

Appendix I

The destruction, removal or rendering harmless of proscribed items and materials in connection with Iraq's biological weapons programme since 1991

1. This paper provides an historical review of the destruction, removal or rendering harmless of items and materials in connection with Iraq's proscribed biological programme.

2. While much was destroyed either unilaterally by Iraq or under the supervision of the Special Commission, there still remained many outstanding questions and issues related to Iraq's biological programme at the time of the commencement of inspections by UNMOVIC in November 2002. The lack of documentation or other evidence to support Iraq's claims of unilateral destruction of biological weapons or agent, as well as concern about the possible continuation or resumption of the programme during the period 1998-2002 when no inspections were conducted, resulted in a lack of certainty as to the completeness and accuracy of Iraq's declarations relating to its biological weapons programme.

Iraq's initial declarations regarding biological weapons

3. In April and May 1991, Iraq did not include any biological facilities, materials or activities in its declarations pursuant to Security Council resolution 687 (1991).

4. In August 1991, Iraq declared to the Special Commission that one facility, under the control of the Technical Research Centre at Salman Pak, had actually conducted research activities on biological warfare agents. Iraq acknowledged that those military biological activities were aimed at familiarization with biological warfare agents and that their results could be used for both offensive and defensive purposes. However, Iraq maintained that the work did not go beyond laboratory research and that no bulk production of biological warfare agents or their weaponization had ever occurred.

5. In August 1991, the first biological inspection team of the Special Commission inspected Salman Pak. It found that laboratories in the building of the Forensic Department of the Technical Research Centre where such biological warfare activities had been conducted had been destroyed or heavily damaged by coalition aerial bombardment. At the facility only an underground cold storage bunker and a structure used as an animal house remained intact.

6. Iraq also handed over to the first biological inspection team the remaining bacterial isolates it had obtained from international culture collections. They comprised some 70 unused original vials with different microbial materials, including *Bacillus anthracis*, *Clostridium botulinum*, *Clostridium perfringens* and *Brucella*. All the materials were removed from Iraq by the first biological inspection team of the Special Commission.

7. During 1991 and 1992, Iraq further declared and the Special Commission subsequently inspected several other biological facilities that, according to Iraq, had never been involved in biological warfare activities. These included Al-Hakam single cell protein production facility at Latifiyah, Al-Kindi Veterinary Vaccine Production Company at Abu Gharaib, the foot and mouth disease vaccine plant at

Al-Dawrah, the Amiriyah Serum and Vaccine Institute and the Agricultural Research and Water Resources Centre at Al-Fudhaliyah. The Special Commission noted the dual-use capabilities present at some of those facilities, but found no conclusive evidence of their affiliation to past biological warfare activities at that time.

8. In addition, in the same period, the Special Commission inspected a variety of sites not declared by Iraq and other locations referred to it by outside sources as having been allegedly involved in Iraq's past biological weapons programme. They included suspected facilities with possible underground structures. No such facilities matching the descriptions given were found in Iraq, however.

9. By 1995, the Special Commission, in the course of its continuing verification activities, collected much evidence suggesting that Iraq's biological weapons programme had not only been limited to research activities but had also included the production of bulk biological warfare agents and, possibly, their weaponization. The evidence included information received from former suppliers on Iraq's procurement of specific types of equipment and large quantities of bacterial growth media required for bulk production of biological warfare agents. In May and June 1995, Iraq was asked to clarify the evidence and to make final disclosure of the full extent of its biological weapons programme.

Further disclosure of the biological weapons programme

10. In July 1995, under pressure from the Special Commission, Iraq finally admitted the production of bulk biological warfare agents. Iraq stated that the biological weapons programme had been obliterated shortly after the 1991 Gulf war. Iraq acknowledged that it had decided not to declare the full extent of its biological weapons programme, to remove any evidence of its former existence but to retain all remaining associated facilities, equipment and materials. According to Iraq, a clean-up of the sites involved in the biological weapons programme began in June 1991 and continued until August 1991, prior to the arrival in Iraq of the first biological inspection team of the Special Commission.

11. Information on the weaponization of biological warfare agents was provided by Iraq following the defection of Lieutenant General Hussein Kamal from Iraq in August 1995. Iraq provided to the Special Commission documents including those related to its biological warfare activities, on research, production, field trials and weaponization.

12. With respect to weaponization, Iraq declared that warheads for the Al-Hussein missiles and R-400 aerial bombs had been filled with liquid biological warfare agents. It also provided information on other types of aerial and artillery munitions used in field trials with biological warfare agents or simulants. At that time Iraq declared the involvement of other major facilities in its biological weapons programme. The list of other facilities given below excludes sites used for field testing, storage or destruction:

- The Ibn Sina Centre of the Al-Hazen ibn al Haitham Institute was the first organization in Iraq to be involved in biological weapon research during the period from 1974 to 1978. Several old structures belonging to that organization remained abandoned and non-functional at Salman Pak.
- Laboratory buildings of the toxicological section of the Research and Development Department of the Muthanna State Establishment hosted a

biological weapon research group during the period from 1985 to 1987. Those structures and parts of the filling plant at the Muthanna State Establishment used to weaponize biological agents were destroyed by aerial bombardment in 1991.

- The single cell protein production unit at Al-Taji was used for pilot production of *Botulinum* toxin in 1988. All equipment at the unit was transferred to Al-Hakam by the end of 1988. The site was not operational after 1988 and contained no biological equipment or capabilities.
- The Al-Hakam complex was Iraq's major biological weapon research, production and storage site. It was constructed in 1988 as a dedicated biological weapon facility. By the time it was first inspected by the Special Commission in 1991, Al-Hakam had been converted into a civilian facility and stripped of any obvious signs of its former role. The equipment that had previously been used to produce biological warfare agents was producing, or attempting to produce, yeast for animal feed. Other equipment was used for the production of a bacterial insecticide. From 1991 to 1995, Al-Hakam continued to operate as a civilian complex and, in fact, underwent expansion.
- The Agricultural Research and Water Resources Centre (Al-Safah project) at Al-Fudhaliyah was utilized in 1990 for biological weapon research and production. Aflatoxin was produced there. The Centre was also used in 1990 for the storage and later destruction of wheat cover smut that had been produced during previous Technical Research Centre activities. When the Special Commission inspected the buildings associated with the proscribed programme at the Al-Fudhaliyah Centre in 1991, it was found to have been abandoned.
- The foot and mouth disease vaccine plant (Al-Manal project) at Al-Dawrah was acquired by the Technical Research Centre in 1990 and used for biological weapon research and the production of *Botulinum* toxin. By the time the Special Commission first inspected it in 1991, the plant had been returned to the Ministry of Agriculture and all trace of production activity of weapons of mass destruction had been removed.
- Al-Kindi Veterinary Vaccine Production Company at Abu Gharaib was not directly involved in biological weapon activities, but its fermentation and support equipment was transferred to Al-Hakam, and later used to produce biological warfare agents. The facility had also been used to train Al-Hakam personnel.
- The Amiriyah Serum and Vaccine Institute was used for the temporary storage of bacterial isolates in 1991, prior to their being given to the first biological inspection team. The Rasheed Central Military Hospital at Zafaraniyah was involved in the acquisition of some bacterial isolates.
- The State Establishment for Heavy Engineering Enterprises produced 5-m³ storage tanks and 1-m³ mobile tanks used at the Al-Hakam complex for the storage and transport of biological warfare agents.
- The Nasser State Establishment was involved in the production of R-400 aerial bombs for biological and chemical warfare fill. According to Iraq, moulds for the production of R-400 bombs were destroyed unilaterally at the Muthanna

State Establishment in 1991. However, the Special Commission was not able to locate remnants of the destruction. Other general-purpose machinery used for the production of R-400 bombs remained intact.

- Project 144 was involved in the production of missile warheads for filling with biological warfare agents. All structures and equipment involved in the production of warheads were destroyed through aerial bombardment in 1991.

Unilateral destruction of biological weapons and agents

13. Iraq also declared that it had unilaterally destroyed all biological weapons and bulk agents during July and August 1991. After August 1995, Iraq recovered and provided for verification by the Special Commission and later UNMOVIC remnants of biological munitions (missile warheads and aerial bombs that had been filled with *Bacillus anthracis*, *Botulinum* toxin and aflatoxin), including several intact bombs, and locations of the unilateral destruction of bulk agent (*Bacillus anthracis*, *Botulinum* toxin, *Clostridium perfringens* and aflatoxin). These included a dumping site at Al-Hakam, Al-Aziziyah firing range and Al-Nibai desert.

14. In 1996, Iraq declared and identified the site of the unilateral destruction of biological bulk agent at Al-Hakam. Samples were taken by the Special Commission and analysis at that time indicated that the samples contained elevated levels of *Bacillus anthracis* spores. Genotypic analysis of the samples was recently conducted by the same laboratory contracted by UNMOVIC. The results of the analysis are reported in paragraph 5 of the report.

15. Although no complete documentation relating to the unilateral destruction was said to be available, Iraq's statements are consistent with the qualitative results obtained through sampling and analyses indicating that some of the biological weapons and agents were indeed destroyed at locations declared by Iraq.

16. Owing to the extent of the destruction carried out by Iraq and the stated lack of records relating to those activities, it was not possible to fully quantify all aspects of Iraq's account of its unilateral destruction, including quantities of bulk agents and numbers of munitions. During February and March 2003, however, Iraq presented to UNMOVIC initial findings on the study for the quantification of bulk agent and the number of R-400 bombs destroyed at Al-Aziziyah and Al-Hussein warheads destroyed at Al-Nibai.

17. Iraq declared that the "working seed stock" of microbial materials reproduced from bacterial isolates received from international culture collections and used for the production of bulk agents had also been destroyed unilaterally through autoclaving by the end of 1990. No positive verification of Iraq's statement was possible, however, owing to the absence of verifiable evidence or destruction records.

Destruction of biological weapon-related items under Special Commission supervision in 1996

18. In June 1996, in the light of new information revealed by Iraq, the following facilities, items and materials were designated by the Special Commission for destruction and were subsequently destroyed, removed or rendered harmless by Iraq under Special Commission supervision:

- The entire Al-Hakam biological weapon complex was destroyed, including all buildings, support infrastructures, utilities, equipment and materials. In total, over 300 pieces of equipment, instruments and laboratory accessories and all microbial cultures found at the facility were destroyed. They included equipment and materials acquired by Al-Hakam from the single cell protein plant at Al-Taji and Al-Kindi Company.
- Some 28 tons of bacterial growth media and chemical ingredients procured by Iraq for its biological weapons programme were destroyed. This included not only materials that remained at Al-Hakam but also the media collected from four other storage locations declared by Iraq.
- About 40 pieces of equipment used for the production of *Botulinum* toxin at the foot and mouth disease vaccine plant were destroyed. The equipment included various sizes of fermenters and vessels, as well as separators, centrifuges, autoclaves and refrigerators transferred from that plant to Al-Hakam for their destruction. The air-handling system at the plant was rendered inoperable.
- Four environmental chambers, a fume hood and an incubation oven used in connection with the production of aflatoxin at the Agricultural Research and Water Resources Centre were also transferred to Al-Hakam and destroyed.
- Seventeen pieces of laboratory equipment remaining in the Technical Research Centre laboratories at Salman Pak, including autoclaves, sterilizers and freeze dryers, were moved to Al-Hakam for destruction. Eight aerolization devices were removed from the Centre and taken into the custody of the Special Commission for further evaluation and analysis.

Destruction of biological items under UNMOVIC supervision in 2003

19. As noted in the Commission's thirteenth quarterly report (S/2003/580), in addition to the destruction of biological weapon-related items mentioned above, UNMOVIC observed and verified the destruction of 244.6 kilograms of growth media, declarable under the monitoring plan, that had exceeded its useful shelf life. The inspectors also observed and verified the destruction of 40 vials of expired toxin standards used in food testing and analysis.

Status of facilities involved in Iraq's biological weapons programme after 1996

20. The foot and mouth disease vaccine plant has not been operational since 1992. As the facility was originally constructed for the production of animal vaccines and, according to Iraq, was only being temporarily used in the biological weapons programme, its buildings, infrastructures and remaining equipment not directly involved in biological weapon-related activities were not designated for destruction by the Special Commission. It must be recalled that equipment destroyed under Special Commission supervision at that plant was largely identified on the basis of Iraq's declarations and the recollections and testimonies of personnel regarding its past use, as well as sampling and analysis. In addition, the sewage treatment system, steam generator and water plant used in the past to support the production of *Botulinum* toxin had not been destroyed, as the facility had already been rendered harmless through the disablement of the air-handling system.

21. Equipment remaining at the plant, including autoclaves, a steam sterilizer, an incinerator, stainless steel fermenters with exhaust air filtration, stainless steel mixing tanks with exhaust air filtration, a dozen mobile stainless steel tanks, a variety of centrifuges and filter presses and several freeze driers, were tagged. The facility was placed under monitoring by the Special Commission and inspected by UNMOVIC.

22. A similar approach was taken by the Special Commission with regard to the Agricultural Research Centre at Al-Fudhaliyah. In the mid-1990s, it was transformed into the State Company for Water Resources Research under the Ministry of Irrigation. The Special Commission decided not to destroy its buildings and infrastructure, which had not been directly involved in the production of aflatoxin. Some equipment was taken to Al-Hakam for destruction. The remaining equipment comprised one centrifuge, shakers, shaking incubators and biosafety cabinets. The facility was also placed under monitoring by the Special Commission.

23. There was no dual-use biological equipment left at the former single cell protein plant at Al-Taji. UNMOVIC inspected the facility and found that recently, with certain structural modifications, the building of the former plant had been rehabilitated and occupied by two petrochemical laboratories belonging to the Baghdad liquid petroleum gas filling plant of the Ministry of Oil.

24. Other facilities and equipment declared by Iraq in connection with its biological weapons programme that had not been directly involved in biological weapons research and production, including the Al-Kindi Company, the Amiriyah Serum and Vaccine Institute, the Rasheed Hospital, the State Establishment for Heavy Engineering Enterprises and the Nasser State Establishment were not designated for destruction, but placed under monitoring. UNMOVIC inspected all these facilities in 2003 and found no evidence of proscribed activities.

25. Several structures belonging to the Al-Hazen Institute and the Forensic Department of the Technical Research Centre, including an underground bunker, still remain abandoned at Salman Pak.