Chapter 21
Water Security Agency—Ensuring Dam Safety

1.0 Main Points

By November 2024, the Water Security Agency fully implemented the two outstanding recommendations we first made in 2005 about its processes to ensure the safety of the province's four largest dams.

The Agency completed testing of emergency preparedness and emergency response plans for three of its major dams—Rafferty, Grant Devine (formerly Alameda), and Qu'Appelle River by November 2024. The Agency expected to test its emergency plans for its Gardiner Dam in early April 2025.

The Agency used results of its testing of the three plans to update and enhance the emergency preparedness and response plans. For example, it added contact information for key emergency command staff into its plans.

Testing emergency plans is essential for the Water Security Agency to help ensure the plans function as intended during an emergency. The lessons learned from these tests allow the Agency to continuously improve its emergency preparedness and response.

Additionally, the Agency completed and kept up-to-date its 32 manuals required to operate, maintain, and monitor dam safety. We found the contents of the manuals consistent with good practice.

Use of effective emergency plans can safeguard lives and reduce property damage.

2.0 Introduction

2.1 Background

The Water Security Agency is responsible for managing the province's water supply, including owning, maintaining, and ensuring the safety of over 70 dams (2005: 45 dams) that help preserve a sustainable water source.[1] The Agency considers nine of these dams major (2005: four major dams) in that failure of any of these dams would risk serious downstream flooding, potentially damaging homes, businesses, crops, infrastructure, and wildlife habitat.[2]

Our 2005 audit focused on four dams the Agency was responsible for and deemed major as of 2005; our follow-up audit work continued to focus on these four dams. See **Figure 1** for information about these four dams.

[1] Water Security Agency, *Annual Report 2023–24*, p. 4.
[2] wsask.ca/lakes-rivers/dams-reservoirs (19 December 2024).

Figure 1—Information about the Water Security Agency's Four Major Dams

Dam (year constructed)	Location	Purpose	Height (metres)	Age (years) as of December 2024
Gardiner (1967)	Central Saskatchewan	Built to create Lake Diefenbaker—a critical source of water for Saskatchewan	64	57
Qu'Appelle River (1967)			27	57
Rafferty (1992)	Southern Saskatchewan near Estevan	Provide water for electricity generation, flood protection, irrigation, recreation	20	32
Grant Devine (formerly Alameda) (1995)	Southern Saskatchewan near Oxbow	Provide regional water supply, flood protection, irrigation, recreation	43	29

Source: Adapted from information in Provincial Auditor Saskatchewan, *2005 Report – Volume 1*, Chapter 3.

2.2 Focus of Follow-Up Audit

This chapter describes our seventh follow-up audit of management's actions on the recommendations we first made in 2005.

We concluded the Water Security Agency had effective processes to ensure the safety of its four major dams other than in the areas of our four recommendations.[3] We previously reported on whether the Agency implemented these recommendations in 2007, 2010, 2012, 2014, and 2016.[4] By March 2019 (our last follow-up audit), the Agency implemented two of the four recommendations we made.

To conduct this audit engagement, we followed the standards for assurance engagements published in the *CPA Canada Handbook—Assurance* (CSAE 3001). To evaluate the Agency's progress toward meeting our recommendations, we used the relevant criteria from the original audit. Agency management agreed with the criteria in the original audit.

We interviewed management responsible for the Agency's processes to keep dams safe and reviewed related documentation (e.g., emergency preparedness plans, emergency response plans, lessons learned from testing of emergency plans, completed manuals).

3.0 Status of Recommendations

This section sets out each recommendation including the date on which the Standing Committee on Public Accounts agreed to the recommendation, the status of the recommendation at November 30, 2024, and the Water Security Agency's actions up to that date.

[3] *2005 Report – Volume 1*, Chapter 3, pp. 33–45.
[4] *2007 Report – Volume 3*, Chapter 7, pp. 89–103; *2010 Report – Volume 2*, Chapter 19, pp. 293–306; *2012 Report – Volume 2*, Chapter 41, pp. 342–344; *2014 Report – Volume 1*, Chapter 30, pp. 209–211; *2016 Report – Volume 2*, Chapter 48, pp. 309–311; and *2019 Report – Volume 1*, Chapter 44, pp. 367–369.

3.1 Emergency Plans Tested or Testing Planned

We recommended the Water Security Agency (formerly Saskatchewan Watershed Authority) have up-to-date, tested emergency preparedness plans for each of its major dams (i.e., Rafferty, Grant Devine [formerly Alameda], Qu'Appelle River, and Gardiner). *(2005 Report – Volume 1,* p. 38, Recommendation 2; Public Accounts Committee agreement June 21, 2005)

Status—Implemented

The Water Security Agency completed testing of its emergency preparedness plans (EPP) and emergency response plans (ERP) for three of four major dams subject to audit—Rafferty, Grant Devine (formerly Alameda), and Qu'Appelle River. At November 2024, the Agency planned to test its Gardiner Dam emergency plans in early April 2025.

The Agency developed its EPPs for external use (e.g., by SaskPower, rural municipalities, Ministry of Environment) during a dam emergency. The EPPs provide vital information on dam failure inundation (i.e., flooding), warnings, and notifications to assist others in emergency planning. For example, the EPPs indicate SaskPower will be responsible to restore power as quickly as possible during a dam emergency.

We reviewed the EPPs for all four dams and found they were comprehensive and appropriate. For example, they included key areas such as identifying dam safety issues and guidelines for the organizations that will respond to dam emergencies (e.g., SaskPower, municipalities), which help them develop local emergency plans to deal with dam emergencies.

The Agency developed its ERPs for internal staff use during a dam emergency. The ERPs outline the emergency process, including emergency declarations, organizational structures, roles, responsibilities, and response actions. For example, during an emergency, Agency staff must coordinate communications with interested parties and responding agencies (e.g., SaskPower, municipalities).

We reviewed the ERPs for all four dams and found they were comprehensive and appropriate.

The Agency also coordinated discussion-based emergency exercises called tabletop exercises to test its EPPs and ERPs for Rafferty, Qu'Appelle River, and Grant Devine dams. See **Figure 2** for when the Agency completed its tests. Tabletop exercises are often part of the preparation for later full-scale tests. We encourage the Agency to consider completing broader, periodic testing once it has tested its emergency plans for all major dams.

Figure 2—Testing Details for the Water Security Agency's Four Major Dams' Emergency Preparedness and Emergency Response Plans

Dam	Date and Test Location	Test Participants	Test Activities
Qu'Appelle River	March 18, 2021 Virtual due to COVID-19 pandemic restrictions	75 participants from EPP and ERP plan holders attended the session (e.g., Agency staff, other government agencies, nearby municipalities)	• Orientation seminar Tabletop exercise[A]
Rafferty	January 23–24, 2018 Estevan	45 participants from EPP and ERP plan holders attended the exercise (e.g., Agency staff, other government agencies, nearby municipalities)	• Orientation seminar Tabletop exercise
Grant Devine (formerly Alameda)	February 6–7, 2023 Moose Jaw	52 Agency staff with EPP and ERP responsibilities attended the session	• Orientation seminar Tabletop exercise • Drill test (i.e., operations-based exercise in addition to discussion-based tabletop exercise)

Source: Water Security Agency records.
[A] A tabletop exercise is a simulation exercise where participants follow the steps they would take in an emergency (e.g., dam failure, dam equipment malfunction) using the Agency's documented emergency plans and procedures. This allows the Agency to assess their documented emergency plans.

We observed that the Agency invited participants in October 2024 to join in testing the Gardiner Dam emergency plans scheduled for early April 2025 where it plans to do a tabletop exercise similar to what was conducted for three dams' emergency plans.

The Agency assessed the results of its EPP and ERP testing and documented progress on recommendations resulting from the testing. The tests identified areas of improvement based on feedback from test participants, as well as from consultants hired to deliver the test exercises. As of November 2024, the Agency had fully implemented 23 out of 29 recommendations, including updating its EPPs and ERPs. The remaining six recommendations are scheduled for completion by December 31, 2025. This helps ensure the Agency's plans will be effective in an emergency, such as a dam failure.

We assessed the Agency's actions to implement three recommendations for the emergency plans and found it appropriately addressed the recommendations. For example, it added contact information for the three major emergency command staff (Information, Liaison, and Safety Officers) and relevant general staff (from operations, planning, logistics, and finance/administration sections) into its plans.

Testing emergency plans is essential for the Water Security Agency to ensure its plans function as intended during an emergency. The lessons learned from these tests help the Agency to continuously improve its emergency preparedness. Use of effective emergency plans can safeguard lives, reduce property damage, and help local governments and other interested parties to develop their own emergency plans.

3.2 Operational Manuals for Dam Safety Completed

We recommended the Water Security Agency (formerly Saskatchewan Watershed Authority) set processes that ensure its manuals always include complete procedures to operate, maintain, and monitor dam safety. *(2005 Report – Volume 1*, p. 38*,* Recommendation 3; Public Accounts Committee agreement June 21, 2005)

Status—Implemented

The Water Security Agency established adequate processes to ensure its manuals to operate, maintain, and monitor dam safety are complete and up-to-date.

By November 2024, the Agency created all 32 manuals (2019: 25 manuals) that it requires to operate, maintain, and monitor the safety of these four major dams—Rafferty, Grant Devine (formerly Almeda), Qu'Appelle River, and Gardiner. The Agency also established processes to track revisions as necessary, which help staff keep the manuals current.

Each major dam has one main manual called Operation, Maintenance & Surveillance Manual (OMS manual).[5] Each manual covers dam components and relevant operation, maintenance, and surveillance information. The manuals also outline security measures for public interaction around dams to ensure public safety.

We tested the OMS manual for all four major dams and found the contents aligned with good practice (e.g., *Dam Safety Guidelines 2007* published by the Canadian Dam Safety Association). The four OMS manuals included appropriate components and procedures to operate, maintain, and monitor dam safety like periodic visual inspections of concrete and embankment structures for cracks.

The remaining 28 documents are sub-manuals that support the main OMS manuals for dam safety. We reviewed four of these sub-manuals (one for each dam) and found each provided reasonable information regarding the dam's technical maintenance as well as the Agency's programs for monitoring the maintenance of different dam components (e.g., inspection of drainage structures once every four years).

We observed all manuals have a sufficient record of revisions made to the manuals with the most recent updates in December 2023.

Having fully documented operating and maintenance procedures in place, along with tracking updates, help mitigate the risk of dam failure and ensure continued safety for homes, businesses, crops, infrastructure, and wildlife habitat.

[5] Dam surveillance refers to the systems to monitor/assess dam performance, and how and when to complete performance monitoring.