the following support:
 - (1) AAAvn. AAAvn provided:
 - (a) three LOH and accompanying ground support crew from 161 Recce Sqn from 24 May 95 to 10 Jun 95 for a combined total of 180 task hours in the AO, and

- (b) one civilian aircraft (Titan) from 173 Survl Sqn, fitted with an RC-10 aerial camera provided by 4 Fd Svy Sqn from 24 May 95 to 10 Jun 95 for a total of 64.8 task hours in the AO.
 - (2) Army Svy Regt. The Army Svy Regt provided six Cartographic Technicians (Field Completion personnel) for the period 30 Apr 95 to 20 Jun 95.
 - (3) 16 AD Regt. 16 AD Regt provided:
 - (a) one Truck Cargo MC3 Unimog for the duration, and
 - (b) two FFR 110 Landrovers (equipped with Raven radios) for the duration.
 - (4) Darwin Log Bn. Darwin Log Bn provided:
 - (a) supply support and advice on supply issues for the duration; and
 - (b) pre-positioned aviation fuel in AO.
 - (5) 1 BASB. 1 BASB assisted in the acquisition of supplies within the AO, and provided advice on supply issues.
 - (6) Adelaide Log Coy. Adelaide Log Coy provided:
 - (a) one 150 cubic foot skid mounted refrigerator, and
 - (b) two FFR 110 Landrovers.
 - (7) 107 Fd Wksp. 107 Fd Wksp supplied one Forward Recovery Team - Mechanical (FRT). The Team consisted of two GRes vehicle mechanics and Landrover six-wheel variant.
 - (8) School of Mil Svy. The School of Mil Svy provided:
 - (a) seven VHF Raven radios, and
 - (b) one video camera.
 - (9) 144 Sig Sqn. 144 Sig Sqn provided one Signal Operator - Radio for the period 03 May 95 to 20 Jun 95.
 - (10) 1 CLU. 1 CLU provided:
 - (a) land clearance provision, and
 - (b) informing general population of forthcoming Operation.
- b. RAAF. The RAAF provided the following support:
- (1) 321 ABW. 321 ABW provided:
 - (a) accommodation and messing for Main Base personnel,

- (b) operations centre facilities, and
 - (c) access to photographic facility.
- (2) 322 ABW. 322 ABW provided:
- (a) accommodation and messing for Katherine detachment,
 - (b) rooms for office completion of maps, and
 - (c) impromptu mechanical repairs to Katherine detachment Landrovers.
- (3) 6 Sqn. 6 Sqn provided a versamat operator for the period 24 May 95 to 08 Jun 95.
- (4) Delamere Air Weapons Range. Delamere Air Weapons Range supplied facilities for the Delamere detachment.
- (5) Central Photographic Establishment (CPE). CPE provided photo-processing of film from the RC-10 Aerial Camera and production of prints.
- c. Government Agencies. Government Agencies provided the following support:
- (1) Department of Lands and Housing (DOLAH). DOLAH provided:
- (a) infra-red photography,
 - (b) 1:50 000 colour photography,
 - (c) 1:25 000 topographical map plan prints, and
 - (d) miscellaneous source data.
- (2) Conservation Commission of NT. The Conservation Commission of NT supplied gazetted Park boundaries.
- (3) NT Power and Water Authority. NT Power and Water Authority supplied tank heights and powerline positions.
- (4) NT Gas. NT Gas supplied gas pipeline positions.
- (5) Dripstone High School. Dripstone High School provided access to a dark room for the development of aerial photography prints.
- d. Civilian. Civilian organisations provided the following support:
- (1) As per Reference I, the Titan aircraft supplied by AAAn was obtained through a contract with Vee H Aviation instituted by HQ 1 Div. The Titan was utilised due to the grounding of Army Nomad aircraft.

- (2) Heliwork WA Pty Ltd supplied a helicopter through a hire agreement to perform aerial checks at Drysdale River.

Aircraft

20. A Titan aircraft was hired from Canberra based company Vee H Aviation to be utilised for the acquisition of aerial photography. The RC-10 aerial camera was fitted in Canberra due to the proximity of qualified mechanical personnel.
21. The Titan was based from 321 ABW and proved to be a highly effective craft for its purpose. Further technical details are provided in Annex G.
22. B Tp, 161 Recce Sqn provided support for aerial checking. The Troop was based from 161 Recce Sqn's facilities on 321 ABW. While this provided greater access to support for the aircraft it had a tendency to restrict the flexibility of operations in comparison with previous operations. An accurate forecast of timings for completion of map sheets was not possible, particularly in built up areas and areas affected by rain. This did not permit the provision of accurate tasking schedules which caused concern due to 161 Recce Sqn wishing to utilise the aircraft on secondary tasking where possible.
23. On 30 May 95, Kiowa 021 crashed SSE of Gibb River while conducting air checks of the Drysdale River AO. The pilot (LT P. Tolchard) and field checking party (SGT D. Willis and CPL R. Crawford) were recovered by Kiowa and flown to Gibb River landing ground. A RAAF Caribou evacuated the personnel to 321 ABW where they were examined by a doctor at the base hospital. The doctor was satisfied that the personnel had not suffered any serious injuries. LT Tolchard continued flying duties, while the field check party were returned to their respective units via civilian air. 161 Recce Sqn replaced the aircraft at short notice and this enabled operations to proceed with less disruption than was expected from such an incident.
24. The Titan was utilised to provide transport for the accident investigation team within the AO. This caused a minor disruption to the aerial photography planning.
25. The civilian helicopter hired for the Forward Base proved a successful venture however this process should only be repeated where absolutely necessary due to the cost involved.

Vehicles

26. Vehicles utilised during the Operation included 12 Landrover 110's (nine survey variants and three FFR GS variants), one Landrover six-wheeled variant (FRT), two Truck Cargo MC3 Unimogs, a Ford station-wagon and Mitsubishi van.
27. Whilst in Darwin an additional commercial vehicle was hired through DAS to provide an administration vehicle. The hiring fees were paid through the Army's established monthly billing system. The vehicle proved to be an invaluable addition to the main base.
28. It was found that the tyres of the Landrovers supplied by Adelaide Log Coy were prone to flats. It appeared that the tyres had largely perished due to infrequent use and exposure to sun.
29. The canopies of all soft top Landrovers were in poor condition. One was replaced during the Operation.

30. The air-conditioners fitted to the survey variant Landrovers caused the securing bolts to sheer due to vibration. The bolts passed through the water jacket and sheering resulted in a loss of coolant which was found to be quite severe in some cases. This problem caused a Landrover in the Darwin detachment to seize an engine. The effect of the inoperability of this Landrover, prior to the engine being replaced, was minimal as an additional Landrover had been allocated to the Darwin detachment. 4 Fd Svy Sqn is rectifying the problem with the air-conditioners.

// Is it Toyota?
Have they been fixed
prior to landing
to 1 Topo

31. The Katherine detachment experienced severe mechanical problems with one of the Landrovers. The Landrover broke the steering pin and had seals placed incorrectly on the rear axle. The vehicle was repaired by 322 ABW mechanics.

32. The Unit's Mitsubishi van received a 40 000 km servicing prior to departing Darwin.

POL

33. AVTUR (Jet- A1). Arrangements were made for the following distribution of AVTUR prior to commencement of the Operation:

- a. Bulk. A total of 23 200 litres of bulk fuel consisting of:
 - (1) RAAF Base Darwin - 9 750 litres;
 - (2) RAAF Base Tindal - 3 200 litres; and
 - (3) Kununurra Airport - 4 000 litres.
- b. 200 litre Drums. Total of 17 200 litres (86 drums) pre-positioned by Darwin Log Bn consisting of:
 - (1) Drysdale River Homestead - 30 drums (6 000 litres);
 - (2) Gibb River Landing Ground - 21 drums (4 200 litres);
 - (3) Ellenbrae Landing Ground - 21 drums (4 200 litres);
 - (4) Delamere Landing Ground - 7 drums (1 400 litres); and
 - (5) Mt Bunday Landing Ground - 7 drums (1 400 litres).

34. Purchases of AVTUR at civilian airports were made utilising SP21.

35. AVGas. Arrangements were made for the following distribution of bulk AVGas prior to commencement of the Operation:

- a. Darwin - 6 750 litres;
- b. Kununurra - 1 500 litres; and
- c. RAAF Tindal - 750 litres.

36. Purchases of AVGas at civilian airports were made utilising SP21.

37. Diesel /ULP. Fuel cards and SP21 were used to purchase diesel and unleaded petrol for the duration of the Operation. Diesel usage for the Operation was less than expected due to the inclement weather restricting ground checking in the WA AO. Total usage was as follows:

- a. Diesel - 6 909L; and
- b. ULP - 2 213L.

38. LPG. There was no requirement to purchase additional LPG during the Operation.

Stores and Equipment

39. Sufficient stores and equipment were taken to the AO.

40. The unforeseen closing of the photo-processing facilities at 321 ABW necessitated the acquiring of the ability to process aerial film and make prints. To achieve this the Metoform 5040 processor was shipped via civilian contractor from Adelaide to 321 ABW. Additional chemicals were purchased through 4 Fd Svy Sqn and shipped from Adelaide via civilian contractor.

41. Stores requirements which could not be met by 4 Fd Svy Sqn resources were resolved by either Darwin Log Bn or 1 BASB whilst in the AO. Their assistance and professionalism was invaluable.

42. Two of the Trimble Scout Global Positioning Systems (GPS) utilised on the Operation experienced problems with locking onto satellites. There were sufficient GPS available to replace them in the field. They have since been returned to the supplier and replaced on a one for one basis.

Accommodation

43. Accommodation for night halts during insertion and extraction was provided at camp sites in caravan parks. This method saves significant funds and provides good quality amenities for personnel during transit.

44. Darwin. The Darwin detachment was housed at 321 ABW in ATCO style rooms in the transit lines. The accommodation provided was of a good standard. It was found that the clothes washing facilities provided for the transit lines were insufficient for the number of personnel resident during the Operation.

45. Drysdale River. The Drysdale River detachment was accommodated in tents and administration areas were provided in the rented buildings. The facilities were of a good standard and the Homestead owners proved to be most hospitable.

46. Katherine. The Katherine detachment was housed in 'Teal Camp' transit lines. Similar ATCO style rooms were made available as were found at 321 ABW. The facilities provided were of a good standard.

47. Delamere. The Delamere detachment were in receipt of accommodation element of Travel and Subsistence Allowance during the detachment.

48. Mt Bunday Training Area. The field party tasked to field complete the Mt Bunday Training Area were in receipt of accommodation element of Travel and Subsistence Allowance during the detachment.

49. Civilian accommodation, with the exception of Drysdale River Homestead, was paid for through cash advance or Australian Government Credit Card (AGCC). The accommodation at the Homestead was paid for by Adelaide Log Coy through the site rental vote.

Messing

50. Prior to deployment Survey Party Ration Allowance was sought for personnel deploying to Drysdale River (consisting of a variety of separate allowances). Log Comd provided the funds at a rate of \$15.00 per man per day.

51. The cost of rations for personnel deploying to military bases was met by Log Comd.

52. All personnel were payed meal allowance for the insertion and extraction phases. Meals were obtained at roadhouses and caravan parks and found to be of a generally high standard. This method provided personnel with more time to rest during breaks as there was no administrative overhead with preparation or cleaning.

53. Darwin / Katherine. The Darwin and Katherine detachments were catered for in their respective messes. Field parties were given in flight meals for lunches and supplied with rations from the respective Unit ration stores on request. The food provided was both voluminous and of a high standard.

54. Drysdale River. The Drysdale River detachment utilised fresh rations purchased in Kununurra and prepared by the Unit cook. The variety and standard of meals was very high.

55. Delamere Air Weapons Range. The Delamere detachment was in receipt of meal allowance for the duration of their detachment to that area.

56. Mt Bunday Training Area. The field party tasked with field completing the Mt Bunday Training Area were in receipt of meal allowance during the task.

Medical

57. Base hospitals were located at 321 ABW and 322 ABW.

58. All vehicles contained First-Aid Kits which were issued prior to departing Adelaide.

59. CPL I. Baldwin was bitten by some form of insect or spider during the extraction phase. He was taken to the Tennant Creek Base Hospital casualty ward for treatment. He was provided with prescription drugs and ordered to report to the Keswick Barracks Medical Centre upon return to the Unit.

Morale and Discipline

60. The overall morale of the detachments was good. The Darwin detachment experienced problems due to the lack, or poor quality, of updated information placed upon

field check masters for the Darwin area maps (1979 era) by the Army Svy Regt. This situation arose from the Army Svy Regt's source acquisition cell not obtaining the most current source data available (including infra-red and colour photography) for the Darwin area. As a consequence source data had to be obtained and additional information annotated to the maps in the field. Since data was being added to field check masters in an ad-hoc fashion as source data became available from external agencies, maps could not be checked in a specific order or even by the same parties in some cases. The frustration of the personnel was readily evident.

61. There were no events which warranted disciplinary action during the Operation.

Finance

62. Funds were expended against the following codes:

- a. Cost Centre Code - 352270.
- b. Account Codes - 24366, 28152, 25669, 61875, 62143.
- c. Pseudo Requisition Numbers were allocated as required.

63. AGCC. A total of six AGCC's were taken on the Operation and evenly distributed throughout the detachments.

64. Order and Receipt for Supplies (Form SP21). SP21 forms were utilised for payment of bulk fuel purchases.

65. Cash Advance. Cash advances of \$1 000 were issued to LT P. Davies and WO2 P. Hammer prior to departure from Adelaide. A total of \$1529.65 was expended utilising the advances.

66. Fuel. Vehicle fuel was purchased as far as was practicable using Shell or Mobil fuel cards.

67. Hire of aircraft. The helicopter hired from Heliwork WA Pty Ltd cost a total of \$10 148 which was financed through the Unit's Direct Unit Financing allocation utilising cost code 61012.

68. The hire of the Titan aircraft was funded by HQ 1 Div at a cost of \$111 000.

69. Ration Allowance. A ration allowance of \$11 655 was provided by Log Comd to purchase fresh rations for the Drysdale River detachment. A total of \$4 943 was expended upon fresh rations by the detachment.

70. Due to the Operations proximity to the end of Training Year 94/95 it was important to minimise a carry over of liabilities. To achieve this, AGCC purchases were limited and accounts were established with local businesses in Darwin. The invoices were faxed to Adelaide where they could be paid by cheque. This method was found to be very effective and almost eliminated carry over expenditure into Training Year 95/96.

Allowances

71. Allowances for military personnel were provided as follows:
- a. District Allowance. District Allowance was paid at the following rates:
 - (1) Drysdale River/Katherine/Delamere \$82.42 per fortnight (INDMAN 1 Vol 1 Chap 3 Instr 0301); and
 - (2) Darwin \$36.51 per fortnight (INDMAN 1 Vol 1 Chap 3 Instr 0301).
 - b. Field Allowance. Field Allowance was paid at the rate of \$14.68 per day (INDMAN 1 Vol 1 Chap 2 Instr 0209).
 - c. Separation Allowance. Separation Allowance was paid at the rate of \$4.47 per day after the first 14 days and only to Cat M personnel who were not in receipt of Travelling Allowance (INDMAN 1 Vol 1 Chap 2 Instr 0202).
 - d. Incidentals. Incidentals were paid at the rate of \$10.95 per day (INDMAN 1 Vol 1 Chap 4 Instr 0401).
 - e. Flight Duties. Flight Duties were paid at the rate of \$8.20 per day (INDMAN 1 Vol 1 Chap 1 Instr 0107).
 - f. Travelling Allowance. Meal element of travelling Allowance was paid to personnel in transit to and from the AO's. Full travelling Allowance was paid to personnel whilst detached to Delamere and Mt Bunday. Personnel were paid at the rate applicable to the areas as at the 4 May 95 (INDMAN 1 Vol 1 Chap 4 Instr 0401).

Resupply

72. Resupply of the Forward Base at Drysdale River Homestead was achieved by purchasing rations at Kununurra and transporting them to the Homestead via Unimog truck. This arrangement proved satisfactory except in the initial phase of operations in Drysdale River. The late rainfalls experienced cut the road to Kununurra and left the forward base desperately short of supplies. Arrangements for an air-drop were investigated but were not required because the rain ceased. The potential problems with resupply caused by late rainfalls indicated that future operations should be commenced at a later date.

73. Field parties were resupplied upon return to their respective bases.

Leave

74. Remote Locality Leave. As per INDMAN 1, Vol 3, Chap 26, Instr 2601, operation personnel are entitled to remote locality leave accumulated at a rate of 10/12 of a day per month whilst in the AO.

75. Flying Leave. As per INDMAN 1, Vol 3, Instr 2601, flying leave is to be calculated retrospectively according to the hours flown by individual members.

76. Short Leave. Five days short leave was recommended for all operation personnel who were tasked on the Operation for the duration. Other personnel were recommended to receive short leave as applicable.

Mail

77. Mail was addressed care of either 321 ABW or Drysdale River Homestead. This system proved reliable with delivery times varying from three to 10 days. Mail for the Katherine/Delamere detachment was passed on by Darwin detachment personnel during liaison visits.

78. Delivery of stores via civilian contractor care of 321 ABW resulted in initial stores arriving and being sent to the Base warehouse. This resulted in minor delays to expected delivery times.

Land Clearances

79. Land clearances were obtained by 1 CLU, Darwin. Areas which could not be covered by individual clearances due to population size were exposed to a media campaign to inform residents of the forthcoming operation.

80. Land clearance indemnity forms are now being returned to 1 CLU where they will be processed.

81. After the Operation, 'Brolga Air' (tourist company) registered a complaint that members of the Katherine detachment had utilised their thoroughfares without their permission. This situation resulted from a misunderstanding. The detachment commander had interviewed the leader of the local Aboriginal Association and was informed that they controlled the land upon which the Brolga Air establishment had been constructed. The Aboriginal leader had meant that the Association was in control of culturally significant features within the area and not that they owned the property in question.

82. A letter of apology explaining the misunderstanding has been sent to the Managing Director of Brolga Air.

Visits

83. The following visits were conducted during the Operation:

- a. LHQAUST - LTCOL L.A. Newton and CAPT S. Buckpitt;
- b. DSVY-A - LTCOL P.A. Jensen; and
- c. Army Svy Regt - CAPT T. Harder, LT R. Grose, LT D. Sapparth and LT J. Selman.

Contact Information

84. A list of contacts made within the AO which could be of future use is located at Annex I.

COMMAND AND SIGNAL

Command

85. Command arrangements as per Reference C were adhered to.

Communications

86. Telephone/Facsimile. Telephone and facsimile facilities were available at all bases. Telecards were utilised throughout the AO's to pay for calls on civilian lines.

87. Field Check Parties. HF Raven Radio was utilised for communications between bases and field-check parties. Radio communication was maintained between Drysdale River Homestead and 321 ABW, with base stations established at both sites.

88. Some problems were encountered with radio communications over short distances in Darwin. This problem was alleviated by field check parties erecting di-pole antennas.

89. A number of field check parties in Darwin preferred to report to main base via telephone rather than waste time erecting antennas. The close proximity of public telephone facilities made this technique a very effective and expedient method for delivering SITREP's.

SITREP's

90. Daily SITREP's were provided by field check parties to their respective main bases. Weekly SITREP's were transmitted via facsimile to LHQAUST, DSVY-A, Army Svy Regt and 4 Fd Svy Sqn.

CONCLUSIONS

91. General. Op MIZMAZE 95 was a successful field checking operation in that all areas tasked with field checking were completed. The Operation will enable all areas completed to be produced as 1:50 000 line maps.

92. The poor weather conditions, with an abnormally long and intense wet season, disrupted the Operation but did not compromise the quality of the final product. While the weather was unusual for the time of year it would be preferable for future operations of this sort to be commenced at a later stage.

93. Source data was available for the Darwin area in a variety of formats. Advice provided by 4 Fd Svy Sqn as to this fact was not heeded by the Army Svy Regt due to the collection of data not being a 4 Fd Svy Sqn responsibility. In cases such as these personal knowledge can reveal a large volume of useful information. All members of Survey Corps should be treated as valid sources of information and any issues raised followed to their logical conclusion.

94. Manning. Manning for the Operation was satisfactory. The Head Quarters element for Darwin was larger than required due to the overstaffing of positions to provide personnel experience in survey operations.

95. Finance. The opening of accounts with local businesses in Darwin expedited financial procedures. This method of organising finances allows for greater control of expenditure and speedy payment of bills. Due to the Operation being conducted so close to the end of the training year a lot of time was spent ensuring that finances were expended in the current training year. This problem would be alleviated if operations were scheduled further from the transition period between training years.


96. Vehicles. Vehicles loaned from pools have a higher instance of tyre malfunctions than those provided from active Units. The air-conditioners mounted on the survey variant Landrovers caused bolts holding the water housing brackets to shear.

RECOMMENDATIONS

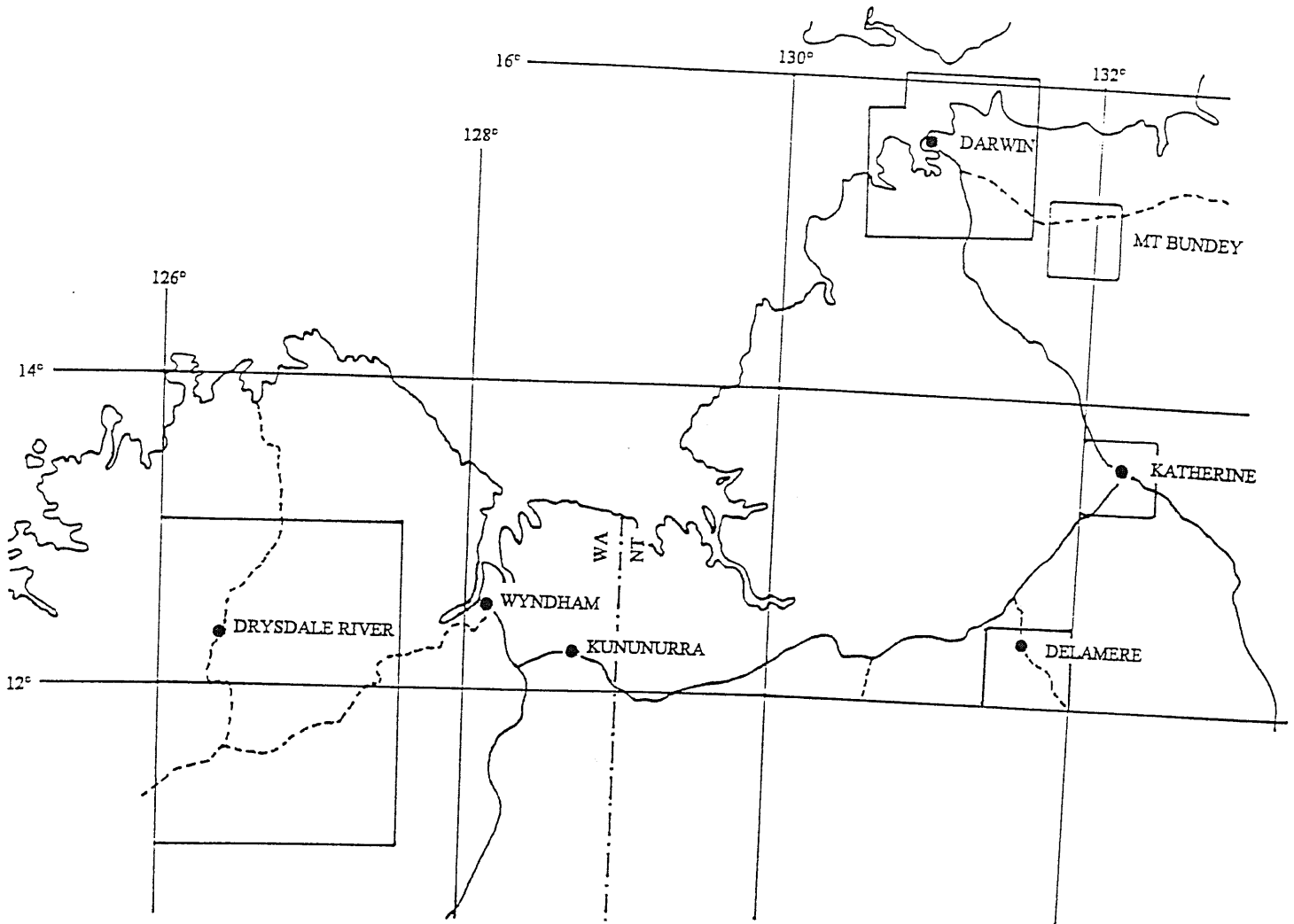
97. As a result of observations and conclusions drawn from Operation MIZMAZE 95 the following recommendations are made in respect to the Operation:

- a. The provision of information between Units of an informal nature should be encouraged. While not excluding the official procedures it is a useful adjunct and can save time and money. It must be remembered that we are one Corps and exist to assist each other. Action By: LHQ, DSVY-A, Army Svy Regt and 4 Fd Svy Sqn.
- b. Forecasting and expenditure of funds would be simplified if operations were scheduled further from the transition period between training years. Action By: LHQ, DSVY-A and 4 Fd Svy Sqn.
- c. Accounts with businesses should be utilised as much as possible in future operations to minimise time spent on accounting procedures during and after the Operation. Action By: 4 Fd Svy Sqn.
- d. An alternative method for vehicle storage should be examined to prolong the serviceability of tyres on loan pool vehicles. Action By: Adelaide Log Coy.
- e. The air-conditioner unit brackets should be reviewed on 4 Fd Svy Sqn Landrovers to resolve the problem of bolt shear. Action By: 4 Fd Svy Sqn.

10th November 1995


P.C. DEMAINE
Major
Officer Commanding

AREA OF OPERATIONS



NOT TO SCALE

TECHNICAL REPORT
NORTHERN TERRITORY (NT) SHEETS

Reference:

- A. DSVY-A /A92-12622 OP MIZMAZE 95 - TECH DIRECTIVE dated 5 Apr 95

BACKGROUND

Package Construction

1. Army Svy Regt produced field completion packages for map sheets in the following 1: 250 000 areas:
 - a. SD 52-4 DARWIN - 15 x 1:50 000;
 - b. SD 52-16 DELAMERE - 4 x 1:50 000;
 - c. SD 53-9 KATHERINE - 4 x 1:50 000; and
 - d. MOUNT BUNDEY TRAINING AREA SPECIAL.
2. A list of the 1:50 000 scale map sheets is included at Appendix 1 to this Annex.

Source Data

3. Source data consisted of:
 - a. 1:50 000 field completion packages;
 - b. 1:50 000, 1:100 000 and 1:250 000 existing/published topographic mapping; and
 - c. hydrographic charts at various scales.

Field Completion Packages

4. Field completion packages were produced containing the following:
 - a. computer generated cultural, drainage, relief and vegetation (CDRV) composite colour paper plots;
 - b. various sheets in assorted colour combinations for use in the production of the guides and to assist in checking specific detail; and

- c. CDRV, CD and 1:25 000 CDRV enlargement film positives for use as field completion masters.

5. Map Integrity Points (MIPs) were chosen by the Army Svy Regt to help compute the map accuracy. A list of these points and an overlay showing their position was included in all NT packages.

Field Completion Colour Guides

6. All guides were either produced by 4 Fd Svy Sqn using conventional techniques or where detail had few amendments by using the printed map sheet as a guide.

EXECUTION

General Outline

7. The Operation was conducted by deploying seven field completion parties to the field. Two field completion parties were initially deployed to field complete the map sheets in the Katherine and Delamere areas. The remaining parties operated out of the main base, at Darwin, and deployed to field complete the Darwin and Mt Bunday areas. Towards the completion of the Operation all seven parties congregated at the main base and deployed to conclude the field completion of the Darwin area.

Ground Verification

8. Ground verification was undertaken by two-man parties who remained in the field for up to three days. On their return to base, corrections were applied to the master field check positives. Homestead owners/managers, park rangers and other officials within the AO were visited and provided valuable assistance on new development, positioning of detail and the placement and verification of nomenclature.

Air Verification

9. At the completion of the ground verification, an aerial inspection was completed to resolve any outstanding queries and to verify any detail inaccessible by road. Where possible the air check was completed by the same personnel that carried out the ground verification.

Map Integrity Points (MIPs)

10. Where possible MIPs were collected at the same time as ground verification was carried out.

Comments

11. Photography. The dates of plotting photography for the digital data used to produce the field check packages were as follows:

- a. Darwin - 1977 to 1978;
- b. Katherine - 1977;

- c. Delamere - 1986; and
 - d. Mt Bunday - 1988.
12. Updated information was added to this data by 'heads up' digitising from more recent scanned photography. The dates of this photography were as follows:
- a. Darwin - Jun 93;
 - b. Katherine - May 93;
 - c. Delamere - Jun 93; and
 - d. Mt Bunday - Jul 94.
13. Due to the short time frame available to the Army Svy Regt not all areas were updated.
14. Photography used by the compilation agency was not made available to the field completion agency. Some of this was re-sourced from the Department of Lands and Housing (DOLAH) and it was found that numerous features that appeared on the photography had not been added to the field completion package (eg Robertson Barracks and Palmerston South).
15. Supplementary Photography. DOLAH had flown infra-red photography at a scale of 1:25 000 in Apr 95 for the BUAs around Darwin and Palmerston. Prints of this photography were loaned to 4 Fd Svy Sqn and utilising digital data supplied by the Army Svy Regt and an A1 digitiser, digital set-ups were carried out to extract new data.
16. Strip photography at a scale of 1:25 000 was flown of the Darwin sheets. As soon as prints were made of areas not updated by Army Svy Regt the same procedure detailed above was used to extract updated data.
17. As this detail couldn't all be positioned accurately in the field or because it was too time consuming a task, as soon as new data was positioned from the infra-red or supplementary photography a new field check master was produced using MGI Pilot Project's plotter. This resulted in some map sheets having up to nine separate field check masters (including enlargements) making checking and editing more time consuming and difficult than on previous Ops.
18. For the duration of the Op one or two parties were employed at the main base on digitising tasks. Initially there was a large training overhead as most technicians did not possess the necessary photo interpretation and cartographic skills.
19. Photo Interpretation. The photo interpretation of topographic features was generally good; the major problems being:
- a. Most orchards were missing.
 - b. Large areas of vegetation in the Mt Bunday Training Area were incorrectly classified.

20. The photo interpretation of cultural features was generally poor, the major problems being:
- a. Linear and area features were missing (eg roads, cleared lanes, transmission lines, fences and mining areas).
 - b. The majority of roads/VTs classified as 'Road General' were in fact cleared lanes or fences.
 - c. Large BUAs missed completely (eg Palmerston South and Robertson Barracks).
 - d. New buildings (on one sheet approx 300) and other point features (eg tanks and yards) were missing .
21. This Unit will produce Photo Interpretation Guides (PIGs) as well as a video to clarify the problems highlighted above and forward it to the Army Svy Regt.
22. A detailed explanation of amendments and photo interpretation errors is included in the Field Completion Report attached at Annex E to the Operation Report.
23. Enlargements. Coloured enlargements were used to clarify areas of clutter. These were produced by either the Army Svy Regt or 4 Fd Svy Sqn, prior to the Op. Other enlargements were produced by 4 Fd Svy Sqn in the field utilising MGI Pilot Project's plotter.
24. All enlargements that were utilised were compiled as per Compilation Specifications. The area covered by the enlargement was boxed on the composite positive with a notation indicating which enlargement was used. No changes were annotated within the boxed area on the composite positive.
25. All enlargements were included in their relevant Field Completion Package.
26. Source Data. Source data provided by the plotting agency was minimal and this must have been as much of a hindrance to the compilation agency as it was to the field completion agency.
27. This lack of source data hindered the field completion operation as source data had to be collected by the completion agency in the field. A list of additional source data collected by the completion agency is attached at Appendix 2 to this Annex.
28. Administrative Boundaries. Conservation park and military training area boundaries, whether originally positioned by the Army Svy Regt or not, should be positioned from either their gazetted coordinates or from the pastoral leases they were created from. All this information will be forwarded to the Army Svy Regt with the field check packages.
29. Watercourse classification. The overall watercourse classification for all areas checked during the Op was kept as per the original map sheets. Where individual changes had to be made, these were shown on both the comp pos and the drainage guide.
30. Hand Held Global Positioning Systems (GPS). Hand held GPS were used for checking information and positioning new data. Equipment used was the Trimble Scout and Magellan NAV 5000 PRO.

31. The positional accuracy of these receivers was:
- a. for positioning MIPs = +/- 10m;
 - b. for positioning detail = +/- 25m; and
 - c. where reading affected by selected availability = +/- 100m.
32. All linear features over 5 km in length were either positioned by supplementary photography on the Zoom Transfer Scope (ZTS) or by dig set-ups.
33. Due to the fact that good survey principles were employed in positioning linear features by GPS fidelity of shape was maintained.
34. Joins. All internal joins were either completed in the field or solved with the use of aerial photography.
35. The Eastern join on the Darwin block has to join printed maps on AGD-66. No bleed edge was produced with the package, therefore, a data gap exists between the sheets. Unfortunately a number of features occur in this gap (including 'Rustlers Roost' gold mine at GR 710705 map sheet 5172-2 MARRAKAI), these features did not exist on early map editions and have not been field checked and therefore cannot be positioned post field check.
36. No external joins were effected due to disparate dates of the photography between blocks.
37. Field Check Concept Used. This Unit field checked solely for 1:50 000 line map content.
38. Nomenclature. Nomenclature listings will be completed and forwarded to the appropriate authority. Included in the listings will be recommendations to change the names of two map sheets (5172-1 HUMPTY DOO and 5172-4 NOONAMAH).
39. MIPs. MIPs were poorly chosen on most sheets. Problems of inaccessibility and features no longer in existence caused 38.5% of all points not to be recorded, the worst case being 5172-1 HUMPTY DOO where 71.5% of points were not captured. For all points not captured the reason for this has been recorded on the MIP result sheet. MIP result sheets were sent to the Army Svy Regt on 31 Jul 95.

Stereo Compilation Reports and Other Documentation

40. No Stereo Compilation Reports were received for any area in the NT, contrary to recommendations made in the Op ARIGHT 93 and Op NERVOSE 94 reports. In past years these reports helped the completion agency understand the problems encountered and the decisions made by the compilation agency. In a job that was far from routine a compilation report was sorely missed.
41. There was no document detailing which areas had been updated from more recent photography and very few queries were detailed in the relevant PD log sheet. This lack of documentation and explanation hindered the completion agency; as prior to the collection of source data, no judgement could be made on the expected timeframe required for completion of individual sheets.

Field Completion Report

42. A Field Completion Report was compiled for the NT AO and is located at Annex E to the Operation Report.

Supplementary Photography

43. Supplementary photography was acquired for detail that could not be positioned accurately during field completion. A full report on the aerial photography is at Annex G to the Operation Report.

Vital Asset Protection (VAP)

44. VAP photography was acquired as an opportunity task from a prioritised request compiled by 1 Topo Svy Sqn and MGI Pilot Project. All priority tasks were completed and a full report on VAP photography is located at Annex G to the Operation Report.

Photo Interpretation Guides (PIGs)

45. Photographs for the production of PIGs were taken by all field completion parties whilst in the AO. A number of videos were also taken, these will be edited and forwarded with the PIGs to the Army Svy Regt when complete.

CONCLUSIONS

46. Not enough data was extracted from the supplementary photography supplied to the Army Svy Regt. The data missed had to be extracted in the field from other sources, resulting in:

- a. field check personnel having to be employed in the office, and
- b. editing problems occurring due to numerous field check masters being used.

47. Photographic interpretation of data added by Army Svy Regt was generally poor. This resulted in more time spent field checking than would normally be expected in similar areas and in numerous MIPs being in inaccessible locations.

48. The large percentage of MIPs not observed may impact the Army Svy Regt's accuracy assessment on some map sheets. The procedure used, however, should give an accuracy of +/- 10 metres on all observed MIPs.

49. Source data provided to the completion agency was again minimal. Data was collected by the completion agency in the field and helped aid interpretation and position features. The lack of this data may have contributed to the poor photo interpretation by the compilation agency.

50. As no bleed join was produced for the eastern edge of the Darwin block a data gap exists between those sheets and the printed map sheets (which are on AGD-66).

51. It was hard to determine which areas had been updated and to what extent as this information was not recorded anywhere; this hindered field check timeframe judgements being made for individual map sheets.

RECOMMENDATIONS

52. As the photo interpretation and data collection from 'heads up' digitising was so poor, products should not be produced using this technique, unless they are to be subsequently field checked.

53. A thorough source data check be completed prior to the compilation of any product and all source data collected be forwarded to the completion agency, prior to the field completion operation.

54. As Alligator River, the next block to the east, is on WGS 84 the seven remaining map sheets in the Darwin block (presently on AGD-66) should be updated and transformed to WGS 84. This will eliminate user confusion and to maintain a seamless database.

55. When additional data is digitised the features added and the area where this occurred is recorded in the individual map sheet PD folder.

October 1995

S.C. CAPP
Warrant Officer Class 2
Operations Warrant Officer

Appendices:

1. 1 : 50 000 Scale Map Sheets Field Completed on Op MIZMAZE 95
2. Source Data Collected by Completion Agency - Op MIZMAZE 95 (NT)

APPENDIX 1 TO
ANNEX B TO
OP MIZMAZE 95
OPERATION REPORT
DATED 16 NOV 95

1:50 000 SCALE MAP SHEETS FIELD COMPLETED (NT)

The following 1:50 000 scale maps were field completed during Op MIZMAZE 95:

SD 52-04	DARWIN	1:250 000:
5072-1	MIDDLE ARM	
5072-2	TUMBLING WATERS	
5072-3	SWEETS LOOKOUT	
5072-4	BYNOE HARBOUR	
5073-1	GUNN POINT	
5073-2	DARWIN	
5073-3	CHARLES POINT	
*5172-1	HUMPTY DOO	
5172-2	MARRAKI	
5172-3	MANTON DAM	
*5172-4	NOONAMAH	
5173-1	CAPE HOTHAM	
5173-2	LAKE FINNIS	
5173-3	KOLLPINYAH	
5173-4	VERNON ISLANDS	
SD 53-09	KATHERINE	1:250 000:
5368-1	TINDAL	
5368-4	MANBULLOO	
5369-2	KATHERINE	
5369-3	O'SHEA	
SD 52-16	DELAMERE	1:250 000:
5266-1	BUCKLAND PARK	
5266-2	TINKER HILL	
5266-3	ROMULA KNOB	
5266-4	BARNEY BLUFF	

MT BUNDEY TRAINING AREA SPECIAL

* recommendation for name change

APPENDIX 2 TO
ANNEX B TO
OP MIZMAZE 95
OPERATION REPORT
DATED 16 NOV 95

SOURCE DATA COLLECTED BY COMPLETION AGENCY - OP MIZMAZE 95 (NT)

The following source data was collected by the completion agency:

- a. 1:25 000 Topographic maps for entire Darwin and Katherine areas;
- b. 1:7 500 Cadastral maps of the Tindal and Katherine areas;
- c. 1:75 000 Cadastral map of Katherine;
- d. 1:10 000 map of RAAF Base Tindal;
- e. plans of RAAF Base Darwin, Larrakeyah Barracks, and Robertson Barracks;
- f. various pastoral maps and survey plans at varying scales;
- g. 1:10 000 Topographic map of Robertson Barracks Close Training Area;
- h. 1:25 000 Robertson Barracks land tenure map;
- i. Darwin water supply map;
- j. gas pipeline information (coords and cross over points);
- k. water tower information sheet and water supply map;
- l. electricity grid map;
- m. conservation Commission gazetted park boundaries;
- n. military training area gazetted boundaries;
- o. tourist maps and brochures;
- p. Darwin Photography Index sheets;
- q. administrative maps for Darwin, Litchfield and Palmerston;

- r. Telecom tower information; and
- s. 1: 25 000 Infra - Red photography of Darwin and Palmerston BUA's (subsequently returned to DOLAH NT).

ANNEX C TO
OP MIZMAZE 95
OPERATION REPORT
DATED 10 NOV 95

TECHNICAL REPORT
WESTERN AUSTRALIA (MT ELIZABETH / ASHTON) SHEETS

Reference:

- A. DSVY-A/A92-12622 OP MIZMAZE 95 - TECH DIRECTIVE dated 5 Apr 95

BACKGROUND

Package Construction

1. The Army Svy Regt plotted and produced field completion packages for map sheets in the following 1: 250 000 areas:
 - a. SD 5213 ASHTON 24 x 1:50 000; and
 - b. SE 521 MOUNT ELIZABETH 24 x 1:50 000.
2. A detailed list of the 1:50 000 scale map sheets field verified in the Western Australian AO during Op MIZMAZE 95 is included at Appendix 1.

Source Data

3. Source data supplied from the Army Svy Regt consisted of:
 - a. 1:50 000 field completion packages;
 - b. 1:80 000 mosaics;
 - c. 1:50 000, 1:100 000 and 1:250 000 existing/published topographic mapping; and
 - d. pastoral plans (various scales).

Field Completion Packages

4. Field completion packages were produced and contained the following:
 - a. computer generated composite colour paper plots containing assorted combinations of the following:
 - (1) cultural,
 - (2) drainage,

- (3) relief,
 - (4) relief related, and
 - (5) vegetation.
- b. various sheets in assorted colour combinations for use in the production of the guides and to assist in checking specific detail;
 - c. computer generated vegetation colour guides on paper;
 - d. hydrographic colour guides on paper;
 - e. composite film positives for use as field completion masters;
 - f. nomenclature sheets; and
 - g. a copy of the Technical Decision Sheet from the PD.
5. Field completion packages were checked prior to being despatched to the field for:
- a. completeness,
 - b. join information, and
 - c. source data.

Field Completion Colour Guides

6. Army Svy Regt produced computer generated vegetation colour guides, prior to departure to the AO. These guides were used successfully in the field, and the use of computers to produce these guides should be continued as the time saving alone in their production is invaluable.
7. All other guides were produced by 4 Fd Svy Sqn using conventional techniques.

EXECUTION

General Outline

8. The Operation was conducted by deploying three field completion parties from the main base located at Drysdale River homestead. On completion of the ground verification stage, a civilian and Army LOH's were employed to carry out verification of the area from the air.

Ground Verification

9. Ground verification was undertaken by two man field parties who remained in the field for up to two days. On their return to base, corrections were applied to the master field completion positives. The ground verification stage finished earlier than anticipated due to

the unseasonable wet weather conditions encountered, therefore field completion parties were unable to complete the required ground verification because all tracks and roads within the AO were extremely boggy.

10. Homestead owners/managers, park rangers and other officials within the AO were visited and provided valuable assistance on new development, positioning of detail and also the placement and verification of nomenclature.

Air Verification

11. At the completion of the ground verification stage, an aerial inspection was completed to resolve any outstanding queries and to verify detail inaccessible by road and those areas not completed earlier. A civilian Jet Ranger was hired for the initial air verification stage because Army Aviation were unable to give support earlier than previously planned.

12. Where possible, the air check was completed by the same personnel that carried out the ground verification. This was unachievable in the later stages of the Op because of injuries sustained to two survey personnel in an LOH accident.

Edits

13. All sheets were edited for cartographic and logic errors after the corrections were completed to the field completion masters prior to departure from the AO.

Photography

14. Plotting photography. The dates of plotting photography used for the digital data to produce the field check packages were as follows:

- a. MT ELIZABETH 1988 (run 12) and 1992; and
- b. ASHTON 1988 (run 12) and 1992.

15. Supplementary Photography. Supplementary photography was flown of areas where confirmation of detail was required by the field completion teams. The photographic coverage required was detailed on 1: 100 000 scale maps. The information was deduced from the photography on return to the Unit using the Zoom Transfer Scope (ZTS). A full report on the aerial photography is contained at Annex G to the Op Report.

Photo Interpretation.

16. The photo interpretation of physical features was generally good; the major problems being:

- a. an insufficient amount of cliffs and escarpments were portrayed on some sheets; and
- b. the average height of vegetation notes were consistently 3-7m lower than what they actually were.

17. The photo interpretation of cultural features was generally good. The only major problem was that too many linear and area features were added using digital setups off source data (due to it not being seen on the plotting photography). These features had to be removed as they could not be located during the field completion.

18. A detailed explanation of amendments and photo interpretation errors are included in the Field Completion Report attached at Annex F.

Source Data

19. Source data provided by the plotting agency was generally very good. Some data wasn't forwarded to the Unit (such as telecom information) and it is recommended that all data utilised at the plotting stage be forwarded with future field completion packages.

Joins

20. All internal joins were completed in the field. Confirmation of external joins is to be carried out by the Army Svy Regt. Any external join problems were noted in the relevant PD folio.

Field Completion Concept Used

21. This Unit field checked solely for 1:50 000 line map content using current Unit SOPs for field completion.

Nomenclature

22. Nomenclature listings have been completed and will be forwarded to the appropriate authority at a later date. The listings include recommendations to change the names of four map sheets. A list of these map sheets are included in Appendix 1 to this Annex.

Stereo Compilation Report

23. The stereo compilation report was found to be informative regarding possible problems that may have arisen during the field completion of the sheets.

Field Completion Report

24. A Field Completion Report was compiled for the WA AO and is located at Annex F to the Operation Report.

Photo Interpretation Guides (PIGS)

25. Photographs for the production of PIGS were taken by all field completion parties whilst in the AO. These will be edited and forwarded to the Army Svy Regt when complete.

CONCLUSIONS

26. All source data utilised at plotting was not made available to this Unit.

27. Too many linear and area features were positioned from source data when they were not visible on the mapping photography, this caused wasted field completion time. This practice will cause confusion to the map user if future mapping areas are not field completed.
28. The computer generated Vegetation colour guides were used successfully in the field.

RECOMMENDATIONS

29. A thorough collection of source data should occur prior to compilation. This data should then be forwarded to the completion agency prior to field completion.
30. Only features that would not normally be visible on the mapping photography (eg bores, towers, submerged reef, gates and grids) should be positioned from source data.
31. The use of computers to produce Vegetation colour guides should be continued as the time saving alone in their production is invaluable.

October 1995

P.W. HAMMER
Warrant Officer Class 2
Detachment Operations Warrant Officer

Appendix:

1. 1: 50 000 Scale Map Sheets Field Completed (WA)

APPENDIX 1 TO
ANNEX C TO
OP MIZMAZE 95
OPERATION REPORT
DATED 12 NOV 95

1:50 000 SCALE MAP SHEETS FIELD COMPLETED (WA)

1. The following 1:250 000 were field checked during Op MIZMAZE 95:
 - a. SE 52-01 MT ELIZABETH; and
 - b. SD 52-13 ASHTON

2. The AO comprised of the following 1:50 000's:

4164 1 BELLA CREEK	4266 1 DAMPER CREEK
4164 2 MACNAMARA	4266 2 ELLENBRAE CREEK
4164 3 PHILLIPS RANGE	4266 3 RUSS CREEK
4164 4 BARNETT RANGE	4266 4 MAITLAND
4165 1 PINDAN CREEK	4364 1 ULLINGER
4165 2 GIBB RIVER	4364 2 BROCKMAN
4165 3 MOUNT ELIZABETH	4364 3 MUNRO
4165 4 NUMALGUN *	4364 4 THREE MILE CREEK
4166 1 HEAD HILL	4366 1 MOUNT LAWLEY
4166 2 DONKEY CREEK	4366 2 MOSQUITO HILLS
4166 3 GARDNER PLATEAU	4366 3 MOUNT DOROTHY
4166 4 POONJURRA	4366 4 MOUNT BEATRICE
4167 1 COUCHMAN	4267 1 GATTENOF HILL
4167 2 MOUNT HORACE	4267 2 ASHTON
4167 3 HAIR CREEK	4267 3 WEEKES
4167 4 CHANGOOLA	4267 4 LAURIE CREEK
4264 1 BLACKFELLOW CREEK	4365 1 ROYSTON CREEK
4264 2 WOOD RIVER	4365 2 BLUFF FACE RANGE
4264 3 SIDDENS *	4365 3 KURUNJIE
4264 4 SULLIVAN *	4365 4 DUCKS LAGOON
4265 1 OOLRUI CREEK	4367 1 YOYGIN CREEK
4265 2 CHAPMAN	4367 2 ERNEST RIVER
4265 3 BOTTLE TREE CREEK	4367 3 BAN JO CREEK
4265 4 PARNELL	4367 4 MONGONA *

* denotes recommendation for name change

ANNEX D TO
OP MIZMAZE 95
OPERATION REPORT
DATED 2 NOV 95

SEQUENCE OF EVENTS

<u>Serial</u>	<u>Date</u>	<u>Event</u>
1.	1 May	Pre-Op trg commences.
2.	5 May	Pre-Op trg completed.
3.	8 May	Load stores.
4.	9 May	Load stores.
5.	10 May	Unimogs/FRT depart Adelaide for Glendambo.
6.	11 May	Main body departs Adelaide for Alice Springs by rail ('Ghan'). Unimogs/FRT depart Glendambo for Alice Springs.
7.	12 May	Two parties rendezvous at Alice Springs and depart in convoy for Wycliffe Well.
8.	13 May	Convoy departs Wycliffe Well for Mataranka.
9.	14 May	Convoy departs Mataranka for Katherine where it splits. Two field check parties remain 322 ABW. Darwin detachment continues to 321 ABW. Drysdale detachment continues to Kununurra.
10.	15 May	Darwin detachment establishes base. Drysdale detachment departs Kununurra for Drysdale River Homestead. Field check commences Katherine.
11.	16 May	Field check commences Darwin. Drysdale detachment establishes base.
12.	17 May	Field check commences Drysdale River. OC arrives Darwin via civilian air from Canberra. Darwin detachment obtains infra-red photography from DOLAH and commences digitisation of detail.
13.	18 May	Drysdale detachment report very low fuel and food. Two Landrovers, Landrover 6x6 and Unimog bogged. All except one Landrover recovered (a road grader was required). A Unimog managed to reach Kununurra and return with supplies.

14. 19 May Darwin detachment acquires 1:25 000 plan prints from DOLAH as source data.
Drysdale detachment reports that roads are closed to heavy vehicle traffic to minimise damage and that roads are impassable to Landrovers. Request approval to hire civilian helicopter as 161 Recce Sqn can not provide support until 27 May 95.
Permission granted by LHQ to utilise 4 Fd Svy Sqn funds.
15. 20 May Darwin detachment attempts to digitise off plan prints but the technique is not effective. OC, OPSWO and Tech WO transit to 322 ABW to examine progress of Katherine sheets.
16. 21 May Darwin detachment stands down for the day while OPSWO and SGT F. Downie examine digitising procedures.
Drysdale detachment commences utilising civilian helicopter.
17. 22 May Darwin detachment finds that 1993 digital information for cultural features in Darwin area exists. Due to inability of Unit to purchase digits the issue is passed to DSVY-A (no digits were purchased).
18. 23 May Katherine detachment reports severe mechanical problems with a Landrover. Vehicle repaired by mechanics at 322 ABW.
SGT P. Longbottom flies to Canberra for fitting of RC-10 camera to Titan.
Cease use of civilian helicopter at Drysdale.
19. 24 May Darwin detachment informed that base facilities could no longer be used for paper processing of photography due to the building being condemned for OH&S reasons.
2xLOH air check Darwin in the morning and 3xLOH transit to 322 ABW in the afternoon.
RC-10 camera fitted in Titan.
20. 25 May Titan departs Canberra for Mt Isa.
Air check commences Katherine.
3xLOH transit Darwin in afternoon.
Drysdale River detachment stands down for the day due to impassability of roads.
21. 26 May LOH not available for use due to 161 Recce Sqn tasking.
Titan departs Mt Isa for 321 ABW.
Day visit by LTCOL Jensen and MAJ Cooper from DSVY-A.
22. 27 May 2xLOH transit to Drysdale River, 1xLOH transit to 322 ABW.
Field check complete Katherine.

23. 28 May LT P. Davies and SSGT P. Sandberg collect map sheets from Katherine detachment.
Katherine detachment transits to Delamere.
1xLOH transits from 322 ABW to 321 ABW for servicing.
Air checking commences at Drysdale River.
24. 29 May Field check commences Delamere.
1xLOH Darwin provided by 161 Recce Sqn to replace aircraft being serviced.
25. 30 May Darwin detachment stands down. 1xLOH Drysdale crashes near Gibb River. Pers involved evacuated to 321 ABW by RAAF Caribou.
26. 31 May LTCOL Newton and CAPT Buckpitt from LHQ arrive Darwin via civilian air.
Army Svy Regt Offrs arrive via Service air.
27. 01 Jun Army Svy Regt Offrs visit MGI-PP.
28. 02 Jun Titan flies to Drysdale with OC and LT Grose.
1xLOH Darwin transits to Delamere.
LTCOL Newton and CAPT Buckpitt depart Darwin.
29. 03 Jun Air check commences Delamere.
Field check commences Mt Bunday.
Field check completed Drysdale River.
Titan returns 321 ABW from Drysdale River.
SGT D. Willis and CPL R. Crawford RTU via civilian air.
30. 04 Jun 2xLOH Drysdale not able to return to 321 ABW due to recovery of crashed aircraft, remain at Kununurra airport.
1xLOH transit Delamere to 321 ABW.
Drysdale detachment depart Drysdale River Homestead for Kununurra.
31. 05 Jun 2xLOH Drysdale transit to 321 ABW.
1xLOH air checks Mt Bunday.
Field check Mt Bunday completed.
Drysdale detachment depart Kununurra for Mataranka. One Landrover and the FRT are detached to 321 ABW (driven by SGT W. Hobson and CFN D. Walters).
Field check complete Delamere and detachment transits to 321 ABW.
32. 06 Jun Drysdale detachment depart Mataranka for Tennant Creek.
33. 07 Jun Drysdale detachment depart Tennant Creek for Eraldunda.

34. 08 Jun Drysdale detachment depart Erldunda for Glendambo.
Army Svy Regt Offrs depart Darwin via Service air.
35. 09 Jun Drysdale detachment depart Glendambo for Adelaide.
Field check complete Darwin.
36. 10 Jun Titan (pilot and SGT P. Longbottom) departs Darwin for
Adelaide.
LOH support ceases.
37. 11 Jun Darwin detachment departs Darwin for Mataranka.
LT T. Bucknall remains in Darwin.
Titan departs Adelaide for Canberra.
38. 12 Jun Darwin detachment departs Mataranka for Tennant Creek.
Remove camera in Canberra and dispatch to Adelaide.
39. 13 Jun Darwin detachment departs Tennant Creek for Erldunda.
SGT P. Longbottom departs Canberra for Adelaide.
40. 14 Jun Darwin detachment departs Erldunda for Glendambo.
41. 15 Jun Darwin detachment departs Glendambo for Adelaide.
End operation.

FIELD COMPLETION REPORT
NORTHERN TERRITORY AO

GENERAL

Report Areas

1. The field check phase of Op MIZMAZE 95 for NT area encompassed seven 1:250 000 map areas. The coordinates for the areas are as follows:

- a. SD 52 - 04 DARWIN 15 X 1:50 000 map sheets:
 - (1) NE cnr 12° 00'S, 131° 30'E;
 - (2) NW cnr 12° 00'S, 130° 30'E;
 - (3) SE cnr 13° 00'S, 131° 30'E; and
 - (4) SW cnr 13° 00'S, 130° 00'E.
- b. SD 53 - 09 KATHERINE 4 X 1:50 000 map sheets:
 - (1) NE cnr 14° 30'S, 132° 30'E;
 - (2) NW cnr 14° 30'S, 132° 00'E;
 - (3) SE cnr 14° 45'S, 132° 30'E; and
 - (4) SW cnr 14° 45'S, 132° 00'E.
- c. SD 52 - 16 DELAMERE 4 X 1:50 000 map sheets:
 - (1) NE cnr 15° 30'S, 132° 00'E;
 - (2) NW cnr 15° 30'S, 131° 30'E;
 - (3) SE cnr 16° 00'S, 132° 00'E; and
 - (4) SW cnr 16° 00'S, 131° 30'E.
- d. MOUNT BUNDEY TRAINING AREA SPECIAL 1 X 1:50 000 :
 - (1) NE cnr 12° 49'S, 132° 05'E;
 - (2) NW cnr 12° 40'S, 131° 40'E;

(3) SE cnr 13° 11'S, 132° 05'E; and

(4) SW cnr 13° 11'S, 131° 40'E.

2. A description for each area is given below:

- a. SD 52 04 DARWIN. The area is located in the Northern Territory on the northern coast of Australia 80 km south of Melville Island and covers approximately 6000 km² of land area. The topography of the area is flat to undulating with the Finnis Range in the SW and the Daly Range in the south, vegetation in the area is predominantly medium. A number of islands exist to the north in Clarence Strait and the coastline is dominated by large areas of mangrove and associated coastal features. The Darwin River and Manton Dams are the largest drainage features in the south of the AO. Cultural development is extensive with the city of Darwin on the coast and large areas of urban and rural sprawl on either side of the Stuart Highway heading SE.
- b. SD 53 09 KATHERINE. The Katherine area is approximately 300 km SE of Darwin on the Stuart Hwy. Topography of the area is generally low undulating terrain, except to the NE where steep gorges and broken ground exist. Vegetation in the area is predominantly medium. The major cultural centres in the area are the township of Katherine and RAAF Base Tindal, which lies 15 km to the SE of Katherine. The Stuart Hwy runs from NW to SE through the area and the Katherine River running NE to SW.
- c. SD 52 16 DELAMERE. The Delamere area lies approximately 400 km to the south of Darwin. Topography of the area is generally flat with a number of small escarpments around the Delamere Homestead. Vegetation is predominantly medium and no major hydrography features exist. Cultural features include the Delamere Homestead and Range Control for the Delamere Air Weapons Range.
- d. MOUNT BUNDEY TRAINING AREA SPECIAL. The area is located approximately 150 km east of Darwin and covers approximately 1700 km² of land area. It is bordered on the northern edge by the Arnhem Highway, the south and east by the Kakadu National Park and on the west by the Mary River. The topography of the area is flat to undulating, vegetation is predominantly medium with an average height of six - seven metres. The major drainage features in the area are the Mary River and large areas of STI located on the western edge. Cultural development consists of the Bark Hut Inn and the Annaburroo Homestead.

Insertion

3. The Field Parties were inserted into the AO in two Phases:

- a. phase one was by Rail (the "Ghan") to Alice Springs; and
- b. phase two by road from Alice Springs to Katherine and Darwin.

4. Main base for the Operation was established at RAAF Base Darwin, while forward bases were also established, at RAAF Base Tindal and later at the Delamere Air Weapons Range.

Task

5. The field check task involved the field completion of 23 standard 1 :50 000 map sheets and one 1:50 000 special, as detailed in Appendix 1 to Annex C.

Method

6. The area was field checked using both ground and air methods.

7. Truck Panel Survey Series and Truck Ute 110 Land Rovers were used for the ground phase and LOH for the air phase.

8. Hand held GPS (Trimble) were used, with the understanding that the solutions gained were to be used in conjunction with traditional field check methods and supplementary photography.

Duration

9. Field checking commenced on the 16 May 95, starting on the southern sheets and gradually working north to finish on the 10 Jun 95.

10. The time spent on the field check phase are as follows:

- a. 705.5 hrs ground completion;
- b. 67.10 hrs air check;
- c. 380.50 hrs spent in the office applying corrections onto the reformat;
- d. 130 hrs spent in preparation (hand digitising); and
- e. 205 hrs spent in completing joins and edits.

11. These times are indicative only and do not include planning or allocation of time for preliminary map production, briefings, civil liaison, transit times and resource tasking.

AMENDMENTS/COMMENTSDarwin

12. Cultural. Although some cultural updates were done by the Army Svy Regt, the overall plotted detail was lacking and portrayed the area poorly. Due to this, additional source data had to be acquired in the AO. This is the responsibility of the Army Svy Regt and not the FC agency. Large amounts of updating from recent aerial photography by digitising was required. Fortunately, numerous 1:25 000 blowups (requested by 4 Fd Svy Sqn) of the Darwin area were provided, this made the task of adding the large amounts of extra detail easier if not quicker. The major additions are listed below:

- a. large areas of BUA completely missed (eg Palmerston South) or poorly portrayed;
- b. Robertson Barracks completely missed, map sheet 50732;

- c. missing roads within BUA over entire block;
- d. marina development in Cullen Beach area north of Larrakeyah Barracks;
- e. marina development Dinah Beach on map sheet 50732, south of Darwin;
- f. construction of the new Darwin Harbour on map sheet 50732 in the East Arm Settlement area, which incorporates a large breakwater extending to North Shell Island;
- g. new areas of BUA added to map sheet 50732 at GR 0728, 0924, and 1322;
- h. due to large amounts of rural development (hobby farming) more than 300 buildings and associated roads were added to the northern part of map sheet 51724; and
- i. large amounts of detail added to map sheet 51723 in the form of buildings and roads.

13. Drainage. Considering the age of the data (some 15 years) the drainage had only minor changes effected. Most of these were made due to urban sprawl and involved the addition of drains and tanks.

14. Relief. Portrayal of relief was good and required nil changes.

15. Vegetation. Generally portrayed well, with a few areas over generalised, the most common change was the addition of numerous orchards throughout the block. However the use of printed maps caused problems in distinguishing vegetation classifications due to indistinct portrayal of vegetation boundaries, ie. between scattered and medium areas.

16. Nomenclature. Numerous changes were made. As per the Nomenclature List the only major change is that Humpty Doo Homestead is now known as Wairuk.

17. Joins. Problems occurred with joins only in that detail on the field check maps was portrayed differently on each map. The feature symbology was not consistent throughout the block.

18. Probable Obsolescence Rate (POR). Due to the rapid development in the Urban and Rural areas of this entire area, the POR is One - Rapidly Developing/High Obsolescence Areas.

Katherine

19. Cultural. Numerous changes to the cultural detail were made throughout the AO, especially within the Katherine and Tindal townships, these are summarised below:

- a. numerous hobby farms along the Katherine River were added;
- b. a new sub-division consisting of hobby farms was added at 'Edith Farms' approximately 30 km NW of Katherine;
- c. two new hangar complexes and associated taxi-ways were added at RAAF Base Tindal;

- d. numerous fences were deleted as they no longer existed; and
- e. many fences were not added due to the complexity of cultural detail in the vicinity of Katherine.

20. Drainage. Generally drainage was portrayed well with the following amendments made:

- a. drains classified as roads in the Katherine/Tindal area were changed,
- b. numerous drains added in conjunction with the new hangar complex at RAAF Base Tindal, and
- c. rapids were added to the Katherine River within Katherine Gorge.

21. Relief. Nil corrections applied to the relief.

22. Vegetation. Vegetation was portrayed well and required minimal change, however the use of printed maps caused problems in distinguishing vegetation classifications due to indistinct portrayal of vegetation boundaries, ie. between scattered and medium areas. Changes made included:

- a. large orchards added around Katherine; and
- b. large clear areas around the Katherine area were added due to large market garden development.

23. Nomenclature. Numerous changes and additions were made as per the nomenclature list.

24. Joins. No problems were encountered with joins.

25. Supplementary Photography. Supplementary photography was flown as requested, including tasking from outside this Unit of RAAF Base Tindal.

26. Probable Obsolescence Rate (POR). This area has a POR of two - Moderately Developing area.

Delamere

27. Cultural. The following cultural amendments were applied to the cultural:

- a. numerous roads and vehicle tracks that were plotted do not exist or are washed out, and disused;
- b. minor development in the Delamere Air Weapons Range mainly in the tactical range area;
- c. some new ranges were added within the Delamere Air Weapons Range; and
- d. fences stopping in the middle of nowhere were checked and rectified.

28. Drainage. Generally drainage was portrayed well and the following amendments were made:
- a. major dam not plotted to NNE of Delamere Homestead, the dam wall was portrayed but not the Hydro Bdy, and
 - b. single line stream to the NE of the above dam was portrayed as a vehicle track.
29. Relief. Relief detail was portrayed well and no corrections were needed.
30. Vegetation. Generally well portrayed, however the use of printed maps caused problems in distinguishing vegetation classifications due to indistinct portrayal of vegetation boundaries, ie. between scattered and medium areas. The following changes were made to the vegetation:
- a. Delamere Air Weapons Ranges T1 and T2 are clear of vegetation.
31. Nomenclature. Numerous changes and additions were made as per the nomenclature list.
32. Joins. No problems were encountered with joins.
33. Supplementary Photography. Supplementary photography was flown of the Delamere Air Weapons Range areas only.
34. Probable Obsolescence Rate (POR). The POR for this area is three - Slowly Developing area.

Mount Bunday Training Area

35. Cultural. The following major cultural amendments/comments apply:
- a. four major roads were added in the office, using plans obtained from the Engineers Office at Larrakeyah Barracks and verified by ground;
 - b. vehicle tracks deleted due to regrowth; and
 - c. a new landing ground was added at GR 1573.
36. Drainage. Only minor changes were made which involved a reclass of small features (swamps and waterholes) along the Mary River.
37. Relief. Nil change to relief.
38. Vegetation. Generally vegetation was good, and the following changes were made:
- a. large areas of medium vegetation covering approximately 50 km² (GR 2360, 2266, 2567, 9368, and 2767) were incorrectly classified as clear/scattered; and
 - b. the average height of vegetation was increased by approximately three metres.
39. Nomenclature. The following amendments were made to the nomenclature:
- a. Wildman River East Branch GR 248716 changed to Wildman River, and

- d. The practice of using printed maps as classification guides be abandoned. Army Svy Regt

November 1995

F.L. DOWNIE
Sergeant
Compilation Supervisor

FIELD COMPLETION REPORT
WESTERN AUSTRALIAN AREA

References:

- A. Op MIZMAZE 95 Op Order dated May 1995
- B. Stereo Compilation Report SE 52-1 MT ELIZABETH dated 17 February 1995
- C. Stereo Compilation Report SE 52-13 ASHTON dated 26 November 1993

GENERAL

Report Areas

1. The field check phase for Operation MIZMAZE 95 encompassed two 1:250 000 map areas, the coordinates of the entire area are:
 - a. NE cnr 15° 00'S, 127° 30'E,
 - b. NW cnr 15° 00'S, 126° 00'E,
 - c. SE cnr 17° 00'S, 127° 30'E , and
 - d. SW cnr 17° 00'S, 126° 00'E.
2. A description for each area is given below:
 - a. SE 52-1 ASHTON. The area is situated approximately 215 km SW of Kununurra and covers approximately 15,000 sq km. The area consists of three major rivers, the Drysdale, Gibb and Durack. Carson Escarpment is the major relief feature on this map, other prominent features included the Ashton, Couchman and Foster Ranges. The topography of the area is flat to undulating. The vegetation is predominantly eucalyptus with an average height of approximately 5-6 metres. The main cultural centres are the Drysdale River, King Edward River and the Ellenbrae homesteads. Aboriginal land covers approximately 1,000 sq km in the NE area of the map.
 - b. SD 52-13 MOUNT ELIZABETH. The area is situated approximately 230 km SW of Kununurra and covers approximately 15,000 sq km. The major River in the area is the Durack. Other smaller rivers include the Chapman, Gibb and the Hahn. The Durack Ranges and the Elgee Cliffs are situated at the SE of the map and are the major relief features. Bluff Face Range covers a large area on the Eastern edge of the map. Other

prominent ranges are Caroline, Gibb, Barnett and Phillips. The topography of the area is undulating to hilly. The vegetation in the area is predominantly eucalyptus with an average height of approximately 5-6 metres. The main cultural centres are the Gibb River, Mt Elizabeth and Kurunjie homesteads. The Pentagon is a large erosion basin and is a very prominent feature in the NW area.

Insertion

3. Insertion to the AO was as per Reference A.
4. Parties working in the AO were deployed initially by road. The area had an exceptional wet season prior to deployment to the AO and rain continued to fall for the first week of the Operation. This forced the cancellation of the ground completion phase. Due to the early requirement of air completion a civilian helicopter was hired to commence the ground check and was completed with Army helicopters when they became available.
5. The main base for the Operation was established at the Drysdale River Homestead.

Task

6. The field completion task involved the checking of 48 x 1:50 000 map sheets as detailed in Appendix 1 to Annex C.

Method

7. The area was field completed using both ground and air methods.
8. Truck Panel Survey Series 110 Land Rover was used for the ground phase with civilian and Army LOH for the air checks.
9. Hand held GPS (Trimble Scout) were used with the understanding that the solutions gained were to be used in conjunction with traditional field completion methods and supplementary photography.

Duration

10. Field checking commenced on the 16 May 95 and was completed on the 3 Jun 95.
11. The time spent on the field check phase are as follows:
 - a. 60.75 hrs ground completion,
 - b. 73.8 hrs air check,
 - c. 64.0 hrs spent in the office applying corrections to the reformat, and
 - d. 50.0 hrs spent in the office doing edits/joins.
12. These timings do not include preparation/allocation time for tasking, ie maps, vehicles, LOH, pilots, briefings, civil liaison with property owners, transit time, etc.

AMENDMENTS/COMMENTSAshton / Mt Elizabeth

13. Cultural. Generally, plotted cultural detail was portrayed well with the following amendments and/or comments apply:
- a. The old Gibb River-Wyndham Road was visible from the air but not on the ground, therefore it was deleted.
 - b. Most tracks that were approximately positioned from old source data were deleted.
 - c. Numerous Telstra towers were added. All towers not previously displayed were added with available heights.
 - d. Nearly all vehicle tracks in the AO are four wheel drive only or impassible in the wet season.
 - e. Nearly all fences in the AO had access tracks on both sides. Placing the text "track follows both sides of fence" would only clutter congested areas. Descriptive text was placed when necessary.
14. Drainage. The portrayal of drainage was generally good with only minor amendments. The extended wet season made it difficult to change or re-classify the drainage classifications. Some of the other factors that made amending the drainage difficult were:
- a. It was just at the end of the wet season and all drainage features had water in them.
 - b. The AO had an above average rainfall for the year.
15. Relief. Relief generally was portrayed well. The following ammendments/comments apply:
- a. Faultlines portrayed in all areas except where distorted surface occurs are called 'sandstone bars' (local knowledge). They are highlighted by a denser line of trees or lines of low level rocks and will impede movement to vehicles. In some cases, water will settle around them making the area boggy.
 - b. The distorted surface areas on 41673 and 41674 appeared not to be accurately portrayed. Supplementary photography was taken of an area on the western edge of 4167 to determine if this was the case. The results of this investigation are shown below:
 - (1) The areas plotted as distorted surface on 41673 and 41674 are correctly portrayed. Areas portrayed as scattered vegetation in the same location contain distorted surface but are not as prominent.
 - (2) The mapping photography shows both areas as a lighter colour. The main difference being that the distorted surface that was plotted, is more prominent.
 - (3) The supplementary photography showed the scattered areas to contain distorted surface but was not conclusive. The following

note should be added to these areas: "numerous rocky outcrops in this area".

- c. During the air check phase of the field completion it appeared that a large number of cliffs were not plotted on 4364 2. Studying the mapping photography showed that there are some cliffs not shown but not as many as originally believed. These cliffs were added using the zoom transfer scope (ZTS).
16. Vegetation. Vegetation portrayal was good throughout the AO, the most relevant change was the average height of vegetation. This was adjusted to an average of 5 or 6m over the entire block.
17. Nomenclature. The following amendments/corrections apply:
- a. The Old Doongan homestead is in ruins. Doongan homestead is presently called King Edward River but this may change as new owners took over the homestead as of 30th May 1995.
 - b. Drysdale River South on 4165 4 and 4166 3 was renamed to Jopalli River.
 - c. The Mount Elizabeth homestead originally shown is now called Old Mount Elizabeth homestead. The new Mount Elizabeth homestead is now at GR 906825 on 4165 3.
 - d. Durack River homestead was added.
 - e. The Kurunjie Road has been repositioned due to the old road being washed out and overgrown, therefore the name was shifted accordingly.
18. All other nomenclature corrections were as listed on the Nomenclature sheets. These sheets have been completed and will be forwarded to the appropriate authority at a later date. The listings include recommendations to change the names of 4 map sheets. A list of these map sheets are included in Appendix 1 to Annex C.
19. Joins. No problems occurred affecting internal joins. External joins to the block were not completed as no data was supplied with the block.
20. Probable Obsolescence Rate (POR). The POR for the AO is 4, Undeveloped Area. The area comprises mostly of cattle properties with only six homesteads situated inside the AO.
21. Supplementary Photography. Supplementary photography is detailed in Annex G.
22. Production Data Folders. All recommendations as detailed in References B and C have been answered. Each item was actioned in the normal course of the field completion operation.

CONCLUSIONS

23. The following conclusions are made:
- a. The ground checking phase of the operation was discontinued due to the rain and the extended wet season.

- b. Roads digitised from outdated source material and annotated as approximate position proved little value and wasted the time of the Field Completion Parties.
- c. Portrayal of Distorted Surface in some areas caused concern.
- d. Some cliffs were not plotted on 4364 2.
- e. Faultlines were well portrayed.

RECOMMENDATIONS

24. The following recommendations are made:

<u>Recommendation</u>	<u>Recommended Action By</u>
a. Future operations in similar AO's should not commence until June to allow for the end of the wet season.	4 Fd Svy Sqn & Army Svy Regt
b. The practice of digitising additional cultural detail from 10 year old source data to supplement current mapping photography should cease immediately. Source data should be used as an aide only.	4 Fd Svy Sqn & Army Svy Regt
c. Distorted surface should be left as shown with a note added "numerous rocky outcrops in this area" and placed in or near to the scattered vegetation areas on 41673 and 41674.	4 Fd Svy Sqn & Army Svy Regt
d. Extra cliffs to be added using the ZTS on 4364 2.	4 Fd Svy Sqn & Army Svy Regt
e. Fault lines should remain as shown.	4 Fd Svy Sqn & Army Svy Regt

November 1995

P. Hardy
Sergeant
Compilation Supervisor

ANNEX G TO
OP MIZMAZE 95
OPERATION REPORT
DATED 10 NOV 95

AERIAL PHOTOGRAPHY REPORT

General

1. Supplementary and Vital Asset Protection (VAP) photography was flown during the period 27 May to 6 Jun 95, throughout the AO.
2. Photography was acquired using a WILD RC10 Camera, Serial No. 2611 with a Super Wide Angle lens, Serial No. 2090, mounted in a Cessna Titan 404, No. VH-CSV.

Results

3. Supplementary Photography. Approximately 3 380 line kms of supplementary photography was flown using 64.8 task hours. The photography was flown at a scale of 1:25 000 with a forward overlap of 60%. Photography in the Darwin region was flown as full block coverage, which was approximately 80% of overall photography. Achieving block photography at 1:25 000 scale meant that overall an inordinate amount of time was spent achieving this task. It would have been more time and cost efficient to only fly photography of those areas requested by field check parties. This would have reduced the amounts of film, photographic paper, chemicals and flying hours used. Diagrams showing coverage are in Appendices 1 to 5.
4. Vital Asset Protection Photography. Requests for VAP photography were received from 1 Topo Svy Sqn and the MGI PP for various targets within the AO. Vertical and oblique photography was flown with Kodak Plus-X 2402 and Kodak Aerocolor being used. A diagram showing coverage is in Appendix 6.

Personnel

5. The following personnel were involved:
 - a. 329037 CAPT D.H. Kemp, 173 Surveillance Squadron, Pilot;
 - b. F328934 LT T.C. Bucknall, 4 Field Survey Squadron, Air Camera Ops Offr;
 - c. 49654 SGT P.D Longbottom, 4 Field Survey Squadron, Air Camera Operator;
 - d. 454289 CPL G. Huxley, 4 Field Survey Squadron, Air Camera Operator;
and
 - e. W131910 CPL C. Sisson, Photographic Section, 6 Squadron, Versamat Operator.

Processing

6. Film Processing. Film processing was carried out at RAAF Base Darwin utilising 6 Squadron's Versamat film processor. Two rolls of film were sent by overnight courier for processing by 6 Squadron's Photographic Section, RAAF Amberley. One roll of film was processed at Central Photographic Establishment (CPE), RAAF Williams, on return to Adelaide. The colour photography was processed in Adelaide by the Department of Environment and Natural Resources (DENR).

7. Paper Print Production. Paper prints were produced using the Zeiss KG30 Contact Printer and the Metaform Paper Processor. This was carried out during the Operation utilising the dark room facilities at Dripline High School, Darwin. Paper prints were also produced at 4 Fd Svy Sqn on return to Adelaide. Colour prints were produced by DENR in Adelaide.

8. Dispatch. Eleven rolls of film and accompanying A36 Photographic Reports were despatched safe hand to CPE, for registration and storage.

WILD RC 10 Aerial Camera

9. The WILD RC10 was fitted and removed from the aircraft in Canberra, where the plane operates from. There were no problems encountered with the insertion of the camera or any aspect of the camera during the operation.

Equipment Problems

10. Kodak Versamat. The Kodak Versamat located at RAAF Darwin is owned by 6 Squadron, RAAF Amberley. As such the equipment is only utilised on the occasions that personnel from 6 Squadron are deployed to Darwin. For the processor to remain fully serviceable it is required to be operated on a regular basis. On initial use by CPL Sisson there were a number of mechanical problems that took several days to rectify. Therefore film, which was urgently required, was air freighted to RAAF Amberley for processing, until the Versamat was fully operational.

11. An electrical problem towards the end of the operation meant that one roll of film was transported back to Adelaide and processed by CPE.

Army Aviation Support

12. The Cessna Titan 404 was on contract to AAAvn from Vee H Aviation Pty Ltd as a result of the grounding of the Defence Forces Nomad Aircraft. CAPT D. Kemp provided the pilot support for the entire operation. CAPT Kemp has worked with RASvy previously on Aerial Photography operations and that experience coupled with his professionalism, proved to be a great asset to the detachment.

Conclusions

13. All supplementary and the majority of VAP photographic tasks were completed in the allocated time.

14. The use of a civilian plane under contract to the Army proved to be a successful venture.

15. Full block coverage is an inefficient, costly and time consuming way of flying Supplementary Photography.

Recommendations

16. Only areas requested by field parties have Supplementary Photography flown.

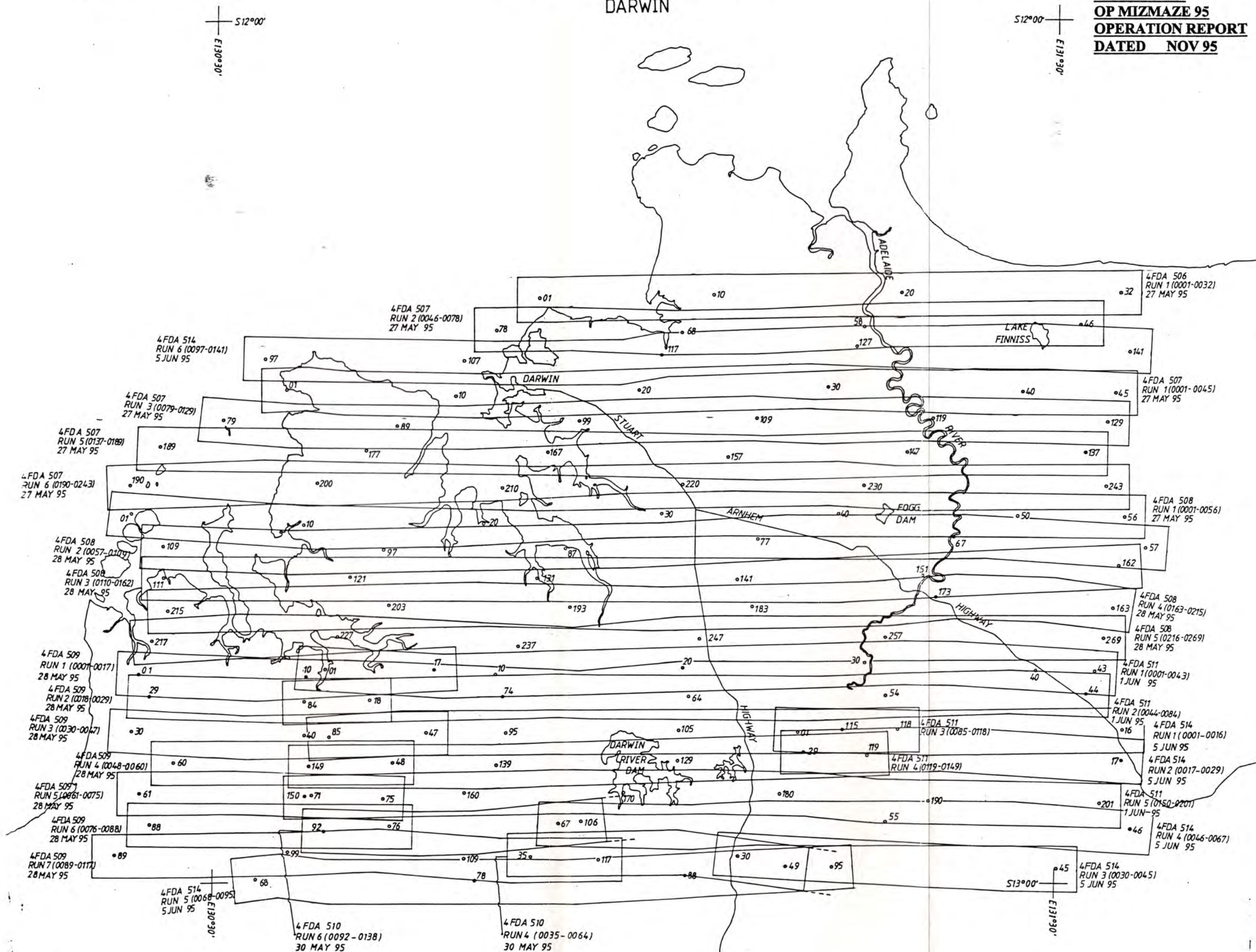
17. If military aircraft are unavailable for use, then a civilian plane should be contracted.

October 1995

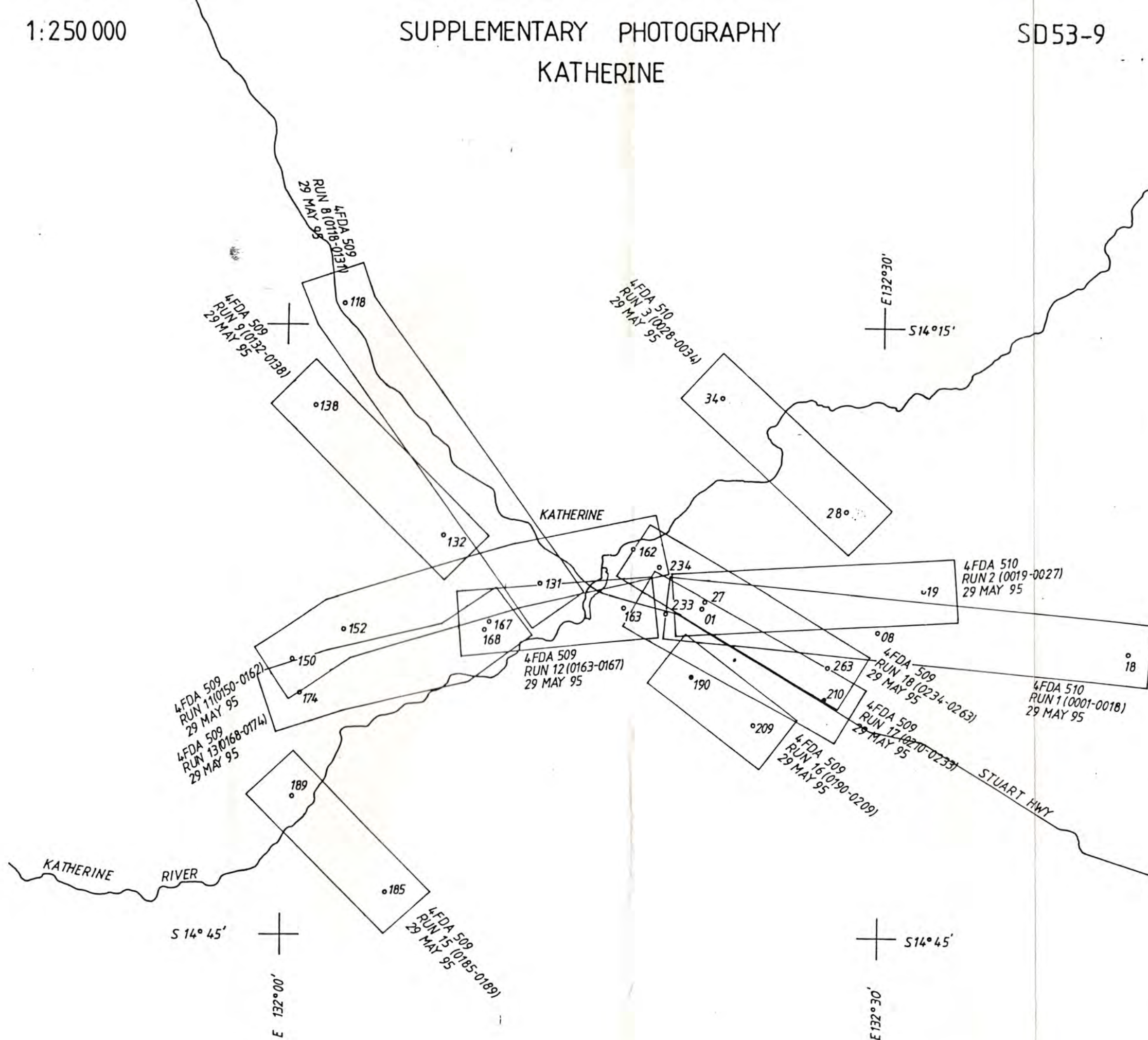
T.C. BUCKNALL
Lieutenant
Air Camera Operations Officer

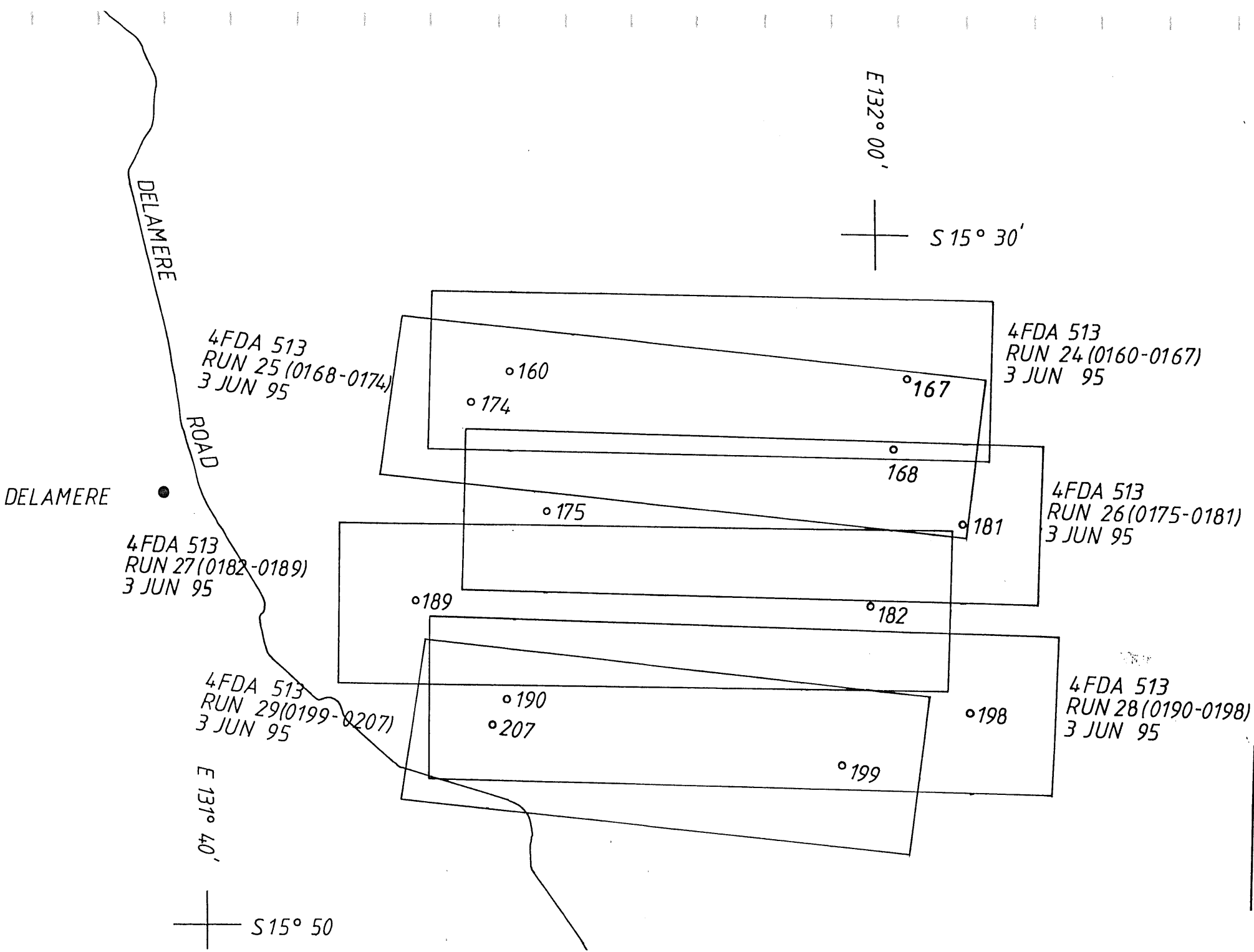
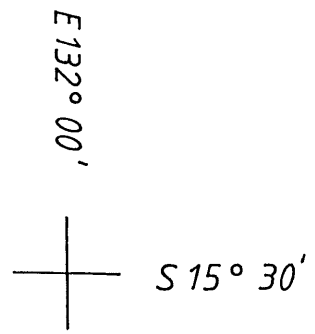
Appendices:

1. Darwin Supplementary Photography Overlay
2. Katherine Supplementary Photography Overlay
3. Delamere Supplementary Photography Overlay
4. Ashton Supplementary Photography Overlay
5. Mt Elizabeth Supplementary Photography Overlay
6. VAP Photography Overlay



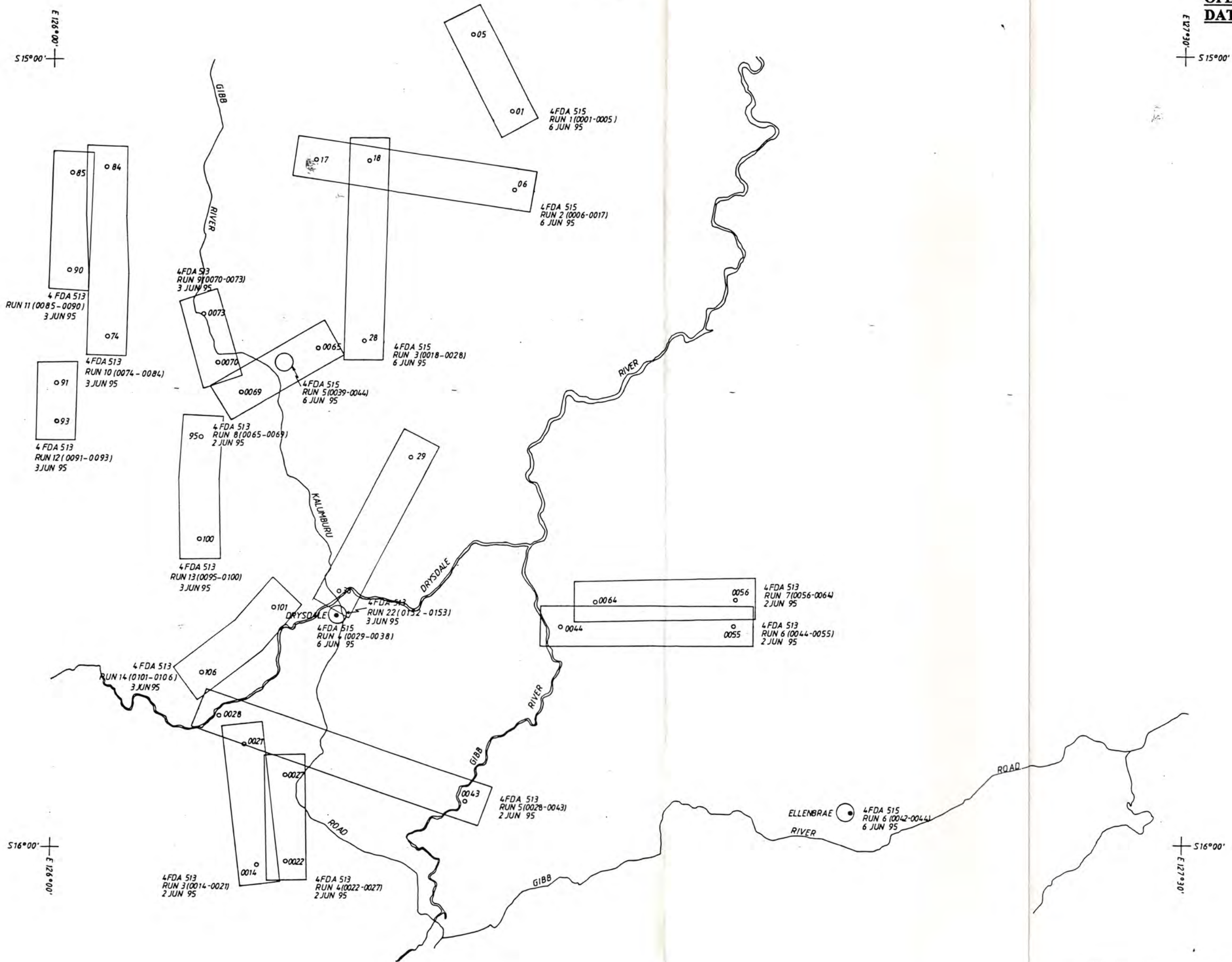
SUPPLEMENTARY PHOTOGRAPHY
KATHERINE





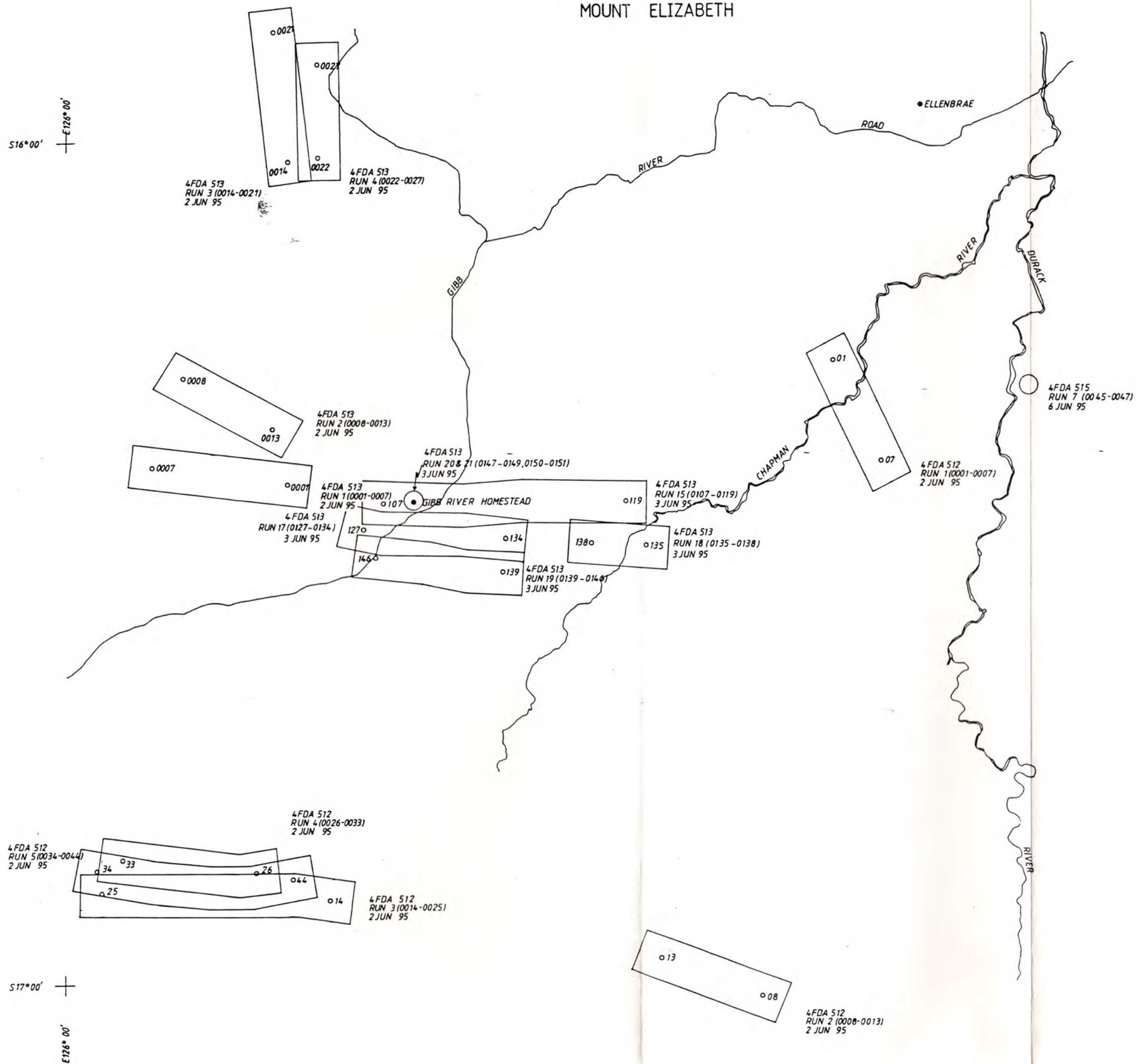
E 126° 00'
S 15° 00'

E 127° 30'
S 15° 00'



S16°00' + E126°00'

E127°30' + S16°00'



S17°00' + E126°00'

E126°00'

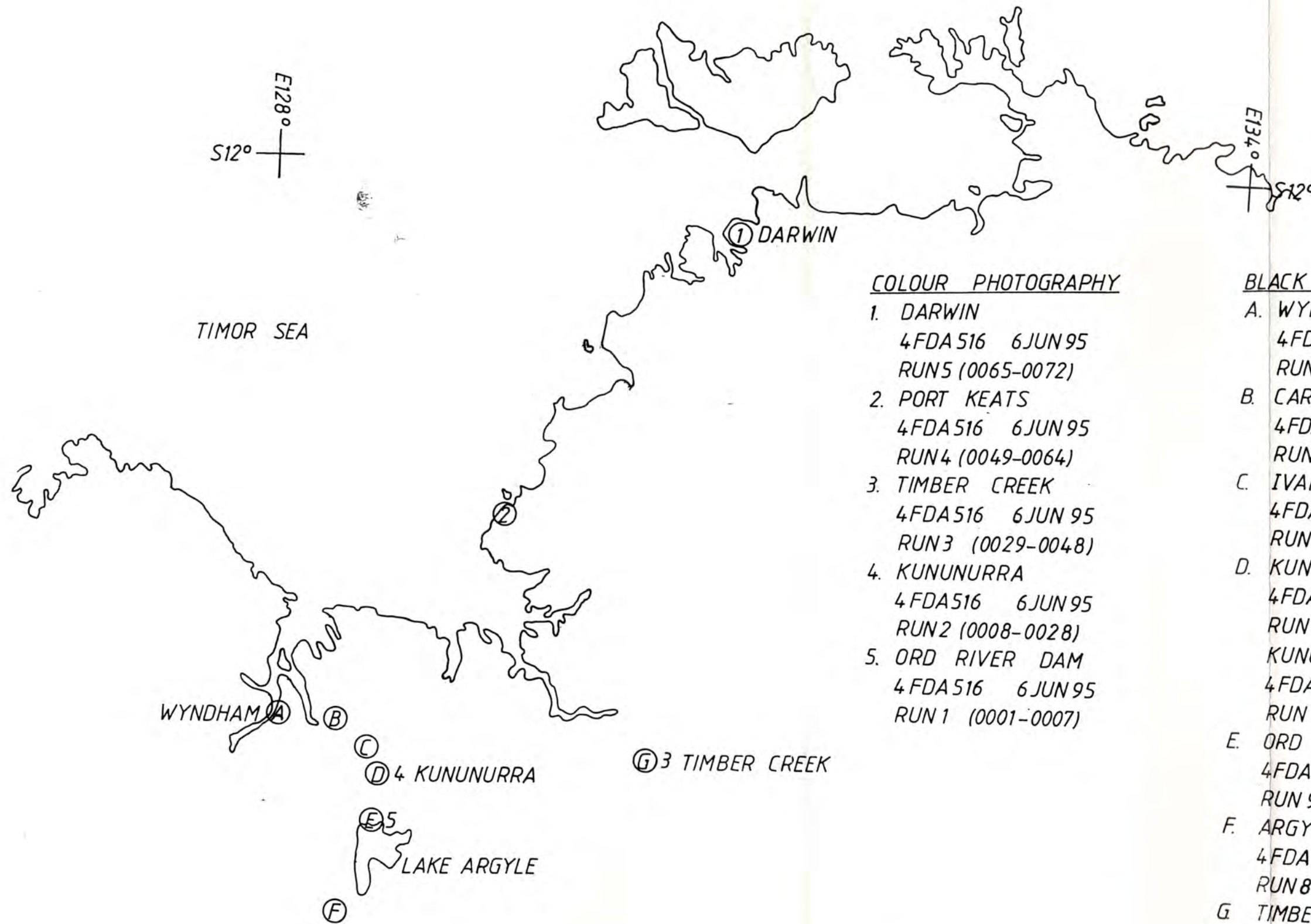
+ S17°00'

E127°30'

4FDA 512
RUN 2 (0008-0013)
2 JUN 95

VAP PHOTOGRAPHY

APPENDIX 6 TO
ANNEX G TO
OP MIZMAZE 95
OPERATION REPORT
DATED NOV 95



COLOUR PHOTOGRAPHY

1. DARWIN
4FDA516 6JUN95
RUN5 (0065-0072)
2. PORT KEATS
4FDA516 6JUN95
RUN4 (0049-0064)
3. TIMBER CREEK
4FDA516 6JUN95
RUN3 (0029-0048)
4. KUNUNURRA
4FDA516 6JUN95
RUN2 (0008-0028)
5. ORD RIVER DAM
4FDA516 6JUN95
RUN1 (0001-0007)

BLACK & WHITE PHOTOGRAPHY

- A. WYNDHAM
4FDA515 6JUN95
RUN 15 (0075-0076)
- B. CARLTON HILL HOMESTEAD
4FDA 515 6JUN 95
RUN 14 (0074)
- C. IVANHOE CROSSING
4FDA515 6JUN95
RUN13 (0073)
- D. KUNUNURRA-DIVERSION WALL - AIRFIELD
4FDA515 6JUN95
RUN12 (0070-0072)
KUNUNURRA
4FDA515 6JUN95
RUN11 (0060-0069)
- E. ORD RIVER DAM WALL
4FDA515 6JUN95
RUN 9 (0055-0056)
- F. ARGYLE MINE
4FDA515 6JUN95
RUN8 (0048-0054)
- G. TIMBER CREEK
4FDA 513 3JUN95
RUN 23 (0154-0159)

NOT TO SCALE

ANNEX H TO
OP MIZMAZE 95
OP REPORT
DATED 10 NOV 95

OPERATION MANNING

1. 4 Fd Svy Sqn:

a. Darwin:

322069	MAJ	P.C. Demaine
F328934	LT	T.C. Bucknall
329605	LT	P.A. Davies
45892	WO2	S.C.Capp
1204137	SSGT	B.W.Collings
212143	SSGT	P.J. Sandberg
180179	SGT	F.L.Downie
1202719	SGT	M.D. Evans
49654	SGT	P.D. Longbottom
321968	SGT	S.E.McGuinness
555441	CPL	I.D. Baldwin
325734	CPL	P.J.Ball
F6800034	SPR	F.A. Calvert
453378	CPL	A.D. Clarke
454289	CPL	G. Huxley
184457	SPR	M. Linwood
3804924	SPR	D.K. Miller
183333	CPL	B.C. Parkin

b. Drysdale River:

328915	CAPT	R.C. Carpenter
424848	WO2	S.M. Clark
315292	WO2	P.W. Hammer
318818	SSGT	P.A. Drover
49351	SGT	P.A. Hardy
3804915	CPL	M.J. Arnold
454834	CPL	R.P. Crawford
3804881	CPL	C.V.R. Pearse
3168177	CPL	N.A.Smith

2. Army Svy Regt:

320155	SGT	B.D.S. Johnson
555573	SGT	D.J.Q. Willis
321306	CPL	G.J. Webb
F3804739	SPR	D.L. Grayland
F3804904	SPR	A.D. Odgers
330705	SPR	A.T. Szczepaniak

3. 144 Sig Sqn:

543882	CPL	A. Mc Donald
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4. 161 Recce Sqn (LOH):

2306875	CAPT	G.D. Gibbons
1285796	LT	J. Otter
1800651	LT	M. Motts
1803423	LT	P.E. Tolchard
1800059	LT	J. Winder
282326	SGT	J. Dunningham
184608	CFN	R.J. Morgan

5. 173 Survl Sqn (Titan):

329037	CAPT	D.H. Kemp
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6. 107 Fd Wksp:

316123	SGT	W.A. Hobson
4801706	CFN	D. Walters

7. 6 Sqn Amberley:

W131910	CPL	K. Sisson
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OPERATION CONTACTS

1. The following is a list of civilian contacts of possible use for further operations mounted in the region:

- a. Mr Greg Heron (Manager - Information Centre)
NT Dept of Lands and Housing
Information Services Division Nichols Place
GPO Box 1680
DARWIN NT 0801
tel: (089) 89 7752
- b. Mr Ralf Lante
NT Dept of Lands and Housing
Aerial Photography Section
tel: (089) 89 6186
- c. Mr Percy Winkey (Chief Cartographer)
NT Dept of Lands and Housing
tel: (089) 89 7565
- d. Mr Austin James Chin (Client Services)
Power and Water Authority
Facilities Information Unit
Fourth Floor, Jape Plaza
Cavenagh St
DARWIN NT 0800
tel: (089) 827 068
- e. Mr Graham Reed (Chief Draftsman)
Power and Water Authority
Fourth Floor, Jape Plaza
Cavenagh St
DARWIN NT 0800
tel: (089) 827 111
- f. Anne and John Koeyers
Owners Drysdale River Homestead
PMB 9
via WYNDHAM WA 6740
tel: (091) 614 326