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Report No. 1011688. Project No. 1002588.

June 27, 2006

Lizanne Avon, Health Canada
Pest Management Regulatory Agency
Sir Charles Tupper Bldg, 2710 Riverside Dr.
Ottawa, Ontario
K1A 0K9

Re: Addendum to the Scoping Study to Assess Potential Historical Surface and Groundwater Migration Associated with Herbicide Spraying Operations at CFB Gagetown (Task 2E)

1.0 INTRODUCTION

Jacques Whitford Limited (JW) has completed the following report in response to Health Canada Pest Management Regulatory Agency (PMRA)'s receipt of additional well information from CFB Gagetown. It forms an addendum to the Scoping Study to Assess Potential Historical Surface and Groundwater Migration Associated with Herbicide Spraying Operations at CFB Gagetown (Task 2E) (May 25, 2006, Revised June 22, 2006) Project No. 1002588 Report No. 1011688 and is to be read in conjunction with that report.

As part of the information gathering efforts for subject report, PMRA sent a query to Base staff asking for additional information on potential potable water wells within the RTA. This information was received on June 14, 2006, and forms the focus of this addendum. In addition, incomplete identification of the number and location of potable water (bivouac) wells sampled during Task 2B has been corrected. The following sections outline the nature of the revisions to the report, and further describe the additional information on potential potable (bivouac) water wells received from Base staff.

2.0 SCOPE OF WORK / METHODOLOGY

To address the conditions noted above, the following tasks were executed:

- Task 1: Report Revision
- Task 2: Review and Compilation of Additional Base Information

The methodologies used for completion of each of these tasks are described below.

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2.1 Report Revision

Revisions to the report were undertaken as follows:

- Page 2 Section 1.2: addition of comment regarding PMRA query to base staff,
- Page 6 Section 3.1: addition of comment clarifying that the number of potable water wells sampled as part of the Task 2B field work was 12 (12 potable bivouac water wells within the RTA were reported, however two could not be located – Hogan Hill and Springbok - and two additional ones were found during the field work that were sampled – Blissville and Enniskillen), and
- Pages 7, 9, 14, and 15 (Figures 1-4): addition of Enniskillen and Blissville water (bivouac) wells to figures, removal of airfield and Drummond DML-south wells (not bivouac-realted).

2.2 Review and Compilation of Additional Base Information

The additional well information provided by the Base was reformatted into tabular form, as Attachment #3. This permitted automatic importing into ArcView GIS, and plotting of the well locations onto new Figure 1A, provided for reference as Attachment #1.

3.0 RESULTS

3.1 Report Revision

Attachment #2 holds hard copies of revised report pages 2 and 6 (text), and pages 7, 9, 14 and 15 (Figures 1-4).

3.2 Review and Compilation of Additional Base Information

The water well information supplied by the base lists 28 wells, 11 of which are reported to be for ‘domestic’ use and the remaining 17 of ‘unknown’ use. Note that the water well theme that forms part of the VMAP dataset identifies fourteen wells, the twelve associated with bivouac sites plus two more – the two sites in the theme that are additional to the twelve sampled as part of Task 2B are the airfield well (southeast area of base proper) and the well south of the Drummond demolition area. Note that the Hogan Hill and Sprinkbok bivouac sites were reported to have wells, but neither were found during Task 2B (also note that a Hogan Hill well does not exist in the VMAP dataset, although a Sprinkbok well does).

Bivouac sites not reported to have potable wells during the Task 2B field work (other than Blissville and Enniskillen as already discussed) were Nerepis, Olinville, Murphy, Elder Jackson, Jerusalem, George, Corner, Clark, Kelly,

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Lawfield, Oak, Little Swan and Goans. Of these thirteen sites, four are listed by name in the additional well information supplied by the base (Lawfield, Swan Lake/Swan Lake (SW6), and Jerusalem).

UTM coordinates are provided for all but three wells; with one of the coordinates being a misreport (for L 14, too many digits). It is beyond the scope of this scoping study to try to ascertain which of the listed wells are the same as the 12 bivouac wells sampled in Task 2B. Coordinate errors due to transformations or otherwise can be in the hundreds of meters; many of the listed wells are less that this apart, such that field verification will be required. As an approximate determination of well location, however, Figure 1A has been produced, which is Figure 1 with the addition of the tabulated wells provided by the base plotted as per the coordinates listed. It appears that all of the additional wells listed other than Lawfield, Swan Lake, and Jerusalem, are in the vicinity of bivouac sites originally reported to have potable wells.

4.0 CLOSURE

This addendum has been prepared for the sole benefit of Public Works and Government Services Canada (PWGSC), their client the Department of National Defence (DND) and their partner Health Canada. The addendum may not be used by any other person or entity without the express written consent of Jacques Whitford, PWGSC, DND and Health Canada, for any purposes other than those deemed necessary by them.

Any use that a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. Jacques Whitford accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made, or actions taken, based on this report.

The information contained in this addendum is based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this addendum, we request that we be notified immediately to reassess the information provided herein. We would like to thank you for the opportunity to submit this report. Please do not hesitate to contact David Wilson (613-738-0708) extension 231 or e-mail, dwilson@jacqueswhitford.com should you have any questions.

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Yours truly,

JACQUES WHITFORD LIMITED

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Attachments: #1 – Figure 1A
#2 – Revised Pages for Report
#3 – Tabulation of Additional Potential Potable Well Information Received from CFB Gagetown

DW/amc

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ATTACHMENT #1
Figure 1A

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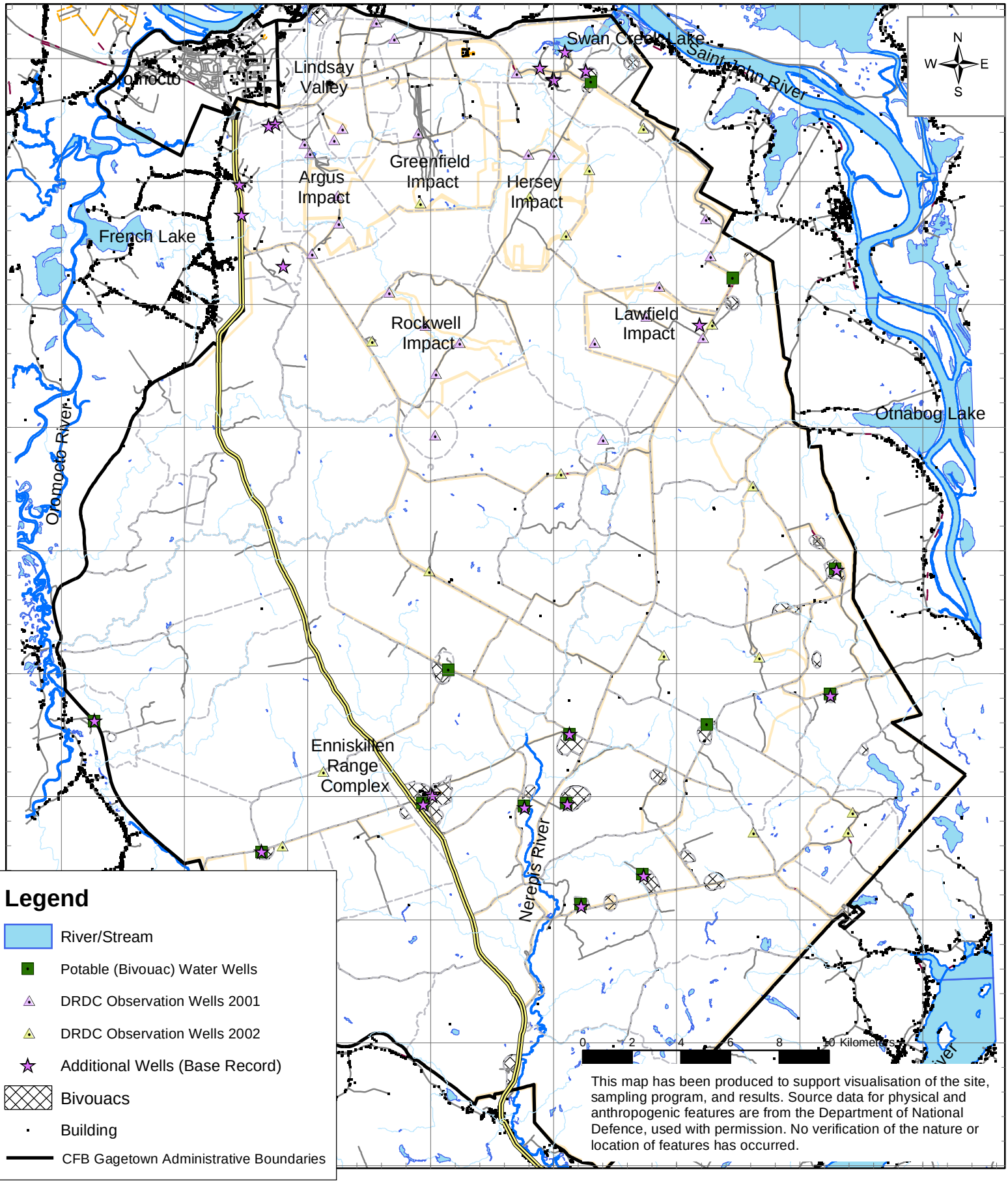

Legend

- River/Stream
- Potable (Bivouac) Water Wells
- DRDC Observation Wells 2001
- DRDC Observation Wells 2002
- Additional Wells (Base Record)
- Bivouacs
- Building
- CFB Gagetown Administrative Boundaries

This map has been produced to support visualisation of the site, sampling program, and results. Source data for physical and anthropogenic features are from the Department of National Defence, used with permission. No verification of the nature or location of features has occurred.

CFB Gagetown Environmental Site Assessment Herbicide Migration Potential Receptor Locations Including Additional Wells	Project 1002588. Report 1011688.	Drawn by DJW	Reviewed by CAO	Fig. No. 1A 2006-06-27

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ATTACHMENT #2
Revised Pages for Report

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In order to better establish the feasibility of executing the scoping study, available data covering the surface water and groundwater characteristics of the RTA were reviewed, as follows:

- Initial Environmental Evaluation of the Military Training Activities in the CFB Gagetown Training Area, Washburn and Gillis Assoc. Ltd., Jan. 28, 1994
- Research on the Environmental Conditions of Ground and Surface Water Prevailing in the Training Area at CFB Gagetown, New Brunswick – Part I, DRDC, Sep. 26, 2003
- Research on the Environmental Conditions of Ground and Surface Water Prevailing in the Training Area at CFB Gagetown, New Brunswick – Part II, DRDC, Apr. 18, 2005
- Interpretation of Baseline Stream Sediment and Water Quality Results CFB Gagetown, SNC Lavalin, 2005
- Vector Smart Map (VMAP) Level 2 Coverage Series: VMAP 2, MCE 24 Gagetown, 1997
- CFB Gagetown 1:10000 USGS Digital Elevation Model (DEM), DIIT, 1998

In addition, Health Canada Pest Management Regulatory Agency queried base staff asking for additional information on potential potable water wells within the RTA.

2.0 SCOPE OF WORK AND METHODOLOGY

2.1 Scope of Work

The scope of work for the scoping study was broken down into five tasks, as follows:

- Task 1: identification of potential human receptor (potable water well and frequented surface water body) locations
- Task 2: qualitative assessment of potential for surface water migration of herbicides and associated contaminants of concern to potential human receptor locations as identified in Task 2B through production of a sub-basin surface water drainage map using existing DEM
- Task 3: qualitative assessment of potential for groundwater migration of herbicides and associated contaminants of concern identified in Task 2B to potential human receptor locations through use of existing DRDC potentiometric surface map
- Task 4: preparation of a report and accompanying qualitative assessment results map that excludes areas where migration to potential human receptors is deemed highly unlikely

3.1 Task 1: Identification of Potential Human Receptor Locations

Potential human receptor locations are shown in Figure 1. Potential human receptor locations considered are as follows:

- Potable (bivouac) water wells
- Buildings (which may have private water wells associated with them)
- Surface water bodies with known recreational use (bathing, fishing)
- Natural areas for human use

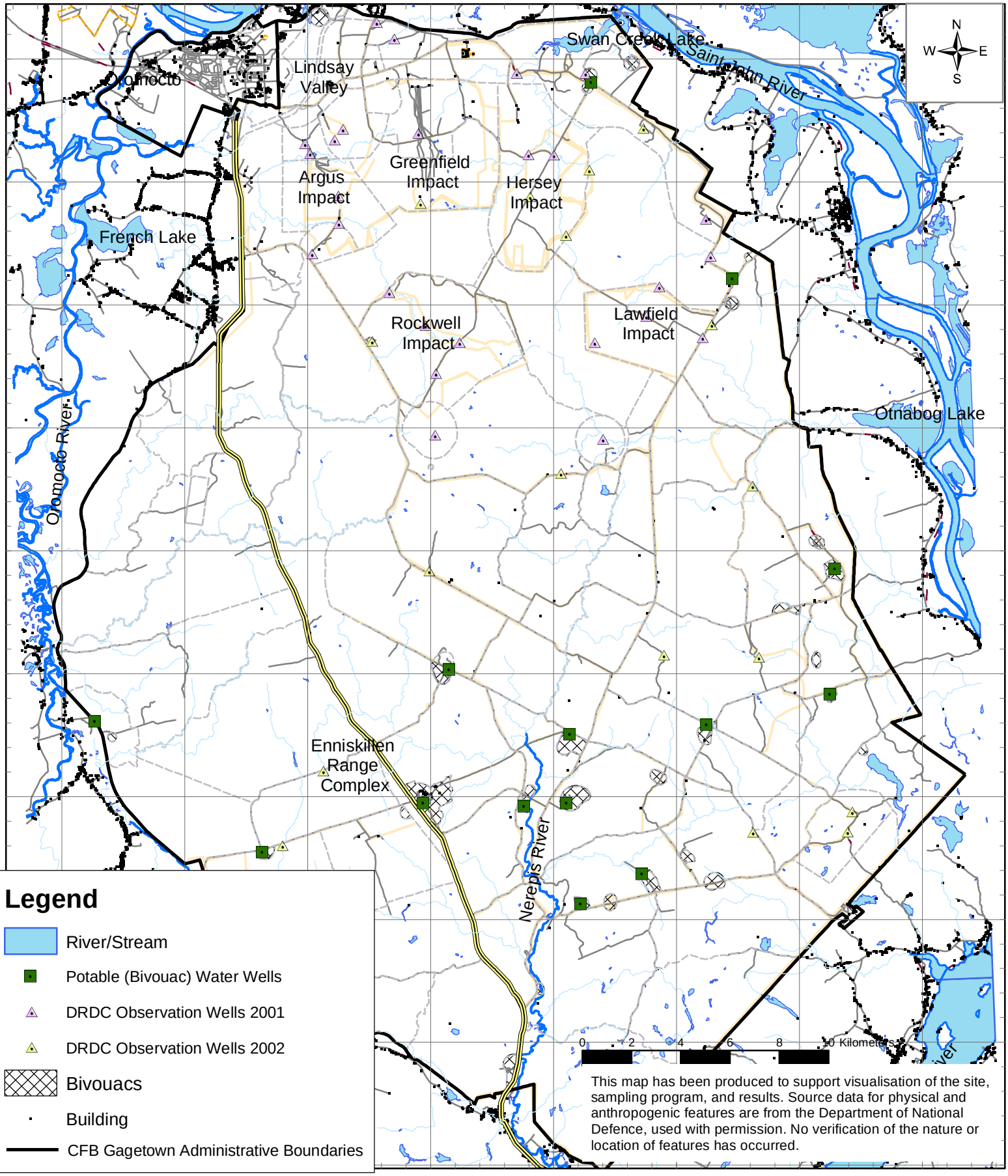
This report identifies 15 potable water wells within the RTA that are either directly in or are within 1 kilometer of plotted herbicide application areas. Twelve were sampled as part of the Task 2B field work[3]. Buildings that fall within application areas are confined to the east portion of the base proper, while some additional buildings near the base boundary fall outside application areas but within drainage basins that intersect application areas. Surface water bodies with known significant recreational uses include three lakes, French Lake which is approximately 5 km west of the northwest RTA boundary, Otnabog Lake which is approximately 2 km east of the central-east boundary, and Swan Creek Lake that has also reportedly seen some recreational use historically. Stream and river courses within the RTA are not open to visitor use, however some fishing in the Nerepis River is known to take place by base personnel. The Lindsay Valley natural area has also been established for use by base personnel – it is located within the RTA immediately east of the base.

The comprehensiveness of potential human receptor location information is fair. Good information is available covering potable water wells, buildings and natural areas for human use. Recreational use of surface water bodies is less well understood – off-site uses of French and Otnabog Lakes are well established, however information regarding on-site uses of bodies like the Nerepis River and Swan Creek Lake is mostly anecdotal in nature.

3.2 Task 2: Qualitative Assessment of Potential for Surface Water Migration of COPCs

Surface water drainage is detailed in Figure 2. The sub-watershed discretisation is shown, with the relevant watersheds (i.e., watersheds with recreational uses) highlighted, those being Lindsay Valley, French Lake – Rockwell Stream, Otnabog Lake and Stream, Swan Creek and Lake, and the Nerepis River and tributaries. Together, these basins include more than 70% of the RTA. The sub-watershed discretisation generated through the hydrology toolset in ArcView shows a good match to catchments as evident through creek/stream courses.

[3] Environmental Site Assessment of CFB Gagetown, NB: Task 2B – Stage 3, Field Program, Jacques Whitford, 2006



Legend

- River/Stream
- Potable (Bivouac) Water Wells
- DRDC Observation Wells 2001
- DRDC Observation Wells 2002
- Bivouacs
- Building
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CFB Gagetown Environmental Site Assessment Herbicide Migration Potential Receptor Locations Revised	Project 1002588. Report 1011688.	Drawn by DJW	Reviewed by CAO	Fig. No. 1 2006-06-27

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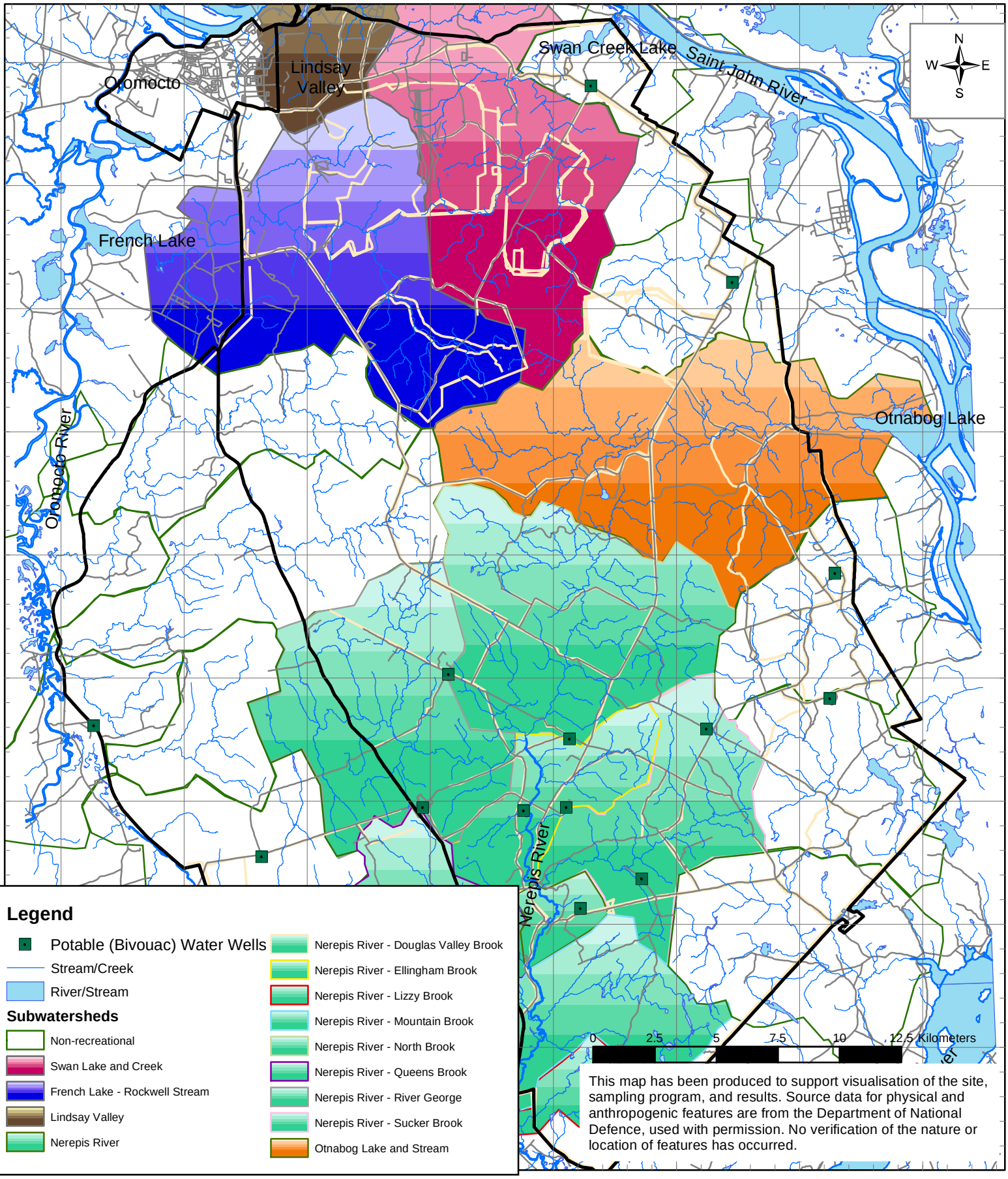

Legend

- Potable (Bivouac) Water Wells
- Stream/Creek
- River/Stream

Subwatersheds

- Non-recreational
- Swan Lake and Creek
- French Lake - Rockwell Stream
- Lindsay Valley
- Nerepis River
- Nerepis River - Douglas Valley Brook
- Nerepis River - Ellingham Brook
- Nerepis River - Lizzy Brook
- Nerepis River - Mountain Brook
- Nerepis River - North Brook
- Nerepis River - Queens Brook
- Nerepis River - River George
- Nerepis River - Sucker Brook
- Otnabog Lake and Stream

This map has been produced to support visualisation of the site, sampling program, and results. Source data for physical and anthropogenic features are from the Department of National Defence, used with permission. No verification of the nature or location of features has occurred.

CFB Gagetown Environmental Site Assessment Surface Water Drainage Revised	Project 1002588. Report 1011688.	Drawn by DJW	Reviewed by CAO	Fig. No. 2 2006-06-27

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