

**KIRKUK TO BAIJI PIPELINE  
EXCLUSION ZONE – PHASE 3  
KIRKUK, IRAQ**

**SUSTAINMENT ASSESSMENT**

**SIGIR PA-08-137  
JULY 24, 2008**



## SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

July 24, 2008

MEMORANDUM FOR COMMANDING GENERAL, MULTI-NATIONAL FORCES-IRAQ  
COMMANDING GENERAL, JOINT CONTRACTING COMMAND-  
IRAQ/AFGHANISTAN  
COMMANDING GENERAL, GULF REGION DIVISION, U.S.  
ARMY CORPS OF ENGINEERS  
DIRECTOR, IRAQ TRANSITION ASSISTANCE OFFICE

SUBJECT: Report on Construction of the Kirkuk to Baiji Pipeline Exclusion Zone - Phase 3,  
Kirkuk, Iraq (Report Number SIGIR PA-08-137)

The Office of the Special Inspector General for Iraq Reconstruction is assessing projects funded under the Economic Support Fund to provide real-time relief and reconstruction information to interested parties to enable appropriate action, when warranted.

We are providing this report for your information and use. It addresses the current status of the Kirkuk to Baiji Pipeline Exclusion Zone - Phase 3, Kirkuk, Iraq and whether intended objectives will be achieved.

This report does not contain any negative findings or recommendations for corrective action. As a result, management comments were not required. Representatives of the Gulf Region Division of the U.S. Army Corps of Engineers reviewed a draft of this report and had no comments.

We appreciate the courtesies extended to our staff. If you have any questions please contact Mr. Brian M. Flynn at [brian.flynn@sigir.mil](mailto:brian.flynn@sigir.mil) or at 914-360-0607. For public queries concerning this report, please contact SIGIR Public Affairs at [publicaffairs@sigir.mil](mailto:publicaffairs@sigir.mil) or at 703-428-1100.

Stuart W. Bowen, Jr.  
Inspector General

# Special Inspector General for Iraq Reconstruction

SIGIR-PA-08-137

July 24, 2008

## Kirkuk to Baiji Pipeline Exclusion Zone – Phase 3 Kirkuk, Iraq

### Synopsis

**Introduction.** This project assessment was initiated as part of our continuing assessments of Economic Support Fund funded construction activities. The overall objective was to determine whether projects are operating at the capacity stated in the original contract or task order objective. This limited scope assessment was conducted in accordance with the Quality Standards for Inspections issued by the President's Council on Integrity and Efficiency. The assessment team included an engineer/inspector and two auditors/inspectors.

**Project Objective.** The objective of the project was to reduce oil pipeline interdictions, improve the reliability of crude oil delivery from the Kirkuk oilfields to the Baiji Oil Refinery, and increase exports of northern crude oil via the Iraq-to-Turkey Pipeline.

**Project Assessment Objective.** The objective of this project assessment was to provide real-time information on relief and reconstruction projects to interested parties to enable appropriate action, when warranted. To accomplish this objective, SIGIR determined whether the project was at full capability or capacity when accepted by the U.S. government, when transferred to the appropriate Iraqi ministry, and when observed during the site visit. Specifically, SIGIR determined whether the completed project was operating at the capacity stated in the objective of the original contract or task order.

For this assessment, SIGIR focused on the most recently completed phase of the project, Phase 3, which the United States Army Corps of Engineers, Gulf Region North accepted in May 2008.

**Conclusions.** On June 7, 2008, SIGIR visited the Phase 3 portion of the Kirkuk to Baiji Pipeline Exclusion Zone project. The fences, berms, ditches, concertina wire, and guard houses were in compliance with contract designs and specifications. In addition, during the site visit, SIGIR noticed Iraqi Army soldiers manning the guard houses at each road crossing.

Since the beginning of construction for the Kirkuk to Baiji Pipeline Exclusion Zone in July 2007, there have been no reported interdictions—resulting directly in the substantial rise of northern crude oil exports. From July 2007 to May 2008, northern crude oil exports have increased by approximately 91.3 million barrels, or approximately \$8.215 billion. When completed, the entire length of the Kirkuk-to-Baiji Pipeline Exclusion Zone project will cost approximately \$34.4 million. In only 11 months, the additional \$8.215 billion in crude oil revenues has provided a 239:1 return on investment.

In addition to the increased oil exports, additional supplies of crude oil are now available at Baiji for refining. The growth in supplies of refined petroleum products has contributed to the increase in electricity production and improved the living conditions of the Iraqi people by making fuel available for heating, cooking, and transportation.

**Recommendations and Management Comments.** This report does not contain any negative findings or recommendations for corrective action; therefore, management comments were not required. Representatives of the Gulf Region Division of the United States Army Corps of Engineers reviewed a draft of this report and had no comments.

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# Introduction

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## Background

The Department of State fact sheet, “The Story of Oil in Iraq”, states that Iraq has the world’s second largest proven oil reserves. The Iraqi oilfields have proven reserves of approximately 100 billion barrels, with the potential of as many as 200 billion barrels. The Iraqi oilfields account for approximately 16% of all Middle East oil reserves. With the world’s second largest crude oil reserves, the Iraq oil industry is perhaps the most critical link to re-establishing the country as a major economy in the Arabian Gulf. Currently, oil exports provide over 95% of the country’s revenue and are critical to the successful funding of the Iraqi government. Iraq’s oilfields are divided into two distinct production areas: the Southern fields and the Northern fields (Figure 1). The Northern oilfields are dominated by the Kirkuk fields, with production capacity of approximately 900,000 barrels per day (bpd). The Kirkuk oilfields provide all crude oil for the Baiji Refinery, 40% to 45% of the crude oil for the Daura Refinery, and export of crude oil to Turkey.

Along with providing constant revenue to the Iraqi government, oil and gas fuel are used to operate electrical generation facilities, which in turn support oil, water, telecommunications, and other key essential services. In short, Iraq’s entire infrastructure is dependent on the constant and sustainable production of oil.

Several pipelines from the Kirkuk oilfields to the Baiji Refinery carry crude oil, liquid petroleum gas, diesel, benzene, and kerosene. Crude oil from the Kirkuk oilfields to the Baiji refinery is delivered through three different sized pipelines – 26-inch, 40-inch, and 46-inch. Crude oil exports leave the Baiji refinery to Turkey via the 46-inch Iraq to Turkey Pipeline (ITP).

## Iraqi Oil Production History

Oil was discovered in Iraq in 1903. Only 17 of 80 oilfields have been developed, with the most significant fields being Kirkuk in the north and Rumaila in the south. The giant Kirkuk fields were discovered in 1927; while the Rumaila fields were discovered in the 1970s. There has been virtually no exploration for many years, which suggests that Iraq may have significantly more oil than originally estimated.

Iraq’s peak production occurred in December 1979 at 3.7 million bpd, and then just prior to its invasion of Kuwait in July 1990 at 3.5 million bpd. However, after the invasion of Kuwait, exports were halted due to the international boycott. From 1991–1996, when production crashed due to the war, Iraqi oil output increased slowly, to approximately 600,000 bpd. Iraqi’s southern oil industry was decimated in the first Gulf War, with production capacity falling to approximately 75,000 bpd in mid-1991. The first Gulf War resulted in the destruction of gathering centers and compression/degassing stations at Rumaila, storage facilities, the 1.6 million bpd Al Basrah Oil Terminal (ABOT) export terminal, and pumping stations along the 1.4 million bpd (pre-war capacity) Iraqi Strategic (North-South) Pipeline.

With Iraq’s acceptance in late 1996 of U.N. Resolution 986, which allowed limited Iraqi oil exports in exchange for food and other supplies (“Oil for Food”), the country’s oil output began increasing more rapidly, from approximately 1.2 million in 1997 to approximately 2.6 million bpd in January 2003.

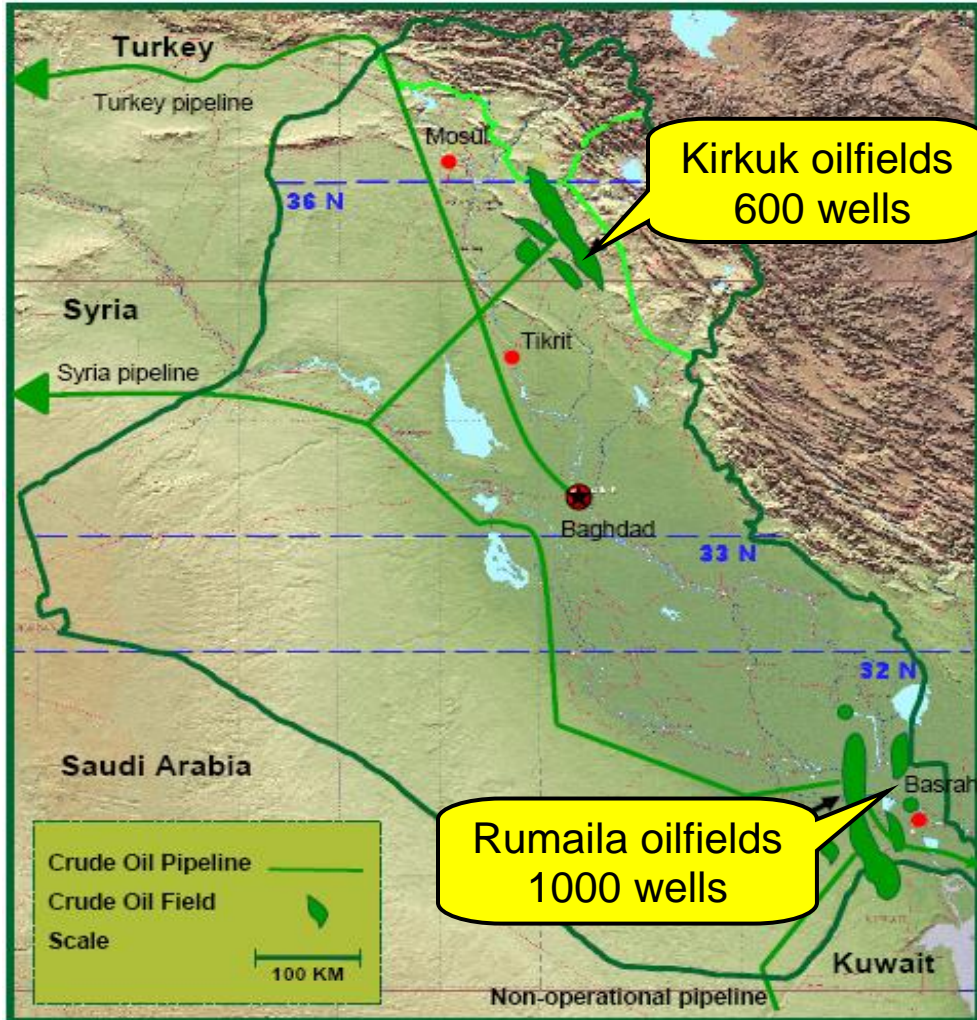


Figure 1. Map of Iraq's northern and southern oilfields

Iraq was able to increase oil production in the 1990s through the use of improvised maintenance techniques, scavenged spare parts, and the cannibalization of equipment, especially at the country's refineries.

### Organization of the Iraqi Ministry of Oil

The Iraqi Ministry of Oil (MOO) oversees the nationalized oil industry through the Iraq National Oil Company (INOC). The charter of the MOO is to be the "premier oil supplier to the world through effective exploration, production, and supply." The MOO functional areas are divided into the following: upstream, downstream, and distribution and marketing. Autonomous companies under the INOC include the following: State Company for Oil Projects— design and engineering of upstream and downstream projects; Oil Exploration Company— exploration; Northern Oil Company (NOC) and Southern Oil Company (SOC) – upstream activities in northern/central and southern Iraq, respectively; State Organization for Oil Marketing— crude oil sales and Organization of the Petroleum Exporting Countries (OPEC) relations; and Iraqi Oil Tankers Company.

## Oil Pipeline Interdictions and Smuggling/Illegal Taps

After the 2003 Coalition invasion, Iraq's 4,300 mile network of pipelines has been a continuous target for interdictions and sabotage. Although many pipeline incidents are not reported, since 2003, there have been over 400 reports of either sabotage or violence against Iraq's oil infrastructure, consisting of pipelines, refineries, and workers (Figure 2 and Site Photo 1).

This has been especially burdensome for the northern pipelines bringing oil from Kirkuk to the refinery at Baiji because a majority of the pipeline is located either above ground or buried shallow underground. Terrorists place explosives at critical points such as junctions and attempt to destroy custom-made parts, which take months to replace. In addition, since the oil pipelines are old, any damage to one section generally leads to leaks and cracks down the line.

U.S. officials have noted that corruption in Iraq's oil sector is pervasive. According to the MOO's Inspector General, millions of dollars of potential Government of Iraq (GoI) revenue are lost each year due to smuggling or diversion of refined products. In many cases, criminals simply puncture the pipelines, siphon oil into tanker trucks, and sell it on the black market (Site Photo 2). Apparently, this type of smuggling has gone on in Iraq for decades. It has been reported that even during the Saddam regime, Saddam let local tribes illegally tap into the crude oil pipelines in exchange for protecting the pipelines from further damage.

Considering approximately 95% of the GoI's revenue is from the export of oil, any loss of crude oil by either interdiction or smuggling has consequences for the people of Iraq.

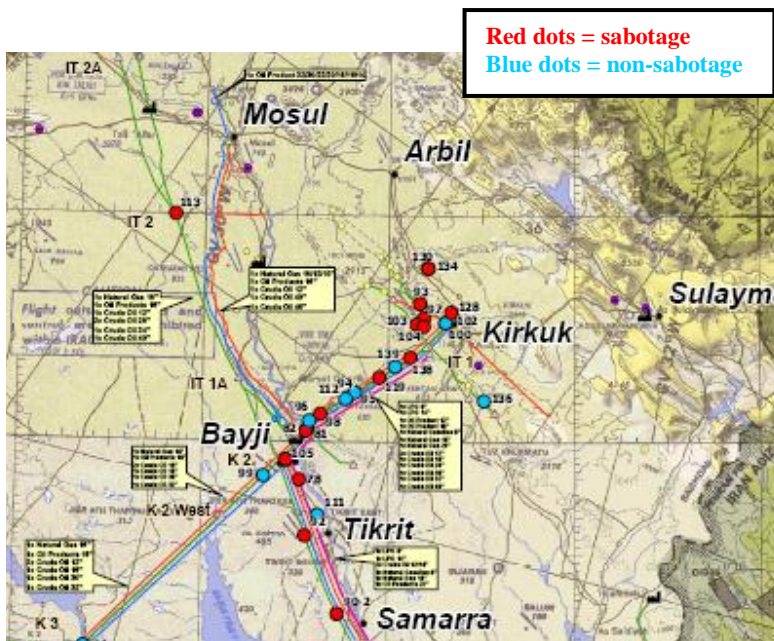


Figure 2. Reported pipeline incidents between 4 Jan and 24 May 2004 (Courtesy of the USACE)



Site Photo 1. Example of pipeline interdiction (Photo courtesy of ITAO)





**Site Photo 2. View of two oil tanker trucks making unauthorized taps into Iraq's pipelines  
(Photo courtesy of the USACE)**

## **Infrastructure Security Program**

The Infrastructure Security Program (ISP) is a collaborative effort between the Iraqi Transition Assistance Office (ITAO), the U.S. Army Corps of Engineers (USACE) Gulf Region Division (GRD), and the Energy Fusion Cell. The ISP was initiated to reduce the incidents of insurgent damage to the oil pipeline system, electrical distribution system, and other important infrastructure throughout Iraq. Specifically, the ISP objective is to mitigate the opportunity of attack or theft by deterring, slowing, or impeding attempts to interdict key infrastructure. According to the Fiscal Year 2006 Supplemental Economic Support Fund appropriation of \$227 million, the ISP is executing projects for infrastructure security protection, such as the following:

- Pipeline exclusion zones
- ABOT/KAAOT (Khor Al Amaya Oil Terminal) security enhancements
- Hardening of critical 400-kV electrical transmission towers
- Key facility hardening
- Infrastructure & security support projects
- Identity management projects

### Pipeline Exclusion Zone

In order to protect and provide security to critical oil pipeline corridors, the ISP developed the concept of a Pipeline Exclusion Zone (PEZ). The Kirkuk to Baiji (K2B) PEZ is part of a country-wide effort to secure the key energy infrastructure to ensure the viable oil export, power generation, and distribution of refined petroleum products for the GoI and its people. Specifically, the K2B PEZ will provide physical barriers to prevent the interdiction/destruction of the oil pipelines or tapping to illegally extract petroleum

products. The PEZ provides physical and visible protection through the use of ditches, berms, fences, and guard houses<sup>1</sup>.

The K2B PEZ will ensure the protected flow of oil to Baiji and subsequently on to the 46 inch ITP export line. The anticipated benefits of a secured pipeline corridor would be a decrease in the number of attacks, which would result in an increase in oil production and oil exports and consequently, increased revenue for the GoI. In addition, the increased oil production would improve the living conditions of the Iraqi people by making available fuel for electric power plants, heating, cooking, and transportation. With daily export revenue approximations ranging from \$20 million to \$30 million, the approximately \$34 million<sup>2</sup> K2B PEZ project cost will be potentially returned with 1-2 days of increased export capability.

#### *Coalition Forces currently patrolling the PEZ*

The U.S. Army maneuver unit, the 3<sup>rd</sup> Battalion, 6<sup>th</sup> Field Artillery (3-6) of the 10<sup>th</sup> Mountain Division (Light Infantry), is currently securing the PEZ. Specifically, the 3-6 patrols the entire length of the K2B PEZ to dissuade any attempts at interdicting the oil pipelines. In addition, the 3-6 meets with the members of the small villages and towns to discuss various issues and also gauge their thoughts about the PEZ. According to a 3-6 representative, the public reaction to the PEZ is “generally good.”

#### Responsibility of the GoI

The PEZ is a significant example of the GoI’s increasing desire to take responsibility for the security of its oil pipelines. The PEZ concept is a cost sharing partnership between the U.S. government and the GoI. To complement the approximately \$34.4 million investment by the U.S. government, the GoI stepped forward and agreed to contribute to the project.

#### *Cost Sharing Partnership with the GoI*

The GoI has committed its own resources, both monetary and military, to enhance the overall effectiveness of the PEZ. Specifically, the GoI awarded a contract worth approximately \$12.3 million to provide extra security in the form of 185 guard towers, 16 company headquarters, and 4 battalion headquarters buildings along the entire length of the K2B PEZ; while also supplying Iraqi Army (IA) troops to staff guard towers and patrol the entire length of the PEZ.

#### Providing troops to guard the PEZ

According to Ministry of Defense (MOD) representatives, approximately 762 IA soldiers will be dedicated to the protection of the entire length of the K2B PEZ. These soldiers will man the road crossings/guard houses, high watch towers, and patrol up and down the PEZ.

#### Phases of the K2B PEZ

The entire length of the K2B PEZ is approximately 95 kilometer (km). In order to complete the project as expeditiously as possible, the project was divided into 7 phases (Figure 3) and awarded to multiple local national contractors in order to work on all phases simultaneously.

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<sup>1</sup> The PEZ was not designed to be an absolute security zone; rather, the intent was to make it just hard enough for people to be discouraged from attempting an interdiction.

<sup>2</sup> The approximate cost of \$34.4 million for the entire length of the K2B PEZ was provided by ITAO.

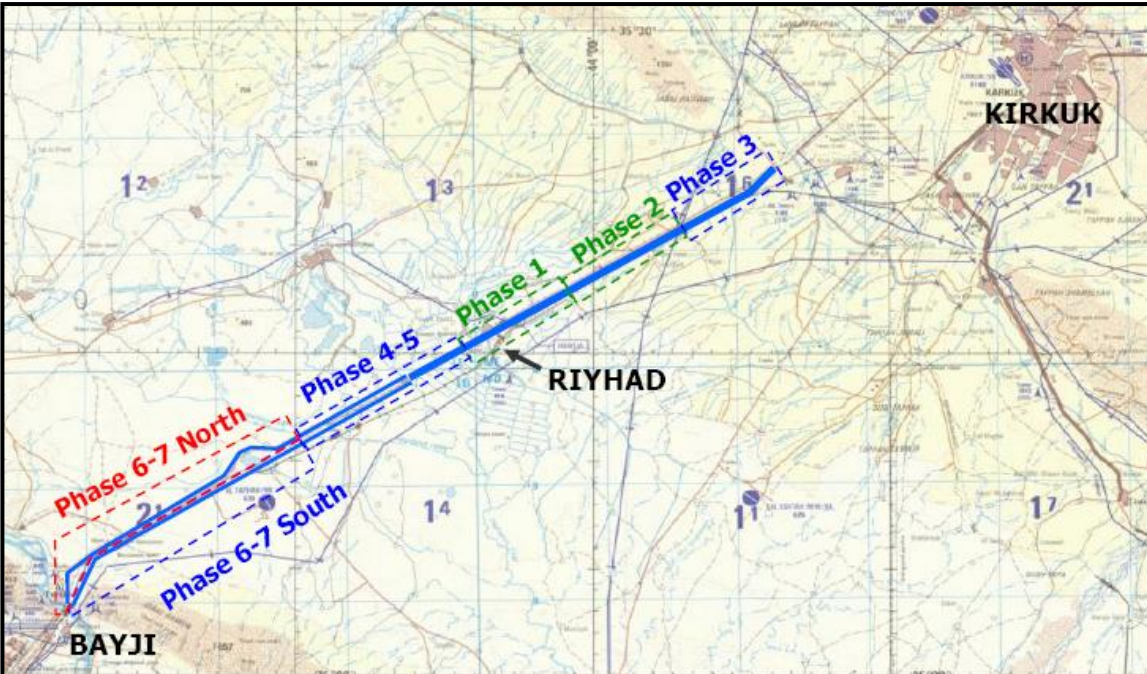


Figure 3. Phases of the K2B PEZ

## Objective of the Project Assessment

The objective of this project assessment was to provide real-time relief and reconstruction project information to interested parties to enable appropriate action, when warranted. Specifically, we determined whether the completed project was operating at the capacity stated in the original contract or task order objective. To accomplish this, we determined if the project was at full capability or capacity when accepted by the U.S. government, when transferred to the appropriate Iraqi ministry, and when observed during our site visit.

## Pre-Site Assessment Background

### Contract, Costs and Payments

Contract W917BE-07-C-0039, a firm fixed price contract, in the amount of \$3,390,893, to design and construct Phase 3 of the oil pipeline force protection exclusion zone, was awarded to a local contractor on 6 June 2007.

This contract contained two modifications. Modification 1 extended the project completion date to 20 March 2008, and increased the contract amount by \$200,665. Modification 2 resulted from the contractor's request for equitable adjustment; the government increased the final contract amount by \$246,750. Consequently, the final contract amount for Phase 3, including contract modifications, was \$3,838,308.

## **Project Objective, Pre-Construction Description**

The objective of the PEZ is to reduce oil pipeline interdictions, improve the reliability of crude oil delivery from the Kirkuk oilfields to the Baiji Oil Refinery, and increase northern crude oil exports via the ITP.

The K2B PEZ is approximately 95 km long. In an attempt to complete the entire length of the PEZ expeditiously, the project was divided into seven phases, with each segment awarded to a different contractor. Phase 3, which is at the northern end of the PEZ, is surrounded by farmland and small scattered villages on both sides. Cherry North, an asphalt road, runs between two main pipelines southwest from Kirkuk to the town of Riyadh. This road will be included within the PEZ; however, according to Gulf Region North (GRN) representatives, Cherry North is a service road for the exclusive use of the Northern Oil Company (NOC). A public road, Cherry South, will be located outside the PEZ.

Due to the significant length of the entire PEZ and the fact different contractors were used for each phase, SIGIR decided to focus on the most recently completed phase for this assessment. Consequently, SIGIR chose Phase 3 since it was completed and accepted by the USACE GRN in May 2008.

## **Statement of Work**

The Phase 3 Statement of Work (SOW) required the contractor to create an exclusion zone approximately 9,400 meters (m) long, comprised of chain link fences, berms and channel, concertina wire, miscellaneous types of barriers, and masonry guard houses.

The requirements for the barriers are the following:

- Chain link fences – galvanized 1.8-m high, 60 millimeter (mm) line posts equally spaced not exceeding 3-m, with straight runs braced every 30 m with 75-mm pull posts.
- Berms – at least 2.5-m high with a base of 3-m and 0.5-m across the top. The fill dirt for the berms must be excavated adjacent to the berms to form a canal. The berms run along both sides of the exclusion zone from start to end points.
- Road crossing have a fence gate on both sides of the new road into the exclusion zone.
- Masonry guard houses (2) at each road crossing. The guard houses have reinforced concrete floors and roof, three 1-m x 1-m windows with screens, and one lockable steel door.

## **Current Project Design and Specifications**

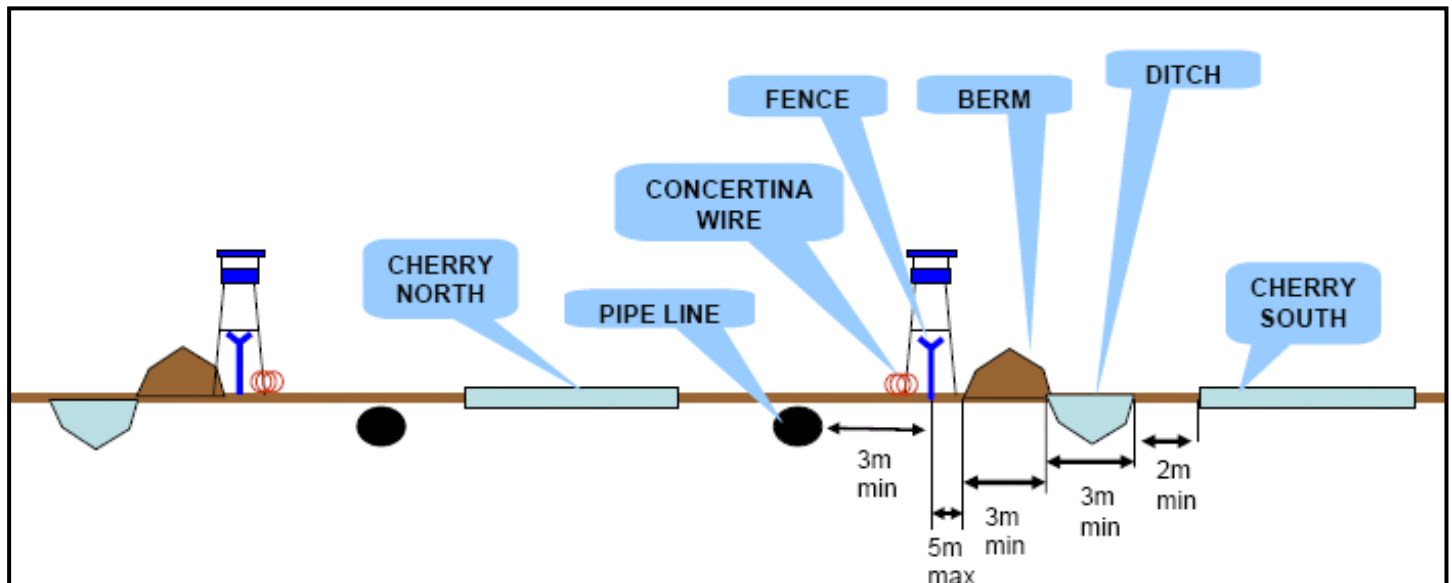
The Phase 3 contract included requirements for project design submittals and approval. The contract required the contractor to submit the 100% project design to the USACE project engineer for review and approval. Specifically, the project design was to include the following:

- survey of existing site as described
- basis of proposed design and calculations
- updated drawings based on the provided concept drawings
- detailed drawings of the electrical layout

According to USACE representatives, the ISP developed and provided the original design to the contractor, who was encouraged to improve upon the furnished design.

The USACE provided SIGIR with the 100% design submittal. SIGIR reviewed the ISP's original designs, which provided typical views of the following:

- side view of the PEZ (Figure 4)
- layout of crossing points
- fence detail
- guard tower/house details



**Figure 4. Side view of the PEZ, including fence, concertina wire, berm, and ditch (Courtesy of the USACE)**

The ISP's original furnished designs provided the contractor illustrations of the contract's requirements. For example, the side view of the PEZ provided a site layout, which assisted in identifying the types of barriers required (i.e. berms, ditches, and fences) and the minimum distances between the different barriers. In addition, the fence specifications identified significant information, such as the diameter of the posts, tension band detail, grounding detail, and brace panel detail. Further, the furnished designs allowed the contractor the opportunity to improve upon the design. For example, the typical guard tower/house details only provided the dimensions and a typical wall section; allowing the contractor to add further details, such as the location of electrical wiring for the pre-wired ceiling fan and interior and exterior lights.

The contractor's final design submittal package included the following:

- survey of the existing site
- berm design
- chain link fence
- drainage plan

SIGIR reviewed the contractor's final design submittal package and determined it mirrored the ISP design. The ISP's design drawings appeared adequate to construct the various barriers and guard houses for the PEZ.

# Progress During Construction

The PEZ Phase 3 contract file contained numerous progress photographs documenting construction work done throughout the project. We reviewed and subsequently relied on selected progress photographs to document examples of construction performance which appeared to be accomplished in accordance with SOW requirements before the project was turned over to the NOC in May 2008.

Site Photos 3 and 4 document the initial excavation of a ditch and the formation of a berm; Site Photos 5 and 6 capture the installation of the chain link fence. Finally, Site Photo 7 is an aerial photograph illustrating the current status of work completed as of April 2008.



**Site Photo 3. Excavation for the PEZ ditch  
(Photo courtesy of the USACE)**



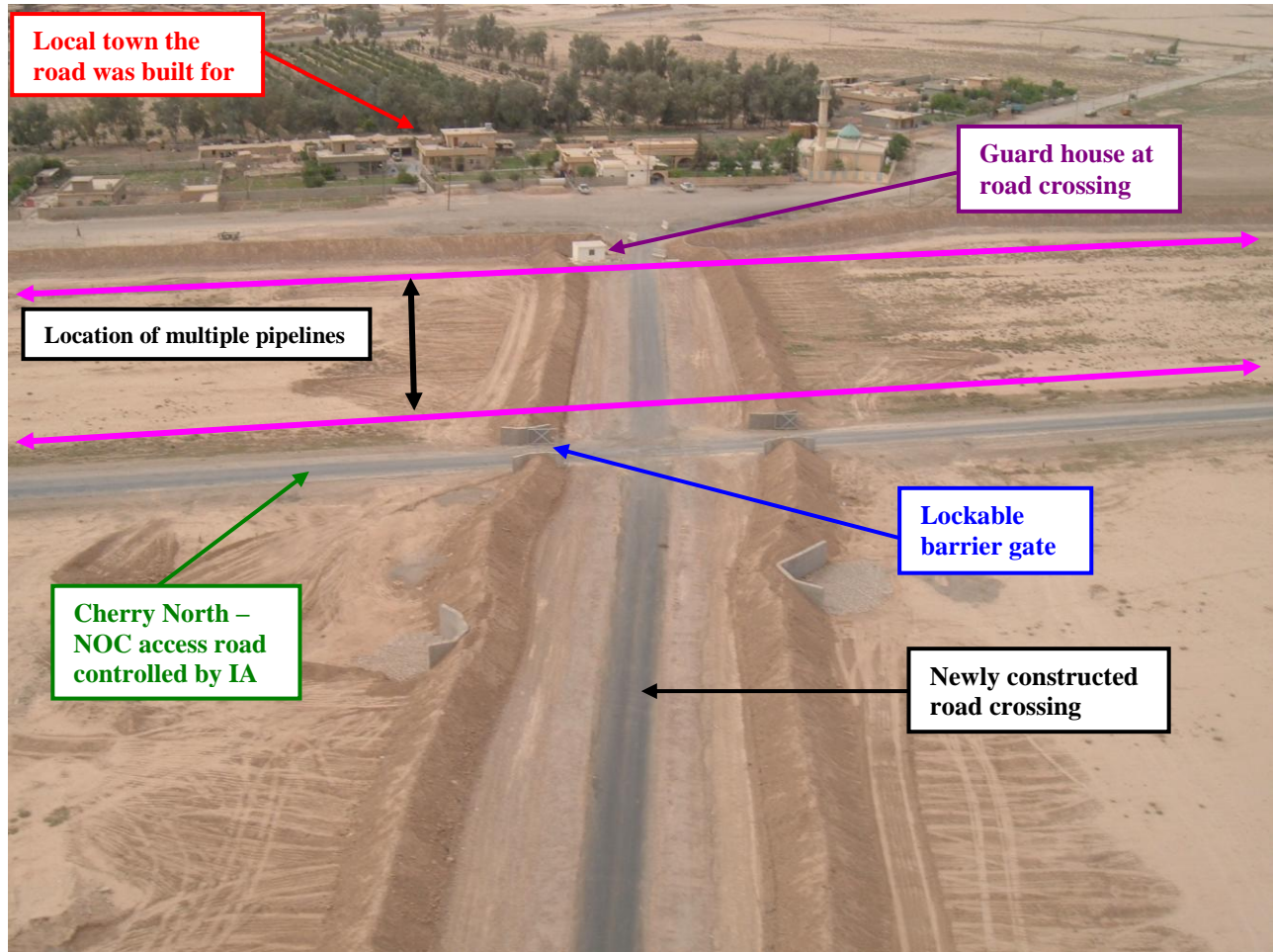
**Site Photo 4. Formation of the PEZ berm  
(Photo courtesy of the USACE)**



**Site Photo 5. Installing posts for the PEZ fence post  
(Photo courtesy of the USACE)**



**Site Photo 6. Installed PEZ fence posts  
(Photo courtesy of the USACE)**



Site Photo 7. Aerial view of a Phase 3 PEZ road crossing (Photo courtesy of the USACE)

## Status of the PEZ at Time of Turnover

According to the quality management program, as instituted by the contractor and the USACE GRN, a number of measures were taken to ensure that the construction of the PEZ met the requirements of the contract designs and specifications. Specifically, the quality management program was designed to assure that all construction, including that of subcontractors, suppliers, and test laboratories, complied with the latest applicable contract drawings, specifications, certified or approved submittals, as well as authorized changes to the contract.

This project consisted primarily of the installation of fences, excavation of ditches, formation of berms, and the construction of simple structures (single-story guard houses). The focus of the quality management program was to ensure that the contractor performed in compliance with the contract designs and specifications. The USACE GRN project engineer and local national Iraqi Construction Engineers<sup>3</sup> (ICE) regularly visited the project site to monitor field activities and identify, report, and correct any construction deficiencies.

<sup>3</sup> Local nationals with engineering and/or construction backgrounds working for the USACE.

The GRN, NOC, and contractor representatives performed a “pre-final inspection” of the PEZ Phase 3 construction work. The inspection report noted that the “clearance between the ditch and berm was less than the minimum 1 meter requirement,” but all parties agreed this was “acceptable.” However, the inspection did identify significant deficiencies, such as an exposed wall electrical socket for the main power line in the guard house and no bottom rails along the entire fence line. The contractor corrected the deficiencies and on 12 May 2008, the GRN stated that all “noted deficiencies and punch list items that required correction and/or replacement had been completed.” Consequently, the project construction work met the requirements of the contract design and specifications.

#### Turnover of PEZ not yet finalized

On 12 May 2008, the USACE GRN and the contractor signed a contract completion document, which stated that both parties “acknowledge that the work performed under the subject contract meets the standards set forth in the contract plans and specifications.” The same day, the GRN sent the NOC Director of Projects the appropriate transfer document for signature and official acceptance of the project and all certified warranties

## **Site Assessment**

On 7 June 2008, SIGIR performed an on-site assessment of the PEZ Phase 3, accompanied by representatives from GRN. Due to security concerns, the entire length of the Phase 3 was not inspected; instead, sample areas along the phase were inspected including the beginning and end of Phase 3 and all three road crossings.

#### Fence and Concertina Wire

The contract design required the installation of a continuous chain link fence, 1.8-m high, with V-barb fittings on the top of each post to enable six strands of barbed wire (three strands of barb wire on each side of a “V” shape) on top of each post and rolled concertina wire cradled within the “V” formation on top of the fence (Figure 5). In addition, the contract design required three rolls of coiled concertina wire; each roll connected to the other with a third roll stacked on the other two and secured to a metal post.

During the site visit, we inspected the fence and concertina wire. We measured different sections of the fence and found it to be at least the required 1.8-m high; each section had the V-barb fittings with rolled concertina wire on top of the fence (Site Photo 8). We also observed three rolls of concertina wire inside the fence and secured to a metal post (Site Photo 9).



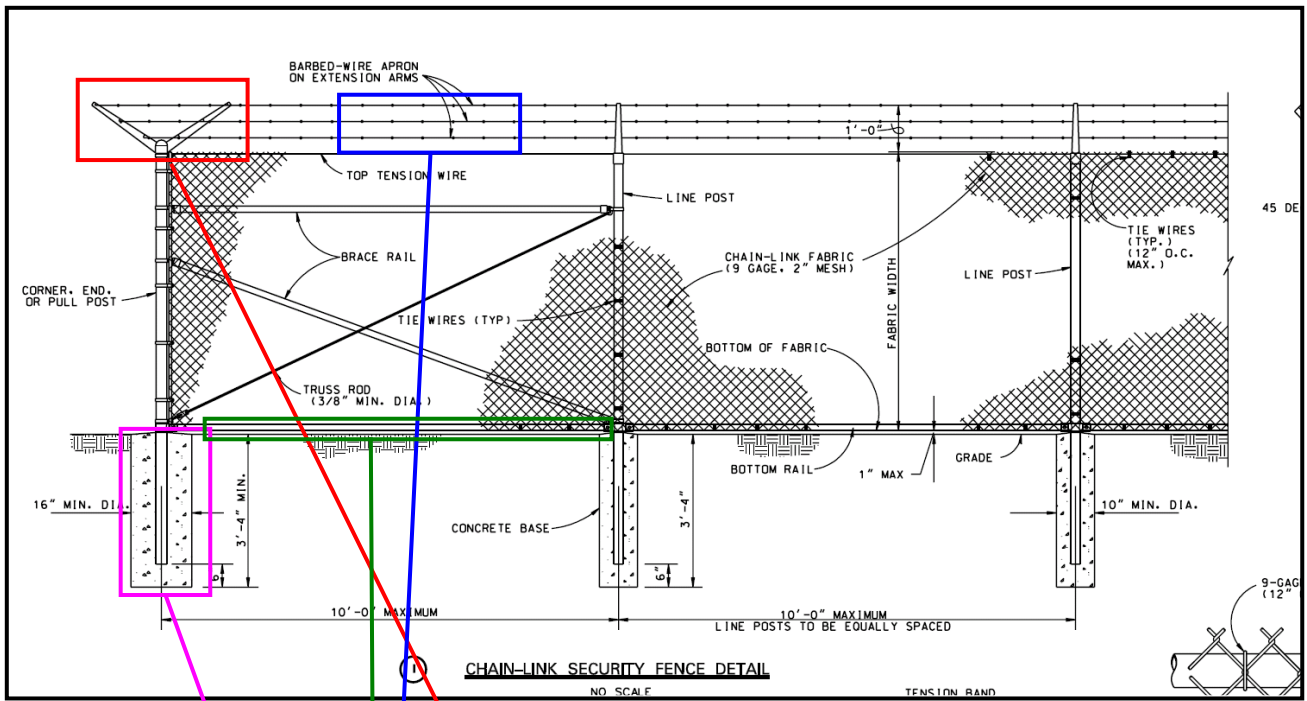
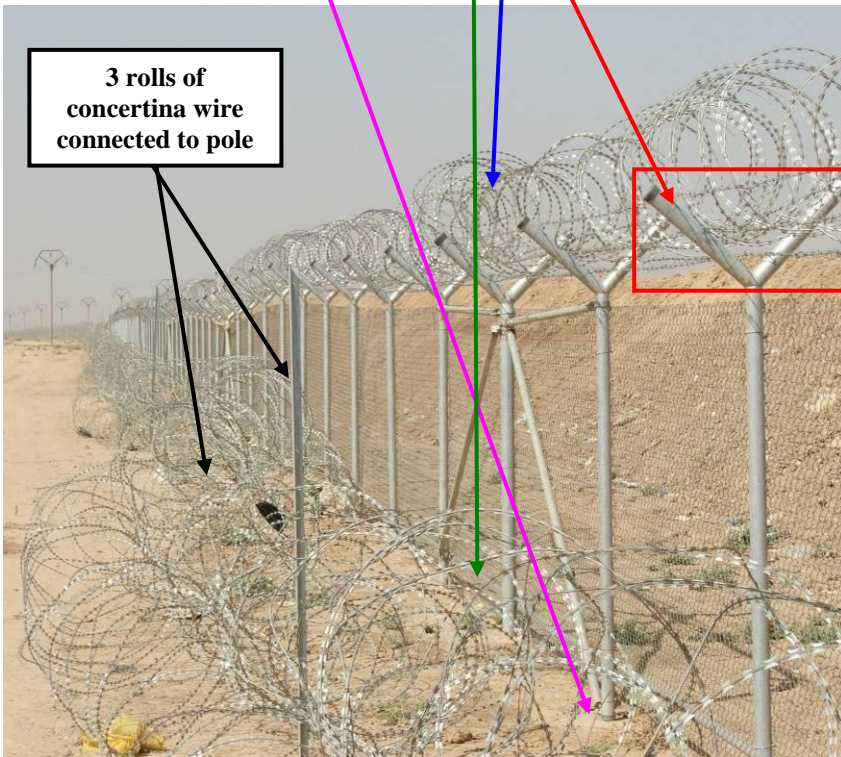


Figure 5. Contract design for the fence (Courtesy of the ITAO)



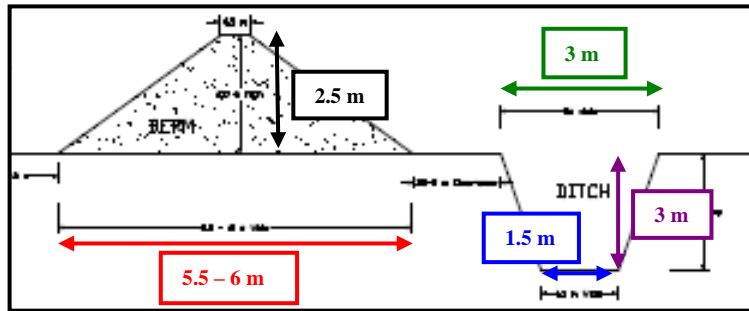
Site Photo 8. Representative sample of fence and concertina wire



Site Photo 9. SIGIR inspectors measuring height of fence

## **Berms and Ditches**

The contract required the construction of berms with dimensions of at least 2.5-m high and a base of 3-m and 0.5-m across the top. The dirt for the berm must be excavated adjacent to the berms to form a canal (ditch). The contractor's design submittal mirrored the contract's specification, except it increased the base requirement from 3-m to 5.5-m - 6-m (Figure 6).



**Figure 6. Cross section of ditch and berm**

Since we could not continuously measure the berm along the almost 6 km PEZ, we chose specific areas to use as a representative sample. We measured the dimensions of a berm and found them within the range required by the contract's design (Site Photo 10). We confirmed the dirt for the berm came from an adjacent ditch/canal (Site Photo 11).

During the site visit, the GRN project engineer stated that in some specific areas, the berm is less than 2.5-m high. According to the project engineer, some local villages complained about the berm being too high and made them feel imprisoned by the PEZ. A joint agreement was made by the GRN, NOC, the contractor, and local village leaders to lower the height of the berm in specific places; however, the berm's height was not lowered below 2-m at any location throughout the PEZ.



**Site Photos 10 and 11. SIGIR inspectors ensuring the ditch and berm met contract design specifications**

### Potential Sustainability Issues

Maintaining the desired compaction integrity/quality of the earthen berms will be a concern for the GoI. During the site visit, we identified instances where the integrity of the compaction has been degraded (Site Photo 12). The GoI will have to make continual efforts to sustain the original quality of the earthen berm.



**Site Photo 12. Example of earthen berm compaction degradation**

### Road Crossings

Road crossings were planned to allow access to small towns and villages. The road crossings intersect the NOC controlled Cherry North access road. The contract design required each road crossing to have a fence gate on both sides of the new road into the exclusion zone, with a swinging chain link gate that can be locked in either the open or closed position (Figure 7). In addition, gate posts leading into and out of the small towns and villages must be 100-mm set in concrete.

We inspected the three sets of Phase 3 road crossings. The newly constructed asphalt roads and chain link gates appeared to meet contract specifications (Site Photos 13 and 14). The gate posts were set in concrete; however, we noticed that some gate posts were damaged. We asked the IA soldiers manning the gate posts and they stated the gate posts were damaged when installed by the contractor. However, according to GRN representatives, the gate posts, when installed were not damaged. It appeared the guards may have damaged the posts by standing on them (Site Photos 15 and 16).

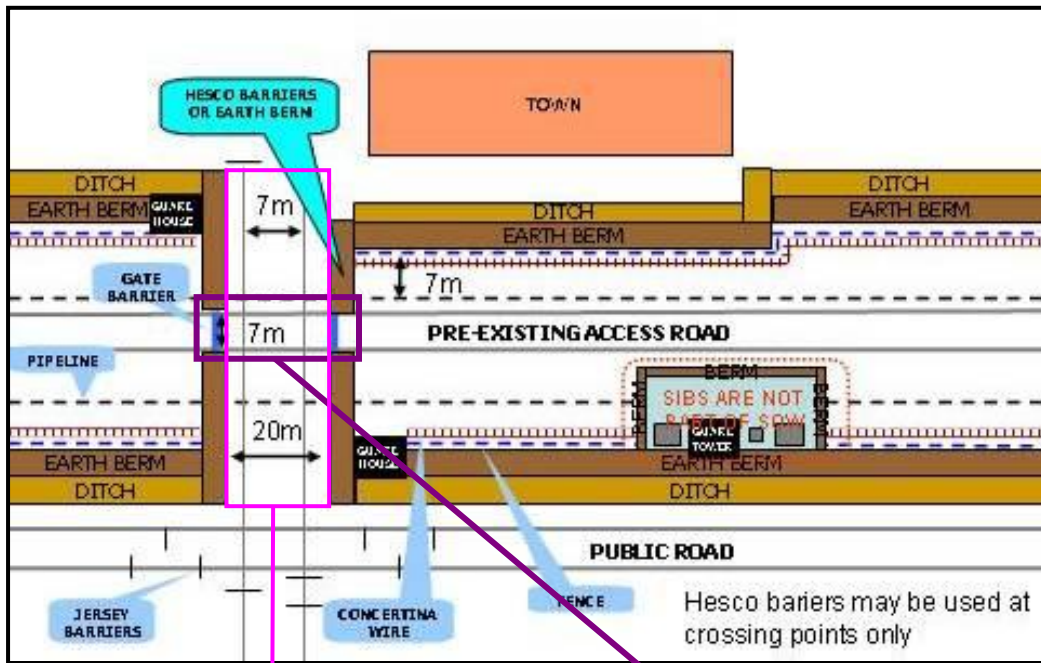


Figure 7. Contract design for road crossings



Site Photos 13 and 14. Asphalt road and chain link gate for the road crossing



Site Photo 15. Gate post in for the guard house



Site Photo 16. Close-up of Site Photo 15

### **Guard Houses**

The contract design required the construction of a masonry guard shack for each road crossing with reinforced concrete floors and roof, three 1-m x 1-m windows with screens, and one lockable steel door.

SIGIR inspected three of the six guard houses in Phase 3. The guard houses appeared to meet contract requirements by having reinforced concrete floors and roofs, three 1-m x 1-m windows with screens, and lockable steel doors (Site Photos 17 and 18). The guard house interiors appeared to be adequately constructed (Site Photo 19).

At the time of the site visit, the GoI's contractor had not completed the nearby guard towers. To compensate for the lack of guard towers, the IA soldiers manning the guard houses converted the tops of the roofs into makeshift guard towers by adding a protective barrier of sand bags, sunshades, and weapons (Site Photo 20). The contractor's roof design calculations did not take into account the added weight on the roof. According to the GRN project engineer, for the time being, the guard house roofs should be able to hold the additional weight; however, that is only if the majority of the weight is concentrated on the edge of the roof and not the middle because the edge of the roof is the most secure, since it is held up by the walls. After the GoI contractor completes the guard towers, the IA will take down the makeshift guard towers.



**Site Photo 17. SIGIR inspectors measuring the window dimensions**



**Site Photo 18. Window with screen and lockable steel door**



**Site Photo 19. Guard house interior**



**Site Photo 20. Iraqi Army constructed guard tower on roof of guard house**

# Ministry of Defense Facilities

Along the entire length of the K2B PEZ, there will be 185 guard towers and 16 company headquarters and 4 battalion headquarters buildings, which will be staffed with IA soldiers (Figure 8). When completed, accommodations will be available for approximately 762 IA soldiers and non-commissioned officers (NCOs) and 32 officers. These soldiers will be charged with defending the oil pipelines from interdictions.

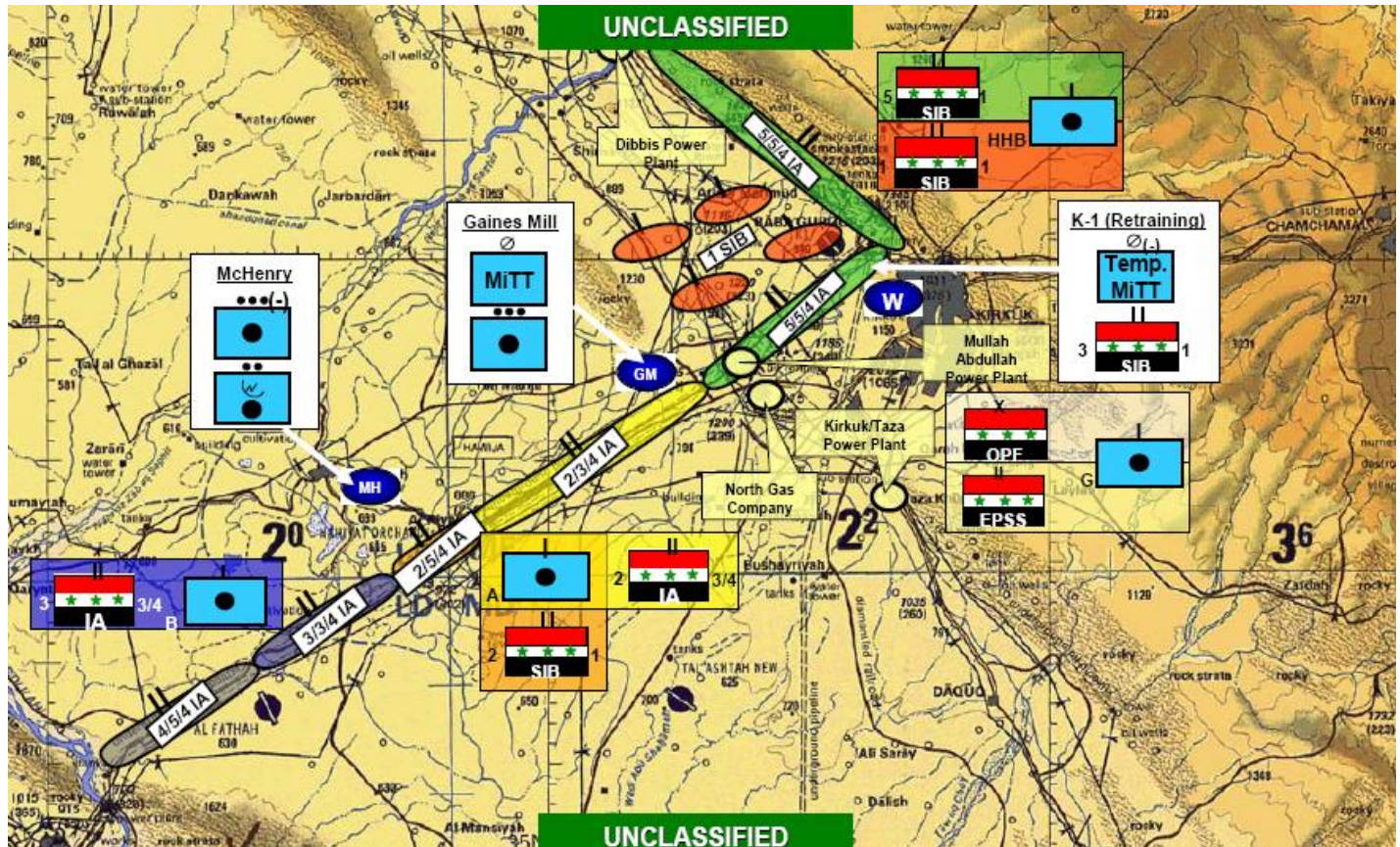


Figure 8. Location of IA and SIB troops along the K2B PEZ (Courtesy of the ITAO)

Even though the facilities constructed under the GoI/MOD contract are outside the scope of our review, we toured them since they are an important component of the overall effectiveness of the PEZ.

## Guard Towers

The guard towers include a 10 m high watch tower, two small one-story buildings for housing, water closets (WCs), and earth berm security (Figure 9). The entire guard tower facility was under construction, with only the high watch tower completed (Site Photo 21). SIGIR climbed into the high watch tower to determine if the tower provides adequate coverage of the PEZ (Site Photo 22). From the high watch tower, the IA soldiers will have a good view of any activity along the PEZ (Site Photo 23).

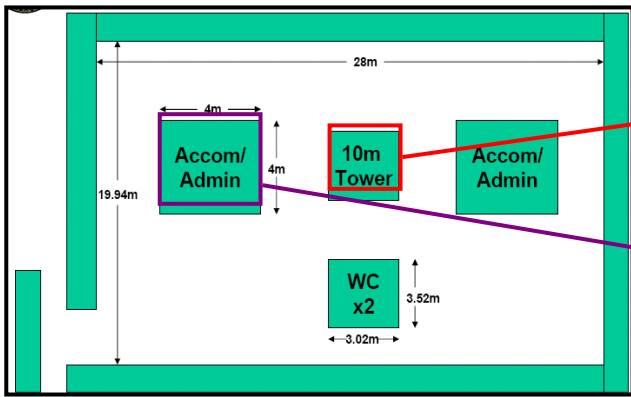


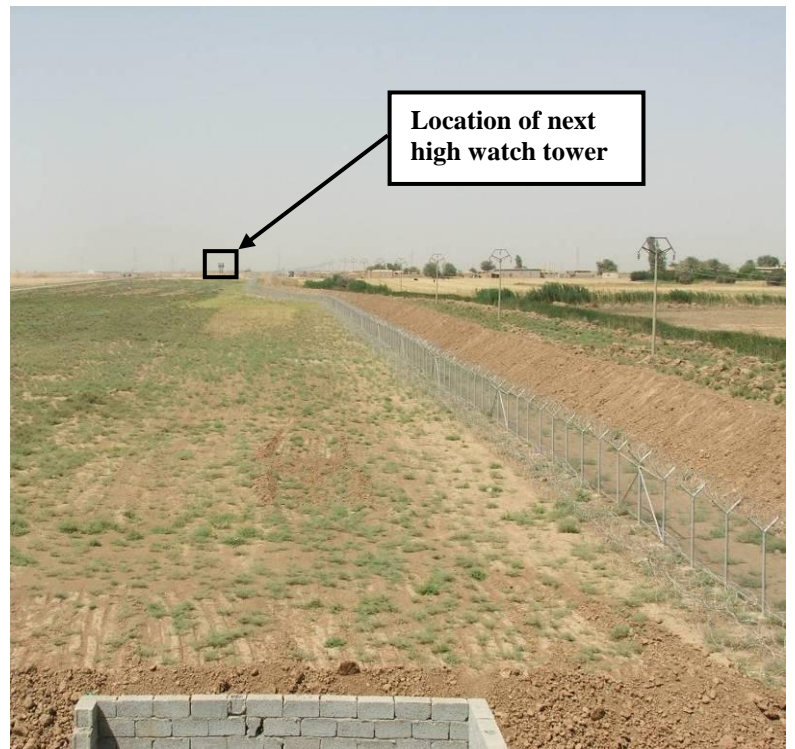
Figure 9. Layout for MOD guard towers



Site Photo 21. Partial construction of the MOD guard towers



Site Photo 22. SIGIR inspectors climbing guard tower to determine if towers provide adequate coverage



Site Photo 23. View from the guard tower



Company Headquarters

The company headquarters include barracks, WCs, kitchen, dining facility (DFAC), fuel and water storage, and earth berm security fence (Figure 10). The company headquarters complex was under construction, with the NCO's barracks being further along than the other facilities. (Site Photos 24-26).

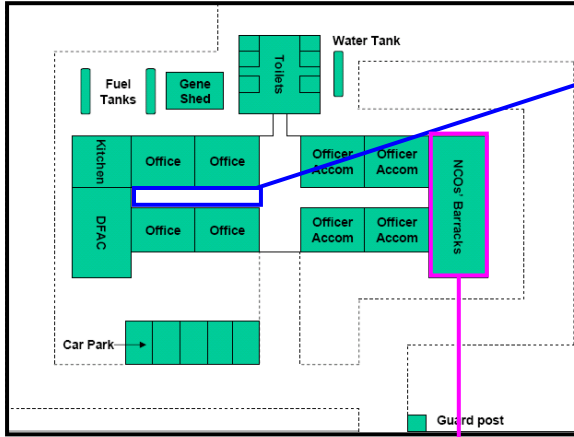


Figure 10. Layout of MOD company headquarters



Site Photo 24. Partially constructed hallway



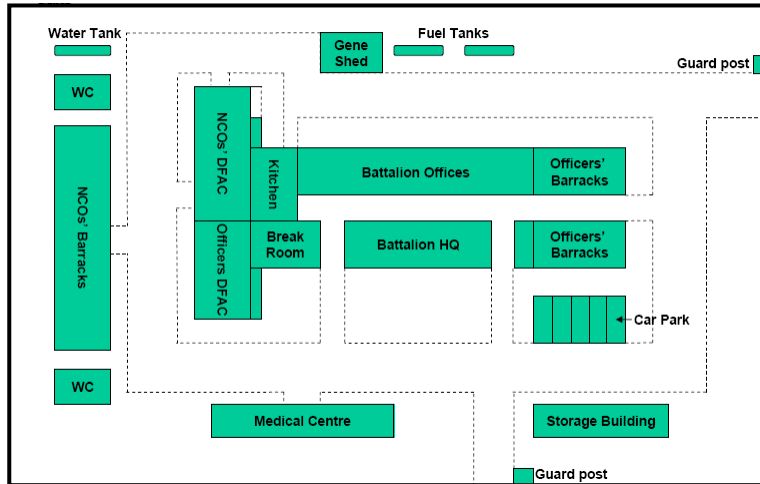
Site Photo 25. View of exterior of partially constructed company headquarters



Site Photo 26. Interior of NCO's barracks within the company headquarters

Battalion Headquarters

The battalion headquarters include barracks, WCs, kitchen, DFAC, medical office, storage building, and fuel and water storage (Figure 11). There is one MOD battalion headquarters facility in Phase 3. Site Photo 27 provides an aerial view of a partially constructed battalion headquarters facility.



**Figure 11. Layout of MOD battalion headquarters**



**Site Photo 27. Aerial view of a partially constructed battalion headquarters facility  
(Photo courtesy of the USACE)**

Contractor Behind Schedule Due to Payment Issues with the MOD

According to U.S. government officials working with the MOD, the contractor constructing the guard towers and company and battalion headquarters complexes is significantly behind schedule because the MOD did not make timely payments. Consequently, due to lack of payment, the contractor stopped all work. Recently, the

payment issue was resolved and the contractor reportedly began construction activities; however, on the day of our site visit, no construction activities were ongoing.

It is imperative to the overall effectiveness of the K2B PEZ that the contractor completes the remaining work. Otherwise, there will not be enough accommodations required for the number of IA soldiers necessary to staff the guard towers and patrol the entire PEZ.

### **Developing Role of the Iraqi Troops**

The Strategic Infrastructure Battalion (SIB) was originally developed as a specific paramilitary force, with special emphasis directed towards infrastructure protection. However, the SIB suffered from a lack of training and equipment to operate successfully. Since the protection of the oil pipelines is of significant importance to the GoI, the original SIB soldiers were sent back through the traditional three months of IA training and have resumed guarding the PEZ. In addition, the 3-6 provides mentoring to the SIB soldiers with regard to interdiction, detection, and prevention. With the additional training, the SIB soldiers are much more competent at manning the guard houses (until the high watch towers are completed) and road crossings.

The SIB currently provides manning for the road crossings and guard houses with 2 shifts of 10 guards. At the time of our site visit, there were between 3 to 10 SIB soldiers at each guard house.

According to 3-6 representatives, the ultimate goal will be for the SIB is to not only man the guard houses, but to patrol the entire length of the PEZ.

## **Decreased Oil Pipeline Interdictions and Subsequent Increased Oil Exports**

Between acts of sabotage or violence against Iraq's oil infrastructure and corruption within Iraq's oil sector, millions of dollars of potential GoI revenue have been lost since the 2003 Coalition invasion. With approximately 95% of the GoI's revenue coming directly from the export of oil, any loss of crude oil by either interdiction or smuggling has consequences for the Iraqi people.

The ISP was initiated to reduce the incidents of insurgent damage to the oil pipeline system by mitigating the opportunity of attacks or theft by deterring, slowing, or impeding attempts to interdict key infrastructure.

According to ITAO and GRD representatives, since the start of the K2B PEZ in July 2007, there have been no reported interdictions. SIGIR also confirmed this number during a meeting with a senior representative of the 3-6 who is responsible for the security of the PEZ and also maintains close contact with the NOC, who would notify them of any interdiction causing a shutdown of the pipelines. The 3-6 representative also stated that another contributing factor to the decline in interdictions was the presence of a more highly trained IA, along with U.S. troops patrolling the area.

### **Increase in Northern Crude Oil Exports**

The decrease in interdictions along the K2B PEZ has directly resulted in an extraordinary increase in northern crude oil exports. Figure 12 documents the amount of northern crude oil exports per month since the beginning of 2003. The average monthly exports

prior to the K2B PEZ (January 2006 – June 2007) was approximately 0.99 million barrels per month. Using the 0.99 million barrels per month as the baseline, from July 2007 to May 2008, northern crude oil exports have increased by approximately 91.3 million barrels or approximately \$8.215 billion<sup>4</sup>.

Considering the cost of the entire length of the K2B PEZ, when completed, will be approximately \$34.4 million, the additional \$8.215 billion in crude oil revenues provided a 239:1 return on investment in only 11 months.

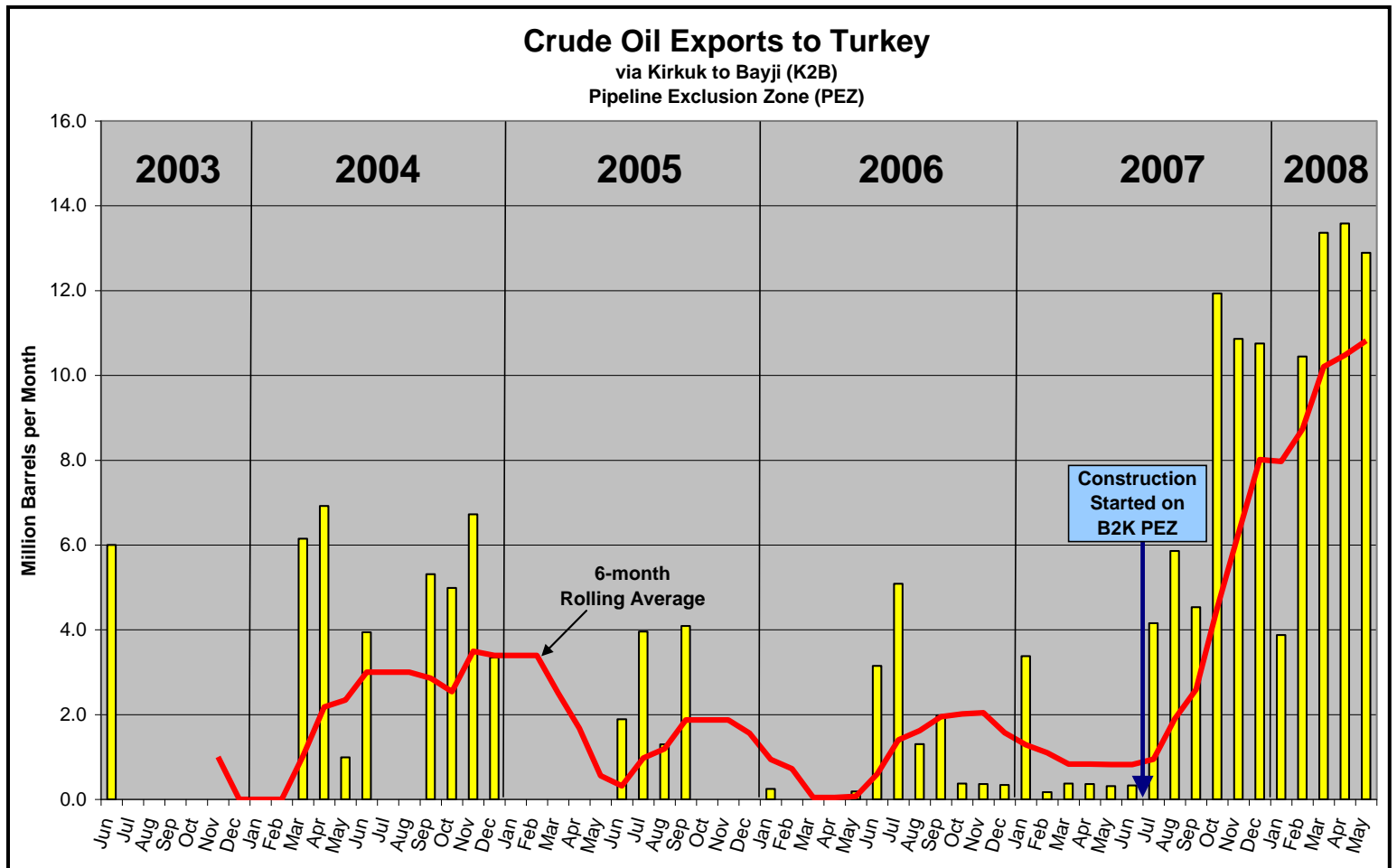


Figure 12. Amount of crude oil exports via the northern ITP  
(Courtesy of the ITAO)

## Conclusions

On June 7, 2008, SIGIR visited the Phase 3 portion of the Kirkuk to Baiji Pipeline Exclusion Zone project. The fences, berms, ditches, concertina wire, and guard houses were in compliance with contract designs and specifications. In addition, during the site visit, SIGIR noticed Iraqi Army soldiers manning the guard houses at each road crossing.

<sup>4</sup> Based on ITAO calculations at \$90 a barrel

Since the beginning of construction for the Kirkuk to Baiji Pipeline Exclusion Zone in July 2007, there have been no reported interdictions—resulting directly in the substantial rise of northern crude oil exports. From July 2007 to May 2008, northern crude oil exports have increased by approximately 91.3 million barrels, or approximately \$8.215 billion. When completed, the entire length of the Kirkuk-to-Baiji Pipeline Exclusion Zone project will cost approximately \$34.4 million. In only 11 months, the additional \$8.215 billion in crude oil revenues has provided a 239:1 return on investment.

In addition to the increased oil exports, additional supplies of crude oil are now available at Baiji for refining. The growth in supplies of refined petroleum products has contributed to the increase in electricity production and improved the living conditions of the Iraqi people by making fuel available for heating, cooking, and transportation.

## **Recommendations and Management Comments**

This report does not contain any negative findings or recommendations for corrective action; therefore, management comments were not required. Representatives of the Gulf Region Division of the U.S. Army Corps of Engineers reviewed a draft of this report and had no comments.

## Appendix A. Scope and Methodology

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SIGIR performed this project assessment from May 2008 through July 2008 in accordance with the Quality Standards for Inspections issued by the President's Council on Integrity and Efficiency. The assessment team included an engineer/inspector and two auditors/inspectors.

In performing this Project Assessment we:

- Reviewed contract documentation to include the following: contract W917BE-07-C-0039 and contract modifications, including Statements of Work and invoices;
- Reviewed the available design package (drawings and specifications);
- Interviewed the U.S. Army Corps of Engineers Gulf Region North personnel and Iraqi Transition Assistance Office personnel; and
- Conducted an on-site assessment and documented results at the Kirkuk to Baiji Pipeline Exclusion Zone Phase 3 project in Kirkuk, Iraq.

**Scope Limitation.** Due to security concerns, we did not inspect the entire length of the Phase 3 (almost 6 kilometers); instead, we selected sample areas along the phase to inspect, such as the beginning and end of the phase and all three road crossings.

Due to the significant length of the entire K2B PEZ and the fact different contractors were used for each phase, SIGIR decided to focus on the most recently completed phase for this assessment. Consequently, SIGIR chose Phase 3 since it was completed and accepted by the U.S. Army Corps of Engineers Gulf Region North in May 2008.

## Appendix B. Acronyms

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bpd	Barrels per Day
DFAC	Dining facility
GoI	Government of Iraq
GRD	Gulf Region Division
GRN	Gulf Region North
IA	Iraqi Army
ICE	Iraqi Construction Engineers
INOC	Iraq National Oil Company
ISP	Infrastructure Security Program
ITAO	Iraqi Transition Assistance Office
ITP	Iraq to Turkey Pipeline
km	Kilometer
K2B	Kirkuk to Baiji
KAAOT	Khor Al Amaya Oil Terminal
m	Meter
mm	Millimeter
MOO	Ministry of Oil
NCO	Non-commissioned Officer
NOC	Northern Oil Company
OPEC	Organization of the Petroleum Exporting Countries
PEZ	Pipeline Exclusion Zone
SIB	Strategic Infrastructure Battalion
SIGIR	Special Inspector General for Iraq Reconstruction
SOC	Southern Oil Company
USACE	United States Army Corps of Engineer
WC	Water Closet

## **Appendix C. Report Distribution**

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### **Department of State**

Secretary of State

Senior Advisor to the Secretary and Coordinator for Iraq

Director of U.S. Foreign Assistance/Administrator, U.S. Agency for  
International Development

Director, Office of Iraq Reconstruction

Assistant Secretary for Resource Management/Chief Financial Officer,  
Bureau of Resource Management

U.S. Ambassador to Iraq

Director, Iraq Transition Assistance Office

Mission Director-Iraq, U.S. Agency for International Development

Inspector General, Department of State

### **Department of Defense**

Secretary of Defense

Deputy Secretary of Defense

Under Secretary of Defense (Comptroller)/Chief Financial Officer

Deputy Chief Financial Officer

Deputy Comptroller (Program/Budget)

Deputy Assistant Secretary of Defense-Middle East, Office of Policy/International  
Security Affairs

Inspector General, Department of Defense

Director, Defense Contract Audit Agency

Director, Defense Finance and Accounting Service

Director, Defense Contract Management Agency

### **Department of the Army**

Assistant Secretary of the Army for Acquisition, Logistics, and Technology

Principal Deputy to the Assistant Secretary of the Army for Acquisition,  
Logistics, and Technology

Deputy Assistant Secretary of the Army (Policy and Procurement)

Commanding General, Joint Contracting Command-Iraq/Afghanistan

Assistant Secretary of the Army for Financial Management and Comptroller

Chief of Engineers and Commander, U.S. Army Corps of Engineers

Commanding General, Gulf Region Division

Chief Financial Officer, U.S. Army Corps of Engineers

Auditor General of the Army

### **U.S. Central Command**

Commanding General, Multi-National Force-Iraq

Commanding General, Multi-National Corps-Iraq

Commanding General, Multi-National Security Transition Command-Iraq

Commander, Joint Area Support Group-Central



## **Other Federal Government Organizations**

Director, Office of Management and Budget  
Comptroller General of the United States  
Inspector General, Department of the Treasury  
Inspector General, Department of Commerce  
Inspector General, Department of Health and Human Services  
Inspector General, U.S. Agency for International Development  
President, Overseas Private Investment Corporation  
President, U.S. Institute for Peace

## **Congressional Committees and Subcommittees, Chairman and Ranking Minority Member**

### **U.S. Senate**

Senate Committee on Appropriations  
    Subcommittee on Defense  
    Subcommittee on State, Foreign Operations, and Related Programs  
Senate Committee on Armed Services  
Senate Committee on Foreign Relations  
    Subcommittee on International Development and Foreign Assistance, Economic Affairs, and International Environmental Protection  
    Subcommittee on International Operations and Organizations, Democracy and Human Rights  
    Subcommittee on Near Eastern and South and Central Asian Affairs  
Senate Committee on Homeland Security and Governmental Affairs  
    Subcommittee on Federal Financial Management, Government Information, Federal Services, and International Security  
    Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia  
Permanent Subcommittee on Investigations

### **U.S. House of Representatives**

House Committee on Appropriations  
    Subcommittee on Defense  
    Subcommittee on State, Foreign Operations, and Related Programs  
House Committee on Armed Services  
    Subcommittee on Oversight and Investigations  
House Committee on Oversight and Government Reform  
    Subcommittee on Government Management, Organization, and Procurement  
    Subcommittee on National Security and Foreign Affairs  
House Committee on Foreign Affairs  
    Subcommittee on International Organizations, Human Rights, and Oversight  
    Subcommittee on the Middle East and South Asia

## **Appendix D. Project Assessment Team Members**

The Office of the Assistant Inspector General for Inspections, Office of the Special Inspector General for Iraq Reconstruction, prepared this report. The principal staff members who contributed to the report were:

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