1.0 Introduction

This Technical Memorandum summarizes the conceptual stormwater control features anticipated for the Scholefield-McCleary Alternative associated with the proposed Rosemont Copper Project in Pima County, Arizona. The conceptual stormwater plan for the alternative is shown on Figure 1. This alternative consists of a Waste Rock Storage Area located in McCleary Canyon Basin and a Dry Stack Tailings Facility located in Scholefield Canyon Basin. Stormwater control on the Scholefield-McCleary Alternative is accomplished primarily by drainage benches that intercept runoff from the slopes of the waste rock and tailings waste rock buttresses. Stormwater collected in the drainage benches exit the structure via rock drop structures placed at select locations.

2.0 Stormwater Management Features

The stormwater management features and hydrologic considerations for the Scholefield-McCleary Alternative is based on previous studies and methodologies as reported in the Reclamation Concept Update report by Tetra Tech (Tetra Tech, 2010b); the Site Water Management Update report by Tetra Tech (Tetra Tech, 2010d); and the Rosemont Baseline and Post-Mining Conditions – Alternatives Sediment Delivery technical memorandum by Tetra Tech (Tetra Tech, 2010c). Additionally, a technical memorandum titled Scholefield Tailings and McCleary Waste Alternative Stormwater Assessment (Tetra Tech, 2010a) quantified the potential stormwater impacts on downstream stormwater flows (100-year storm) and average-annual runoff. The results of this analysis would apply to the conceptual stormwater control plan highlighted herein for the Scholefield-McCleary Alternative.

The overall final reclaimed slopes of the Scholefield-McCleary Alternative will generally be 3.5 Horizontal (H):1 Vertical (V). A drainage bench every 100 feet of vertical elevation will be incorporated. Maximum slope lengths will be limited to approximately 320 feet.

The principles and concepts to be employed in managing stormwater for the Scholefield-McCleary Alternative are similar to features developed for the Rosemont Ridge Landform (Tetra Tech, 2010b). The major stormwater control features planned for the reclaimed surface of the Scholefield-McCleary Alternative will include:

- Drainage benches with channels;
- Drop structures and energy dissipation pools; and
Retention basins/ Perimeter Containment Areas (PCAs).

Drainage divides and drop structures (see Figure 1) were strategically placed based on the carrying capacity of the drainage bench channels. Stilling pools would be placed at the confluence of drainage bench flows and drop structures to dissipate flow energy. Once dissipated, storm flows would leave the drainage benches via drop structures. Drop structures would either route stormwater into McCleary Canyon or into Scholefield Canyon. Storm flows on top of the waste rock and tailings will be retained. If desired, the top of the capped tailings and waste rock areas may be graded to shed stormwater. Figure 1 shows the anticipated stormwater control features.

Drainage bench channels and drop structures would be designed to accommodate up to the 500-year, 24-hour event as defined in the Site Water Management Update report by Tetra Tech (2010d). Management of the General Probable Maximum Precipitation (PMP) event will be accommodated with the use of PCAs as discussed in the Site Water Management Update report by Tetra Tech (2010d).

2.1 Dry Stack Tailings Facility

The final outer slopes of the Dry Stack Tailings Facility are designed to have 3H:1V inter-bench slopes with drainage benches placed at 100-foot elevation increments. The benches will be 50 feet wide and accommodate a drainage channel, an access road and safety berm. Drainage divides will be incorporated and will determine the direction of stormwater flow that is captured by these drainage channels.

Stormwater flow on the western side of the tailings facility will either flow to the north drop structure or to the south and will pond in PCAs along the toe. Stormwater runoff generated on the top surface of the tailings facility will be retained. If desired, the top of the tailings facility could be graded to drain to either the drop structure on the north corner or to the west where it will continue to flow to the south into PCAs.

Drainage benches on the northeastern and northwestern face of the Dry Stack Tailings Facility would eventually report to the drop structure located to the north. Flows would then be routed around the tailings facility and will flow south along the toe of the tailings facility and eventually into lower Scholefield Canyon (see Figure 1).

Drainage benches on the east face of the tailings facility would route flows either to the north drop structure or to a drop structure located at the most eastern point of the tailings facility. Flows will exit the tailings facility via the drop structure and will flow into lower Scholefield Canyon.

2.2 Waste Rock Storage Area

The Waste Rock Storage Facility will be designed in the same manner as the Dry Stack Tailings Facility, with inter-bench slopes of 3H:1V and 50 foot benches every 100 feet of elevation change. Stormwater control on the surfaces of the Waste Rock Storage Area would consist primarily of drainage benches and drop structures.

Runoff on the southern and southeastern sides of the waste rock would be routed to two drop structures located at the most southeastern point and most southern point of the waste rock. Stormwater would then exit the waste rock via the drop structures and flow into McCleary Canyon.
Stormwater on the top of the Waste Rock Storage Area may either be retained or may drain to the drop structures and eventually into McCleary Canyon.

3.0 Pre-Mining/Baseline and Post-Mining Hydrology

Pre-Mining/Baseline and Post-Mining hydrology estimates for 100-year flood-peak and the average-annual runoff volume for the Scholefield-McCleary Alternative will have the similar values as previously determined in the technical memorandum titled Scholefield Tailings and McCleary Waste Alternative Stormwater Assessment (Tetra Tech, 2010a). Additionally, Baseline and Post-Mining estimates for sediment delivery will also have similar values as previously determined in the technical memorandum titled Rosemont Baseline and Post-Mining Conditions – Alternatives Sediment Delivery (Tetra Tech, 2010c).

4.0 Conclusion

Stormwater control structures associated with the Scholefield-McCleary Alternative would closely resemble the structures presented in the Sitewater Management Update report (Tetra Tech, 2010d). The Scholefield-McCleary Alternative will be designed to shed as much stormwater runoff from the surface as possible with the use of drainage bench channels, drop structures and stilling pools. Hydrology flow and sediment delivery estimates as determined in Tetra Tech (2010a) and Tetra Tech (2010c) will be similar to the estimates for the conceptual Scholefield-McCleary Alternative stormwater control plan presented in this memorandum.
REFERENCES


