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19 October 2015

Electronic Mail
Ms. Christine Gervais, MCIP, RPP
Township Planner
Township of East Garafraxa
374028 6th Line
Amaranth, Ontario L9W 0M6

RE: TRI-COUNTY AGGREGATES LTD. GRAVEL PIT APPLICATIONS

Dear Ms. Gervais

We are responding to the technical comments issued by R. J. Burnside & Associates on July 20th and received from Rob Stovel on August 11th.

Our responses are shown in three colours below each of the Burnside comments. Groundwater Science's are shown in green, Arcadis comments in burgundy and Long Environmental comments are in blue.

A copy of the revised site plan is also attached. Drawings 1 and 2 are dated October 19, 2015 and Drawing 3 was revised to satisfy the MNRF comments in July. Revisions have been highlighted in yellow.

The CVC has provided its comments in a letter dated October 9, 2015. We expect to complete our response before the end of the month and will copy the Township. We are satisfied that the CVC issues can be addressed.

Also included is a copy of the MTCS clearance letter regarding "Review and Entry into the Ontario Public Register of Archaeological Reports" of the Stage 1 and 2 Archaeological Assessments prepared by ASI.

We note, among other things, that ARA objections were only received from the County, Township and from Mr. & Mrs. John Kamphuis. We understand that the Kamphuis objection will be withdrawn. MNRF comments have been addressed.

We have requested a meeting with the Township, County and MNRF, to flush out any remaining issues, the Development Agreement and to discuss the process moving forward.

General Comments

Planning Report

- On Page 52, we assume the "minimum working face height is 7 m" should actually be "maximum".

  The *minimum* working face height is a noise requirement specified in the Noise Control Study prepared by Aercoustics and is reflected in notes N11 & N12 on the Operational Plan.

Site Plan

- The label for "Area to be Licensed" should connect to the licensed boundary, not the buffer zone.

  It is shown correctly

Existing Features Plan

- Note C1 refers to the Thomas Madill site as ALHA-46, but it should be ALHb-13.

  This has been corrected

- Prescribed Condition 5 states that a Spills Program will be developed prior to site preparation, but we would prefer to review it as part of the current application.

  We have attached our Client's Emergency & Spill Response Plan. It has been adapted from existing Emergency & Spill Response Plans currently implemented at its other licensed operations.

Operational Plan

- Note W4 alludes to observations being made with respect to the washwater operations interfering with groundwater flow to Shaw's Creek. It is unclear who will be making these observations or how it will be defined. The note seems like a very informal form of a monitoring program and should be expanded.

  The assessments completed indicate no impact to Shaw's Creek is expected due to normal extraction or washwater operations. As stated in the assessment, groundwater levels were observed to be below the creek over the potential washwater operational period, precluding impact to the creek itself. A water level monitoring update is attached for reference. As shown by the update the water table at MW9-14, which is located between the proposed wash pond area and Shaws Creek, was below the creek bed at DP2-13 over most of 2014 and all of 2015 to date. This confirms the interpretations to date, and serves to illustrate the low potential for washwater related impacts.

  However, as part of a prudent approach, the monitoring program includes detailed groundwater level measurements across the site, including DP2-13 and MW9-14. The observations regarding impact to groundwater flow would be made in context with the historical record and relate to seasonal groundwater levels at, and near, the creek.

The condition is general at this time due to the lack of impact potential and straight-forward nature of the impact indicators. For example, washwater drawdown affecting levels at the creek, or gradient toward the creek, at a time of groundwater discharge, would be considered by most reviewers to be a potential impact. Natural fluctuations consistent with pre-extraction, or washwater operation drawdowns at a time when the water table is naturally below the creek, would not represent an impact. Any observation of impact potential would be addressed by the mitigation measures proposed. These observations, and mitigation measures, would be described by the hydrogeological consultant in the annual monitoring report and would be reviewed by MNRF, CVC and the Township.

In addition, separate specific monitoring requirements regarding washing operations are expected as part of any PTTW that would be issued for the operation and will be developed during the preparation of a PTTW application. No washing is proposed for at least 3 to 4 years after excavation begins.

- Please add the Township to the list of recipients of monitoring data in Note W5.

  This has been added.

- There is a well labelled in the location of the existing farmhouse. Does it need to be properly abandoned?

  We agree that any unused former water well within the extraction area should be properly abandoned prior to excavation within that area. A note has been added to the Site Plan stating that: Any unused water well within the license boundary shall be abandoned in accordance with R.R.O. 1990, Regulation 903 (wells) under the Ontario Water Resources Act, prior to extraction activities in the area of the well. The Township may want to consider elimination of the berm adjacent to the 18th Line because of concerns for snow drifting.

  This question is directed to the Township. It is essential practice to build berms adjacent to roadways for noise control. The berm north of the farm entrance is required for Stage 3 noise control. The berm south of the entrance is a visual screen. The berm centerlines are at least 15 m from the road allowance. A snow fence could be installed on the berm tops.

- The haul route may need to be shifted north in order to maintain proper slopes to the southern boundary.

  The onsite Haul Road cross section is shown on Drawing 2. The proposed slopes are 3:1.

Progressive and Final Rehabilitation Plan

- Note 5 suggests that fill will be brought to the site from an external source. The Township has encountered difficulties in monitoring and controlling such activities. It is preferred to use on site materials and to only consider external sources if a soils balance report determines that there is a shortfall. Should the importation of external fill be approved, there will need to be a number of additional notes added to deal with potential contamination etc. and the traffic report will need to consider the additional trucking.

This note is prescribed by the by the MNRF, under whose jurisdiction, specifications and protocols any rehabilitation fill will be imported. There is a soil balance which indicates a shortfall. Our Client is prepared to ensure that no additional daily traffic numbers occur.

- Note E1 refers to reforestation occurring within 0.21 ha immediately north of the site. This area should be shown on the plan. With the post extractive use being agricultural, we would have expected that the agricultural area would be maximized. It is not clear, but it appears that some additional modification may be in order to blend the grades of the rehabilitated site with the adjacent farm field to achieve a better integrated farm field.

  The 0.21 ha planting area location will be finalized with the MNRF and CVC. The site is located within the Greenbelt Plan. Current legislation requires a percentage of all aggregate sites be reforested. The rehabilitation contours are correctly shown and blend well with the adjacent farm fields. Slope transitions will be nominal.

Traffic

- 3.0 m road widening is required on the 17th and 18th Line.

  Our Client agrees to provide the required widening once the licence has been issued.

- It is difficult to understand exactly what is being put forward to address traffic issues. The application was supported by a Traffic Impact Study prepared by C.F. Crozier and Associates dated March 2014 (a copy of which was previously provided to the Township on an informal basis). As noted in the Section 11 of the Planning report, the projected traffic volumes in the Crozier report became obsolete right around the time it was released, as a result of Greenwood posting its application to increase annual production. Those numbers were confirmed in October of 2014. While the Planning Report makes reference to the recommendations of the Greenwood traffic consultant, it isn't clear whether or not Tri-County agrees with the recommendations and is willing to participate in the upgrades. If so, there is a need to establish how and when the recommendations will be implemented.

  Tri-County does not foresee any need for additional studies. We discussed this with Scott Burns, the County Engineer on August 14th. He agreed that the County and the Township and their consultants should determine the road improvement requirements to accommodate an annual production of 3 million tonnes, as proposed by Greenwood. Tri-County has always recommended that this engineering should be handled by the municipalities and it has agreed to pay its one third share of the cost all the required improvements.

- We support the comments made by Triton Engineering on behalf of the County of Dufferin as outlined in their memos of June 5 and 22, 2015. These comments mostly affect the design details for the intersection of County Road 3 and Township Line 17.

  Please refer to above response.

- The Crozier report found a number of site line issues on the 17th Line, concluding that appropriate design speeds had not been followed. However, these conclusions were based on contours taken from aerial photography, which are relatively inaccurate. We have field checked the conclusions and determined that a number of the areas identified are in fact satisfactory.

  Please refer to above response.

- In our email of December 12, 2013 we asked that the traffic report determine queuing lengths for trucks awaiting the unlocking of the gate, with the intent of locating the gate at a distance that would allow the queue to take place outside of the municipal right of way. The report did not provide the information requested.

  The onsite haul road has approximately 670 m of 2 lane road for queuing trucks. The length of a typical tractor trailer is about 16 m. The proposed internal "Truck Parking Lane" is shown on the Operational Plan. This lane could accommodate up to 40 trucks. A fence and locking gate has been added to the Operational Plan, between stages 1 and 4, at mid concession to permit after hours, onsite parking. Township road parking can be prohibited.

Hydrogeology

- Groundwater levels have only been monitored since November 2013, which is a relatively short period of time. The application is premised on a maximum seasonally high groundwater elevation of 475.5 masl at the southern part of the site (see Note 6 on the Existing Features Plan). The southern part of the Tri-County site is contiguous to the northern part of the Greenwood (East Pit) site, which is also currently under review for license. The supporting documents for the Greenwood site contain several more years of data, and suggest a maximum seasonally high groundwater elevation of 477.2 masl (MW99-09) at its northern end. In other words the Tri-County application is based on a groundwater elevation that is 1.7 m lower than what was determined by Greenwood in the same general location. This discrepancy could require significant amendment to the Tri-County plan.

  The high water table at the site is based on data available to the study team at this time, which does not include the historical monitoring record for the Greenwood site. If the Township can make available the entire monitoring record for the Greenwood site then longer term comparisons could be made. We note that the monitoring record for the Tri-County Pit site does include some measurements from the spring of 2010, which are approximately 0.5 m lower than the maximum elevations used to establish the water table.

  We do have some publically available information from the MTE Greenwood April 2010 report, which includes 4 measurements at MW9-09 from May to June 2009. However we do not have enough information to determine what factors may be involved in the apparent discrepancy at this location (only). For example we know that the till unit rises east to west, and may also rise to the south of the Tri-County site. The drilling results for Greenwood MW9-09 and are significantly different than those for nearby Tri-County MW7-14. In other areas of the site, for example near MW2-10, the maximum water table identified for the Tri-County property is at or above the maximum water level of the Greenwood monitor BH2, according to the data we have at this time.

  We cannot speak to the technical sufficiency of the Greenwood monitoring program or interpretations to date, however we are confident that the data collected to date, and the determination of the established water table for the Tri-County pit, are technically sound.

The established water table at the Tri-County site is based on the best available data for the site at this time. However, as noted on the Site Plan, the excavation will also remain above the water table as determined by the ongoing monitoring program. Any future adjustments needed to extraction depths will be made in order to maintain site compliance. The proposed monitoring program is robust enough to ensure sufficient data is available for this purpose.

- The GSI report includes the location of wells within 500 m of the site with locations based on coordinates obtained from the MOECC interactive water well mapping website. All offsite wells are indicated to be deep drilled wells completed in the bedrock. However, it is possible that there may be shallow dug wells in the area that are not included in the MOECC database. This should be confirmed with a door to door well survey.

  The proposed extraction is above water table only, which does not have the potential to affect the water table, or shallow water supplies, in the overall area. Private well surveys to assess shallow dug well locations are typically required for below water extraction proposals (only). We do anticipate a door to door survey would be needed as part of any PTTW application involving a make-up well. The survey would be completed at that time and as part of that process.

  We can confirm that based on air photos there are only 9 off-site residences within 500 m of the site, one of which is the Kamphuis farm. In addition there are three active pits. Drilled bedrock well records appear to correspond to all but one of the residences, for which there is no corresponding well record located nearby.

- After the observation wells were developed response tests were completed to estimate the hydraulic conductivity (K) of the sand and gravel unit. The overall geometric K valve of 1.07×10^{-4} m/s was calculated by GSI. However, the K value for MW7-14 (8.4×10^{-7} m/s) seems abnormally low considering the material is described as medium to coarse sand. The borehole logs indicate that some native material has collapsed around the screen.

  We note that the sand-pack and subsequent annular seal were placed as the augers were removed. Therefore any native material collapse would be from within the screened interval depth and not above (where more silty material was noted).

- The water level response for MW7-14 shows a similar trend as MW5-15 which suggests that the well is providing appropriate water level data. However, the water levels were initially very similar, but the difference between water levels has increased over time. Burnside recommends that MW7-14 be subjected to additional development to remove any silt that may have accumulated in the well.

  As illustrated by the monitoring update, the long-term water level trend at MW7-14 corresponds to MW5-14 and the remaining on-site monitors. This indicates that the water level data to date at MW7-14 is appropriate and not significantly affected by any silt accumulation. In addition, monitor MW7-14 was redeveloped on September 23, 2015. The well pumps continuously at a low rate, however the discharge water contains silt and very fine sand, and, does not seem to clear over time. This is likely due to a larger silt fraction within some portion of the screened interval than noted within the borehole log, perhaps within a discrete layer or over the entire interval. The static level prior to redevelopment and after full recovery was the same, also indicating that the silt that was removed from the well did not interfere in the static water levels measured to date.

- The pumping from the wash pond has the potential to lower the water table. This will need to be considered when establishing the high water table for the site. Consideration also needs to be made for cumulative impacts, as other pits in the area may be operating washing plants at the same time. In addition, as indicated above it should be confirmed that there are no dug wells in the area.

  The high water table at the site was established based on spring 2014 levels, this will not change due to any potential drawdown, or water table lowering, at the wash pond. If levels trend higher over time some change in maximum extraction depths could be expected.

  Impact assessments and monitoring requirements regarding washing operations will be developed during the preparation of a PTTW application. Monitoring conditions related to water taking drawdown and/or private wells are expected as a condition of any PTTW issued for the site. No washing is proposed for at least 3 to 4 years after excavation begins.

- GSI suggests that a bedrock well pumping would provide sufficient water to "top up" the pond. Prior to considering the use of a bedrock "make-up" well GSI should confirm that the predicted drawdown will not result in water levels below the pump setting in nearby domestic wells. If a bedrock "make-up" well is to be considered, the monitoring program should be expanded to consider the closest domestic wells. The "high water table" will need to take into account any drawdown associated with the wash pond.

  Potential impacts will be addressed during the preparation of a PTTW application.

- Any required MOECC approvals, such as a Permit to Take Water, should be obtained prior to final approval by the Township of the project. The Township should be copied with any application as well as supporting documentation.

  The MOECC will not process or issue permits until the zoning is in place and the licence has been issued. We have attached a June 2007 MOE "Notice of Refusal" for the PTTW application for Mr. Pevato's proposed Melville Pit. We understand that David Germain was involved in the hearing for Nelson Aggregates' proposed Burlington Quarry, where the same issue was raised, with the same outcome.

Air Quality

The following comments arise from our review of the Air Quality Assessment prepared by Senes Consultants and dated January 2015.

- Page 1.6 indicates "These sources include exhaust emissions from mobile equipment such as haul trucks and front end loaders, and stationary equipment such as a diesel generator." The diesel generator, depending on specific parameters may be required to be registered on the Environmental Activity and Sector Registry (EASR) or apply for an Environmental Compliance Approval.

  The diesel generator will be used to provide primary power to the processing plant. EASR applies to stand-by generators only, and is therefore not applicable to Tri-County operations. The processing plant, which includes the diesel generator, crushing and screening equipment will be situated in different areas of the pit during the extraction lifecycle and is therefore considered to be mobile equipment. Any mobile equipment that is used for the

crushing or screening of aggregate, if the mobile equipment is located below grade in a pit or quarry that is operated in accordance with a licence or permit issued under the *Aggregate Resources Act* is exempt from Section 9 of the *Environmental Protection Act* under Ontario Regulation 524/98. Tri-County will not be required to prepare and submit an application to the MOECC for an Environmental Compliance Approval.

- Clarification is required for the source and the data that was used for background data. There is reference on Page 2-1 to a report dated October 13, 2013 by C.F. Crozier & Associates which is not included in the references. However on Page 3-11 reference is made to a Crozier report dated March 2014 and that report is listed in the references. We would like to know what information was taken from each of the two studies.

  All traffic data used in the air quality assessment was taken from the C.F. Crozier & Associates report dated March 2014. Section 3.3 on page 2 of the Crozier report explains that the turning movement counts on nearby roads to the proposed Tri-County Pit were taken on October 13, 2013. So the report is dated March 2014 but the counts were collected on October 13, 2013.

- The permanent processing plant may require an Environmental Compliance Approval from MOECC. If so, the approvals should be secured prior to final approval of the project. The Township should be copied on any applications to MOECC.

  See above response to air quality comment 1.

- Table 3.1 should include rehabilitation activities that take place during Stages 1 through 4.

  ARCADIS provided a brief description of rehabilitation activities within the last paragraph on page 3-1 that reads: *"During Stages 1 through 4, progressive rehabilitation of processed areas will occur in addition to extraction."*

  Progressive rehabilitation will occur in 5 stages, as shown on Drawing 3. Perimeter slopes and worked out pit floor areas will be rehabilitated in sequence during site preparation. Subsoil and topsoil will be replaced in the reverse order in which it was removed during site preparations using similar equipment. The maximum disturbed area is 40 ha. Based on the maximum production rate, up to 8 ha of land will be required annually. Therefore, it is expected that up to 8 ha of extracted land will be allocated for progressive rehabilitation annually.

- It would be helpful if a legend was provided with Figure 3.1. Location of berms A, B, C

  The berms are correctly shown on drawing 2 of 3 Operational Plan plotted 11 December 2014.

- The MOBILE 6C Emissions Model was used, rather than MOVES, which is more current and replaced MOBILE in 2010. Please justify why the latest version was not used in the assessment.

  Mobile 6C is the Environment Canada modified version of the U.S. EPA vehicle emissions model that better represents the Canadian vehicle fleet. ARCADIS has historically suggested to Environment Canada that the new U.S. EPA MOVES model be updated to represent the

Canadian vehicle fleet. When the Tri-County assessment was completed it was ARCADIS practice to continue with the Mobile 6C model; however, ARCADIS has ultimately moved to the use of the newer MOVES model for vehicle emissions.

It should be noted that use of the MOVES emissions model is not expected to impact the results of the Tri-County Air Quality Assessment.

- Table 4-2 includes Area-3, but not driving length through Area 1 or 2. It is not clear how trucks get to Area 3 without passing Area 2.

  Travel through Areas 1 and 2 are included within the modelling scenario outlined in Table 4.2. The ID (or nomenclature) used is as follows: source SHIP_3 includes Shipping Truck travel through Area 2 from the processing plant out to Area 1; source SHIP_4 includes Shipping Truck travel through Areas 1 and 4 to the site entrance; and, source OHT_3 included Off-Highway haul trucks travel within Areas 2 and 3.

- Truck movement is included in Stage 4 in Area 3; however, Table 3.1 does not mention any activities in Area 3 during Stage 4. Please clarify what activities are occurring in Area 3 during Stage 4. 1

  During stage 4 the processing plant will remain in Area 2 as per the Operation Plan. The processing plant activities are modelled as an open pit source called "AREA3". AREA3 emission sources include: primary crushing, secondary crushing, screening, diesel generator, tailpipe emissions from 2 shipping loaders, and road dust and tailpipe emissions associated with the shipping and haul truck movements.

- Does the column in Table 5.1 for "Exceedances (days/yr.)" for overall maximum mean 72 exceedances on average per year, or does it mean 72 exceedances in 5 years?

  The column in Table 5.1 for "Exceedances (days/year)" means on average per year.

- The overall maximum 24-hr PM10 concentration for the Stage 4 case is predicted to be 146 µg/m^3 compared to an interim AAQC of 50 µg/m^3. Table 5.2 indicates that there will be 26 exceedances per year, which means every 2nd week there will be a day where the concentration is above the criteria. In this case, the contribution just from the pit extraction activities not including roads is 74%; therefore, it appears that this one source would result in off-property concentrations above the AAQC value. After removing outliers, the predicted maximum concentration is 114 µg/m^3, which is more than double the AAQC value of 50 µg/m^3.

  AAQC are applicable at receptor locations and are not applicable at maximum off-site locations. The model predicted maximum off-site concentration is located immediately adjacent to the unpaved site entrance road (approximately 2.5 m away), which is typically for aggregate extraction operations.

  It should also be noted that as outlined in Table 5.4 the source "Tri-County Pit" contributes 74% of the overall PM10 maximum, but this does include road sources located below grade within the pit. If all road and wind-blown dust sources are removed from the source "Tri-County Pit", then extraction activities account for 29% of the overall maximum 24-hr PM10 Stage 4 concentration of 146 µg/m^3 (or 42 µg/m^3).

- A similar situation exists with TSP. Table 5.2 indicates exceedance on 72 days per year. If the facility operates 6 days a week for 10 months a year then the facility operates (6*10*4.3=) 258 days/year. With 72 exceedances in 258 days, there will be exceedances on (72/258*100% =) 28% of the days of operation which is one or two days a week. If the simulation used emissions for 365 days/year, then the exceedances happen (72/365*100%=) 20% of the time which is still more than once a week.

  AERMOD is known to predict concentrations quite well but not predict the location of that concentration as well. The distance from the predicted 24-hr TSP overall maximum to the nearest receptor is less than 100 m; therefore, there is a significant possibility that the worst-case exceedances might actually occur at receptor R9.

  ARCADIS disagrees with this statement – the 24-hr TSP maximum off-site location is approximately 2.5 m from the edge of the site entrance road, whereas R9 and R10 are both 106 m from the entrance road.

- Please justify why exceedances above the criteria, given their frequency, contribution from pit extraction and distance to the nearest sensitive receptor should be considered acceptable.

  AAQC are applicable at receptor locations and are not applicable at maximum off-site locations. The model predicted maximum off-site concentration is located immediately adjacent to the unpaved site entrance road (approximately 2.5 m away), which is typical for aggregate extraction operations.

- Cumulative impacts with other local pits should be considered. Potentially, if approvals are given there could be several hundred acres of pits exposed and creating dust at the same time.

  Cumulative impacts were considered: Table 5.4 outlines the contributions from all sources considered that result in maximum predicted concentrations. The Air Quality Assessment evaluated the potential impact of the proposed Tri-County Pit in combination with emissions from the nearby existing and proposed Greenwood Pits which were then added to regional background concentrations.

Yours very truly,

LONG ENVIRONMENTAL CONSULTANTS INC.

R. J. Long, P. Eng, MCIP, RPP

c.c. Client, GSC & Arcadis (Senes)