

## Technical Memo

To: Graham Buck and Oleg Ivanov, NDMNRF  
From: Shannon Catton, GEI  
Date: May 31, 2022  
Re: **Nelson Burlington Extension and the Medad Valley Life Science ANSI and PSW**

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The Medad Valley Life Science ANSI and PSW contains headwater tributaries of the Grindstone and Bronte Creek watersheds. This feature consists of a valley, forest and wetland habitats.

According to the ANSI Report (MNR 1996), the slopes of the gorge average 20 m in height on the east side and 10-15 m in height on the west side. These cliff walls are predominantly shaded and moist with Bulblet Fern and Herb Robert, along with White Cedars intermittently growing on the cliff faces.

The ANSI Report (MNR 1996) notes that the talus area along the valley consists of White Cedar and White Birch talus stands, Hemlock – Sugar Maple stands in the areas with deeper soils, broadleaf/mixed stands of White Birch, White Cedar and Trembling Aspen, with open talus areas consisting of Fowl Manna Grass and Bulblet Fern. Sugar Maples are also prevalent on the west side of the valley, along with American Yew and Mountain Maple. The valley floor is densely vegetated with mixes of White Birch, White Cedar, White Pine, Tamarack and ash. Red-osier Dogwood and Pussy Willow thickets are also dense within the broader areas of the valley floor. Seeps have been observed along the base of the Medad Valley slope, which contribute water to the PSW (wetland 13204).

These vegetation species are provincially common and abundant and are tolerant to a wide moisture regime range. However, the location and form in which they are found (limestone cliff faces and talus), make these vegetation communities provincially rare and significant, confirming the provincial significance of the ANSI and wetlands. Therefore, though the feature is significant in its form and function, the vegetation species are not overly sensitive and can tolerate varying levels of moisture.

Groundwater and surface water data recently collected by Tatham Engineering and Earthfx indicate that there are two contributing components of groundwater to the stream baseflow in Medad Valley: the groundwater that upwells directly into the watercourse through the streambed and the groundwater that enters the watercourse through seepage along the valley walls and trickles down into the watercourse.

The model of the proposed extraction activity in P3456 predicts that the limited groundwater reduction primarily occurs during spring melt or large storm (rain) events, so it is a highly temporal reduction that occurs when water inputs are typically higher. The reduction also takes place in a relatively small section of the watercourse between No. 2 Sideroad and Colling Road.

To address this potential impact, a deep infiltration pond has been proposed to mitigate any reduction of groundwater discharging to the Medad Valley. The recent model predicts that the deep infiltration pond reduces the affected area by over 50% (compared to the passive infiltration pond) and is sporadically distributed along the eastern portion of the Medad Valley.

The proposed deep infiltration pond (located between Cedar Springs Road and the West Extension), has been designed to mitigate any negative effects from the extraction of the West Extension on the Medad Valley ANSI and PSW. The deep pond will maintain seepage to the groundwater regime and will aid in maintaining groundwater levels and discharge to the Medad Valley.

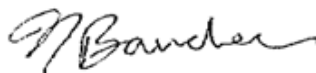
Overall, the setback distance from the extraction footprint to the ANSI and PSW, the moisture-tolerant conditions of the vegetation species and communities and the temporal and limited reduction of groundwater, along with the construction of the deep infiltration pond, all indicate that there will be no negative impact on the ANSI and the PSW.

Proposed extraction activities in the West Extension are more than 10 years from now. Therefore, as a precautionary measure, the AMP is recommending that updated ecological surveys in the Medad Valley will occur at least three years prior to the commencement of extraction activities (in addition to the finalization of the surface water and groundwater triggers). This updated baseline data will be re-evaluated to ensure that there will be no negative impacts to the Medad Valley ANSI and PSW.

Sincerely,  
**GEI Consultants**



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