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- Although airplanes armed with spray systems offer Iraq an effective, low-tech capability to deliver BW¹, Saddam might prefer unmanned over manned aircraft due to concerns that pilots would defect if ordered to carry out a BW-attack mission.

[Redacted]

Efforts to convert jet aircraft into unmanned aerial vehicles (UAVs) as a BW-agent delivery system suggest Iraq judges UAVs to be its best option for BW-delivery. Iraq began to convert L-29 "Maya" jet trainer aircraft into remotely piloted vehicles in 1995 and then into UAVs.²

[Redacted]

Range, payload, and geographical considerations factor prominently in Baghdad's calculus for employing a BW-armed L-29.

[Redacted]

These range restrictions would prompt Iraq to deploy the UAV and its ground support equipment to airfields in far western or southeastern Iraq, if Saddam decided to launch a BW attack against Israel or coalition forces.

- To strike Israel, Iraq would need to deploy its UAVs to H-3 airfield near the Iraqi-Jordanian border.
- Iraq probably would deploy its UAVs to Tallil airbase near Al Nasiriyah or to any of the three airfields near Basrah in order to attack coalition forces in Kuwait or the Persian Gulf.

[Redacted]

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Iraq: Developing Biological Weapons as a Strategic Deterrent [redacted]

Summary (U)

Iraq is attempting to address its regional security concerns by developing weapons of mass destruction and is focusing on biological warfare (BW) agents as a strategic deterrent to its enemies' conventional and non-conventional forces. The greatest challenge to Iraq's BW program is creating a delivery system that can both reach its target and disseminate the BW agent efficiently.

- Iraq may assess that an L-29 UAV equipped with an aerosol spray tank will be the most effective system for delivering BW agent to a target.

[redacted]

If Iraq's BW threat fails to deter an all-out attack against Iraq designed to remove the regime, Saddam would order a biological attack only as a last resort—if his capture were imminent.

- Saddam probably believes the use of biological weapons would invite a massive military response.
- A BW-armed L-29 attack against Israel runs the risk of killing Palestinians—because of the unpredictable nature of BW agents—and Syrians and Jordanians—if the plane crashed on its way to Israel.

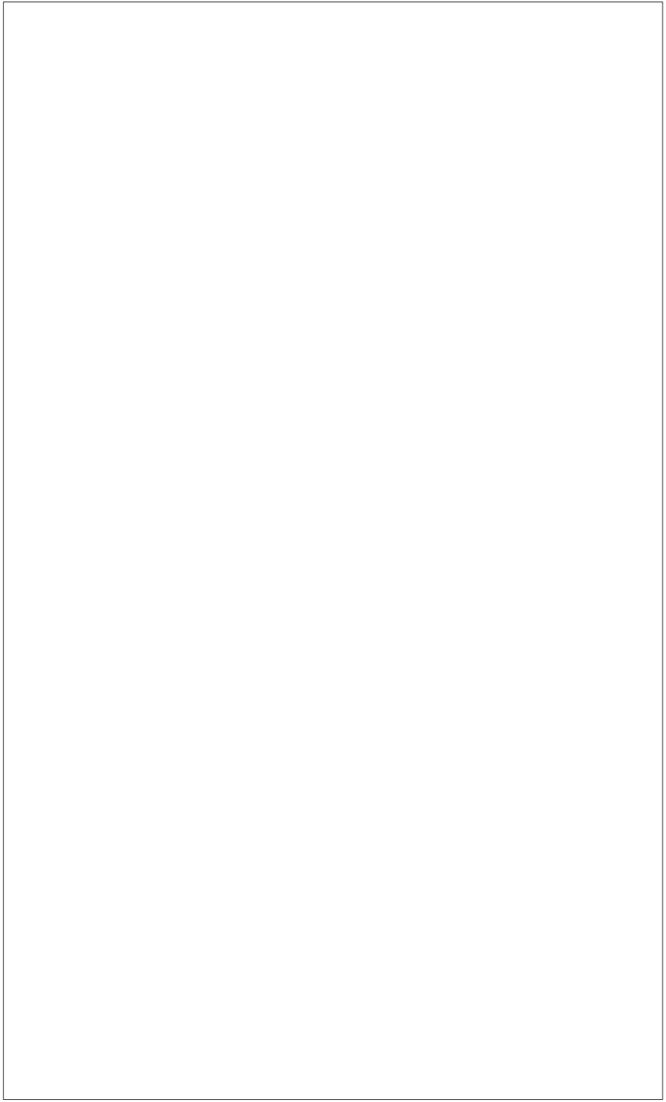
[redacted]

Fixed centers for US civilian and military personnel in Kuwait are the easiest targets for a BW-armed UAV attack, because of Kuwait's close proximity to airfields in southeastern Iraq.

[redacted]

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Iraq: Developing Biological Weapons as a Strategic Deterrent

[redacted]

BW as Strategic Deterrent [redacted]

Iraq is intent on developing weapons of mass destruction (WMD) because its regional adversaries' conventional military power exceeds or may soon exceed that of Iraq. Sanctions and the UN arms embargo hamper Baghdad's ability to keep up with the conventional military forces of its neighbors, a frustrating situation for Saddam, who prizes military prowess over all other forms of national power.

- Iran and Iraq continue to engage in a proxy war, even after eight years of fighting throughout the 1980s. Should the two sides go to war again, Iran probably holds the edge with its conventional and non-conventional forces.

[redacted]

We believe Iraq has concluded that biological warfare (BW) agents are its best bet in the near term for deterring nuclear and biological attacks because of their lethality and because they are easy to produce even while Iraq is under sanctions. Iraq does not require outside assistance to produce BW, which can be easily hidden from weapons inspectors and national technical collection means.

- A BW arsenal gives Iraq the potential for scoring an attack as lethal as nuclear weapons, as opposed to chemical warfare (CW) agents, which inflict a comparatively small number of casualties.

- Unlike Iraq's nuclear program—which is three to four years away from producing a weapon if Iraq can obtain sufficient fissile material—we assess Baghdad already has a thriving BW program to augment any stockpiles it hid from UN weapons inspectors.
- Iraq probably is capable of producing at least the agents it declared to the UN—*Bacillus anthracis* (the causative agent of anthrax), botulinum toxin, ricin, *Clostridium perfringens*, and aflatoxin—as well as other bacterial and viral agents. It was able to conceal its program using transportable labs capable of hiding from inspectors at a moment's notice. [redacted]

Developing an Effective BW Delivery System [redacted]

The greatest challenge to Iraq's BW program is creating a delivery system that can both reach its target and disseminate the BW agent efficiently. Iraq has several options, all with some limitations.

- BW-filled missile warheads and bombs—without a mechanism to help spread the agent—are likely to infect only the area in which they land, and the agent could burn up on impact.
- Cruise missiles equipped with aerosol spray systems potentially are the most lethal BW delivery platforms because of their ability to spread BW agent over a large area, but guidance and control difficulties greatly complicate targeting.

This assessment was prepared by the Office of Near Eastern, South Asian, and African Analysis. Comments and queries are welcome and may be directed to [redacted]

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- Western Iran and probably Tehran are within range of the L-29 UAV, but mountainous terrain of western Iran will limit the UAV's ability to navigate to its target.

[Redacted]

UAVs Better Suited for BW Delivery

[Redacted] a UAV— particularly if equipped with an aerosol spray system—would be better suited to deliver BW vice CW.

In the event of another war with the United States, we believe Saddam would wait until the last possible moment before authorizing a BW-armed UAV strike against US forces. A variety of complications, such as the destruction of Iraq's UAVs or disarray or insubordination in the military chain of command could cause the order to be lost or ignored.

Any calculation of a BW attack on Israel would have to factor the risk of alienating neighbor states.

- CW agents—such as sarin and VX—are heavier and less lethal than the BW agents Iraq is likely to use, and the concentration of the chemical agent released by the L-29 UAV probably would largely dissipate by the time it reached the ground.

- To hit Israel, Iraq would have to guide the UAV across either Jordan or Syria, and a flight failure could cause the BW agent to cause casualties in those countries.

The few converted L-29 UAVs in Iraq's arsenal suggest Iraq would prefer not to use them as a tactical CW-delivery system when other delivery means would suffice. Iraqi forces used CW-filled aerial bombs and artillery shells to conduct chemical attacks against the Iranians and the Kurds.

- Syria and Jordan probably would not permit Iraq to transit their respective airspaces to launch BW against Israel for fear of Israeli retaliation. If Iraq launched an attack over the objections of its neighbors, Syria and Jordan might try to shoot down the UAV if they calculate they could do so successfully without danger of contamination.

- A UAV-borne BW attack against Israel might kill Palestinians because of the unpredictable nature of biological agents.

Outlook and Implications for the United States

Should Saddam opt to use BW, he would try to do so only as a last resort. Saddam probably believes that launching a BW attack against US forces in the region would invite a massive and overwhelming military response that would bring down his regime—a belief shared by Iraq's military leadership.

Centers for US civilian and military personnel in Kuwait are the easiest targets for a BW-armed UAV attack, because of Kuwait's close proximity to airfields in southeastern Iraq.

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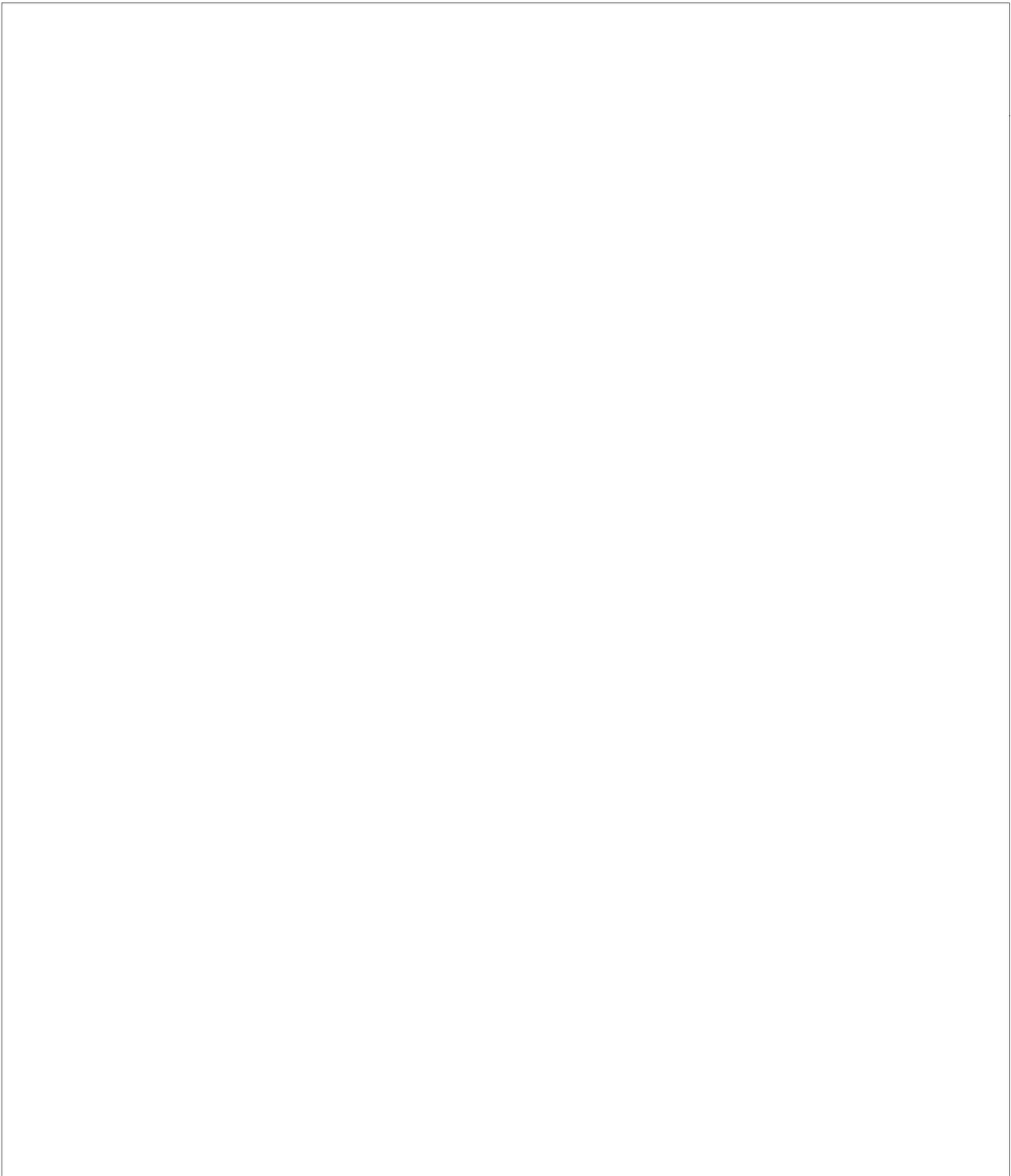
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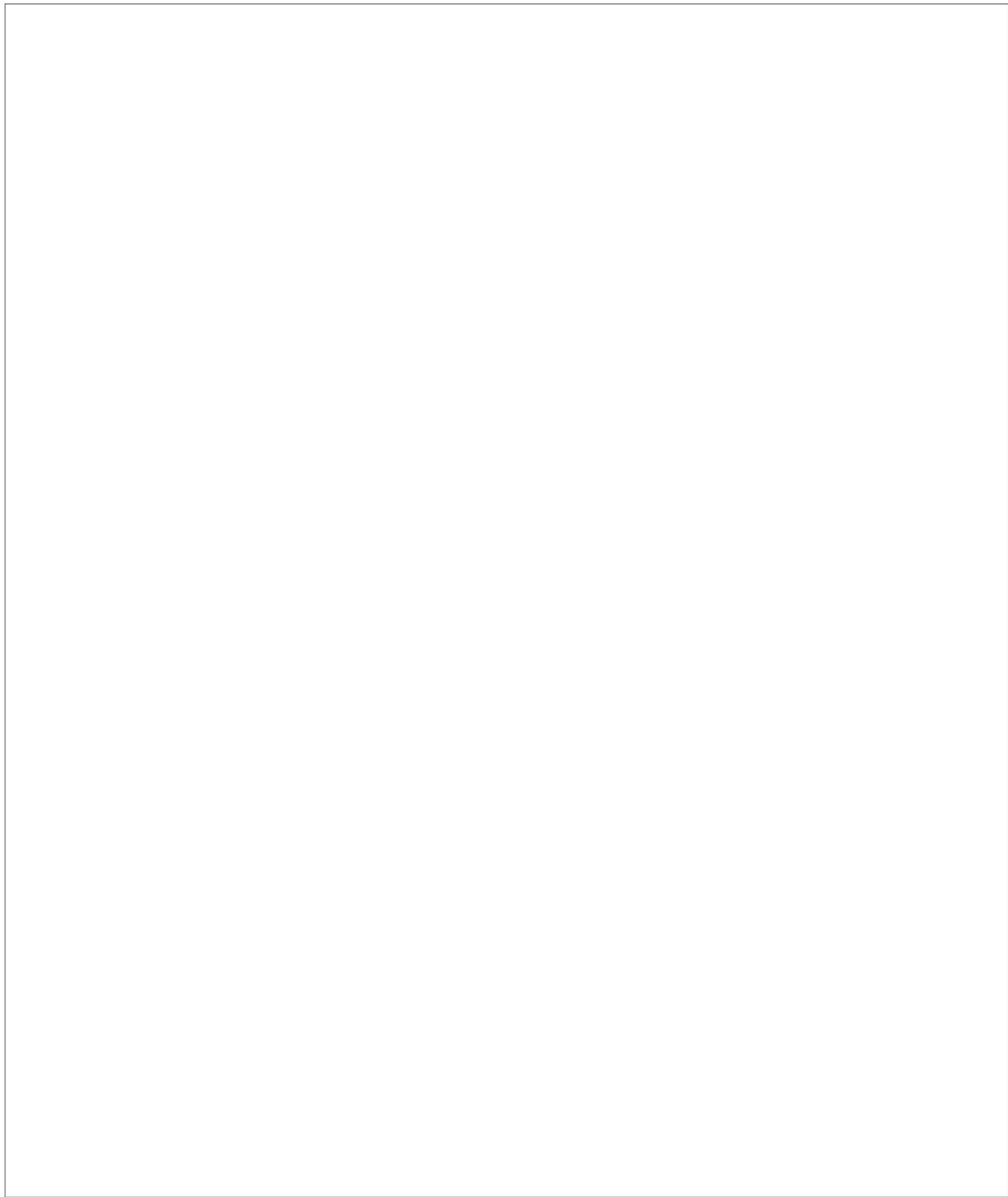
Figure 1
Iraqi L-29 UAV Likely Deployment Area and Potential Ranges



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10 August 2001

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