UNITED
NATIONS

S

Security Council

Distr.
GENERAL

S/24223
2 July 1992

ORIGINAL: ENGLISH

NOTE BY THE SECRETARY-GENERAL

The Secretary-General has the honour to transmit to the members of the Security Council the attached communication which he has received from the Director-General of the International Atomic Energy Agency (IAEA).

Annex

Letter dated 24 June 1992 from the Director-General of the International Atomic Energy Agency addressed to the Secretary-General

Please find attached the report of the twelfth IAEA Inspection in Iraq under Security Council 687 (1991). You may deem it appropriate to transmit the report to the members of the Security Council. I remain, of course, available with the Chief Inspector, Mr. Demetrius Perricos for any consultations you or the Council may wish to have.

(Signed) Hans BLIX

REPORT ON THE TWELFTH IAEA ON-SITE INSPECTION IN IRAQ
UNDER SECURITY COUNCIL RESOLUTION 687 (1991)

26 May - 4 June 1992

SALIENT POINTS

- The destruction of key technical installations and equipment at the Al Atheer-Al Hatteen site, begun during the eleventh IAEA inspection mission to Iraq, was completed in the course of the twelfth mission. Three more buildings, with a combined surface area of approximately 11 000 square meters, and the remaining equipment items were destroyed.

- At the request of the inspection team, the Iraqi side has begun preparations for the destruction of selected buildings at the Tarmiya and Ash Sharqat EMIS sites. Related actions associated with the dismantling of utilities and ventilation systems and the reduction in delivered electrical power to the sites are also under way. Progress was monitored throughout the inspection mission. More than 50% of the necessary work has been done. The actions will be finished during the next mission.

- As was the case at the Al Atheer-Al Hatteen site, the Iraqi side is providing all equipment, materials and manpower necessary for the efficient fulfillment of the destruction plan under the supervision of the inspection teams.

- Despite repeated requests for information by inspection teams, the Iraqi side has implemented a government decision not to identify the suppliers of the maraging steel, the carbon fibre centrifuge tubes and technical advice regarding centrifuge technology. This "grey area" will persist as the IAEA Action Team continues to seek this information through other avenues.

- The work to identify the machine tools and better understand the overall capabilities existing in facilities declared by the Iraqi side to have been involved in the Iraqi Atomic Energy Commission programme was completed. The purpose was directly related to establishing the basis for the longer-term monitoring programme.

- The amount of undeclared nuclear material processed in a safeguarded fuel fabrication facility, in violation of the safeguards agreement between Iraq and the IAEA, has been revised upward by the Iraqi side from 19 kilograms to approximately 60 kilograms of natural uranium dioxide. This non-compliance with the safeguards agreement was first communicated to the IAEA Board of Governors in July and August 1991.

- The last quantity (473 grams U235) of fresh highly enriched uranium fuel remaining in Iraq was removed by the twelfth inspection team.

- Through written questions, meetings and interviews, some clarification of issues related to Iraqi work on weaponization and uranium enrichment and to Iraqi nuclear material declarations was obtained. Open issues related to the centrifuge enrichment programme and the extent of the chemical enrichment work remain.

- The Iraqi side's co-operation in implementing destruction plans at Al Atheer-Al Hatteen, Tarmiya and Ash Sharqat cannot be faulted and should be noted. However, in the course of the twelfth mission there was a definite stiffening in the Iraqi attitude to working with the inspection team. There were numerous attempts to prohibit or limit the taking of photographs and the placing of seals. Meetings, transportation and other activities were often slow to be organized. The Iraqi explanation was that the active co-operation extended during previous inspections had not resulted in an improvement in the sanctions situation.

INTRODUCTION

1. This report summarizes the findings of the twelfth inspection mission carried out by the IAEA under United Nations Security Council resolution (UNSCR) 687 (1991) with the assistance and co-operation of the Special Commission of the United Nations. The mission took place from 26 May to 4 June 1992 and was headed by Mr. Demetrius Perricos of the IAEA as Chief Inspector. The team consisted of 21 inspectors and 6 supporting staff; it comprised 17 nationalities.

The objectives of the inspection mission were broadly

- to supervise the completion of the destruction of key technical installations comprising buildings and equipment at the Al Atheer-Al Hatteen site.

- to supervise the destruction of key technical installations at the Tarmiya and Ash Sharqat sites.

- to clarify issues arising from nuclear material accountancy questions and to visit related facilities.

- to further investigate the work done in enrichment, particularly in the areas of centrifuge and gaseous diffusion methods, and to assess procurement data in the centrifuge area.

- to assess the Iraqi answers to questions related to experiments and studies in the area of weaponization and to inspect related facilities.

- to continue field activities related to the identification and cataloguing of equipment used or capable of use in Iraq's nuclear programme.

- to remove from Iraq the remaining quantity (473 grams) of fresh highly enriched uranium.

These objectives were assigned to three groups within the overall team, with a group leader responsible for co-ordinating the work of each group. A total of 23 facilities and sites were inspected. These are shown in Table 1. All of these facilities and sites had been inspected previously by an IAEA team.

Table 1

List of facilities and sites inspected during the twelfth inspection mission

1. Tuwaitha site and associated locations (Locations A, B, C, Ash Shakyli storage, Al Nafad storage)
2. Tarmiya site
3. Al Atheer site
4. Al Qa Qaa site
5. Ash Sharqat site
6. Al Jesira site, including uranium waste location and equipment storage
7. Al Furat project site
8. State Enterprise for Heavy Engineering Equipment (Daura)
9. Badr General Establishment
10. Auqba Bin Nafi State Establishment
11. Al Radwan
12. Al Ameer
13. Nassr Establishment (Taji)
14. Saladdine Establishment (SAAD-13)
15. Al Dijla site
16. Saddam State Establishment
17. Dhu Al Fiqar Establishment
18. National Computer Centre, Baghdad
19. Iskandariyah State Enterprise for Mechanical Industries
20. Al Qaim site
21. Geological Survey Institute, Baghdad
22. Al Hadre explosive test site
23. Nassariya Ur Establishment

SUMMARY

2. The Al Atheer-Al Hatteen complex, located approximately seventy kilometers south-west of Baghdad, has been identified by the IAEA as the site where Iraq had planned to locate its nuclear weapons development effort. The destruction of key technical installations and equipment at the Al Atheer-Al Hatteen site, begun during the eleventh IAEA inspection mission to Iraq, was concluded in the course of the twelfth mission.

Three large buildings (the carbide, powder and polymer buildings), with a combined surface of approximately 11 000 square meters, and two equipment items (large, hot and cold isostatic presses) were completely destroyed with explosive charges. Eight buildings, covering a surface of approximately 35 000 square meters, and equipment items that together constituted a major portion of the Al Atheer-Al Hatteen complex have now been destroyed.

As was the case in the eleventh mission, the Iraqi side provided all equipment, materials and manpower necessary for efficient implementation of the destruction plan under the supervision of the IAEA team.

3. A list of actions to be undertaken pursuant to UNSCR 687 with respect to the facilities at the Tarmiya and Ash Sharqat sites (see Annex 1) had been communicated to the Iraqi side on 15 May 1992. The Iraqi side responded with an energetic and well organized effort to carry out the required actions. The progress of the work at Tarmiya was inspected three times in the course of the twelfth mission. The work at Ash Sharqat was inspected twice. Overall, the work is more than 50% complete and the actions detailed in the 15 May 1992 letter, including the destruction of eight buildings (four at each site), will be concluded during the next mission.

4. The verification of Iraqi declarations regarding quantities of maraging steel and carbon fibre centrifuge rotors procured for Iraq's centrifuge programme and the identification of the source(s) of technical advice remain as open issues. A political decision by the Iraqi Government not to provide specific information on suppliers has been taken and formally communicated to UNSCOM. Resolution of these issues will be delayed while information is sought through Member States' Governments.

5. The work to identify the machine tools and better understand the related capabilities existing in facilities declared by the Iraqi side to have been involved in the IAEC programme was completed. The purpose was directly related to establishing the basis for the longer-term monitoring programme. This work was a source of contention with the Iraqi side throughout the inspection. Attempts were made to limit the placing of identification seals on selected pieces of equipment and the taking of photographs. The Iraqi argument was that they believed that these activities were being carried out with the goal of destroying the industrial base of Iraq. The Iraqi side requested and received clarification from the IAEA Action Team regarding the intended use of the machine tool inventory (Annex 2).

6. In July and August 1991, the IAEA Board of Governors was informed of the non-compliance of Iraq with its obligations under the safeguards agreement concluded by Iraq with the Agency. Continuing work with the Iraqi side to resolve inconsistencies in Iraq's nuclear material declarations have resulted in revisions that indicate that amounts of unsafeguarded material processed in the safeguarded fuel fabrication facility had been understated by the Iraqi side. Specifically, the Iraqi authorities had stated that they had fabricated five fuel assemblies containing approximately 19 kilograms of natural uranium dioxide pellets. The revised declaration is that an additional 26 kilograms of natural uranium dioxide pellets and 14 kilograms of natural uranium dioxide pellets in fresh fuel rods had been fabricated using unsafeguarded material.

7. The last quantity (473 grams U235) of fresh highly enriched uranium fuel (93% plates and 36% pins) remaining in Iraq was removed by the twelfth inspection team. The removal from Iraq of the remaining 36 kilograms of U235 contained in the irradiated fuel elements of the Tamuz 2 and IRT 5000 research reactors is a major task still pending.

8. As has been the case throughout recent inspections, a number of meetings took place with the Iraqi side to clarify issues related to Iraqi work on weaponization and uranium enrichment and Iraq's nuclear material declarations. In general terms, a more consistent picture as regards the work on weaponization and gas diffusion enrichment technology has emerged. Some inconsistencies in the Iraqi nuclear material declarations were resolved, but the Iraqi side indicated its unwillingness to meet further on this subject and requested that all further questions be put in writing. Open issues relating to the centrifuge enrichment programme and the extent of the chemical enrichment work remain.

9. The long awaited "full, final and complete" declaration from the Iraqi side regarding all activities involving weapons of mass destruction covered by UNSCR 687 was delivered on 4 June. A copy of the nuclear portion is currently being translated. No judgement can yet be made regarding the completeness and accuracy of the report.

10. A full record of the correspondence between the Chief Inspector of the twelfth inspection team and the Iraqi counterpart is given in Annex 3.

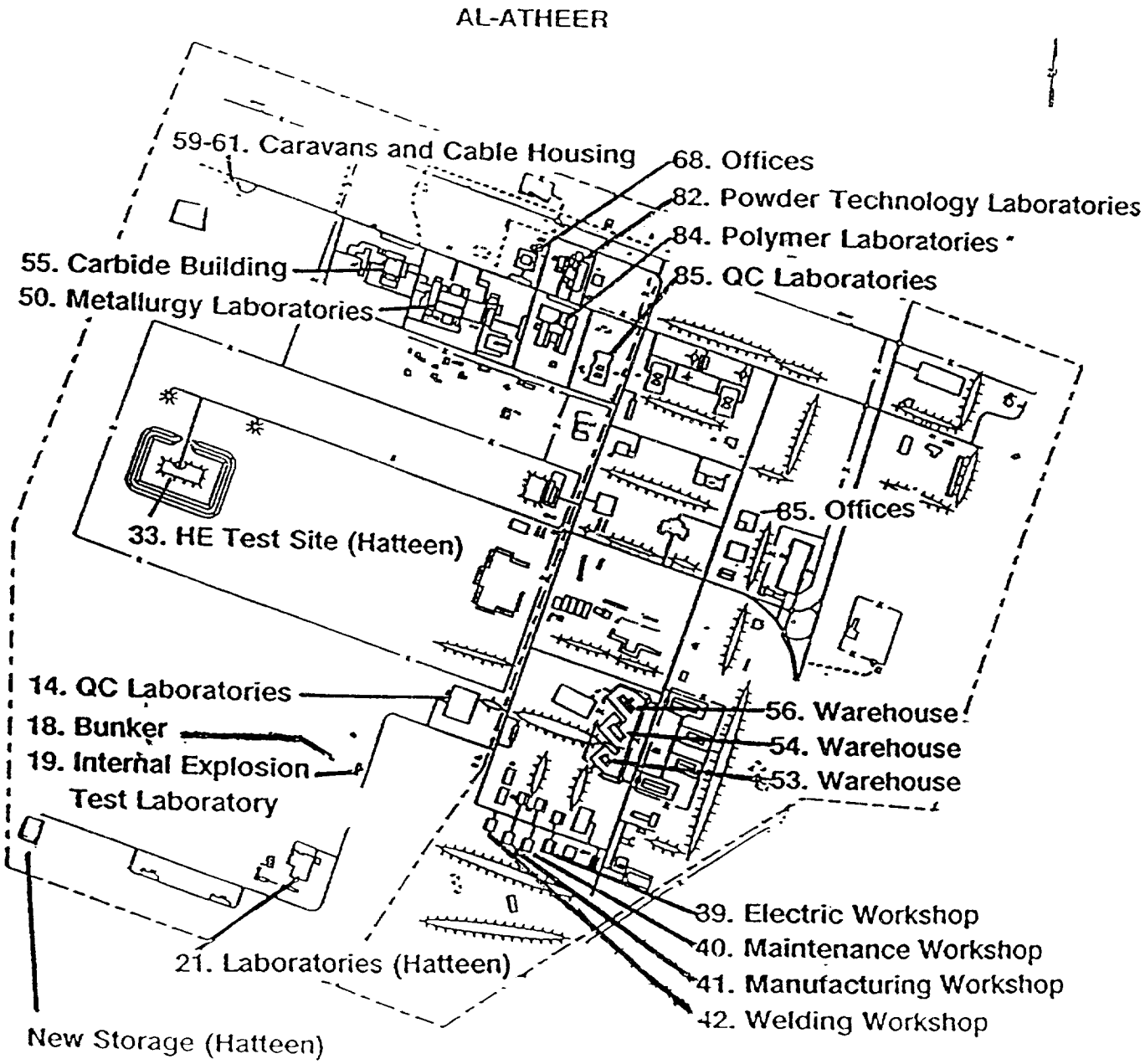
DESTRUCTION OF KEY TECHNICAL INSTALLATIONS AND EQUIPMENT

11. The destruction of buildings and equipment at the Al Atheer-Al Hatteen site specified in a communication transmitted to the Iraqi authorities on 25 March 1992 has been completed. The destruction of three major buildings (the carbide, powder and polymer buildings) and of remaining equipment items (the hot and cold isostatic presses) and the removal of the protective berm from around the Building 33 firing site were observed during the twelfth inspection.

12. The status as of 4 June 1992 is given below. A line drawing of the Al Atheer-Al Hatteen site is provided in Figure 1.

1. Building 33 - The high explosives test bunker was destroyed by filling it with concrete and scrap metal. The protective berm has been removed.

Figure 1


AL-ATHEER
59-61. Caravans and Cable Housing
68. Offices
82. Powder Technology Laboratories
84. Polymer Laboratories
85. QC Laboratories
55. Carbide Building
50. Metallurgy Laboratories
85. Offices
33. HE Test Site (Hatteen)
14. QC Laboratories
18. Bunker
19. Internal Explosion Test Laboratory
56. Warehouse
54. Warehouse
53. Warehouse
39. Electric Workshop
40. Maintenance Workshop
41. Manufacturing Workshop
42. Welding Workshop
21. Laboratories (Hatteen)
New Storage (Hatteen)

2. Building 18 - Explosion chamber destroyed with cutting torch.

3. Building 19 - Control building destroyed by explosives.

4. Building 21 - Physics building destroyed by explosives. Cell foundation destroyed with cutting torch.

5. Building 50 - Casting building destroyed by explosives.

6. Building 55 - Carbide building destroyed by explosives.

7. Building 82 - Powder building destroyed by explosives.

8. Building 84 - Polymer building destroyed by explosives.

The combined surface area of the eight destroyed buildings was approximately 35 000 square meters. An updated list of destroyed equipment is given in Table 2. The hot and cold isostatic presses were destroyed with explosives. The destruction of specified ventilation and process equipment left in the buildings was verified by the inspection team.

As has been stated previously, the Iraqi side provided all equipment, materials and manpower necessary for efficient implementation of the destruction plan. The actual destruction of buildings and equipment took place under the supervision of the inspection team.

13. A list of actions to be undertaken pursuant to UNSCR 687 with respect to the facilities at the Tarmiya and Ash Sharqat EMIS sites (see Annex 1) had been communicated to the Iraqi authorities on 15 May 1992. The Iraqi side responded with a large and well organized effort to carry out the required actions. The progress of work at both sites was monitored in the course of the inspection mission. The work is more than 50% complete. The actions detailed in the 15 May 1992 letter, including the destruction of eight buildings (four at each site), will be completed during the next mission.

Table 2

List of type of equipment destroyed at the Al Atheer-Al Hatteen Site

Equipment	Manufacturer	Status
Large cold isostatic press	ASEA-Brown Boveri	Completed
Large hot isostatic press and two associated furnaces	ASEA-Brown Boveri	Completed
Cold isostatic press	ABRA	Completed
Hot isostatic press	ABRA	Completed
Resistance furnaces	Pfeiffer	Completed
Induction furnace	Pfeiffer	Completed
Vacuum furnaces	Pfeiffer	Completed
Vacuum plasma spray system	Plasmatechnik	Completed
Atmospheric plasma spray system	Plasmatechnik	Completed
Precision turning machine	Schäublin	Completed
Superprecision lathe	Hardinge Brothers	Completed
Jig grinding machine	Waida	Completed
3-axis coordinate measuring machine	Leitz	Some key components removed by IAEA; manufacturer has confirmed that this equipment is rendered harmless
Viewing windows for high explosives test bunker	not determined	Completed

14. The Tarmiya site was inspected three times in the course of the twelfth mission. The purpose was to monitor the preparations being made by the Iraqi side to meet the requirements of the 15 May 1992 letter. The work force at Tarmiya consisted of some 700 people on an around-the-clock basis. The situation as it existed on 4 June 1992 vis-à-vis the various requirements is summarized below:

- The electric substation serving the site is part of the national grid. It serves a number of local users in addition to the Tarmiya site. Representatives from the site worked with technical people from the State Electric Establishment to develop a proposal for reducing the delivered power to the site by an order of magnitude. The proposal was delivered to the inspection team on the last day of the inspection and is currently being evaluated.

- The horizontal return iron installed in Building 33 has been completely removed. There is a total of 51 identical pieces (~30 tonnes each). They are currently in front of the building, and will later be moved to a nearby open storage area (named Al Nafad II).

- All transformers and switchgear have been removed from Buildings 5, 38 and 243 to nearby storage areas. About 50% of the electrical cable connecting Buildings 5 and 38 to Building 33 and Building 243 to Building 245 has been removed.

- The equipment installed in the Building 248 (general utilities) is essentially disassembled. Connecting flanges for the main pumps have been removed. The equipment will be stored in situ.

- At the request of the inspection team, the Iraqi side had concentrated a large effort on preparing Building 245 for destruction. The work was more than 50% complete by the conclusion of the inspection.

All preparations will be completed prior to the next inspection, scheduled for mid-July. Buildings 5, 38, 243 and 245 will be destroyed during that inspection. With the

exception of Building 245, all buildings in the main process area (particularly Building 33) were damaged during the war. All high-efficiency particulate air filters (HEPAs) and activated charcoal filter elements from the high-efficiency exhaust air filtration units installed in chemistry Buildings 46, 57 and 225 have been removed and inventoried and are awaiting destruction as requested by the twelfth inspection team.

15. The Ash Sharqat facility was severely damaged during the war. This, together with Iraqi salvage efforts that had begun prior to the first inspection of the site in July 1991, has resulted in a situation where the work necessary to meet the requirements of the 15 May 1992 letter is much less here than at Tarmiya. The status as of 3 June 1992 is summarized below:

- The substation serving the Ash Sharqat site has been completely dismantled. All that remains are two badly damaged step-down transformers.

- Rubble has been removed from Building 51 to the extent necessary for the inspection team to confirm previous judgements that no horizontal return iron had ever been installed there.

- All transformers and switchgear have long since been removed from Buildings 27, 29 and 20. Approximately 90% of the electric cable connecting Buildings 27 and 29 to Building 51 and Building 20 to Building 21 has been removed.

- The general utilities in Building 31 had been dismantled during the period between the third and seventh inspection missions (July-October 1991). Most of the equipment is sitting in a nearby open storage area.

- Building 21 was damaged during the war, but the basic structure is still intact. Preparations to complete the destruction of this building are nearly complete.

As is the case for Tarmiya, all preparations at Ash Sharqat will be completed prior to the next inspection mission. The destruction of Buildings 27, 29, 20 and 21 will be completed at that time. A portion of the high-efficiency exhaust air filtration systems in the chemistry buildings had been installed. Action that parallels that to be carried out at Tarmiya has been initiated.

ACTIVITIES RELATED TO NUCLEAR MATERIAL

16. In the report on the eleventh inspection mission, an evaluation of the changes in the nuclear material balance included in Iraq's "final and revised chart" received by the IAEA in Vienna on 22 April 1992 was presented. In that report, the differences between declared and verified amounts and categories of nuclear material were identified. One of the objectives of the twelfth team was to clarify these differences. The Iraqi side indicated that it was not willing to discuss any differences further and that its "final and revised chart" was to be regarded as its final declaration. After several meetings, however, changes were made; they are reflected in the chart included in the "full, final and complete" report (Figure 2). The changes are summarized below. The declarations regarding the processing of material in the Building 73 complex are presented in detail because of the connection with the statements of Iraq's non-compliance with the safeguards agreement made to the IAEA Board of Governors in July and August 1991.

- The amounts of EMIS solutions produced at Al Tuwaitha and presented to the IAEA were modified so as to be in agreement with those declared in the letter of 31 May 1992 from the Iraqi counterpart to the Chief Inspector of the twelfth IAEA team. The changes related to the amounts of enriched and depleted uranium, but the 782 grams of natural uranium declared in the above-mentioned declaration were not included in the revised chart.

- The processes involved and the nuclear material produced in Building 73 in Tuwaitha (Figure 3) have been redistributed. In the "final and revised chart" of 22 April 1992, the nuclear material processed in the Building 73 complex was divided into two categories, one corresponding to material of Italian origin which was under safeguards and the other to material which was not under safeguards: 9.1 tonnes of natural uranium and UO_4 from Al Qaim, 375.2 kilograms of natural uranium and UO_2 from Al Jesira and 220 kilograms of natural uranium (as UO_2) from Brazil.

  During the twelfth inspection mission, the Iraqi side explained that "Building 73" referred to a complex of buildings (see Figure 4). Of this complex, Buildings

73A and 73B were under safeguards. In addition, the Iraqi side declared that the activities involving the unsafeguarded material had taken place in Building 73C except for the production of 18.9 kilograms of natural uranium as five fuel elements, of 26 kilograms of natural uranium as pellets and of 14 kilograms of natural uranium as 46 fresh fuel pins; these had been produced in Building 73A using UO_2 from Al Jesira. The production of the five fuel elements, their irradiation in the IRT 5000 reactor and the reprocessing of three of them had been previously declared and the corresponding non-compliance with the safeguards agreement between Iraq and the IAEA communicated to the IAEA Board of Governors. Figure 5 includes the processes declared as having taken place in Building 73C. Building 73C had been declared in the past as containing only utilities and a mechanical workshop (including the electron beam welder).

- The Iraqi side indicated that no filtration system had been installed in Building 73C. Thirty-seven filters containing 50 kilograms of natural uranium as UO_4 were declared as belonging to Building 73B and the nuclear material present in them as being of Italian - instead of Al Qaim - origin. Additional samples have been taken with a view to clarifying this matter.

17. Several questions about remaining inconsistencies (see Table A4-1) in the Iraqi nuclear material flow chart were put to the Iraqi side in writing. The Iraqi side's response was that "any differences in weights existing in the chart of nuclear material as verified by the Agency are attributed to either losses of the material during the bombing or mixing of the material during the evacuation or the inaccuracy of the analysis of the samples". According to the statements of the Iraqi side, it considers that the "nuclear material file is closed".

18. Other nuclear-material-related inspection activities carried out during the twelfth IAEA inspection mission were:

- Inspection and sampling of the waste tanks belonging to the Building 73 complex. There is a rectangular concrete tank beside the complex. Inside this concrete tank there is a cylindrical steel tank with a capacity of approximately

Figure 2

Nuclear material flow chart as included in the "full, final and complete" report

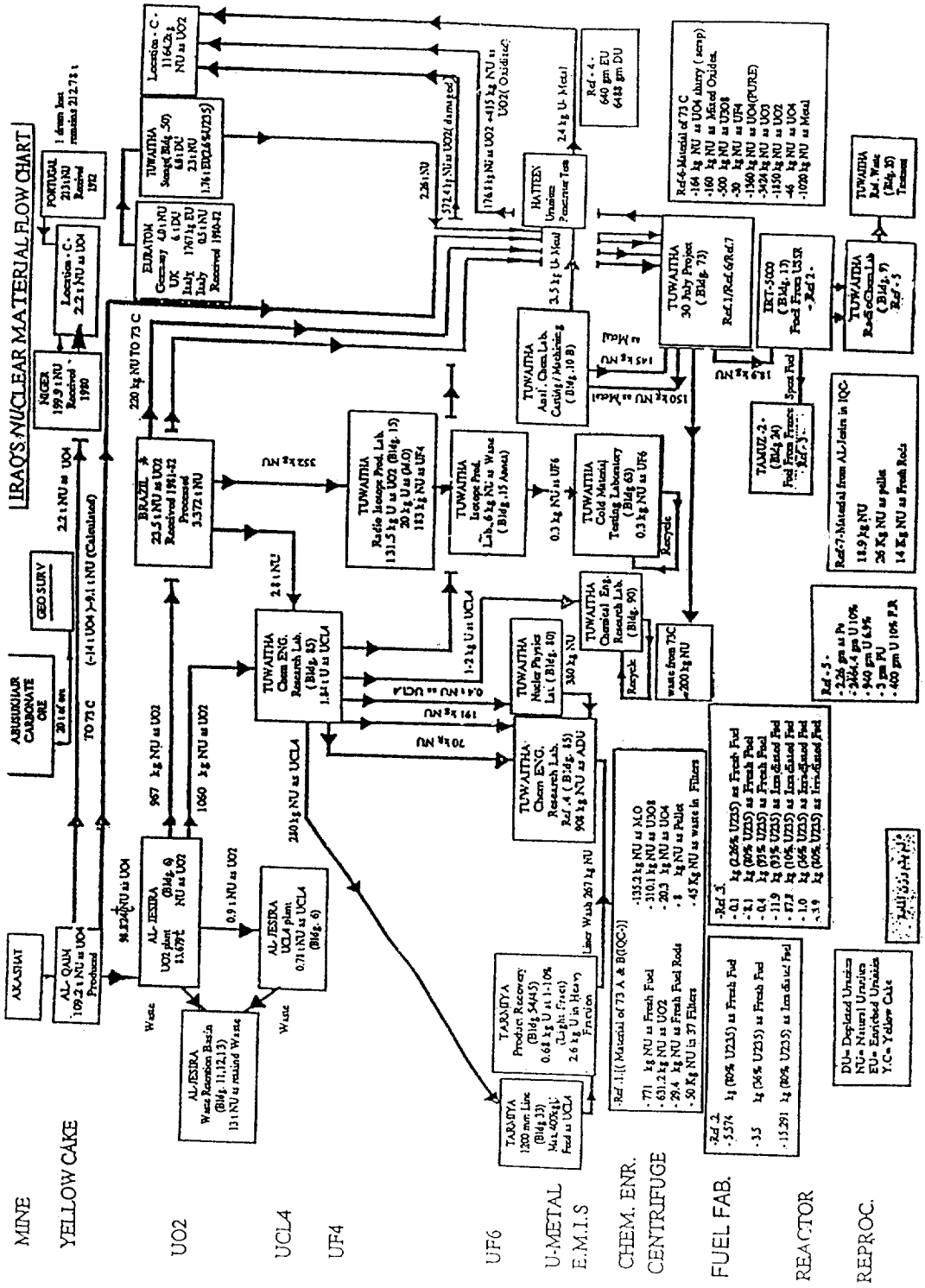
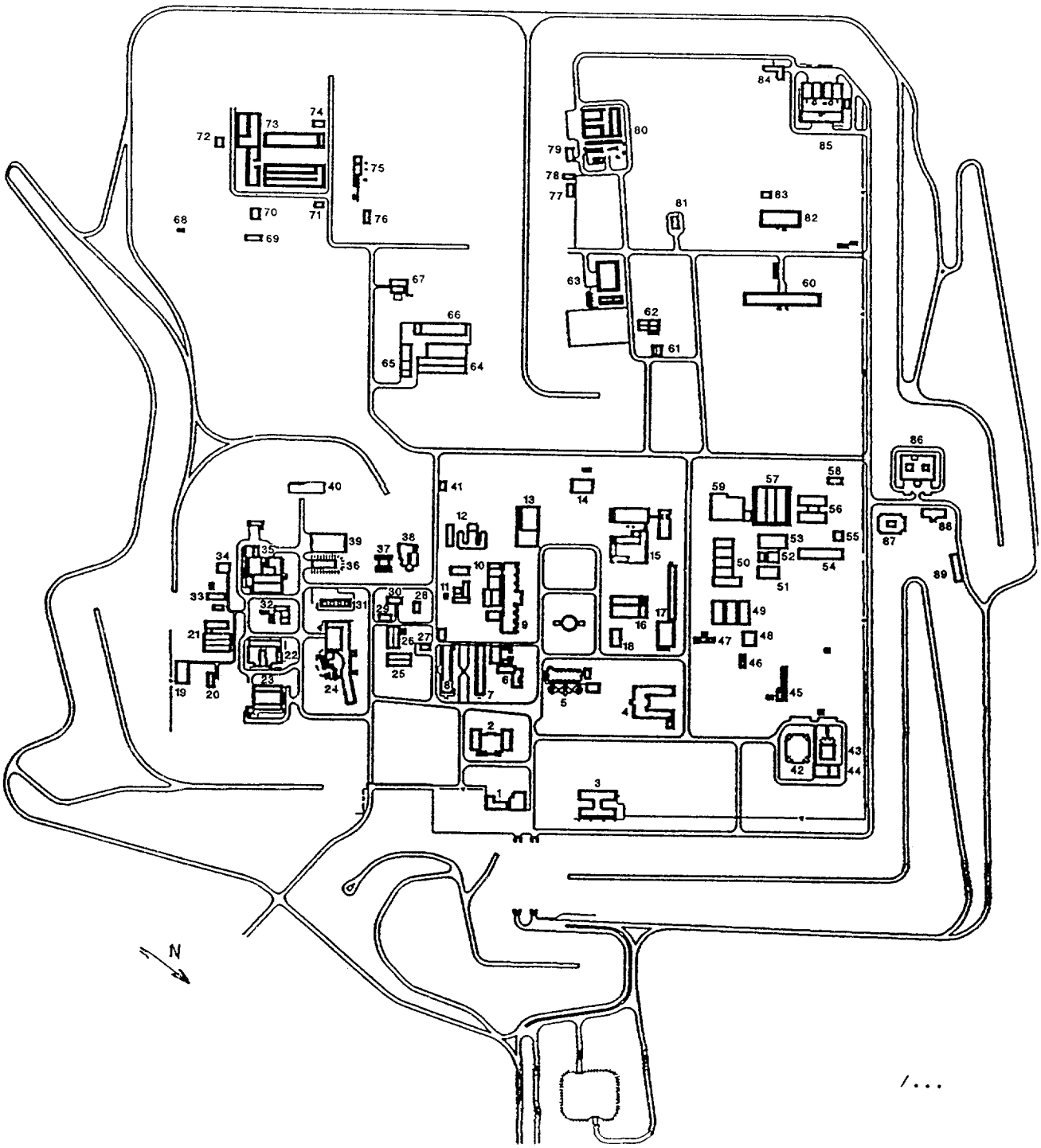


Figure 3

Tuwaitha Nuclear Research Centre



/...

Figure 4

Layout of the Building 73 complex presented by the Iraqi authorities

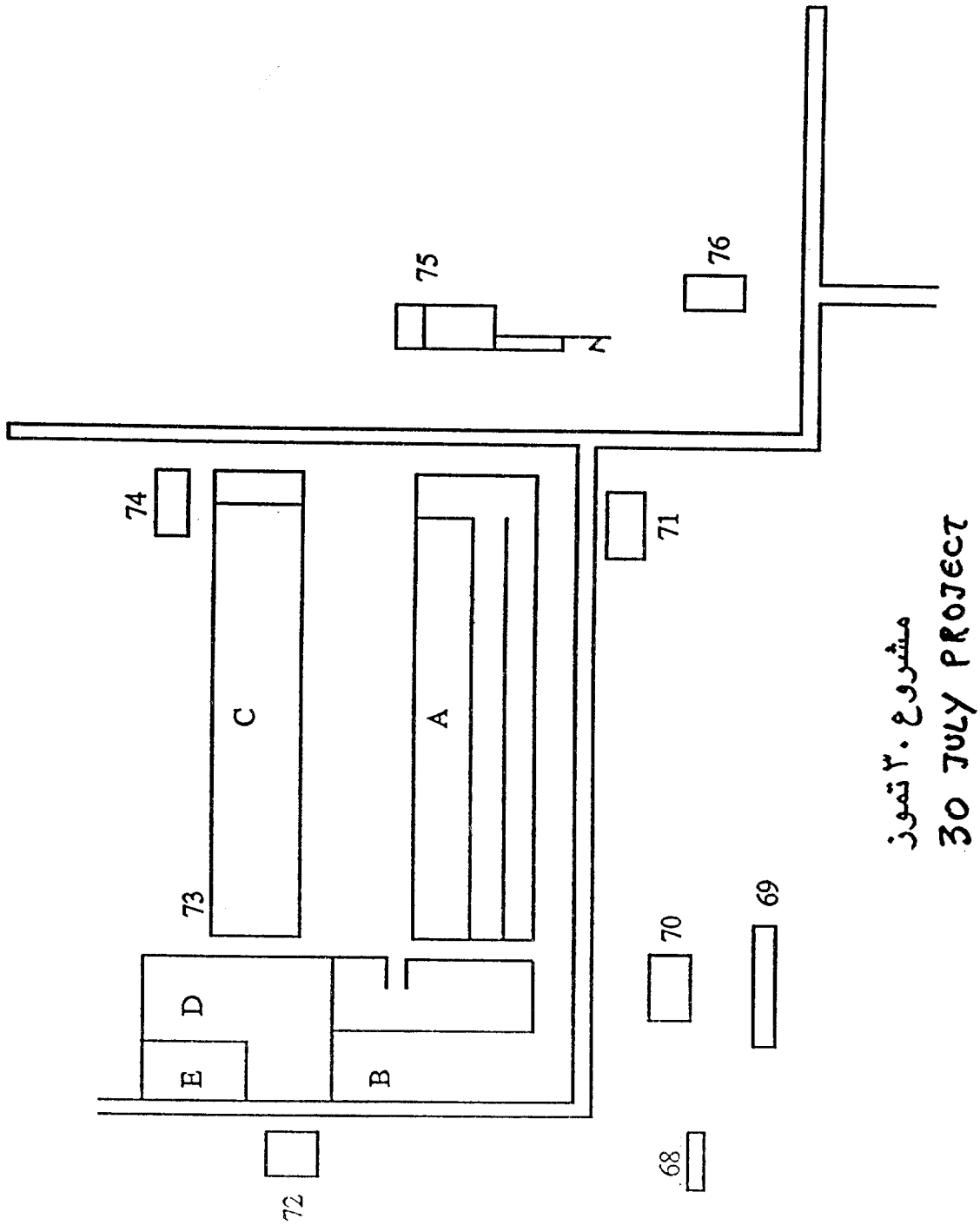
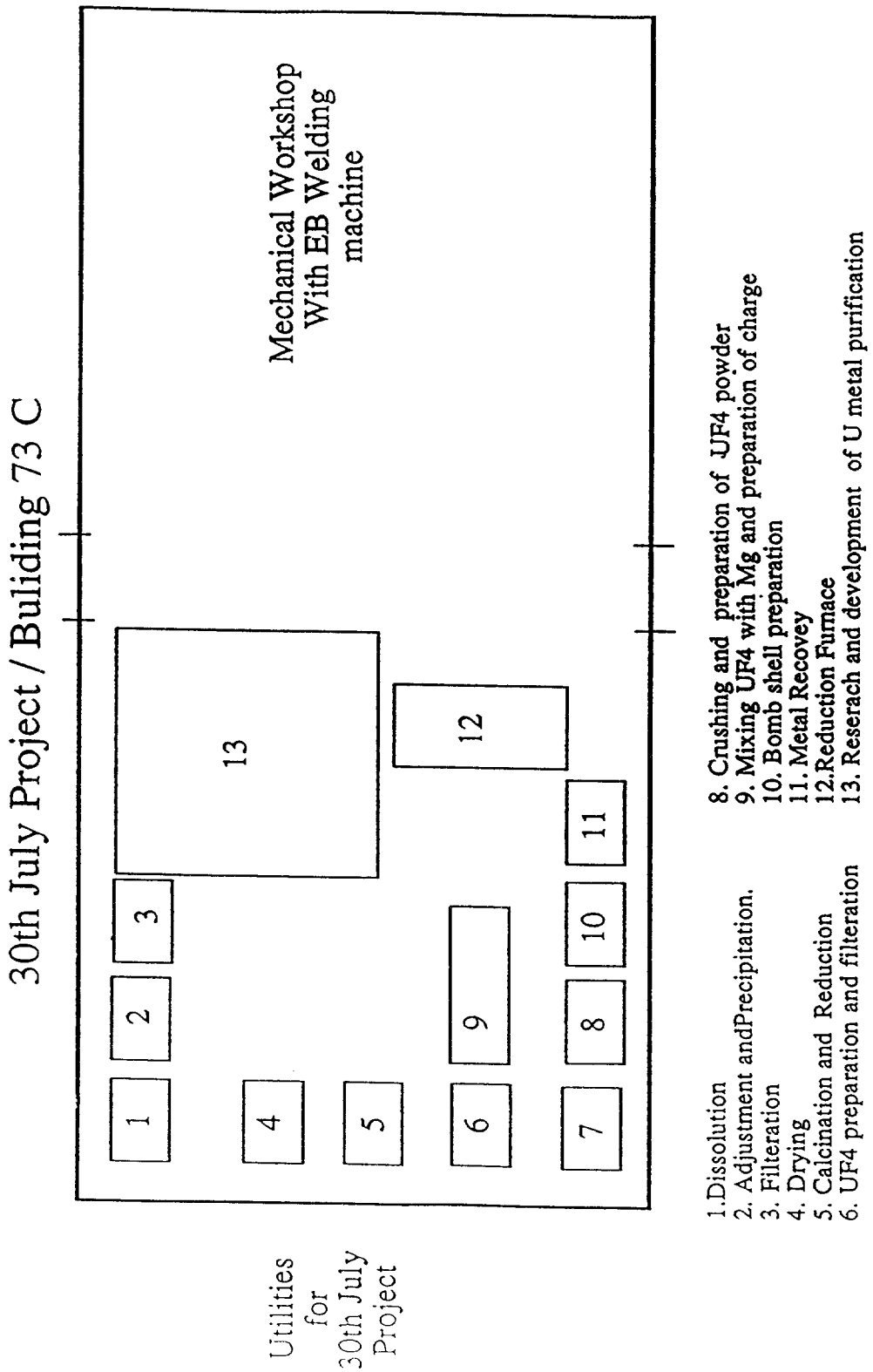


Figure 5

Layout of Building 73C as presented by the Iraqi authorities



/...

$7m^3$. The Iraqi side declared that the content of the steel tank belongs to Buildings 73A and B and that the content of the concrete tank belongs to Building 73C. Samples were taken from both tanks to confirm the declared origins and the amounts of uranium contained in them.

- EMIS solutions containing highly-enriched uranium produced in Al Tuwaitha Building 80 was diluted using nuclear material of Brazilian origin. The dilution was performed in order to downgrade the highly-enriched uranium present in the solutions to low-enriched uranium.

- The remaining unirradiated highly enriched uranium was removed from Iraq. It included 14.5 pins of 36%-enriched uranium (332.6 grams uranium, 116.1 grams U235) and 23 plates of 93%-enriched uranium (383 grams uranium, 356.5 grams U235).

- A drum containing 163 grams of enriched uranium (5.8%) in solution form (145 litres) was moved from Tarmiya to location C and placed under IAEA seal. The remaining low-enriched uranium and depleted uranium solutions are still in Tarmiya.

- The nuclear material stored at location C has been reconfigured in line with new Iraqi declarations (see Figures A4-1 and A4-2). Monitoring activities (seals check and item counting) were carried out on the irradiated fuel located in the IRT 5000 reactor and in the tanks at location B.

A complete summary of the declared amounts and the corresponding verification results for nuclear material stored at locations B and C and in the IRT 5000 reactor are presented in Annex 4.

ACTIVITIES RELATED TO THE ENRICHMENT PROGRAMME

19. On the last day of the eleventh inspection mission a meeting was arranged with the Chairman of the IAEC to discuss the Iraqi position that the suppliers of the maraging steel, carbon fibre rotor tubes and technical advice (centrifuge technology) would not be disclosed. The Chairman indicated that the matter was being discussed at the highest levels of the Iraqi Government and requested that the inspection team regard

it as an "open issue" that would be resolved during the next inspection mission. At a meeting held early during the twelfth mission, the Iraqi side described a political decision of the Government not to provide specific information on suppliers. The decision reflected inter alia "a position based on moral grounds which Iraq is not prepared to abandon". The necessary information continues to be sought through other sources, and in the meantime these aspects of the Iraqi centrifuge programme remain open issues.

20. A list of questions calling for additional details about various aspects of the Iraqi enrichment programme was given to the Iraqi side on the first day of the inspection mission. These questions were discussed and further clarifications offered during subsequent meetings. A written response to the questions, although often promised, was not received. In several instances the Iraqi side referred the team to the "full, final and complete" report as containing the requested information. Throughout the discussions, the Iraqi side took the position that Iraq's enrichment programme had been fully disclosed and that the inspection team's efforts to obtain additional details were a form of harrassment that would not add to the overall assessment.

21. Nevertheless, in spite of the above, a number of meetings between Iraqi technical experts and uranium enrichment experts from the inspection team did result in an improved understanding of Iraqi efforts in both centrifuge and gaseous diffusion. Detailed technical statements regarding such things as the method used to assemble the extraction system, the effect of the choice of wall velocity on the overall centrifuge design and the method of manufacturing the bottom bearing cup were credible and further convinced the team that the Iraqi side had received significant advice from abroad. Similarly, the Iraqi experts' description of their attempts to develop gaseous diffusion barrier was technically credible and consistent with information contained in the PC-3 reports.

ACTIVITIES RELATED TO THE WEAPONIZATION PROGRAMME

22. The Iraqi side responded to a number of written questions regarding weaponization issues. The information is still being analyzed, but the answers appear to be consistent with previous declarations, seized documentary evidence and direct inspection results. More than before, the Iraqi side seems anxious to end this process.

23. A follow-up inspection was conducted at the Al Qa Qaa facility, south of Baghdad. The Iraqi side had presented to the eleventh team a die set declared to have been used for pressing high explosive lenses. However, further evaluation suggested that this die set could not have been used to produce the described high explosive components. Iraqi engineers met with the twelfth inspection team and provided a detailed decription of a manufacturing process that appears consistent with both the declared components and the observed equipment. The team went on to inspect two areas consisting of small-scale testing and research buildings. One area contains a number of test facilities that could be adapted to machining and manufacturing. The other area was declared to be a quality control facility serving the whole Al Qa Qaa high explosive component manufacture operation. Construction is still under way. Al Qa Qaa's role in the weapons development programme appears to have been that of a service organization. The inspection process has not identified a facility uniquely associated with the Iraqi nuclear programme.

24. Buildings 66 and 73C at Tuwaitha were again inspected as a result of changed Iraqi declarations regarding the location of uranium metallurgy work and detonator development tests. Both buildings were badly damaged during the war and by subsequent cleanup operations. They have continued to deteriorate since then. Little can be done to verify the Iraqi declarations that Building 73C was the location of the uranium metal production (approximately one tonne) and that Building 66 had been planned for this activity in the future. Building 66 was declared as the location of the detonator development work. Samples taken from waste tanks adjacent to Building 73C may provide some clues. Both buildings lack the appropriate filtered ventilation systems for long-term work with uranium metal.

25. The Al Hadre munitions testing site, first inspected in October 1991 by the seventh inspection team, was visited again by the twelfth team. The judgement that the site is convertible to nuclear hydrodynamic testing was confirmed. The facility has not been used, and the war damage observed during the October visit has not been repaired.

ACTIVITIES RELATED TO EQUIPMENT AND MATERIALS

26. The team visited the Nassr State Establishment (Taji), the State Enterprise for Heavy Engineering Equipment (Daura), the Badr General Establishment, Al Ameen, the Al Ameer and Al Radwan factories of the Auqba bin Nafi Establishment, the Saddam State Establishment (Al Ameer) and the Saladdine State Establishment to inventory machine tools and other relevant equipment. With these visits, the inventory of machine tools at facilities related to the nuclear programme declared in July 1991 has been completed. The current inventory of machine tools is shown in Table 3. According to the declaration, the involvement of some of these facilities in the nuclear programme was only slight. Key machines are those which have technical characteristics required for producing key components needed in a nuclear programme. Key machines have been identified (to the extent possible) by type, serial number and manufacturer, and in some cases an IAEA seal has been applied for identification purposes (see Annex 2). Such key machines include high-precision milling and turning machines (Schäublin, Matrix Churchill), large turning and milling machines (SHW, Zayer, Innocenti, Dorries, Schiess Froriep), turning and milling machines with special fixtures (MAHO, Magdeburg), jig bores (SIP), and flow forming machines (H & H Metalliform). Key machines include also electron beam welders (Leybold, Heraeus, Sciaky) and precision measurement machines (Leitz, DEA). The Iraqi side attempted to limit the placing of identifying seals and the taking of photographs on numerous occasions throughout these inspections.

27. The team inspected the Ash Shaykhili warehouses of the Ministry of Industry to identify, photograph and inventory. The items of interest included those brought back by the 93-truck convoy during the third IAEA inspection mission. Additional items of interest were discovered during this inspection. They included ten pieces of small EMIS discs (880 mm pole diameter) which probably belonged to the R-24 experiment, a small EMIS coil winding machine for these discs, and two large vacuum valves. The Iraqi side promised to move items of interest to the area of warehouse 13B at Ash Shaykhili, where there are other items under IAEA control. The remaining equipment was judged to be of general use and was released.

28. The team visited the Ur State Establishment (Nassariya), where melted aluminium components of centrifuge housings are stored. Material which had been presented to the tenth IAEA team, was declared to contain 84 tons of aluminium tubing for centrifuge molecular pumps and 300 tons of aluminium tubing for centrifuge housings. These have been melted together into large blocks; according to Iraqi declarations, it was done prior to the start of UNSCR 687 inspections. During the tenth IAEA inspection mission, the total weight was estimated and samples were taken. The twelfth IAEA team took additional samples (total 15) to confirm the analytical results. It found partially melted blocks which were sampled selectively. The tenth IAEA team was presented with a batch of smaller blocks, which was declared to contain the melted remains of aluminium forgings for 9000 upper flanges, 9000 jacket rings and 200-250 disk-shaped lower flanges. The total weight of 126 tons had been confirmed by the tenth team. An intact top flange from a poorly melted block was removed. The twelfth team took five additional samples for chemical analysis. In some poorly melted blocks, identification marks and components were detected which could be of help in confirming manufacturer information.

29. The team revisited the Iskandariya foundry to take additional samples from the maraging steel blocks, which again, according to Iraqi declarations, had been melted unilaterally by Iraq prior to the start of UNSCR 687 inspections. During the eleventh IAEA inspection mission, two blocks of maraging steel were rendered harmless by remelting with an equal amount of scrap carbon steel. The analytical results indicate that this action renders the material harmless. The Iraqi side has located a foundry in Basra which is capable of completing the destruction in a few days. This activity will therefore be completed during a future mission.

TABLE 3

UPDATED LIST OF IDENTIFIED EQUIPMENT - BASED ON RESULTS OF THE TWELFTH INSPECTION MISSION

Type of Machine	Total	Key Machines
Milling, 5 axes	32	32
Milling, 4 axes	62	0
Milling, 3 axes	214	10
Turning	148	71
Grinding	21	0
Jig grinding	8	0
Jig boring	7	3
Electric discharge, RAM or wire type	15	0
Precision measurement	16	3
Cutting	7	0
Boring	4	0
Electron beam welding	5	5
Flow or spin forming	16	14
Press	16	0
TOTAL	**571**	**138**

OTHER ACTIVITIES

30. Inspection at Al Qaim - Al Qaim, located about 300 kilometers north-west of Baghdad, near the Syrian border, is the site of a yellow cake (UO_4) production facility co-located with a very large superphosphate fertilizer plant. This plant was badly damaged during the Gulf War. The yellow cake facility was particularly hard hit. Portions of the fertilizer plant have been repaired. The yellow cake facility remains in the condition it was in when first inspected, in July 1991, by the third IAEA inspection team. The team was given a complete description of the construction history (including contractors), processes and operational history of the plant.

The yellow cake facility is located within the site boundary in a separately secured area. Construction began in 1982. The design capacity was 103 tonnes/year, the second cycle and refinery sections being built with an overcapacity of 100%. The capacity is based on a feed concentration of 75ppm and a minimum recovery rate of 93%. The plant was planned for commissioning in the first half of 1984. Operating records show that 20 514 kilograms of UO_4 had been produced by 1 October 1984. The team was presented with daily production records. Copies of the records have been requested for review at Tuwaitha.

31. Inspection at the Geological Survey Institute, Baghdad - This is the location of process development and pilot plant operation intended to recover uranium (as UO_4) from carbonate ore from the Abou-Sukhair mine. The team received a complete description of the process. The pilot plant was completed in June 1990 and 20 tonnes of ore were received from Abou-Sukhair in July 1990. Ten tonnes were processed, producing 500 grams of UO_4, and the remaining 10 tonnes was sent back to the mine. The processing capacity of the plant was 200 kilograms of ore per hour. At present the plant is being used for aluminium extraction. Equipment located at the Institute was inspected by the fifth IAEA inspection team.

32. Follow-up inspection at Al Jesira - The transfer of uranium waste from the oil tank to the open-air settling tanks at Al Jesira, begun during the tenth mission, is complete. It is expected that the solutions will evaporate during the summer; the solid deposit will

then be collected into drums and transferred to location C at Tuwaitha. The team performed a seal check on the equipment items stored in an open area adjacent to the facility. The search for additional manufacturer information was not successful.

33. Follow-up inspections were carried out at Al Furat, Dijla and the National Computer Centre (NEC-750) during the twelfth inspection mission. A second and again unsuccessful attempt was made to operate the NEC-750 computer.

34. The second version of the Iraqi "full, final and complete" report (dated May 1992) regarding all activities relating to weapons of mass destruction covered by UNSCR 687 (the Iraqi Nuclear Programme Before and After UNSCR 687 (1991)), was provided on 4 June for onward transmission. The Minister of State for Foreign Affairs - Mr. Al-Sahaf - requested in the covering letter that the report be treated as confidential because of the nature of the contents. The nuclear portion of the report is currently being translated. No judgement can yet be made regarding the completeness and accuracy of the report.

ANNEX 1

Actions required regarding Tarmiya/Ash Sharqat sites

The actions identified below apply to both sites and should be undertaken only in the presence of the IAEA inspection team.

Requested actions:

(1) Reduce delivered electrical power to the Tarmiya and Ash Sharqat sites by approximately an order of magnitude. Proposals are expected from the Iraqi side on how this could be done such that (i) it can be monitored, and (ii) has minimum impact on other users in the area).

(2) Remove the 1200mm system horizontal return iron from Building 33, Tarmiya and Building 51, Ash Sharqat to the Al Nafad storage area.

(3) Remove the electrical cables connecting Buildings 5 and 38 to Building 33, Tarmiya; Buildings 27 and 29 to Building 51, Ash Sharqat; Building 243 to Building 245, Tarmiya; and Building 20 to Building 21, Ash Sharqat.

(4) Dismantle and remove the general utilities infrastructure from Buildings 248, Tarmiya and 31, Ash Sharqat.

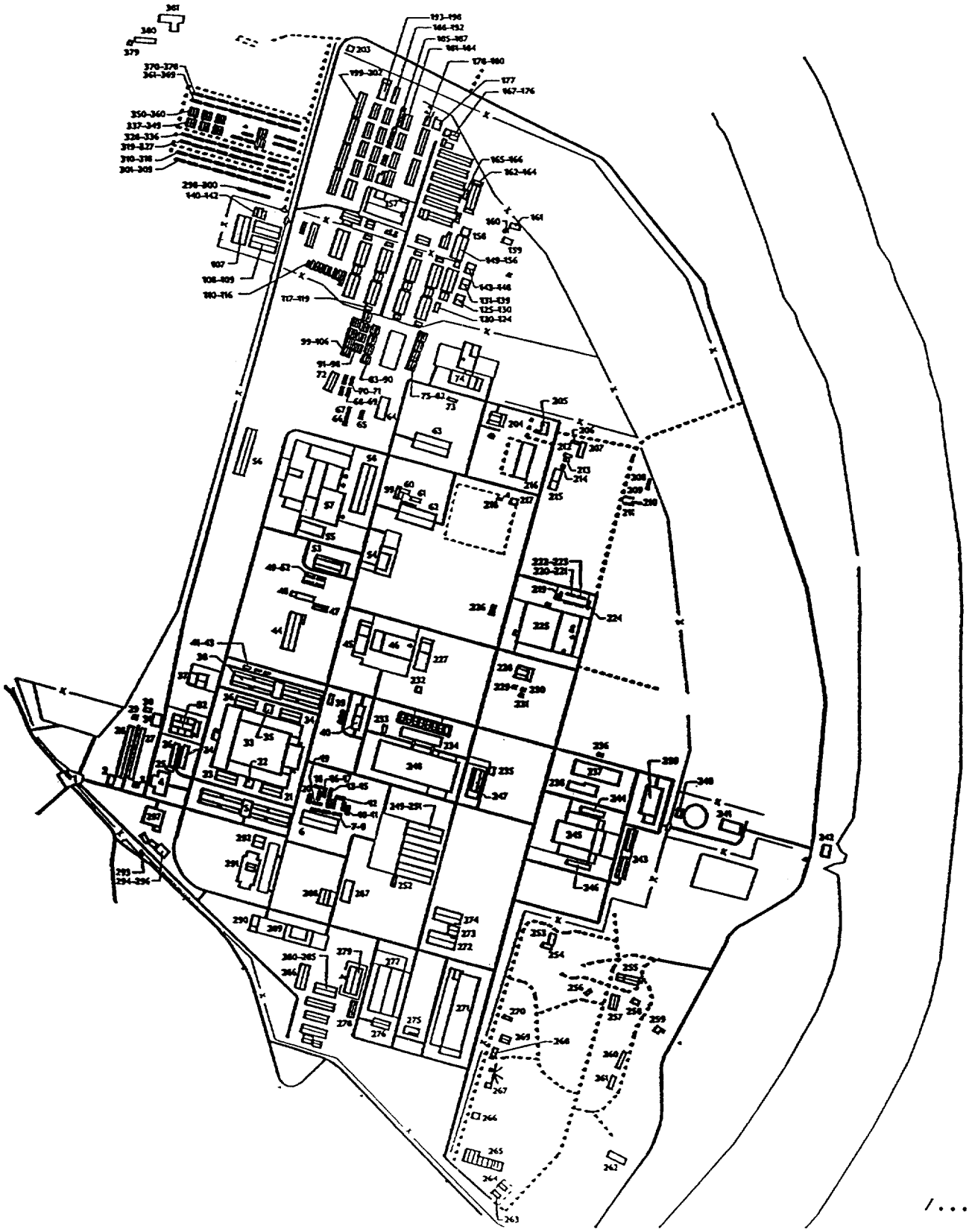
(5) Buildings 5, 38, 243, 245 - Tarmiya and Buildings 27, 29, 20, 21 - Ash Sharqat are to be destroyed.

(6) Building 33, Tarmiya and Building 51, Ash Sharqat are not to be re-built.

Equipment and other useable materials, with the exception of the ventilation systems in Building 245, Tarmiya and Building 21, Ash Sharqat, may be salvaged, but should be stored at the site for inspection prior to removal.

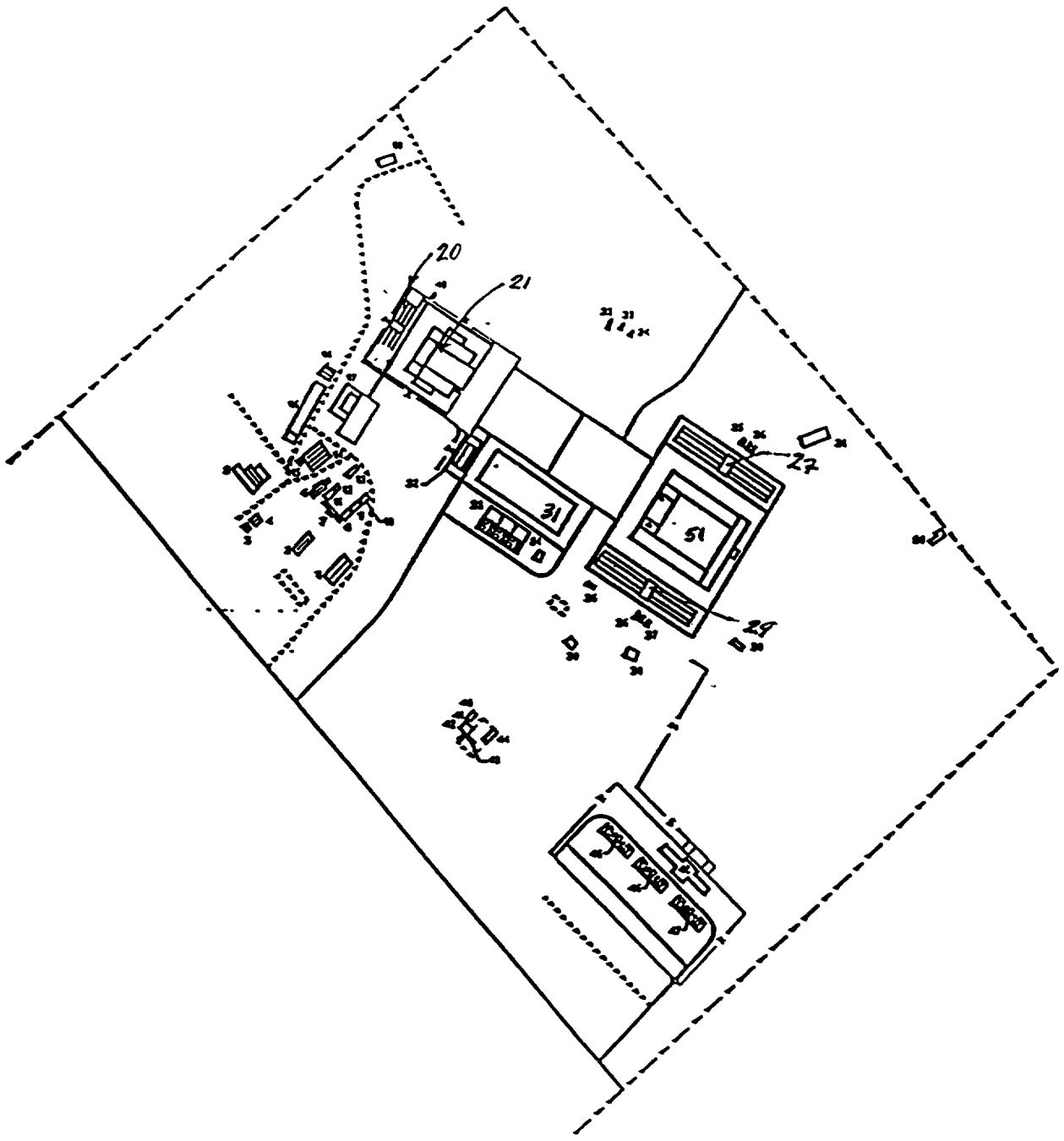
Additional actions covering equipment at either or both sites may be required.

Tarmiya



/...

Ash Sharqat



INTERNATIONAL ATOMIC ENERGY AGENCY
AGENCE INTERNATIONALE DE L'ENERGIE ATOMIQUE
МЕЖДУНАРОДНОЕ АГЕНТСТВО ПО АТОМНОЙ ЭНЕРГИИ
ORGANISMO INTERNACIONAL DE ENERGIA ATOMICA

WAGRAMERSTRASSE 5, P.O. BOX 100, A-1400 VIENNA, AUSTRIA
TELEX: 1-12645, CABLE: INATOM VIENNA, FACSIMILE: 43 1 234564, TELEPHONE: 43 1 2360

IN REPLY PLEASE REFER TO:
PRIERE DE RAPPELER LA REFERENCE:

DIAL DIRECTLY TO EXTENSION:
COMPOSER DIRECTEMENT LE NUMERO DE POSTE:

ANNEX 2

1 June 1992

Dear Dr. Al Hajjaj,

1. The Chief Inspector of IAEA-12 informed me that you request clarification as to the purpose of the current inventorying/seals application activity on certain equipment and machine tools located at different facilities.

2. As communicated to you by the Chief Inspector, these measures are chiefly meant to facilitate the identification of items, particularly those associated with the implementation of the long-term monitoring plan, and save time in subsequent inspections.

3. In more general terms, the application of seals does not prejudge the final disposal of the item in question, i.e., the decision to release the sealed items for general use under the long-term monitoring plan or to destroy, remove or render harmless the item in question, under UN Security Council resolution 687 (1991).

4. Items which are prohibited under UN Security Council resolution 687 (1991) are identified for destruction, removal or rendering harmless. The application of seals to such items found in Iraqi facilities is to prevent their use or movement prior to their destruction, removal or rendering harmless, as appropriate.

5. Dual-use items, for which there is no evidence of use in activities prohibited under UN Security Council resolution 687 (1991), are sealed for identification and will be considered for release under the long-term monitoring plan, or allowed to be used pending the implementation of such a plan. The definition of dual-use items, the procedure for release and the modalities of the long-term plan are established in UN Security Council resolutions 707 (1991) and 715 (1991).

6. Hence, acceptance of these resolutions by the Iraqi authorities and full compliance with their provisions will greatly facilitate the orderly processing of requests for re-use of facilities and equipment, including machine tools and materials.

Sincerely,

Maurizio Zifferero
Leader
UNSC 687 Action Team

Dr. Al Hajjaj
Directorate for International Organizations
Baghdad

/...

ANNEX 3

List of Documents Received or Sent

12-01 Mr. Zifferero to Mr. Al Hajjaj on 920515 regarding actions to be taken for the destruction of buildings and equipment at Al Atheer/Al Hatteen complex, Tarmiya and Ash Sharqat

12-02 Mr. Muhammad Said Al-Sahaf, Minister of State for Foreign Affairs, to Mr. R. Ekeus, Executive Chairman of UNSCOM, on 920524 stating among other things the reasons for not providing procurement information related to the Iraqi centrifuge programme.

12-03 Mr. Al Hajjaj to Mr. Perricos on 920527 providing a response to questions concerning the plutonium line asked on 920414 (IAEA-11)

12-04 Mr. Al Hajjaj to Mr. Perricos on 920527 providing a response to questions regarding Al-Rabee and Al Dijjla factories, centrifuge programme and weaponization asked on 920414 (IAEA-11)

12-05 Mr. Perricos to Mr. Al Hajjaj on 920527 clarifying the purpose of attaching IAEA seals to equipment.

12-06 Mr. Perricos to Mr. Al Hajjaj on 920527 reminding the Iraqi side that there were still open questions - such as the procurement of carbon fibre rotors and maraging steel and source(s) of technical advice on the centrifuge programme - and asking for additional information on EMIS 1200-mm iron cores, light metal collectors used for EMIS, properties and current location of some HV DC power supply cabinets for EMIS, identification of gaseous diffusion projects 304 and 305 (including siting information on various gaseous diffusion projects), location of frequency converters, list and sources of imported chemical enrichment equipment, installation diagram for Building 90 at Al Tuwaitha, purpose of "paper plant", and locations of Khairat collection and Al Khayrat assembly points.

12-07 Mr. Perricos to Mr. Al Hajjaj on 920528 clarifying the criteria and specifications on the basis of which machine tools would be considered by the IAEA inspection team to be key equipment and have IAEA seals applied to them.

12-08 Mr. Perricos to Mr. Al Hajjaj on 910528 asking for clarifications regarding nuclear material balance and production at Abu Sukhair, Al Qaim and Al Jesira, processing of material of Brazilian origin, UCl_4 production in Building 85 at Tuwaitha, inconsistencies in U235 and U236 content of some samples, discrepancies in depleted uranium and enriched uranium recovered from the EMIS programme at Tuwaitha, and exact location and description of flows and dates of various activities performed in building complex 73 at Tuwaitha.

12-09 Mr. Perricos to Mr. Al Hajjaj on 920530 asking for clarifications and additional information on IAEC/PC-3 projects, code names and PC-3 organization chart.

12-10 Mr. Perricos to Mr. Al Hajjaj on 920530 requesting a special meeting on the activities performed in Building 73 "30 July project" at Tuwaitha.

12-11 Mr. Perricos to Mr. Al Hajjaj on 920531 asking for explanations regarding the Iraqi nuclear material flow chart sent to IAEA on 920422, the activities in Building 73 at Tuwaitha and the origin of materials in a batch of ADU.

12-12 Mr. Perricos to Mr. Al Hajjaj on 920601 confirming the removal of MTR fuel plates containing 93% and pins containing 36% enriched uranium.

12-13 Mr. Perricos to Mr. Al Hajjaj on 920601 requesting presentation of the daily production records of the yellow cake plant at Al Qaim.

12-14 Mr. Perricos to Mr. Al Hajjaj on 920602 asking for information on the feasibility studies on underground nuclear reactors, including siting studies, type(s) of reactor, and procurement information related to reactors and reprocessing.

12-15 Mr. Al Hajjaj to Mr. Zifferero on 920602 providing information on the planned use of some radioisotopes in Iraq.

12-16 Mr. Zifferero to Mr. Al Hajjaj on 920601 clarifying the purpose of the inventorying/seals application activities involving certain equipment and machine tools.

12-17 Mr. Al Hajjaj to Mr. Perricos on 920602, in response to the request of 920528 (item 12-08 above), providing information on the production at Abou-Sukhair mine, Al Qaim and Al Jesira and discrepancies observed by the inspection teams.

12-18 Mr. Al Hajjaj to Mr. Perricos on 920528, in response to the request made by IAEA-11 on 920407, providing information on the inventory of nuclear material mentioned in an Al Atheer plan progress report, deliveries from Akashat/Al Qaim to Tuwaitha and Al Jesira, materials lost during bombing, shipments of UO_2 from Brazil, and EMIS washing solutions.

12-19 Mr. Perricos to Mr. Al Hajjaj on 920604 regarding the destruction activities at Tarmiya and Ash Sharqat and requesting the destruction of high-efficiency and activated charcoal filters and actions to be taken with regard to filter housings during IAEA-13.

12-20 Mr. Perricos to Mr. Al Hajjaj on 920604 agreeing to the removal and demolition of the two hot cells in Building 15 at Tuwaitha and requesting the presentation of manipulators, leaded glass windows etc, to the IAEA-13 team.

12-21 Mr. Perricos to Mr. Al Hajjaj on 920604 agreeing to release the general-purpose equipment and utilities stripped from the destroyed buildings at Al Atheer/Al Hatteen site and the destroyed equipment (IAEA-12).

12-22 Mr. Perricos to Mr. Al Hajjaj on 920604 requesting the presentation of missing parts (such as power supply, control unit, mandrels and rollers) of a flow forming machine inspected by the team at Iskandariya on 920601.

12-23 Mr. Perricos to Mr. Al Hajjaj on 920604 asking about the original purpose of the design workshop, the designer and the intended user, and requesting information on the contracts of Dijjla with foreign firms.

12-24 Mr. Perricos to Mr. Al Hajjaj on 920604 reminding the Iraqi side about the remaining open questions relating to the hydrodynamic codes and NEC 750 computer used in the weaponization studies.

12-25 Mr. Al Hajjaj to Mr. Perricos on 920604 providing some information on the studies and experiments related to weaponization.

12-26 Mr. Al Hajjaj to Mr. Perricos on 920604 providing a list of UO_2 shipments received from Brazil in 1981.

12-27 Mr. Al Hajjaj to Mr. Perricos on 920604 regarding proposals to retain two generators in Building 243 at Tarmiya, and tasks and power requirements for Tarmiya site.

12-29 Mr. Al Hajjaj to Mr. Zifferero on 920603 reminding the Iraqi side that the irradiated fuel, which has not yet been removed form Iraq, is causing a potential environmental hazard.

12-30 Mr. Al Hajjaj to Mr. Perricos on 920603 providing two additional diskettes containing codes and data used by Group IV of PC-3.

ANNEX 4

Tables A4-1, A4-2 and A4-3 provide a complete description of the nuclear materials and the declared and verified inventories stored at location C, location B and the IRT 5000 reactor respectively. Figures A4-1 and A4-2 give a description of the physical configuration of the nuclear material stored at location C.

SUMMARY OF INSPECTION RESULTS

12th On-Site Inspection

Table 1

Location C

ORIGIN	Processing Site	Material Type		Presented to Team No.	DECLARED INVENTORY				VERIFIED INVENTORY							
					No. of Items	Compound Weight (kg)	Element Weight (kg)	U_{235} (kg)	No. of Items	Compound Weight (kg)	Element Weight (kg)	U_{235} (kg)	Verification Activities			
													I	NDA	B	D
Niger	-	NU	Yellow Cake	1,3,8	858	276844	199934	-	858	276844	199934	-	858	329	122	41
Portugal	-			1,3	916	286435	213016	-	916*	286435	213016	-	916	322	127	48
Italy	Al Tuwaitha Bldg. 73 A & B		UO_2 Pellets	1,3	1	-	8	-	1	9.272	8.17	-	1	1	1	1
			U_3O_8 Powders	1,3	10	366.58	310.1	-	10	366.58	309.75	-	10	6	3	3
			UO_2 Powders	1	22	721.43	631.2	-	22	721.43	624.54	-	22	18	7	3
			UO_4 Powders	1	1	29.71	20.3	-	1	29.5	20.14	-	1	1	1	1
			Mix U Oxides	1	6	166.77	135.2	-	6	166.77	135.51	-	6	6	3	2
			FF Bundles	3	4	-	771	-	4	876.1	771	-	4	4	4	1
			FF Rods	1,3	55	-	29.96	-	54**	33.82	29.42	-	54	4	54	-
			UO_4 in Filters	4	37	-	50	-	37	-	50	-	37	-	-	6
	-		UO_2 Powders	1	68	-	2253.6	-	68	2620.5	2253.6	-	68	68	14	10
	-	LEU (2.6%)	UO_2 Powders	1	75	-	1767	45.82	75	2031	1767	45.82	75	75	23	10
	-	DU	UO_2 Powders	1	183	-	6005	-	183	7007	6005	-	183	183	16	7
U.K.	Al Tuwaitha Bldg. 9	DU	Metal	4	2	2	2	-	2	2	2	-	2	1	2	-
		NU	$UO_2(NO_3)_2$ Solution	4	4	-	0.4	-	4	0.54	0.4	-	4	1	1	-

I = item counting, B = weighing, D = sample analysis, NDA = non-destructive analysis
LEU = Low Enriched Uranium, DU = Depleted Uranium, NU = Natural Uranium, FF = Fresh Fuel

* Drum #MHI contains about 150 kgs Yellow Cake from Portugal and 217 kgs from Al Qaim origin and purified in Bldg. 73C (30 July Project)
** 1 FF Rod containing 0.54 kg NU was declared lost during bombing

UNSC 687

SUMMARY OF INSPECTION RESULTS

12th On-Site Inspection

Table 1 (cont. 1)

Location C

ORIGIN	Processing Site	Material Type		Prese-nted to Team No.	DECLARED INVENTORY				VERIFIED INVENTORY							
					No. of Items	Comp-ound Weight (kg)	Element Weight (kg)	U_{235} (kg)	No. of Items	Com-pound Weight (kg)	Element Weight (kg)	U_{235} (kg)	Verification Activities			
													I	NDA	B	D
Brazil	-	NU	UO_2 Powders	3	201	-	20128	-	201	20731	18036	-	201	37	201	7
	Al Tuwaitha Bldg. 15		UF_6	3	1	0.465	0.3	-	1	0.6	0.4	-	1	1	1	1
			Liquid Waste	4	4	-	6	-	4	-	6	-	4	-	-	5
			Mix U Powders	1,3,4	1	-	20	-	1	30	13.9	-	1	1	1	6
			UF_4 Powders		1	-	183	-	1	227	170.2	-	1	1	1	3
			UO_2 Powders		3	-	131.5	-	3	150.8	131.2	-	3	3	3	2
	Al Tuwaitha Bldg. 85		UCL_4	3,4	33	-	1840	-	33	2996.1	1917	-	33	33	33	17
			ADU Powders	3	13	-	717	-	13*	1140	545.04	-	13	13	13	15
	Al Tuwaitha Bldg. 80		EMIS Solutions	3	19	-	0.783	-	5**	-	0.393	-	5	5	5	3
		EU				-	0.322	0.050		-	0.278	0.044				10
		DU				-	2.438	-		-	1.746	-				6
		EU	EMIS Powders	10	8	0.398	0.318	0.021	8	0.411	0.308	0.020	8	8	8	8
		DU			13	5.063	4.050	-	13	5.150	4.120	-	13	13	13	11
	Tarmya Bldg. S4/46	EU	EMIS Solutions	3	1	-	0.146	0.009	1	-	0.163	0.010	1	1	1	5
Denmark	Tamuz-2 Bldg. 24	LEU (2.26%)	FF Rod	1	1	-	0.080	0.002	1	-	0.080	0.002	1	1	1	-

I = item counting, B = weighing, D = sample analysis, NDA = non-destructive analysis
HEU = High Enriched Uranium, LEU = Low Enriched Uranium, NU = Natural Uranium, EU = Enriched Uranium
DU = Depleted Uranium, FF = Fresh Fuel
* Drum #1 among ADU from Al-Jesira (contains 95.8 kg NU) is a mixture of Brazilian and Akashat powder
** Since part of the solutions were HEU. All mixed to change category to LEU (~1% U-235)

12th On-Site Inspection

SUMMARY OF INSPECTION RESULTS

Table 1 (cont.2)

Location C

ORIGIN	Processing Site	Material Type		Presented to Team No.	DECLARED INVENTORY				VERIFIED INVENTORY							
					No. of Items	Compound Weight (kg)	Element Weight (kg)	U_{235} (kg)	No. of Items	Compound Weight (kg)	Element Weight (kg)	U_{235} (kg)	Verification Activities			
													I	NDA	B	D
USSR	IRT-5000	-	Beryllium Cell	4	1	-	-	-	1	-	-	-	1	1	-	-
Akashat	Al Qaim	Natural Uranium	Yellow Cake	3	12	-	2200	-	12	3008	2023	-	12	12	12	9
	Al Jesira		UO_2 Powders	3	410	-	84843.2	-	410	97331	84680	-	410	308	98	47
			UCL_4	3	8	1207	780	-	8	1156	747	-	8	8	8	1
			Retained Waste	3	-	-	13000	-	-	-	-	-	-	-	-	10
	Al Tuwaitha Bldg. 85		ADU Powders	4	2	219	191.4	-	2	92	53.34	-	2	2	2	3
	Al Tuwaitha Bldg. 73 A&B		FF Pins	4	46	-	14	-	46	-	14	-	46	10	46	-
			UO_2 Pellets	4	1	-	26	-	1	29.25	25.8	-	1	1	1	3
Akashat & Brazil	Al Tuwaitha Bldg.73C (30 July Project)		UO_4 Slurry	4	8	-	164	-	8	1181.5	206.15	-	8	8	8	10
			UO_2 Powders	3	23	-	1850	-	23	2024.4	1755.15	-	23	23	23	2
			Mix U Oxides	3	19	-	160	-	19	200.5	172.21	-	19	19	19	2
			U_3O_8 Powders	3,4	5	-	500	-	5	154.9	130.99	-	5	5	5	2
			UF_4 Powders	3,4	2	-	30	-	2	78.2	56.18	-	2	2	2	2

I = item counting, B = weighing, D = sample analysis, NDA = non-destructive analysis
FF = Fresh Fuel

SUMMARY OF INSPECTION RESULTS

12th On-Site Inspection

Table 1 (cont.3)

Location C

ORIGIN	Processing Site	Material Type		Presented to Team No.	DECLARED INVENTORY				VERIFIED INVENTORY							
					No. of Items	Compound Weight (kg)	Element Weight (kg)	U_{235} (kg)	No. of Items	Compound Weight (kg)	Element Weight (kg)	U_{235} (kg)	Verification Activities			
													I	NDA	B	D
Akashat & Brazil	Al Tuwaitha Bldg. 73 C (30 July Project)	NU	UO_4 Purified	3	9	-	1360	-	9	1991.5	1314.4	-	9	9	9	2
			UO_3 Powders	3,4	24	-	3424	-	24	4599.3	3187.8	-	24	24	24	34
			U Metal	4	21	-	1020	-	21	-	1023.4	-	21	21	21	5
			UO_4 Powder	3	4	-	46	-	4	146.2	73.73	-	4	4	4	5
			Waste	12	1	-	200	-	1	-	-	-	1	-	-	1
USSR (Exempted)	Al Tuwaitha Bldg. 9	LEU (10%)	U-oxides & ADU	1,4,10	11	-	2.464	0.246	11	-	1.949	0.190	11	11	11	13
		LEU (6.9%)	ADU Powder		1	-	0.940	0.065	1	1.373	0.934	0.064	1	1	1	1
		LEU (10%)	FF Pins		5	-	0.400	0.040	5	-	0.400	0.040	5	5	-	-

I = item counting, B = weighing, D = sample analysis, NDA = non-destructive analysis
NU = Natural Uranium

/....

12th On-Site Inspection

SUMMARY OF INSPECTION RESULTS

Table 2

Location B

ORIGIN	Processing Site	Material Type		Presented to Team No.	DECLARED INVENTORY				VERIFIED INVENTORY							
					No. of Items	Compound Weight (gm)	Element Weight (gm)	U_{235} (gm)	No. of Items	Compound Weight (gm)	Element Weight (gm)	U_{235} (gm)	Verification Activities			
													I	NDA	B	D
France	Tamuz-2 Bldg. 24	HEU (93%)	Irradiated Fuel	1	38	-	11874	11050	38	-	11874	11050	38	98	-	-
USSR		HEU* (80%)		1	20	-	3933	3165	20	-	3933	3165	20	20	-	-
		HEU (36%)		1	3	-	1002	360	3	-	1002	360	3	3	-	-
		LEU (10%)		1	69	-	87760	8776	69	-	87760	8776	69	69	-	-
Al Qaim		NU		4	2	-	7900	-	2	-	7900	-	2	2	-	-
France		-	Beryllium blocks	1	7	-	-	-	7	-	-	-	7	-	-	1

I = item counting, B = weighing, D = sample analysis, NDA = non-destructive analysis
HEU = High Enriched Uranium, LEU = Low Enriched Uranium, NU = Natural uranium
* Six elements in tank no. 14 contain control rods

SUMMARY OF INSPECTION RESULTS

12th On-Site Inspection

Table 3

IRT-5000 Reactor

ORIGIN	Processing Site	Material Type		Presented to Team No.	DECLARED INVENTORY				VERIFIED INVENTORY							
					No. of Items	Compound Weight (kg)	Element Weight (kg)	U_{235} (kg)	No. of Items	Compound Weight (kg)	Element Weight (kg)	U_{235} (kg)	Verification Activities			
													I	NDA	B	D
USSR	IRT-5000 Reactor	HEU (80%)	Irradiated Fuel	1	76	-	15291	12232	76	-	15291	12232	76	68	-	-
		-	Beryllium Blocks	1	17	-	-	-	17	-	-	-	17	-	-	-

I = item counting, B = weighing, D = sample analysis, NDA = non-destructive analysis
HEU = High Enriched Uranium

(NOT UNDER IAEA SEALS)

/...

FIGURE 4: LEFT SIDE STORAGE OF LOCATION C

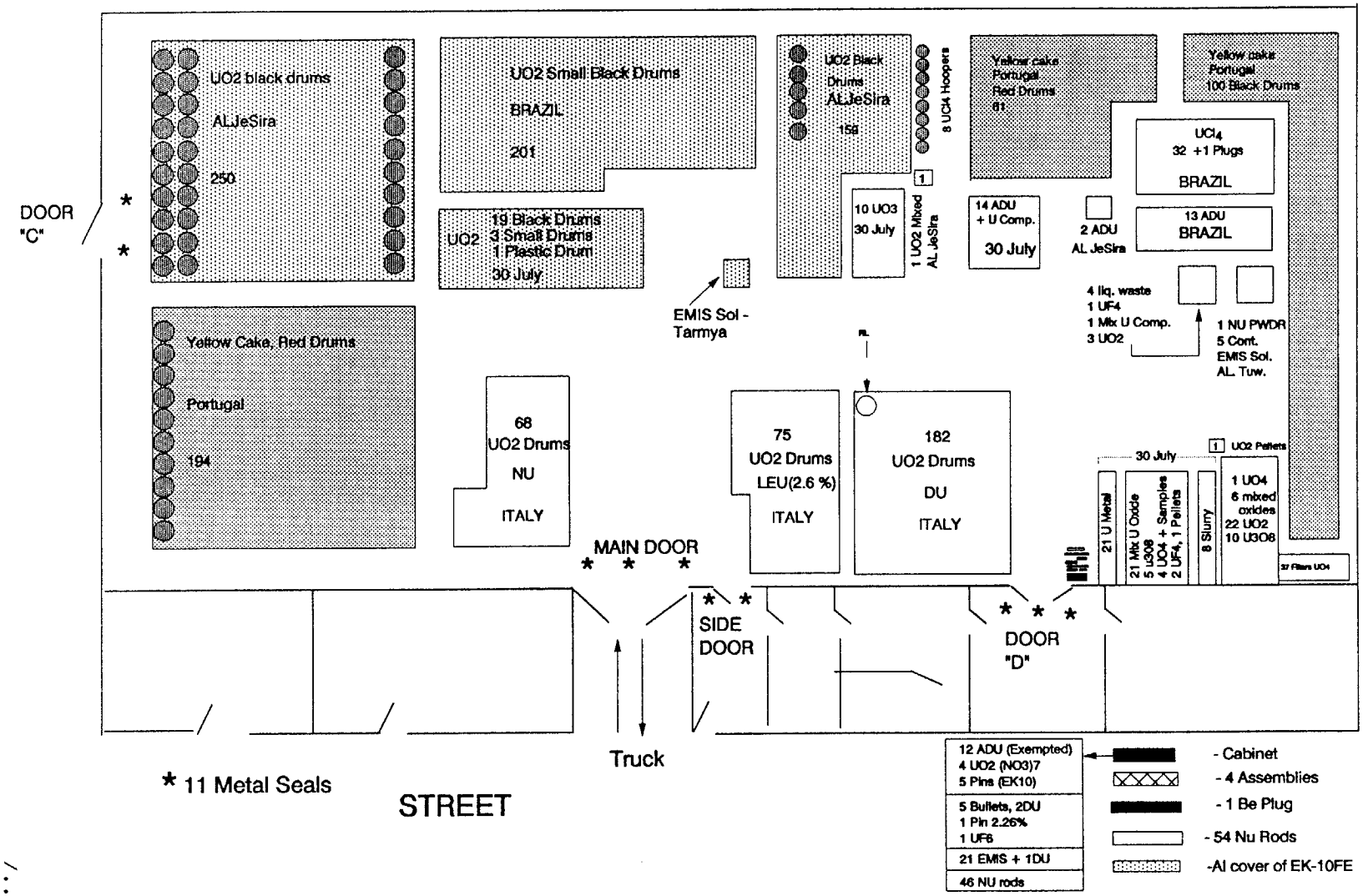


FIGURE 5: RIGHT SIDE STORAGE OF LOCATION C